Climate change is risky business: learn more about tools, rules and FAQ's

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WEDA Western Dredging Association

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Agenda

1. Changing climate
2. Strategies to protect our communities from climate disruptions
3. Approaches to addressing impending changes
4. Tools, guides, and checklists to direct and streamline preparedness strategies

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Changing climate – “the new normal?”

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Changing climate – “the new normal?”

- The climate is changing, regardless of the cause
- Increase in earth’s temperature causing changes to weather patterns
- Rising Sea Levels
- Increasing Storm Intensity
- Changing Precipitation Patterns and Frequencies
- High Heat Days

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Changing climate – Potential Impacts?

- Rising sea levels - Causing Coastal inundation, Infrastructure damage, Erosion, Storm Surge Flooding, Rising water table, saltwater intrusion;
- Increased water temperature - causing larger, more intense storm events, harmful algal blooms, shifts in Species range, change in timing of ecological events;
- Changing rainfall and snow patterns - Causing Prolonged drought, wildfires, and tsunamis;
- Changes to biological systems - Causing invasive species, changing biodiversity.

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Changing climate – “Potential Impacts?”

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Changing climate – what are the risks?

- Coastal Infrastructure damage
- Increased flash flood risk
- Risks of danger to human health and property damage

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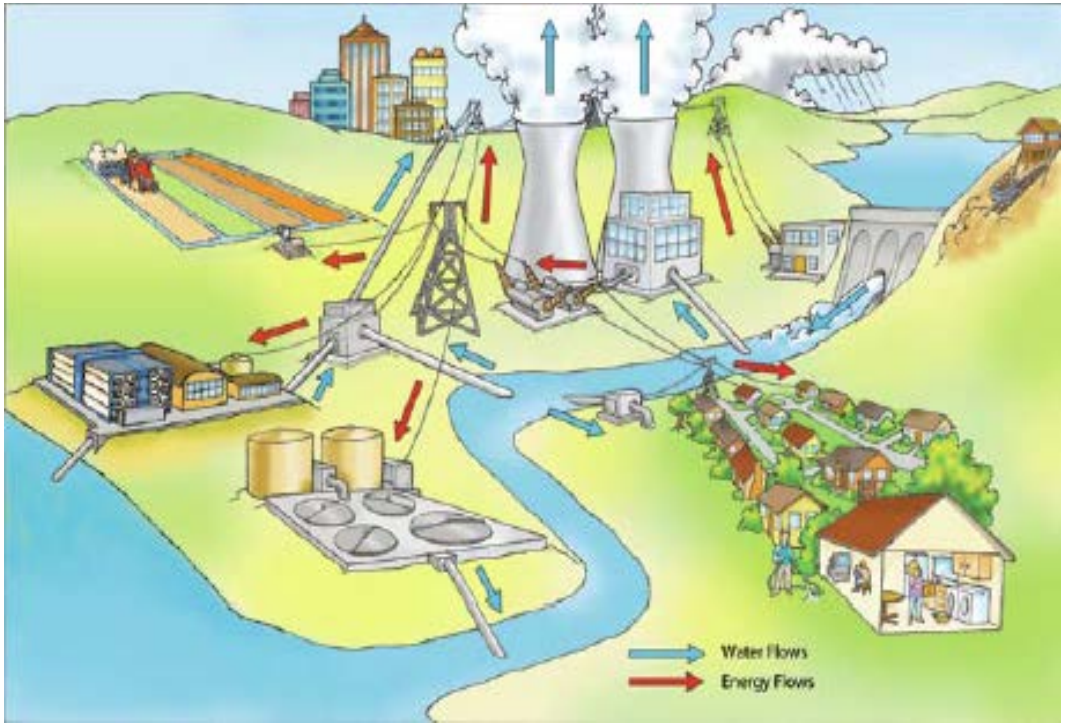
Changing climate – what are the risks?

