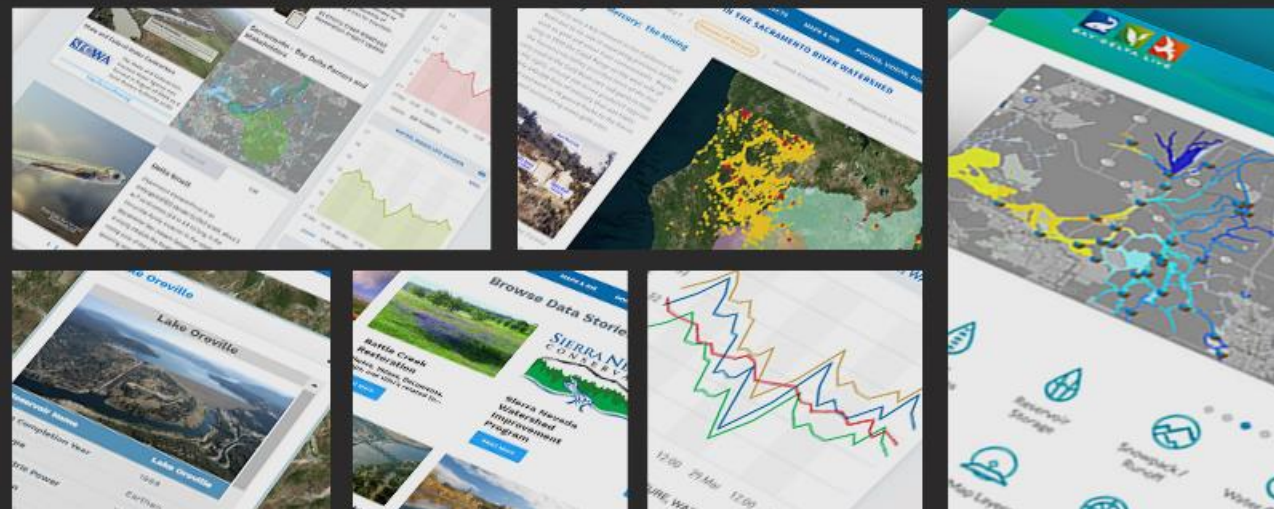


# Data Driven Decisions



**Presenter**  
Val Connor



# The Monitoring Council Mission



Improve the effectiveness of water quality and associated ecosystem monitoring and assessment.

Make data and information available to decision makers and the public via the internet.



# Breaking Down Silos for improved Scientific Understanding



"Over many years, we have seen a significant investment in agencies and organizations to conduct data management ....  
....[but we lack] a business model to sustain the development and maintenance of data standards, integration points, web services, and data federation to facilitate synthesis across agency and issue boundaries.»

Enhance the Vision for Managing  
California's Environmental Information 2015



# The Challenge: Connecting Research



- Most data are collected and stored within origination organization.
- Data is typically shared at quarterly meetings, after publication and then added to state databases when funding is available, or only accessible by request.
- Delays in sharing data does not support adaptive management actions and real time operations.

# BAY-DELTA LIVE

## Agency Work Team



### Mission & Values

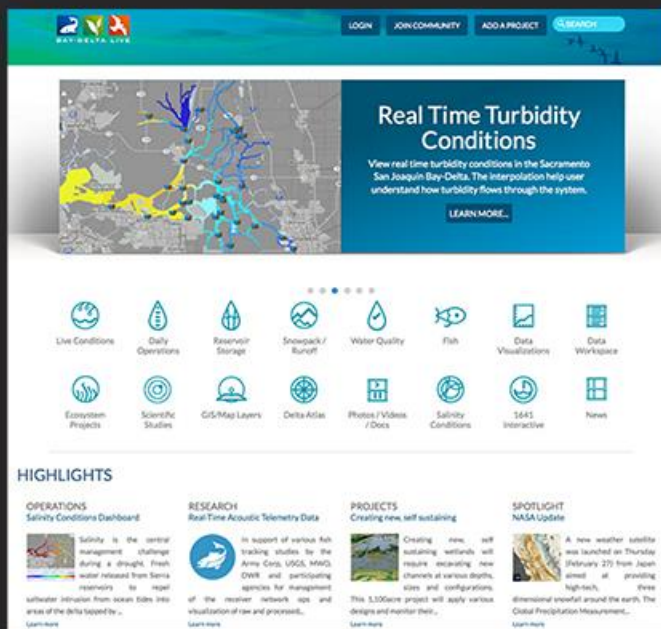
Bay-Delta Live's mission is to organize Delta's scientific data and information and make it widely accessible and useful.

