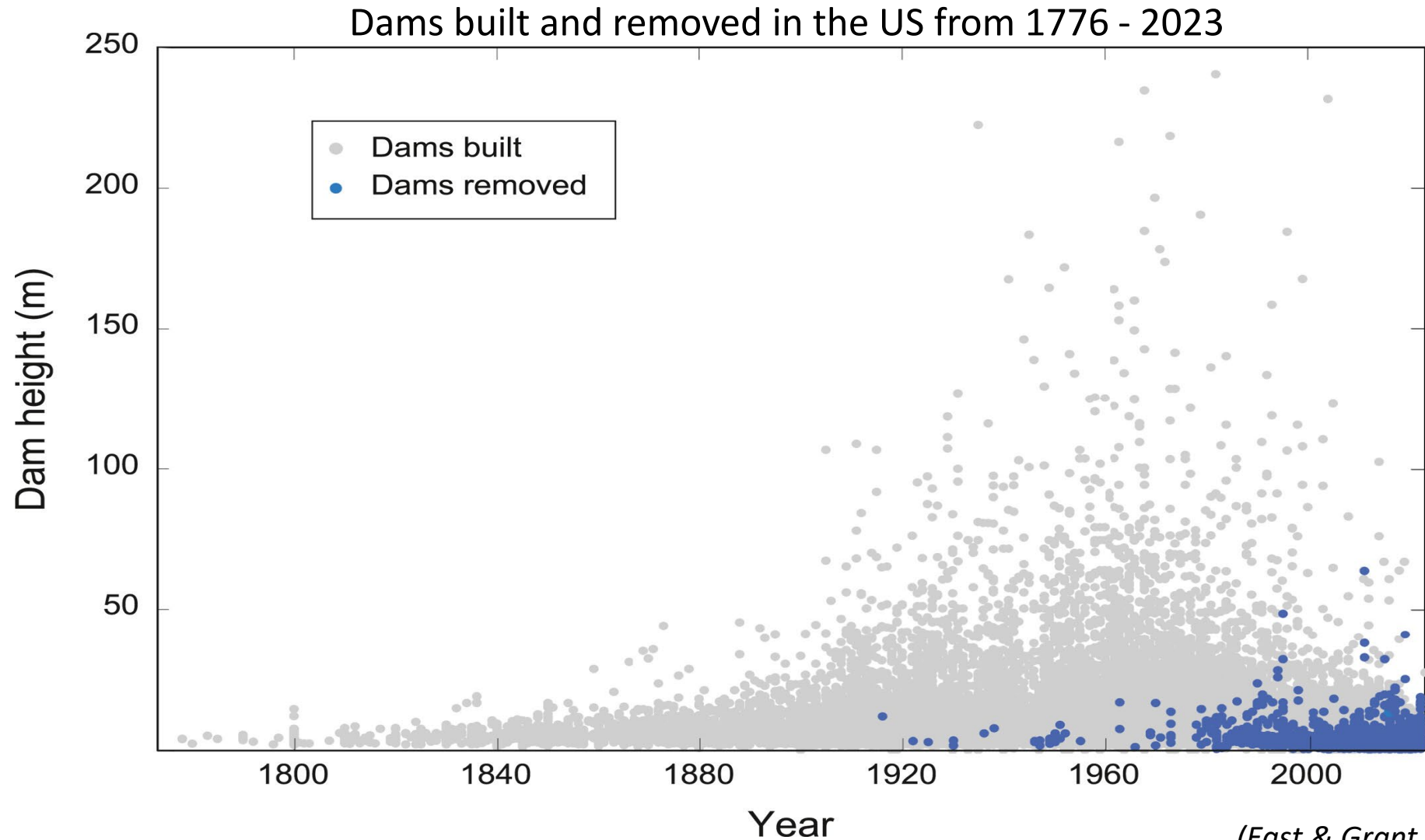


Dam Removal and Climate Resilience

Sarah Null, William Bosen, Gregory Goodrum
Department of Watershed Sciences
Utah State University

