

Stream Classification Tool (SCT)

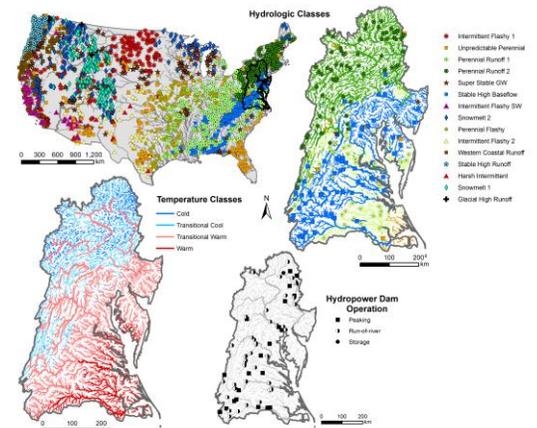
A classification system to characterize and generalize the biophysical settings on stream environments including hydrologic, thermal, geomorphological, and ecological dynamics.

What is a Stream Classification?

At a basic level, stream classifications are an inventory of different types of streams. Classifications help us explore similarities and differences among different types of streams, make inferences regarding stream ecosystem behavior, and communicate the complexities of ecosystem. While classifications aid in understanding fundamental differences among streams, they also have many applied outcomes, such as grouping sites with similar character, stratifying analyses for monitoring and/or experimentation, prioritizing mitigation or aquatic conservation, and generalizing ecological responses to disturbances.

How is it useful to Hydropower?

The Stream Classification Tool (SCT) is useful to environmental mitigation for hydropower dams in multiple ways. The purpose of the SCT is to create efficiency in the regulatory process by creating an objective and data-rich means to address meaningful mitigation actions. First, the SCT addresses data gaps as it quickly provides an inventory of hydrology, temperature, morphology, and ecological communities for the immediate project area, but also surrounding streams. This includes identifying potential reference streams as those that are proximate to the hydropower facility and fall within the same class. These streams can potentially be used to identify ideal environmental conditions or identify desired ecological communities. In doing so, the SCT provides some context for how streams may function, respond to dam regulation, and an overview of specific mitigation needs.



An example of stream classification (hydrology, size, temperature classes) related to different dam operations within the Chesapeake Bay drainage.

Objectives

Biophysical settings determine the extent and nature of hydropower development and operations, constraints to development and operations, and associated mitigation requirements. The SCT is useful for:

- Improving the efficiency of Environmental Impact Assessment (EIA) and scoping for licensing/relicensing
- Providing high resolution datasets to foster future water power research,
- Prioritizing conservation measures for different stream types or prioritizing areas for future development
- Providing a generalized framework to understand the extent and nature of hydropower and associated mitigation measures.

To date this project has classified almost 1 million stream reaches of the Eastern US into groups of similar hydrology, temperature, and morphological types as well as assessing hydrologic alteration and temperature alteration. These datasets provide a tool that can be used to assess mitigation needs at finer resolutions, prioritize mitigation actions, identify case studies or reference streams for comparison, and fill information gaps. The datasets will be disseminated to allow viewing within *Google Earth* to provide a user-friendly, open-access platform for stakeholder, regulator, and industry use.

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