1.5.1.605 – Scoping Study: Demonstrating Value of River Data Aggregation and Visualization Capabilities

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## Project Overview

### Project Summary

- Easier access to diverse types of “river data” is needed to facilitate basin-wide approaches to multi-objective river management and streamlining regulatory processes, yet significant challenges remain.
- Gain a better understanding from stakeholders and lab researchers about factors affecting accessibility and usability of river data.
- Demonstrate the values of accessible data through a series of “data stories” about complex river management scenarios across the U.S.

### Intended Outcomes

- Inform WPTO hydropower strategy on future efforts aimed at improving access to river data and facilitating basin-scale planning.
- Identify related initiatives being undertaken by other agencies/organizations.
- Build broader interest within the community of river data users and producers to support efforts to improve accessibility and usability of river data.

### Project Information

#### Principal Investigator(s)

- Kyle Larson (PNNL), Dan Reicher (Stanford)

#### Project Partners/Subs

- Weiwei Mo (UNH), David Hart (U Maine), Debjani Singh (ORNL)
- Subs: Stanford University ($169K)

### Project Status

- Ongoing

### Project Duration

- Project Start Date: October 2019
- Project End Date: September 2022
- **Total Costed (FY19–FY21)**: $656K
Project Objectives: Relevance

Relevance to Program Goals:

Key challenges

- Lack of access to information necessary to support decision-making
- Addressing environmental impacts and hydrologic uncertainties

Accessibility/usability of data is a fundamental issue that has cross-cutting relevance to Hydropower Program goals

Scoping the issue and demonstrating value is a necessary first step to building internal and external support for...

- Development of systems and standards to improve access to integrated water data
- Improve capabilities to analyze multifaceted types of water data to weigh tradeoffs of multiple objectives at basin scales
Project Objectives: Approach

Approach:

Phase 1 (FY19-20)

- Engage diverse cross-section of stakeholders to better understand challenges and needs regarding accessibility/usability of water data
- Technical report describing complex landscape of “water data”
  - Stakeholder sentiments, key categories of data, critical national and regional level datasets, and related initiatives

Phase 2 (FY20-21)

- Develop a series of interactive data stories that demonstrate the diversity and importance of water data to river basin management
- Hold virtual workshop with engaged stakeholders to identify key challenges and benefits of improving access to water data
**Project Objectives: Expected Outputs and Intended Outcomes**

**Outputs:**
- Two technical reports
  - (FY20) Results of stakeholder engagement and initial scoping investigation
  - (FY21) Challenges and benefits of improving data accessibility and usability identified during May 2021 workshop
- Five interactive, web-based data stories highlighting importance of data accessibility in select U.S. river basins

**Outcomes:**
- Inform WPTO hydropower strategy efforts aimed at improving access to river data and facilitating basin-scale planning
  - e.g., Intelligent Watersheds lab call
- Build strategic bridges with related initiatives
  - e.g., Internet of Water Coalition
- Build broader interest within the community of river data users and producers
  - e.g., Uncommon Dialogue
Project Timeline

NOTE: There were no Go/No-Go Decisions for this project
## Project Budget

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<th>FY19</th>
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End-User Engagement and Dissemination

• Outcomes are primarily intended to assist WPTO with development of longer-term strategies to address issues regarding access to river and water-energy data
• **External Engagement**
  • Insight of data consumers and producers is key to understanding the nature and scope of the issue
  • Engaged wide range of stakeholders (e.g., federal and stage agencies, Tribes, NGOs, universities, utilities) at multiple stages throughout project
  • Access to information disproportionately affects underrepresented or under-resourced groups such as Tribes
• **Dissemination**
  • **Two technical reports**
    • Larson et al. 2021. *Improving Discovery, Sharing, and Use of Water Data: Initial Findings and Suggested Future Work*. [https://doi.org/10.2172/1778100](https://doi.org/10.2172/1778100)
  • **Five online data stories**
    • From Walleye to Wild Rice: How Data Are Informing Water Management in the Wisconsin River Basin. [https://arcg.is/1yevDi](https://arcg.is/1yevDi)
    • Song et al. 2021. *Managing Dams for Energy and Environmental Sustainability: Exploring Mutually Beneficial Possibilities in the Connecticut River Basin*. [https://arcg.is/1HqTyi0](https://arcg.is/1HqTyi0)
    • Roy et al. 2021. *Hydropower in the Penobscot River, USA: The Data Behind the Dams, and Opportunities for Better Energy, Environmental, Social, and Financial Outcomes*. [https://arcg.is/54iGz](https://arcg.is/54iGz)
    • Singh et al. 2021. *HydroSource: A Platform for US Hydropower Data for Basin-Specific Applications*. [https://arcg.is/1q4CGb](https://arcg.is/1q4CGb)
    • Seagrist et al. 2021. *Potter Valley Project: A Look at Cross-Basin Decision-Making Informed by Water Data*. [https://arcg.is/1TCS0H0](https://arcg.is/1TCS0H0)
Engagement with broad range of stakeholders

- Perceptions about data accessibility/usability vary across user groups
- Critical for raising awareness and building partnerships

Online, interactive data stories

- Convey complexity and importance of water data to a general audience
Future Work

FY22

Investigate accessibility/usability of mission critical water data used or produced by PNNL in support of WPTO research portfolio

Provide advisory support for emerging analytical needs identified by the Uncommon Dialogue Working Groups 3 & 5

  WG3: Increase Basin-Scale Decision-Making and Access to River-Related Data
  WG5: Advance Effective River Restoration Through Improved Off-Site Mitigation Strategies

Investigate use of structured metadata for making lab-produced data Findable, Accessible, Interoperable, and Reusable (FAIR)