



Connecting Scientific Research Projects and Data Through Software

An Opportunity for Collaboration and Data Synthesis



Presenters

Amye Osti, 34 North





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.

Leverage existing data platforms. Publish and share data on these platforms. Combine studies with existing data, GIS, projects and documents.

Researchers can easily discover related projects, data integration plans, support resources (Map & GIS, Reports, images).

Improve regional knowledge by simplifying access to information.





**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**





Custom GIS and Databases: Building on the BDL and Ca Estuaries data platforms, 34 North is aggregating all monitoring and key data from Cache Region research projects, nearby project areas and other data currently available in the region. This includes fish and food web monitoring programs, custom GIS, project datasets, reports, related projects and real time data.

Project Tools: Working with project Principal Investigators project pages were developed for each study with general project data, documents, reports, data, GIS and saved maps with live data.

Cache Collaborative Info Hub: A dashboard collective synthesizing and informing all projects



Cache Complex Monitoring Review Reports: Current monitoring within the cache region.

Water Quality
Meteorological

Food Web
Hydrology

Data Integration Plan: Data integration documentation and schema for project stakeholders. Includes data types, owners, Methods comparison, parameter library, collection frequency, etc.

		Program												
		Myole & Durand: ARC	Kimmerer & Bergmasch: Flux Study	Weston & Young: Toxicity Study	Smith & Simenstad: Food for Native Fishes	USFWS DJFMP	CA DFW Summer Townet	CA DFW FMWT Survey	CA DFW Smelt-larval Survey	CA DFW Spring Kodiak Trawl	CA DFW 20mm	DWR EMP	DWR CDEC	USGS NWIS
Electrical Conductivity	Methods		moored flow-		Surface	Surface	sfc			sfc	sfc	1m below	sfc	@ 25 deg.
	Units	uS/cm	uS/cm		uS/cm	uS/cm	uS/cm			uS/cm	uS/cm	uS/cm	uS/cm	uS/cm
	Frequency	monthly	contingent with sampling period			each trawl & seine						monthly	hourly, daily, and event	15 m
Chlorophyll A	Methods		extracted											in-situ, IVF
	Units		ug/L									ug/L	ug/L	
	Frequency												event	
Turbidity	Methods		discrete											event
	Units		NTU			NTU						NTU	NTU	
	Frequency		contingent on			contingent on						monthly	hourly	

	GEOGRAPHICAL EXTENT	TIME FRAME	METHODS-FISH CATCH	METHODS-ZOOPLANKTON	METHODS-PHYTO	METHOD-WATER QUALITY	RESULTS-UNITS
Factors affecting distribution and abundance of fish prey within the Cache-Liberty Complex, Part of: Extending the Arc Study [Peter Moyle and Jon Durand]	Suisun Marsh upstream along the Sacramento River to the Yolo Bypass, including the confluence of the Sacramento and San Joaquin river, the Cache Slough Complex, Liberty Island, Little Holland Tract, the Toe Drain, and the Deepwater Shipping Channel, 32 Sites Total	2012-2015	Fish surveys: otter trawling, beach seining minnow trapping, boat electrofishing, fyke netting, and mark-recapture via passive integrated transponder (PIT) tags.	With a 63-mm net with a 0.5-m mouth and 2-m length, Duplicate samples were collected by 5-min oblique tows, Results of community structure reported as Density (individuals/m ³)	estimated by Chi-a concentration	Continuous chi-a measurements taken along zooplankton sampling transects using a flow-through system. Turbidity, specific conductivity, and DO were also taken along the transects	Catch and CPUE
Factor Affecting the abundance, Community Composition, Distribution, Availability and Timing of Food for Native Species in Liberty Island [Charles Simenstad and Lori Smith]	Larval trawls around the border of Liberty Island, beach seines in Liberty Island as well as several locations in waters feeding into Liberty Island, random sampling locations within Liberty Island	2014-present	Surface trawls: 500 µm mesh, Feb. June. Fish ID conducted using DJFMP protocols	Physical-chemical parameters recorded with net tows. stable isotopes			CPUE= (Total flow meter value) x (mouth area of net) x (K factor).
20mm Survey [CA DFW]	Eight sites in the CSC. Every neap tide between March and July	8-10 annually, ongoing	8-10 larval fish trawls per year with a 20mm mesh net	Zooplankton tows collected simultaneously to fish surveys using a Clarke-Bumpus net (0.160-mm mesh nylon cloth, outer mouth diameter of 12.5 cm, 76-cm length screened with 0.150-mm mesh). Volume was recorded using a flow meter)		surface EC and surface temperature measured concurrently with trawls	CPUE=fish /10,000m ³ water



