

## Linking Extreme Precipitation and Floods: Implications for Climate Change Scenarios

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### Project Goals:

- Examine basin response to extreme precipitation events in regions of the western U.S.
- Identify basin factors and storm conditions that produce the largest floods
- Apply results to regional climate change scenarios to determine potential changes in basin response

### Motivation:

Changes in streamflow magnitude, frequency and volume as the climate changes will undoubtedly impact Reclamation structures from both a dam safety and water operations perspective. This study investigates the runoff response of watersheds to extreme precipitation (rainfall) recorded in basins of the western U.S. and to understand the basin and storm conditions that produce the largest floods. Simply stated, this study seeks to answer the question, "Do the largest precipitation events produce the largest floods and if not, why?" While this question may seem relatively simple, there are many factors that can complicate the relationship between rainfall and floods. While rainfall runoff models are a useful predictive tool, they require intensive inputs to accurately portray complex topography, soils, geology, antecedent moisture and resultant runoff from storms that impact basins of the intermountain west. Historical data can be used in many basins to first understand how precipitation and runoff are related under recent historical conditions and then to apply this understanding to how basins might respond in the future given changes in climate.

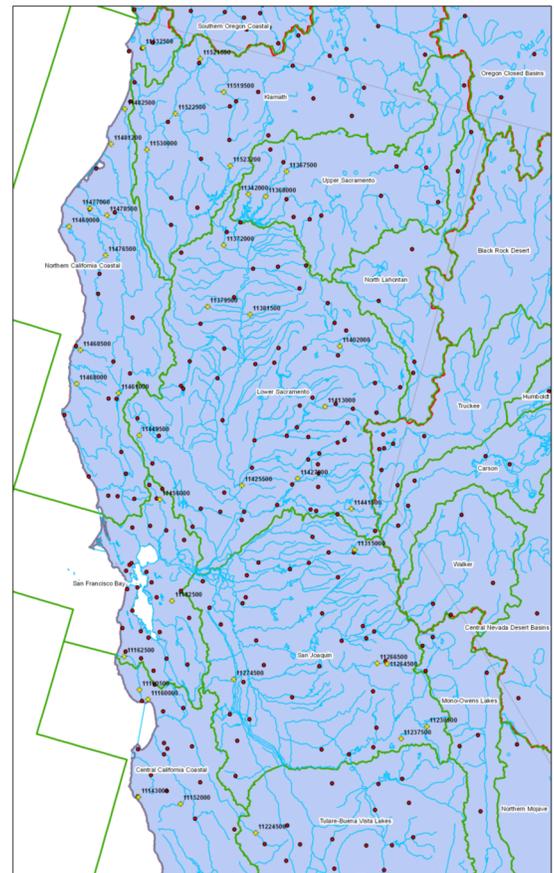


Figure 1 - Example of streamgages and COOP precipitation gages used in the analysis for northern and central California

### Approach:

- Compile the 10 largest rainfall and flood events from gages in the western U.S. for 1-, 3-, 5- and 7-day rainfall durations
- Develop relationships between extreme rainfall and streamflow
- Apply results to climate change scenarios and predicted changes in precipitation intensity, duration or seasonality

### Related Projects:

- ◆ West-Wide Climate Risk Assessments (WWCRA) (RDO/S&T)
- ◆ Extreme Floods in a Changing Climate (DSO/Tech Development)
- ◆ Methodology and Data for Quantifying Extreme Precipitation Events in a Changing Climate (RDO/S&T)

### Collaborators:

NOAA-ESRL, USGS-SIO, Reclamation (RSD, Flood Hydrology)