# EMERGENCY DROUGHT BARRIERS CENTRAL VALLEY FLOOD PROTECTION BOARD BRIEFING

*April 25, 2014*

DROUGHT PREPAREDNESS & RESPONSE

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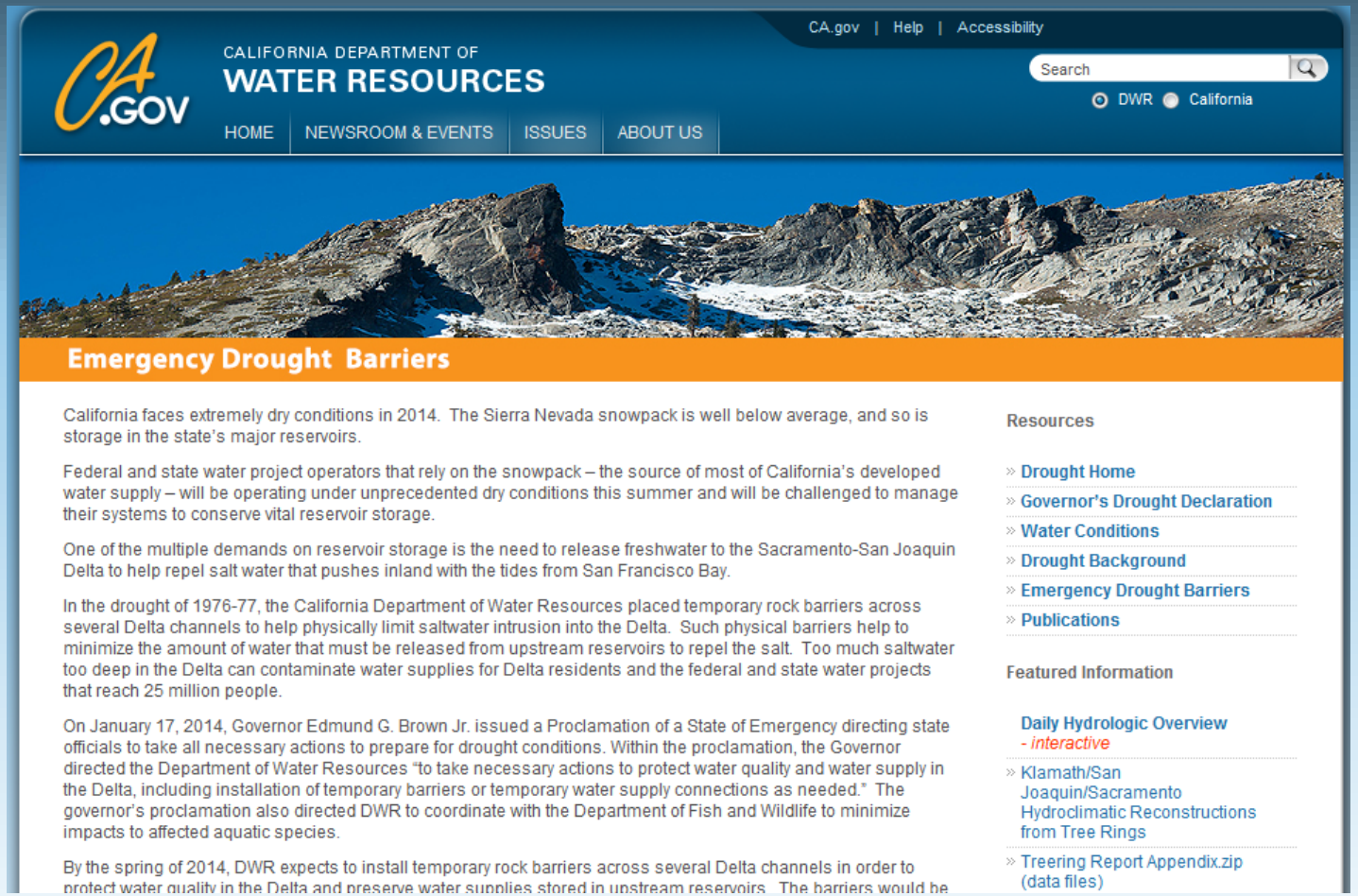
Department of Water Resources

PUBLIC SAFETY ENVIRONMENTAL STEWARDSHIP ECONOMIC STABILITY

# Public Information

http://www.water.ca.gov/waterconditions/emergencybarriers.cfm



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## Emergency Drought Barriers

California faces extremely dry conditions in 2014. The Sierra Nevada snowpack is well below average, and so is storage in the state's major reservoirs.