How is the Portal is Organized?

Catalogs (Geo-Located Everything)

Store and help organize content throughout the site. Catalogs are organized into the categories but can be expanded or condensed.

Projects

While officially a type of catalog, projects are organized to showcase project details according to the amount of project information a user has.

Explore Data

Explore monitoring programs and key datasets from the region.

Interactive Map Tools

Tools to explore the Cache region spatially. Layers can be combined and saved to be used with projects, data stories, maps stories, dashboards and more.

Data Stories

Portal topics (questions) are organized here. Data story templates combine storytelling and data dashboards.

Data Dashboards

Compilations for easy display and discovery of data.

Community

Share and collaborate with colleagues.





Catalogs (Geo-Located Everything):

Store and help organize content throughout the site. Catalogs are organized into the following categories but can be expanded or condensed:

Document Library


GIS

Projects

Resources Wiki


Data Catalog

Presentation Tools




Endangered Fishes and the Delta
Peter Moyle, UC Davis
[PDF]
Nov 10, 2014 10:58 PM
application/pdf

Pdf Tools




Anadromous Salmonids in the Delta: New Science 2006-2014
Perry, Russell W., Buchanan Rebecca A., Brandes, Patricia A., Burau, Jon R., Israel, Joshua A.
Peter Moyle and John Durand

Pdf Tools




Extending the Arc: Understanding the importance of freshwater tidal habitat and changing environmental conditions to native fish populations of the Delta
Peter Moyle and John Durand

Pdf Tools




Delta Smelt: Life History and decline of a Once Abundant Species in the San Francisco Estuary
Moyle, Peter B., Brown, Larry R., Durand, John R., Hobbs, James A.
[PDF]
Nov 10, 2014 10:51 PM
application/pdf

Pdf Tools

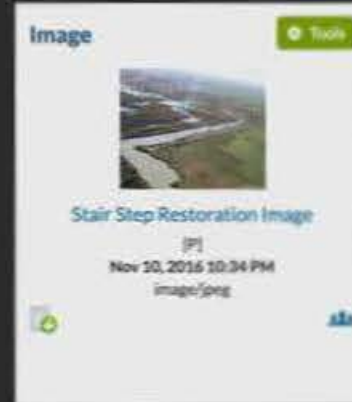
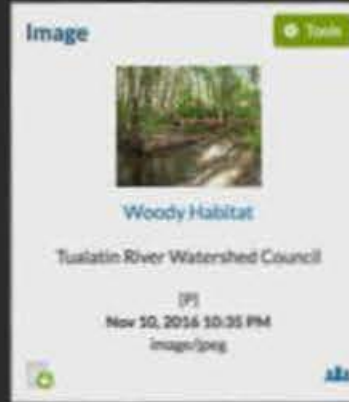


The importance of vegetated ponds to water quality and phytoplankton carbon production in Liberty Island, California
Lehman, P.W., S. Mayer, B.A. Larsen and M. Dempsey
[PDF]
Nov 10, 2014 10:51 PM
application/pdf

Pdf Tools



BDCP Bay Delta Conservation Plan Executive Summary
[PDF]
Nov 10, 2014 10:50 PM
application/pdf





Water Hyacinth

Water hyacinth (*Eichhornia crassipes*) is a floating aquatic plant with bright green, waxy leaves and attractive, violet flowers that have yellow stripes on the lower petals. Hyacinth is native to Brazil and has become widespread on a global scale, first...

