New, Old, and Reconfigured: Exploring the U.S. Department of Homeland Security’s Path to Climate Security

By Jeremiah O. Asaka and Magdalena M. Denham
Abstract

The creation of U.S. Department of Homeland Security (DHS) was primarily driven by 9/11. Thus, at creation, DHS was laser-focused on terrorism. However, since 9/11, the global and domestic security threat landscape has changed significantly and, in part, influenced DHS’ shift towards an all-hazards approach. Climate change, for example, is today an established global and domestic security concern. This case study explores DHS’ shift towards an all-hazards approach and focuses specifically on climate change – a known threat multiplier. The case study is based on a review of key DHS strategic documents and examines three DHS agencies: Federal Emergency Management Agency (FEMA), U.S. Customs and Border Protection (CBP), and Transportation Security Administration (TSA). The case study establishes that significant variation exists between FEMA, CBP, and TSA with regards to their treatment, or lack thereof, of climate change. The article concludes with recommendations for future policy and research.

Suggested Citation


Introduction

The purpose of this study is to explore and document change in the U.S. Department of Homeland Security (DHS) focus over time from its initial emphasis on terrorism to current concern about all hazards, and in particular climate change. Climate change – the long-term changes in earth’s climate system driven by human and natural factors and effecting changes in temperature, rainfall, and wind patterns1 – has been an issue of national concern in the United States for several decades now. Testifying before the Committee on Energy and Natural Resources of the U.S. Senate, James E. Hansen – the then Director of the National Aeronautics and Space Administration (NASA) Goddard Institute for Space Studies – pointed out that,

> the earth is warmer in 1988 than at any time in the history of instrumental measurements... global warming is now large enough that we can ascribe with a high degree of confidence a cause and effect relationship to the greenhouse effect. And... our computer climate simulations indicate that the greenhouse effect is already large enough to begin to affect the probability of extreme events such as summer heat waves.2

His statement and those of others like Daniel J. Dudek, Syukuro Manabe, William R. Moomaw, Michael Oppenheimer, and George M. Woodwell who testified alongside him in Congress on June 23, 1988 served to cement climate change’s place as a public policy issue of concern in the United States.
In 1989, President Ronald Reagan proposed the establishment of the U.S. Global Change Research Program (USGCRP) to coordinate the study of global change at the federal level. The following year, President George H. W. Bush signed the Global Change Research Act of 1990 (GCRA) into law thereby effectively establishing USGCRP as a “comprehensive and integrated United States research program which will assist the Nation and the world to understand, assess, predict, and respond to human-induced and natural processes of global change.”

Refer to table 1 for the federal agencies that comprise USGCRP. Section 2(3) of GCRA defines global change as “changes in the global environment (including alterations in climate, land productivity, oceans or other water resources, atmospheric chemistry, and ecological systems) that may alter the capacity of the Earth to sustain life.”

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Note: This table details the 14 federal agencies that make up USGCRP. The inclusion of Department of Defense at the inception of USGCRP offers insight into how long climate change has been perceived by U.S. federal government as an issue with actual/potential implications for U.S. national security. Moreover, inclusion of DHS as a member of USGCRP in 2023 shows that climate change is a significant homeland security concern.

Since its establishment, USGCRP has produced four National Climate Assessment (NCA) reports and is currently working on the fifth NCA report expected to be out sometime this year (2023). The quadrennial NCA, mandated by GCRA, is an assessment of the state of climate change science and impacts in the U.S. context. The most recent NCA report finds that climate change is already impacting the United States with risks being higher for the already vulnerable including the poor and minority communities. The report further notes that climate change adaptation and/or mitigation related action(s) may pose new risks or worsen existing vulnerabilities such as poverty and poor health if not well thought out.
At the international level, six successive Intergovernmental Panel on Climate Change (IPCC) assessment reports have consistently established that the current observed increase in rate of change in the climate system is attributable to burning of fossil fuels, land use change, and other human-induced processes. Greenhouse gases – produced mainly from burning of fossil fuels such as oil, coal, and natural gas – are the main culprits in anthropogenic climate change. Greenhouse gases cause climate change by trapping heat in the atmosphere thereby raising the temperature of the planet. A growing body of climate science literature establishes that “higher temperatures tend to have various negative implications for nature and humans, including more severe droughts, floods, extreme weather events, and sea-level rise.”

Over the past several years, there have been numerous attempts by state and non-state actors at all levels of governance to combat climate change and its associated socio-ecological impacts with varying degrees of success. At the global level, these efforts are exemplified in such outcomes as the Kyoto protocol, Paris agreement, the post-2015 development agenda, Glasgow Climate Pact, Partners in the Blue Pacific, and the Comprehensive Africa Climate Change Initiative (CACCI) among others. In the United States, similar efforts are exemplified in at least five areas as follows: first, the U.S. federal government’s continued engagement in global climate change negotiations; second, the U.S. National Academies’ continued involvement in climate change research; third, on-going uptake and mainstreaming of climate change policy consideration(s) at the U.S. federal government level; fourth, on-going uptake and mainstreaming of climate change policy consideration(s) at the U.S. state government level including counties, cities, and tribal governments; and fifth, climate action led by U.S. private and/or non-governmental sector.

In addition to being one of the major global environmental problems of the 21st century, climate change is today also widely regarded as a significant security concern alongside pandemics, loss of biodiversity, armed conflict (including violent extremism and terrorism), and rise in number of refugees and internally displaced persons among others. In recognition of the interplay between security and climate change, the IPCC – a global body charged with assessing the state of climate change science and impacts around the world – dedicated an entire chapter of its fifth assessment report to exploring human security within the context of a changing climate. The IPCC’s sixth assessment report (the most recent IPCC report) finds that climate change negatively impacts aspects of human security including food security, health security, and economic security among others; and notes, in part, that climate change “impacts and risks are becoming increasingly complex and difficult to manage.” In the next sub-section, we provide a brief review of the climate-security nexus literature.

