

Smelt Working Group
February 29, 2016

Meeting Summary

The Working Group reviewed current Delta Smelt distribution, salvage data, and Delta conditions. The Working Group described the risk of entrainment under the Service-provided advice framework. Under this framework the relative risk of entrainment for OMR flow ranges is discussed and assessed. For the current week, the risk of entrainment of adult delta smelt for each of the flow ranges is characterized as follows:

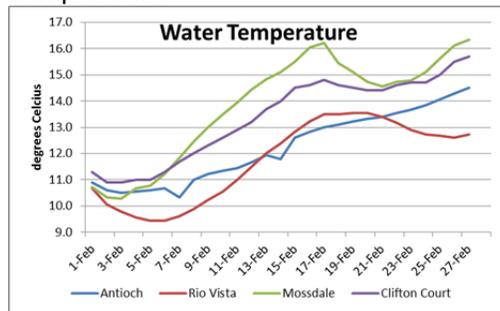
- -1250 to -2000 cfs has a low risk of entrainment,
- -2000 to -3500 cfs has a medium risk of entrainment,
- -3500 to -5000 cfs has a medium to high risk of entrainment.

The Working Group is following guidance for entrainment protections from both Action 2 (adult Delta Smelt) and Action 3 (juvenile Delta Smelt). The risk values provided for this week refer to adult Delta Smelt. The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Monday, March 7, 2016 at 10 am.

Reported Data

1. Current environmental data

a. Temperature



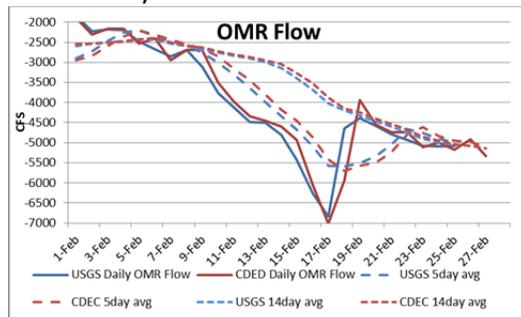
b. OMR flow

USGS OMR daily average flow on February 25 is -5070 cfs.

USGS OMR 5-day and 14-day OMRs on February 26 were -5070 cfs and -5110 cfs, respectively.

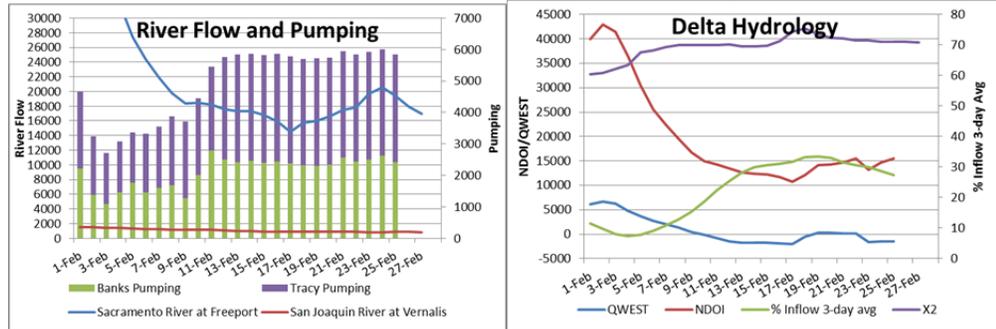
The OMR index 5-day and 14-day value on February 26 were -4990 cfs and -4990 cfs, respectively.

CDEC OMR daily average flow for February 27 was -5338 cfs. The daily OMR index value on February 28 was -5000 cfs.

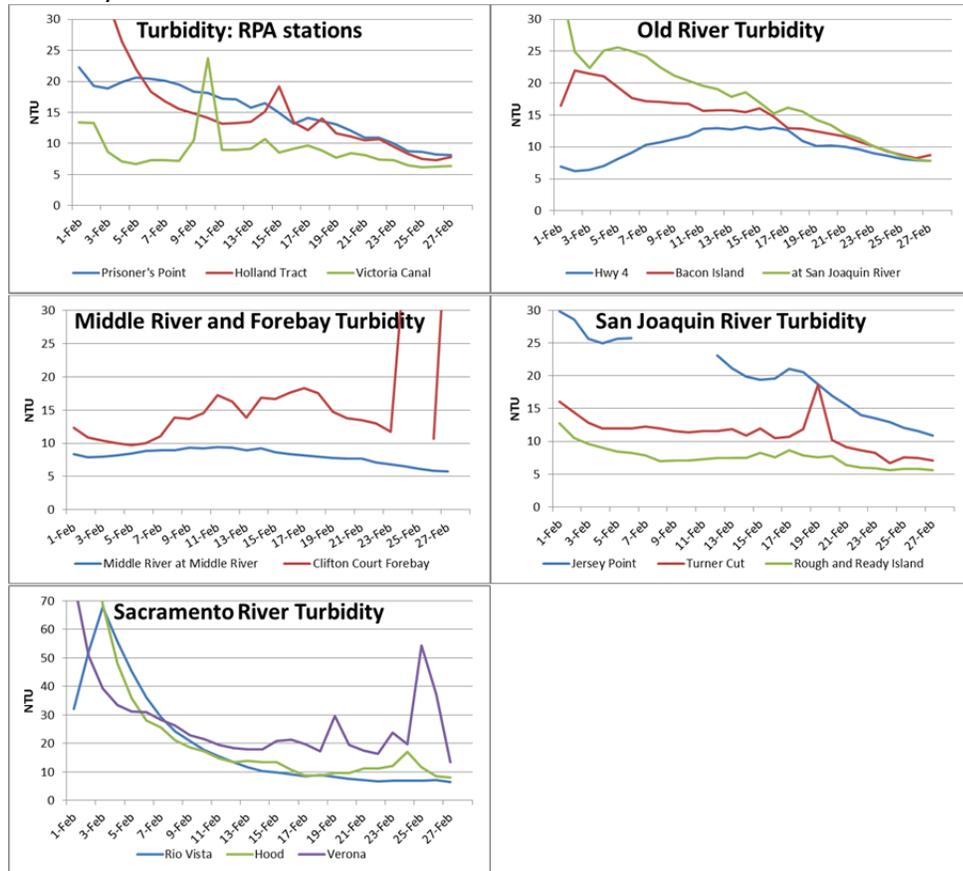


c. River Flows and pumping

Sacramento River at Freeport flow for February 28 was 16,081 cfs. San Joaquin River at Vernalis river flow for February 28 was 805 cfs. Combined exports are 5790 cfs today.



d. Turbidity



2. Delta fish monitoring

CDFW has released the 2015 FMWT indices:
 The 2015 Delta Smelt annual FMWT index is 7.
 The 2015 Longfin Smelt annual FMWT index is 4.
 Both indices are the lowest on record (i.e. since 1967).

Smelt Larva Survey (SLS) #4 was in the field the week of February 15. All samples have been processed, except for Napa River stations. No Delta Smelt have been detected in the samples

processed to date. A total of 194 young of the year Longfin Smelt have been identified, ranging in length from 6-17mm.

SLS # 5 is in the field this week (February 29).

Spring Kodiak trawl #3 will be in the field the week of March 7.

The first 20-mm survey of the season will commence March 14, and run concurrently with SLS #6.

The Early Warning Survey began November 30.

Early Warning Survey Results, February 15 through 19

Date	Location	Delta Smelt Catch
2/22	Prisoners Point	0
2/23	Jersey Point	0
2/24	Prisoners Point	0
2/25	Jersey Point	1
2/26	Station 902	0

3. Modeling

No Particle Tracking modeling (PTM) runs were reviewed. PTM runs are being requested this week to help inform subsequent larval/juvenile Delta Smelt entrainment discussion.

DWR turbidity modeling was provided by the DCT; however, given the low model accuracy discussed in previous weeks' notes they are not being relied upon for turbidity forecasting.

4. Salvage

An estimated four Delta Smelt were salvaged on February 22 at the CVP fish salvage facility (see attached). The cumulative season total of salvaged adult Delta Smelt is 12, which represents 29% of the concern level of the WY 2016 adult Delta Smelt incidental take.

No Longfin Smelt has been observed in salvage sampling at either the federal or state Delta facilities during the current water year.

On February 22 at Tracy Fish Collection Facility, one of the primary louver panels into bypass 2 became stuck during routine cleaning resulting in a partial opening in the primary louver array from 0140 to 0410. On February 23 at Tracy there was a voluntary 20-minute interruption in the salvage process during one of the 2-hr fish counts, resulting in a loss of salvage efficiency during that count period.

5. Expected Project Operations

Jones pumping plant is pumping 3400 cfs today. The daily average intake to Clifton Court (CC) is 2390 cfs. Combined pumping is 5790 cfs today. Pumping is constrained by the NMFS and FWS BiOp's RPAs, which limits OMR flow to no more negative than -5000 cfs. The projects are currently meeting D-1641; however, as river flows fall this week, there is potential that exports will be constrained by D-1641 water quality standards.

6. Delta Conditions Team

DCT met on 02/26; the February 19 DWR turbidity transect data (see attached) and a DCT summary (including turbidity forecasting) were provided (see attached). The turbidity forecasting model results remain unreliable, and have therefore been distributed but not discussed at the DCT.

