



CEDEN

CALIFORNIA ENVIRONMENTAL DATA EXCHANGE NETWORK



The California Environmental Data Exchange Network (CEDEN): A Statewide Water Quality Monitoring and Visualization System for California

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Everyone needs data!

California has:

- 🌍 211,000 miles of rivers and streams
 - 🌍 1100 miles of coastline
 - 🌍 1.6 million acres of lakes
 - 🌍 1.3 million acres of bays and estuaries
- 🌍 Annually – 15 million acre-feet of groundwater extracted

Everyone needs data!

... but

Everyone needs data!

... but

that data must be ...

Everyone needs data!

... but

that data must be ...

GOOD DATA!

(comparable and of known quality)

The Water Quality & Ecosystem Information Problem



8th National Monitoring Conference
May 2, 2012 – Portland, Oregon



WHY CEDEN?

CEDEN consolidates California's data in a central location, where it can be easily accessed by resource managers, scientists, citizen groups, and the public for reports and research purposes.

CEDEN is consolidating data from:

- Local, State and Federal Agencies
- Tribal Governments
- Citizen Monitoring Groups
- NGO's
- Private firms

CEDEN Structure

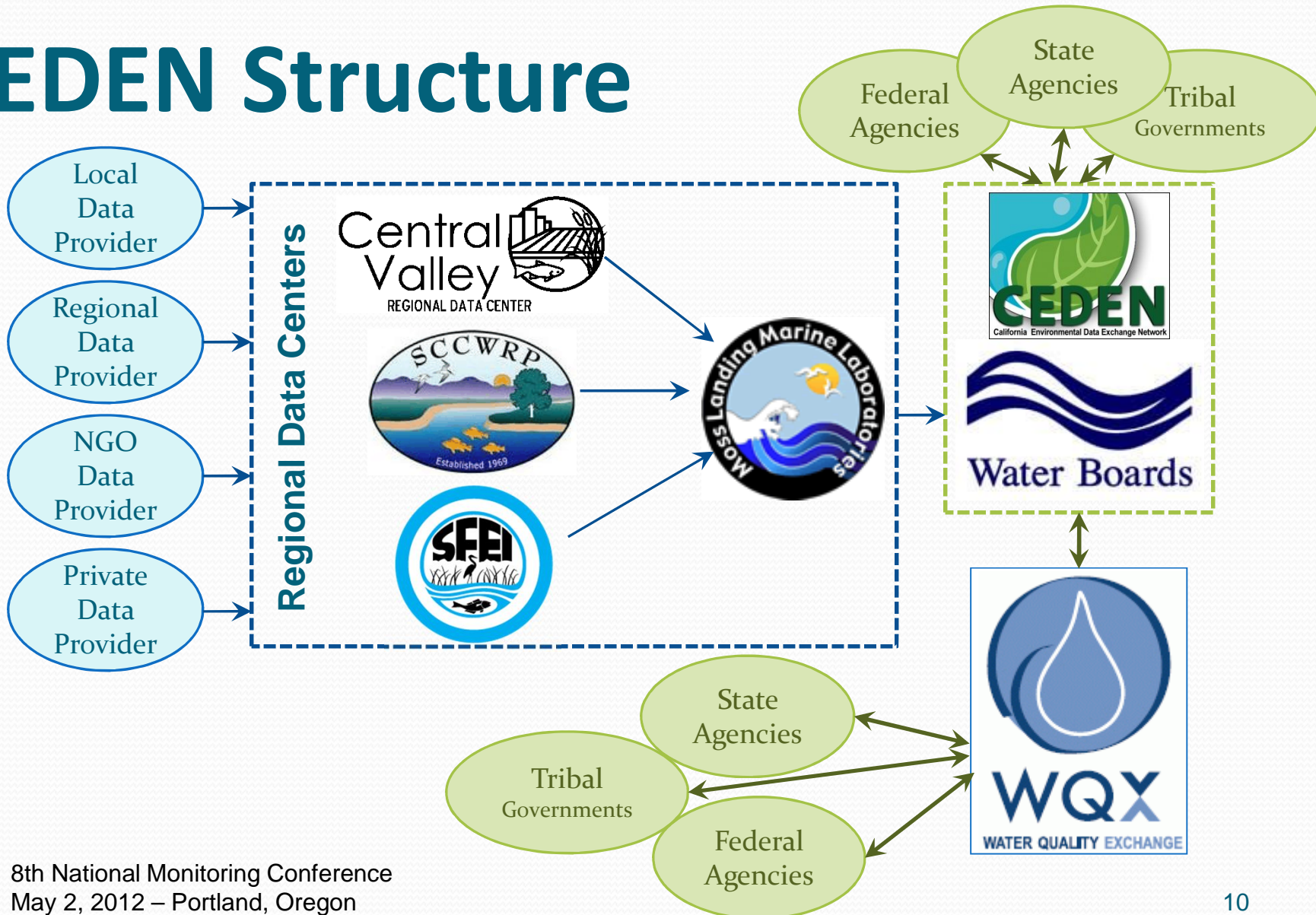
- Institutional support for development came from multiple programs
- Driven by need for these data for regulatory processes and analysis



