

Translating Climate Science into Adaptation: Examples from the US Northeast Climate Adaptation Science Center

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Global warming due to anthropogenic causes has led to significant worldwide shifts in precipitation distribution and increases in temperature. By the 21st century, global temperature increase could rise between 2.0 to 4.20 C based on projected emission scenarios by Intergovernmental Panel on Climate Change whereas, precipitation extremes have also been projected to increase in many places with increasing water vapor content in the atmosphere (Karmalkar and Bradley, 2017). Together these changes could lead to an imbalance in global and regional water cycle and may result in increased hydrological extremes in future (Kay et al., 2009). Changes in climate and hydrological extremes, compared to the past, have already shown increased magnitudes and severity of impacts and these impacts are expected to get more frequent and intensified in future with increase in urbanization and population growth. In the United States (US), for instance, the northeastern portion of the nation is projected to experience the most significant increases in temperature. To facilitate informed adaptation planning, regional studies are required that can provide valuable guidance on assessing risks and appropriate actions.

The Secretary of the US Department of Interior, with Secretarial Order 3289, established eight Climate Science Centers in the US in 2009 with the goal of understanding the effects of climate change on fish, wildlife and habitat and providing science-based information and decision support tools to inform landscape scale adaptive management. This talk explores the establishment and first six years of operation of the Northeast Climate Science Center. The talk will present the goals and aspirations of the new enterprise as it has engaged natural resources managers in their climate science needs and adaptation policies. The talk will begin with recent climate projections and their implications for the northeast of the US and the impacts of these climate changes on regional hydrology. Four successful case studies will be presented that focus on stakeholder engagement and the use of actionable science in

management. These case studies will include an investigation of the impacts of climate change on urban water supplies, a Climate Action Tool for exploring climate impacts on wildlife, loosely-linked models forevaluating regional scale climate change on forests, and Ecosheds, a decision support system for exploring the impacts of climate change on water temperature in streams and fish. Lessons learned from engaging stakeholders, federal employees, university students and university faculty in co-generation of research objectives and research results will also be discussed.