7. Assessment of Risk:

BiOp Background

RPA Component 1, Action 2 states, “An action implemented using an adaptive process to tailor protection to changing environmental conditions after Action 1. As in Action 1, the intent is to protect pre-spawning adults from entrainment and, to the extent possible, from adverse hydrodynamic conditions.” “The range of net daily OMR flows will be no more negative than -1,250 to -5,000 cfs. Depending on extant conditions specific OMR flows within this range are recommended by the Working Group from the onset of Action 2 through its termination...”

RPA Component 2, Action 3: “The objective of this RPA component (which corresponds to Action 3 in Attachment B), is to improve flow conditions in the Central and South Delta so that larval and juvenile delta smelt can successfully rear in the Central Delta and move downstream when appropriate” (page 282).

The WY 2016 adult Delta Smelt incidental take (IT) is 56, as stated in the Service’s December 23, 2015 memo to the Bureau of Reclamation. The concern level is 42. The method to calculate the adult IT is described on p 386 of the 2008 BiOp, with the corrections described in both the February 22, 2013, and December 23, 2015 memos. The alternative approach that the Service presented to the 2015 independent review panel at the Long-term Operation Biological Opinions annual science review will be piloted this year.

The WY 2016 larval/juvenile Delta Smelt incidental take is 392, and the concern level is 261. The method to calculate the larval/juvenile IT is described on p 389, with revision provided in the February 22, 2013 Service memo to the Bureau of Reclamation.

2015 Delta Smelt abundance

The four primary 2015 annual abundance indices for all Delta Smelt life stages are the lowest on record.

	2014	2015
SKT	30.1	13.8
20-mm	1.1	0.3
TNS	0.5	0.0
FMWT	9	7

Discussion

The Working Group concluded that overall risk of entrainment of adult Delta Smelt into the south Delta has decreased, and remains moderate to high as OMRs become more negative in the flow range of -3500 cfs to -5000 cfs. Turbidity levels from Jersey Point through the Old River corridor have decreased since Monday, February 22. Four adult Delta Smelt were salvaged on February 22.

Since February 8, when Jersey Point, Prisoners Point and station 902 have been consistently sampled, there has been no single-day total Delta Smelt catch of greater than 2 (NOTE: through the week of February 1, the survey visited Prisoners Point and station 902). Though no Jersey Point sampling was conducted during the week of February 1 to observe the potential signal of movement from Jersey Point to Prisoners Point, the Working Group expects that it is likely that Delta Smelt moved into the south Delta during this time, coincident with elevated turbidity (see DWR boat turbidity transect survey maps from February 3 through February 19).

Turbidity throughout the Old River corridor has dropped since last week. However, the Working Group indicated that some fish likely are still migrating and therefore sensitive to variations in turbidity levels.

As it stated last week, the Working Group expects that entrainment into the south Delta export facilities may be continuing; even if this signal is not evident in salvage. The Working Group maintains that any level salvage observed at either facility will be of high concern because Delta Smelt abundance is at a historic low, contributing to low detection probability of Delta Smelt in salvage under RPA compliant operations (BiOp page 338). One fish was detected in salvage sampling on February 22 (= four fish salvaged).

Sporadic catches of gravid females and females expressing eggs during the early warning survey, SKT trawls, and in salvage with the increase in water temperatures greater than 12°C suggest that the spawning season began in early February. The Working Group expects that larval Delta Smelt may be present in the Delta, and could begin to show up in field surveys soon, particularly SLS #5 that is in the field this week.

This week's entrainment risk advice for the OMR flow ranges (see below) pertains to adult Delta Smelt entrainment. The Working Group expects that larval Delta Smelt are present in the system, but that there is not enough information to provide entrainment risk by OMR flow range. The Working Group will be looking to larval fish sampling efforts in the field (SLS # 5, and 20-mm Survey #1 during the week of March 14) and at the salvage facilities (larval sampling at the facilities begins this week), as well as requesting PTM runs to inform entrainment risk discussions for larval/juvenile Delta Smelt.

Scheduled OMR flow for today (-5000 cfs) is anticipated to represent a medium to high risk of entrainment for adult Delta Smelt in the Old River corridor and the lower San Joaquin River. The Working Group suspects that fish are being entrained but not detected in salvage—as they are too diluted to have much likelihood of being detected in the salvage counts.

The above discussion points influenced and contributed to all three flow ranges described below:

Advice Framework OMR Level Risk Ranking and Discussion

- OMR flow of -1250 to -2000 cfs: There is a low risk of entrainment under this flow range. This is the most protective range for Delta Smelt.
 - Risk factors: lowest annual indices on record, decreased confirmed presence of Delta Smelt in south Delta, reduced turbidity in the south Delta.
 - Salvage: Four on February 22, geographic influence of the pumps does not extend to central Delta under this flow range

- Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes; low Sacramento River catch densities (unable to assess percentage of population in the lower San Joaquin River); unknown duration of widespread elevated turbidity.
- Persistence of risk: contingent upon early warning survey catch, potentially reduced to low once the daily maximum turbidity levels from the OH4 station to the export facilities is 8 NTU or less
- OMR flow of -2000 to -3500 cfs: There is a medium risk of entrainment under this flow range, given conditions listed below:
 - Risk factors: lowest annual indices on record, decreased confirmed presence of Delta Smelt in south Delta, reduced turbidity in the south Delta.
 - Salvage: Four on February 22, geographic influence of the pumps not likely to extend to central Delta under this flow range
 - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes, low Sacramento River catch densities (unable to assess percentage of population in the lower San Joaquin River) and duration of current widespread elevated turbidity. A lower risk of entrainment for this flow range could occur should Old River corridor and south Delta turbidity decrease to 8 NTU or less (CDEC station and DWR boat transect).
 - Persistence of risk: contingent upon early warning survey catch and salvage.
- OMR flow of -3500 to -5000 cfs: There is a medium to high risk of entrainment under this flow range.
 - Risk factors: lowest annual indices on record, decreased confirmed presence of Delta Smelt in south Delta, reduced turbidity in the south Delta.
 - Salvage: Four on February 22, geographic influence of the pumps is likely to extend to central Delta under this flow range. Recent salvage of adult Delta Smelt confirms that entrainment into the export facilities has occurred and likely is continuing.
 - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes, low Sacramento River catch densities (unable to assess percentage of population in the lower San Joaquin River).
 - Persistence of risk: contingent upon early warning survey catch, unlikely to change until turbidity levels in Old River decrease to 8 NTU, and possibly not until turbidity levels in the lower San Joaquin River decrease to a similar level.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Monday, March 7, 2016.

WEEKLY ADVICE FOR THE DEPARTMENT OF FISH AND WILDLIFE FOR LONGFIN SMELT

Advice for week of February 29, 2016:

The Smelt Working Group does not have any advice for Longfin Smelt based on recent information.

No Barker Slough operations advice is warranted at this time (see #5 below).

Basis for advice:

The 2009 State Water Project 2081 for Longfin Smelt states that advice to WOMT and the DFW Director shall be based on:

1. Adult Salvage – total adult (≥ 80 mm) Longfin Smelt salvage (SWP+CVP) for December through February > 5 times the Fall Midwater Trawl Longfin Smelt annual abundance index.
2. Adult abundance, distribution or other information indicates that OMR flow advice is warranted.
3. Larva distribution in the Smelt Larva Survey or the 20-mm Survey finds Longfin Smelt larvae present at 8 of 12 central and south Delta sampling stations in 1 survey (809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, 919; see Figure 1).
4. Larva catch per tow exceeds 15 Longfin Smelt larvae or juveniles in 4 or more of the 12 survey stations listed.
5. During the period January 15 through March 31 of a dry or critically dry water year only, advice for Barker Slough pumping plant operations may be warranted if larval Longfin Smelt are detected at station 716 and other information indicates risk of entrainment.

Discussion of Criteria

1. As of February 28, 2016, no Longfin Smelt has been salvaged for the water year. The **Longfin Smelt adult salvage threshold for advice is 20** based on a Fall Midwater Trawl abundance index of 4 for 2015 (see criterion in #1 above). No advice is warranted based on this criterion.
2. No sampling was conducted in February by Bay Study. January Bay Study sampling detected no Longfin Smelt in the lower San Joaquin or Sacramento rivers and no data reported for February. December Bay Study sampling collected no Longfin Smelt in the San Joaquin River. The December Fall Midwater Trawl sampled the region and did not detect Longfin Smelt in the San Joaquin River or the south Delta. Distribution information does not indicate advice is warranted based on this criterion.
- 3 & 4. The fourth Smelt Larva Survey (SLS) of 2016 was completed during the week of February 16th and sample processing complete except for Napa River stations. Longfin Smelt larvae were detected in low numbers at 4 of 12 criteria stations (Table 1, Figure 1). Neither the distribution (Basis for advice #3) nor the catch density (Basis for advice #4) criterion was achieved. Over all, catches of Longfin Smelt larvae were very low.

5. The January 1 water supply index forecast at 90 percent exceedance remains within the “critical” range of water year types, and triggers review of larva distribution and Barker Slough operations. One larva was detected at station 716 or 723 during SLS survey 4 (not shown in Table 1, Figure 1). Barker Slough exports remained below 30 cfs since January 1. These results were not sufficient to warrant advice for Barker Slough operations.

