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ABSTRACT

In local communities across the United States, local government officials – specifically local bureaucrats – are faced with the realities of a changing climate which include severe storms, prolonged droughts, larger and more damaging floods, and more. Simultaneously, the issue of climate change is incredibly polarized in US politics with one side claiming it is not happening (or if it is happening it is not human caused) and the other framing the issue as the direst threat (or close to it) facing the planet.

This dissertation examines an empirical puzzle, asking whether and how local bureaucrats respond to the threat of climate change in their communities. I find that many, but not all, local bureaucrats are responding by developing climate adaptation plans and considering policies which might help their communities avoid the consequences of climate change. They are not acting alone, they work with support from the federal or state government, other bureaucrats, or multi-stakeholder organizations which allow them to access resources and gain political support when they would otherwise not have it. Climate change adaptation, like other emergency and disaster management policies, does not garner much attention from local politicians unless there currently is a disaster the community is responding to or recovering from that forces their attention.

Throughout this project, I examine how local bureaucrats step out of their conventional role as policy implementors to shape local agendas and formulate policy – policymaking roles often dominated by elected politicians, members of the media, and advocacy organizations. I argue that local bureaucrats occupy the perfect institutional role for shaping the development of climate adaptation in local governments. They have issue-specific knowledge, making them emergency management and climate adaptation experts (or at least the actors with the most

expertise of this kind in local government). This often leads to elected officials deferring to bureaucrats when policies and plans need to be written, like emergency management plans, land use plans. When bureaucrats write these plans, they have the opportunity to incorporate climate adaptation provisions. Local bureaucrats also hold institutional knowledge in local governments. They are more likely to know state and federal policies and requirements, which may encourage climate adaptation (e.g. the Obama Administration's efforts through the Federal Emergency Management Agency (FEMA) to encourage local adaptation policy).

Local bureaucrats are also more motivated than elected officials to address climate change. I find that the bureaucrats in this study were aware of the political debates around climate change, but they often adopted a position which separated local adaptation efforts from the polarizing debate around what causes climate change (i.e. who or what is responsible for the problem). This enabled them to address their communities' needs to adapt without drawing opposition from conservative members of their communities who do not think climate change is happening or caused by human activities.

I also address the intergovernmental environment local bureaucrats respond to: specifically, their relationship with their state governments and the federal government. Even though states and the federal government wield significant influence over local governments – mostly through the control of resources – local bureaucrats do not avoid climate adaptation solely because the state government disapproves. A few cases demonstrate that state governments' and FEMA's encouragement to address climate adaptation impacted local bureaucrats' decisions to create adaptation policies. However, it was not the only or the most important influence in local bureaucrats' decision-making.

In sum, this project demonstrates that local bureaucrats are important actors in the development of local climate adaptation policy. Local bureaucrats' efforts alone are not enough to adapt to climate change, but they are an important first step when politicians cannot or will not act. While only climate adaptation policy was studied in this project, these findings speak to the important role bureaucrats play in creating policy when elected officials do not – either because the issues have low saliences, are highly technical, or are politically polarized.

LOCAL BUREAUCRATS AND CLIMATE CHANGE ADAPTATION

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DISSERATATION

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LIST OF COMMONLY USED ACRONYMS

CRS	Community Rating System
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FL	Florida
GIS	Geographic Information Systems
IPCC	Intergovernmental Panel on Climate Change
NFIP	National Floodplain Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NC	North Carolina
NV	Nevada
NWS	National Weather Service
PE	Public Engineer
QCA	Qualitative Content Analysis
SC	South Carolina
UNC	University of North Carolina
UNFCCC	United Nations Framework Convention on Climate Change
UNVR	University of Nevada, Reno
US	United States
WA	Washington

CHAPTER 1: THEORY

1. The Water Is Rising in Miami Beach

Miami Beach, Florida is a city of approximately 90,000 people situated on a barrier island at the southernmost end of the Floridian peninsula. The city is known for its pristine white sand beaches and semi-tropical climate, but in the past four years Miami Beach has been making national headlines for its sea level problems. The city sits at an average elevation of only four feet above sea level and many areas in the city are at or below sea level. In the past several years, ocean tides caused flooding even on sunny days and a yearly extreme high tide called “King Tide¹” has inundated the entire city.

Despite the immediacy and obviousness of sea level rise in Miami Beach, the city is operating without support from the State of Florida in their attempts to address the flooding (Wile, 2015). Florida’s Governor Rick Scott claims he is incapable of judging if climate change or sea level rise is a real threat or not because he is “not a scientist” (Caputo, 2014). Additionally, Scott’s administration has an unofficial policy banning the use of “global warming” or “climate change” in any official state communication (Korten, 2015).

Without state government support, Miami Beach is left to figure out its own solution and raise its own funding. The city government decided to install a massive pumping system to keep the streets dry. The project is estimated to cost in excess of \$400 million dollars (Davenport, 2014; Paquette, 2014) and relies on existing drainage canals which use gravity to drain the land. However, the canals no longer properly function because of sea level rise, so large pumping stations push the water out to sea. The project is funded in large part by local property taxes,

¹ For more information about King Tides, see the Environmental Protection Agency’s explanation at <https://www.epa.gov/cre/king-tides-and-climate-change>.

leading to what *Washington Post* reporter Danielle Paquette deemed “Miami’s climate catch-22” because the city must encourage beachfront development in order to raise funds to build the pumping system that will keep those same beachfront locations from flooding (2014).

The situation in Miami Beach provides an example of how climate change will impact communities in the United States and how the polarized political debate surrounding the issue is likely to force policymaking away from federal or state venues and into alternative policy pathways with fewer partisan political consequences. Miami Beach is not the only community facing significant threats from climate change. The Universal Ecological Fund published a report in September 2017 estimating that the costs of climate-driven extreme weather and air pollution accounted for \$360 billion in economic losses annually in the U.S. (Watson, McCarthy, & Hisas, 2017). This report took into consideration the National Oceanic and Atmospheric Administration’s (NOAA) list of billion-dollar disasters. In 2017, NOAA identified 16 billion-dollar (or more) disasters including Hurricane Harvey in Texas, Hurricane Irma in Florida, Hurricane Maria in Puerto Rico, wildfires in the western states, and severe storms and tornadoes in the plains states. These 16 disaster events combined caused upwards of 309 billion dollars of damage (NOAA National Centers for Environmental Information, 2018).

Compiling the direct costs of severe weather or disease outbreaks caused by climate change is in many ways a conservative estimate of climate change costs. According to a study of the county-level damages from climate change written by Hsaing et al (2017), climate change will also injure the economy by disrupting entire sectors like agriculture or hurting the labor market (e.g. more people suffer from diseases which take them out of work and more people are displaced from their homes due to severe weather). The researchers calculated a county-level mortality estimate. Nationwide, nine people out of every 100,000 people is likely to die from

climate change each year. Their estimate allowed variation by county, and they found that the high range of this is in Hernando County, Florida (just north of Tampa, Florida) where 69 people a year are likely to die from climate change. The authors found that climate change is likely to exacerbate existing inequalities. Poor communities and the southern states will be hit harder by the effects of climate change, largely because these areas have less economic capacity than northeastern or west coast states whose communities can afford to prepare for and respond to climate threats.

Studies like those mentioned above try to quantify the costs of climate change. However, they cannot capture more intangible damages that lead to larger, long-term problems. For instance, after Hurricane Katrina devastated New Orleans in 2005, entire neighborhoods were abandoned as their former residents migrated out of the state. Businesses and schools in these communities were radically transformed (Robertson & Fausset, 2015). The cultural and social impacts of Hurricane Maria in Puerto Rico are only beginning. Due to the U.S. federal government's minimal disaster recovery efforts, campaigns for statehood and even independence are stronger (Hernández, 2018). If successful, these efforts could radically redefine the island's economy, politics, and society.

Even though the risks from climate change are not evenly distributed across the U.S., every county faces the potential of significant problems if climate change is not addressed. Climate mitigation would minimize these threats across the country (and the world), although it is too late to prevent any effects of climate change (Jones N., 2017). However, if climate mitigation does not occur – or occur fast enough – communities will need to adapt to minimize damage and save lives.

The risk of climate change damage, especially in areas with political opposition to addressing climate change, means that many local communities will be left to deal with the consequences of climate change without support from the state government. This raises a number of important questions about how local communities deal with climate change adaptation including: Who in local government is advocating for climate adaptation? What impact does polarization have on local adaptation policy development? Broadly speaking, this dissertation will answer this question: what role do local bureaucrats play in shaping local policy, especially local climate adaptation policy?

2. Research Questions

Climate change adaptation policy is at a nascent stage at the federal level in the United States largely due to political polarization and gridlock around the issue. Like many other environmental policy areas, legislative gridlock in Congress has pushed advocates to pursue non-Congressional venues for policy change (Klyza and Sousa 2008, Pralle 2003). As alternatives to the national legislature become more important, scholars must turn their attention to the actors and institutions that shape policy change at the state and local level, which will not merely look like ‘scaled down’ versions of national politics.

For U.S. policy, scholars are only beginning to explore local climate change adaptation planning. Scholars are looking at how institutions and organizations are building capacity to address climate change across sectors (Craft & Howlett, 2013), the adoption of specific policies (see Wood, Hultquist and Romsdahl’s work on Midwestern U.S. policy development (2014) and Zimmerman and Faris’s study of climate action plans (2011)), and the legal foundations for creating local policy (Gremillion, 2011). These articles suggest that integrating or “mainstreaming” climate adaptation into existing policies in the United States as an important

pathway for local policy development.² Mainstreaming (or policy layering) capitalizes on existing structures rather than creating entirely new institutions. In other words, it represents a path of less resistance to policy change, although some authors have raised the possibility that this leads to maladaptation (Tennekes et al, 2014). While scholars are beginning to address climate adaptation integration, including Haywood et al's study of adaptation through land-use planning in North and South Carolina (2014) and Wilbanks and Kates's work on New Orleans (2010), they do not examine the process by which integration happens.

Furthermore, when climate adaptation is considered as a new goal within an existing nonpartisan or bipartisan issue area – like preparing for disasters or managing public water – we expect to see climate change's partisan baggage enter the conversation about the new policy.³ This can cause traditional policymaking channels – like the federal legislature and the executive branches – to close due to partisan gridlock. However, other policymaking routes exist and may constitute the main arenas for action, including policymaking through the bureaucracy. As media reports show, some local bureaucrats are already playing an important role in shaping new climate adaptation policies (see Flesher 2014, Wernick 2014). Picketts, Curry, and Rapaport, for example, found that environmental planners in British Columbia are interested in incorporating climate adaptation into land use planning, even though they currently did not have the resources to do so (2012).

Local bureaucrats are an important group of actors who are often overlooked in research on policy formulation and change. Scholars often focus on their role in policy implementation

² There is a large emerging literature on climate policy integration focusing largely on efforts in Europe to address climate change through existing policies. For examples see Adelle & Russel (2013), Brouwer et al (2013), Carter (2011), Kok & de Coninck (2007), and Uittenbroek et al (2013).

³ This dynamic has already been observed in the recovery effort from Sandy in New York City where Henry Ovik – former advisor to former Housing and Urban Development Secretary Shaun Donovan – admitted to avoiding the language of climate adaptation to sidestep the associated polarization (Shorto, 2014).

and miss how their behavior might impact whether and how policies change. I argue that local bureaucrats are uniquely situated to shape local climate adaptation policies because of their expertise and relative isolation from partisan pressures. I seek to improve our understanding of whether, and how, local bureaucrats influence climate change adaptation policy by studying the integration of climate adaptation goals into local flood and drought management policies.⁴ Additionally, I examine how polarization and intergovernmental relations interact when a polarized issue – climate change – is introduced in an already complex policy area – disaster management. Understanding these dynamics sheds light on the role that bureaucrats play in shaping policy at the local level, but it also helps us understand when and how bureaucrats engage with highly polarized issue areas and become policy advocates or agents of policy change. The polarized nature of climate change contributes to the gridlock that stops national action and it also influences bureaucrats in unanticipated ways to both encourage and discourage action at the local level.

This project specifically draws attention to bureaucrats as important strategic actors whose choices are influenced by their career goals, the wishes of their political superiors, a polarized issue environment, pressure from the public, and their personal beliefs (Teodoro 2011, Lipsky 2010, Wilson 1989, Stensöta 2011). Their position as local implementers of natural disaster policies makes them more likely to (a) pay attention to how climate change alters flood and drought prediction models, and (b) have expertise at the local level to shape the integration of climate change into existing policy. Thus, the first question this project asks is: *In what ways*

⁴ See Chapter 2: Methods for a more in-depth discussion of why flooding and drought management policy were chosen. In short, floods and droughts represent two types of regularly occurring disasters that will become worse with climate change.

do local bureaucrats play a driving role in shaping local communities' climate adaptation plans?

Second, this project unpacks the influence of intergovernmental arrangements on bureaucratic behavior. Federal, state, and local governments participate in flood and drought management. Federal and state governments set minimum standards and local governments design and implement policies to comply with those standards. Due to this, existing institutional arrangements and intergovernmental relationships shape local bureaucratic behavior as it pertains to integrating climate change adaptation into flood and drought management. Therefore, this project also addresses *if and how the intergovernmental policy environment influences bureaucratic behavior vis-à-vis the development of climate adaptation policy.*

In the following sections, I develop a series of testable hypotheses and a typology of bureaucratic behavior. First, I discuss who front-line bureaucrats are and why they are uniquely situated to address climate adaptation in local governments. Next, I examine the sources of local bureaucrats' influence over policy change, discussing both structural autonomy and personal motivations. Third, I argue that the level of agreement within the policy community about the validity of climate change and agreement on whether local governments can or should adapt influences bureaucratic decision making and action. Fourth, I present a typology of bureaucratic behavior which helps us understand how bureaucrats act to shape local climate adaptation efforts. This typology is not specific to climate change and can be applied to any situation where bureaucrats might act to shape policy in highly polarized issue contexts. Finally, I discuss how the influence of multiple principals at each level of government – local, state, and federal – shapes bureaucrats' decision making.

3. Local Bureaucrats' Unique Position to Shape Local Climate Adaptation

To begin, it is important to clarify who front-line bureaucrats are and where their ability to shape local policy comes from. Front-line bureaucrats are on the edge of the bureaucracy, they work directly with the targets of a policy within a given community (the recipients of services or subjects of regulation). Also called street-level bureaucrats (as coined by Lipsky in his book *Street Level Bureaucracy* (1980 [2010])), common examples of front-line bureaucrats are police officers, social services case workers, and public-school teachers. Front-line bureaucrats can also be administrators whose work is predominately completing paperwork or attending meetings, as long as those tasks work directly for the people in a community.⁵ Examples of bureaucrats who work on flood management and drought management are publicly employed civil engineers, land-use and zoning administrators, community planners, and public water utility managers. These bureaucrats often work with community members on technical questions about policy regulations and requirements.

Scholars and advocates often focus attention on elected officials as agents of change and overlook bureaucrats as potential policymakers. Instead, bureaucrats are cast primarily as policy implementers (Pressman & Wildavsky, 1984; Altfeld & Miller, 1984; May & Winter, 2007; Wilson, 1989). This strain of the literature relies heavily on the principal-agent model⁶ (beginning with Terry Moe's application of principal-agent modeling to the bureaucracy (1984)) and shows clearly bureaucrats are not only agents of elected officials but are also beholden to their bureaucratic superiors and to the publics they serve.

⁵ This differs slightly from Lipsky's definition because he was most interested in bureaucrats who worked directly with members of the general public. However, many of his observations apply to bureaucrats who work with a select group or class of community members.

⁶ This work does not argue that principal-agent theory cannot explain part of the role of bureaucrats in the policymaking process. However, it demonstrates that principal-agent theory can be limiting because it minimizes the role bureaucrats play in shaping climate adaptation policy independent of their implementation duties.

Principal-agent theory provide a framework for scholars to examine how well bureaucrats implement the policy preferences of elected officials and how and why bureaucrats do not conform to these preferences (Moe, 1984; Whitford, 2005; McCubbins, Noll, & Weingast, 1987; McCubbins & Schwartz, 1984). Scholars have also tested alternative explanations for why bureaucrats conform to politicians' wishes, including bureaucratic values (Meier & O'Toole, 2006) and organizational structure (Hammond, 1986).⁷ Despite their disagreements, these scholars all remind us that bureaucrats step out of the role of "agent" and occupy other roles in the policymaking process. They can change policies during implementation by being 'bad agents': defying their superiors through whistleblowing (Peters & Branch, 1972; Martin & Rifkin, 2004), employing guerilla behaviors (O'Leary, 2006), or exercising their autonomy (Rourke, 1979; Carpenter, 2001). They can also exercise significant powers of discretion during policy implementation (Teodoro, 2011). Bureaucrats also influence policy formulation through sharing their expertise and influencing agendas (Altfeld & Miller, 1984), building neutrality in political fights (Huber, 2007), and by playing multiple principals off one another (Whitford, 2005).⁸ Some bureaucrats even become policy entrepreneurs and introduce new policies onto the agenda in the same way that activists and elected officials might (Teske & Schneider, 1994).

While most of these studies focus on federal or state-level bureaucrats, local bureaucrats are capable of shaping policy change, as several studies show. Lipsky (2010) focuses on the power of discretion in policy implementation and demonstrates that street-level bureaucrats are capable of ushering in innovations. Relatedly, Teske & Schenider (1994) argue that local

⁷ Although it is not germane to this project, the growing literature on stewardship theory to explain bureaucratic behavior further demonstrates the weaknesses in assuming a perfect principal-agent relationship between politicians and bureaucrats (see Davis, Schoorman, & Donaldson (1997) and Van Slyke (2006) for examples). The relationship is much more fluid with bureaucrats taking on significant policymaking responsibilities.

⁸ These will be discussed in more detail in Chapter 1, Section 4.

bureaucrats – especially city managers – are well positioned in local government to become policy entrepreneurs: introducing new agenda items and formulating policies. The authors argue that city managers’ structural influence in local government makes them excellent candidates to introduce a wide range of innovations. Both of these studies were right to focus on the institutional position of local bureaucrats as their source of influence over policy. This project builds on their work to argue that front-line local bureaucrats occupy an institutional position which makes them likely to influence policy change for the following reasons. First, they are more sensitive to changing conditions and attitudes of the publics they serve because they work on the front lines (Lipsky, 2010). This is especially true in local disaster management where bureaucrats are active in mitigation and response planning (Kusumasari, Alam, & Siddiqui, 2010). The number and types of interactions front-line bureaucrats have with community members change with on-the-ground conditions, serving as a barometer of sorts. For instance, when heavy rain events lead to increased flooding in a community, the city engineer and public works director get more calls from residents, leading them to increase the community’s debris-removal efforts or to consider changes to their storm water management system.

The further removed a bureaucrat is from these pressures – or the higher in the organizational chart an individual is – the less likely they are to be responsive to these fluctuations. This is not to say that top-level officials in the bureaucracy or elected officials are always unresponsive; however, since their day-to-day activities do not include working with the local community or local environment in one issue area, they are less exposed to fluctuations as they occur. While Teske and Schneider emphasize the influence of top-level local bureaucrats (city managers), they overlook the role of information in shaping policy agendas (Jones B. D.,

1994). Front-line bureaucrats have first-hand knowledge about the policy environment⁹ whereas city managers must rely on these actors passing information to them. Lower-level local bureaucrats therefore have an agenda setting power that managers lack. Their decisions about how to prioritize information shape how policy is created.

Local bureaucrats have access to and influence in local agenda-setting venues. They are present during conversations and in spaces where local policies are made. These spaces include both public and private government meetings, conversations with other bureaucrats at the local, state, or federal level, and interactions with policy targets – property owners, builders, local businesses, the agricultural community, etc. Where advocacy groups have to establish access to local governments in order to shape policy, bureaucrats have this access as a part of their job. The spaces or locations where policies would change, then, include: local ordinances, local management plans, and conversations between the local bureaucrats and policy targets. Empirically, it is easier to see formal policy change – e.g. in ordinances and formal planning – because these are recognized spaces often documented with meeting minutes. However, as Lipsky (2010), Lin (2000) and others show this is not the only space where policies are shaped – informal venues like conversations between policy implementers and policy targets are spaces where policies can change.

In local governments, front-line bureaucrats are also more likely to be aware of the policies that state and federal governments are addressing than their elected counterparts. Most local governments have volunteer or part-time elected officials, with the exception of large cities.

⁹ Here, “policy environment” describes the physical and social conditions the policy affects or is affected by. In the case of flood or drought management, the policy environment includes the local climate (rainfall and water in the natural environment), government agencies, citizens that would be affected by a flood or drought, and organized groups that have an interest in floods or droughts including – but not limited to – disaster response organizations like the Red Cross, homeowners associations, environmental protection groups, agricultural organizations, business owners, and business advocacy groups.

Thus, the professionalized policymakers in local governments are almost always bureaucrats. Local bureaucrats' tenure is often long – surviving many turnovers in elected officials, and they are full-time hired staff rather than volunteers. Therefore, local bureaucrats are aware of signals sent from superior governments in the form of memos, grant application guidelines, discussions about new laws or policies, and more. For instance, when Massachusetts Governor Deval Patrick created a climate change adaptation fund (Schoenberg, 2014), it sent the signal to local governments that climate adaptation is an important policy priority. Conversely, when North Carolina's legislature passed a law to prevent localities from considering sea level rise in their planning documents, this sent the signal that climate change adaptation should not be prioritized (Rawlins, 2012).

Additionally, front-line bureaucrats are nonpartisan actors, allowing them to take unpopular positions without worrying about straying from the “party-line.” Due to this, front-line bureaucrats might be more accountable by responding to changing conditions and the needs of the public (e.g. preventing flooding damage due to climate change) than elected officials who are pressured to follow partisan commitments. In the case of flood management and drought management policy, front-line bureaucrats are sensitive to changes in flood or drought frequency and severity (including those due to climate change) as well as public attitudes about acceptable levels of risk. This makes them more likely to consider promoting or blocking flood or drought-related climate adaptation efforts to fit with the community's needs. Since they are more removed from partisan consequences, the polarized debate around climate change is less likely to influence how they act.

Due to the characteristics discussed above: (1) responsiveness to the public and to changing on-the-ground conditions, (2) awareness of signals from superior governments, and (3)

protection from partisan or electoral consequences of policy positions, I offer the following hypotheses:

Hypothesis 1: Front-line local bureaucrats are more likely than elected officials to introduce climate adaptation into the local agenda.

Hypothesis 2: Bureaucrats with a special area of focus – e.g. water managers, floodplain managers, etc. – are more likely than general-focus bureaucrats – e.g. city managers – to suggest integrating climate adaptation into existing policy areas.

However, just because they can take more politically controversial positions – like introducing climate change adaptation onto the local agenda – does not mean that they will. The following sections argue that bureaucrats' actions are shaped by their institutional environment, specifically the amount of autonomy they have in relation to their superiors (the principal in a principal-agent relationship) and the amount of agreement there is in the policymaking community that climate change is real and the locality should adapt to it.

4. Local Bureaucrats' Influence: Expertise and Autonomy

In the few studies that look at the conditions under which bureaucrats act as policy advocates and introduce agenda items, scholars consistently find that autonomy mixed with personal or professional motivations shape bureaucratic action. Examples of studies include Teske and Schenider's study of city managers (1994), Teodoro's examination of the link between career motivations and bureaucratic innovation (2011), and Carpenter's in-depth examination of bureaucratic-led policy innovation during the Progressive Era in the United States (2001). Autonomy comes from personal experience and knowledge as well as structural

independence. Personal experience and knowledge-based autonomy come from a variety of sources including professionalization standards related to their expertise, training, and educational background (Teodoro, 2014) as well as ideology (O'Leary, 2006). Structural autonomy comes from policies and institutions like administrative procedures (McCubbins, Noll, & Weingast, 1987), who has hiring or firing power, where funding for a program or agency comes from, and agency structure (Huber & Shipan, 2002).

An important implication of the bureaucratic behavior literature is that when bureaucrats have autonomy, they are more likely to influence the shape of policy (Carpenter, 2001; Lin, 2000; Lipsky, 2010; Teodoro, 2011). Lipsky's study on street-level bureaucrats demonstrates that the bureaucrats working at the street-level or on the front lines often have significant autonomy in shaping policy implementation (2010). By combining the lessons of the entrepreneurship literature (Mintrom & Norman, 2009; Kingdon, 1995), bureaucratic entrepreneurship studies (Teske & Schneider, 1994; Teodoro, 2011; Carpenter, 2001) and the literature on street-level bureaucratic discretion, this project argues that front-line bureaucrats are capable of acting as agenda-setters and policy advocates. This is not to say that bureaucrats create policies singlehandedly. Local bureaucrats are saddled with high institutional obstacles as the U.S. democratic system gives law-making power to elected officials and not the bureaucrats whose primary responsibility is to implement laws (Waterman, Rouse, & Wright, 1998; Wood & Waterman, 1991; McCubbins, Noll, & Weingast, 1987). However, they can introduce new goals into pre-existing policy areas, like integrating climate adaptation into existing floodplain management policy.

I expect local hazard mitigation administrators to be especially well situated to introduce climate adaptation into local policies for two reasons. First, these bureaucrats cultivate autonomy

using their expertise and their institutional position. They monitor climate and weather in order to predict or prepare for disasters like floods, which makes them more likely to be aware of and understand the science and debates concerning climate change. Additionally, these bureaucrats work with federal agencies like NOAA and the Federal Emergency Management Agency (FEMA) which disseminate information about climate change on their websites and in communication with local governments (NOAA, 2016; FEMA, 2016; FEMA, 2013). Local bureaucrats' attention to these issues combined with their expertise and training prepares them to implement policies addressing hazard mitigation, but it also enables them to serve as experts and agenda setters in the formulation of new policies.

Second, bureaucrats working on climate-related disaster management policies will likely be motivated by professional ambitions. To minimize blame from politicians, advocacy groups, and the public when problems arise that are not adequately addressed (Boin, McConnell, & Hart, 2008; Hood, 2002), we would expect bureaucrats to try to understand the many causes and consequences of phenomenon related to their work. In the case of managing climate-related disasters like flooding and drought, bureaucrats would view climate change as an important threat multiplier (i.e. climate change will make disasters worse). Simply put, bureaucrats want to be successful at their jobs and avoid blame (Hood, 2002), and this may lead them to integrate climate change adaptation into existing policies even in the face of political polarization. This leads to the third hypothesis:

Hypothesis 3: Local bureaucrats drive climate adaptation by providing issue-specific expertise about potential harms.

5. Bureaucrats and Problem Definitions

Like any other policy entrepreneur, local bureaucrats have the ability to shape the political agenda by offering particular definitions of public problems. Problem definitions frame issues to convey information about the issue's severity, frequency, temporal proximity, geographic proximity, who or what caused the problem, and who is responsible to remedy the problem (Rochefort & Cobb, 1994; Stone, 2002). After becoming aware of climate change's potential impacts in their communities, local bureaucrats can identify climate change as a driver of local disasters, implying that climate change adaptation is needed in addition to existing disaster prevention goals. Policy entrepreneurs do not need to invent a new problem definition, they can employ existing problem definitions that work toward their goals. For instance, local bureaucrats can look at problem definitions in superior governments as signals describing how they should act vis-à-vis a new policy area. In the case of climate change, signals from FEMA or state governments influence how local bureaucrats perceive the importance of including climate change as a threat multiplier for floods or droughts. These signals are important to local bureaucrats because FEMA and state governments determine grant funding levels for local hazard mitigation planning (discussed more below in Chapter 1, Section 7).

A possible problem definition would likely (1) define climate change as a significant threat or threat multiplier to existing disasters like floods or droughts; (2) claim that local adaptation is possible; and (3) argue that local government should get involved. In this way, local bureaucrats highlight deficiencies in current policies and suggest routes for fixing those deficiencies. This problem definition frames the political conflict by describing what the conflict is about: minimizing risk from climate change. It describes who or what is to blame for a problem (climate change), what solutions are appropriate (using existing policies to address the

new climate change threat), and how much we should care (Rocheffort & Cobb, 1994). In sum, local bureaucrats can use problem definitions which link climate change to existing flood or drought management concerns to push for local policy change.

Hypothesis 4: Local bureaucrats drive climate adaptation by presenting arguments that climate change predictions can be integrated into existing policies rather than suggesting adaptation should be pursued through new policy areas.

However, problem definitions are not infinitely powerful ideas that can be employed in a Machiavellian manner by politicians or bureaucrats. Often, problem definitions are deemed acceptable based on ideological or partisan attitudes and fundamental disagreements about one or more aspects of a problem definition arise. Disagreements emerge concerning the cause of a problem, its severity, its proximity (temporally and geographically), whether government is capable of addressing it, and if proposed solutions are appropriate and efficacious (Rocheffort & Cobb, 1994). For the problem definition above, each of the elements is influenced by ideological and partisan attitudes concerning the validity of climate change and the appropriate role of government. Republican leaders often deny climate change is happening, claim it is not a problem, or argue that government should not be involved in addressing it (Antonio & Brulle, 2011; McCright & Dunlap, 2011). Furthermore, liberals and conservatives fundamentally disagree about the appropriate role of government in addressing climate change (Leiserowitz, Maibach, Ropser-Renouf, & Hmielowski, 2011).

While bureaucrats do not face the same pressures from political parties to “tow the party line” that elected officials might, the fundamental disagreements a problem definition can shape how bureaucrats act to influence policy. If key actors like elected politicians and powerful

community groups agree with the bureaucrats' problem definition, change can be facilitated through those positions. However, if these actors disagree, the policy can be gridlocked and stasis becomes the default. Therefore, to avoid gridlock, bureaucrats might choose less overt methods of policy change like implementation discretion (Lipsky, 2010; Lin, 2000) or guerilla behaviors (O'Leary, 2006). What motivates bureaucrats to choose between different types of action is discussed in the next section.

6. Modeling How Bureaucrats Change Policy

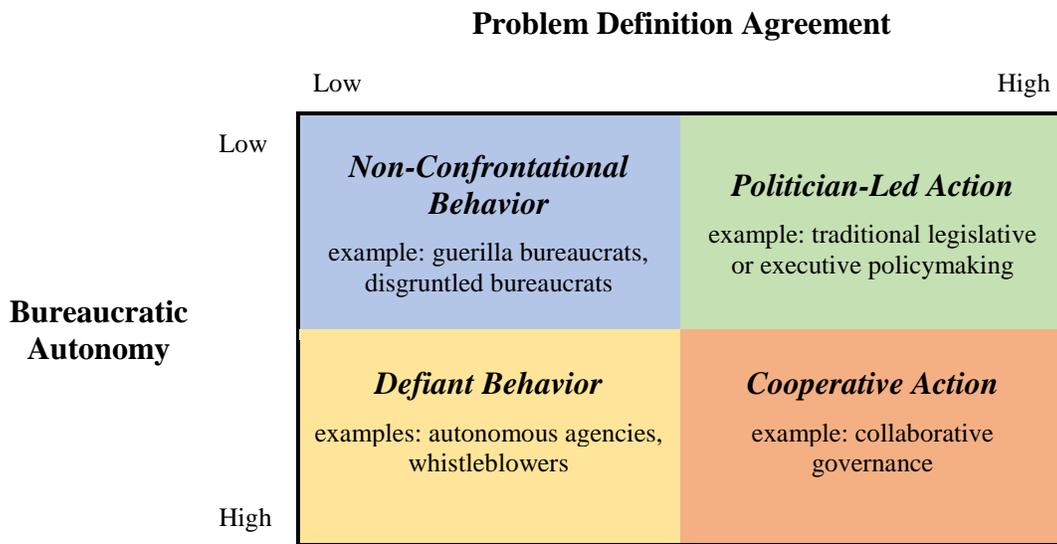
As discussed above, autonomy and problem definition agreement both independently influence if and how bureaucrats act to change climate change adaptation policy. (Autonomy describes the bureaucrats autonomy in their position rather than just on the issue of climate adaptation.) I propose they interact to shape the type of action local bureaucrats take to influence policy change. As Figure 1 shows, the interaction of these variables leads to four distinct or “pure-types¹⁰” of actions: defiant behavior, cooperative action, politician-led action, and non-confrontational behavior. While each of these behaviors has been described in the literature, no studies attempt to explain why a bureaucrat would choose to act defiantly rather than non-confrontationally. By developing and testing this typology of action, this study attempts to explain the variation in bureaucratic behavior rather than studying the different categories in isolation.

Defiant Behavior is likely to arise in a situation with high autonomy and low problem definition agreement between politicians and bureaucrats. In these instances, we would expect to see bureaucrats capitalize on their autonomy to actively challenge politicians, leading to conflict.

¹⁰ These categories are referred to as pure-types because administrative independence and political agreement are both continuous scales rather than dichotomous categories. However, theorizing about the pure-types helps us conceptualize differences between low and high values for each dimension.

Bureaucrats might choose less overt pathways to change policy but would still be doing so openly rather than in secret. Substantive policy changes are unlikely, but changes controlled by the administrators are possible. These include implementation decisions like the choice of measurement tools, the prioritization of tasks, and allocation of (human) resources (May & Winter, 2007; Rourke, 1979; Carpenter, 2010). Defiant behavior is likely to manifest itself in informal spaces including conversations between the local bureaucrat and citizens affected by policies as well as policies that are controlled by bureaucrats including departmental policies.

Figure 1: Forms of Bureaucratic Behavior to Integrate Climate Change Adaptation into Existing Policies



Bureaucrats cannot defiantly pass new ordinances or write management plans without the cooperation of superiors, so we would not expect to see defiant behavior show up in ordinances or management plans that must be approved by superiors.

Cooperative Action is likely to arise in a situation with high bureaucratic autonomy and high problem definition agreement. In these cases, we would expect bureaucrats and politicians

to work together to change policy. Bureaucrats can work with local politicians *or* with state-level politicians depending upon which principal-agent relationship we are considering. Policy change would likely occur through political (legislative or executive) channels to capitalize on elected official support but could also occur through bureaucratic rule changes endorsed by elected officials. Since there is high bureaucratic independence, buy-in from bureaucrats is crucial to ensure implementation.

Politician-Led Action is likely to arise in a situation with low bureaucratic independence and high problem definition agreement. In these instances, politicians would lead reform efforts, with support (i.e. no defiance) from bureaucrats. Policy integration is expected to occur through political channels rather than through administrative rule changes. This is the more traditional legislative-executive route to policy change.

Non-Confrontational Behavior is the type of bureaucratic behavior (if any) that will likely occur in a situation with low bureaucratic autonomy and low problem definition agreement. If bureaucrat-driven attempts at policy change occur, bureaucrats would likely avoid confrontation with politicians. If politicians seek policy change, bureaucrats can “drag their feet” or engage in other tactics to prevent policy implementation which effectively prevents policy change (O’Leary, 2006). Therefore, no policy change is expected because both politicians and bureaucrats can effectively stall change. This project, then, will test the following:

Hypothesis 5: If a bureaucrat acts to integrate climate change into existing policy, the form their action takes will depend upon their autonomy and the extent of problem definition agreement in the policymaking community.

Hypothesis 5a: When the bureaucrat is autonomous and there is low problem definition agreement in the policymaking community, they will act defiantly.

Hypothesis 5b: When the bureaucrat is autonomous and there is high problem definition agreement, they will cooperate with politicians and other policymakers.

Hypothesis 5c: When the bureaucrat is not autonomous and there is high problem definition agreement, politicians will lead policy development.

Hypothesis 5d: When the bureaucrat is not autonomous and there is low problem definition agreement, they will either act non-confrontationally or not act at all.

7. Managing Floods and Droughts: An Intergovernmental Tangle

The model presented above (Figure 1) defines bureaucratic action in relation to the bureaucrat's principal. For instance, when an autonomous bureaucrat disagrees with her principal, her action is *defiant*. When they agree, it is *cooperative*. However, the intergovernmental nature of flood and drought management policy means that local bureaucrats who implement intergovernmental policies are subject to multiple principals¹¹ who had different levels of influence and expertise (see the argument Whitford (2005) makes about multiple principals).

In terms of influence over local bureaucrats, federal and state principals have the power of the purse and local principals have hiring and firing power. For example, the Stafford Act (42 U.S.C. 5121 et seq.) distributes funds to local governments that have recently experienced a disaster so they might take measures to mitigate future disasters. While the program is

¹¹ Figure 2 maps these relationships.

administered through FEMA and state disaster management agencies,¹² the mitigation activities are planned and implemented by local bureaucrats including city or county engineers, public works directors, and building code enforcement officers. The federal and state governments create rules and standards, but do not employ the people who enforce them. Instead, FEMA uses grants to stipulate what (at minimum) local policies should include. States can also add requirements to FEMA's policies that local governments must follow in order to get funds. Without these grants, most local governments could not possibly fund any disaster mitigation, and even the largest local governments would not be able to afford recovery efforts. So, the federal government influences local bureaucratic action by controlling funding.

In a way, this reinforces what Birkland and Waterman (2008) identify as the dominant pattern where local governments are first responders in natural disasters but state and federal governments can help overcome the limitations of small government (funding and coordination across jurisdictions). However, they do not make hiring or firing decisions; this power is given to local principals. Therefore, the multi-level implementation of disaster mitigation and planning policies has insulated bureaucrats from oversight from federal politicians and made bureaucrats more answerable to local preferences (akin to Whitford, 2002). If these principals all agreed, then bureaucrats' decision-making environment would be clear. However, in the area of climate change adaptation, this is not the case.

To understand if local bureaucrats will integrate climate change adaptation into existing policies, we need to understand how the principals (federal, state, and local) and bureaucrats view a problem. Often, federal, state, and local principals' goals diverge. For instance, FEMA

¹² FEMA provides funding to state governments who distribute it to local governments. The federal government does not directly provide grants to local governments through this program.

has been encouraging local governments to engage in climate adaptation (FEMA, 2013; FEMA, 2016) but some state governments like those in Florida and North Carolina wrote rules and created laws discouraging or preventing local action (Korten, 2015; Rawlins, 2012). Local governments' attitudes towards climate change adaptation vary as well. As strategic political actors, local bureaucrats shape their behavior based on the level of agreement they perceive in a policy area. When agreement is high, they are likely to work with the principals they agree with; but when there is disagreement, bureaucrats are likely to find other pathways to shape policy. Therefore, we would expect local bureaucrats who think that climate change is a threat to align their actions with federal principals and try to bypass state influence. On the other hand, local bureaucrats who think climate change is not a threat may align their actions with state principals if those principals reject adaptation policies. As a result, a locality might be cooperating with their federal principals but defying their state principals when incorporating climate adaptation into local hazard mitigation.

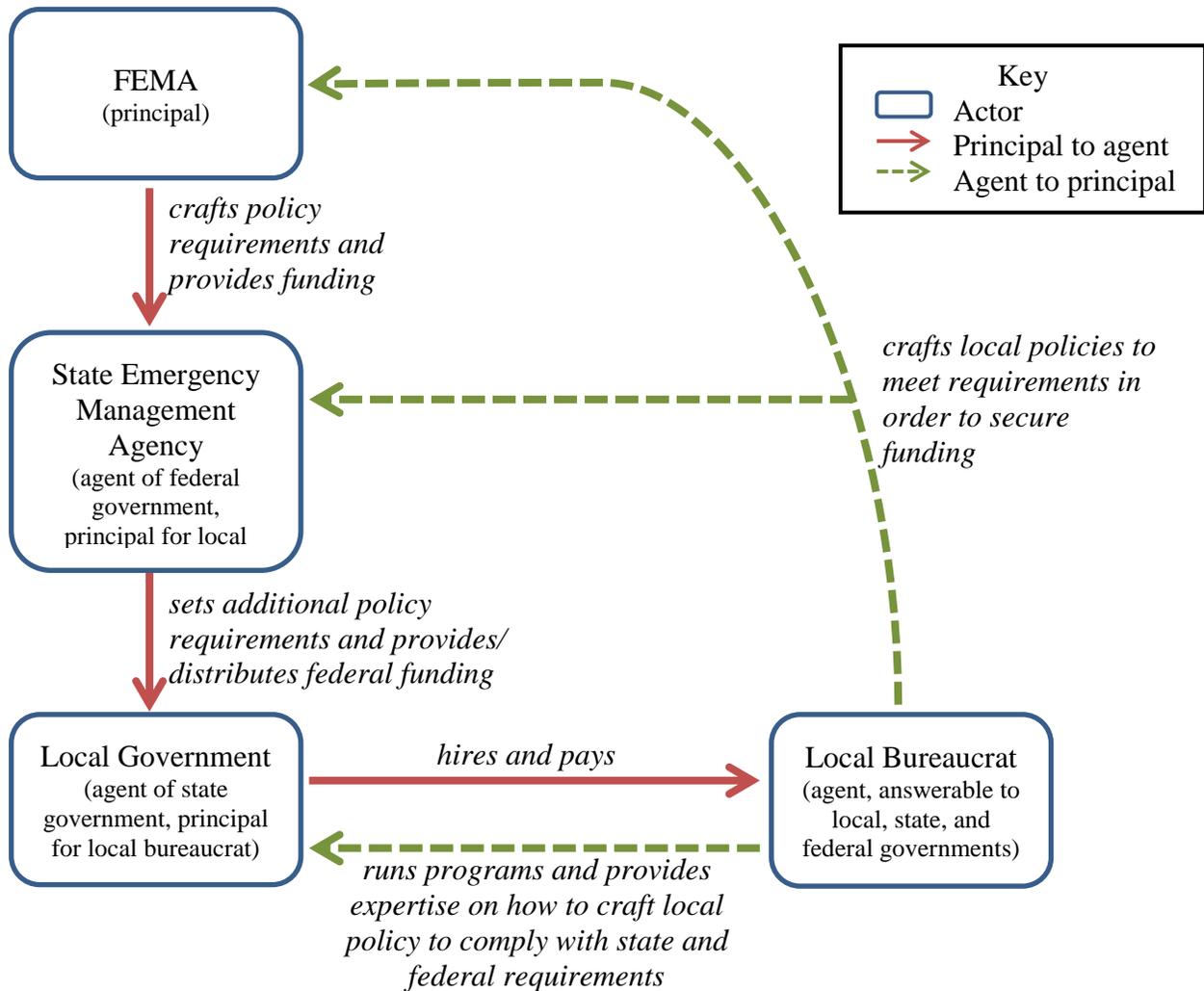
Additionally, how we understand autonomy changes based on which principal we are talking about. Regardless of who their principal is, autonomous bureaucrats are more likely to follow personal motivations or internal pressures when deciding how to act. Yet, autonomy from state or federal principals does not come from establishing expertise because local disaster managers and federal disaster managers have similar knowledge bases. Instead it largely comes from fiscal independence and local government independence from the state. If a local government can raise funds for flood management on its own (and the local bureaucrat has expertise in flood management), then local bureaucrats have a high amount of independence to shape policy. Or, if a local government does not need state approval to create a new policy

initiative (i.e. they have home rule¹³), then we would expect to see local bureaucrats using their expertise at the local level to shape policy. The more dependent the local government is on superior governments for either funding or legislative authority, the less autonomy bureaucrats have to shape policies. Therefore, the institutional position of the principal changes both how we understand problem definition agreement and autonomy. Throughout this dissertation, special attention will be paid to who the principal is in any given relationship.

Figure 2 (below) shows the relationship between local bureaucrats and their principals at each level of government. As the figure shows, disaster management policy is shaped by an intergovernmental web of policies and actors – all of which local bureaucrats respond to.

¹³ “Home rule” policies mean that local governments exist separately of the state government and are not tied to the state’s wishes and policies, except through grants or regulations, much like the relationship of the 50 states and the U.S. federal government (Wolman, McManmon, Bell, & Brunori, 2008; Zimmerman J. F., 2012).

Figure 2: Principal-Agent Relationships for Local Implementation of Disaster Mitigation Policy



Finally, we must understand the intergovernmental context of policy development because local governments are often considered appendages of their state governments: they do not exist without state approval and they exist to enact state goals. Called Dillon’s Rule, this arrangement is prevalent in most states. However, a minority of states operate under ‘home rule’ arrangements where cities and counties are essentially independent from the state, allowing them to set different (and sometimes opposing) political goals. We can also think of this as local governments having high autonomy or low autonomy in terms of creating and implementing

their own policies (Wolman, McManmon, Bell, & Brunori, 2008). The character of the state-to-local relationship shapes how local governments act because states determine local government size, funding sources, and required policy initiatives (Zimmerman J. F., 2012). Even in home rule states, the state government influences local behavior much in the same way the U.S. federal government influences how states act. State governments in home rule states can set minimum policy requirements, provide grants, pass unfunded mandates, etc. to shape local action. Thus, even though local disaster management policy is answerable to federal standards, local governments must answer to state governments first and foremost. While there might be differences in political relationships between localities in home rule states and those in Dillon's Rule states, we would expect local governments to work with (or at least not actively against) the wishes of state governments. This leads to the last hypothesis:

Hypothesis 6: When state governments oppose climate change action, local bureaucrats are less likely to develop climate change adaptation policy for fear of losing an important source of disaster mitigation or relief funding.

8. Plan for the Dissertation

In the following chapters, the six hypotheses presented above will be evaluated using case studies of local governments and front-line bureaucrats in communities that are at high-risk of climate-related disasters. Chapter 2 will discuss the methods used to choose cases, collect data, and analyze the data.

Chapter 3 addresses the question: *Do local bureaucrats play a driving role in shaping local communities' climate adaptation plans?* In this chapter, I will establish if climate change is on the local agenda and trace who introduced it. Hypotheses 1 and 2 are evaluated to see if

bureaucrats introduce climate change adaptation instead of politicians and if special-focus bureaucrats (like emergency managers) introduce climate adaptation instead of general-focus bureaucrats (like city managers). Chapter 4 addresses *if and how* bureaucrats choose to act. It specifically looks at how autonomy and problem definition agreement shape bureaucratic action to evaluate hypotheses 3, 4, and 5 (including 5a, 5b, 5c, and 5d).

Chapter 5 addresses the intergovernmental context for disaster management and climate adaptation policy. This chapter discusses how the web of laws and policies from the federal government and state governments shapes local bureaucratic behavior. Additionally, it considers how bureaucrats negotiate conflicting orders from the federal and state governments – especially when state governments discourage climate adaptation.¹⁴ Finally, Chapter 6 presents conclusions and future directions for research into local bureaucratic behavior and local climate adaptation.

¹⁴ The Obama Administration was in office during the entirety of the data collection for this project. During the Obama Administration, climate change adaptation was encouraged by FEMA. Therefore, disagreements between the federal and state governments can only arise when state governments do not think climate change is a threat because the Obama Administration consistently identified it as one.

CHAPTER 2: METHODS

To test the hypotheses for this project, I use the method of structure-focused comparisons described by George and Bennett (2005). Structure-focused comparisons give the researcher the ability to examine a variety of cases in a systematic fashion. It capitalizes on the richness of qualitative data while providing a replicable test of the hypotheses. The research design for this project is guided by George and Bennett's description of structured-focused comparisons, although it requires a slight modification when it comes to case selection. As George and Bennett argue, researchers should not only focus on cases that have a large quantity of data that is easily accessed (p. 69) but focus on theoretically interesting and important cases. For the purpose of this study, I am interested in looking at local bureaucrats responding to the threat of climate change. Unfortunately, there is no database of local bureaucratic behavior or action on climate change upon which to base my case selection. Therefore, this study takes a new approach for choosing cases. I use geographic informational systems (GIS) analysis of climate risk to choose cases. This avoids selecting cases on the dependent variable (form of bureaucratic action on climate change adaptation), but the larger number of cases (18 communities and 30 local bureaucrats in those communities) increases the chances of capturing variation on the dependent variable (explained in more detail below).

Structured-focused comparisons allow for exploring the hypotheses presented here as well as any unexpected variables or mechanisms at play in local government policy development. Like all non-experimental research, it is not possible to control for all variables except those of interest. However, the larger number of cases (18) allows for finding most-similar comparisons between cases as well as most-different comparisons within the same study.

The cases are built using a large quantity of government documents, media reports,¹⁵ and interviews with local officials. To make sense of these documents, this project also uses qualitative content analysis as a strategy for sifting through the high volume of data (Schreier, 2014; Mayring, 2000).

In the following sections, I describe the case selection strategy. Then, I describe the variables and measurement strategies employed to test each hypothesis. Third, I discuss the data collection strategy. Fourth, I outline how qualitative content analysis is used to code the data. Finally, I discuss limits to generalization from this study.

1. Choosing Cases

When developing structured-focused comparisons, the first and most important step is to identify appropriate cases. As George and Bennett describe, the first step in choosing cases is to clearly identify the universe of cases. In this study, the universe of cases is local bureaucrats who work on existing policies that will be affected by climate change in communities at risk of climate-related disasters.

This study looks specifically at flood management and drought management because they are both policy areas where climate adaptation goals can be achieved by front-line bureaucrats. For instance, a local flood manager can suggest to builders to move structures further from floodable waters or build the structure higher off the ground to prevent flooding damages. Similarly, a drought manager might plan water storage goals in line with more severe droughts predicted under climate change. Furthermore, these policies are ideal cases to study because front-line bureaucrats in these policy areas are employed by local governments but they often

¹⁵ All total, this project has upwards of 1,000 documents between meeting minutes, government reports, and news articles for each of the 18 communities (totaling over 20,000 documents for the entire project).

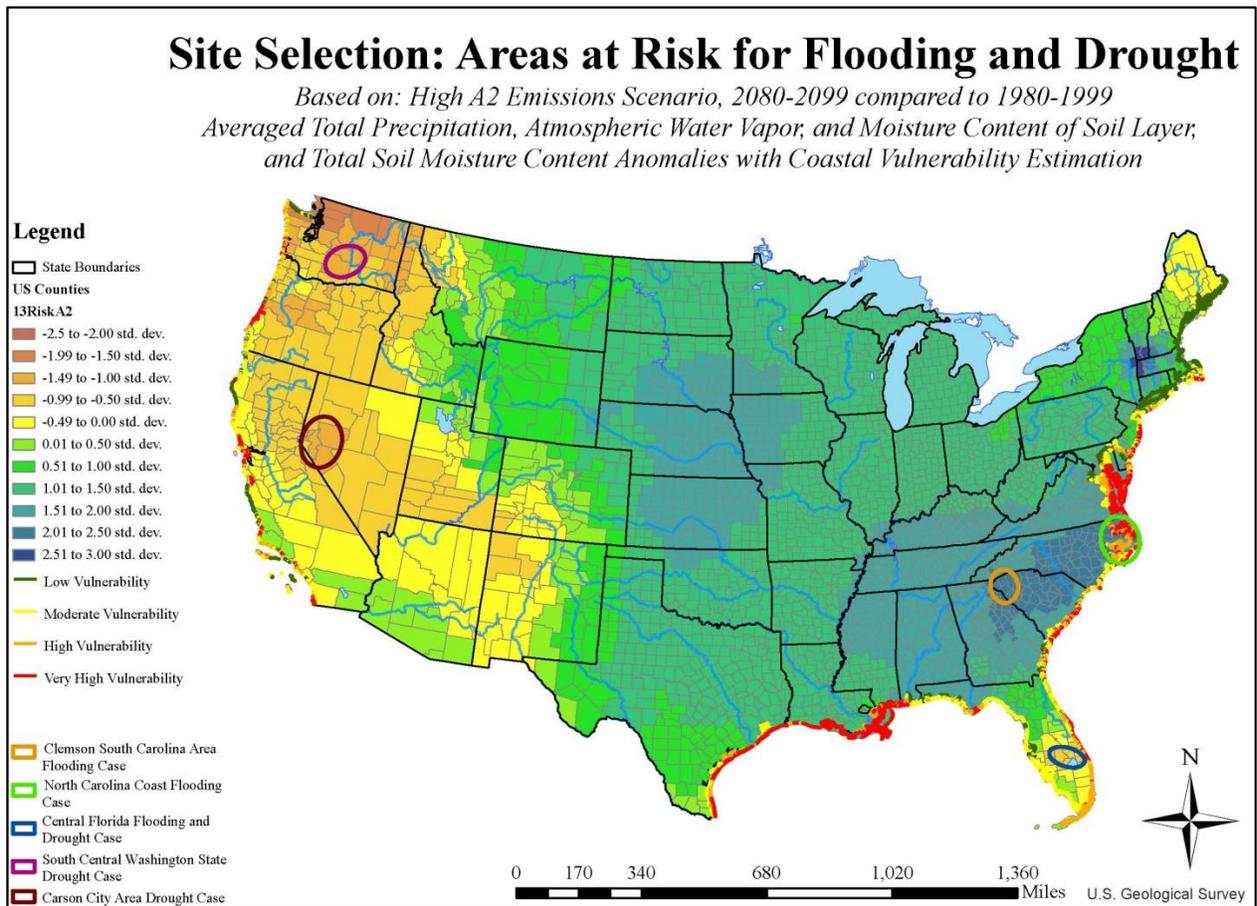
implement intergovernmental policies like those run through FEMA and state emergency management and mitigation policies. Thus, studying the intergovernmental versus intra-governmental tension is possible with these policy areas.

