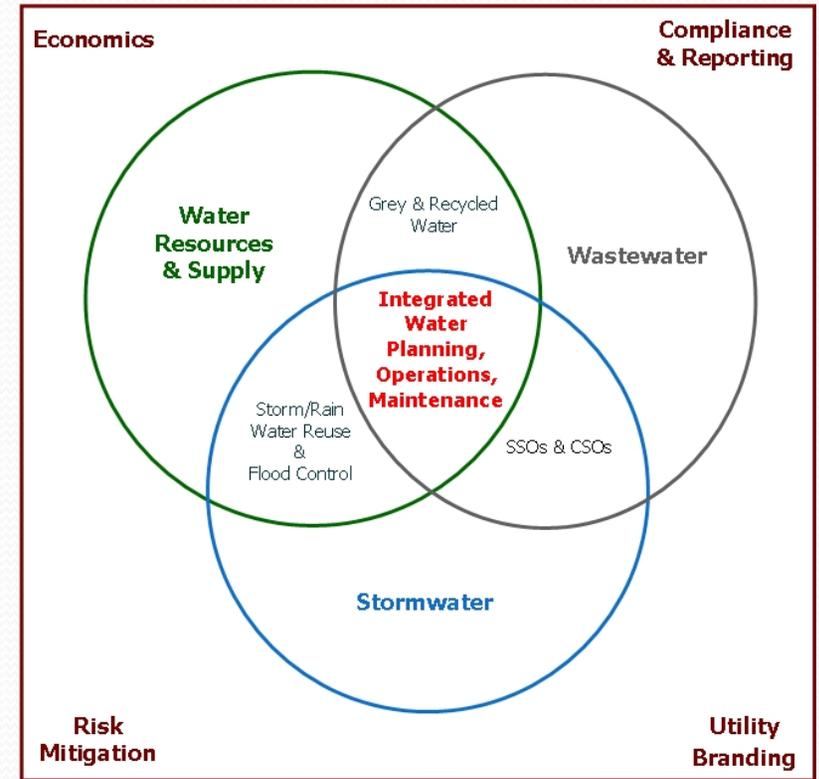
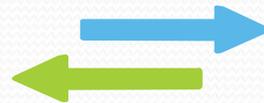


Tools for Integrated Water Quality Management (IWQM): the San Diego Experience



Joe Purohit, Founder, EcoLayers, Inc., Phone: 858 240 2340, Email: Joe@ecolayers.com
Clay Clifton

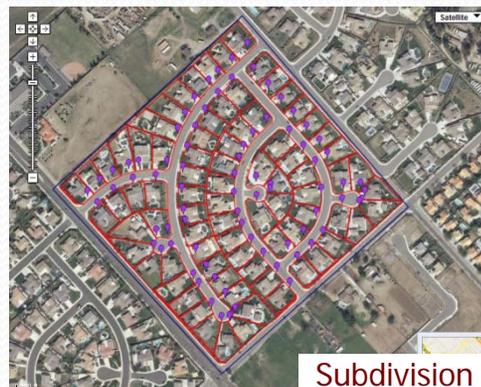
Topics

- Overview: Integrated Water Quality Management (IWQM)
- Implementing IWQM
- The San Diego Experience



