# Interagency Ecological Program Seasonal Monitoring Report

# Metadata for Summer 2018

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## 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 summer season, which we defined as the months of June, July, and August. 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, aquatic vegetation surveys sometimes occurred in September or Octover). Data from other times of year will be featured in the corresponding future seasonal reports (i.e., fall, winter, spring). The other seasons (for future reports) are defined as follows: Fall = September to November, Winter = December to February, Spring = March to May.

### 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., Delta Smelt).

### Year Ranges

Most of the graphs in the report have an x-axis range from 1966 to 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. Data sets that began before 1966 were truncated for purposes of consistency within the report. The graphs in the Recent Trends section of the winter report range from 2004 to 2018.

### 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 (June-August) 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:** 1975 – 2018

**Stations by Region**

**San Pablo:** Stations = 2, years: 1998-2018. Note: One station sampled consistently since 1998 and the other one since 2003.

**Suisun:** Stations = 6, years: 1975-2018

**Delta:** Stations = 8, years: 1975-2018

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

### Northern Anchovy

**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 Northern Anchovy is derived from Bay Study’s Midwater trawl, which samples pelagic fishes and retrieved obliquely such that all depths are sampled equally.

**Year Range:** 1980-2018

**Stations:** 52

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

### Sacramento Pikeminnow – Beach Seine Survey

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

**Metric Used:**

**Year Range:** 1995-2018.

**Stations:** ?

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

### Delta Smelt

**Data Source:** Summer Townet Survey

**Metric Used:** Catches of age-zero Delta Smelt at each index station are weighted by a station-specific weighting factor, summed for all index stations and divided by 1000 to calculate the survey index. The annual index is calculated from the first two survey indices. This method was chosen for consistency with the index calculated by the California Department of Fish and Wildlife.

**Year Range:** 1959-2018

Note: The Summer Townet Survey was initiated in 1959, but no index was calculated 1966-1968.

**Stations:** 31

**Additional Information:** <https://wildlife.ca.gov/Conservation/Delta/Townet-Survey>

### Microcystis

**Data Source: Summer Townet Survey and Environmental Monitoring Program**

**Metric Used:** Microcystis bloom presence and intensity are measured on a qualitative scale with 5 categories: absent, low (widely scattered colonies), medium (adjacent colonies), high (contiguous colonies), and very high (concentration of contiguous colonies forming mats/scum).

**Year Range:** 2007 - 2018

**Stations:** 69

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

### Aquatic Vegetation

**Data Source:**

**Metric Used:**

**Year Range:**

**Stations:**

**Additional Information:**