To study the variation in front-line bureaucratic behavior, this project looks at local governments in five sites across the US. The five sites represent areas at high risk from climate change-related flooding or drought. Within each site, several local governments were selected for case analysis. This allows both within-site and across-site comparisons. The case studies for this project will provide rich data to understand how relationships between bureaucrats and their superiors shape how bureaucrats consider (or disregard) climate adaptation as an influence on flood or drought management. The local governments selected for study are at high risk of climate-related flooding or drought, making it more likely that climate adaptation is on the agenda for the individual bureaucrat or the entire community. I select cases based on climate risk rather than the existence of adaptation policies so this project includes cases where action was taken and cases where no action was taken.

Specific sites for data collection were chosen based on high predicted risk from climate change related flooding and drought. To capture this risk, I combined climate change prediction data from the National Center for Atmospheric Research (2014) with the United State Geological Survey's (2014) coastal vulnerability index to show areas in the contiguous US that are at a greater risk of climate change-related flooding and drought. Climate anomalies (i.e. how different the future is from the historical average) were calculated for four variables: total precipitation, atmospheric water vapor (precipitable water), soil moisture, and moisture in the top 10 centimeters of soil. Using ArcGIS, a county-level average for these four variables was calculated. The climate anomalies were then standardized so these measures could be combined

to find areas of high drought risk (low precipitation and low soil moisture) or high flood risk (high precipitation and high soil moisture). Then, the climate prediction models and coastal vulnerability measures were displayed together to guide study site selection.

Figure 3: Site Selection for Case Studies



Data courtesy of the National Center for Atmospheric Research sponsored by the National Science Foundation for climate change predictions and the United States Geological Survey for the Coastal Vulnerability Index

Map and calculations by Bridget K. Kelley

The resulting map displays several areas at high risk of drought (red or orange indicating low standardized average climate anomaly) or flooding (teal or blue indicating high standardized average climate anomaly or high coastal vulnerability). From these regions, five sites for study emerge: (1) coastal flooding and increased precipitation on the North Carolina coast, (2) inland flooding in the Savannah River basin in South Carolina, (3) a combination of sea-level flooding

and decreased precipitation (freshwater) or drought in central Florida, (4) drought in the Carson City, Nevada border area, and (5) drought in central Washington state (see Figure 3)¹⁶.

From these sites, cases were chosen based on two criteria. First, to be included in the study, the county or city government needed to be sufficiently large to have a professionalized bureaucracy dedicated to addressing flooding or drought concerns. While not a perfect relationship, areas with larger populations are more likely to have larger city or county governments. Therefore, having a city with a population of 15,000 or more people was a requirement to be considered in the study. Cities with a population of less than 15,000 were dropped as well as counties that had no cities with a population of 15,000 or greater.

This yielded an initial list of potential cases for each site:

- **Florida:** five cities and three counties
- **Nevada:** two cities and one county (one city – Carson – is a combined city/county)
- **North Carolina:** three cities and two counties
- **South Carolina:** seven cities and four counties
- **Washington:** four cities and three counties

From this list, any site that had three or more potential cases was trimmed down to three cases using a random number generator. For instance, South Carolina had seven cities and four

¹⁶ Climate risk could have been operationalized to reflect estimated costs of climate change in the community. However, these data were not available at the local level until Hsaing et al published a study in Science in summer 2017 (after data collection for this project concluded). The potential loss of life and economic costs of climate change, however, are influenced by an area's population density and its current economic capacity. Areas with higher population density are at higher risk of loss of life from severe weather. Areas with larger economies can divert funds to managing risk from severe weather and other consequences of climate change, effectively reducing their climate risk. As Hsaing et al found, this means that areas with weaker economies and more spread out populations – i.e. rural counties – are at higher risk of climate change damage. Therefore, future studies should take into account economic risks and mortality risks from studies like that by Hsaing et al. However, this information should be combined with data on climate threats like floods and droughts to capture a fuller image of climate risk.

counties as potential cases, the cities were assigned a random number and one through three were chosen for study. Similarly, the four counties were assigned random numbers and numbers one through three were chosen for study. Therefore, for each site we are left with the following number of potential cases:

- **Florida:** three cities and three counties
- **Nevada:** two cities and one county (one city – Carson – is a combined city/county)
- **North Carolina:** three cities and two counties
- **South Carolina:** three cities and three counties
- **Washington:** three cities and three counties

Each of the 14 cities and 12 counties was contacted for interviews. Of the 26 total potential cases, eight did not respond to any interview requests.¹⁷ As interview data is considered vital for understanding the role of bureaucrats in developing climate adaptation policy, cases with no response were dropped. The final list of 18 communities is below:

- **Florida:** Fort Pierce (city), Martin (county), St. Lucie (county)
- **Nevada:** Carson City (county/city), Fernley (city)
- **North Carolina:** Elizabeth City (city), Havelock (city), New Bern (city), Pasquotank (county), Craven (county)
- **South Carolina:** Greer (city), Mauldin (city), Greenville (county), Oconee (county)
- **Washington**¹⁸: Grant (county), Yakima (city), Kittitas (county), Yakima (county)

Cases were chosen to control for potential alternative explanations including the severity of expected effects of climate change (all cases have severe expected effects) and size of

¹⁷ The strategies for contacting interview subjects and the interview protocol are described below (Section 3)

¹⁸ Yakima and Kittitas Counties (and the localities therein) are part of a multi-jurisdictional effort to regulate the Yakima River Basin called the Yakima River Basin Integrated Plan (hereafter “Integrated Plan”). While they are treated as separate cases for this analysis, these governments often collaborate through the Integrated Plan.

jurisdiction which is related to several other variables.¹⁹ These include economic status (measured by median income, property values, and employment rate.) Additionally, local attitudes concerning climate change (public opinion) and government structure (e.g. most local governments are run through a manager-council form of government) might account for differences in local climate adaptation efforts. However, these variables do not greatly vary nationwide or in the cases tested here. Therefore, these too are controlled for as potential explanations. Specific data for the control variables are presented in tables in Appendix D.

The total number of cases in this project allows for both within-site comparisons and cross-site comparisons. As George and Bennett argue:

“...a study that includes many cases may allow for several different types of comparisons. One case might be most similar to another and both may be least similar to a third case. As noted below, case selection is an opportunistic as well as structured process – researchers should look for whether the addition of one or a few cases to a study might provide useful comparisons or allow inferences on additional types of cases,” (2005, p. 83).

These 18 cases allow for several types of comparisons, capitalizing on similarities on the following dimensions. Cases in the same state have similarities which include the attitudes of state leaders, experiences with prior disasters (at least those that were sufficiently large to hit an entire region in a state), and proximity to a local climate leader like Miami, Seattle, or New York City. The cases can also be compared on a variety of other dimensions including population size, economic strength, budget size, attitudes of local leaders, number or severity of prior disasters (see Appendix D for these comparisons).

¹⁹ Although there is not a perfect correlation between the size of a jurisdiction and its economic status, the differences are not overwhelming. For instance, we are not comparing a small town in New York State to New York City’s economic power.

2. Variables and Measurement

As George and Bennett stress, structured-focused comparisons work best when each case is interrogated using the same variables to standardize data collection and comparisons (2005, p. 67). To test the six hypotheses in this project, six main variables of interest are considered:

1. **Agenda-setter:** Who introduces climate change adaptation onto the local agenda, bureaucrats or elected officials? (*Independent variable*).
2. **Status of climate change adaptation policy:** Integration of climate change into existing policies; separate initiative to address climate change adaptation (*Dependent variable*).
3. **Bureaucratic background:** Training and current responsibility of bureaucrats who address flooding or drought in their jobs (*Independent variable*).
4. **Bureaucratic autonomy:** Bureaucratic independence from her superior (*Independent variable*).
5. **Problem definition agreement:** Agreement concerning the need climate change adaptation between the bureaucrat and her superior; to build this measure, two sub-measurements are required: (*Independent variable*).
 - a. **Bureaucrat's argument about climate change adaptation:** How the bureaucrat frames the need for local adaptation (and the path by which adaptation should be achieved).
 - b. **Principal's argument about climate change adaptation:** If and how the principal frames the need for local adaptation (and the path by which adaptation should be achieved).
6. **Bureaucratic action:** How bureaucrats act to address climate change (*Dependent variable*)

Table 1 on the next page shows which variables will be used to test each of the six hypotheses in the project. In the following sections, I describe how each variable is measured including which data will be used to craft the measures and how different values for each variable are determined.

Table 1: Variables Used to Test Hypotheses

Hypothesis	Variables
1. Front-line local bureaucrats are more likely than elected officials to introduce climate adaptation into the local agenda.	<ul style="list-style-type: none"> • Agenda-setter • Bureaucratic action
2. Bureaucrats with a special area of focus are more likely than general-focus bureaucrats to suggest integrating climate adaptation into existing policy areas.	<ul style="list-style-type: none"> • Agenda-setter • Bureaucratic background • Bureaucratic action
3. Local bureaucrats drive climate adaptation by providing issue-specific expertise about potential harms.	<ul style="list-style-type: none"> • Bureaucratic autonomy (specifically expertise-based autonomy) • Bureaucratic action
4. Local bureaucrats drive climate adaptation by arguing that climate change predictions can be integrated into existing policies.	<ul style="list-style-type: none"> • Bureaucrat’s argument about climate change adaptation (part of measure for problem definition agreement) • Bureaucratic action
5. If a bureaucrat acts to integrate climate change into existing policy, the form their action takes will depend upon their autonomy and the extent of problem definition agreement in the policymaking community.	<ul style="list-style-type: none"> • Bureaucratic autonomy • Problem definition agreement • Bureaucratic action
5a. When the bureaucrat is autonomous and there is low problem definition agreement in the policymaking community, they will act defiantly.	
5b. When the bureaucrat is autonomous and there is high problem definition agreement, they will cooperate with politicians and other policymakers.	
5c. When the bureaucrat is not autonomous and there is high problem definition agreement, politicians will lead policy development.	
5d. When the bureaucrat is not autonomous and there is low problem definition agreement, they will either act non-confrontationally or not act at all.	
6. When state governments oppose climate change action, local bureaucrats are less likely to act for fear of losing an important source of disaster mitigation or relief funding.	<ul style="list-style-type: none"> • Principal’s argument about climate change adaptation (part of measure for problem definition agreement) –for state government principals • Bureaucratic action • Status of climate change adaptation policy

Additional data were used to supplement these measures, including statements made by policymakers, budget information (especially funding for disaster mitigation), and characterizations of policymakers' action in the local press. These data are supplements to the six main variables of interest listed above. In the following sections, I describe how these six main variables of interest are used in this study.

2.1 Agenda-Setter

Not all agenda-setters are created equal. The identity of the individual who brings an issue onto the policymaking agenda can shape the eventual outcome of the policy. This argument is woven through the literature on policy entrepreneurs (see Kingdon, 1995; Mintrom, 1997 and subsequent work; Schneider, Teske and Mintrom, 1995). Constructing a measure of agenda-setters and policy entrepreneurs, then, is an important step for this project. This measure has two parts. First, I determine if and when climate change is on the local agenda²⁰. This part of the measure attempts to identify the first time the issue was discussed either formally or informally. Second, I identify the individual or individuals who introduced the issue onto the agenda.

Agenda setting can occur during official meetings where records are kept, but it can also happen during informal discussions among policymakers. Additionally, a policy entrepreneur often advocates for her policy over an extended time. Thus, if an individual is repeatedly discussing climate change adaptation, this too will identify her as an agenda-setter. However, a distinction should be made between agenda setters who repeatedly advocate for an issue or policy response and those who casually address the issue once or twice.

²⁰ If and when climate adaptation reaches the agenda is an element in both the variable capturing who the agenda-setter is and the status of climate change adaptation policy. For clarity, the agenda-setter variable is measuring the identity of the actor and not the action. The action is captured in the status of climate change adaptation policy variable.

Several data sources will be used to get the best possible measure of who introduced climate adaptation onto the agenda. Data for this measure come from government reports, meeting minutes, media articles, and interviews.²¹ As Flescher showed in his article on local bureaucrats using euphemisms to address climate change (2014), a simple search for “climate change” would miss these euphemisms. Therefore, this project used Atlas.ti to search for climate change as well as flooding, and drought in the documents. The areas that contain these search terms (see Appendix A for list of search strings) were then manually coded to determine if climate change is being addressed (see Appendix B for codebook).

Once mentions of climate change were identified, the next step was to determine who brought the issue on to the agenda. Members of the public, members of the media, members of interest groups, and members of the government can all introduce issues on the local government agenda. Within the group of members of the local government, I distinguish elected officials from hired or appointed public bureaucrats. Public bureaucrats are individuals employed by a government who did not arrive at their position through a public election. The growing use of contractors for government service muddles this distinction somewhat, but if a local government chooses to outsource their disaster management or planning efforts, the contractor will have similar expertise and autonomy (even more autonomy than a typical bureaucrat). They might lack the same quality of access to the elected officials, but they will likely engage in similar activities like meeting with elected officials and presenting plans and updates at local meetings that government-employed bureaucrats do. Data for this measure come from local government websites which identify elected officials and employees of the local government. Contractors working for local governments are often identified on government websites as well.

²¹ A description of the data collection procedures is below (Section 3)

2.2 Status of Climate Adaptation Policy

Policy scholars widely recognize that public policy encompasses both what governments decide to do as well as what they decide not to do. Therefore, every local government either has a policy to address climate change adaptation or does not have a policy to address climate change adaptation (either explicitly stated or implied by a lack of policy and discussion).

However, it is not a fair evaluation of government policy to group purposeful inaction with lack of discussion of the issue altogether (Dye, 2010). Therefore, identifying the status of climate adaptation policy requires two steps. The first step is determined during the previous measure on agenda-setters: is climate change on the agenda? If climate change is not on the

Table 2: Status of Climate Change Policy on Local Agendas

Policy Status	Description	Indicators
<i>No action</i>	Decided not to address climate change adaptation	Discussions proposing climate change action existed and either no follow up OR an active decision not to act
<i>On the agenda</i>	Climate change adaptation is being discussed by members of the local government and policymaking community	Climate adaptation is mentioned by members of local government, even if it is dismissed
<i>Policy formulation</i>	Crafting policies to address climate adaptation, although not necessarily adopting any	Elected officials or bureaucrats discussing climate adaptation and strategies to achieve it
<i>Policy adoption</i>	Policy has been approved by the necessarily players in local government (most likely elected officials, but could be a discretionary policy adopted by bureaucrats)	Policy is “on the books” – written as a local law/ordinance or put into a planning document that is used to guide local government choices
<i>Implementation of an adaptation policy</i>	A plan is in place and the local government is creating programs or developing infrastructure to respond	Developing infrastructure, hiring adaptation planners, creating systems, etc. Investing and implementing a policy to address climate change

Categories based on Anderson, Brady, and Bullock III (1978). Not including evaluation because adaptation policy is in its infancy.

agenda, then this is distinguishable from a policy of inaction on climate adaptation. If climate change is on the agenda, we can progress to the second measure which measures the state of the policy as shown in the range of options in Table 2 (above). Data for this measure come from analyzing government documents (meeting minutes, planning documents, and reports), media coverage of local government, and interviews with government officials.

2.3 Bureaucratic Background

Bureaucrats' training and expertise can shape how they act (Lipsky, 2010; Teodoro, 2011). Information on bureaucrats that will be helpful for this analysis include education and training, length of tenure in local government they currently work for, and time in current position. Education and training is operationalized by looking at their professional training (i.e. disaster management specific training, engineering training, or natural science/environmental science training).

As several interview subjects chose not to be identified, this information was generalized to protect confidentiality of interview participants. For instance, education and training was described as either (a) general administrative or public policy background or (b) specific policy area expertise. Their length of tenure in their current job was described as either five or fewer years or more than five years. While more a specific measure would contribute to a richer and fuller analysis, it would compromise the confidentiality assured to the interview participants. Data for these measures came from interviews with bureaucrats, personal biographies on local government websites, and resume websites like LinkedIn.

2.4 Bureaucratic Autonomy

The bureaucratic politics literature identified several ways that bureaucrats establish autonomy or independence from their political superiors. In this project, I employ several

different measures of bureaucratic autonomy in order to provide a clearer and more comprehensive picture of the independence that bureaucrats can exert. For instance, autonomy built by expertise might yield different results than autonomy derived from structural rules and protections.

First, bureaucrats can establish autonomy through their expertise. This is an expected outcome, especially when the politician-bureaucrat relationship is viewed through the perspective of a principal-agent relationship. Asymmetric information in the principal-agent relationship means that as agents, bureaucrats have specified knowledge (Weber, 1922; Altfeld & Miller, 1984). We would expect bureaucrats with merit-based appointments to have specialized training and knowledge that politicians do not. However, because local bureaucrats answer to principals at multiple levels of government and with different types of expertise, including non-elected principals like FEMA or state emergency management agencies as well as elected officials, the form asymmetric information takes should be modified for the specific principal-agent relationship. Below (Table 3) I identify the different groups of principals that local disaster managers answer to and what type of expertise, information, or knowledge they likely have in common with the bureaucrat.

Federal and state principals are also knowledgeable about emergency management practices and FEMA requirements. State emergency management agencies have similar knowledge about emergency management practices, FEMA requirements, and any additional state requirements. However, the federal government and the state government do not have specific knowledge about local conditions.

Local elected officials and local bureaucrats share knowledge about their communities, the local political scene (budget and staff constraints, current debates, etc.), and present and past

disasters. However, we would not expect local elected officials to have specialized knowledge about disaster management policy implementation or even FEMA or state emergency management agency requirements.

Table 3: Sources of Bureaucratic Autonomy vis-à-vis Superiors

Principal	Information in Common with Bureaucrat	Bureaucrat’s Specialized Knowledge vis-à-vis their Principal
FEMA/Federal Government	<ul style="list-style-type: none"> • Emergency management practices • Policy requirements of FEMA’s programs (Stafford Disaster Act, NFIP) 	<ul style="list-style-type: none"> • Local Community • Local Conditions (present and past disasters) • Local politics
State Emergency Management Agency/State Government	<ul style="list-style-type: none"> • Emergency management practices • Policy requirements of FEMA’s programs (Stafford Disaster Act, NFIP) • Additional state emergency management requirements 	<ul style="list-style-type: none"> • Local Community • Local Conditions (present and past disasters) • Local politics
Local Elected Officials	<ul style="list-style-type: none"> • Local Community • Local Conditions (present and past disasters) • Local politics 	<ul style="list-style-type: none"> • Emergency management practices • Policy requirements of FEMA’s programs (Stafford Disaster Act, NFIP) • Additional state emergency management requirements

To measure differences in expertise, I used several types of data:

1. Interviews with bureaucrats, asking if they think of themselves as experts and what types of expertise they bring to the table.
2. Education, training, and personal background of bureaucrats and local principals.
3. Reports written by local bureaucrats: information provided in reports (i.e. specific to the locality, about emergency management, etc.) reflecting the expertise of writer.
4. Reports, guide books, manuals written by FEMA or state emergency management agencies: information provided in reports reflecting the expertise of writer.
5. Types of information local bureaucrats provide when reporting at meetings for the local elected officials.

When the measures of expertise do not match the principal, we can conclude that the bureaucrats have expertise-based independence. This does not mean that they use it to act on climate change adaptation, but it leaves open the possibility. These measures are meant to be

completely separate of their actions on climate change adaptation to prevent the problem of endogeneity.

A second measure of bureaucratic independence comes from structural independence. Again, because local bureaucrats answer to three sets of principals at different levels of government, structural independence is level-dependent. One measure of structural independence is if the bureaucrat runs their own department or is a member of a separate department that is mandated with running programs. If bureaucrats have autonomy over their own department or program implementation, they have structural authority to make decisions separately from the elected officials. For example, if the local bureaucrat is a department head or part of a separate emergency management department where she can make her own decisions on implementation or running a program, she has structural autonomy.

Structural independence also comes from fiscal independence. At the local level, fiscal independence can be identified if they run their own budget. The data for this can be found in local budgets. At the state and federal level, local bureaucrats can be said to have fiscal independence if they can raise money at the local level through levies, fees, or taxes in sufficient quantity to respond to disasters on their own. Data for this measure come from measures of local fiscal independence and the number of grants received for disaster management.

A third measure of independence comes from who holds hiring and firing power. For all the cases, only the local principals will have hiring and firing power. While this does not vary when we are discussing local principals for each case, there is variation when comparing a situation with a local principal to one with a state- or federal-principal. Thus, this measure provides a useful distinction for those comparisons.

The fourth and final type of independence comes from bureaucrats exercising discretion in their work. While bureaucrats can exercise discretion often during their work (Lin, 2000; O'Leary, 2006; Lipsky, 2010), we get a sense of their opportunity to do so by looking at the programs and policies they implement and what extent of influence they have in writing planning documents or dealing with citizens. Data for this measure come from interviews, bureaucrats' job descriptions (often found on government websites and local ordinances), and planning documents.

2.5 Problem Definition Agreement

As Rochefort and Cobb (1994), and Stone (2002) show, defining problems involves several elements and disagreement can arise for each dimensions of the problem definition²². First, policymakers can disagree if climate change is the reason why the local government needs to adapt their flood or drought management policy to respond to changing conditions. In other words, is climate change the cause – or at least one important cause – for their need to adapt?

Second, there can be disagreement about whether the local government can address or should address climate adaptation. In other words, is the local government the correct scale for action? While disaster management has historically been the purview of local government, the growing role of state and federal governments in providing grants has increased their influence over the shape of local policy (Birkland & Waterman, 2008). As a response, local governments increasingly rely on the federal and state governments to respond to new threats. Local governments might hesitate to take on climate change because it is framed as a global problem

²² Rochefort and Cobb's problem definition concept is used throughout this project as the basis for the problem definition measure. It can also be understood as issue definition or problem definition. I use the term problem definition to refer to Rochefort and Cobb's concept which highlights several dimensions including temporal proximity, geographic proximity, problem cause, severity, and who is responsible for fixing the problem.

requiring global solutions. Although this rhetoric largely surrounds questions of mitigation, adaptation is increasingly part of the global conversation through the United Nations Climate Adaptation Fund for developing nations and the Intergovernmental Panel on Climate Change (IPCC) Second Working Group which focuses on adaptation. Therefore, the question concerning who should respond is unsettled and grounds for disagreement.

Third, disagreement can arise around the issue of proximity. As Rochefort and Cobb (1994) show proximity refers both to geographic proximity and temporal proximity. These dimensions of problem definition answer the questions: Is climate change going to make natural disasters worse here (within the local government's jurisdiction) as opposed to elsewhere? Is climate change going to be an issue now or in the near future as opposed to a long time from now?²³

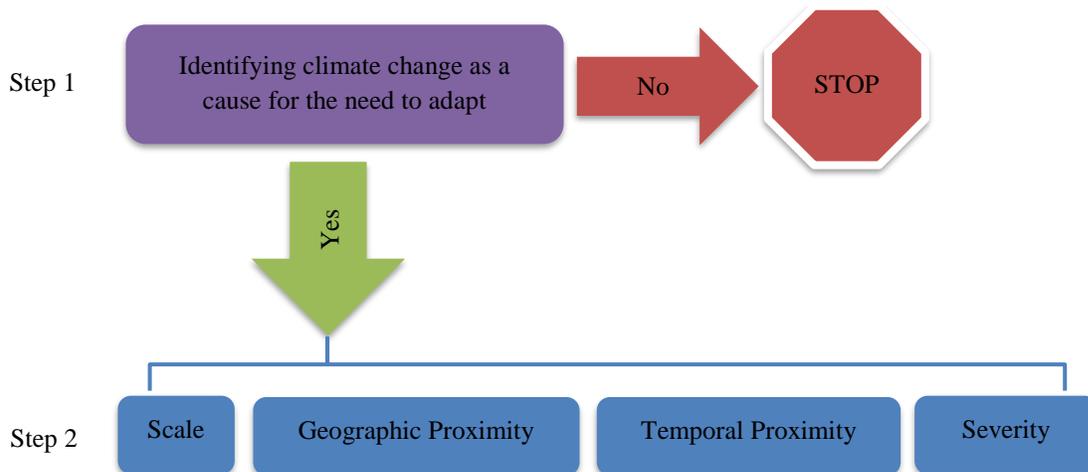
Fourth, there can be disagreement on the question of problem severity. This asks: Is climate change going to be a severe problem or a mild one? The case selection strategy controls for the predicted level of severity, but objective severity does not necessarily match subjective judgments of severity. As problem definitions are more a matter of perception, then it is possible that even within places at high risk of climate related flooding or drought that there would be disagreement on this dimension.

To measure problem definition, I use statements made by policymakers – bureaucrats and elected politicians – about climate change. For bureaucrats, this largely comes from interviews and meeting minutes; for their principals, I use statements from media coverage, meeting

²³ It is important to note that answers to these questions are political as well as empirical. Political, social, and economic motivations shape how information is received and processed by political actors (Jones B. D., 1994)

minutes, press releases, and reports.²⁴ As opinions about scale, proximity and severity all rely on agreeing that climate change requires adaptation, that question must be answered first. If the individual or organization expressed that climate change requires adaptation, then questions about scale, geographic proximity, temporal proximity and severity were asked. If, however, the individual or organization expresses that climate change is not happening or will not require adaptation, then we would not expect them to make further statements about other dimensions of the problem definition. The flow chart (Figure 3, below) was used to identify the elements of

Figure 3: Problem Definition Agreement for Climate Change Adaptation Flow-Chart



problem definition.

Then, a measure of problem definition agreement was constructed between the bureaucrat and their principal. Agreement is measured on five dimensions: (1) climate change is the reason why local flood or drought policy should be changed, (2) the local government is the right scale

²⁴ Ideally, interviews would have been conducted with all elected officials. However, many did not respond to interview requests. Of those that did, most pointed the researcher to speak with the local bureaucrats who managed flooding and drought policy instead of completing an interview themselves. This is a limitation, but it also speaks to the dominance local bureaucrats have over these policy areas. Other data sources like meeting minutes and news coverage supplemented the missing data interviews would have provided for this measure.

for adapting to climate change, (3) climate change is geographically proximate, (4) climate change is temporally proximate, and (5) climate change will be severe. For each element, agreement received a score of 1 and disagreement received a score of -1. When there was not opinion (from a bureaucrat or elected official), disagreement was assumed because when someone does not have an opinion, they likely require persuasion (like someone who disagrees with you).

2.6 Bureaucratic Action

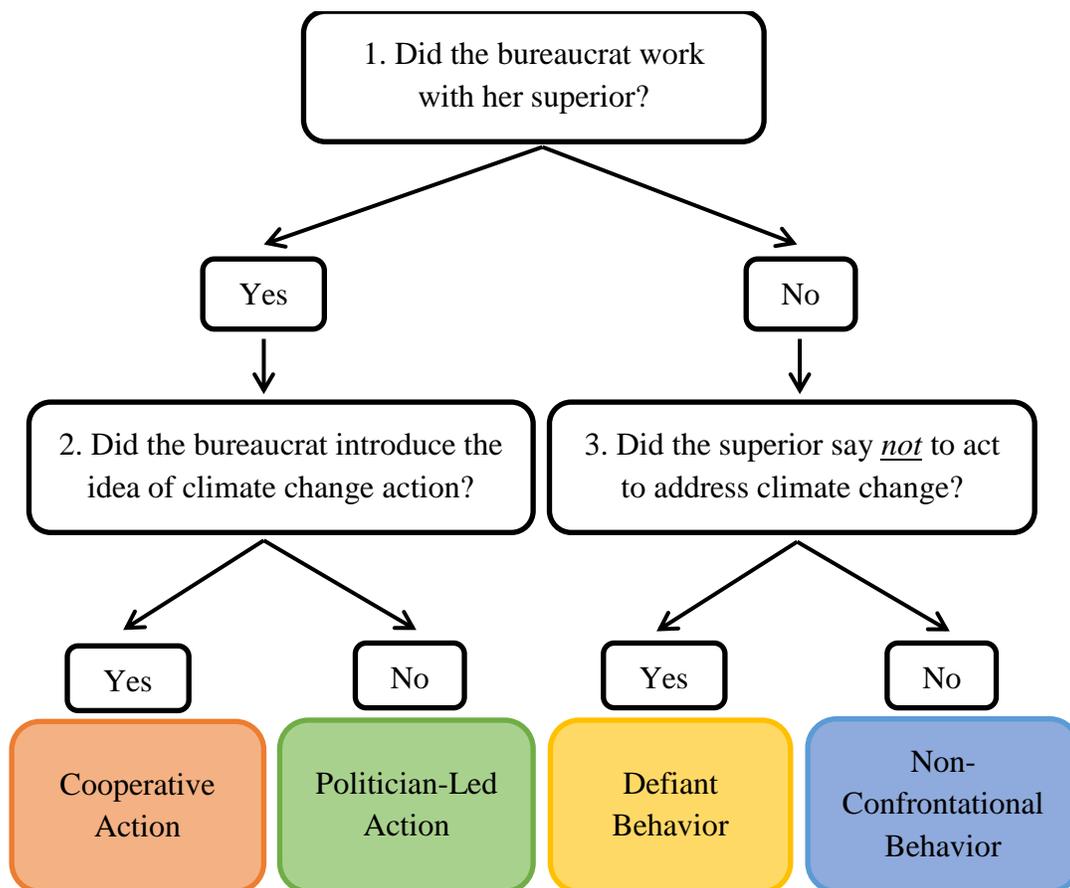
Measuring bureaucratic action was achieved through interviews with bureaucrats, and when possible, the results were confirmed with meeting minutes, planning documents, and media reports. (If bureaucrats are acting in a non-confrontational manner, it is unlikely their actions would be reflected in media coverage, meeting minutes or official documents.)

In order to determine bureaucratic action, the following types of questions were asked of interview subjects *after* they acknowledged that climate change is a problem they will need to address. The questions were:

1. Did you discuss climate change when crafting planning documents, like emergency management plans, land use plans, comprehensive plans, etc.?
 - a. If so, why?
 - b. Who introduced the idea?
2. Do you think the policies need to be changed?
3. Are you working with others to address climate change?
4. Did you introduce the idea of climate change adaptation onto the agenda?

These questions were used to guide analysis of meeting minutes and media reports. Distinguishing between the different types of action presented in Chapter 1 was based on this series of coding questions shown in Figure 4 (below).

Figure 4: Type of Bureaucratic Behavior Flow Chart



3. Data Collection

Data for this project came from three types of sources: (a) interviews with local bureaucrats and other players in the policymaking community, (b) government documents, and (c) media articles.

3.1 Interviews

Selecting interview participants for each community began by identifying a list of local bureaucrats whose work was related to flood or drought management, as shown on local government websites. These individuals were contacted by either email or telephone asking for an interview on local flood or drought management practices and policies. (Copies of Internal

Review Board approved emails and phone scripts are in Appendix C.) By framing the interview requests broadly – flood and drought management policy instead of climate change adaptation affecting flood and drought management policy – I avoided priming the respondents to think about or talk about climate change if they would not have otherwise. Furthermore, it allowed me to speak to people who might have otherwise refused the request because climate change is a taboo subject in their state.

Often, the first people contacted in a locality would redirect me to someone else who knew more about the policy or was more involved in implementing the policy.²⁵ Anyone who did not reply to the first request for an interview was contacted again, but no more than three additional times.

Interviews lasted an average of 44 minutes and ranged from the shortest interview at 12 minutes to the longest lasting one hour and 14 minutes. The length of interview varied based on how much information the interviewee wanted to share and how developed the local climate adaptation policy was. Interviews were semi-structured and covered the following topics: describing (a) the subject's work for the local government, (b) existing flood or drought management policy, (c) bureaucratic autonomy and expertise in the local government, (d) challenges for flood and drought management success, (e) the local governments' (and the bureaucrats') relationship with local elected officials, state-level government, and the federal government, and (f) attitudes about the issue of climate change. Climate change was left as a last topic unless the interviewee brought up the issue independently of the researcher's questions. This was meant to allow participants to identify climate change without prompting. Furthermore,

²⁵ This is the primary reason many elected officials refused interview requests when a reason was provided to the researcher.

interviewees who identified climate change independently demonstrated that the issue is higher on their personal agenda than interview subjects that had to be prompted.

Interviews were transcribed verbatim using *TranscriberPro* software. All except one interview was recorded using an audio recording device. For one interview where audio recording was not used at the request of the interviewee, I took extensive notes which were typed for use in analysis. Any section containing a personal story, like a story about family members or personal vacations, was removed. Additionally, any interviewee who requested to make their comments confidentially had personal references removed to protect their identity, including names and job titles.²⁶

3.2 Government Documents

All local governments studied in this project had online data and document repositories which included meeting minutes, planning documents, and budgets. For each case, as many documents and webpages as possible that related to flood or drought management or the bureaucrats of interest were collected. This process was intended to collect more documents than would eventually be used in analysis in order to avoid missing anything relevant to climate adaptation, flood management, or drought management.

I used the following process to identify and collect documents. First, all meeting minutes for the local elected council from 2010 to 2016 were downloaded, and when possible additional meetings from years before 2010 were obtained. Not all local governments had this entire time period available in digital form, so I contacted the local government to have the files sent to me. As climate adaptation in local U.S. governments is a relatively new issue, missing documents

²⁶ The interview protocol was developed, tested, and refined through three test cases: Troy, New York, Manchester, Vermont, and Pittsburgh, Massachusetts. These interviews were conducted in the fall and spring of 2014 and 2015.

from before 2010 was not seen as an obstacle for thorough data collection. Even large, climate-friendly local governments had not begun to plan for climate change adaptation until the late 2000s. Climate adaptation pioneers Chicago, Illinois published their plan in 2008, King County, Washington (Seattle-Tacoma) published their plan in 2009, and New York City, New York created their climate adaptation plan in 2013 (C2ES, 2015; Georgetown Climate Center, 2015).

Second, all local planning documents were downloaded. These include land use plans, comprehensive plans, economic plans, and emergency management plans. Often, local government websites have a section devoted to planning documents. However, when this did not exist, I looked for links to planning documents on the webpages for each department. When available, old and new versions of planning documents were obtained. When planning documents were not available electronically, I requested them from the local government records office. Third, I downloaded all local budgets available from fiscal year 2000 to fiscal year 2016. Like meeting minutes, budgets for this time period were not always available. Therefore, budgets from at least 2010 to 2016 were downloaded. Fourth, I downloaded the local laws of each city or county. Often called “Codes of Ordinances” or “Municipal Codes,” these were sometimes managed by the local government, but many were managed by a third-party organization called *Municode*.

Fifth, I created PDF versions of any webpage related to flooding or drought, climate change, or any of the bureaucrats of interest. When there was no profile for a bureaucrat available on the website, I looked for one from LinkedIn.com, a professional social media website where members post resumes which include employment and educational background. Sixth and finally, if a website had a search function, I used it to find documents with the key terms “flood,” “drought,” or “climate.” Any new documents identified in this fashion were also

downloaded. If a local government had something like a newsletter that was identified through this search, I then downloaded any available version of the newsletter from 2000 to 2016.

3.3 Media Articles

While interviews and government documents provide good data to test the hypotheses presented here, both sources originate from the local government. Therefore, using local media coverage provides an important perspective which covers community attitudes and responses to local government actions and does not reflect government bias. However, the declining number of local newspapers and resources for the local papers that have persisted makes it difficult to find thorough coverage of local governments (Farhl, 2014). Thus, media coverage will be used to confirm or add to findings from interviews and government documents but does not represent a strong enough data source on its own.

Media articles were collected using the Access World News Database. First, I identified which publications covered the local community. Articles were identified for collection by searching for climate, or flood, or drought. Before downloading the article, I checked for false positives like “business climate,” or “a flood of responses.” Often one news media organization covers an entire county, so some publications were used for multiple cases. However, when this was the case, searches included the name of the local jurisdiction to make sure articles were appropriate for each community.

4. Qualitative Content Analysis: Computer-Guided and Manual Coding

Qualitative content analysis (QCA) was the coding strategy used to measure each of the six variables. According to Margrit Schreier and Phillip Mayring – two prominent methods scholars – QCA allows the researcher to deal with a high quantity of qualitative data in a way that does not lose sight of the information contained and its context (Mayring, 2000; Schreier,

2014). While not specified in George and Bennett's description of structured-focused comparisons, QCA provides an excellent approach for making sense of the large quantity of data for each case. Schreier (2014) presents a series of eight steps which complement the steps presented by George and Bennett (2005). Steps 1 and 2 instruct the researcher to determine research questions and select material (described above). In step 3, the researcher builds a coding frame or a codebook. For step 4, the material is segmented. This is the process of choosing which portions of the data to focus on for analysis. In step 5, the codebook is tested on a small segment of the data. The sixth step is when the codebook is revised. Then during the seventh step, the data are analyzed in their entirety. Below I describe how the codebook was developed and refined (steps 3, 5, 6 and 7) and how the documents are curated for manual coding (step 4). Step 8 is the presentation of findings.

4.1 Developing the Codebook

This project relies predominantly on a deductive coding scheme. Decisions about coding were made prior to analysis and are driven by the theory presented in Chapter 1. The codebook is presented in Appendix B. However, I acknowledge that the complexities of social reality are difficult to anticipate or fully describe. To accommodate this, the codebook was tested and subsequently refined. The test was performed on a subset of the data: Pasquotank County, North Carolina; the City of Elizabeth City, North Carolina; and Martin County, Florida. These three cases represent both counties and a city in two states in order to capture as much variety as could be anticipated for testing the codebook.

After the codebook was finalized, data for all cases were analyzed including the three cases used to test the codebook. Repeating the analysis on these cases serves two purposes: (1) it allows for conformity in coding across cases, especially as it regards any changes made to the

codebook during testing, and (2) it tests for reliability. Recoding yielded highly similar results with no substantive interpretation changes. For instance, when recoding one county, problem definition agreement between the elected officials and bureaucrats was measured at an eight during the first code but a 7 on the second code. This did not change the substantive interpretation of the result.

4.2 Curating Documents for Manual Coding

The data collection strategy employed in this project purposefully over-collected documents to build the cases. By collecting more documents than might apply, it minimizes the likelihood that a discussion about climate change adaptation – however minute – is missed. However, this requires that the extraneous documents are sorted out. To achieve this, I use computer-assisted coding through Atlas.ti²⁷ to identify documents with key words or phrases that relate to the variables of interest (see Chapter 2, Section 2; search strings listed in Appendix A). Any document not containing one of the search terms related to climate change adaptation, flooding, drought, and the bureaucrats of interest were not analyzed.

Once the quantity of documents was pared down, manual coding was used to determine specific measures. The manual coding is guided by the codebook (see Appendix B) When questions arose concerning the coding decision, the decision was made conservatively (i.e. in a way that would underestimate theorized effects). For instance, when coding for bureaucratic autonomy, the coding decision was made for less expertise.

²⁷ Atlas.ti is a computer program that allows researchers to automatically and manually code qualitative data including written documents, pictures, audio files, and video.

5. Limits to Generalizability

The 18 cases included in this study are not intended to be representative of all local governments. There are limits to the generalizability of the findings from this study that I acknowledge. First, the findings do not apply equally to bureaucrats in all local governments. The choice to focus on small-to-medium-sized localities was an intentional one because the dynamics of a smaller municipality do not match those of a mega-city like New York City or Los Angeles or a very small community. Many other researchers focus on dynamics in large cities (for examples see Bhullar, 2013 (Singapore); Gremillion, 2011 (large U.S. cities); Zimmerman & Faris, 2011 (large U.S. cities)) and these are important studies. However, the effects of climate change are being felt and will be felt by smaller communities with smaller populations and fewer government resources. Local bureaucrats are likely to play a larger policy-shaping role in a small or medium sized government than one that serves a population of millions of residents with professionalized elected officials who have their own advisory staffs. Conversely, these results should not be applied to bureaucrats in very small localities. Bureaucrats in these communities often take on many jobs and do not have the same types of expertise or amount of resources that those studied here do. Additionally, as described above in justifying the size cut-off for choosing cases, smaller communities often do not provide the services studied here like drought management or flood control. Instead, these are contracted out to larger governments with the resources to address these concerns.²⁸

²⁸ Unfortunately, scholars do not often devote time studying very small governments (i.e. communities with fewer than 10,000 residents). This represents a gap in our understanding of local government behavior, although the importance of filling it is up for discussion. Small communities might provide interesting cases for understanding the social world, but often they provide few services and rely on contractors and collaboration with other (larger) governments to provide services (see articles on the “Hollow State” including Milward and Provan (2000) and Terry (2005)).

Second, these findings do not apply to communities with no climate change-related threats. With the progression of climate change and the wide-ranging predicted impacts, this is admittedly a very small group of localities.

However, I argue that there are important lessons which can be derived from this study to apply beyond the case of climate change adaptation to other issues where local governments face growing on-the-ground problems but state and the federal government are stymied from acting due to political disagreement and polarization. Similar issues might include vaccinations, natural gas extraction (fracking), school vouchers, and rights for transgender individuals. In all of these policy areas, local officials are dealing with implementing policies and navigating these problems while state and federal politicians disagree about how the policies should be shaped, what the role of the government should be, and if the problems are even real.

Third, the findings should be limited to local governments in federalized systems. The division of labor, expertise, and funding is central to the theory and findings presented here. Similarly, political systems without a professionalized bureaucracy are not sufficiently similar to warrant generalization of these findings.

CHAPTER 3: DO LOCAL BUREAUCRATS SHAPE LOCAL CLIMATE ADAPTATION PLANNING?

In order to answer the question, “How do local bureaucrats shape local climate adaptation planning?” we must first establish *if* they do. This essentially is a question of local bureaucrats’ agenda-setting power. As this chapter will show, local bureaucrats are not the only players in local policymaking circles who bring climate adaptation onto the local agenda. Like state, national, and international policy agendas, a wide range of actors work to put issues onto the agenda (Cobb & Elder, 1983; Rochefort & Cobb, 1994; Mortensen & Seeberg, 2016) and work to prevent issues from reaching the decision agenda (Cobb & Ross, 1997). However, bureaucrats occupy a key space in local policymaking – they fulfill the roles of policy implementer as well as policy advisor to local elected officials (much like staff for members of congress or governors). In their role as advisors, local bureaucrats provide elected officials with (a) policies for approval (b) suggestions about how policies should be crafted to meet requirements from superior governments or legal requirements, (c) research and data germane to policy decisions, and (d) information about issues that are not typically the concern of local citizens or the local media. Access to local politicians and influence over the agenda puts local bureaucrats in a key position to shape the agenda and consequently influence policy.

In this chapter, I look at several ways to answer the question: Do bureaucrats shape the local agenda on climate change adaptation? To begin, I look to see if bureaucrats bring the issue of climate adaptation onto the local agenda first. Answering this “first mover” question addresses if bureaucrats are creating interest in adaptation by introducing the issue; if they do not introduce the issue it indicates that they are likely responding to a pre-existing concern in the community. However, a single mention is not enough to claim that climate adaptation is part of an ongoing conversation at the local level. Therefore, I also look to see if local bureaucrats are responsible

for increasing attention to the issue beyond a single mention. Here, I operationalize this by determining if climate was discussed by at least two individuals on two separate occasions within a 30-day period.²⁹ Identifying multiple mentions attests to the rising salience of the issues being addressed. If only one person is discussing climate adaptation, and there are no responses to those statements, the issue has not been fully integrated into the local agenda. Policy agenda scholars from Downs' issue attention cycle (1972) to Baumgartner and Jones' punctuated equilibrium (2009) have paid considerable attention to how issue rise and fall in prominence on the agenda. However, I am not aware of any scholars who examined the first mentions of issues – especially issues like climate adaptation – that have not risen to a point where they dominate attention. For the purposes of this project, differentiating between a simple mention and multiple mentions is sufficient. Climate adaptation remains a low salience issue in most local governments.

Next, I examine where local bureaucrats discuss climate adaptation because local agendas are multifaceted – comprised of public meetings with elected officials, meetings among government officials without public participation, and discussions between government actors.³⁰ In these different settings, I look to see where local bureaucrats discuss climate adaptation and I connect these spaces to bureaucrats' institutional power and the control they can exert. In the order they appear in this chapter, I examine: public meetings with elected officials (section 2), policy documents written by local bureaucrats³¹ (section 3), conversations or research efforts

²⁹ A month was chosen to allow for the variation in meeting schedules and activity levels of different jurisdictions. Jurisdictions that meet biweekly would then be discussing an issue at two back-to-back meetings in order to qualify. Any longer period might miss-measure jurisdictions that meet at a more frequent interval, like weekly meetings. For a more detailed discussion of methods, see Chapter 2 and the Appendix B: Codebook.

³⁰ Includes conversations between (a) an elected official and an elected official, (b) an elected official and a bureaucrat, and (c) between bureaucrats.

³¹ As a reflection of meetings among government officials without public participation.

initiated by elected officials where bureaucrats complete the research and fill in the details (section 4), and conversations between bureaucrats and other members of local government (section 5).

I find that bureaucrats are not always the first or the only actors in local governments to bring climate adaptation onto the local agenda. However, they are the actors in local government who develop climate adaptation ideas into concrete (actionable) policies by (a) including climate adaptation in policy documents they write, (b) following-up on elected officials' suggestions to consider climate adaptation solutions, and (c) bringing up the issue in conversations with coworkers. I do not find much evidence in my cases that local bureaucrats use public meetings to discuss climate adaptation. Consequently, there is support for hypothesis 1: *Front-line local bureaucrats are more likely than elected officials to introduce climate adaptation into the local agenda*, although elected officials are still important players in this process.

This chapter also addresses hypothesis 2: *Bureaucrats with a special area of focus – i.e. water managers, floodplain managers, etc. – are more likely than general-focus bureaucrats – i.e. city managers – to suggest integrating climate adaptation into existing policy areas*. In order to discuss differences between general-focus bureaucrats and specific-focus bureaucrats, all of the bureaucrats discussed in this chapter are listed in Table 7: Special- or General-Focus Bureaucrats.³² Hypothesis 2 is supported because there are many more special-focus bureaucrats working on integrating climate adaptation into local policies. Their positions include: planners, emergency managers, floodplain managers, water (and irrigation) managers, engineers, and public works and utilities specialists. This indicates that climate adaptation is less of a political issue in many of these localities and more of a technical challenge for the local government to

³² For more information about the coding system used, see the Codebook, Appendix B.

address. This distance from the polarized and partisan nature of climate change politics helps to explain why climate adaptation is being considered in many conservative areas of the country represented in these cases. However, it is not the only explanation because, as cases from North Carolina will show, the polarized nature of climate change politics does impact local government actions in some areas.

1. Agenda-Setters

In this section, I look generally at who introduces the issue of climate adaptation onto the agenda in the local community. First, I look at the individual who initially mentions climate adaptation. Second, I look at who is involved in increasing climate adaptation's salience by discussing the issue beyond the first mention.

1.1 Do Local Bureaucrats Introduce Climate Adaptation onto the Agenda?

As Table 4: First on the Agenda shows, local bureaucrats do introduce the issue of climate adaptation onto the agenda first. In half of the cases in this study (9 of 18), a local bureaucrat is responsible for the first mention of climate adaptation on the local agenda.³³ Comparatively, in only one of the 18 did cases local citizens bring the issue onto the agenda first and in five of the 18 cases elected officials brought climate adaptation onto the agenda first.³⁴

³³ In three cases climate adaptation was not on the agenda: The City of Greer, SC, the City of Mauldin, SC, and Oconee County, SC.

³⁴ Count does not include the City of Havelock, NC where local citizens and local elected officials advised in the creation of the Comprehensive Land Use Plan but were not responsible for drafting portions.

Table 4: First on the Agenda

State	Case	First on the Agenda	Identity of Individual(s)	Position of Individual(s)
North Carolina	Craven County	November 19, 2007 Board of Commissioners Meeting	County Commissioner M. Renée Sisk	Local Elected Official
	City of Elizabeth City	May 12, 2008 City Council Meeting	Councilwoman L. Anita Hummer	Local Elected Official
	City of Havelock	June 15, 2009 Comprehensive Land Use Plan	Written by Planning Director Scott Chase, Consultants Matt Noonkester and Erin Musiol, with comments and guidance from the Board of Commissioners and Citizen Advisory Committee	Local Bureaucrat with guidance from Local Elected Officials and Local Citizens
	City of New Bern	December 13, 2011 Board of Aldermen Meeting	Mike Avery, Director of Planning & Inspections	Local Bureaucrat
	Pasquotank County	February 21, 2011 Board of Commissioners Meeting	Board of Commissioners Chairman Lloyd Griffin	Local Elected Official
Florida	City of Fort Pierce	Not on the public agenda; mentioned as a concern in interview January 29, 2016	Marc Meyers and FL-Local Bureaucrat-762	Local Bureaucrats
	Martin County	November 2013 in the Comprehensive Emergency Management Plan	Written by the Emergency Management Department with input from all Martin County Departments, Martin County Constitutional Offices, the Martin County School Board, County municipalities and quasi- and non-governmental agencies involved in emergency preparedness	Local Bureaucrats
	St. Lucie County	March 2010 in the Local Mitigation Strategy	St. Lucie County Grants / Disaster Recovery Department	Local Bureaucrats

Table 4: First on the Agenda

State	Case	First on the Agenda	Identity of Individual(s)	Position of Individual(s)
Nevada	Carson City	February 15, 2006 Board of Supervisors Meeting	Supervisor Pete Livermore	Local Elected Officials
	City of Fernley	August 2014 University of Nevada Reno Water for the Seasons	Dr. Maureen McCarthy (Project Director), and team of academics and hydrologists	Local Citizens
South Carolina	Greenville County	January 2015 Greenville County Multi-Jurisdictional Hazard Mitigation Plan	Greenville County Floodplain Administrator Robert Hall; Greenville County Codes Enforcement Teresa Barber and representatives of city governments	Local Bureaucrats
Washington	Grant County	May 2, 2007 in “Area water managers respond to declining snowpack concern” in the Moses Lake Columbia Basin Herald	General manager for the Grant County Public Utilities District Tim Culbertson; East Columbia Basin Irrigation District Manager Dick Erickson	Local Bureaucrats
	Kittitas County	October 2012 Kittitas County Hazard Mitigation Plan	Christina Wollman, Hazard Mitigation Plan Project Manager; Kirk Holmes, Public Works Director; Jason Eklund, Information Services; Fred Slyfield, Emergency Management Specialist; Joe Gilbert, Public Health; and Tetra Tech Engineering and Architecture Services	Local Bureaucrats and Local Consultants
	City of Yakima	June 2011 City of Yakima Water System Report	Thomas E. Coleman, P.E. Consulting Services; David Brown Water/Irrigation Manager	Local Bureaucrats and Local Consultants
	Yakima County	December 29, 2009 “County commissioners approve of Yakima basin water plan” in the Yakima Herald-Republic	Yakima, Kittitas and Benton County Commissioners	Local Elected Officials

Note: The following cases did not have climate adaptation on the agenda: the City of Greer, SC, the City of Mauldin, SC, and Oconee County, SC.