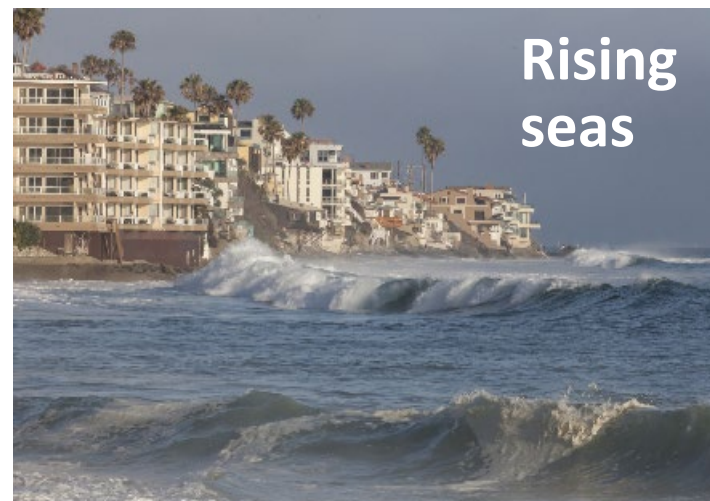



Over 2000 dams have been removed in the US since 1912



(East & Grant, 2023)

Climate pressures that impact river systems

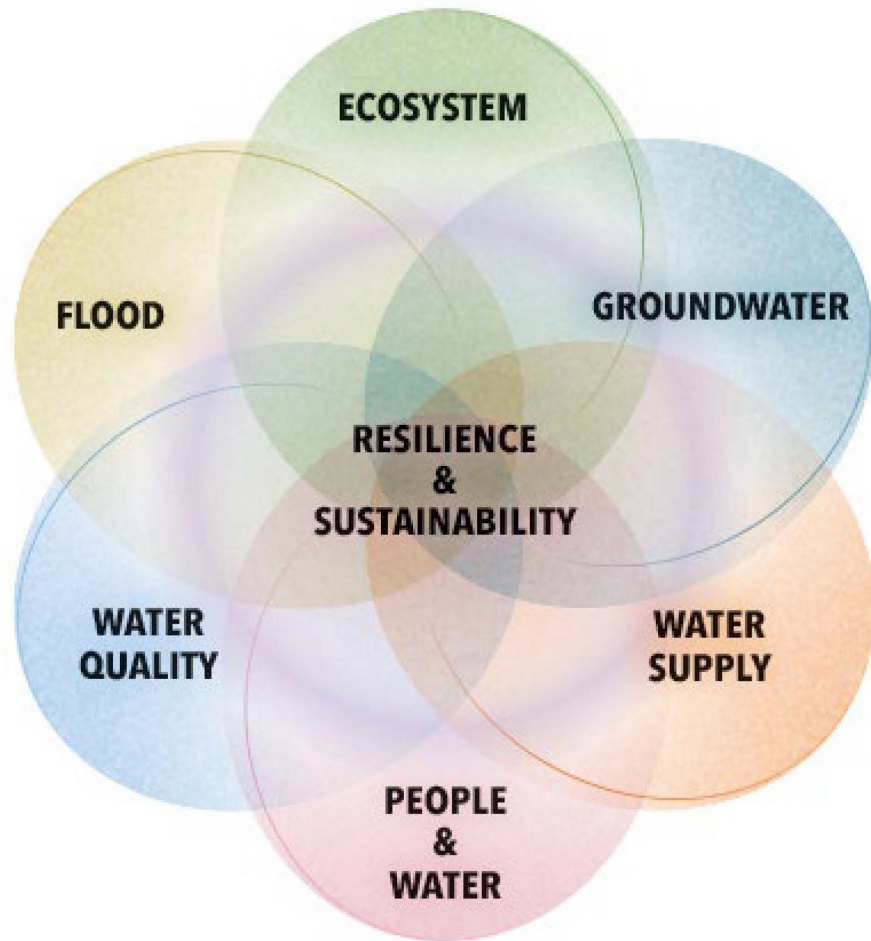




Climate resilience = the ability to prepare for, recover from, and adapt to the effects of climate change

- "to bounce back" = Sir Francis Bacon

Climate resilience allows watersheds to cope with drought, flooding, wildfire, and heat waves

