Optional Assessment 6A: Disaster Risk Reduction by Coastal Habitats

Developed by: Katie Arkema, Jess Silver and Gregg Verutes

You have been tasked by the United States state and county governments to assess where investments in habitat conservation and restoration will be most effective for reducing risk of coastal communities and properties to sea-level rise and storms. Use results from the InVEST coastal vulnerability model to answer the questions below. You do not need to run the InVEST model. Rather, use the Risk Explorer in Coastal Resilience 2.0 to explore habitat and sea-level rise scenarios, visualize results and communicate your findings.

Coastal Resilience Network URL: http://maps.coastalresilience.org/network/

Background

Extreme weather, sea-level rise and degraded coastal ecosystems are placing people and property at greater risk of damages from coastal hazards. Natural habitats work as buffers from storms and floods, reducing the need and investment costs in riprap, levees, bulkheads, and other types of 'hard' shore protection. Coastal habitats include oyster reefs, coral reefs, marshes, dunes, seagrass, and kelp forests. They habitats all play different roles in reducing risk from coastal hazards as well as providing many other auxillary benefits, such as carbon sequestration, opportunities for recreation and nursery habitat for fisheries. The Natural Capital Project is working with The Nature Conservancy and other partners to determine where to prioritize habitat conservation and restoration for hazard risk reduction and the sustained benefit of a suite of ecosystem services.

seagrasses beds

coral reefs

sand dunes

coastal forests

emergent marsh

oyster reefs

Tasks

1. **United States Risk Explorer App**
   http://maps.coastalresilience.org/unitedstates/
   Determine where existing habitats are most important for reducing exposure to coastal hazards and risk to poor families, people over 65 and coastal property.

2. **Gulf of Mexico Restoration Explorer and Coastal Defense Apps**
   http://maps.coastalresilience.org/gulfmex/
   Determine where oyster restoration will be most effective for reducing exposure to coastal hazards and risk to poor families, people over 65 and coastal property.

Discussion Questions

Use the 'Risk Explorer' at the following link to answer Q 1-3: http://maps.coastalresilience.org/unitedstates/

1. On the scale of the whole United States, which regions (Northeast, Southeast, Gulf Coast and West Coast) are most exposed to coastal hazards?
   Hint: This is just biophysical exposure and does not include social vulnerability.

2. Zoom into the northeast states. Identify an area at high risk when vulnerability is measured with total population, but at lower risk when vulnerability is measured with poor families. Take a screen shot of the area.

3. On the scale of the whole United States, where is the risk reduction provided by coastal habitats greatest? Take a few screen shots to communicate your findings.
   Hint: Check the box for "Priority conservation areas where habitats likely reduce risk now".

Use the 'Risk Explorer' at the following link to answer Q 4-6: http://maps.coastalresilience.org/gulfmex/

4. Moving to the Gulf of Mexico, name a region with the highest older population at risk from coastal hazards.
   Hint: Uncheck the box for "Priority conservation areas where habitats likely reduce risk now".

5. Where would oyster restoration for the entire Gulf lead to the greatest risk reduction? Take a few screen shot to communicate your findings.
   Hint: Check the box for "Priority restoration areas where new oyster reefs could reduce risk".

6. Where in Mobile Bay, Alabama would oyster restoration lead to the greatest risk reduction? Take a screenshot to communicate your findings.

To receive course credit, please compile your screenshots for Q 2, 3, 5 and 6 into one document and upload to https://www.formpl.us/form/5161298325143552/