NCCOS | NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

Vulnerability Assessment Program: Overview, Site Selection, Research Capacity, and Partner Roles

Program Overview

Coastal communities experience flooding, storms, and erosion, and climate change is exacerbating these and other natural hazards. The impacts are felt differently across the nation and some communities are more vulnerable than others. Through our Vulnerability Assessment Program, each year we identify one community or region and work with local partners and their stakeholders to assess community climate vulnerability (e.g., social vulnerability, flood hazard). Working with partners directly ensures that results are locally tailored and relevant for effective, equitable planning.

How Do We Choose Locations?

This program starts one assessment each year. It prioritizes communities and regions that anticipate high hazard probability and high social vulnerability. Additional priority is given to communities that are often omitted from national screening tools (such as U.S. Territories and Alaska) and communities adjacent to coastal restoration projects. In addition, all selected research sites must have:

- Engaged project partners
- Active project stakeholders
- Research needs that align with program capabilities
- Research needs that inform climate adaptation action
- Capacity to receive and act on research
- Disadvantaged or underserved populations
- High vulnerability within the EJScreen Tool and CDC SVI Tool (or omission from these tools)

What Do We Provide?

All assessments are locally tailored, but will follow the general steps provided in this graphic:

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Partner engagement	**Indicator development**	**Assess vulnerability and hazard**	**Assess risk**	**Conduct place-based analysis**	**Develop and release products**
Determine project advisory committee. Hold workshop meeting(s) to determine project goals and prioritize local analyses.	Develop indicators and indices, using partner/stakeholder input and national and local data sources.	Spatially assess vulnerability (and/or exposure) and hazard(s). Present for key partner feedback.	Spatially assess risk by intersecting vulnerability (and/or exposure) with hazard. Present for key partner feedback.	Use hazard, vulnerability, or risk maps to conduct further place-based analysis. Present for key partner feedback.	Develop products. Present findings and products to full list of partners and stakeholders. Revise and finalize.

The project advisory committee and stakeholder workshops provide local context throughout all assessment phases.

At a minimum, all assessments will identify:

- Social vulnerability, structural vulnerability, and/or structural exposure using the best available secondary data in concert with local partner feedback.
- Flood hazard(s) using the best available data to deliver spatial information on flood hazard(s) (e.g., coastal flooding, stormwater flooding) of local importance.
- Relative risk through intersection of vulnerability/exposure and hazard profiles using bivariate choropleth mapping or a similar mapping technique.
- At-risk communities or community assets in relation to chosen flood hazard(s).
- Areas of interest for further investigation through spatial analysis or spatial statistics (e.g., hot spot/spatial autocorrelation, cluster detection).

What Are Our Standard Products?

- Report that includes methods and findings
- Mapbook
- Geodatabase
- One communications item for public outreach (ex. infographic, key findings onepager, or storymap)
- Plain language webpage, summarizing the project

Are There Other Local Considerations?

In addition to our standard information and products, local needs and research questions often require additional analysis. Within team capacity and data availability, partners will be able to select up to two place-based analysis types from the example list below and/or propose similar analyses that align with local context and need.

- Expansion to additional hazard categories (i.e., drought, wildfire, extreme heat, or a locally important hazard type).
- Further downscaled vulnerability assessment (i.e., originally conducted for a county, but now conducted for a community within that county).
- Exploration of natural resource exposure as it relates to social systems (i.e., access equity or hazard impacts).
- Exploration of cultural or historical asset exposure (i.e., access equity or hazard impacts)
- Transportation/network vulnerability assessment (i.e., network interruptions or evacuation route access).
- Exploration of flood insurance access (i.e., equity of flood insurance claims).
- Suitability modeling for green infrastructure (i.e., social suitability for habitat or coastal restoration investment).
- Other locally-driven, place-based analysis to directly inform local climate adaptation action.

If elected, partners may substitute one or more place-based analysis types for an online map portal.

Partners will be consulted on preferred assessment bounds and unit of analysis. Assessments may be completed for a state, congressional tract, county, municipality, designated region, or combination of these boundaries. The unit of analysis might include the Census Block, Block Group, Zip Code Tabulation Area (ZCTA), or utilize a hexagonal grid system or appropriate geographical mesh.

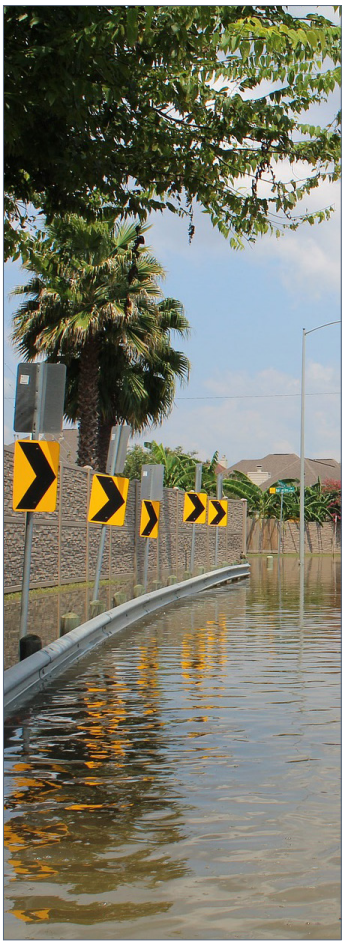
All partner preferences will be assessed for feasibility prior to commitment or execution.

How Important Are Our Partners?

Our partners are key to our success. We ask that they:

- Serve as liaisons between our team and local stakeholders
- Represent the needs of local stakeholders and/or ensure that key stakeholders are involved in engagement processes
- Recommend local data sources or stakeholders who can
- Assist in the coordination of a prioritization workshop to identify assessment scope, goals, and prioritization among partners and/or stakeholders
- Provide assessment feedback at key inflection points
- Assist in the coordination of a roll-out meeting to communicate assessment findings and next steps
- Assist in the transfer of assessment information and/or training of stakeholders to use assessment products
- Share assessment uses 12 months following assessment completion

(Optional) Key partners are also invited to take a more active role in analysis.



Why Is This Research Important?

Historic structural inequalities have led to development patterns that place our nation's most disadvantaged and underserved populations in harm's way. As climate change continues, many of these populations are less able to prepare for or recover from natural hazard events. This increases their climate vulnerability.

Many of America's most vulnerable populations are also marine resource-dependent coastal and island communities. While there are national tools that screen for vulnerable populations, they often do not provide place-based information at a scale or resolution meaningful for local action and often exclude U.S. Territories and Alaska. This program offers additional support to these types of communities.

For More Information

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