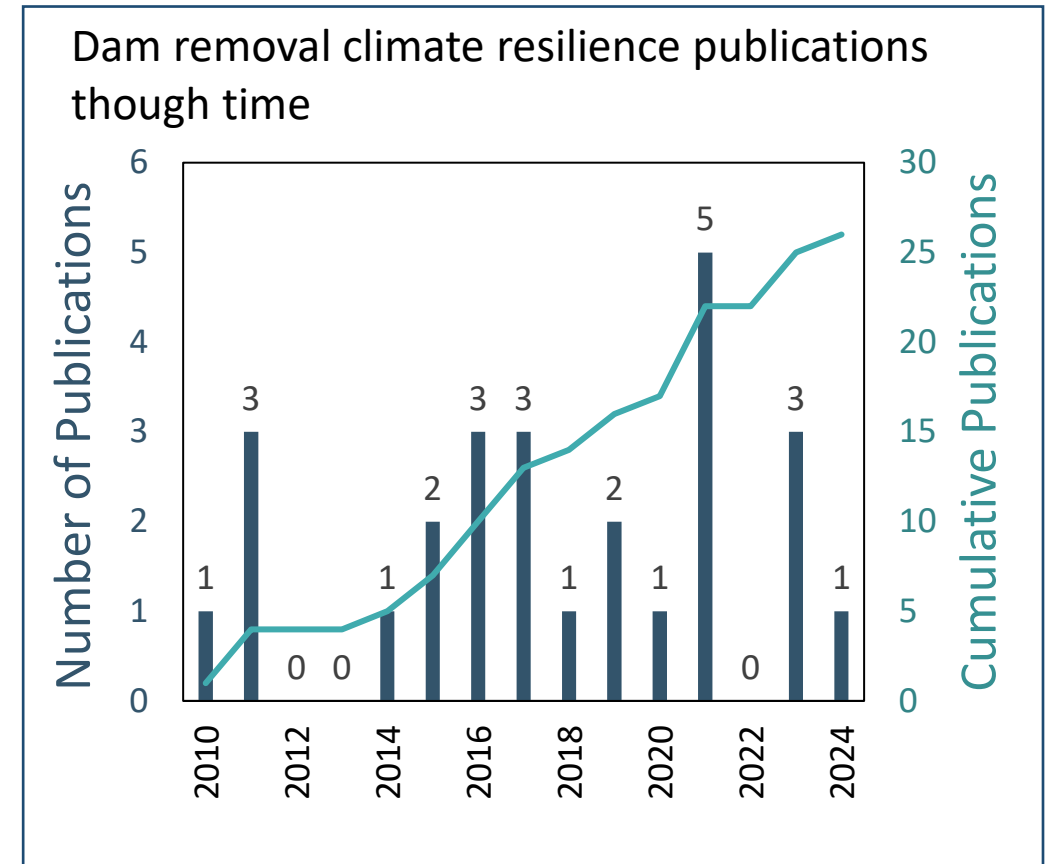