Federal and state water project operators that rely on the snowpack – the source of most of California's developed water supply – will be operating under unprecedented dry conditions this summer and will be challenged to manage their systems to conserve vital reservoir storage.

One of the multiple demands on reservoir storage is the need to release freshwater to the Sacramento-San Joaquin Delta to help repel salt water that pushes inland with the tides from San Francisco Bay.

In the drought of 1976-77, the California Department of Water Resources placed temporary rock barriers across several Delta channels to help physically limit saltwater intrusion into the Delta. Such physical barriers help to minimize the amount of water that must be released from upstream reservoirs to repel the salt. Too much saltwater too deep in the Delta can contaminate water supplies for Delta residents and the federal and state water projects that reach 25 million people.

On January 17, 2014, Governor Edmund G. Brown Jr. issued a Proclamation of a State of Emergency directing state officials to take all necessary actions to prepare for drought conditions. Within the proclamation, the Governor directed the Department of Water Resources "to take necessary actions to protect water quality and water supply in the Delta, including installation of temporary barriers or temporary water supply connections as needed." The governor's proclamation also directed DWR to coordinate with the Department of Fish and Wildlife to minimize impacts to affected aquatic species.

By the spring of 2014, DWR expects to install temporary rock barriers across several Delta channels in order to protect water quality in the Delta and preserve water supplies stored in upstream reservoirs. The barriers would be

Resources

- Drought Home
- Governor's Drought Declaration
- Water Conditions
- Drought Background
- Emergency Drought Barriers
- Publications

Featured Information

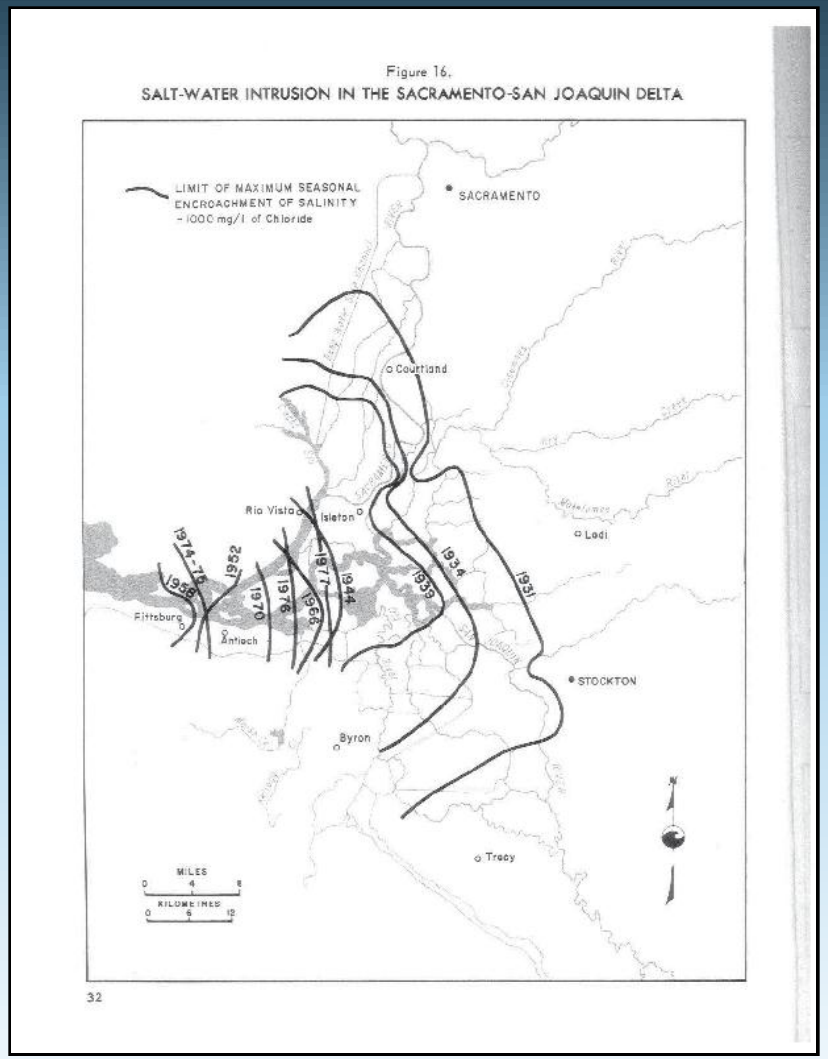
Daily Hydrologic Overview - *interactive*