Climate Change and Security Nexus

Social scientists have been interested in the relationship, or lack thereof, between security and the Environment since at least the late-80s or early-90s. Early work on the topic primarily focused on understanding the role of natural resources in war (or violent conflict) and/or the impact of war (or armed conflict) on the environment. A later offshoot of this research agenda focused on the role of natural resources in conflict resolution and peacebuilding/peacemaking. Since the early 2000s, the research agenda has expanded further to include the climate-security nexus.
In this regard, climate-security nexus scholarship should be understood as an extension (and/or dimension) of the broader environmental security scholarship. Climate-security nexus scholars seek to bring about understanding of the interaction(s) between climate change and security.

Environmental security researchers and analysts typically focus on one, or a juxtaposition of any, of the following levels of analysis: Global, transnational, international, national, subnational, community, and/or individual. Because of the inherently contested nature of the security concept, such analyses are based on varying understanding of what security actually means. Some of the conceptualizations of security commonly employed in environmental security research and analysis include national security, human security, international security, and ecological security. We frame this article within an emerging homeland security scholarship on the climate-security nexus.

On a macro scale level, climate-security nexus literature establishes that there is a two-way relationship between climate change and security. On one hand, the interplay between climate change and security plays out in at least three different ways as follows. First, climate change acts as a threat multiplier that worsens existing security-related risks and vulnerabilities. For example, climate change increases the intensity and frequency of extreme weather events such as hurricanes among others. Extreme weather events are a major threat to state and human security across the world. Second, climate change can contribute to the emergence of new security-related risks and/or vulnerabilities. For example, Arctic ice melt is opening new routes in the Arctic with implications for geopolitics and security of Arctic people and States. Third, climate change adaptation and/or mitigation action(s) can have negative effects and contribute to security-related risks if not well thought out. For example, numerous case studies of REDD+ initiatives (especially in the developing world) show that, in most contexts, such initiatives disrupt local norms and leave the already vulnerable local community members worse off. REDD+ is a framework that guides activities aimed at reducing greenhouse gas emissions from deforestation and forest degradation. It was created by the 19th Conference of Parties (COP 19) to the United Nations Framework Convention on Climate Change (UNFCCC) to guide sustainable management and conservation of forests particularly in the developing world. On the other hand, the security sector contributes to the global environmental problem of climate change in at least two ways. First, the military industrial complex is heavily reliant on fossil fuels for its energy. Fossil fuels produce greenhouse gases which are the primary cause of anthropogenic climate change. Second, war and armed conflict destroy the Environment either through pollution (i.e., air, water, and land pollution) or decimation of tree cover or forests. Trees and/or forests act as an important carbon sink. Thus, destruction of tree cover or forests contributes to climate change.

At the micro scale level, emerging homeland security literature on the climate-security nexus focuses on the interplay between climate change and U.S. domestic security. The literature explores both local and international dimensions of the nexus. As with other types of security, climate change impacts homeland security through a variety of indirect pathways. A dominant pathway discussed in the homeland security literature involves a sort of cascading effect where climate change influences the frequency and intensity of extreme weather events (e.g., storms, floods, wildfires, heat waves, and cold spell) that in turn produce devastating impacts which leave people and critical infrastructure vulnerable and insecure. For example, these effects were seen during the 2021 Texas winter freeze, 2022 California wildfires, 2022 Eastern Kentucky floods, 2022 U.S. West heatwave,
and 2005 U.S. Gulf Coast’s Hurricane Katrina among others. Climate change also contributes to the unfolding migrant crisis on the U.S. southern border through its negative impacts on food and economic security in Central America. Furthermore, climate change has been found to worsen social vulnerability in certain terrorism-affected regions of the world thereby presenting terror groups with recruitment opportunities. In effect, climate change indirectly contributes to terrorism abroad with implications for U.S. national and homeland security. Terrence O’Sullivan, a leading homeland security studies academic, points out that climate change is likely to be the driver of all insecurities in the not-so-distant future if action is not taken to address it.

In this article, we focus on DHS, which came into existence following 9/11. At the time of its founding, DHS was primarily concerned with terrorism. But considering the emergence of climate change as a major security concern/issue in the last two decades or so, we specifically seek to understand how DHS has evolved its policy and/or practice, if at all, in light of climate change. Our case analysis is guided by three broad questions as follows. How has DHS treated climate change at the strategic level over time since its inception? How has DHS responded to the emergence of climate change as a major security concern/issue? What are the differences/similarities, if any, in how individual DHS agencies have responded to the emergence of climate change as a major security concern/issue? In the next sub-section, we provide an overview of DHS with 9/11 as an analytical starting point (and a landmark event that brought about new thinking in U.S. national and domestic security).

**DHS: An Overview**

In the wake of the seismic events of 9/11, the United States engaged in the largest reorganization of its government since the post-Second World War (WWII) era when the National Security Act of 1947 came into existence. Consequently, the DHS was established by the Homeland Security Act of 2002 as an executive federal agency tasked with safeguarding domestic safety and security. The creation of DHS involved merger of hitherto free-standing agencies (some with cabinet-level authority), non-free-standing agencies housed in various executive departments, and newly created agencies that did not exist prior to 9/11. Table 2 provides a summary of old, new and/or reconfigured agencies that exist today relative to old agencies that existed in the lead up to 9/11.

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<th>Old agencies that existed in the lead up to 9/11</th>
<th>Old, new, and/or reconfigured agencies in existence today</th>
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<td>The U.S. Customs Service (Treasury)</td>
<td>U.S. Customs and Border Protection (CBP)</td>
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<td>The Immigration and Naturalization Service (Justice)</td>
<td>U.S. Immigration and Customs Enforcement (ICE)</td>
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<tr>
<td>The Federal Protective Service</td>
<td>CBP, ICE, and U.S. Citizenship and Immigration Services (USCIS)</td>
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<td>The Transportation Security Administration (Transportation)</td>
<td>ICE until 2009: Now under the National Protection and Programs Directorate (NPPD)</td>
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<td>Federal Law Enforcement Training Center (Treasury)</td>
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Thus, in addition to becoming the third largest department of the U.S. government, DHS inherited a panoply of entities with dispersed legacies, histories, organizational cultures, and ethos – all factors with potential to complicate adoption of the new agency vision, mission, and/or strategy. Deficiency in leadership continuity during the first two decades of DHS existence only adds to the already complicated situation the organization finds itself in. Since its inception, DHS has been led by 15 Secretaries of Homeland Security. Moreover, 7 out of the 15 – nearly 50% – served in an acting capacity. Thus, with an average lifespan of 1.3 years in office, DHS leadership has continued to face tenure-security related challenges. It is within such a complex context that this case study sets out to explore DHS’ shift from a predominantly terrorism prevention-oriented mission towards an all-hazards-oriented mission with a particular focus on the agency’s treatment of climate change. In the next section, we discuss the methodological aspects of the case study including data upon which it is premised and how we went about gathering and analyzing the same.
Materials and Methods