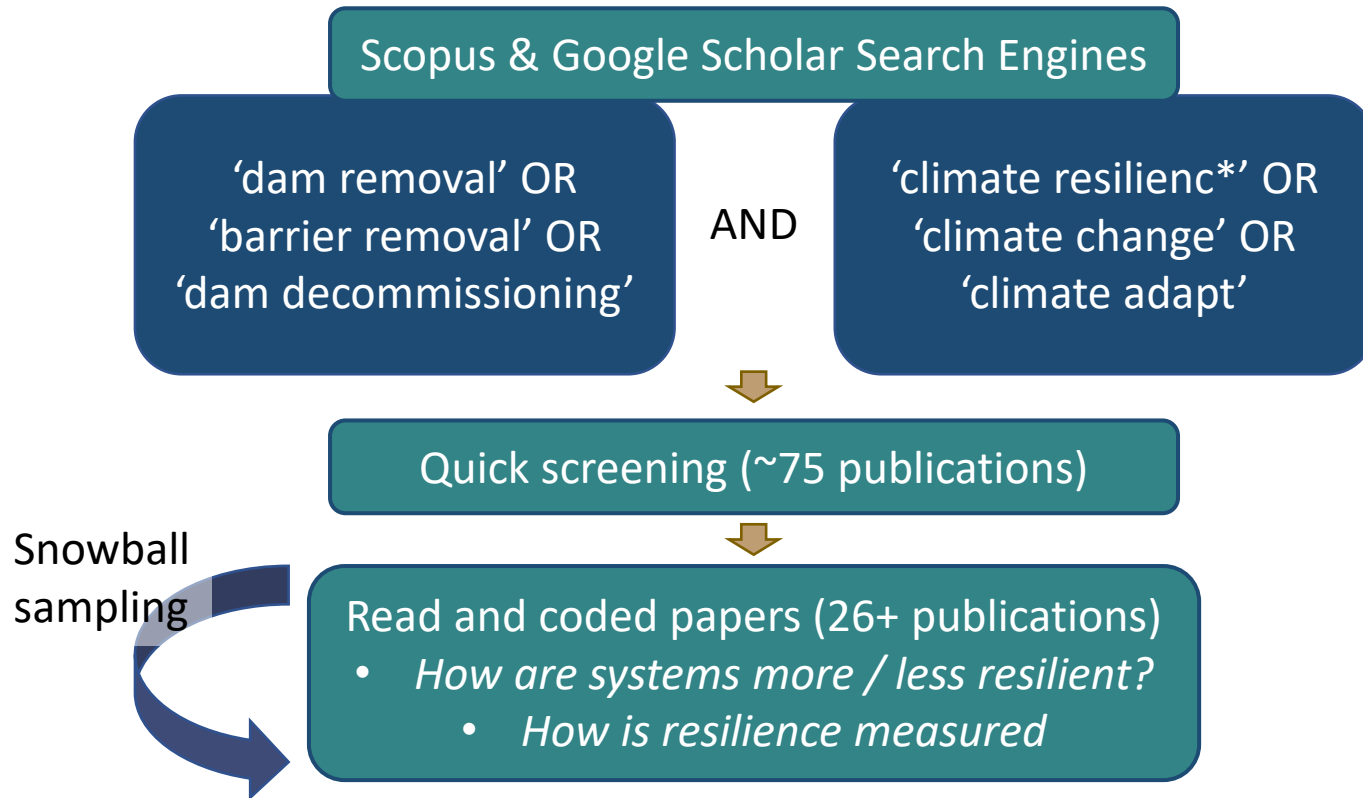


