



Ventura Countywide  
Stormwater Quality  
Program

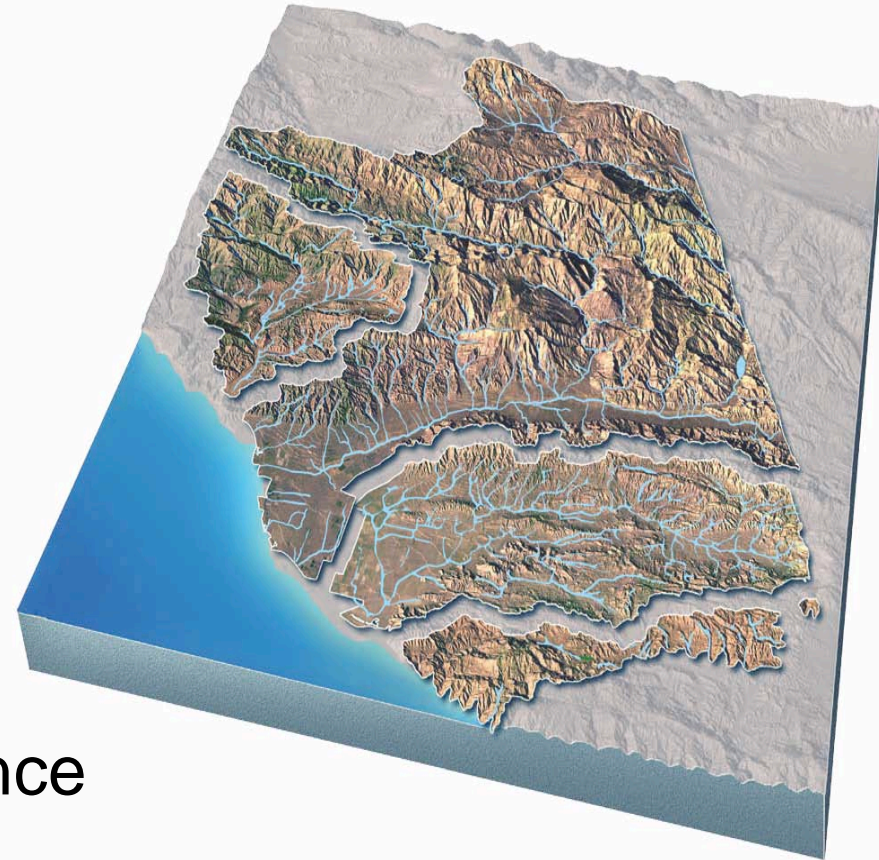
# Ventura Countywide Stormwater Quality Program

Presentation to  
Ventura River Watershed Council  
February 6, 2014



# Overview

- Program Description
- Accomplishments
  - Data Analysis
  - New Websites
- Future Activities
  - Next Permit Reissuance
  - Special Studies





# Municipal Stormwater Permit

- Countywide Permit
  - 10 Cities
  - Unincorporated County
  - Watershed Protection District
- District is named Principal Permittee
- Partially Funded Through Benefit Assessments Collected by District
  - Implementation Agreement
    - Cost Sharing Structure
    - Management Committee Decision Process