This case study of DHS adopts an embedded case study design. An embedded case study comprises two or more sub-units for analysis to bring about deeper understanding of components in human and environmental systems and has been an accepted design in research on environmental literacy. The main unit of analysis was DHS with the two decades (i.e., 2002 to 2022) of its existence as the study period. Because we sought to understand change and continuity in the department’s policy and programs in response to the emergence of climate change as a security concern over the past two decades, data sources informing our assessment of the main unit of analysis include the department’s policies, frameworks, and foundational documents.

However, since DHS is a massive department that brings multiple old, new and/or reconfigured agencies together, the embedded unit analysis allowed our case to be more nuanced, faceted, and conceptually richer. Our sampling criterion for choosing a representative sample of DHS agencies was purposive and centered on those whose mission or function intersects with climate change specifically or environmental security generally. Patton points out that, “this strategy for purposeful sampling aims at capturing and describing central themes or principal outcomes that cut across a great deal of data variation.”

Moreover, to ensure representativeness, we selected three agencies for analysis from the list of old, new, and reconfigured DHS agencies. Our embedded units of analysis include an old agency (i.e., FEMA), a new agency (i.e., TSA), and a reconfigured agency (i.e., CBP). For embedded units of analysis, we sought to determine their institutional history, mission and function, climate security-related programs and initiatives, relevant climate change policies, and climate change adaptation/mitigation challenges.

Our sources of data consisted of a mix of DHS foundational documents, DHS strategy reports, DHS website, DHS action plans, Executive Office of the President reports, policy documents, other relevant government reports, and relevant scholarly publications. Our analysis was sequential and proceeded as follows. We first assessed the main unit of analysis for strategic positioning and contextualization. Then, we examined the three purposively selected individual agencies. Data analysis involved both document analysis (i.e., a qualitative method) and descriptive statistical analysis (i.e., a quantitative method). The former was based on a human-coded content analysis approach, while the latter was aided by Excel. Excel was specifically used to calculate totals, percentages, and visualize results. In the next section, we present and discuss the results of both analyses in a narrative format that also incorporates tables and graphs.
Results and Discussion

The Evolution of DHS Climate Security Policy

At inception, DHS foundational documents made no reference to either climate or environmental security writ large. In fact, only four agencies were proposed to comprise DHS: Border and Transportation Security (BTS), Emergency Preparedness and Response (EPR), Chemical, Biological, Radiological and Nuclear Countermeasures (CBRNC), and Information Analysis and Infrastructure Protection (IAIP). Moreover, the suggested three DHS missions – “Prevent terrorist attacks within the United States, Reduce America’s vulnerability to terrorism, and Minimize the damage and recover from attacks that do occur” – predominantly focused on the threat of terrorism. Notably, the Homeland Security Presidential Directive 7 (HSPD7) issued after the creation of DHS in December of 2003 proposed identification of Critical Infrastructure and Key Resources (CIKR) with the latter (i.e., key resources) represented by climate-sensitive sectors such as agriculture and water among others, but terrorism (and not climate change) was considered the most significant threat. In fact, it was not until 2007 (i.e., after Katrina) that the risks of weather-related disasters – revealed in the post-mortem of hurricane Katrina – were first articulated by DHS in the National Strategy for Homeland Security. The strategy recognized domestic risks beyond terrorism such as disasters and infectious diseases. But it would not be until the first Quadrennial Homeland Security Review Report (QHSRR) – released in February of 2010 – that DHS officially framed climate change as a homeland security concern. In part, the report noted that “Climate change is expected to increase the severity and frequency of weather-related hazards, which could, in turn, result in social and political destabilization, international conflict, or mass migrations.” The 2010 QHSRR outlined five core missions of the DHS including, among others, ensuring resilience to disasters.

A subsequent QHSRR of 2014, notably mirrors the pathways laid out to the nation in President Obama’s 2013 Climate Action Plan. The 2014 QHSRR specifically linked homeland security to natural hazards, disasters, pandemics, and climate change. DHS referred to climate change trends as threat multipliers that could indirectly impact poverty levels, environmental degradation, and social tensions. The report also indicated that weather patterns such as droughts and tropical storms could trigger legal and illegal population displacements and disaster-driven migrations as additional stressors to DHS operational environment. It further underscored that, “a devastating pandemic remains the highest homeland security risk.”

In a departure from the 2010 report, the 2014 report renamed DHS’s fifth mission as: Strengthen national preparedness and resilience. Thus, the 2014 QHSRR was very much aligned with President Obama’s Executive Order 13653 and the national strategy for climate action at the federal level by creating awareness of climate change impacts and steps toward climate adaptation within the Homeland Security arena.

Regrettably, despite the Climate Action Plan requiring federal agencies to adopt frameworks to address climate change, DHS did not produce a new strategy in the years from 2014 to 2021. In fact, the department did not publish a new Quadrennial Homeland Security Review Report
anticipated for 2018-2022, and its actions towards climate change planning reached a climate security nadir under the Trump administration. President Trump’s Executive Order 13783 rescinded climate-related presidential and regulatory actions to include President Obama’s Executive Order 13653.60

The foregoing notwithstanding, it is noteworthy that DHS issued the first ever Strategic Approach for Arctic Homeland Security in January of 2021.61 While disproportionately oriented towards future threats and foreign threats in the Arctic Region, the document advocated for expanded DHS activities related to natural events, including tsunamis, land fires, and earthquakes. The document also discussed the changing geographic environment such as frequency and severity of storms, coastal erosion, thawing of permafrost, and hazards related to disaster response and recovery. Importantly, the document signaled a shift towards environmental justice through inclusion of “Alaskan Natives representing generations of experience often seen as critical “first responders” in the region.”62 The inclusion of tribal elements in a new strategic approach to environmental issues in the Arctic aligned with the Executive Order 13175 of 2000 on consultation and coordination with Indian tribal governments. Thus, DHS Components were called to “strengthen United States government-to-government relationships” with federally recognized tribes and bolster Arctic Governance through Targeted, Enhanced National and International Engagement and Cooperation.63 Overall, the Strategic Approach for Arctic Homeland Security marked an important milestone in the development of DHS climate security orientation.