Current conditions: The Sacramento River flow was 16,087 on February 28. The San Joaquin River at Vernalis was 805 on February 28. X2 was about 71 on February 28. Qwest was negative at -1,931 cfs on February 28. On February 28, combined State and federal exports reached almost 5,800 cfs targeting an OMR of -5,000 cfs; this is planned to continue with exports varying with San Joaquin River inflow. Barker Slough exports have been ≤ 20 cfs for the past week and < 30 cfs since January 1, 2016; these export levels do not pose much risk of entrainment.

Bay Study sampling will not be conducted in February. During January sampling, Bay Study detected no Longfin Smelt within the Delta and Suisun Bay. Chipps Island Trawl sampling has collected very few Longfin Smelt this water year (all adult size): three on February 8th, one each on the 11th and the 12th; eight Longfin Smelt were collected January 13th; two adults on December 18 and the third adult on December 23. In December, a few Longfin Smelt were collected by the Fall Midwater Trawl, one each in Carquinez Strait, Grizzly Bay and just upstream of Chipps Island. These were the first and only collections of Longfin Smelt by the Fall Midwater Trawl this year. Also in December, a single Longfin Smelt was collected by the Bay Study in Carquinez Strait. No Longfin Smelt was collected in the San Joaquin River or south Delta by either survey in December.

The Smelt Larva Survey #4 caught larvae at four criteria stations in the central and south Delta (Table 1), but did not achieve either trigger criterion (Criteria 3 & 4 above). A single larva was detected at station 716, the criterion station for potential advice on Barker Slough operations during dry and critical water-year types.

No Longfin Smelt has been salvaged this water year.

Summary of Risk: Risk of entrainment remains moderate due to negative OMR and Qwest. Qwest will likely remain negative for several more days prior and may not reach neutral because of the predicted low pressure. The likelihood remains high of additional larvae hatching in the lower San Joaquin River, but their numbers may remain low: few adults have been detected this year and few larvae have been detected in the lower San Joaquin River and south Delta by the Smelt Larva Survey (Table 1). Increased hatching has occurred through February in past years, but lack of adult catch makes predictions of the same this year highly speculative. We currently have no information indicating much or any spawning in the central or south Delta.

The Barker Slough distribution trigger, that is larvae present at Smelt Larva Survey station 716, was achieved with a single larva (Table 1, Figure 1). Nonetheless, Barker Slough exports have been low (<30 cfs) so far through the month of February, so risk of entrainment remains very low at this location.

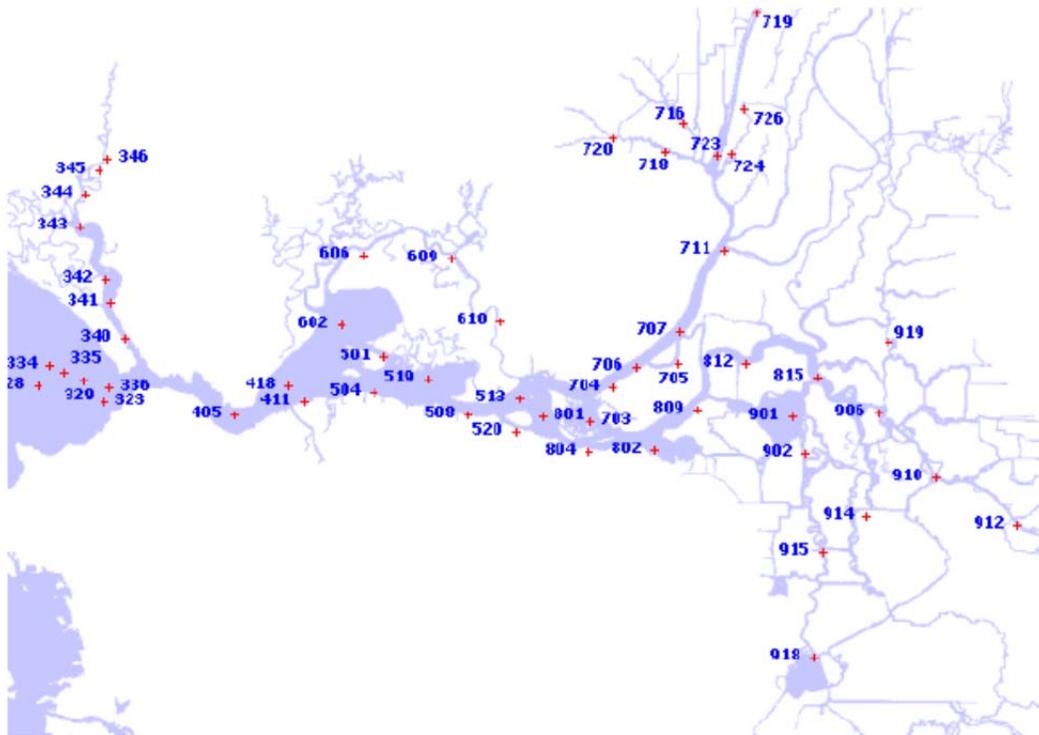
Table 1. Longfin Smelt catch by station in the Smelt Larva Survey 4. Sample processing is complete except for Napa River stations, which will be processed later in the year.

Study Year	Survey #	SLS Station	Sample Status	Species	Smelt Catch
2018	4	340	Processed		No Smelt Catch
2018	4	342	Not yet processed		
2018	4	343	Not yet processed		
2018	4	344	Not yet processed		
2018	4	345	Not yet processed		
2018	4	346	Not yet processed		
2018	4	347	Not yet processed		
2018	4	348	Not yet processed		
2018	4	349	Not yet processed		
2018	4	405	Processed		No Smelt Catch
2018	4	411	Processed		No Smelt Catch
2018	4	418	Processed	Longfin Smelt	1
2018	4	501	Processed	Longfin Smelt	2
2018	4	504	Processed	Longfin Smelt	27
2018	4	508	Processed	Longfin Smelt	27
2018	4	513	Processed	Longfin Smelt	7
2018	4	519	Processed	Longfin Smelt	6
2018	4	520	Processed	Longfin Smelt	31
2018	4	602	Processed	Longfin Smelt	1
2018	4	606	Processed	Longfin Smelt	12
2018	4	609	Processed	Longfin Smelt	39
2018	4	610	Processed	Longfin Smelt	2
2018	4	703	Processed	Longfin Smelt	3
2018	4	704	Processed	Longfin Smelt	7
2018	4	705	Processed		No Smelt Catch
2018	4	706	Processed	Longfin Smelt	4
2018	4	707	Processed	Longfin Smelt	7
2018	4	711	Processed		No Smelt Catch
2018	4	716	Processed	Longfin Smelt	1
2018	4	723	Processed		No Smelt Catch
2018	4	801	Processed	Longfin Smelt	6
2018	4	804	Processed	Longfin Smelt	5
2018	4	809	Processed	Longfin Smelt	3
2018	4	812	Processed	Longfin Smelt	3
2018	4	815	Processed	Longfin Smelt	1
2018	4	901	Processed	Longfin Smelt	2
2018	4	902	Processed		No Smelt Catch
2018	4	906	Processed		No Smelt Catch
2018	4	910	Processed		No Smelt Catch
2018	4	912	Processed		No Smelt Catch
2018	4	914	Processed		No Smelt Catch
2018	4	915	Processed		No Smelt Catch
2018	4	918	Processed		No Smelt Catch
2018	4	919	Processed		No Smelt Catch

SWP ITP Criteria Stations

Processing is complete through 2/28/16

Figure 1. DFW's Smelt Larva Survey/20-mm Survey station locations.



SWG Weekly Salvage Update
Reporting Period: February 22-28
Prepared by Bob Fujimura on February 29, 2016 8:25
Preliminary Results - Subject to Revision

Species/Life Stage	Daily Salvage							Trend	
	22-Feb	23-Feb	24-Feb	25-Feb	26-Feb	27-Feb	28-Feb		
Adult Delta Smelt									
SWP	0	0	0	0	0	0	0		0
CVP	4	0	0	0	0	0	0		1
TOTAL	4	0	0	0	0	0	0	→	0.6
CUM TAKE	12	12	12	12	12	12	12		
% of 2016 CL	29%	29%	29%	29%	29%	29%	29%		
Adult Longfin Smelt									
SWP	0	0	0	0	0	0	0		0
CVP	0	0	0	0	0	0	0		0
TOTAL	0	0	0	0	0	0	0	→	0
SWP daily export	4,859	4,974	5,190	4,791	4,660	4,314	4,663	→	4,779
CVP daily export	6,728	6,795	6,728	6,814	6,737	6,725	6,749	→	6,753
SWP reduced counts	0%	0%	0%	0%	0%	0%	0%	→	0%
CVP reduced counts	0%	0%	0%	0%	0%	0%	0%	→	0%

TOTAL = combine daily salvages for CVP+SWP; daily water export = AF; Trend = compared to previous week

NA = not available at the time of this report

Reduced counts = percentage of time that routine salvage sample time were less than 30 min per 2 hours of salvage and export operation

