

# **Adaptation Strategies in a Changing Climate: Building Resiliency in Maine's Coastal Communities and the Statewide Stakeholder Process**

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Maintaining resilient ecological, economic and social systems is a key theme of sustainability science. Unforeseen changes in a subsystem of social-ecological systems (SES) can shift normally flexible equilibriums and threaten the integrity, and more importantly our understanding, of these complex systems.

Maine's coastal communities represent, not only a complex social-ecological system, but also an important segment of the state's population on which the state's economy heavily relies. Tourism, the state's largest industry, is impacted by weather/climate-related problems, such as: constant beach closers due extremely wet seasons or property destruction from extreme storm events like the Patriot's Day Storm of 2007. Many coastal communities have been forced beyond their ability to cope with such events and are now confronted with having to adapt current and future development projects to withstand future storms that are projected to increase in both frequency and intensity as the climate changes.

Building resiliency in a changing climate requires a sound knowledge of the location-specific contexts, challenges across various sectors of the society and economy, and the nature of interconnectedness between social-ecological systems. Efforts to elucidate place-based climate information needs and vulnerabilities are often stymied by lack of community-scale networks of scientists and stakeholders at the community level (citizens, groups, local governance) which have the ability to probe, understand, and facilitate the use of climate information. The research team has employed community-based research and outreach, as well as detailed analyses of historical and projected climate scenarios and weather forecast products to find place-based solutions, while also attempting to generalize a framework for climate change adaptation. The team has two main foci that have driven this research:

Focus 1: What are the knowledge gaps and information entry points for weather and climate information that directly related to the climate-related vulnerabilities of the coastal communities in Maine?

Focus 2: What are the recent changes in weather and climate variability on time scales most relevant towards support of decision-making and planing needs in select communities?

Results from this research reflect the co-evolution of biophysical analyses and community-based elucidation of information needs in order to build community resiliency. Simultaneously, the researchers were also interested in knowing whether or not their methodology could be used to generate salient information from coastal communities outside of Maine. This parallel research has given the researchers insight into generalizations of building resiliency in coastal communities.