Finally, after nearly two decades of slow progress – and back and forth occasioned by realities of U.S. domestic politics – and buoyed by a renewed focus on climate action by the Biden administration as exemplified in Executive Order 14008 on ‘Tackling the Climate Crisis at Home and Abroad’,64 DHS has announced a ‘Strategic Framework for Addressing Climate Change.’65 With this strategic framework, DHS acknowledges that it operates on the frontlines of the climate crisis, highlights increasing and destructive weather-related catastrophes, and stresses the need to strategically forecast climate-induced risks.

Moreover, DHS announced coordination between the operating authorities of CBP, ICE, USCIS, and USCG to understand these risks and develop coordinated adaptation. This is quite significant as previous research underscored that DHS needed to build mass migration intelligence through a strategic foresight unit, tasked with mass-migration anticipation, and direct entities within DHS such as USCIS, ICE, CBP, and FEMA.66 In the next section, we present and discuss our findings on FEMA within the context of DHS path towards climate security.

The Old: FEMA and Climate Security

FEMA Pre-9/11
The impetus for creating FEMA in 1979 under the Carter administration stemmed from the month-long Three Mile Island nuclear power plant episode.67 Thus, when it was first established, among the agency’s primary goals were disaster relief, prevention, and mitigation.68 Given the potential environmental impacts of the nuclear incident, it can be argued that environmental security (and by extension climate security) was germane to the agency from its...
inception. Indeed, by mid 1990s – especially during the Clinton administration and particularly under the stewardship of FEMA Director James Witt, the notion of “all-hazards” comprehensive approach to emergency emerged. The approach aimed to deemphasize civil defense and terrorism and highlight hazard mitigation activities such as construction of weather-related hazard-resistant structures. Mitigation activities had been linked to “environmental benefits such as improved wildlife habitat, improved wetland functions, and increased water quality.” Under Witt, mitigation became the primary goal of FEMA. Subsequently, he expanded the agency by adding the Mitigation Directorate under it.

One of the most notable early mitigation efforts by FEMA that can be linked to environmental benefits was Project Impact (PI), which was launched in 1997 and introduced the concept of pre-disaster mitigation. Its broad goal was to invite community-based initiatives across local, state, federal, non-governmental, and private entities to address sustainable community development such as effective hazards planning yielding environmental dividends such as restoring wetlands, or creating park lands. Ultimately, PI spurred the creation of the Disaster Mitigation Act of 2000 (P.L. 106-390) which allowed FEMA to: (1) offer enhanced technological assistance in pre-disaster hazard mitigation measures to states and local jurisdictions, and (2) require states and local jurisdictions to engage in pre-disaster activities such as hazard mapping, planning, and development of hazard-sensitive building codes as conditions for federal post-disaster aid. In its design, the Act marked a demonstrable shift in FEMA’s philosophy to a proactive disaster policy approach. The Act was specifically designed to be implemented through the Hazard Mitigation Grant Program – a significant initiative in environmental planning and management.

Because the Act called for technology transfer in hazard identification and risk assessment, FEMA enhanced its risk assessment methodologies by the use of software such as HAZUS MH-MR1. Those developments aligned with parallel conversation between practitioners (some of whom like Michael Armstrong, Richard Krimm, or Arthur Zeizel were FEMA employees themselves) and academics affiliated with the Natural Hazards Center in Boulder, Colorado that culminated in an edited volume entitled Disasters by Design – a national assessment linking hazards and sustainability edited by Dennis Mileti. The assessment confirmed that environmental security was both on FEMA’s and researchers’ joint agenda which called for focus on: (a) changing Earth physical systems; (b) increase in severe weather events; and (c) increased vulnerability to environmental hazards due to population displacement, wealth inequality, and growth in the built environment. Remarkably, by early 2000s, FEMA had positioned itself as a government agency with a strong environmental security mission. But this was disrupted by the post 9/11 U.S. federal government reorganizations.

**FEMA in the Aftermath of 9/11**

Post 9/11 U.S. federal government reorganizations resulted in FEMA being absorbed by DHS under a top-down command-and-control model adopted by the Bush administration whose focus turned predominantly towards terrorism and response, and away from other threats and mitigation. The PI, whose initial effectiveness in enhancing community adaptation was confirmed in emerging research at the time, became a casualty of post 9/11 era reorganization as it was quietly dropped by the Bush administration. Some have pointed to PI’s distributive,
non-competitive, and small scale nature – i.e., selected communities like Wilmington, North Carolina in Ewing and Kruse’s 2002 study were chosen – in justifying its demise. Poignantly, Michael Brown – Administrator of FEMA under President Bush – admitted that, “Project Impact was dropped because the administration saw little value in funding what they believed to be frivolous community building activities.”

Prior to FEMA being put under DHS, it was an independent entity with direct congressional oversight. The move to DHS and implications of FEMA losing its independent agency status raised concern among some observers who feared that its natural disaster management mission could be diverted. James Witt testifying before the House of Representatives Subcommittee on National Security, Emerging Threats, and International Relations, and the Subcommittee on Energy Policy, Natural Resources and Regulatory Affairs in March of 2004, admitted that FEMA’s success as an agency was due to direct communications with the White House.

Following the move to DHS, FEMA not only became dependent on layers of larger bureaucracy, but it also suffered its critical functions being stripped and relocated elsewhere. In addition to mitigation efforts like PI being cancelled/dropped, many FEMA preparedness grant programs were first relocated to another office under DHS. Eventually, in January 2004 all FEMA preparedness activities were absorbed by a single directorate led by an Under-Secretary for Preparedness and the agency lost one of its essential roles.

