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Improving Causal Assessment in California Step 1: Selecting Comparators for Your Site

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Abstract

As bioassessment becomes an ever increasingly required component of stormwater monitoring efforts, more sites are going to be found being in less than desirable condition. A recent survey across Southern California indicated that 75% of perennial, wadeable streams have impaired biological communities. Causal assessment is the process of identifying the stressor(s) that are behind those impaired conditions. In order to develop a causal assessment approach for use in California, we tested – and eventually recommended – the US EPA's causal assessment tool (CADDIS). Through the process of testing out CADDIS, it became apparent that there were some modifications that could be made to the framework to improve its large-scale application in California. For example, CADDIS provides little guidance on how to select comparator sites – sites that provide data used to diagnose the cause of an impairment. The characteristics of a good set of comparator sites are that they should: 1. Represent a similar environmental setting as the test site and potentially support the same biological expectation; 2. Represent a gradient of observed biological condition good to bad, bracketing the condition at the test site; 3. Comprise enough sites to facilitate different analyses; and 4. Ideally contain a few reference sites. Thanks to California's regional assessment programs, there are hundreds of potential comparator sties that can be potentially used. Given this resource, we have developed two new quantitative approaches to select comparator sites based on environmental gradients or biological communities predicted from the California Stream Condition Index (CSCI) output. These new approaches were evaluated alongside CADDIS's traditional approach at 15 different test sites using the four tenants of a good set of comparator sites. The new biological community approach to selection produces a better set of comparator sites than the traditional approach. These results suggest that there are much greater opportunities for selecting appropriate comparator sites than previously considered. This advance has the potential to greatly accelerate the causal assessment process for streams in California.