- Increased energy and water demands and associated costs
- Water shortages
- Interruptions to operations and loss of productivity



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Strategies to protect our communities from climate disruptions

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Assessing vulnerability and adapting to climate change

- Understanding impacts and vulnerabilities of the system enables stakeholder development of an adaptation plan.
- A vulnerability assessment is the process of identifying, quantifying, and prioritizing the vulnerabilities in a system.
- Adaptation planning is the idea that changes are occurring or will occur, and we can increase resilience to the effects and mitigate harmful impacts for the future.

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Vulnerability assessment – what is at risk and why?

- Age of assets
- Geographic location
- Elevation
- Current/historical performance and condition
- Water supply and usage (forecasted demand)
- Water/power reliability
- Repair/maintenance schedule and costs
- Structural design
- Materials used
- Design lifetime and stage of life
- Floodplains and surface flooding
- At-risk road crossings
- Stormwater BMPs
- Emergency response capacity
- Wells and septic systems
- Hazardous materials storage

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Coastal Vulnerabilities

- Rising sea levels
  - erode beaches;
  - drown marshes and wetlands;
  - damage barrier islands, habitat, and ecological processes;
  - saline intrusion into freshwater ecosystems and groundwater;
  - flooding or inundation of low-lying areas, and damage to private and public property and infrastructure.

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Record-breaking rain drenches San Diego

By Gary Robbins and Edward Sifuentes | 7:14 a.m. July 18, 2015 | San Diego Union Tribune

Drought-stricken San Diego received record rainfall on Saturday from Tropical Storm Dolores, whose unexpectedly tough punch also caused power outages, street flooding, a brush fire, downed trees and dozens of accidents on local freeways.

By 5 p.m. Saturday, San Diego's Lindbergh Field had recorded 1.03 inches of rain, which is more precipitation than the city had received during the entire month of July dating back to 1902. San Diego averages only 0.02 inch of precipitation in July.

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Approaches to addressing impending changes

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Adaptation strategy: steps to prepare for climate variability

- Education and behavioral change
- Adjusting maintenance practices
  - e.g., cleaning drains more frequently
- Engineering new assets to withstand anticipated environmental conditions
  - e.g., better suited construction materials for hotter days
- Revise planning tools to represent greater climate extremes
  - e.g. flood maps, specifications

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Adaptation strategy continued

- Retrofitting existing assets
  - e.g., adding barriers to prevent water incursion into tunnels
- Systems planning
  - e.g., siting new facilities outside of expanded flood plains
- Improved operations plans for weather emergencies
- Engage stakeholders and effectively communicate about climate change vulnerability

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Tools, guides and checklists to direct and streamline preparedness strategies

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Vulnerability assessment and adaptation planning tools and guides

- The Ecosystem-Based Management Tools Network - a climate change - vulnerability assessment and adaptation tool portal
- matrices and the tools help communities focus on how to get started in planning for climate change

Dust Bowl of 1935 in Stratford, Texas

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Vulnerability assessment and adaptation planning types of tools

- **Process Tools**: allow development of a planning process to incorporate climate vulnerabilities
- **Portals**: give access to other tools and/or data that may be important in climate work
- **Analytical Tools:** allow investigation of current conditions and determine the effects of potential future conditions
- **Visualization Tools**: allow users to build unique tools and simulations that enable stakeholder engagement through the use of pictures or web-based tools
- **Natural Resource Tools**: can be used to assess the vulnerability of ecosystems or specific species to climate change

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NOAA Office for Coastal Management

Sea Level Rise Viewer – mapping tool to visualize community-level impacts from coastal flooding or sea level rise (up to 6 feet above average high tides)

