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AMY SINGLER

Building a River Restoration Movement: Lessons from the U.S.





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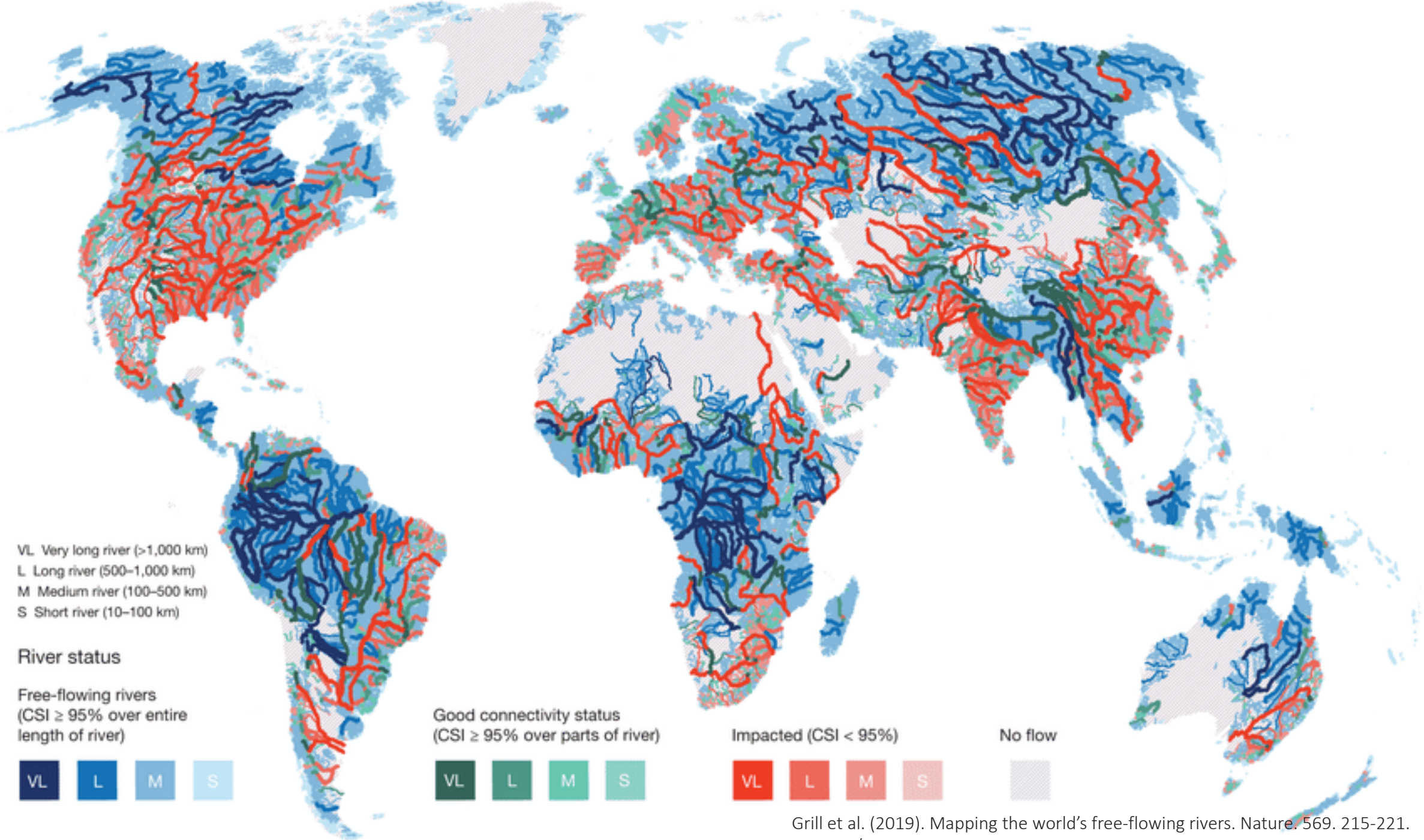
If there is magic on this planet,
it is contained in water.

