Resilient Lands and Waters Initiative

Southwest Florida

A regional vision for collaborative conservation efforts and building resilience

Introduction

Introduced by the White House on Earth Day 2015, the Resilient Lands and Waters Initiative (RLWI) is an effort by the US Government to support collaborative landscape partnerships where Federal agencies will work with partners to conserve and restore important lands and waters and make them more resilient to a changing climate.

The study region spans seven counties in southwest Florida, where a combination of population growth, sea level rise and increasing water temperature threaten coastal, marine and terrestrial ecosystems.

This project looks ahead to 2060 to assess resiliency, considering two scenarios with distinct sets of development and conservation policies, as well as the implications they may have on the region's natural resources and populated coastal areas. To support the formation of partnerships and decision-making to enhance resilience, a website was developed which enables a better understanding of the role habitats play in reducing adverse effects of the projected changes.

The project was made possible with the support of the Peninsular Florida Landscape Conservation Cooperative, as well as the research and conservation efforts undertaken by our partners in the region.

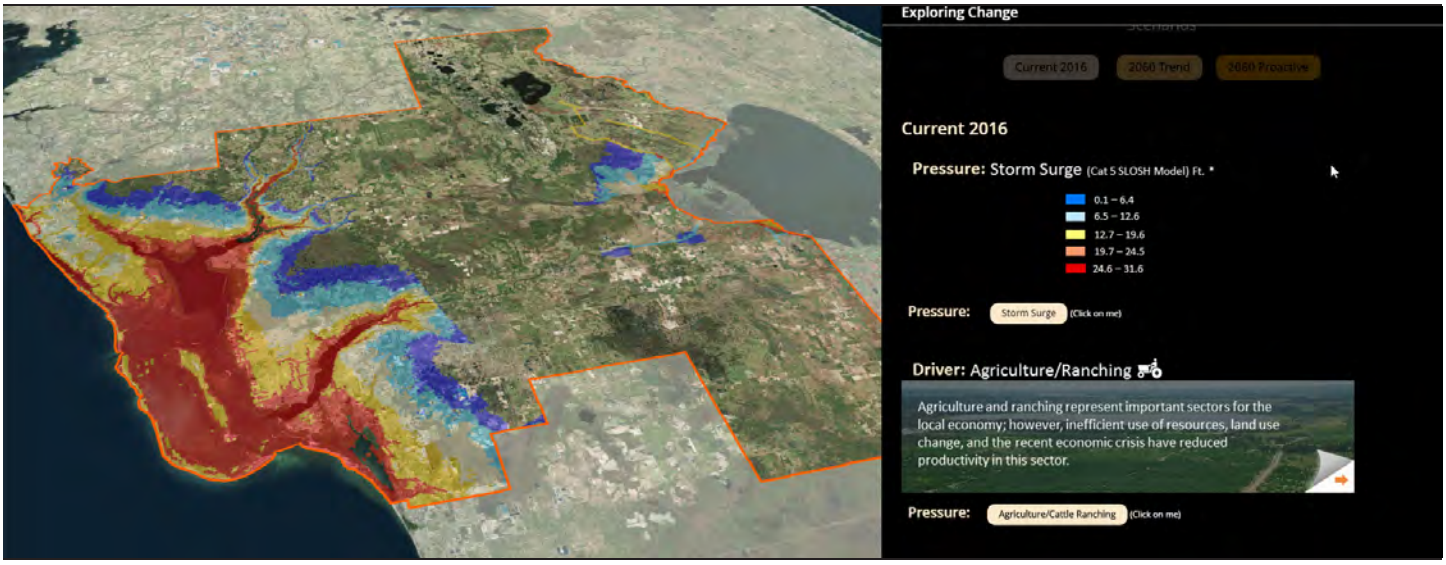
Challenge

Southwest Florida is a landscape home to precious marine and terrestrial habitats such as the Everglades wetlands, which is facing multiple stressors such as climate change, urbanization, land use changes, and invasive species that threaten the integrity of this region. These challenges are stressing this landscape and emphasize the need to understand the role that ecosystem services and key partnerships have in sustaining and increasing the resilience of the region's natural and built environment.

