Riparian Climate-Corridors: Priority Areas for Conservation in a Changing Climate

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Riparian areas are expected to facilitate range shifts and provide refugia

Riparian areas span climatic gradients

Riparian areas contain cool, moist micro-climates relative to surrounding areas

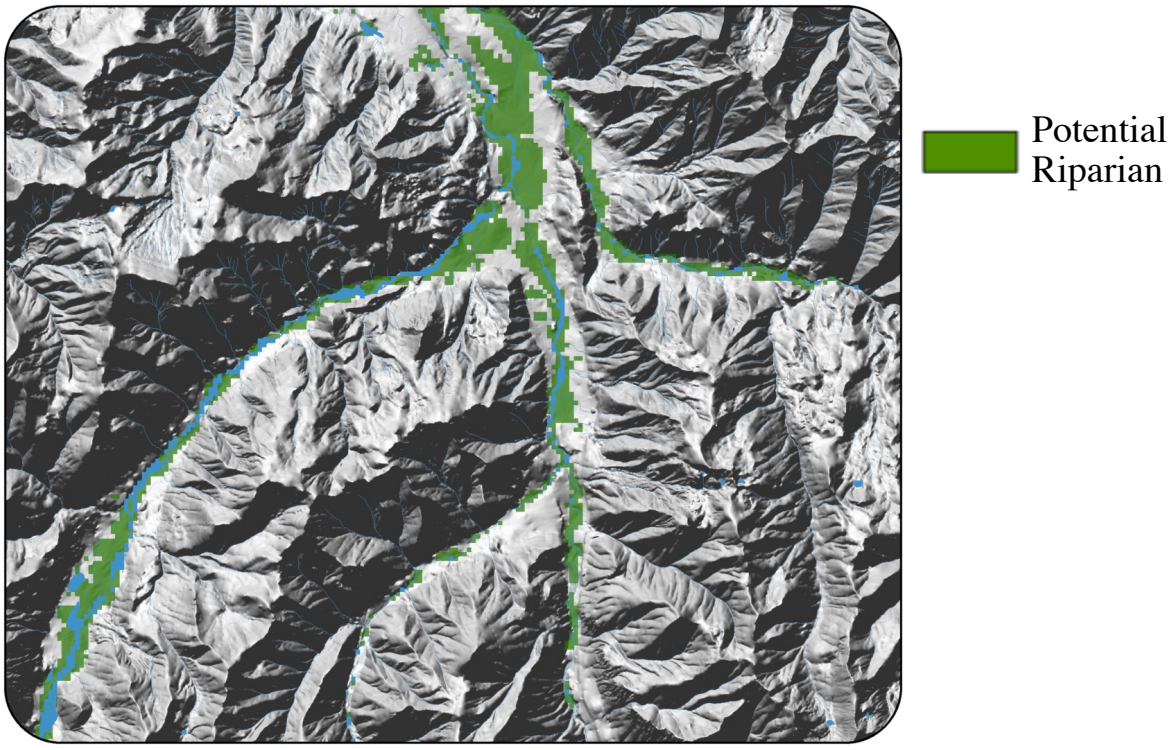
Riparian areas feature high levels of biodiversity and provide benefits to upland and aquatic species

Which riparian corridors are most likely to promote biological resilience?

- Span climatic gradients
- High canopy cover
- Relatively wide
- Low solar insolation
- Low human modification

Mapping riparian climate corridors

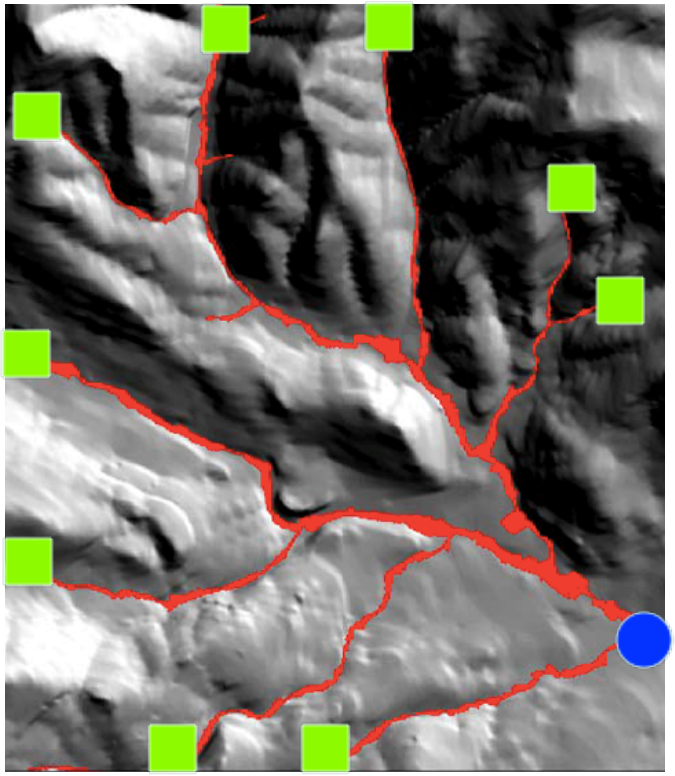
. Acquire base map of potential riparian areas