– Loren Eiseley
American Anthropologist

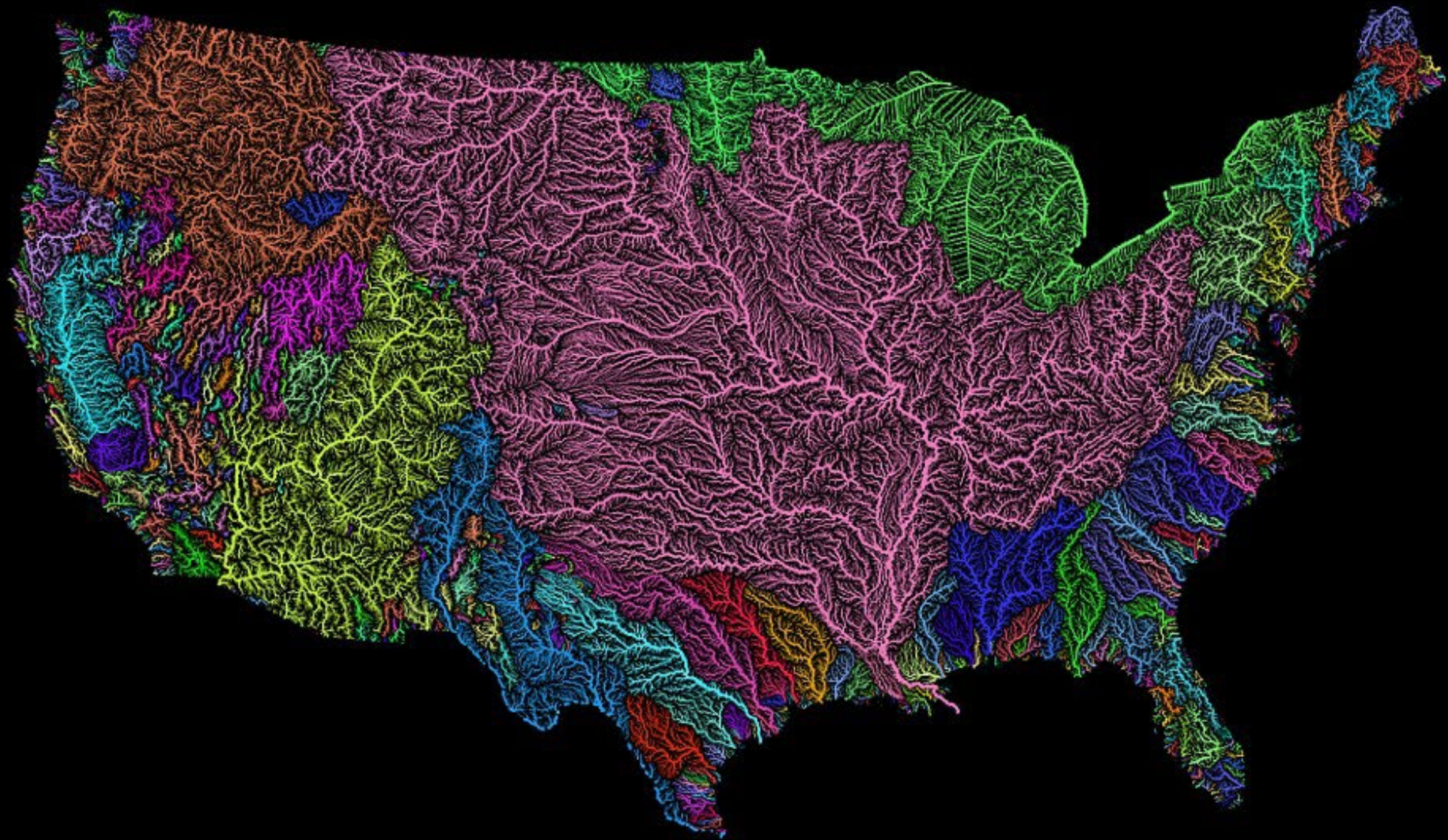


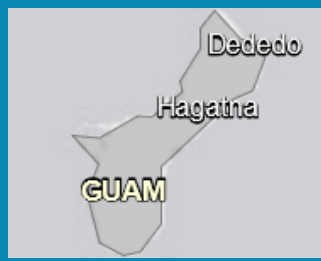
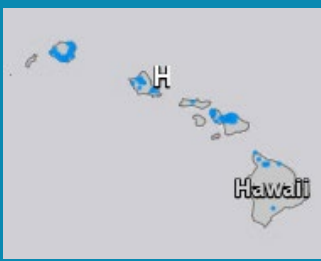
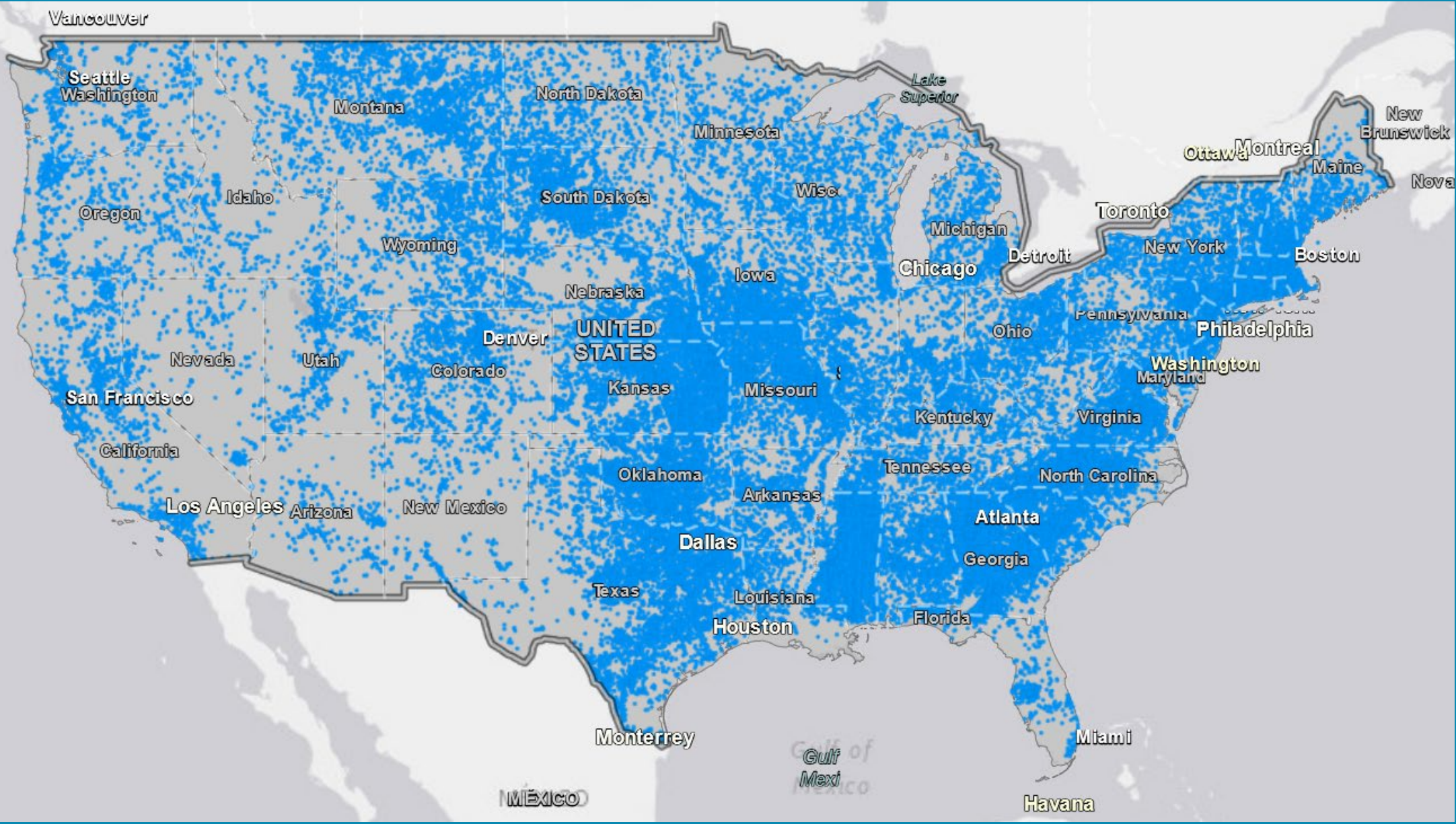
Freshwater ecosystems cover <1% of the planet but provide some of the most important ecosystem services. Freshwater populations are declining faster than terrestrial or marine^{1,2} and yet these systems receive less conservation investments than other ecosystems³.

1: Dudgeon et al. 2006. 2: Collen et al. 2014. 3: Darwall et al. 2011.



Grill et al. (2019). Mapping the world's free-flowing rivers. *Nature*, 569, 215–221. [10.1038/s41586-019-1111-9](https://doi.org/10.1038/s41586-019-1111-9).