Project Contributions

Using the DPSIR causal framework as a conceptual backbone, the resiliency assessment applied previously-developed statewide scenarios and geospatial analysis to evaluate the expected impacts on natural habitats and people in alternative futures, including:

- Evaluation of drivers, pressures, and key ecosystem services
- Resilience assessment (biophysical and socio-economic factors)
- Coastal vulnerability and population exposure analysis



Project Component Framework

Understanding the Drivers of Change

Based on a review of scientific studies developed by various partners, 8 primary drivers of change were identified for the landscape and seascape of southwest Florida:

- *Climate change*
- *Population and water management*
- *Population growth*
- *Tourism*
- *Urbanization*
- *Fishing*
- *Marine Industry/Industry*
- *Agriculture/ranching*

A relative impact score was determined for each of these drivers under three scenarios: "Current", "2060 Trend", and "2060 Proactive". For all drivers, the scenario based on current trends had the highest impact. Specific pressures and their geographic extent are explored further on our website.

Ecosystem Services & Landscape Resiliency

Landscapes and their communities derive multiple benefits from ecosystems. The Millennium Ecosystem Assessment, conducted by a consortium of scientists at the request of the UN in the early 2000's, grouped ecosystem services into four broad categories of service types:

- *Supporting*
- *Provisioning*
- *Regulating*
- *Cultural*

The southwest Florida region contains a multitude of ecosystem goods and services. Ecosystem services specific to southwest Florida were identified from eight terrestrial and marine research projects conducted in the region. Examples of these services and goods are represented spatially through a web visualization.

From Vulnerability to Resiliency

A methodology developed by the UN University in 2014 was used to evaluate a series of resilience indicators for five categories, in order to determine a combined score for each scenario:

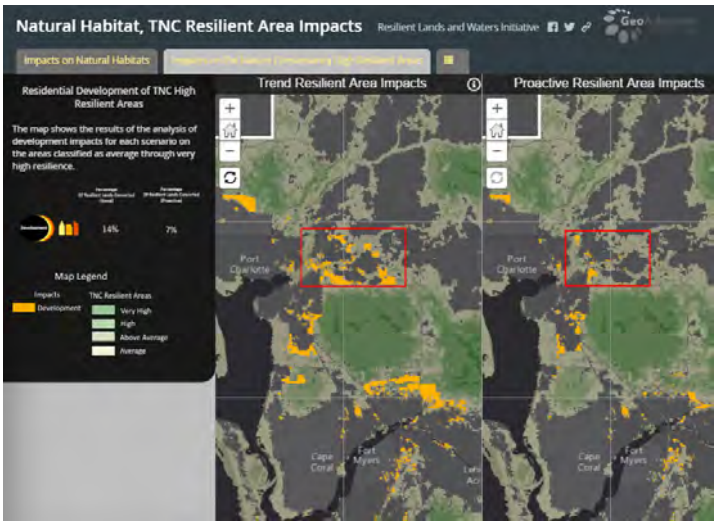
1. *Landscape and seascape diversity*
2. *Biodiversity and innovation*
3. *Social equality and well-being*
4. *Governance and livelihoods*
5. *Economic influence*

In addition, spatial impact assessments were conducted to evaluate the extent of habitats and resilient lands affected by development and sea level rise. The implications of changing urban patterns and coastal ecosystems on coastal hazards were also analyzed through the Natural Capital Project's InVEST model, which calculates coastal exposure & population impacts.

Results

Resilience capacity and driver impact scores were used to determine which factors are less sensitive to proposed resilience strategies under each scenario. These results help support decision-making and identify areas with greater need for key partnerships and non-regulatory conservation mechanisms to address future changes to the natural and built environment.

The results of the habitat impact analysis and coastal vulnerability assessment can be reviewed through comparative visualizations, available on the project website. These tools make it easy to contrast the extent of impacts based on different assumptions related to land use planning and funding for conservation. Future work will explore other regions and scenario variables.



Ongoing Work

Southwest Florida

- Integrate resilience assessment results with spatial impact analysis to prioritize future resilient strategies in key areas
- Work with partners in the region to promote the web tool and its applications for policymaking and conservation

State of Florida

- Expand partnerships such as the DOI's Wildland Fire Resilient Landscapes program and Florida Panther National Wildlife Refuge landscape conservation design
- Apply methodology for Big Bend landscape conservation design and explore applications in other regions

Other Work

- Explore additional scenario variables to provide management relevant projections of development and climate change
- Collect additional stakeholder input and establish strategic partnerships to support science and enhance resilience throughout the Gulf of Mexico region

Visit us and learn more:

http://www.geoadaptive.com/RLWI_Southwest_Florida

Thanks to our partners and sources of data:
PFLCC, USFWS, USGS, FWC, FNAI, FGDL, SWFRPC, CHNEP, SFWMD, SWFWMD, NOAA, TNC, UF GeoPlan Center, The Natural Capital Project, GeoDesign Technologies, 1000 Friends of Florida

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