### Bay-Delta Live is committed to:

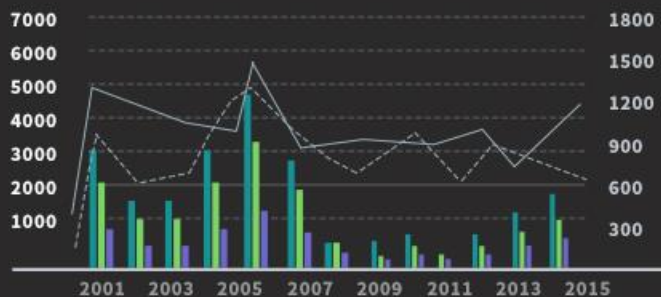
- Openness
- Collaboration
- Transparency
- Sharing comparable data and tools
- Education
- Continuous enhancement
- Respect for integrity of source data
- Recognizing the Delta's connectivity to other watersheds



# BDL Agency Workgroup Collaborators

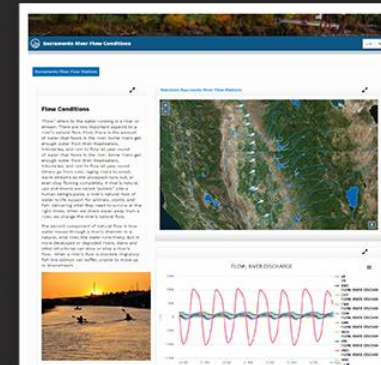
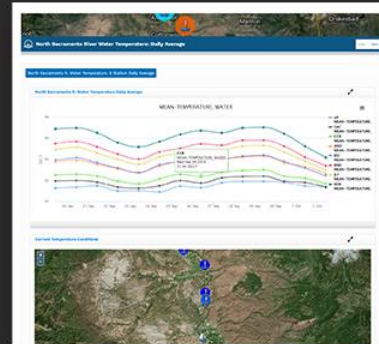


California Department of Water Resources  
U.S. Geological Survey  
U.S. Department of Fish and Wildlife  
National Oceanic and Atmospheric Administration  
U.C. Davis  
California Department of Fish and Wildlife  
U.S. Bureau of Reclamation  
Delta Conservancy  
Delta Science Program  
California Estuary Workgroup  
Metropolitan Water District of SC  
San Luis Delta-Mendota Water Authority  
State and Federal Water Contractors  
JPL/NASA



Page Views 274,264  
410 Registered Users  
2,200 Images, Documents  
121 Active Projects





## Project Specific Data Dashboards

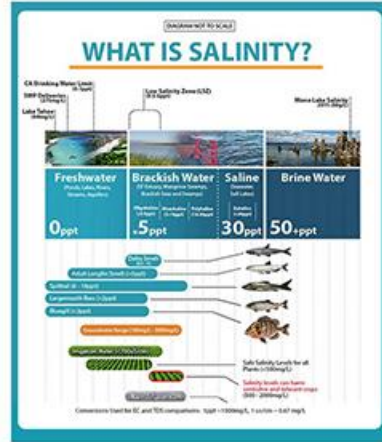
# Salinity



## What is Salinity?

### An Overview

Salinity is simply a measure of the amount of salts dissolved in water. Salinity is usually expressed in parts per thousand (ppt) or ‰. Freshwater rivers have a salinity of 0.5 ppt or less. Within an estuary, salinity levels are referred to as oligohaline (0.5-0 ppt), mesohaline (1.0-18.0 ppt), or polyhaline (18.0-30 ppt). Near the connection with the open sea, estuarine waters may be euhaline, where salinity levels are the same as the ocean at more than 30.0 ppt (Mitch and Gosselink, 1996). In an unaltered environment there is natural variation in salinity levels. The main causes of the natural variation are driven by changes in climate and season, tidal cycles, and evaporation.