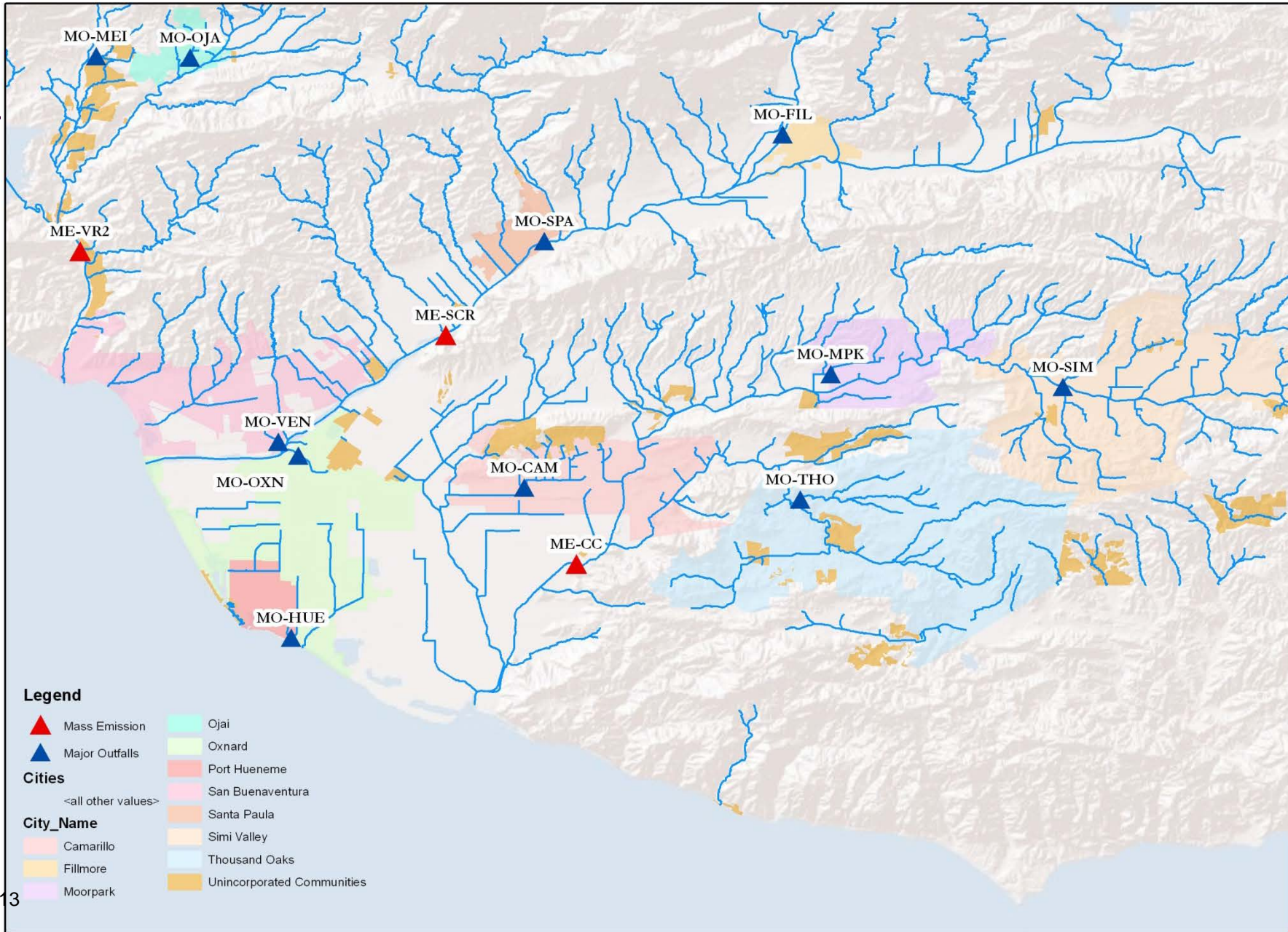


# Ventura Countywide Stormwater Management Program

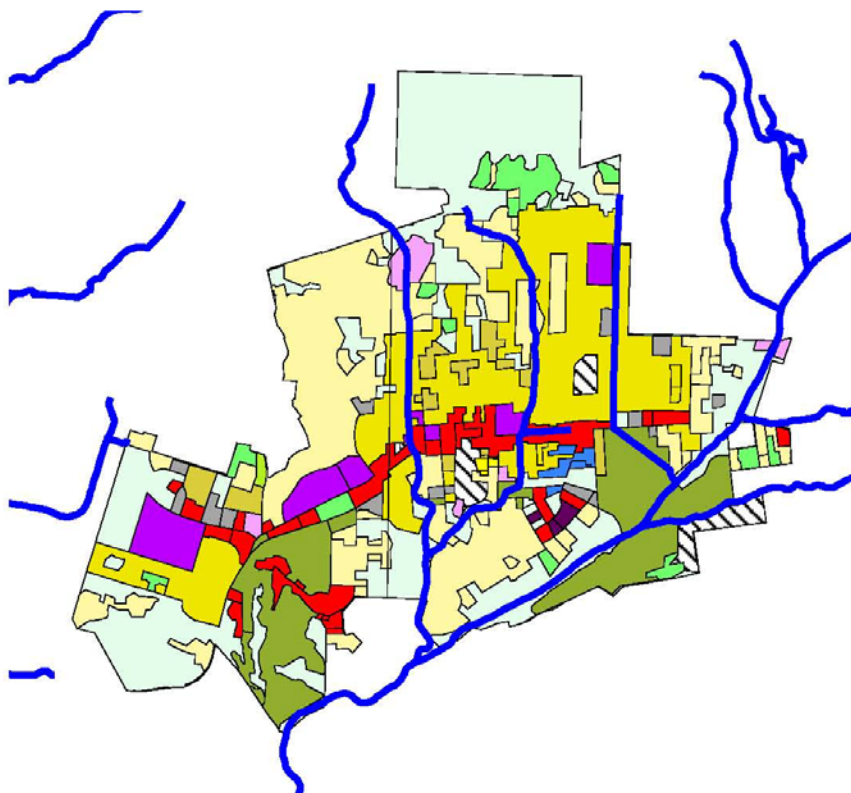
- Program Management
- Public Outreach
- Business Inspection
- Land Development
- Construction
- Public Agency Activities
- Illicit Discharge/Connection Elimination
- Monitoring