Local bureaucrats were not the only actors who introduced climate adaptation on the local agenda. However, in half of the 18 cases, local bureaucrats introduced the issue first.

1.2 Do Local Bureaucrats Increase the Salience of Climate Adaptation on the Agenda?

When looking at which actors worked to raise the salience of climate adaptation on the local agenda, the story looks somewhat different. As shown in Table 5, climate adaptation rose on the agenda in only seven cases, indicating that in most areas adaptation is only discussed occasionally. Of those seven cases, four had bureaucrats involved in raising the salience of the issue on the agenda: Pasquotank County, NC, Martin County, FL, Greenville County, SC, and Kittitas County, WA. Comparatively, in four cases local citizens increased the issue's salience (Elizabeth City, NC, Pasquotank County, NC, St. Lucie County, FL, and Carson City, NV) and local elected officials increased the issue's salience in two cases (Elizabeth City, NC and Kittitas County, WA).³⁵

These counts give us a rough picture of the role that bureaucrats play in introducing the issue of climate adaptation onto the local agenda. However, it is an imperfect picture because the numbers do not illuminate the methods chosen to introduce the issue of climate adaptation or the potential impacts of that choice. In the next sections, I examine four different pathways bureaucrats use to introduce or shape discussions and policymaking for climate change adaptation in their local governments.

³⁵To be described as rising on the agenda, climate adaptation needed at least two mentions from two different individuals. For many cases, these two people were not in the same category (elected official, bureaucrat, or citizen). Therefore, the total number does not add up to seven.

Table 5: Climate Adaptation Rising on the Agenda

State	Case	Dates of Two Mentions of Climate Adaptation	Identity of Individual(s) who Discussed Climate Adaptation	Position of Individual(s)
North Carolina	City of Elizabeth City	January 25, 2016 City Council Work Session Minutes	UNC College Students	Local Citizens
		January 29, 2016 City Manager’s FYI	City Manager Richard Olson	Local Bureaucrats
	Pasquotank County	November 16, 2015 Board of Commissioners Meeting	UNC Students presenting report on sea level rise	Local Citizens
		December 7, 2015 Board of Commissioners Meeting	Floodplain Manager Shelley Cox	Local Bureaucrat
Florida	Martin County	No two mentions are within a month; however the interviews indicated that there was an ongoing effort by bureaucrats to craft a climate change adaptation strategy that is at its formative stages	Anne Murray	Local Bureaucrat
			Kathy Fitzpatrick	Local Bureaucrat
			Deborah Drum	Local Bureaucrat
	St. Lucie County	October 1, 2013 Board of County Commissioners Meeting	Richard Sylvestri, Stockard Holand	Local Citizens
October 15, 2013 Board of County Commissioners Meeting		Richard Sylvestri, David Luke, Jerry Beekler, Rick Modine, Howard Fine	Local Citizens	
Nevada	Carson City	February 7, 2008 Carson City Board of Supervisors Meeting	Nevada Division of Forestry Fire Management Officer Michael Klug	State Bureaucrat
		February 16, 2008 “The time is now to begin thinking about Nevada’s water future” in the Carson City Nevada Appeal	Fred Kessler, general contractor	Local Citizen

Table 5: Climate Adaptation Rising on the Agenda

State	Case	Dates of Two Mentions of Climate Adaptation	Identity of Individual(s) who Discussed Climate Adaptation	Position of Individual(s)
South Carolina	Greenville County	Low salience on a public agenda; interviews indicate that it is an ongoing conversation among bureaucrats in hazard mitigation	Paula Gucker	Local Bureaucrat
			James Bishop	Local Bureaucrat
Washington	Kittitas County	May 18, 2015 “Basinwide water plan aims for long-range solution” in the Ellensburg Daily Record	Urban Eberhart Kittitas Reclamation Board Director (also participant in the Yakima Integrated Plan)	Local Bureaucrat
		April 11, 2015 “Residents, county at odds over Lake Kachess reservoir” in the Ellensburg Daily Record	Gary Berndt County Commissioner	Local Elected Official

Note: The following cases did not have climate adaptation on the agenda: The City of Greer, SC, the City of Mauldin, SC, and Oconee County SC. The following cases had climate change on the agenda, but it was discussed infrequently enough that it was deemed to be low salience: Craven County, NC, the City of Havelock, NC, the City of New Bern, NC, the City of Fort Pierce, FL, the City of Fernley, NV, Grant County, WA, the City of Yakima, WA, and Yakima County, WA.

2. Introduce Climate Adaptation during a Public Meeting

The most direct (and public) way that an issue can be introduced onto the local agenda is to mention it during a public meeting. In council-manager or council-administrator forms of government, the agendas for these meetings are set by the council members and the local manager or administrator. The issues considered are often determined by current events but are also influenced by what local bureaucrats bring to the attention of a council member or the local manager.

There is evidence from the cases in this study that bureaucrats introduce issues directly onto the agenda. In three cases, bureaucrats independently brought up climate adaptation during public meetings:³⁶ New Bern, NC, Pasquotank County, NC and Elizabeth City, NC.

In New Bern, NC, climate adaptation never reached the agenda beyond one mention. However, the first-time climate adaptation was addressed – and the only time it was mentioned in a public meeting or other official documentation – was on December 13, 2011 when Planning and Inspections Director Mike Avery discussed a program run by the Environmental Protection Agency (EPA) and the Federal Emergency Management Agency (FEMA) to address community resilience planning. The meeting minutes state:

“...the city has been selected to participate in the EPA/FEMA Community Resilience Planning in a Coastal North Carolina technical assistance program. This will help the city use the best data to determine how climate change might impact local land use and infrastructure investments and to develop strategies that reduce vulnerability to known hazards, build long-term community resilience, and provide economic, environmental, and social benefits.” (Board of Aldermen Meeting, December 13, 2011)

There appears to be no follow up on this by the elected officials and no comments from community groups or members. The only other times climate adaptation enters the local agenda are in the local newspaper³⁷ and when a University of North Carolina graduate course capstone project was presented.³⁸

In Pasquotank County, NC, local Floodplain Manager Shelley Cox brought up climate change in a discussion of floodplain maps with elected officials (County Commissioners Joe

³⁶ Local bureaucrats are present at local public meetings to provide information either on specific agenda issues or to be available in case a topic arises they can speak to. If a local bureaucrat is only responding to someone else discussing climate adaptation, they were not considered to be introducing the issue.

³⁷ “Commentary: Reform national disaster policy before the next storm strikes” in the *Sun Journal* August 25, 2014; “Letter: Climate change and the Clean Power Plan” in the *Sun Journal* June 2, 2015

³⁸ “New Bern Stormwater Management: An Integrated Low-Impact Design Approach” capstone for ENST 698 at UNC Institute for the Environment, Spring 2013.

Winslow and Bettie Parker) on December 7, 2015. The discussion was mostly about how new floodplain maps issued by FEMA would impact flood insurance premiums in the community.

The meeting minutes state:

“[Shelley Cox] said the state believes that these maps are more accurate than we had before. She said she and other planners throughout the region have some concerns that these maps may take the reductions too far. She added that these maps do not take climate change or sea level rise into consideration. They are just storm modeling from hurricanes. ... Ms. Cox said her concern is residents dropping flood insurance and then being flooded. She said hopefully people will see this as an opportunity to reduce their flood insurance policies and not completely eliminate them. ... She is a little disappointed because she feels the maps do not accurately reflect some of the areas that she feels there could be flooding.” (Board of Commissioners meeting, December 7, 2015)

In addition to introducing the issue themselves, local bureaucrats can organize to have others present information to the elected officials at a public meeting. While the local bureaucrat is not speaking herself, she is using her position to make space for a message to be delivered. This happened in Elizabeth City, NC at the City Council’s January 25, 2016 work session when City Manager Richard Olson brought a group of University of North Carolina Chapel Hill students to present their capstone project on the likely impacts of climate change on sea level rise and flooding in the area.³⁹ The meeting minutes state:

“Mayor Peel recognized Mr. Olson for an overview of this matter. Mr. Olson reported that present for the meeting were some of the members of a team from the University of North Carolina at Chapel Hill. He advised that the team had performed an assessment of the vulnerability to sea level rise in Pasquotank County and had recommended a number of mitigation strategies to combat the issue. ... He noted that the presentation had been given to the Board of County Commissioners in November 2015; and based on that report, City staff felt it

³⁹ A similar presentation occurred at the Pasquotank County Board of Commissioners meeting on November 15, 2016. However, the county’s meeting minutes are not clear how the issue entered the agenda (e.g., at the request of a commissioner or a local bureaucrat).

would be appropriate to provide the information to the City Council.” (City Council Work Session, January 25, 2016)

Later in the same meeting, one of the elected officials – Councilwoman Jean Baker – asked about the information from this presentation and asked if the city was going to follow-up on the students’ recommendations. From the city manager’s response, it seems unlikely that he will be heading any efforts to proactively address the issue because he emphasized existing policies that address current flooding concerns. City Manager Olson did follow-up on the presentation in a few weeks in his weekly memo to the elected officials on January 29, 2016. However, he again did not present any long-term planning efforts to address climate adaptation, only a focused effort on one development project.

“Additionally, and at Council’s suggestion, I have shared with GEI’s project engineer details from the UNC Sea-Level Rise Study recently presented to the City of Elizabeth City. The MGP site is one of several properties in the Knobbs Creek area to be affected by potential sea level rise. In order to mitigate saturation of the subject property and others nearby, I have suggested formation of a berm along the northern border of the MGP site. GEI nor Pivotal have committed to this suggested storm water management improvement.” (City Manager’s Weekly FYI, January 29, 2016)

It is possible, then, that local bureaucrats will present information in public forums without supporting further action on that issue – as Richard Olson’s actions indicate.

In only one case – New Bern, NC – a local bureaucrat introduced climate change adaptation onto the formal agenda. The issue was discussed by local bureaucrats in two other cases but was not introduced by the bureaucrats themselves: (1) in Pasquotank County, NC a local bureaucrat discussed climate change but only in response to questions about a related topic (floodplain maps), and (2) in Elizabeth City, NC the issue was on the public agenda without support from the City Manager who facilitated the presentation.

Bringing information about climate adaptation to local public meetings is done more often by elected officials and citizens. In Craven County, NC, Elizabeth City, NC, Pasquotank County, NC, St. Lucie County, FL, Martin County, FL, and Carson City, NV elected officials or citizens discussed climate adaptation on 17 separate occasions. Considering that for each of the 18 cases in this study there are regular public meetings (weekly, bimonthly and monthly), there are relatively few mentions of climate adaptation. Public meetings do seem to be more the realm of elected officials and citizens for bringing up issues or topics of concern, and not where bureaucrats discuss issues or shape the agenda. This might be one reason why local bureaucrats are overlooked as important policymakers – their efforts are not as clearly documented or visible. Meeting minutes show bureaucrats’ role as more supportive than leading the policy discussion. However, as the next sections will show, bureaucrats are shaping local discussions about climate change more ‘behind the scenes’ than at public meetings.

3. Bureaucrats Write Policy Language and Policy Documents

Local bureaucrats are often responsible for both drafting policy language or writing planning documents, as well as researching what is required and recommended to be included in these documents. In this way, they act like congressional aides by providing information for council members to propose policies. This is especially true for complex policy documents like hazard mitigation plans or floodplain documents which are required by FEMA for disaster recovery and mitigation funds.

From my interviews and readings of local government documents, the adoption of hazard mitigation plans or floodplain ordinances is often a response by the local elected officials to incentives attached to these policies. For instance, when a local community adopts a hazard mitigation plan, FEMA promises matching funds for the community in the aftermath of a

disaster, plus extra funds for disaster mitigation projects designed to reduce damage from future natural disasters (FEMA, 2017). Similarly, membership in the Community Rating System (CRS) allows localities to offer discounted flood insurance to residents (FEMA, 2017). However, local elected officials who want to participate in these programs do not craft documents. Interpreting requirements from superior governments, researching, collecting data, and crafting language are left to bureaucrats (and increasingly contractors hired by local governments to help write these documents. See Peters, 1994; Peters & Pierre, 1998 for a discussion of the “hollowing out” of government services). Local officials are consulted during the process and they approve or reject the final project but are not directly involved in the creation of these documents. Thus, it is often in local bureaucrats’ power to make decisions about if or how to address non-required elements like the influence of climate change on the community and the need to adapt.

In seven cases – Havelock, NC, Martin County, FL, St. Lucie County, FL, Greenville County, SC, Grant County, WA, Kittitas County, WA, and the City of Yakima, WA – the first-time climate adaptation was on the formal agenda it was written into planning or policy documents written by local bureaucrats. In an additional three cases – Carson City, NV, Pasquotank County, NC, and Craven County, NC – climate adaptation was included in these documents although it was not the first mention. As shown in Table 6: Planning Documents, climate adaptation appears in a variety of documents written by bureaucrats including hazard mitigation plans,⁴⁰ land use plans, and a water system report.

⁴⁰ Also called Local Mitigation Strategies (in Florida) and Emergency Management Plans (as in the case of Martin County).

Table 6: Planning Documents Written By Bureaucrats which Mention Climate Adaptation

Case	Date	Type of Document	First Mention of Adaptation
Havelock, NC	June 2009	Comprehensive Land Use Plan	Yes
Craven, NC	October 2009	Coastal Area Management Act Land Use Plan	No
St. Lucie County, FL	March 2010	Local Mitigation Strategy	Yes
	October 2010	Comprehensive Plan: Coastal Management Element	No
Carson City, NV	November 2010	Hazard Mitigation Plan	No
	September 2015	Hazard Mitigation Plan Update	No
City of Yakima, WA	June 2011	Water System Report	Yes
Kittitas County, WA	October 2012	Hazard Mitigation Plan	Yes
Martin County, FL	November 2013	Comprehensive Emergency Management Plan	Yes
	October 2015	Local Mitigation Strategy	No
Grant County, WA	December 2013	Hazard Mitigation Plan	Yes
Greenville County, SC	January 2015	Multi-jurisdictional Hazard Mitigation Plan	Yes
Pasquotank, NC	March 2015	Albemarle Regional Hazard Mitigation Plan	No

3.1 Land Use Plans

Including sea level rise in a planning document can guide future land use decisions, potentially prompting zoning or development decisions which discourage development in areas at risk of flooding related to sea level rise or encouraging water smart development sensitive to drought risk. The main strength of incorporating climate adaptation through land use planning is that the document is written by bureaucrats and for bureaucrats to interpret during implementation. This insulates climate adaptation from political debates which might otherwise

prevent progress. There are three cases where climate adaptation was incorporated into land use or comprehensive planning documents.

The first case where climate adaptation was incorporated is Havelock, NC. The city's Comprehensive Land Use Plan was finalized in June 2009⁴¹ and is a 304-page document outlining "long-term, sustainable growth in the community," (p. 1-2). It was written by two contracted consultants for land planning – Matt Noonkester and Erin Musiol – and local planning director Scott Chase. The document was crafted with input from citizens and local elected officials. It mentions sea level rise twice:

"The City of Havelock will continuously monitor the effects of sea level rise and update land use plan policies as necessary to protect the city's public and private properties from rising water levels. Annual report documenting the effects of sea level rise; revisions to the land use plan based on the conclusions and recommendations from this report." (p. 278)

"The City of Havelock will support bulkheading on the mainland to protect its shoreline areas from intruding water resulting from rising sea level. Number of bulkheads constructed on the mainland to protect the shoreline since 1996." (p. 279).

Nearby Craven County, NC also included climate adaptation in their land use plan. Their Coastal Area Management Act Core Land Use Plan was finalized in October 2009, and like the Havelock Plan was written by local bureaucrats working with contracted consultants. Holland Consulting Planners worked with local bureaucrats in the Planning and Inspections Department to craft the 258-page document. It includes four mentions of monitoring and preparing for sea level rise, but does not plan for any specific actions:

⁴¹ Dates when the document was finalized are reported instead of dates when the documents were written because crafting these documents takes many years.

“Craven County will continuously monitor the effects of sea level rise and update the land use plan policies as necessary to protect the county’s public and private properties from rising water levels.” (p. 145)

“Craven County recognizes the uncertainties associated with sea level rise. The rate of rise is difficult to predict. Thus, it is difficult to establish policies to deal with the effects of sea level rise. Craven County supports cooperation with local, state, and federal efforts to inform the public of the anticipated effects of sea level rise.” (p. 154)

“Craven County will rely on the North Carolina Department of Environment and Natural Resources, Division of Coastal Management to monitor and regulate development in areas susceptible to sea level rise and wetlands loss.” (p. 154)

“Craven County will support bulkheading to protect its shoreline areas from intruding water resulting from rising sea level.” (p. 155).

No subsequent documents in Havelock or Craven County discuss climate change or sea level rise. This could be due to the changing attitudes of the North Carolina legislature which became more opposed to climate change action starting in 2012 (for a more detailed description of this and state-local dynamics in North Carolina see Chapter 5, Section 3.1).

St. Lucie County’s (FL) Comprehensive Plan was written by the planning division led by Planning and Development Services Director Leslie Olson and Planning Manager Bonnie Landry and completed in October 2010; it also mentions the threat sea level rise poses to the county in the Coastal Management Element section. It focuses on documenting and monitoring sea level rise data as a basis for future actions:

“The County shall continue to monitor all credible climate change and sea level rise data and what direct and potential effects this has on the coastal system natural resources. Based on this data the County shall evaluate and update the resource protection standards of the Land Development Code and this plan as necessary.” (p. 5-17)

“Policy 5.2.1.6 - The County shall consider the most current and credible sea level rise data when planning long term infrastructure and capital improvement expenditures and land use amendments in areas less than 10 feet in elevation.” (p. 5-25)

In St. Lucie County, climate change and sea level rise come up again and again including in the county's Local Mitigation Strategy (2010 and 2016 updates, discussed more with other hazard mitigation plans below). It is clear that the Comprehensive Plan's treatment of climate change and sea level rise reflect local commitments, at least among the local bureaucrats.

3.2 Disaster Preparation and Mitigation Documents

Disaster preparation and mitigation documents are prepared by bureaucrats and predominately used by bureaucrats, much like land use plans. While the literature faults these documents as exercises in completing checklists rather than thoughtful hazard planning efforts (Godschalk, 1999; Birkland T. A., 2009), I argue that because these documents are mostly used by bureaucrats, the exercise is useful in raising awareness among bureaucrats about the threats from climate change including flooding, drought, wildfires, and severe storms. By including information about how climate change will impact disaster frequency and severity and how the community can respond to these threats, hazard mitigation plans can encourage climate adaptation driven by emergency managers. For instance, connecting climate change to increasingly severe and more frequent floods can lead emergency managers to recommend flood management strategies like preserving green space or turning lots into green space instead of rebuilding structures after a flood (called Severe Repetitive Losses by FEMA (FEMA, 2015)).⁴²

In the seven cases where climate adaptation is incorporated into hazard mitigation plans, there is a range from plans that quickly mention climate change as a general threat to plans that incorporate climate threats in every section and for every hazard the document addresses. The

⁴² FEMA Hazard Mitigation Grants often provide the funds necessary to purchase lots that have been repeatedly damaged by floods. The goal is to turn these lots into non-inhabited spaces to reduce the human and property losses associated with flooding.

extent to which climate adaptation is addressed in the plan reflects how committed the bureaucrats are or how much pressure they faced to include climate adaptation in the plan.

Greenville County's (SC) Multi-Jurisdictional Hazard Mitigation Plan, January 2015

Update contains a single paragraph referencing climate change's impacts on the county:

“Greenville County acknowledges that climate change can have an impact on hazards affecting the County. Over time, the County may experience more intense rainfall events and droughts of longer duration. However, it is not anticipated that climate change will have a significant impact during this planning cycle. Issues regarding climate change will be considered again in the next planning cycle.” (p. 6-2)

Interviews with members of the county's emergency management team indicate that they believe climate change will be a larger part of their hazard mitigation efforts, but they had not done enough research to include details in their most recent update to the hazard mitigation plan.⁴³

“That is the next big thing that we've been told by a number of folks in some of the other regulatory agencies, and by doing a lot of research, that climate change will be the next thing that we have to deal with.” (Interview with Paula Gucker, October 29, 2015)

“So it is better to plan for something [like climate change] and it not happen than obviously not plan and it does. We need to address that. And again this whole document is to try to help Greenville County citizens to be safer and more prepared.” (Interview with Brian Bishop, November 9, 2015)

While Greenville County, SC barely mentioned climate change, the hazard mitigation plan covering Pasquotank County, NC goes into more depth to address climate adaptation.

Pasquotank County is a member of the Albemarle Region in North Carolina's northeast corner.

They joined with 24 other local governments to craft the Albemarle Regional Hazard Mitigation Plan, published in March 2015. While the local bureaucrats in Pasquotank County were not the

⁴³ Under FEMA rules, hazard mitigation plans need to be updated every 5 years for the locality to remain eligible for disaster mitigation funds (FEMA, 2013).

principals in writing the documents – that task was completed mostly by the Wooten Company, a planning consultant firm – Pasquotank’s previous hazard mitigation documents were used to craft the Albemarle Plan and two representatives from Pasquotank County participated in developing the plan: Emergency Management Coordinator Christy Saunders and Floodplain Manager Shelley Cox. The document does not extensively address climate adaptation, but it does discuss how climate change is likely to impact flooding from sea level rise:

“Sea level rise may impact the frequency and severity of these hazards in the future. Sea level rise occurs when the oceans warm or ice melts, bringing more water into the oceans. ... There is strong evidence that global sea level is now rising at an increased rate and will continue to rise during this century.” (p. 7)

“Additional factors involved in coastal erosion include human activity, sea-level rise, seasonal fluctuations and climate change.” (p. 29)

The Albemarle Plan does not develop a strategy for addressing sea level rise. It is merely bringing attention to the threat.

St. Lucie County and Martin County in Florida go beyond the brief treatment that Greenville, SC and the Albemarle Regional Hazard Mitigation Plans gave climate adaptation. Both St. Lucie and Martin counties include information about how climate change, and more specifically sea level rise, is likely to hurt their communities.

The St. Lucie County’s 2010 Hazard Mitigation Plan⁴⁴ discusses the impacts of climate change on severe storms and hurricanes, pointing to the potential for warmer temperatures to lead to stronger storms (March 2010, p. 84-85) and the impacts of sea level rise on coastal area development (August 2010 update). In the county’s 2016 update to their Local Mitigation

⁴⁴ Written by William Hoeffner the Local Mitigation Strategy Coordinator and the Grants/Disaster Recovery Division.

Strategy,⁴⁵ climate adaptation – specifically dealing with the threat that sea level rise poses – is given more extensive attention. In addition to an entire section describing the threat sea level poses to the county (p. 145-149) and it links sea level rise to flooding:

“The probability for future flooding in St. Lucie County is high, and based on recent rain events and potential climate change will continue to grow.” (p. 92)

It also discusses climate change in relation to severe storms, storm surges, and hurricanes:

“Global warming may cause changes in storm frequency and the precipitation rates associated with storms. A modest 0.9°F (0.5°C) increase in the mean global temperature will add 20 days to the annual hurricane season and increase the chances of a storm making landfall on the U.S. mainland by 33%. The warmer ocean surface also will allow storms to increase in intensity, survive in higher latitudes, and develop storm tracts that could shift farther north, producing more U.S. landfalls.” (p. 103)

St. Lucie, FL’s plan discusses the threat in more detail but does not separate responses to flooding from responses to sea level rise-based flooding. The Martin County Comprehensive Emergency Management Plan,⁴⁶ published in November 2013, discusses sea level rise:

“Sea level changes can have a compounded impact when a flooding or storm surge event impacts coastal and inland areas. Adaptation of current structures, mitigation and/or managed withdrawal of structures in redevelopment activities can lessen economic and social impacts to County businesses, government and residents.” (p. 12-13)

The plan does suggest strategies the county can adopt which specifically address responding to climate change. The county’s 2015 Unified Local Mitigation Strategy echoed these sentiments discussing sea level rise at length (p. 157-162) and how climate change will impact the number of hurricanes expected (p. 99).

⁴⁵ Written by Tom Daly, the Local Mitigation Strategy Coordinator with the Department of Public Safety Division of Emergency Management and the Treasure Coast Regional Planning County.

⁴⁶ Written by the Emergency Management Department, led by Mike Ewing.

More extensive coverage of climate adaptation and suggestions for responses are present in the disaster preparation documents from Carson City, NV, Kittitas County, WA, and Grant County, WA. Carson City, NV's Hazard Mitigation Plan was completed in November 2010⁴⁷ and includes several sections discussing how climate change will change snowpack levels which are crucial for water storage in the area (p. 5-21). The document's 2015 update (completed in September of that year) went into more detail about how the area needs to prepare for changing precipitation patterns (p. 5-21 to 5-22). Additionally, every hazard was evaluated for impacts of climate change, including predictions for more rain instead of snow in winter (p. 5-14), increased length and severity of drought (p. 5-14), higher temperatures linked to the spread of disease (p. 5-33), a longer fire season (p. 5-56), and more severe winter storms (p. 5-45). The document goes on to make suggestions for how the community can respond to these threats, although it does not differentiate adaptation from other disaster preparation efforts.

Kittitas County's (WA) Hazard Mitigation Plan was completed in October 2012⁴⁸ and looks at climate adaptation for every identified hazard and includes a separate section on climate change where the threat is discussed holistically – considering how different climate threats interact. The document discusses drought and higher temperatures in depth. As drought will strain the already dry climate in Kittitas and increase forest fire concerns, the mitigation plan points to ways local planners can build on current projects to deal with these challenges:

“The best advice to water resource managers regarding climate change is to start addressing current stresses on water supplies and build flexibility and robustness into any system. Flexibility helps to ensure a quick response to changing conditions, and robustness helps people prepare for and survive the worst

⁴⁷ Written by Staci Giomi the Carson City Emergency Management Director, Gary Dunn from the Carson City Fire Department, and Karen Johnson from the State Department of Emergency Management.

⁴⁸ Written by Christina Wollman, a planner in the Kittitas County Department of Public Works and members of the Tetra Tech, Inc. consultant firm.

conditions. With this approach to planning, water system managers will be better able to adapt to the impacts of climate change.” (p. 8-6)

Grant County’s (WA) Hazard Mitigation Plan update was completed in December 2013,⁴⁹ and like Carson City, NV and Kittitas County, WA, it addresses climate adaptation concerns for every hazard included in the plan. They also suggest that the best adaptation strategies local water managers can adopt for dealing with water shortages (one of the county’s biggest predicted problems) is to improve and maintain existing water storage systems (p. 11-8).

Moving forward, it is possible that more plans will include climate adaptation. However, this is contingent on the Trump Administration’s actions. As Chapter 5 will discuss in more detail, FEMA’s move to integrate climate adaptation in their grant programs inspired many localities to start considering the impacts of climate change – and in some areas like Greenville County, SC this was the first time the locality started planning for the impacts of climate change. As FEMA’s approach to climate adaptation changes with the Trump Administration, fewer communities may be inspired to act.

Hazard mitigation plans provided a space for bureaucrats – the main authors and users of the documents – to (1) think about what threats they will face from climate change and (2) explore strategies to adapt. Although they do not always lead to new projects, they represent local government policy on climate adaptation.

3.3 Other Documents

The final type of document written by bureaucrats that incorporates climate adaptation is a Water System Report from the City of Yakima, WA, completed in June 2011, it was written by Thomas Coleman, P.E. Consulting Services with the City of Yakima’s Water and Irrigation

⁴⁹ Written by Grant County Emergency Management Staff Members: Sam Lorenz (Former Director), Sandi Duffey (Project Manager), and Joy Reese (Special Project Coordinator) with help from the Tetra Tech, Inc. consultant firm.

Division Manager Dave Brown. Climate change is briefly included as a stressor on the city's water system because it will change water quantities (occasional floods and more frequent drought spells) and increase water temperatures making the city's water supply hospitable for the growth of water-borne diseases (p. 4-44). The document warns that these threats will need to be dealt with but does not commit to specific strategies to do so.

In conclusion, local bureaucrats bring climate adaptation onto the local agenda by including it in documents they write. Many of these documents are only read by bureaucrats,⁵⁰ limiting their agenda-setting power. However, this limit is inconsequential when bureaucrats are the ones changing policies – either by writing new policies and getting politician approval or changing policies through implementation decisions.

Additionally, some of these documents are required to contain information about climate change by the state government (e.g. Washington State requires that hazard mitigation plans address climate change).⁵¹ Although bureaucrats did not independently choose to introduce climate adaptation on the local agenda, their actions do introduce the idea and can spur action. It should not be concluded that these bureaucrats will necessarily become advocates for climate action beyond the bounds of hazard mitigation plans or other documents. Conversely, in areas where state action prevents local governments from integrating climate adaptation into documents like hazard mitigation plans or comprehensive plans (e.g. North Carolina), it does not necessarily mean that local bureaucrats do not use other avenues to get climate adaptation on the local agenda or shape it once it is introduced – in ways I will address next.

⁵⁰ This includes mostly local bureaucrats but sometimes state or federal bureaucrats who approve or comment on these documents so the locality can be eligible for state or federal grant monies.

⁵¹ See Chapter 5 for a discussion of intergovernmental relations surrounding local bureaucratic behavior and climate adaptation policy development.

4. Bureaucrats Following-Up on Elected Official’s Ideas

If bureaucrats do not introduce climate change adaptation onto the agenda first, it does not mean that they cannot or do not shape how that issue is presented and addressed on the agenda. As discussed earlier (see Section 3) local elected officials do not have the equivalent staff to a governor, or a state/federal legislator. Due to this, they often do not draft their own complete policies – they ask local bureaucrats to draft these policies. Filling in the details leaves significant space for bureaucrats to influence policies.

Of the 18 cases, there was one case where local bureaucrats took a suggestion made by an elected politician as an opportunity to craft comprehensive climate adaptation strategies. While the local bureaucrats were not the first to introduce the issue of climate adaptation onto the agenda, their efforts shaped Martin County, FL’s climate efforts since.

According to Anne Murray, the county hydrogeologist, Martin County’s efforts to address climate adaptation began with the formation of the Southeast Florida Regional Climate Compact in January 2010. Martin County is just north of Palm Beach – a member of the compact. The creation of the compact began a broader discussion of the impacts of climate change and sea level rise in southeastern Florida – a conversation which culminated in the creation of the Seven50 project which studied the economic future of seven south Florida Counties (Indian River, St. Lucie, Martin, Palm Beach, Broward, Miami-Dade, and Monroe⁵²) over the next 50 years. This effort was a burst of activity to account for sea level rise:

“And so as part of that effort, we did a vulnerability study - and basically – it’s an analysis: if sea level rises this much, between 1 and 3 feet - what infrastructure is going to be affected, where are we hanging out. So it gave us an overview of what

⁵² Palm Beach, Broward, Miami-Dade, and Monroe are members of the South Florida Regional Climate Compact and have been outspoken advocates for climate action (Bump, 2016; Burleigh, 2016).

that looks like and then what storm surge would look like on top of that sea level rise.” (Interview with Anne Murray, June 6, 2016)

However, after this initial burst of activity, “it kind of stopped” according to Ms. Murray.

The county was equipped with studies outlining the impacts of sea level rise but no actionable plans to counter the threat. Ms. Murray worked with a few colleagues – Deborah Drum, an ecosystem restoration manager, and Kathy Fitzpatrick, a coastal engineer – during this time to monitor sea level rise threats as well as any actions from other organizations.

Eventually, the elected county commissioners, specifically John Haddox, became interested in the threat of sea level rise and asked this group of bureaucrats to start developing a more comprehensive picture of the sea level rise threat and how the county can respond to it.

According to Ms. Murray:

“... one of our commissioners ended up coming to one of these climate change summits. And he brought us all together and said, "I think we need to do something about all of this. We've got cities and counties that are more advanced in our planning at this than we are, and I think we need to start moving on this. We need to get our communities involved, we need to have more awareness, we need to have more of a plan." (Interview with Anne Murray, June 6, 2016)

Ms. Fitzpatrick echoed this:

“Yeah, I mean Commissioner John Haddox asked for information to be brought forward on sea level rise. And I think he's possibly the only commissioner to publicly express that, although certainly in one way or another it's been mentioned by other commissioners.” (Interview with Kathy Fitzpatrick, June 14, 2016)

The commissioner’s interest and support led to a more robust effort to address climate adaptation in the county. According to Ms. Murray and Ms. Fitzpatrick, the county is putting together a comprehensive adaptation plan involving many county departments (planning, public works, engineering, growth management, etc.) which addresses direct threats like land loss from sea level rise to indirect threats like migration of people from southern counties which are

currently experiencing problems with sea level rise. (Interview with Anne Murray, June 6, 2016; Interview with Kathy Fitzpatrick, June 14, 2016).

The involvement of the county commissioner expanded the effort from the three bureaucrats monitoring climate adaptation needs to the development of a comprehensive adaptation plan. While the commissioner's requests on sea level rise and climate adaptation energized the effort, the work of the local bureaucrats shaped the policy itself.

5. Conversations with Co-Workers

Bureaucrats did not use public meetings to introduce climate adaptation. A potential reason for this is that bureaucrats are more likely to introduce new policy initiatives or advocate for new ideas in conversations with other government employees away from the public eye. Once these initiatives generate momentum, they are presented to the public. In this way, the conversations between government employees are an important facet of the local government agenda.

While the transition from informal agenda⁵³ to policy is more difficult when an issue is discussed informally by government employees the likelihood of policy action increases. Bureaucrats can bring up the issue of climate adaptation with their colleagues and raise the issue on the personal agenda of other bureaucrats or elected officials. This type of lobbying can help local bureaucrats build support for the idea of addressing climate adaptation. However, because this is a more informal path, discussions about climate adaptation are not sufficient for policy change. Co-workers often discuss a myriad of topics without acting on them. These discussions,

⁵³ This is also referred to as a systemic agenda or the universe of issues being discussed at any time (see Cobb and Elder, 1983; Anderson, 2011)

on the other hand, are necessary for policies that need cooperation between bureaucrats or between bureaucrats and politicians.

In nine of the 18 cases in this study, local bureaucrats indicated that they are discussing climate change and the need for climate adaptation with their coworkers – either fellow bureaucrats or bureaucrats *and* elected officials.

Often, local bureaucrats frame the need for climate adaptation in an acausal way, arguing that it does not matter why climate change is happening. The locality needs to respond anyway. For instance, Director of the Roza Irrigation District Scott Revell in Yakima County, WA said:

“We talk about it every day. I mean basin-wide, our water plan ... is predicated on the fact that the climate is changing. And we could debate why it is changing and what you can do about it ... But, if it is changing, it is changing. It doesn't matter why, it just is.” (Interview with Scott Revell, September 16, 2016)

Don Donaldson, the Director of Engineering in Martin County, FL made a similar remark about the impact of climate change and sea level rise:

“Staff-wise, we look at [sea level rise]. I mean I think if you... basically if you look at the data, the State of Florida and the water level gauges has experienced - if I remember the data correctly - about 10 inches of sea level rise in the last 100 years; and the land sank roughly 2 inches. So we had a one foot rise basically in 100 years. And no matter whether we want to believe anything has to do natural climate effects or not, we're going to see at least that much or more. So the fact is that, yes, the water levels are incrementally changing.” (Interview with Don Donaldson, May 26, 2016)

In Greenville County, SC, the local bureaucrats have been discussing climate adaptation in the context of updating their hazard mitigation plan. The county's floodplain manager Brian Bishop had a discussion with members of the South Carolina Emergency Management Division about the need to eventually include climate change in their hazard mitigation plan. Although climate adaptation was only briefly mentioned in the document, Mr. Bishop's recommendation

to Paula Gucker, the Assistant County Administrator for Community Planning (in charge of emergency management), and other Greenville County emergency planners led to a discussion about the impacts of climate change in the region and the need to integrate it into the next hazard mitigation plan update due to be finished in 2020. As Gucker describes:

“It was discussions our floodplain manager was having with folks down at South Carolina Emergency Management Division. And then, he had done some research and he was doing a lot of reading – he's new – so he's been doing a lot of research to find out, what the heck is this stuff, and what are we doing here, and how are we doing that, and why? And through his research on EPA's site and other sites that he went on, and talking to folks, he found out that, "Uh-oh, this is the next thing that is coming." So we figured we would put it in there.” (Interview with Paula Gucker, October 29, 2015)

In several cases, discussions about climate adaptation began when a neighboring area experienced extreme events linked to climate change like sea level rise and flooding in Miami, Florida and the “mega-drought” in California. For instance, the situation in Miami influenced conversations in Martin County, FL:

“The other thing is that we've started to have some inquiries from newspaper reporters, T.V. reporters - "What is your sea level rise program?" And they are probably feeling a need to have an answer for that. I don't know if they told you, but the four counties to our south have been extremely proactive on climate change and sea level rise. And so I think that people are starting to look at the next county to the north to see what is being done.” (Interview with Kathy Fitzpatrick, June 14, 2016)

It also came up during discussions with local bureaucrats in the City of Fort Pierce, FL (in St. Lucie County):

“All we have heard for the three or four years out of South Florida, and we are on the fringes of south and central Florida, that the sea level rise and the all-time record tides that we are seeing within 50 miles of us to the South, and the horror stories that within 20 years a majority of South Florida will be under water. And that's a real concern. They are receiving, and I thought we had a high tide here

within the last 18 months that was extremely high.” (Interview with Marc Meyers, January 29, 2016)

California’s mega-drought raised concerns over drought management in Carson City, NV:

“And the term of 'mega-drought' and what are we going to do 20 years from now if we have a 20-year drought?” (Interview with David Bruketta, June 9, 2016)

And in nearby Fernley, NV:

“And you know, with California being right next door to us and we see all of the impacts, those are some indicators that are certainly considered. Because if it is there, it is not far away from us. And we share a river system, so that is important for us to consider.” (Interview with NV-Local Bureaucrat-282, June 15, 2016)

In several cases, non-governmental organizations’ work on climate change inspired conversations about adaptation in the local government. For instance, Fernley, NV is participating in a program run by researchers at the University of Nevada Reno called “Water for the Seasons,” which addresses the water shortages expected in the Truckee-Carson drainage area.

“[Climate change] is this big broad concept that they are addressing at the state level and again through the University of Nevada - that is kind of what that Water for the Seasons is addressing too - is the climate change and what that means. ... And part of that process was really looking at what happens if it is a super dry year and this is what the hydrology looks like and this is what the climate looks like, and what does that mean? So it has been kind of a team approach and all of the stakeholders involved are kind of running through those models and figuring out what that means for the system.” (Interview with NV-Local Bureaucrat-282, June 15, 2016)

Similarly, the creation of the Yakima Basin Integrated Water Resource Management Plan (or Yakima Integrated Plan) spurred conversations about climate change in participating localities – several of which are in this study: Yakima County, WA, the City of Yakima, WA, and Kittitas County, WA. Responding to a question asking if climate change was part of the discussion around drought management, David Brown from the City of Yakima, WA said:

“There is a large program here called the Yakima Integrated Plan. And that is all of the farmers and the Yakima Nation - that's the Indian Tribe, cities, the Forest Service, the Fish and Wildlife Agencies. We've all gotten together and put this plan together about adding more storage, making more conservation available, doing all of this work. So there is a lot of talk about climate change. That has become one of the big parts of that plan. We know climate change is going to happen. We've decided that we don't argue why, we just know it is here. And it doesn't really, in the end, it doesn't really matter why it is here, it's here. And we're going... we know we are going to have less snowpack, we're going to have probably the same amount of water but it will come as rain instead of snow.”

(Interview with David Brown, June 22, 2016)

In these cases, elected officials often participate in these non-governmental organizations and are part of the discussion about climate adaptation with local bureaucrats. In a way, by participating in these non-governmental efforts, local governments contract out their adaptation planning to these organizations.

Occasionally, worries about the politics (i.e. negative citizen feedback) of funding adaptation projects or imposing additional regulations stop these conversations before any further adaptation steps are taken. As David Bruketta from Carson City, NV said:

“And we have looked at some of those concepts [like mega-droughts], and it's really scary because it involves a significant amount of money. So when that happens, a lot of people don't want to hear that. So we have looked at it, but no formal plans have been implemented.” (Interview with David Bruketta, June 9, 2016)

This sentiment was also reflected by Craven County, NC Department Head NC-Local Bureaucrat-823:

“[Sea level rise] is a big level of concern. They are already doing a lot of studies on it. And there is a group out of Greenville, North Carolina ... they've been doing something about sea level and sea level change and how it is going to affect local counties and planning and zoning for future development. And they are like, you maybe better start looking at it now, and might start changing where you allow and don't allow people to build now instead of having to deal with it in the

future. But I think when the money washes out, it will go away.” (Interview with NC-Local Bureaucrat-823, September 23, 2015)

In localities in North Carolina, the attitudes of state politicians regarding climate change stop conversations about adaptation almost altogether.⁵⁴ This sentiment came up a few times, including remarks from Shelley Cox in Pasquotank County, NC:

“I don't know if you follow North Carolina politics, but our legislature the last few years has become extremely conservative. They have changed a lot of development regulations, there is a lot less support for water management or any type of limits on development, so when you are talking sea level rise and sea level rise policy, it is regulations, and that is also a dirty word right now for our legislature.” (Interview with Shelley Cox, April 17, 2015)

Landin Holland, a planning consultant who works with several Inner Banks⁵⁵ communities to develop hazard mitigation plans and land use plans, said something similar:

“Well, one thing that is quite interesting and intriguing is that, in our mitigation plans, under this cycle, under our current regime in terms of governor and our legislature, we are not allowed to acknowledge or discuss in any way shape or form sea level rise in these mitigation plans. I mean it is basically, I won't use the word illegal. But we are not allowed to discuss it. And if it is in there, the State of North Carolina State Office of Emergency Management makes you remove it prior to submitting it to FEMA.” (Interview with Landin Holland, September 11, 2015)

These conversations with coworkers about climate change adaptation shape the informal agenda by raising the issue on the personal agendas of other government actors. However, it can lead to real changes like in the Greenville County, SC case where discussion about climate adaptation among the emergency management staff led to studying the impacts of climate change for inclusion in future hazard mitigation plan updates. When these conversations about climate adaptation include elected officials, bureaucrats can build support for more extensive

⁵⁴ For a discussion about why the state's influence is this strong, see Chapter 5.

⁵⁵ North Carolina cases for this study all fall in the Inner Banks area: Craven County, Pasquotank County, New Bern, Havelock, and Elizabeth City.

efforts, like the Yakima Integrated Plan or the effort in Martin County, FL where a team of bureaucrats is building a comprehensive approach to adaptation.

6. Special-Focus or General-Focus Bureaucrats

Overwhelmingly, bureaucrats identified in this study as influencing the local agenda on climate change adaptation are bureaucrats with a special focus. They include planners, emergency managers, floodplain managers, water (and irrigation) managers, engineers, and public works and utilities specialists. As Table 7 shows, there are 40 bureaucrats mentioned in this chapter as influencing their respective local agendas on climate change. Of those, only five are categorized as general-focus bureaucrats.

The large number of special-focus bureaucrats working on climate change indicates that local climate adaptation efforts are drawing on specific knowledge and research to craft these policies. These bureaucrats are often seen as experts in their subject areas (see Chapter 4 for more discussion of bureaucratic expertise) and this expertise is being drawn upon largely to craft policy rather than implement it for the emerging issue of climate adaptation. Additionally, special-focus bureaucrats can often avoid the polarized debate around climate change by focusing on the details of securing an adequate water supply, preventing damage and fatalities from flooding, and preparing the community for other threats from climate change.

Table 7: Special- or General-Focus Bureaucrats

State	Case	Name of Bureaucrat	Position	Special or General Focus
North Carolina	Craven County	Landin Holland	Consulting Planner	Special
		NC-Local Bureaucrat-823	County Department Head	Special
	City of Elizabeth City	Richard Olson	City Manager	General

Table 7: Special- or General-Focus Bureaucrats

State	Case	Name of Bureaucrat	Position	Special or General Focus
	City of Havelock	Scott Chase	Planning Director	Special
	City of New Bern	Mike Avery	Planning and Inspections Director	Special
	Pasquotank County	Shelley Cox	Floodplain Manager	Special
		Christy Saunders	Emergency Management Coordinator	Special
Florida	City of Fort Pierce	Marc Meyers	Director of the Building Department	Special
		FL-Local Bureaucrat-762	Lower Level Bureaucrat	Special
		Anne Murray	County Hydrogeologist	Special
		Deborah Drum	Ecosystem Restoration Manager	Special
	Martin County	Kathy Fitzpatrick	Coastal Engineer	Special
Don Donaldson		Director of Engineering	Special	
Florida		Mike Ewing	Emergency Management Department Manager	Special
		Leslie Olson	Planning and Development Services Director	Special
	St. Lucie County	Bonnie Landry	Planning Manager	Special
		William Hoeffner	Local Mitigation Strategy Coordinator (2010 Version)	Special
		Tom Daly	Local Mitigation Strategy Coordinator (2016 Update)	Special
Nevada	Carson City	David Bruketta	Utilities Director	Special
		Staci Giomi	Emergency Management Director	Special

Table 7: Special- or General-Focus Bureaucrats

State	Case	Name of Bureaucrat	Position	Special or General Focus
		Gary Dunn	Fire Department	Special
	City of Fernley	NV-Local Bureaucrat-282	City Department Head	Special
South Carolina	Greenville County	Paula Gucker	Assistant County Administrator for Community Planning	Special
		Brian Bishop	Floodplain Manager	Special
		Robert Hall	Floodplain Administrator	Special
		Teresa Barber	Codes Enforcer	Special
Washington	Grant County	Sam Lorenz	Director of Emergency Management Department (former)	Special
		Sandi Duffey	Project Manager, Emergency Management Department	Special
		Joy Reese	Special Project Coordinator, Emergency Management Department	Special
		Tim Culbertson	General Manager for the Grant County Public Utilities District	General
		Dick Erickson	East Columbia Basin Irrigation District Manager	General
	Kittitas County	Christina Wollman	Planner, Department of Public Works	Special
		Kirk Holmes	Public Works Director	Special
		Jason Eklund	Information Services	Special
		Fred Slyfield	Emergency Management Specialist	Special
		Joe Gilbert	Public Health	Special
Urban Eberhart		Kittitas Reclamation Board Director	General	
City of Yakima	David Brown	Water and Irrigation Manager	Special	

Table 7: Special- or General-Focus Bureaucrats

State	Case	Name of Bureaucrat	Position	Special or General Focus
		Thomas Coleman	Consultant	Special
	Yakima County	Scott Revell	Director of the Roza Irrigation District	General

Note: No bureaucrats were mentioned from the City of Greer, SC, the City of Mauldin, SC, or Oconee County, SC because climate adaptation was not on the agenda in these three cases.

7. Conclusion

Local bureaucrats occupy a position in local government which allows them to influence climate adaptation as an issue on local policy agendas. As this chapter demonstrated, bureaucrats have more influence when they (a) have knowledge elected officials lack or (b) are working on low salience issue areas like emergency management⁵⁶ and water management.

While many different actors can be the first to introduce climate adaptation onto the local agenda, bureaucrats are often the first actors to discuss climate change. In nine cases bureaucrats were the first to mention climate change. Furthermore, bureaucrats play a large part in raising the salience of climate adaptation on the local agenda. However, bureaucrats are not the only actors involved in increasing the salience of the issue, indicating that bureaucrats do not often take on the role of policy advocate without support from other actors in local policymaking circles.

These findings support hypothesis 1: *Front-line local bureaucrats are more likely than elected officials to introduce climate adaptation into the local agenda.* It is important to understand the ways that bureaucrats bring up the issue of climate adaptation. While bureaucrats are unlikely to use public meetings with elected officials as a venue to discuss climate

⁵⁶ Unless there is a recent disaster, emergency management is often a low salience issue. It is only in the wake of disasters that attention is drawn to disaster mitigation efforts (Birkland T. A., 2006).

adaptation, they are likely to include climate adaptation in documents they write, in research they do at the request of elected officials, and in conversations they have with coworkers. Essentially, bureaucrats work on climate change in venues where they have more control and are not immediately scrutinized by either elected officials or the public. This happens for several (not mutually exclusive) reasons:

1. Climate adaptation policy is complex and involves many local departments from emergency management to public works to engineering to planning (as demonstrated by Martin County’s attempt at a comprehensive climate adaptation policy). Bringing these actors together takes time behind the scenes. This work is not accomplished in public meetings where government presents ideas more than brainstorms them.
2. Polarization around climate change can “chill” conversations about climate adaptation, but this does not happen everywhere (only in the North Carolina cases in this project). Often, bureaucrats side-step polarization by arguing that the cause of the problem does not matter, only the solutions to prevent harm in the community (i.e. Yakima County, WA and Martin County, FL).
3. Climate adaptation is often seen as an expensive undertaking, which can lead to a lack of support for adaptation policies among politicians and citizens (i.e. Carson City, NV and Craven County, NC).
4. Bureaucrats are often responding to the attitudes of superior governments on climate change (state or federal governments) while writing documents like hazard mitigation plans. Therefore, their efforts to set the local agenda happen as a response to other governments rather than bureaucrats deciding independently that climate change is a concern. (Addressed in Chapter 5 in more depth.)

There is evidence that bureaucrats are shaping the agenda on climate change, and, more precisely, bureaucrats with specialized knowledge and with special-focus positions in local government are acting to shape climate adaptation policy. In other words, the data presented here support hypothesis 2: *Bureaucrats with a special area of focus – e.g. water managers, floodplain managers, etc. – are more likely than general-focus bureaucrats – e.g. city managers – to suggest integrating climate adaptation into existing policy areas..* This is because most localities

are still researching what climate impacts they will face and how to address them. Bureaucrats with specialized knowledge represent important resources for gathering technical information requested by elected officials or information that local bureaucrats see as important in crafting a climate adaptation response. Furthermore, the focus on solutions to climate threats rather than the causes of climate change shifts conversation towards the technical rather than political, which helps avoid the partisan baggage associated with climate change. There is not just one type of specialized bureaucrat who works on climate adaptation. Local planners, emergency managers, floodplain managers, water (and irrigation) managers, engineers, and public works and utilities specialists all work on climate adaptation in the communities studied in this project. This indicates that local bureaucrats commonly recognize climate change as a threat and this is not an issue being pushed by one particular professional association or in the training for a specific type of position. Additionally, this speaks to the complexity of crafting local climate adaptation policies.