Mapping riparian climate corridors

- Identify those riparian areas likely to promote biological resilience

Unit of Analysis:
Outlet-to-Headwater stretches of potential riparian



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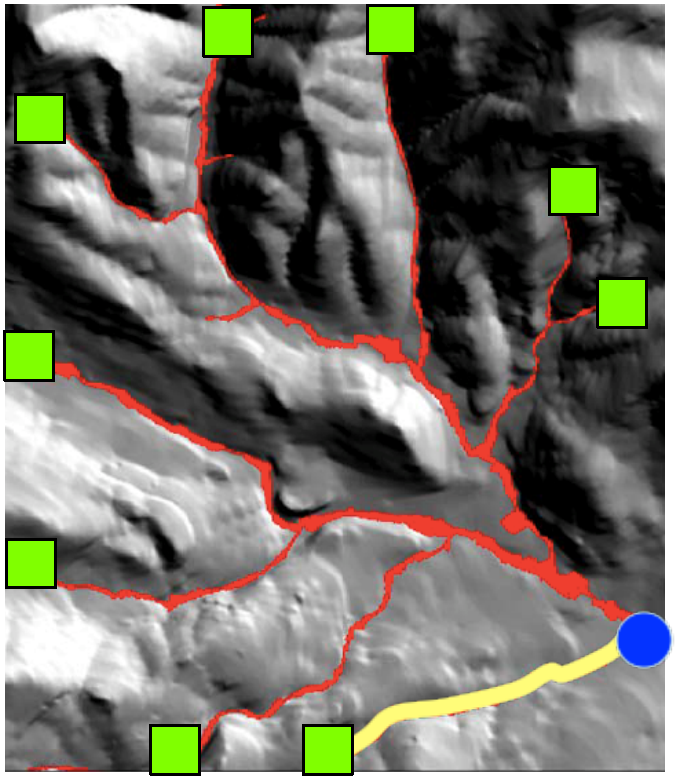

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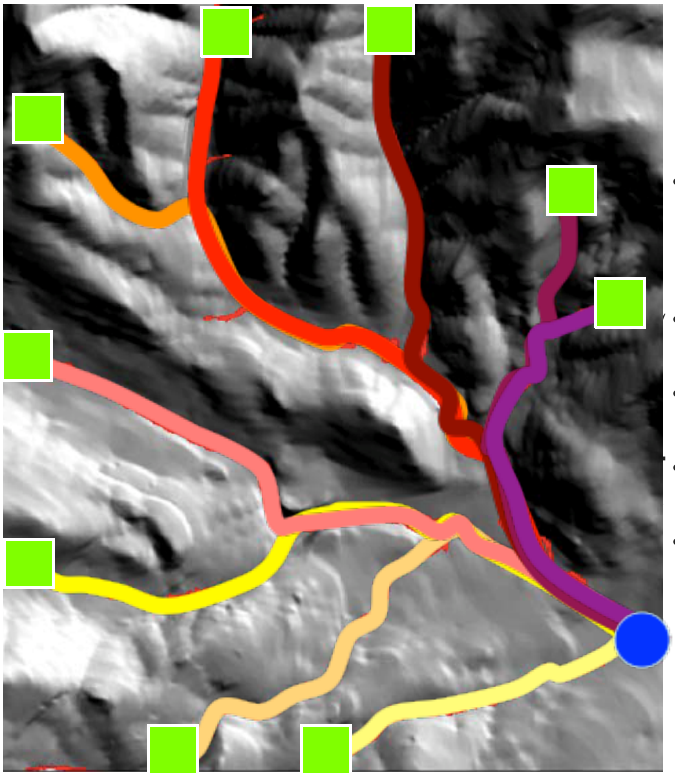


Calculate Outlet-Headwater:

- Change in Temperature
- Canopy Cover
- Area
- Solar Insolation
- Landscape Condition

Calculate Riparian Climate-Corridor Index

- Calculate index for each stretch:

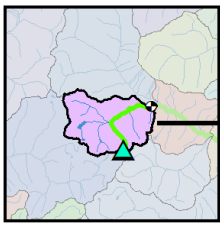
$$\Delta \text{Temperature} \frac{\text{Canopy Cover + Area}}{\text{Solar Insolation + Landscape Condition}}$$

Calculate Riparian Climate-Corridor Index

- Calculate index for each stretch
- Account for scale

a) Calculate index at each nested HUC level

HUC 12



Lake Creek Subwatershed

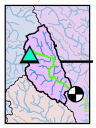
Headwater

Mouth

Stream

10 km

HUC 8
Wenatchee Subbasin

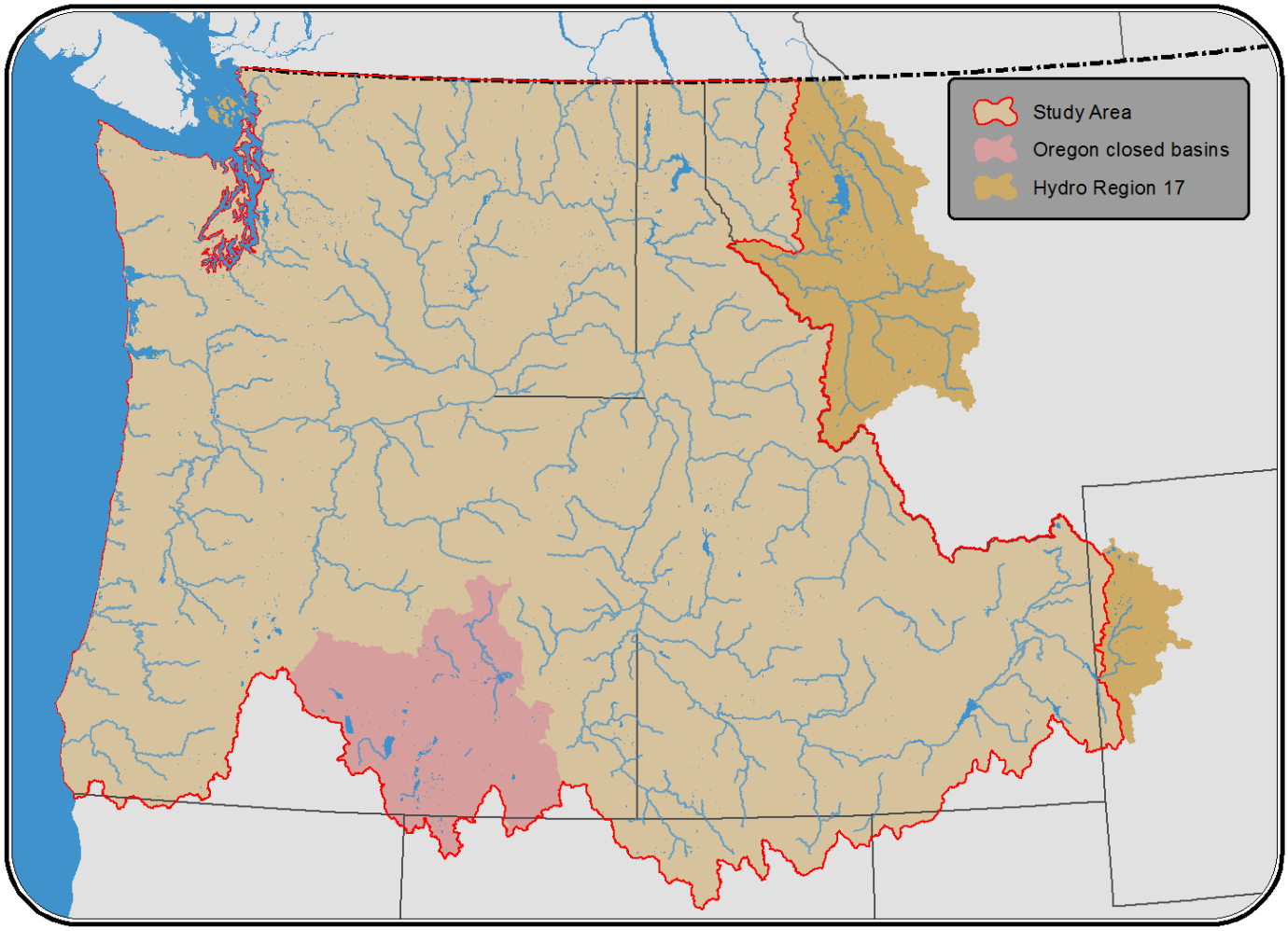