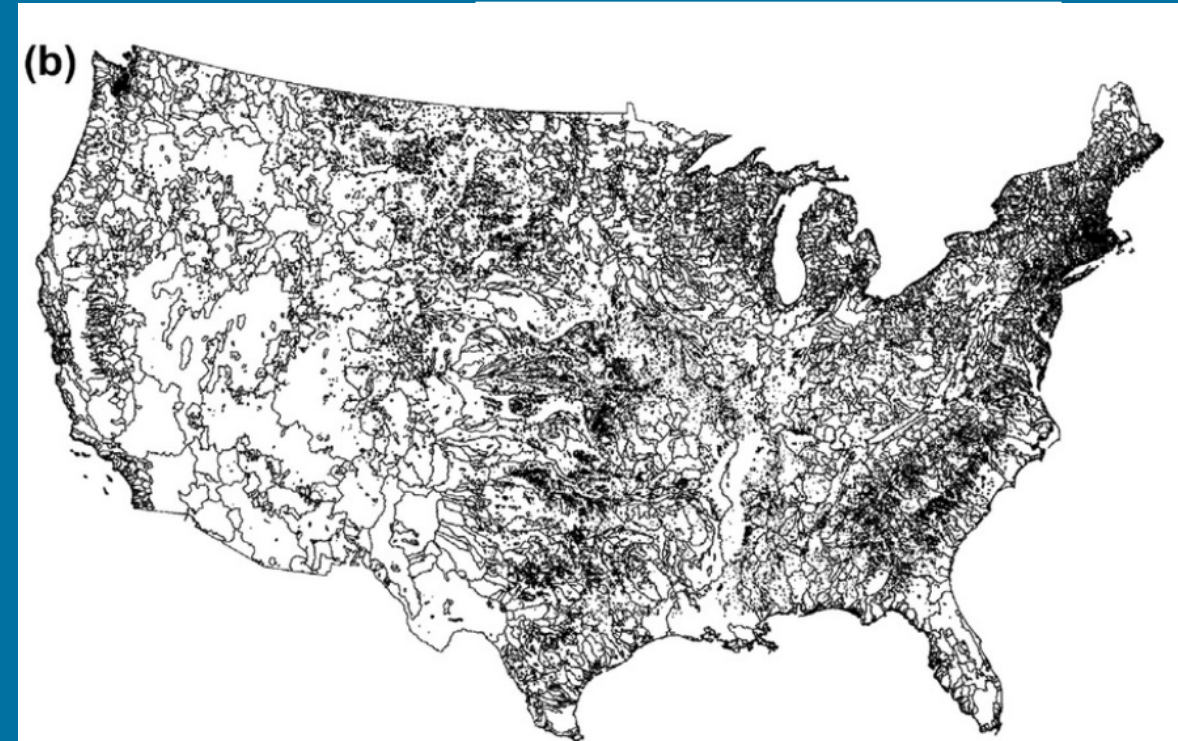




If there were no dams . . .
the US would have 6007 stream networks.



With dams, we have 54,120 stream networks.