- Klamath/San Joaquin/Sacramento Hydroclimatic Reconstructions from Tree Rings
- Treering Report Appendix.zip (data files)

# Historic Saltwater Intrusion

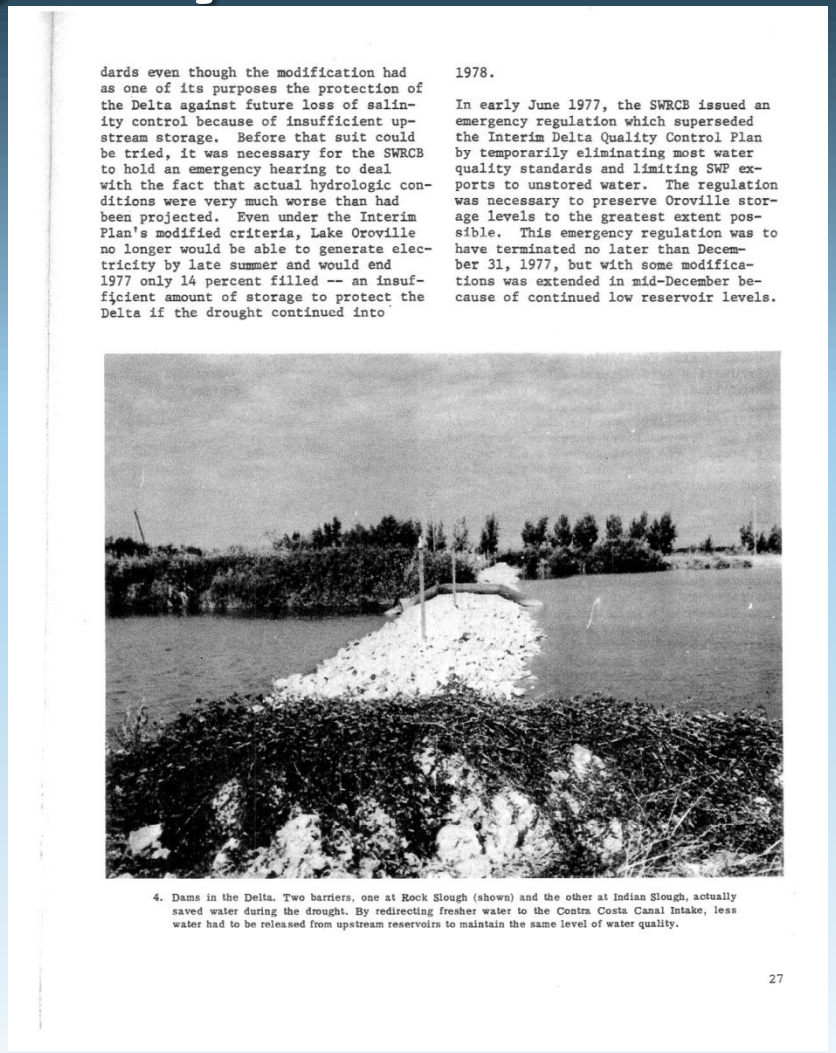
**Salinity intrusion makes water unsuitable for:**

- **Drinking**
- **Irrigation**
- **Fish and Wildlife**
- **Export**
- **Other in-Delta uses**



# 1976-77 Emergency Barriers

- 37 years ago
- California's population was 22 million then
- In 2014, the population is 38 million
- The '76-77 barriers helped protect many Delta water users including:
  - Delta farmers
  - City of Antioch
  - City of Tracy
  - CCWD