Regional

Department or Organization Level



Subdivision

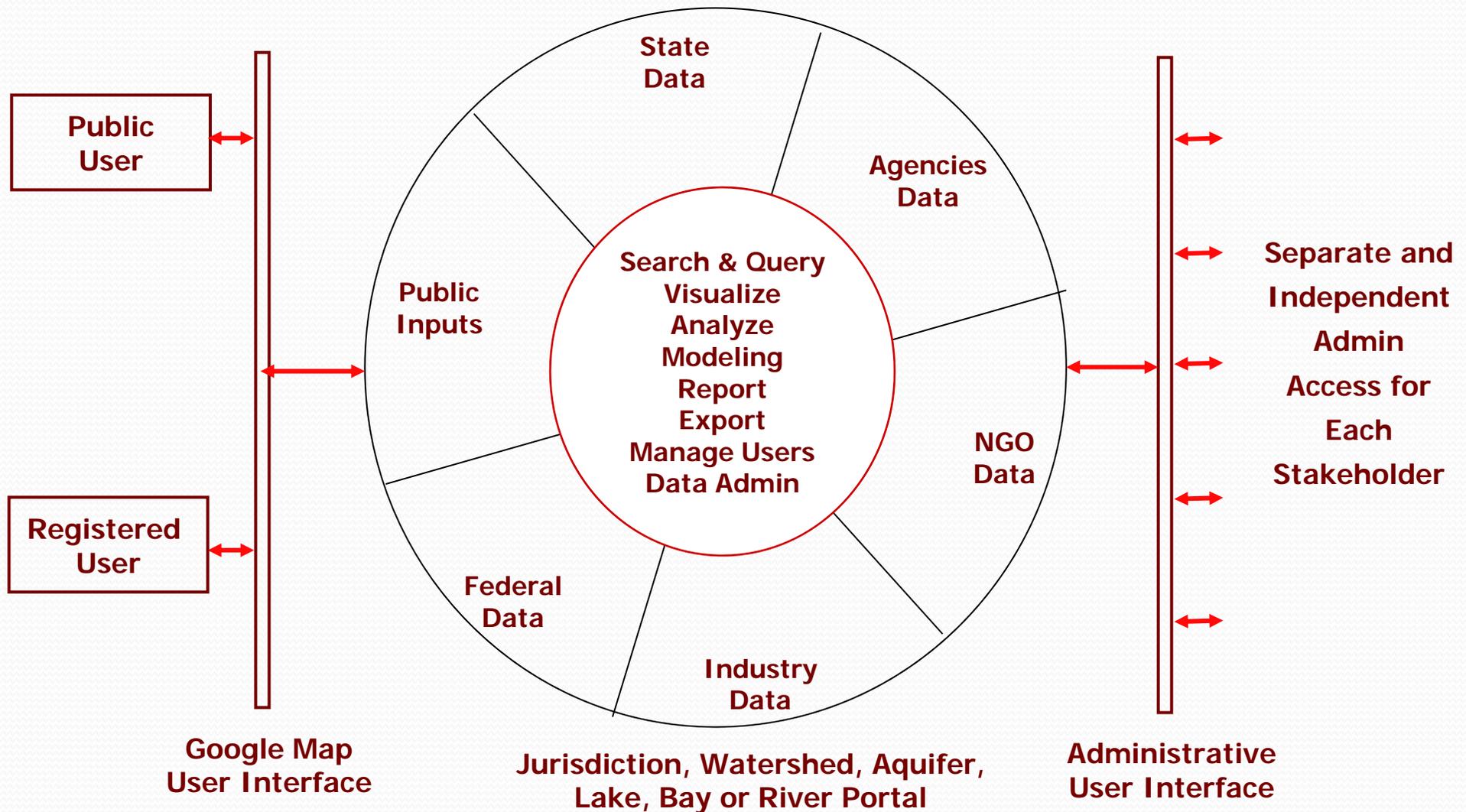


Landscape/Meter

- Policy, regulatory, and grant requirements driving integrated water management
- Integrated strategies result in lower costs and more sustainable outcomes
- Common integration challenges for organizations
 - Highly fragmented information, organizations, decisions, and regulations.
 - Lack of appropriate tools to integrate processes and data

EcoLayers platform – Data Portal

Regional Collaboration and Integrated Water Management



↔ Permissions-based access to data and functionality

The San Diego experience, background

- rooted in an informal, growing partnership between key stakeholders
 - San Diego Regional Water Quality Control Board
 - river NGO: San Diego River Park Foundation
 - state agency: San Diego River Conservancy
 - university: San Diego State University
 - regional agencies
- started out as separate data portals
 - single applications, e.g., bioassessment
 - watershed-level portals - San Diego River Watershed
 - regional water quality data portal
- evolving into watershed and regionally integrated platform

Portfolio of San Diego regional data portals

A. San Diego River watershed portal

San Diego River Park Foundation

- RiverWatch– volunteer water quality monitoring data
- RiverBlitz - volunteer trash removal/ management

San Diego River Conservancy

- Land Conservation projects
- Water Quality and Flood Control projects
- Recreation
- Natural & Cultural Resources
- Real time water quality data (San Diego State University project)

