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Technical obstacles and solutions for the management of temporary streams: What are western States doing, and how can researchers help?

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Abstract

Despite increasing concern over the ecological importance of temporary streams, technical challenges prevent their full integration in water quality protection programs. Broadly, three major areas of uncertainty require further research: physical, biological, and ecological. Physical uncertainty results from the hydrologic diversity temporary streams exhibit. We do not know how to characterize their hydrologic regimes, nor do we understand the climatic, geological, or anthropogenic activities that influence them. This uncertainty has complicated mapping efforts, and location and type of temporary streams is largely a matter of local knowledge. Biological uncertainty casts doubt on the utility of traditional indices of biological integrity, or even what indicator types are most appropriate. Ecological uncertainty arises because we know little about the function of temporary streams that we can't assess how important they are for watershed health, nor how they respond to particular stressors. These uncertainties have impeded multiple aspects of waterbody management, including assessment, protection, and restoration. Faced with challenges, several western US states have independently engaged in research efforts to determine the most effective way to incorporate temporary waterbodies into their management programs. In this presentation, we compare approaches used by California, Nevada, and Arizona (where temporary streams are predominant), and identify common needs that the research community can meet.