Is the U.S. Critical Infrastructure Workforce Ready to Tackle Climate Preparedness?

Findings from ACCO’s Research Contracted by the National Institute of Hometown Security on behalf of the U.S. Department of Homeland Security

Daniel Kreeger
Executive Director
Association of Climate Change Officers
Background on the Project

Critical to ensure that critical infrastructure workforce and leadership is positioned to implement resilience and adaptive planning strategies

**Project Goal:** Assess the workforce’s capacity to effectively engage in preparedness of 5 critical infrastructure sectors* in 4 distinct regions of the country

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**Timeline:**
Began in 2016, initial phase concluded in February 2019

* Read about DHS’ 16 critical infrastructure sectors at https://www.dhs.gov/cisa/critical-infrastructure-sectors
Overview of the 5 Sectors Selected

These sectors were chosen based on a number of factors:
1) their susceptibility to disruptive risks such as flooding, drought, and wildfire;
2) the need for these sectors to remain functional during and immediately after such disasters and extreme weather events;
3) the interconnected nature of these sectors

A Glance at the Intersecting Sectors

- **Energy**: A ‘lifeline sector’ foundational to all other critical infrastructure sectors, it is also one of the most vulnerable to climate risks.

- **Food & Agriculture**: Essential to health and economic vitality. Drought and wildfires can cause massive disruptions that can substantially degrade security conditions.

- **Water & Wastewater Management**: Access to clean water may become scarce, leading to use of unsafe water with risks for the outbreak of deadly disease. Resilience of water and wastewater management facilities is crucial for the continued health of the population as well as for the operations of other critical sectors like energy, food and agriculture.

- **Communications**: A ‘lifeline sector’ critical to all other sectors that is increasingly vulnerable to hurricanes, wildfires and natural disasters.

- **Emergency Services**: The emergency services sector is the front lines during disaster and disruption events. Its wide range of institutions, responsibilities and professions create a challenge and an opportunity in advancing resilience efforts.
Research Findings:
Governance & Leadership Structure

- More than half of interview and survey subjects indicated their organizations had assigned multiple people to serve in a non-committee capacity, rather than in a more directly accountable structure;

- Leadership on climate preparedness in each sector was generally shared across organizational divisions, departments, or teams, with no entity reporting a central business unit that manages such efforts; and

- Most participants reflected that there was almost no distinction between practitioners whose expertise should position them to be leaders of climate preparedness from those who should be playing supporting roles.

**Key Finding:** For most organizations to implement an effective preparedness initiative, a change management initiative will be critical to developing and implementing effective preparedness plans.
Research Findings:
Nature of Job and Performance Expectations

• Individuals are being hired with a wide diversity of backgrounds for similar roles because broad standardization around preparedness and resiliency has not yet been mainstreamed; and

• Many respondents were expected to participate in multi-stakeholder preparedness initiatives, however, very few indicated other performance expectations or metrics related to climate preparedness.

Key Finding: The integration of climate-related competencies into the core job descriptions and requirements for numerous occupations is critical to successful preparedness and resilience efforts.
Research Findings:
Continuing Education, Training Requirements, and Preferred Credentialing

- Overwhelmingly, interview and survey respondents indicated there were very few examples of credentialing, training or continuing education requirements related to climate preparedness either to be hired into, or stay in, a position.

- Strong need for specific-occupation technical credentialing around the intersection of climate preparedness and planning/engineering competencies, as well a greater focus on translating technical details into more broadly understandable terms for practitioners and the general public.

**Key Finding:** Professional societies need to work with policymakers, trade associations, leading experts and early adopters to establish consensus competencies, credentialing, training and updates to job descriptions.

Skills recommended by respondents included:
- Understanding of finance with a focus upon disaster finance;
- Law and policy landscape and emerging strategies;
- Insurance, risk, and liability;
- Organizational change;
- Project and logistics management; and
- Public/stakeholder engagement and communication.
Research Findings:

Formal Planning and Adaptation Barriers

• The majority of stakeholders across sectors noted that their organizations had not yet developed a formal climate adaptation, resilience, or preparedness plan. For those entities that have created plans, several reported that a designated team drove plan development.

• The most significant barriers noted for integrating preparedness and resilience into their organizations included budgetary restrictions, competing institutional priorities, and lack of standardization and established/accepted best practices.

• Approximately two-thirds of the stakeholders expressed concerns about their organization’s ability to meet the need for rapid design and implementation of preparedness and resiliency initiatives.

Key Finding: Evolving from current planning and decision-making to practices that incorporate effective climate preparedness will require a change in understanding among senior leadership in organizations of how climate change and extreme events will disrupt operations and impact their bottom line and/or mission. This transformation in understanding is foundational to obtaining the internal resources and prioritization, and is also a key cog in standardization and establishment of best practices.
Research Findings: Participation in External Activities

- All research participants interviewed or who were surveyed indicated that some form of local, regional, or sectoral collaborations were emerging to address preparedness and resilience.

- Many noted ongoing actions of preparedness for emergency response through vulnerability assessments, hazard mitigation and adaptation planning activities, and active collective learning from recovery initiatives.

Other trends for action measures included:
- Expansion of communication and engagement with the general public and fields of practice;
- Decentralized networks and system redundancy (energy/water sectors);
- Coordinating across organizational boundaries through regional governance/collaboration and Federal agency and/or nongovernmental organization administered partnership programs.

Key Finding: Collaborating with peer organizations both in the region and within the sector is a key component of climate preparedness. However, many U.S. regions do not yet have robust climate preparedness initiatives, and numerous trade associations either do not yet have established initiatives or are just standing them up. Efforts to support and align these collaborative initiatives would benefit climate preparedness activities nationwide and across sectors.
Research Findings:
State of Decision-Support Tools and Usage

- There are currently no widely used guidelines or practices for ensuring that available data and planning tools are used in a standardized way. This can lead to the tools being used in inconsistent or conflicting ways that can hinder recovery efforts.

- Research participants indicated that they had trouble accessing and using existing datasets and interpreting and analyzing the data required for use. The lack of availability of data at the right scale to create accurate analyses for the systems involved is also a serious knowledge gap.

- Without access to a decision-support tool that downscales the needed data by geography or timescale, critical infrastructure entities are not sufficiently equipped to effectively prepare for localized climate and extreme weather impacts.

**Key Finding:** As credentialing bodies will inevitably need to update competencies requirements, continuing education and training, and professional codes, they will also need to examine standardization of data usage to inform decision-making and the tools used by practitioners.
Key Themes in the Project Findings

- Resilience is resulting from reaction, and is evolving across sectors at different paces and with different practices
- Local and sectoral collaboration is a critical best practice
- Key challenges to deploying resiliency measures
  - Science literacy and preparedness competencies must be systemically advanced
  - Standardization and leveraging of data and risk
ACCO’s Initial Conclusion

Based upon the research conducted, ACCO proposed a set of focused efforts to address the following three areas:

1. Increasing Sectoral and Regional Collaboration
2. Advancing Workforce Standardization and Professional Development Resources
3. Enhancing Accessibility of Data, Codes/Standards, and Decision-Support Tools