USGS – real time stream flow and gauge height

Stream Team – bio-assessment data

B. Buena Vista watershed portal, 30 + data sets

C. Golf Course (private)

D. Ramona Municipal Water District – groundwater well data

E. San Diego Regional Water Quality data portal

- 10,000 sites
- 11 watersheds
- 22 jurisdictions
- 35 water quality data sets

Stream Team bio-assessment

San Diego River Watershed Data Portal



San Diego River Park Foundation



San Diego Regional Water Quality Control Board

San Diego River Watershed Data Portal

San Diego Stream Team - Bioassessment Data



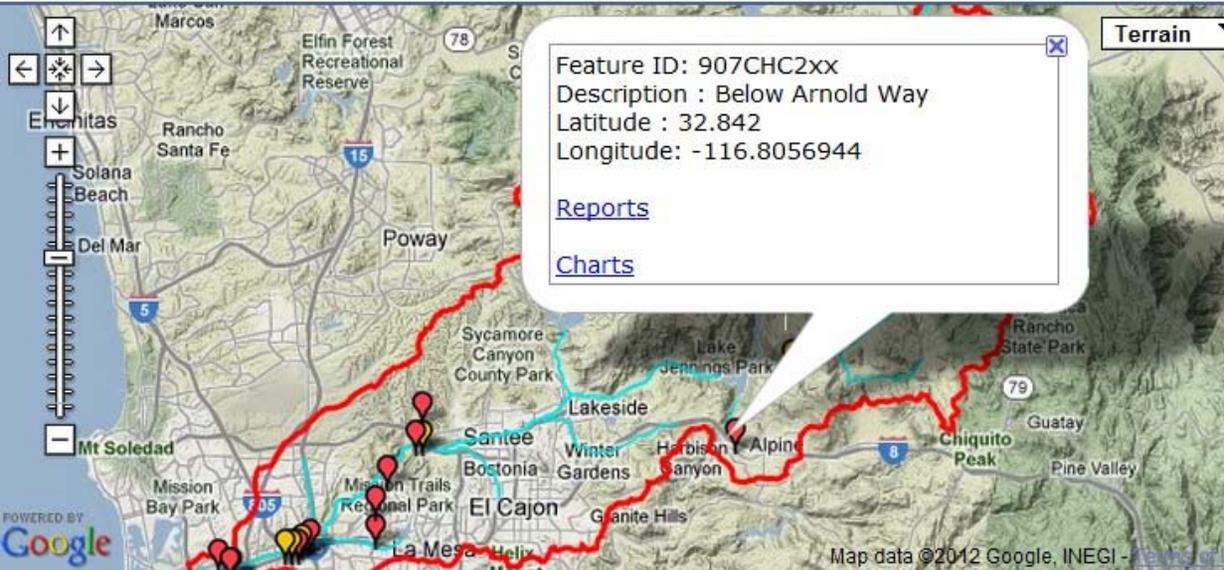
San Diego River Conservancy

[About](#) | [Instructions](#) | [Get Involved](#) | [Terms of Use/Privacy](#)

Select Watershed Program

Bioassessment Data

Very Poor Poor Average Good Very Good No Data



Monitoring Site Selected: Below Arnold Way

Bioassessment Data Reports

- [SDST IBI Metrics Table \(Public\)](#)

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Land Conservation projects San Diego River Conservancy



San Diego River Park Foundation



Water Boards

San Diego Regional Water Quality Control Board

San Diego River Watershed Data Portal
San Diego River Conservancy Projects Information