Building on the findings in this chapter which establish that bureaucrats have raised the issue on the local government agenda, Chapter 4 describes the tactics, strategies, and approaches bureaucrats use to develop climate adaptation policy. It looks at five general categories of action: (1) defiant behavior, (2) cooperative action, (3) politician-led action, (4) non-confrontational behavior, and (5) no action.

CHAPTER 4: HOW BUREAUCRATS ACT TO ADAPT TO CLIMATE CHANGE IN THEIR COMMUNITIES

1. Introduction

Chapter 3 established that local bureaucrats play an important agenda-setting function in local governments for the issue of climate adaptation. Their efforts to advise local leaders, craft policy documents, and bring attention to low-salience issues like emergency preparedness shape the local agenda and introduce the idea of climate adaptation at the local level. However, agenda setting is only the first step in crafting new policy. This chapter examines if and how bureaucrats take the second step: creating new policy or changing existing policy to address climate adaptation.⁵⁷

First, this chapter describes actions bureaucrats took to craft climate adaptation policy in their local governments. These are organized by the four forms of action bureaucrats can take: defiant behavior, cooperative action, politician-led action, and non-confrontational behavior. The behavior of bureaucrats in the sample who did not act to address climate change is also discussed. Definitions and examples of these are presented in Table 8.

Second, I look at how bureaucrats act to adapt climate to climate change – either by using their expertise or crafting arguments about how to create adaptation policy. Hypothesis 3 states: *local bureaucrats drive climate adaptation policy by providing issue-specific expertise about potential harms*. It suggests bureaucrats recognize the power of their expertise and use it to shape policy. They provide information about risks from climate change in order to encourage adaptive

⁵⁷ This chapter does not evaluate the benefits or drawbacks of the different approaches bureaucrats take to craft policy. I acknowledge that some policy approaches may be more successful than others. However, that evaluation is beyond the scope of this project and will be difficult to accurately assess until climate change has progressed to the point that adaptation is essential in many communities where different approaches can be compared.

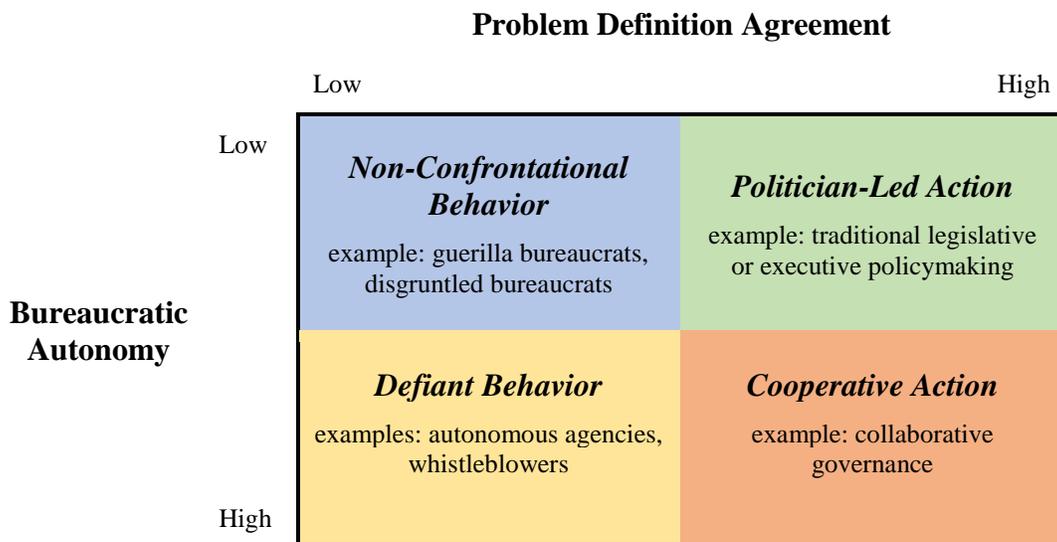
responses to those risks. This hypothesis was overwhelmingly supported by the data with 15 of the 16 bureaucrats who addressed climate adaptation acting in this way. Hypothesis 4 states: *local bureaucrats drive climate adaptation by arguing that climate change predictions can be integrated into existing policies rather than suggesting adaptation should be pursued through new policy areas.* Hypothesis 4 suggests that bureaucrats will argue to integrate climate adaptation into existing policies rather than arguing for entirely new initiatives or programs. This study finds support for this hypothesis as well, but there were a few bureaucrats working on a comprehensive plan instead of integrating climate adaptation only into existing policies, demonstrating that not all bureaucrats are interested in addressing climate change only through existing policies.

The data also suggest that bureaucrats use more than these two methods (using their expertise to highlight harms from climate change and arguing for integrating climate adaptation into existing policy). Bureaucrats also depoliticized climate adaptation by divorcing the causes of climate change (fossil fuel emissions, deforestation, poor land use practices, etc.) from the need to prepare for potentially devastating consequences from climate change. This shifts focus towards risk management conversations anchored in the precautionary principle (Applegate, 2010; UNFCCC, 1992), and argues that the costs of doing something now to respond to climate change are lower than reacting to disasters like mega-droughts or devastating floods.

Additionally, bureaucrats encouraged local participation in multi-stakeholder groups whose goals include climate adaptation. The rationale for joining these groups rests on other goals (like water management, cost-sharing, etc.) instead of climate adaptation. However, participation in the group encourages the local government to adopt climate adaptation practices as they cooperate with other stakeholders.

Third, this chapter evaluates the ability of the model presented in Chapter 1 (Figure 1) to correctly describe how bureaucrats acted based on their level of autonomy and the amount of problem definition agreement there is in the policymaking community concerning the need for climate change adaptation policy. The model presented in Chapter 1 (and replicated below in Figure 6) proposes that once bureaucrats decide to act to address climate adaptation in their communities, the form their action takes is shaped by the interaction of (a) their personal autonomy as a local government bureaucrat and (b) the amount of agreement members of the policymaking community have concerning the need to adapt to climate change. While the model correctly predicts the actions of 13 of the 16 bureaucrats, the three incorrect cases reveal flaws in the model including too much emphasis on bureaucratic autonomy and missing the important role of multi-stakeholder cooperative organizations. Corrections to the model are suggested for future research.

Figure 6: Forms of Bureaucratic Behavior to Integrate Climate Change Adaptation into Existing Policies



In sum, this chapter demonstrates that bureaucrats act to create and develop climate adaptation policy even in the conservative and small- to medium-sized communities this study focuses on. Bureaucrats use a variety of strategies to push climate adaptation policy development in their local communities with varying levels of success. How bureaucrats act is influenced by their level of autonomy, agreement with superiors about the need for climate adaptation policy, and their government's participation in multi-stakeholder groups which address climate change adaptation among other goals.

2. How Bureaucrats Act to Address Climate Change Adaptation in their Communities

In this section I describe how the bureaucrats in my sample acted to integrate climate change adaptation into existing policies. First, I categorize bureaucrats' behavior into the four types of action described in the theory chapter of this project: (1) defiant behavior, (2) cooperative action, (3) politician-led action, and (4) non-confrontational behavior. Those bureaucrats who did not act are also described.⁵⁸ An overview of the forms of action are presented in Table 8.

Second, I evaluate hypothesis 3 and hypothesis 4 (described above). These hypotheses address the methods through which local bureaucrats drive climate change adaptation, mainly through providing issue-specific expertise about potential harms (hypothesis 3) and arguing that climate change predictions can be integrated into existing policies (hypothesis 4).

2.1 Defiant Behavior

Defiant behavior occurs when bureaucrats disagree with politicians on an issue but act to address it regardless. The key distinguishing factor here is that bureaucrats are aware of their

⁵⁸ The theory chapter outlines the first four forms of action in more detail. The option of no action is included here to include those bureaucrats captured by the sample who did nothing to help their communities address climate change. More research and theorizing are necessary to explain why some bureaucrats act and others do not.

Table 8: Forms of Bureaucratic Action

Form of Action	Description
Defiant Behavior	<p>Bureaucrats know that their superiors disagree with the local government adapting to climate change, but they act anyway.</p> <p><i>Examples: write policy documents, change department policy, use discretion to change implementation of existing policies to make them fulfill adaptation goal while voicing need to adapt in front of elected officials</i></p>
Cooperative Action	<p>Bureaucrats work with politicians to address climate change adaptation through local government policy. Bureaucrats or politicians can initiate policy changes. Both bureaucrats and politicians stay involved in policy development past the initial idea to start addressing climate change.</p> <p><i>Examples: politicians work with bureaucrats at monthly meetings to create adaptation policy, politicians and bureaucrats become involved in a multi-stakeholder organization to develop regional climate adaptation strategy</i></p>
Politician-Led Action	<p>Politicians initiate climate change adaptation policy development, but unlike cooperative action they do not stay involved. In other words, politicians “assign” climate change adaptation to local bureaucrats and wait for bureaucrats to finish the policy development on their own.</p> <p><i>Examples: politicians pass resolution to raise flood elevation levels to prepare for increased flooding – then leave to bureaucrats to enforce, politicians pass resolution ordering expansion of water storage capacity – leave to bureaucrats to find strategy to achieve this</i></p>
Non-Confrontational Behavior	<p>Bureaucrats take steps to adapt to climate change but try to avoid attention of politicians. Bureaucrats may avoid drawing the attention of politicians because they know politicians will disagree <i>or</i> they do not know the attitudes of politicians but do not want to involve them for other reasons.</p> <p><i>Examples: bureaucrats include climate adaptation in a document they write which politicians do not evaluate in-depth, bureaucrats use discretion to achieve climate adaptation goals through existing policies but do not announce to elected leaders</i></p>
No Action	<p>The bureaucrat does not take steps to address climate change adaptation through role as government employee. Bureaucrats can believe climate change is a problem. They can also think that their local government <i>should</i> do something to adapt. However, they are not doing anything themselves (either initiating or supporting someone else) to address the impacts of climate change.</p>

superiors' disagreement with the potential action, but they act anyway. This type of behavior includes actions ranging from writing documents which must be approved by superiors (e.g. planning documents, reports, etc.) which address issues politicians do not want addressed or disagree with, to bureaucrats changing how they implement existing policies to integrate an adaptation goal (e.g. enforcing a higher flood standard, seeking more water storage or water rights). For a bureaucrat to act defiantly, she needs to be aware of politicians' attitudes on an issue. This means that her superiors need to have vocal positions – either in public forums or in conversations with the bureaucrat. Overall, I would not expect defiant behavior to happen often. Many people are conflict-averse and there is a norm in the US where bureaucrats do not make policies unless they have democratic support from public opinion or elected officials. The policy studies literature and the bureaucratic behavior literature demonstrate that this norm oversimplifies what policymaking is, but the norm discourages bureaucrats from acting in ways they might think are “political.”

Planning Director Shelley Cox from Pasquotank County, NC was the only bureaucrat in the sample to demonstrate defiant behavior. Among Ms. Cox's job responsibilities is floodplain management (i.e. making sure that homes and businesses are not in the path of frequently or regularly occurring floodwaters). Climate change is likely to increase flooding in Pasquotank County through a combination of increased precipitation events and sea level rise. Ms. Cox acknowledged that sea level rise and climate change are threats to the area:

“We also have sea level rise now to kind of start thinking about because we're hearing more and more that with sea level rise, particularly for areas like ours where we are already pretty low, and we could definitely see some tremendous flooding impacts from that in the future as well. ... There has been a little bit of reluctance politically to even admit that that is even happening. But I think in the future, that is going to be something that we're going to have to really address.

It's not a matter of if; it is a matter of when." (Interview with Shelley Cox, April 17, 2015)

The local politicians – along with the state government – in 2013 to 2015⁵⁹ were actively trying to stop efforts to integrate sea level rise predictions into flood management and minimize any predictions of sea level damages. Ms. Cox was aware of this, she said:

“North Carolina has been a little bit more hesitant to even discuss that issue, because politically it is kind of a dirty word when you start to talk about sea level rise and climate change. ... It is definitely at the state level, to some degree it is at the county level too.” (Interview with Shelley Cox, April 17, 2015)

Additionally, the Board of Commissioners unanimously supported a resolution on April 2, 2012 which uses a lower predicted rate of sea level rise (that does not consider climate change predictions) instead of the original 39-inch prediction released by the North Carolina Coastal Area Management Commission (Rawlins, 2012; WUNC News, 2014). The resolution cites the “irreparable economic harm to the coastal plain of North Carolina by adversely changing land/property values, uses, insurances, and construction/maintenance costs of both private and public infrastructure,” that the higher sea level prediction would have produced.⁶⁰

Despite the strong signals sent from the Board of Commissioners, Ms. Cox worked with a group of UNC Chapel Hill students to complete a study of the impact of sea level rise in Pasquotank County. She helped the students present their findings to the Board of Commissioners on November 16, 2015 and advocated for the county to adopt several of their recommendations. Three weeks after the UNC student presentation, Ms. Cox presented

⁵⁹ As described in the methods chapter (2), bureaucratic action is considered in a limited time frame around the time the interview took place. This time-frame is 2010 to 2016 for all bureaucrats, although the moment of the interview is considered as well to contextualize bureaucrats' remarks. Ms. Cox was interviewed in April 2015.

⁶⁰ The Pasquotank County Board of Commissioners also had previously been members of the NC-20 advocacy organization which lobbied against sea level rise and climate change adaptation measures in the state legislature. They discontinued their membership by 2012 when this resolution was signed, but it does not appear this was done because the Board of Commissioners disagreed with the organization's stance on climate change.

information to the Board of Commissioners about new floodplain maps from FEMA. During this December 7, 2015 meeting, Ms. Cox lamented that the new maps might lead some residents to drop flood insurance when they are still at risk due to sea level rise and climate change – two factors which the maps did not take into consideration.

Ms. Cox's behavior is defiant because she is aware that the local elected officials do not support working to address climate change, but she still advocated for local efforts to consider the impacts of climate change. Her choice to work with the UNC students shows she is willing to be creative in finding ways to elevate the issue in the county.

The Board of Commissioners did not rebuke Ms. Cox as far as the data show,⁶¹ so it is likely that her position as an expert and a long-standing member of the Pasquotank County staff helped her act in this way. However, it does not appear that she convinced the board to take up the issue of sea level rise adaptation because they have not taken any steps to act since her actions in late 2015.⁶²

2.2 Cooperative Action

Cooperative action occurs when bureaucrats and politicians work together to develop or change policy. This can include instances where bureaucrats initiate a policy change idea (a new policy tool, a new approach to a problem, or recognizing a new problem that needs policy solutions) or instances where politicians initiate the effort. Cooperative action occurs when the bureaucrats and politicians are involved in discussions, work-groups, etc. to create or change policy. It is distinguishable from politician-led action in that cooperative action is a collaborative

⁶¹ Ms. Cox was interviewed on April 15, 2015 before she helped the UNC students present information on climate change, so the researcher did not hear Ms. Cox's personal account of these events.

⁶² In an email exchange in April 2018, Ms. Cox said that the commissioners' eyes were opened to the county's sea level rise and flooding risk by the students' presentation. However, the cost and difficulty of taking action meant the issue was dropped shortly after the students' presentation.

effort whereas politician-led action looks more like a teacher giving an assignment to her students. While students can express creativity, and use their own knowledge in completing the assignment, they were not responsible for the genesis of the ideas surrounding the assignment. In cooperative action, a more collaborative approach is used. Bureaucrats and politicians work together to define the problem and pursue solutions. Since it is a collaborative effort, politicians are not hands-off here. They stay involved in developing solutions.

There were six bureaucrats from four communities who acted to address climate adaptation in a cooperative way: NV-Local Bureaucrat-282 and NV-Local Bureaucrat-895 from Fernley, NV; Public Works Director Mark Cook from Kittitas County, WA; Water and Irrigation Manager David Brown from the City of Yakima, WA; and Direct of the Roza Irrigation District Scott Revell and Senior Natural Resource Specialist Joel Freudenthal from Yakima County, WA.

In the four cases in this study where local bureaucrats engaged in cooperative action on climate adaptation with their superiors, multi-stakeholder partnerships helped facilitate this cooperation. Highly limited water supplies in Nevada and Washington led to litigation, and two multi-stakeholder partnerships – Water for the Seasons in Nevada and the Yakima Basin Integrated Plan in Washington – formed in its wake to help resolve existing litigation and prevent future lawsuits.

Fernley, NV is a participating local government in the University of Nevada, Reno's (UNVR) Water for the Seasons project. The project began in 2014 with funding from the National Science Foundation and the U.S. Department of Agriculture. Its mission is to bring together scientists from UNVR, community water managers, and water rights holders in the Truckee-Carson River System to model and develop strategies for responding to drought and flooding problems that climate change will cause in the basin (Water for the Seasons, 2016).

Climate change is the principle goal of the group, but its efforts include drought and flood management strategies that are needed regardless of a changing climate.

Elected officials and bureaucrats from the City of Fernley are active participants in the Water for the Seasons project in the roles of (a) community water managers and (b) holders of significant groundwater rights in the basin. Both NV-Local Bureaucrat-282 and NV-Local Bureaucrat-895 work with the Water for the Seasons group to develop strategies to deal with significant droughts predicted by climate change models. Additionally, NV-Local Bureaucrat-282 and NV-Local Bureaucrat-895 participate in the city's water team. The city's water team is composed of the city manager, water rights manager, public works director, water attorney, and water engineer. This team meets weekly to address water supply concerns for the city, and every month they meet with at least two members of the city council to discuss water policy development.

These two meeting structures keep politicians and bureaucrats in Fernley actively involved in policy development. The local politicians and the local bureaucrats both feel responsibility for being involved and crafting successful policy responses to climate change driven drought in the area. Furthermore, by involving partners in the larger basin area (including other municipalities and indigenous governments), Fernley benefits from a basin-wide strategy instead of facing a tragedy of the commons problem where their efforts are undermined by others' actions in the basin (Hardin, 1968).

A similar story played out in the Yakima River basin in South Central Washington. The Yakima Basin Integrated Water Resource Management Plan (referred to commonly at the Integrated Plan in the region) is a unique collaborative partnership to manage water use, environmental protection, agriculture, recreation, and historical water rights of the indigenous

people: the Yakima Nation. The project officially began in 2009 and emerged from the effort of Ron Van Gundy⁶³ from the Roza Irrigation District⁶⁴ and Phil Rigdon from the Yakima Nation who began working together to develop solutions to the area's long-standing water shortages and conflicts.

Van Gundy's and Rigdon's partnership led to a joint letter addressed to Derek Sandison – the Washington State Department of Ecology's Regional Director for the Yakima Area – and David Kaumheimer – the Federal Bureau of Reclamation's Director of the Upper Columbia Office. The March 31, 2008 letter implored the Department of Ecology and the Bureau of Reclamation to support a comprehensive effort to manage water in the Yakima Basin, bringing together actors who had been longstanding adversaries in water litigation battles. The letter ends with the follow recommendation:

“We recommend that Ecology and Reclamation work with Roza, the Yakima Nation, and others with interest and expertise in water and fisheries management to construct a package of measures to solve problems of flow, passage, and habitat in the Yakima basin.”

The letter was signed by Ralph Sampson, Jr. – the Chairman of the Yakima Tribal Council – and Ric Valicoff – the Chairman of the Roza Irrigation District Board of Directors – but was widely understood to be the work of Van Gundy and Rigdon.

The next year, the Department of Ecology created the Integrated Plan by bringing together representatives from the Yakima Nation, irrigation districts, environmental

⁶³ Ron Van Gundy served the Roza Irrigation District (one of the largest irrigation districts in South Washington state) for 40 years. Under his leadership, the area adopted scientific water management systems, low flow irrigation technology, and began the Integrated Plan. Van Gundy passed away in early 2017 and was widely heralded as a great water management innovator and local leader. He is credited for helping save the area's agricultural systems from disaster during severe droughts during his 40-year tenure (Jenkins, 2017).

⁶⁴ Irrigation districts are special-purpose governments which help manage water resources, mainly in agriculturally dependent communities. They are governed by elected boards chosen by water users or water rights holders and administered by a small staff of local bureaucrats.

organizations, and federal, state, county, and city governments. The resulting group – the Yakima River Basin Water Enhancement Project Working Group (referred to as the Working Group) – has been working since 2009 on creating a balanced water management strategy. Recognizing the challenge that climate change poses to the basin – and the delicate balance they have achieved with the Integrated Plan – the Working Group has a committee focused specifically on climate change adaptation strategies.

Yakima County, Kittitas County, and the City of Yakima are all participating local governments in the Integrated Plan and send representatives to the Working Group. During interviews with bureaucrats from these governments, they *all* referenced the Integrated Plan. Mr. Brown from the City of Yakima, said:

“There is a large program here called the Yakima Integrated Plan, and that is all of the farmers and the Yakima Nation... cities, the Forest Service, the Fish and Wildlife agencies. We’ve all gotten together and put this plan together about adding more storage, making more conservation available, doing all of this work. So there is a lot of talk about climate change. That has become one of the big parts of the plan. We know climate change is going to happen. We’ve decided that we don’t argue why, we just know it is here. And it doesn’t really, in the end, it doesn’t really matter why it is here, it’s here.” (Interview with David Brown, June 22, 2016)

This attitude is common among water managers in the region. Mr. Revell from the Roza Irrigation District, echoed this sentiment:

“We talk about [climate change] every day. I mean basin-wide, our water plan is predicated on the fact that the climate is changing. And we could debate why it is changing and what you can do about it, but it is not a phrase that gets a lot of credibility amongst a lot of our growers. But if it is changing, it is changing. It doesn’t matter why, it just is.” (Interview with Scott Revell, September 16, 2016)

By divorcing the causes of climate change from the impacts of climate change, it seems these conservative areas can begin tackling the issue. However, the role of the Integrated Plan

cannot be understated. Local elected officials from these governments – Yakima County, the City of Yakima, and Kittitas County⁶⁵ – are active participants in the development of the Integrated Plan as well.

The Yakima County Commissioners wrote a joint letter supporting the Integrated Plan, published on September 28, 2014 in the *Yakima Herald-Republic*. They argued that the project helps safeguard the economy of the area from agricultural losses during drought,⁶⁶ and that droughts are more of a risk in a world with climate change. They write:

“The governor made it clear that he is concerned about the worsening impacts of climate change on water supplies. These impacts have become a common refrain here. City water managers, farmers, and tribal leaders have all told us they have witnessed summertime water levels decrease as warmer temperatures cause the snowpack to melt earlier in the spring. Without our proactive water plan and joint participation, these variations in rainfall and snowpack will leave junior water rights, instream needs, and even senior water rights at risk.” (Leita, Bouchey, and Elliot, 2014)

Similarly, in Kittitas County, Commissioner Paul Jewell has become a regular participant in the Integrated Plan’s Working Group and an advocate for the plan in his county. He regularly attends meetings of the Working Group. He also wrote a guest column in the local paper: the *Ellensburg Daily Record* on March 4, 2016 supporting the plan and arguing that the Integrated Plan’s efforts led to an easier experience with the 2015 drought season than would have otherwise occurred.

⁶⁵ Mr. Brown from the City of Yakima, Commissioner Mike Leita from Yakima County, and Commissioner Paul Jewell from Kittitas County are the regular representatives from their local governments at the Integrated Plan Working Group meetings. However, they often bring others from their governments to these meetings as well.

⁶⁶ The Yakima basin is an incredibly productive and rich agricultural economy. The area produces high value crops including apples, cherries, grapes (wine), and hops (beer). Many of these crops take years (up to a decade) for the plants to produce. For instance, a hop vine takes five to eight years to become productive. Grape wines can take three years to produce. Crop losses from drought in this area have long-lasting negative impacts, especially for orchards, grape vines, and hop vines.

Commissioner Jewell's involvement and knowledge was cited by Mr. Cook as a reason why their drought management and water management policies are developing well:

“I think, we are benefitting from an elected body that has gone through this groundwater issue together, for the most part. So they have a good knowledge base. And so the conversation isn't just being driven on the staff-side. I think we have a unique situation where we have a fairly educated group of elected officials, and they are certainly very cognizant - they are very conversant - in the challenge of drought management in Kittitas County.” (Interview with Mark Cook, September 21, 2016)

For both the Water for the Seasons project in Nevada and the Yakima Integrated Plan in South Washington state, local bureaucrats and their elected official superiors worked to address water management in light of climate change stressors. Through these multi-stakeholder collaborative organizations, local bureaucrats collaborated with their peers in other governments as well as with their local elected politicians. The long-term and large-scale nature of these projects likely inspires continued interest and involvement from elected officials who might move on from emergency management issues when there is not a current emergency to respond to. Furthermore, these organizations provide a venue wherein bureaucrats and politicians present a united front representing their local governments. In other words, it is an outside force that inspires cooperation within the government.

2.3 Politician-Led Action

Politician-led action describes policy development that is initiated by elected officials. Bureaucrats are significantly involved in the process, but they are not the actors who initiate the effort. This includes policies that are developed because a politician asks bureaucrats to investigate or research a new policy option the elected official has heard about⁶⁷ or a new policy

⁶⁷ In other words, the elected official is participating in policy diffusion.

idea. It also includes politicians asking bureaucrats to develop options (policies) to address a problem. In the case of climate change adaptation, a local politician may ask bureaucrats to develop solutions to a problem like sea level rise or mega-droughts. While the solution itself is not specified, the politician initiated the effort to develop policy. The most important element here is that the politicians initiate the effort to develop policy but are not active in subsequent efforts to develop policy.

This form of action fits the expected pattern of politicians delegating work to bureaucrats. However, the local government context changes this dynamic from how it typically works at the federal level in the U.S. At the federal level, elected politicians write policies then pass them to bureaucrats to implement and fill in necessary details. Admittedly this is an oversimplified version of policymaking, but it differs from the local context because in local governments, bureaucrats are more active in writing policy before it is approved by elected officials. They also fill in the gaps after the policy is approved by elected officials.

The three bureaucrats demonstrating politician-led action in this study were from one case (Martin County, FL): County Engineer Kathy Fitzpatrick, Director of Engineering Don Donaldson, and County Hydrogeologist Anne Murray. In this case, local bureaucrats started working on climate change adaptation after prompting from one local politician. Commissioner John Haddox asked three local bureaucrats to begin working on sea level rise adaptation after he attended a conference on the subject with representatives of other South Florida counties.⁶⁸ As Ms. Murray described:

⁶⁸ County Hydrogeologist Anne Murray stated that she and several other local bureaucrats had been aware of the need to adapt to sea level rise since the publication of the Seven50 report by the southeast Florida Regional Partnership in early 2013. The partnership comprises seven counties (Indian River, St. Lucie, Martin, Palm Beach, Broward, Miami-Dade, and Monroe) and is intended to plan for the next 50 years of economic development in the region. Ms. Murray and several others began monitoring and discussing the threat of sea level rise but did not begin any concrete planning at that time.

“There were some staff members including myself that have been following [sea level rise] because we know it is coming down. ... We’ve been kind of checking in with each other on what has been going on and involving ourselves in other organizations. So, all of this is to say, one of our commissioners [John Haddox] ended up coming to one of these climate change summits. And he brought us together and said, ‘I think we need to do something about all of this. We’ve got cities and counties that are more advanced in our planning at this that we are, and I think we need to start moving on this.’” (Interview with Anne Murray, June 6, 2016)

After the encouragement from Commissioner Haddox, Ms. Murray began an inventory of what the county’s various departments were already doing to address climate adaptation, to serve as a starting point for crafting a comprehensive plan. She is working predominantly with Ms. Fitzpatrick and Deborah Drum – the county Ecosystem Restoration Manager. Both Ms. Murray and Ms. Fitzpatrick stressed that the project is going to require comprehensive planning and a combination of planning tools to achieve successful adaptation. They mentioned considering a wide range of issues from addressing loss of coastal land, to property damage for people living in flood-prone areas, to dealing with migrants from areas further south (e.g. Miami, Puerto Rico, the Florida Keys). While they do not have any concrete plans, they are beginning to work on formulating the policy.

While Commissioner Haddox was working with members of the engineering department to craft a plan, other bureaucrats felt that existing policies were enough, at least for now, to address climate adaptation. Mr. Donaldson pointed to existing local flood management policies which can essentially self-update as sea levels rise. For example, local flood ordinances require homes to sit one to four feet above sea level (depending on their level of flood risk). As sea level rises, homes in the county will need to be at higher elevations to pass local requirements. This self-updating mechanism is dependent upon accurate sea level measurements and flood maps. Unfortunately, flood maps are not updated frequently enough to keep pace with climate-driven

sea level rise. FEMA acknowledges that their flood map updating process is slowed down (FEMA, 2014). Additionally, the maps can be challenged by local governments, do not take into account climate change models, and are built on historical data only which discounts the impact of climate change (i.e. the floodplains are expanding at a heightened rate) (Skibba, 2017). Mr. Donaldson described how sea level rise is happening in the county and a few commissioners “are asking about it,” but that on the whole the issue is still not discussed. Responding to the question, “Is sea level rise a big concern in Martin County?” Mr. Donaldson said:

“Politically, no, it is not talked about. Staff-wise, we look at it. ... We had a one foot rise basically in the last 100 years. And no matter whether you want to believe anything has to do with natural climate effects or not, we’re going to see at least that much or more.” (Interview with Don Donaldson, May 26, 2016)

While the bureaucrats in Martin County were aware of the need to address climate change, they did not begin to put together a framework to actively address it until support emerged from an elected official. Ms. Murray said:

“It has more weight when a commissioner gets interested in a program or you get public input that says "What are we doing on this?" It helps to put legs on it.” (Interview with Anne Murray, June 6, 2016)

There is a chance that a cooperative relationship will evolve between the local bureaucrats and the local elected officials – especially if the Seven50 Plan or a different multi-stakeholder cooperative group becomes more successful in organizing.⁶⁹ However, without the

⁶⁹ The Seven50 plan faced steep opposition from many community members. In the Martin County and St. Lucie County meeting minutes analyzed for this project, community members regularly came to speak about the economic growth that could be deterred by adopting the program, especially the elements that required adapting to sea level rise.

encouragement of Commissioner Haddox, it is unlikely the comprehensive approach to climate adaptation initiated by Ms. Murray, Ms. Fitzpatrick, and Ms. Drum would have begun.⁷⁰

2.4 Non-Confrontational Behavior

Non-confrontational behavior describes a situation where bureaucrats act but do so in a way to avoid conflict with politicians. Bureaucrats know or assume they will face disagreement from elected politicians, so they pursue pathways for policy change using discretion, crafting departmental policies (which do not require supervisor oversight), and having discussions about future policy options but tentatively pursuing them.

Non-confrontational behavior can include more overt actions to address climate change adaptation, but only when they are not presented defiantly to counter politicians' wishes. For instance, if the elected officials and city manager in a city government do not voice opinions on climate change (either publicly or in a way the bureaucrat would be aware of their attitude), bureaucrats might integrate climate change adaptation into planning documents. Although these planning documents must be approved by elected officials, the choice from bureaucrats to integrate them "quietly" is a non-confrontational behavior.

There were six bureaucrats from three cases who demonstrated non-confrontational behavior: Floodplain Manager Brian Bishop and Assistant County Administrator for Community Planning Paula Gucker from Greenville County, SC; Director of Building Development Marc Meyers and FL-Local Bureaucrat-762 from Fort Pierce, FL; and Deputy County Administrator Mark Satterlee and Stormwater Program Coordinator Jason Bessey from St. Lucie County, FL.

⁷⁰ After the conclusion of data collection for this study, Commissioner Haddox lost his 2016 re-election bid. However, the bureaucrats' efforts do not appear to have stopped. The county submitted an amendment to their comprehensive plan in September 2017, the entirety of which addressed sea level rise.

The bureaucrats who engaged in non-confrontational behavior in this study took small steps towards adapting to climate change but did not start any big new projects or initiatives. Largely, they acknowledged the threat posed by climate change in their communities but did not go out on a limb. Additionally, these actions were not significant policy efforts which will likely make an important difference adapting to climate change.

In Greenville County, SC, Ms. Gucker acted on advice presented by Mr. Bishop to begin studying the impact of climate change as a hazard multiplier in their area. Mr. Bishop worked with representatives from federal government agencies including the Federal Emergency Management Agency (FEMA), the National Oceanic and Atmospheric Administration (NOAA), and the National Weather Service (NWS) in the creation of the county's hazard mitigation plan 2015 update. During his discussions, Mr. Bishop learned that climate change adaptation was likely to be required in future updates to the hazard mitigation plan. Furthermore, he believes there is a benefit in being prepared for worst-case scenarios that may arise from climate change.

“Well, it’s just a hazard that whether or not you believe it or not we have to be prepared for. So if these El Niños and all this other stuff that is happening, and the water are increasing in temperature and things like that – if all of that comes about, if it actually comes about, we’ve got to know what the effect would be. ... So its better to plan for something and it not happen than obviously not plan and it does.” (Interview with Brian Bishop, November 9, 2015)

Mr. Bishop and Ms. Gucker both pointed to the October 2015 storm – Hurricane Joaquin – that flooded coastal South Carolina area as a case-in-point for being proactive. However, neither Mr. Bishop or Ms. Gucker made special efforts to bring climate change adaptation to the attention of elected officials.⁷¹ Climate change is not on the agenda of the county commissioners:

⁷¹ Hazard mitigation plan updates are shown to elected officials for approval. However, these hundred-page documents are often “rubber stamped” by elected officials.

there have been no mentions in public meetings, neither Mr. Bishop or Ms. Gucker had conversations with the commissioners about climate adaptation, and there were no mentions of the issue in conjunction with local government officials in the local newspaper. Furthermore, Mr. Bishop and Ms. Gucker gave no indication they knew what the commissioners thought about climate change. Essentially, Mr. Bishop and Ms. Gucker are taking some small steps, but not advertising them, fitting the definition of non-confrontational behavior.

Similarly, Mr. Meyers and FL-Local Bureaucrat-762 in the City of Fort Pierce, FL are taking small steps to address the threat of sea level rise and climate change driven flooding in their community. Mr. Meyers and FL-Local Bureaucrat-762 began to worry more about sea level after hearing predictions coming out of the southernmost communities on the Florida peninsula – like Miami-Dade and Broward Counties. Mr. Meyers said:

“All we have heard for three or four years out of South Florida, and we are on the fringes of south and central Florida, that the sea level rise and the all-time record tides that we are seeing within 50 miles to use to the South, and the horror stories that within 20 years a majority of South Florida will be under water. And that’s a real concern.” (Interview with Marc Meyers, January 29, 2016).

Mr. Meyers and FL-Local Bureaucrat-762 are working with existing policies to start planning. For example, they are working to use the most up to date sea level data for evaluating home elevation requirements⁷² and other flood prevention measures. They discuss how sea level changes risk with builders and homeowners. FL-Local Bureaucrat-762 said:

“We have discussed the risk of building at the current base flood elevation versus thinking about the future, and what that means for insurance and what it means in times of disaster. We have, when customers come in, we try to help them when they are smart enough to look about the flood zone. [We] try to recommend that

⁷² To qualify for the National Flood Insurance Program, local governments need to have specific requirements for structures in the floodplain. One requirement is elevating the first level of a structure a certain number of feet (often 2 feet) above sea level to prevent regular flooding problems. This is referred to as “base flood elevation.” As sea levels change, the height of this elevation increases.

they try to find a location that is outside the flood zone.” (Interview with FL-Local Bureaucrat-762, January 29, 2016)

They are exercising discretion in a limited way to educate and encourage smarter, climate aware development in their community. They are not reaching out to property owners, only discussing climate risk with those who ask about their flood risk. However, neither Mr. Meyers or FL-Local Bureaucrat-762 are acting to engage elected officials. When asked if they had any conversations about sea level rise were with elected officials, Mr. Meyers replied with a flat “No.” The bureaucrats had no evidence that their actions run counter to the wishes of their superiors as there are no public mentions of sea level rise or climate change by elected officials in Fort Pierce.

St. Lucie County’s bureaucrats are also engaged in non-confrontational behavior in addressing sea level rise and climate adaptation. Mr. Satterlee described how the county was a participant in several regional studies and has incorporated sea level rise into several existing policies:

“We were part of a - several years ago there was a study that covered the seven counties of south east Florida called Seven50, and as part of that, we did some new mapping of projected sea level rise of one, two and three feet. A person on my staff worked with what is called the South Florida Compact,⁷³ and they were all sort of doing this as sort of a subset of the Seven50 planning. So we did that work. And the Treasure Coast Regional Planning Council back in 2010 did a 10,000 foot study of what sea level rise might entail.

“And so while we've adopted some policies into our comprehensive plan specific to sea level rise, but between our flood elevation rules, our drainage rules, FEMA, NFIP - National Flood Insurance Program, South Florida Water Management District - all of this sort of web of things that we do. Whether it is a local mitigation strategy planning. We did a post-disaster redevelopment plan a couple of years ago. So we are kind of all around it in terms of trying to mitigate the impact of sea level rise. But certainly the biggest single thing that we do is we

⁷³ Its formal name is the Southeast Florida Regional Climate Change Compact.

keep new development out of the floodplain. It is for the best. To the best extent we can.” (Interview with Mark Satterlee, February 24, 2016)

However, the local bureaucrats are not taking many steps beyond what the regional studies recommended. Additionally, the county’s stormwater program coordinator – Mr. Bessey – said any significant action to address climate change would likely follow the state government’s lead.

“So [sea level rise is] on our radar, at least it's on my radar, and it’s something we have to think about. ... And again, we follow the state - whether it is stormwater or building codes or roads. So it would be a public decision and then the state would adopt it or argue about it, and over the years it would eventually come down to us.” (Interview with Jason Bessey, March 10, 2016)

Like in Greenville County, SC and Fort Pierce, FL, the local elected leaders in St. Lucie County are not discussing climate change. Therefore, the limited steps Mr. Satterlee and Mr. Bessey are taking to address climate change are not intentionally defying the wishes of the local elected officials.

Non-confrontational behavior occurred in these three cases where local bureaucrats did not know that their elected superiors would be upset with acting on climate change. The generally conservative political leaning of these areas might suggest that climate change is an unpopular topic, but as many bureaucrats have said in this study, climate adaptation is occurring despite opposition from some community members to the politics of climate change. Many localities are preparing for climate change because the consequences of not preparing are worse than taking some steps now to develop emergency management responses and smart development patterns.

However, not all bureaucrats are taking this precautionary approach to climate adaptation. As the next section describes, many local bureaucrats have taken no action to address

climate change, even though some recognize the threat climate change poses to their communities.

2.5 No Action

Fourteen bureaucrats representing nine of the 18 cases did not act to address climate adaptation in their communities. They were (1) NC-Local Bureaucrat-823 and (2) Landin Holland, a consultant planner from Craven County, NC; (3) City Manager Richard Olson from Elizabeth City, NC; (4) Planning and Inspections Director Katrina Marshall from the City of Havelock, NC; (5) Stormwater Engineer Amanda Boone and (6) Director of Public Works Matt Montayne from the City of New Bern, NC; (7) City Administrator Edward Driggers, (8) SC-Local Bureaucrat-523, and (9) Stormwater Engineer Lillian Hanley from the City of Greer, SC; (10) Business and Development Services Director⁷⁴ Kimberly Hamel from the City of Mauldin, SC; (11) SC-Local Bureaucrat-413 from Oconee County, SC; (12) Utilities Director David Bruketta and (13) NV-Local Bureaucrat-734 from Carson City, NV and (14) Emergency Management Department Project Manager Sandi Duffey from Grant County, WA.

The reasons for inaction varied across the 14 bureaucrats. For two bureaucrats – Mr. Montayne and SC-Local Bureaucrat-413 – they said that climate change was not on the local government’s agenda implying that it was not their place to introduce the issue. SC-Local Bureaucrat-413 acknowledged speaking with peers about the issue, but did not believe it was going to affect Oconee County:

“I mean, global warming and those things making storms more volatile, being more prepared for tornadoes, flash flooding and stuff. Um, [pause] not publicly. Not pushing, not a huge public conversation, but more of a say, me and another person just talking about when we are doing our hazard mitigation plan. Where is

⁷⁴ The Business and Development Services department in Mauldin is in charge of planning efforts in the community, which includes flood management.

it going? Not, [pause] this is the reason why.” (Interview with SC-Local Bureaucrat-413, March 28, 2016)

Others expressed that climate change was not going to impact their area, or at least not anytime soon. These bureaucrats were Ms. Marshall, Mr. Driggers,⁷⁵ Ms. Duffey, Mr. Bruketta, and NV-Local Bureaucrat-734. Ms. Marshall did not believe that Havelock, NC was or would be seeing the impacts of climate change anytime soon. Mr. Driggers said that Greer, SC will prepare for storms, but he is less interested in the reasons why they might be as severe as they are. Ms. Duffey was confident that Grant County, WA’s water reserves were large enough that climate change driven droughts would not impact them. Similarly, in Carson City, NV, previous efforts to secure more access to water (water rights⁷⁶) in the area⁷⁷ gave the local bureaucrats confidence that climate change was not going to be a problem anytime soon. Mr. Bruketta credits the city’s former elected officials and city managers for helping secure water rights. He said:

“I think that we are very fortunate that we can always improve something, but I think that, for the most part, there is nothing outstanding – and especially because, and again I have to give credit to our previous managers and electeds where they were very proactive in actively going after water rights years ago.” (Interview with David Bruketta, June 9, 2016)

However, he expressed concern about the cost of preparing Carson City for the type of mega-drought that hit California from 2011 to 2017 – the type of drought that is likely to occur more often with climate change. He said:

“[Climate change] enters the conversation, but a lot of times we – the term ‘mega-drought’ has been used a lot here. ... And there is not, I mean there has been

⁷⁵ Mr. Driggers, Ms. Hanley and SC-Local Bureaucrat-523 participated in a joint interview and responded to follow-up questions individually by email. Neither Ms. Hanley or SC-Local Bureaucrat-523 responded to questions about climate change.

⁷⁶ Water rights refer generally to the legal system that governs water use in western states. Senior water rights are fulfilled before junior water rights when there are water shortages. For more information on water rights, see Getches, Zellmer, & Amos, 2015.

⁷⁷ Carson City is a unified city-county government. For this project it will be referred to as a city when a generic term for local government is used.

discussions about it, but ... there has been mixed feedback because a lot of it involves money and dollars to secure an infrastructure for future use. And there is discussion about it, but there is not clear direction.” (Interview with David Bruketta, June 9, 2016)

Despite being aware of these concerns, both Mr. Bruketta and NV-Local Bureaucrat-734 expressed they would be cautious in developing plans without direction from the Board of Supervisors. Mr. Bruketta described the culture of policy development in Carson City being elected leader driven. Should Carson City begin to adapt to climate change, it is likely the bureaucrats would fit a politician-led action pattern.

There were bureaucrats who *did* think that climate change was going to be a problem in their localities but did not see the local government as the appropriate level to respond. Mr. Holland from Holland Consulting Planners works with local governments in the inner and outer banks region of North Carolina. He was interviewed specifically about his work helping Craven County, NC prepare their hazard mitigation plans. During this interview, Mr. Holland referenced the state government’s stance on climate change as a reason not to address climate change. He said:

“Well, one thing that is quite interesting and intriguing is that, in our mitigation plans, under this cycle, under our current regime in terms of governor and our legislature, we are not allowed to acknowledge or discuss in any way shape or form sea-level rise in these mitigation plans. I mean it is basically, I won't use the word illegal. But we are not allowed to discuss it. And if it is in there, the State of North Carolina State Office of Emergency Management make you remove it prior to submitting it to FEMA.” (Interview with Landin Holland, September 11, 2015)

He also acknowledged that many areas in the coastal area were not capable of preparing for sea level rise:

“I think one of the reasons why sea level rise is very controversial in Eastern North Carolina is there are a lot of these counties, if you want to talk about sea level rise, there is nothing they can really do. What are they going to do? They

don't have the money locally to address it in a manner that will ensure the sound, the establishment of a sound and stable environment years down the road. From an engineering perspective, I don't know how they would do it, and secondly, I don't know how they would ever pay for it. So to go out there and talk about sea level rise in this plan or in their land use planning documents, is kind of cutting your own throat as it relates to economic development, because who would ever want to build something somewhere they are being told is going to be underwater in 15 to 20 years.” (Interview with Landin Holland, September 11, 2015)

Ms. Hamel from the City of Mauldin, SC echoed this sentiment: state governments are better situated to take the lead on climate change action because they have more resources. She acknowledged that local governments could do something in terms of crafting a strategy in the hazard mitigation plan or planning department documents. However, she has not seen any action in Mauldin to address climate change.

In the City of New Bern, NC, Ms. Boone does not think that the local government can adapt to climate change. She said:

“I would say that we are not having a conversation related to climate change, and I don't know that there is, I don't know how much of that we would be having a discussion about because we can't control that, I think is probably... A town of approximately 30,000 is certainly not going to impact climate change. So I don't know that I've heard anybody having a conversation about climate change.”
(Interview with Amanda Boone, September 24, 2015)

Ms. Boone said the city government was aware of how climate change will impact the community, but she pointed to initiatives to prepare for the threat from hurricanes as their best chance to prepare for any sea level rise or climate change impacts.

For the remaining two bureaucrats, lack of support from local politicians and belief that the policies would not be supported led to inaction. NC-Local Bureaucrat-823 in Craven County worked in the county government for over two decades, but constantly faces a battle between flood prevention and economic development:

“And one of the issues I've dealt with is the balancing act between the elected officials who want all of the taxable property they can have as far as having taxable property, but we look at the strain that it puts on us as far as emergency response and also the threat of someone losing their life. So I've been very strong verbally over the years for when we have an event to participate in the mitigation programs [inaudible] like property acquisition. ... That's how you keep people out of harm's way.” (Interview with NC-Local Bureaucrat-823, September 23, 2015)

NC-Local Bureaucrat-823's struggle to implement emergency management practices generally makes addressing climate adaptation even more of an uphill battle. The bureaucrat expressed frustration throughout the interview that economic development won out over emergency preparedness most of the time. They emphasized the need to “pick my battles” in order to make meaningful advances in emergency management, much less adding climate adaptation to the mix.

In Elizabeth City, NC, it was actually the city manager who acted to stop a climate adaptation process before it could develop. Mr. Olson from Elizabeth City, NC does not believe that sea level rise (he calls it “ocean rise”) would impact his community anytime soon, and if it did there would be consequences closer to the coast first giving them time to prepare. Mr. Olson pointed to disagreement in the scientific community, saying “the scientists debate and disagree on what is causing that issue,” as another reason not to address climate change. In early 2015, the same group of UNC Chapel Hill students who presented an evaluation of sea level rise in Pasquotank County, NC presented their findings to the Elizabeth City Council (Elizabeth City is the county seat of Pasquotank County). Following this presentation, several council members asked how sea level rise might impact areas of the city that were already struggling with flooding. Mr. Olson's response to this was to investigate and present the finding that flood management and stormwater management policies already in place were satisfactory to address

flooding concerns. There were no follow-ups on the issue from the council members, and no further action on climate change from the local bureaucrats in Elizabeth City, NC.

2.6 Observed Forms of Behavior from Bureaucrats Who Acted

Figure 7: Observed Form of Behavior organizes the 16 bureaucrats (from nine cases) who took action on climate change into the categories theorized in Chapter 1. (The model does not predict inaction, so the 14 bureaucrats who chose not to act are not included.) These placements are based on observed data, and do not reflect the bureaucrats' levels of autonomy or the amount of agreement they have with elected officials.

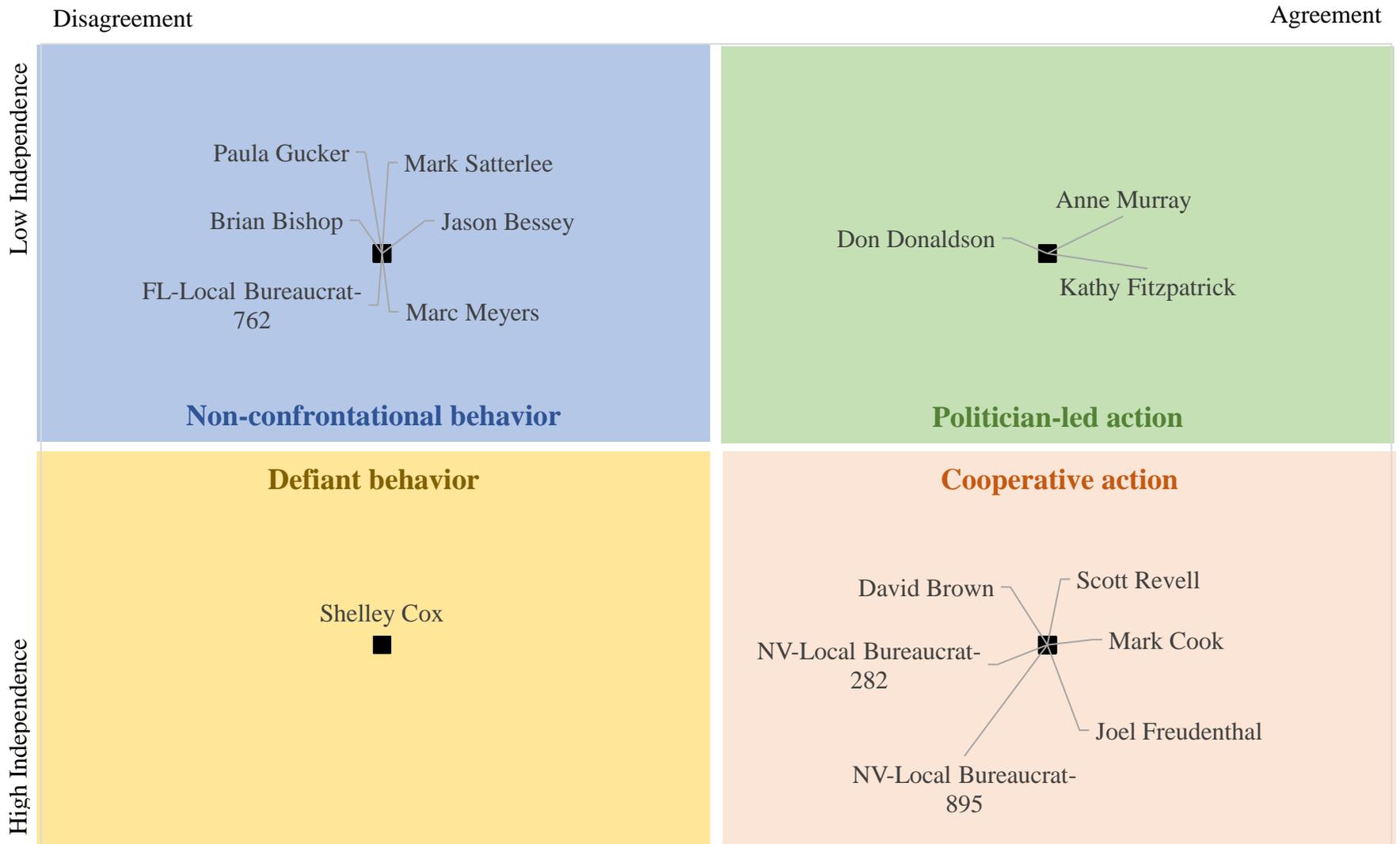
In the next section, I discuss the two factors which are theorized to predict how these bureaucrats have acted: (1) the amount of agreement there is between bureaucrats and their elected official superiors on the need to adapt to climate change and (2) the level of autonomy local bureaucrats have to act on their own preferences. As discussed in Chapter 1, this builds on principal agent theory which argues that agents (local bureaucrats) can act in accordance with their own wishes when they have sufficient autonomy⁷⁸ (Carpenter, 2001; Lin, 2000; Lipsky, 2010; Teodoro, 2011). However, this project adds a new dimension, arguing that when principals and agents have shared beliefs, the elected official principals can contribute by either leading or partnering with their bureaucratic agents to craft more effective public policy (describing the politician-led and cooperative behavior categories).