Generated by Bob Fujimura on February 26, 2016

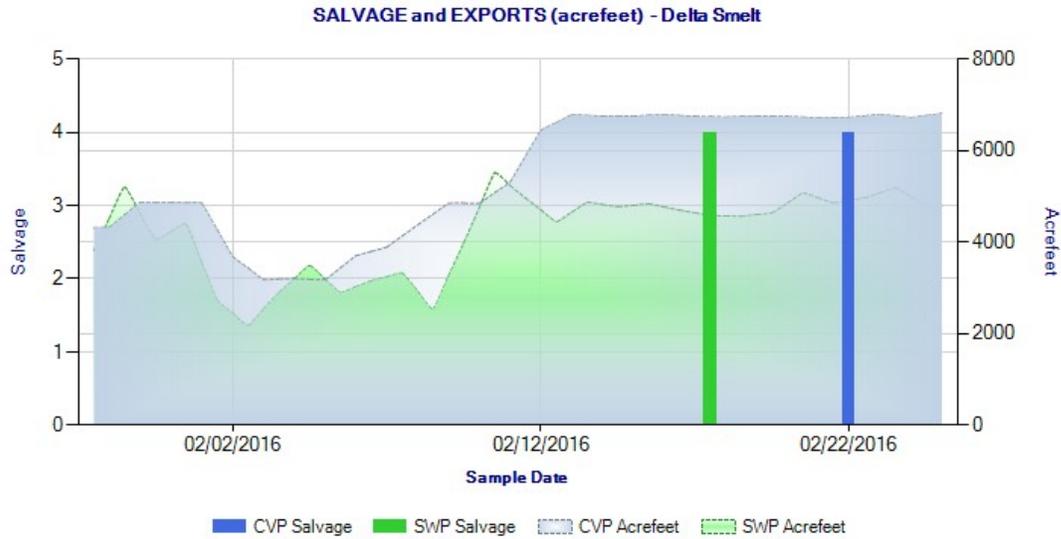


Figure 1. Daily salvage of Delta Smelt and water exports from the state and federal fish salvage facilities during January 27-February 25, 2016. Graph obtained from the DFG salvage monitoring web-page:

<http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

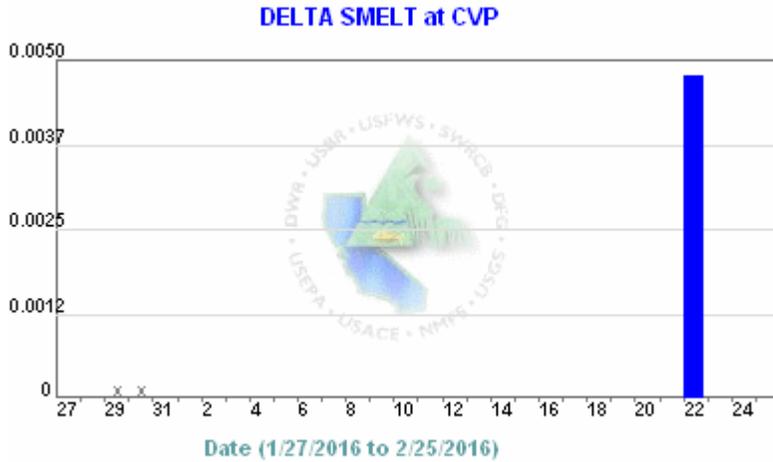


Figure 2. Daily salvage densities (fish per 10,000 m³) Delta Smelt from the federal fish salvage facilities during January 27-February 25, 2016. Graph obtained from the DFG salvage monitoring web-page:

<http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

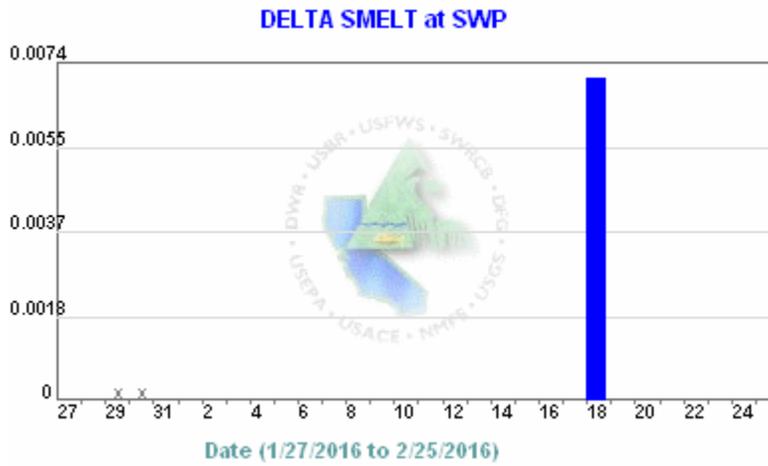


Figure 3. Daily salvage densities (fish per 10,000 m³) Delta Smelt from the state fish salvage facilities during January 27-February 25, 2016. Graph obtained from the DFG salvage monitoring web-page:

<http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

California Department of Fish and Wildlife - Results Subject to Revision

Prepared by Geir Aasen

Report Date: 2/26/2016

Table 1 Adult smelt sexual maturation data for the time period covering 2/19/2016 to 2/25/2016

Date	Facility	Species	Fork Length (mm)	Sex	Eggs	Egg Diameter (mm)	Egg Color	Comments
2/22/2016	CVP	Delta Smelt	66	Male	---	---	---	Readily expressed milt. Left testis large and white. Right testis small. External breeding tubercles on head and pectoral fins

PRELIMINARY DATA
SUBJECT TO REVISION WITHOUT NOTICE

EXECUTIVE OPERATIONS SUMMARY ON 2/25/2016

This summary can also be found at:
<http://www.water.ca.gov/swp/operationscontrol/docs/delta/deltaops.pdf>

SCHEDULED EXPORTS FOR TODAY

Clifton Court Inflow	=	2,370 cfs
Jones Pumping Plant	=	3,400 cfs

State Water Project Informational Data can be found at:
<http://www.water.ca.gov/swp/operationscontrol/projectwide.cfm>

ESTIMATED DELTA HYDROLOGY

Total Delta Inflow	~	22,278 cfs
Sacramento River	=	20,593 cfs
San Joaquin River	=	844 cfs

Data for previous 30-days is available at:
<http://www.water.ca.gov/swp/operationscontrol/docs/delta/DeltaWQ.pdf>

DELTA OPERATIONS

Delta Conditions	=	Excess
Delta x-channel Gates (% of day is open)	=	0%
Outflow Index	~	15,500 cfs
% Inflow Diverted	=	30.1% (14-day avg)
X2 Position	=	71 km
Controlling Factor(s)	=	OMR(-5000)

RESERVOIR STORAGES (AS OF MIDNIGHT)

Shasta Reservoir	=	2,705 TAF
Folsom Reservoir	=	623 TAF
Oroville Reservoir	=	1,818 TAF
San Luis Res. Total	=	865 TAF
SWP Share	=	569 TAF

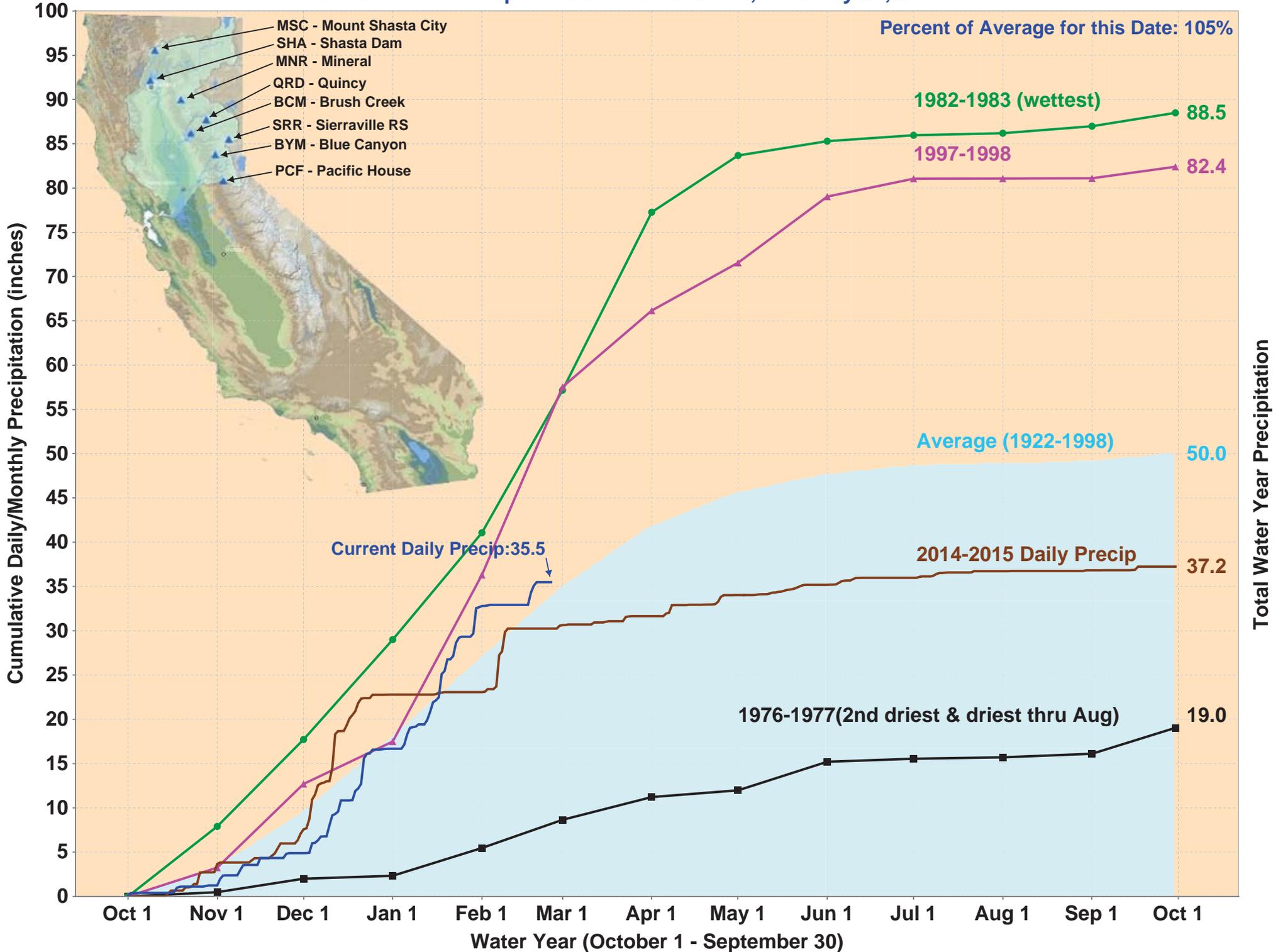
Reservoir data and reports are available at:
<http://cdec.water.ca.gov/reservoir.html>

