# Interagency Ecological Program Seasonal Monitoring Report

# Metadata for Winter 2017-2018

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Report developed by:

* Rosemary Hartman (California Department of Water Resources (CDWR, Rosemary.Hartman@water.ca.gov)
* Nicholas Rasmussen (CDWR)
* Lara Mitchell (US Fish and Wildlife Service)
* JohnFranco Saraceno (CDWR)
* David Bosworth (CDWR)
* Jason DuBois (California Department of Fish and Wildlife)
* Michael Koohafkan (CDWR)
* Louise Conrad (Delta Science Program)

## Overview

Long-term ecological surveys have been a core function of the Interagency Ecological Program (IEP) since the program’s inception in the 1970s. The IEP Seasonal Monitoring Report presents the full time series for selected water quality, plankton, and fisheries surveys conducted by IEP in a single graphical report. While the report is not a comprehensive view of all the data collected by IEP, it is intended to provide a general overview of the longevity and breadth of IEP survey work. A major goal of this report is to illustrate the scope of IEP surveys and emerging trends in the San Francisco Bay-Delta ecosystem to the public, potential science collaborators, and IEP and other resource agency managers and directors. The report is generated on a quarterly basis, with different set of ecosystem variables and surveys highlighted in each season. The report is developed by IEP scientists (including leads for monitoring surveys and the IEP Lead Scientist) and is reviewed by the IEP Science Management Team and Coordinators before online publication.

## General Information

### Season Definitions

This report covers a suite of key IEP data sets relevant to the winter season, which we defined as the months of December, January, and February. For data sets collected throughout the year, such as water temperature, we only used data from this three-month period to generate graphs. For data sets that are season-specific, we include the entire sampling period, even if it does not overlap exactly with our season definition (for example, the Spring Kodiak Trawl index includes data from January-April). Data from other times of year will be featured in the corresponding future seasonal reports (i.e., spring, summer, fall). The other seasons (for future reports) are defined as follows: Spring = March to May, Summer = June to August, Fall = September to November.

### Geographic Region Definitions

Many of the data sets in the report are represented by a panel of three plots, one for each of three geographic regions: San Pablo Bay, Suisun Bay, and the Sacramento-San Joaquin Delta. This subdivision of data sets is designed to facilitate comparison among major regions that differ in a variety of characteristics. San Pablo Bay includes data collected east of Point San Pablo and west of the Carquinez Straight. Suisun Bay includes data collected east of the Carquinez Straight and west of the town of Collinsville. The Delta includes data east of Collinsville. Data sets are represented as a single graph when the data are only collected within a single region (e.g., Net Delta Outflow) and for wide-ranging organisms that frequent multiple regions (e.g., Sturgeon).

### Year Ranges

Most of the graphs in the report have an x-axis range from 1967 to 2017 (with 2017 including data from January and February of 2018). This start year was selected because it is the year of initiation for the Fall Midwater Trawl survey, one of the longest-running surveys. Standardizing the year range on the x-axis facilitates visual comparison across data sets. The entire time series for nearly all data sets fits within this time range. The data set for Net Delta Outflow, which was initiated in 1929, represents the sole exception and is truncated in this report to only data since 1967, for purposes of consistency within the report. The graphs in the Recent Trends section of the winter report range from 2003 to 2017.

### Calculations for Data Points

The points plotted on the graphs represent mean values. Means are generated by averaging data over the three months of the winter season for a given year (December—February) and across sites within a given region where relevant (e.g., water quality and plankton data sets). The dotted horizontal line indicates the average value over the entire period of record.

## Data Sets

### Flow

**Data Source:** Department of Water Resources, Environmental Planning and Information Branch

**Metric Used:** Net Delta Outflow Index, which is estimated using a summation of river inflows, precipitation, agricultural consumptive demand, and project exports.

**Year Range:** 1967-2017. The entire data set includes 1929-2017 but was truncated to conform to the year range of the rest of the data sets in the report.

**Additional Information:** <https://www.water.ca.gov/Programs/Environmental-Services/Compliance-Monitoring-And-Assessment/Dayflow-Data>

### Water Quality: Secchi depth, Temperature, Chlorophyll-a

**Data Source:** Department of Water Resources, Environmental Monitoring Program

**Metric Used:** Monthly discrete water quality data

**Year Range:** 1975 – 2017

**Stations by Region**

**San Pablo:** Stations = 4, years: 1976-2017

**Suisun:** Stations = 11, years: 1975-2017

**Delta:** Stations = 29, years: 1975-2017

**Additional Information:** <https://water.ca.gov/Programs/Environmental-Services/Water-Quality-Monitoring-And-Assessment>

### Zooplankton: Biomass of Calanoids, Cyclopoids, Cladocerans, and Mysids

**Data Source:** California Department of Fish and Wildlife, Zooplankton Study

**Metric Used:** Biomass of zooplankton (milligrams of carbon per cubic meter) based on monthly surveys.

**Year Range:** 1995 – 2017

Note: while the EMP survey has been collecting zooplankton in the estuary since 1974, the survey did not start sampling during the winter months until 1995.