### Delta Conditions

Excess

Delta X Channel 0%

% of Inflow Diverted 53.7% %

Outflow 3,700 cfs cfs

X2 Position > 81 km

### Key Temperature Stations

Important temperature indicator stations

Temperature (Salty)

Mossdale (MSD) °F Rio Vista (RVV) °F

50.3 50.1

Antioch (ANT) °F Clifton Court (WCC) °C

52.8 11.6

### Delta Operations Summary

#### Summary Graphs

##### Scheduled Exports

Clifton Court Inflow 6,680 cfs cfs

Jones Pumping Plant 4,100 cfs cfs

Last Updated: 2016-12-5

Data Sources

##### Estimated Hydrology

Total Delta Inflow -16,715 cfs cfs

Sacramento River 15,149 cfs cfs

San Joaquin River 956 cfs cfs

Last Updated: 2016-12-5

Data Sources

### Index is calculated Dec-June

#### OMR Index Calculation WY16

##### Daily Average

-2770 cfs

##### 5-Day Average

-2390 cfs

##### 14-Day Average

-2050 cfs

Last Updated: 2016-04-26

Download PDF

Old Middle River (OMR)

Old and Middle River (OMR)

Tidally Filtered Estimate

Flow Mean Daily

-9833.0 cfs

Last Updated: 2016-12-5

Data Sources

### SACRAMENTO RIVER AT RIO VISTA (RVS) - EC

Summary USGS

Lat 38.160000 Lon -121.684000 Elev 0

#### ELECTRICAL CONDUCTIVITY MICRO S

Download Data 188 uS/cm

Dec 05, 2016 00

Display Marker as Value

UnMap Add to Favorite Zoom to Station

### OLD RIVER AT HIGAWAY 4 - EC

Summary USGS

Lat 37.891109 Lon -121.569168 Elev 10

#### ELECTRICAL CONDUCTIVITY MICRO S

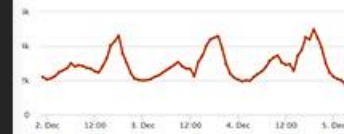
Download Data 702 uS/cm

Dec 05, 2016 00

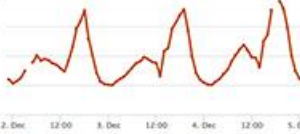
Display Marker as Value

UnMap Add to Favorite Zoom to Station

### ELECTRICAL CONDUCTIVITY MICRO S at ANTIOCH (USBR)



### ELECTRICAL CONDUCTIVITY MICRO S at ANH



### ELECTRICAL CONDUCTIVITY MICRO S at BACON ISLAND AT OLD RIVER



### ELECTRICAL CONDUCTIVITY MICRO S at BELDON LANDING



### ELECTRICAL CONDUCTIVITY MICRO S at CLC

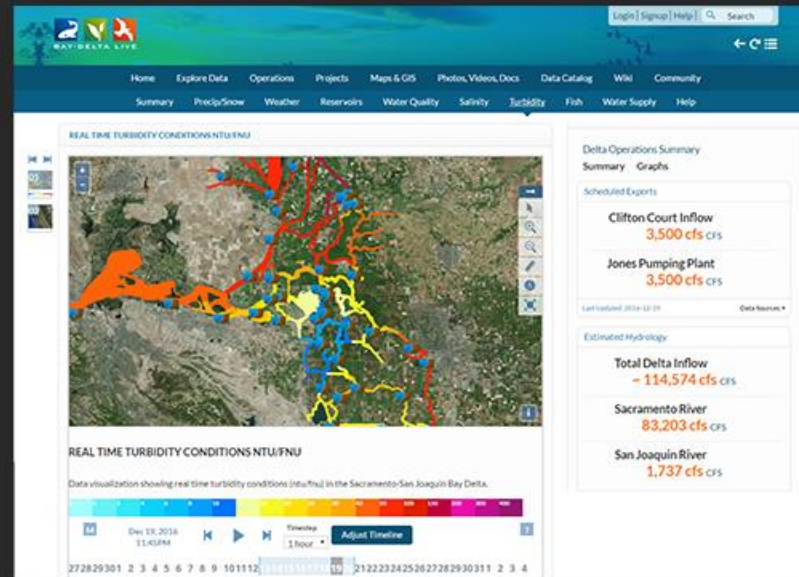


### ELECTRICAL CONDUCTIVITY MICRO S at RIO VISTA





# Turbidity Conditions



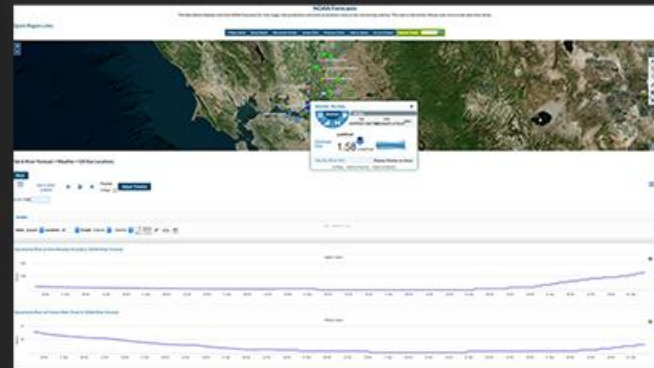