Reservoir Releases		
Keswick	=	3,250 cfs
Nimbus	=	6,280 cfs
Oroville	=	950 cfs

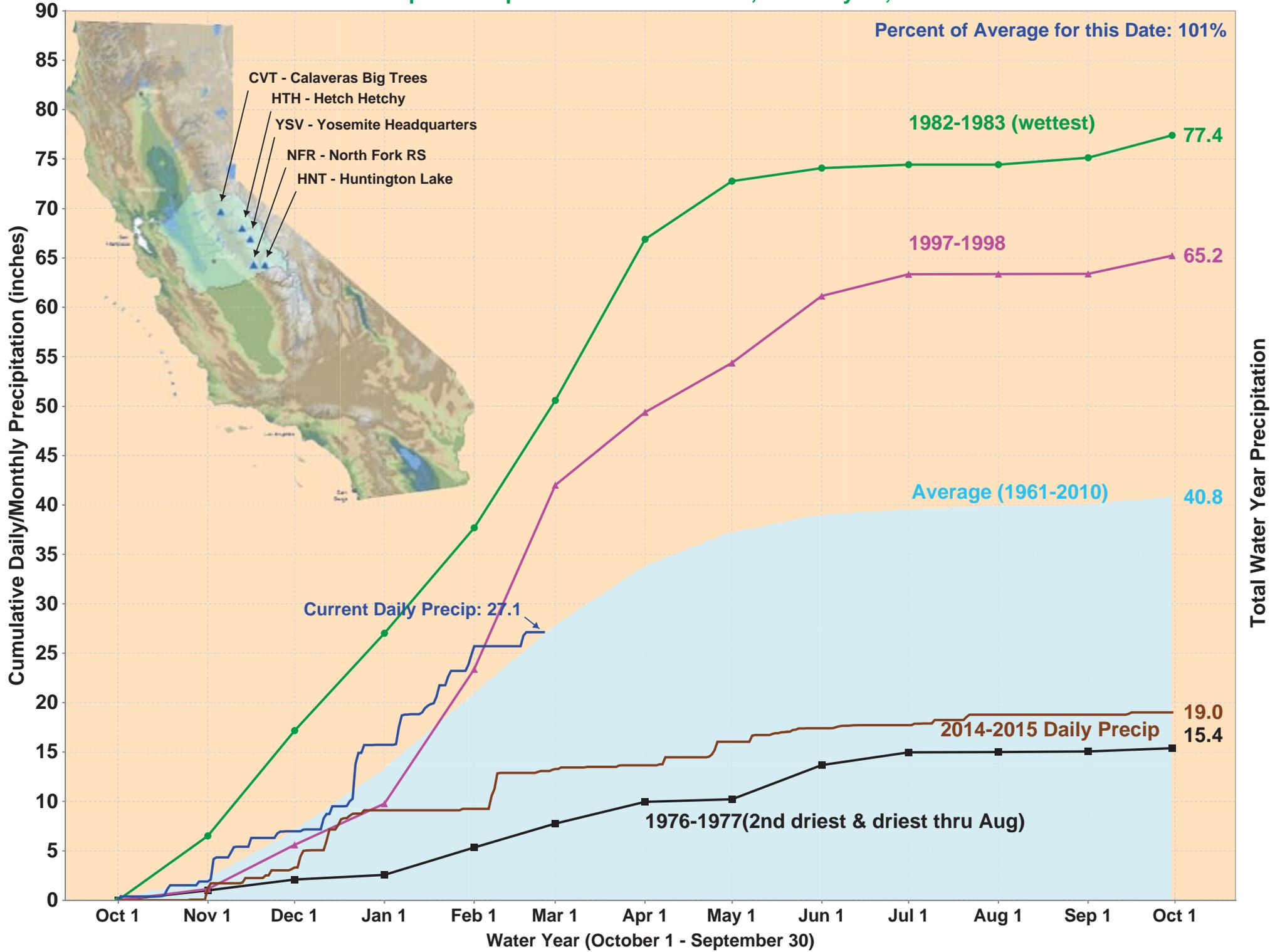
Provisional Old River & Middle River Flows (as of 2/24/2016)
Based on USGS stations 11312676 & 11313405 via CDEC available at:
http://www.usbr.gov/mp/cvo/vungvari/OMR_Feb2016.pdf

If you have any questions regarding the preliminary data
in this report, please contact OCO_Export_Management@water.ca.gov

North Sierra Precipitation: 8-Station Index, February 25, 2016



San Joaquin Precipitation: 5-Station Index, February 25, 2016

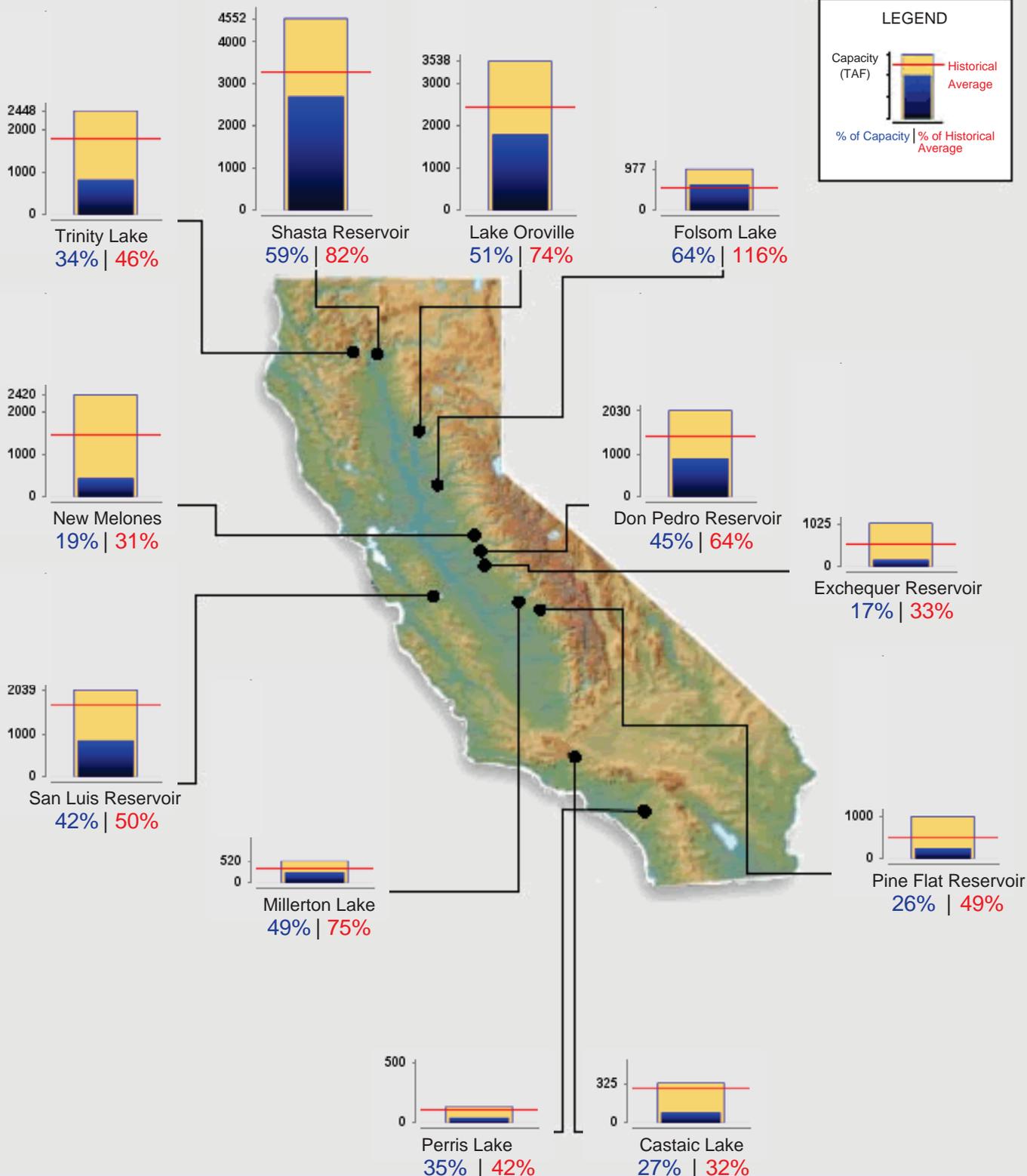
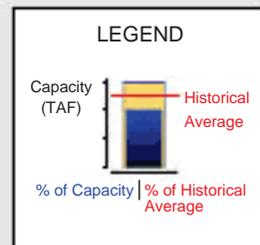




Reservoir Conditions

Ending At Midnight - February 24, 2016

CURRENT RESERVOIR CONDITIONS



Turbidity Forecast 2/23/2016

General Information

The attached model run results cover the period of February 23, through March 14, and are based on the following assumptions:

Common Assumptions

1. CCFB Gates are operating to Priority 3 throughout the forecast period.
2. The Delta Cross Channel gates will be closed throughout the forecast period.
3. Suisun Marsh salinity control flashboards are in, and the three Suisun Marsh Salinity Control Gates are in open position.