# Permittees and Sampling Locations

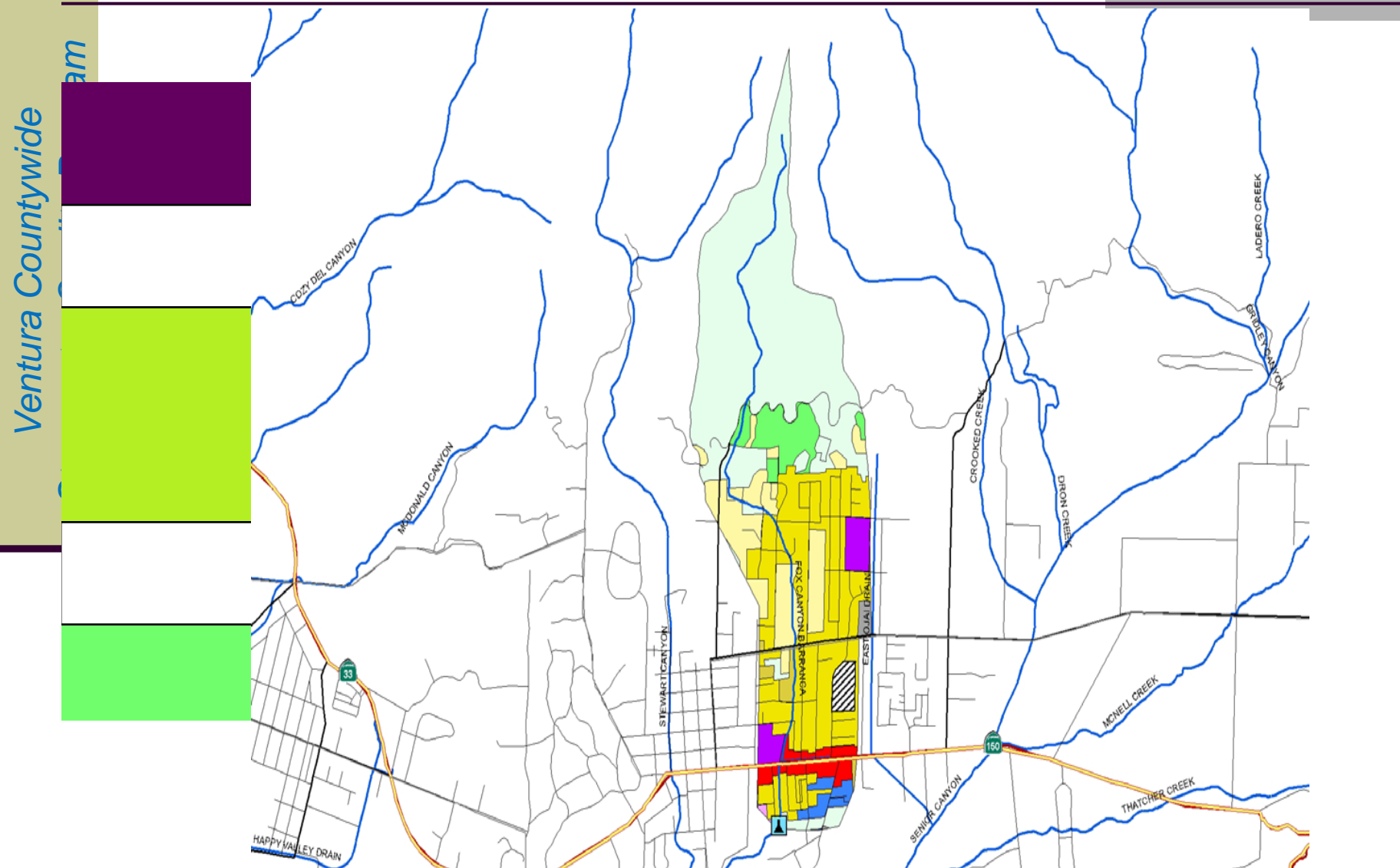


## City Land Use Ojai



Land Use	Percent	Acre	
Agriculture	0.0298	83.1481	Green
Cemeteries	0.0014	3.8334	Grey
Com_Indus. Mix	0.0027	7.6182	Grey
Commer.	0.0557	155.1137	Red
Facility	0.0154	43.2255	Grey
Industrial_3	0.0048	13.2375	Grey
No Info Given	0.0199	55.6258	Hatched
Recreation	0.1118	312.0504	Grey
Res.1	0.2217	620.7189	Yellow
Res.2	0.0219	61.3324	Yellow
Res.3	0.1914	534.8453	Yellow
Res.4	0.0011	3.2763	Yellow
Schools	0.0360	100.6181	Purple
Utilities	0.0119	32.9340	Orange
Vacant Undiffere	0.2747	767.1168	Grey
Totals	1.0000	2794.6900	

# Compare City of Ojai's Land Use to Drainage Area



# Field Verify Sites for Flow Measurement, Access and Safety

## Ojai

**Waterbody:** Fox Canyon Barranca (tributary to San Antonio Creek)

**Location:** Concrete box channel upstream Ojai Valley Athletic Club and downstream pedestrian walkway (34°26'41.25"N, 119°14'28.43"W)

**Pros:** Numerous bridges to sample from, located behind VCWPD gate, likely well-defined rating table

**Cons:** Some potential for vandalism

**Outstanding Site Selection Tasks:** Work with VCWPD O&M to ensure enclosure doesn't interfere with maintenance activities