Current Condition

With 6 feet of Sea Level Rise

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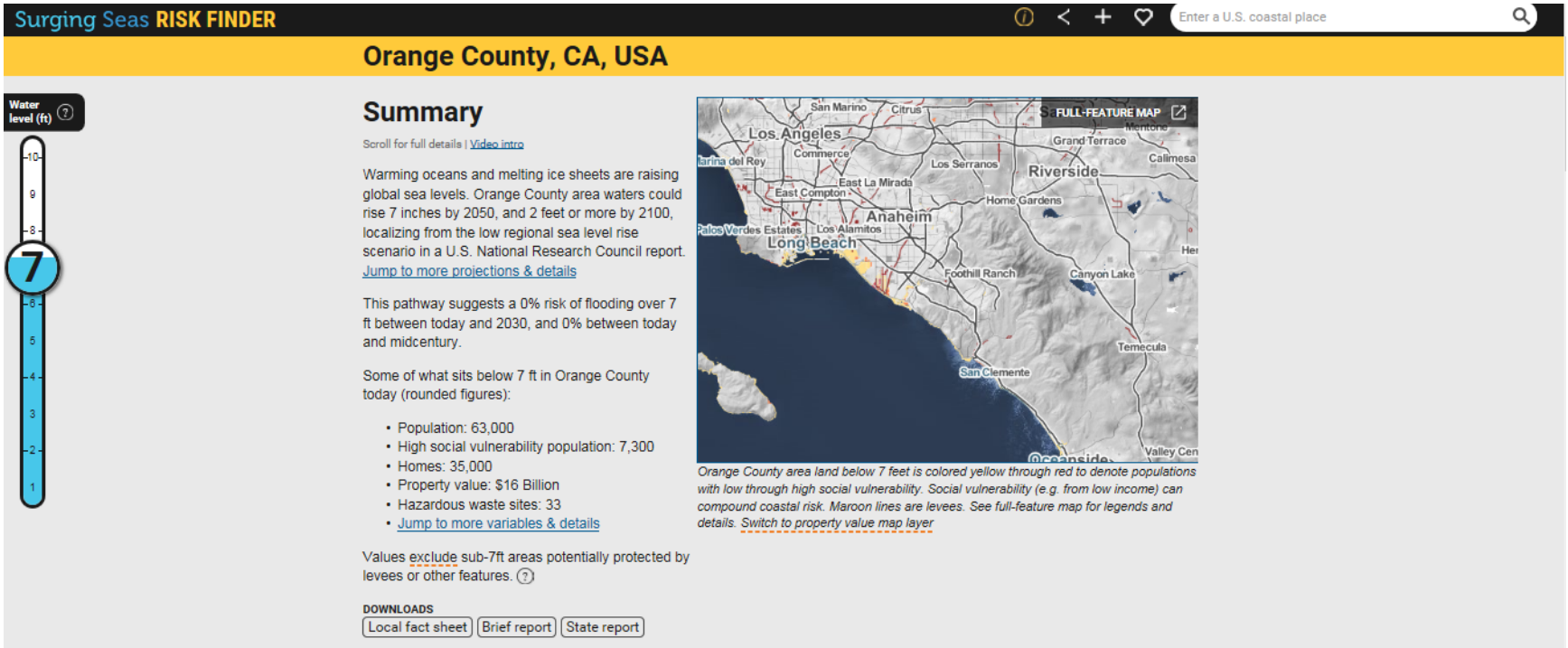
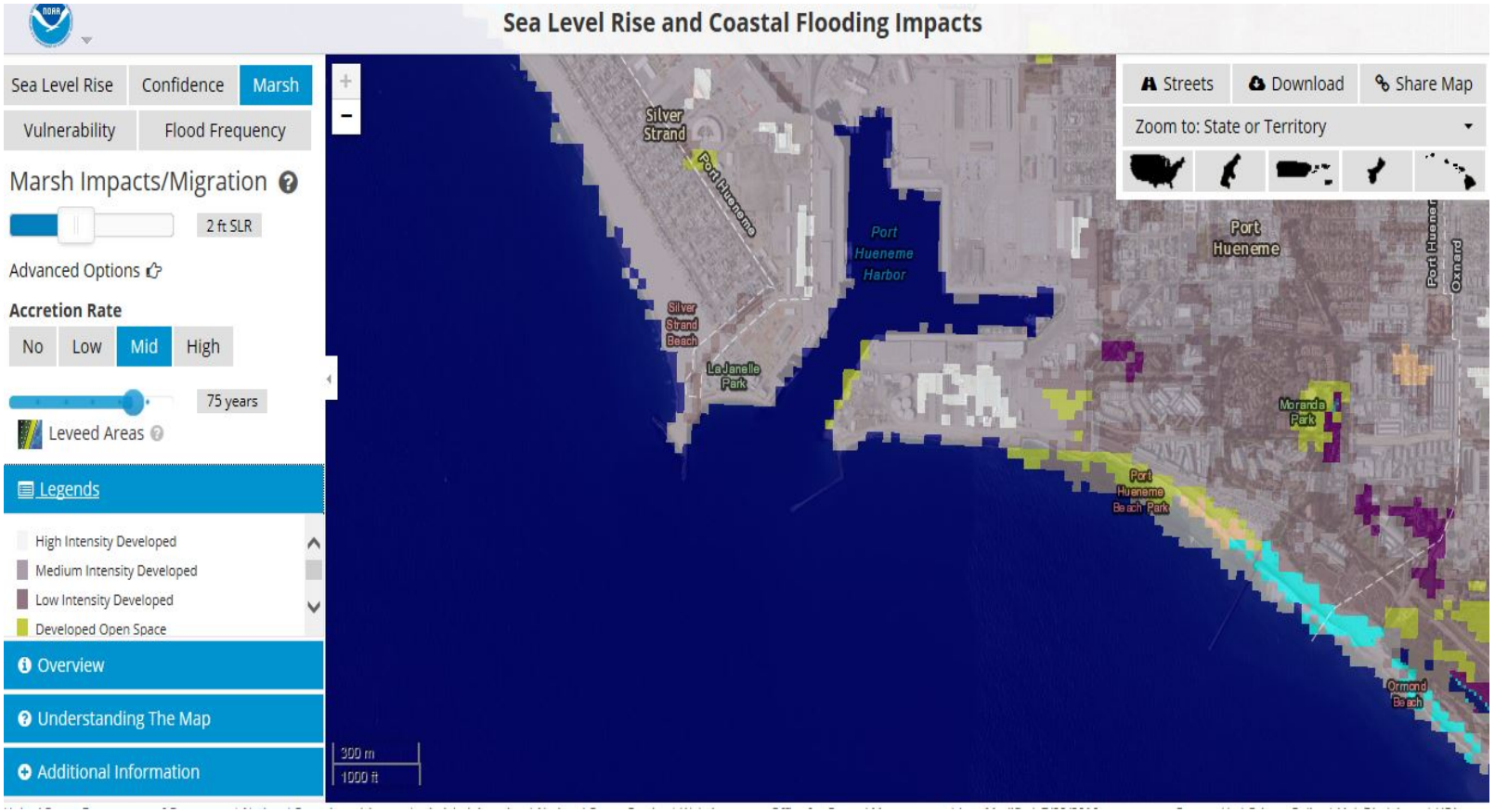
Risk Finder Sea Level Tool