INPUT FLOW DATA (-5000 cfs OMR)

Date	Delta Inflows [cfs]								Delta Exports [cfs]	
	Sacram. River	Yolo bypass	Sacto Treat. rel.	DXC Gate ops	San Joaquin River	Cosum River	Mokel. River	Calaver River	Clifton Court intake	Jones pump
	Freeport prev.day FPT	Cache &weirs pr.day	estim. week avg pr.day	% of day open current day	Vernalis prior day VNS	Michigan Bar pr. Day	Wood- bridge pr.day	New Hogan pr.day		
23-Feb-16	17,940	87	190	0	868	520	107	20	2,396	3,426
24-Feb-16	19,768	79	190	0	843	479	106	19	2,400	3,400
25-Feb-16	19,130	70	190	0	820	470	106	20	2,370	3,400
26-Feb-16	17,800	70	190	0	810	460	106	20	2,370	3,400
27-Feb-16	16,621	60	190	0	790	460	106	20	2,360	3,400
28-Feb-16	15,791	60	190	0	770	470	106	20	2,350	3,400
29-Feb-16	15,280	50	190	0	750	400	106	20	2,320	3,400
01-Mar-16	14,280	40	190	0	730	400	106	20	2,320	3,400
02-Mar-16	13,500	40	170	0	800	400	106	20	2,340	3,400
03-Mar-16	13,000	40	170	0	800	400	106	20	2,400	3,400
04-Mar-16	12,330	40	170	0	800	400	106	20	2,400	3,400
05-Mar-16	12,000	40	170	0	800	400	106	20	2,400	3,400
06-Mar-16	12,000	40	170	0	800	400	106	20	2,400	3,400
07-Mar-16	12,000	40	170	0	800	400	106	20	2,400	3,400
08-Mar-16	12,000	40	170	0	800	400	106	20	2,400	3,400
09-Mar-16	12,000	40	170	0	800	400	106	20	2,400	3,400
10-Mar-16	12,000	40	170	0	800	400	106	20	2,400	3,400
11-Mar-16	12,000	40	170	0	800	400	106	20	2,400	3,400
12-Mar-16	12,000	40	170	0	800	400	106	20	2,400	3,400
13-Mar-16	12,000	40	170	0	800	400	106	20	2,400	3,400
14-Mar-16	12,000	40	170	0	800	400	106	20	2,400	3,400

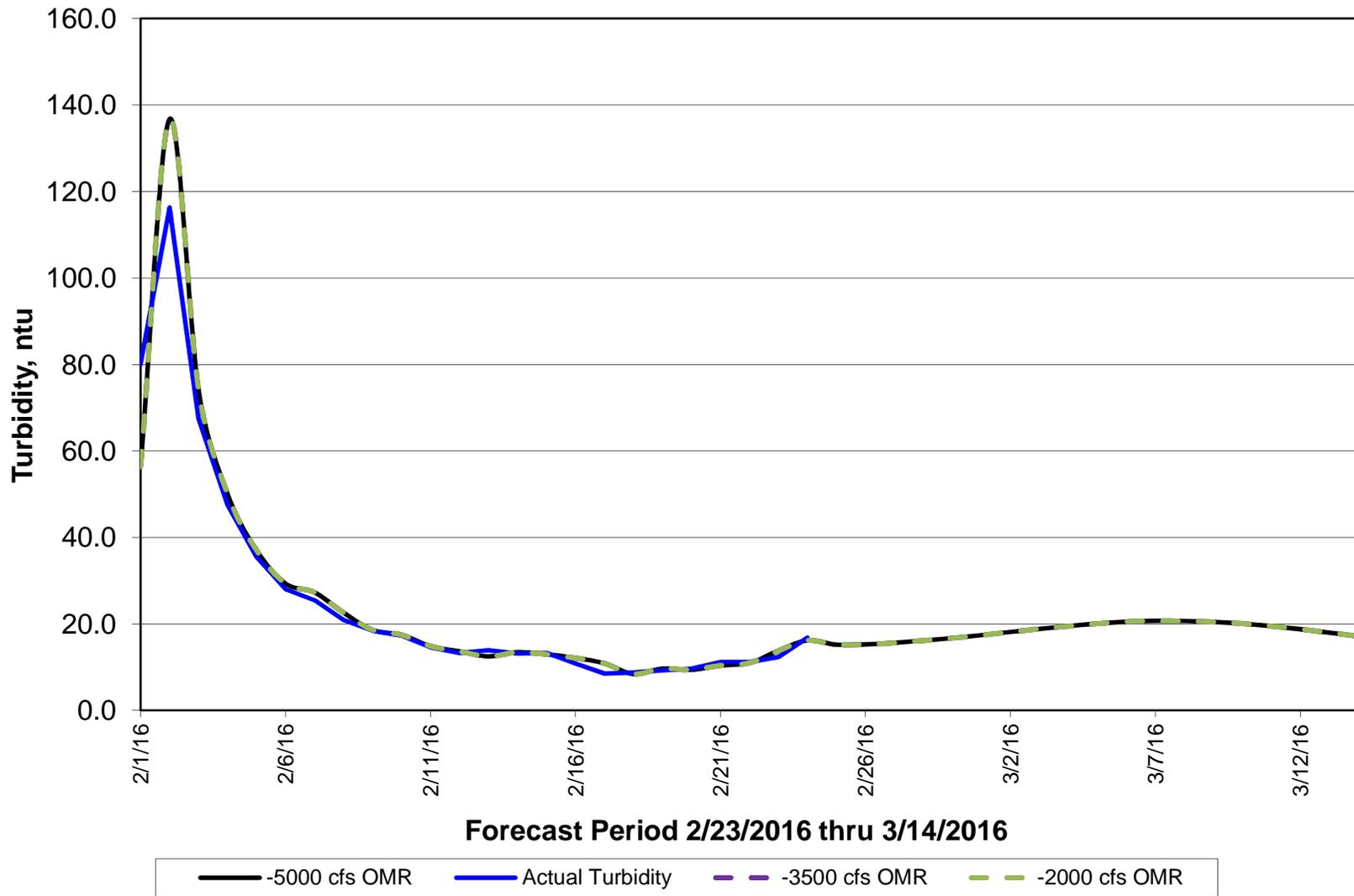
INPUT FLOW DATA (-3500 cfs OMR)

Date	Delta Inflows [cfs]								Delta Exports [cfs]	
	Sacram. River	Yolo bypass	Sacto Treat. rel.	DXC Gate ops	San Joaquin River	Cosum River	Mokel. River	Calaver River	Clifton Court intake	Jones pump
	Freeport prev.day FPT	Cache &weirs pr.day	estim. week avg pr.day	% of day open current day	Vernalis prior day VNS	Michigan Bar pr. Day	Wood- bridge pr.day	New Hogan pr.day		
23-Feb-16	17,940	87	190	0	868	520	107	20	2,396	3,426
24-Feb-16	19,768	79	190	0	843	479	106	19	2,400	3,400
25-Feb-16	19,130	70	190	0	820	470	106	20	2,370	2,000
26-Feb-16	17,800	70	190	0	810	460	106	20	2,370	2,000
27-Feb-16	16,621	60	190	0	790	460	106	20	2,360	2,000
28-Feb-16	15,791	60	190	0	770	470	106	20	2,350	2,000
29-Feb-16	15,280	50	190	0	750	400	106	20	2,320	2,000
01-Mar-16	14,280	40	190	0	730	400	106	20	2,320	2,000
02-Mar-16	13,500	40	170	0	730	400	106	20	2,340	2,000
03-Mar-16	13,000	40	170	0	730	400	106	20	2,400	2,000
04-Mar-16	12,330	40	170	0	730	400	106	20	2,400	2,000
05-Mar-16	12,000	40	170	0	730	400	106	20	2,400	2,000
06-Mar-16	12,000	40	170	0	730	400	106	20	2,400	2,000
07-Mar-16	12,000	40	170	0	730	400	106	20	2,400	2,000
08-Mar-16	12,000	40	170	0	730	400	106	20	2,400	2,000
09-Mar-16	12,000	40	170	0	730	400	106	20	2,400	2,000
10-Mar-16	12,000	40	170	0	730	400	106	20	2,400	2,000
11-Mar-16	12,000	40	170	0	730	400	106	20	2,400	2,000
12-Mar-16	12,000	40	170	0	730	400	106	20	2,400	2,000
13-Mar-16	12,000	40	170	0	730	400	106	20	2,400	2,000
14-Mar-16	12,000	40	170	0	730	400	106	20	2,400	2,000