CEDEN Structure

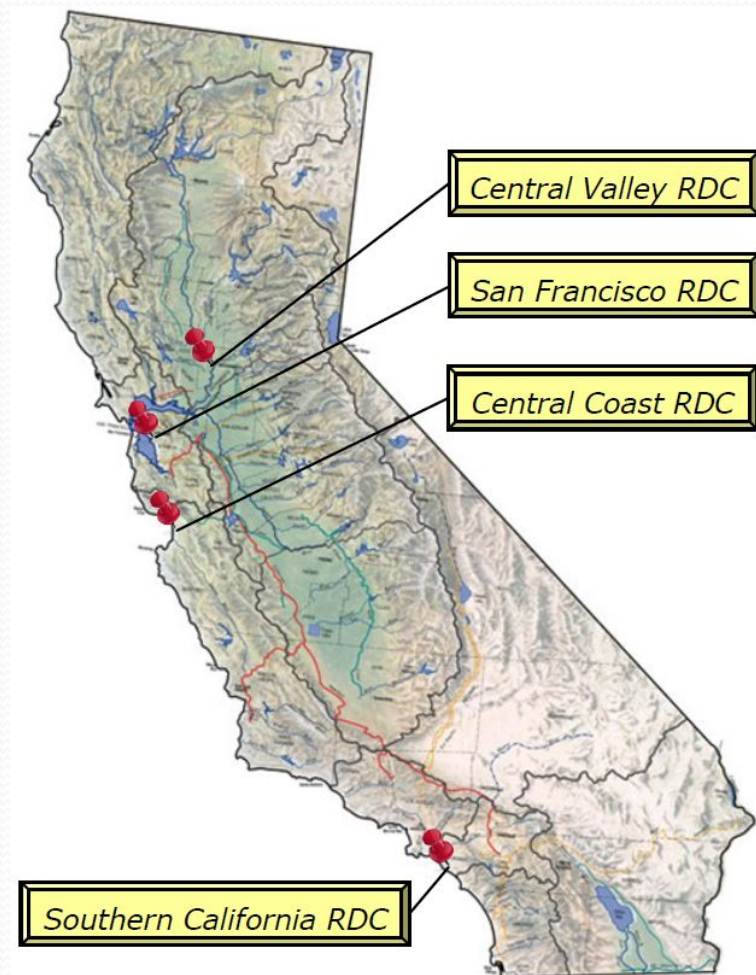
- 🌱 Avoid the big database in the cloud!
- 🌱 Instead:
 - 🌱 Take advantage of what already exists:
e.g. dbases and web services available from larger data providers
 - 🌱 House data within CEDEN where appropriate
 - 🌱 Entities w/o sufficient internal capacity
e.g. smaller, government agencies, tribes and non-profits

CEDEN Structure



Regional Data Center Model

- Provide local, user-centric support to data providers.
 - Built RDCs upon known/trusted organizations
 - Leverages expertise re: data types/methods
 - Allows the State to focus on its strengths, analytical and policy needs



All data is spatial

- Defined data templates:
 - Include: feature geometry, lat/long, datum, and a variety of geographic names (local, GNIS, etc.)

