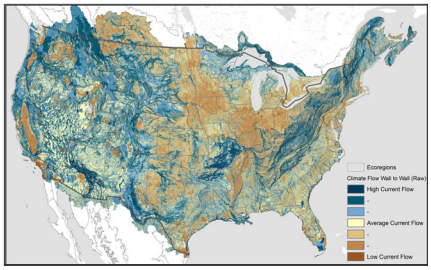
Connectivity and Climate Flow

File Geodatabase Raster Dataset



Tags

Climate Flow, Upslope, Downslope, Northward, CONUS

Summary

Resilience concerns the ability of a living system to adjust to climate change, moderate potential damages, take advantage of opportunities, or cope with consequences; in short, the capacity to adapt. The Nature Conservancy's resilience analysis develops an approach to conserve biological diversity while allowing species and communities to rearrange in response to a continually changing climate. See more at: http://nature.org/climateresilience.

In the Resilient and Connected Network analysis, sites and linkages between them identified by the combination of resilience, flow, and biodiversity were integrated into a single network. The network is designed to represent resilient examples with all the characteristic physical environments of the region while maximizing the amount of diversity contained within in them and the natural flow that connects them. By building the network around the natural pathways that allow species populations to shift and then identifying representative resilient sites situated within those pathways, the network is specifically configured to sustain biological diversity while allowing nature to adapt and change.

The Resilient and Connected Landscapes analysis was tailored to regions based on input from regional steering committees that modified factors to capture local ecological functions important to each region. This national dataset is directly derived from the 9 regional datasets and care should be taken to understand the different methods in each of the regions.

Description

The following methods apply for the Rocky Mountians and east. For Califonia methods see: https://omniscape.codefornature.org/#/analysis-tour. For the Pacific Northwest, the base flow was calculated using omniscape and the climate flow was using eastern methods. For more information see:
https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/oregon/science/Documents/McRae_et_al_2016_PNW_CNS_Connectivity.pdf

The wall to wall results reveal how the human-modified landscape is configured. The results allow you to identify where population movements and potential range shifts may become concentrated or where they are well dispersed.

For our final model, we weighted the regional flow model with the upslope, downslope and northward models to simulate species populations could flow through the natural landscape finding climate refuge both by moving up or down slopes and mostly in a northward direction. The goal was to approximate a species population expanding locally then northward as allowed by the anthropogenic resistance within its neighborhood.

When combining the factors, a challenge was how to weight the influence of each factor in a way that most closely approximates the real world. We wanted to keep the emphasis on the

areas that are important for regional flow, while boosting slightly the areas that channel slope-based and northward movements. We accomplished this by using the northward regional flow map as our based dataset and boosted the score of cells if they were important for upslope or downslope movement. For each of the two factors we took the areas that were above-average with respect to their factor.

Credits

The Nature Conservancy, Eastern Resource Office, Eastern Conservation Science (ECS), Boston, MA

Use limitations

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Extent

West -97.247230 **East** -89.358819
North 49.386892 **South** 43.359459

Scale Range

Maximum (zoomed in) 1:5,000
Minimum (zoomed out) 1:150,000,000

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