**Stations by Region**

**San Pablo:** Stations = 2, years: 1998-2017. Note: One station sampled consistently since 1998 and the other one since 2003.

**Suisun:** Stations = 6, years: 1995-2017

**Delta:** Stations = 8, years: 1995-2017

**Additional Information:** <https://www.wildlife.ca.gov/Conservation/Delta/Zooplankton-Study>

### Longfin Smelt

**Data Source:** California Department of Fish and Wildlife, San Francisco Bay Study  (Region 3, Bay Delta)

**Metric Used:** Average catch per unit effort (CPUE) for adult (Age 1+) Longfin Smelt is derived from Bay Study’s Midwater trawl, which samples pelagic fishes and retrieved obliquely such that all depths are sampled equally.

**Year Range:** 1980-2017

**Stations:** 52

**More Information**: <https://www.wildlife.ca.gov/Conservation/Delta/Bay-Study>

### White Sturgeon

**Data Source:** California Department of Fish and Wildlife, San Francisco Bay Study  (Region 3, Bay Delta)

**Metric Used:** Year-class index (YCI) calculated by methods described in [Fish 2010](https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fnrm.dfg.ca.gov%2FFileHandler.ashx%3FDocumentId%3D26542%26inline&data=02%7C01%7C%7C81567497fa01424b8c1808d762d9660b%7Cb71d56524b834257afcd7fd177884564%7C0%7C1%7C637086558190222966&sdata=klDZ%2BHelR%2FUbUH0k9wB0nIzmiMHwOrviQV6I5Q9n4Cw%3D&reserved=0)

**Data source**: Fish CPUE and Index calc\_July2019.accdb (standalone database, copy received from Bay Study personnel)

**Year Range:** 1980-present. Annual survey conducted monthly in the bays, estuary, & delta. Deploys otter & mid-water trawls. Sturgeon YCI calculated using otter trawl only ([Fish 2010](https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fnrm.dfg.ca.gov%2FFileHandler.ashx%3FDocumentId%3D26542%26inline&data=02%7C01%7C%7C81567497fa01424b8c1808d762d9660b%7Cb71d56524b834257afcd7fd177884564%7C0%7C1%7C637086558190232962&sdata=Me5Wq5QJBHZF50mQ1SnnjZ6OoSJMEsJf0eMSAO90AXc%3D&reserved=0)).

**Stations:** 52

**Additional Information:** [https://www.wildlife.ca.gov/Conservation/Delta/Bay-Study](https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.wildlife.ca.gov%2FConservation%2FDelta%2FBay-Study&data=02%7C01%7C%7C81567497fa01424b8c1808d762d9660b%7Cb71d56524b834257afcd7fd177884564%7C0%7C1%7C637086558190242955&sdata=3chCrPd8RHphC6Yv0WQWDXlJFhbM4o6NoSVB58sjnvM%3D&reserved=0)

### Winter-run Run Chinook: Chipps Island Trawl

**Data Source:** US Fish and Wildlife Service, Lodi Field Office, Delta Juvenile Fish Monitoring Program

**Metric Used:** Mean catch per unit effort estimates for Winter-run Chinook. The calculation method is similar to that used by DJFMP staff for reporting.

**Year Range:** 2003-2017.

Note: Although sampling at Chipps Island started in 1976, this year range was chosen for consistency with the range most recently reported on by DJFMP staff.

**Stations:** 1

**Additional Information:** <https://www.fws.gov/lodi/juvenile_fish_monitoring_program/jfmp_index.htm>

### Winter-run Run Chinook: Red Bluff Diversion Dam

**Data Source:** Red Bluff US Fish and Wildlife Service

**Metric Used:** Estimated number of juvenile outmigrants passing the Red Bluff Diversion Dam based on catches from rotory screw traps.Since winter Chinook spawning ground lie almost exclusively above the dam, this provides an estimate of salmon production from the upper reaches of the river.

**Year Range:** 1999 – 2003-2017.

Note: Although sampling at Chipps Island started in 1976, this Data were truncated year range was chosen for consistency with the range most recently reported on by DJFMP staff. at 2003 to focus on the more recent trends. Data are also available for 1994-2000.

**Stations:** 4 screw traps across the river

**Additional Information:** <https://www.fws.gov/redbluff/rbdd_jsmp.html>

### Delta Smelt

**Data Source:** Spring Kodiak Trawl

**Metric Used:** Annual abundance indices are calculated by grouping index stations into 3 spatial regions, calculating mean catch per 10,000 m3 of water sampled by region, and summing the 3 regional means. Only data collected from January – April are used in the calculations. This method was chosen for consistency with the index calculated by the California Department of Fish and Wildlife.

**Year Range:** 2004 – 2017. Note: Indices are not calculated for 2002 or 2003 because Spring Kodiak Trawl methods were standardized starting in 2004. Also, the month range of the index deviates from the standard December – February definition of winter in this report.

**Stations:** 39

**Additional Information:** <https://www.wildlife.ca.gov/Conservation/Delta/Spring-Kodiak-Trawl>