Global Climate Change and National Security: Institutional Culture and Leadership Within Three Federal Departments

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National security implications (The White House, 2015; CNA, 2014) of global climate change currently radiate throughout the U.S. government. These implications are critically acute for three federal departments most responsible for U.S. national security: the Department of Defense (DoD), the Department of State (DoS), and the Department of Homeland Security (DHS). However, the effect on these federal departments is understudied and poorly specified. This research intends to rectify the dearth of academic studies. Comparative analysis (Collier, 1993) of the institutional cultures and leadership of the DoD, DoS, and DHS was conducted determining how these agencies are responding to multiple vulnerabilities created by climate change (The White House, 2013a). Research revealed significant differences in how the DoD, DoS, and DHS are responding. The analysis discovered the DoD has institutionalized, or "mainstreamed" (Leggett, 2015, p. 16) planning for climate change and planning is driven mainly through hierarchical cultural organizations. The DoD bureaucratic leadership is multi-faceted with some transactional, transformational, and charismatic leadership elements. The DoS has also mainstreamed adaptation planning to a lesser extent and planning is driven primarily by an ad-hoc culture with a top-down/bottom-up, charismatic/transformational leadership emphasis. In contrast, the DHS has been unable to mainstream planning into their organizational culture due to the presence of several internal clans. The DHS bureaucratic leadership is somewhat chaotic with little top-down, transformational, or entrepreneurial direction. Overall, the knowledge gained from this comparative analysis provides valuable insights into how governmental institutions adapt to a multi-faceted national security threat.

Keywords: climate change, culture, leadership, national security

Introduction

The central issues explored in this study are the comparative efforts to frame and respond to the national security implications of global climate change (GCC). Specifically, the researchers evaluated how the three federal agencies most directly responsible for the national security of the U.S.—the Department of Defense (DoD), the Department of State (DoS), and the Department of Homeland Security (DHS)—are framing and addressing the national security ramifications related to climate change. A comparative analysis, also known as a systematic analysis, of the institutional cultures and leadership within a small number of federal agencies (Collier, 1993), was conducted. Those agencies convey and address the potential vulnerabilities of their missions, property, operations, and/or personnel related to projected climate change (The White House, 2013a).

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The research focused on how the efforts by the DoD, DoS, and DHS articulate and respond to GCC compare. Also, the researchers assessed which agency's efforts most effectively and realistically address climate change related impacts on and risks to the agency's ability to accomplish its missions, operations, and programs. The purpose of the analysis of these federal departments was to answer the following questions:

(1) What systems, processes, and policies are the DoD, DoS, and DHS using to prepare for and adapt to the national security ramifications of GCC?

(2) Which organizational culture and bureaucratic leadership models best explain the effectiveness of DoD, DoS, and DHS systems, processes, and policies used to prepare for and adapt to national security ramifications of GCC?

(3) How do the perceptions by department leadership of their relative effectiveness compare to an independent analysis of their effectiveness addressing the climate change related impacts on and risks to the agency's ability to accomplish its missions, operations, and programs?

Finally, researchers completed the study with a comparison of how the leadership of these three agencies perceives the effectiveness of adaptation planning efforts against an independent analysis of these adaptation planning efforts. Interviews were conducted with key climate change adaptation leadership personnel within these agencies to ascertain not only how efforts are progressing but also to ascertain which organizational culture and bureaucratic leadership models are reflected in their actions (See Appendixes E and F). The researchers concluded that there are significant differences between how the DoD, DoS, and DHS frame and address the national security ramifications related to climate change. The major differences can be explained by applying two important core theories of bureaucracies: organizational culture and bureaucratic leadership.

Background Information

Climate change may become a premier challenge for U.S. national security specialists. Security analysts have concluded that: "The emergence of harmful nonlinear, long-term, cumulative, anthropogenically generated changes to the Earth's climate and natural environment pose a "serious threat to America's national security" (Ackerman, 2008, p. 56). This proposition has been reinforced and expanded upon by subsequent U.S. administrations. "Climate change is an urgent and growing threat to our national security, contributing to increased natural disasters, refugee flows, and conflicts over basic resources like food and water" (The White House, 2015, p. 12). The role that the federal government plays in addressing these national security challenges has been difficult to assess and has been sparsely analyzed. The assessment difficulties can partially be attributed to the complex and multi-faceted nature of climate change. The challenges created by this overtly environmental dilemma often obscure the threats created to economic, social, cultural, and technological facets of the U.S. Clearly the U.S. government is "uniquely positioned to provide the necessary leadership, guidance, information, and resources" (Smith et al., 2010, p. ii), nevertheless, how the federal government is providing the "leadership, guidance, information, and resources" is underspecified and rarely critiqued. President Obama's *Executive Order 13514* directed federal agencies to begin considering climate change adaptation across operations, programs, and policies (The White House, 2013b). An initial study of these federal activities reveals early efforts by the various federal agencies to adapt to climate change, organize efforts, determine the impacts on their missions and operations and to prepare a climate adaptation plan (Yurkovich, 2012). The three federal departments under study in the research—the DoD, DoS, and DHS—have all developed climate change adaptation plans (DoD, 2014a; DoS, 2014; DHS, 2012; 2014).

The efforts to follow the guidance provided in President's Obama's Executive Order by creating adaptation plans for climate change have been analyzed by a few researchers. Specifically, the U.S. Army Corp of Engineers (USACE) report *Comparison of 2014 Adaptation Plans* by Conner, White, and Arnold (2015) and the CRS report *Climate Change Adaptation by Federal Agencies: An Analysis of Plans and Issues for Congress* (Leggett, 2015) provide the initial analysis of the adaptation plans developed by DoD, DoS, and DHS used in this research. A detailed synopsis of their efforts, only in regard to DoD, DoS, and DHS, are included in the Appendixes. Appendix A identifies the comments from the USACE report of exemplary actions taken by DoD, DoS, and DHS. In Appendix B, the analysts conducted a "Crosswalk" to compare how adaptation plans met the objectives identified in the *President's Climate Action Plan* (2013). This Appendix also contains results of the Crosswalk, again, only related to DoD, DoS, and DHS activities. Appendix C identifies specific efforts in each adaptation plan that address department needs, department efforts to address resiliency requirements, on-going coordination efforts between departments, and various interagency efforts (Conner, White, & Arnold, 2015). Appendix D provides a summary by the CRS of the efforts by DoD, DoS, and DHS to create adaptation plans. The CRS summary includes risk analysis information, adaptation plan goals, plan priorities, and a discussion of barriers to adaptation plan implementation (Leggett, 2015).

Furthermore, the researchers applied two core sociological and political science theoretical frameworks in the study of these federal institutions. The research repeatedly revealed that both the culture of each department studied and the leadership of each bureaucracy were very influential on how successful each department was in organizing and prioritizing adaptation efforts, determining the impacts on their missions and operations, and implementing an effective climate adaptation plan. In particular, the organizational cultures and leadership of the DoD, DHS, and DoS directly impact the missions and operations of each agency in regard to climate change adaptation efforts.

Organizational Culture

Organizational culture is clearly a major determinant of how good bureaucracies perform. But what is organizational culture and where does it come from? The concept of organizational culture has been around for some time and has been extensively studied (Needle, 2004; Cameron & Quinn, 1999; Morgan, 1997; Handy, 1976) and many models, concepts, and explanatory terms have emerged. One encompassing explanatory term describes organizational culture as the "shared values, shared beliefs, shared meaning, shared understanding, and shared sense making" which are part of a "process of reality construction that allows people to see and understand particular events, actions, objects, utterances, or situations in distinctive ways" that enable organization members to make their "own behavior sensible and meaningful" (Morgan, 1997, p. 138). Edgar Schein (1985) defines organizational culture as,

> A pattern of basic assumptions, invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems. (p. 9)

Dr. Schein also provides a useful explanation of where organizational culture originates. Schein (1985) posits three sources: (1) the legacy of the organization founders, (2) key subsequent leaders, and (3) the lessons learned by the organization as it grows and develops.

Researchers have used these basic definitions to expand the understanding of organizational culture by developing several models or frameworks for analysis (Hogan & Coote, 2014; Kong, 2003; Schultz, 1994).

