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COASTAL RESILIENCE Virginia Eastern Shore

COASTALRESILIENCE.ORG/VIRGINIA

Coastal Resilience is a program led by The Nature Conservancy to examine nature's role in reducing coastal flood risk. The program consists of an approach, a web mapping tool, and a network of practitioners around the world supporting hazard mitigation and climate adaptation planning.

APPROACH

The approach consists of four critical steps:



1. Assess Risk and Vulnerability to coastal flood hazards including current and future storms and sea level rise



2. Identify Solutions for reducing coastal flood risk across social-ecological systems



3. Take Action at priority conservation and restoration sites to help communities identify and implement nature-based risk reduction solutions



4. Measure Effectiveness to ensure that efforts to reduce flood risk, while increasing community and ecosystem resilience, are successful

PARTNERSHIP

The customized Virginia Eastern Shore Coastal Resilience decision-support tool is based on a 30-year partnership between The Nature Conservancy and the University of Virginia's Virginia Coast Reserve Long-Term Ecological Research Program. LTER research provides data and empirical models of the Virginia coastal barrier ecosystem and its response to climate change that are incorporated into the Coastal Resilience tool. This kind of collaboration is critical to connect science with action, to inform the decision-making process that will ultimately enhance resilience in coastal communities like the Virginia Eastern Shore.



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TOOL

The Coastal Resilience tool allows users to visualize and assess regional vulnerability to storm surge, sea-level rise, changes in coastal habitats, and recommendations for nature-based shoreline stabilization solutions. The tool incorporates the best available science and local data to enable communities to visualize the risks imposed by sea-level rise and storm surge on the people, economy, and coastal habitats of the Eastern Shore and identify nature-based solutions for enhancing resilience and reducing risks where possible.

CHALLENGES

In the naturally functioning barrier island ecosystem of the Virginia Eastern Shore, climate change is expected to drive a combination of extreme weather and sea-level rise that will increase the risk of coastal erosion, flooding, and the permanent inundation of what is now normally dry land.

The science of nature-based solutions in reducing coastal flood risk is growing rapidly; a Coastal Resilience communication and decision-support tool examines when and where they are most effective.



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SOLUTIONS & ACTIONS

The best solutions may depend less on modern infrastructure, and more on rethinking how we value existing natural resources. By providing information on coastal hazards, socio-economics, habitats and ecosystems, Coastal Resilience explores nature-based solutions in:

- protecting or restoring habitats in front of coastal communities as buffers to flooding
- developing hybrid approaches that link natural and built defense structures
- accommodating the landward movement of tidal marshes as sea levels rise
- designing restored oyster reefs as breakwaters that reduce wave height and power
- educating local stakeholders and communities about climate adaptation and nature-based solutions

LIVING SHORELINE EXPLORER



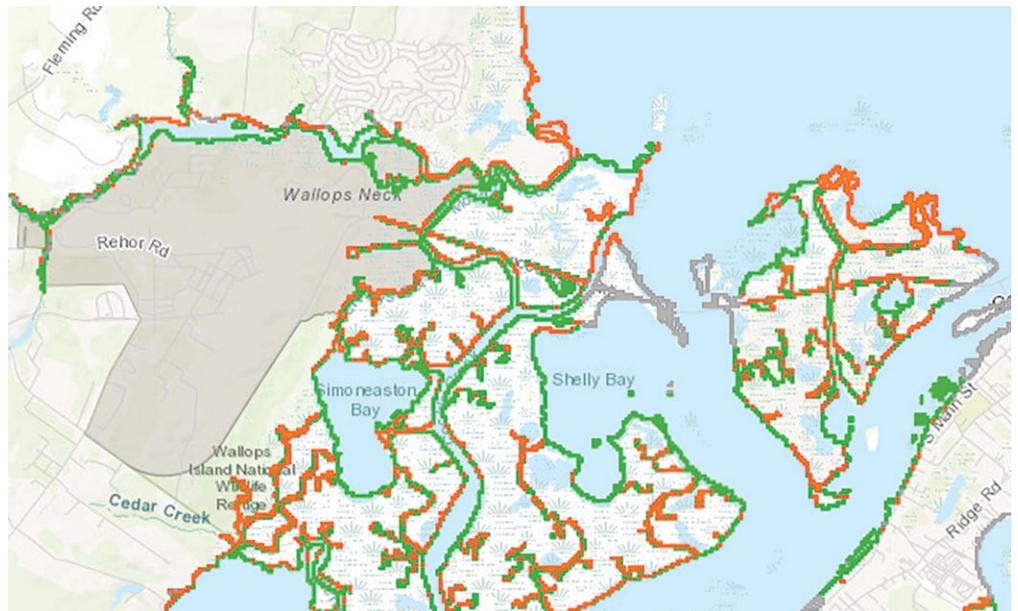
The Living Shoreline Explorer app shows the vulnerability of tidal marshes to erosion and inundation as well as conditions suitable for the use of soft and hybrid shoreline stabilization methods. Soft stabilization involves treatments like marsh plantings (i.e., marsh enhancement); hybrid stabilization involves treatments like marsh enhancement with rock or oyster sill (i.e., marsh with structures).



Living shorelines seek to control erosion while maintaining ecosystem functions by buffering waves and preserving the connection between marine and terrestrial environments. Field study in Virginia's coastal bays suggests that marsh vegetation and constructed oyster reefs may offer effective and sustainable long-term shoreline stabilization.

OYSTER REEFS AND WAVE ATTENUATION

Wave and water-level measurements collected across four constructed oyster reefs in Virginia's coastal bays suggest that they can be effective at reducing wave energy, but that this effectiveness is largely limited to shallow water depth conditions. Field studies are currently underway to define optimal oyster reef design criteria to mitigate shoreline erosion.



Zoomed-in area showing examples of shorelines suitable for marsh vegetation enhancement (green) or marsh vegetation with structure (orange) and unsuitable for living shorelines (gray).

ADDITIONAL APPS



REGIONAL PLANNING



FLOOD & SEA LEVEL RISE



COASTLINE CHANGE



FUTURE HABITAT

Contact us at vacoastalresilience@tnc.org, discover the tool at maps.coastalresilience.org/virginia, and follow us @CoastResilience

PARTNERS INCLUDE



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