

Lecture 3.2

An Overview of the Sustainable Rivers Program

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US Army Corps
of Engineers®

The Nature
Conservancy 

The mission of the Sustainable Rivers Program:

Improve the health and life of rivers by changing infrastructure operations to restore and protect ecosystems, while maintaining or enhancing other project benefits.

Bill Williams River, Arizona

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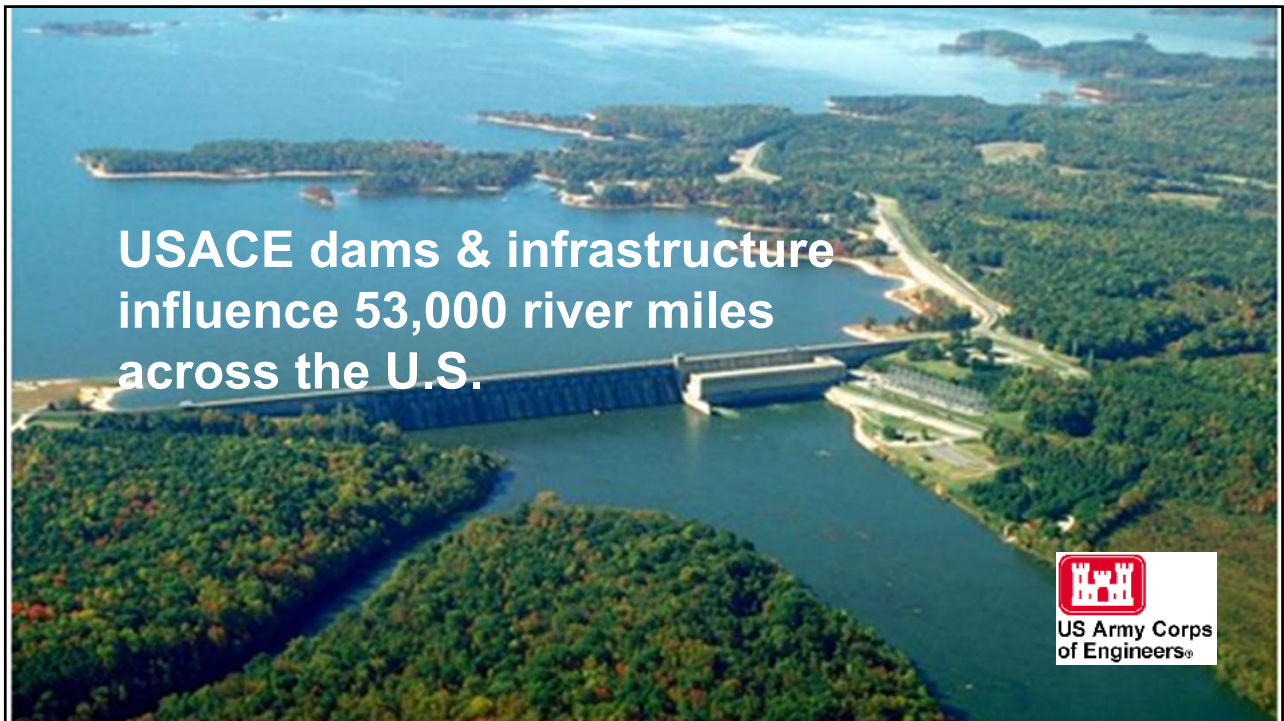
Why is SRP important?



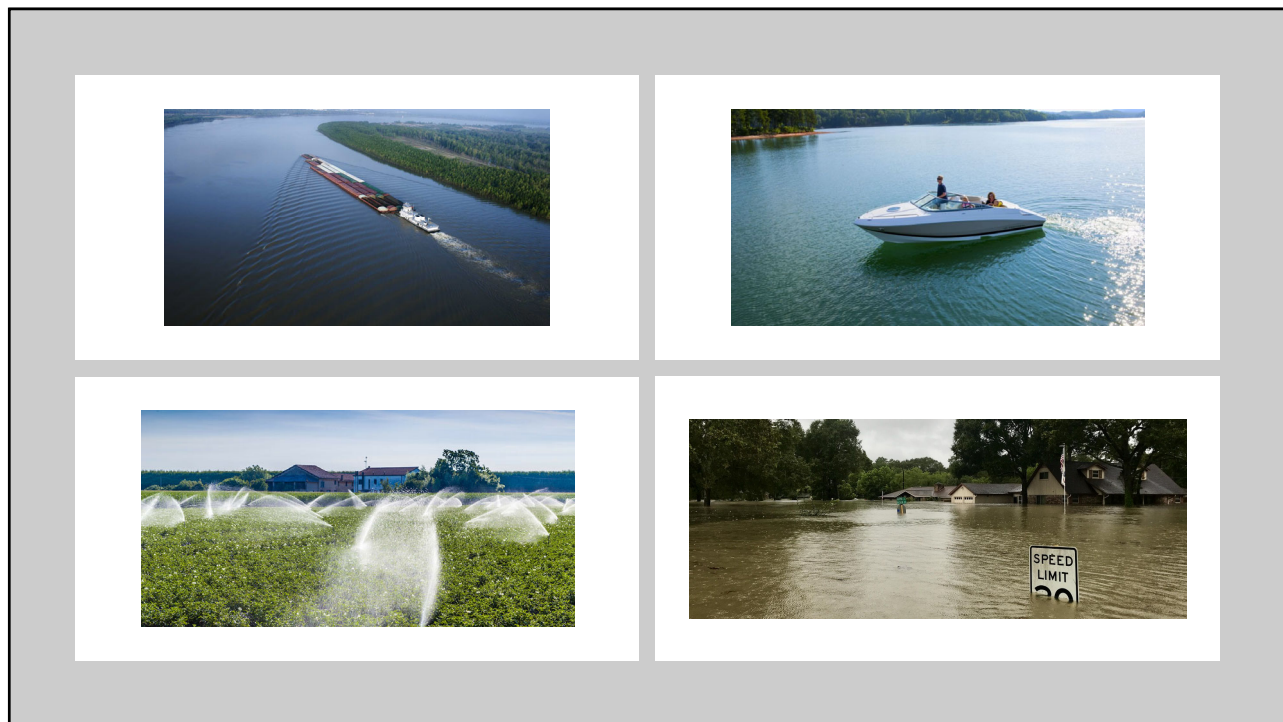
1. Modernizes dams and infrastructure to achieve environmental benefits
2. Creates balanced and win-win solutions for nature and people
3. Engages stakeholders and USACE districts in inclusively developing new water management plans for infrastructure