One specific model of organizational culture posits four archetypes to consider. Cameron and Quinn (2006), have identified four ideal types of organizational culture: Clan, Adhocracy, Market, and Hierarchy. The four ideal types can be illustrated on a two-dimensional array. The two dimensions involve flexibility/freedom to act and stability/control on one axis and internal versus external focus on the other axis.
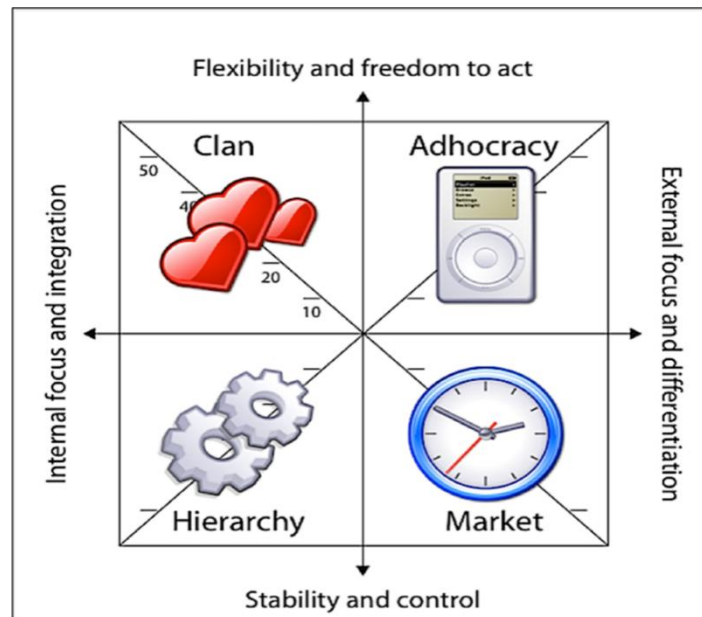

Figure 1. Ideal types of organizational culture.
Source: Original copied from ArtsFWD (2013).

This two-dimensional array creates four quadrants of organizational behavior described below:

(1) Clan (Collaborative) oriented cultures are focused on facilitating mentoring and team building: Human development and participation produce effectiveness.

(2) Adhocracy (Creative) oriented cultures are innovative, visionary, and entrepreneurial: Innovativeness, vision, and new resources produce effectiveness.

(3) Market (Competing) oriented cultures are results-oriented, with a focus on competition, driving hard for results, and producing: Aggressively competing and customer focus produce effectiveness.

(4) Hierarchy (Control) oriented cultures are organized, coordinated, and monitored with a focus on efficiency, timeliness, consistency, and uniformity: Control and efficiency with capable processes produce effectiveness (Cameron & Quinn, 2006, p. 46).

As explained below, this model has direct application to this study and will be used as a basic analytical tool.

A clan organization could be made up of several agencies under one head department. An organizational culture that epitomizes a clan culture would be the Department of Interior (DoI), which includes the Bureau of Indian Affairs, Bureau of Indian Education, Bureau of Land Management, Bureau of Ocean Energy Management, Bureau of Reclamation, Bureau of Safety and Environmental Enforcement, National Park Service (NPS), Office of Surface Mining Reclamation and Enforcement, U.S. Fish and Wildlife Service (USFWS), and U.S. Geological Survey (USGS) (DoI, 2016). The bureaus, offices, and services are mostly semiautonomous in accomplishing their individual missions yet: "Shared values and goals, cohesion,

participativeness, individuality, and a sense of "we-ness," permeate the clan-type structure of the DoI and is often exemplified by the teamwork seen between NPS park rangers, FWS agents, and USGS scientists (Cameron & Quinn, 2006, p. 41).

Adhocracy culture is found in many different bureaucracies. For example, "industries such as aerospace, software development, think-tank consulting, and filmmaking" routinely display adhocracy cultures (Cameron & Quinn, 2006, p. 43). An example of an adhocracy culture in the federal government could be found in the National Aeronautics and Space Administration (NASA) and their efforts to explore uncharted regions of space. Their forthright vision is to "reach for new heights and reveal the unknown for the benefit of humankind" (NASA, 2016, Vision Statement). NASA prizes innovation and visionary projects that are transformative. Examples of these types of successful projects include the Apollo Mission to the Moon, the Juno Mission to Jupiter, and the Hubble Space Telescope.

A market culture is all about competition and producing results. "The term market is not synonymous with the marketing function or with consumers in the marketplace. Rather, it refers to a type of organization that functions as a market itself. It is oriented toward the external environment instead of internal affairs" (Cameron & Quinn, 2006, p. 39). Critics of the federal bureaucracy say the lack of competition is a major weakness of the federal government and that more competition is needed in government to increase effectiveness and efficiency (Osborne, 1993). Specifically, some of the characteristics of the market culture do not appear in federal bureaucracies because federal agencies are not directly competing with other agencies or bureaucracies. Nevertheless, an agency that is trying to incorporate competition, value, productivity, and results is the Department of Health & Human Services (HHS) through the *Affordable Care Act* (HHS, 2015). The Act has been touted to improve access, affordability, and quality of health care and has made health care coverage affordable to millions of Americans by enabling more competition in the health care marketplace (HHS, 2015) (Cameron & Quinn, 2006).

Finally, a hierarchical culture "is characterized by a formalized and structured place to work. Procedures govern what people do. Effective leaders are good coordinators and organizers. Maintaining a smooth-running organization is important. The long-term concerns of the organization are stability, predictability, and efficiency. Formal rules and policies hold the organization together" (Cameron & Quinn, 2006, p. 38). An example of a federal institution that is based on a hierarchical or controlling culture is the Internal Revenue Service (IRS). The IRS, a Bureau of the Department of Treasury, is all about expertly implementing, monitoring, and enforcing the federal taxation laws in the U.S. The steps are clear: Congress passes the tax laws; the taxpayers must know their obligations, and the IRS's role is to help taxpayers comply. Research indicates that most government agencies are generally controlled by a hierarchical culture, and they include large numbers of standardized procedures, multiple hierarchical levels, and a firm emphasis on rule reinforcement (Cameron & Quinn, 2006, p. 39).

These organizational culture arch-types clearly have application to federal agencies that deal with complex issues but are the models also applicable to agencies that deal with complex, national security issues? National security policy has always been influenced by culture, and the works of Thucydides, Sun Tzu, and Carl von Clausewitz provide classic examples of how the cultures of the government, the military, and the people interact to forge these policies (Lantis, 2002, p. 93). The overriding issue for this research is that national security policy is the most important and contentious policy domain and consequently is influenced by many political actors and strategic cultures. Political scientist Jack Snyder (1977) argued that "strategic culture

was 'semi-permanent' and that new problems and developments would not be assessed objectively but rather through the perceptual lens provided by strategic culture" (p. 8). Essentially, strategic culture "provides the milieu within which strategy is debated" but it is still influenced by national culture (Gray, 1986, pp. 36-37).

Recent strategic culture studies emphasize identity formation, organizational processes, history, tradition, and culture through a constructivist lens (Lantis, 2002, pp. 96-97). These characteristics fit well into the previous discussion of organizational culture, but the overbearing influence of strategic culture must be acknowledged. Therefore, this research will assume a realpolitik strategic culture is dominant within U.S. security institutions such as DoD, DoS, and DHS. While not as expressive as many forms of strategic culture, realpolitik assumes the state is the primary actor, survival of the state is paramount, and all other activities must contribute to state survival or be considered secondary (Mearsheimer, 2001). Essentially, climate change is considered an existential threat to U.S. security and under a realpolitik policy, all government agencies responsible for U.S. security must contribute to mitigating and adapting to this threat (The White House, 2015).

In sum, the organizational culture model by Cameron and Quinn (2006) can be used to explain organizational behavior in the DoD, DoS, and DHS while recognizing that strategic culture gives climate change a higher priority than some domestic and international issues due to the national security ramifications. Nevertheless, the low probability of imminent armed conflict because of climate change (The White House, 2015; CNA, 2014) reduces the pressure for immediate action by these agencies, regardless of cultural orientation.

The second model used to analyze the systems, processes, and policies used by the DoD, DoS, and DHS when adapting to climate change is based on bureaucratic leadership research. This research is expansive and specific, and this research is also very applicable to this study.

Bureaucratic Leadership

Bureaucratic leadership also has an enormous impact on the effectiveness and efficiency of how bureaucracies function. Again, several genres of bureaucratic leadership scholarship have produced many powerful models, concepts, and explanatory terms (Hersey & Blanchard, 1977; Burns, 1978; Doig & Hargrove, 1987; Baliga & Hunt, 1988; Chemers, 1997; Hunt, 1996). One broad descriptive term contends that,

> In organizations, effective leadership provides higher-quality and more efficient goods and services; it provides a sense of cohesiveness, personal development, and higher levels of satisfaction among those conducting the work; and it provides an overarching sense of direction and vision, an alignment with the environment, a healthy mechanism for innovation and creativity, and a resource for invigorating the organizational culture. (Van Wart, 2003, p. 214)

For the purposes of this study, bureaucratic leadership will be considered, "leadership from the frontline supervisor (or even lead worker) to the non-political head of the organization. The focus is not on elected legislative leaders and only on elected executives and their political designees, such as agency secretaries and directors, commissioners, or legislatively approved directors, to the degree that they include nonpolicy functions as a significant component of their responsibilities" (Van Wart, 2003, p. 216). Recent theories of leadership include the following eras and characteristics (Van Wart, 2003, p. 218).

