

Society for Freshwater Science, – June 4-8, 2017

<http://sfsannualmeeting.org/>

## **Solving the problem of dynamic target populations in interpreting long-term stream surveys**

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### **Abstract**

Stream surveys are typically designed under the assumption that the target population is static. However, this population can fluctuate over the course of long-term surveys, particularly in arid regions like California. Variable weather patterns and changes in land use affect flow patterns, meaning that the inclusion of a reach in the target population is not constant. Dynamic target populations complicate comparisons of surveys across years: for example, in dry years, surveys may over-represent streams sustained by effluent, giving an inaccurate impression of degradation relative to wet years. Additionally, programmatic changes (e.g., choices to delay sampling in one year) and variability among practitioners (e.g., subjective choices to reject a site) may exacerbate the problem. California is developing a multi-pronged effort to address these challenges that includes: 1) assessment tools that work in the range of flow conditions in the target population, including streams in an intermittent or ephemeral state, 2) hydrologic models to characterize the dynamic flow status of stream segments in a standardized and objective way and 3) a framework to assess the variable representativeness of probabilistic sites.