Standard Names and Codes

CEDEN has developed a list of standard names and codes for describing data, called "Valid Value Lists". This makes your data understandable to others and increases comparability among different data sources. The lists assist in matching your data with the valid value lists.

CE DEN Controlled Vocabulary

Choose which controlled vocabulary you want:

Do you also want to include all optional metadata values?

Choose the type of format you want:

Get Data

A screenshot of a web application interface showing a dropdown menu. The menu is open, displaying a list of terms: Agency, Analyte, BatchVerification, CollectionDevice, CollectionMethod, Constituent, DataCompliance, DigestExtract, Event, Fraction, LabSubmission, LifeStage, Location, Matrix, Media, Method, Organism, ParentProject, Program, and Project. The 'Agency' option is currently selected and highlighted in blue. To the right of the dropdown, there is a small text prompt that says 'Please choose'.

New values are added to the lists each week as they are updated in the database. If there are additional values you would like to suggest for inclusion, please contact the CEDEN Help Desk: 831-771-4114.

Data templates/vocabulary

- Benthic Template
- Field Collection and Results
- Chemistry Data
- Toxicity Data
- Tissue Data
- Taxonomic Data



- **Controlled Vocabulary**
for data maintained in
the CEDEN system
 - Analytes
 - Methods
 - QA

Additional Data Structures

- Database does NOT currently contain all data types needed by users (system updated weekly)
 - Examples of additional data types:
 - Emerging contaminants
 - New variants of existing categories
 - Other biotic communities (focus has been freshwater)
 - New methods (gear, QA protocols)
 - New categories (marine debris, invasive species, etc.)

How is CEDEN being used?

 Our primary clients (at present) are:

-  State Water Quality Control Board/EPA

-  California Water Quality Monitoring Council

-  Citizen Monitors

-  Public

Partnerships

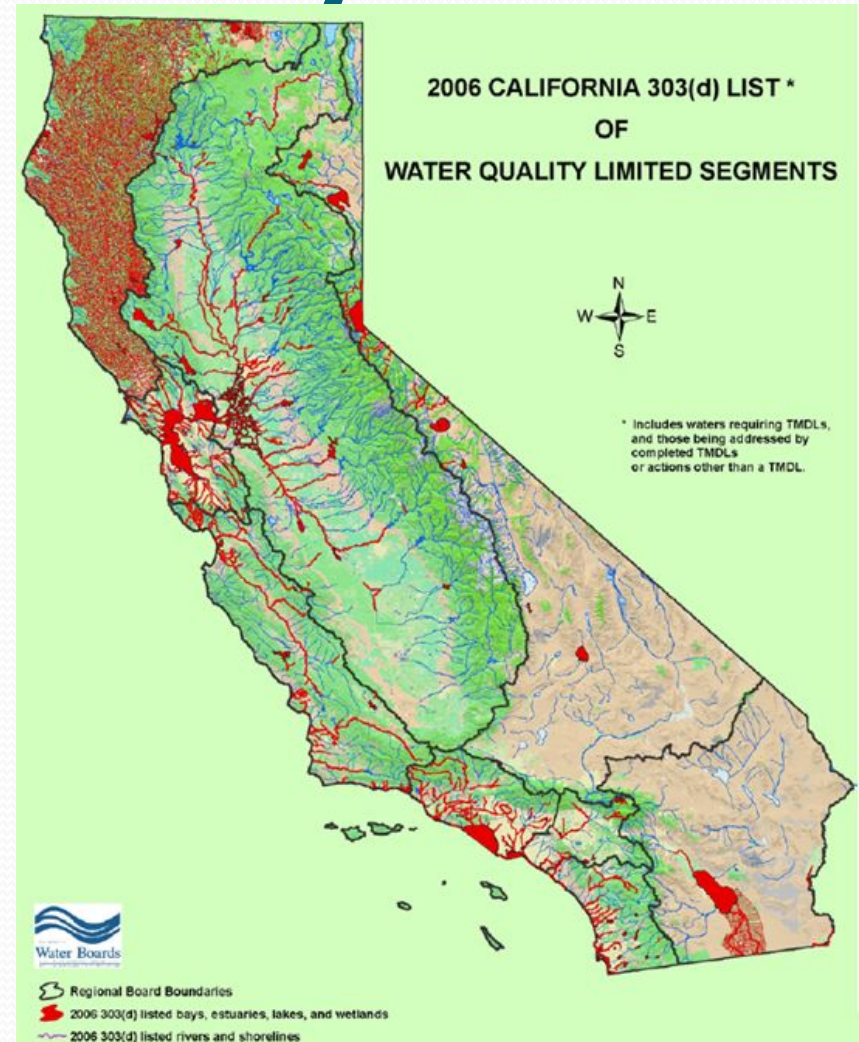
- 🌍 Other entities have similar missions (data collators)
- 🌍 We are consciously focused on working with potential partners
 - 🌍 Identify and prioritize where and how CEDEN will collaborate
 - 🌍 Avoid duplication of efforts
 - 🌍 Share knowledge and resources

