

Mapping of Non-Perennial and Ephemeral Streams in the Santa Ana Region

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EXECUTIVE REPORT

Overview

Ephemeral streams lack surface flow for most of the year and are common features of hydrologic networks in arid regions of Southern California. These streams drain large areas of watersheds and can greatly influence the quantity and quality of downstream waters. However, ephemeral streams are generally excluded from regional assessment programs due to lack of assessment tools. For example, there are no reliable maps that show where ephemeral, intermittent, or perennial streams occur in Southern California. The assessment of non-perennial streams, in addition to traditional monitoring of perennial waters, is critical for developing a complete picture of watershed health.

Identifying the locations and extents of ephemeral streams is the first step towards more comprehensive assessments. Existing maps do not adequately represent which streams are ephemeral vs. those with longer flow durations. Knowing the extent and locations of these streams is important to evaluating the ability of existing assessment tools to characterize hydrologic and ecological conditions and to support development of new assessment tools.

Stream maps that are currently available are insufficient to describe the extent and location of ephemeral streams. Existing map products are typically created by manual photointerpretation or based on estimates of flow accumulation with elevation changes. Maps produced using both methods will under-represent ephemeral streams or provide inaccurate locations. Streams may not be visually identified with photointerpretation or maps based on elevation layers may have poor sensitivity in low gradient environments.

The Santa Ana Regional Water Quality Control Board (RWQCB) has recently investigated the use of stream periodicity models to map and describe ephemeral streams in Southern California. These models improve on traditional mapping methods by estimating the likelihood of perennial vs. ephemeral flow at every stream reach in the drainage network. Building on earlier efforts in the San Diego region, this report summarizes efforts to develop and apply stream periodicity models in four watersheds of the Santa Ana region, plus the adjacent San Gabriel watershed. The objective of this application is to better characterize non-perennial streams in this highly developed watershed, in addition to understanding the abilities of existing tools to characterize flow conditions in different watersheds.

Full text:

http://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/1012_MappingStreamsSantaAna.pdf