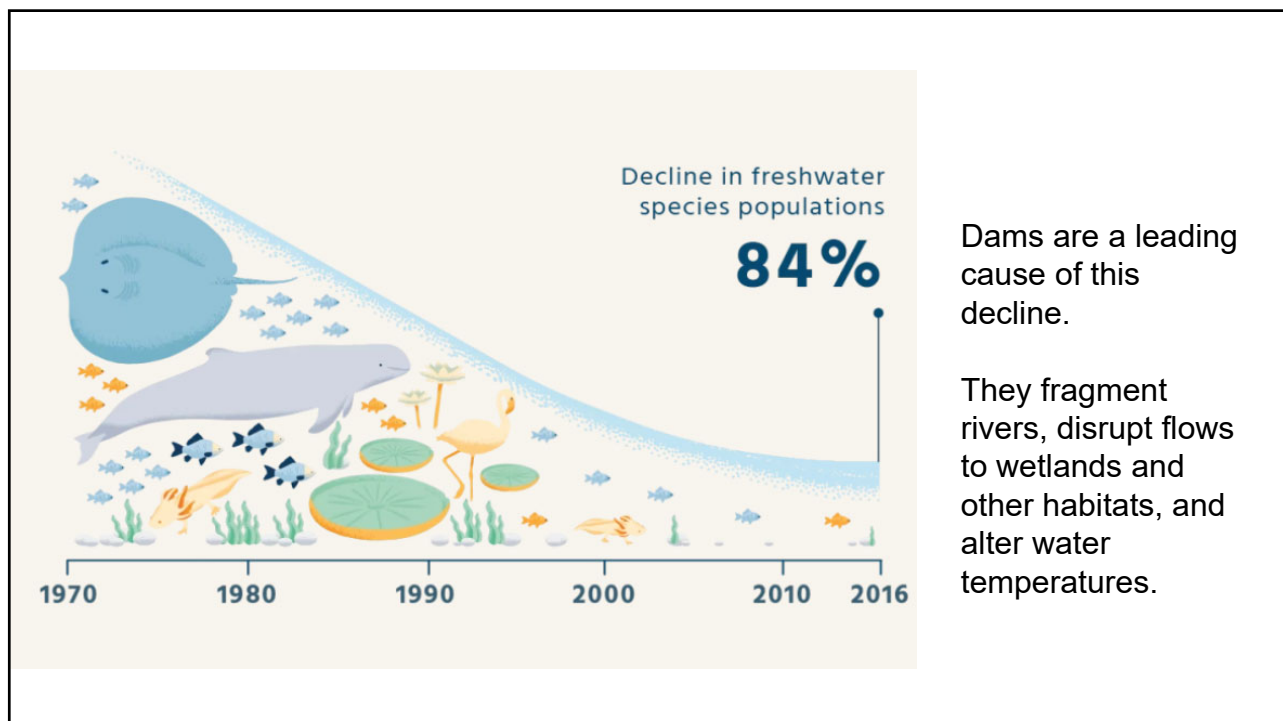
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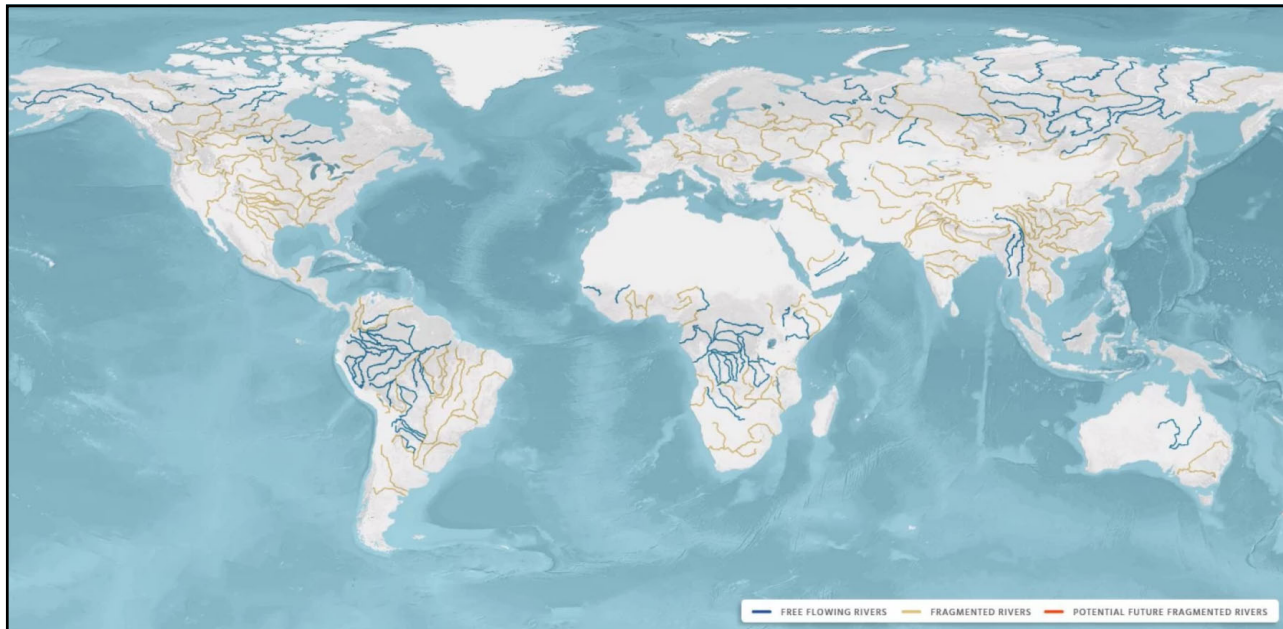
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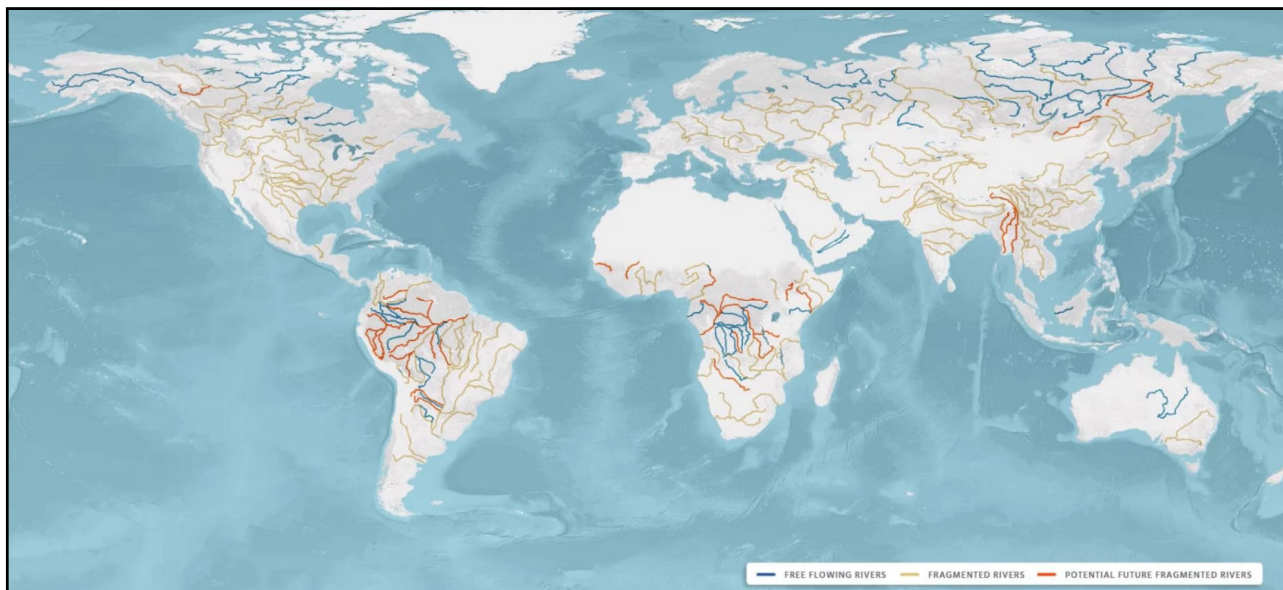


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Only one-third of the world's 242 longest rivers remain free-flowing.

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Hydropower is expected to double by 2050, threatening many of the world's remaining free-flowing rivers.

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The Good News

Management of existing dams and reservoirs can be used as a tool to restore ecosystems.