Climate Central's Surging Seas Risk Finder is designed to provide citizens, communities and policy makers in the U.S. with tailored local information to understand and respond to the risks of rising sea levels and coastal flooding in their own neighborhoods.



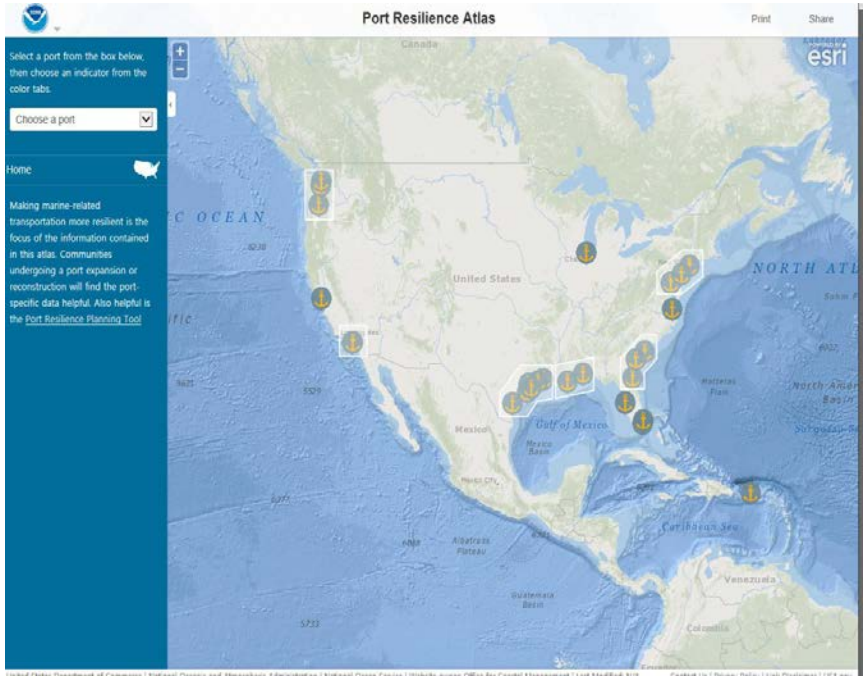
NOAA Sea Level Rise

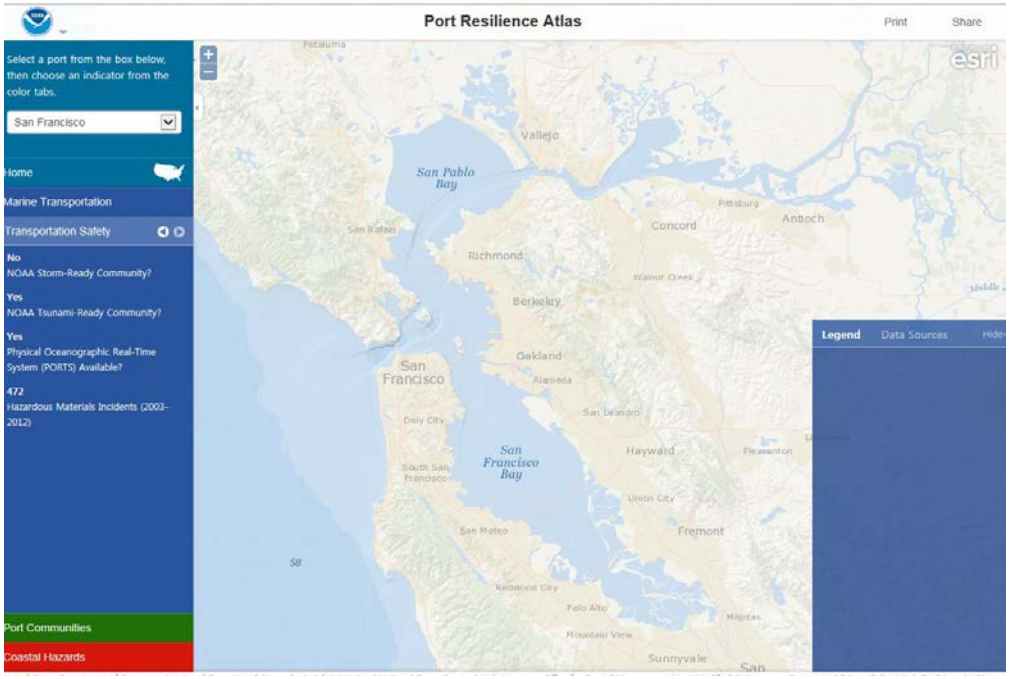
Used by Coastal Managers to evaluate several aspects of sea-level rise impacts to the natural environment and examines the impact to human land development along the coast.



