

# Towards Integrated Water Management: Data Strategies

CWQMC webinar for September 15, 2011

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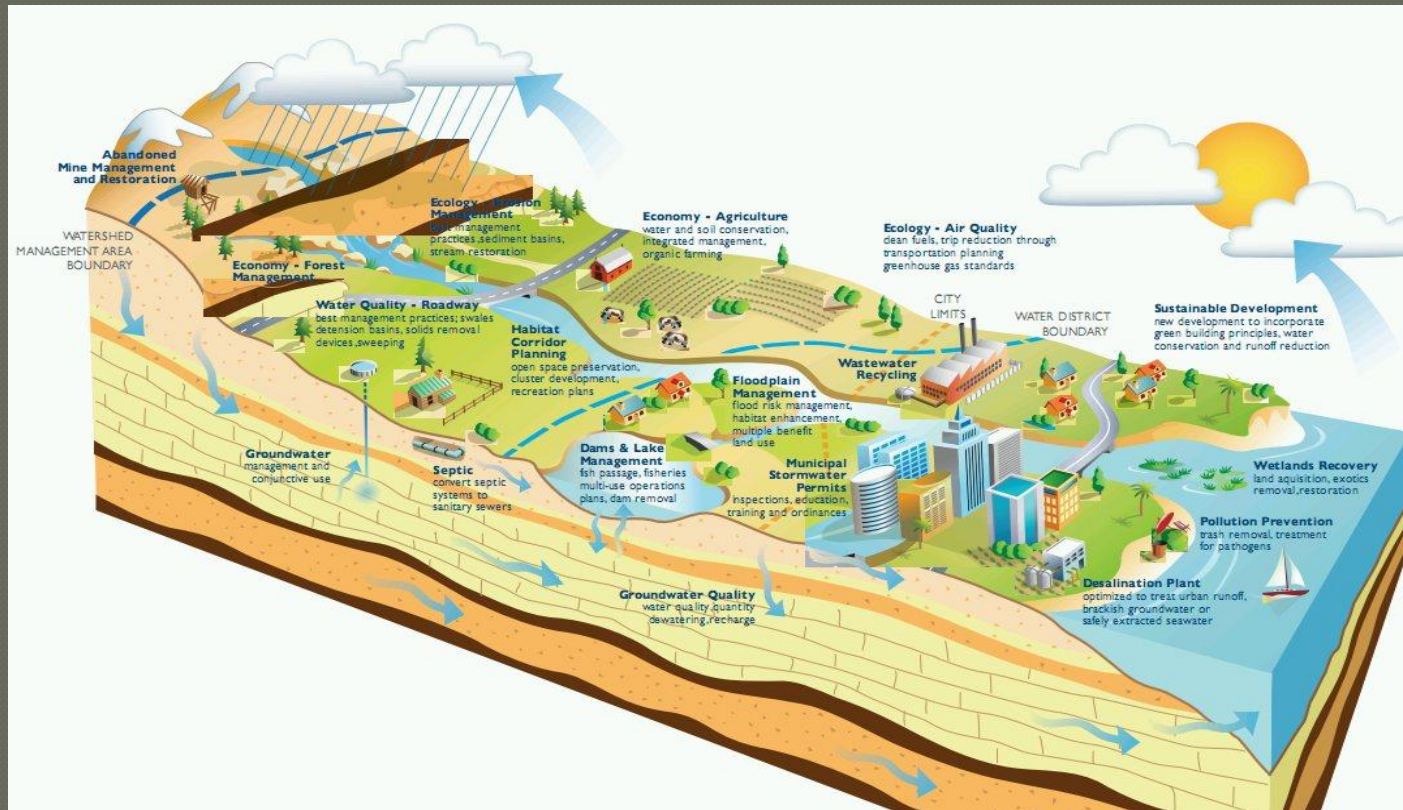
Email: [clay@ecolayers.com](mailto:clay@ecolayers.com)

# Outline

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- ◉ Integrated water management (IWM)
  - Integrated Water Management, what is it?
    - Compare to conventional approach
    - Elements / segments of the water environment
    - Components of IWM
- ◉ Case study
  - Integrated Water Quality Management

# Water environment an Integrated System; one scale is the watershed



However, impact, use and management of water environment is highly fragmented

# What is “Integrated Management”?

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- Simply put, Integrated Mgmt views the water environment as an integrated, inter-dependent system
- How do we understand and manage this system?
  - a. Data integration: Bring together multiple data sets
  - b. Information sharing
  - c. Collaboration between stakeholders
- Integration ≠ “Data Management” or GIS

# Integrated Water Management: Key Drivers

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## ○ Policy and planning

- Integrated Regional Water Mgmt (IRWM)
- Urban Water Mgmt (UWMP)
- Green infrastructure

## ○ Regulatory

- MS4 / stormwater permits
- TMDLs

## ○ Operations and reporting

- MS4 / stormwater

# Integrated Water Management: Benefits

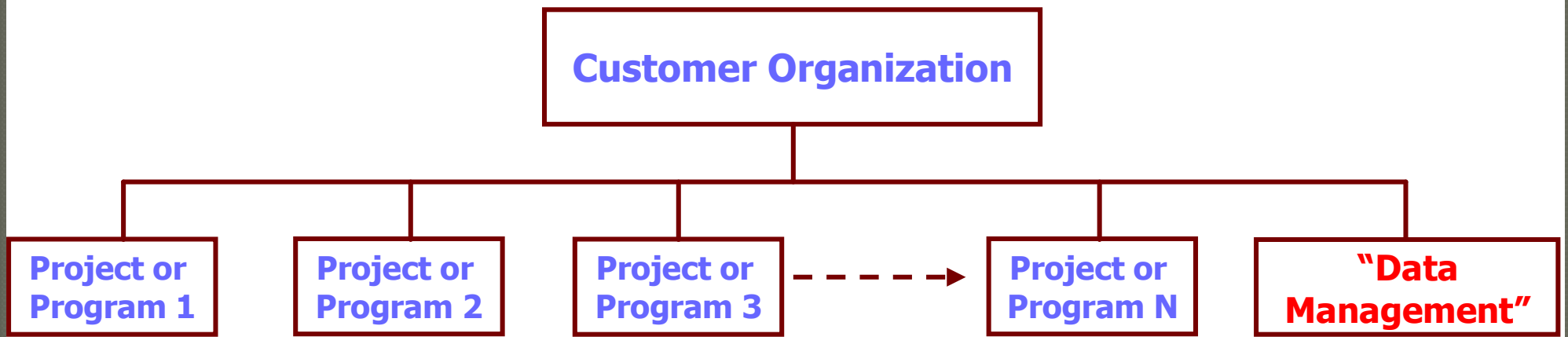
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- Integrated strategies result in more efficient and sustainable outcomes, e.g.,
  - Better local/regional water augmentation and pollution prevention strategies
  - Lower costs for resource management, permitting, and compliance
  - Lower capital expenditures
  - Improve ability to identify stressors (root causes)