One interesting and related assertion by Edgar Schein (1985) is that "the only thing of real importance that leaders do is to create and manage culture" (p. 2).

The charismatic leadership style relies on the charm and persuasiveness of the leader. Charismatic leaders are often driven by their convictions and commitment to their cause. In addition: "Charismatic leaders are

sometimes called transformational leaders because they share multiple similarities. Their main difference is focus and audience. Charismatic leaders often try to make the status quo better, while transformational leaders focus on transforming organizations into the leader's vision" (Spahr, 2015a, para. 1-2).

Table 1

Recent Leadership Theories

Era	Major Time Frame	Major Characteristics/examples of proponents
Transformational	1978-present	Emphasis on leaders who create change in deep structures, major processes, or overall culture. Leader mechanisms may be a compelling vision, brilliant technical insight, and/or charismatic quality. Era influenced by the loss of American dominance in business, finance, and science, and the need to re-energize various industries, which had slipped into complacency.
Servant	1977-present	Emphasis on the ethical responsibilities to followers, stakeholders, and society. Business theorists tend to emphasize service to followers; political theorists emphasize citizens; public administration analysts tend to emphasize legal compliance and/or citizens. Era influenced by social sensitivities raised in the 1960s and 1970s.
Multifaceted (Transactional, Transformational, and Charismatic)	1990s-present	Emphasis on integrating the major schools, especially the transactional schools (trait and behavior issues largely representing management interests) and transformational schools (visionary, entrepreneurial, and charismatic). Era affected by a highly competitive global economy and the need to provide a more sophisticated and holistic approach to leadership.

Source: (Van Wart, 2003, p. 218)

Servant Leadership is "focused on service to others. Servant leadership begins with a vision for providing a resource such as employment, public service or education and requires leaders to be optimists with empathy for people in many types of situations. Servant leaders identify complex problems and can implement workable solutions in a timely fashion by planning. To invoke the words of American author Garrison Keillor, they 'do good works'" (Spahr, 2015b, para. 4).

Transactional leadership "is most often compared to transformational leadership. Transactional leadership depends on self-motivated people who work well in a structured, directed environment. By contrast, transformational leadership seeks to motivate and inspire workers, choosing to influence rather than direct others. A transactional leader is someone who values order and structure. They are likely to command military operations, manage large corporations, or lead international projects that require rules and regulations to complete objectives on time or move people and supplies in an organized way" (Spahr, 2015c, para. 1-2).

Finally, transformational leadership can be described as, "inspirational, in that the leader can inspire workers to find better ways of achieving a goal; mobilization, because leadership can mobilize people into groups that can get work done, and morale, in that transformational leaders raise the well-being and motivation level of a group through excellent rapport. They are also good at conflict resolution" (Spahr, 2015d, para. 2).

All four leadership models were used to analyze the leadership within the DoD, DoS, and DHS.

Research Design

This study utilized comparative analysis methods (Collier, 1993). A detailed examination, discussion, evaluation, and comparison of the federal efforts to counteract the national security challenges associated with GCC was conducted. The study was conducted in three distinct phases:

Phase One. Data and information were collected using content analysis of major systems, processes, and policies of the DoD, DoS, and DHS related to GCC. Also, the results of the content analysis were compared to the latest literature on organizational cultures, bureaucratic leadership, climate change politics, and environmental security.

Phase Two. Interviews with key DoD, DoS, and DHS officials in Washington, D.C. were conducted to collect more information on the research topic (See Appendix F). Administration officials were contacted to determine which official was most knowledgeable and available for follow-up face-to-face interviews. Pre-interview surveys were administered to gather background information and to narrow topic discussions to pertinent issues (See Appendix E). The efforts of each agency to frame or articulate the national security challenges were the focus of this research. In addition, the overall perceptions of how effective each agency is at addressing climate change related impacts on and risks to the agency's ability to accomplish its missions, operations, and programs were assessed.

Phase Three. The results of Phase One and Two were compared and conclusions inferred based on observed similarities and differences in how the agencies address and perceive how they address the national security challenges created by GCC.

Limitations

The researchers encountered several limitations that constrained this study. The small sample size, involving only three federal departments and five departmental leaders (two from DHS, one from DoD, and one from DoS), was a significant limitation on gathering first-hand and diverse information. Besides, the subject matter experts (SMEs) at each department were sent an initial interview survey, but only one expert completed the pre-interview survey (See Appendix E), further limiting available data. Additionally, personal interview times with each SME were constrained to 1-2 hours because of scheduling and work conflicts. Interview windows were further restricted due to funding issues that only allowed the researchers one week in the Washington, D.C. area. Finally, all interviewees were concerned about the confidentiality and attribution of their comments primarily due to current political conditions. While the validity and reliability of the interview information collected are not in question, the attribution concerns may have reduced openness and transparency of responses (See Appendix F). These limitations, overall, bound the broad applicability of research analysis and conclusions.

Analysis

As previously discussed, the baselines for the analysis of the efforts by the DoD, DoS, and DHS to frame and address the national security ramifications related to climate change come from two primary documents: The USACE report *Comparison of 2014 Adaptation Plans* by Conners, White, and Arnold (2015) and the CRS report *Climate Change Adaptation by Federal Agencies: An Analysis of Plans and Issues for Congress* (Leggett, 2015). Each report investigated and then evaluated the various efforts by several federal agencies in regards to planning for climate change. The USACE report by Conners, White, and Arnold (2015) compares federal adaptation plans to identify significant actions taken and documented in 37 different adaptation plans. The DoD, DoS, and DHS adaptation plans were included in their analysis. The CRS report by Leggett (2015, Summary), "reviews current actions (as of January 2015) of selected federal department and agencies to adapt their missions, infrastructures, operations, and personnel to projected climate change".

The CRS also evaluated the efforts by several federal agencies to develop plans for adapting to current and projected climate change. The guidance for these efforts came from the November 2013 Presidential Executive Order 13653, *Preparing the United States for the Impacts of Climate Change*, which "directed agencies to undertake vulnerability assessments and planning for adaptation. The Administration aimed efforts at reducing agencies' own risks, taking advantage of "no-regrets" adaptation opportunities, and actions that promote resilience to climate changes". The report reviewed the actions (as of January 2015) of the DoD, DoS, and DHS "to adapt their own missions, infrastructure, operations, and personnel to projected climate change". The report concluded that most agencies were still in the early stages of developing plans and were still conducting assessments and strategic planning. Most agencies assessed did not have "on-the-ground adaptations" nor had conducted evaluations of "the effectiveness and efficiency of alternative adaptation approaches and actions" (Leggett, 2015). Additionally, the CRS report concluded that:

> Few, if any, departments or agencies have prepared comprehensive, quantitative assessments of the vulnerabilities of their missions and programs to projected climate change. DOD is perhaps the farthest along in assessing its vulnerabilities; Secretary Hagel stated in October 2014 that the department had nearly completed a baseline survey of its nearly 7,000 bases, installations, and other facilities that would be used to integrate climate change considerations into planning, operations, and training. Most agencies' assessments have been at a "high level"—broad views with generalized information, though some have been preparing detailed assessments for locations that appear to have mission-critical vulnerabilities. Many agencies remain primarily in stages of "fact-finding," initial analysis, and broad planning, and sometimes outreach and training for personnel. (Leggett, 2015, p. 17)

The report also identified some specific barriers to the development of effective adaptation plans. The CRS report identified a 2009 GAO review that found:

> The challenges faced by federal, state, and local officials in their efforts to adapt fell into three categories, based on our analysis of questionnaire results, site visits, and available studies. First, available attention and resources are focused on more immediate needs, making it difficult for adaptation efforts to compete for limited funds. Second, insufficient site-specific data, such as local projections of expected changes, makes it hard to predict the impacts of climate change, and thus hard for officials to justify the current costs of adaptation efforts for potentially less certain future benefits. Third, adaptation efforts are constrained by a lack of clear roles and responsibilities among federal, state, and local agencies. (p. 31)

Other potential barriers include funding constraints, where other department priorities compete with climate change adaptation plans and efforts. Also, some agencies have difficulties finding and accessing pertinent data, and some agencies lacked the expertise to exploit the information needed. Another constraint to effective planning and decision making is the uncertainty of what exactly are the social, economic, and environmental ramifications of climate change locally, regionally, and globally (Leggett, 2015, pp. 26-29).

Department of Defense

The organizational culture and bureaucratic leadership of the DoD's efforts to plan for and adapt to climate change are discussed below.

Organizational Culture. The organizational culture of the DoD is very hierarchical. The DoD still has many of the "classical attributes of bureaucracy: rules, specialization, meritocracy, hierarchy, separate ownership, impersonality, accountability" that sociologist Max Weber (1947) identified long ago. In addition, the DoD has clear lines of communication and authority, standardized rules of engagement, and battle-tested command and control processes and procedures (Cameron & Quinn, 2006). The personal interviews also revealed elements of this type of culture.

