

Stakeholder vulnerability and resilience strategy assessment of maritime infrastructure: Pilot project for Port of Providence, Rhode Island

The 2015 *Stakeholder vulnerability and resilience strategy assessment of maritime infrastructure* project served as a pre-planning exercise to investigate climate vulnerability and resilience at the Port of Providence in Rhode Island and to stimulate stakeholder dialogue around long-term planning. Results suggest stakeholders agree that preventative resilience planning could greatly reduce cost to the public and private sectors in Rhode Island and that there is a distinct need for leadership around this critical issue.



Figure 1 - 3D storm visualization

The Port of Providence does not have a centralized planning body such as a port authority to plan for long-range climate change resiliency. Maritime transportation serves a critical role in the Rhode Island economy, providing energy products, raw materials, and revenue from scrap metal and other exports. Since the flooding from a major storm and associated damage will cause both short and long term disruptions in the state economy, public and private sectors have a significant stake in assessing proactive measures to avoid post-storm decline. With funding support from the RI Dept. of Transportation, researchers at the University of Rhode Island (URI) assessed perceptions of port stakeholders through surveys, interviews, and a half-day workshop. They facilitated robust dialogue about long-term hazard resilience challenges with key stakeholders of the Port of Providence using three tools 1) a storm scenario with local-scale visualizations, 2) three long-term resilience concepts, 3) and a decision support tool called Wecision. Researchers developed detailed images demonstrating the inundation risk from a hurricane making landfall near the Port of Providence during a high tide (Fig. 1). The modeling showed that 86% of the study area would be inundated with water, affecting all waterfront businesses and the connecting land-transportation arteries. Using the hurricane scenario and accompanying visuals to focus the conversation, port stakeholders described what they viewed as potential consequences and concerns for weeks, months, and years after the event. Stakeholders noted that loss of critical utilities (electric, water, telephone) in the weeks after the storm scenario event could cripple business, as well as have serious impacts on both the nearby Rhode Island hospital and wastewater facilities.

The participants next considered long-term resilience concepts: The “Protect” concept reduces storm risk by decreasing the probability of occurrence of impacts by constructing a new hurricane barrier; “Relocate” also known as retreat, moves infrastructure out of the flood prone area; “Accommodate” invests in a suite of strategies enhance resilience through upgrading, hardening, elevating, and flood-proofing. The workshop and decision support tools engaged stakeholders in critical thinking to better understand shared risk and complexity inherent in implementing meaningful resilience strategies. Though the workshop did not, by design, result in a concrete decision for action or specific plan, it represents an example of a preplanning exercise necessary to lay the groundwork for future decision making in the face of climate change related hazard events.

As the climate becomes less stable, with greater occurrence major hurricanes, shipping lines will turn to ports that are quick to return to business as usual. The state of Rhode Island and cities of Providence and East Providence can approach the challenges of climate change as an opportunity: the inclusion of resilience planning in economic development is a business decision that will likely pay off. The port community should create a new collaborative partnership to more directly address the issues of storm resilience planning.

For more on this project, see www.portofprovidenceresilience.org

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