San Diego River Conservancy

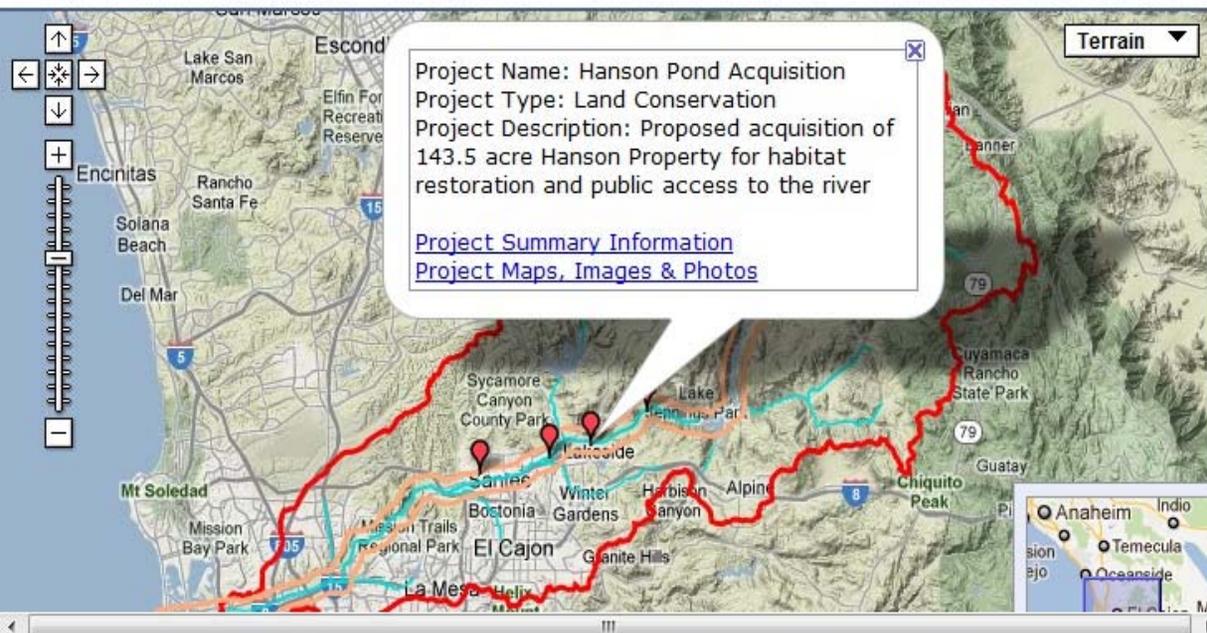
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Select Watershed Program

Select Project from Map or Dropdown Menu

- All Land Conservation Recreation & Education
 Natural & Cultural Resources Water Quality & Flood Conveyance

Select Project Image



SDRC Project Information: Hanson Pond Acquisition

- [View project summary](#)
- [View project documents](#)

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Volunteer WQ monitoring San Diego River Park Foundation



San Diego River Park Foundation



Water Boards

San Diego Regional Water Quality Control Board

San Diego River Watershed Data Portal RiverWatch Data



San Diego River Conservancy

RiverWatch Data

Parameter:

Click on site icon to see more information

Impaired
 Healthy
 No Recent Data

Dissolved Oxygen < 5.0
 Dissolved Oxygen > 5.0

Map | Satellite | Hybrid | Terrain

Site No: 10
 Site Name: Old Mission Dam W
 Latitude : 32.83954
 Longitude: -117.0432

[More Info](#)
[View Data](#)
[View Charts](#)

Monitoring Site Selected: Old Mission Dam W

Historical data at: Old Mission Dam W

- [Dissolved Oxygen](#)
- [Percent Dissolved Oxygen](#)
- [Phosphate](#)
- [Specific Conductivity](#)
- [Temperature](#)
- [pH](#)
- [Nitrate](#)
- [Water Quality Index \(WQI\)](#)

Most recent value at all monitored sites: 2 2012

- [Dissolved Oxygen](#)
- [Percent Dissolved Oxygen](#)
- [Phosphate](#)

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San Diego Regional Water Quality Portal

Water Resources Control Board (Regulatory Agency)

San Diego Regional Water Quality Data Portal

The screenshot displays the San Diego Regional Water Quality Data Portal interface. On the left is a 'Layers' panel with various categories like Base Layers, Watersheds, SWAMP, and NPDES Facilities. The central map shows the San Diego region with a red boundary and a popup window for station CAR-11-2009. On the right, there are tabs for 'Columns', 'Charts', and 'Integrated Data', with a list of data parameters and a 'Key Statistics' box.

Station ID: CAR-11-2009
 Program: random dry
 Latitude: 33.14691
 Longitude: -117.12192
[View Reports & Charts](#)
[Add to selection](#)

San Diego River Park Foundation (HU 907 only)
 RiverWatch Sites
Base Layers
 Land Use
303(d) List
 303(d) Streams Pollutant Category In (Nutrients)
NPDES Facilities
 INDSTW Facility Type = Industrial AND City Contains El Cajon
Municipal Stormwater - Outfall Monitoring
 Dry Weather (Outfall) Analyte = pH AND Date >= 2010 AND Result >= 8.5