100 km

Headwater

Mouth

Stream


Study Area
Oregon closed basins
Hydro Region 17

Calculate Riparian Climate-Corridor Index

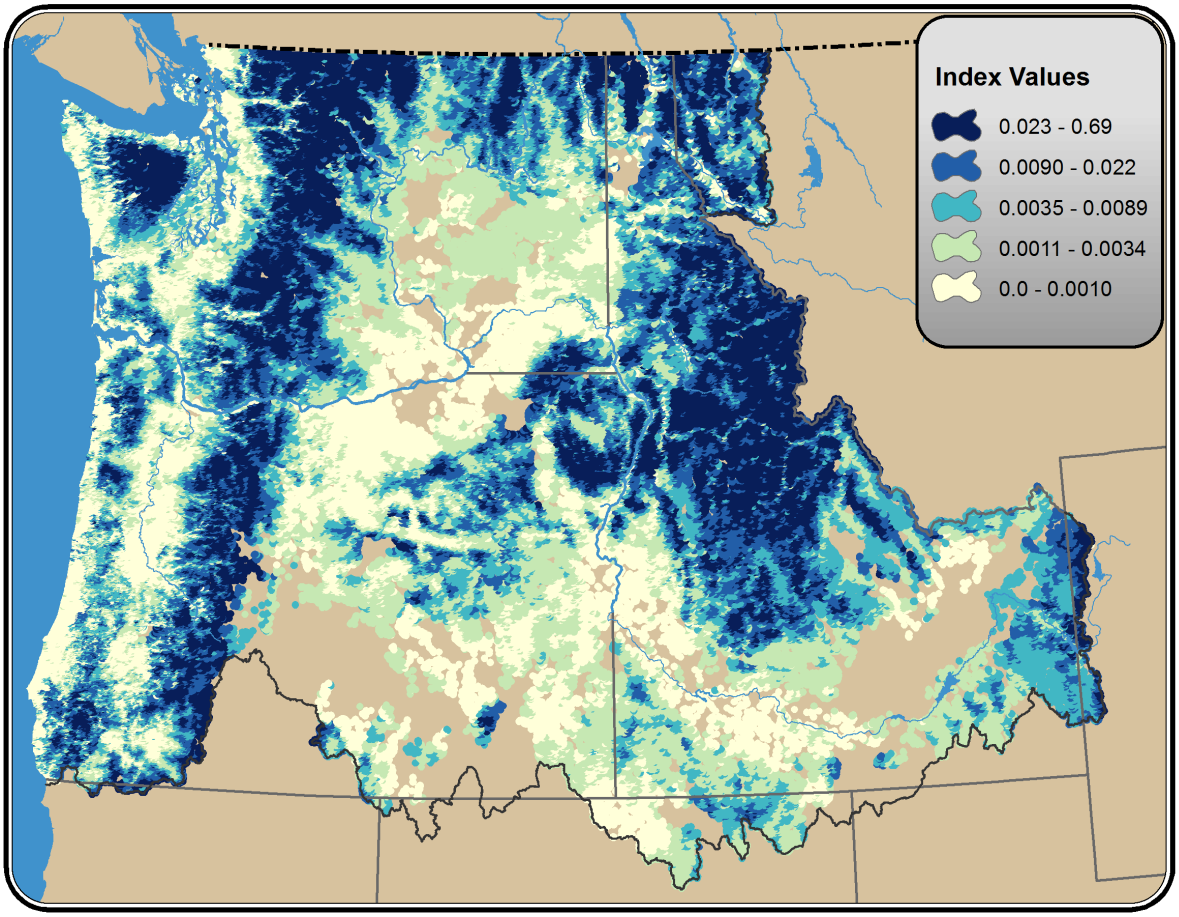
- Calculate Riparian Climate-Corridor index for each stretch
- Account for scale

  a) Calculate index at each nested HUC level

  b) Average across scales

$$\text{Index} = \frac{(\text{HUC12} + \text{HUC10} + \text{HUC8} + \text{HUC6} + \text{HUC4} + \text{HUC2})}{6}$$