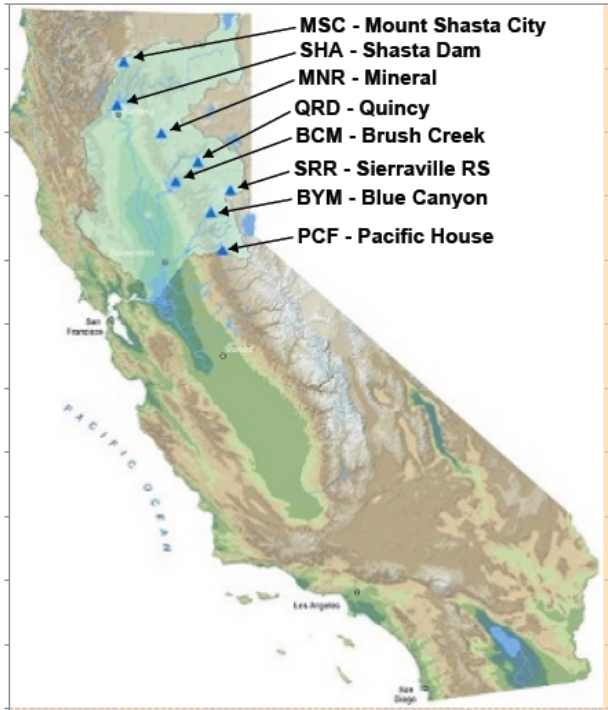
dards even though the modification had as one of its purposes the protection of the Delta against future loss of salinity control because of insufficient upstream storage. Before that suit could be tried, it was necessary for the SWRCB to hold an emergency hearing to deal with the fact that actual hydrologic conditions were very much worse than had been projected. Even under the Interim Plan's modified criteria, Lake Oroville no longer would be able to generate electricity by late summer and would end 1977 only 14 percent filled -- an insufficient amount of storage to protect the Delta if the drought continued into 1978.

In early June 1977, the SWRCB issued an emergency regulation which superseded the Interim Delta Quality Control Plan by temporarily eliminating most water quality standards and limiting SWP exports to unstored water. The regulation was necessary to preserve Oroville storage levels to the greatest extent possible. This emergency regulation was to have terminated no later than December 31, 1977, but with some modifications was extended in mid-December because of continued low reservoir levels.

4. Dams in the Delta. Two barriers, one at Rock Slough (shown) and the other at Indian Slough, actually saved water during the drought. By redirecting fresher water to the Contra Costa Canal Intake, less water had to be released from upstream reservoirs to maintain the same level of water quality.

27

# Northern Sierra Precipitation: 8-Station Index, April 16, 2014




Percent of Average for this Date: 61%

1982-1983 (wettest) 88.5

2005-2006 Daily Precip. 80.1

Average (1922-1998) 50.0

2012-2013 Daily Precip. 44.3

Current Daily Precip: 26.7

1923-1924 (driest) 19.0 17.1

1976-1977 (2nd driest & driest thru Aug)

Cumulative Daily/Monthly Precipitation (inches)

Total Water Year Precipitation

Water Year (October 1 - September 30)

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Oct 1 Nov 1 Dec 1 Jan 1 Feb 1 Mar 1 Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sep 1 Oct 1

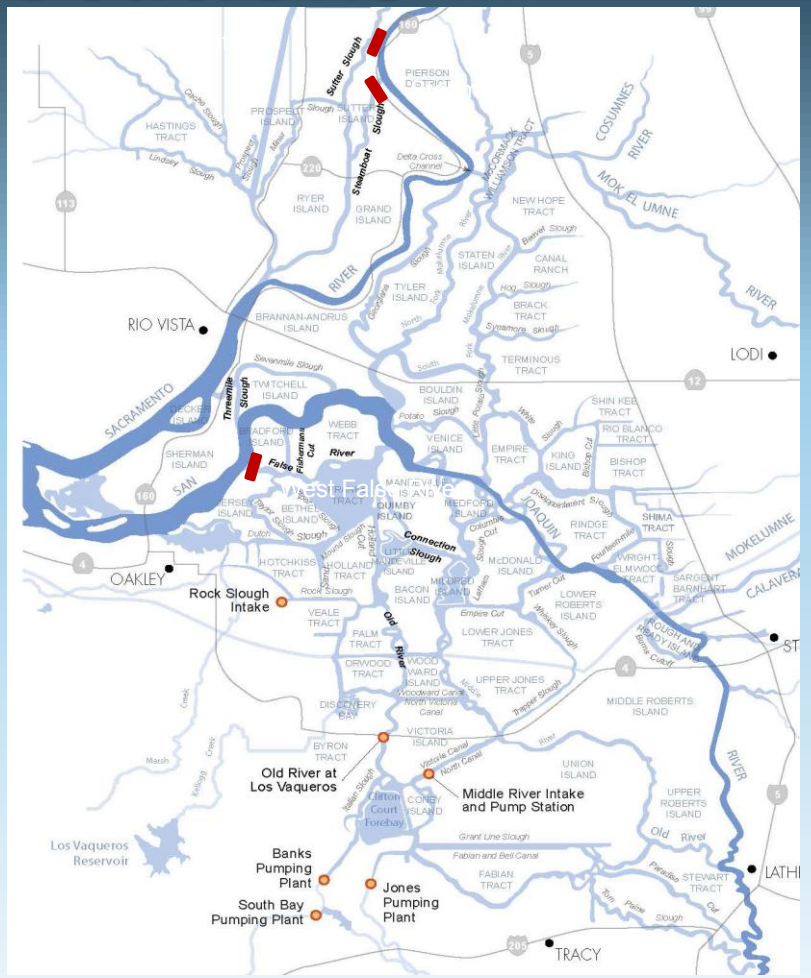
# 2014 Emergency Drought Barriers Proposed Locations