**Other Potential Sites:** Downstream where Stewart Canyon crosses beneath Ventura St. (bioassessment #8)

**Dry Season Flow Potential:** Likely intermittent year-round flow due to urban runoff







# City of Ojai's Monitoring Station

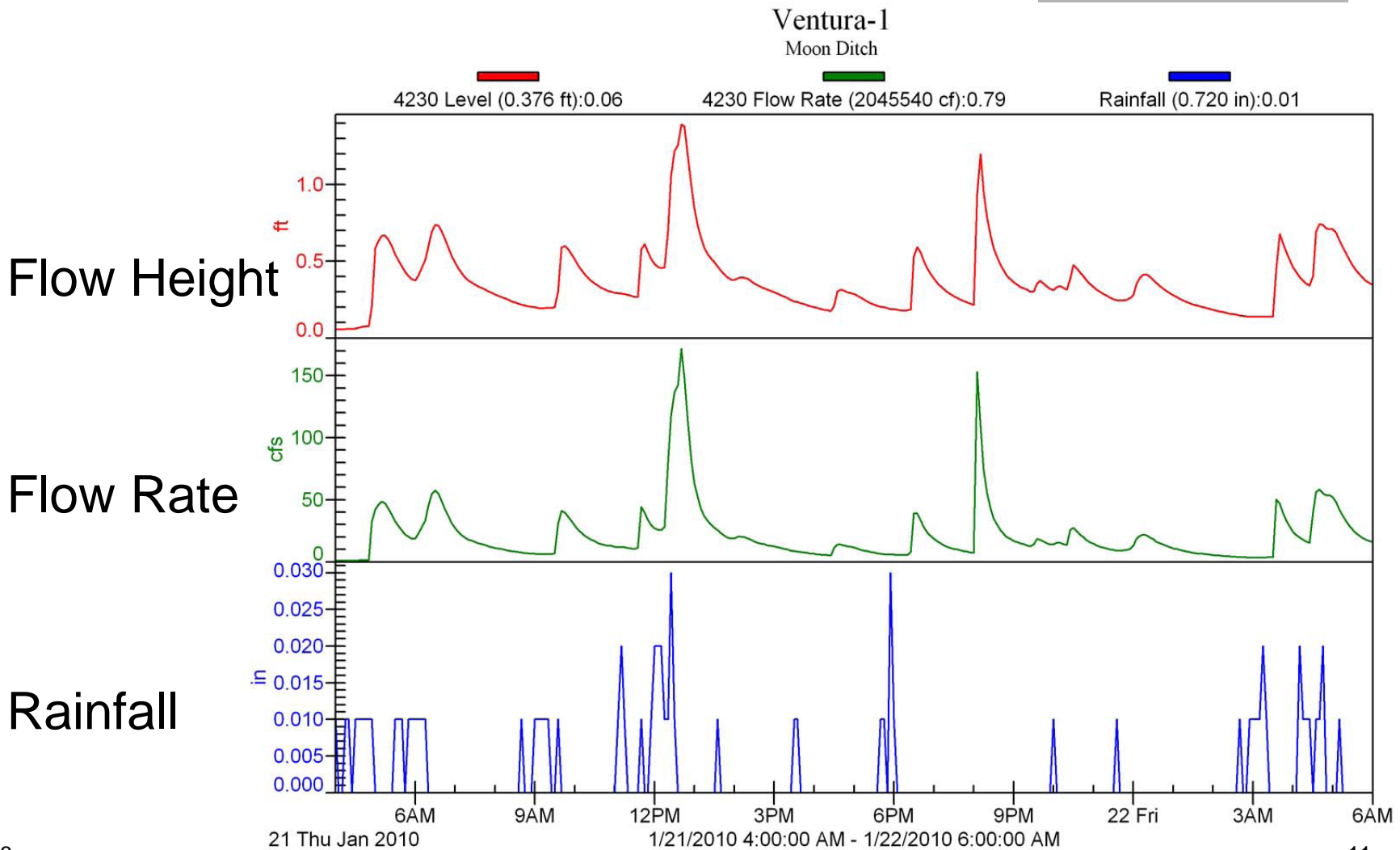






# Program Accomplishments - Monitoring Station Telemetry

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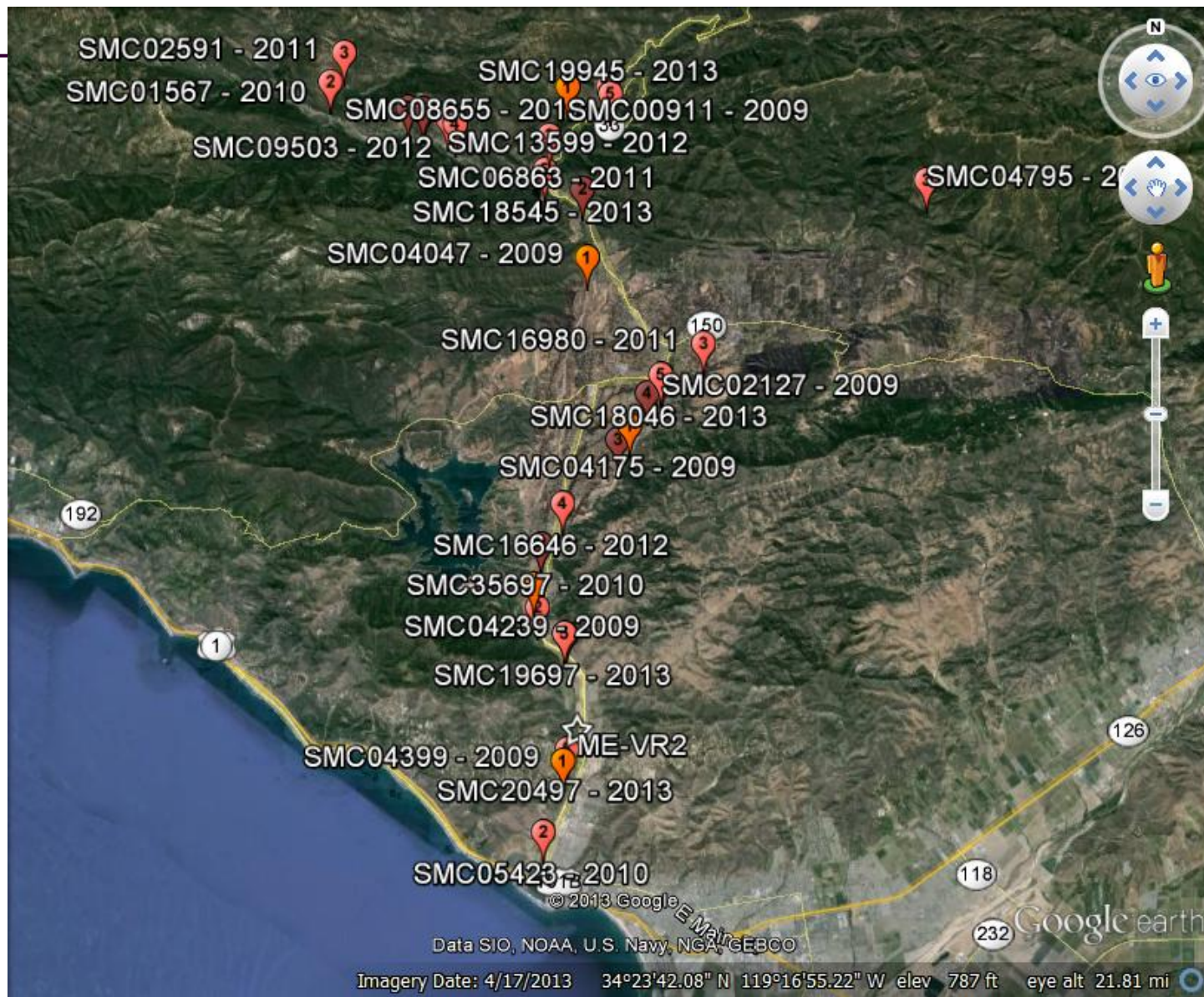