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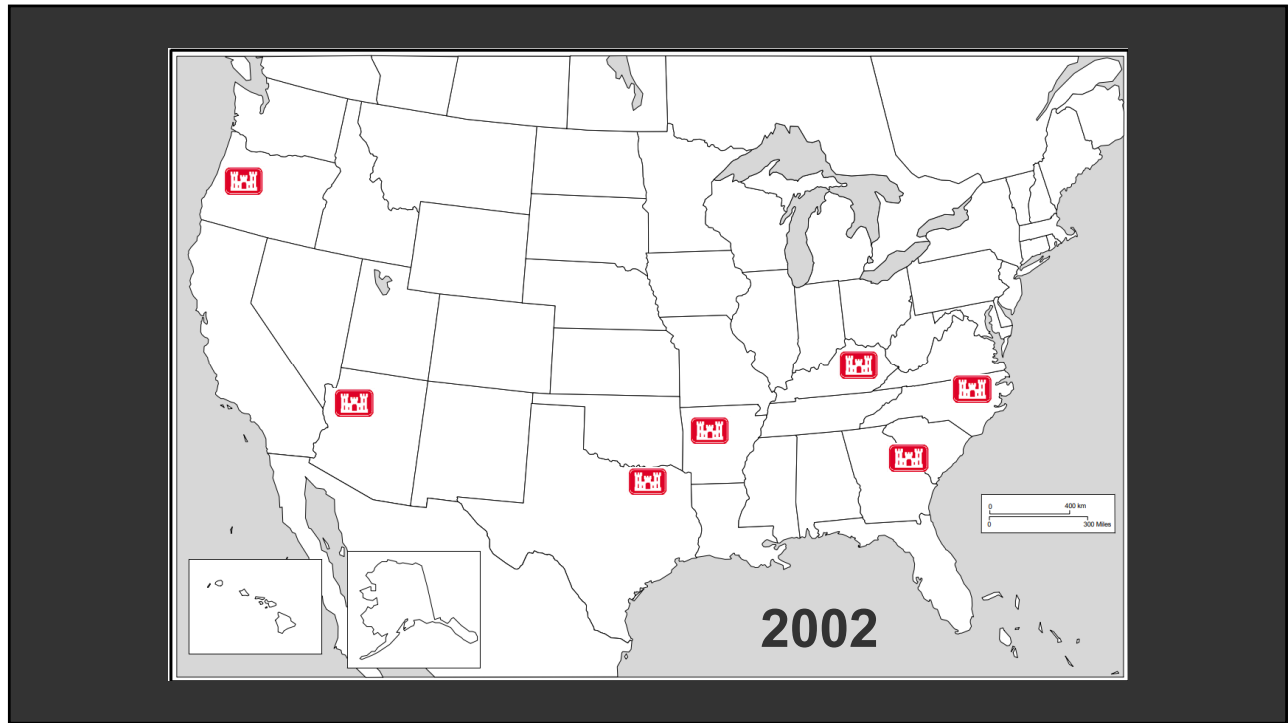
History of the Sustainable Rivers Program (SRP)

- In the 1990s, The Nature Conservancy approached the U.S. Army Corps of Engineers about modifying flows on the Green River in Kentucky.
- Together, they determined flows could be modified to enhance fish spawning, maintain flood control, and extend the recreation season.
- In 2002, TNC & USACE entered into a Memorandum of Understanding to launch a nationwide “Sustainable Rivers Program.”

