Understanding and improving California's river and water resource predictions
using in situ and remote sensing data

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ABSTRACT

The goal of the proposed research is to improve river and soil moisture
predictions in California's Sacramento-San Joaquin River Basin. For California's
policymakers and water resource managers, such predictions are particularly
crucial to managing the State's significant irrigation requirements. Because the
study area is large, with tight water resources and stringent water regulations to
address irrigation needs, developing accurate predictions poses special
challenges. However, a variety of long-term data sets have been accumulated for
this river basin, making it an ideal candidate for such a study. The proposed
research will employ advanced land-surface hydrological modeling and passive
microwave remote sensing techniques. We expect to complete the following
objectives in the two-year period:

1. Document the data for the long-term study. Research that applies
comprehensive modeling and remote sensing for hydrological predictions in a
large, heavily irrigated region is at the early stages, and the data collected by the
proposed work will pave the way for future studies.

2. Test how well current modeling and remote sensing techniques can predict the
dynamics of the key hydrologic variables: river flow, soil moisture, and identify
the sources of the major uncertainties.

3. Develop guidelines to improve model predictions of river flow and soil moisture
in conjunction with in situ and remote sensing data to improve irrigation
management.

In this study, California's Sacramento-San Joaquin River Basin will function as a
test case to guide water resource planning in other areas of the world that face
similar problems from the increasing threats posed by global warming.