Thresholds Synthesis to SLR and Storm Threats for Focal Species along the U.S. Atlantic and Gulf Coasts

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The North Atlantic LCC

Based on partner goals and needs

- Identify threats beyond the scope of individual agencies and organizations

- Develop best available science, scaled to region

- Coordinate among partners working at different scales, with different strengths

- Provide scientific and technical support to apply information
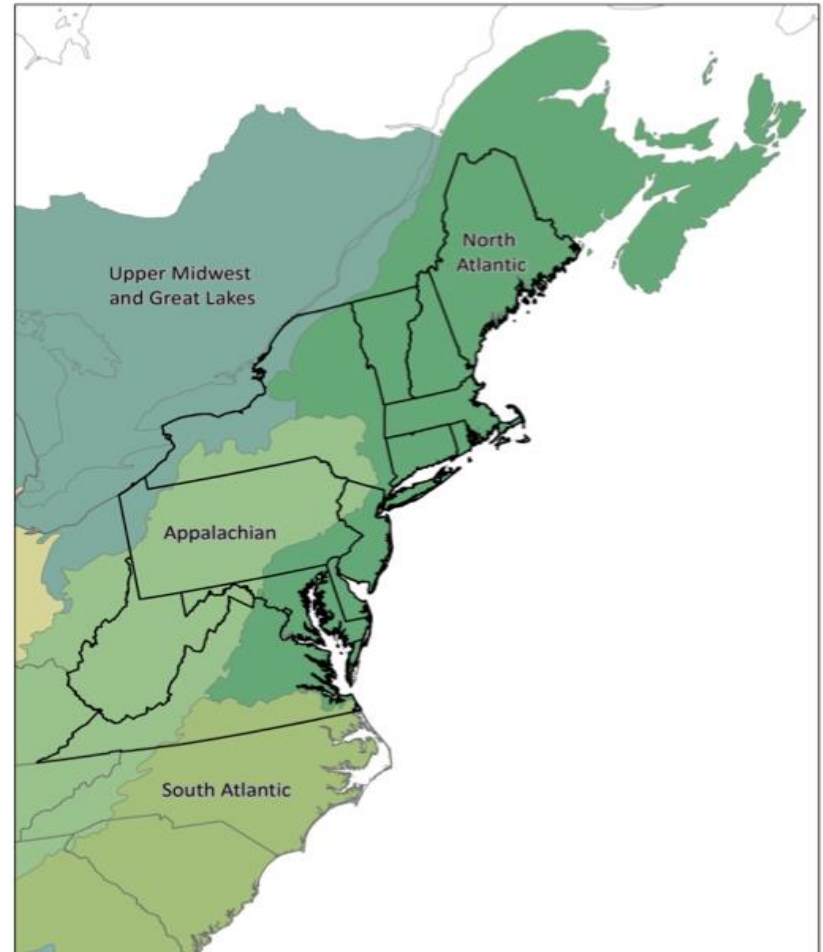
Multi-LCC projects
Atlantic and Gulf Coast Resiliency Project

Compilation of coastal resilience related decision support tools and resources

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ORGANIZATION		NAME OF TOOL	DESCRIPTION		VIEW THE TOOL
LCCs					
	South Atlantic LCC	Southeast Conservation Blueprint	A spatially explicit plan describing the places and actions needed to meet shared conservation objectives in the face of future change to sustain natural and cultural resources.		http://www.southatlanticlcc.org/page/...
			...cilitate partner-driven		http://nalcc.databasin.org
			...t and Midwest where ...e the greatest impact. ...t from the North Atlantic ...stablish and rank ...s management scenarios,		http://www.fishhabitattool.org/
			...e northeastern U.S. ...ding) response to sea-...e.g., landforms such as ...n regions of intense ...areas likely to respond ...By distinguishing the ...m appropriate scientific ...ise have been ...ble Landscapes" ...University of		http://northatlanticlcc.org/projects/dec... level-rise https://necsc.umass.edu/projects/rese... level-rise-impacts-northeastern-us
CSCs					
	NE CSC	Massachusetts Wildlife Climate Action Tool	Designed to inform and inspire local action to protect the Commonwealth's natural resources in a changing climate. This Tool focuses on providing information for a range of local decision-makers, including conservation practitioners, landowners, municipal agencies, and community leaders, seeking to conduct on-the-ground climate change adaptation efforts. With this tool, users can: 1) access information on climate change impacts and vulnerabilities of fish and wildlife species and associated habitats; 2) explore adaptation strategies and actions to help maintain healthy, resilient natural communities based on location and area of interest; and find additional resources to help guide decision-making and actions. Initial development of the tool is focused on fish and wildlife species, forests and forestry practices, aquatic and terrestrial connectivity (with a focus on roads and culverts), land protection, and conservation planning. Although it was designed for MA, it provides broadly relevant climate and adaptation information, and can serve as a model for related efforts across the entire Northeast.		http://climateactiontool.org
	SE CSC	The Global Change Monitoring Portal	the existence and operation of programs that monitor the effects of global change processes, such as climate and land use change, on important air, land, and water resources. This is a public service project intended to support both education and decision making by providing comprehensive "one stop" access to information about hundreds of monitoring programs in North Carolina and throughout the Southeast. This work will provide additional development of the Global Change Monitoring Portal, which is currently in the pilot phase.		https://my.usgs.gov/gcmp/
USGS					
			Organizes relevant products and information under three specific coastal hazard themes: extreme storms, shoreline change, and sea level rise. The products fulfill critical needs for information that is scientifically		