Additionally, this project takes the position that bureaucratic policymaking is not necessarily a subversion of democratic values, especially for issues that are avoided by

⁷⁸ Much of the political science literature on bureaucracy focuses at the federal level and is concerned with political control over the bureaucracy. The principal problem appears to be that bureaucracies are not easily controlled by politicians (for some of this debate see Gailmard & Patty, 2012; Balla, 1998; Gailmard, 2002; Waterman & Rouse, 1999; Whitford, 2002).

politicians due to partisan commitments, ideological commitments, or because the issue is low-salience at the time. Emergency management policy receives little attention from elected officials and members of the community, leaving local bureaucrats to think about and address disaster risk. By including climate change as a risk, bureaucrats are doing their job of preparing the community for disaster risk.

Figure 7: Observed Form of Behavior Based on Observed Behaviors from Interviews and Documents



Bureaucrats who did not act on climate adaptation: NC-Local Bureaucrat-823 and Landin Holland from Craven County, NC; Richard Olson from Elizabeth City, NC; Katrina Marshall from the City of Havelock, NC; Amanda Boone and Matt Montayne from the City of New Bern, NC; David Bruketta and NV-Local Bureaucrat-734 from Carson City, NV; Edward Driggers, SC-Local Bureaucrat-523, and Lillian Hanley from the City of Greer, SC; Kimberley Hamel from the City of Mauldin, SC; SC-Local Bureaucrat-413 from Oconee County, SC, and Sandi Duffey from Grant County, WA.

2.7 Bureaucratic Action

Table 9 (below) outlines how local bureaucrats who took action to address climate adaptation in their communities acted, specifically if they provided expertise or if they argued to integrated climate adaptation into existing policies. This information is used in sections 2.7a to evaluate hypothesis 3 (local bureaucrats drive climate adaptation by providing issue-specific expertise about potential harms) and 2.7b to evaluate hypothesis 4 (local bureaucrats drive climate adaptation by arguing that climate change predictions can be integrated into existing policies.)

Table 9: Bureaucrats Influencing Policy Change

Locality	Bureaucrat	Short Description of Action or Inaction	Provided Expertise (hypothesis 3)	Argue to Integrate Climate Adaptation into Existing Policy (hypothesis 4)
Pasquotank County, NC	Shelley Cox , Planning Director	Worked with UNC Chapel Hill students on sea level rise vulnerability study, argued for paying attention to sea level rise risk in floodplain management	Yes	Yes
City of Fort Pierce, FL	Marc Meyers , Director of the Building Department	Used up-to-date sea level data in flood management; encouraged local builders and property owners to be aware of future threats from climate change	Yes	No, acted using discretion for integrating into policy
	FL-Local Bureaucrat-762 , Lower level bureaucrat	Used up-to-date sea level data in flood management; encouraged local builders and property owners to be aware of future threats from climate change	Yes	No, acted using discretion for integrating into policy

Table 9: Bureaucrats Influencing Policy Change

Locality	Bureaucrat	Short Description of Action or Inaction	Provided Expertise (hypothesis 3)	Argue to Integrate Climate Adaptation into Existing Policy (hypothesis 4)
Martin County, FL	Anne Murray , Hydrogeologist	Worked with group of county bureaucrats (engineers) to develop a comprehensive approach for climate adaptation planning	Yes	No, interested in creating a comprehensive plan
	Kathy Fitzpatrick , Coastal Engineer	Worked with group of county bureaucrats (engineers) to develop a comprehensive approach for climate adaptation planning	Yes	No, interested in creating a comprehensive plan
	Don Donaldson , Director of Engineering	Incorporated latest sea level rise data into existing flood management	Yes	Yes
St. Lucie County, FL	Jason Bessey , Stormwater Program Coordinator	Incorporated latest sea level rise data into existing flood management	Yes	No, acted using discretion for integrating into policy
	Mark Satterlee , Deputy County Administrator	Incorporated latest sea level rise data into existing flood management	Yes	No, acted using discretion for integrating into policy
City of Fernley, NV	NV-Local Bureaucrat-282 , City Department Head	Worked with the Water for the Seasons Project to develop climate adaptation solutions to predict drought; purchased water rights and developed water use strategy to deal with shortages	Yes	Yes
	NV-Local Bureaucrat-895 , Lower level bureaucrat	Worked with the Water for the Seasons Project to develop climate adaptation solutions to predict drought; purchased water rights and developed water use strategy to deal with shortages	Yes	Already in progress when joined, supports

Table 9: Bureaucrats Influencing Policy Change

Locality	Bureaucrat	Short Description of Action or Inaction	Provided Expertise (hypothesis 3)	Argue to Integrate Climate Adaptation into Existing Policy (hypothesis 4)
Greenville County, SC	Paula Gucker , Assistant County Administrator for Community Planning	Supported Floodplain Manager Brian Bishop when he argued to incorporate climate change into hazard mitigation predictions and management strategies	Supported subordinate's expertise	Yes
	Brian Bishop , Floodplain Manager	Argued for incorporation of climate adaptation into hazard mitigation plan (for future updates beyond 2015 draft)	Yes	Yes
Kittitas County, WA	Mark Cook , Public Works Director	Worked with Yakima Integrated Plan to incorporate climate models into drought management practices; increased water storage capacity; encouraged water conservation practices	Yes	Supporting efforts that are already underway; suggesting new policies/strategies when appropriate
City of Yakima, WA	David Brown , Water and Irrigation Manager	Worked with Yakima Integrated Plan to incorporate climate models into drought management practices; increased water storage capacity; encouraged water conservation practices	Yes	Supporting efforts that are already underway; suggesting new policies/strategies when appropriate
Yakima County, WA	Joel Freudenthal , Senior Natural Resource Specialist	Worked with Yakima Integrated Plan to incorporate climate models into drought management practices; increased water storage capacity; encouraged water conservation practices	Yes	Supporting efforts that are already underway; suggesting new policies/strategies when appropriate
	Scott Revell , Director of the Roza Irrigation District	Worked with Yakima Integrated Plan to incorporate climate models into drought management practices; continued to implement low-flow irrigation systems	Yes	Supporting efforts that are already underway; suggesting new policies/strategies when appropriate

2.7a Bureaucrats Providing Expertise to Encourage Adaptation

Of the 16 bureaucrats who acted, 15 used their expertise to provide information about the potential harms from climate change (hypothesis 3). The only bureaucrat who did not provide her own expertise for changing adaptation policy was Ms. Gucker from Greenville, SC who used information collected by her subordinate Mr. Bishop. There is overwhelming support for hypothesis 3: local bureaucrats drive climate adaptation by providing issue-specific expertise about potential harms.

While almost every bureaucrat did use information to influence policy, they did not all do so in the same manner. There were three ways local bureaucrats provided information about the potential harms from climate change: (1) giving information to their superiors, (2) giving information to peers in government, and (3) giving information to community members. Nine bureaucrats provided information to their superiors: Ms. Cox, Ms. Murray, Ms. Fitzpatrick, NV-Local Bureaucrat-282, NV-Local Bureaucrat-895, Mr. Cook, Mr. Brown, Mr. Freudenthal, and Mr. Revell. (These nine bureaucrats represent six cases.)

Ms. Cox from Pasquotank County presented information on the damage sea level rise could cause in the county to her superiors and helped UNC Chapel Hill students complete a comprehensive study of the problem and present their results to the county commissioners. Ms. Murray and Ms. Fitzpatrick in Martin County were working to compile information about the full spectrum of impacts. They produced information at the request of Commissioner Haddox that covered sea level rise, potential drinkable water shortages,⁷⁹ and climate migrants from

⁷⁹ Florida's freshwater reserves are at risk of becoming contaminated with saltwater as sea levels rise. Additionally, climate change is likely to result in less rainfall, which is instrumental in refilling freshwater reserves in the area.

South Florida and Puerto Rico. They have not formally presented their results but shared their expertise with Commissioner Haddox.

Additionally, the two bureaucrats involved in the Water for the Seasons project (NV-Local Bureaucrat-282 and NV-Local Bureaucrat-895) and the four bureaucrats working on the Yakima Integrated Plan (Mr. Cook, Mr. Brown, Mr. Freudenthal, and Mr. Revell) provided information to their superiors and the other participants in these projects about local harms likely under climate change. For these six bureaucrats, providing information about local harms was their way of advocating for their localities' needs within the group.

Ten bureaucrats provided information to their peers: Mr. Donaldson, Mr. Bessey, Mr. Satterlee, NV-Local Bureaucrat-282, NV-Local Bureaucrat-895, Mr. Bishop, Mr. Cook, Mr. Brown, Mr. Freudenthal, and Mr. Revell. (These bureaucrats are from seven cases.) This type of information provision is often more informal, representing discussions between peers in government. As Mr. Donaldson (Martin County, FL) and Mr. Revell (Yakiam County, WA) said, they often speak with other staff members about climate change.

Sharing information with other local bureaucrats can occur more formally. For example, Mr. Bishop was tasked with collecting information on threats from natural disasters for Greenville County (SC)'s most recent hazard mitigation plan update by his boss: Ms. Gucker. During his research, Mr. Bishop became aware of the county's climate change risk and the need to address it in future hazard mitigation plans.

Similarly, information sharing is a formalized process in the Water for the Seasons project and the Yakima Integrated Plan Working Group. However, in these cases, bureaucrats share information with members of their own local government as well as peers in other participating local governments.

Six bureaucrats provided information to community members: Mr. Meyers, FL-Local Bureaucrat-762, Mr. Cook, Mr. Brown, Mr. Freudenthal, and Mr. Revell. (They are from four cases.) In these instances, bureaucrats are either communicating with individuals who have contacted their department for a service or they are advocating for their department's actions to the community at large.

Mr. Meyers and FL-Local Bureaucrat-762 communicated directly with property owners in Fort Pierce, FL who approached them about risks from sea level rise and flooding due to climate change. Mr. Revell from the Roza Irrigation District in Yakima County regularly speaks with the growers in his community about water conservation strategies they can use to respond to climate induced drought. Mr. Revell both speaks to growers who approach him and he actively seeks out growers to speak to.

Also, local bureaucrats participate in broader education or advocacy efforts to address risks related to climate change. Mr. Freudenthal and Mr. Brown both run water use conservation campaigns in their communities (Yakima County and the City of Yakima respectively) to reduce overall water consumption so droughts will have less of an impact.

Those bureaucrats who worked cooperatively to address climate adaptation provided expertise in several ways to several groups. NV-Local Bureaucrat-282, NV-Local Bureaucrat-895 worked with the Water for the Seasons project and provided information to both the elected officials in Fernley, NV and to their peers (the other bureaucrats working in Fernley government). The bureaucrats involved in the Yakima Integrated Plan also provided information to elected officials, other bureaucrats, and community members. For both of these projects, bureaucrats served as ambassadors from their community in the group *and* ambassadors from the group when presenting to their communities.

2.7b Bureaucrats Crafting Arguments about How Communities Should Adapt to Climate Change

Bureaucrats provided information based on their expertise, but they also framed arguments about how policies should look. They did not just present information. Bureaucrats crafted arguments and presented information that supported a specific policy approach, like developing a comprehensive plan or integrating adaptation into existing policies.

Hypothesis 4 states that local bureaucrats drive climate adaptation by arguing that climate change predictions can be integrated into existing policies. Among the bureaucrats who acted, four bureaucrats from four cases⁸⁰ argued (to their superiors or peers) that climate predictions can be integrated into existing policy (Ms. Cox, Mr. Donaldson, NV-Local Bureaucrat-282, and Mr. Bishop).

Ms. Cox presented arguments to the Pasquotank County Board of Commissioners with the support of the UNC Chapel Hill student's study and followed up with remarks about how the flood risk maps issued by FEMA and subsequent county flood management policy needed to address the risks of climate change. Mr. Bishop presented information about the need to adapt to climate change, but rather than speak directly to the elected officials, he presented the information in a report to Ms. Gucker (his boss). His argument focused on the need to include adaptation planning in the hazard mitigation plan because it might eventually be required by FEMA and because climate change was likely to cause problems because of increasingly severe storms.

Mr. Donaldson and NV-Local Bureaucrat-282 also presented arguments that climate change adaptation should be included in existing policies, but largely spoke to their peers. While

⁸⁰ Bureaucrats from the same community argued for different approaches. For instance, Mr. Donaldson argued to integrate climate adaptation into existing policies in Martin County, FL while Ms. Murray and Ms. Fitzpatrick were working to develop a comprehensive plan to address climate adaptation.

Mr. Donaldson's subordinates in Martin County, FL (Ms. Murray and Ms. Fitzpatrick) were also working on climate adaptation, Mr. Donaldson presented a different argument. Ms. Murray and Ms. Fitzpatrick thought that climate adaptation needed comprehensive planning, while Mr. Donaldson was confident that existing flood management policies could be updated to reflect current sea levels to help the community respond to sea level rise. NV-Local Bureaucrat-282 in Fernley, NV focused on expanding water storage to address climate change driven droughts while working on the city's water team. The water team included NV-Local Bureaucrat-282's superiors as well as elected leaders who met occasionally with the water team. Additionally, NV-Local Bureaucrat-282 was with the city government long enough to advocate for participation in the Water for the Season's project. According to their interview, NV-Local Bureaucrat-282 helped convince the local elected leaders to participate.

An additional five bureaucrats benefitted from other actors having already incorporated climate adaptation into existing policy. Rather than argue that it should be integrated, they supported these ongoing efforts (NV-Local Bureaucrats-895, Mr. Cook, Mr. Brown, Mr. Freudenthal, and Mr. Revell). NV-Local Bureaucrat-895 joined the Fernley, NV government too late to help initiate the water team efforts or the city's participation in the Water for the Seasons project, although they did support it. Similarly, Mr. Cook, Mr. Brown, Mr. Freudenthal, and Mr. Revell supported the efforts of the Yakima Integrated Plan and pre-existing water storage projects in their local governments but did not initiate them.

The group of bureaucrats from Martin County – Ms. Murray, Ms. Fitzpatrick, and Ms. Drum – believed that a comprehensive approach to adaptation was necessary. They might support limited instances of integration, but they argued for new policies and approaches to deal with the climate threat.

Five bureaucrats in three communities used climate change predictions while exercising their discretion. In this way, they integrated climate adaptation into existing policies, but did not present an “argument” for doing so, they just did it. They are Mr. Meyers, FL-Local Bureuacrat-762, Ms. Gucker, Mr. Bessey, and Mr. Satterlee. As described above, Mr. Meyers and FL-Local Bureaucrat-762 said they spoke with property owners about flood risks changing with sea level rise and climate change. Ms. Gucker made the decision as head of her department to add climate adaptation language to the county’s hazard mitigation plan. Mr. Bessey and Mr. Satterlee used their discretion to update flood policy based on the most recent sea levels to account for sea level rise.

2.7c Other Ways Bureaucrats Act to Address Climate Adaptation

Bureaucrats acted in other ways than providing information about potential harms and arguing for integrating policy into existing initiatives. The bureaucrats in this study also (1) argued that the cause of climate change does not matter, but we should act anyway to prevent potential harms, and (2) encouraged participation in multi-stakeholder groups whose goals include climate adaptation. Each is discussed in turn.

The bureaucrats in this study commonly expressed the sentiment that the cause of climate change was not important, what was important was preparing for potential harms and being proactive. Greenville County, SC bureaucrats Ms. Gucker and Mr. Bishop repeatedly said they were proud of how proactive their disaster management policies were. Similarly, the bureaucrats in South Washington state relied on the argument that the causes of climate change were less important than the consequences. By focusing on minimizing the negative consequences of climate change, bureaucrats like Mr. Cook, Mr. Brown, Mr. Revell, and Mr. Fruedenthal justified the need for adaptation in a largely conservative area.

This approach relies on the precautionary principle which argues that minimizing potential future harms is preferable to inaction to save resources or time in the present (Applegate, 2010). It is captured in the colloquial saying “better safe than sorry” and is prevalent in economics, environmental conservation, and risk management.⁸¹ The argument combines the precautionary principle with the depoliticization of climate change policy by arguing that the causes of climate change are not as important as the consequences. Focusing on potential harms divorces the problem of climate change from the debates around the cause of the problem. Often pro-climate actors lay responsibility on the shoulders of high-carbon emitters including fossil fuel energy producers, the agricultural sector, and energy users in developed countries.⁸² It is unsurprising, then, that this argument was popular in areas like South Washington state which has an agriculture-dependent economy and any community where people use cars for transportation, heat their homes with natural gas, and consume electricity from coal or other fossil fuels like most of the United States.

Bureaucrats in this study also advocated for local government participation in multi-stakeholder groups. While the Water for the Seasons project and the Yakima Integrated Plan provided important examples, there are also initiatives in South Florida like Seven50 and the Southeast Florida Regional Climate Change Compact which have led to climate adaptation initiatives. Seven50 partially inspired Martin County’s effort to craft comprehensive climate adaptation planning. While none of the cases in this study are members of the Southeast Florida Regional Climate Change Compact, the organization’s success in helping Miami-Dade,

⁸¹ The prevalence of the precautionary principal in these fields makes it unsurprising to see the bureaucrats in this study embracing it. These bureaucrats include emergency managers, resource managers, and environmental managers who likely encountered this attitude in their training and professional societies.

⁸² There are some efforts to discredit climate adaptation rooted in conservative political circles in the United States. However, adaptation that does not lay blame for climate change avoids some of the most passionate political debates.

Broward, Monroe, and Palm Beach counties (and 30 municipalities in those counties) create adaptation plans is widely cited as a successful multi-stakeholder climate adaptation organization (US Department of Energy, 2018; Georgetown Climate Center, 2017).

Participation in these groups presents several advantages to bureaucrats. First, it allows bureaucrats to benefit from the efforts of many participants, essentially outsourcing some of the work. For instance, in the Water for the Seasons project, the UNVR researchers are measuring climate risk and mapping basin-wide water storage capacity, water flows, and water uses. Similarly, the Yakima Integrated Plan spreads work across a wide range of participants allowing individual bureaucrats to benefit from a more comprehensive look at the problem. These projects can also lead to more creative solutions generated by the participants. Solutions that were too expensive (in terms of time or resources) might not have been considered by a single locality but are possible with a larger group. For instance, the Yakima Integrated Plan is developing large storage reserves like the Kachess Drought Relief Pumping Plant (Yakima River Basin Integrated Water Resource Management Plan, 2015) and the Cle Elum Fish Passage Facility and fish reintroduction effort (US Bureau of Reclamation, 2016) which would be too expensive for any one jurisdiction to afford on its own.

In sum, bureaucrats act in a wide variety of ways to address climate adaptation in their communities. They provide information about potential risks, argue that climate adaptation can be achieved by integrating it into existing policies, emphasize the precautionary principal, divorce the causes of climate change from the discussion about adaptation, and encourage participation in multi-stakeholder groups. The next section tests the model presented in Chapter 1 which posits that bureaucratic autonomy and problem definition agreement shape bureaucratic action.

3. Explaining the Variation in Bureaucratic Action

The theoretical model presented in Chapter 1 argues that bureaucratic action is influenced by the interaction of two variables: (1) problem definition agreement between bureaucrats and their superiors, and (2) bureaucratic autonomy or independence. This section tests the applicability of this model with the 16 bureaucrats in the study who acted to integrate climate adaptation into local policy. First, problem definition agreement and bureaucratic autonomy are described independently. I address how they were measured and the variation present in the sample. Then, the model is presented with the predicted form of action each bureaucrat should have taken. The predicted model is juxtaposed with the actual type of action each bureaucrat took (presented in section 2.6) to determine the accuracy of the model. Throughout, alternative explanations and critiques of the model are discussed.

3.1 Problem Definition Agreement

Problem definition in the policy studies literature refers to the way a problem is described and understood in the policymaking community. It involves dimensions like problem severity, how soon the problem will occur (or if it is currently occurring), who is responsible for solving the problem, and if the problem will occur nearby (Rocheffort & Cobb, 1994).

Measuring problem definition agreement for each bureaucrat who acted to address climate adaptation requires examining both the stated attitudes of the local bureaucrats and their superiors. Only bureaucrats who had been interviewed by the researcher were included in the study. Their attitudes were discerned primarily through interviews. Bureaucrats' statements in public documents were also used to supplement their interview statements. Although it would have been ideal to also conduct interviews with all of the elected officials in these cases, most

local elected officials⁸³ did not respond to requests for interviews. Instead, local elected officials' attitudes were determined by looking at their public statements, newspaper coverage, and how bureaucrats described the elected officials.

Five questions were asked to develop a full picture of the bureaucrats' and elected officials' attitudes about climate adaptation. They were:

1. Is climate change the cause for needing to change local flood or drought management policy?
2. Is the local government the appropriate scale for addressing climate adaptation? (As opposed to the state or federal government level.)
3. Will climate change be an issue for this locality? In other words, is the problem geographically close?
4. Will climate change be an issue soon? In other words, is the problem temporally proximate?
5. Will climate change lead to severe problems for the local community?

Answers to each question were written for each bureaucrat and the local elected leaders as a group.⁸⁴ Then, where bureaucrats and the elected leaders had different answers, it was labeled as disagreement. When the opinions were similar, it was labeled as agreement. In several cases, local elected officials made no statements on climate change or made statements which could only answer a few of the five questions. In these cases, no opinion was treated as slight disagreement. This was done because disagreement is a fairer evaluation than agreement. Local

⁸³ The researcher only conducted interviews with Commissioner Paul Jewell in Kittitas County, WA and Commissioner Cindy Carter in Grant County, WA.

⁸⁴ Bureaucrats often respond to the elected officials as a group. Grouping the opinions of elected officials provides the best measure of agreement between the bureaucrat and their superiors.

bureaucrats who want to act on climate change and face elected leaders with no opinions on climate change are likely to need to convince the local leaders. (If a local bureaucrat faced disagreement, she would have to work to convince leaders.) Additionally, according to data from Leiserowitz's climate opinion study (Marlon, Howe, Mildenerger, & Leiserowitz, 2016), the counties in this study have low percentages of residents who believe climate change will harm them personally (30% to 36% range). Similarly, climate change is often understood as a national or global issue meaning it would be more likely that a bureaucrat would have to convince elected officials that they need to act. (Data for each country can be found in Appendix D, Table D4.)

Agreement between bureaucrats and their superiors on the issue of climate change adaptation ranged in the sample from mostly disagreeing (Ms. Cox) to complete agreement (Ms. Murray, Mr. Cook, Mr. Revell, and Mr. Freudenthal). (Responses for each bureaucrat are listed in Appendix E, Table E1.)

In three cases, the local elected officials did not present any public attitude on climate change and the local bureaucrats were not aware of their attitudes either. These were the City of Fort Pierce, FL, St. Lucie County, FL, and Greenville County, SC. In all three cases, the local bureaucrats generally believed climate change was a severe problem that the local government could and would have to address. However, a few did think that the consequences from climate change would take a while to reach them (Mr. Satterlee, Ms. Gucker, and Mr. Bishop). As discussed above, these were coded as disagreement.

Furthermore, in Fernley, NV the local officials only presented enough of an opinion on climate change adaptation to say it would impact local policies but did not go beyond that. This is largely because of the city's involvement in the Water for the Seasons project. The elected officials were informed but did not have any strong opinions on climate adaptation.

3.2 *Autonomy*

Autonomy is measured in the literature in a variety of ways: structural autonomy (Carpenter, 2001; Whitford, 2002), the ability or opportunity to use discretion (Lipsky, 2010; Lin, 2000; Teodoro, 2011), and expertise (Altfeld & Miller, 1984; Gailmard, 2002; Teodoro, 2014). This study sought to capture this variety of ways to understand autonomy and build a combined measure. For all components, autonomy was considered in relation to local elected officials and the government's manager or head administrator.

Structural autonomy describes bureaucratic independence in relation to the organizational structure of government. Bureaucrats who run departments can make decisions about how policy is implemented, how budgets are distributed, and what takes precedence when there are competing priorities. Department heads also influence department culture: can lower level bureaucrats innovate in their work? Are they allowed to approach the elected council directly or does information flow through department heads and the government manager?

In this study, structural independence is measured as low, moderate, or high based on the bureaucrat's position in the local government's organizational chart. Bureaucrats with low structural independence answer to more superiors than those with high structural independence. Structural independence was also captured using hiring and firing power. If a bureaucrat can be hired and fired only by the city council, they have more structural independence than a bureaucrat who can be fired by the city manager or county administrator as well.

Discretion describes how many opportunities a bureaucrat has to make decisions (i.e. on a case-by-case basis). As Lipsky (2010) described in his study of street-level bureaucrats, bureaucrats who interact with community members have more opportunities for discretion than those at the top of the organizational chart who work more on management of other bureaucrats.

While it is often true that bureaucrats with higher levels of structural independence have fewer opportunities for discretion, it is not always the case. For instance, Ms. Cox runs her own department and works directly with property owners to enforce flood management policy.

In this study, discretion is categorized into three groups: many opportunities, a moderate number of opportunities, or a few opportunities. Categories were assigned based on descriptions bureaucrats gave of their work during interviews, the description of their position on local government websites, and the description of their position in government ordinances. Ms. Cox has both high structural independence and many opportunities to exercise discretion.

A third way the literature measures autonomy is by bureaucratic expertise. Expertise gives bureaucrats an information advantage⁸⁵ over their superiors, allowing them to make decisions based on their knowledge. Forms of bureaucratic expertise cover a wide range. For this project, expertise was generalized to five categories: (1) emergency management, (2) FEMA policies, (3) state emergency management policies, (4) local conditions (present and past flooding or drought events), and (5) local politics.

Expertise was coded based on knowledge demonstrated during the interview, area of training (e.g. someone who has a master's degree in emergency management has expertise in that area) and demonstrated knowledge in government documents (e.g. testifying at a city council meeting or writing a technical report). This was determined for both the bureaucrats and their superiors because areas of common expertise do not represent information advantage. The difference in expertise was measured by the number of areas where superiors and bureaucrats had shared expertise. For example, if there are people on the elected board with backgrounds in

⁸⁵ In principal-agent theory, this is referred to as information asymmetry. Information asymmetries are unavoidable and often the reason principals seek out agents: people with expertise they do not have to help them accomplish their goal (Eisenhardt, 1989).

emergency management, bureaucrats have less of an information advantage on emergency management.

Expertise was also captured by determining if bureaucrats had specialized training or general training. Described in more detail in Appendix B, (section 3a), specialized training refers to degrees or training in technical areas like engineering, land management, forest management, biology, conservation, water management, and disaster management. General training refers to administrative or public policy training: areas like political science, law, public administration, public policy, or government management.

The last measure in the combined measure of independence is the number of years a bureaucrat worked in local government in their position because bureaucrats are the source of institutional knowledge in local government. To protect the identities of those bureaucrats who requested confidentiality, this measure was categorized as either 0 to 5 years to indicate low levels of institutional knowledge or 5 or more years to indicate high levels of institutional knowledge.

These six measures were combined (added together), yielding an overall possible score between four and 22. A score of four indicates low autonomy and a score of 22 is high autonomy. The range of autonomy scores among the bureaucrats in this study was 7 to 16.⁸⁶ A score of 12 or higher was considered high and 11 or lower considered low. This cut-off point was chosen because it was the median of the actual scores.⁸⁷ (For the scores for each bureaucrat, see Appendix E, Table E2; for coding of these measures, see Appendix B, sections 3 and section 4.)

⁸⁶ Scores were calculated for bureaucrats who did not act as well as those who did. The scores for the bureaucrats who did not act are not used to test the model because the model is not meant to be applied to inaction. However, the scoring system for autonomy is applicable to both bureaucrats who acted and those who did not.

⁸⁷ The theoretical scores of 4 and 22 are extremes and using the mid-point of that scale would distort the data. For example, a bureaucrat with a perfect 22 (high) autonomy score could not be fired by the local government, would run the entire local government without oversight, and has no shared expertise with her superiors. This bureaucrat

Half of the bureaucrats who acted to address climate adaptation had high autonomy scores. Eight bureaucrats scored a 12 or higher for their autonomy level. They are Ms. Gucker, Ms. Cox, Mr. Meyers, Mr. Brown, NV-Local Bureaucrat-282, Mr. Cook, Mr. Freudenthal, and Mr. Revell. The combination of factors that led to these scores varied; there is not one area where all eight had high scores or low scores. This speaks to the need to capture multiple dimensions of autonomy.

The remaining eight bureaucrats had low autonomy scores (11 or lower). They are FL-Local Bureaucrat-762, Ms. Murray, Ms. Fitzpatrick, Mr. Donaldson, Mr. Bessey, Mr. Satterlee, NV-Local Bureaucrat-895, and Mr. Bishop. These bureaucrats did share a few commonalities: all had low or moderate levels of structural independence and were hired and could be fired by both the city manager or county administrator and elected officials. There was variation on the other dimensions of autonomy.

3.3 Predicted Forms of Bureaucratic Action

To evaluate how well my theory explains the observed outcomes, the bureaucrats who acted⁸⁸ to address climate adaptation in their communities were plotted on the theorized 2x2 table. I then looked to see which bureaucrats were correctly predicted and which were not by comparing their observed action (shown in Figure 7) with their predicted action (shown in Figure

cannot exist. Conversely, a bureaucrat with a score of 4 for low autonomy would have no expertise, could be fired by the manager and the council or board of commissioners, and has no structural independence. Again, this bureaucrat does not exist in reality.

⁸⁸ Those bureaucrats who took no action are not included because this is meant to help describe how bureaucrats decided to act. Considering that nearly half of the bureaucrats in this study chose not to act, future research should investigate explanations which discern between those who do act and those who do not. Appendix F shows the local bureaucrats who thought climate change was happening but decided not to act plotted on the 2x2 theorized table. They are not included in Section 3 of this chapter because they did not act. However, including their autonomy and agreement scores provides an additional dimension of the model. Three bureaucrats should have acted in a non-confrontational way (NV-Local Bureaucrat-734, Mr. Bruketta, and Ms. Boone). Two bureaucrats should have acted defiantly (NC-Local Bureaucrat-823 and Mr. Holland).

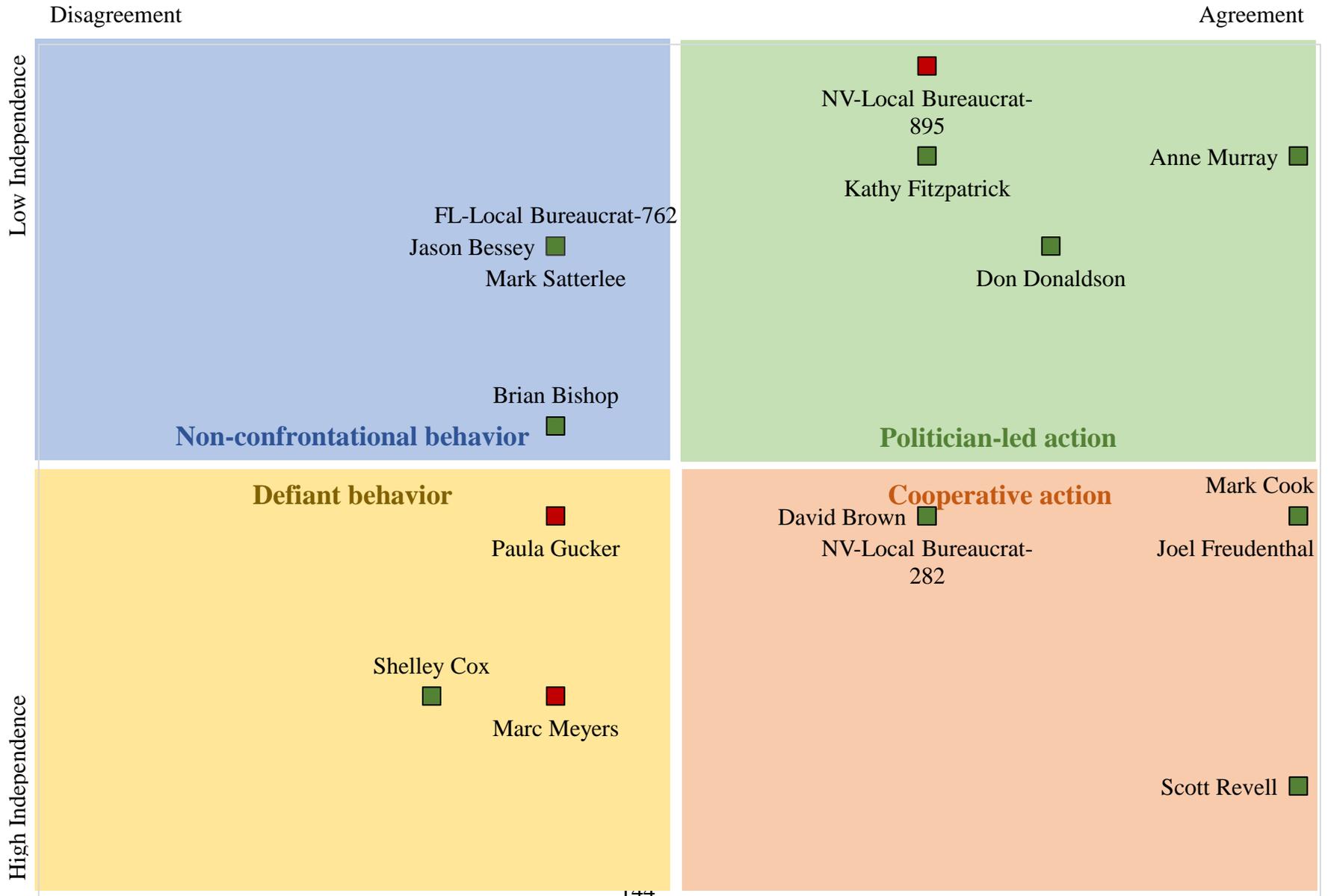
8). The bureaucrats who were correctly predicted are in green and those who are incorrectly predicted are in red.

Hypothesis 5 is broken into four subparts – one for each type of behavior in the 2x2 table. Each subpart will be evaluated separately and then all four will be considered together to evaluate hypothesis 5 overall which states *if a bureaucrat acts to integrate climate change into existing policy, the form her action takes will depend upon her level of autonomy and the extent of problem definition agreement in the policymaking community.*

The first subpart of hypothesis 5 addresses defiant behavior. It says: *when the bureaucrat is autonomous and there is low problem definition agreement in the policymaking community, she will act defiantly.* Only one bureaucrat was observed to act defiantly: Ms. Cox from Pasquotank County, NC. According to the measures for autonomy and problem definition agreement, the model correctly predicts Ms. Cox's behavior. She has high autonomy and faces a policymaking community where her superiors disagree with her that climate change adaptation should be integrated into existing policies. Therefore, there is support for this hypothesis, but with only one data point, so more data are required to make a strong conclusion.

According to the model, Ms. Gucker from Greenville County, SC and Mr. Meyers from the City of Fort Pierce, FL should also act defiantly. Both Ms. Gucker and Mr. Meyers have high levels of independence and they do not face policymaking communities that agree on the

Figure 8: Predicted Forms of Bureaucratic Action, Based on Observed Autonomy and Agreement Measures



need to include climate adaptation in existing policy. However, both Ms. Gucker and Mr. Meyers were observed to have non-confrontational behavior. In these cases, it is possible that the lack of expressed opinion on climate change led both Ms. Gucker⁸⁹ and Mr. Meyers⁹⁰ to choose *not* to exercise their available autonomy by taking a more defiant stance. While neither Ms. Gucker nor Mr. Meyers expressed trepidation about addressing climate change, neither attempted to draw attention of elected officials in their communities to their climate adaptation efforts.

The second part of hypothesis 5 addresses cooperative behavior. It posits that when there is high agreement in the policymaking community and the bureaucrat has high autonomy, we should see bureaucrats cooperating and working with politicians to address climate change. Six bureaucrats were observed demonstrating cooperative behavior, but according to the model only five were predicted to be acting cooperatively. In other words, the model correctly predicted the actions of Mr. Brown, Mr. Revell, Mr. Freudenthal, Mr. Cook, and NV-Local Bureaucrat-282, but missed for NV-Local Bureaucrat-895.

NV-Local Bureaucrat-895 was predicted to be in the politician-led action quadrant but acted cooperatively. It is possible that the Water for the Season's organization imposed a cooperative structure which overcame the limits that NV-Local Bureaucrat-895 might otherwise have encountered due to their low level of autonomy. Future studies should look at the influence

⁸⁹ Data on the political leanings and climate change attitudes of residents of Greenville County, SC suggest that the county is conservative. In 2008, 37.2% of voters chose the Democratic candidate: Barack Obama for president. In 2012, 35.2% supported Obama and in 2016, 34.7% voted for Clinton (New York Times, 2009; New York Times, 2013; New York Times, 2017). However, there is concern about climate change (59% believe climate change is happening, 44% are worried about it, and 32% believe it will hurt them personally (Marlon, Howe, Mildenerger, & Leiserowitz, 2016).

⁹⁰ Data on political leanings of the residents of Fort Pierce, FL and attitudes on climate change for the city are unavailable because they are aggregated at the county, not city, level. However, the county level data for St. Lucie County (where Fort Pierce is located) suggest a moderate population. Fifty-six percent (55.7%) voted for Obama in 2008, 53.5% voted for Obama in 2012, and 47.5% voted for Clinton in 2016 (New York Times, 2009; New York Times, 2013; New York Times, 2017). Additionally, 62% of St. Lucie County residents believe climate change is happening, 51% are worried about climate change, and 34% think it will hurt them personally (Marlon, Howe, Mildenerger, & Leiserowitz, 2016).

of organizations like Water for the Seasons and the Yakima Integrated Plan which change local policymaking dynamics (for work on cooperation in public administration generally, see Ansell & Gash, 2007; McGuire, 2006). It is likely that participation in these organizations by low-autonomy bureaucrats gives them more equal footing with their superiors to present ideas and work collaboratively when they might not have otherwise.

Overall, the model correctly predicted five of the six incidents of cooperative behavior. The model could be improved by including a dimension measuring the existence and influence of an external organization like Water for the Seasons and the Yakima Integrated Plan, especially because these organizations often have multiple goals. Individuals and governments may choose to become involved because one goal is especially important to them but end up adopting the other goals as a byproduct of their involvement. Additionally, this can lower the potential political costs for elected officials who might be unwilling to break with their partisan or ideological commitments. And this project finds some evidence that politicians who identify as conservative are taking action on climate change and working cooperatively with their bureaucratic staff to address the issue – like Commissioner Jewell in Kittitas County or Commissioner Leita in Yakima County.

Part three of hypothesis 5 addresses politician-led action. It predicts that politician-led action will occur when bureaucrats have low levels of autonomy in a policymaking community with high levels of agreement on climate change adaptation. In the model, four bureaucrats were predicted to demonstrate politician-led action: NV-Local Bureaucrat-895, Ms. Murray, Ms. Fitzpatrick, and Mr. Donaldson. (Ms. Drum was also a participant in this project but is not included as a case because she could not be reached for an interview to confirm her actions and attitudes as reported by her coworkers.) As discussed above, NV-Local Bureaucrat-895 actually

worked cooperatively to address climate change. The model was mostly accurate for this form of action, predicting three of the four bureaucrats correctly.

The final form of action was non-confrontational behavior. As the fourth part of hypothesis 5 says, we expect to see non-confrontational behavior to occur when bureaucrats have low levels of autonomy and they face a policymaking community that disagrees about the need to adapt. The model predicts that four bureaucrats will engage in non-confrontational behavior: Mr. Bishop, Mr. Satterlee, Mr. Bessey, and FL-Local Bureaucrat-762. However, six bureaucrats were observed engaging in non-confrontational behavior. As discussed above, Mr. Meyers and Ms. Gucker were predicted to behave defiantly but instead acted in a non-confrontational way.

Another interesting thing to note: for all six bureaucrats who engaged in non-confrontational behavior, their elected officials did not take a public position on climate change. It is possible, then, that defiant behavior emerges in the face of true disagreement but non-confrontational behavior is more likely when the elected leaders and the bureaucrat's superiors are apathetic on the issue. This inspired a closer look at the power of bureaucrats to shape local climate responses without involvement from elected officials. It appears that limited progress can be achieved by bureaucrats on their own without help from elected officials or other sources of support.

While the model correctly predicted the behavior of 13 of the 16 bureaucrats in the study who acted to address climate change, the inaccurate predictions exposed flaws in the model which are worth examining. First, bureaucratic behavior appears to be better predicted by the bureaucrat's understanding of support from other policymakers. Even though the bureaucrats in the defiant behavior and non-confrontational behavior categories acted to address climate adaptation, they were less committed than those in the politician-led and cooperative action

categories. The involvement of elected officials seems to lend a legitimacy (possibly a sense of democratic accountability) which allows local bureaucrats to make changes in policy.

Furthermore, non-confrontational behavior was best predicted by an apathetic attitude on the need for climate adaptation among elected leaders rather than disagreement that climate change adaptation is needed. Many local elected officials did not even comment on climate adaptation. It is possible, then, that local elected officials as a group (on average) do not see the local level as the correct scale for addressing adaptation. Future studies should examine how widespread this sentiment is among local elected officials, because this is potentially a large barrier to local adaptation. Additionally, cooperative action was better predicted by the presence of a collaborative partnership project than by the bureaucrat's level of autonomy. This makes sense because the partnership externally imposes a cooperative structure which inspired elected official involvement and equalizes bureaucratic involvement in the partnership.

Even though the model had a high accuracy rate: 13 of 16, it should be improved before being applied to a larger sample. It revealed the need for including more variables which change the dynamic between bureaucrats and their superiors. For instance, including the role of resource availability might help explain why some bureaucrats chose to act and others did not as well as why some acted in one way and not the other.

4. Conclusion and Implications

The central questions of this chapter were (1) do local bureaucrats influence and create local climate adaptation policy (in small- to medium-sized cities and counties in conservative areas) and (2) how do they achieve this? From a sample of 30 bureaucrats from 18 cities and counties, 16 bureaucrats took action (in nine cities and counties) to develop climate adaptation policy in their communities.

The approach these 16 bureaucrats took varied. Most (15 of 16) used their area of expertise to provide information about the risks their community will face as the climate changes (supporting hypothesis 3). Many, but not all, thought that integrating climate change into existing policies would be the way to begin adapting (supporting hypothesis 4). Four bureaucrats presented this argument to their superiors or peers. Five more supported ongoing efforts to address climate change they did not initiate themselves. Two bureaucrats thought a comprehensive policy approach is needed to address climate change and began working with a third co-worker to create one. And five bureaucrats used their discretion to add climate adaptation to existing policy.

Bureaucrats commonly used the precautionary principal to support adaptation. In this way, they separated local adaptation efforts from larger debates on cause and blame related to climate change. By separating these arguments, they could more easily gain the support of conservative politicians who do not believe climate change is the fault of humans (McCright & Dunlap, 2011).

This study also shows the importance of multi-stakeholder organizations which encourage cooperation between groups *and* between politicians and bureaucrats in local governments. Projects like Water for the Seasons in Nevada and the Yakima Integrated Plan in Washington state provide structures for local governments to address an otherwise expensive and overwhelming issue like preparing for sea level rise or mega-droughts.

Chapter 4 tested the model shown in Figure 1 that argued bureaucratic action – defiant behavior, cooperative action, politician-led action, or non-confrontational behavior – is influenced by the interaction of bureaucratic autonomy and problem definition agreement. The model correctly predicted the behavior of 13 of the 16 bureaucrats. Despite this high success

rate, I argue that there is only partial support for the model (and therefore hypothesis 5). The three bureaucrats the model did not correctly describe revealed the need for revising the model. Bureaucratic autonomy did not interact with problem definition agreement entirely as expected.

First, defiant behavior is the product of disagreement and high autonomy as expected, but this combination is necessary but not sufficient. There were bureaucrats who had high disagreement levels and high autonomy who did not act at all: NC-Local Bureaucrat-823 and Mr. Holland from Craven County (see Appendix F). Therefore, something else is necessary to explain the choice to act defiantly rather than not at all. Potentially the bureaucrat needs to feel like she has support for her actions from outside the local government. For Ms. Cox in Pasquotank County, this came in the form of UNC Chapel Hill students who completed a sea level rise vulnerability analysis and presented it to the local elected officials. It could also have resulted from a change in state leadership (see Chapter 5 for a longer discussion of the role of the state in local climate adaptation).

Second, two bureaucrats who were predicted to act defiantly engaged in non-confrontational behavior instead (Ms. Gucker and Mr. Meyers). Looking at the six bureaucrats (from three local governments) who acted non-confrontationally, their behavior is better explained by politicians' non-engagement with climate change adaptation as an issue. This supports the idea that bureaucrats can be an alternative policymaking pathway (see Klyza and Sousa, 2008). Bureaucrats can act on low salience issues with real consequences for the community that elected leaders are uninterested in (due to limited attention, ideological commitments, partisan consequences, etc.). Considering this, non-confrontational behavior has less to do with autonomy than the model suggests. Instead, the ability to influence policy using discretion was the only necessary element in the autonomy measure. In short, non-

confrontational behavior is better understood as the outcome of (1) unengaged politicians, (2) bureaucrats thinking the issue is pressing, and (3) bureaucratic discretionary ability.

Cooperative action is also underexplained. While bureaucratic agreement with superiors is necessary, high autonomy is not. The existence and influence of multi-stakeholder organizations does more to explain cooperation than high autonomy. While there is a great deal of research looking at collaboration and networks in public administration (see Ansell & Gash, 2007 for an overview of collaboration and Brass, Galaskiewicz, Greve, & Tsai, 2004 for an overview of networks), none to date examines how these structures influence the relationship between bureaucrats and the elected officials they serve *or* how collaborative structures and networks alter bureaucrats' level of autonomy. The data in this project suggest that multi-stakeholder organizations shape bureaucrat-elected leader relationships by encouraging them to cooperate more, becoming partners representing their locality instead of principal and agent.

While the politician-led action category fit the model well, this does not provide insight into bureaucratic behavior because it represents the straightforward elected-leader-as-principal and bureaucrat-as-agent model expected in politician-bureaucrat relationships. This category just represents those bureaucrats who agree with the politicians they serve, so moral hazard is not a problem.⁹¹

Overall, this chapter demonstrates that bureaucrats play a significant role in the development of local climate adaptation policy. They move policy through exercising discretion, arguing that potential costs of inaction outweigh the costs of preparedness (precautionary principal), and participating in multi-stakeholder organizations to share costs and tackle larger

⁹¹ Moral hazard is a frequently studied concern in the bureaucratic politics literature. Moral hazard describes the situation where agents do not share the same values as their principals, forcing principals to create incentive structures so agents will act in line with principal's values (Eisenhardt, 1989).

projects. Not all bureaucrats who thought climate adaptation was important acted, but the majority did (16 of 21).

In the next chapter, I examine how policymaking dynamics for climate change adaptation change when we look at states as the principals and bureaucrats as agents representing their localities.

CHAPTER 5: THE INTERGOVERNMENTAL CONTEXT AROUND DISASTER MITIGATION AND CLIMATE CHANGE ADAPTATION

1. Introduction

Local government bureaucrats' actions are shaped by their intergovernmental context in addition to the preferences of local political leaders. This chapter seeks to describe the intergovernmental signals bureaucrats receive on climate adaptation and understand how those signals shape bureaucratic action in the realm of disaster management policy.

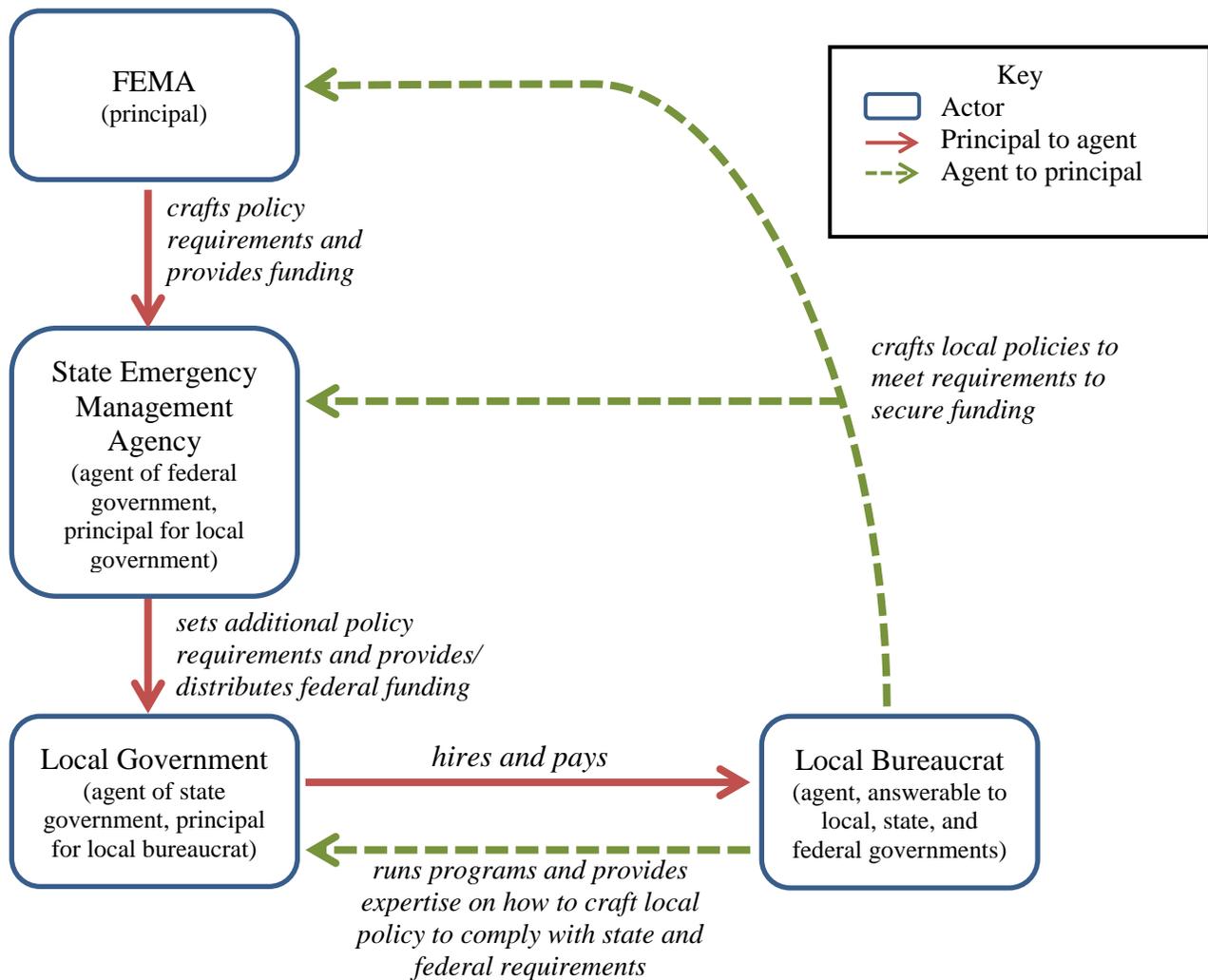
Disaster management policy is largely set by the federal government through FEMA and administered by local governments. FEMA provides resources, sets standards, and encourages local participation in its programs through a mix of grants and funding incentives. State governments set additional standards and serve as an intermediary between FEMA and local governments. Local governments who participate in FEMA's programs – including hazard mitigation planning and floodplain management – can receive grants and other fiscal benefits.

