Identifying Elevation Maintenance Strategies for GTM NERR

(Guana Tolomato Matanzas National Estuarine Research Reserve)

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GTMNERR researchers and stakeholders are assessing *where* investments in habitat conservation and restoration will be most effective for reducing risk of coastal communities and assets to sea-level rise and storms. Use results from the InVEST coastal vulnerability tool to answer the questions below. You do not need to run the InVEST model. Rather, use the online viewer tool to explore habitat scenarios, visualize results and communicate your findings. You will be learning how to interpret the InVEST coastal vulnerability model results, but most importantly, you will be building spatial reasoning and problem solving skills to link restoration science and adaptation planning.

Online tool URL: http://cons.scienceontheweb.net/ewe

Background

As you are aware, extreme weather, sea-level rise and degraded coastal ecosystems are placing people and property in the northeast Florida region at greater risk of damages from coastal hazards. Natural coastal habitats (e.g., marshes, oyster beds, and new mangrove stands) can work as buffers from storms and floods, reducing the need for and investment costs in riprap, bulkheads, and other types of 'hard' shore protection. These 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 InVEST coastal vulnerability model produces a qualitative estimate of such exposure in terms of an exposure index, which differentiates areas with relatively high or low exposure to erosion and inundation during storms. Over the last two years, the WETFEET project has engaged coastal planners, managers, and members of the public to co-develop a decision-support tool that highlights at 50m intervals where nature-based elevation maintanence strategies can protect at-risk communities of the intracoastal waterway (ICW) of GTM NERR.

SALT MARSHES

OYSTER BEDS

MANGROVES

Tasks

In preparation for March 3rd workshop, please perform the following tasks. There are hints below to use the viewer tool. Estimated time to complete: 15-20 minutes

1. **Determine where existing habitats are most important for reducing exposure to coastal hazards and risk to people and assets along the ICW of GTM NERR, Florida.**
2. **Explore at-risk sections of the ICW: a) Pellicer Creek, and b) your area of interest to learn about elevation maintenance strategies currently under consideration.**

Discussion Questions

Select the "CVI" tab to answer Q 1-3:

Coastal Exposure

1. Based on your interpretation of the exposure map, which area(s) (north, central, or south Reserve) is most exposed to coastal hazards?

   Hint: Click on "Relative exposure to hazards" under "SHOW ME…" of the "CVI" tab and visualize the relative hazard index scores along the ICW. Explore each section and compare the maps.

Habitat Role

2. On the scale of the GTM NERR, where is the risk reduction provided by all three coastal habitats greatest? Take a few screen shots to communicate your findings.

   Hint: Click the button "Where habitats reduce risk to coastal communities" and then "SHOW".

3. Zoom in to one of the three GTM NERR regions (north, central or south). Identify an area where the current distribution of one habitat plays a substantial role in risk reduction.

   Hint: After zooming in on the map. Select the button for "Priority areas where [habitat type drop-down] likely reduce risk" under "SHOW ME…" of the "CVI" tab.

Select the 'DRIVERS" tab to answer Q 4-6:

4. What factor(s) are driving the exposure in the region/area you selected for Q3? Take a few screen shots to communicate your findings. *Hint: Click the ■ icon and draw a box around the coastline of this area. This will create a chart that maps drivers of coastal exposure, including:*
   - GMPH = Geomorphology
   - ELEV = Elevation
   - HABS = Natural habitat
   - WAVE = Wind-generated waves
   - SRGE = Surge

5. Turn on the "Streets" base map and zoom to the mouth of Pellicer Creek (south Reserve, just north of the Palm Coast on the St. Johns/Flagler County border). This area of GTM NERR is prone to flooding during storm events such as Hurricane Irma in 2017. Click on blue diamonds to get a street view picture of the area. Which factors seem to make this area most vulnerable to coastal hazards and rising sea levels? Take a screenshot to communicate your findings.

   Hint: Use the same drawing tool as Q4 to identify drivers of exposure around Pellicer Creek.

Putting Restoration Science into Practice

6. Zoom in to the area of your favorite boat launch ramp, beach, or coastal park along the ICW and explore the "DRIVERS" and "ASSETS" tabs. Get a sense for how the current distribution of natural habitats protect coastal assets and reflect on elevation maintenance strategies that might be appropriate for this area. Write a 2-3 sentences summary and include any suggested improvements to the reference layers. What are the limitations of this tool?

   Hint: Click the "SHOW" button under "ASSETS" tab to display select socioeconomic assets.