# Conventional Approach

Data, like Projects/Programs, forced into its own “silo”



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# A Closer Look at the Water Environment

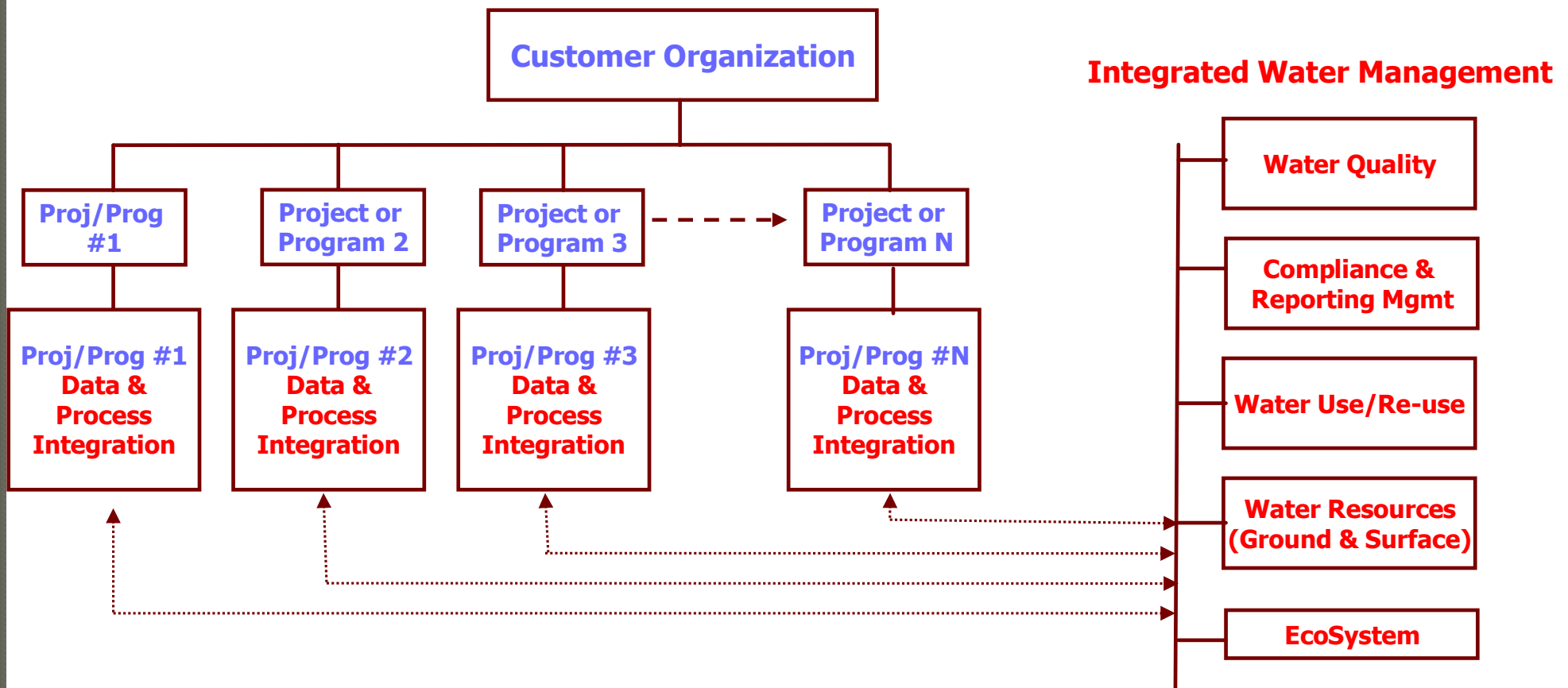
<p>NPDES Permits MS4 Phase 1 &amp; 2 Industrial Stormwater Construction Stormwater Non-point Source Discharges Groundwater Discharges TMDL Development TMDL Implementation</p>	<p>Basin Planning Water Quality Objectives Beneficial Uses Chemical Integrity Biological Integrity Physical Integrity</p>	<p>Water Supply CEQA (Water Quality) Low Impact Development Wetlands Impact 401/404 Permits Mitigation</p>	<p>Spills &amp; Clean-ups Remediation Treatment Facilities (BMPs) Facilities Inspections Incidents Tracking Monitoring Sewer System Overflows</p>	<p>Aquifers Lakes River Basins Reservoirs</p>	<p>Mitigation Conservation Invasive Species Endangered Species Trails</p>
Discharges - Water Quality	Water Quality Standards	Land Use	Site Activities	Water Resources	Aquatic Ecosystem

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# What True Integration of the Water Environment Should be

## True Integration of the Water Environment



# Integrated Water Management: Impacts All Key Stakeholder Groups

Stakeholders	Water in the "Non-Built" Environment					
	Water Resources	Water Use	Water Quality	Ecosystem	Permitting & Enforcement	Compliance & Reporting
Regulatory Agencies			+	+	+	
Water Agencies/Districts	+	+	+	+		
Dischargers (Permittees) <sup>1</sup>			+			+
Wastewater Agencies		+	+			+
Municipalities	+	+	+	+	+	+
Infrastructure Developers <sup>2</sup>	+	+	+			+
Stewardship Organizations <sup>3</sup>	+	+	+	+		
Environmental Consultants	+	+	+	+	+	+

1. Stormwater Phase 1 & Phase 2, and general NPDES permits.

2. Real-estate developers, utilities, mining, oil and gas, transportation, and others

3. River/lake conservancies, land trusts, watershed councils, municipalities, corporate environmental assets, and others

# Integrated Water Management – Key Functionality

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- Data aggregation and single-point online access
- Search, visualize and export for a wide range of content, e.g., data, spatial, documents, schematics, images, URLs and others.
- Integrated statistics, modeling, custom analytics, and reporting.
- Shared permission-based access to information and decision support tools by affiliated third parties
- Online tools to reduce or automate manual activities.
- Engage public and other constituencies-of-concern around specific customer objectives

# Case Study – Integrated Water Quality Management

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- ◉ Integrated WQ metrics: chemical, physical, and biological
- ◉ Integrated monitoring
- ◉ Integrated data administration, analysis and visualization
- ◉ Integrated permit compliance and reporting
- ◉ Integrated mitigation, BMP and pollution prevention strategies
- ◉ Support the virtuous planning cycle

# Case study – key components for water quality IWM (tool box)

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- Comprehensive Watershed-wide Monitoring Program for Surface Water
- WQ data content aggregation
  - Centralized (CEDEN)
  - local (SD Regional Data portal)
- Access to monitoring directories and laboratories
- Addition of non-water data, i.e., trash, CRAM, bio-assessment, PHAB, photo uploads, special studies, USGS data, political boundaries, reports, SSOs
- Ability to efficiently apply limited resources for intensive projects, i.e., TMDLs
- On-line reporting, report cards and ability to easily update reports