State/EPA: regulatory use

- Clean Water Act 303(d) and 305(b) listings:
 - Section 303(d) of the federal Clean Water Act require states to identify **waterbodies that do not meet water quality standards** and are not supporting their beneficial uses.
 - The Section 305(b) report describes the current conditions of the state's waters to the U.S. Congress and the public. It is a state-wide assessment of the status of **all the state's waters**.

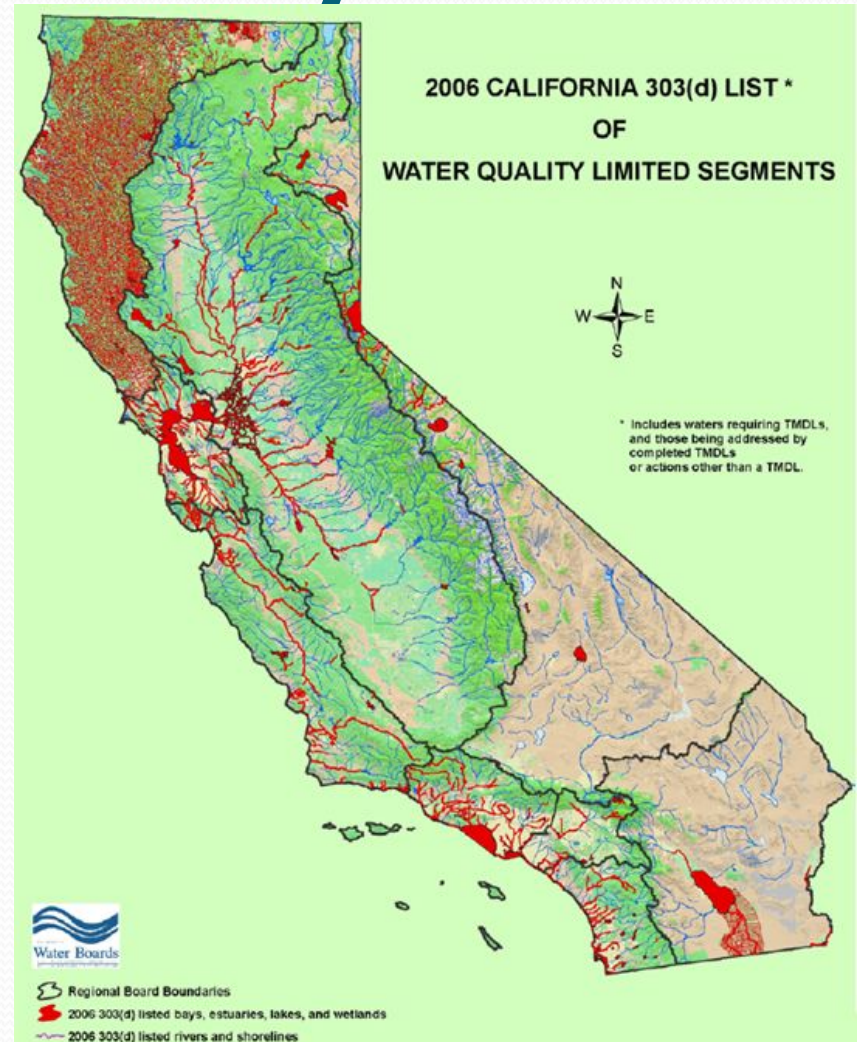
State/EPA: regulatory use

- 🌿 ...or in other words...
...to improve this map!