## Temporary rock barriers

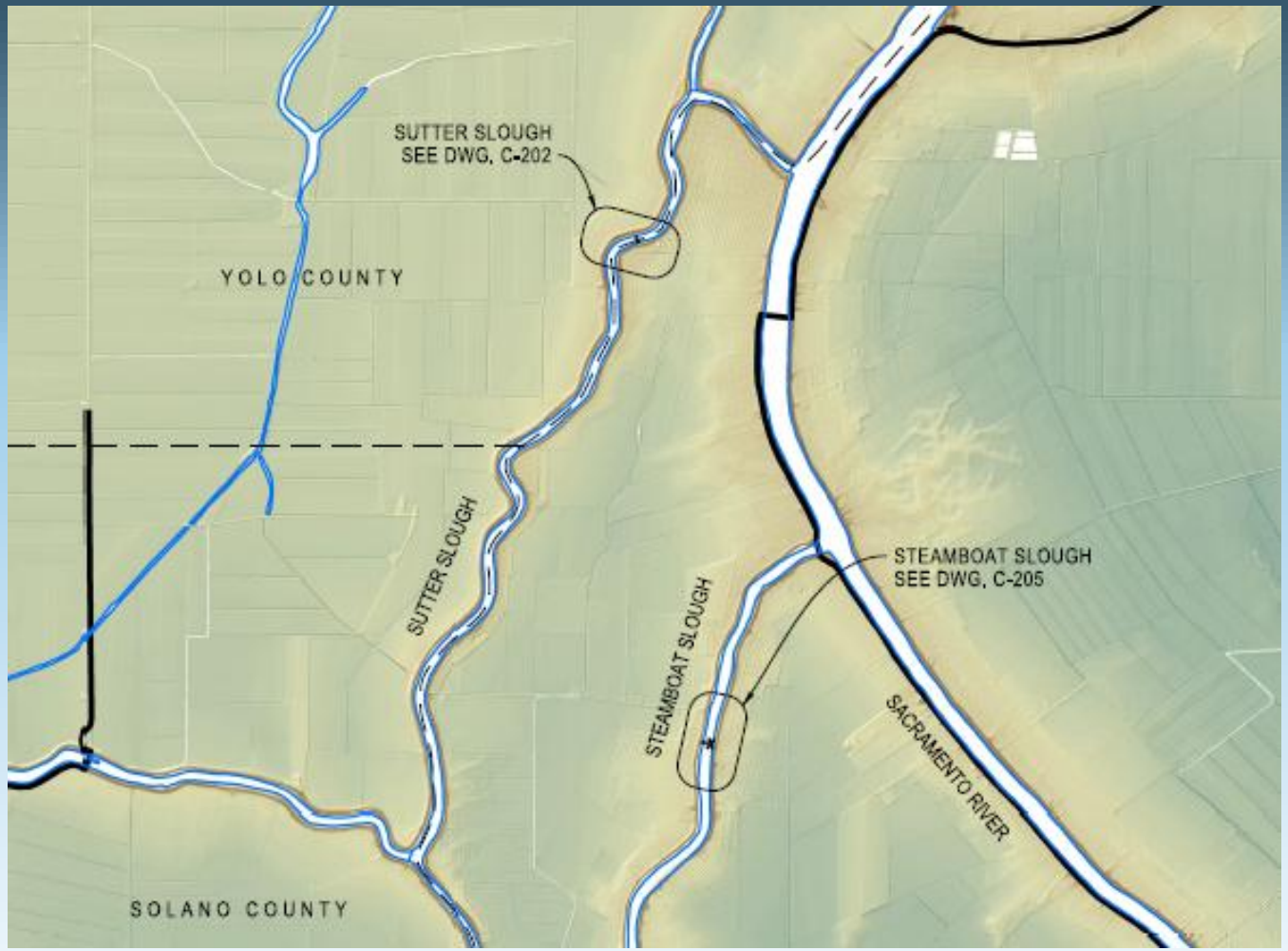
- Reduce saltwater intrusion
- Help save upstream storage for release later in the year