# Integrated Water Management

## The Feedback Loop

**Stakeholder-level: Optimize stakeholder objectives**

**Stakeholder-level: Information aggregation, access, visualization and analysis**

**INTEGRATING WATER QUALITY, WATER RESOURCES, LAND USE, AND HABITAT**

Discharges (Pollution)	Water Quality Standards	Land Use & Re-development	Site Activities	Water Resources	Habitat
NPDES Permits	Basin Planning	Water Supply	Spills/Clean-ups	Aquifers	Mitigation
MS4 Phase 1 & 2	WQ Objectives	Landscapes	Remediation	Lakes	Conservation
Industrial	Beneficial Uses	LID	BMPs	River Basins	Invasive Species
Construction	Chemical Integrity	Wetlands Impact	Facility Inspections	Reservoirs	Endangered Species
Non-point Discharges	Biological Integrity	401/404 Permits	Monitoring		Trails
Groundwater	Physical Integrity	Mitigation	Sewer Overflows		

**Integrate Public Participation**

- Public outreach
- Public input
- On-line tools
- Community building



# Integrated Water Management Applications

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- Enable integrated data access for general use: Watersheds, river basins, other water resources, species conservation
- Integrated Regional Water Management Plans (use, conservation, quality)
- Integrated stormwater management/compliance - jurisdictional & watershed levels
- TMDL development and management
- 303(d) de-listing process
- 401/404 permitting and mitigation, wetlands monitoring, recovery, etc.
- Beach water monitoring and upstream surveillance
- BMP effectiveness at the water body or watershed level
- Invasive species – tracking and treatment effectiveness
- Ecosystem services – landscape and watershed scales
- Conservation and re-development programs
- Public involvement
- Long-term research programs or studies

# Integrated Water Quality Management Challenges

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- Dependency on the status quo:
  - Systems and processes that are difficult to change
  - Resistance from beneficiaries of the current inefficiencies
  - Inter-departmental or inter-stakeholder tensions
- Data availability and access
- Lack of the right cost-effective tools

# Integrated Water Management Is Not....

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- ⦿ Data management
- ⦿ GIS
- ⦿ “Synergistic” collaborative projects

# Examples of IWM data types

www.ca-watersheds.org/reg9/

unicatio... Rx Surf,life Web Slice Gallery bills health Rx new job retirement surfing taxes travel, airfare

## Welcome to the San Diego Regional Water Quality Data Portal

Select a watershed and a data set, then click the "Load Map" link below to proceed.

Select Watershed First	Select Water Quality Program
<input type="checkbox"/> All Watersheds	<input type="checkbox"/> SWAMP
<input type="checkbox"/> 901.00=SAN JUAN HYDROLOGIC UNIT	<input type="checkbox"/> SWAMP Sites
<input type="checkbox"/> 902.00=SANTA MARGARITA HYDROLOGIC UNIT	<input type="checkbox"/> Municipal Stormwater-Urban Runoff
<input type="checkbox"/> 903.00=SAN LUIS REY HYDROLOGIC UNIT	<input type="checkbox"/> Dry Weather
<input type="checkbox"/> 904.00=CARLSBAD HYDROLOGIC UNIT	<input type="checkbox"/> Municipal Stormwater-Receiving Waters
<input type="checkbox"/> 905.00=SAN DIEGUITO HYDROLOGIC UNIT	<input type="checkbox"/> Chemical
<input type="checkbox"/> 906.00=PENASQUITOS HYDROLOGIC UNIT	<input type="checkbox"/> Biological (IBI)
<input type="checkbox"/> 907.00=SAN DIEGO HYDROLOGIC UNIT	<input type="checkbox"/> Bioassessment Taxa
<input type="checkbox"/> 908.00=PUEBLO SAN DIEGO HYDROLOGIC UNIT	<input type="checkbox"/> Benthic
<input type="checkbox"/> 909.00=SWEETWATER HYDROLOGIC UNIT	<input type="checkbox"/> Bacteria
<input type="checkbox"/> 910.00=OTAY HYDROLOGIC UNIT	<input type="checkbox"/> Toxicity
<input type="checkbox"/> 911.00=TIJUANA HYDROLOGIC UNIT	<input type="checkbox"/> Municipal Stormwater - Outfall Monitoring
	<input type="checkbox"/> Dry Weather (Outfall)
	<input type="checkbox"/> Wet Weather (Outfall)
	<input type="checkbox"/> Coastal Storm Drain
	<input type="checkbox"/> San Diego River Park Foundation (HU 907 only)
	<input type="checkbox"/> RiverWatch Sites
	<input type="checkbox"/> Bioassessment (Stream Team)
	<input type="checkbox"/> Bioassessment (Stream Team)
	<input type="checkbox"/> 401 Projects and Mitigation Sites
	<input type="checkbox"/> 401 Projects
	<input type="checkbox"/> Mitigation Sites



# Stream flow data


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[← Back](#)

[Download Report](#) [Number of Rows: 101]

## Daily Peak Discharge (cu.ft./sec)

Analyte	ObservationDate	Result	Unit
Discharge	04-17-2011	25.00	cubic feet per second
Discharge	04-17-2011	25.00	cubic feet per second
Discharge	04-18-2011	23.00	cubic feet per second
Discharge	04-18-2011	23.00	cubic feet per second
Discharge	04-19-2011	23.00	cubic feet per second
Discharge	04-19-2011	23.00	cubic feet per second
Discharge	04-20-2011	22.00	cubic feet per second
Discharge	04-20-2011	22.00	cubic feet per second
Discharge	04-21-2011	22.00	cubic feet per second
Discharge	04-21-2011	22.00	cubic feet per second
Discharge	04-22-2011	22.00	cubic feet per second
Discharge	04-22-2011	22.00	cubic feet per second
Discharge	04-23-2011	20.00	cubic feet per second
Discharge	04-23-2011	20.00	cubic feet per second
Discharge	04-24-2011	20.00	cubic feet per second
Discharge	04-24-2011	20.00	cubic feet per second
Discharge	04-28-2011	11.00	cubic feet per second
Discharge	04-29-2011	11.00	cubic feet per second
Discharge	04-29-2011	11.00	cubic feet per second
Discharge	04-30-2011	10.00	cubic feet per second

Powered By  Software for Integrated Management of Watersheds

# Rain gauges

**Buena Vista Audubon**  
A Chapter of the National Audubon Society

**Buena Vista Creek Watershed Data Portal - (Non-)**

Layers Feature Count: 1/1

Logout

- Pland 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
- Parcels
- BV Lakes
- BV Rivers Streams
- BV Vegetation
- BV Invasives
- BV North County MSCP
- BV Open Space Easement
- Data Layer
  - Receiving Water Sites
  - Dry Weather And MS4 Outfall Sit
  - Bioassessment
  - Rain Guage Station Name = Buen
  - Reports
  - Watershed Projects Activity Tur