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Delta Smelt

The delta smelt is a small, slender-bodied fish with a typical adult size of 2-3 inches (55-70mm standard length) although some may reach lengths up to 5 inches (120mm). Live delta smelt have a steel blue sheen on the...

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Water Quality

The CALFED Water Quality and Ecosystem Restoration programs aim to improve Delta water quality for all uses in Delta. Delta related, drinking water, environmental and agricultural uses. The Water Quality Program focuses on the use of the Delta water for drinking and...

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Tule (*Schoenoplectus californicus*)

A dominant inter-tidal vegetation is bulrush, locally called tules (*Scripus californicus* and *S. acutus*). Natural evulsion control is achieved by tules which grow in the intertidal zone and function as "ecosystem engineers". The tule culm is fast growing...

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Woody Habitat

Dead wood, both standing and down, serves as important wildlife habitat. Wildlife evolved in forests where dead wood was never removed in the name of woodland management. The increasing demand for forest products has, in many instances, resulted in a...

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Hyalella azteca

Hyalella azteca is a 1/8- to 1/4 inch-long crustacean commonly found in lakes, ponds, and streams throughout North America. They are an important link in the aquatic food chain and a food source for several predators, including fish and various river invertebrates.

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Integrated chemical and genomic assessment of contaminant effects..

Our general objective is to protect fish populations..

Winter storms provide a mechanism for off-site movement of pesticide residues from urban areas of Vacaville and agricultural lands within the Ukiah Creek watershed. These residues enter Ukiah and New Adams Creek via runoff and are then transported to the...

[Read More](#)



Factors Affecting the Abundance, Community Composition, Distribution, Availability..

In collaboration with the US Fish and Wildlife..

In addition to the physical and hydrological transformations that have altered the landscape configuration of the Sacramento-San Joaquin Delta that historically supported fish spawning, rearing, and migratory habitats, the Delta's food web production and linkage appear to have withered commensurately...

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Dynamics of Zooplankton in the Cache Slough Complex

Our purpose is to investigate what controls the distribution and abundance of fish prey within the Cache Slough Complex (CSC). We assume that the principal fish of concern there is delta smelt, which feeds mainly on zooplankton. Our key question...

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Cache Collaborative

The Sacramento - San Joaquin Delta has been described as food limited and tidal wetland, where restoration is being exhibited as a means to increase food resources and productivity for fish species of concern. The Cache Slough Complex (CSC) includes...

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SFCWA Project Library
Updated November 2012

This is a syndicated document and project library from the State and Federal Contractors Water Association. The State and Federal Contractors Water Agency was formed in August of 2009 as a Joint Powers Authority under California law by various water agencies...

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Salinity in the Bay Delta

Salinity is simply a measure of the amount of salts dissolved in water. Salinity is usually expressed in parts per thousand (ppt) or 0/100. Fresh water in rivers has a salinity of 0.3 ppt or less. Within an estuary, salinity...

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Extending the Arc: Understanding the importance of freshwater tidal habitat and changing environmental conditions to native fish populations of the Delta.

Deliverables: Hydrodynamic and water quality models of the local region; scientific paper(s) and reports describing the effects of hydrodynamics on water quality, food web production, and the potential for intertidal and subtidal habitat restoration in the region

Status: Initiated October 2014

Primary Investigator: Peter Moyle and Jon Durand

Recipient Organization: University of California, Davis

Project Cost: \$230,649

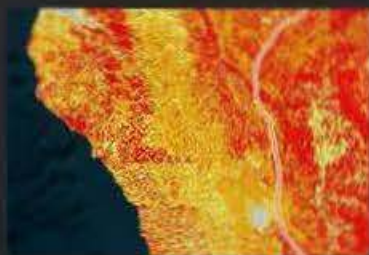
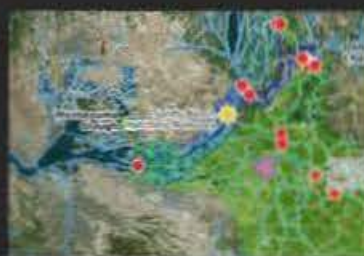
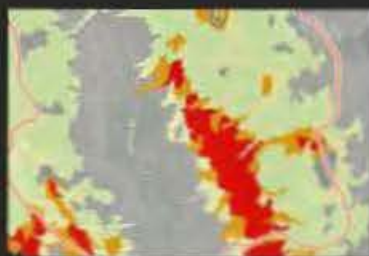
SFCWA Funding: \$230,649