- Turbidity Model displays real-time data from 46 CDEC Stations.
- View data at various intervals (15 min, 1 r, 6 hr, 12 hr, 1 day, 1 week, 1 mo, 1 yr).
- Data is 15-minute and averaged based on interval.

# Fisheries



Red Bluff Observation Dam

Date	Time	Water Type	Species	SP#	SP#	SP#	SP#	SP#	SP#	SP#
1/1/2018	10:00	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:05	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:10	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:15	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:20	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:25	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:30	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:35	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:40	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:45	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:50	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	10:55	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:00	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:05	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:10	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:15	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:20	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:25	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:30	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:35	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:40	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:45	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:50	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	11:55	Water	Bluegill	1	2	3	4	5	6	7
1/1/2018	12:00	Water	Bluegill	1	2	3	4	5	6	7



# Project Tools:

## Tools:

- ✓ *Spatial Analysis Data*
- ✓ *Project Pages*
- ✓ *Interactive Mapping and GIS*
- ✓ *Workspaces*
- ✓ *Data Dashboards*

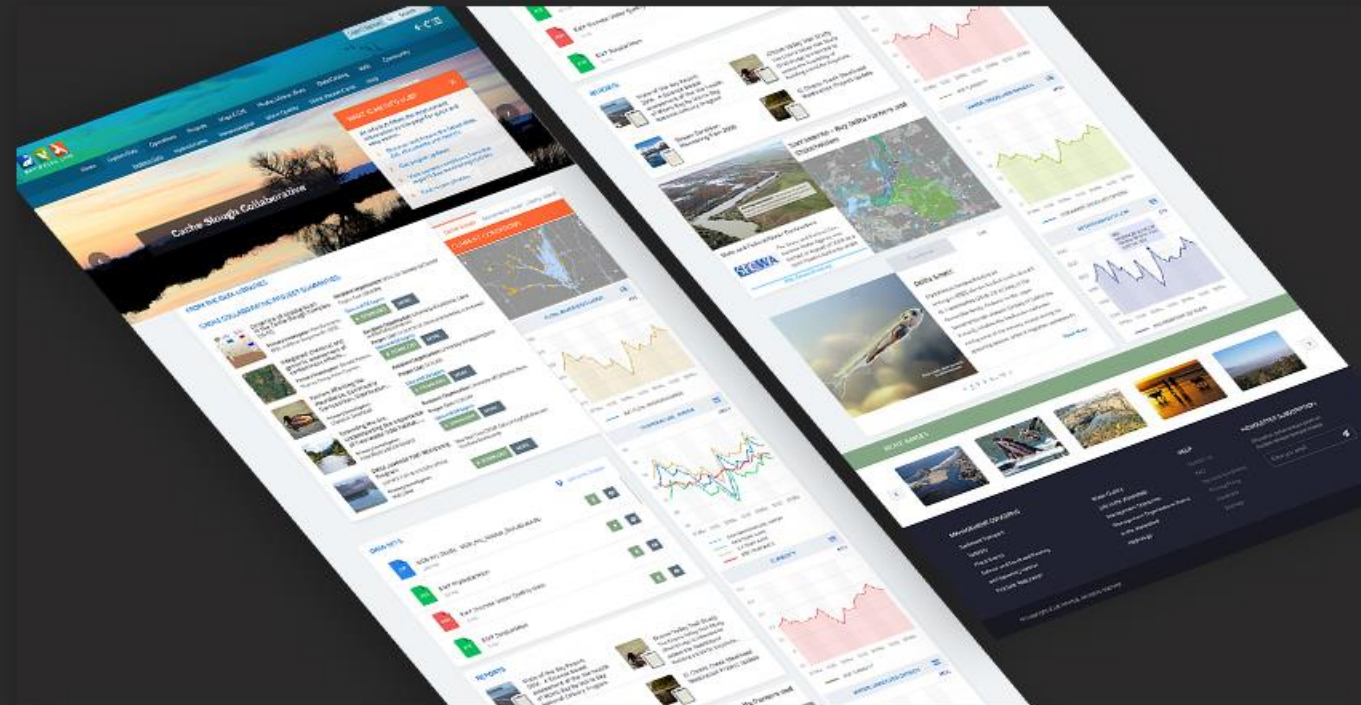
## GIS:

- ✓ *Key Features and Locations*
- ✓ *Delta Vegetation*
- ✓ *Monitoring Sites for All Studies in Region*
- ✓ *Trawls and Surveys*
- ✓ *Habitat*



# Connecting Scientific Research Projects and Data Thoughts Software

## An Opportunity for Collaboration and Data Synthesis



# A Collaborative Effort

## Regional and Statewide Programs



**SACRAMENTO SAN  
JOAQUIN BAY-DELTA**



**SWRCB MY WATER  
QUALITY PORTALS**



**CALIFORNIA ESTUARY  
PORTAL**



**SAN JOAQUIN REAL  
TIME MANAGEMENT**



**DWR 1641 WATER  
QUALITY**



**SACRAMENTO RIVER  
WATERSHED**



# Building on Each Other's Program

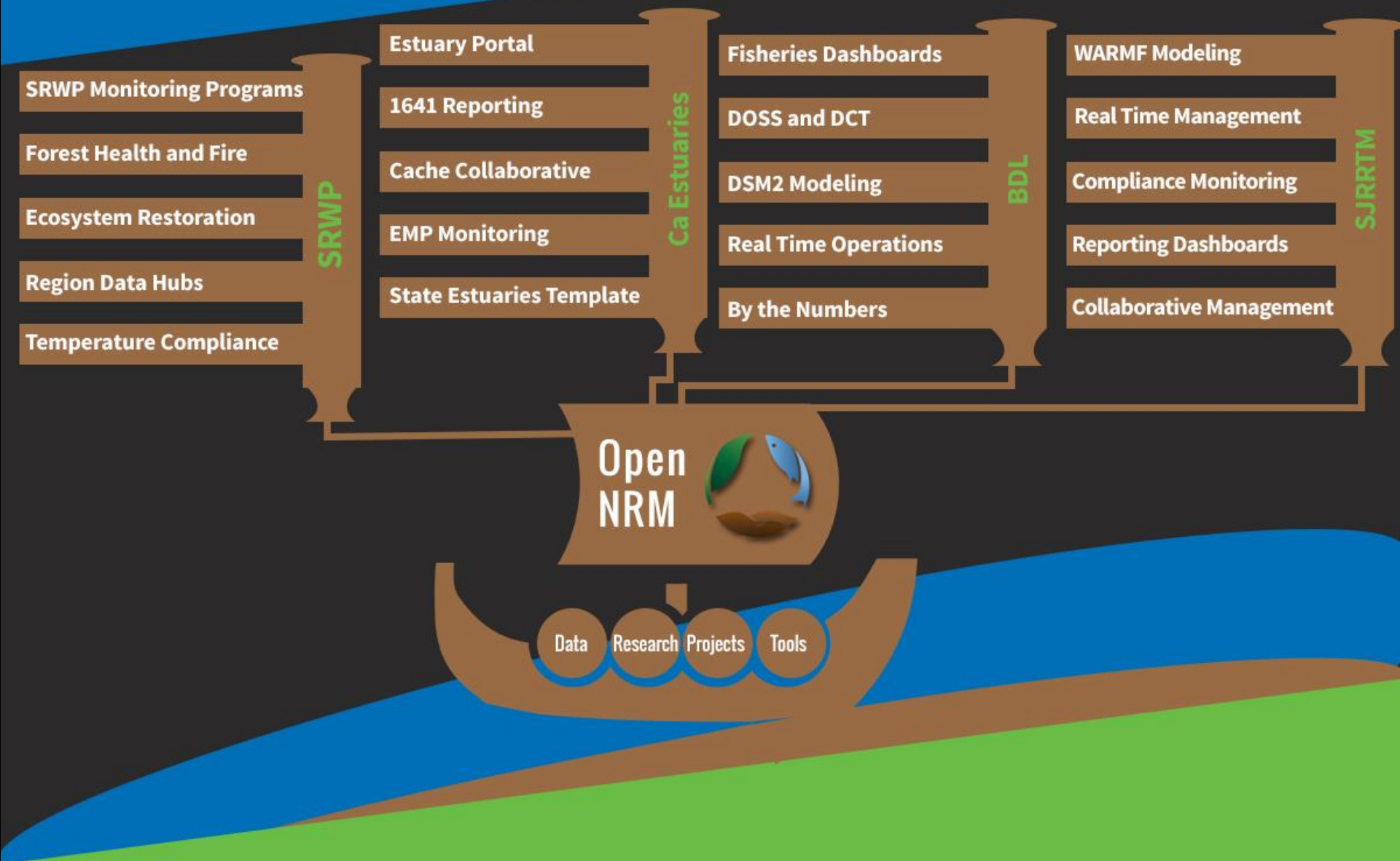
## Regional and Statewide Programs



Regional efforts share in investment. Benefit from an open platform.

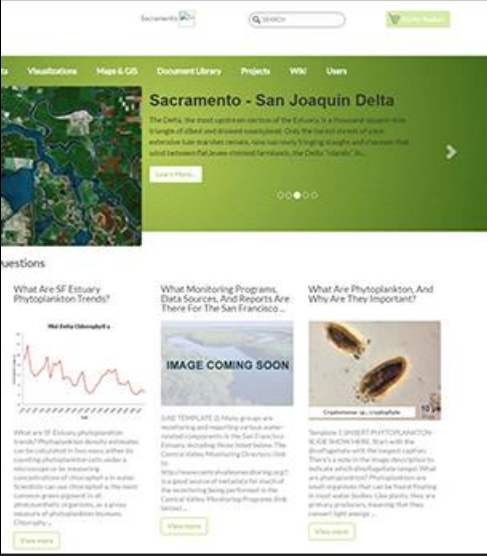


# OpenNRM



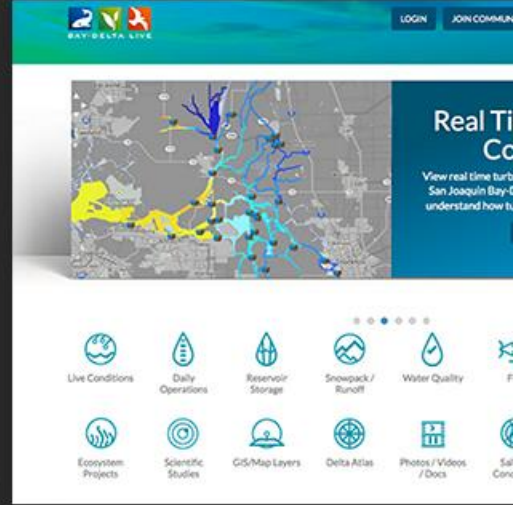
# Benefits of a Collaborative Program

1 Benefit and learn from each other's regional monitoring programs and assessment efforts.



California Estuary Portal

2 All investments are contributed back to the community: Content, GIS, data sets, mapping tools.



BaydeltaLive

3 Data is managed at the regional level and shared with all stakeholders for larger watershed assessment and analysis.

4 Application updates.







## Major Data Providers:

Data is aggregated from stakeholders throughout the region:

Hydrologic  
Water Quality

Terrestrial  
Satellite

Meteorological  
Volunteer Sampling



## Available Data (Water Quality, Operations, Food Web)

- ✓ *California Environmental Data Exchange Network (CEDEN)*
- ✓ *California Data Exchange Center (CDEC)*
- ✓ *Water Data Library (WDL)*
- ✓ *National Water Information System (NWIS)*
- ✓ *California Irrigation Management Information System (CIMIS):*
- ✓ *National Oceanic and Atmospheric Administration (NOAA)*
- ✓ *Environmental Monitoring Program (EMP/IEP)*
- ✓ *Surface Water Ambient Monitoring Program (SWAMP)*
- ✓ *Sacramento Coordinated Monitoring Program (CMP)*
- ✓ *U.S. Fish and Wildlife Surveys (Delta Juvenile Fish Monitoring Program, Red Bluff Diversion Dam, Juvenile Salmonid Monitoring)*