While local governments have effectively ceded authority over the shape of disaster management policy to the federal government, scholars have described this as a willing trade by local governments who lack the resources to act on their own (Birkland & Waterman, 2008). This arrangement is described by Conlan (2006) as opportunistic federalism instead of the more cooperative federalism that dominated intergovernmental relations at the close of World War II. In an opportunistic federalism system, individual governments work to pursue their best interest without concern for institutional arrangements and effective policy implementation. For disaster management, local governments must cope with a system that encourages them to craft disaster management policies in the hope of pleasing multiple principals in order to secure the funds and other resources they need to prepare for and respond to disasters. When an agent responds to

multiple principals, they are responding to a dynamic and often competitive environment where their principals are jostling for power – and in this case policy outcomes (Whitford, 2005).

Local bureaucrats tasked with disaster management are then left to interpret a complicated intergovernmental environment. As Figure 9 (below⁹²) shows, FEMA crafts policy requirements and provides funding for disaster mitigation policy to state governments, specifically state emergency management agencies. Those agencies then set additional

Figure 9: Principal-Agent Relationships for Local Implementation of Disaster Mitigation Policy



⁹² This is also described in Chapter 1, Section 7.

requirements and potentially add extra money to FEMA funds, but they do not implement disaster management policy. The role of implementer is left to the local government, which in this case is specifically the local bureaucrat in charge of disaster management. The local bureaucrat is the individual who crafts local policies and ensures they are aligned with state and federal requirements so that the local government can receive funding in the event of a disaster or for completing projects to minimize the impacts of predictable disasters.

Local bureaucrats, therefore, are answerable to three sets of principals: FEMA, state emergency managers, and local elected officials. As it pertains to climate change adaptation, all three sets of principals are not likely to be pleased by the same action. For this study, cases were chosen specifically so that conflict would be likely between these principals. As this chapter will show, FEMA and state governments often send conflicting signals which are compounded by local principals' anti-climate attitudes or apathy for disaster management policymaking (except in times of crisis, as described in Chapter 4).

Taking into account this complex intergovernmental arrangement, this chapter tests the hypothesis that money talks in deciding how local bureaucrats navigate the disagreements between their various principals. Since bureaucrats must follow the chain of command where they must first interact with state governments before accessing resources from FEMA, I test the following: *When state governments oppose climate change action, local bureaucrats are less likely to act for fear of losing an important source of disaster mitigation or relief funding* (Hypothesis 6).

To test this hypothesis, this chapter is organized as follows: In section 2, I describe the signals from the federal government on climate change, focusing on President Barack Obama⁹³

⁹³ President Obama was in office for the entirety of the data collection for this study, and therefore the President whom local bureaucrats would be responding to.

and FEMA. Then, in section 3, I look at state governments' attitudes on climate change. Section 4 describes the status of local climate policy for each case as well as how local bureaucrats' actions are understood vis-à-vis state principals. Finally, in section 5, I evaluate hypothesis 6 and find that only one local government chose not to address climate change because it might endanger their relationship with the state and subsequent opportunities to receive disaster mitigation funding. Although bureaucrats are responding to multiple principals, it does not appear that they craft disaster management and climate adaptation policy to please state principals. This may be due to the low salience of disaster management policy, the highly technocratic (bureaucrat-expert controlled) nature of disaster management policy, and the relative freedom many local governments have in creating their own policy free from state oversight. These reasons are described in more detail in the conclusion.

2. Signals from the Federal Government on Climate Change

This section considers the signals sent by President Obama and FEMA about climate change adaptation in disaster management policy. First it addresses President Obama's leadership on climate change because it shapes FEMA's policy priorities. Second, it examines FEMA's climate adaptation and disaster management policies.

2.1 President Obama's Administration and Climate Change Adaptation

During his presidency, President Obama issued several executive orders directing federal agencies to consider climate change mitigation and adaptation. Executive Order 13514 – “Federal Leadership in Environmental, Energy, and Economic Performance” – established climate mitigation as an important goal of the Obama Administration and federal agencies. Section 16 of this order addressed climate adaptation, saying:

“In addition to other roles and responsibilities of agencies with respect to environmental leadership as specified in this order, the agencies shall participate

actively in the interagency Climate Change Adaptation Task Force, which is already engaged in developing the domestic and international dimensions of a U.S. strategy for adaptation to climate change, and shall develop approaches through which the policies and practices of the agencies can be made compatible with and reinforce that strategy.” (Executive Order No. 13514, 2009).

Four years later on November 1, 2013, President Obama issued Executive Order 13652 –

“Preparing the United States for the Impacts of Climate Change.” This order instructed agencies to promote:

“(1) engaged and strong partnerships and information sharing at all levels of government, (2) risk-informed decision-making and the tools to facilitate it, (3) adaptive learning in which experiences serve as opportunities to inform and adjust future actions, and (4) preparedness planning.” (Executive Order No. 13652, 2013)

This Executive Order also established the State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience, a body representing all levels of U.S. government and indigenous governments. The Task Force was charged with making recommendations to the president for how federal government agencies could help communities respond to climate change. They issued their recommendations to the President in a public document published in November 2014 and a subsequent update in July 2015.

The Executive Order and recommendations from the Task Force pushed federal agencies to develop climate adaptation plans and, where possible, encourage and support local efforts to adapt to climate change. The next section describes how FEMA addressed climate change adaptation under the Obama Administration.

2.2 FEMA Climate Change Adaptation Policies

First, it is important to understand how FEMA’s policies are administered to understand how they address climate change adaptation. FEMA’s policies are administered at the local level (see Figure 9). While FEMA does employ some of their own emergency responders who help

local emergency responders, most FEMA employees work at an administrative level: drawing flood maps, approving local hazard mitigation plans, and helping develop disaster response and mitigation measures. While FEMA relies on local bureaucrats to implement their policies, the agency rarely has a direct relationship with local bureaucrats. Instead, they work through state governments and interact with local governments only in the aftermath of disasters or during specific projects (like disaster preparation efforts). FEMA, then, largely provides resources to local governments. With these resources, FEMA provides information and sets standards which encourage local governments to approach emergency management in a certain way – in this case in a way that is sensitive to climate adaptation.

The federal government addresses flooding and drought through two FEMA programs: Hazard Mitigation Planning (disaster preparation and response programs⁹⁴) and the National Floodplain Insurance Program (NFIP). Both programs are structured so that local governments implement large portions of the programs. I will briefly describe the role local governments play in implementing these policies. First, I describe hazard mitigation plans. Second, I describe the NFIP.

Local governments craft their own disaster preparedness plans – called hazard mitigation plans – which outline steps they will take to minimize potential damage from likely disasters (e.g. severe storms, hurricanes, floods, droughts, and earthquakes) and how they will respond

⁹⁴ Hazard mitigation plans address drought as well, but mostly focus on the frequency of drought. These plans are not necessarily equipped to address the complex water storage solutions needed to truly address drought. Instead, water storage is addressed through the Bureau of Reclamation which addresses drought management in the U.S. west by attempting to store enough water for agriculture, commercial, and domestic use in aquifers and reservoirs. Hazard mitigation plans do not address expanding these storage basins, but rather include plans for responding to drought like enforcing water restrictions (not watering lawns every day, rationing water, etc.). This project does not address the Bureau of Reclamation because it does not have the same principal-agent relationship to local governments that FEMA does. The Bureau of Reclamation works in partnership with local governments, but it only maintains water storage on federal land. Local governments have an interest in how much water is stored on federal land because that water eventually leaves federal land and is used by localities. However, localities do not implement the Bureau of Reclamation's policies in the same way they implement FEMA's policies.

should a disaster strike. If FEMA approves a local government's hazard mitigation plan,⁹⁵ the local government qualifies for increased levels of federal government support in the aftermath of a disaster and is eligible for disaster mitigation grants (i.e. preventing the worst impacts of predictable disasters).

Although FEMA has some first responders who arrive on the scene of major disasters – like Hurricane Katrina, Superstorm Sandy, etc. – local governments' first responders are the first on the scene and the last to leave. Furthermore, local government bureaucrats (in departments like engineering, land management, zoning enforcement, building code enforcement, and emergency management) work to implement disaster preparedness programs. These programs include strategies like setting up early warning systems, keeping buildings out of flood-prone areas, and setting up evacuation plans and shelters. Most of the time, FEMA's role is to support local government bureaucrats with data, best practice suggestions, and other resources so that local bureaucrats can effectively implement disaster management efforts.

Similarly, the NFIP is implemented by local actors. FEMA employees provide guidelines for local flood ordinances that local governments must meet to qualify for insurance and issue flood maps to help them determine areas where flooding is most likely to occur.⁹⁶ FEMA also developed a ranking system called the Community Rating System which evaluates the strength of flood management policies in a community. Higher rankings for the Community Rating System lead to lower insurance rates for members of a community. However, local governments are responsible for enforcing flood ordinances which address things like how high buildings need

⁹⁵ State governments approve the plans before they are sent to FEMA. This means that both the state government and FEMA have veto power over local government hazard mitigation plans.

⁹⁶ Flood maps are complex, negotiated political documents as much as they are reflections of a scientifically measured flood risk. FEMA issues maps based on flood models and satellite imaging, but local governments can appeal the maps. Sometimes these changes are motivated by a greater understanding of local conditions. However, they are also motivated by economic or political reasons which distort objective flood risk (Pralle S., 2017).

to be above base flood elevation and where habitable structures can be built. Flood policy is enforced through a combination of zoning rules, building codes (and inspections), and land use planning documents. While FEMA sets policy parameters, they do not engage in implementation of flood insurance policy.

FEMA began to incorporate climate adaptation into their policies following President Obama's Executive Order 13514. In January 2012, FEMA Administrator W. Craig Fugate and FEMA Office of Policy and Program Analysis Director David J. Kaufman signed and released a new administrative policy on climate change adaptation. The policy's purpose was:

“...to establish an Agency-wide directive to integrate climate change adaptation planning and actions into Agency programs, policies, and operations.”

In line with this policy, FEMA's guidebook for local hazard mitigation planning was updated to include climate change adaptation. In the October 1, 2011 edition, the guide first mentioned climate change as a factor local governments *could* include in their plans. The guide said that including extra elements like climate change adaptation signals that the community is genuinely interested in hazard mitigation and that these communities “will be better positioned to receive FEMA technical and financial assistance to implement their actions or projects,” (p. 6). In the March 2013 update to the guidebook, FEMA took this a step further by encouraging local governments to address climate change adaptation and giving more guidance on how to do so:

“The planning team may decide to include a discussion of the impacts of climate change in the risk assessment. This is not required by federal mitigation planning regulation, but can provide a better understanding of how risk may change in the future. Climate change in and of itself may not be a hazard, but it may change the characteristics of the hazards that currently affect the planning area. The planning team can include climate change as a separate section in the plan or within descriptions of the existing hazards, such as severe storms, flooding, wildfire, and drought.” (p. 5-8)

Similarly, the NFIP and Community Rating System programs encouraged communities to consider climate change and sea level rise in their planning. NFIP went through several policy changes and revisions since Hurricane Katrina revealed serious flaws in the program.⁹⁷ To address climate change, FEMA began incorporating sea level rise into their flood modeling (although it did not make it into the official maps sent to communities) and added climate change as a dimension for local communities to consider in crafting their flood plans. The agency also announced that applications for community flood ratings and hazard mitigation programs that take climate adaptation into account are more likely to be funded. While they are not requiring climate adaptation planning, they are sending strong signals encouraging it.

FEMA's strategic plan (2014-2018) included several references to the importance of climate adaptation for disaster management. The document called for the emergency response community to take the risks from climate change seriously. They wrote:

“A changing climate is already resulting in quantifiable changes to risks communities face, showing that future risks are not the same as those faced in the past. State, tribal, territorial, and local demands for climate-enabled risk management information and tools are expected to rise and evolve as the need to adapt to climate change increases.” (p. 29)

FEMA developed climate adaptation resources and made them available on its website.⁹⁸ They included tools for (1) sea level rise mapping, calculators, and a guide for sea level rise adaptation, (2) a new process for threat and hazard identification which includes climate modelling, (3) access to climate.gov – a large federal data repository for climate data, and (4) links to other government agencies' efforts on climate adaptation.

⁹⁷ For a complete history of these changes, see “A Broke, and Broken, Flood Insurance Program” in The New York Times (Walsh, 2017)

⁹⁸ Data collection for this project ended in November 2016. All conclusions reflect Obama-era only FEMA climate actions. Since then, several of these resources have been removed from FEMA's website.

FEMA also launched several pilot programs to encourage climate adaptation innovation including the Community Resilience Innovation Challenge. This program funded 30 communities' climate adaptation projects. It is a public-private partnership, funded by the Rockefeller Foundation and administered by the Los Angeles Emergency Preparedness Foundation.

In sum, under the Obama Administration, FEMA began to incorporate climate adaptation into their policies and encouraged local governments to start considering how they might need to adapt to climate change. It incorporated climate adaptation goals into its hazard mitigation plan program and its flood insurance program, sending strong signals that climate adaptation is important for local governments.

3. State Government Climate Change Attitudes

In this section, I describe the attitudes of each state government on climate change and the signals they send to local governments about the issue. First, however, it is useful to understand the different forms of state-local relationships. State-local relations are often described as Dillon's rule or home rule states. These classifications do not come from the U.S. Constitution, it does not mention local governments. Instead, the evolution of state-local relationships has been largely left up to interpretation by the courts. Two court cases in particular defined the spectrum of state-local relations. Both were written in the aftermath of the Civil War when the courts began ruling on questions pertaining to state-local relationships as city governments grew in size and influence. Judge John Dillon from Iowa wrote in an 1868 ruling (*Clinton v. Cedar Rapids and the Missouri River Railroad*, 1868) that local governments were subordinate to state governments. They could not craft their own policies independent of state approval. In contrast, Judge Thomas Cooley from Michigan ruled in 1871 that local governments

had an inherent right of self-governance (People v. Hurlbut, 1871). These two perspectives – commonly known as Dillon’s Rule and home rule (Cooley’s ruling) – came to define the spectrum state-local relationships (Richardson, Jr., 2011).

However, modern scholars of federalism argue that juxtaposing Dillon’s Rule and home rule is an oversimplification of state-local relationships (Richardson, Jr., 2011; Grumm & Murphy, 1974; Wolman, McManmon, Bell, & Brunori, 2008). Instead, home rule and Dillon’s Rule represent two different and not entirely conflicting interpretations of state-local relationships. According to Richardson (2011), Dillon’s Rule is a statutory interpretation used by courts to clarify legislative intent whereas home rule is a way to clarify the separate spheres of state and local power and responsibility. Grumm and Murphy (1974) argue that over time the move towards or away from Dillon’s Rule or home rule interpretations of state-local relationships is less meaningful than the concentration of power in bureaucracies over elected politicians.

Wolman et al. (2008) constructed a measure of state-local relationships to describe the amount of autonomy local governments have in each state to create and implement their own policies, going beyond the home rule-Dillon’s Rule dichotomy. Their measure attempts to capture the range of areas where local governments have influence over policy and fiscal freedom to achieve those policy goals. As the authors describe, the measure:

“define[s] local government autonomy conceptually as a system of local government in which local government units have an important role to play in the economy and the intergovernmental system, have discretion in determining what they will do without undue constraint from higher levels of government, and have the means or capacity to do so.” p. 377

Wolman et al. build their measure based on: (1) local government importance in the intergovernmental system, (2) policy discretion,⁹⁹ and (3) local government capacity. According to their measure, the five states in this study range from high local autonomy in Florida to low-to-moderate local autonomy in Washington State. Wolman et al.’s scores range from the highest local autonomy in New York State (score = 0.845) to the lowest autonomy in Delaware (score = -0.982). The scores for the five states in this study below are:

Table 10: Wolman et al. Scores for Local Autonomy

State	Score	Low or High Local Autonomy
Florida	0.378	Moderate-high autonomy
South Carolina	0.201	Moderate-high autonomy
North Carolina	0.131	Moderate autonomy
Nevada	0.103	Moderate autonomy
Washington	-0.073	Moderate-low autonomy

Although not representing the extremes of high- and low-autonomy, Wolman et al.’s scores show that there is variation in local autonomy across the five states in this study. As this chapter will demonstrate, local governments in moderate-high autonomy states (Florida and South Carolina) are more able to act without worrying about state attitudes.

Next, I discuss the attitudes of each state government on climate adaptation. The states are arranged from most anti-climate change adaptation to pro-climate change adaptation.

3.1 North Carolina

North Carolina’s government alternated between Democratic control and Republican control since 2010. During periods of Democratic control, the state encouraged climate

⁹⁹ Discretion is used by Wolman et al. (2008) slightly differently than by scholars focused on bureaucratic action (like Teodoro (2011) and Lipsky (2010)). In this chapter, Wolman et al.’s version of discretion is referred to as “policy discretion” and street-level bureaucratic discretion is referred to as “implementing discretion”. Both represent important aspects of local bureaucrats’ autonomy as representatives of their local government (agents) to the state government (the principal).

adaptation and during periods of Republic control, the state actively discouraged climate adaptation. The reversals of policy in 2012 which continued until 2016 drew national attention – including that of comedian and satirist Stephen Colbert¹⁰⁰ - for changing policy to downplay the threat of sea level rise along the state’s vulnerable coastline.

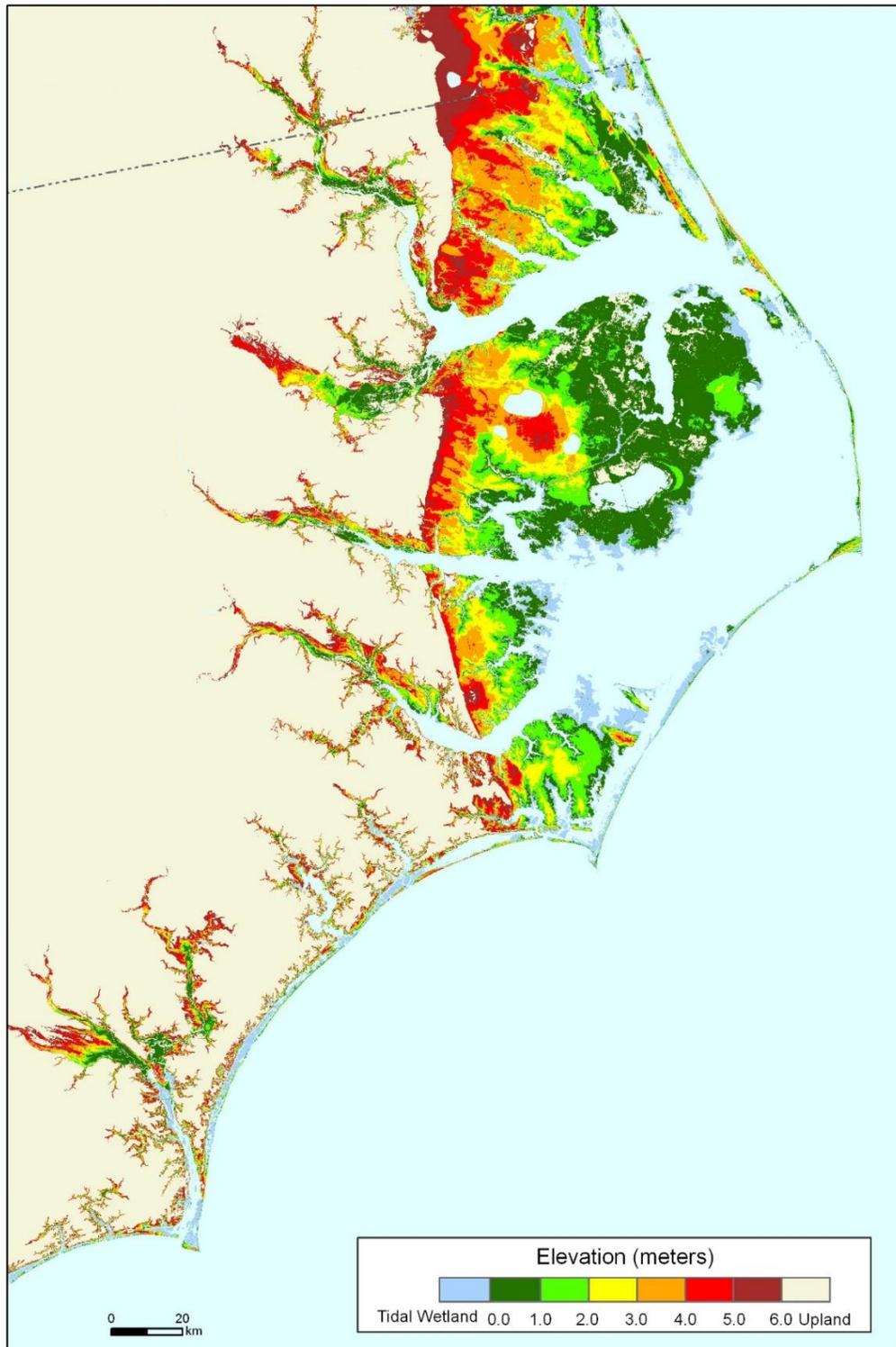
In 2010, the North Carolina Coastal Resources Commission released a sea level rise assessment which determined that the coast will experience 39-inches in sea level rise by the year 2100. This analysis was completed by a panel of scientists and engineers who generated predictions using historical trends and climate change prediction models (N.C. Coastal Resources Commission's Science Panel on Coastal Hazards, 2010). The 39-inch rise in sea level rise would devastate the coast – washing away most of the Outer Banks and flooding cities in the Inner Banks region, as Figure 10 shows.

The report drew opposition from the newly created NC-20 advocacy group.¹⁰¹ NC-20 represents the 20 coastal counties in North Carolina and is comprised of public officials, county managers, and business leaders (Dewitt, 2014). In 2010, the state legislature (the General Assembly) was controlled by Democrats and the Governor – Beverly Perdue – was a Democrat. During Purdue’s tenure as governor, NC-20’s initial lobby efforts made no changes in the Coastal Resources Commission’s conclusions on sea level rise or state policy.

¹⁰⁰ On June 4, 2012, Stephen Colbert’s *Colbert Report* news-comedy-satire program drew national attention to a law which prevented the North Carolina Coastal Resources Commission from using climate change models to predict future sea level rise. This move was mocked by the comedian who said, “I think this is a brilliant solution, if your science gives you a result that you don’t like, pass a law saying the result is illegal. Problem solved.”

¹⁰¹ According to the group’s website, NC-20 formed to oppose new state stormwater regulations proposed by the NC Department of Environmental Quality’s Environmental Management Commission. The group saw the new regulations as onerous. It quickly turned its advocacy efforts to fighting the Coastal Resources Commission sea level rise estimates when they were released as well.

Figure 10: Map of Predicted Sea Level Rise along North Carolina Coast



Elevations of Land Close to Sea Level

Elevations are above spring high water, which is the average high tide during new and full moons, and approximately the inland boundary of tidal wetlands. This map is a general graphical representation of elevations in the area depicted, not designed to estimate the precise elevations at specific locations. Actual elevations at specific locations may be 30 cm above or below the elevation shown. Source: J.G. Titus and J Wang. 2008. "Maps of Lands Close to Sea Level along the Mid-Atlantic Coast". US Environmental Protection Agency.

However, in 2011 Republicans won a majority of seats in the General Assembly. In 2012, the legislature passed a four-year moratorium on new sea level rise reports and directed the Coastal Resources Commission to revise its prediction based on a 30-year limited outlook (Dewitt, 2014). This policy change was welcomed by members of the NC-20 organization. The changes drastically limited the predicted sea level rise to 8 inches by privileging historical data over climate modeling (Rawlins, 2012).

By 2013, when Republican Governor Pat McCrory took office, sea level rise had become a hot button issue in the state. As Governor, McCrory supported appointments to the Coastal Resources Commission who were interested in protecting economic development over providing sea level rise predictions and included members of NC-20 on the Commission.¹⁰² When the commission met in spring 2014, it voted to limit sea level rise studies to a 30-year outlook corresponding with the term of a typical home mortgage (WUNC News, 2014).¹⁰³

Governor McCrory repeatedly attributed climate change to natural cycles and questioned the extent to which humans were causing changes in global temperature and climate (Associated Press, 2014). Therefore, from 2011 to 2016, North Carolina's local governments received strong signals from the legislature and the governor to avoid discussion of climate change or sea level rise.

¹⁰² The Coastal Resources Commission members (13 total) are appointed by the Governor, Speaker of the House, and Senate President Pro Tempore. During this period of Republican control in North Carolina government (2013-2014), two thirds of the Coastal Resources Commission were replaced (WUNC News, 2014).

¹⁰³ At the end of the data collection phase of this study, no new sea level rise predictions had been issued. However, the election of Democratic Governor Roy Cooper led to changes in the state's climate change and sea level rise policy. Governor Cooper joined the US Climate Alliance in September 2017 to address climate change in-lieu of the federal government withdrawing from the Paris Agreement (Bennett, 2017; Friedman & Plumer, 2017).

3.2 Florida

Florida's state government similarly changed positions on climate change adaptation. It initially supported action under Governor Charlie Crist, and then rescinded this support under Governor Rick Scott. However, the policy changes matched changes in the governorship more than changes in partisan control of state government. (Florida has been dominated by Republican legislators and Republican governors since 2010.) Charlie Crist became Governor of Florida in 2007 (as a registered Republican, but he later switched to be an Independent in 2010, (Lazar, Konstantinides, Rossoll, & Greve, 2013)) and made climate change an immediate priority. He addressed it in his first State of the State address, convened a summit in Miami to discuss climate risks, and signed legislation encouraging renewable energy and greenhouse gas emissions reductions. In direct contrast to Crist's actions, Governor Rick Scott began his term in 2011 and started deprioritizing the issue and dismantling Crist's efforts (Dennis & Fears, 2017; Dearen & Kay, 2015). According to Associated Press writers Jason Dearen and Jennifer Kay,

“[Florida state government] has yet to offer a clear plan or coordination to address what local officials across Florida's coast see as a slow-moving emergency. Republican Gov. Rick Scott is skeptical of man-made climate change and has put aside the task of preparing for sea level rise, an Associated Press review of thousands of emails and documents pertaining to the state's preparations for rising seas found.” (Dearen & Kay, 2015)

Governor Scott's administration also banned state environmental bureaucrats from using the phrases climate change, global warming, or sustainability (Korten, 2015). While the governor's office has denied that this is an official policy – unwritten or otherwise – critics of the governor point to quotes from former state bureaucrats and a hearing where Brian Koon (Chief of the Florida Division of Emergency) engaged in verbal gymnastics to avoid saying “climate change” during questioning from the Florida Senate Appropriations Subcommittee on Transportation, Tourism, and Economic Development (Elfrink, 2016). Furthermore, scientists

working on a wide range of reports for the state have confirmed they were encouraged or pressured to remove references to climate change from reports they were working on (Allen, 2015).

However, Florida's state legislature took steps to address climate change and sea level rise, albeit small ones, during Governor Scott's tenure. In May 2015, the legislature passed, and Governor Scott signed, a bill which mandated local government comprehensive plans include sea level rise as a cause of flood risk (Florida Sea Grant, 2015). The law targeted flood risk planning generally, and the inclusion of sea level rise as a required element expands on earlier versions of the law that allowed and encouraged local governments to consider sea level rise but did not require it.

While Florida's governor is not actively working to address climate change, the 2015 sea level rise requirement for comprehensive planning demonstrates he is not trying to stop all climate action. However, neither the state Division of Emergency Management nor the Department of Environmental Protection (two agencies most likely to address climate change in Florida) have resources to help local governments adapt to climate change on their websites.

3.3 South Carolina

The South Carolina state government largely stayed silent on climate change. Governor Nikki Haley has made no public comments on climate change¹⁰⁴ but has often pointed to the efforts her state made to protect the environment (Phillips, 2014). Even during Hurricane Joaquin, which dumped up to 20 inches of rain in parts of South Carolina (Weather.gov, 2015), leading to historic flooding in October 2015, Governor Haley did not address the potential link

¹⁰⁴ As Governor, Haley was largely silent on the issue. However, in her new role as United Nations Ambassador for the United States, she has spoken on the issue representing President Trump's position on the issue (Skiba, 2017).

between the storm's unusual severity and intensity and climate change. Instead she focused on emergency response efforts.

The state legislature has not directly addressed climate change either. Conservationists in the state characterize the body as catering to special interests instead of addressing environmental concerns. Nancy Cave – the north coast director of South Carolina's Coastal Conservation League – spoke about a bill, which on its face was responding to sea level rise for the community of Debordieu Beach, saying:

“I don't think our legislature has acknowledged climate change in any way, shape, or form, so I don't think that's something they really think about as they make decisions and vote on issues. I think that this is special interest legislation that a group of wealthy and influential voters are able to influence.” (Atkin, 2014)

Debordieu Beach is a wealthy coastal community. The bill approved building a sea wall around beach houses. Environmental and climate advocates argue that this is a band-aid solution because the sea wall will encourage erosion and provide a false sense of security for beach residents against rising sea levels and storm surges.

South Carolina's only government report addressing climate change was written by the state's Department of Natural Resources in 2011. The report outlined the expected rate of warming in South Carolina and the consequences this warming will have on ecosystems and species. The report generated some controversy because it was not immediately released when finished. According to environmental and climate advocates, the report was shelved for more than a year.

The report was finished in November 2011 under the leadership of Department of Natural Resources Director John Frampton. Shortly after its completion, Frampton said he was pressured to leave his position as director by an administrative appointee of Governor Haley (who was in her first year as governor). Although Frampton believed the report was ready for public release,

it was not released until after an article came out on February 23, 2013 in *The State* newspaper in Columbia, SC. The article, written by Sammy Fretwell, said:

“A team of state scientists has outlined serious concerns about the damage South Carolina will suffer from climate change – threats that include invading eels, dying salt marshes, flooded homes and increased diseases in the state’s wildlife.

“But few people have seen the team’s study. The findings are outlined in a report on global warming that has been kept secret by the S.C. Department of Natural Resources for more than a year because agency officials say their ‘priorities have changed.’”

The document was released but has not appeared to influence state policy.

3.4 Nevada

The State of Nevada has done very little to address climate change – neither encouraging nor discouraging local governments to prepare for the impacts of climate change. Governor Brian Sandoval became Nevada’s governor in 2011 and has been taking the drought problems in Nevada seriously while in office, although he is not linking them to climate change. California’s drought problems were more dramatic than those in Nevada,¹⁰⁵ but the same drought system was impacting both states. In 2015, Governor Sandoval organized a drought summit and a panel of eight experts called the Nevada Drought Forum to develop solutions to the chronic water shortages in the state (Rindels, 2015; Snyder, 2015; Associated Press, 2015).

When asked about climate change, Governor Sandoval carefully avoided addressing its cause (mainly human driven greenhouse gas emissions), but he also committed his state to reducing their greenhouse gas emissions by investing in renewable energy. In an interview with

¹⁰⁵ California experienced a historic mega-drought which devastated water supplies in the state. The drought spurred serious questions about sustaining California’s thirsty agricultural economy, if people have the right to buy extra access to water, and how to govern extreme water shortages which may become more common with climate change (Fountain, 2015; Nagourney, Healy and Schwartz, 2015).

RealClearPolitics, Governor Sandoval was asked if humans were the main driver of climate change. He responded,

“I’m not qualified to answer that question... let me tell you what we’ve done, without getting to whether it’s human-caused or whatever that may be.” (June 2014)

While the Governor was unwilling to take a firm stance on the causes of climate change, in 2017 he supported several state bills to encourage clean energy development in the state.¹⁰⁶

Additionally, Governor Sandoval fought to attract Tesla’s battery factory to the Reno-Sparks area in 2014 (Ward, 2014).

The only state document to address climate change comes from the Department of Conservation and Natural Resources’ Nevada Natural Heritage Program. The report – “State Wildlife Action Plan” – was published in 2012 and acknowledges the threat climate change poses to wildlife and ecosystems in Nevada.

Overall, Nevada’s state government is neither encouraging nor discouraging local government action on climate change, and it is not taking any definitive steps of their own to address the issue.

3.5 Washington State

Washington State, unlike the other four states in this project, is actively working on climate change mitigation and adaptation. These efforts are driven by the state’s Democratic leadership and liberal population centers around Seattle.¹⁰⁷ Washington State began its efforts in 2008 after Governor Christine Gregoire issued Executive Order 07-02 which ordered state

¹⁰⁶ The Nevada legislature meets once every two years. A search of the 2013, 2015, and 2017 legislative sessions revealed only one bill which identified climate change as a reason to change state or local policy. Senate Joint Resolution No 10 in 2017 addressed the problems with overconsumption and water shortages in the Colorado River Basin. It identified climate change as an additional stressor on the river.

¹⁰⁷ King County was the first county to publish an adaptation plan in 2007 (Georgetown Climate Center, 2015).

agencies to mitigate climate change and develop adaptation strategies (Washington State Executive Order, No. 07-02, 2007). A year later, the legislature approved the State Agency Climate Leadership Act (SB 5560) which ordered state agencies to craft an integrated response to climate change to “better enable state and local agencies, public and private businesses, nongovernmental organizations, and individuals to prepare for, address, and adapt to the impacts of climate change.”

Since becoming governor in 2013, Jay Inslee worked to maintain Washington State’s reputation as a climate leader. He introduced several mitigation initiatives, including a controversial carbon tax. His efforts faced opposition in the legislature (Brunner, 2015). Members of the legislature cited the costs of these programs and the potential harm they might cause to the economy as reasons to oppose them. According to the *Seattle Times*, opposition is coming from both the Republican-controlled state Senate and moderate Democratic members of the state House of Representatives (mostly from rural areas) (Brunner, 2015).

Governor Inslee took several steps on his own including traveling to the UNFCCC COP21¹⁰⁸ meeting in Paris where he signed agreements committing his state to greenhouse gas reduction agreements with other nations (Governor Jay Inslee's Office, 2015a; Governor Jay Inslee's Office, 2015b; Bernton, 2015). He also supported projects related to climate adaptation. As Mr. Revell from Yakima County, WA said, climate change projects almost always draw the governor’s attention. He said,

“If you are going to get a hold of the Governor's attention, just talk about carbon reduction and climate change. He came up to look at our reservoir, and that was the price of his visit. He wanted to talk about climate change. Which we agreed because if in fact the climate is changing and getting warmer, we need to be more drought resilient.” (Interview with Scott Revell, September 16, 2016).

¹⁰⁸ United Nations Framework Convention on Climate Change, Conference of the Parties 21

The state's agencies, especially the Department of Ecology, are developing and implementing their own climate adaptation strategies. Reports from various state agencies cover sea level rise, ecosystem and habitat health, and transportation vulnerability (Georgetown Climate Center, 2017). However, the most inclusive report was published by the Department of Ecology in April 2012. The report – “Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy” – addresses how existing policies and programs can be updated to prepare the state for the likely impacts of climate change.

4. Local Governments Climate Policy

Sections 2 and 3 established that local bureaucrats are responding to many (often conflicting) signals on climate change. Local governments in North Carolina are actively told not to adapt to climate change. Florida is sending signals that climate adaptation is not their policy priority, but because of home rule and local policy autonomy rules, they cannot forbid local action. In South Carolina and Nevada, climate adaptation is not on the state agenda and state leaders' avoidance of the subject does not encourage (or, to be fair, explicitly discourage) local action. In only one state – Washington – are local governments actively encouraged to address climate adaptation. As hypothesis 6 suggests, local governments respond to signals from state governments so they can access money from the state and money from the federal government funneled through state governments.

To evaluate hypothesis 6, this section covers two things. First, it gives an overview of the status of climate adaptation policy in each case. Chapter 3 addressed if climate adaptation was on the agenda and which actors brought the issue onto the agenda. Chapter 4 described local bureaucrats' actions to integrate climate change into existing policies. However, this project has thus far not outlined the status of any local policies. It is important for evaluating hypothesis 6 to

understand the status of climate adaptation policy, especially because many localities in this study are addressing climate adaptation through hazard mitigation plans that are required by FEMA to be eligible for disaster management grants.¹⁰⁹

The second part of this section re-examines bureaucratic action in light of state attitudes. It employs the same five categories of action used in Chapter 4 but changes the principal in the principal-agent relationship from local elected leaders to state governments. If bureaucrats were acting as hypothesis 6 suggests, they would avoid conflict with the state because we would expect to see fewer bureaucrats acting in a defiant way¹¹⁰ and more seeking to follow the state's lead (state-led/politician-led action), cooperating with the state's wishes (cooperative action), or, if they choose to act against the state's wishes, trying to minimize any potential harm by acting in a non-confrontational way.

4.1 Climate Change Policy Status for Each Case

The status of climate change policy across these 18 cases varies a great deal; in some cases, it is not on the agenda and in others, climate adaptation policies are in the implementation stage. Each case is described in Table 11. Each locality's climate change adaptation policy status was labeled as either (1) not on the agenda, (2) on the agenda, (3) policy formulation, (4) policy adoption, or (5) policy implementation.¹¹¹

¹⁰⁹ To be clear: local governments are not (yet) required to include climate adaptation in documents they submit to FEMA. They are required to evaluate their disaster risk and outline steps for minimizing risk before disasters and responding to disasters should they occur to minimize harm. FEMA has encouraged the inclusion of climate adaptation in these documents.

¹¹⁰ Considering only one bureaucrat acted defiantly, as identified in Chapter 4, we should see no bureaucrats acting defiantly.

¹¹¹ These categories are based on Anderson, Brady and Bullock III's model of the policy process in *Public Policy and Politics in the United States* (1978). Where Anderson, Brady and Bullock III have five categories, they slightly differ from those presented here. The authors use five categories: agenda setting, formulation, adoption, implementation and evaluation. Here, the evaluation stage is dropped because adaptation policies are new, and few are being evaluated. The fifth category used here is "not on the agenda".

Additionally, this project recognizes the difference between policies that are adopted awaiting implementation (i.e. the strategies for implementing the policy are not yet in place) and policies that are adopted but are largely unimplemented. In a few cases, climate change adaptation was included in a policy document, but the local bureaucrats and politicians are not aware of the policy. Therefore, it has been adopted, but that adoption is not changing how the government operates.

As Table 11 shows, climate change adaptation is not on the agenda in three cases, four cases have climate adaptation on the agenda but there is no further action, two cases are formulating policies, four cases have adopted policies but these policies are not implemented, two cases have adopted policies that are awaiting implementation, and three cases are implementing their climate adaptation policies.

Table 11: Status of Local Government Climate Change Adaptation Policy

Case	Policy Status	Evidence	
North Carolina	Craven County	Adoption of policy, but unimplemented	There was action in 2009 by integrating climate adaptation into the Land Use Plan (October 2009), but these actions were for “monitoring” and “cooperation” with other governments. There were no independent efforts except one project: a bulkheading project. Interview indicated that this action was not actively implemented. In many ways the local government was not committed to the plan.
			They are currently doing nothing to address threat of climate change, and not including climate change in any updated plans.
	City of Elizabeth City	On the agenda, but no action	The issue has been discussed, but there is no discussion about policy responses or efforts to formulate a policy. Heard from group of students about need to adapt to sea level rise, but not crafted any response.
	City of Havelock	Adoption of policy, but unimplemented	Climate adaptation is on the agenda and even incorporated into the comprehensive land use plan from 2009. However, interview indicated that this is not something that is being actively pursued. There is no evidence that Havelock is doing anything about this aspect of the plan. In many ways the plan is unimplemented.

Table 11: Status of Local Government Climate Change Adaptation Policy

	Case	Policy Status	Evidence
North Carolina	City of New Bern	On the agenda, but no action	Interviews and documents show climate adaptation is being discussed, and an EPA grant was used by UNC students to do a study and make recommendations about policy change. Interviews indicate that climate change is not being actively considered to be integrated into existing policy.
	Pasquotank County	Policy formulation	Climate adaptation has been discussed and elected officials are not signaling support for sea level rise studies/climate action. However, climate adaptation has been introduced into the Albemarle Regional HMP which included participation from two Pasquotank bureaucrats. Additionally, Shelley Cox assisted UNC students in their study of sea level rise issues in Pasquotank County. Cox and Christy Saunders (Emergency Management) are making some efforts to work on climate adaptation, but the elected officials’ stances are likely preventing any action.
Florida	City of Fort Pierce	On the agenda, but no action (government-wide)	Local bureaucrats are using discretion to discourage development in areas threatened by climate-driven flooding. There is no government-wide policy.
	Martin County	Adoption of policy, but no implementation yet	Climate adaptation was integrated into the Local Mitigation Strategy as a hazard to be considered, but there are no steps to respond. Also, there are efforts by bureaucrats in the engineering department about creating a separate policy for adaptation, but again no concrete steps to implement.
	St. Lucie County	Adoption of policy, but no implementation yet	Climate adaptation (especially to sea level rise and increasingly severe tropical storms) is included in their hazard mitigation documents – the old and the updated. They have a long section on sea level rise. However, there are no indications that implementation is happening in any way for adaptations to these threats. They are being studied, recognized, and incorporated into documents that would allow for concrete steps, but there is no indication of building infrastructure, hiring adaptation planners, or creating adaptation systems.
Nevada	Carson City	Adoption of policy, but largely unimplemented	Climate change is included in the hazard mitigation plan, including lengthy descriptions of the hazards posed by climate change. However, no concrete actions have been taken to implement the policy. During interviews, climate change was not acknowledged as part of their drought management strategy.
	City of Fernley	On the agenda, but no local government action	The city is working with the Water for the Seasons project but have not integrated any of the project’s recommendations into their own policy efforts.

Table 11: Status of Local Government Climate Change Adaptation Policy

	Case	Policy Status	Evidence
South Carolina	Greenville County	Policy formulation	Local bureaucrats are discussing climate adaptation, but not taking any action to integrate it into existing plans. Discussion about putting climate adaptation into the update for hazard mitigation plan but it did not make it into existing plan beyond a brief mention that it should be studied. It is possible that forward progress would be stopped if FEMA did not require climate adaptation to be considered.
	City of Mauldin	Not on the agenda	Climate change is not mentioned in meeting minutes, planning documents, media coverage of local government, or interviews with bureaucrats.
	City of Greer	Not on the agenda	Climate change is not mentioned in meeting minutes, planning documents, media coverage of local government, or interviews with bureaucrats.
	Oconee County	Not on the agenda	Climate change is not mentioned in meeting minutes, planning documents, media coverage of local government, or interviews with bureaucrats.
Washington	Grant County	Adoption of policy, but unimplemented	Climate change is included in the hazard mitigation plan, including lengthy descriptions of the hazards posed by climate change. However, no concrete actions were taken to implement the policy and the current emergency management program coordinator and county commissioner did not acknowledge it when asked about climate change policy. This is an instance where the document reflected unimplemented policy.
	Kittitas County	Implementation of policy	Climate change is fully integrated into the Kittitas County Hazard Mitigation Plan with action items. Interviews indicate there are steps being taken to meter water and require low-flow fixtures. Not all of this is solely driven by climate change (there was an over-allocation problem in the county for groundwater supplies) but worry about climate change is integrated in the need for action. Additionally, the county is a full participant in the Yakima Integrated Plan, which takes climate change seriously and is taking concrete steps to deal with climate change-drought.
	City of Yakima	Implementation of policy	There is a budget line for aquifer storage and delivery to address climate adaptation. Additionally, the city is a full participant in the Yakima Integrated Plan, which takes climate change seriously and is taking concrete steps to deal with climate change-drought.
	Yakima County	Implementation of policy	The city's water utility is attempting to address climate change. They are also participants in the Integrated Plan which has taken concrete steps to adapt to climate change. Interviews indicated participation in the Integrated Plan is important for the irrigation districts and the county. The Roza Irrigation District in the county is also pursuing many projects to increase water storage as a precaution against drought from climate change.

4.2 Local Governments' Actions Vis-à-vis State Bureaucrats

Table 12: Types of Bureaucratic Action, with State Governments as Principals

Form of Action	Description
Defiant Behavior	<p>Bureaucrats know that the state government does not want the local government adapting to climate change, but the bureaucrat acts anyway.</p> <p><i>Examples: write policy documents, change department policy, use discretion to change implementation of existing policies to make them fulfill adaptation goal while voicing need to adapt so that state leaders can be aware of their actions</i></p>
Cooperative Action	<p>Local bureaucrats work with the state government to address climate change adaptation through local government policy. Local bureaucrats or the state government can initiate policy changes. Both bureaucrats and the state government stay involved in policy development past the initial idea to start addressing climate change.</p> <p><i>Examples: state government representatives work with bureaucrats at regular meetings to create adaptation policy, state government representatives and bureaucrats become involved in a multi-stakeholder organization to develop a climate adaptation strategy</i></p>
Politician-Led Action	<p>The state government initiates climate change adaptation policy development, but unlike cooperative action they do not stay involved. In other words, the state government “assigns” climate change adaptation to local governments, and bureaucrats in local governments take up the issue.</p> <p><i>Examples: state government requires climate change adaptation included in planning documents then leave to bureaucrats to enforce, state government requires local governments to consider the impacts of sea level rise on their communities and create an action plan to prepare then leave to local governments to find strategy to achieve this</i></p>
Non-Confrontational Behavior	<p>Local bureaucrats take steps to adapt to climate change but try to avoid attention of the state government. Bureaucrats may avoid drawing the attention of the state government because they know the state government will disagree <i>or</i> they do not know the attitudes of the state government but do not want to involve them for other reasons.</p> <p><i>Examples: bureaucrats include climate adaptation in a document they write which the state government does not evaluate or review, bureaucrats use discretion to achieve climate adaptation goals through existing policies but do not announce to the state government</i></p>
No Action	<p>Local government and the local bureaucrat do not take steps to address climate change adaptation through role as government employee. Bureaucrats can believe climate change is a problem. They can also think that their local government <i>should</i> do something to adapt. However, they are not doing anything themselves (either initiating or supporting someone else) to address the impacts of climate change.</p>

Local bureaucrats' action (or inaction) to address climate change is viewed differently when state politicians and agencies are the principals instead of local politicians. Furthermore, inaction in several cases might be the local bureaucrat following the wishes of politicians. In this section, local bureaucrats' efforts on climate change are reconsidered in light of state principals' attitudes about climate change.¹¹² This uses the five categories of action: (1) defiant behavior, (2) cooperative action, (3) politician-led action (here also called state-led action for clarity), (4) non-confrontational behavior, and (5) no action. Table 12 describes these five categories considering state politicians and agencies as the principals.

4.2a Defiant Behavior

Seven bureaucrats in three cases – all in Florida – acted defiantly to a limited extent. St. Lucie County, the City of Fort Pierce, and Martin County all took small steps to start addressing climate adaptation, including adding it to their hazard mitigation plans. However, their efforts to address climate adaptation outside the hazard mitigation plans is not defiant because the state government does not review bureaucrats' discretionary behavior or local policies.

As described in Chapter 4, Section 2.4, Marc Meyers and FL-Local Bureaucrat-762 from Fort Pierce, FL acted non-confrontationally vis-à-vis their local principals. They encouraged local property owners and developers to be aware of the threats sea level rise and climate-driven flooding posed in the city. This behavior is also non-confrontational in regard to state principals because the state of Florida cannot review the independent discretionary actions of local bureaucrats. However, the inclusion of sea level rise and climate adaptation in the St. Lucie County Multi-Jurisdictional Hazard Mitigation Plan (that Fort Pierce was a participant in) is a

¹¹² See Section 3 of this chapter for state principals expressed attitudes and Section 2.7 in Chapter 4 for a description of local bureaucrats' actions vis-à-vis local principals.

defiant behavior. The state government reviews these plans before they are sent on to FEMA for review.

Similarly, the actions of Mark Satterlee and Jason Bessey from St. Lucie County were non-confrontational vis-à-vis their local principals. As described in Chapter 4, Section 2.4, they used existing policies to adapt to sea level rise – making sure to update sea levels so that flood management policies reflect increased risk. Again, this action is non-confrontational both for local principals and state principals because they are using their discretion and implementation power to achieve climate adaptation. However, including climate adaptation and sea level rise in the St. Lucie County Multi-Jurisdictional Hazard Mitigation Plan is a defiant action.

The bureaucrats from Martin County took more defiant actions overall compared to their peers in Fort Pierce and St. Lucie County. Their efforts vis-à-vis their local principals were politician-led, as described in Chapter 4, Section 2.3. Anne Murray, Kathy Fitzpatrick, and Deborah Drum were asked by Commissioner John Haddox to begin developing a comprehensive sea level rise plan. Director of Engineering Don Donaldson's efforts to keep flood management policies up-to-date also contributed to this effort, although Mr. Donaldson did not begin acting upon the request of Commissioner Haddox. In a way, he took initiative on his own, but his efforts did fit the larger goal set by Commissioner Haddox. When the state government is the principal, however, Martin County's efforts are defiant. They are aware of the state government's policy preferences (to not address climate change) but began a comprehensive planning effort. Additionally, Martin County included sea level rise and climate change as threats in their hazard mitigation plan. By acting in defiance of the state's preferences, Martin County's efforts firmly fit the defiant behavior category.

While bureaucrats in all three Florida cases acted defiantly, they did so at lower risk than in other states. Florida local governments have a great deal of autonomy over policymaking. Because of the state's home rule structure (high local autonomy), local governments do not need the permission of the state to take on new policy objectives like sea level rise. This was confirmed in an interview with Jamie Leigh Price, the Mitigation Planning Manager for the Florida Division Emergency Management:

“... we have what is called a home rule state in Florida, which means the counties have more power than the state, so we cannot tell them what to profile or how ... we can suggest, but we can't tell them how or what to do.” (Interview with Jamie Leigh Price, February 26, 2016)

She went on to say that the Division of Emergency Management also sees its job as to support local efforts, even if those are to include climate change as a hazard:

“A lot of our local counties have profiled sea level rise. Some of them as an effect, and some as their own hazard. Oh, especially our southeast counties. They have always been very proactive in general. They have a Southeast Florida Climate Change Compact - that's not the right name of it, that's the vague name of it. So they have been focusing on and looking at these types of effects and the changes moving forward for quite some time now. And we've recently approved multiple plans that have sea level rise as an option. ... We do support the counties doing whatever they want to do, and we will help them find the information they need for whichever hazard they want to profile, how they want to profile them - regardless of what any state legislature might say, the locals govern themselves so we support the way they want to do things.” (Interview with Jamie Leigh Price, February 26, 2016)

Interestingly, Ms. Price's statements confirm the contradictory nature of Florida's state climate change adaptation policies. The state government – both the governor and the legislature – are not supporting state-wide climate adaptation. However, state agencies whose job it is to work with local governments are supporting those governments who choose to take on climate adaptation.