Partners: California Department of Fish and Wildlife



The UC Davis team will study how physical habitat, hydrodynamics, water quality conditions and food webs support native fishes of the Cache-Lindsey Complex (CLC), including the lower Yolo Bypass. The region includes an extensive network of remnant and altered tidal wetlands, sloughs, and canals. Zooplankton densities in the region are often an order of magnitude higher than the central Delta and Suisun Marsh, attracting high densities of planktivorous fish. It is likely that the spatial complexity and food web resources provide a seasonal and year-round refuge for both migratory and resident native fishes (e.g., delta smelt, juvenile Chinook salmon, tule perch). Scientists and managers are thus interested in restoring large tracts of tidal habitat in the region





Tools to explore a region spatially
Layers can be combined



Source: California Department of Fish and Wildlife

Stair-step Vegetation





Data Providers:

Data is aggregated from stakeholders throughout the region:

Hydrologic
Water Quality

Terrestrial
Satellite

Meteorological
Volunteer Sampling



Food Web

EMP Zooplankton Monitoring	Recent and historic zooplankton monitoring and environmental data at discrete location in the Delta	CA DFW
EMP Discrete Water Quality Monitoring	Recent and historic water quality monitoring discrete location in the Delta (Key parameters: Secchi Depth, Temperature, Tide, Wind, Electrical Conductance, and pH)	DWR
CEDEN Benthic		CEDEN
CEDEN Habitat		CEDEN
CEDEN Water Quality		CEDEN
CEDEN Toxicity		CEDEN
CEDEN Tissue		CEDEN
CA DFW Fish Monitoring	Recent and Historic Catch data (fish and other aquatic organisms) and environmental data from multiple CA DFW Surveys, including: Spring Kodiak Trawl, Fall Midwater Trawl, 20 MM Trawl, Summer Towner, Smelt Larval Survey and San Francisco Bay Study	CA DFW



Real-time data sensors parameters include:

Electrical Conductivity

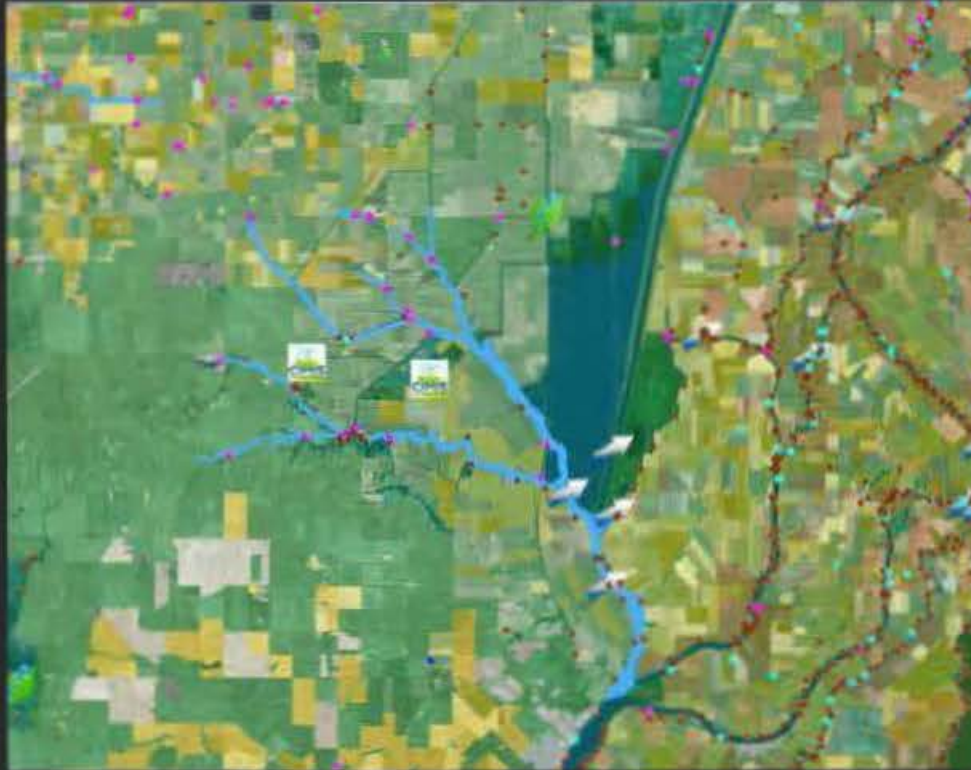
Turbidity





















River Stage

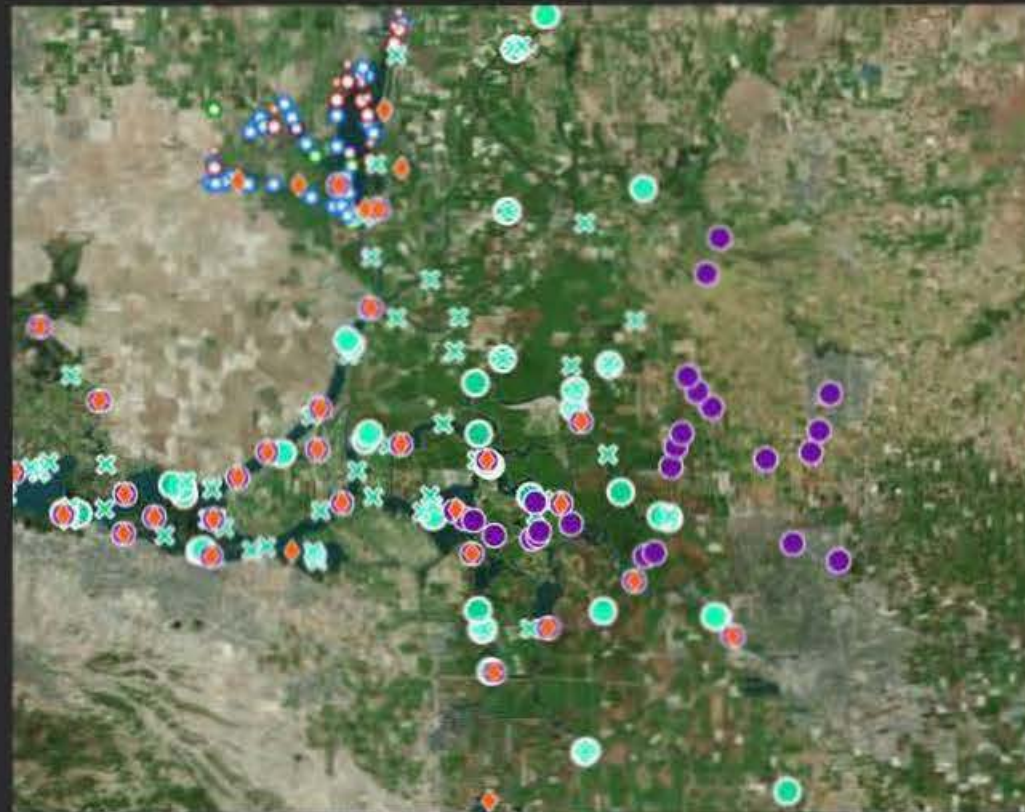
Flow

Water Temperature

Combine with GIS layers of key locations in the Cache Slough Complex and the surrounding areas.