# Bioassessment





# Regional Bioassessment Study

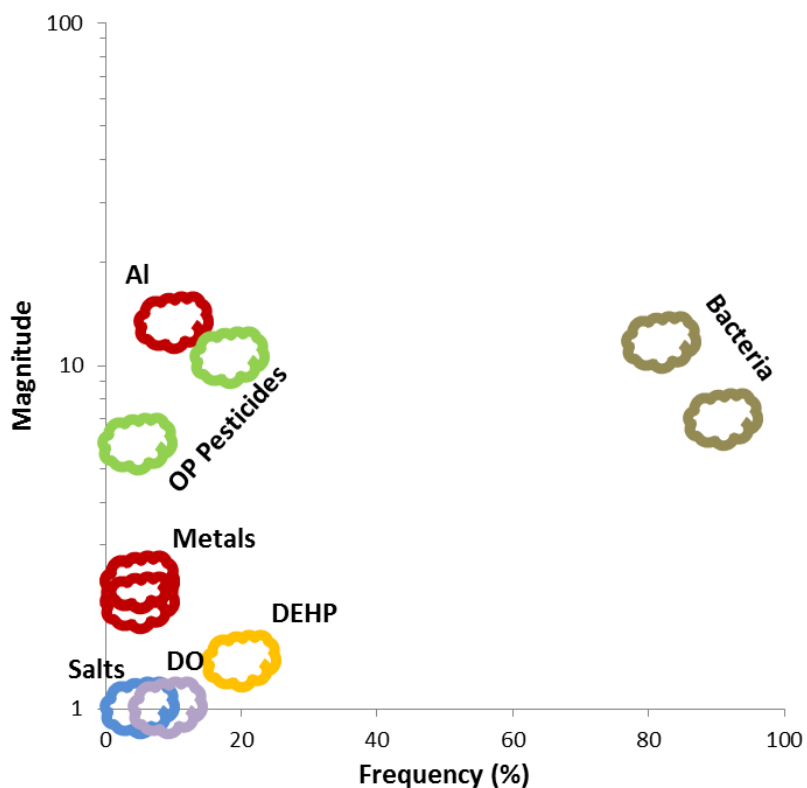




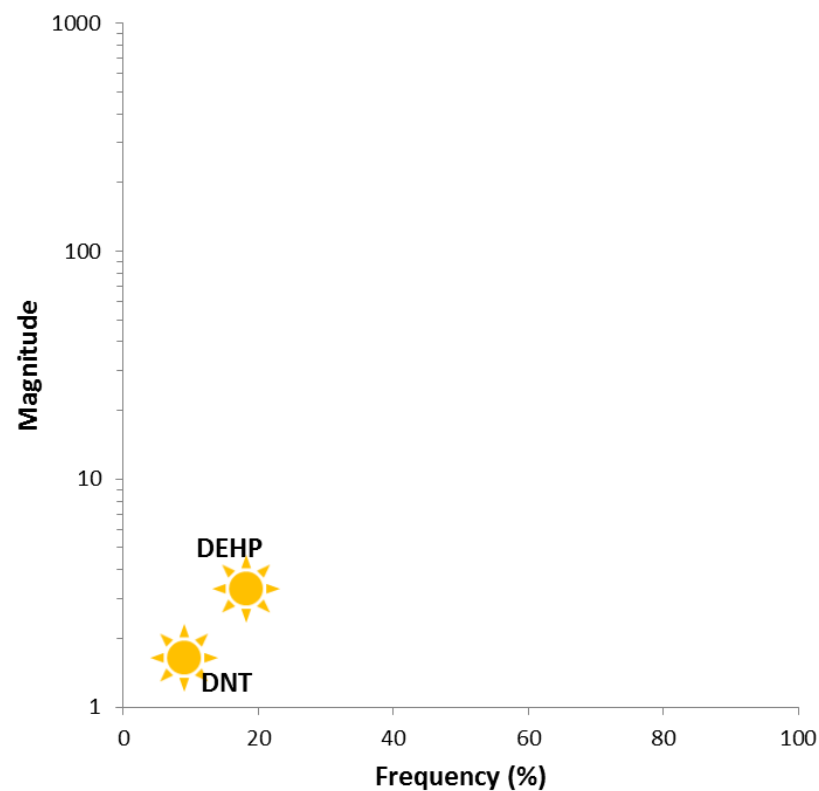
# Ventura River Concerns

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## Wet weather



## Dry weather





# Program Accomplishments - Water Quality Index

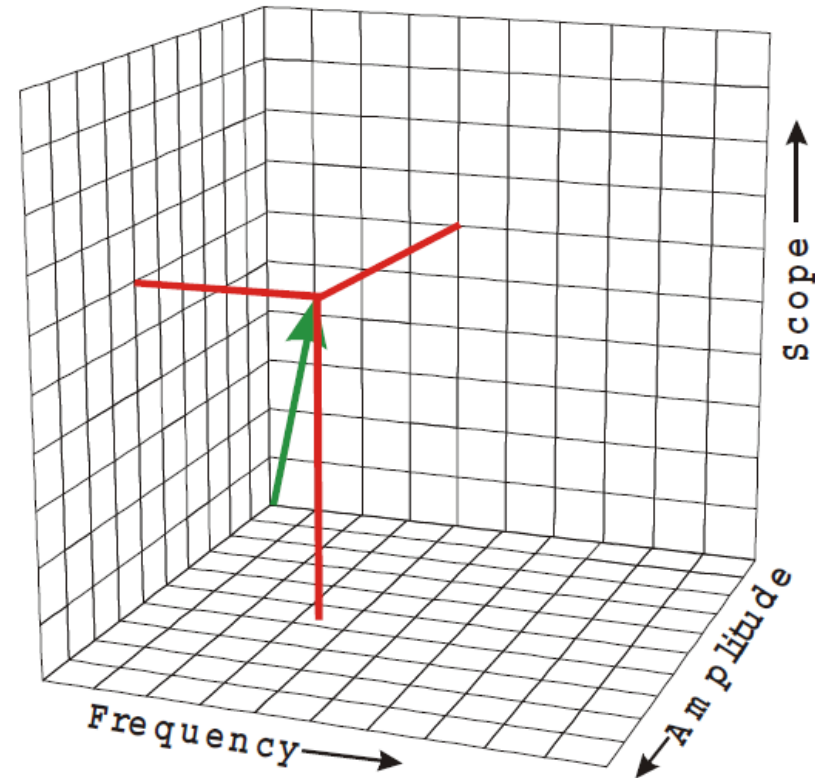
$$WQI_i = 100 - \left( \frac{\sqrt{F_1^2 + F_2^2 + F_3^2}}{1.732} \right)$$

**Based on exceedances of adopted  
or recommended objectives**

**Scope (F1):** how many?

**Frequency (F2):** how often?

**Magnitude (F3):** by how much?



**Canadian Council of Ministers of the Environment (2001).** Canadian water quality guidelines for the protection of aquatic life: CCME Water Quality Index 1.0, Technical Report. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.



# WQI Constituents

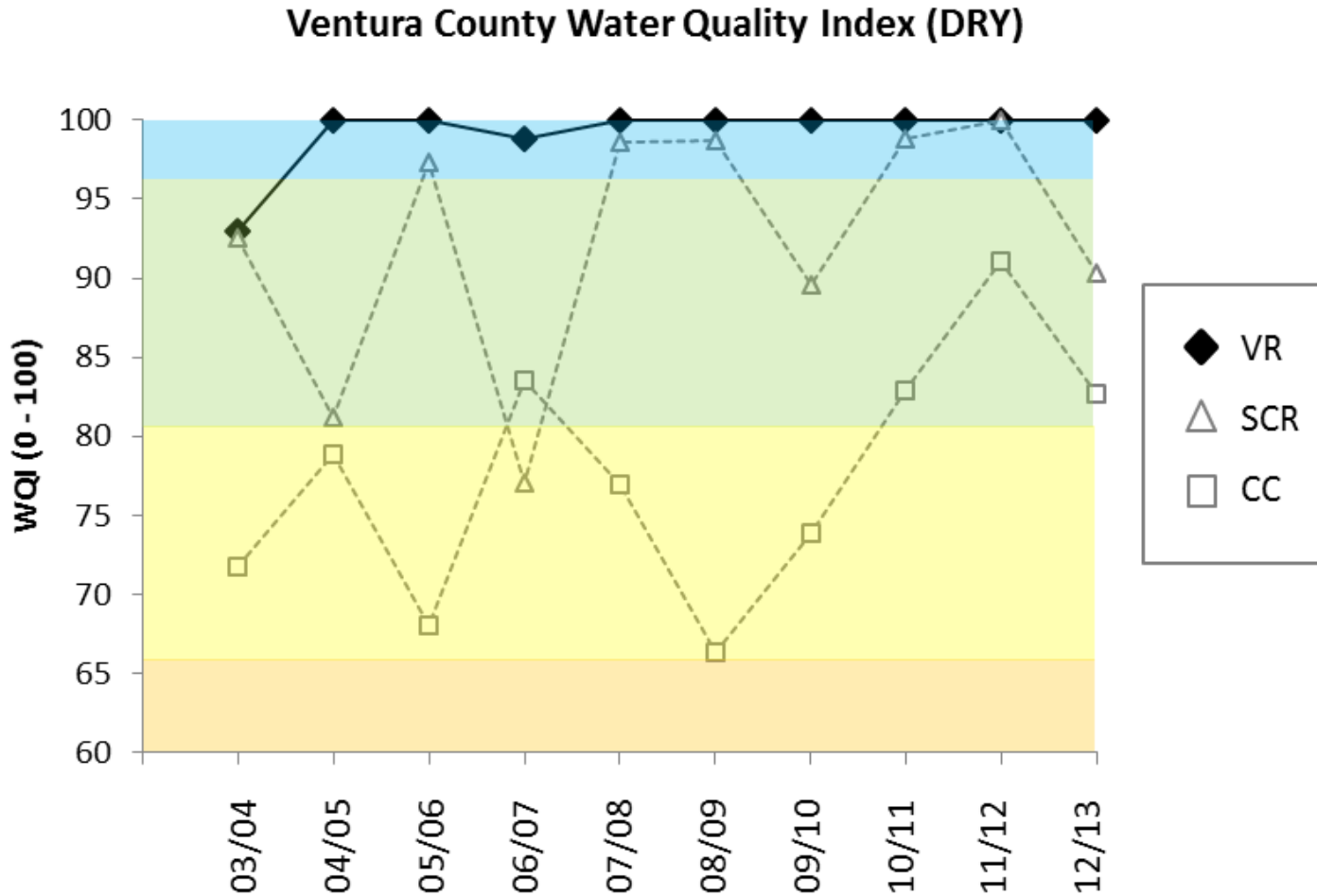
Sub-index	Constituents
Salts	TDS, chloride
Nutrients	NO <sub>3</sub> -N, NH <sub>3</sub> -N, DO, pH, MBAS
Bacteria	<i>E. coli</i>
Metals	Al, Sb, As, Ba, Be, Cd, Cr, Cr(VI), Cu, Pb, Hg, Ni, Se, Ag, Th, Zn
Organics	2,4,5-T*, 2,4-D, 2,4-DB*, 4,4'-DDE, 4,4'-DDT, aldrin, azinphos methyl*, bromacil*, chlorpyrifos*, dalapon*, DCPA*, delta-BHC*, demeton-O*, demeton-S*, diazinon*, dicamba*, dimethoate*, diphenamid*, glyphosate, malathion*, metolachlor*, PCP, simazine, toxaphene, B(a)P, chrysene, DEHP, DEP
Toxicity	IC50