Port Resilience Atlas –

Used by individuals Involved in infrastructure planning for ports and surrounding communities





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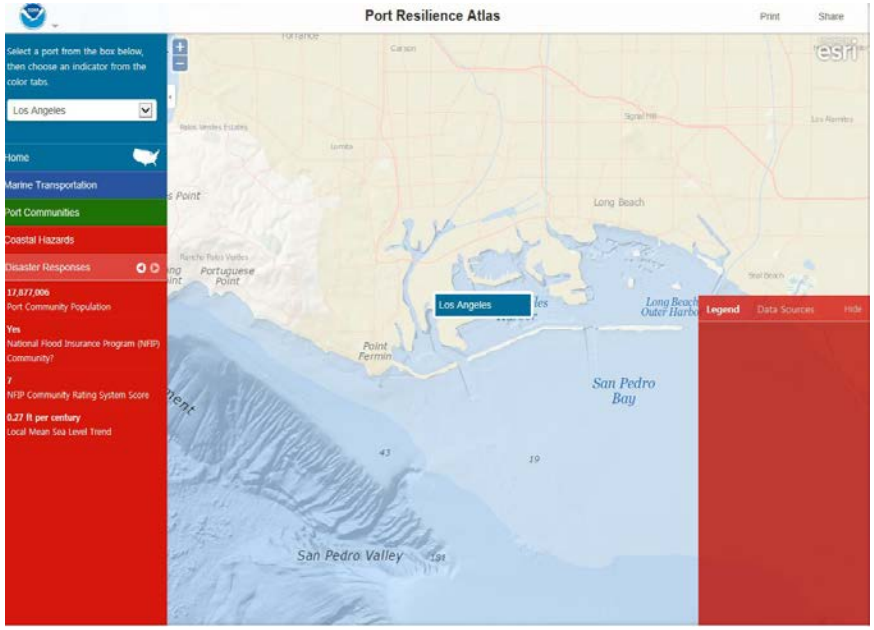
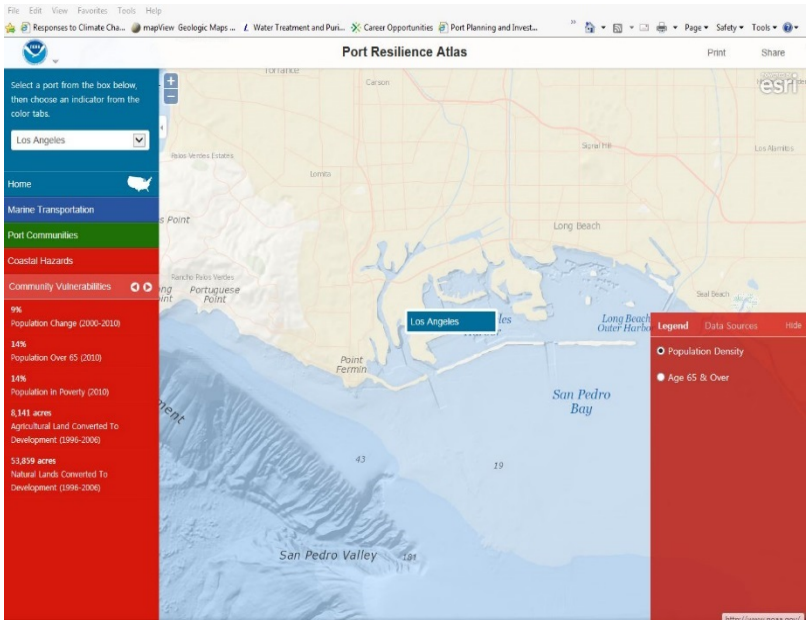