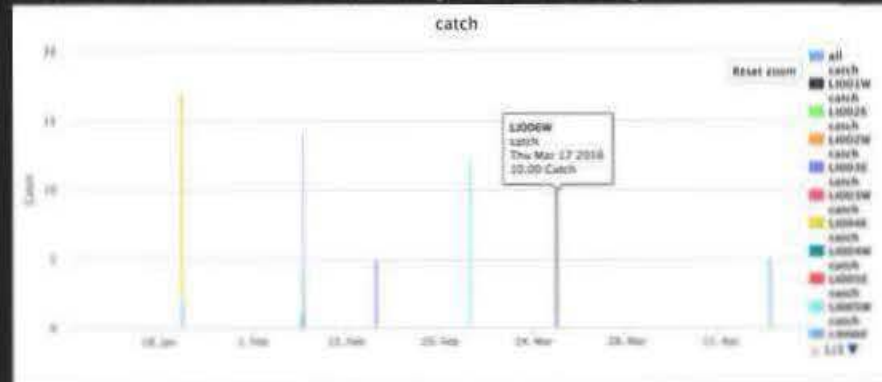
 Cache Collaborative Monitoring Stations	
 Sherwood Harbor Trawl	 Sherwood Harbor Trawl
 20mm Trawl Stations	 20mm Trawl Stations
 SKT Stations	 Spring Kodiak Trawl Stations
 EMP Stations by Historic vs Active	 Active Station  Historic Station
 Mossdale Trawl	 Mossdale Trawl
 Liberty Island Seines (Smith and Simenstad)	
 Arc Study (Durand and Moyle)	
 Contaminant Effects on Fish Prey (Weston, Young, Poynton)	
 Flux Study (Kimmerer and Bergamaschi)	