While the actions of Florida counties still fit the categorization of defiant behavior, their defiance is “safer.” They are receiving support from the state agency which reviews plans before they are sent to FEMA, and the other actions they have taken are not reviewable by the state government partially because they rely on bureaucratic discretion and partially because Florida is a home rule state.

4.2b Cooperative Action

Four bureaucrats’ actions (from three cases) are cooperative with the state government, and all four also fit the cooperative action category when local politicians are the principals. They are Mark Cook from Kittitas County, WA, Joel Fruedenthal and Scott Revell from Yakima County, WA, and David Brown from the City of Yakima, WA. As described in Chapter 4, Section 2.2, these local bureaucrats worked cooperatively to integrate climate change adaptation into their drought management policies through the Yakima Integrated Plan. Through the Integrated Plan, local bureaucrats work cooperatively with a variety of actors to address drought management and climate adaptation: their local principals, other local bureaucrats, state bureaucrats from the Washington Department of Ecology, federal bureaucrats from the Bureau of Reclamation, representatives from the Yakima Nation, and representatives from advocacy organizations.

The Yakima Integrated Plan is unique and grew out of decades of conflict over water in the Yakima Basin. Before the Integrated Plan, stakeholders were embroiled in litigation over water use, eventually leading them to seek a way to break the litigation-driven gridlock. Mr. Fruedenthal from Yakima County described the unusually cooperative atmosphere around drought management in the area:

“With the Integrated Plan there is a great deal of cooperation, and that is unusual. And so it is painful for folks to get approval to certain things - the regulations and

the ordinances are set up in an adversarial way, and we are not totally adversarial here.” (Interview with Joel Fruedenthal, September 19, 2016)

This was echoed by Mr. Cook from Kittitas County:

“Kittitas County is part of the Yakima Basin Integrated Water Plan, so Yakima County, the Yakima Nation, Kittitas County, Kittitas Conservation District, Ellensburg Water Company, all these private irrigators, all these various municipalities, we all pulled together in and are all managed comprehensively under a multi-county, multi-agency, multi-jurisdictional plan. So it is unique in the country.” (Interview with Mark Cook, September 21, 2016)

When describing the history and origins of the Yakima Integrated Plan, Mr. Van Gundy also pointed to the unusually cooperative nature of the project:

“We developed a lot of trust - mutual trust - and started pulling together this program that we've got now. “And it's being looked at nationwide as being pretty much a historically successful process that everybody can do. And they are spreading the word among areas where there is a lot of controversy and legal action and so forth, and telling them, 'Look at the Yakima Project and what they've done, and that's what you need to do.' And to help promote that, we are getting a tremendous amount of state support and a tremendous amount of federal government support to make it a success, so they can continue to promote it among everybody else.” (Interview with Ron Van Gundy, September 26, 2016)

This cooperation – across jurisdictions, levels of government, and public and private organizations – has enabled the region to attempt and to finish projects that would otherwise be unachievable by individual local governments, including projects addressing climate adaptation.

As described in Chapter 4, Section 2.2, the structure of the Yakima Integrated Plan also encourages bureaucrats to take on politically charged or unpopular issues in addition to other more politically palatable and popular goals. As several people expressed, the causes of climate change are not important in their discussions relative to the need to respond to the changes:

“And we could debate why it is changing and what you can do about it, ... But, if it is changing, it is changing. It doesn't matter why, it just is.” (Interview with Scott Revell, September 16, 2016)

Furthermore, the structure and scope of the Yakima Integrated Plan makes it somewhat insulated from changes in state or federal government climate change attitudes and priorities. As Mr. Cook said:

“And I think, to [the organization’s] credit, that the Integrated Plan is such a big animal, that it is kind of moving along with or without the state.” (Interview with Mark Cook, September 21, 2016)

The institutional path dependency literature supports this, showing that organizations like the Integrated Plan set up institutions and systems that are difficult to change after they become established (Pierson, 2000; Pierson 2004). Climate change was incorporated into the Integrated Plan at its conception, so it is likely the organization will maintain its commitment to addressing climate change.¹¹³

4.2c Politician- or State-Led Action

Of the 16 bureaucrats who acted to address climate change adaptation, zero did so because states led the way. This result should not be interpreted as evidence that states cannot or do not encourage, force, or coerce local bureaucrats to adopt climate adaptation policies. Rather, this result is likely due to the purposeful selection of cases where local bureaucrats faced an anti-climate change political environment. With the exception of Washington State, all of the state governments in this study were either apathetic to climate adaptation or actively sought to discourage climate adaptation efforts in their states.

In Washington State, the local governments who acted to address climate adaptation did so cooperatively through the structure of the Integrated Plan. The one local government in Washington State that did not act on climate change was Grant County. To some extent, Grant

¹¹³ The first test of this was the transition from the Obama Administration to the Trump Administration. The Trump Administration’s move away from climate change has not led to the Integrated Plan removing climate adaptation from their priorities, although the lack of funding for the project has led to delays (Yakima Basin Integrated Plan, 2018)

County did respond to pressure from the state government to adapt to climate change: they incorporated climate change into their hazard mitigation plan published in 2013. The Washington State Department of Ecology reviews local hazard mitigation plans before they are submitted to FEMA and encouraged local governments to include climate change. However, when interviewed, neither Emergency Management Department Project Manager Sandi Duffey nor County Commissioner Cindy Carter were aware of climate adaptation or drought management efforts. This indicates that inclusion of climate adaptation in the hazard mitigation plan was more lip-service rather than an actual policy commitment. Thus, Grant County is most appropriately labeled as no action.

4.2d Non-Confrontational Behavior

With state governments as the principals, the second largest group of bureaucrats fit in the non-confrontational behavior category. Five of the 16 bureaucrats who acted to adapt to climate change through their flood or drought management policies acted non-confrontationally vis-à-vis their state principals. They were from three cases: Greenville County, SC, Fernley, NC, and Pasquotank County, NC. There is a great deal of variety in how these bureaucrats acted: ranging from low-effort/low-impact to high-effort/high-impact approaches.

Of the five, two were also in the non-confrontational behavior category when local politicians are the principals: Brian Bishop and Paula Gucker from Greenville County, SC. Two had been in the cooperative action category: NV-Local Bureaucrat-895 and NV-Local Bureaucrat-282 from Fernley, NV. One had been in the defiant behavior category: Shelley Cox from Pasquotank County, NC. In the following paragraphs, I describe the range of actions these five bureaucrats took, why they are non-confrontational vis-à-vis their state principals, and why the three bureaucrats who changed categories did so.

As described in Chapter 4, Section 2.4, Paula Gucker and Brian Bishop from Greenville County, SC took minimal steps to incorporate climate change adaptation into their local flood management efforts. They added a line to Greenville County’s hazard mitigation plan acknowledging that climate change is a threat multiplier for existing natural disasters like flooding, and they committed to study climate adaptation for inclusion in future iterations of the plan. This action is non-confrontational because Ms. Gucker and Mr. Bishop had no reason to expect mentioning climate adaptation would go against the wishes of the state government because the South Carolina government does not have a strong or clear position.¹¹⁴ Furthermore, neither mentioned potential opposition from the state government in their interviews.

In Fernley, NV, NV-Local Bureaucrat-895 and NV-Local Bureaucrat-282 worked to address their city’s climate change-driven drought risk by working cooperatively with local elected officials and other local entities through the Water for the Seasons project (see Chapter 4, Section 2.2 for a full description). However, when the state is the principal, the local bureaucrats’ efforts are no longer cooperative because the State of Nevada is not an active participant in the Water for the Seasons project. The group is comprised of local water rights holders, local governments, indigenous governments¹¹⁵, and researchers from the University of Nevada-Reno.¹¹⁶ Furthermore, Fernley’s participation in the Water for the Seasons project to address their climate-driven drought risk is not defiant for two reasons. First, the state government does

¹¹⁴ South Carolina’s state government has to approve hazard mitigation plans before they are submitted to FEMA, so the state government had the opportunity to see and object to the inclusion of climate adaptation. The key for labeling this action as non-confrontational is that the local government did not expect the state to be upset by this.

¹¹⁵ The indigenous groups are the Fallon Paiute-Shoshone Tribe, the Washoe Tribe of Nevada and California, and the Pyramid Lake Paiute Tribe.

¹¹⁶ The group has one representative from the Nevada Division of Water Resources – Kevin Hickenbottom – listed as a participant stakeholder on its website. However, unlike the Washington Department of Ecology playing an active role in the Yakima Integrated Plan, the Division of Water Resources is not running the group or playing a lead role in the group, as far as the Water for the Season’s website and publications show. Personal communication between Loretta Singletary and the author did not emphasize a large role of the Division of Water Resources as well.

not review the Water for the Seasons project outcomes. Second, the state government does not have any clear anti-climate change policies. If anything, the governor and legislature are ambivalent on the topic. Therefore, the Water for the Seasons project and its participants are neither following the state's lead or defying the state's preferences by addressing drought and climate change.

Shelley Cox – the Planning Director from Pasquotank County – acted non-confrontationally by limiting her action to the local level. She worked to address climate adaptation by bringing up the potential threats from climate change in the county and supporting a group of local students who researched the impacts of sea level rise in the county. As described in Chapter 4, Section 2.1, Ms. Cox's actions were defiant vis-à-vis her local principals because she acted to address climate change fully aware the local politicians did not support climate adaptation. Although Ms. Cox's actions were taken with full knowledge of the state's disagreement, she did not act in a way that the state could review or comment on her actions. Ms. Cox's efforts focused on presenting information to local officials on the need to adapt. Her behavior would have been defiant if she incorporated climate adaptation into a document that North Carolina state government officials would review – like a hazard mitigation plan.

4.2e No Action

The same bureaucrats who were in the category of “no action” vis-à-vis local principals are in this category for state principals: their lack of action does not change based on who the principal is. (While an argument could be made that *not* acting to address climate change could fit the state-led/politician-led action category, this label means not acting on climate adaptation.) Why bureaucrats chose not to act, however, is important. Only one of the bureaucrats in this

category did not act because he expected the state to object and prevent them from addressing climate adaptation.

As described in Chapter 4, Section 2.5, there is one bureaucrat who did not act because he felt the state would prevent any climate adaptation efforts: Landin Holland, a consultant planner for Craven County and other coastal North Carolina local governments. Mr. Holland pointed directly to the North Carolina state government's anti-climate adaptation attitudes as a reason not to act. He said:

“Well, one thing that is quite interesting and intriguing is that, in our [hazard] mitigation plans, under this cycle, under our current regime in terms of governor and our legislature, we are not allowed to acknowledge or discuss in any way shape or form sea-level rise in these mitigation plans. I mean it is basically, I won't use the word illegal. But we are not allowed to discuss it. And if it is in there, the State of North Carolina State Office of Emergency Management makes you remove it prior to submitting it to FEMA.” (Interview with Landin Holland, September 11, 2015)

Since he is a consultant for many local governments, other local governments (beyond the cases in this study) also held back from acting on climate adaptation because of Mr. Holland's understanding of the political climate in the state.¹¹⁷

None of the other bureaucrats who did not act to address climate change pointed to state pressure as a reason they did not act. Two acknowledged that the state would have more resources and therefore would be a better level of government to address climate change: Kimberly Hamel from the City of Mauldin, NC and Amanda Boone from New Bern, NC. The remaining 11 bureaucrats in the study who did not act on climate change did so for other reasons including not thinking climate change would be a problem for them or feeling the issue would

¹¹⁷ Mr. Holland spoke specifically about Craven County for most of the interview he gave for this project. However, on this topic he broadened his comments to more areas in coastal North Carolina.

never reach the local government's agenda (see Chapter 4, Section 2.5 for a more complete description).

As stated at the beginning of Chapter 5, we would expect to see fewer bureaucrats acting defiantly if they were worried about the state government blocking access to disaster management funding. However, more bureaucrats' actions are considered defiant from the perspective of a state principal than from the perspective of a local principal. Thus, the way bureaucrats chose to act on climate adaptation does not support hypothesis 6 which states that bureaucrats will avoid climate change if the state government is against climate change adaptation efforts.

Next, I turn to look at federal grant data to see if receiving federal grants or having the potential to receive federal grants makes a local government less likely to choose to adapt to climate change if their state government does not support climate adaptation efforts.

5. Local Government Reliance on State and Federal Grants for Disaster Management

This section evaluates hypothesis 6 by looking at which localities rely on federal grant money for disaster mitigation *and* which local governments have included climate adaptation in the hazard mitigation plans they submit to FEMA to be eligible for federal disaster funding. If local governments have received federal grant money, we would expect them to understand the importance of satisfying the state government in order to access federal dollars. Additionally, state governments must approve hazard mitigation plans before they are submitted to FEMA. Due to this, local bureaucrats might seek to avoid climate adaptation in their hazard mitigation plans to avoid drawing the ire of state governments and improve their chances of securing grant funding.

5.1 FEMA Grants and Hazard Mitigation Plans

Grants are one of the most common tools FEMA uses to encourage states and localities to prepare disaster mitigation plans. As the literature on fiscal federalism shows, the federal government's large budget (relative to state and local governments) allows it to use the promise of funding and grants to shape subordinate governments' actions (Oates, 1999). FEMA provides grants through their hazard mitigation planning programs to states and localities so they can prepare for and minimize the potential damage of natural disasters. As the federal government moved to embrace climate adaptation, they encouraged grant applicants to address climate change in their applications.

Not all local governments have received grants from FEMA for disaster preparation.

Table 13 (below) indicates the FEMA grants received since 2000.

Table 13: Grants from FEMA

State	Case	Budget Size in FY2016 (Summer 2015- Summer 2016) ^o	Number of Grants from FEMA since 2000 [†]	Total Dollar Amount in Grants from FEMA
North Carolina	Craven County	\$101,527,342	22 (Years: 2002, 2007, 2008, 2009, 2010, 2011, 2012, 2014, 2015, 2016, 2017)	\$7,461,587
	City of Elizabeth City	\$64,923,424	0	\$0
	City of Havelock	\$15,466,475	0	\$0
	City of New Bern	\$37,774,254	0	\$0
	Pasquotank County	\$41,217,450	0	\$0
Florida	City of Fort Pierce	\$35,853,263	0	\$0
	Martin County	\$370,733,628	9 (Years: 2002, 2004, 2008)	\$12,006,241
	St. Lucie County	\$472,621,450	14 (Years: 2004, 2008, 2010, 2013)	\$16,840,081

Table 13: Grants from FEMA

State	Case	Budget Size in FY2016 (Summer 2015- Summer 2016)[°]	Number of Grants from FEMA since 2000[†]	Total Dollar Amount in Grants from FEMA
Nevada	Carson City	\$118,011,039	3 (Years: 2005, 2014)	\$237,037
	City of Fernley	\$9,665,060	0	\$0
South Carolina	Greenville County	\$252,695,643	5 (Years: 2004, 2006, 2008, 2014, 2015)	\$5,622,547
	City of Mauldin	\$3,137,491	0	\$0
	City of Greer	\$20,605,900	0	\$0
	Oconee County	\$41,848,004	4 (Years: 2006, 2014, 2015 2016)	\$474,704
Washington	Grant County	\$861,478	2 (Years: 2005, 2009)	\$91,446
	Kittitas County	\$91,778,331	4 (Years: 2001, 2009 2015, 2016)	\$562,317
	City of Yakima	\$228,105,939	0	\$0
	Yakima County	\$70,142,907	5 (Years: 2006, 2009, 2011, 2016)	\$3,720,804

[°] This is the most recent fiscal year for all the cases before interviews concluded in November 2016. Budget size generally does not fluctuate year to year, except in the case of unusual circumstances like an influx of jobs from a new business moving in or a loss of property value from a significant disaster. The only cases where this is possible are Carson City, NV and Fernley, NV which were affected by the new Tesla plant outside Reno, NV.

[†]FEMA grant programs include Hazard Mitigation Grant Program, Severe Repetitive Loss (from flooding), Repetitive Flood Claims Program, Pre-Disaster Mitigation, and Flood Mitigation Assistance.

As shown in Table 13, not all local governments received hazard mitigation grants from FEMA. Nine of the 18 cases received zero grants from FEMA: The City of Elizabeth City, NC, the City of Havelock, NC, the City of New Bern, NC, Pasquotank County, NC, the City of Fort

Pierce, FL, the City of Fernley, NV, the City of Mauldin, SC, Greer, SC, and the City of Yakima, WA. In interviews with bureaucrats in these cities, several pointed to resource limitations which prevented them from even drafting grant proposals. For instance, Amanda Boone from New Bern, NC said:

“I love grants, I wish I could get grants. Grants kind of come with their own problems. First of all, it takes a lot of time to even put in an application for a grant. That is something that is very challenging for local governments to do, because they don't have extra staff just sitting around doing nothing to write up grant proposals. ... And then of course most of them require some sort of financial match and working with the financial portions of the city to make sure that even though you have that all put together the way it needs to be put together. So, grants are difficult also because many, many, many places are underfunded.”
(Interview with Amanda Boone, September 24, 2015)

Six of the nine cases that did receive FEMA grants received five or fewer grants. The remaining three cases – Craven County, NC, Martin County, FL, and St. Lucie County, FL – received many grants. Craven County received 22 grants, Martin County received nine grants, and St. Lucie County received 14 grants. Most of the grants for these counties were for purchasing property in the floodplain to turn into parks or green space¹¹⁸ *or* raising existing properties above the base flood level.¹¹⁹ St. Lucie County, FL received the highest dollar value in grants at \$16.8 million. Most of this money funded flood management through storm water management systems.¹²⁰ retrofitting public buildings to withstand high winds, and elevating structures above the floodplain.

¹¹⁸ The acquisition of property in floodplains minimizes flood risk in two ways: (1) it reduces the number of people in the path of floods, and (2) it allows water to soak into permeable ground instead of pooling on impermeable surfaces like parking lots.

¹¹⁹ This describes the expected height of a 100-year flood, expressed in terms of feet above sea level.

¹²⁰ Storm water systems in Florida were not included in original subdivision plans (Interview with Jason Bessey, March 10, 2016). Therefore, these systems need to be installed through retrofitting. This process of installing storm water drainage pipes, digging ditches, and installing pumping systems is an expensive endeavor.

As Table 13 shows, FEMA granted significant quantities of money to minimize the impact of future disasters in several cases. While local government budgets are large, these grants demonstrate how expensive disaster mitigation – not just climate adaptation specifically – is for local governments. (Local budgets for FY2016 are given as context.) This point was underscored by several bureaucrats. Commenting on the cost-benefit ratio for elevating houses, SC-Local Bureaucrat-413 from Oconee County, SC said:

“That [elevating a home] is a great concept, but when you look at cost and feasibility, so often it is more feasible and cost-effective for someone to have their house destroyed than it is for them to have it raised. So, you are making someone raise their home which costs more money than if it was to be destroyed during a disaster.” (Interview with SC-Local Bureaucrat-413, March 28, 2016)

Due to the high number of cases in which local governments received no grant money from FEMA, it is difficult to evaluate hypothesis 6 (“When state governments oppose climate change action, local bureaucrats are less likely to act for fear of losing an important source of disaster mitigation or relief funding”) solely on this data. Therefore, I also consider the potential for grant funding. This is expressed in the form of having approved hazard mitigation plans. As described above, FEMA approves hazard mitigation plans for local governments. If a locality has an approved plan, they are eligible for financial assistance in the wake of disasters and have access to specific disaster mitigation grants.

Table 14 shows the approval date of each locality’s most recent hazard mitigation plan or plan update and indicates whether the plan addresses climate adaptation. It also shows whether the locality’s action on adaptation would defy the state government’s wishes on climate change. In total, there were 12 hazard mitigation plans that included climate adaptation. This reflects in part the high risk of climate change these areas face – especially in coastal areas where they are already experiencing sea level rise. However, the high number of hazard mitigation plans that

address climate change also captures the proactive attitude of many of these communities who are working to include a new threat (or threat multiplier) that FEMA encouraged them to consider¹²¹.

The inclusion of climate change adaptation in three plans went against the expressed preferences of the state government (shown in bold in Table 14). They are Pasquotank County (the Albemarle Sound Regional plan, also covers the City of Elizabeth City), Martin County, FL, and St. Lucie County (which includes the City of Fort Pierce, FL as well). As described above, local Florida governments have high policy autonomy. Ms. Price from the Florida Division of Emergency Management emphasized that this autonomy limits the state’s ability to dictate the terms of a local government’s hazard mitigation plan.

Table 14: Hazard Mitigation Plans

State	Case	Date Hazard Mitigation Plan Approved	Does the Hazard Mitigation Plan Address Climate Adaptations?	Would the State Government Disapprove of the Inclusion (or Exclusion) of Climate Change
North Carolina	Craven County	2015 (Pamlico Sound regional plan)	No	No
	City of Elizabeth City	<i>Included in the Pasquotank County plan (Pasquotank is in the Albemarle Region plan)</i>		
	City of Havelock	<i>Included in the Craven County plan (Craven is in the Pamlico Sound plan)</i>		
	City of New Bern	<i>Included in the Craven County plan (Craven is in the Pamlico Sound plan)</i>		
	Pasquotank County	2015 (Albemarle Sound regional plan)	Yes	Yes

¹²¹ It is not possible to determine if the high number of hazard mitigation plans with climate adaptation included is reflective of a greater trend or an anomaly of the cases studied here. The author is not aware of any research that has systematically studied if local hazard mitigation plans are increasingly addressing climate change.

Table 14: Hazard Mitigation Plans

State	Case	Date Hazard Mitigation Plan Approved	Does the Hazard Mitigation Plan Address Climate Adaptations?	Would the State Government Disapprove of the Inclusion (or Exclusion) of Climate Change
Florida	City of Fort Pierce	<i>Included in the St. Lucie County plan</i>		
	Martin County	2015	Yes	Yes
	St. Lucie County	2016	Yes	Yes
Nevada	Carson City	2015	Yes	Governor ambivalent
	City of Fernley	2013 (Included in the Lyon County plan)	Yes	Governor ambivalent
South Carolina	Greenville County	2015	Yes	Governor ambivalent
	City of Mauldin	<i>Included in the Greenville County plan</i>		
	City of Greer	<i>Included in the Greenville County plan</i>		
	Oconee County	2012 (Part of the Western Piedmont plan)	No	Governor ambivalent
Washington	Grant County	2013	Yes	No
	Kittitas County	2012	Yes	No
	City of Yakima	<i>Included in the Yakima County plan</i>		
	Yakima County	2015	Yes	No

The inclusion of climate adaptation in the Albemarle Sound plan (which also covers Pasquotank County and the City of Elizabeth City) seems strange considering North Carolina localities have limited autonomy. Moreover, Mr. Holland acknowledged that the North Carolina

government would reject any plans that mentioned climate change and would ask for revisions before it sending it to FEMA for approval. Upon examination of the document, the low-lying Outer Banks communities at extremely high risk from sea level rise drove the inclusion of climate change in the document. Sea level rise and climate change are identified as hazards for the entire region, but only the low-lying Outer Banks communities mention plans to address them. It is possible that these communities saw the threat as significant enough to include climate adaptation anyway.

5.2 Are Bureaucrats' Decisions Shaped by State Government Attitudes on Climate Change?

By considering both actual grants received and the potential for grants received, ensuring access to disaster mitigation funding is important. However, the fear of potential state displeasure does not determine whether local governments address or neglect climate change adaptation. As shown in Table 15 below, three cases support hypothesis 6. The authors of the Pamlico Sound Hazard Mitigation Plan chose not to address climate change in the document (the Pamlico Sound plan includes Craven County, New Bern and Havelock, NC) because the North Carolina government does not want localities to work on climate change. However, during the interview, NC-Local Bureaucrat-823 acknowledged that there was little local political support for addressing climate change as well.

Table 15: Support for Hypothesis 6

	Case	Grants from FEMA	Hazard Mitigation Plan Approved	Includes Climate Adaptation	Supports Hypothesis 6
North Carolina	Craven County	Yes \$7,461,587	2015 Pamlico Sound regional plan	No	Yes
	City of Elizabeth City	No	2015 Albemarle Sound regional plan	Yes	No
	City of Havelock	No	2015 Pamlico Sound regional plan	No	<i>Partially – plan does not mention climate change, but does not receive grants</i>
	City of New Bern	No	2015 Pamlico Sound regional plan	No	<i>Partially – plan does not mention climate change, but does not receive grants</i>
	Pasquotank County	No	2015 Albemarle Sound regional plan	Yes	No
Florida	City of Fort Pierce	No	2015 In the St. Lucie County plan	Yes	No
	Martin County	Yes \$12,006,241	2015	Yes	No
	St. Lucie County	Yes \$16,840,081	2016	Yes	No
Nevada	Carson City	Yes \$237,037	2015	Yes	No – state government ambivalent on climate change
	City of Fernley	No	2013 Included in the Lyon County plan	Yes	No – state government ambivalent on climate change
South Carolina	Greenville County	Yes \$5,622,547	2015	Yes	No – state government ambivalent on climate change
	City of Mauldin	No	2015 Included in the Greenville County plan	Yes	No – state government ambivalent on climate change
	City of Greer	No	2015 Included in the Greenville County plan	Yes	No – state government ambivalent on climate change
	Oconee County	Yes \$474,704	2012 (Part of the Western Piedmont plan)	No	No – state government ambivalent on climate change

Table 15: Support for Hypothesis 6

	Case	Grants from FEMA	Hazard Mitigation Plan Approved	Includes Climate Adaptation	Supports Hypothesis 6
Washington	Grant County	Yes \$91,446	2013	Yes	No
	Kittitas County	Yes \$562,317	2012	Yes	No
	City of Yakima	No	2015 Included in the Yakima County plan	Yes	No
	Yakima County	Yes \$3,720,804	2015	Yes	No

Grant County, WA presents an interesting example of a local government that chose to include climate change, potentially to appease the state governments' enthusiasm for climate adaptation planning. Grant County's hazard mitigation plan includes an extensive discussion of adaptation, but the local bureaucrats and politicians interviewed for this project were not aware of it when asked about local climate change policy. This does speak to hypothesis 6 but does not provide direct support because the local government's actions fit Governor Inslee's wish to adapt to climate change. Their lack of implementation efforts demonstrates that they were not committed to the policy change because they saw climate change as a threat they needed to adapt to.

However, for the remaining 14 cases, local bureaucrats and their governments did not act in a way that indicates they wanted to conform to the state's wishes or attitudes on climate adaptation. It is more likely that local governments are picking up on the signals sent from FEMA on climate adaptation and working to make their relationship with FEMA stronger. It is also possible that state emergency managers who review local hazard mitigation plans and grant

applications to FEMA agree that climate adaptation is becoming an important part of disaster planning. The state bureaucrats might be engaging in non-confrontational behavior – approving local documents to be sent to FEMA even though the Governor or legislature may prefer not to act on climate change.

6. Conclusion

This chapter tested the hypothesis that local governments, and specifically local bureaucrats working on flood and drought management, would make strategic decisions about climate change adaptation in order to secure funding from FEMA. Funding from FEMA must pass through state governments to reach local governments, so we might expect local governments to align with state governments to secure this funding source. However, the data do not support this conclusion. Most local governments in this sample did not avoid the subject of climate change, even when their state governments had clearly expressed preferences that climate adaptation not be addressed. In only one instance did local actors consciously make the decision *not* to include climate adaptation in a document that would be reviewed by their state government because they were aware of state disapproval: that is the Pamlico Sound Regional hazard mitigation plan (which covers three cases: Craven County, NC, New Bern, NC, and Havelock, NC). Craven County received a large number of grants from FEMA in the past 10 years, suggesting that they might be more likely to avoid touchy subjects in order to maintain access to this funding. Additionally, the local consulting planner who helped craft the Pamlico Sound Regional plan acknowledged they did not address climate change out of concern for state censorship.

However, no other cases in this study expressed similar concerns about the state interfering with their disaster management planning due to the existence of climate adaptation

provisions. There are a number of factors which help explain this pattern. First, disaster management policy is generally a nonpartisan policy area (in contrast to climate change adaptation policy which is highly polarized). In part, this is because disaster management is a low-salience issue until a disaster strikes. During the periods between events, it is only technical experts (in this case bureaucrats) who are concerned with the issue (May, Koski, & Stramp, 2016). When politicians become involved, it is often to provide relief to constituents affected by the disaster. Generally, this is a politically beneficial activity, and politicians “enjoy” the ability to provide aid (Birkland & Waterman, 2008).¹²²

Second, disaster management policy is largely a technocratic exercise where policy development and implementation are dominated by bureaucrats trained in emergency management. Emergency management as a discipline relies heavily on the precautionary principle. A colloquial phrase captures the precautionary principle well: “An ounce of prevention is worth a pound of cure.” Disaster management experts often work to minimize the impacts of disasters before they happen. Similarly, many climate change policy debates are rooted in the precautionary principle (Applegate, 2010). It is no surprise that a similarly structured argument – prevent the worst impacts of climate change through pre-disaster adaptation efforts – is appealing to disaster managers.

Third, only one state government – North Carolina – had both (1) an active anti-climate adaptation agenda and (2) control over local government policy development (i.e. local governments had low levels of policy autonomy). In Florida, the state government discouraged action on climate adaptation and sea level rise adaptation, but local governments have high

¹²² I do not intend to suggest that politicians look forward to disasters or hope they happen. However, disaster management policy in the US is structured so politicians can take on a “hero” role by providing aid, going to the site of a disaster, and generally be seen providing comfort (Birkland & Waterman, 2008).

autonomy. In Nevada and South Carolina, the state government neither encouraged nor discouraged action on climate adaptation. In Washington State, the governor actively encouraged climate adaptation. Future research would benefit from the inclusion of more cases where state governments actively discouraged local action on climate adaptation *and* local governments have low policy autonomy. However, the results from this study question the notion that a combination of anti-climate adaptation signals from the state government and low local autonomy is enough to prevent local adaptation efforts. Even during the state of North Carolina's most active anti-sea level rise efforts, the Albemarle Sound's Regional hazard mitigation plan addressed climate adaptation and sea level rise. This piece of evidence lends more support to the argument that disaster management is controlled by expert bureaucrats trained in emergency management who are less worried about the political ramifications of their work and more interested in acting on their best judgment.

These findings speak to the larger point made by this dissertation: local bureaucrats exert a great deal of influence over the shape of local climate adaptation policy. While only about half of the bureaucrats acted to include climate change adaptation in local flood or drought management policy, it was the bureaucrats who acted to integrate climate adaptation in local policy. Even in the context of intergovernmental relationships, local bureaucrats are important actors. Their efforts should not be minimized.

CHAPTER 6: CONCLUSION

Throughout this dissertation, I sought to answer the question: *What role do bureaucrats play in shaping local policy, especially local climate adaptation policy?* Bureaucrats are not typically seen as policymakers, but at the local level they are uniquely situated to shape climate adaptation policy. They are knowledgeable about the needs of the community, local policymaking channels, and intergovernmental relations. Additionally, they are isolated from the partisan (electoral) consequences of taking a position on climate change, so they can be more open to addressing climate adaptation when elected leaders might shy away.

I show that not all bureaucrats took on the issue of climate adaptation – even in areas where the risk of climate change flooding or drought was high. However, half of the cases in this project did have bureaucrats working to address climate change adaptation in their communities. They were agenda setters, worked to craft new policies with and without support from politicians, used discretion to encourage community members to take climate risk seriously, and worked with other governments (local, state, and federal) and community groups to take on large climate adaptation projects.

I also sought to comment on *why* bureaucrats would be interested in stepping out of their role as implementers and take on an issue as controversial and partisan as climate change. The answer to this question is in two parts. First, local bureaucrats are not only implementers. They hold institutional knowledge which makes them invaluable advisors to elected officials, especially because elected official turnover is significantly higher in local government than bureaucratic turnover. They are accustomed to being involved in policymaking, so stepping into this role for one issue is not breaking significantly with their role in local governments. Since they are motivated to be successful at their jobs, and increasingly their work in emergency

preparedness involves climate change adaptation, bureaucrats in this study talked about responding to climate change like it was just the next step. Climate change was going to be a problem, so they needed to come up with a response.

Local bureaucrats are key players in the development of these policies, and climate policy scholars, climate policy advocates, and others need to pay attention to them. As several cases demonstrated (Martin County, FL, St. Lucie County, FL, Fort Pierce, FL, Greenville County, SC, and Pasquotank County, NC), local bureaucrats are working on climate adaptation without the active involvement – or even awareness – of elected officials. Bureaucrats are running the show in developing climate adaptation policy. They are paying attention, when few others (if any) in local government are working on this threat.

Second, bureaucrats are concerned with addressing on-the-ground problems in their communities. Bureaucrats also acted because they are members of these communities and they care about their communities. Bureaucrats in Washington State were worried about the impact a drought would have on their neighbors – the farmers in the area. Florida bureaucrats worried about how their communities would react to both the next storm and the potential wave of migrants they would absorb from places harder hit to the south.

In summary, this project shows that local governments – driven by the efforts of local bureaucrats – are beginning to address climate change adaptation. Although these efforts are constrained by limited resources and occasional hostility from superior governments, some local governments are taking climate adaptation seriously. Broadly, this demonstrates that local bureaucrats, and the governments they work for, are important players in the development of climate adaptation policy. While bureaucrats are not the only actors – and they were more

successful when they acted with the assistance or partnership of others – they are important players in the development of local policy.

1. Bureaucrats Drive Local Climate Adaptation Policy Development

As this project showed, local bureaucrats are active players in the development of local climate change adaptation policy – from setting the agenda to implementing policies. In some cases, local bureaucrats dominated the development of climate adaptation policy from start to finish. In other cases, local bureaucrats drove the process, but worked with politicians, interest groups, and other policy makers throughout.

Chapter 3 showed that local bureaucrats acted as policy agenda-setters. In nine of the 18 cases, local bureaucrats were the first actors in their respective governments to introduce climate adaptation to the agenda. In seven of the 18 cases, local bureaucrats raised the salience of the issue after it was first mentioned by others. Although bureaucrats rarely used public meetings to discuss climate adaptation, they shaped the local agenda by (1) writing policy language and crafting entire policy documents like land use plans and hazard mitigation plans with sections that addressed climate adaptation, and (2) having conversations with other bureaucrats and elected officials about the need for climate adaptation.

In addition to being agenda setters, local bureaucrats were active players in the formulation of policy.¹²³ Bureaucrats are vital players in local policy formulation for several reasons. First, bureaucrats often have more institutional knowledge in local government than elected officials. Those that have been in the same government for many years understand how local systems work, are familiar with the culture of the local government, and understand intergovernmental obligations and requirements. For instance, NC-Local Bureaucrat-823 worked

¹²³ Agenda-setting and policy formulation overlap. For instance, writing emergency management plans to address climate change adaptation both sets the agenda and formulates new policy.

in Craven County, NC's government for more than 20 years and spoke about being patient and picking your battles when dealing with new elected officials. Mr. Van Gundy worked for the Roza Irrigation District for 40 years and initiated the Yakima Integrated Plan as well as Yakima County's groundbreaking drought management strategies. Many bureaucrats do not have the impressive tenure of Mr. Van Gundy and NC-Local Bureaucrat-823, but they often outlast elected officials. As many bureaucrats pointed out, they are regularly approached by elected officials for both their specific expertise (e.g. flood management) and knowledge of systems in local government. Bureaucrats also used their expertise to encourage the citizens they served to take climate change threats seriously. As the bureaucrats from St. Lucie County, FL indicated, when citizens or developers came to them to discuss flood risk they would emphasize that flood risk is impacted by climate change as well. These (rare) informal conversations changed the expression of policy even if they did not change the written policies.

Second, local bureaucrats have area-specific expertise which elected officials, city and county managers, and other bureaucrats call upon and defer to when policies are written. This dynamic represents an important difference between local governments and state or federal governments. State and federal legislators and executives are more likely to have professional staffs that can advise them on policy and draft new policies. The elected officials themselves also have more time to study policy (National Conference of State Legislatures, 2017; Boushey & McGrath, 2017). (There are some exceptions: some states have volunteer legislators and some large cities or county governments can afford staff assistants who serve legislators. However, this is not common.) Therefore, in local governments, bureaucrats work both to craft policy language and implement it. This happened in several cases in this project. The team of bureaucrats in Martin County was asked by an elected official, Commissioner Haddox, to

research policies to address sea level rise. Commissioner Haddox did not write the policy or do his own research, he delegated it to the bureaucrats. In every case with an emergency management plan that addressed climate adaptation, local bureaucrats – not elected officials – wrote the policy. For instance, in Greenville County, SC, climate adaptation was added to the emergency management plan by bureaucrats without consulting elected officials; Ms. Gucker and Mr. Bishop felt no need to consult with them.

This project also showed that bureaucrats occasionally had informal conversations with members of the public to make climate-friendly choices. In St. Lucie County, FL, local bureaucrats encouraged property owners and developers to be aware of their climate-related flood risk. In Yakima County, the Director of the Roza Irrigation District worked with local farmers to reduce their water use to minimize the impacts of drought. However, this did not happen often. More often, bureaucrats worked on climate adaptation by including it in existing policies and plans like hazard mitigation plans.

Local bureaucrats are involved at every stage of local policy development. We fully expect them to be policy implementers and evaluators, matching what bureaucrats at the state and federal level do. However, as this project shows, they are also active agenda setters and policy implementers. Elected officials at the local level set the general direction of policy but are much more hands off – at least for climate adaptation, flood management, and drought management.

This finding demonstrates that principal-agent modeling provides a useful tool for focusing on important aspects of politician-bureaucrat relationships, but it is a limited picture of local bureaucratic influence in policymaking. Moving towards a stewardship model of bureaucratic behavior might help (e.g. Van Slyke, 2006). Stewardship models of principal-agent

behavior cast bureaucrats and their superiors as cooperative partners in the implementation of policy (i.e. they both believe in the same goal so principals do not need to use coercive measures to ensure bureaucratic buy-in). However, this approach again is not a complete picture because bureaucrats can act non-confrontationally or defiantly to change policy.

I am not arguing for moving away from principal-agent theory for the study of bureaucrats. Instead, this project demonstrates that it should be considered in addition to other theories of bureaucratic behavior including treating bureaucrats as independent policy actors with their own motivations, policy preferences, and institutional capacity to shape policy. Furthermore, when principal-agent theory is employed, we need to take Whitford's argument about multiple principals (2005) to heart and acknowledge that bureaucrats are often making choices between their bureaucratic superiors, elected officials, and the publics they serve.

2. Climate Change Adaptation Is a Low Salience Issue

Climate change adaptation policy is strongly tied to emergency management and natural disaster policy in all nine cases where it is being addressed. While this is a product of case selection (I deliberately looked at flood and drought management), climate adaptation is often framed as a way to prevent damage from new and increasingly severe natural disasters caused by climate change. The IPCC Working Group on Adaptation looks at natural disasters like droughts, floods, heat waves, fires, and severe storms (IPCC, 2012; IPCC Working Group II, 2007). Similarly, the US EPA and the National Aeronautics and Space Administration (NASA) reference natural disasters in their work on climate adaptation (NASA, 2018; EPA, 2018).

Emergency and natural disaster management are issues where salience is low until an emergency occurs (Birkland T. A., 2006). Most people, most of the time, do not think about emergency or disaster management. This includes emergency preparedness, what they would do

in the case of an emergency, or how to recover from an emergency. The bureaucrats who work on these issues think about emergency and disaster management in their day-to-day work. The bureaucrats that I spoke with noted that they are often the only people thinking about the community's flood and drought management, and they expect to be the only ones because it is their job. They would bring it up with elected officials and even members of the public (encouraging them to take their climate risks seriously), but few said they were approached by elected officials, their bureaucratic superiors, or members of the public with concerns about emergency management much less climate change adaptation. People do not usually associate natural disaster response with local governments, even though they expect local firefighters, EMTs, and police officers to respond in the case of a disaster. People tend to connect disaster response with FEMA *even though* FEMA is not involved in most natural disasters – they only step in during disasters that are large enough or severe enough to warrant a federal disaster declaration.

These two factors combine to mean that – in a local government – the only people who are consistently thinking and talking about emergency and disaster management are bureaucrats. My research supported this. When I contacted local government officials to speak about their flood and drought policies (and how those policies related to climate adaptation), I was redirected to one or two bureaucrats whose job focused on emergency management. The few people I spoke with whose work was unrelated to emergency management had little or nothing to say on the topic and pointed me to the bureaucrats who were tasked with it. Even the bureaucrats who were not pursuing climate adaptation acknowledged that climate change could make floods or droughts worse (although maybe not in their area). Several admitted that elected officials

largely ignored emergency management until a disaster occurred and indicated that as bureaucrats they would be tasked with climate adaptation in their communities.

Bureaucrats in areas that experienced repeated floods or droughts – like the droughts in the Yakima Basin (Yakima County, Kittitas County, and the City of Yakima), floods and hurricanes in coastal North Carolina, and floods and hurricanes in Florida – had an easier time raising the issue with elected officials, although they often had to justify their actions by mentioning negative economic impacts. When emergency management and economic development clashed, emergency management and related climate change adaptation lost. For example, a bureaucrat in Craven County, NC lamented that expanding the tax base often outweighed emergency management. The bureaucrat did not believe that they could pursue climate adaptation projects because they already faced an uphill battle fighting to mitigate current flood threats. In Martin County and St. Lucie County, FL, the creation of the Seven50 plan to address climate change threats in the area received significant pushback from citizens and elected officials because it was seen as limiting economic growth.

3. Consequences of Bureaucrats Driving Local Climate Adaptation Policy Development

What are the consequences of bureaucrats dominating the development of local climate adaptation policy? First, and most obviously, if local bureaucrats control the development of this policy, they are the actors that advocates should approach to influence the direction of policy. Their predilections or any biases they have are likely to show up in climate adaptation. As this project found, many local bureaucrats emphasized the need to focus on adaptation but did not want to get entangled in discussions of the causes of climate change. Additionally, local bureaucrats referenced the precautionary principle – mentioning that it was important to be prepared for increasingly severe droughts and floods rather than hoping they will not occur.

Thus, if emergency managers are more likely to embrace the precautionary principle, then climate adaptation will embody a risk averse approach.

Second, local bureaucrats are constrained and aware of their constraints, which means that local adaptation efforts are inherently limited. While they are important actors, they cannot craft effective solutions alone. One of the ways bureaucrats are restrained is through limited resources. Several bureaucrats in this study acknowledged that a lack of money, staff time, or other resources were the reasons they could not pursue climate adaptation – either at all or to a level they would like to. Calls to adapt to climate change at the local level should acknowledge these inherent limitations. Furthermore, advocates should focus on helping bureaucrats build coalitions of support to raise necessary resources and overcome other barriers.

Local bureaucrats also acknowledge limits from superior governments. State governments' and the federal government's control over resources coerces local governments to comply with state and federal priorities. One way to interpret this is to say that progress on climate adaptation will only occur under climate-friendly state and federal government administrations – i.e. liberal or Democratic administrations, especially those who prioritize climate adaptation. Another way this can be interpreted is that local governments will need to solicit support from alternative sources – like multi-stakeholder cooperative organizations (e.g. Water for the Seasons or the Yakima Integrated Plan) to secure resources they cannot get from hostile or apathetic state or federal government administrations.

Last, bureaucrat-driven policy change is not enough to completely adapt to climate change. In the communities where climate adaptation policy had developed the most, the local bureaucrats acknowledged the role of including many stakeholders and members of the community in the conversation. In the Yakima Integrated Plan, participants pointed to the

inclusion of advocacy groups and other community members as one of its strengths. In Martin County, the three bureaucrats working on a comprehensive adaptation plan stressed the need for community and politician buy-in. While bureaucratic action is a step – and in many cases it is a crucial first step – climate adaptation is a huge task requiring cooperation between governments, buy-in from stakeholders, and community participation.

4. How Do Bureaucratic Autonomy and Problem Definition Agreement Shape

Bureaucratic Action? Testing the Model

This project posited that bureaucrats' choice regarding climate adaptation could be explained by the interaction of their level of autonomy and the amount of problem definition agreement there was in the policymaking community. It suggested that high autonomy and high problem definition agreement would yield cooperative action, high autonomy and low problem definition agreement would yield defiant behavior, low autonomy and low agreement would yield non-confrontational behavior, and low autonomy and high agreement would yield politician-led action. Although the model accurately predicted how 13 bureaucrats acted (of the 16 bureaucrats who acted to address climate adaptation), the model presents an incomplete picture of bureaucratic action.

Bureaucratic autonomy does not appear to explain action as much as the model predicted. Bureaucrats who have high levels of autonomy do not necessarily use their autonomy. For example, Ms. Gucker from Greenville County, SC was an assistant county administrator who ran the community planning department and could have addressed climate adaptation through her department. However, she only included it in the hazard mitigation plan – even though she acknowledged that Greenville County would need to address climate adaptation. Similarly, NV-Local Bureaucrat-895 had low levels of bureaucratic autonomy suggesting the bureaucrat should

have followed the lead of the bureaucrat's superiors in Fernley, NV. However, the Water for the Seasons project created a cooperative framework for the elected officials and the bureaucrats to work on climate-driven drought preparedness. While this does not negate the importance of bureaucratic autonomy, autonomy is better conceived as a potential for action.

Instead, we should look at both autonomy *and* external sources of support bureaucrats can draw upon when crafting policies. When bureaucrats can draw on support from a multi-stakeholder organization, a nearby university, other governments (local, state, or federal), or a powerful community group, they are more likely to act defiantly or cooperatively. Shelley Cox acted defiantly while relying on UNC Chapel Hill students to argue for the importance of climate adaptation. All the bureaucrats who acted cooperatively had the support of multi-stakeholder organizations (Water for the Season and the Yakima Integrated Plan). However, this needs to be tested with a larger sample of communities and bureaucrats (discussed in more detail below).

5. Role of Intergovernmental Relations and Pressure from Superior Governments

Local bureaucrats are not able to tackle climate adaptation on their own. Without support from the state, local elected officials, and other local bureaucrats, the bureaucrats' ability to make significant changes is limited. In other words, local bureaucrats' efforts seem necessary but not sufficient to tackle climate adaptation.

As shown in Chapter 5, local government decisions to act on climate change adaptation are influenced, but not determined by state government preferences. In only one case – Mr. Holland in Craven County, NC – did a local bureaucrat admit he did not pursue climate adaptation because he felt the state would object. In Florida, bureaucrats in all three communities acted to integrate climate change despite the state's objections. Several bureaucrats in

Washington State indicated that state support for climate change action helped them find resources, but claimed it was not the determining factor for why they acted.

However, local governments did point to the vast resources in state governments and the federal government (FEMA) as critical for the implementation of emergency management projects in general. Several local bureaucrats mentioned that the state or federal government is better suited to act on climate change than they are because they have more resources. Support from the Washington State Department of Ecology breathes life (specifically money) into Yakima Integrated Plan projects. Many local bureaucrats in this study said that they develop and update hazard mitigation plans in order to access federal resources. These findings underline the importance of intergovernmental cooperation in the development of climate adaptation policy, especially when it comes to resources.

Finally, Chapter 5 supports the conclusion that climate adaptation policy is often dominated by bureaucrats. Local bureaucrats wrote emergency management plans and these plans were reviewed by state bureaucrats (like Jamie Leigh Price in Florida). Local bureaucrats also interacted with federal representatives in the creation of hazard mitigation plans, as was the case with Brian Bishop's conversations with FEMA, NOAA, and NWS. This could enhance climate adaptation policy development generally because bureaucrats do not face significant partisan constraints. Indeed, during interviews with local bureaucrats, none mentioned a partisan commitment as a reason for inaction. Of those who did mention their partisan affiliation,¹²⁴ they often said they were addressing climate change despite being Republican.

¹²⁴ Bureaucrats' partisan affiliations were not asked for during the interview. The interviews were focused on the development of policy and talking to the bureaucrats about their partisan identification would have derailed this conversation (especially close to the 2016 presidential election).

Additionally, if bureaucrats control climate change adaptation, it is likely we will see climate adaptation efforts build on existing emergency management efforts. This policy layering (Beland, 2009; Hacker, 2004; Thelen, 2003) can lead to the neglect of innovative solutions, unintended consequences, and concentration of influence in existing institutional structures. For example, the NFIP program was designed in part to move people out of flood-prone areas. However, the program focuses more on providing financial assistance to people who live in floodplains whose homes were damaged during floods. The main goal of reducing the number of people living in floodplains was lost (Wright, 2000). If we deal with climate change driven flooding using the same program, we might never achieve the needed goal of moving people out of flood-prone areas. Instead, we will see more of what several bureaucrats in this study lamented as a silly idea: putting houses on stilts in flood-prone areas so the homes themselves will not flood.

Downsides of integrating climate adaptation into existing policies are discussed in detail by Adelle and Russel (2013). They point out that climate adaptation policies that do not rethink existing strategies for flood management, urban development, storm preparedness, etc. will not be flexible enough to truly deal with the unpredictable nature of climate change threats.

While Adele and Russel's argument is sound, policy layering has advantages, especially in the polarized U.S. context. Layering climate adaptation onto existing policies might bypass a drawn-out political debate around the creation of new policies, thus speeding up the development of adaptation efforts. As described by McCright and Dunlap (2011), Antonio and Brulle (2011), and Leiserowitz and colleagues's (Leiserowitz, Maibach, Ropser-Renouf, & Hmielowski, 2011; Marlon, Howe, Mildenerger, & Leiserowitz, 2016) conservative strategies to stall the development of climate policy. By creating new policy "from scratch" opponents can stall policy

progress at more junctures. Defenders of the status quo have many strategies at their disposal to defend the status quo (Cobb & Ross, 1997). When policies are layered on existing policy, changes happen more subtly and incrementally, but they build into larger more significant changes (e.g. Hacker, 2004; Beland, 2009).

Bureaucrats are better positioned to engage in policy layering than introducing new policy, especially when they can capitalize on their expertise. As this project showed, most bureaucrat-driven policy change built on existing policy areas rather than crafting a new program or plan. (Only Martin County, FL sought to craft a new plan focused on climate adaptation.) Bureaucrats in this project made arguments that climate change was an important element to layer onto existing projects like hazard mitigation planning, comprehensive land use management, drought management, and flood management.

These findings bolster the argument that local governments engage in opportunistic federalism: seeking to derive the most benefits from their relationship with FEMA or state governments as possible without necessarily complying with the superior governments' policy preferences. It also demonstrates that when the federal and state governments do not act on climate change adaptation, local governments are left to patch together solutions of their own. Due to their limited resources, local adaptation efforts do not progress far beyond the policy formulation or adoption stages. The huge challenge that climate adaptation poses means that local governments cannot truly address the issue without support from other governments or organizations with more resources. While the federalism literature sometimes points to this situation (subordinate governments filling in policy gaps with superior governments do not act) as an opportunity for innovation (Berry & Berry, 2007), for climate change adaptation the lack of support from superior governments stymies local action.