## Designs Include:

- Four 48-inch operable culverts
- Boat portage facility at Steamboat Slough barrier



# Sutter & Steamboat Sl Barriers



# Daily Statewide Hydrologic Update

Change Date: Jan 17, 2014


*Regional river forecast conditions reflect river forecast guidance products issued jointly by CNRFC/DWR. NWS Weather Forecast Offices issue the official watches, warnings, statements, and advisories.*

Data as of 11:59:59 PM on Jan 17, 2014

| Sacramento Region Summary | | | |
|---|---|---|---|
| Precip: 8-Station Index | | | |
| Season to Date | 16% | % Avg year | 7% |
| Northern Sierra Snow Water Content | | | |
| % to Date | 8% | % Apr 1 | 4% |
| Reservoir Storage | | | |
| Reservoir | %Hist.Avg. | %Capacity | *Encrch |
| Shasta | 56% | 36% | -1969 |
| Oroville | 56% | 36% | -1897 |
| New Bullards | 73% | 43% | -381 |
| Folsom | 34% | 17% | -407 |

| San Joaquin Region Summary | | | |
|---|---|---|---|
| Precip: 6-Station Index | | | |
| Season to Date | 18% | % Avg year | 7% |
| Central Sierra Snow Water Content | | | |
| % to Date | 16% | % Apr 1 | 8% |
| Reservoir Storage | | | |
| Reservoir | %Hist.Avg. | %Capacity | *Encrch |
| New Melones | 75% | 44% | -920 |
| Don Pedro | 76% | 51% | -649 |
| Exchequer | 47% | 22% | -451 |
| Millerton | 69% | 41% | -224 |

| Tulare Lake Region Summary | | | |
|---|---|---|---|
| Precip: Tulare Precipitation Index | | | |
| Season to Date | n/a | % Avg year | n/a |
| Southern Sierra Snow Water Content | | | |
| % to Date | 20% | % Apr 1 | 9% |
| Reservoir Storage | | | |
| Reservoir | %Hist.Avg. | %Capacity | *Encrch |
| Pine Flat | 39% | 17% | -499 |
| Terminus | 64% | 6% | -0 |
| Success | 36% | 7% | -5 |
| Isabella | 36% | 10% | -111 |

*Encrch = Flood Space Encroachment in 1,000 acre-ft

# Jan 17, 2014

- ✓ Precip 16% to 18% of season average
- ✓ Snow pack 8% to 20% of average (to date)
- ✓ Reservoirs 17 to 43% of capacity

# Daily Statewide Hydrologic Update

Change Date: Apr 18, 2014


*Regional river forecast conditions reflect river forecast guidance products issued jointly by CNRFC/DWR. NWS Weather Forecast Offices issue the official watches, warnings, statements, and advisories.*

Data as of 11:59:59 PM on Apr 18, 2014

| Sacramento Region Summary | | | |
|---|---|---|---|
| Precip: 8-Station Index | | | |
| Season to Date | 61% | % Avg year | 53% |
| Northern Sierra Snow Water Content | | | |
| % to Date | 11% | % Apr 1 | 10% |
| Reservoir Storage | | | |
| Reservoir | %Hist.Avg. | %Capacity | *Encrch |
| Shasta | 63% | 53% | n/a |
| Oroville | 66% | 52% | -1390 |
| New Bullards | 89% | 68% | -194 |
| Folsom | 76% | 54% | -220 |

| San Joaquin Region Summary | | | |
|---|---|---|---|
| Precip: 6-Station Index | | | |
| Season to Date | 46% | % Avg year | 40% |
| Central Sierra Snow Water Content | | | |
| % to Date | 27% | % Apr 1 | 25% |
| Reservoir Storage | | | |
| Reservoir | %Hist.Avg. | %Capacity | *Encrch |
| New Melones | 66% | 41% | -1160 |
| Don Pedro | 73% | 54% | -601 |
| Exchequer | 45% | 26% | -538 |
| Millerton | 50% | 35% | n/a |

| Tulare Lake Region Summary | | | |
|---|---|---|---|
| Precip: Tulare Precipitation Index | | | |
| Season to Date | n/a | % Avg year | n/a |
| Southern Sierra Snow Water Content | | | |
| % to Date | 21% | % Apr 1 | 19% |
| Reservoir Storage | | | |
| Reservoir | %Hist.Avg. | %Capacity | *Encrch |
| Pine Flat | 44% | 26% | -702 |
| Terminus | 68% | 23% | -78 |
| Success | 30% | 14% | -51 |
| Isabella | 28% | 11% | -300 |