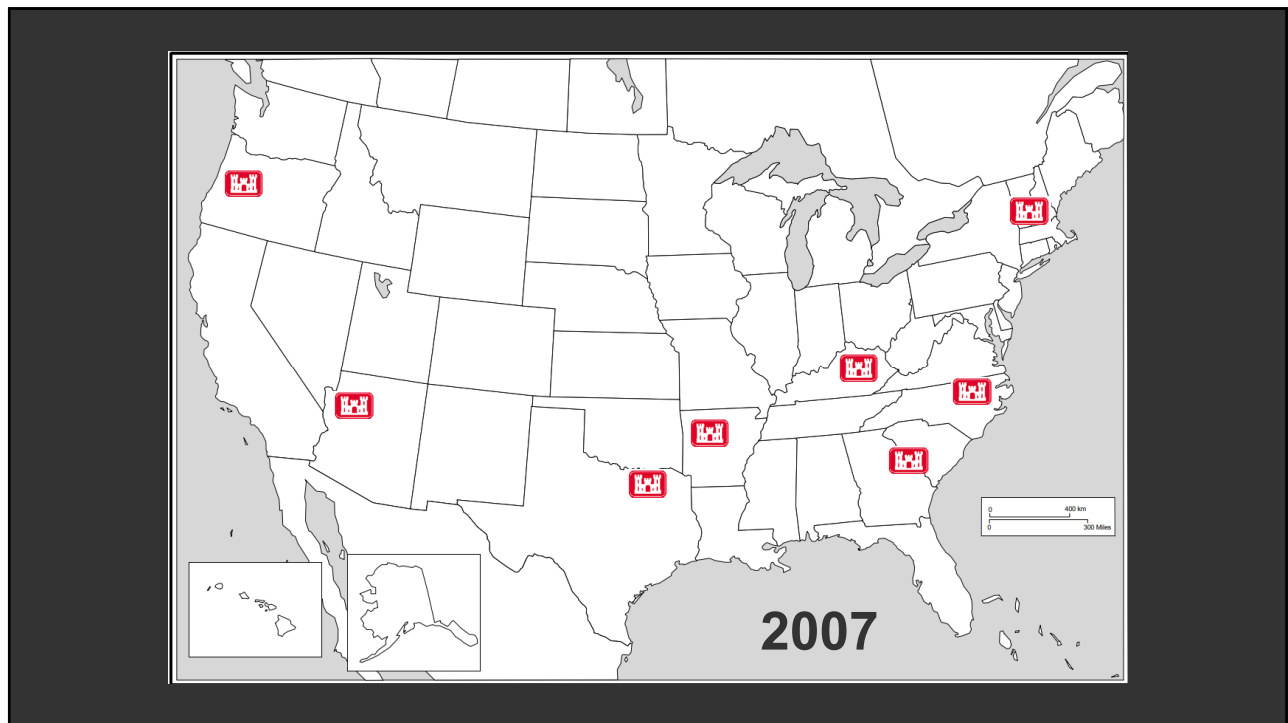


Photo by Mark Godfrey/TNC

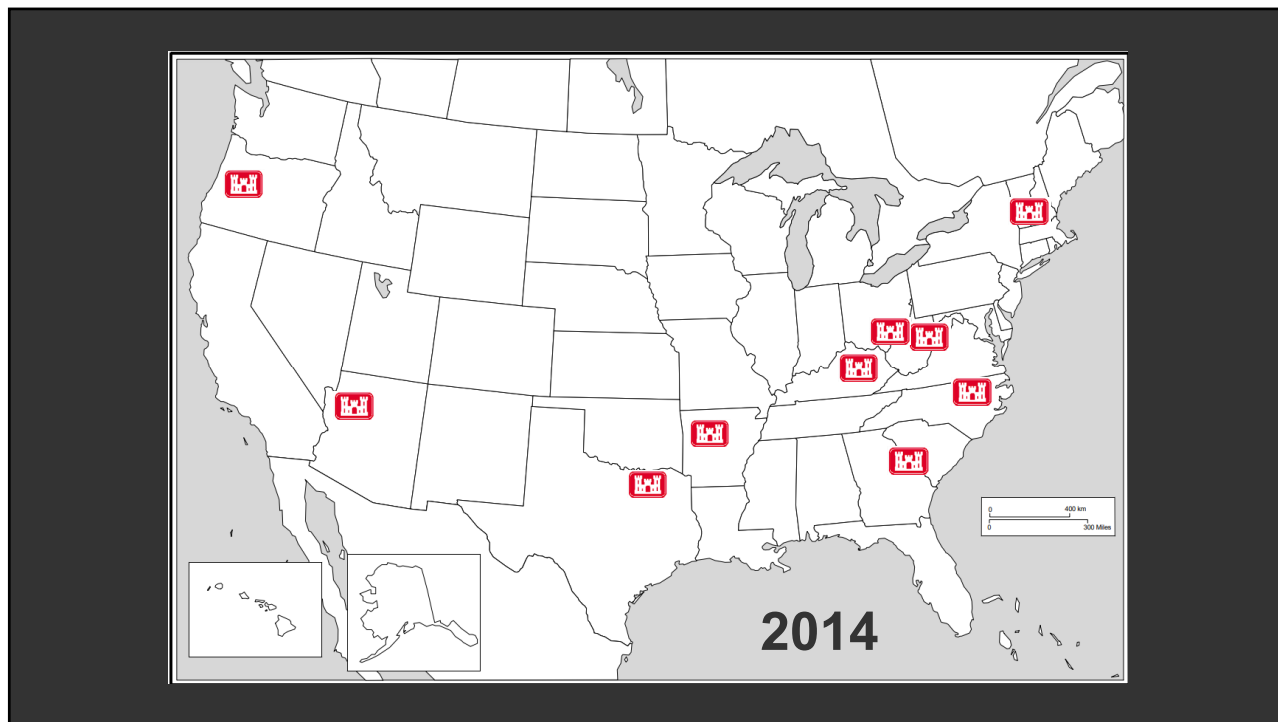
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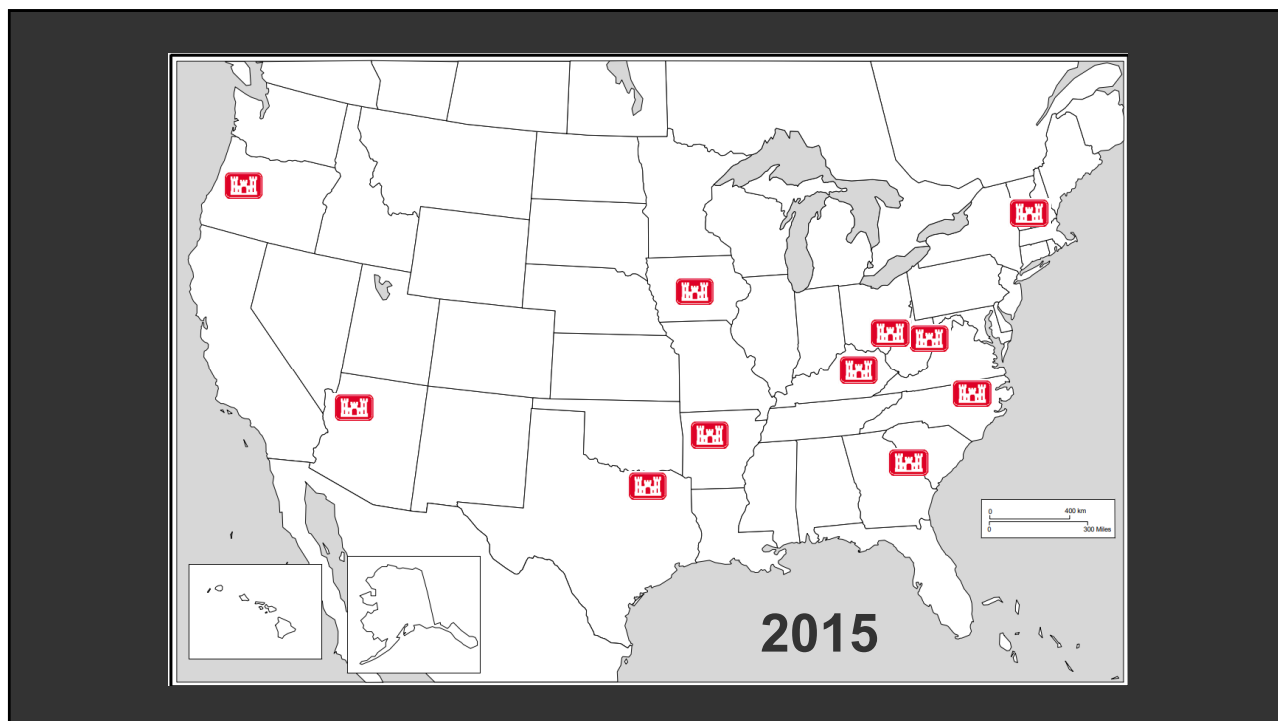
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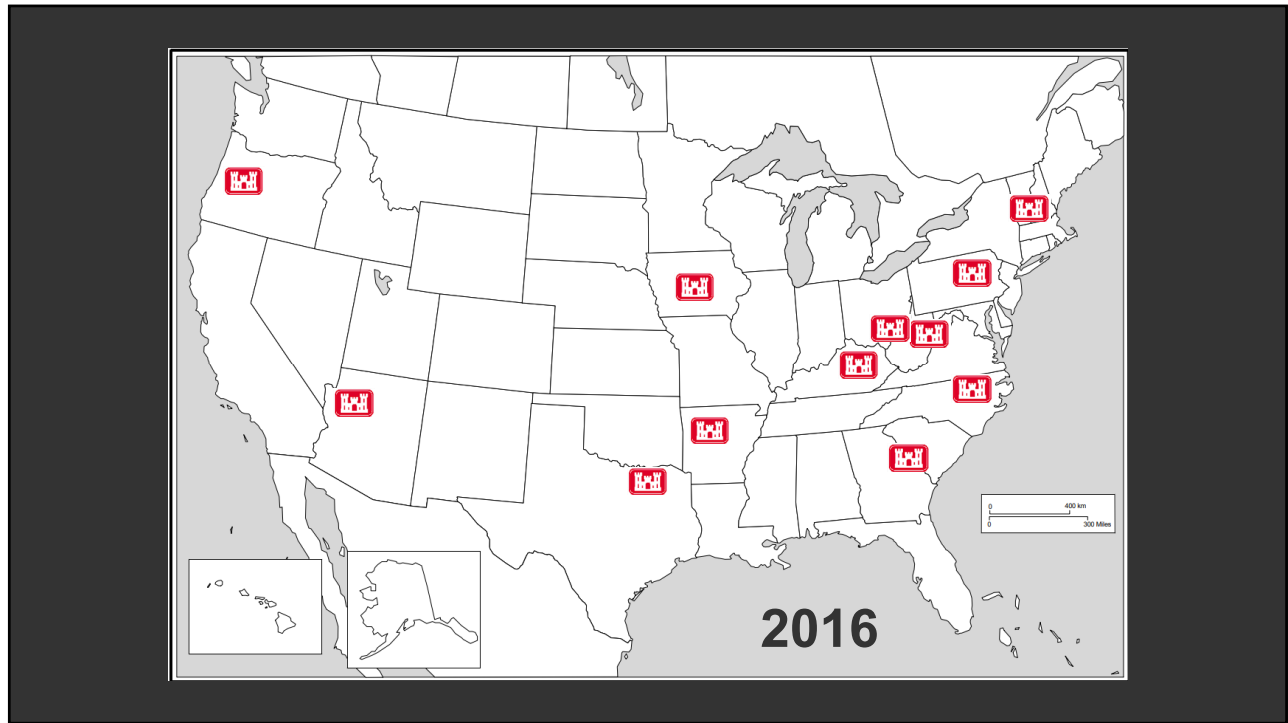