State/EPA: regulatory use

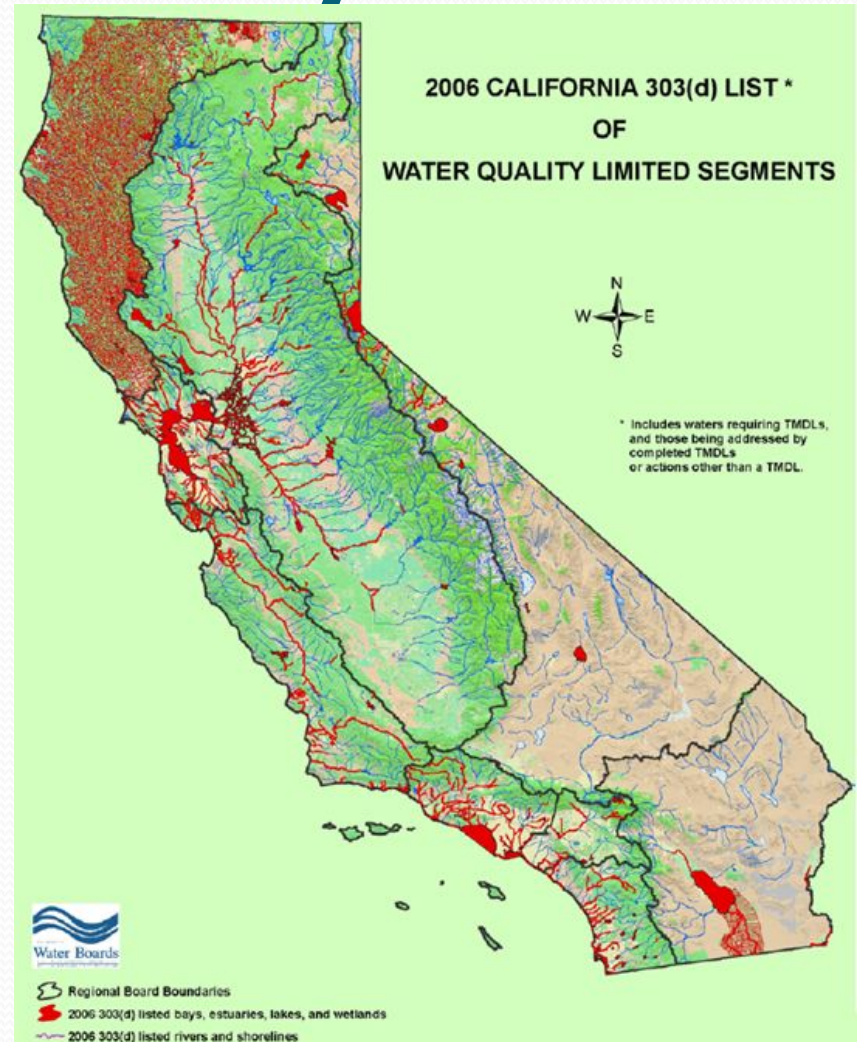
- 🌍 ...or in other words...
- ...to improve this map!
- ...but not just the map



State/EPA: regulatory use

- ...or in other words...
 - ...to improve this map!
 - ...but not just the map

- Also: quality, consistency and transparency of the data and analysis leading to its creation



Water Quality Monitoring Council

- Established via State legislation in 2007 to:

Improve the coordination and cost-effectiveness of water quality and ecosystem monitoring and assessment, enhance the integration of monitoring data across departments and agencies, and increase public accessibility to monitoring data and assessment information.