The DoD interviewee considered the DoD very hierarchical and that the entire climate change adaptation process originated from a DoD Directive 4715.21, *Climate Change Adaptation and Resilience* (2016) based on presidential directives. This directive is enforceable, and DoD members are accountable for how well each branch of the DoD (Air Force, Army, Navy, and Marine Corp) is meeting directive goals and objectives. Each major organization within DoD was expected to provide personnel for a Climate Change Working Group that would meet the DoD objectives and goals on climate change adaptation. Mainstreaming is very important to the DoD because: "Climate change has long been addressed adjunct to the line missions of agencies. That is, in most agencies, climate change has been researched and analyzed in specialized staff offices that were not generally integral to the mission-oriented "line" operations of the agency" (Leggett, 2015, p. 19). The interview confirmed that progress towards "mainstreaming" climate change data and considerations into programmatic decisions and actions is being made. An official from DoD voiced this approach as follows: "... [T]he crux of this report is, rather than creating a stovepipe within the DoD organizational structure to deal with climate change, we are going to integrate climate change considerations into the normal processes, the day-to-day jobs of everybody" (Leggett, 2015, p. 19).

Still, within the services, there are substantial differences in responses to the DoD Directive. The Navy and USAF are very active in mainstreaming adaptation and resiliency efforts while the Army and Marine Corp are not as far along in their efforts. The interviewee contended that the hierarchical culture was effective for the DoD, but adaptation advocates needed expertise, personal connections, and knowledge of the bureaucracies they were working in to be effective. Nevertheless, other forms of organizational culture were observed by the interviewee. Clan culture was seen in the behavior of senior officers in their support and advocacy for their branch of service. Also, adhocracy culture was seen when the DoD *Climate Change Adaptation Roadmap* (2014) came out as many innovations and ideas emerged to address the roadmap goals and objectives. The new innovations and ideas also contributed to a market culture of competition between the services and some other parts of the DoD.

Bureaucratic Leadership. The interviewee asserted that the leadership of the DoD has been and is multi-faceted. Leaders have displayed some transformational, transactional, and charismatic leadership elements. The leadership of Secretary Hagel (2013-2015) was seen by many to be transformational and at times charismatic. He provided an initial vision and directive for the roadmap and used his interpersonal and political skills to find compromises and to build acceptance of climate change as a threat to national security. Current Secretary of Defense Carter has been more transactional, as his focus has been on managing and maintaining the momentum started by Secretary Hagel. The barriers to progress have come from the Republican leadership in Congress, which have relied on charismatic and almost demagogic leadership styles to impede mainstreaming efforts (DoD Personal Interview, 2016; See also Appendix F).

Summary. The hierarchical culture and multi-faceted leadership styles within the DoD have been effective at mainstreaming adaptation for climate change planning. The DoD is maintaining and increasing resiliency to the impacts of climate change. Still, climate change is a unique challenge for the DoD that will require effective interagency cooperation and coordination to overcome traditional "stove-pipes" that remain within the DoD culture (See Appendixes A, B, C, and D for more details).

Department of State

The organizational culture and bureaucratic leadership of the DoS's efforts to plan for and adapt to climate change are discussed below.

Organizational Culture. The organizational culture of the DoS reflects in many aspects an adhocracy culture. In response to an anarchic, complex, and dynamic international environment, the DoS has encouraged and supported innovation, creativity, and entrepreneurship in their operations (Cameron & Quinn, 2006). The interviewee was very proud of the DoS's efforts to make adaptation and resiliency to climate change a core issue for the DoS. Climate change has been identified in State's *2010 Quadrennial Diplomacy and Development Review* (QDDR) as one of six development priority areas (Leggett, 2015, p. 95).

In addition, these efforts have gained buy-in from DoS employees as the efforts are considered innovative and creative ways to protect investments and make smart choices around the globe that support U.S. national interests. New "Integrated Country Strategies" that address country-specific challenges from climate change, developed independently by embassies, illustrate some of the creativity and entrepreneurship of DoS personnel. However, the interviewee identified a reluctance to change in some parts of the DoS and fear that climate change will become a "Christmas Tree" opportunity. The interviewee described this "Christmas Tree" effect as a potential rush by some DoS leaders to get funding and attention for their specific issues if they could attach it to a climate change related goal or objective. This has slowed efforts to mainstream adaptation to climate change planning but not stopped it. As alluded to before, climate change is considered a priority issue in DoS and has support from "top to bottom".

The interviewee did not think there were any major cultural barriers to climate change planning except for long-standing limitations on funding and personnel. Information on climate change was being shared throughout DoS and risk analyses were being conducted not only from a regional/country perspective but also from a functional perspective. DoS was also working with DoD and DHS within interagency working groups to share information and best practices. DoS overseas personnel were also actively sharing climate change adaptation information through embassies and through the U.S. Agency for International Development (USAID). The "Integrated Country Strategies" were being used as screening tools for projects and programs overseas so that planning and adapting to climate change concepts were built into all overseas diplomatic efforts.

Bureaucratic Leadership. The interviewee asserted that the leadership of the DoS has been charismatic and transformational. The convictions and commitment of Secretary Kerry (2013-2016) to making climate change a priority for the entire U.S. government and especially for the DoS were very evident to the interviewee. Charismatic leaders share multiple similarities with transformational leaders and here is where one difference was evident. While "charismatic leaders often try to make the status quo better", in contrast "transformational leaders focus on transforming organizations into the leader's vision" (Spahr, 2015a, para. 1-2). Secretary Kerry is determined to mainstream all aspects of climate change adaptation planning into what the DoS does. In a recent speech, Secretary Kerry "referred twice to climate change, including the statement that 'this new QDDR will enable us to take advantage of this unique moment in history, one where new tools, technologies, and partnerships are redefining what's possible, and where we have to address real opportunities and challenges we will face—the challenge of climate change and performance in fragile states and conflict-affected settings'" (Kerry, 2014). Secretary Kerry clearly considers climate change to be a preeminent threat to U.S. national security (Kerry, 2015).

In addition, leadership throughout DoS is actively supporting climate change planning from the top-down and line workers in State are also supporting planning from the bottom-up. The emphasis from the top is on creating clear guidance for personnel, and the interviewee found that roles and responsibilities at all levels have

been well defined by leadership. Specific diplomatic posts overseas are already taking measures to adapt to climate change and "green teams" are operating in more than 150 locations installing solar panels or finding other ways to mitigate and adapt to climate change (Leggett, 2015). Leadership is also incorporating sustainability science into planning and into training new personnel. A major effort by DoS leadership is the Global Climate Change Initiative (GCCI) that intends to "integrate climate change considerations into U.S. foreign assistance through a full range of bilateral, multilateral, and private-sector mechanisms to foster low-carbon growth, reduce emissions from deforestation and land degradation, and promote sustainable and climate-resilient societies in each partner country" (Leggett, 2015, p. 97). However, interagency cooperation and support from Congress continue to be major concerns (DoS Personal Interview, 2016; See also Appendix F).

Summary. The DoS has mainstreamed climate change adaptation planning to a lesser extent and planning is driven primarily through an adhocracy cultural approach with a top-down/bottom-up, charismatic/transformational leadership emphasis. The DoS is significantly challenged in efforts to plan for and adapt to climate change in two profound ways because of their domestic and international operations. Operational, diplomatic, and programmatic issues in regard to climate change will require robust interagency coordination and cooperation within DoS and the Department is aware and effectively addressing these challenges (See Appendixes A, B, C, and D for more details).

Department of Homeland Security

The organizational culture and bureaucratic leadership of the DHS's efforts to plan for and adapt to climate change are discussed below.

Organizational Culture. The organizational culture of the DHS appears to be a somewhat dysfunctional clan culture. A functional clan culture in a bureaucratic organization is characterized by the following: "Shared values and goals, cohesion, participativeness, individuality, and a sense of 'we-ness'" (Cameron & Quinn, 2006, p. 41). However, the DHS clan structure is so dominated by the autonomous missions of the 22 different agencies under DHS control that the ability to focus each operational or support component on one challenge is very difficult and perhaps impossible. While the mission of DHS is very straightforward, "With honor and integrity, we will safeguard the American people, our homeland, and our values", it is accomplished by a myriad of organizations. From Citizen and Immigration Services, Customs and Border Protection, Coast Guard, Federal Emergency Management Agency (FEMA), to the Secret Service, Domestic Detection Office, and Office of Health Affairs, to name a few, it is very hard to imagine that DHS could mainstream such a complex and multi-faceted problem as climate change into the operations and planning of each of these components. The sense of being part of one family was not discussed by the interviewees, and a sense of "we-ness" was also missing.