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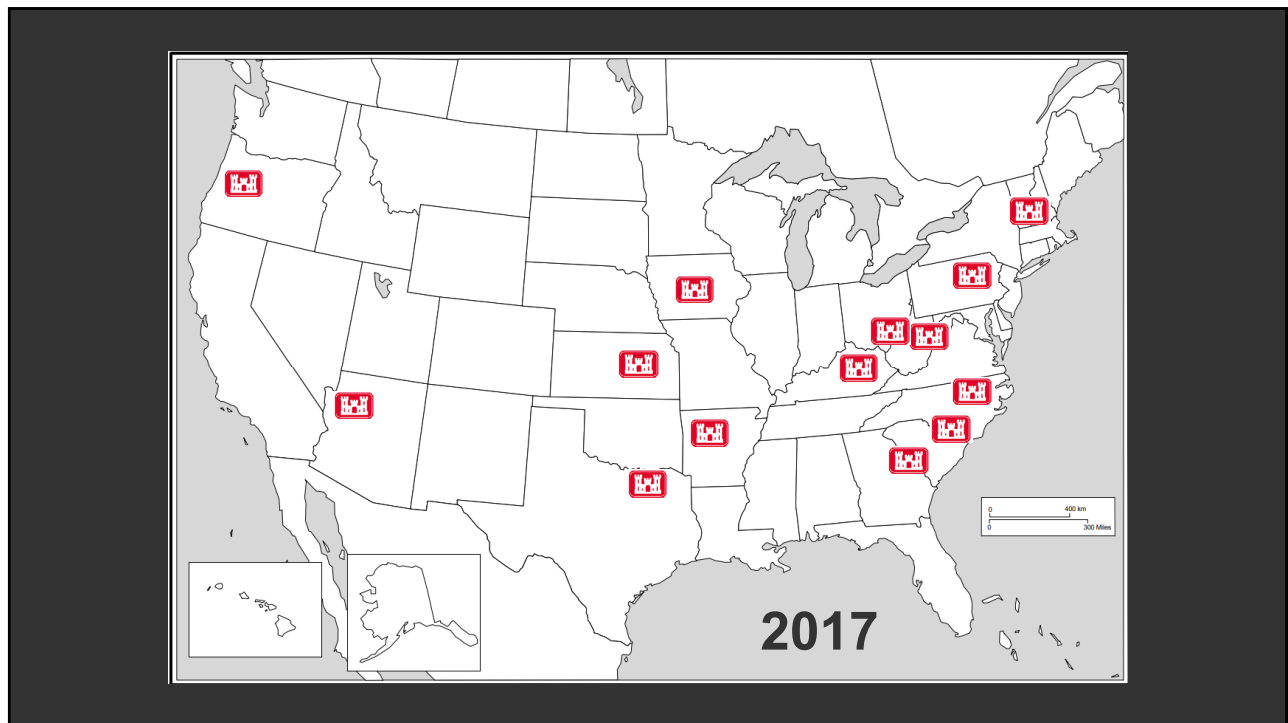
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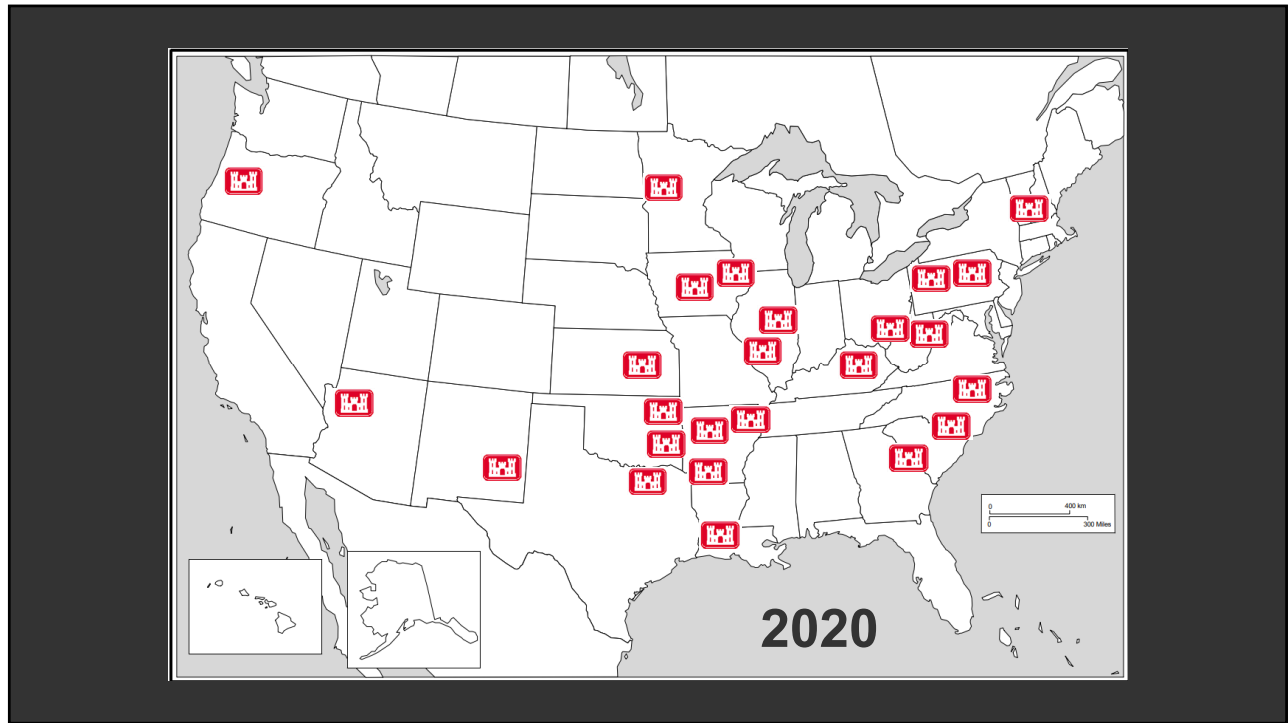
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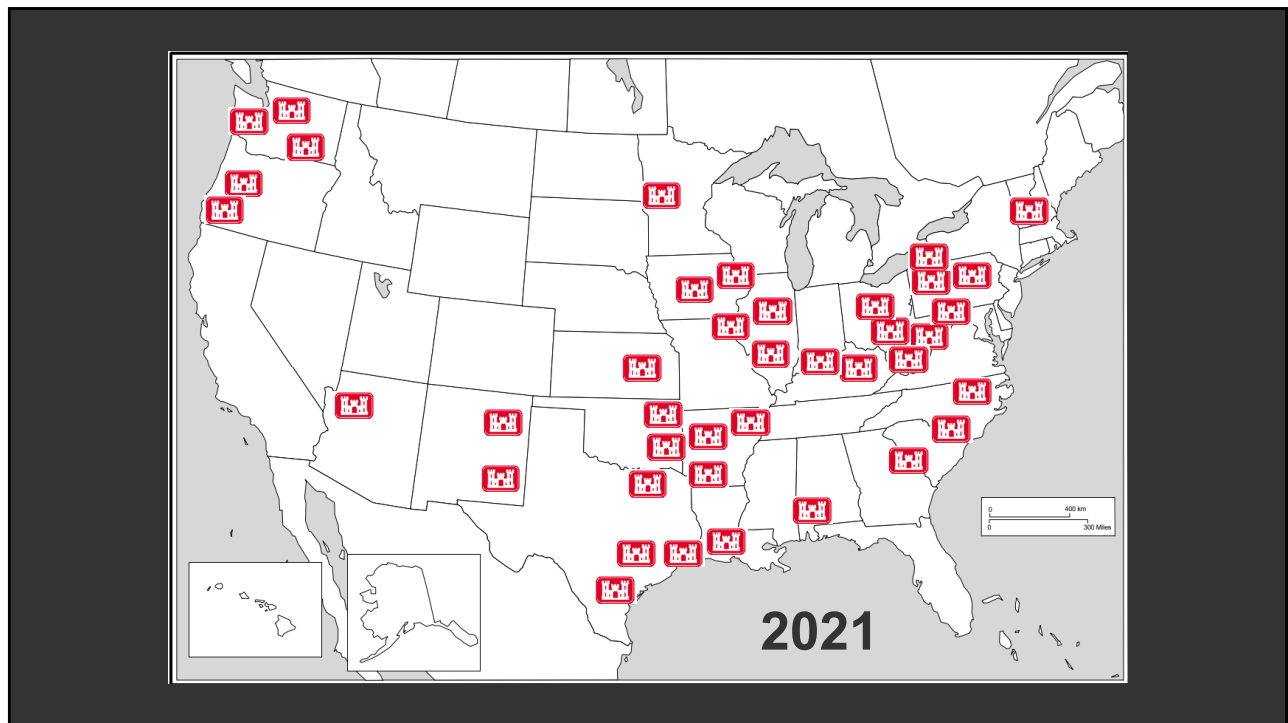