6. Future Research

This project is an important first step towards understanding local bureaucrats' role in policy development beyond implementation. However, it is limited by its focus on one issue area (climate change adaptation) and a small number of cases (both in terms of communities represented and the number of bureaucrats studied). These limitations were necessary for this qualitative exploratory study. However, expanding our understanding of the role of local bureaucrats in policy development requires looking at a larger representative sample of bureaucrats and communities. The larger number of cases would allow researchers to develop models that explain what distinguishes bureaucrats who act from those who do not and identify additional factors affecting the type of action bureaucrats take (e.g. defiant behavior vs. non-confrontational behavior). Future studies should also expand to other policy areas to determine if climate change adaptation policy is unique or if this model applies to other policy areas. Potentially, we would see bureaucrat-driven policy development around many low salience problems that carry serious consequences if left unaddressed. These types of studies are natural successors to this project and will help determine the frequency of local bureaucrat-driven policy development.

This project also represents a snapshot of climate adaptation policy development. After data collection concluded, the climate-friendly Obama Administration was replaced by the climate-hostile Trump Administration, and new governors in South Carolina and North Carolina took office.¹²⁵ These changes in political administrations came with changes in attitudes towards climate change mitigation and adaptation. Additionally, the 2017 hurricane season demonstrated

¹²⁵ Governor Henry McMaster in South Carolina is more openly anti-climate action than his predecessor Nikki Haley (Petersen, 2017). Governor Roy Cooper in North Carolina is much more climate-friendly than his predecessor Pat McCrory (Bennett, 2017).

the devastating costs that may be associated with climate disasters, as Hurricane Harvey overwhelmed Houston, Texas and Hurricanes Irma and Maria devastated Puerto Rico. The massive flooding in Houston led to a national re-examination of local flood management efforts, especially when it became clear that actual flood risk was minimized by development-driven local planners in Houston (Pralle S., 2017; Boburg & Reinhard, 2017). In short, a lot has changed since data collection concluded in November 2016. Revisiting these same cases in the coming years would be a good next step. It would indicate whether and how climate adaptation policy and bureaucratic action have changed, speak to the permanency of bureaucrat-driven policy change, shed light on how changes in national attention to climate disasters affect local action, and reveal how changes in superior government policy or attitudes on climate change influence local action.

A notable finding of this study centers on the role of multi-stakeholder cooperative organizations. These organizations helped local governments tackle climate adaptation, even if the group's focus was not solely on climate adaptation. This was an unexpected finding and warrants further examination to understand exactly how these organizations help governments tackle climate adaptation. Do multi-stakeholder organizations have more resources? Which resources (time, staff expertise, money, etc.) are the most important? Do these organizations encourage cooperative behavior because they were formed to prevent future litigation battles? The participants in the Yakima Integrated Plan and the Water for the Seasons project touted the uniqueness of their endeavors. However, future research should examine the accuracy of this claim. What about the Yakima Integrated Plan and the Water for the Seasons project made them successful? Are these traits shared with other multi-stakeholder cooperative organizations like

the Southeast Florida Climate Change Compact or the Mayors Climate Change Protection Agreement? How effective are these organizations? This is a rich area for future study.

Throughout this dissertation, I focused on the political and institutional barriers to crafting climate adaptation policy. Intentionally, I have not evaluated the efficacy of adaptation strategies. However, it is an important next step will be to evaluate how effective bureaucrat-driven climate adaptation policy is. The potential loss of life, economic costs, and political and social disruption climate change will cause are so significant that we need to understand if these policies will be effective.

APPENDICES

Appendix A: Search Strings

Searches in Atlas.ti used to identify portions of the documents that are relevant for this research project. The emboldened word indicates how the phrase was automatically coded by the program. The researcher then manually evaluated all computer-identified codes to remove false positives. For instance, “business climate” does not relate to “climate change”, but both terms would be identified by computer auto-coding.

- **climate change** will be searched for using: climat|warming|greenhouse|global
- **adaptation** will be searched for using: adapt|resilien
- **severe weather** will be searched for using: sea level|extrem|storm|hurricane
- **flooding** will be searched for using: flood
- **drought** will be searched for using: drought|water short|

Many of the search terms of shortened or root words – for instance “resilien” instead of “resilient” or “resiliency”, or “climat” instead of “climate” or “climatology” – so that multiple words with the same root can be found in a single search.

For searches related to the bureaucrats of interest, their last name and key words from their position were used. Because some of the bureaucrats of interest requested that their names not be identified with this study, the list of bureaucrats will not be included in its entirety here. However, two examples are presented below which are representative of other searches.

1. **Name of Bureaucrat:** Anne Murray, **Position:** Martin County Hydrogeologist
Search: Murray|hydrogeologist
2. **Name of Bureaucrat:** Shelley Cox, **Position:** Planning Director and Floodplain Manager
Search: Cox|floodplain manager|planning director

Appendix B: Codebook for Qualitative Data Analysis

Note: common synonyms for words in the codebook will be acknowledged as that word. For instance, adapt can also be referred to as “respond” “prepare” “adjust” “acclimate.”

1. Agenda-setter

1a. Determining when climate change arrives on the local agenda

As described in Chapter 2: Methods determining when climate change adaptation arrives on the local agenda requires looking through government reports, meeting minutes, media articles, and the interviews with local government officials. These documents are compiled into a single Atlas.ti hermeneutic unit for analysis where searches for “climate change,” “flooding,” and “drought” were auto-coded by the program (see the search strings used in Appendix A).

The auto-coded sections were then analyzed manually by the researcher to remove false positives (i.e. “a flood of positive response to the school levy” instead of a physical flood of water). The researcher then determined when climate change was first introduced onto the agenda by looking for the following types of terms to indicate adaptation:

- adapt
- respond
- prepare
- adjust
- acclimate
- become accustomed

These terms needed to be in the same idea expression as terms which refer to climate change or the effects of climate change including:

- climate change
- changes climate
- global warming
- greenhouse effect
- long-term changes in the weather
- [the climate OR the regular weather is] not like how it used to be around here

As all of these documents are dated, the first chronological mention of climate change adaptation in the available data will be considered the moment when climate change was introduced onto the agenda. As

the issue attention cycle shows us (Downs, Up and down with ecology - the "issue-attention cycle", 1972) the first mention of an issue does not necessarily mean that decision-makers will pay a lot of attention. Therefore, after the first mention, the researcher identified subsequent discussions of climate change to determine when climate change adaptation had achieved low salience on the agenda. When climate change was discussed by at least two individuals on two separate occasions with a 30-day period,¹²⁶ it will be considered on the agenda with low salience. Examples of this coding include:

Local bureaucrat A introduces climate change in a discussion on Day 1. On Day 15 at a subsequent public meeting, local bureaucrat B brings up climate change adaptation again. ***Climate change is on the agenda with low salience.***

Local elected official A is quoted saying "climate change adaptation is important" on Day 1 in a local media article. Three weeks later at a local government meeting, local bureaucrat A and local bureaucrat B both mention climate change adaptation in their reports. ***Climate change is on the agenda with low salience.***

Local bureaucrat A introduces climate change adaptation in a hazard mitigation planning document on Day 1. On Day 15, local bureaucrat A discusses the hazard mitigation plan and climate change adaptation in the local government meeting. On Day 17, local bureaucrat A discusses climate change adaptation with a member of the local newspaper. ***Climate change was mentioned several times within a 30-day period, but only by one individual is advocating for the issue. It is not on the agenda with low salience.***

Local elected official A introduces climate change adaptation in a discussion on Day 1. Three months later, Local elected official A gives an interview to a newspaper and reasserts that climate change adaptation is an important issue. ***Climate change is not on the agenda with low salience because of the long time between mentions.***

Local elected official A introduces climate change adaptation in a discussion on Day 1. Three months later, Local bureaucrat A gives an interview to a newspaper and reasserts that climate change adaptation is an important issue. ***Climate change is not on the agenda with low salience because of the long time between mentions, even though two people brought up the issue.***

1b. Identifying the individual(s) who introduced the issue

The identity and position of the individual(s) who introduced climate change onto the agenda will be noted.

If the identity of the individual is kept confidential (i.e. in an interview or a media article), then the individual's position will be identified as: local citizen, local elected official, local bureaucrat, state elected official, state bureaucrat, federal elected official or federal bureaucrat.

¹²⁶ A month was chosen to allow for the variation in meeting schedules and activity levels of different jurisdictions. Jurisdictions that meet biweekly would then be discussing an issue at two back-to-back meetings in order to qualify. Any longer period might miss-measure jurisdictions that meet at a more frequent interval, like weekly meetings.

2. Status of climate change adaptation policy

This project identifies five potential stages for the status of climate change adaptation policy in any jurisdiction. Coding decisions for each are discussed below:

1. **Not on agenda:** No-one has introduced climate change adaptation onto the agenda of the local government. To qualify for this, the “agenda status” variable would be coded as “not on the agenda with low salience.” In other words, it is possible that only one person brought up the issue, or it has been brought up sporadically but not discussed by two or more individuals within a two-month timespan.
2. **No action:** climate change adaptation is on the agenda, but policy actors decided not to address climate change adaptation. Discussions addressing climate change exist, but there is either no follow up or there is an active discussion not to act.
3. **On the agenda:** climate change adaptation is being discussed by members of the local government and policymaking community.
4. **Policy formulation:** local policymakers are crafting policies to address climate adaptation, although they are not necessarily adopting any.
5. **Policy adoption:** the policy to address climate adaptation has been approved by necessary officials (elected officials but could also be discretionary policy adopted by bureaucrats). The policy is “on the books.”
6. **Implementation of an adaptation policy:** a plan is in place for adapting to climate change and the local government is creating programs or developing infrastructure to respond to climate change.

These categories are based on Anderson, Brady, and Bullock III (1978). I am not including evaluation because adaptation policy is in its infancy.

3. Bureaucratic background

3a. Training and Expertise

Bureaucratic background will be coded as either (a) general administrative or public policy background or (b) specific policy area expertise. General administrative or public policy backgrounds include individuals whose education and training are in broad areas of public administration and/or management. Those with specific policy area expertise are individuals who have specialized training in an area like engineering, land use management, hydrology, disaster management, or water management. Examples of each are provided below:

General administrative or public policy background:

- degree in political science
- degree in law
- degree in public administration

- degree in public policy
- job experience in government management

Specific policy area expertise:

- degree or training in engineering
- degree or training in land management
- degree or training in forest management
- degree or training in biology
- degree or training in conservation
- degree or training in water management
- degree or training in disaster management

Some government employees are likely to have training in multiple areas, which can include choices from each list. Any individual with training both in a specialized and a general area will be evaluated to see which area they have spent the most time or training dedicated to. If an individual has a political science degree but has spent 15 years as a water manager (including attending trainings, membership in the water managers association, etc.), they will be labeled as having more specific policy expertise. Similarly, if an individual was trained as a public engineer, but has spent the majority of their 20-year career as a city manager then they will be coded as having a general administrative background.

When used in the measure of autonomy, this is coded 0 = general training and 1 = special training. This is coded with only two options because it is intended to have a lower weight than the four types of autonomy listed in the next section

3b. Years in Current Job

The number of years an individual spent in their current job is determined by looking at her resume, public biography, or asked during interview. The number of years is recoded into one of two categories: zero to five years, or more than five years.

When used in the measure of autonomy, this is coded 0 = 0-5 years and 1 = five or more years. This is coded with only two options because it is intended to have a lower weight than the four types of autonomy listed in the next section

4. Bureaucratic autonomy

4a. Expertise-based autonomy

As described in Chapter 2: Methods, differing knowledge-bases change what type of expertise the bureaucrat is likely to have. When the principal is at the federal or state government levels, it is likely the bureaucrat will share knowledge about disaster management with their principal but the bureaucrat will have specialized knowledge about the local community. Therefore, determining when bureaucrats have expertise-based autonomy requires two steps.

First, the principal is identified and the principal's forms of expertise are identified. For instance, if the principal in question is the state emergency manager's office, then the principal is identified as having

expertise in emergency management. However, if the principal is a local elected official, then the local elected official is likely to have knowledge about local conditions. For each principal, the researcher will use written biographies, descriptions of the position, and any written documents produced by the principal¹²⁷ to determine which issues the individual (or organization) has expertise on. Their expertise can be identified as being in at least one of the following categories:

- emergency management
- FEMA policies
- state emergency management policies
- local conditions (present and past disasters)
- local politics

Second, the bureaucrat's areas of expertise are identified. Data come from interviews, written biographies, resumes, reports written by the bureaucrat, and meeting minutes where bureaucrats provide information to the community and elected officials. Similarly, bureaucratic expertise can be identified as being in one or more of the following categories:

- emergency management
- FEMA policies
- state emergency management policies
- local conditions (present and past disasters)
- local politics

For principals and bureaucrats, Atlas.ti will be used to facilitate qualitative content analysis to determine forms of expertise. First, the researcher uses Atlas.ti to search for the name of the principal (i.e. Jane Smith) and for the name of their position (i.e. Director of Flood Management) in documents for each case. This auto-coding step allows the researcher to identify documents and sections of documents where the individual spoke or wrote. Those sections will then be manually coded by the researcher to identify what types of expertise were displayed.

Phrases and words to indicate expertise in each area are listed below:

- *emergency management:*
 - discussing emergency preparedness, response, or mitigation programs;
 - discussing the emergency management policy cycle
 - discussing specific emergency situations (i.e. natural disasters, man-made disasters) including flood management and drought management
- *FEMA policies:*
 - discussing details of programs like the Hazard Mitigation Grant Program, the National Flood Insurance Program, Community Rating System;

¹²⁷ For instance, if a state emergency manager is the principal, a guidebook written by the state emergency manager helps identify the forms of expertise that individual has.

- discussing FEMA’s operating procedures (vis-à-vis the local community’s experience with FEMA or how FEMA policies apply to local governments)
- *state emergency management policies:*
 - discussing details of state-level emergency management policies (will vary by state context)
 - discussing details of state emergency management operating procedures (vis-à-vis the local community’s experience with the agency)

In all areas, expertise can be shown by providing detail about management strategies, the implementation of existing policies, and debates or discussions about management and implementation strategies.

For expertise concerning the local community’s present or past disasters and political situation, the following phrases and words would indicate expertise. However, lack of discussion of the local community will also be taken as a lack of expertise. For example, if FEMA does not produce documents about how Onondaga County, New York deals with natural disasters, they will be assumed to lack that form of expertise.

- *local conditions (present and past disasters):*
 - discussions about specific events (natural disasters) that have hit the community
 - discussions about recovery efforts following disaster events
- *local politics:*
 - working in local government
 - attending public meetings
 - discussing political differences or political debates occurring in the local community

The measure of expertise-based autonomy is built by comparing the principal’s expertise to the bureaucrat’s expertise; more areas where the bureaucrat has expertise that the principal does not indicate more bureaucratic expertise-based autonomy.

Values were assigned in this way:

- 1 = complete overlap in expertise
- 2 = three or four (but not all five) areas of overlap
- 3 = two areas of overlap
- 4 = one area of overlap
- 5 = no overlap

4b. Structural independence

Structural independence will be determined by looking at organizational charts and budgets. Organizational charts show if the local bureaucrat runs their own department or program, and therefore is expected to make decisions separate from their superiors. However, this form of organizational independence is limited to local principals’ relationship to bureaucrats. Therefore, fiscal independence

from state and federal governments is also considered. If the local bureaucrat's department and/or programs are reliant on grants from the state or federal government, they have less structural independence.

Values were assigned in this way:

- 1 = low
- 3 = medium
- 5 = high

4c. Hiring and firing power

For all cases, only local principals will have hiring and firing power. Therefore, when the local government is the principal, bureaucrats have less autonomy. When the state or federal government is the principal, bureaucrats have more autonomy.

Values were assigned in this way:

- 1 = council/board of commissioners AND manager
- 3 = only council/board of commissioners
- 5 = no hiring and firing power

4d. Opportunities for exercising discretion

Determining the opportunities that local bureaucrats have to exercise discretion in their work is measured by looking at the programs and policies they administer. In areas where they are in charge of writing planning documents or dealing with citizens (on a case-by-case basis), bureaucrats will be coded as having more opportunities for discretion. For instance, if Bureaucrat A is in charge of approving building plans to make sure they are compliant with the flood insurance policy, they have the opportunity to use discretion for each construction plan they approve. Conversely, if Bureaucrat B does not approve plans, rather her job is primarily to write grants for the department, than Bureaucrat A will have more opportunities for exercising discretion than Bureaucrat B. Bureaucrats will be coded as having a few, a moderate number, or many opportunities for exercising discretion. Indicators for each level are described below:

- *A few:*
 - bureaucrat does not work on cases
 - bureaucrat's main responsibilities do not require engagement with the public generally or individual stakeholders; mainly works with other governments
- *A moderate number:*
 - bureaucrat works on some cases
 - bureaucrat's main responsibilities are a mix of engaging with the public and working within government

- *Many*:
 - bureaucrat’s main responsibility is to work on cases
 - bureaucrat works with members of the public or stakeholders often

Values were assigned in this way:

- 1 = a few areas
- 3 = a moderate number
- 5 = many

5. Problem definition agreement

To capture the elements of problem definition agreement described in Chapter 2: Methods, the following measures is captured for each individual bureaucrat and their superiors. Then, a combined measure of agreement is built by comparing the individual measures to determining how much agreement there is.

Omitted elements (i.e. the bureaucrat did not mention her opinion about scale or geographic proximity), it will be coded as “missing data”. When constructing the combined measure of agreement, these values will not be considered either “agreement” or “disagreement” because assuming a measure for either would be mis-measuring attitudes. Instead, these elements with missing data will be considered on a case-by-case basis but weighted less than data where there are solid responses.

5a. Individual attitudes on need for climate change adaptation

1. Climate change is the cause or need for changing local flood and/or drought management policy.

- we need to prepare for climate change in our [flood or drought] policy
- climate change will make [floods or droughts] worse
- the future is changing, we need to respond in our [flood or drought] policy
- we will consider how climate change will affect [flood or drought]

2. The local government is the right scale for adapting to climate change instead of another scale, like the state or federal government.

Local Government is the Right Scale	Another Scale is More Appropriate
Climate change is something we will have to deal with or address	We cannot deal with climate change
We can tackle the challenges of climate change here	Climate change adaptation should be done by the states [federal government] [Name of state or federal government agency] will or is already dealing with climate change adaptation

3. *Climate change will be an issue for the local government; in other words there is geographic proximity.*

Geographically Close	Geographically Far Away
Climate change is happening here	Climate change won't happen here
We are dealing with climate change already around here	Climate change isn't an issue here
[Naming areas in jurisdiction] are already experiencing the effects of climate change	

4. *Climate change will be an issue for the local government soon; in other words there is temporal proximity.*

Temporally Close	Temporally Far Away
We are already experiencing climate change	Climate change will not hit us for a long time
Climate change is a concern now	Climate change and its effects is something we will see in the future
We are worried about the effects of climate change coming soon	

5. *The problem is severe. Flooding or drought will be a problem for the local community.*

Climate change's effects are severe	Climate change's effects are <u>not</u> severe
Climate change will be a big problem	[discuss positive outcomes of climate change]
[List many effects of climate change]	We are not too worried about problems from climate change
[Discuss high cost of climate change]	

5b. Combined measure of agreement

The combined measure of agreement is determined by comparing the problem definitions for the bureaucrat of interest with her superior(s). The more elements of agreement, the higher the combined measure of agreement is.

6. Bureaucratic action

As described in Chapter 2: Methods, determining which category of bureaucratic action the bureaucrat fits into relies on three questions. Coding determinations for each of the three questions are below:

1. *Did the bureaucrat work with her superior(s)?*

Yes	No
I worked with [city manager, elected official, anyone above bureaucrat in organizational chart]	I worked alone
	I did this myself
	I worked with [equals/coworkers]
	I worked with [subordinates]

2. *Did the bureaucrat introduce the idea of climate action?*

Uses variable for agenda setter to answer.

3. *Did the superior say not to act to address climate change?*

Uses variable for problem definition agreement, focus on superior(s)'s position(s).

Appendix C: Interview Solicitation Forms and Scripts

Interview Recruitment Scripts

Telephone:

Hello [NAME], my name is Bridget Fahey¹²⁸ and I am studying for my PhD in political science. My dissertation research project is studying local government [FLOOD or DROUGHT – whichever is appropriate] policy development in the face of new challenges. I found your name [WEBSITE, OTHER INDIVIDUAL, MEDIA REPORT, etc.] and I think you could give me some really good information about [LOCALITY NAME]'s efforts at [FLOOD/DROUGHT] management.

Would you be willing to participate in an interview – either in person or over the telephone – with me? It should only last 45 minutes to an hour at most. You have the option to make your statements confidential if you wish, which means I will not use your name in any reports from this research.

[IF LEAVING A MESSAGE, SKIP TO CONTACT INFORMATION AT END]

[IF INITIAL POSITIVE RESPONSE]: I can provide more information about the purpose of the research as well as how your interview responses will be managed. I can offer you confidentiality if you so desire. I have this information in an electronic document that I can email you, could you give me an email address?

[IF YES, AND GIVES EMAIL] Thank you. To confirm, your email is [REPEAT EMAIL TO THEM]. I will be sending you more information within the hour. Please look it over and then we can set up an interview time and location. The location and mode of the interview is up to you. If you wish to speak face-to-face, and it would be great to meet you in person, I can travel to you area during [STATE DATES OF POTENTIAL TRAVEL].

[IF NO EMAIL]: That's ok, I can also answer any of your questions about the project now.

[IF INITIAL NEGATIVE RESPONSE]: Ok, thank you. If you change your mind and would like to participate in an interview, please feel free to get in touch with me at any time.

[AT END OF CONVERSATION] You can contact me for more information by emailing me at bkfahey@syr.edu or calling at 720-884-6363.

¹²⁸ During the data collection phase of this research, the researcher used the last name of Fahey. Between ending data collection and completing the dissertation, the researcher changed her last name to Kelley. All documents reflect the researcher's maiden name.

Email:

Dear [NAME],

I'm Bridget Fahey, a doctoral candidate studying Political Science at the Maxwell School at Syracuse University. For my dissertation research project, I am studying local government [FLOOD or DROUGHT] management policy. Specifically, I'm interested in how these policies develop in the face of new challenges.

I found your name [WEBSITE, OTHER INDIVIDUAL, MEDIA REPORT, etc.] and I am interested in speaking with you about your important role in [FLOOD or DROUGHT] management in [LOCALITY]. I know that your on-the-ground experiences and work in this important policy area will provide valuable insight for my research. Would you be willing to participate in an interview – either in person or over the telephone – to speak about your role in [FLOOD or DROUGHT] management as well as where you see the policy area changing in the future? The interview would only take 45 minutes to an hour maximum.

I have attached a brief description of my project, a copy of the consent form I am using for interview participants, and a few sample questions for you to look over at your convenience. I am also completely willing to answer questions about the nature of the study and how any information you provide will be used for my research (contact information in signature). If you wish, I can provide confidentiality in any reports, papers, or other written projects that emerge from this research (your name will not be identified).

I look forward to hearing from you. Please feel free to email bkfahey@syr.edu or call 720-884-6363 for more information. You can also get in touch with the Syracuse Office of Research Integrity and Protections at 315-443-3013 with questions about the research process.

Sincerely,
Bridget K. Fahey

Email: bkfahey@syr.edu | Phone: 720-884-6363

[Not for email, for IRB information **NOTE: Time, date and location of interview will be determined if they respond to the initial email inquiry. It is not solicited here because a brief and direct email about their participation increases the chances of hearing back from potential interview participants. Longer emails might get pushed aside and forgotten.]

Project Description:

This project seeks to uncover and understand how elected politicians and public administrators act when governments face new problems which fundamentally challenge an existing policy area. This project looks specifically at flood management and drought management. It hypothesizes that how these actors behave and their relationships shapes changes to the existing policy areas.

Drawing on the policy development and bureaucratic politics literatures, this study proposes that four categories of bureaucratic action are possible: (1) defiant bureaucratic behavior where autonomous bureaucrats take action without support from politicians, (2) cooperative action where autonomous bureaucrats and politicians accept the same problem definition and act together to make policy, (3) politician-led action where politicians create policies and bureaucrats lack the autonomy to influence the outcomes, and (4) non-confrontational behavior where bureaucrats disagree with politicians but do not have the autonomy to openly defy them and instead they work under-the-radar. Essentially, this project juxtaposes (a) problem definition agreement (Rochefort & Cobb, 1994) concerning the importance of integrating new information into existing policies and (b) level of autonomy public administrators have from politicians (Rourke, 1979; Waterman & Rouse, 1999; Carpenter, 2001; Walters, 2013). While this project recognizes the importance of other variables like government capacity to change policy and the role of non-governmental actors, the main goal is to understand how bureaucrats and politicians relate to one another, even if their interests differ.

In order to understand these relationships, this study has identified local communities in six sites across the U.S. where the researcher will conduct in-depth case studies. For these case studies, the researcher will speak with important players in the policy community including elected officials, public administrators, community activists, and experts to understand the local policy and how these players see it changing due to new pressures. Additionally, the researcher will collect government reports, meeting minutes, memos, and media reports where available to paint a complete portrait of these local policy issues.

The goal of this research is to contribute to theoretical debates in political science as well as collect important information about the people working on the front-lines of these issues. Floods and droughts can be incredibly damaging disasters and our understanding of local actions to protect communities is woefully incomplete.

This project is a requirement for Bridget K. Fahey to complete her PhD. Therefore, the immediate material goal is to collect data for a dissertation.

Appendix D: Case Similarities and Differences

Below are tables showing similarities and differences between the cases for variables like geographic location, climate risk, government structure, budget size, strength of economy, etc. Cases are presented alphabetically by state for each table. Similarities are shown using color coding when possible.

Table D1: State and Climate Risk

Case	State	Climate Hazard ¹²⁹
City of Fort Pierce	Florida	Flooding - Sea Level Rise; Drought - Lack of Precipitation
Martin County	Florida	Flooding - Sea Level Rise; Drought - Lack of Precipitation
St. Lucie County	Florida	Flooding - Sea Level Rise; Drought - Lack of Precipitation
Carson City and County	Nevada	Drought - Lack of Precipitation
City of Fernley	Nevada	Drought - Lack of Precipitation
City of Elizabeth City	North Carolina	Flooding - Sea Level Rise and Increased Precipitation
City of Havelock	North Carolina	Flooding - Sea Level Rise and Increased Precipitation
City of New Bern	North Carolina	Flooding - Sea Level Rise and Increased Precipitation
Craven County	North Carolina	Flooding - Sea Level Rise and Increased Precipitation
Pasquotank County	North Carolina	Flooding - Sea Level Rise and Increased Precipitation
City of Greer	South Carolina	Flooding - Increased Precipitation
City of Mauldin	South Carolina	Flooding - Increased Precipitation
Greenville County	South Carolina	Flooding - Increased Precipitation
Oconee County	South Carolina	Flooding - Increased Precipitation
City of Yakima	Washington	Drought - Lack of Precipitation
Grant County	Washington	Drought - Lack of Precipitation
Kittitas County	Washington	Drought - Lack of Precipitation
Yakima County	Washington	Drought - Lack of Precipitation

¹²⁹ Hazards identified through GIS Analysis of NCAR and USGS data (see Chapter 2, Section 1).

Table D2: Government Structure and Department in Control of Climate-Related Hazard

Case	State	Government Structure ¹³⁰	Department(s) in Control of Flooding OR Drought ¹³¹		
City of Fort Pierce	Florida	Commissioner-Manager	Building Department		
Martin County	Florida	Commissioner-Manager	Engineering	Utilities	Emergency Management
St. Lucie County	Florida	Commissioner-Manager	Building Department	Public Works	
Carson City and County	Nevada	Council-Manager	Public Works Department		
City of Fernley	Nevada	Council-Manager	Public Works Department		
City of Elizabeth City	North Carolina	Council-Manager	Building Department		
City of Havelock	North Carolina	Commissioner-Manager	Building Department	Public Services	
City of New Bern	North Carolina	Aldermen-Manager	Building Department	Public Works	
Craven County	North Carolina	Commissioner-Manager	Emergency Management	Planning Department	
Pasquotank County	North Carolina	Commissioner-Manager	Building Department	Engineering	
City of Greer	South Carolina	Council-Administrator	Engineering	Planning and Zoning Department	
City of Mauldin	South Carolina	Council-Administrator	Business and Development Services		
Greenville County	South Carolina	Council-Administrator	Public Works Department	Community Planning	Engineering
Oconee County	South Carolina	Council-Administrator	Emergency Management		
City of Yakima	Washington	Council-Manager	Utilities Services Division		
Grant County	Washington	3 Commissioners (elected managers)	none - local irrigation districts manage water and drought		
Kittitas County	Washington	3 Commissioners (elected managers)	Public Works Department		
Yakima County	Washington	3 Commissioners (elected managers)	Water Resources Division (in the Public Services Department)	Emergency Management	

¹³⁰ Data from local government websites. All variations on Manager or Administrator are considered the same for the purposes of this project

¹³¹ Data from local government websites, interviews, and email correspondence with the local governments.

Table D3: Vote Share for Democratic Presidential Candidates (Partisanship)

Case	State	Vote for Obama 2008	Vote for Obama 2012	Vote for Clinton 2016
City of Fort Pierce <i>(Data for St. Lucie County)</i>	Florida	55.70%	53.50%	47.50%
Martin County	Florida	42.80%	38.20%	35.20%
St. Lucie County	Florida	55.70%	53.50%	47.50%
Carson City and County	Nevada	49.10%	44.10%	38.40%
City of Fernley <i>(Data for Lyon County)</i>	Nevada	39.80%	34.40%	25.90%
City of Elizabeth City <i>(Data for Pasquotank County)</i>	North Carolina	56.60%	57.50%	49.80%
City of Havelock <i>(Data for Craven County)</i>	North Carolina	42.60%	40.70%	37.80%
City of New Bern <i>(Data for Craven County)</i>	North Carolina	42.60%	40.70%	37.80%
Craven County	North Carolina	42.60%	40.70%	37.80%
Pasquotank County	North Carolina	56.60%	57.50%	49.80%
City of Greer <i>(Data for Greenville County)</i>	South Carolina	37.20%	35.20%	34.70%
City of Mauldin <i>(Data for Greenville County)</i>	South Carolina	37.20%	35.20%	34.70%
Greenville County	South Carolina	37.20%	35.20%	34.70%
Oconee County	South Carolina	30.40%	27.90%	23.80%
City of Yakima <i>(Data for Yakima County)</i>	Washington	43.50%	42.00%	39.40%
Grant County	Washington	35.00%	32.40%	27.50%
Kittitas County	Washington	44.90%	42.60%	39.20%
Yakima County	Washington	43.50%	42.00%	39.40%

Data from the New York Times Presidential Elections Results Maps 2008, 2012, and 2016

Table D4: Attitudes on Climate Change from the Yale Climate Change Communication Project (2014)

Case	State	Global Warming is Happening	Global Warming is Mostly Caused by Human Activities	Worried About Global Warming	Global Warming is Already Harming the US Now or Within 10 Years	Global Warming Will Harm Them Personally	Global Warming Will Harm People in the US
City of Fort Pierce <i>(Data for St. Lucie County)</i>	Florida	62%	44%	51%	41%	34%	50%
Martin County	Florida	62%	45%	50%	40%	33%	49%
St. Lucie County	Florida	62%	44%	51%	41%	34%	50%
Carson City and County	Nevada	64%	51%	52%	41%	34%	51%
City of Fernley <i>(Data for Lyon County)</i>	Nevada	56%	41%	46%	37%	30%	47%
City of Elizabeth City <i>(Data for Pasquotank County)</i>	North Carolina	62%	45%	50%	43%	35%	50%
City of Havelock <i>(Data for Craven County)</i>	North Carolina	62%	45%	50%	41%	33%	49%
City of New Bern <i>(Data for Craven County)</i>	North Carolina	62%	45%	50%	41%	33%	49%
Craven County	North Carolina	62%	45%	50%	41%	33%	49%
Pasquotank County	North Carolina	62%	45%	50%	43%	35%	50%
City of Greer <i>(Data for Greenville County)</i>	South Carolina	59%	44%	48%	41%	32%	48%
City of Mauldin <i>(Data for Greenville County)</i>	South Carolina	59%	44%	48%	41%	32%	48%
Greenville County	South Carolina	59%	44%	48%	41%	32%	48%
Oconee County	South Carolina	58%	45%	47%	39%	31%	47%
City of Yakima <i>(Data for Yakima County)</i>	Washington	62%	49%	54%	42%	36%	52%
Grant County	Washington	62%	46%	53%	41%	35%	51%
Kittitas County	Washington	67%	52%	58%	45%	36%	54%
Yakima County	Washington	62%	49%	54%	42%	36%	52%

Data from the Yale Climate Change Communication Project, 2014 Survey (Howe, Mildenerger, Marlon, & Leiserowitz, 2015)

Table D5: Demographics: Population Size, Age, and Educational Attainment

Case	State	Population, Census, April 1, 2010	Households, 2011-2015	Persons under 5 years, percent, April 1, 2010	Persons under 18 years, percent, April 1, 2010	Persons 65 years and over, percent, April 1, 2010	High school graduate or higher, percent of persons age 25 years+, 2011- 2015
City of Fort Pierce	Florida	41,590	16,522	8.2	25.9	15.2	76.1
Martin County	Florida	146,318	61,952	4.2	17.6	27.3	89.8
St. Lucie County	Florida	277,789	107,898	5.9	22.3	19.9	85.4
Carson City and County	Nevada	55,274	21,594	5.8	21.4	16.5	86.8
City of Fernley	Nevada	19,368	6,875	8.0	27.7	11.8	88.0
City of Elizabeth City	North Carolina	18,683	6,602	7.5	22.4	13.9	80.5
City of Havelock	North Carolina	20,735	6,454	11.4	27.0	4.2	94.9
City of New Bern	North Carolina	29,524	12,746	7.5	22.8	17.9	83.8
Craven County	North Carolina	103,505	40,131	7.4	23.4	15.3	87.3
Pasquotank County	North Carolina	40,661	14,448	6.6	22.6	13.6	83.8
City of Greer	South Carolina	25,515	10,339	8.5	26.6	10.9	84.5
City of Mauldin	South Carolina	22,889	9,363	6.8	24.5	11.8	93.3
Greenville County	South Carolina	451,225	179,862	6.9	24.2	12.8	86.7
Oconee County	South Carolina	74,273	30,556	5.6	21.1	19.0	83.2
City of Yakima	Washington	91,067	33,081	8.6	28.3	13.1	73.3
Grant County	Washington	89,120	30,358	9.1	30.5	11.8	75.5
Kittitas County	Washington	40,915	16,953	5.0	18.3	12.7	90.8
Yakima County	Washington	243,231	79,972	8.8	30.4	11.6	71.9

Data from the U.S. Census Bureau: Quick Facts

Table D6: Demographics: Housing Statistics

Case	State	Housing units, April 1, 2010	Owner-occupied housing unit rate, 2011-2015	Median value of owner- occupied housing units, 2011-2015	Persons per household, 2011- 2015
City of Fort Pierce	Florida	21,357	44.6	85,900	2.58
Martin County	Florida	78,131	75.5	200,200	2.39
St. Lucie County	Florida	137,029	72.8	125,600	2.64
Carson City and County	Nevada	23,534	56.1	186,000	2.43
City of Fernley	Nevada	7,975	65.8	136,800	2.79
City of Elizabeth City	North Carolina	8,167	43.1	125,300	2.49
City of Havelock	North Carolina	6,810	39.8	142,000	2.85
City of New Bern	North Carolina	14,471	50.3	147,700	2.34
Craven County	North Carolina	45,002	62.6	154,500	2.51
Pasquotank County	North Carolina	16,833	62.5	158,800	2.61
City of Greer	South Carolina	11,127	53	143,800	2.62
City of Mauldin	South Carolina	9,929	67	153,600	2.60
Greenville County	South Carolina	195,462	66	156,200	2.58
Oconee County	South Carolina	38,763	74.1	147,000	2.43
City of Yakima	Washington	34,829	53.9	156,700	2.74
Grant County	Washington	35,083	60.5	157,500	3.00
Kittitas County	Washington	21,900	57.6	242,900	2.34
Yakima County	Washington	85,474	62.5	158,200	3.05

Table D7: Demographics: Income and Employment

Case	State	In civilian labor force, total, percent of population age 16 years+, 2011-2015	Median household income (in 2015 dollars), 2011-2015	Per capita income in past 12 months (in 2015 dollars), 2011-2015	Persons in poverty, percent
City of Fort Pierce	Florida	52.5	43,459	23,657	16.4
Martin County	Florida	52.4	51,593	34,742	11.2
St. Lucie County	Florida	54.7	25,635	17,027	36.6
Carson City and County	Nevada	59.7	47,668	26,127	16.4
City of Fernley	Nevada	59.7	52,001	23,189	11.1
City of Elizabeth City	North Carolina	56.7	30,803	16,783	29.8
City of Havelock	North Carolina	47.3	47,208	20,322	13.6
City of New Bern	North Carolina	59.9	41,148	23,511	19.9
Craven County	North Carolina	55.2	47,985	24,553	15
Pasquotank County	North Carolina	59.1	45,378	22,187	19.1
City of Greer	South Carolina	68.6	44,455	24,360	18.9
City of Mauldin	South Carolina	68	59,960	28,161	6.5
Greenville County	South Carolina	63.4	50,540	27,200	13.8
Oconee County	South Carolina	52.4	41,237	24,666	18
City of Yakima	Washington	61.6	40,726	20,187	23
Grant County	Washington	63.5	48,714	20,251	16.1
Kittitas County	Washington	60.6	46,458	24,014	20
Yakima County	Washington	61.6	44,749	19,793	19.1

Data from the U.S. Census Bureau: Quick Facts

Table D8: FEMA Declared Disasters

Case	State	Total FEMA Declared Disasters Since 1953	Total FEMA Declared Disasters since 2000
City of Fort Pierce <i>(Data for St. Lucie County)</i>	Florida	25	11
Martin County	Florida	28	13
St. Lucie County	Florida	25	11
Carson City and County	Nevada	11	9
City of Fernley <i>(Data for Lyon County)</i>	Nevada	9	6
City of Elizabeth City <i>(Data for Pasquotank County)</i>	North Carolina	13	6
City of Havelock <i>(Data for Craven County)</i>	North Carolina	20	8
City of New Bern <i>(Data for Craven County)</i>	North Carolina	20	8
Craven County	North Carolina	20	8
Pasquotank County	North Carolina	13	6
City of Greer <i>(Data for Greenville County)</i>	South Carolina	9	7
City of Mauldin <i>(Data for Greenville County)</i>	South Carolina	9	7
Greenville County	South Carolina	9	7
Oconee County	South Carolina	8	7
City of Yakima <i>(Data for Yakima County)</i>	Washington	23	12
Grant County	Washington	6	3
Kittitas County	Washington	22	13
Yakima County	Washington	23	12

Data from the FEMA Disaster Declaration Database for States and Counties

Table D9: Estimated Costs of Climate Change by County

Case	State	Mortality (deaths per 100,000 people)	Total Damages (percent of county income)
City of Fort Pierce <i>(Data for St. Lucie County)</i>	Florida	42.56	14.44
Martin County	Florida	57.02	8.84
St. Lucie County	Florida	42.56	14.44
Carson City and County	Nevada	-7.78	0.15
City of Fernley <i>(Data for Lyon County)</i>	Nevada	-3.76	0.18
City of Elizabeth City <i>(Data for Pasquotank County)</i>	North Carolina	17.48	6.22
City of Havelock <i>(Data for Craven County)</i>	North Carolina	17.73	5.71
City of New Bern <i>(Data for Craven County)</i>	North Carolina	17.73	5.71
Craven County	North Carolina	17.73	5.71
Pasquotank County	North Carolina	17.48	6.22
City of Greer <i>(Data for Greenville County)</i>	South Carolina	18.49	5.92
City of Mauldin <i>(Data for Greenville County)</i>	South Carolina	18.49	5.92
Greenville County	South Carolina	18.49	5.92
Oconee County	South Carolina	16.05	6.02
City of Yakima <i>(Data for Yakima County)</i>	Washington	-5.81	-0.34
Grant County	Washington	-1.07	0.77
Kittitas County	Washington	-7.22	-0.30
Yakima County	Washington	-5.81	-0.34

Data from Hsaing et al (2017).

Appendix E: Problem Definition Agreement and Autonomy Measures

Table E1: Problem Definition

Locality	Bureaucrat	Overall Agreement (Scale from 0 to 10; 10 is full agreement)	Climate Change is Cause for Changing Policy	Local Level Appropriate Level of Government	Geographically Proximate	Temporally Proximate	Problem is Severe
Pasquotank County, NC	Shelley Cox , Planning Director	3	Disagree - bureaucrat thinks happening, elected leaders do not	No - agree	Yes - agree	Disagree - bureaucrat thinks happening, elected leaders do not	Disagree - bureaucrat thinks happening, elected leaders do not
City of Fort Pierce, FL	Marc Meyers , Director of the Building Department	4	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat
	FL-Local Bureaucrat-762 , Lower level bureaucrat	4	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat
Martin County, FL	Anne Murray , Hydrogeologist	10	Yes - agree	Yes - agree	Yes - agree	Yes - agree	Yes - agree
	Kathy Fitzpatrick , Coastal Engineer	7	Yes - agree	Yes - agree	Yes - agree	Yes - agree	Disagree – bureaucrat doesn’t think it is severe, elected leaders do
	Don Donaldson , Director of Engineering	8	Yes - agree	Yes - agree	Yes - agree	Disagree – bureaucrat doesn’t think it is happening yet, elected leaders do	Yes - agree

Locality	Bureaucrat	Overall Agreement (Scale from 0 to 10; 10 is full agreement)	Climate Change is Cause for Changing Policy	Local Level Appropriate Level of Government	Geographically Proximate	Temporally Proximate	Problem is Severe
St. Lucie County, FL	Jason Bessey , Stormwater Program Coordinator	4	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat
	Mark Satterlee , Deputy County Administrator	4	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	No - opinion only from bureaucrat	No - opinion only from bureaucrat	Yes - opinion only from bureaucrat
City of Fernley, NV	NV-Local Bureaucrat-282 , City Department Head	7	Yes – agree	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	No opinion from bureaucrats or elected officials	Yes - opinion only from bureaucrat
	NV-Local Bureaucrat-895 , Lower level bureaucrat	7	Yes – agree	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	No opinion from bureaucrats or elected officials	Yes - opinion only from bureaucrat
Greenville County, SC	Paula Gucker , Assistant County Administrator for Community Planning	4	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	No - opinion only from bureaucrat	Yes - opinion only from bureaucrat
	Brian Bishop , Floodplain Manager	4	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	No - opinion only from bureaucrat	Yes - opinion only from bureaucrat
Kittitas County, WA	Mark Cook , Public Works Director	10	Yes – agree	Yes – agree	Yes – agree	Yes – agree	Yes – agree
City of Yakima, WA	David Brown , Water and Irrigation Manager	7	Yes – agree	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat	Yes - opinion only from bureaucrat

Locality	Bureaucrat	Overall Agreement (Scale from 0 to 10; 10 is full agreement)	Climate Change is Cause for Changing Policy	Local Level Appropriate Level of Government	Geographically Proximate	Temporally Proximate	Problem is Severe
Yakima County, WA	Joel Freudenthal , Senior Natural Resource Specialist	10	Yes – agree	Yes – agree	Yes – agree	Yes – agree	Yes – agree
	Scott Revell , Director of the Roza Irrigation District	10	Yes – agree	Yes – agree	Yes – agree	Yes – agree	Yes – agree

Table E2: Bureaucratic Independence (Autonomy)

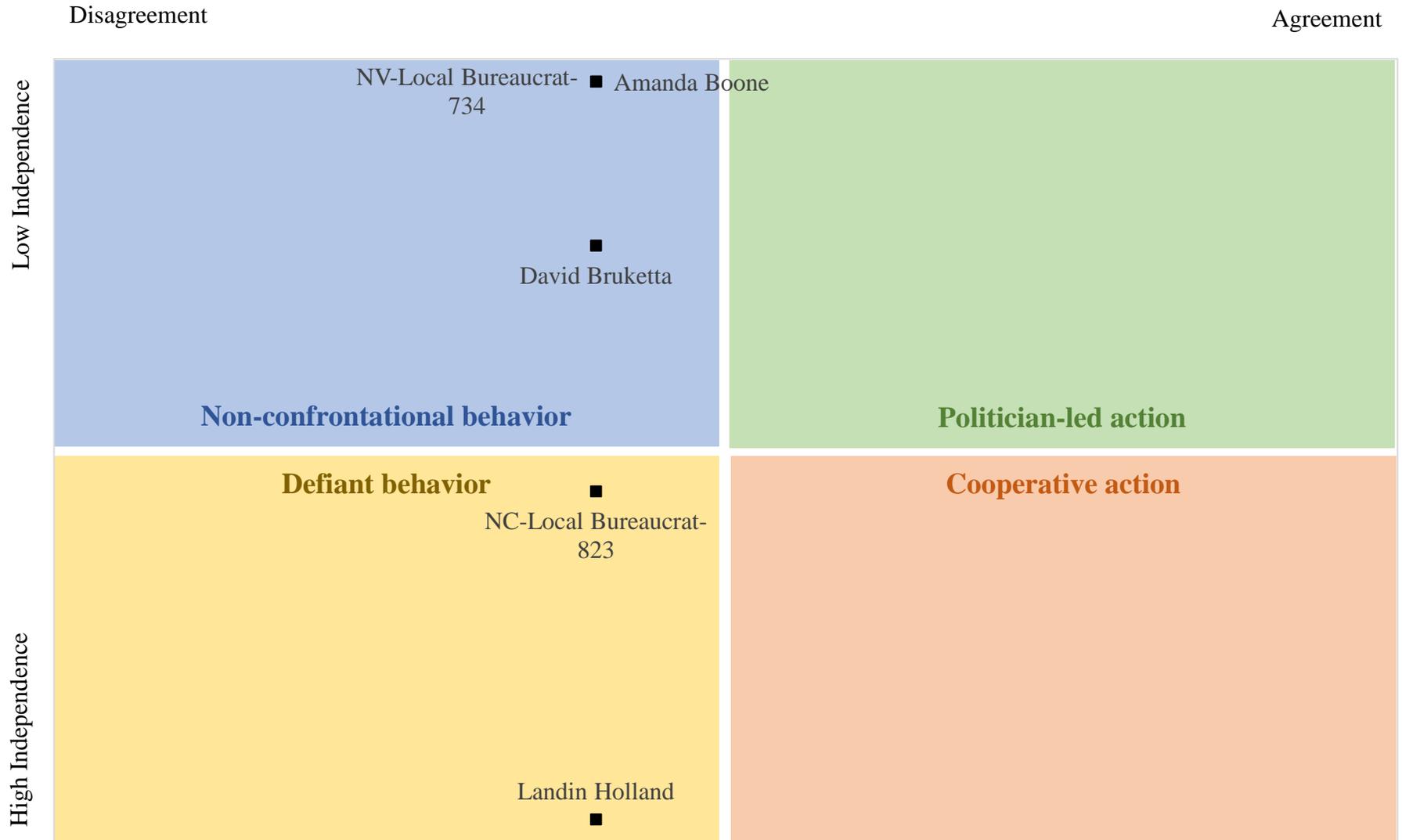
Locality	Bureaucrat	Overall Independence (Scale from 5 to 16, 16 is the highest level of independence)	Years in Position	Training: General or Special	Difference in Expertise	Structural Independence	Hiring and Firing Power	Opportunities for Discretion
Pasquotank County, NC	Shelley Cox, Planning Director	14	5+	special	one area of overlap: local conditions	moderate - runs own department, answers to manager	commissioners and manager hiring and firing power	many
City of Fort Pierce, FL	Marc Meyers, Director of the Building Department	14	5+	special	one area of overlap: local conditions	moderate - runs own department, answers to manager	city council, city manager hiring and firing power	many
	FL-Local Bureaucrat-762, Lower level bureaucrat	9	not clear	special	one area of overlap: local conditions	low - answers to department director then to city council	city council, city manager hiring and firing power	many
Martin County, FL	Anne Murray, Hydrogeologist	8	5+	special	two areas of overlap: local conditions, emergency management	low - answers to department director then to city council	commissioners and manager hiring and firing power	a moderate number
	Kathy Fitzpatrick, Coastal Engineer	8	5+	special	two areas of overlap: local conditions, emergency management	low - answers to department director then to city council	commissioners and manager hiring and firing power	a moderate number
	Don Donaldson, Director of Engineering	9	5+	special	two areas of overlap: local conditions, emergency management	moderate - runs own department, answers to manager	commissioners and manager hiring and firing power	a few

Locality	Bureaucrat	Overall Independence (Scale from 5 to 16, 16 is the highest level of independence)	Years in Position	Training: General or Special	Difference in Expertise	Structural Independence	Hiring and Firing Power	Opportunities for Discretion
St. Lucie County, FL	Jason Bessey , Stormwater Program Coordinator	9	5+	special	two areas of overlap: local conditions, emergency management	low - answers to department director then to city council	commissioners and manager hiring and firing power	a moderate number
	Mark Satterlee , Deputy County Administrator	9	0-5 (but 5+ with city as planning director)	special	two areas of overlap: local conditions, emergency management	moderate - runs own department, answers to manager	commissioners and manager hiring and firing power	a few
City of Fernley, NV	NV-Local Bureaucrat-282 , City Department Head	12	0-5	general	one area of overlap: local conditions	high - answers directly to mayor and city council	city council hiring and firing power	a few
	NV-Local Bureaucrat-895 , Lower level bureaucrat	7	not clear	special	one area of overlap: local conditions	low - answers to department director then to city council	city council, city manager hiring and firing power	a few
Greenville County, SC	Paula Gucker , Assistant County Administrator for Community Planning	12	5+	special	one area of overlap: local conditions	moderate - runs own department, answers to manager	commissioners hiring and firing power	a moderate number
	Brian Bishop , Floodplain Manager	11	0-5	special	one area of overlap: local conditions	low - answers to department director then to city council	commissioners hiring and firing power	many

Locality	Bureaucrat	Overall Independence (Scale from 5 to 16, 16 is the highest level of independence)	Years in Position	Training: General or Special	Difference in Expertise	Structural Independence	Hiring and Firing Power	Opportunities for Discretion
Kittitas County, WA	Mark Cook, Public Works Director	12	0-5	special	two areas of overlap: local conditions, emergency management	moderate - runs own department, answers to manager	commissioners hiring and firing power	a moderate number
City of Yakima, WA	David Brown, Water and Irrigation Manager	12	5+	special	one area of overlap: local conditions	moderate - runs own department, answers to manager	city council, city manager hiring and firing power	a moderate number
Yakima County, WA	Joel Freudenthal, Senior Natural Resource Specialist	12	5+	special	one area of overlap: local conditions	low - answers to department director then to city council	commissioners and manager hiring and firing power	many
	Scott Revell, Director of the Roza Irrigation District	15	0-5	special	one area of overlap: local conditions	high - runs own special-purpose government (irrigation district)	commissioners hiring and firing power	a moderate number

Appendix F: Bureaucrats Who Did Not Act but Thought Climate Change Adaptation Was Necessary

Figure F1: Predicted Forms of Bureaucratic Behavior for Bureaucrats Who Think Climate Change is Happening but Did Not Act, Based on Observed Autonomy and Agreement Measures



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