\*No objectives adopted, use alternative criteria e.g. EPA or CA DFW recommendations





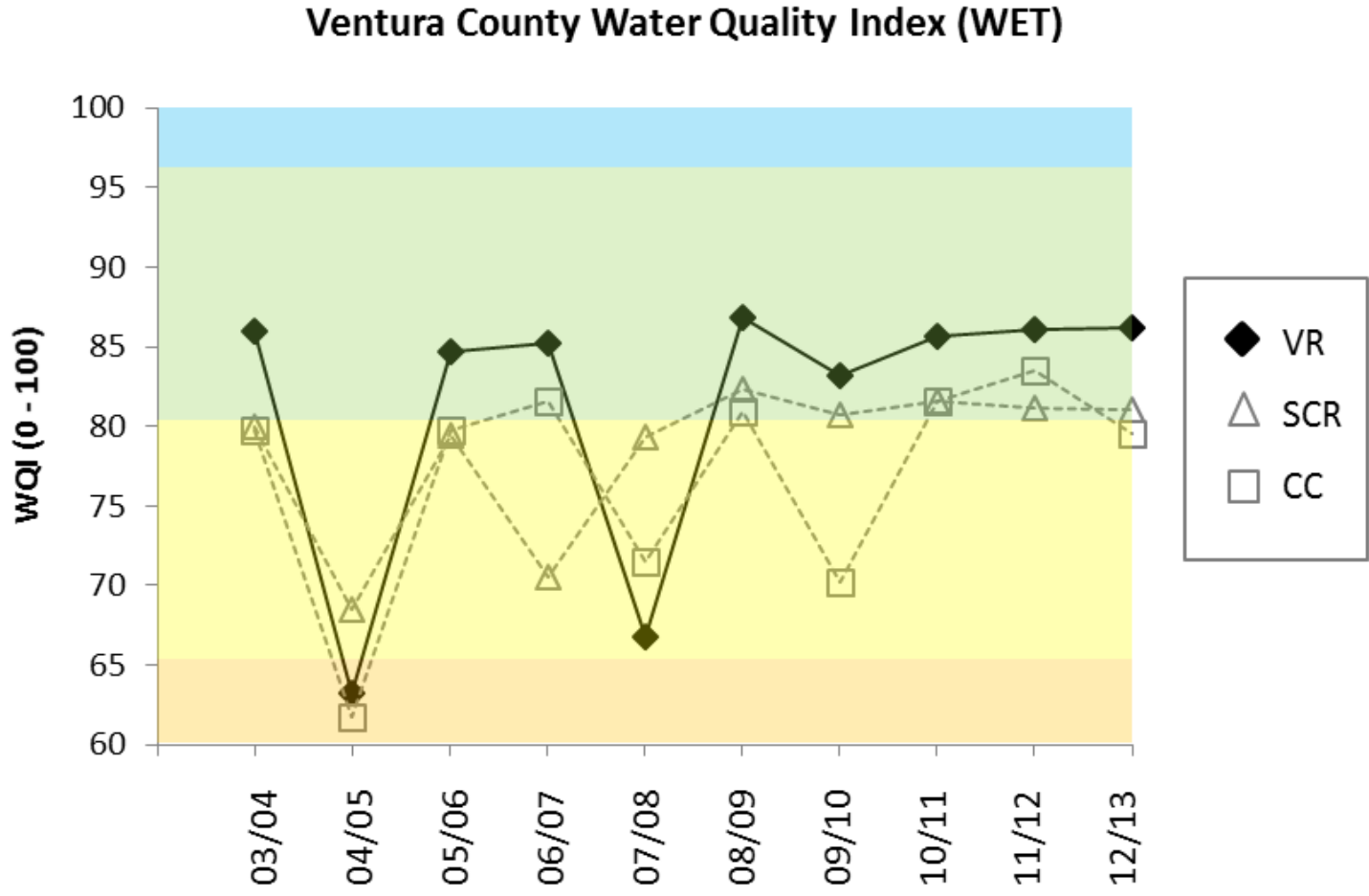
# Index trends for VR compared to other watersheds. Score color coding represented by background



- Ventura River scores best in County
- Generally excellent in dry weather, very good in wet weather, with a few exceptions
- Trends fairly consistent over time, low scores driven by large storm events