Riparian Climate-Corridor Index



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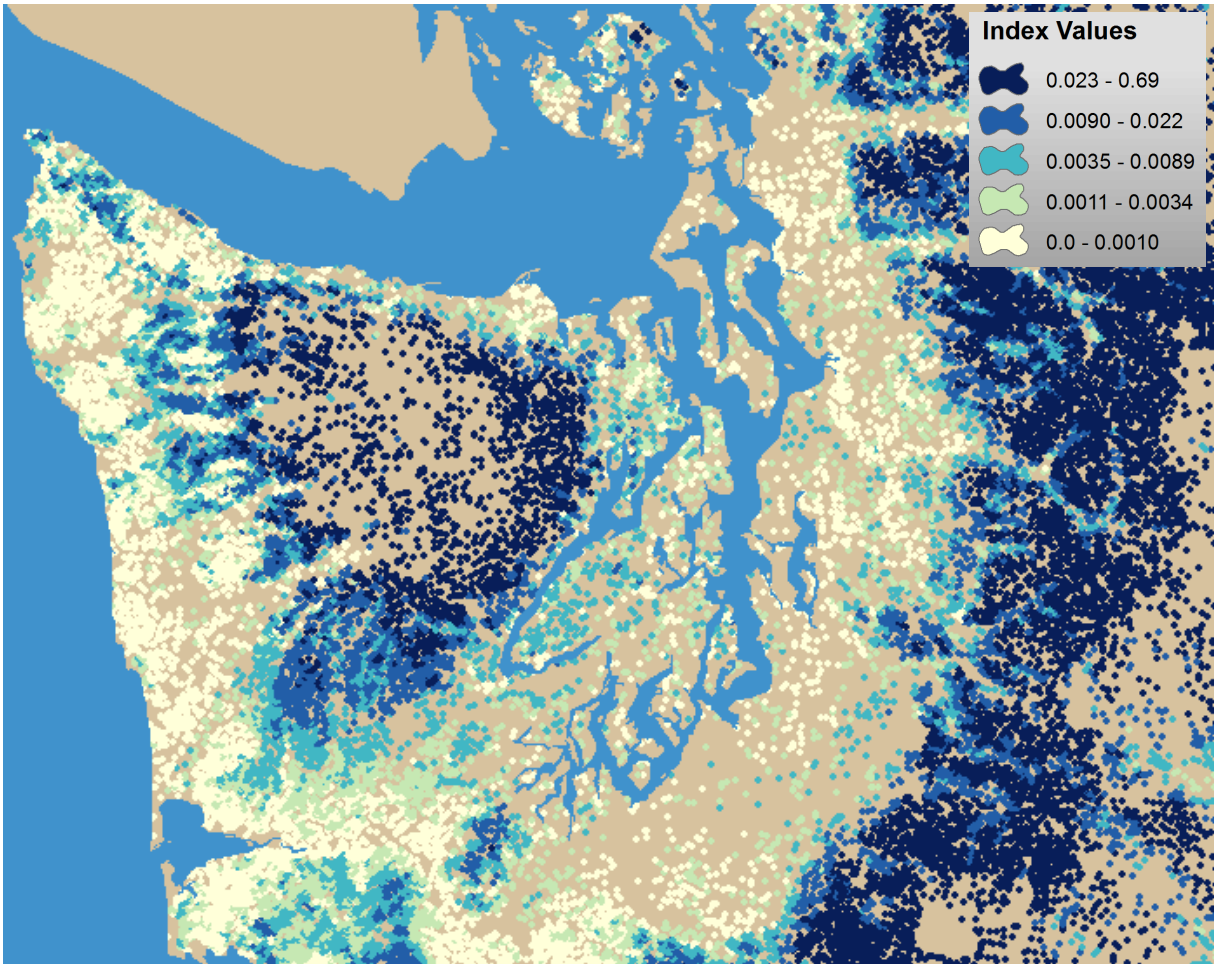
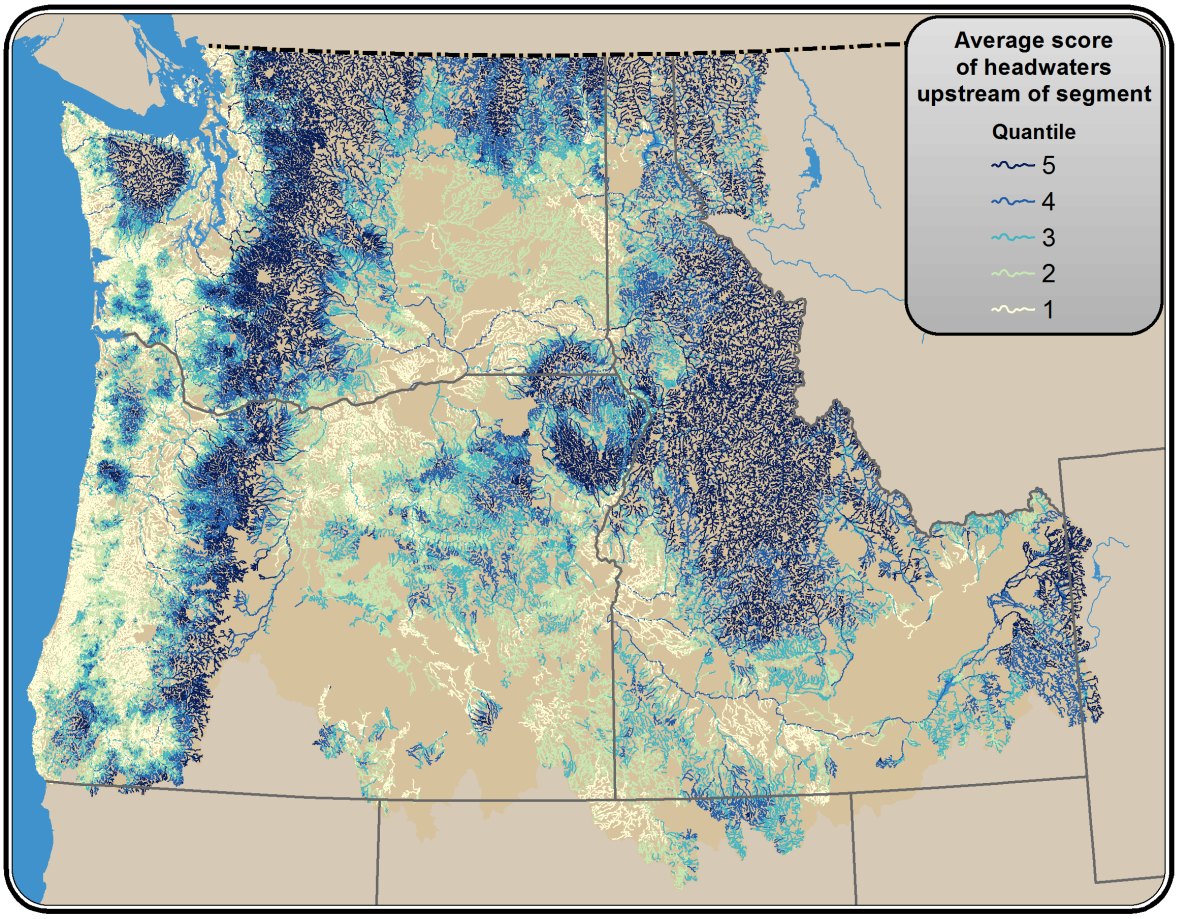
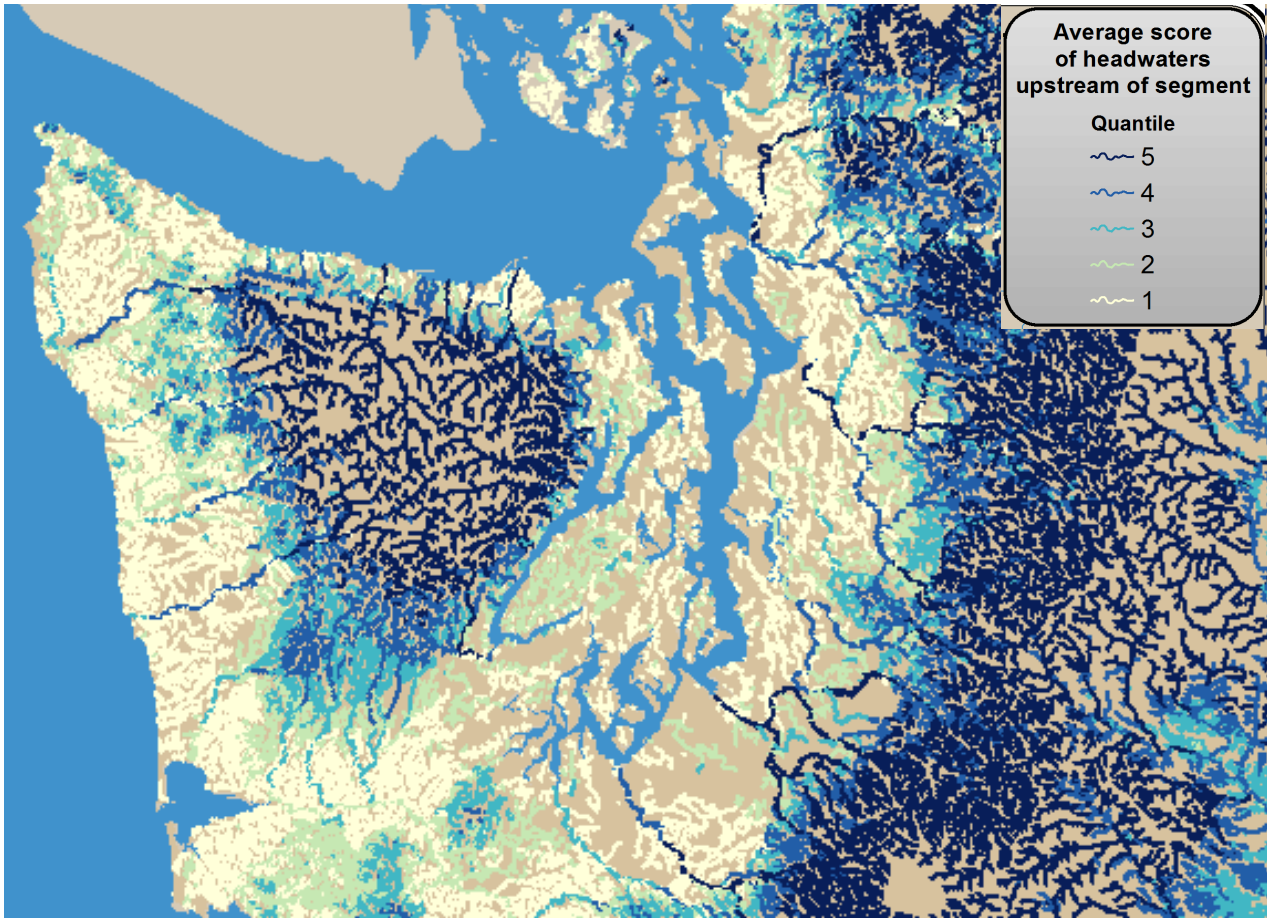