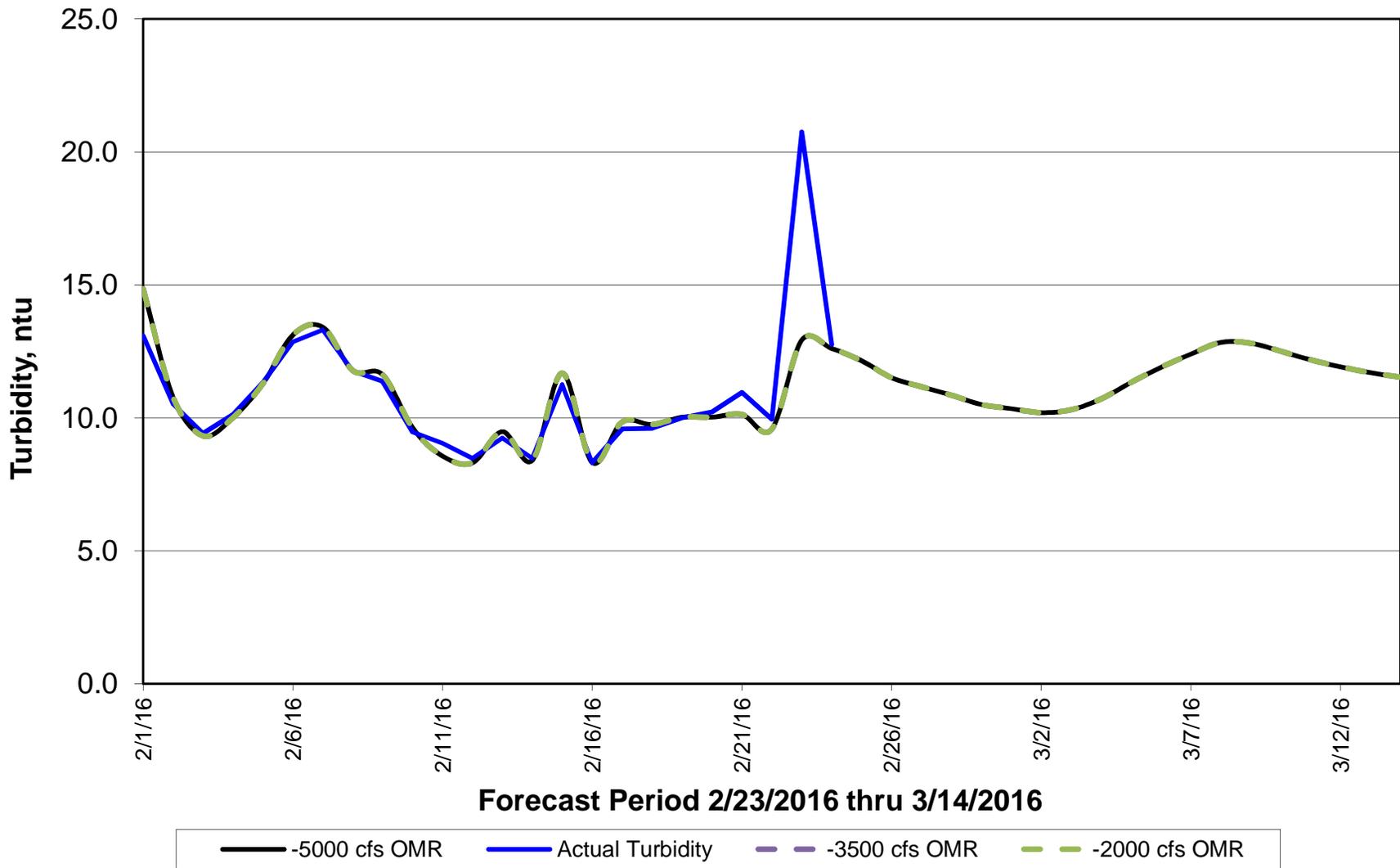
INPUT FLOW DATA (-2000 cfs OMR)

Date	Delta Inflows [cfs]								Delta Exports [cfs]	
	Sacram. River	Yolo bypass	Sacto Treat. rel.	DXC Gate ops	San Joaquin River	Cosum River	Mokel. River	Calaver River	Clifton Court intake	Jones pump
	Freeport prev.day FPT	Cache &weirs pr.day	estim. week avg pr.day	% of day open current day	Vernalis prior day VNS	Michigan Bar pr. Day	Wood-bridge pr.day	New Hogan pr.day		
23-Feb-16	17,940	87	190	0	868	520	107	20	2,396	3,426
24-Feb-16	19,768	79	190	0	843	479	106	19	2,400	3,400
25-Feb-16	19,130	70	190	0	820	470	106	20	2,370	1,000
26-Feb-16	17,800	70	190	0	810	460	106	20	2,370	1,000
27-Feb-16	16,621	60	190	0	790	460	106	20	2,360	1,000
28-Feb-16	15,791	60	190	0	770	470	106	20	2,350	1,000
29-Feb-16	15,280	50	190	0	750	400	106	20	2,320	1,000
01-Mar-16	14,280	40	190	0	730	400	106	20	2,320	1,000
02-Mar-16	13,500	40	170	0	730	400	106	20	2,340	1,000
03-Mar-16	13,000	40	170	0	730	400	106	20	2,400	1,000
04-Mar-16	12,330	40	170	0	730	400	106	20	2,400	1,000
05-Mar-16	12,000	40	170	0	730	400	106	20	2,400	1,000
06-Mar-16	12,000	40	170	0	730	400	106	20	2,400	1,000
07-Mar-16	12,000	40	170	0	730	400	106	20	2,400	1,000
08-Mar-16	12,000	40	170	0	730	400	106	20	2,400	1,000
09-Mar-16	12,000	40	170	0	730	400	106	20	2,400	1,000
10-Mar-16	12,000	40	170	0	730	400	106	20	2,400	1,000
11-Mar-16	12,000	40	170	0	730	400	106	20	2,400	1,000
12-Mar-16	12,000	40	170	0	730	400	106	20	2,400	1,000
13-Mar-16	12,000	40	170	0	730	400	106	20	2,400	1,000
14-Mar-16	12,000	40	170	0	730	400	106	20	2,400	1,000

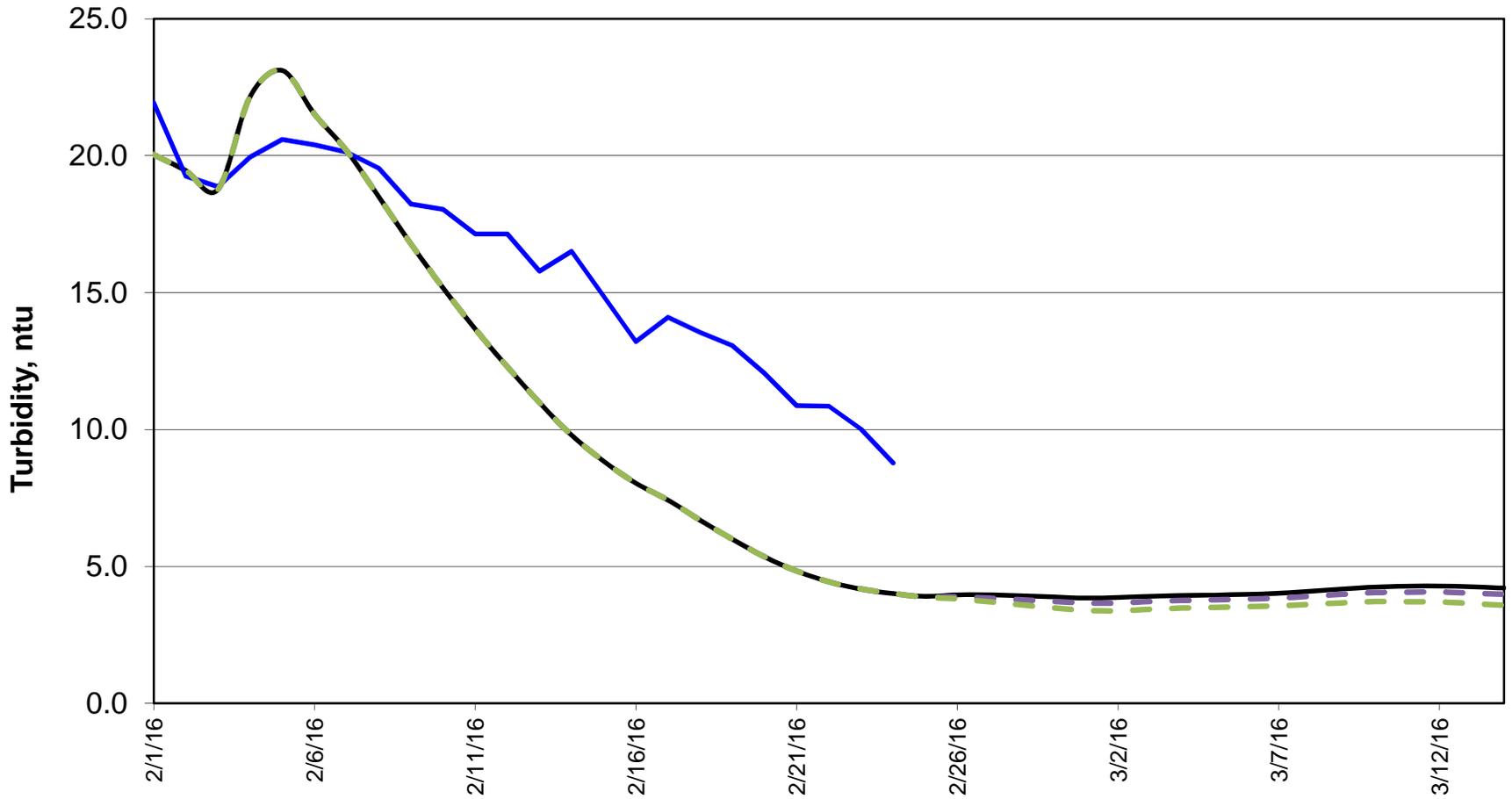
Forecasted Turbidity @ Sacramento River @ Hood