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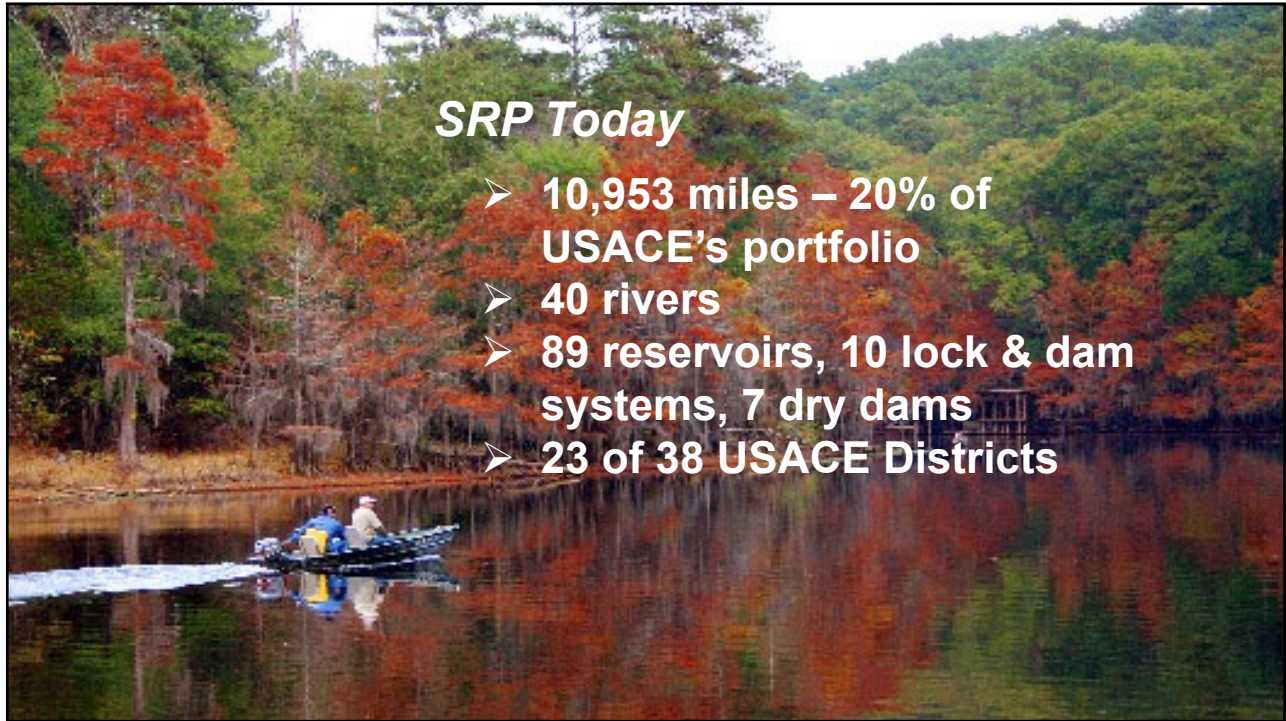
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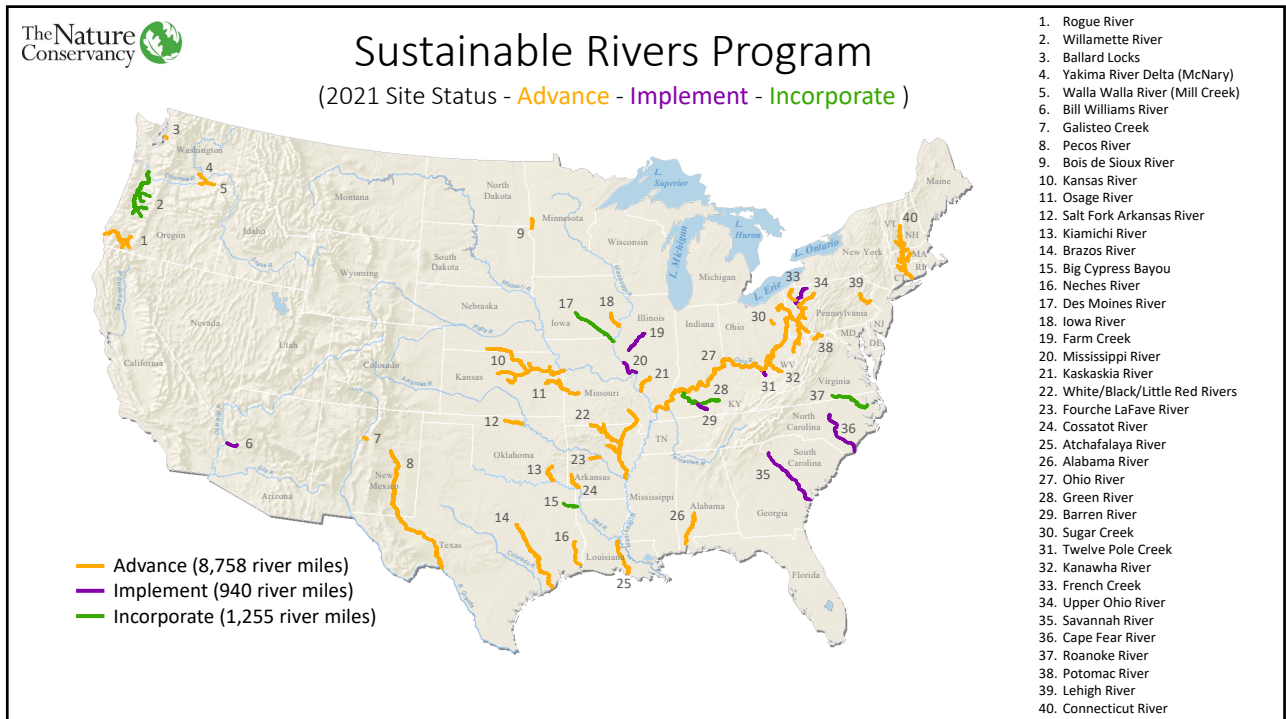
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What Does it Mean to be a “Sustainable River”?