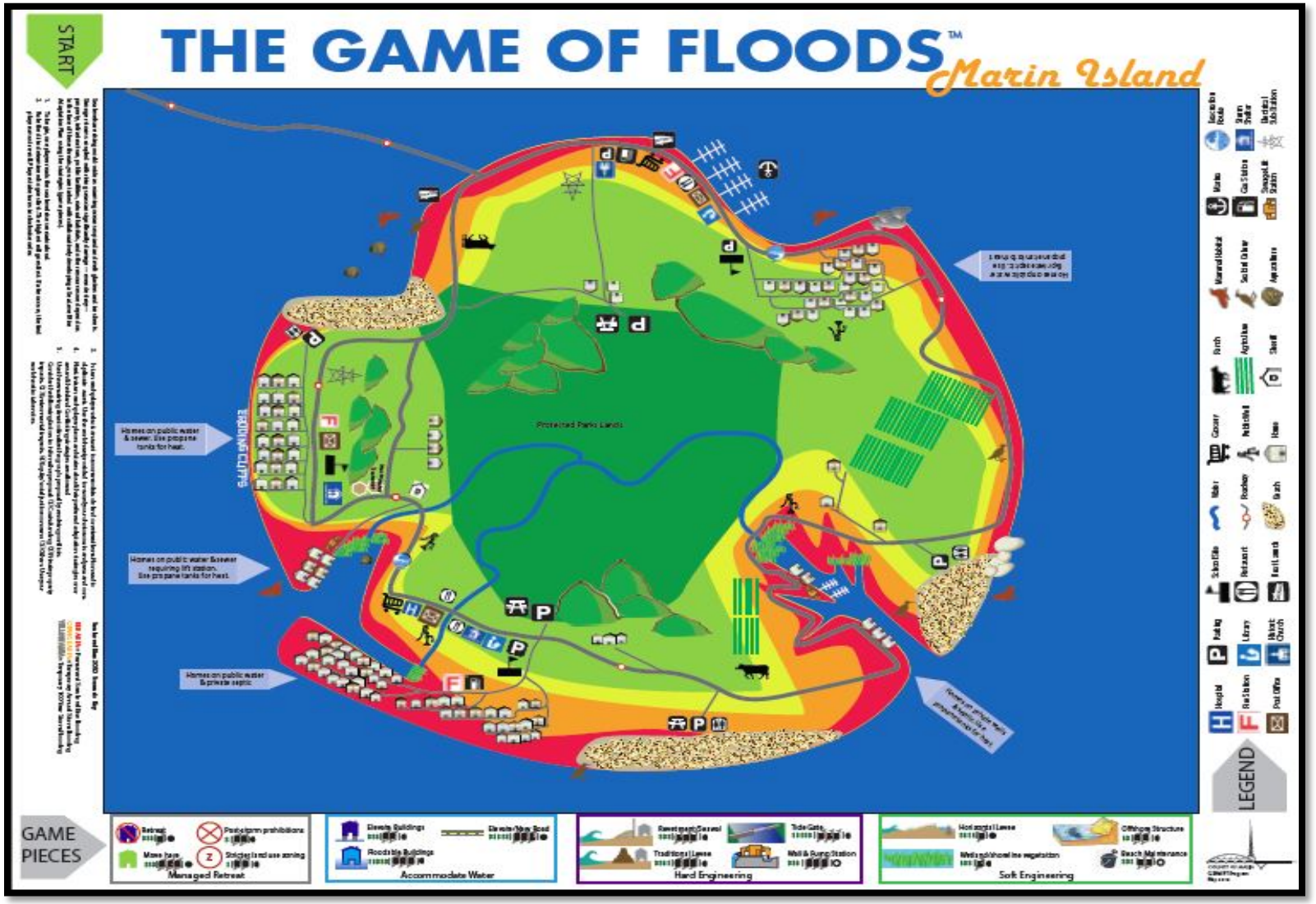
Port Resilience Atlas





Game of Floods – Community outreach



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Questions?

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