From Cooper et al. 2017

Change to the Functionally Connected
Networks in the Conterminous US

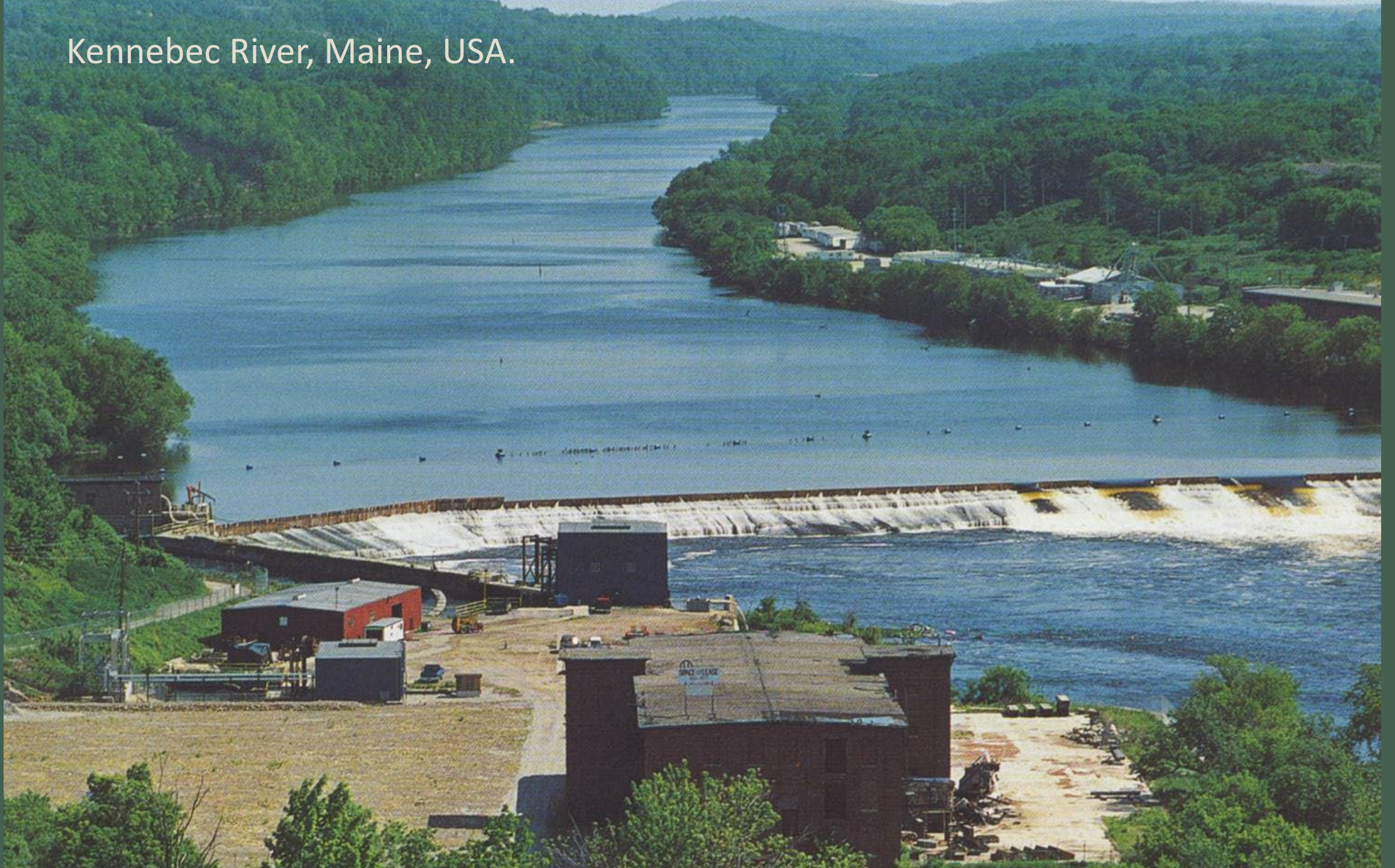




Restoring our rivers: The dam removal movement



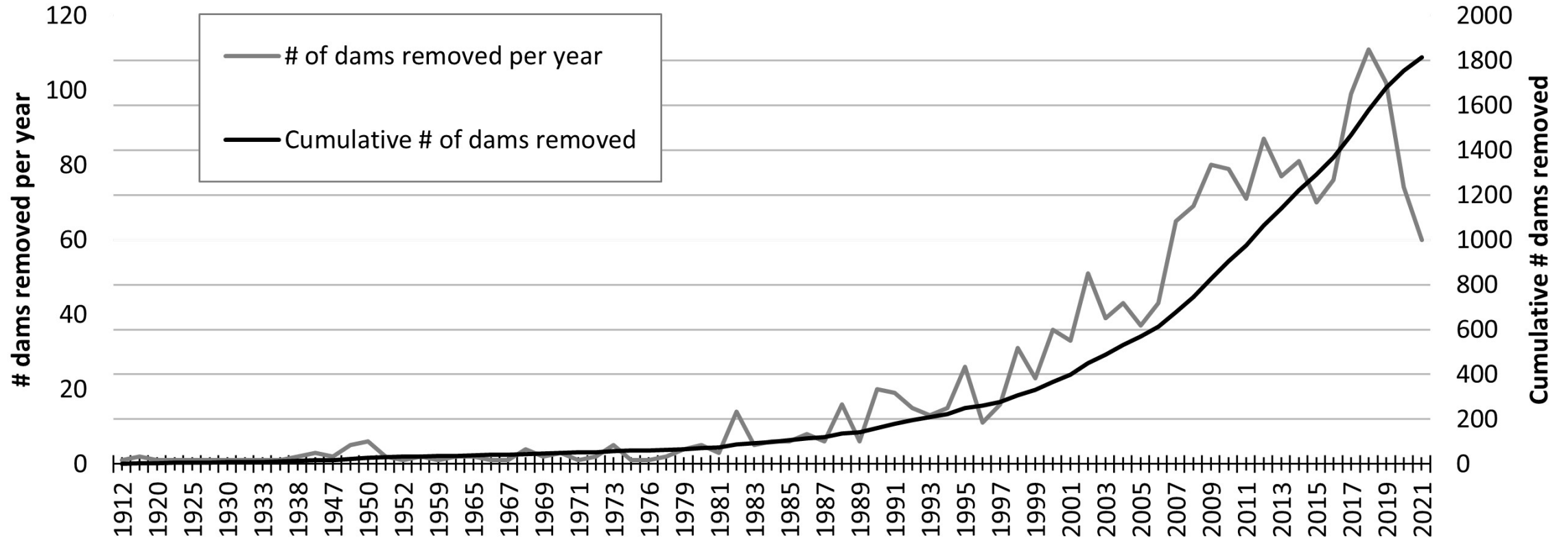
Kennebec River, Maine, USA.





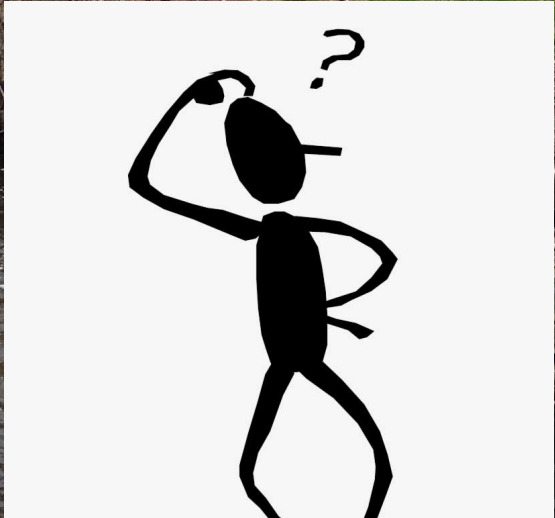
Kennebec River, Augusta Maine, USA.

