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NCAR, Boulder, CO

Climate Change and California’s Water Management System

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Saracino-Kirby-Snow
California Water Systems

- 100 Years of Development
- 100 Years of Conflict
Rainfall Pattern
Sacramento River Flow at Hamilton City
Water Year 95 (Oct 94 through Sept 95)
- $1.4 Trillion Economy
- Diverse Ecosystem
Water Supply and Demand Pattern
Northern California

- Water Use
- Precipitation
- Natural Runoff
Sacramento River Runoff
April - July Runoff in percent of Water Year Runoff

\[ y = -0.0012(\text{year}-1905) + 0.444 \]
\[ R = 0.382 \]

Linear Regression (least squares) line showing historical trend

3-year running average
Water Management Issues

• Major System Investment

• Supply Reliability

• Ecosystem Restoration

• Supply/Flood Control Trade-off
Friant Dam

Operational Uncertainty:
• Flood Control Capacity, or
• Water Supply Storage
Water Manager Needs

• More Data, More Models
  - hydrometeorologic monitoring
  - probabilistic forecasting

• Linked Models
  - hydrographs
  - temperature
Linked Models

Global Climate → Regional Impact → River Basin Response
California Issue Summary

Water Supply
~Volume & Timing of Precipitation
~Snow vs. Rain

Flood Control
~Volume & Timing of Runoff

Delta
~Sea Level
~Flood Volume & Timing

Environmental
~Runoff Pattern
~Water Temperature

Water Quality