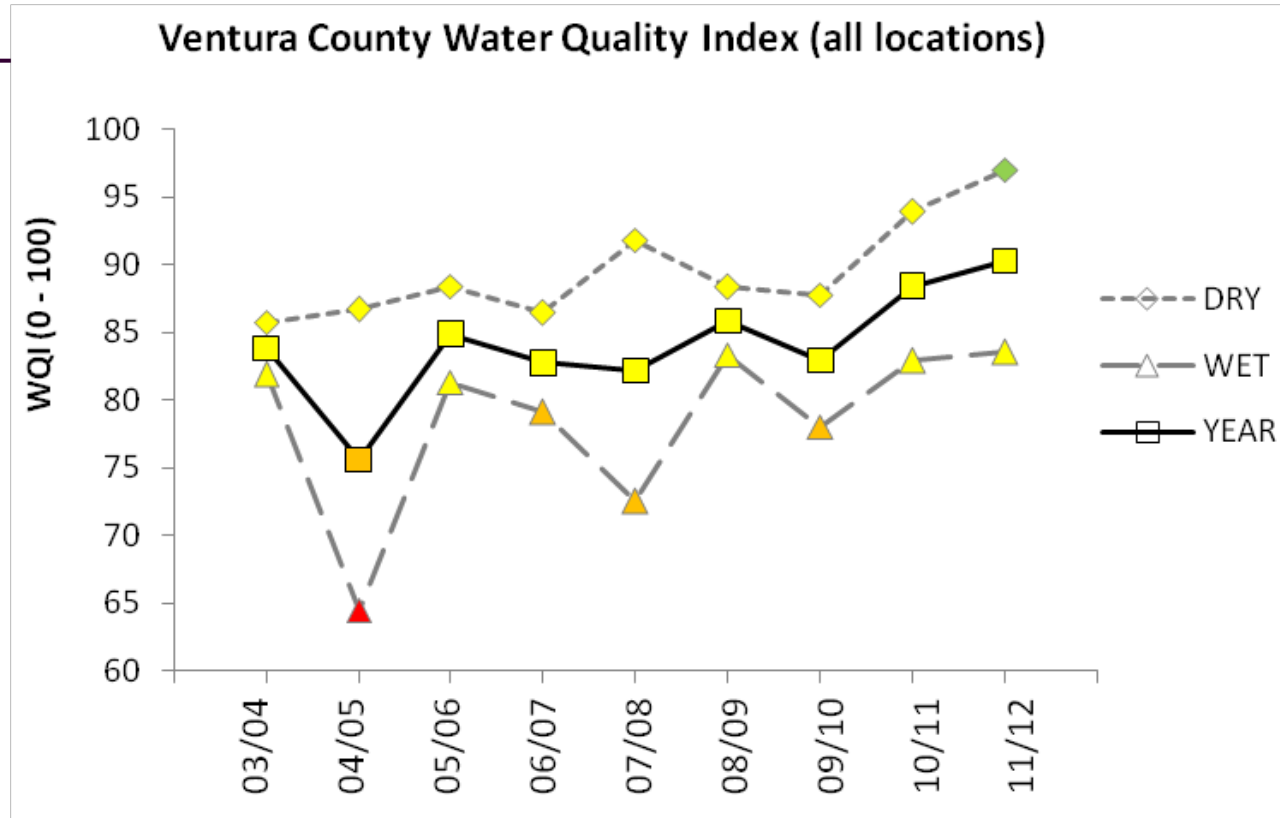
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# WQI Scores 2011/12



Index score	Grade	Interpretation
96 – 100	A	Excellent – Guidelines almost always met
81 – 95	B	Very Good
66 – 80	C	Fair
46 – 65	D	Marginal
0 – 45	F	Poor – Most constituents exceed guidelines with high frequency



# Program Accomplishments - Improving Trends in Receiving Waters

Metals	Dry			Wet		
	ME-CC	ME-SCR	ME-VR	ME-CC	ME-SCR	ME-VR
Arsenic	↑			↓	↓	
Antimony				↓		
Cadmium				↓		↓ ↓
Chromium	↓ ↓	↓	↓ ↓	↓	↓	↓ ↓
Copper	↓ ↓	↓ ↓	↓ ↓		↓	↓ ↓
Mercury	↑ ↑	↑ ↑	↑ ↑	↓	↑	↑
Nickel	↓	↓ ↓	↓ ↓	↓		↓
Lead	↓		↓	↓		↓ ↓
Selenium	↓	↓		↓ ↓	↓ ↓	↓ ↓
Silver				↓		
Thallium				↓		
Zinc	↓ ↓	↓	↓ ↓	↓		↓ ↓

↓ ↑ Dissolved  
↓ ↑ Total



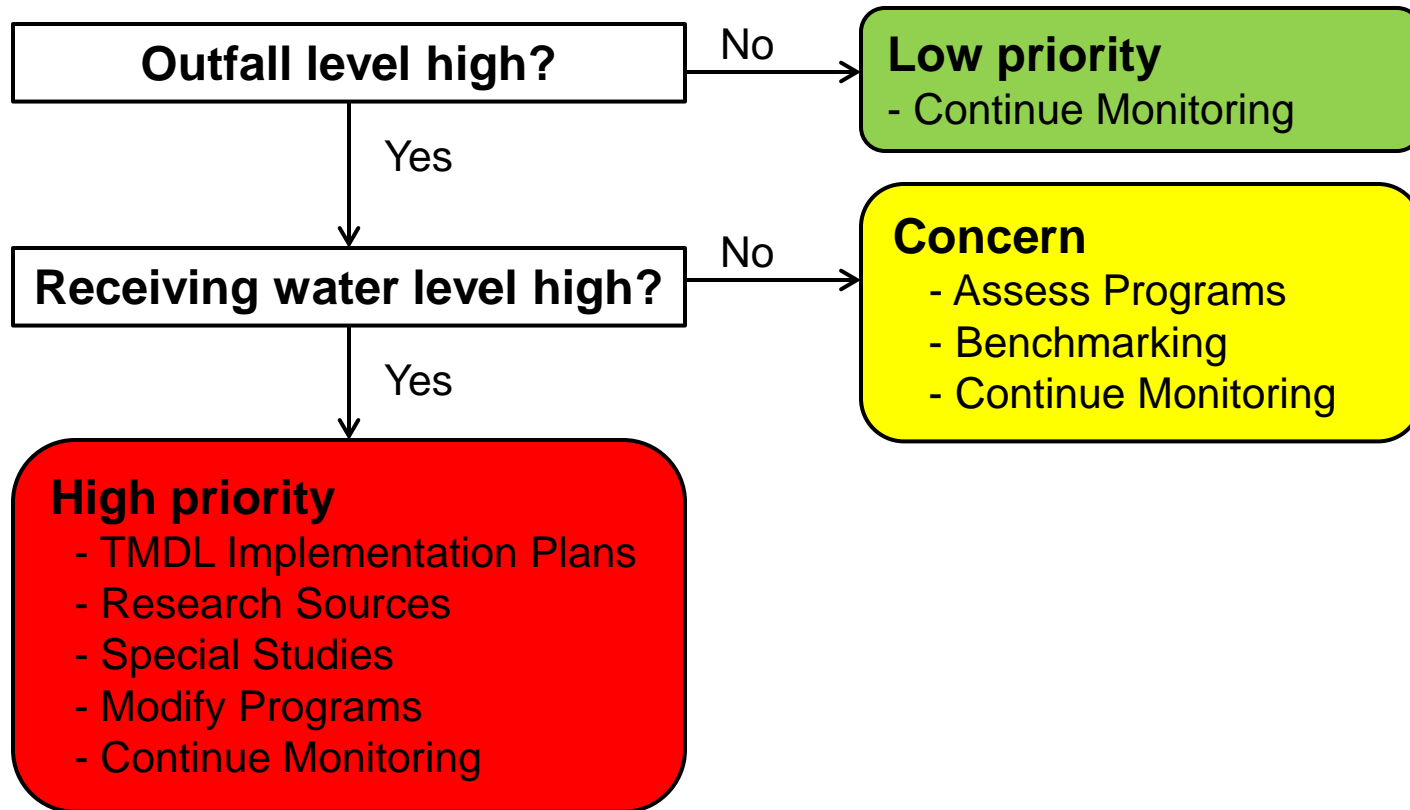
# Program Accomplishments - Improving Trends in Receiving Waters