United States Dam Removal 1912 – 2021



Source: American Rivers

Building a movement





South Branch Gale River, NH, USA. Credit: American Rivers



Columbia Lake Dam, NJ, USA. © Jeff Burian/TNC

Key environmental laws

F&W Coordination Act: requires equal consideration and coordination of wildlife conservation with other water resources development programs

1934–1958

1972

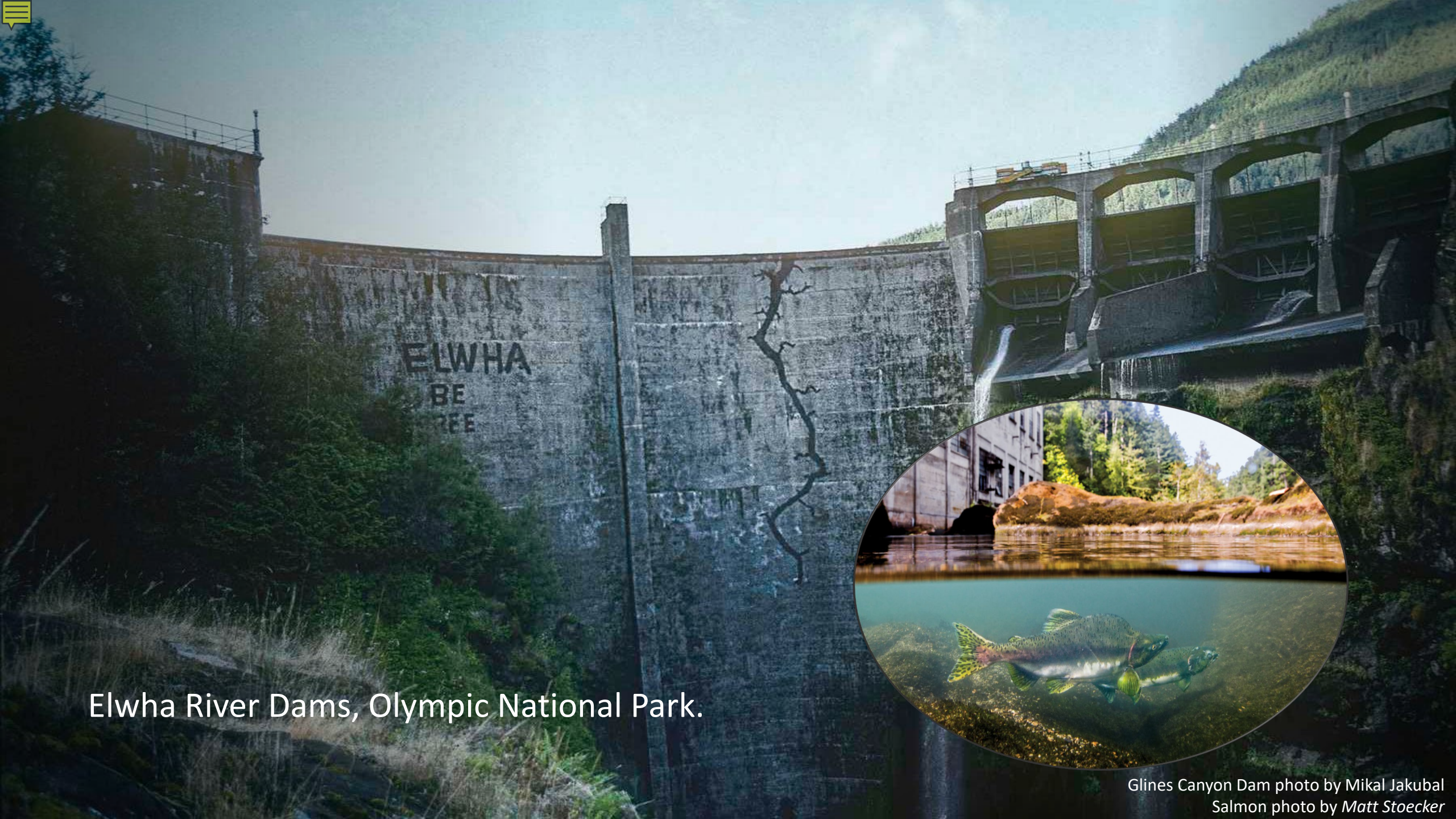
Clean Water Act: restore and maintain the chemical, physical, and biological integrity of the nation's waters

Endangered Species Act

1973

Federal Power Act Section 10

1988



Elwha River Dams, Olympic National Park.

