

MORE HOLISTIC PLANNING FOR LONG-TERM COASTAL RESILIENCE?
PORT OF PROVIDENCE DEMONSTRATION PROJECT

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Our group tested a new workshop methodology to explore the question; How can a more holistic approach to planning reduce climate risks within the environmental, social, economic, and political landscape? Increased frequency of extreme ocean weather events requires investments in coastal resilience to reduce the costs of future climate-driven events. Storm risks and responsibilities for resilience investment distribute across a wide spectrum of public and private stakeholders. While separate private business actions and government programs for ports have received attention, less thought has been given to collective action by businesses and port authorities, the essence of holistic planning that our methodology intends to catalyze. Though a number of efforts have begun to assess vulnerability of coastal communities, numerous barriers stand between knowledge and investment. Disconnects between decision maker perceptions of ports' risk to climate change, and the lack of action being taken, result in increased societal costs. Seaport systems, such as the port of Providence, have interdependent decision-making and governance systems, which make ports an ideal research area for developing innovative holistic planning solutions. While the emergency-response side of disaster planning receives substantial attention, preventative resilience investments, such as those recommended by our science-based tools, could greatly reduce costs to the private and public sectors.

With support from the Federal Highway Administration and Rhode Island Dept. of Transportation, we conducted a workshop with 28 industry, government, and non-profit stakeholders of the port of Providence. We assessed perceptions of resilience strategies and infrastructure vulnerability by presenting a storm scenario overlaid on port infrastructure. Our first workshop in August 2015 tested three tools designed to facilitate a robust dialogue. We created 3D disaster visualizations to help seaport stakeholders contextualize impacts on the region and on individual businesses. We next proposed transformational hurricane resilience design concepts to engage stakeholders in broad, long-term thinking, in contrast to the more immediate typically horizons used in business and civic planning. Finally, we applied a decision support tool called Wecision -- a real-time, interactive, decision-making tool that allowed stakeholders to weigh the costs and benefits of long-term transformational adaptation concepts and recognize common resilience goals. Based on initial results, we will refine and further test these new methods in future stakeholder processes that can lead to proactive co-investments in coastal resiliency.

In the long term, this research program will facilitate a more holistic planning paradigm to meet long-term and complex climate change challenges. The tools leverage direct use of ocean science data, such as hydrodynamic surge models, to inform local decisions for resilience to coastal climate impacts. This work has a tremendous broader and economic impact - ports play a critical role in the economy and facilitate 90% of world trade, supporting 13 million jobs in the U.S. alone. This work is also extensible to other coastal sectors, because the geographical requirements of seaports are similar to other estuarine, environmentally sensitive, and exposed locations.