Connecting current and future suitable climates to facilitate species movement under climate change

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Goal: Predict landscape connectivity, including accessibility of suitable climate conditions in the future.

Why? Traditional connectivity modeling may be missing important routes for species movement under climate change.
Identify climate analogs: places in the future that will harbor today’s climate conditions.

Connect climate analogs (Circuitscape) considering dispersal & landscape permeability.

How do climate projections affect modeled species movement?

Approach:

- Climate niche breadth
- 3 GCMs from CMIP5
- RCP 8.5 emissions scenario
- 2 time periods
today
What areas are most important for climate-induced species movement?
Severity of projected climate change
How does this compare to connectivity that doesn’t include climate projections?
without climate projections comparing with and without climate projections

with climate projections

Potential movement
- High
- Low

Connectivity impact of climate projections
- More important for movement without climate change
- More important for movement with climate change
Isn’t climate change unfolding continuously?
today

? ?

future
Take-aways?
Including climate projections...

- shifts important areas for movement to a smaller proportion of the landscape (esp. for dispersal-limited spp)
- predicts less net movement, less even movement than connectivity based solely on human modification

Modeling climate change incrementally...

- shifts relative importance of pathways
Connectivity enhancement based on human modification alone or simplifying the temporal resolution of climate change may overestimate movement and miss critical pathways.
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Questions?
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Take-aways:

• Including climate projections shifts important areas for movement to a smaller proportion of the landscape.
• Connectivity maps solely driven by human modification predict more net movement, more even movement.
• Relative importance of pathways shifts when climate change proceeds incrementally in two time steps vs. in one time step.
• Connectivity enhancement based on human modification alone or simplifying the temporal resolution of climate change may over-estimate movement and miss critical pathways.