***...and Coming soon Cache Collaborative Data Sets!***



# Collaborative Effort has Produced the Following Products:



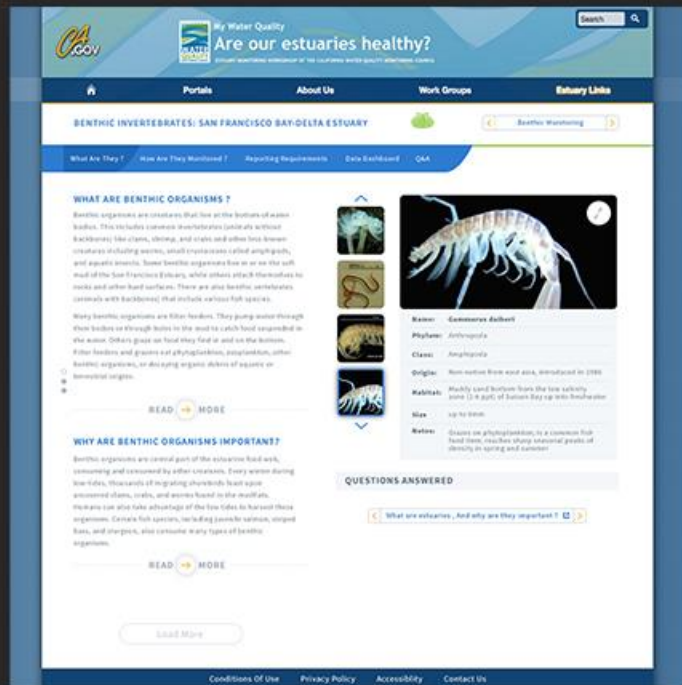
5 Portals all sharing data and information  
Delta Operations for Salmon and Sturgeon Reporting Dashboards  
Delta Conditions Team Dashboard  
Delta Juvenile Fish Monitoring and EDSM Reporting and Web Services  
Operations Dashboards  
Salinity and Turbidity Dashboards  
By the Numbers

# Statewide Impact (Data for the Public)

Available to Public	BDL	SRWP	SJRRTM	CAESTUARIES
Active Projects	121	450	45	51
Documents, Research Images, Video	2,200	950	276	924
Knowledge Articles (Wiki)	200	98	32	475
GIS	157	489		157
Datasets	135	135	139	135
Members	410	215	176	205
Stakeholder Groups	47	55	23	22
Steering Committee	Yse	Yse	Yse	Yse
Page Views	274,264	32,986	16,345	N/A



# California Estuary Collaborators

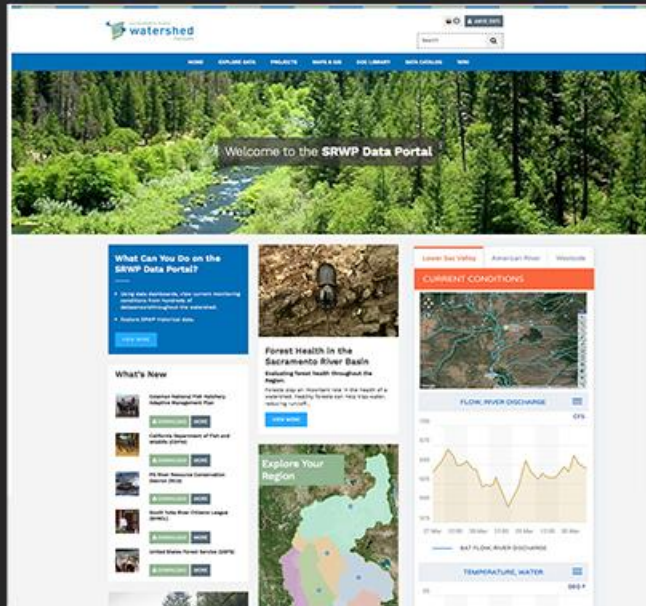


California Department of Water Resources  
Sacramento Regional San  
U.S. Department of Fish and Wildlife  
California Department of Fish and Wildlife  
Delta Conservancy  
Delta Science Program  
State and Federal Water Contractors  
State Water Resources Control Board  
San Francisco Estuary Institute

Monitoring Council Effort  
Regular Workgroup Meetings  
Documents, Research, Images, Video: 924  
GIS Datasets: 135  
Agency Members: 205