Description: Must then link to San Diego County

[Go to site](#)

[Site Table](#)

[Add to selection](#)

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# Land use data

Buena Vista Audubon

A Chapter of the National Audubon Society

Buena Vista Creek Watershed Data Portal - (Non-production version)

Layers

- Buena Vista Watershed Hydrologic Subareas
  - El Salto
  - Vista
- Polygons
  - Land Use(select LU type first) Land Use Ty
  - 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
- Parcels
- BV Lakes
- BV Rivers Streams
- BV Vegetation
- BV Invasives
- BV North County MSCP
- BV Open Space Easement
- Data Layer
  - Receiving Water Sites
  - Dry Weather And MS4 Outfall Sites
  - Bioassessment
  - Rain Guage
  - Reports
  - Watershed Projects
  - Channel Cross Sections
- ABLM
  - Sample Only Sites
  - Composite Sites (Data)

Feature Count: 18/18

Home Page

Introductory Text He

904.21  
HSA: 904.21  
HSA Name: El Salto  
Land Use Type: Intensive Agriculture

Select Layer: Land Use(select LU type first) [# Rows: 18] Preview

HSA	HSA Name	Land Use Type
904.21	El Salto	Intensive Agriculture
904.21	El Salto	Intensive Agriculture



# Soils

## Buena Vista Audubon

A Chapter of the National Audubon Society

## Buena Vista Creek Watershed Data Portal - (Non-production)

Layers

- Buena Vista Watershed Hydrology
  - El Salto
  - Vista
- Polygons
  - Land Use(select LU type first)
  - Soils(select Soil type first)
  - Planned Land Use change
- Slope Classes
  - All Slope Classes
  - 15 to less than 25 slope
  - 25 to less than 50 slope
  - 50 slope or steeper
- Permeability
- Parcels
- BV Lakes
- BV Rivers Streams
- BV Vegetation Category
- BV Invasives
- BV North County MSCP
- BV Open Space Easements

Data Layer:  Reservoir Water Sites

Map Unit Symbol: FaE2  
Component Name: Fallbrook  
Runoff Class: High

Select Layer: Soils(select Soil type first) Runoff Class

Feature Count: 119/119

Logout

Terrain

Introductor

2 mi

Leave a Comment

Preview

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# Vegetation

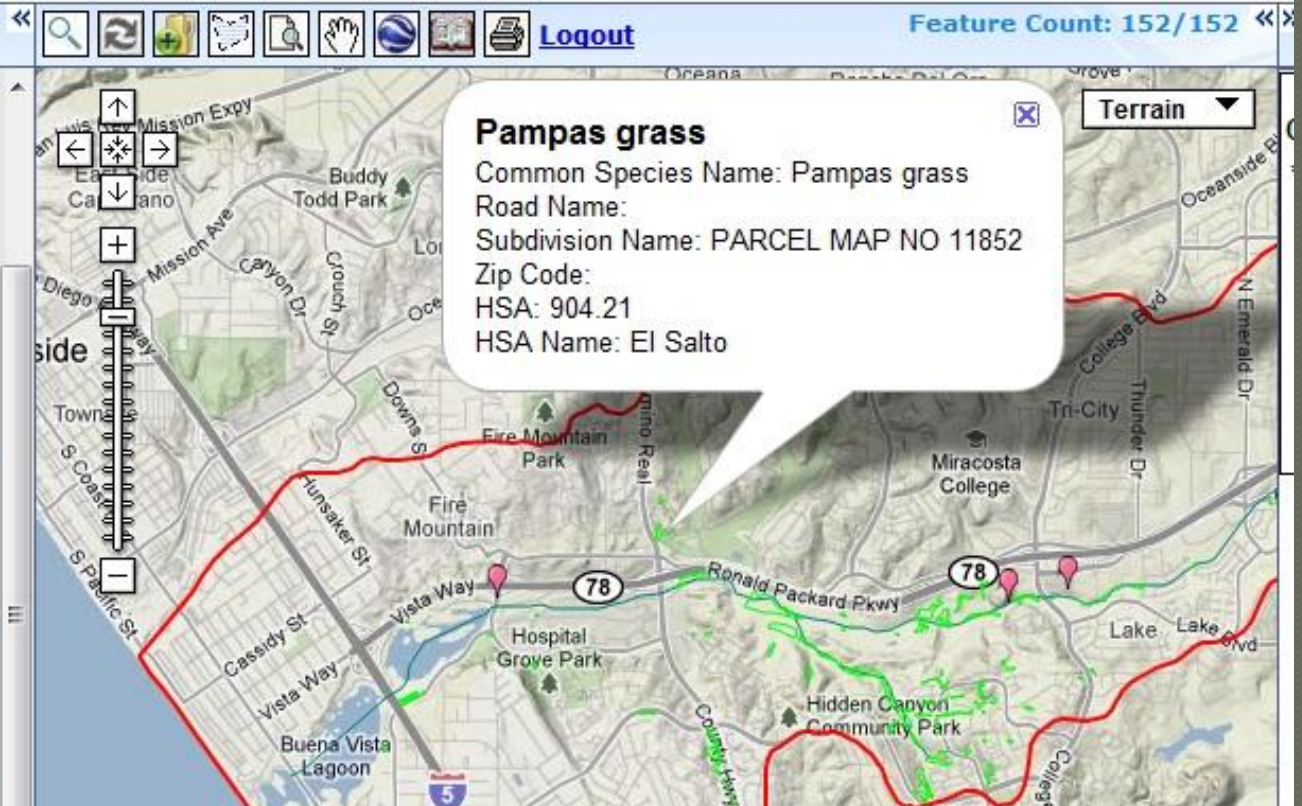
Buena Vista Audubon

A Chapter of the National Audubon Society

Buena Vista Creek Watershed Data Portal - (Non-p)

Layers

- 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
- Parcels
- BV Lakes
- BV Rivers Streams
- BV Vegetation
- BV Invasives HSA Name = El Salto
- BV North County MSCP
- BV Open Space Easement
- Data Layer
  - Receiving Water Sites
  - Dry Weather And MS4 Outfall Sites
  - Bioassessment
  - Rain Gauge Station Name = Buena Vista
  - Reports
  - Watershed Projects Activity Type



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# W.Q. data (by monitoring program)

## San Diego Regional Water Quality Data Portal

Layers

- Base Layers
  - Region 9
  - San Diego County
  - Rivers Name Contains LOS
  - Lakes
- Watersheds
  - 906=PENASQUITOS
  - Land Use
  - Parcels
  - San Diego Jurisdiction Name
  - Rainfall
- Municipal Stormwater-Receiving Watersheds
  - Bacteria
- Municipal Stormwater - Outfall Monitoring
  - Wet Weather (Outfall)
- My Folder