Further, even though the Hazard Mitigation Grant Program under the Disaster Mitigation Act of 2000 was continued during the Bush presidency, researchers argued that the concept of mitigation became devalued, money appropriated by Congress was cut, grants were based on competitiveness versus recent disaster experience, and local contributions were raised making the concept of mitigation efforts cost-prohibitive among local jurisdictions. With the concept of mitigation being superseded by prevention and deterrence of terrorism activities, FEMA’s environmental security (and by extension climate security) focus became dimmed. Ironically, whereas DHS embraced the all-hazards approach birthed by Witt in its doctrinal documents, the ensuing calamity suffered as a result of the national response to hurricane Katrina in 2005 underscored the dilution of FEMA’s role in disaster relief during its initial years under DHS and shortcomings of the latter’s predominant focus on terrorism/counterterrorism. Beyond the many failures of national response to Katrina, FEMA’s dilution had drastic environmental consequences as well. For example, with regards to preparedness, environmental hazards were not properly identified or communicated to emergency responders and the public. There were shortages of qualified responders to conduct environmental assessments and communicate findings effectively. Moreover, rules for debris removal delayed the process of eliminating 118 million cubic yards of debris after the storm.

**FEMA Post-Katrina**

In response to the many failures of national response to Katrina, the Post-Katrina Emergency Management Reform Act (PKEMRA, P.L. 109-295) of October 2006 called for long-term loss reduction for all hazards, increased FEMA’s organizational autonomy under DHS, and restored the core elements of comprehensive emergency management. Overall, FEMA reestablished its all-hazards leadership to include catastrophic incidents. Subsequently, PKEMRA brought
FEMA to refocus on annual Pre-Disaster Mitigation Program (PDM) for funding risk analysis and reduction. Hence, the agency engaged in insurance activities not dependent on previously declared presidential disasters unlike the Hazard Mitigation Grant Program (HMGP) that are only available to states and territories following a federally declared disaster.92

FEMA introduced the Flood Hazard Mapping and Risk Analysis Program, a tool for updating flood hazard data and invested in Flood Map Modernization. In the 2010 fiscal year, FEMA’s Risk Mapping, Assessment, and Planning (Risk MAP) program launched 600 Risk MAP projects in 3,800 communities and targeted the “highest priority engineering data needs, including coastal and levee areas.”93 In 2011, the agency formally implemented Climate Change Adaptation Policy (2011-OPPA-01) to streamline Hazard Mitigation Assistance (HMA) in addressing impacts of climate change. For example, the HMA included tools to estimate sea level rises, green open spaces and riparian areas with estimated economic development values.94

The agency concurrently took on the role of educating local level administration about the importance of mitigation planning. By the end of 2015, more than 80% of the nation’s population (i.e., 22,706 communities) reported existence of local FEMA approved or pending-approval mitigation plans.95 Moreover, in 2015, FEMA included guidance on further including climate adaptation plans in state mitigation planning and risk assessments. It recommended enhancing risk-assessment matrices typically based on past hazard occurrences by incorporating predictions related to climate change impacts on increased intensity, severity, and magnitude of future hazards affecting the states.96

Some states (e.g., California) enacted laws to encourage municipalities to include climate change in their hazard mitigation planning.97 For example, in 2017 Melissa (Missy) Stults, a renowned urban resilience scholar and practitioner, conducted a comprehensive review of 35 hazard mitigation plans nationwide querying them for identifiable climate change criteria.98 Her study revealed that more than two thirds of plans (76.7%) included general discussion about climate change with respect to hazards and more than half of the plans (53%) specifically included “actions that are designed to be viable in a climate-altered future.”99

The most recent FEMA mitigation effort based on the Disaster Recovery Reform Act (DRRA) of 2018 (that amended key parts of the Disaster Mitigation Act of 2000) is the creation of the Building Resilient Infrastructure and Communities (BRIC) grant program, which provides grants for hazard mitigation and large-scale resilient infrastructure projects.100 It differs from FEMA’s other mitigation programs in that funding is from the Disaster Relief Fund (DRF). The DRF has been used primarily to respond to and rebuild after disasters, not to build resilience. BRIC grants are designed to be bankrolled by a 6% put aside from the estimated amount needed to recover from the specific disaster being responded to by a grantee.

Researchers express hope that substitution of PDM programs with BRIC will enhance green infrastructure projects and might fill in the gap in local environmental engineering expertise that previous FEMA mitigation efforts were not able to fully address.101 Most importantly, as of December 2021, FEMA fully integrated climate change into its new strategic plan 2022 to 2026 addressing efforts to increase climate literacy, adopting future orientation in risk assessment.
technologies, committing to climate change mitigation within FEMA’s own facilities, and supporting equity in climate change mitigation.\textsuperscript{102}

Overall, among all DHS components, FEMA is second only to the U.S. Coast Guard with a historical legacy of environmental focus. In spite of challenges related to reorganization under DHS, the agency has been able to realign its climate strategy to a proactive, future risk-based all-hazards orientation. In the next section, we present and discuss our findings on TSA within the context of DHS’ path towards climate security.

The New: TSA and Climate Security

Unlike FEMA, which was in existence before 9/11, TSA was created in 2001 in the aftermath of 9/11 and placed under the Department of Transportation then moved to DHS in March of 2003. TSA assumed direct responsibility for aviation security, with indirect oversight to maritime and surface transportation.\textsuperscript{103} It has been commonly associated with Transportation Security Officers and aviation security at U.S. airports.\textsuperscript{104} However, statutorily TSA’s additional duties and powers relate to:

(a) receiving, assessing, and distributing intelligence and information related to transportation security; (b) assessing threats to transportation; (c) developing policies, strategies, and plans for dealing with threats to transportation security; (e) coordinating domestic transportation including aviation, rail, maritime, and surface transportation; or (f) coordinating and overseeing the transportation-related responsibilities of other departments and agencies of the Federal Government to exclude DOD and military.\textsuperscript{105}