Interviewees also asserted that coordination of climate change planning is not direct and is subsumed under the need to focus on "law enforcement" issues. Adaptation planning for climate change is not a core or even a peripheral topic for DHS. Each individual operational and support component has their own individual missions and some are developing adaptation planning but most are not. Some of the operational and support components have even "pushed back" against adaptation planning initiatives and are concerned with not "doing something stupid and unnecessary" related to climate change. In addition, most DHS personnel need more training on the challenges that climate change will create and on what adaptation and resiliency planning look

like. The focus is on the consequences of climate change and if they will affect the primary mission, not on adapting to climate change.

Also, interviewees contend that the overall DHS focus is more short-term than long-term, which makes adaptation planning even more difficult to envision. The interviewees acknowledged that direct activities related to adapting to climate change were few and far between in DHS and most activities that could be considered as related to climate change were often ancillary to some other mission priority. Some of the barriers to planning originate in Congress, which currently is not sympathetic to any DHS operational or support component spending any funds to adapt to climate change. There is some hope that the law enforcement focus on risk analysis will open some doors for more adaptation efforts but these may be haphazard and uncoordinated.

Bureaucratic Leadership. Interviewees assessed Secretary Johnson's (2013-2016) leadership of DHS has mostly been transactional. As such, the Secretary depends "on self-motivated people who work well in a structured, directed environment" (Spahr, 2015c, para. 1-2). He is trying to maintain order and structure while defending DHS's public image challenges and Congressional investigations (DHS, 2015; Perry & Katko, 2016). The lack of a charismatic or transformational leader that could bring the disparate clans together is clear and impeding adaptation planning. In general, the unique grouping of all these various components together creates a real challenge for any style of leadership. The law enforcement focus by the DHS leadership was also determined to be a hindrance to adaptation planning by the DHS leaders interviewed. Attempts to create adaptation planning from the bottom-up were not evident and were assessed to have little chance of success. A few DHS personnel are consumers of climate change information, but most personnel are not directly involved in using climate change information or producing it for leadership (DHS Personal Interview, 2016; See also Appendix F).

Summary. In contrast to DoD and DoS, the DHS has not been able to mainstream climate change adaptation planning due to several interacting internal clans and a focus more on "law enforcement" instead of national security concerns. The bureaucratic leadership is somewhat chaotic with little top-down, transformational, or charismatic direction.

Conclusion

This project expanded the understanding of how the U.S. government is explaining and responding to the challenges created by climate change. Identification, evaluation, and comparison of DoD, DoS, and DHS systems, processes, and policies used to frame the dynamic effect of climate change increases and deepens the overall knowledge of how the U.S. government reacts to and understands this threat. Furthermore, comparison of the organizational cultures and bureaucratic leadership within these agencies as they address climate change related impacts on and risks to the agency's ability to accomplish its missions, operations, and programs enhance awareness of the effectiveness and efficiency of key bureaucratic institutions in the United States.

This research clearly revealed how important culture and leadership are to the performance of governmental institutions. Even institutions that are responsible for the national security of a country are higher performers, more effective, and more productive when they have a culture and leaders that complement their missions and the challenges they face.

Analysis indicates that the DoD's hierarchical culture can effectively address with the appropriate systems, procedures, and policies the adaptation and resiliency challenges manifesting from climate change. The

charismatic, transformational, and then transactional leadership of the DoD envisioned, enabled, and enhanced adaptation planning to climate change. In addition, the DoS's adhocracy culture is effectively addressing the adaptation and resiliency challenges manifesting from climate change with the suitable systems, procedures, and policies. The charismatic and transformational leadership of the DoS from top-to-bottom and bottom-up is envisioning, enabling, and enhancing adaptation planning to climate change. Finally, DHS's clan culture is not effectively addressing the adaptation and resiliency challenges manifesting from climate change with the proper systems, procedures, and policies. The fact that the clans do not work well together is a major hindrance. Additionally, the lack of charismatic or transformational leadership in DHS from top-to-bottom and bottom-up is stagnating the needed envisioning, enabling, and enhancing of adaptation planning.

Very few issues receive the direct attention and effort of almost every major federal government agency. Climate change is one of those rare domestic and international problems that require multiple agencies to create policy responses. In fact, new climate change systems, processes, and policies are being created every day by a wide variety of federal agencies, but the explanatory effectiveness of these major agencies has not been accessed in-depth. Analyzing how agencies are framing and responding to this issue by comparing the organizational culture and bureaucratic leadership and how effective they are, expands understanding of the major bureaucratic institutions within the U.S. government.

A framework for comparing how key U.S. federal agencies explain and address the national security ramifications of climate change was developed and could be applied to other countries. Identification, evaluation, and comparison of how foreign government agencies frame climate change will broaden and deepen international knowledge of how other governments react to and understand this global threat. Besides, comparison of organizational cultures and bureaucratic leadership found in foreign agencies enhances awareness of the effectiveness and efficiency of not only key bureaucratic institutions in the United States but also of other major countries leaders.

While these frameworks can be successful in government institutions that accept the scientific facts surrounding climate change, how these institutions will react to a complete reversal of scientific acceptance of climate change will be another challenge. The DoD, DoS, and DHS will certainly face cultural and leadership challenges beyond what they have confronted before if the new presidential and congressional leadership are skeptical or outright antagonistic towards climate science and the ramifications of climate change. Clearly, a comparison of how adaptation to climate change was planned for in the Obama administration to how the new Trump administration addresses climate change is warranted.

References

Ackerman, J. T. (2008). Climate change, national security, and the quadrennial defense review: Avoiding the perfect storm. *Strategic Studies Quarterly* (Spring), 56-96.

ArtsFwd. (2013, May 14). *4 types of organizational culture*. Harlem, New York City: EmcArts Inc. Retrieved from http://artsfwd.org/4-types-org-culture/

Baliga, B. R., & Hunt, J. G. (1988). An organizational life cycle approach to leadership. In J. G. Hunt, B. R. Baliga, H. P. Dachler, & C. A. Schriesheim (Eds.), *Emerging leadership vistas* (pp. 129-149). Lexington, MA: Lexington Books.

Burns, J. M. (1978). *Leadership*. New York: Harper & Row.

Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and changing organizational culture: Based on the competing values framework* (Revised edition). San Francisco, CA: Jossey-Bass.

Center for Naval Analysis (CNA) Military Advisory Board. (2014). *National security and the accelerating risks of climate change*. Alexandria, VA: CNA Corporation.

Chemers, M. M. (1997). *An integrative theory of leadership.* Mahwah, NJ: Lawrence Eribaum Associates.

Collier, D. (1993). The comparative method. In A. W. Finifter (Ed.), *Political science: The state of the discipline II* (pp. 105-120). Washington, D.C.: American Political Science Association.

Conners, H., White, K. D., & Arnold, J. R. (2015). *Comparison of 2014 adaptation plans: Report providing comparison of adaptation plans submitted to the white house in 2014*. Washington, D.C.: US Army Corps of Engineers. Retrieved from http://www.corpsclimate.us/interagencyact_adapt.cfm

Doig, J. W., & Hargrove, E. C. (1987). *Leadership and innovation: A biographical perspective on entrepreneurs in government.* Baltimore, MD: Johns Hopkins University Press.

Government Accountability Office (GAO). (2009, October 7). *Climate change adaptation: Strategic federal planning could help government officials make more informed decisions*. Washington, D.C.: GAO.

Gray, S. G. (1986). *Nuclear strategy and national style*. Lanham, MD: Hamilton Press.

Handy, C. B. (1976). *Understanding organizations.* Oxford, UK: Oxford University Press.

Hersey, P., & Blanchard, K. H. (1977). *Management of organizational behavior: Utilizing human resources* (3rd ed.). New Jersey: Prentice Hall.

Hogan, S. J., & Coote, L. V. (2014, August). Organizational culture, innovation, and performance: A test of Schein's model. *Journal of Business Research, 67*(8), 1609-1621.

Hunt, J. G. (1996). *Leadership: A new synthesis.* Newbury Park, CA: Sage Publications.

Kerry, J. F. (2014, April 22). Remarks at the quadrennial diplomacy and development review (QDDR) launch. Washington, D.C.: U. S. Department of State. Retrieved from http://www.state.gov/secretary/remarks/2014/04/225050.htm

Kerry, J. F. (2015, November 10). Remarks on climate change and national security. Norfolk, VA: Old Dominion University. Retrieved from http://www.state.gov/secretary/remarks/2015/11/249393.htm

Kong, S. H. (2003, January). A portrait of Chinese enterprise through the lens of organizational culture. *Asian Academy of Management Journal, 8*(1), 83-102.

Lantis, J. S. (2002). Strategic culture and national security policy. *International Studies Review, 4*(3), 87-113.