2 mi  
5 km

Santa Fe  
Solana Beach  
Del Mar  
Torrey Pines State Park  
CA84  
San Diego Freeway  
Marine Corps Air Station Miramar  
Miramar McAs  
Esccondido  
Poway  
Scripps Poway Pkwy  
Pomerado Rd  
Mt Soledad Fwy  
Santee  
Gillespie  
Woods Mountain  
Blue Sky Ecological Reserve  
Iron Mountain  
San Vicente Reservoir  
Sycamore Canyon County Park

Terrain

Item Report

Columns

Integrated Data

Item Report

- \* [Site Table](#)
- \* [Outfall Wet Weather](#)

Select Layer: Wet Weather (Outfall) [# Rows: 2] Remove Selection All Preview Item Report

Station ID	Program	Latitude	Longitude
80024779	Random	32.912	-117.2297
LPC-06-2009	Random	32.9171	-117.2347



# EIR, CEQA documents

**Buena Vista Audubon**  
A Chapter of the National Audubon Society

**Buena Vista Creek Watershed Data Portal - (Non-pr**

Layers Feature Count: 25/25

- Land Use(select LU 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
- Parcels
- BV Lakes
- BV Rivers Streams
- BV Vegetation
- BV Invasives
- BV North County MSCP
- BV Open Space Easement
- Data Layer
  - Receiving Water Sites
  - Dry Weather And MS4 Out
  - Bioassessment
  - Rain Gauge
  - Reports Report Type = EIR
  - Watershed Projects
  - Channel Cross Sections
- ABLM
  - Sample Only Sites
  - Composite Sites (Data)

Report Type: EIR  
Report Title: Final Environmental Impact Report: Former South Coast Quarry Amended Reclamation Plan

[Reports](#)  
[Site Table](#)  
[Add to selection](#)

Select Layer: Reports Report Type = EIR [Preview Item Report](#)



# Channel cross sections

**Buena Vista Audubon**  
A Chapter of the National Audubon Society

**Buena Vista Creek Watershed Data Portal - (Non**

Feature Count: 9/9

Layers

- Land Use(select LU 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
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- BV Vegetation
- BV Invasives
- BV North County MSCP
- BV Open Space Easement
- Data Layer
  - Receiving Water Sites
  - Dry Weather And MS4 Out
  - Bioassessment
  - Rain Gauge
  - Reports
  - Watershed Projects
  - Channel Cross Sections
- ABLM
  - Sample Only Sites

Feature ID: 3  
Description: In Carlsbad Golf Center, off Haymar Drive east of El Camino Real  
[View Reports](#)  
[Add to selection](#)

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# Examples of IWM data sorting and presentation

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# Query by program and indicator

**Buena Vista Audubon**  
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**Buena Vista Creek Watershed Data Portal - (Non-product)**

**Layers**

- Buena Vista Watershed Hydrologic Subareas
  - El Salto
  - Vista
- Polygons
  - Land Use(select LU 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
- Parcels
- BV Lakes
- BV Rivers Streams
- BV Vegetation
- BV Invasives
- BV North County MSCP
- BV Open Space Easement

Data Layer

Define search criteria [Receiving Water Sites] Advance Filter X

Click icon to change theme  New layer go

**Station Detail**

Program Name:  [?](#)

Station Name:  [?](#)

Hydrologic Sub Area:

**Analytical Detail**

Sample Date:  to  [Get Range](#) (09-10-2008 to 04-01-2009)

e.g., mm-dd-yyyy

Analyte:  [?](#)

Result:  [Get Range](#)

**Field Detail**

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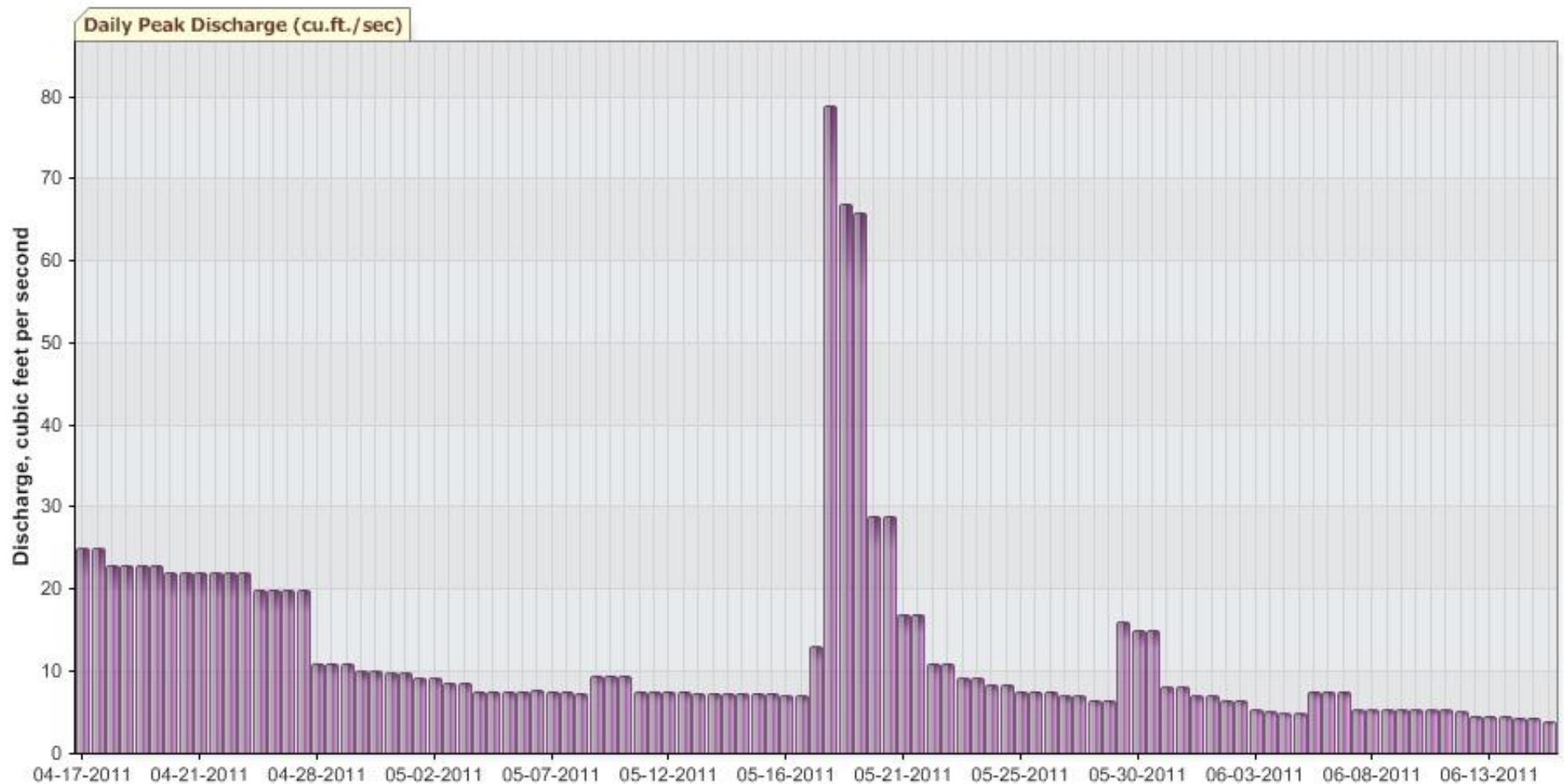
# Time series graph (stream flow)