*Encrch = Flood Space Encroachment in 1,000 acre-ft

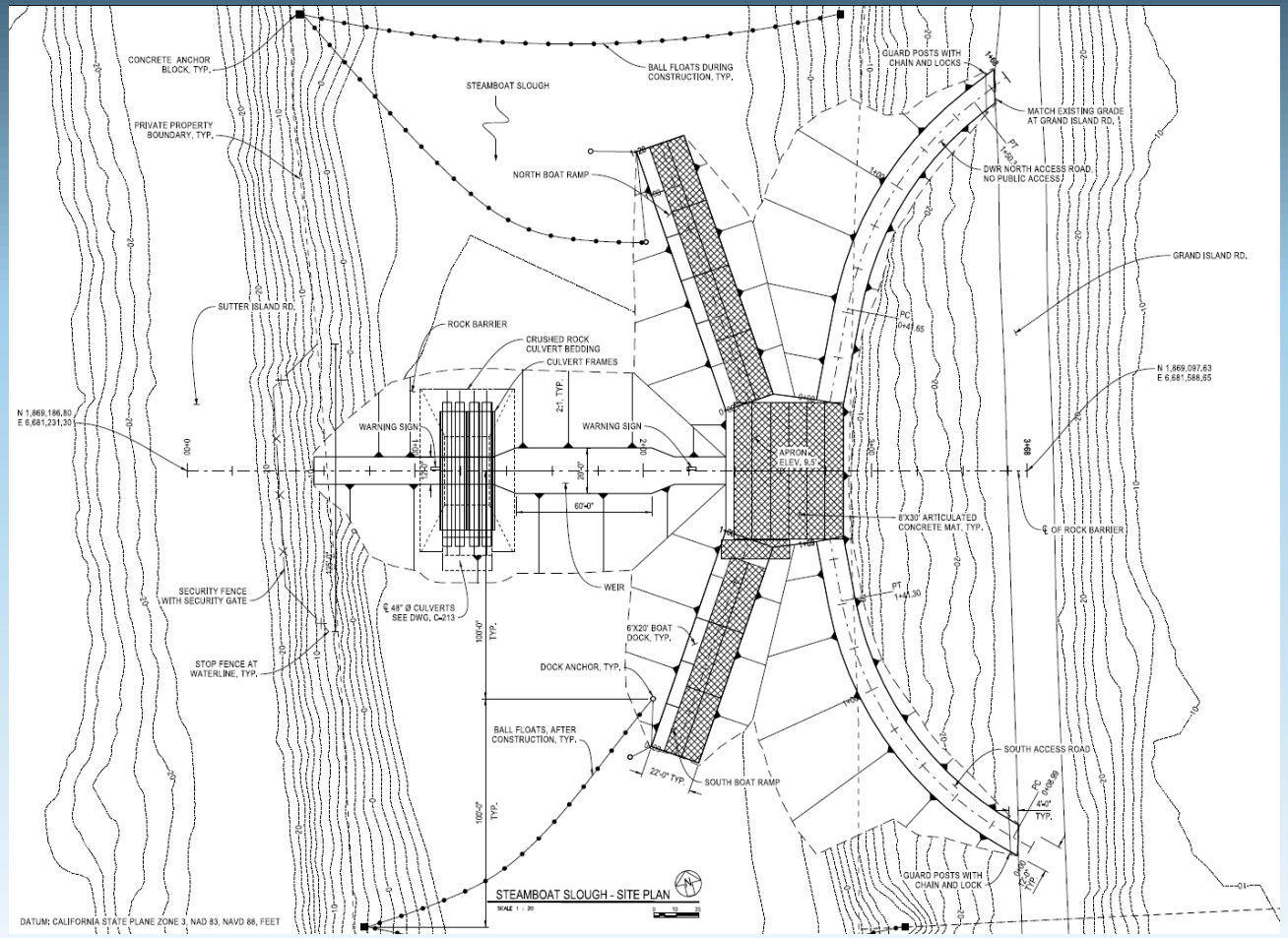
# Apr 18, 2014

- ✓ **Precip 40% to 60% of season average**
- ✓ **Snow pack 10% to 30% of average (to date)**
- ✓ **Reservoirs 52 to 68% of capacity**