Leggett, J. A. (2015, February 23). *Climate change adaptation by federal agencies: An analysis of plans and issues for congress*. Washington, D.C.: Congressional Research Service.

Morgan, G. (1997). *Images of organization*. Thousand Oaks, CA: Sage Publications.

Mearsheimer, J. J. (2001). *The tragedy of great power politics*. New York: W.W. Norton & Company.

National Aeronautics and Space Administration (NASA). (2016). NASA: About. Washington, D.C.: NASA. Retrieved from https://www.nasa.gov/about/index.html

Needle, D. (2004). *Business in context: An introduction to business and its environment* (4th ed.). London: Thomson Learning.

Obama, B. H. (2015, February). *National security strategy*. Washington, DC: Office of the President of the United States.

Osborne, D. (1993). Reinventing government. *Public Productivity & Management Review, 16*(4), 349-356.

Perry, S., & Katco, J. (2016, July). *Misconduct at TSA threatens the security of the flying public.* Washington, D.C.: Homeland Security Committee. Retrieved from https://homeland.house.gov/wp-content/uploads/2016/07/TSA-Misconduct-Report.pdf

Schein, E. H. (1985). *Organizational culture and leadership: A dynamic view.* San Francisco, CA: Jossey-Bass.

Schultz, M. (1994). *On studying organizational cultures: Diagnosis and understanding*. Berlin: de Gruyter.

Smith, J. B., Vogel, J. M., Cruce, T. L., Seidel, S., & Holsinger, H. A. (2010, March). Adapting to climate change: A call for federal leadership. Arlington, VA: Pew Center on Global Climate Change. Retrieved from http://www.c2es.org/docUploads/adaptation-federal-leadership.pdf

Snyder, J. (1977). *The soviet strategic culture: Implications for nuclear operations*. Santa Monica, CA: RAND Corporation.

Spahr, P. (2015a). What is charismatic leadership? Leading through personal conviction. Miami Gardens, FL: St. Thomas University. Retrieved from http://online.stu.edu/charismatic-leadership/

Spahr, P. (2015b). What is servant leadership? Achievement through service to others. Miami gardens, FL: St. Thomas University. Retrieved from http://online.stu.edu/servant-leadership/

Spahr, P. (2015c). What is transactional leadership? How structure leads to results. Miami gardens, FL: St. Thomas University. Retrieved from http://online.stu.edu/transactional-leadership/

Spahr, P. (2015d). What is transformational leadership? How new ideas produce impressive results. Miami gardens, FL: St. Thomas University. Retrieved from http://online.stu.edu/transformational-leadership/

The White House. (2013a). *The president's climate action plan*. Washington, D.C.: Executive Office of the President of the U.S.

The White House. (2013b). *Executive order—preparing the United States for the impacts of climate change* (EO-13653). Washington, D.C.: Executive Office of the President of the U.S.

The White House. (2015). *National security strategy*. Washington, D.C.: Executive Office of the President of the U.S.

U.S. Department of Defense (DoD). (2014a). *Department of defense 2014 climate change adaptation roadmap*. Washington, D.C.: Secretary of Defense.

U.S. Department of Defense (DoD). (2014b). *Strategic sustainability performance plan*. Washington, D.C.: Secretary of Defense.

U.S. Department of Defense (DoD). (2014c). *Quadrennial defense review 2014*. Washington, D.C.: Secretary of Defense.

U.S. Department of Defense. (DoD). (2016, January 14). *DoD directive 4715.21: Climate change adaptation and resilience*. Washington, D.C.: Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics.

U.S. Department of Health & Human Services (HHS). (2015, June 2). Health care: The affordable care act is working. Washington, D.C.: HHS. Retrieved from http://www.hhs.gov/healthcare/facts-and-features/fact-sheets/aca-is-working/index.html

U.S. Department of Homeland Security (DHS). (2012, June). *Department of homeland security climate change adaptation roadmap*. Washington, D.C.: DHS.

U.S. Department of Homeland Security (DHS). (2014, June). *DHS climate action plan: Addendum*. Washington, D.C.: DHS.

U.S. Department of Homeland Security (DHS). (2015, November 23). *Investigation of DHS employee corruption cases*. Washington, D.C.: DHS.

U.S. Department of State (DoS). (2014). *Climate change adaptation plan*. Washington, D.C.: DoS.

U.S. Department of the Interior (DoI). (2016). Bureaus & Offices. Washington, D.C.: DoI. Retrieved from https://www.doi.gov/bureaus

Van Wart, M. (2003, March/April). Public-sector leadership theory: An assessment. *Public Administration Review, 63*(2), 214-228.

Weber, M. (1947). *Max Weber: The theory of social and economic organization*. (A. M. Henderson & T. Parsons, Trans.). T. Parsons, (Ed.). New York: Collier-Macmillan Limited.

Yurkovich, E. (2012, February). *Climate change adaptation: What federal agencies are doing*. Arlington, VA: Center for Climate and Energy Solutions. Retrieved from http://www.c2es.org/docUploads/federal-agencies-adaptation.pdf

Appendix A: U.S. Army Corp of Engineers Report "Highlights"

Department of Defense (DoD)

The USACE report documented the following "Highlights" about the DoD's efforts:

(1) Wrapping up high level vulnerability assessment of 7,000 bases, installations, and other facilities (p. 2);

(2) Working to address projected sea level rise (SLR) of 1.5 feet in the Hampton Roads region in Virginia which houses the largest concentration of U.S. military sites in the world (p. 2);

(3) Establishment of Climate Change Adaptation Working Group (CCAWG) in December 2012 (p. 5);

(4) Strategic Environmental Research and Development Program (SERDP) published report *Assessing Impacts of Climate Change on Coastal Military Installations: Policy Implications* (p. 10);

(5) Researched how increased temperature trends and changes in the fire regime in interior of Alaska will impact thawing permafrost and effects on hydrology, access to training lands, and infrastructure (p. 10);

(6) Arctic Strategy and Navy Arctic Roadmap (p. 11);

(7) February 2014 Floodplain Management Policy (p. 13);

(8) Shares earth-space environmental data such as weather observations and satellite-derived wind profiles (p. 14).

Department of State (DoS)

The USACE report documented the following "Highlights" about the DoS's efforts:

(1) Supported the U.S. Global Change Research Program (USGCRP)'s 2014 National Climate Assessment (p. 7), Intergovernmental Panel on Climate Change (IPCC)'s Fifth Assessment Report (p. 7), and IPCC's Special Report on Extreme Events (p. 7);

(2) Co-chaired Global Adaptation Partnership (p. 7);

(3) Annual Greening Activities Inventory (p. 8, p. 10);

(4) Using information gathered in the Integrated Logistics Management System (ILMS) to understand supply chain risks, including demand planning capabilities (p. 9);

(5) All domestic leased or government-owned space over 5,000 square feet is Leadership in Energy and Environmental Design (LEED) Silver certified. (p. 10), including LEED platinum net-zero building in Charleston, South Carolina (p. 10);

(6) 2nd edition of Guide to Green Embassies: Eco-Diplomacy in Operation provides direction for building and maintaining on-site wetlands and rainwater catchments for irrigation purposes, and to lessen the Department's water usage footprint in vulnerable regions (p. 10);

(7) Policy guidance that includes strategic goal of "Promoting the Transition to a Low-Emission, Climate-Resilient World while Expanding Global Access to Sustainable Energy" (p. 12);

(8) Friends of the Nansen Initiative: examine protection needs associated with cross-border population movements linked to natural disasters, including climate change-related disasters (p. 13);

(9) Active member of the Global Environment Facility's Least Developed Countries Fund (LDCF) and Special Climate Change Fund (SCCF) Council (p. 14);

(10) Contributes funding to the Global Climate Observing System (GCOS) (p. 15);

(11) Highlighted geographic locations at risk: (a) Africa (p. 16-17) including Ethiopia (p. 20), (b) East Asia and Pacific (p. 17), including Maldives (p. 19), (c) Central America (p. 19), (d) Chile (p.19), and (e) Canberra (p. 20);

(12) International adaptation assistance targets: least developed countries, Africa, Small Island Developing States, and glacier-dependent countries through Least Developed Countries Fund and Special Climate Change Fund (p. 18);

(13) Over 150 US diplomatic posts have active green teams focused on overall sustainability activities (p. 20);

(14) Pilot of Capitals Forum program in Washington, D.C. area, with over 77 foreign diplomatic missions entering into a sustainability pledge with the local DC government (p. 22).