Thus, TSA is an important player across multiple transportation vectors and stakeholders in aviation, rail, transit, highway, and pipeline.\textsuperscript{106} That said, our analysis finds that evidence of TSA’s engagement with climate security issues is scarce. Meanwhile, in the TSA’s operational environment, expansion is evident across all transportation sectors with the ones with most growth having the greatest negative impact on the environment. For example, the growth of road freight that consumes 43\% of all transportation energy contributes to pollution and highway congestion. The aviation industry also contributes to greenhouse gases which drive climate change – a known homeland security threat(s) multiplier.\textsuperscript{107} Moreover, TSA operates within a sector where transportation incidents have the potential of causing significant damages to the affected communities due to the release of hazardous materials (HazMat) and where HazMat risk reduction is critical. Railroad freight alone carries approximately 140 million tons of HazMat.\textsuperscript{108} HazMat transportation incidents have been on the rise with 14,816 recorded across various transportation modes in 2009 and 17,459 in 2012.\textsuperscript{109} For example, in 2008, a derailment of the BNSF train in Lafayette, Louisiana, led to the spill of 10,000 gallons of hydrochloric acid and caused wide scale evacuation of 3000 residents.\textsuperscript{110} Admittedly, beyond rail accidents, 63\% of all HazMat transportation accidents occur on roads which creates multiple hazards for crisis management due to traffic congestion or urbanized landscape and raises issues of inspections, credentialling, and other regulations.\textsuperscript{111}

Furthermore, TSA is charged with pipeline security inspections, standards for development, and critical asset analysis.\textsuperscript{112} Any strategy for pipeline security cannot dismiss impacts of increasing extreme precipitation such as heavy rainfall and snowstorms, and that is particularly vital in
pipelines carrying HazMat. For example, pipelines in 48 states that carry HazMat have to be placed at a minimum depth of 3 feet (or minimum depth of 5 feet if the pipeline runs through populated areas). Subsequent intense precipitation can result in land subsidence, scouring, shifting of pipelines in shallow riverbeds, and even fracturing of pipelines.\textsuperscript{113} Compounding climate security issues within the transportation sector may also include changing coastlines and rising sea levels risks for ports and coastal shipping as well as their impacts on road, rail, or airport relocation.

Severe flooding will continue to affect transit systems, roads, and rail. Thawing permafrost is expected to cause collapses of roads, rail lines, pipelines, and bridges all with significant impacts on populations. Moreover, with average life span of transportation infrastructure under current climactic conditions estimated to be about 50 years, weather-related natural hazards such as hurricanes will continue to challenge emergency evacuation planning, facility maintenance, and safety management for surface transport, marine vessels, and aviation.\textsuperscript{114} Zachary Zeigler, a former student of the Naval Postgraduate School, correctly points out in his thesis that, “today’s threats are more encompassing than foreign terrorist organizations, and that the TSA must evolve to respond to the emerging threats on the aviation ecosystem and the entire U.S. transportation sector.”\textsuperscript{115} However, according to the 2018-2026 TSA Strategy, TSA’s strategic priorities for 2018-2026 include:

(a) strengthening the effectiveness of TSA’s core capabilities in aviation security;
(b) improving intelligence-driven operations with increased information sharing;
(c) modernizing transportation vetting; (d) advancing global transportation security standards; and (e) promoting security partnerships across surface transportation systems.\textsuperscript{116}

The 2018-2026 TSA Strategy does not concern itself with environmental concerns – including climate change – and reiterates that, “TSA was created in the wake of the September 11th attacks and charged with the singular mission of preventing another large-scale act of terrorism on the American transportation system. Many things have changed since that fateful day, but our fundamental mission has not.”\textsuperscript{117}

Considering the foregoing, we argue that TSA’s predominant focus on terrorism is a function of its relatively short history, which is also deeply rooted in the narrowly defined founding mission of DHS. This is consistent with the national transportation security strategy that describes its strategic environment as “persistent, dynamic, and adaptive nature of the terrorist threat. They note further that transportation assets may be targeted by terrorists, used as weapons, or used to execute attacks”.\textsuperscript{118} Some observers have questioned the agency’s lack of training standards and professional core, lack of institutionalized identity and organizational culture, excessive bureaucracy, costs not commensurate with benefit and not competitive with the privatization option, and in search of institutional recognition and respect.\textsuperscript{119} Others (e.g., Center for American Progress) argue that the DHS focus remains way out of balance with the most serious risks to America’s safety today including natural hazards, disasters, pandemics, cyberattacks, and domestic extremism. Overall, TSA lacks future risk assessment orientation, all-hazards lens, or climate action strategy.
In the next section, we present and discuss our findings on CBP within the context of DHS’ path to climate security.

The Reconfigured: CBP and Climate Security

CBP is an agency which was created under DHS in March of 2003. It followed reconfiguration of the Customs Service in the Treasury Department and the Immigration and Naturalization Service (INS) in the Justice Department, which produced three separate agencies – CBP, ICE, and USCIS. Its primary missions are defined as: (i) detecting and preventing terrorism, (ii) combating transnational crime, (iii) protecting the nation through air, land, and maritime environments against illegal entry, illicit activity, or other threats, (iv) facilitating lawful trade and protecting revenue, and (v) facilitating lawful travel.

Within the operational environment of CBP related to climate security are functions transferred to CBP by the Homeland Security Act from the U.S. Department of Agriculture (USDA) for agricultural import and entry inspection, including the importation-related provisions of the Plant Protection Act of 2000. Protecting agricultural and economic interests from harmful pests and diseases falls under the mission of protection from illegal entry, illicit activity, or other threats. As such, the detection, control, eradication, suppression, prevention, and/or retardation of the spread of plant pests or noxious weeds deemed as vital to the protection of the agriculture, environment, and economy of the United States became a CBP remit.

It is important to note that 3,200 full-time agricultural CBP inspectors assigned at 182 ports of entry were transferred from across many departments such as Commerce, Transportation, Interior, National Oceanic and Atmospheric Administration, and the U.S. Forest Service. Their duties include inspection of passenger declarations and cargo manifests, verification of import permits and certificates, screening of international passengers, vehicles, luggage, cargo, mail, and conveyances, or disposition and destruction of confiscation. As far as the scope of the problem, confiscation by CBP agricultural specialists averages 400-600 pounds of foodstuff taken from passengers flying into one international terminal at New York’s JFK airport alone.