San Diego River Watershed Data Portal  
USGS Realtime Data

[Terms of Use/Privacy](#)

Select Watershed

**Description:** Discharge, cubic feet per second





# Column or tabular data

[◀ Back](#) [Download Report](#) [Number of Rows: 60]

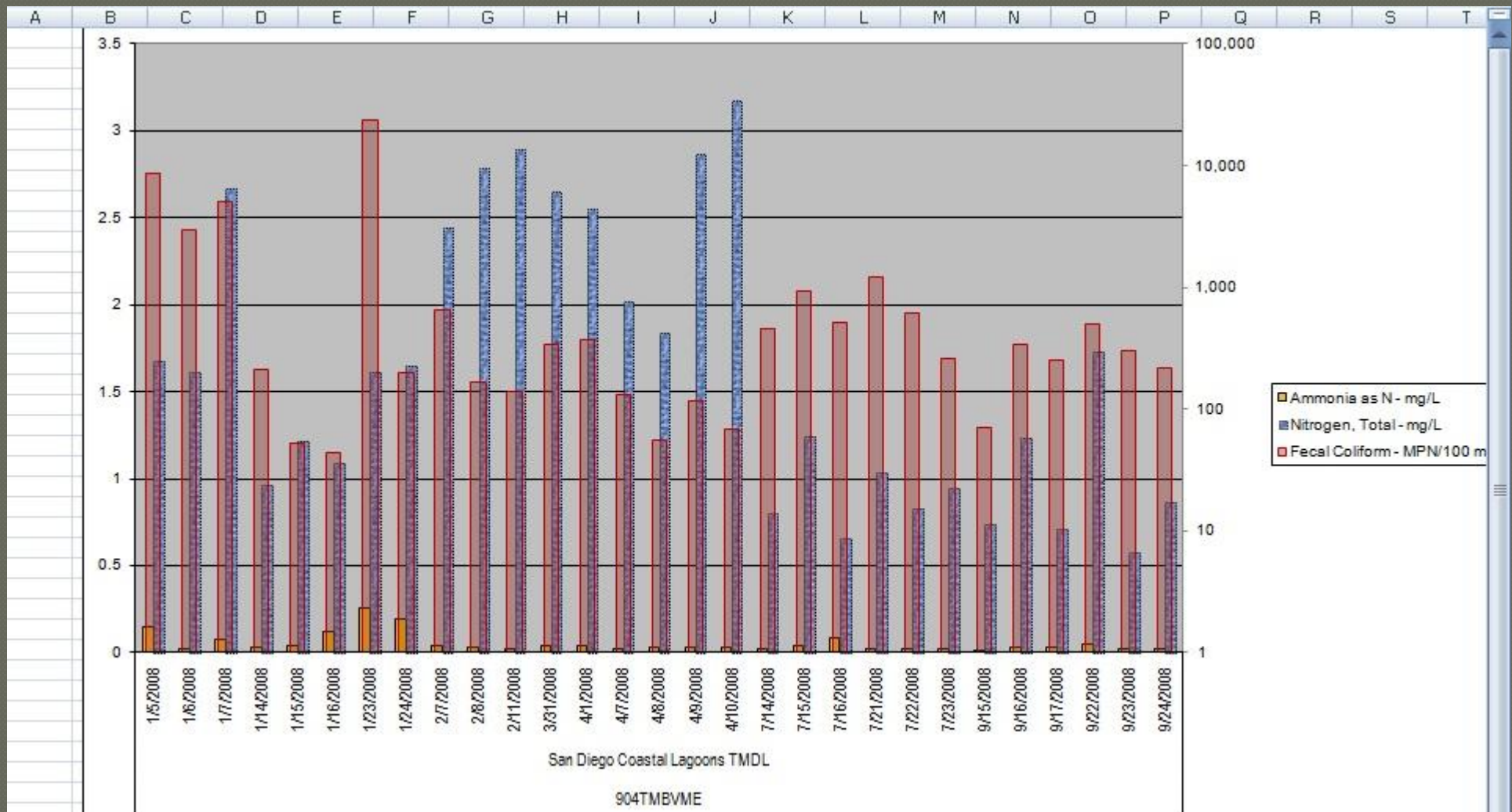
Station Code	Project Name	Sample Date	Collection Method Code	Matrix Name	Method Name	Fraction Name	Analyte Name
BVCSW1	City of Vista Buena Vista Creek Monitoring	09/11/2008	Water_Grab	samplewater	SM4500 NO3 E	None	Nitrate + Nitrite as N
BVCSW1	City of Vista Buena Vista Creek Monitoring	09/10/2008	Water_Grab	samplewater	SM4500 NO3 E	None	Nitrate + Nitrite as N
BVCSW1	City of Vista Buena Vista Creek Monitoring	03/31/2009	Water_Grab	samplewater	SM4500 NO3 E	None	Nitrate + Nitrite as N
BVCSW1	City of Vista Buena Vista Creek Monitoring	09/11/2008	Water_Grab	samplewater	Calculation	None	Nitrogen, Total
BVCSW1	City of Vista Buena Vista Creek Monitoring	09/10/2008	Water_Grab	samplewater	Calculation	None	Nitrogen, Total
BVCSW1	City of Vista Buena Vista Creek Monitoring	03/31/2009	Water_Grab	samplewater	Calculation	None	Nitrogen, Total
BVCSW1	City of Vista Buena Vista Creek Monitoring	09/12/2008	Water_Grab	samplewater	SM4500 NO3 E	None	Nitrate + Nitrite as N
BVCSW1	City of Vista Buena Vista Creek Monitoring	09/12/2008	Water_Grab	samplewater	Calculation	None	Nitrogen, Total
BVCSW1	City of Vista Buena Vista Creek Monitoring	03/30/2009	Water_Grab	samplewater	SM4500 NO3 E	None	Nitrate + Nitrite as N
BVCSW1	City of Vista Buena Vista Creek Monitoring	04/01/2009	Water_Grab	samplewater	SM4500 NO3 E	None	Nitrate + Nitrite as N
BVCSW1	City of Vista Buena Vista Creek Monitoring	03/30/2009	Water_Grab	samplewater	Calculation	None	Nitrogen, Total
BVCSW1	City of Vista Buena Vista Creek Monitoring	04/01/2009	Water_Grab	samplewater	Calculation	None	Nitrogen, Total
BVCSW1	City of Vista Buena Vista Creek Monitoring	09/10/2008	Water_Grab	samplewater	SM 9230 A, B	None	Enterococcus
BVCSW1	City of Vista Buena Vista Creek Monitoring	03/30/2009	Water_Grab	samplewater	SM 9221 B, E	Fecal	Fecal Coliform