Item Report
 Columns | Charts | Integrated Data
Historical data at
 * [Dissolved Oxygen](#)
 * [Percent Dissolved Oxygen](#)
 * [Phosphate](#)
 * [Specific Conductivity](#)
 * [Temperature](#)
 * [pH](#)
 * [Nitrate](#)
Most recent value at all monitored sites
 * [Dissolved Oxygen](#)
 * [Percent Dissolved Oxygen](#)
 * [Phosphate](#)
 * [Specific Conductivity](#)
 * [Temperature](#)
 * [pH](#)
 * [Nitrate](#)

Key Statistics
 10,000+ sites
 11 watersheds
 22 jurisdictions
 35 water quality data sets

Case Study: San Diego Regional Water Quality Portal Water Resources Control Board (Regulatory Agency)

Partial List of Programs & Data sets in San Diego Regional Water Quality Data Portal

1. Surface Water Ambient Monitoring Program (SWAMP)
 - Monitoring sites
 - Field monitoring
 - Laboratory
 - Toxicity
 - Habitat
 - Benthic
2. Stormwater (MS4 Municipal) data
 - Dry Weather Field Screening and Analytical
 - Monitoring sites
 - Field monitoring
 - Laboratory
 - Visual observations
 - Trash
 - Outfall monitoring
 - Monitoring Sites
 - Dry weather
 - Wet weather
 - Receiving Waters
 - Monitoring sites
 - Chemical
 - Biological (IBI)
 - Bio-assessment taxa
 - Toxicity
 - Bacteria
 - Coastal Storm Drains
 - Monitoring sites
 - Coastal storm drain outfall and adjacent receiving water data
3. 401 Projects and Mitigation
 - Project and mitigation sites
 - Project location, description, post review impacts and documents
 - 401 impacts and compensatory mitigation
4. 303(d) lists
 - streams and water bodies
 - extent of impairment
 - pollutants and sources
 - TMDL status
5. NPDES facilities/ CIQWS
 - Facility inventory by type
 - Discharge
 - Regulations
 - Inspection, violation and compliance history
 - Enforcement reports
6. USGS National Water Information Survey
 - Streams, lakes, groundwater
 - Stream flow, reservoir depth, depth to groundwater

Potential Uses:

- MS4 Online Reporting
- Integrated monitoring
- Watershed report cards
- Improve public involvement
- 401 Projects: Cumulative impacts, mitigation priorities
- Prioritize 303 (d) list

Watershed Management

Buena Vista Watershed Data Portal

Buena Vista Audubon
A Chapter of the National Audubon Society

Buena Vista Creek Watershed Data Portal

Layers
Feature Count: 6/6
View Reports & Charts

Layers

- Buena Vista Watershed Hydrology
- El Salto
- Vista
- Polygons**
 - Land Use(select LU type first)
 - Land Use(select LU type first)
 - Soils(select Soil type first)
 - Soils(select Soil type first)
 - Planned Land Use changes
 - Slope Classes**
 - All Slope Classes
 - 15 to less than 25 slope
 - 25 to less than 50 slope
 - 50 slope or steeper
 - Permeability
 - Permeability Mean Permeability
 - Parcels
 - BV Lakes
 - BV Rivers Streams
 - BV Vegetation
 - BV Invasives
 - BV North County MSCP
 - BV Open Space Easement
 - BV Open Space Easement
- Data Layer**
 - Receiving Water Sites
 - Dry Weather And MS4 Outfalls
 - Bioassessment
 - Rain Gauge
 - Reports
 - Reports Report Type = Biological Monitoring
 - Watershed Projects
 - Channel Cross Sections
- ABLM**
 - Sample Only Sites
 - Composite Sites (Data)
- My Folder

Station Code: 904TMBVME
 Station Name: Buena Vista Mass Emissions Station
 Program Name: San Diego Coastal Lagoons TMDL Monitoring
 HSA: 904.21

[View Reports & Charts](#)
[Add to selection](#)

Polygons

Land Use(select LU type first) Land Use Type Contains Light Industry - General
 Soils(select Soil type first) Component Name = Bonsall
 BV Open Space Easement
 Permeability Mean Permeability >= 60

Data Layer

Receiving Water Sites
 Reports Report Type = Biological Monitoring
 Channel Cross Sections