Forecasted Turbidity @ San Joaquin River @ Vernalis



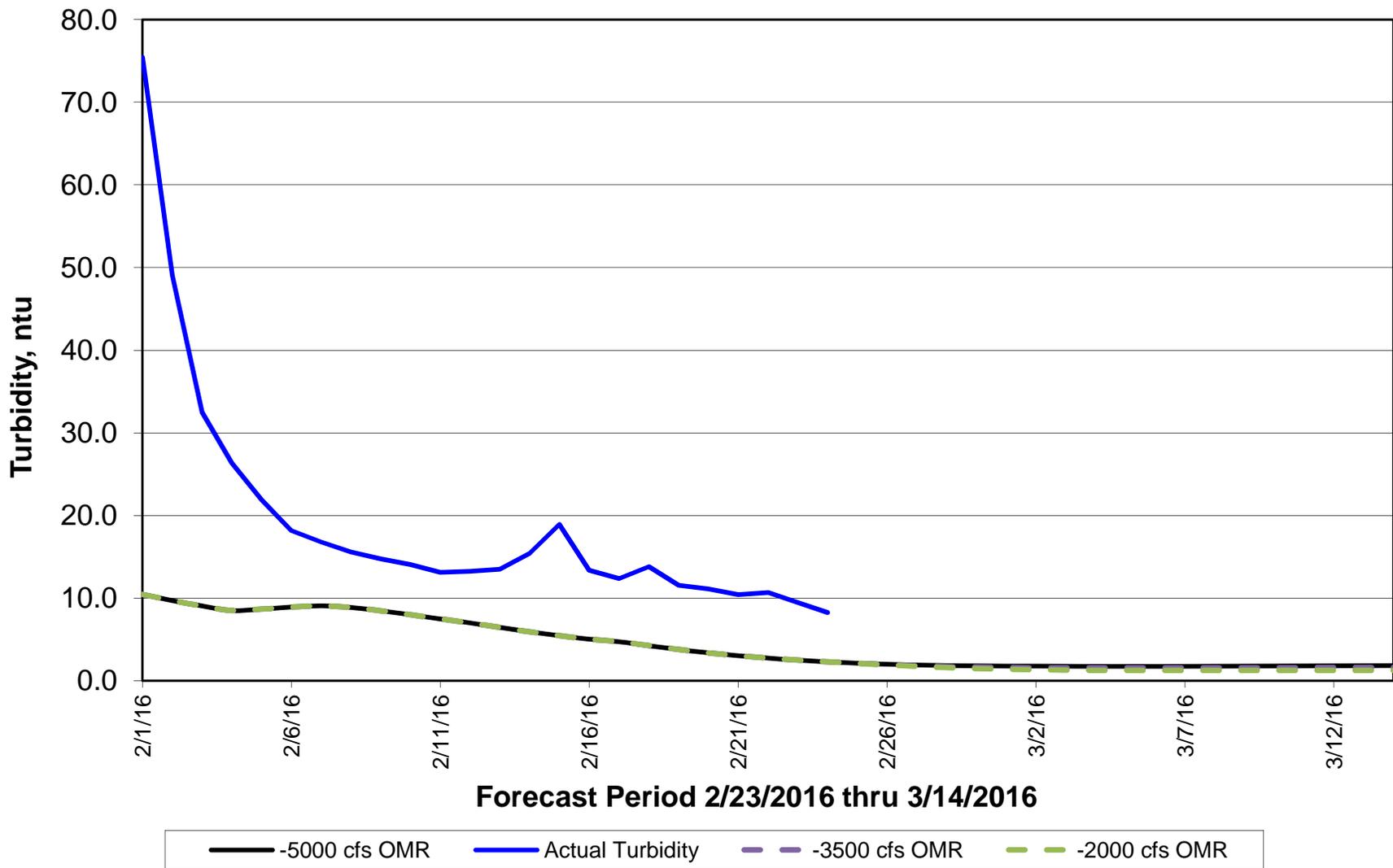
Forecasted Turbidity @ Prisoners Point



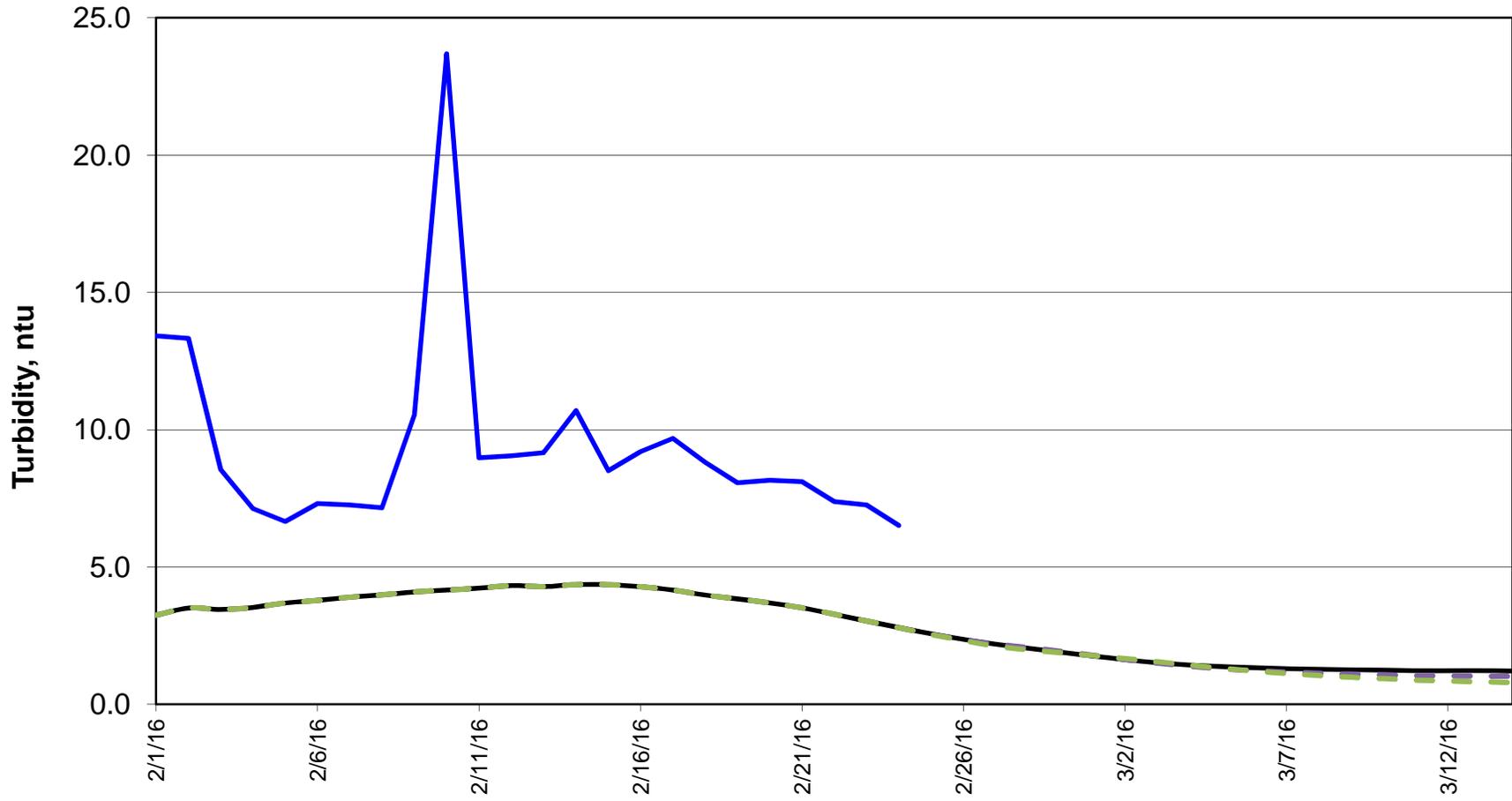
Forecast Period 2/23/2016 thru 3/14/2016



Forecasted Turbidity @ Holland



Forecasted Turbidity @ Victoria Canal



Forecast Period 2/23/2016 thru 3/14/2016