Glines Canyon Dam photo by Mikal Jakubal
Salmon photo by *Matt Stoecker*

Oct 20 11 14:28:30



Elwha Dam. Credit National Park Service



Key environmental regulations and expanding science in last 20 years

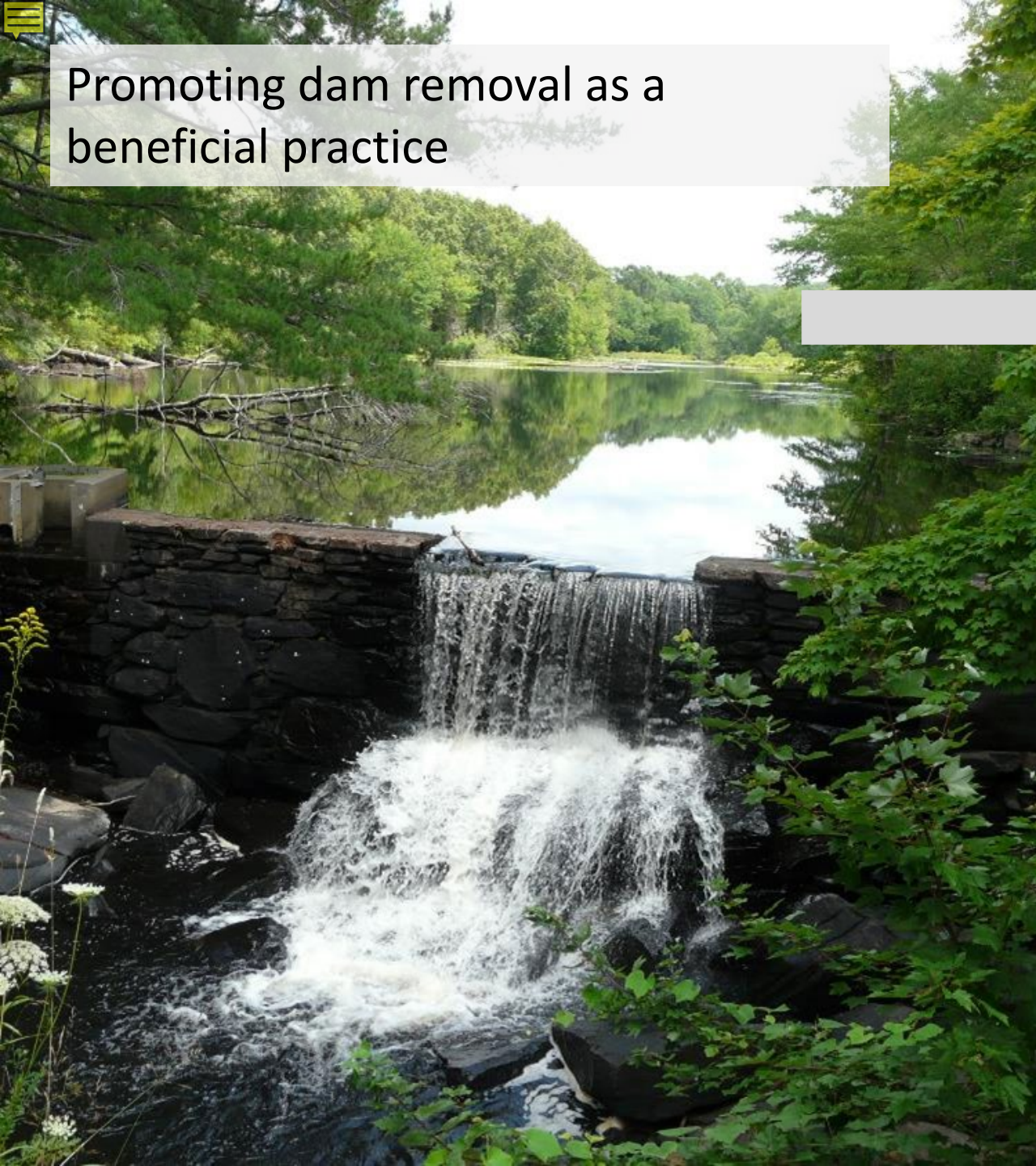
- Strong Dam Safety Programs
- River restoration and dam removal as beneficial practice
- Streamlined State and Federal Restoration Permitting
- Improved understanding of importance of sediment in river systems