Columns Groups

Charts Histo

Item Reports: BVCSW4

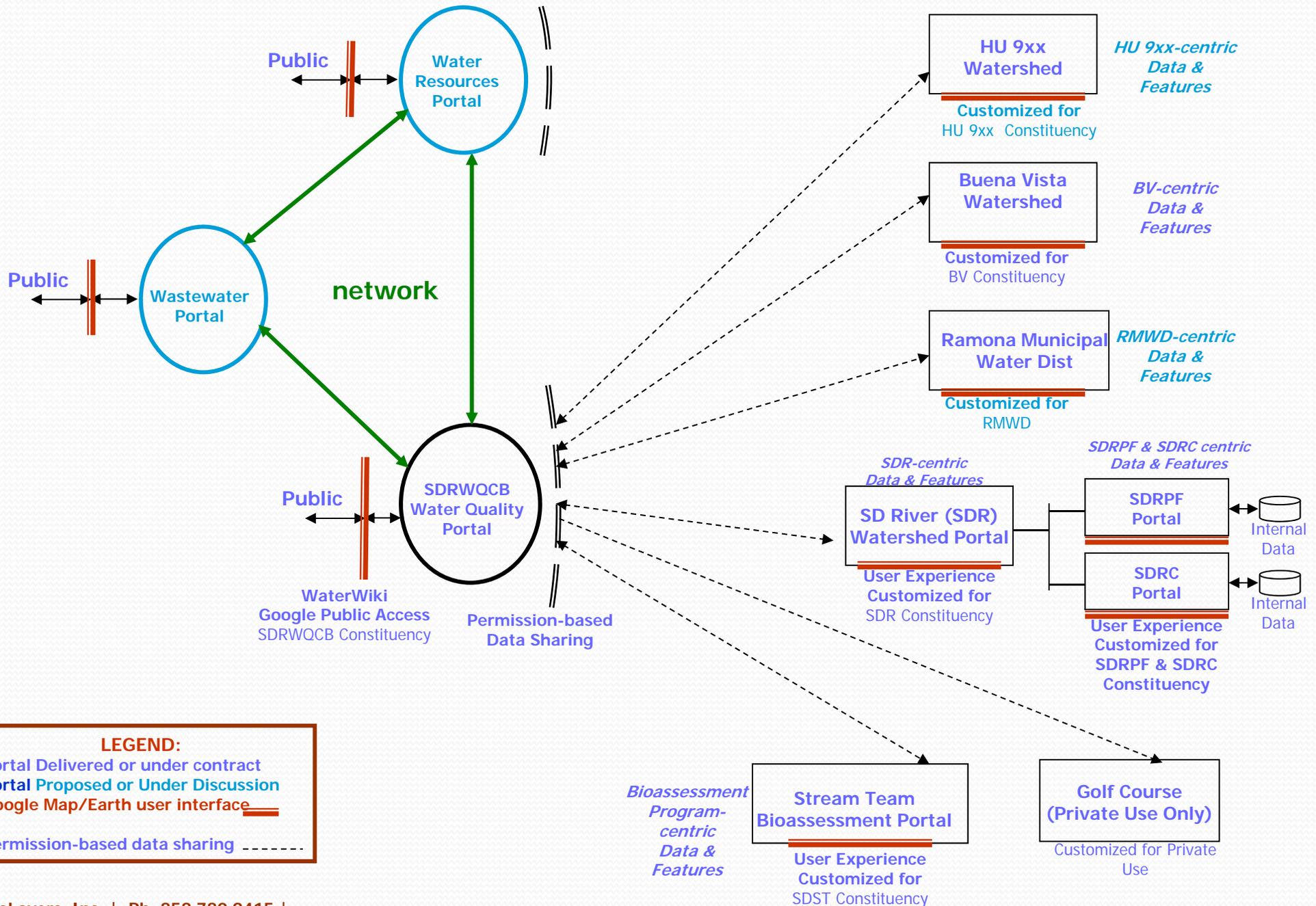
- * [Site Table](#)
- * [Analytical](#)
- * [Field](#)
- * [Toxicity](#)

Select Layer: Reports Report Type = Biological Monitoring

[Preview Item Report](#)

[Leave a Comment](#)

Evolution : Regional Integrated Water Quality Management in San Diego



IWQM : intended uses

- easy access to wide range of information set in local context
- sharing and collaboration
- simple and advanced online analytical tools
- integrated monitoring strategies
- watershed report cards
- online reporting
- improved 401 permitting and mitigation strategies
- assess regulatory program effectiveness

Thank You!