Water Quality Monitoring Council

- CEDEN was viewed as an optimal mechanism to help facilitate this mandate:
 - Enhance the integration of monitoring data across departments and agencies
 - Increase public accessibility to monitoring data and assessment information



Increase public accessibility

CA.GOV State of California ENVIRONMENTAL PROTECTION AGENCY NATURAL RESOURCES AGENCY CALIFORNIA WATER QUALITY MONITORING COUNCIL

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California This Site

Home Safe to Drink Safe to Swim Safe to Eat Fish Ecosystem Health Stressors & Processes Contact Us

My Water Quality | Monitoring Council | This site is hosted by the Surface Water Ambient Monitoring Program (SWAMP) |

Office of Governor Edmund G. Brown Jr. Visit his Website


- Cal/EPA
- Natural Resources Agency
- About the California Water Quality Monitoring Council
- Web Portal Partners
- Monitoring & Assessment Programs, Data Sources & Reports
- Water Quality Standards, Plans and Policies
- Regulatory Activities
- Enforcement Actions
- Research
- State & Regional Water Boards
 - Performance Report
 - About SWAMP
 - SWAMP Tools

SWAMP Surface Water Ambient Monitoring Program


Welcome to My Water Quality

This web portal, supported by a wide variety of public and private organizations, presents California water quality monitoring data and assessment information that may be viewed across space and time. Initial web portal development concentrates on four theme areas, with web portals to be released one at a time. Click the [Contact Us](#) tab for more information.

The Monitoring Council seeks to provide multiple perspectives on water quality information and to highlight existing data gaps and inconsistencies in data collection and interpretation, thereby identifying areas for needed improvement in order to better address the public's questions. Questions and comments should be addressed through the [Contact Us](#) tab.




IS OUR WATER SAFE TO DRINK?




Safe drinking water depends on a variety of chemical and biological factors regulated by a number of local, state, and federal agencies. [\[Future Portal\]](#)

IS IT SAFE TO SWIM IN OUR WATERS?




Swimming safety of our waters is linked to the levels of pathogens that have the potential to cause disease. [More >>](#)

IS IT SAFE TO EAT FISH AND SHELLFISH FROM OUR WATERS?




Aquatic organisms are able to accumulate certain pollutants from the water in which they live, sometimes reaching levels that could harm consumers. [More>>](#)

ARE OUR AQUATIC ECOSYSTEMS HEALTHY?



The health of fish and other aquatic organisms and communities depends on the chemical, physical, and biological quality of the waters in which they live. [More>>](#)

WHAT STRESSORS AND PROCESSES AFFECT OUR WATER QUALITY?



Beneficial uses of our waters are affected by emerging contaminants, invasive species, trash, global warming, acidification, pollutant loads, and flow. [\[Future Portal\]](#)

(Updated 5/13/11)

How will CEDEN be used?



- A variety of applications “Powered by CEDEN”
 - Analytical tools to provide assessments and indices
 - Data filtering tools to facilitate spatial, temporal and attribute based queries
 - Additional council portals continue to be developed
 - Are our aquatic ecosystems healthy?
 - Is it safe to eat fish and shellfish from our waters?
 - Is our water safe to drink?



