State-Level Climate Change Projections for Site-Level Resilience Planning

Hannah S. Rabinowitz (Hannah.Rabinowitz@pnnl.gov) (Pacific Northwest National Laboratory, Richland, WA, USA), Sophia Dahodwala, Sophie Baur, and Alison Delgado

Background/Objectives. In recent years, incorporating climate change considerations has become an important focus of organizations' resilience planning and risk assessment efforts, including United States federal agencies. This has led to an increasing demand for higher-resolution and higher-quality climate projection information that is easy to understand for non-expert users. In particular, there is a demand for information about how climate change may impact high-impact, low-frequency hazards (HILF) that are central to risk assessments focused on infrastructure. While country-level resources like the National Climate Assessment, and tools such as the Climate Toolbox, and county-level Climate Explorer and Climate Mapping for Resilience and Adaptation, are readily available, higher-resolution, location-specific information is often required for site-level resilience planning and is difficult to find. In this presentation, PNNL will review the availability of state-level climate change resources in the United States that can inform site-level planning.

Approach/Activities. To assess the availability of state-level climate change projection resources, PNNL reviewed available climate change resources at the state level that would support site-level resilience planners in identifying potential local climate change impacts. First, PNNL conducted an initial search for resources available at the state level that contain information about climate change projections. Then, to gather more up-to-date information about individual state-level climate change resources, PNNL conducted a web-based survey. PNNL received feedback from 26 states, including state climatologists and other state climate change stakeholders. The purpose of the survey was to solicit information about the status of efforts related to downscaled climate projections for each state for the HILF hazards defined in the National Risk Index (NRI) dataset. This survey was geared toward understanding whether and what type of resources and state-level downscaled projections have been developed by each state. For states that did not have existing state-level climate change resources, PNNL conducted semi-structured interviews with those states' climatologists and relevant climate experts to discuss how the state drives the development and communication of information on climate change impacts on HILF hazards to stakeholders.

Results/Lessons Learned. Almost half of all U.S. states and DC have conducted some level of downscaled climate modeling to support the development of their own state-specific projections. Including states that have not conducted their own downscaling, 36 states (including DC) have resources that provide detailed context on expected changes resulting from climate change based on national or regional downscaled model results. In addition, 29 states currently host official state mesonets (network of automated weather monitoring stations) which collect weather data that can be used to consider trends in climate variables. Key drivers for developing state-level climate resources were identified, including state policies, stakeholder demand, and university engagement. For example, climate assessments in states with a large emergency management community presence tended to have a deeper focus on climate change impacts from HILF events. The climate change projection resources and tools identified can help enhance existing resilience planning tools.