BAY-DELTA LIVE

34NORTH
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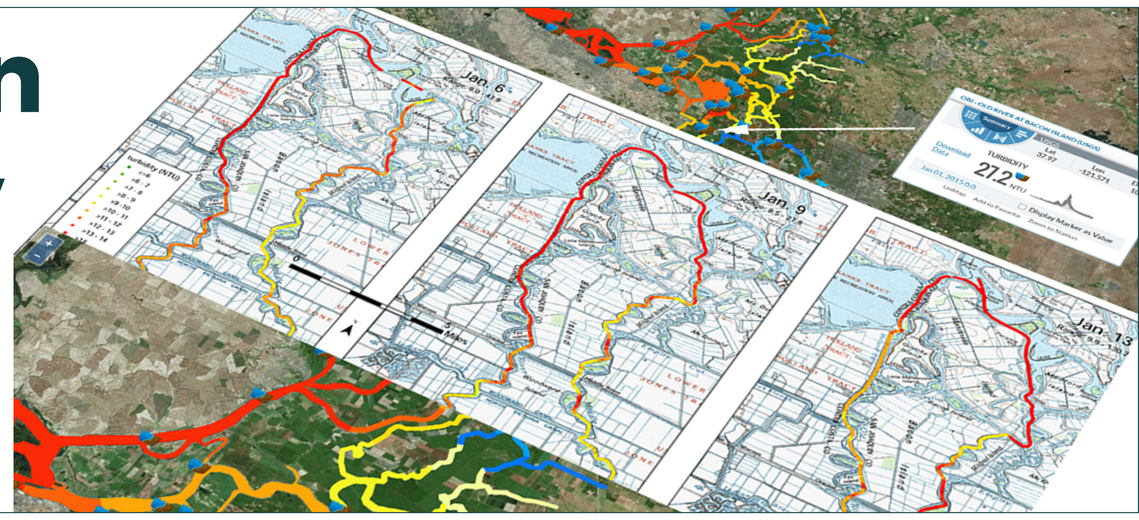
Sacramento San Joaquin Bay-Delta Water Quality Constituent Tracker and Decision Support



In collaboration with USGS and DWR, this research and development project will advance the Bay-Delta Live data management platform to provide data and decision support tools for viewing and analyzing continuous water quality conditions at finer spatial scales within the Delta. We envision that, once developed and demonstrated, this numerical model implemented within the BDL data platform may be incorporated into existing monitoring programs to evaluate current conditions, assess turbidity and nutrient conditions, supplement and replace DWR early warning turbidity transect operations, as well as help to evaluate changes due to wetland restoration, flow alteration and other management actions.

Modeling of Expected Constituent Concentration Field

The ability to quantitatively understand constituent dynamics in the Delta is hindered by the ability to accurately calculate and visualize data from the existing flow measurement network (USGS and DWR collect flow (stage, velocity, discharge)). Current spatial distribution plots (www.baydeltalive.com/turbidity)show that constituent distributions in the Delta appear to be well-behaved fields when in fact the spatial constituent gradients vary significantly over the tidal excursion. These current methods of interpolation yield the approximate spatial distribution of constituents, but for management action and water operations, the true details of the gradients in the constituent fields are needed. To accomplish this goal, USGS is developing a 1D transport equation and data assimilation method (funded by DWR and DSP) to fill in the details of the spatial structure in the constituent fields between sampling stations in the North Delta using a conservative tracer. Building on the USGS transport equations and techniques, 34 North will develop a web based real time tool to visualize the detailed constituent field throughout the Delta. While the algorithms will be most accurate in the North Delta, stakeholders will be able to explore spatial maps throughout the watershed where continuous monitoring is present. Additionally, 34 North will incorporate the DWR turbidity transect operations data for viewing and assessing early warning programs.

What Decisions Must Be Made?

Real-time delta hydrologic operations decisions to protect endangered and threatened anadromous fish species. These management decisions for threatened and endangered species must be balanced with water supply and quality regulations.

About BDL

Bay-Delta Live is a decision support data platform that serves a robust scientific community with the goal of expanding open and transparent sharing of information essential in understanding the complex and dynamic hydrodynamics and water quality conditions of the Sacramento-San Joaquin Rivers and Bay Delta. Bay-Delta Live federates information from hundreds of disparate data sources and displays the data using enhanced visual interfaces. The platform provides resource managers, scientists, conservationists, policy makers, academics, and other stakeholders with tools for collaborative resource management, monitoring, and reporting. Support for BDL is provided by financial contributions from Non-profits, Federal, and California State Agencies.

Project Highlights

- ✔ Develop pilot-level data aggregation tools, databases, real-time data processing procedures to operationalize real time sensor nextwork.
- ✔ Implement transport equation models and information dissemination techniques in collaboration with DWR and USGS.
- ✔ Provide pilot feasibility study to supplement and replace DWR turbidity transect operations.
- ✔ Provide stakeholders with data dashboards and visualizations for easy access to data and spatial maps.
- ✔ Development of machine learning techniques for improving details of the spatial structure.
- ✔ Set up routines for daily map production and reporting at key locations.
- ✔ Integration of fisheries and operations data.
- ✔ Provide feasibility and recommendations for implementation in Central Delta.

Data

Ops, Hydrodynamic and Water Quality Data

- ✔ NDOI, X2, QWEST, Pumping, Percent Inflow Diverted, Unimpaired Runoff, Total Delta Inflow, OMR Index, and Delta Conditions
- ✔ National Water Information System (USGS NWIS): Turbidity, Electrical Conductivity and Flow
- ✔ California Data Exchange Center (CDEC): Flow, Temperature, Electrical Conductivity, Turbidity
- ✔ NOAA Tide and River Forecast Data

Fisheries Data

- ✔ USFWS Delta Juvenile Fish Monitoring Program
- ✔ USFWS Enhanced Delta Smelt Monitoring

Data Providers and Project Collaborators

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