Resources Organized by Group | Resources Organized by Type | Resources Organized by Year | **Decision Support Tools**

North Atlantic Landscape Conservation Cooperative

Multi-LCC projects
Atlantic and Gulf Coast Resiliency Project

25 species have quantitative threshold data available

13 species projected to lose $\geq$50% of population or habitat w. 0.5 m SLR

A Synthesis of Threshold Information for 44 Focal Species of Conservation Concern along the U.S. Atlantic and Gulf Coasts, and Caribbean

Atlantic and Gulf Coast Resiliency Project

Emily Powell

North Atlantic Landscape Conservation Cooperative

Thresholds Synthesis for Focal Species along the U.S. Atlantic and Gulf Coasts

Threat: Sea Level Rise and Storms

107 fish, wildlife, and plant species along the U.S. Atlantic, Gulf and Caribbean

(LCCs) - North Atlantic, South Atlantic, Peninsular Florida, Gulf Coast Prairie, Gulf Coastal Plains and Ozarks, and Caribbean;

(CSCs) - Northeast, Southeast, and South Central

Species chosen due to high ecological (i.e., foundation or representative species), economic, or cultural importance value

107 trimmed to 45 species

Comprehensive literature review and extensive expert elicitation

Results: Thresholds synthesis

Best studied groups: Birds, plants, and reptiles

Information gaps: coastal fishes, mammals, and amphibians

Taxonomic Groups	No. of Species with (√) and without (X) Threshold Data	
	√	X
Shore/Wading Birds	11	10
Plants	5	3
Reptiles	3	2
Fishes	2	3
Invertebrates/Chelicerata	2	0
Mollusk	1	0
Mammals	1	1
Amphibians	0	1
Total	25	20

Species with numeric threshold data

Birds:

red knot, whooping crane, willet, piping and snowy plovers, clapper and black rails, saltmarsh and seaside sparrows, mottled duck, and American oystercatcher

Plants:

mangrove guild, salt marsh hay (*S. patens*), sea oats, saltmeadow cordgrass *(S. alterniflora),* spikegrass (*D. spicata*)

Reptiles:

Diamondback terrapin, green and loggerhead sea turtles

Results: Thresholds synthesis

- 25 of 45 (56%) high value species have quantitative threshold data related to SLR or storms

- quantitative threshold responses to coastal storms were scarce

- 13 species projected to lose at least 50% of their population or habitat (e.g., foraging, nesting, or spawning) w. 0.5 m SLR by 2100

- Oystercatcher & diamondback terrapin only 2 species predicted to have increased habitat availability w. SLR, storms

Relative vulnerabilities by habitat type

Focal species lacking quantitative threshold data:

- American black duck
- Black mangrove
- Black skimmer
- Blackgrass
- Brown pelican
- Common snook
- Diamond killifish
- Gull-billed tern
- Kemp Ridley's sea turtle

- King rail
- Least tern
- Leatherback sea turtle
- Mangrove cuckoo
- Nelson's sparrow
- Perdido Key beach mouse
- Rainwater killifish
- Roseate tern

- Spadefoot toad
- White mangrove
- Wilson's plover

Climate change adaptation strategies to manage vulnerable coastal habitats

Restoration of tidal marsh restrictions

Sediment augmentation (a.k.a. thin-layer deposition for marshes, mangroves)

Manage hydrological alterations - remove ditch plugs, ditch remediation, excavate runnels

Facilitated expansion and assisted migration - marshes, mangroves

Conservation of high biodiversity value areas - acquisitions and easements (e.g., advancement zones, rolling easements)

Beach nourishment

Living shorelines – marshes, beaches, mangroves, shellfish beds