CA Dept. of Water Resources

- Nature-based solutions:
 - Reforestation
 - re-introducing beaver
 - connecting rivers and floodplains
- Green infrastructure
 - Managed aquifer recharge
 - Bioswales
 - Built wetlands
- Gray infrastructure
 - Dams
 - Water treatment facilities
 - Aqueducts and conveyance

Does removing dams and barriers build climate-resilient rivers, ecosystems, and communities?

Literature review:



Most studies do not connect dam removal with climate resilience

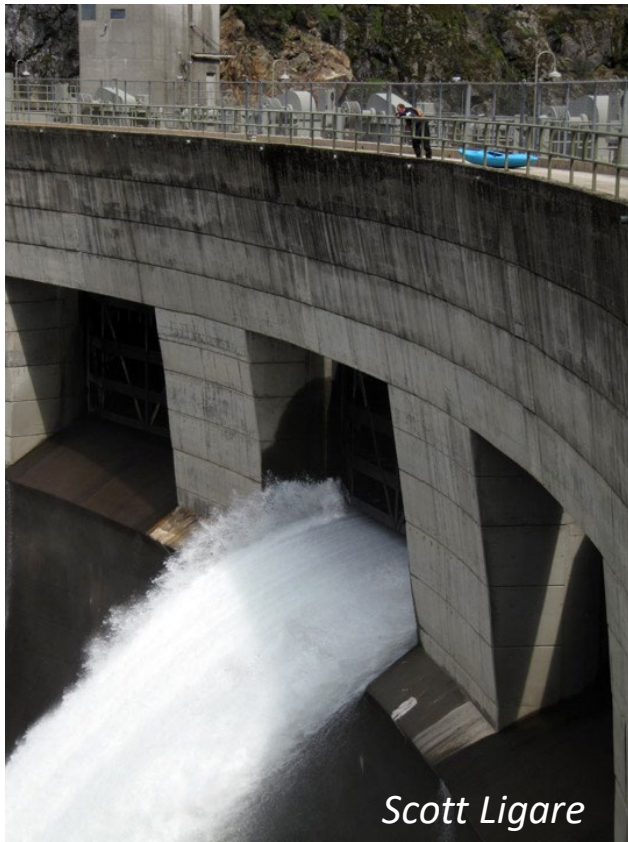