Department of Homeland Security (DHS)

The USACE report documented the following "Highlights" about the DHS's efforts:

(1) Arctic: (a) U.S. Coast Guard's May 2013 Arctic Strategy (p. 3), (b)Enhance Operation Arctic Shield (p. 16), (c) Recapitalize Polar Icebreaking (p. 16), and (d) Improve arctic communications capabilities (p. 16);

(2) Resilience Summit promoting building codes adoption in September 2013 (p. 8);

(3) Assessing exposure of DHS facilities to flood risk (p. 14);

(4) National Biosurveillance Integration Center (NBIC) monitors how climate change impacts may worsen conditions that influence or contribute to bio-threats (p. 20);

(5) United States Citizen and Immigration Services (USCIS) identifying possibility to account for "environmental refugees" (p. 21).

Appendix B: U.S. Army Corp of Engineers Report "Crosswalk" Results

In addition, the USACE researchers conducted "a crosswalk between the USACE Adaptation Plan and the other 37 adaptation plans submitted to the White House in 2014 and the President's Climate Action Plan (PCAP)" (Conners, White, & Arnold, 2015, p. 19).

President's Climate Action Plan (PCAP)
CUT CARBON POLLUTION IN AMERICA
(1)   Deploying Clean Energy (2)   Building a 21st Century Transportation Sector (3)   Cutting Energy Waste in Homes, Businesses, and Factories (4)   Reducing Other Greenhouse Gas Emissions (5)   Leading at the Federal Level
PREPARE THE UNTIED STATES FOR THE IMPACTS OF CLIMATE CHANGE
(1)   Building Stronger and Safer Communities and Infrastructure (2)   Protecting our Economy and Natural Resources (3)   Using Sound Science to Manage Climate Impacts
LEAD INTERNATIONAL EFFORTS TO ADDRESS GLOBAL CLIMATE CHANGE
(1)   Working with other Countries to Taking Action to Address Climate Change (2)   Leading Efforts to Address Climate Change through International Negotiations

Source: (Conners, White, & Arnold, 2015, p. 19).

The USACE conducted a Crosswalk that revealed current and specific efforts in each agency's adaptation plans to meet primary goals identified in the PCAP. Any areas not identified in the table below have not been addressed by the agencies' Adaptation Planning.

CUT CARBON POLLUTION IN AMERICA			
General Progress	DoD	DoS	DHS
(1) Deploying Clean Energy			
(2) Building a 21st Century Transportation Sector			
(3) Cutting Energy Waste in Homes, Businesses, and Factories		p. 17	p. 19
(4) Reducing Other Greenhouse Gas Emissions			
(5) Leading at the Federal Level			
PREPARE THE UNITED STATES FOR THE IMPACTS OF CLIMATE CHANGE			
I. Building Stronger and Safer Communities and Infrastructure			X
I. Building Stronger and Safer Communities and Infrastructure a. Building Coastal Resilience	X		X
I. Building Stronger and Safer Communities and Infrastructure a. Building Emergency Preparedness:	X	X	
I. Building Stronger and Safer Communities and Infrastructure a. Building LEED Certified Buildings	X	X	
II. Protecting our Economy and Natural Resources a. Protecting our Economy and Natural Resources	R		R
II. Protecting our Economy and Natural Resources a. Protecting Fisheries/Fish Stocks		p. 17	
II. Protecting our Economy and Natural Resources a. Protecting the Health Sector	X	p. 8	X
III. Using Sound Science to Manage Climate Impacts:		X	R
LEAD INTERNATIONAL EFFORTS			
(1) Working with Other Countries to Taking Action to Address Climate Change	X	X	X
(2) Leading Efforts to Address Climate Change through International Negotiations			

An "X" indicates that specific examples are listed in the rows below, while a page number means that the adaptation plan mentioned the topic but a specific example is not provided. When specific actions or progress are mentioned, the page number where the information can be found is listed. All page numbers listed reflect the page number displayed in the white box of the .pdf document, or the page number referred to as page #/## within the .pdf document, not necessarily the page number at the bottom of each page within the Adaptation Plan.

(1) Specific Examples of Progress rows: After the "General Progress" row there are rows listed for specific examples of progress mentioned in the adaptation plan.

(2) A p.#(#) provides the page number within the report that the example was listed so users can readily access the adaptation plan for more information.

(3) An 'R' in this row indicates that mention of this area of progress was made in another agency's report, and therefore the page number can only be listed for the agency that mentioned the area of progress.

Appendix C: U.S. Army Corp of Engineers Report—Agency "Needs", "Resilience Comments", "Enhancing Coordination", and "Interagency Efforts"

The USACE report also lists needs that were specified in adaptation plans submitted to Council on Environmental Quality (CEQ) and Office of management and Budget (OMB) in 2014.

AGENCY	NEED(S)
Department of Defense (DoD)	Shared use of training and testing assets. Collaboration on: sustainable infrastructure, encroachment challenges, best practices, and adaptation strategies (p. 15).
Department of Homeland Security (DHS)	Tools to make the economic case for change required for financing resilient investments (p. 17).
Department of State (DoS)	

The USACE report also identified instances where "resilience" was discussed in the adaptation plans submitted to CEQ and OMB in 2014.

Resilience in Adaptation Plans	DoD	DoS	DHS
Cooperation with partner nations to enhance planning, responses, and resilience to the effects of climate change	p. 15		
The U.S. Department of Housing and Urban Development (HUD) established an internal HUD Resilience Council to align new approaches involving key HUD programs with investments that enhance resilience to the effects of climate change and other natural disasters			p. 4
Work with other Departments to ensure that adverse effects of climate change on health are incorporated into the Community Health Resilience Initiative			p. 5
In September 2014, a Senior Level Exercise will take place to include members of the White House Council on Climate Preparedness and Resilience			p. 8
The National Institute of Building Science (NIBS), the Council on Environmental Quality (CEQ), and DHS hosted a Resilience Summit promoting building codes adoption on September 19, 2013			p. 8
DHS will study the Resilience STAR pilot program to determine applicability for infrastructure resilience more broadly			p. 9
National Drought Resilience Partnership with FEMA and other interagency partners with strategies in sectors such as agriculture, municipal water systems, energy, recreation, tourism, and manufacturing			p. 18
The DOL capital equipment investment in information technology infrastructure and the move to the cloud increases resilience		p. 6	
Conducted internal survey in 2014 for all functional, policy, program, and regional bureaus to organize and highlight climate resilience activities		p. 9	
Incorporating climate adaptation and resilience into its broader strategic planning activities, including consideration for inclusion in the next iteration of the QDDR		p. 16	
Laid out an objective with USAID in the FY15-FY17 strategic plan to assist countries in the East Asia Pacific region to increase climate resilience		p. 17	
Strengthening resilience in small island developing states and glacier-dependent countries		p. 18	
Planning to incorporate sustainability modules with resilience/adaptation components into select entry-level Foreign Service officer (FSO) orientation training courses		p. 21	
Climate resilient actions through FY 17		p. 22	

In January 2015, *Executive Order Enhancing Coordination of National Efforts in the Arctic* was released. This Appendix lists actions listed in the adaptation plans submitted to CEQ and OMB in 2014 relating to this important polar region.

ENHANCING COORDINATION OF NATIONAL EFFORTS IN THE ARCTIC			
General Progress	DoD	DoS	DHS
	X	X	

The USACE also listed Interagency Efforts mentioned in the adaptation plans submitted to CEQ and OMB in 2014.

INTERAGENCY EFFORTS			
General Progress	DoD	DoS	DHS

The USACE also listed actions mentioned in the adaptation plans submitted to CEQ and OMB in 2014 relating to Hurricane Sandy.

INTERAGENCY CASE STUDY: HURRICANE SANDY			
General Progress	DoD	DoS	DHS

Appendix D: Congressional Research Service (CRS) Report Adaptation Plans Summaries

Department of Defense (DoD)

The DoD is acutely aware of and planning for the geopolitical and national security implications of the current and expected impact of climate change. For example, the DoD "expects that thawing permafrost and rising sea levels will affect military training, installations, and land management in some locations" and this expectation drives and are focal points for several research projects that are analyzing the potential consequences of climate change (Leggett, 2015, p. 4). In addition, "the Air Force has found that the combination of thawing permafrost, decreasing sea ice, and rising sea levels on the Alaskan coast has increased coastal erosion at several Air Force radar early-warning and communication installations" (Leggett, 2015, p. 48).

The DoD is considered by CRS as the department that is further along with mainstreaming climate change information onto the planning and programming processes. A DoD leader asserted, "rather than creating a stovepipe within the DOD organizational structure to deal with climate change; we are going to integrate climate change considerations into the normal processes, the day-to-day jobs of everybody" (Conger, 2013, as cited in Leggett, 2015, p. 19). The DoD has identified the following risks to their operations as a result of climate change:

(1) Arctic sea ice melting allows increased activity in the Far North, prompting the U.S. Coast Guard and DOD to increase attention to an evolving Arctic Strategy for safety, security, resource development, and environmental protection.

