

Resilient Sites for Conservation in the Eastern United States

Strongholds for Nature in a Changing Climate

Conserving the Stage: Climate change is creating an increasingly dynamic natural world by shifting species distributions and rearranging habitats. Consequently, conservationists need a way to identify important areas for protection that does not assume that the locations of existing plants and animals will stay the same. Rather than trying to protect diversity one species at a time, the key is to protect the different “stages” upon which the drama of nature unfolds. In the Eastern United States, these stages are based strongly on geology and consist of recognizable geophysical settings such as coastal sands, limestone valleys, granite summits, or silt floodplains, that each support a distinct set of species. Conserving a range of physical environments offers an approach to conservation that protects a diversity of plants and animals under both current and future climates.

Settings and Stages: The number of plants and animals in each state across the East is correlated with the number of geology types, the amount of limestone, the latitude, and range of elevation in the state. These geophysical factors form ecological regions across the landscape that support different species.

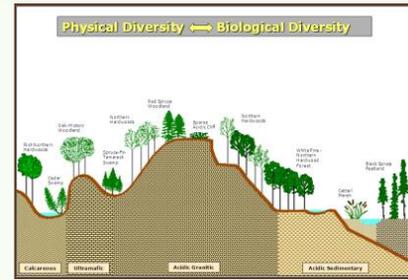


High Elevation Granite High Elev. Limestone High Elev. Mafic



Low Elev. Sand Low Elev. Sedimentary Low Elev. Silt

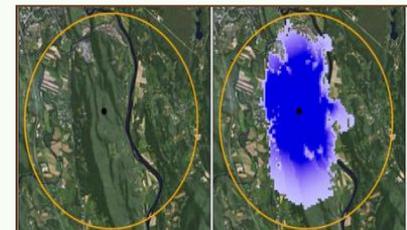
Typical **geophysical settings** of the Eastern United States



GEOPHYSICAL SETTINGS are unique combinations of geology, elevation, and landforms.



COMPLEX LANDSCAPES create “micro-climates” that buffer change by providing species with a variety of local climates.



CONNECTED LANDSCAPES offset the development, roads, and agriculture that can inhibit natural movements. Maintaining a connected area (BLUE REGION above) in which species can move ensures that the area can adapt to climate change.

Natural Strongholds: Lasting conservation depends on identifying and protecting places where the effects of climate change are buffered by the natural properties of the site. Conserving these places is vital to maintaining a diversity of species and natural processes regardless of changes in the climate.



Natural strongholds are places where the direct effects of climate change are moderated by **complex** topography and **connected** natural cover, and where the current landscape contains **high quality biodiversity** features. Natural Strongholds can serve as a bridge to grant safe passage into the future for thousands of species.

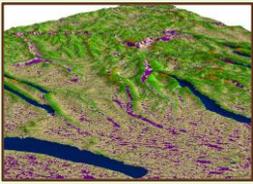
In these sites, species can find areas of suitable moisture and temperature within their local neighborhood. This allows resident species populations to remain strong and helps ensure that changes in the composition and structure of the communities will be more gradual.

Underlying data developed by The Nature Conservancy’s Eastern Science Office with support from the Doris Duke Charitable Foundation and the Northeast Association of Fish and Wildlife Agencies.

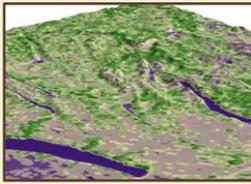
View the report, papers, and full-sized maps at:

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A Complex and Connected Landscape

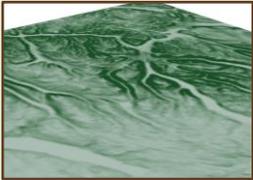


Landforms

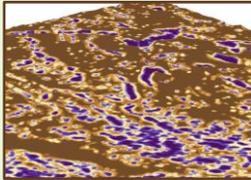


Landform Variety

Complex Landscapes: are places that have an assortment of small, connected, local climates creating a range of temperature and moisture options for the resident species. In essence, complex topography and elevation gradients break the regional climate into a wide array of micro-climates.



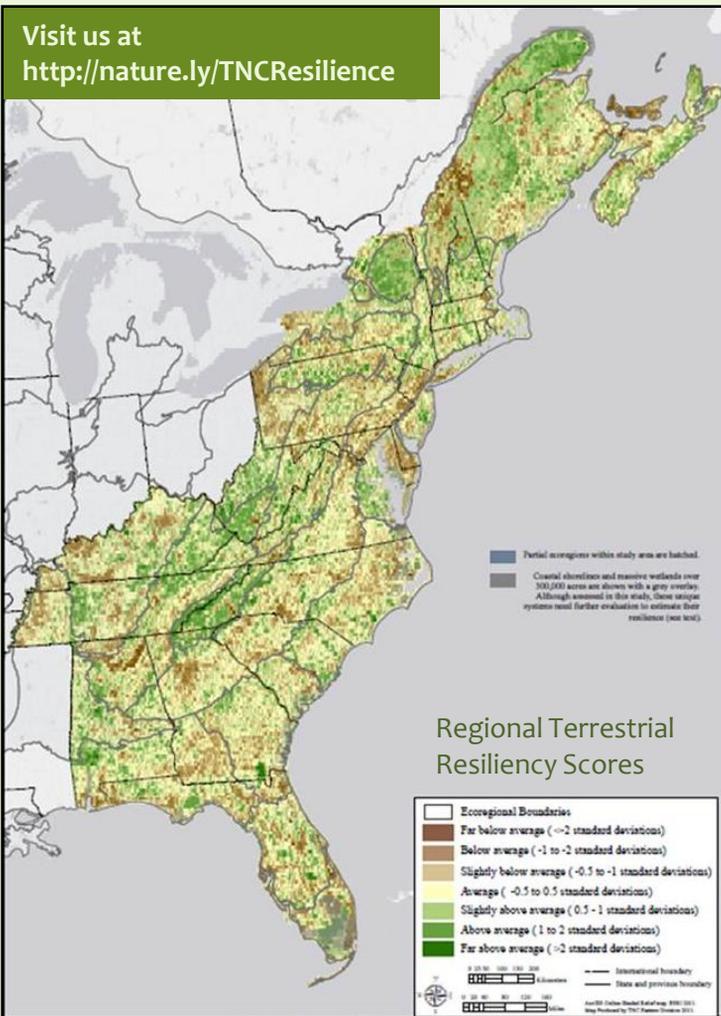
Elevation Range



Wetland Density

Connected Landscapes: are places that allow species to move and disperse, and processes like fire or water movement can occur unimpeded. This facilitates the adjustments necessary for the natural world to stay balanced with the climate. Permeable landscapes have an abundance of connected natural cover.

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Resilient Sites: With a changing climate, many places may become degraded and lose species, but some places will retain high quality habitat and continue to support a diverse array of plants and animals. Sites that have both **complex** topography and **connected** land cover are places where conservation action is most likely to succeed in the long term.

Permanent conservation of the resilient areas should be prioritized to ensure they can continue to provide habitat for species.

Securing resilient sites safeguards natural benefits such as fresh drinking water and clean air for local communities now and into the future.

Resiliency Scores: The map shows areas that offer the greatest potential for species to adapt as the climate changes. A dark green color indicates that the area has high estimated resiliency. Brown indicates areas vulnerable to climate change. The analysis estimates resiliency scores by each ecological region (gray lines) in the East.

Coastal shorelines and wetlands over 300,000 acres need further analysis.