Dams impact people and the environment



Removing dams restores rivers

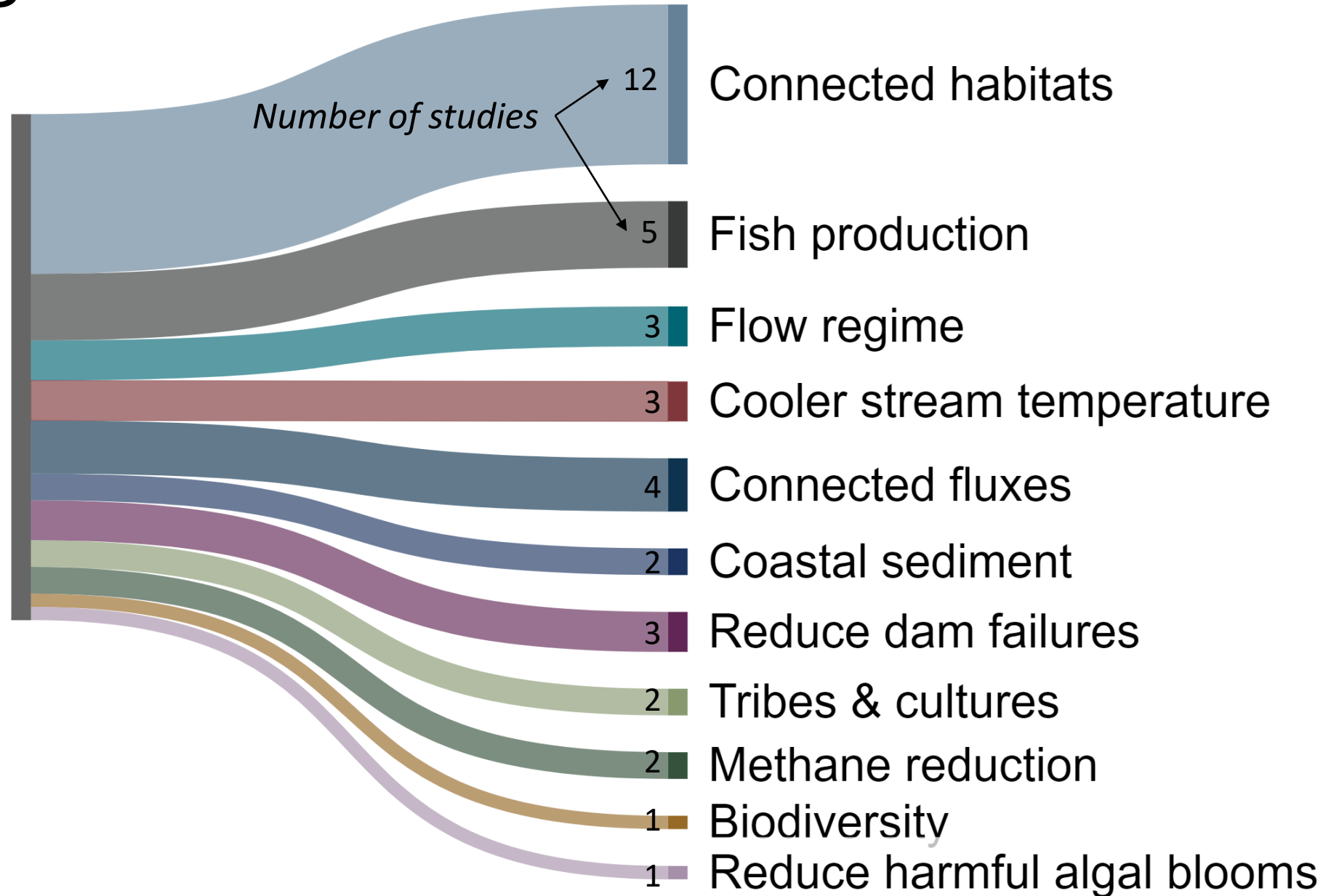


River restoration boosts climate resilience

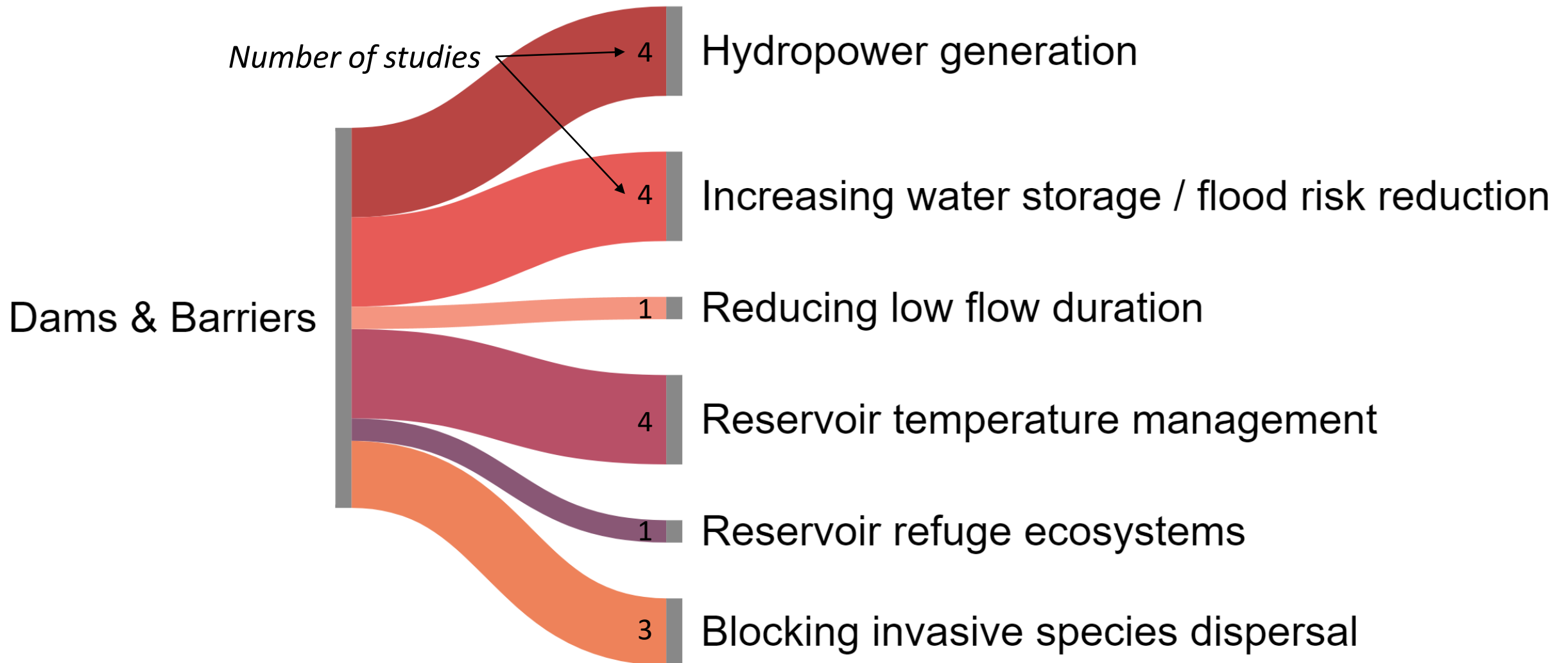


Removing dams increases climate resilience

Removing
Dams & Barriers



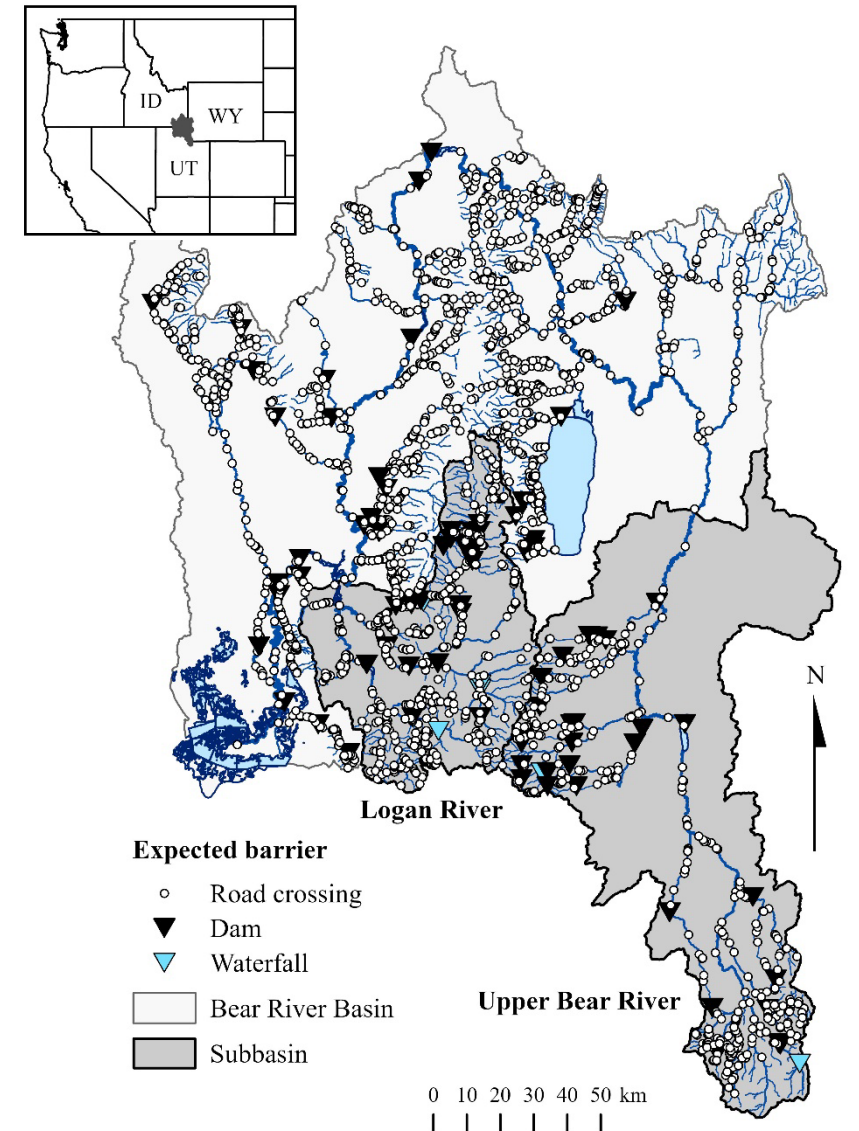
Dams and barriers add resilience



Directions for the future

- More monitoring and scientific studies needed (Bellmore et al. 2017).
 - Pre- & post-removal environmental monitoring
- Describe & quantify how dam removal affects climate resilience.
- Integrate river restoration, safety, and economics for climate-resilient dam removal decisions.
- Incorporate climate resilience into relicensing policy to incorporate it into dam removal decision-making.
- Include climate futures in dam removal modeling.
- Little information about barrier abundance, location, passability in scientific studies.

2,379 potential barrier locations in the Bear River Basin (ID, WY, UT)



(Goodrum et al. In review.)