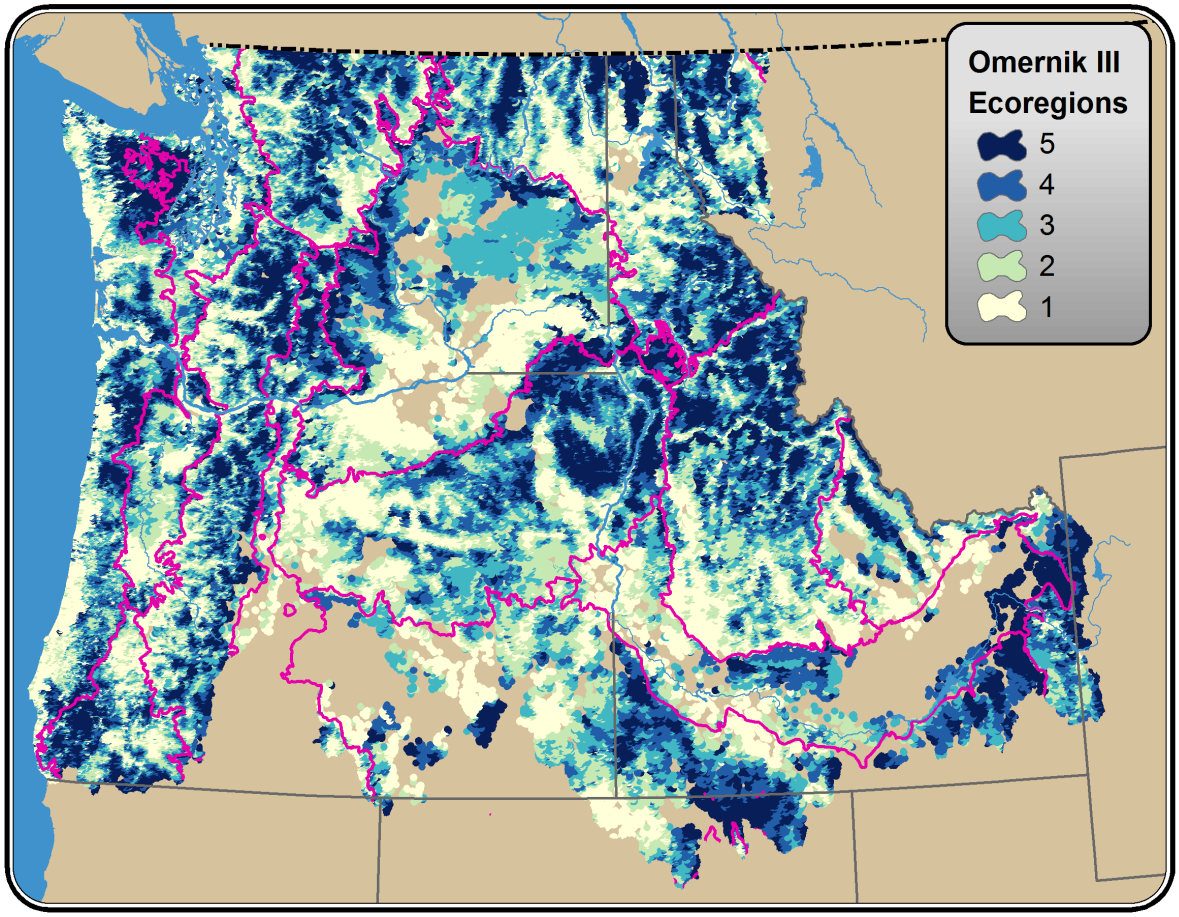
Riparian Climate-Corridor Index



Riparian Climate-Corridor Index



Riparian Climate-Corridor Index: By Ecoregion



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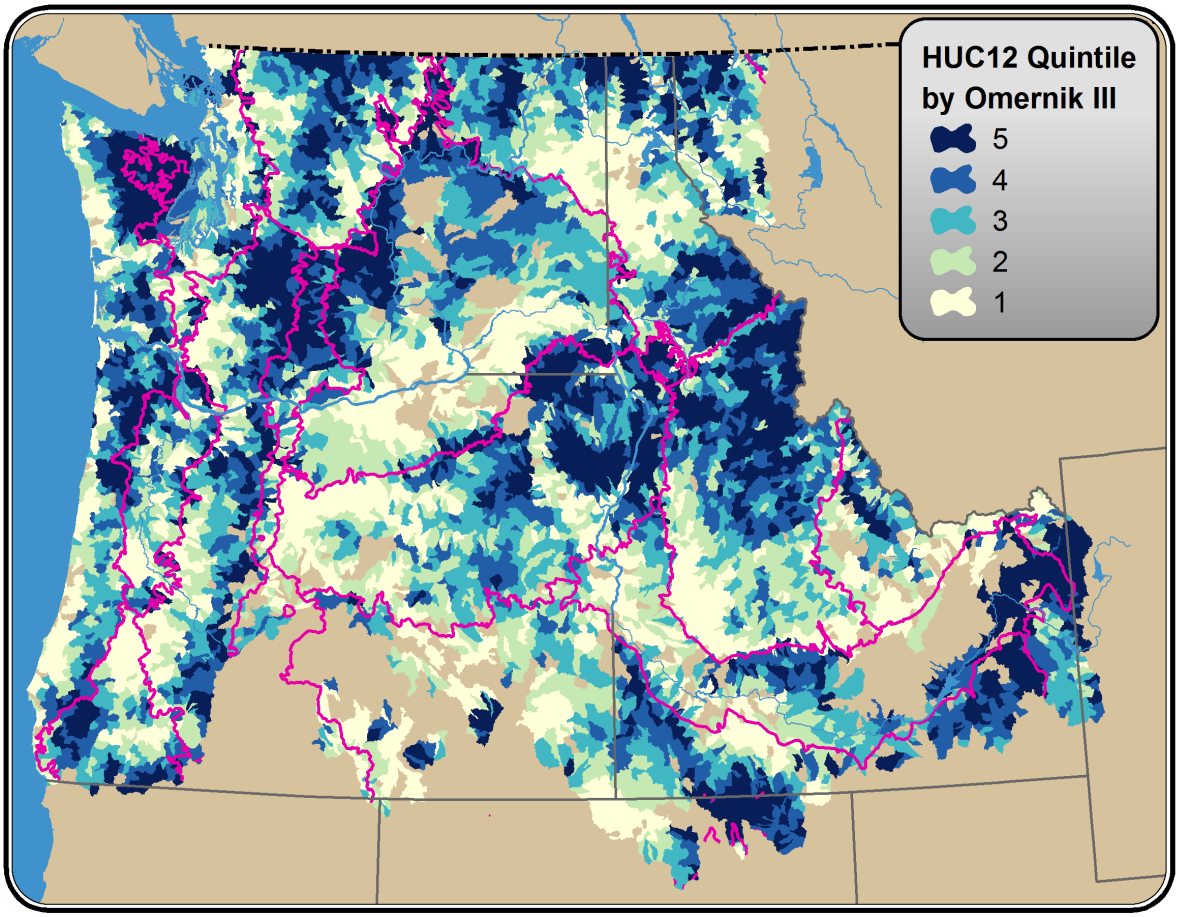

Analysis Take Homes

- Riparian areas offer high climate adaptation bang for your buck
- Analysis provides a climate lens for management decision-making and conservation planning
  - WGA CHAT, State Wildlife Action Plans, restoration, easements, comparison with other analyses
  - Agencies, Tribes, NGOs, others
- Does not rely on projections of future climate

Riparian Climate-Corridor report and layers available on Data Basin:

http://nplcc.databasin.org

Thank you

*Questions? mkrosby@uw.edu