



Developing a Vulnerability Self-Assessment Toolkit for Coastal Communities in Puerto Rico

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INTRODUCTION

Islands such as Puerto Rico have recently been called the “canary in the coal mine” when it comes to climate change (Cantieri 2016). Island communities already face threats from climate change and serve as a warning of what is to come for other coastal areas. In Puerto Rico, an island of about 3.4 million people, about 419,000 people live in the coastal zone and about 2.3 million people reside within the 44 coastal municipalities (PRCCC 2013). The coastal zone is defined as one kilometer (0.62 miles) inland with some additional distance for natural systems.

Coastal communities in Puerto Rico are vulnerable to hazards that include beach and shore erosion, sea level rise, coastal flooding, storm surges, hurricanes, severe storms, and droughts (PRCCC 2013). Climate change has exacerbated these hazards, and on a small island like Puerto Rico that is only about 100 miles (160.9 kilometers) across and 35 miles (56.3 kilometers) wide, the change is noticeable. Communities’ vulnerability to these hazards is only made worse by poor maintenance of critical infrastructure such as storm water management systems and energy facilities, destruction of dunes, reefs, and mangroves, the continuing fiscal crisis, among other factors (PRCCC 2013).

To help coastal communities grapple with coastal hazards, agencies and organizations have developed various tools and toolkits to serve as guides and resources. Recently, technological advances have led to the creation of new tools in the form of apps, interactive websites, and digital maps that provide information to communities, individuals, businesses, and governments with the goal of increasing resilience and preparedness in the face of climate change.



A snapshot of San Juan with the Atlantic Ocean on the left and Condado Lagoon on the right.

Source: Puerto Rico Coastal Zone Management Program, 2015

PROJECT BACKGROUND

After identifying a need to increase outreach and education efforts, the Puerto Rico Coastal Zone Management Program (PRCZMP) envisioned the development of an Online Self-Assessment and Solutions Tool. PRCZMP sought out a NOAA Coastal Management Fellow to carry out this project and was selected to have a Fellow for 2015-2017.

The online “Solutions Tool” has now evolved into the Vulnerability Self-Assessment Toolkit, a suite of tools communities can use to better understand the risk and impacts associated with coastal hazards (specifically sea level rise, storm surge, and coastal flooding) and learn what solutions are available to them to adapt. The toolkit will include a website-based self-assessment tool that is also mobile-friendly. In the future, this could also be available in a mobile app. In addition, the toolkit will contain fact sheets, handouts, and other resources to help communities assess their hazard risk.

The main component of the website will be a vulnerability self-assessment questionnaire that individuals go through to determine their hazard risk. Based on users’ responses to the questions in the survey and their geographic location, the tool will tell them their general level of risk (low, medium, or high), and based off of that, offer adaptation options for their consideration. The toolkit will serve as an educational tool as well, explaining coastal hazards and offering links to existing resources and options to learn more. Through partnerships with other organizations in Puerto Rico, the website will also showcase adaptation actions other communities have already taken.

To develop the toolkit, I will work closely with coastal communities in Puerto Rico to include their concerns and perspectives on risk and adaptation. This process will include community meetings and focus groups in four different regions of the island (to be completed in 2017). Although many tools like this already exist, they usually do not include data for Puerto Rico and are not translated into Spanish. This project hopes to fill that gap.



Map of Puerto Rico’s location. Source: Google Earth



An example of erosion in Rincón, Puerto Rico. Source: J. Cantieri, 2016



Erosion in Loíza, Puerto Rico. Source: J. Cantieri, 2016



Community meeting in Loíza, Puerto Rico. Source: Puerto Rico Coastal Zone Management Program, 2016

NEXT STEPS

1. Hold community meetings (focus groups) in February and March
2. Program/develop the website

KEY PROJECT OUTCOMES

Short-Term

- . Community leaders and members understand climate change and know what hazards put them at risk
- . Community leaders and members learn what adaptation strategies are available and feasible for them

Mid-Term

- . Local officials use the toolkit to guide their decisions
- . Community members decide not to buy or build properties in at-risk areas
- . Local officials and community leaders/members implement adaptation strategies

Long-Term

- . Communities decrease their risk to coastal hazards
- . Local officials fully integrate climate change and coastal hazards into planning and decision-making processes

QUESTIONS TO DISCUSS

1. What is working in stakeholder engagement where you live/work?
2. What tools/toolkits do you use to increase resilience and preparedness for communities and individuals?
3. In general, what works in a tool/toolkit? What does not work?
4. How can you increase public participation in coastal management processes?
5. How can a toolkit serve to promote stakeholder engagement and public participation?
6. How do you include community perspectives on risk and adaptation when developing a toolkit?
7. At what point in the development of a tool should you involve community leaders and members?
8. What are your thoughts on a mobile version of a website versus an app? Are there pros/cons for both? Which do you prefer?

REFERENCES

Puerto Rico Climate Change Council (PRCCC). (2013). *Puerto Rico’s State of the Climate 2010-2013: Assessing Puerto Rico’s Social-Ecological Vulnerabilities in a Changing Climate*. San Juan, PR: Puerto Rico Coastal Zone Management Program, Department of Natural and Environmental Resources, NOAA Office for Coastal Management.

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QR Code to access Climate Central’s Tool Comparison Matrix to check out more info about some tools available in your state.