Climate Change and California Water

CCTAG
April 3, 2014
by Maury Roos
Northern Sierra 8 Station Precipitation for Water Years 2013 and 2014

- WY 2013
- WY 2014
- Average

Precipitation (inches)

Time (month)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
April 1 Snowpack Water Content
Statewide Percent of Average
Sacramento River (SBB+FTO+YRS+AMF Combined)
April - July Runoff in percent of Water Year Runoff

Linear regression (least squares) line showing historical trend

3-year running average

y = -0.0008x + 0.4312
R² = 0.0938

Water Year (October 1 - September 30)
Water Supply and Demand Pattern
Northern California

- Water Use
- Natural Runoff
- Precipitation

Graph showing the supply and demand pattern of water in Northern California, with peaks in water use in the summer and natural runoff in the winter.
April 1 Snow-Water Content
13 Northern Sierra Nevada Snow Courses

y = -0.070x + 30.855
$R^2 = 0.012$
April 1 Snow Water Content
12 Northern Sierra Snow Courses
(Original 13 less Lake Spaulding)

\[ y = -0.0613x + 31.15 \]
\[ R^2 = 0.0091 \]
April 1 Snow-Water Content
13 Southern Sierra Nevada Snow Courses

\[ y = 0.0268x + 26.212 \]
\[ R^2 = 0.0013 \]
Golden Gate Annual Average and 19-Year Mean Tide Levels

Updated Through 2013
Source of Data: National Ocean Service
American River Runoff

Annual Maximum 3-Day Flow

Unimpaired Runoff at Fair Oaks

Data from Corps of Engineers Sacramento District
CA 2012 LEVEL WATER SUPPLY AND USE (Million Acre-Feet)

**Water Supply**
- Natural Runoff 70.8
- Colorado River 4.4

**Water Use**
- North Coast Wild and Scenic Rivers 17.8
- Agriculture 25.6
- Urban 7.2
- Possible Development 3.0
- Development Improbable 6.0
- Other North Coast 7.5
- In-stream Fishery 2.1
- Managed Wetlands 1.0
- Evaporation 1.2
- Outflow to Nevada 1.2
- Ground Water Overdraft 1.5
- Land Use Changes 1.5
- Inflow from Oregon 1.4
- Req'd Delta Outflow 7.0
- Water Supply 79.6
COMPARISON WITH PREVIOUS DROUGHTS
Average Annual Drought Period Runoff in Million Acre-Feet

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* from tree rings

SACRAMENTO FOUR RIVER RUNOFF
Comparison with Previous Droughts
Average Annual Drought Period Runoff in Million Acre-Feet

San Joaquin Four River Runoff

Average: 6.0

WY


0   1   2   3   4   5   6

0  1  2  3  4  5  6

Average  2 Year  3 Year  4 Year  6 Year