CEDEN

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Find Data

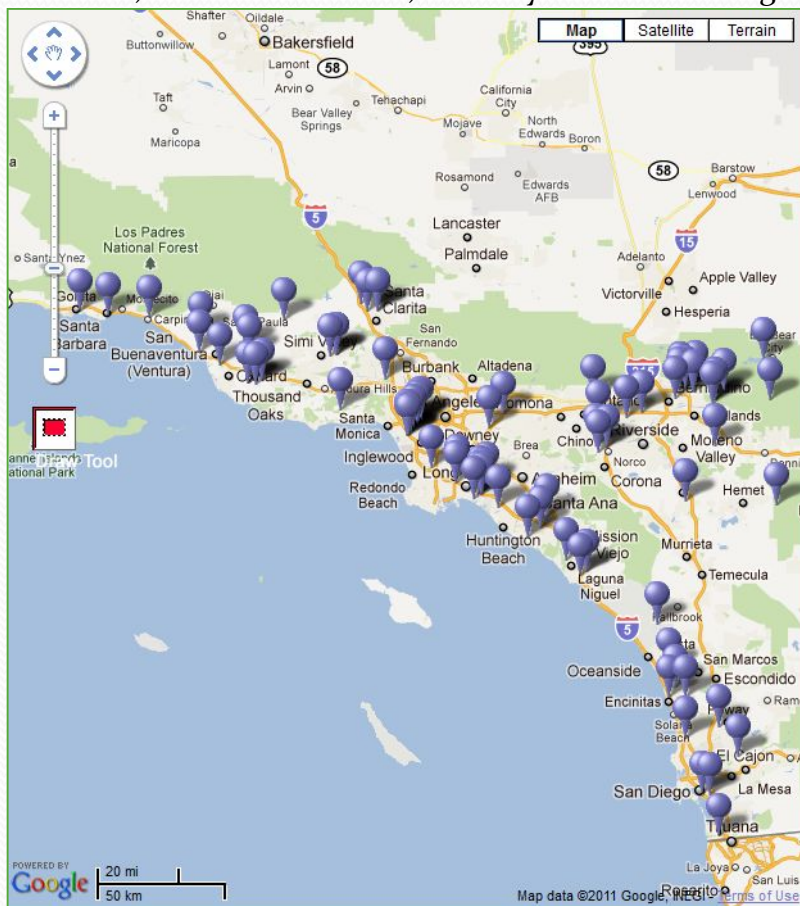
Submit Data

About CEDEN

contact us | site map

Search

CEDEN houses data about California's aquatic habitats and other ambient waters, including lakes, streams, rivers, wetlands, stormwater, treated wastewater, and recycled water dating back to 1950.



RESULT CATEGORY: Water Quality Toxicity Tissue

Turn on automatic station mapping.

Click Map Stations at any time to show stations on the map

START OVER **MAP STATIONS** **HELP**

Programs **SELECT** Southern Ca. Stormwater Monitoring Coalition
Surface Water Ambient Monitoring Program

Projects **SELECT** So. Ca. Stormwater Monitoring Coalition Project
SWAMP Monitoring
SWAMP Stream Pollution Trends

Parameter Groups **SELECT** Do not limit search by Parameter Groups

Parameters **SELECT** Do not limit search by Parameters

Matrixes **SELECT** Do not limit search by Matrixes

Stations **SELECT** A-1
ACJ01
Agua Hedionda Creek 6
Arroyo Simi @ Tapo Upper
Atascadero Creek at Ward Drive
Ballona Creek @ Centinela
Ballona Creek Downstream of Sawtelle (Centinella)
Belmont Pump
Bouquet Canyon Creek
Bouton Creek

Include stations that are missing lat/lngs

Available date range: Feb-17-1994 to Jun-10-2008

From: Mar 01 1994 Show QA Lookup
Show Controlled Vocabulary

To: Sep 31 2008 [Clear Dates]

RETRIEVE DATA All Rows Record Count: 18279
 First 1000 Records Only Download Format: excel
 First 30000 Records Only Include QAData

Note: If number of records exceeds 30000, the data will be zipped and emailed to you.

What makes CEDEN successful?

- 🌍 Planning for data acquisition with a distributed locally supported RDC approach has been essential
- 🌍 Data standards are rigorous but not out of reach
 - 🌍 RDC's work hard to make sure support is provided when needed
- 🌍 Leveraging existing systems and knowledge in and out of CEDEN is essential to success, can't be the big database in the cloud
- 🌍 Focus on serving a few well-defined clients and evolutionary growth and development

What's next for CEDEN?

- 🌍 Focus on integration of more data types into CEDEN
- 🌍 Continue to support bringing in additional data providers
- 🌍 Develop new tools to support filtering and query of data
- 🌍 Continue to support the needs of the California Water Quality Monitoring Council
- 🌍 Work with agencies, NGO's and private firms to develop applications "Powered by CEDEN"



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Thank You! Questions?



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