Next steps



*Tuolumne River, CA
Sarah Null*



Sarah Null

Will Bosen

Gregory Goodrum

Sarah Null

Professor of Watershed Sciences

Utah State University

sarah.null@usu.edu



*Logan River, UT
Sarah Null*

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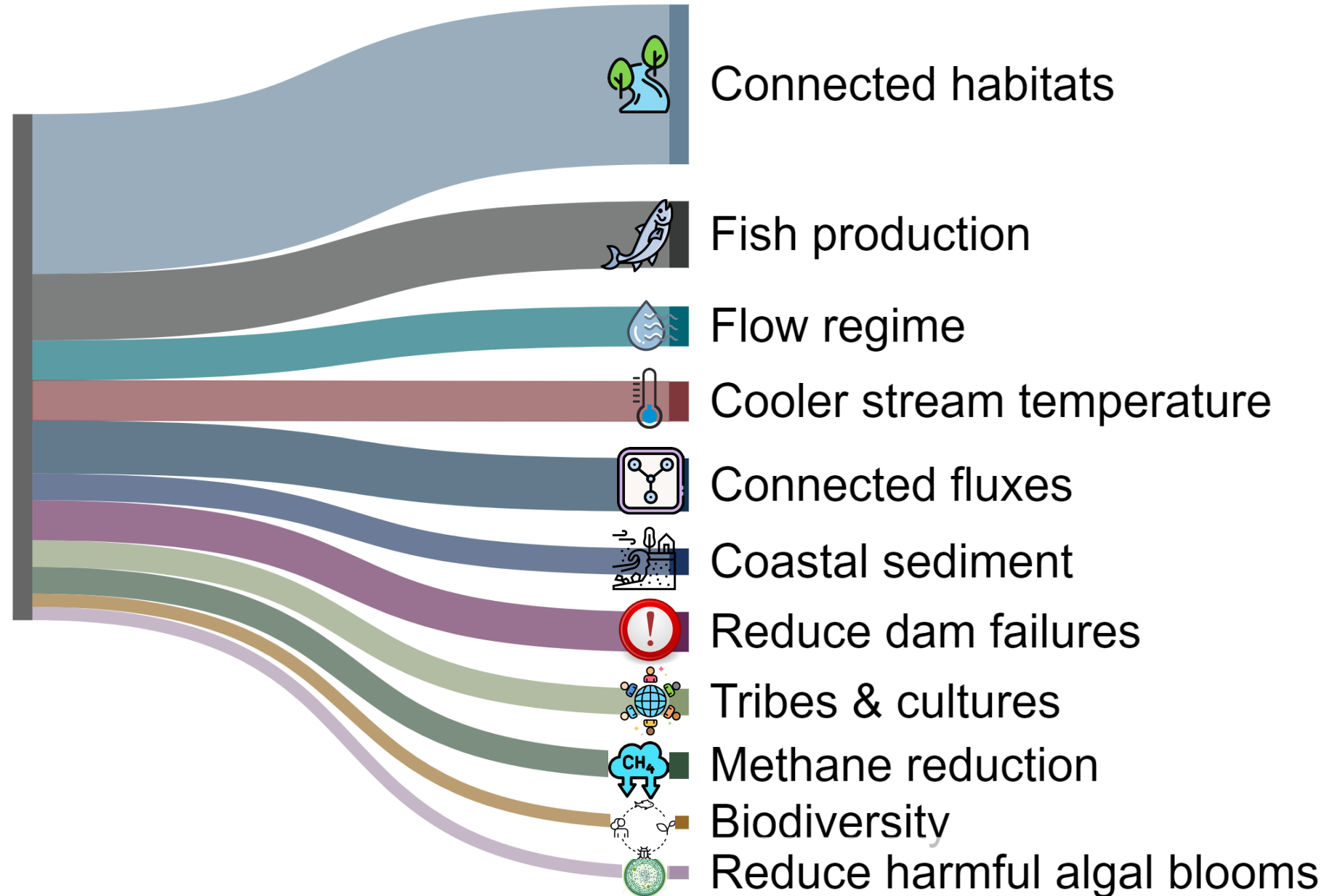
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AMERICAN
RIVERS

Removing dams increases climate resilience by:

Removing
Dams & Barriers



How to quantify climate resilience:

Will dam removal:

- Adapt to on-going climate change?
- Mitigate climate change?
- Increase natural storage (connect floodplains, slow the flow)



- Reverse historic degradation
- Improve human safety
- Improve watershed health
- Reduce hydrologic vulnerability to climate change
- Increase environmental justice