- Analysis of environmental opportunities in partnership with experts from The Nature Conservancy, universities, state and federal agencies, and NGOs
- A willingness among local USACE water managers to explore operational changes
- Commit to engaging Stakeholders to review impacts of current management and consider new alternatives



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Environmental Flows provide a range of benefits ... for nature & people

- Improved in-stream habitat & freshwater for fish & mussels
- Healthier floodplains & wetlands
- Improved water quality, including fewer harmful algal blooms near drinking water facilities



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Environmental Flows provide a range of benefits ... for nature & people

- Reduction of invasive species
- Robust vegetation along lake and reservoir edges, which reduces soil erosion and provides more habitat for waterfowl, fish & wildlife
- More recreational benefits for people



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SRP's Multi-Step Process



Step 1 – Advance

Convene scientific experts & stakeholders to develop flow recommendations

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SRP's Multi-Step Process



Step 2 – Implement

Test different flow regimes to evaluate environmental benefits and assess tradeoffs.

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SRP's Multi-Step Process



Step 3 – Incorporate

Officially add new flow prescriptions to USACE water control plans

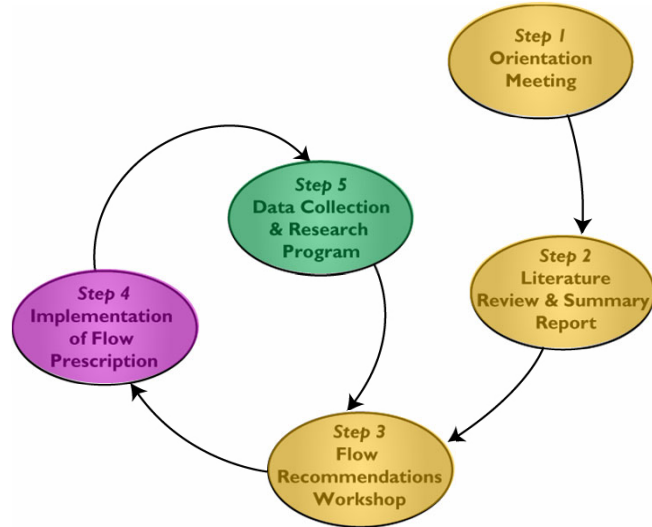


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How do we think about E-flows for an entire river?

Steps One and Two

- 1) Host an orientation meeting with all stakeholders
- 2) Gather background literature on e-flow requirements for habitat conditions (e.g., floodplain needs) and species (fish, mussels, birds).

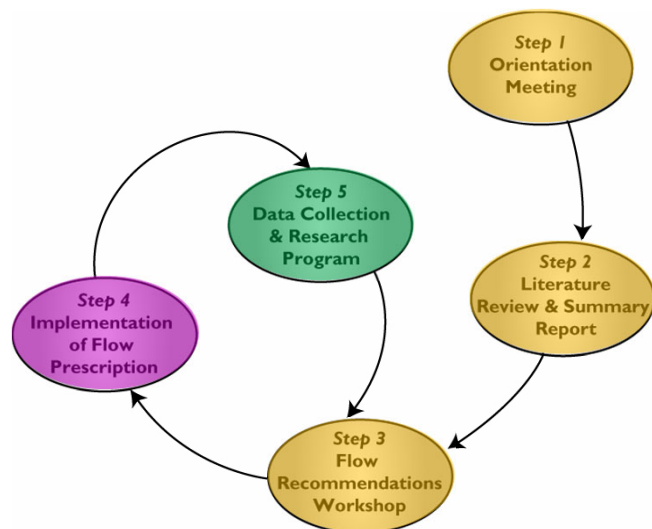


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How do we think about E-flows for an entire river?

Step Three

- a) Use tools and models to examine the effects of hydrologic alterations using pre- and post-dam flow data
- b) Identify incompatibilities between hydrologic alterations and species/habitat flow needs
- c) Brainstorm ways to change dam operations to improve environmental conditions, while still providing for the dam's original purposes (e.g., navigation or flood control)



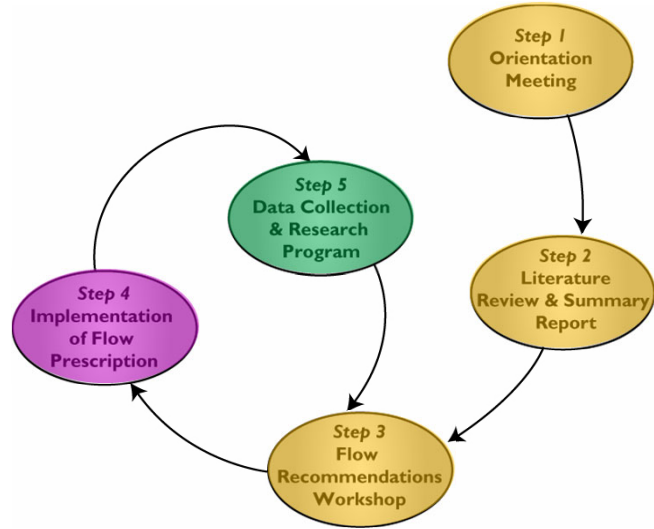
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Testing new flows and incorporating them into operations plans

Steps Four and Five

4) Implement new flow plans on a test basis.

5) Collect data on environmental response to new flows, focusing on species and habitat, as well as effects to other interests like shipping, shoreline property, and recreation.



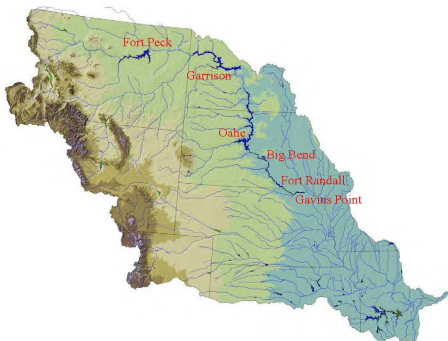
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US Army Corps of Engineers
Northwestern Division



Missouri River Mainstem Reservoir System
Master Water Control Manual
Missouri River Basin



Missouri River Basin Water Management Division
U.S. Army Corps of Engineers
Northwestern Division – Missouri River Basin
Omaha, Nebraska

November 2018

The Final Phase is the most important:

Incorporate the new flow plan into the official Water Control Manual for the dam.

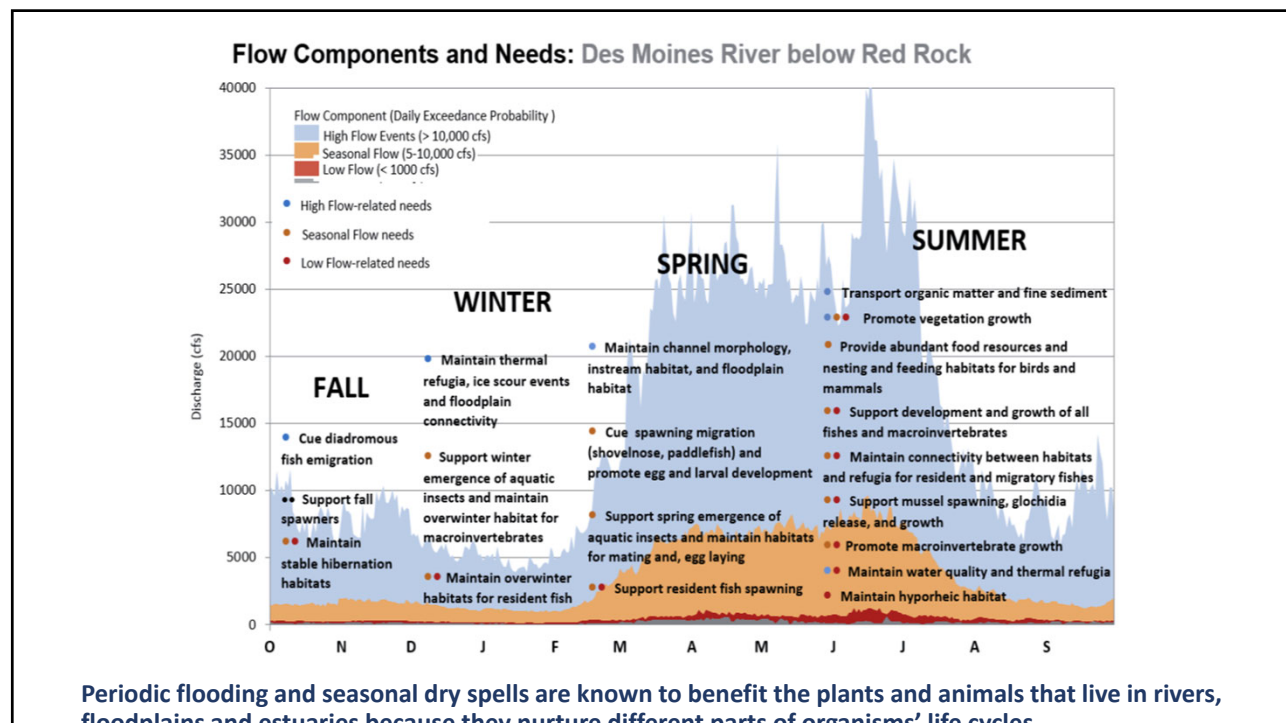
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Example from the Des Moines River, Iowa