# Grouped reports in pivot tables

G13						
Average of Result				Analyte Name	Unit	
Station Code	Project Name	Sample Date	Ammonia as N	Fecal Coliform	Nitrogen, Total	
904TMBVME	San Diego Co		mg/L	MPN/100 mL	mg/L	
		1/5/2008	0.145	8600	1.68096	
		1/6/2008	0.0205	3000	1.6175	
		1/7/2008	0.076	5000	2.6692	
		1/14/2008	0.03361608	213	0.9617	
		1/15/2008	0.04061943	52	1.2201	
		1/16/2008	0.11859006	44	1.094	
		1/23/2008	0.258948866	23474.6	1.612466667	
		1/24/2008	0.189440618	200	1.652925	
		2/7/2008	0.03921876	648	2.4485	
		2/8/2008	0.03081474	166	2.7853	
		2/11/2008	0.02381139	138	2.8984	
		3/31/2008	0.038	340	2.6517	
		4/1/2008	0.03641742	370	2.555	
		4/7/2008	0.02521206	130	2.0243	
		4/8/2008	0.03081474	56	1.8417	
		4/9/2008	0.0280134	118	2.8664	
		4/10/2008	0.02941407	68	3.1743	
		7/14/2008	0.02521206	452	0.7994	
		7/15/2008	0.03921876	928	1.2458	
		7/16/2008	0.08824221	520	0.6564	



# Grouped reports in charts





# W.Q. data results themed by color

San Diego River Park Foundation | San Diego Regional Water Quality Control Board

## San Diego River Watershed Data Portal

### RiverWatch Data

About | Instructions | Get Involved | Terms of Use/Privacy

Select Watershed Program

RiverWatch Data

Parameter: **Dissolved Oxygen** 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

Monitoring Site Selected: Forester Creek

#### Historical data at: Forester Creek

- [Dissolved Oxygen](#)
- [Percent Dissolved Oxygen](#)
- [Phosphate](#)
- [Specific Conductivity](#)
- [Temperature](#)
- [pH](#)
- [Nitrate](#)

#### Most recent value at all monitored sites: 5.2

- [Dissolved Oxygen](#)
- [Percent Dissolved Oxygen](#)
- [Phosphate](#)
- [Specific Conductivity](#)
- [Temperature](#)
- [pH](#)

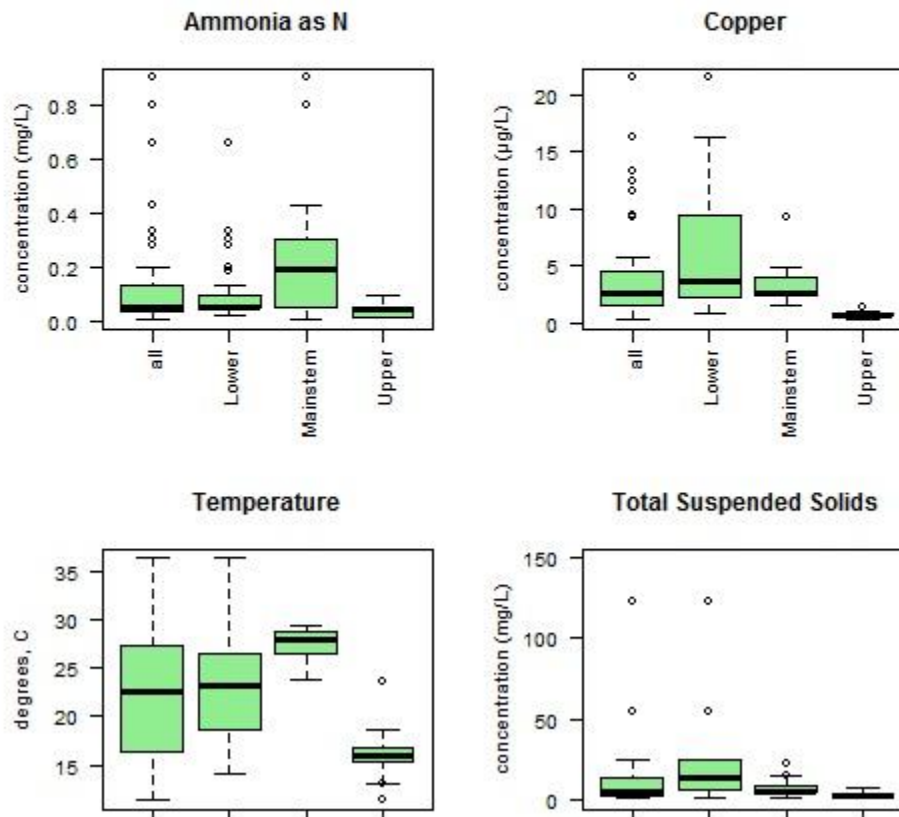
POWERED BY

# Box charts for W.Q. indicators

## San Gabriel Watershed Data Portal

**Title:** Chemistry Box Chart Using R

**Parameters:** AnalyteName in ( 'Ammonia as N', 'Copper', 'Temperature', 'Total Suspended Solids' )



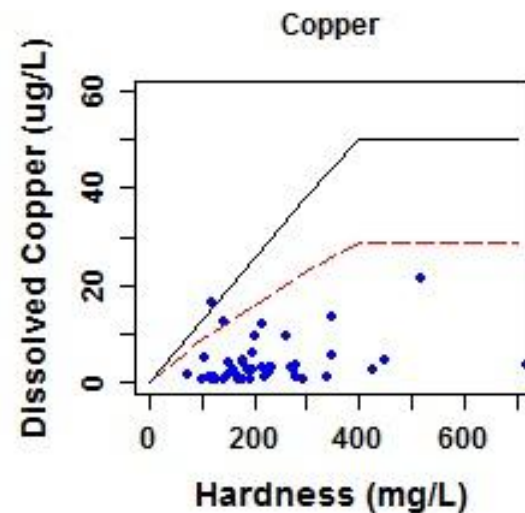
# Indicator plotted with another parameter