(2) DOD, in its FY 2014 Climate Change Adaptation Roadmap, concluded that: "A changing climate will have real impacts on our military and the way it executes its missions. The military could be called upon more often to support civil authorities, and provide humanitarian assistance and disaster relief in the face of more frequent and more intense natural disasters. Our coastal installations are vulnerable to rising sea levels and increased flooding, while droughts, wildfires, and more extreme temperatures could threaten many of our training activities. Our supply chains could be impacted, and we will need to ensure our critical equipment works under more extreme weather conditions. Weather has always affected military operations, and as the climate changes, the way we execute operations may be altered or constrained. The report further noted that climate change-related effects had been observed at DOD facilities (Leggett, 2015, p. 21).

The DoD has divided the risks from climate change into two broad categories:

(1) Climate change could affect the type, scope, frequency, tactics, and location of military operations worldwide.

(2) Climate change could impact the force structure and the effectiveness and configuration of bases, training facilities, and other infrastructure the DoD relies upon to execute its mission (Leggett, 2015, p. 49).

The DoD anticipates that climate change is and will have a negative effect on military operations and "can serve as a catalyst for conflict between nations, instability within nations, and more severe or frequent natural disasters and humanitarian crises" (Leggett, 2015, p. 49). Climate change can also exacerbate conflict and instability by expanding poverty, environmental degradation, fragility of weak governments, and food and water scarcity (Leggett, 2015, p. 50). Internally, the DoD is currently experiencing negative impacts on installations, readiness, and mission assurance as a result of climate change. Sea level rise, storm surges, drought, scarce water resources, extreme heat, flooding, and other extreme weather events are impacting military installations worldwide (Leggett, 2015, p. 52).

The DoD has responded by creating an *FY 2014 Climate Change Adaptation Roadmap* that outlines three broad goals in regard to climate change:

(1) Identifying and assessing the effects of climate change,

(2) Managing risks associated with climate change by integrating climate change considerations into department planning and policy,

(3) Collaborating with other agencies, foreign government, international organizations, and industry to meet the challenges of climate change (DoD Adaptation Roadmap, 2014, p.1).

These goals are also augmented by additional goals to reduce energy, water, and fuel use along with a reduction in greenhouse gas emissions and increased use of sustainable practices throughout the DoD. These efforts are more in-line with mitigation and sustainable development policies and efforts. The DoD is also active in climate change research, system modeling, environmental process modeling and developing assessment and adaptation methods (Leggett, 2015, p. 54).

Military departments within the DoD are each responsible for overseeing the implementation of the *FY 2014 Climate Change Adaptation Roadmap.* The Army, Air Force, and Navy all have programs and policies addressing the Roadmap, and the Navy's climate change adaptation programs are considered the most advanced in the DoD (Leggett, 2015, p. 56).

Department of State (DoS)

The DoS "considers climate change to be a threat multiplier that potentially puts at risk not only the department's facilities and personnel" but also its mission to "create a more secure, democratic, and prosperous world for the benefit of the American people and the international community". State's 2010 QDDR highlights climate change as one of six development areas targeted for action" (Leggett, 2015, p. 95). With over 275 posts worldwide the DoS recognizes that climate change has and will make many areas of the planet vulnerable to climatic changes that could increase instability and conflict.

The DoS is responding to the risks created by climate change by "(1) using reporting, planning, and training to integrate adaptation policies in both domestic and international operations; (2) promoting integration of adaptation policies into "at risk" sectors such as agriculture and disaster risk management, while also implementing policies for adaptation internationally; and (3) encouraging multilateral entities to pursue adaptation policies" (Leggett, 2015, p. 96). One of the major agencies within the DoS is tasked with helping the DoS adapt to climate change is the USAID. In coordination with DoS, USAID has set the following priorities:

(1) Promoting the transition to a low-emission, climate resilient world while expanding global access to sustainable energy;

(2) Enhancing U.S. leadership on global climate change;

(3) Advancing scientific understanding of climate change impacts and adaptation actions; and

(4) Coordinating with other federal agencies, such as USAID, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA), DOI, the U.S. Department of Agriculture (USDA), and the Treasury, and partnering with other countries, to advance climate change policy through various multilateral fora such as the United Nations Framework Convention on Climate Change, the Intergovernmental Panel on Climate Change, and the Global Environment Facility, as well as other international financial institutions and organizations that support adaptation activities in developing countries (Leggett, 2015, p. 96).

Department of Homeland Security (DHS)

The CRS report only reviewed the efforts by the DHS's FEMA. FEMA was found to be a leader nationwide in leading efforts to adapt to extreme weather event generated by climate change. In addition, FEMA "is primarily working to integrate climate change adaptation into existing programs and policies that mitigate these threats, as opposed to developing additional, climate change-specific programs/policies" (Leggett, 2015, p. 69). FEMA's strategic plan identified specific actions that are needed to "integrate climate change adaptation planning into existing programs, policies, and operations" (Leggett, 2015, p. 70). These efforts to mainstream climate change adaptation action into planning are ongoing, and have not produced any specific results. FEMA has also contributed to several DHS policy documents concerning climate change including the 2010 *Climate Change Adaptation Report*, the 2012 *Climate Change Adaptation Roadmap*, the 2013 *DHS Climate Action Plan*, and the 2014 "Addendum" to the 2013 *DHS Climate Action Plan* (Leggett, 2015, p. 70).

One major concern by FEMA leadership identified by CRS was: "A general lack of specific funding for climate change adaptation may reflect FEMA's objective to integrate adaptation activities into existing programs, thus making it difficult to specifically identify funding for adaptation activities in appropriated resources for current programs. Arguably, any funding directed toward the general goal of emergency preparedness may assist the nation as it adapts to changing likelihoods of extreme weather events, in addition to other disasters" (Leggett, 2015, p. 72).

Appendix E: Pre-Interview Questionnaire

Name: _____

Position: _____

Contact Information:

    _____

    _____

Questions:

    (1) How does your agency frame climate change i.e., what kind of threat to national security is climate change?

    (2) How is your agency addressing the national security ramifications of climate change (CC)??

    (3) What vulnerabilities does climate change create for the mission of your agency?

    (4) What vulnerabilities does climate change create to agency property?

    (5) What vulnerabilities does climate change create for agency operations?

    (6) What vulnerabilities does climate change create for agency personnel?

    (7) How is your agency addressing the mission-related vulnerabilities created by climate change?

    (8) How is your agency addressing the property-related vulnerabilities created by climate change?

    (9) How is your agency addressing the operations-related vulnerabilities created by climate change?

    (10) How is your agency addressing the personnel-related vulnerabilities created by climate change?

Appendix F: Interview Survey

Thank you for taking the time to discuss how your department handles the challenges of climate change. Let's discuss climate preparedness and resilience first:

(1) Does your department consider climate change a core issue or a peripheral environmental concern? Why?

(2) Can you describe steps that your department has taken to improve climate preparedness and resilience?

Processes! Each agency needs to follow specific processes: (a) structural processes (engineered, technological, ecosystem-based); (b) institutional processes (laws/regulations, policies, programs, services, economic); (c) societal processes (educational, informational, behavioral, social services, sociodemographic).

(3) Which processes used by your department are effectively addressing the climate change related impacts on and risks to the department's ability to accomplish its missions, operations, and programs? Which processes have hindered your Department? Why?

(4) Is the organizational culture of your department helpful or a barrier to efforts to adapt to climate change? Please explain your response.

Let's take a moment at current programs and pilot studies:

(1)   Does your department have any pilot programs or demonstration project related to adaptation efforts on-going? If so, what and where are they?

(2)   What actions has your department taken to reduce vulnerabilities to climate change?

Let's look at adaptation efforts from your department for a few minutes:

(1) Have adaptation actions been developed and prioritized? Is so, what are they? Who made the call (Top-down, Bottom-up)?

(2) How would you describe the organizational culture of your department? How does that culture impact the ability to address effectively challenges associated with climate change?

Examples of organizational culture: (a) Clan culture (internal focus and flexible)—A friendly workplace where leaders act like father figures; (b) Adhocracy culture (external focus and flexible)—A dynamic workplace with leaders that stimulate innovation; (c) Market culture (external focus and controlled)—A competitive workplace with leaders like hard drivers, or (d) Hierarchy culture (internal focus and controlled)—A structured and formalized workplace where leaders act like coordinators.

We can only imagine challenges associated with addressing climate changes within your department. Current "barriers" to effective adaptation include: Limited resources, insufficient information on climate change, and a lack of clear roles/responsibilities among federal, state, and local agencies. Are these still barriers and have any new barriers merged? If so, what are they?

Long-term impacts of climate change: What aspects of climate change likely to impact your department's ability to achieve its mission and sustain its operations and respond strategically?

A look at the future: What still needs to be done within your department to improve climate preparedness and resilience?