Dam Safety



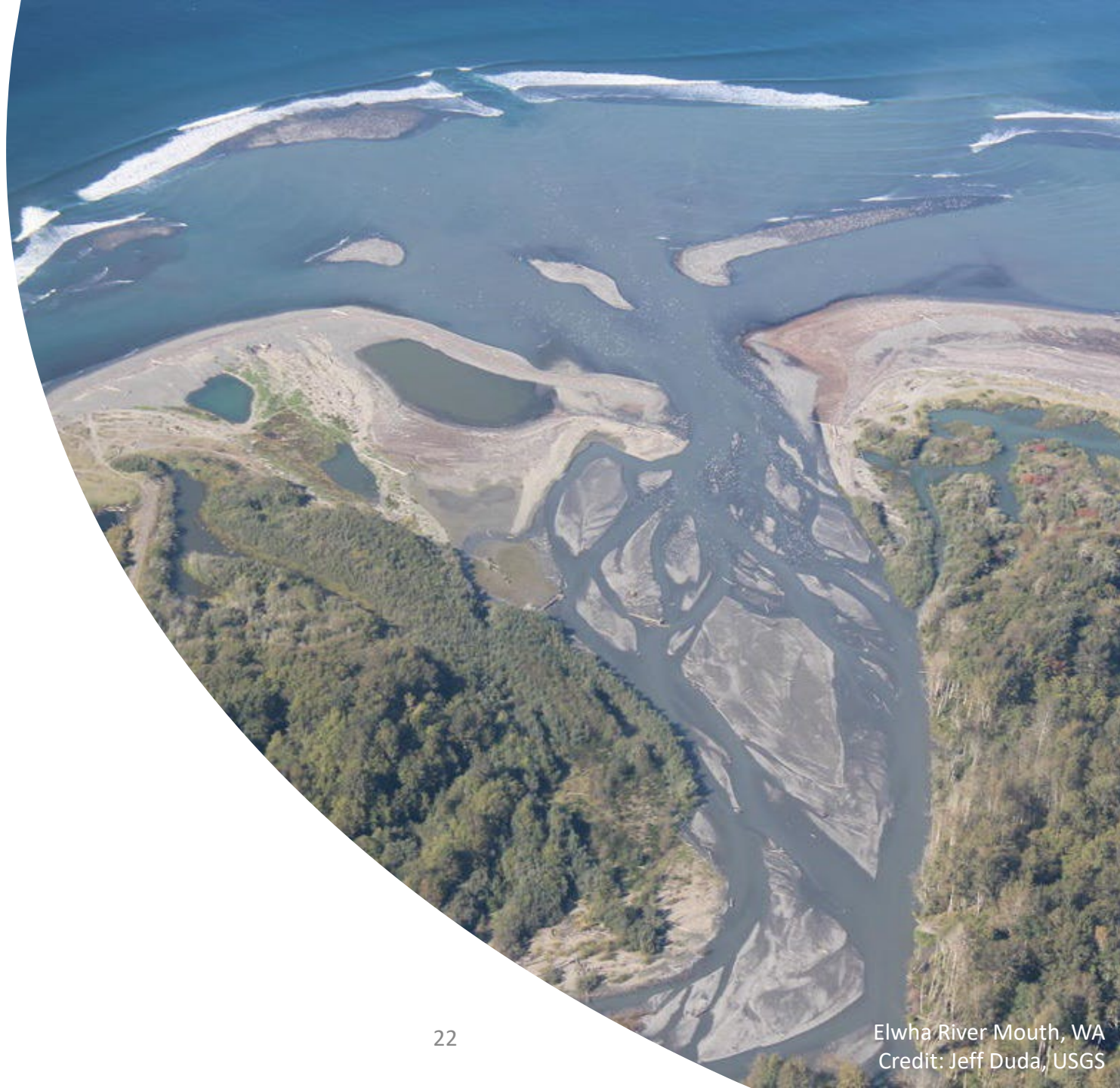
Promoting dam removal as a beneficial practice



Eight Mile River, Connecticut, USA

Improving the science and research

- USGS Dam Removal synthesis at [Powell Center](#)
- Bellmore et al. **Status and trends of dam removal research in the United States**. WIREs Water 2016. <https://doi.org/10.1002/wat2.1164>
- Collins et al. **Channel Response to Sediment Release: Insights from a Paired Analysis of Dam Removal**. Earth Surface Processes and Landforms, January 1, 2017, <https://doi.org/10.1002/esp.4108>
- Null et al. (2014). **Optimizing the dammed: Water supply losses and fish habitat gains from dam removal in California**. Journal of Environmental Management. <https://watershed.ucdavis.edu/files/biblio/Null%20et%20al%20JEMA%20Optimizing%20the%20dammed.pdf>
- Headwaters Economics (2016). **Dam Removal: Case Studies on the Fiscal, Economic, Social and Environmental Benefits of Dam Removal**. <https://headwaterseconomics.org/wp-content/uploads/Report-Dam-Removal-Case-Studies.pdf>





Where are we going?

U.S. New Funds Federal Infrastructure Bill 2021

\$800M to federal
programs for dam
removal and fisheries
restoration

Additional Opportunities
to incorporate dam
removal into public water
infrastructure and public
safety programs



Patapsco River, MD
3 removed in 2010 - 2017



Raritan River, NJ
3 removed 2011 to 2013



Mill River, MA
3 dams removed, 1 removal begins 2017
1 fish ladder installed
3 more removals in the Taunton River watershed



Rogue River, OR
4 dams removed 2007 to 2010



Incorporate dam removal into planning to improve resiliency and modernize our infrastructure



Dams and Adjacent Infrastructure: Coordinating for better results

Include dams as part of public infrastructure planning and funding

Adjacent infrastructure considerations with dam removal





WHY BARRIER REMOVAL

PEOPLE – FLOOD RESILIENCY, PUBLIC SAFETY

ENVIRONMENT – AQUATIC & TERRESTRIAL
WILDLIFE HEALTH, WATER
QUALITY

ECONOMY – MAINTAIN/RESTORE FISHERIES,
REDUCE ADVERSE IMPACTS,
IMPROVING RECREATION





Dam removal is part of the solution as we build sustainable and resilient communities and healthy rivers.





White Salmon River,
Washington State, US

Thank You