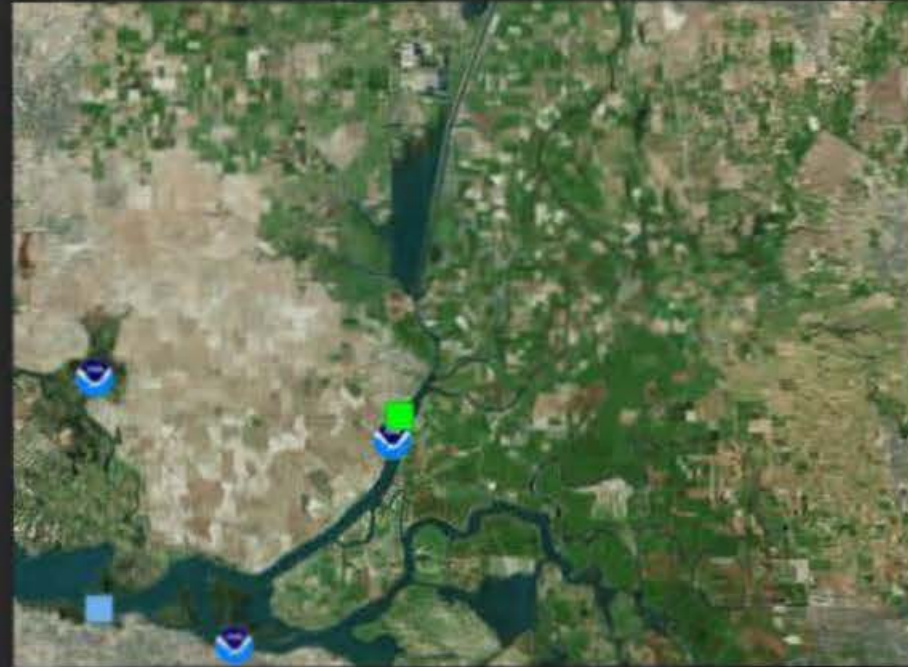


Chinook salmon caught in Liberty Island Beach Seines in the past year

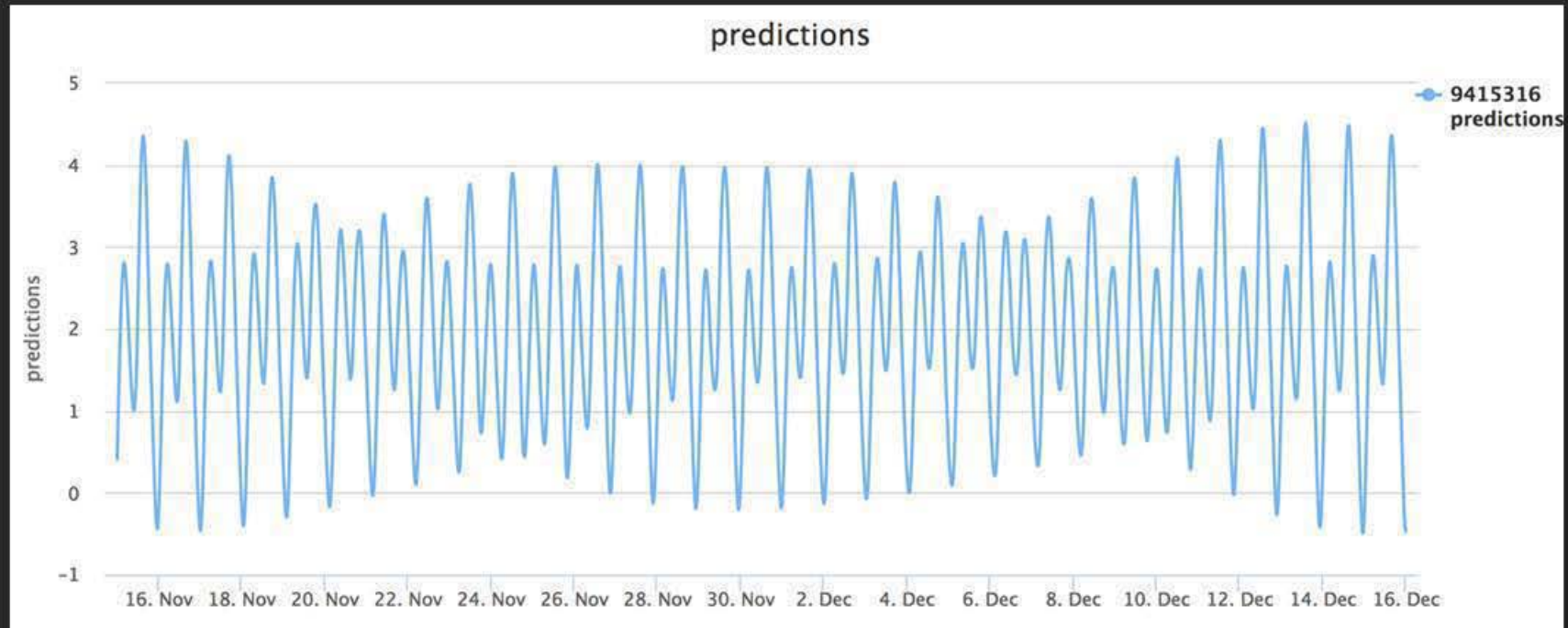


Chinook salmon caught in Liberty Island Beach Seines January 2016-May 2016

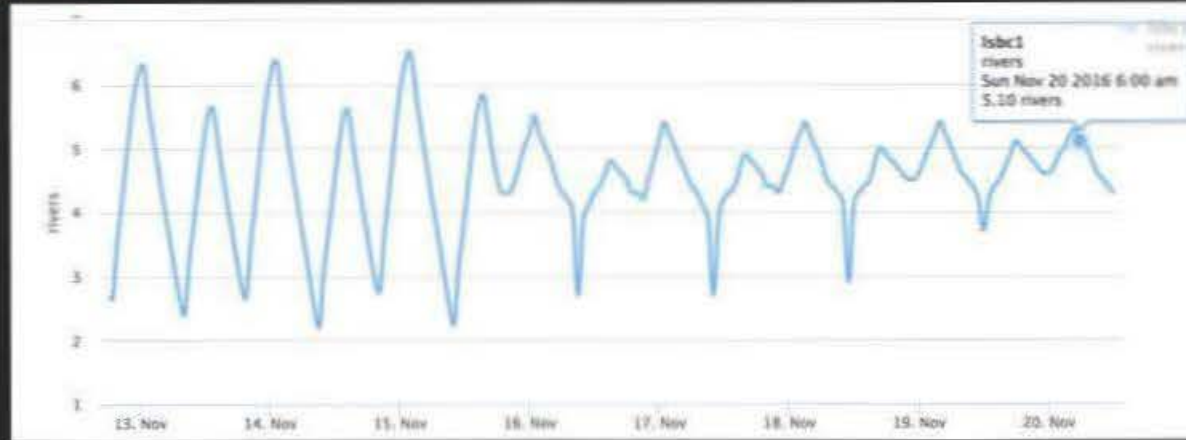




Tide and River Forecast Locations



Rio Vista Tide Prediction for the next 30 Days

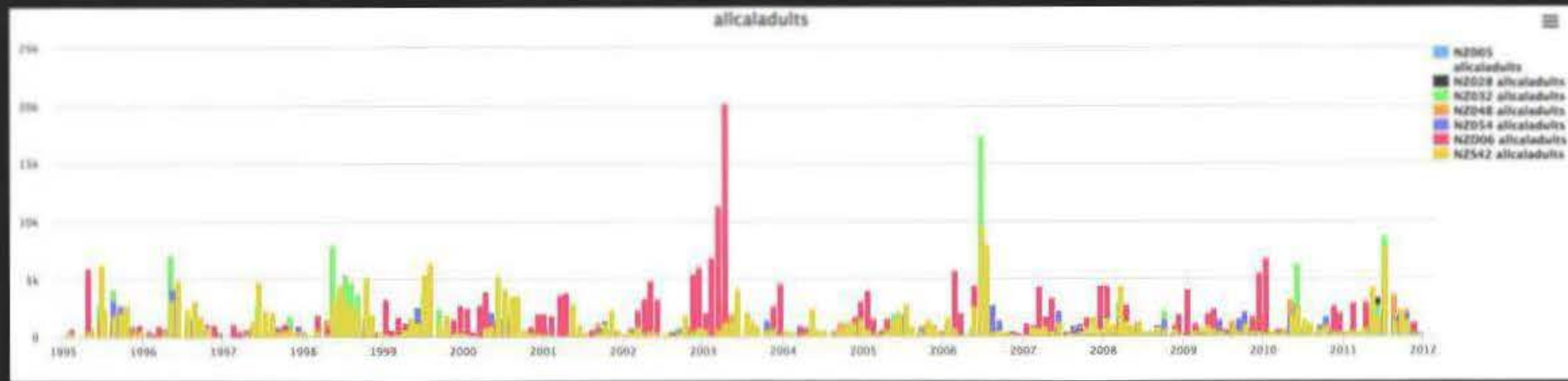


Yolo Bypass River Forecast

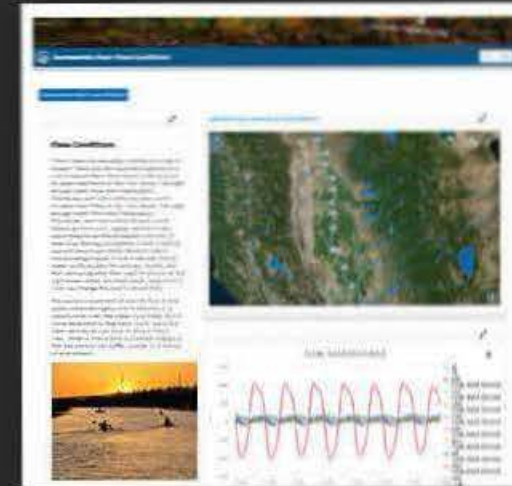
Rio Vista River Forecast







**Adult Calenid Copepod abundance in Suisun Marsh
and Surrounding Region 1995-2012**



Project Specific Data Dashboards



Connecting Scientific Research Projects and Data Thoughts Software

An Opportunity for Collaboration and Data Synthesis





Contact Us



12277 Soaring Way Suite 107

Truckee, CA 96161

www.34north.com

(530) 587-3434





Various Stakeholder Requirements
Regional Data
Region Specific Data Analysis
Local Mapping and GIS
Regional Document Libraries
Share data and products with other portal's for system wide view

Stakeholder Specific Data Dashboards
Tool for Local Ecosystem Projects
Special Studies
Regulatory Reporting
Web Service Development