- Dam operations altered ecosystems by increasing summer flows, lowering spring flows, reducing peak flows, and impacting the river's connectivity to floodplains and oxbow lakes.
- The new Water Control Plan includes seasonal conservation bands for the reservoir that provide natural flow components.
- Environmental benefits include better habitat for paddlefish and sturgeon, and healthier floodplains and terrestrial wildlife.



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Des Moines River – stakeholder engagement and science workshop

TNC and the Corps went through the SRP process:

- Phase I included engaging local stakeholders to gather information and to compile a literature review of the basin.
- Phase II included hosting a two-day technical e-flows workshop that considered
 - Fish and Mussels
 - Water Quality & Other Considerations
 - Floodplain habitat, riverine waterfowl and



Identifying Environmental Flow Requirements for the Des Moines River: Background Literature Review and Summary



January 2017



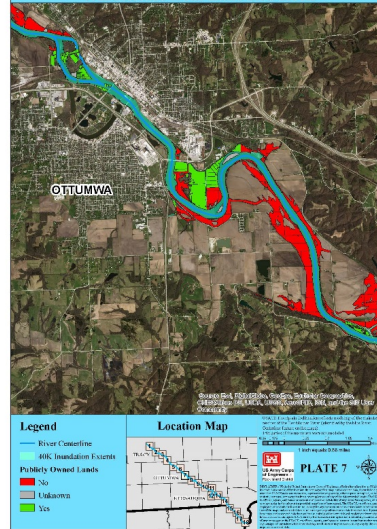
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Des Moines River – getting to success

- Phase III modeled recommendations from the workshop, Phase IV tested them.
- Phase V was to incorporate the new flows into the dam's operating plan. The Water Control Manual was going through an update.



Des Moines River Potentially Inundated Parcels 40K Release from Lake Red Rock



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Kaskaskia River, Illinois

- Added to SRP during the 2020 program expansion.
- Experts brainstormed water level management in three reservoirs.
- Reducing the pool level by 6 inches during the growing season:
 - significantly improves bank vegetation
 - leads to 20 times the amount of bird forage
 - helps improve water quality
- [How Environmental Pool Management Works - Time Lapse Video](#)



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Willamette River, Oregon

- The Willamette is one of the original SRP Rivers.
- Experts defined 63 e-flow prescriptions across 13 reservoirs, especially focused on Chinook salmon.
- One of four “Learning Watersheds” to test scientific methods.
- The recent momentum led to the Rogue River being added to SRP in 2021.



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Roanoke River, North Carolina

- Upper Roanoke Basin is highly regulated, with multiple private & USACE reservoirs.
- Lower Roanoke has the largest intact bottomland hardwood and cypress-tupelo ecosystems on the Atlantic Coast.
- SRP resulted in adoption of new water control plans that increase flows at crucial times to provide more water for the floodplain forest.
- <https://tnc.box.com/s/rtkokf275gnu0fh307wchd5q1ujtcahb>



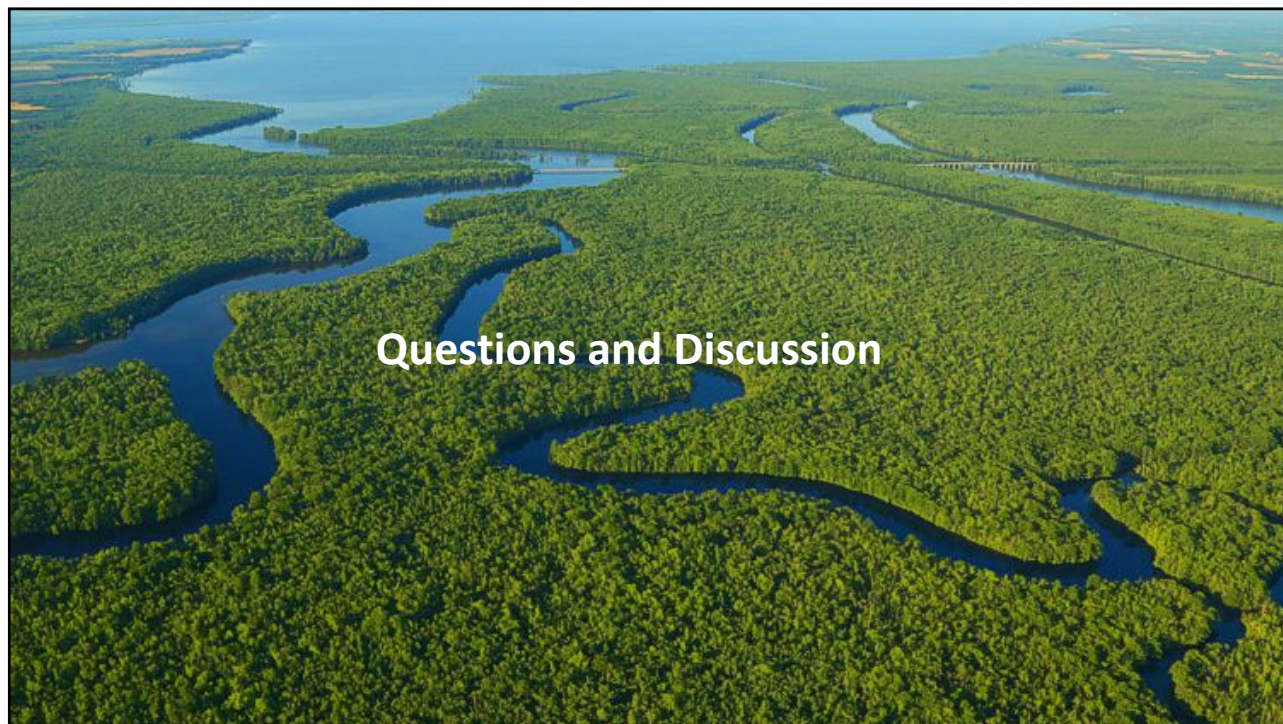
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Current Priorities for Sustainable Rivers Program

1. Expand SRP geographically
2. Accelerate "Incorporation" of SRP recommendations into infrastructure operating plans
3. Broaden the types of environmental actions used by SRP beyond e-flows for downstream
4. Continue to adapt SRP methods to other infrastructure types -- locks & dams, dry dams, Section 7 federal floodplains, control structures & pump stations



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