San Gab

← Back

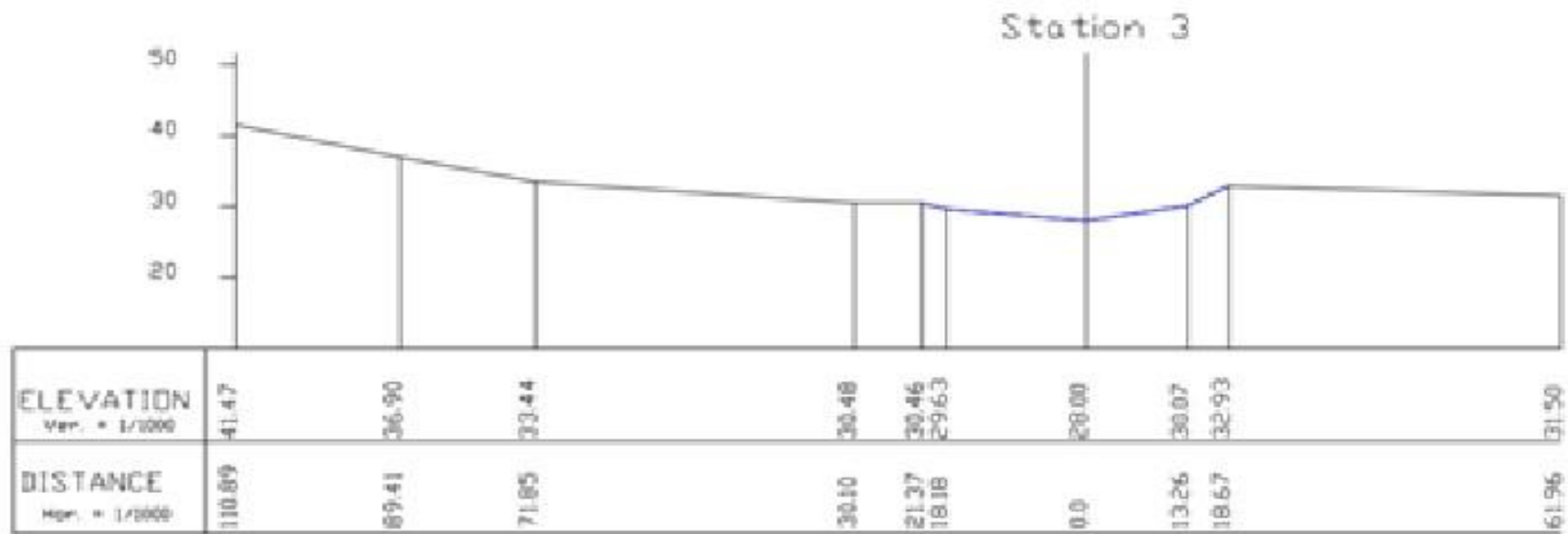
**Title:** SGRandom Dissolved Metals using R

**Parameters:** Analyte in ('Copper')





# Channel cross sections



# EIRs, CEQA documents

## FINAL ENVIRONMENTAL IMPACT REPORT

### FORMER SOUTH COAST QUARRY AMENDED RECLAMATION PLAN

VOLUME I of IV

*of the*

FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

SCH# 2005111124

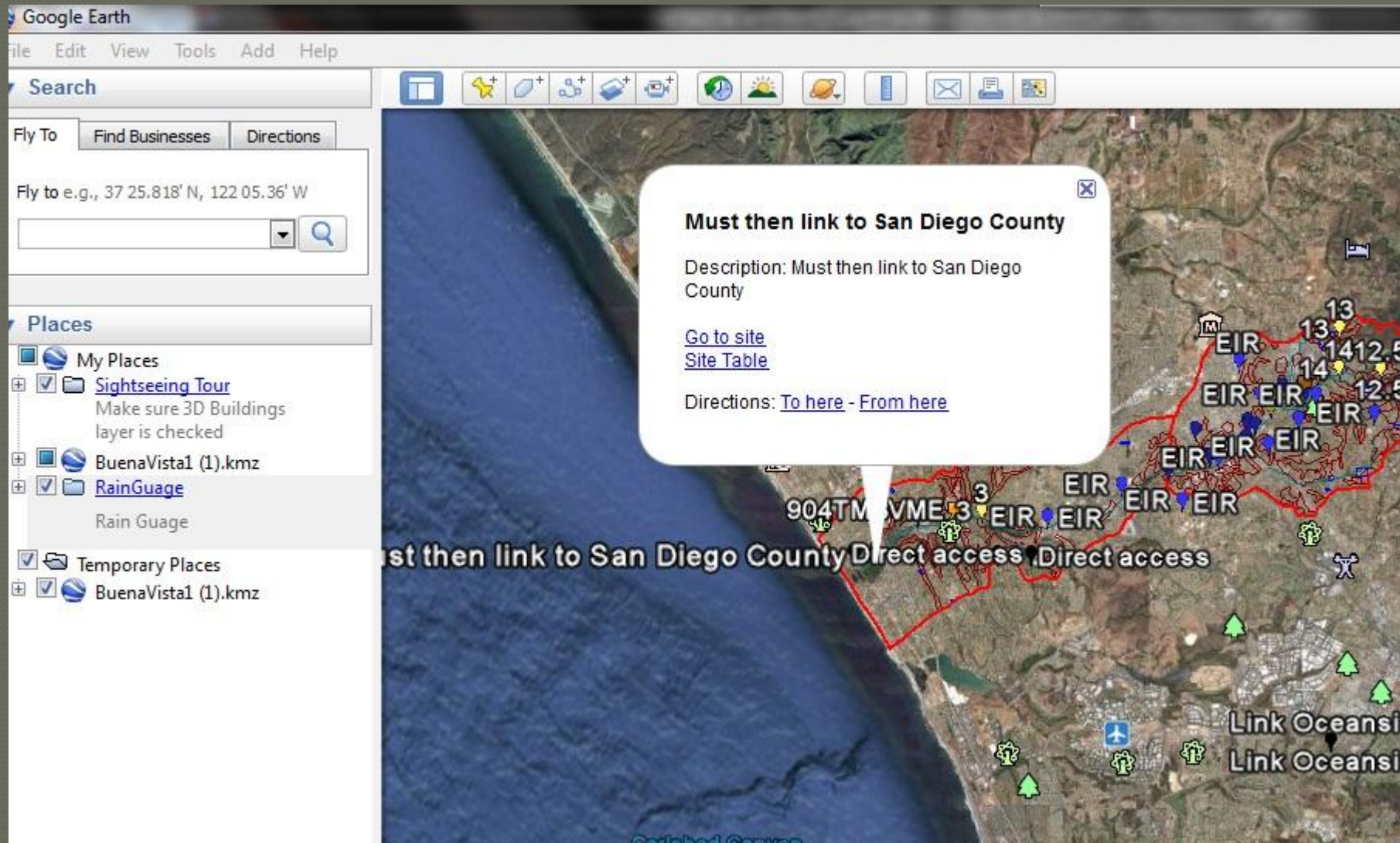
FEBRUARY 2010

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End

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