# Sacramento River Watershed Contributing Stakeholders



- CA Department of Conservation
- CA Department of Water Resources (regional and CWP for Water Management)
- Central Valley Regional Water Quality Control Board (regional and Surface Water Ambient Monitoring Program)
- Northern CA Water Association/Sacramento Valley Water Quality Coalition (Irrigated Lands Regulatory Program)
- Sac Valley Region of Resource Conservation Districts
- Sac Valley Regional Water Management Groups (Integrated Regional Water Management)
- Sierra Nevada Conservancy - WIP/Watershed Assessments
- State Water Resources Control Board

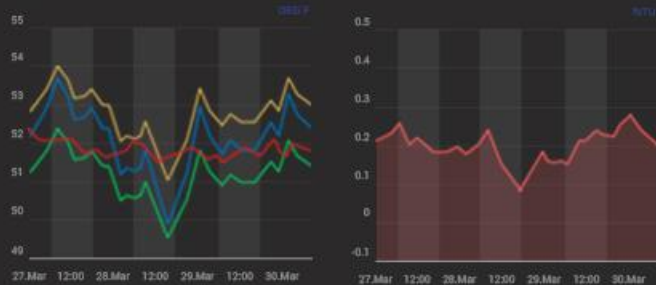
Active Projects: 450

Documents, Research, Images and Video: 950

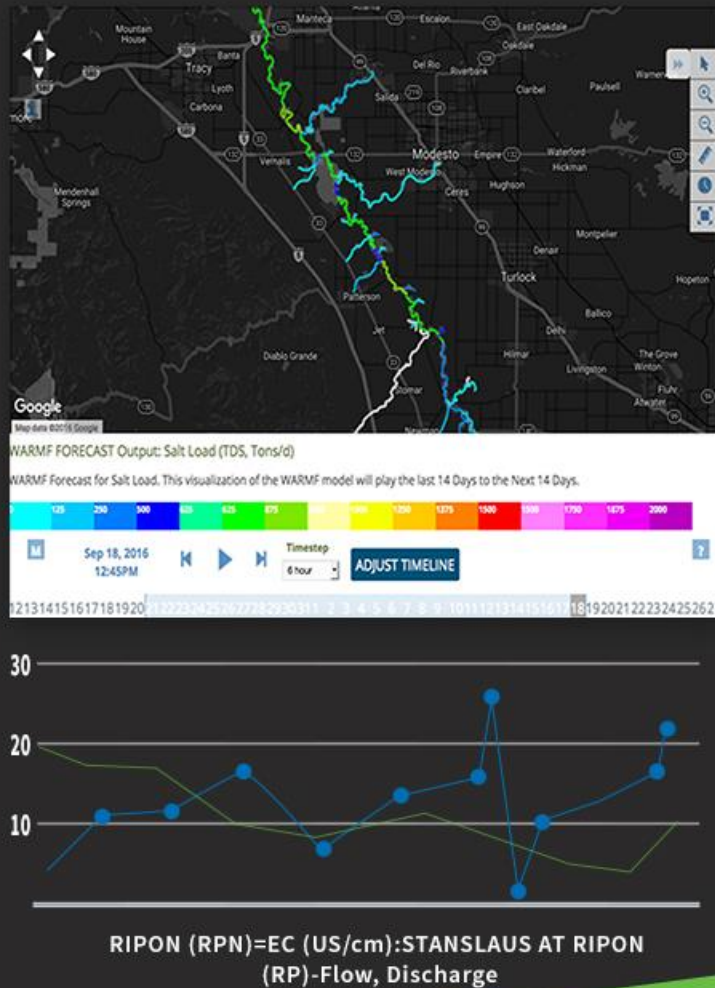
Datasets: 135

GIS Data: 489

Members: 215



# San Joaquin Real Time Management Collaborators



US Bureau of Reclamation  
CURES  
CV Salts  
California Environmental Protection Agency  
CA Department of Water Resources  
State and Federal Water Contractors  
CVRWQCB  
AG Industry  
Central Valley Irrigation Districts

Major Multi-Agency Effort  
Regular Workgroup Meetings for Enhancements  
Real Time Salinity Management  
WARMF Model Online  
Question Driven  
Stakeholder Specific Data Dashboards  
Feed Libraries