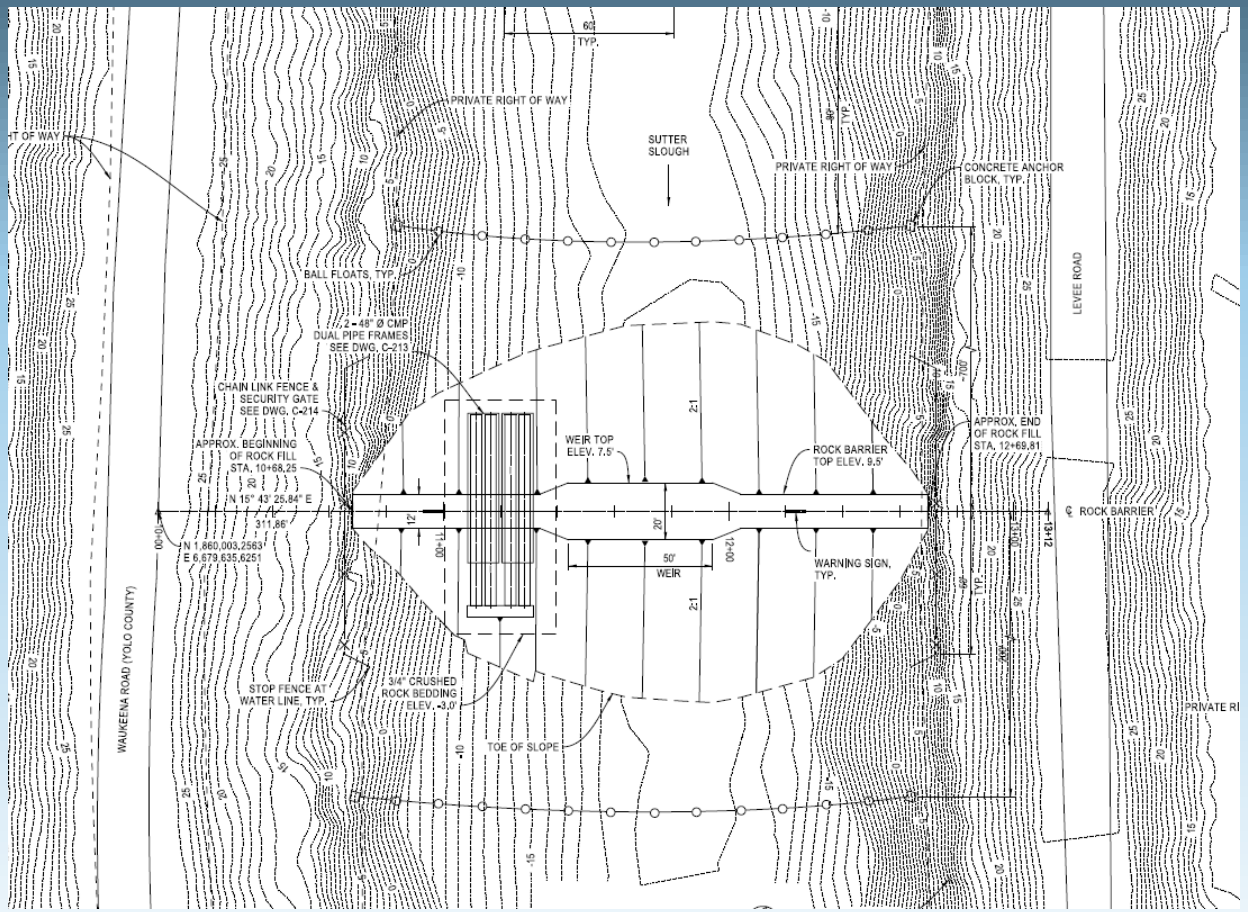
# CVFPB Encroachment Permits

- Needed for Sutter and Steamboat Slough barriers
- Rock barriers place rock against existing levee slopes
- DWR will continue to pursue CVFPB permit for a possible barrier installation later this year

# Steamboat Slough Barrier Proposed Design



# Sutter Slough Barrier Proposed Design



# Emergency Drought Barriers Contacts

| Name | Email | Phone | Role |
|---|---|---|---|
| Doug Carlson | Paul.Carlson@water.ca.gov | 916.653.5114 | Public Information Related to Emergency Drought Barriers |
| Mark Holderman | Mark.Holderman@water.ca.gov | | Emergency Barriers Project Manager |
| Jacob McQuirk | Jacob.McQuirk@water.ca.gov | | Emergency Barriers Permitting Lead |

# Additional Information

**Project factsheet, historical references, and contact information are available at:**

**www.water.ca.gov/waterconditions/emergencybarriers.cfm**