CBP collaborates on the mission of protecting the nation from injurious food substances with the Food and Drug Administration (FDA), for example, in Florida which is very vulnerable to insect pest invasions that threaten crops of corn, peppers, and snow beans, as well as the unique and imperiled South Florida Everglades ecosystem. Florida Department of Agriculture (FDACS), USDA, and CBP agricultural specialists work collaboratively at points of entry at land, sea, or air. Thus, agriculture specialists at CBP enforce USDA standards for detection and interception of injurious pests presenting risk to U.S. resources.

One of the successful mitigation efforts in which CBP collaborated was the “Don’t Pack a Pest” campaign aimed at promoting travelers’ awareness about threats posed by agricultural products since 2011, and extended from Florida’s major ports of entry to partnering with Jamaica, Dominican Republic, Puerto Rico, the U.S. Virgin Islands, and Cayman Islands. The South Florida Ecosystem Restoration Task Force (SFERTF) recently listed “Don’t Pack a Pet” as a successful mitigation strategy...
to fortify the Everglades’ ecosystem from invasion.\textsuperscript{128} Furthermore, data collected by CBP agents in the field are used to conduct pest risk assessments and analysis to identify high-risk pathways for the possible introduction of injurious pests and diseases writ large.\textsuperscript{129} The most recent CBP initiative related to climate change and lawful trade specifically has been an adoption of the Green Trade Strategy.\textsuperscript{130} Specifically, the agency plans to bolster its law enforcement against environmental trade crimes such as illegal logging, wildlife trafficking, illegal, unreported, and unregulated fishing, and illegal mining. Concurrently, it envisions supporting environmentally sustainable trade policies, programs, and infrastructure. Trade related environmental activities will focus on: (a) incentivizing green trade; (b) strengthening the environmental enforcement posture; (c) accelerating green innovation, and (d) improving climate resiliency and resource efficiency. While CBP has engaged in climate security missions related to trade, mass displacement has presented CBP with unique challenges at the nexus of climate induced-migration and human security.\textsuperscript{131}

International research conducted on the Polish Border Guard during its preparation for the influx of refugees from the 2014 Russian invasion of Ukraine, documents the need for strong involvement of modern border agencies in crisis management planning practices (e.g., receiving, identifying, transferring, and protecting/custody) for mass migration flows caused by environmental change and/or conflict.\textsuperscript{132} Increasingly people are forced or obliged to flee or to leave their places of habitual residence due to environmental hazards. The displacement patterns occur both within countries and regions (internal displacement) as well as across borders.\textsuperscript{133} According to the Institute for Economics and Peace, the displacement due to climate change triples the number of those displaced by conflict with 1.2 billion people at risk of displacement by 2050 due to climate change and natural disasters.\textsuperscript{134} However, some have argued that CBP strategies have focused predominantly on border fortification, or exercises like Operation Vigilant Sentry conducted jointly with U.S Southern Command in the Caribbean and focused on interdiction and repatriation.\textsuperscript{135}

While CBP is tasked with terrorist interdiction and arrests of illegal entrants, concurrent protection for those displaced by climate change-related events constitutes an increasing challenge for the agency in the future. For example, CBP was scrutinized by its involvement in apprehension and questioning of child migrants about their origins, family ties, and threats to their life since the U.S. Congress passed Trafficking Victim Protection Reauthorization Act (TVPRA) in 2008. In their study of CBP’s treatment of unaccompanied Mexican minors, Coulter et al. (2020) reported that in spite of many policies directed by CBP to unaccompanied children such as recognition of their at-risk status, and their general inability to make independent return decisions, CBP engaged in violation of due process rights, lack of respect (reported by 57% of children in the study), threatening them with a weapon (75% of children in the study), hitting, pushing, grabbing, or direct physical attacks.\textsuperscript{136} Others reported CBP’s lack of service orientation to displaced persons including: (1) denial of sufficient water or food; (2) failure to provide medical treatment or access to medical professionals; (3) inhumane processing center conditions, (4) abuse (i.e., verbal abuse, physical abuse, psychological abuse); (5) dangerous transportation and/or repatriation practices; (6) separation of family members; (7) failure to return personal belongings; and (8) due process concerns.\textsuperscript{137} These are all indicators that the agency might not be fully prepared for surges of future climate migrants.
Inarguably though, CBP agents have been responding to unprecedented numbers of migrants, frequently diverting their border security mission to search and rescue, sheltering, feeding, and caring for them. The agency reported that in some areas, 60% of agents were reassigned from border security missions to humanitarian protection and support. Meanwhile, the U.S. CBP Strategy 2021-2026 does not mention the word climate, climate change, climate-induced migration; in fact, the word humanitarian occurs only once in the foreword. It is of little improvement from its 2020-2025 Strategy Plan that also did not contain any reference to climate factors impacting migration, or human security. Short of a larger border strategy focusing on addressing global factors related to people displacement, selected CBP initiatives do point to its increasing focus on ad hoc mitigation. For example, surges in Unaccompanied Alien Children (UAC) and Family Unit Aliens (FMUA) triggered ‘CBP Directive 2210-004 Enhanced Medical Efforts’ to mitigate risks and increase provision of medical care to migrants in CBP’s custody along the southwest border. The Heat Mitigation Effort, an initiative aimed to reduce heat-related injuries along the southwest border was launched in summer of 2022; it focused on education related to heat stress, medical distress training, and equipping agents with Heat Stress Kits for migrants. However, those efforts while necessary and vital, are inherently single issue-focused and reactive.

The new ‘DHS Security Action Climate Plan’ declared both slow and disaster-triggered environmental degradation as push factors for mass international migration. The action plan stressed the importance of preparing for contingency operations and introduced the ‘DHS Southern Border Approaches’ and ‘Maritime Migration Contingency Plan’ as new initiatives. Interestingly, the Maritime Migration Contingency Plan was announced by DHS previously in 2014, but no updates or documents have been forthcoming. The plan also included ‘Highlight: CBP Migration Strategic Planning’, which signals continuance of programs like Operation Vigilant Sentry (OVS) “to prevent, deter, prepare for, respond to, and recover from an actual or potential maritime mass migration originating in the Caribbean region.” Notably, the plan does not address humanitarian aspects of service to the displaced persons. Ultimately, CBP – an agency reconfigured under DHS from the climate security perspective – has been relatively successful in the implementation of its agricultural protection and trade mission, but continues to lack proactive, future-risk driven strategy with respect to large scale, cross-border migration trends.

