

## **Visualizing Tradeoffs in How River Flow and Spill Influence Fish Dam Passage Routes and Total Dissolved Gas in a Hydropower System**

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Management operations on the Columbia and Snake rivers provide many services to various communities, including power generation, flood management, and mitigative protection for water quality, wildlife, and endangered salmon. The challenge is to make scientifically-sound decisions in a complex system where variable environmental conditions, management actions and biological responses cannot be isolated from each other. To this end, there is a need for understanding trade-offs among possible actions by studying the past and modeling the future under variable environmental conditions and climate change. For example, spilling water over dams has mixed effects. It is beneficial for helping juvenile fish migrate safely past dams yet also increases the amount of total dissolved gas (TDG) in the water which, at elevated levels, is known to be harmful to salmon. We have developed a tool to: examine historic river conditions, including TDG; visualize spill-influenced trade-offs between fish passage and TDG; and forecast TDG based on environmental conditions and operations. Making informed decisions is essential for assessing ecological impacts and balancing the multiple needs of the region. Please visit:

[https://cbr.washington.edu/shiny/DAM\\_CONDITIONS/](https://cbr.washington.edu/shiny/DAM_CONDITIONS/)