In this section, we have presented and discussed our findings. A key finding is that DHS currently has a climate security strategy, but not all its three units that were analyzed have a unit-specific climate security strategy. Figure 1 shows, in percentage terms, the variation in adoption of unit-specific climate security strategy across the three DHS units that were analyzed (i.e., FEMA, TSA, and CBP).
Finally, table 3 provides a summary of our key findings relating to climate security strategy across all four cases.

Table 3: Summary of Key Findings on Climate Security Strategy

<table>
<thead>
<tr>
<th>Case</th>
<th>Status of Case-Specific Climate Security Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHS</td>
<td>Has a case-specific climate security strategy. The current 2021 DHS Strategic Framework for Addressing Climate Change includes five main areas of focus including: (1) Empowering individuals and communities to build climate resilience; (2) building readiness to respond to increases in climate-driven emergencies; (3) incorporating foresight and climate science into strategy, policy, programs, and budgets; (4) investing in a sustainable and resilient DHS; and (5) developing a climate change-informed DHS workforce.</td>
</tr>
<tr>
<td>FEMA</td>
<td>Has a case-specific climate security strategy. The current 2022 to 2026 FEMA Strategic Plan aims to: (1) increase climate literacy; (2) adopt future orientation in risk assessment technologies; and (3) commit to climate change mitigation.</td>
</tr>
<tr>
<td>TSA</td>
<td>Lacks a case-specific climate security strategy. The current 2018-2026 TSA Strategy does not include future weather-related hazard impacts on transportation, HazMat transportation safety, landslide modeling, or climate literacy.</td>
</tr>
<tr>
<td>CBP</td>
<td>Lacks a case-specific climate security strategy. The current 2021-2026 CBP Strategy does not address climate, climate change, climate-induced migration, or climate literacy.</td>
</tr>
</tbody>
</table>

Source: Authors
In the next section, we provide the article’s conclusion and recommendations.

Conclusion

Our assessment of DHS points to recent strategic shifts from a predominant focus on terrorism to a concern with all-hazards including threat multipliers such as climate change. Realignment and shift in priorities might bring necessary balance for DHS to achieve much needed service-orientation to meet the societal, safety, and security challenges of the future. In this regard, the shift towards environmental literacy and environmental justice as evidenced by strategic efforts to include indigenous populations as stakeholders in the strategy for the Arctic is noteworthy. However, with regards to migration, even though mass migration concerns are at the center of the Arctic strategy, proposed actions seem to center more on security and less on much needed humanitarian dimension and service for the displaced.

As illustrated in both Figure 1 and Table 3, we also find varying degree of readiness, at the operational agency-level (i.e., FEMA, TSA and CBP), for adopting climate change actions projected by DHS. For instance, FEMA – an agency with long history and/or strong legacy of disaster response and disaster risk reduction – is well positioned within the new climate change strategy landscape and is adopting innovative strategies like the BRIC grant program. Conversely TSA – a new agency predominantly focused on terrorism threats to the transportation sector – lacks strategic climate positioning and is disproportionately oriented towards terrorism threats, an orientation that is out of step with the purported DHS all-hazards strategy/approach. We consider the current multi-hazard landscape with a strong nexus to climate change an excellent opportunity for TSA to realign itself within safety and environmental missions guided by the new ‘Strategic Framework for Addressing Climate Change’ with priority adaptation actions resulting from vulnerability and adaptation assessments for climate change impacts on critical infrastructure and key resources (CIKR).

For instance, according to international research, landslide adaptations needed in transportation security strategy will require: (a) landslide identification and inventory to include historical and current landslide events damages for hazard and risk assessment for the federal transport; (b) landslide hazard mapping to account for the potential influence of climate change; (c) landslide impact and vulnerability assessment; and (d) landslide hazard communication with policy guidance and knowledge transfer to practitioners by using innovative geospatial and web-mapping technologies. Those areas align with TSA’s statutory duties including: (i) receiving, assessing, and distributing intelligence and information related to transportation security; (ii) assessing threats to transportation; (iii) developing policies, strategies, and plans for dealing with threats to transportation security; (iv) coordinating domestic transportation including aviation, rail, maritime, and surface transportation; and (v) coordinating and overseeing transportation-related responsibilities of other departments and agencies. Perhaps it is time that DHS reimagined TSA within the context of all-hazards approach and in recognition of climate change as a significant homeland security concern. Focus on those areas offers directions for future policy research.
Moreover, the case of CBP illustrates that continued and increasing migration trends will require DHS to create avenues to expand CBP’s role in humanitarian assistance, search and rescue, sheltering, or emergency relocation planning. This might be in form of various human security service-oriented units created within the agency or better climate and environmental literacy and environmental justice educational programs in the future. Concurrently, CBP’s strategy should focus on research, future risk assessments, and collaborative arrangements to provide life-saving humanitarian assistance to future climate refugees. Most critical will be the ability of DHS to leverage its legacy of climate security established in some agencies to partner across the lines with those who might need recalibration to safety and services model like TSA. Notably, the proposed model\(^{149}\) of bringing the USCG into coordination with the operating authorities of CBP, ICE, and USCIS to understand migration risks and develop joint adaptation plans might be the best practice for the future and worthy replication in other mission areas. Thus, further research should explore cross-agency collaboration within DHS old, new, and restructured entities across shared mission areas related to climate security. Moreover, DHS should encourage and support comparative research on climate-induced migration in order to better predict future global migration patterns and trends both across the border as well as future internal displacements.

It thus appears that DHS has failed to provide climate security mission-specific blueprint for its new and reconfigured agencies as evidenced by the lack of climate security focus in their strategic plans a decade after the national Climate Action Plan was launched. The ‘East Palestine, Ohio train derailment’\(^{150}\) might provide additional research opportunities into the role of DHS managing the crisis and the scope of TSA’s engagement in transportation environmental security disasters.

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Acknowledgement

The authors are grateful to Steve Twing and the two anonymous reviewers for their time, patience, and invaluable feedback.

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