Non - Metals	Dry			Wet		
	ME-CC	ME-SCR	ME-VR	ME-CC	ME-SCR	ME-VR
Coliforms, total		↓				
Coliforms, fecal		↓				
E. coli	↓			↓	↓	
Enterococcus	↓			↓		
BOD	↓					
TKN	↓	↓	↓	↓		↓
Phosphorous, dissolved	↑					
TDS		↓				
Chloride						↑
Conductivity	↑	↓				
Ca, Mg	↑					
Hardness		↓	↓			↑
Diethyl phthalate	↑					
Diazinon	↓			↓		
Malathion				↑		



# Outfall Pollutant Prioritization

Constituents at each outfall are evaluated for elevated levels and compared to receiving waters





# Outfall Pollutant Prioritization

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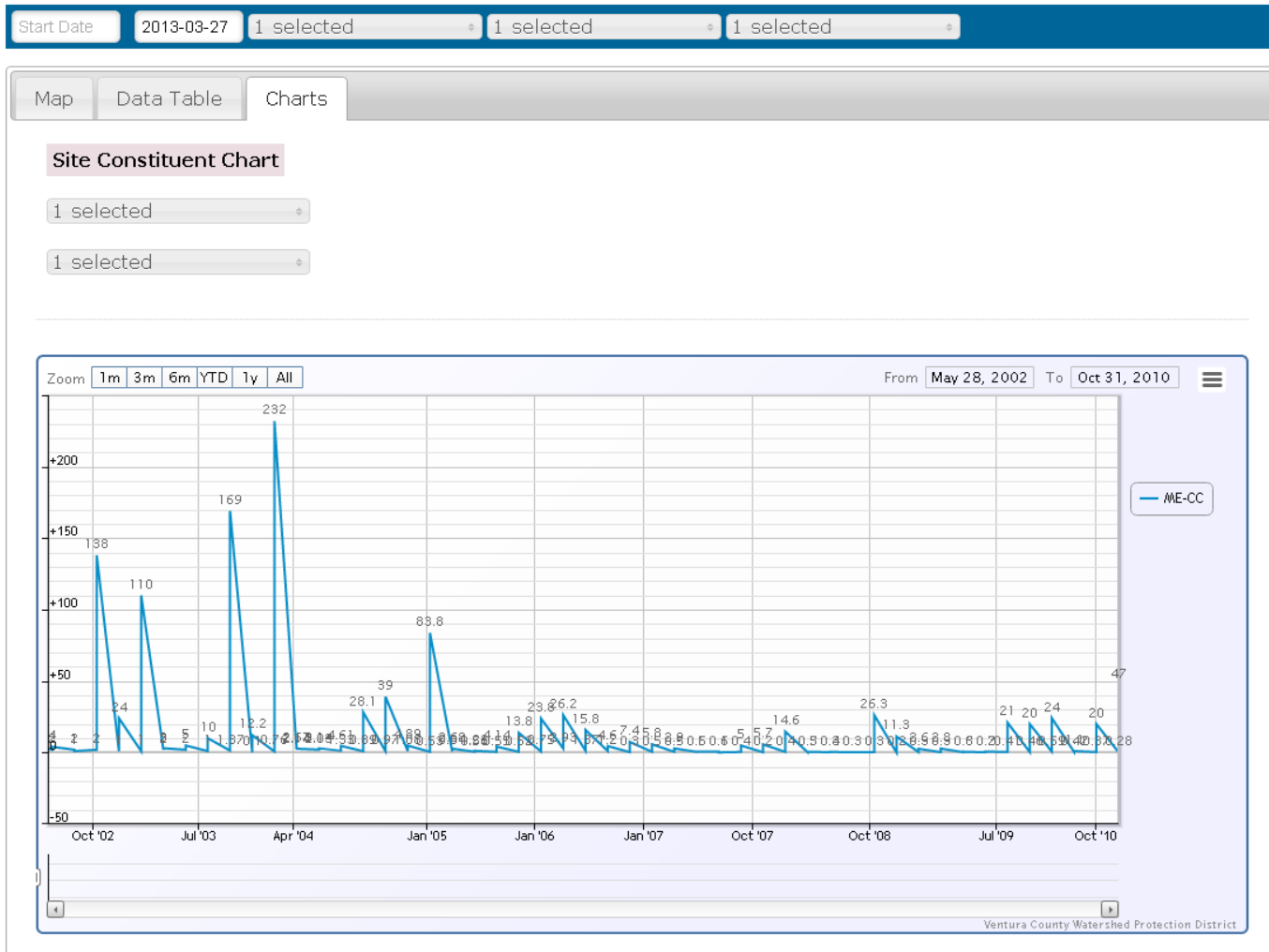
Constituent	OJA	MEI	OXN	VEN	SPA	FIL	CAM	THO	SIM	MPK	HUE
<i>E. coli</i>	91	91	67	75	67	75	92	89	89	88	100
Fecal coliforms	100	100	44	58	56	50	83	78	78	75	100
Al (t)			38	64	63		82	100	75	100	
DO						13			13		75
pH			13				18				
Residual Cl							9				
NH3			13								
Chloride	36							25			
TDS								25			
MBAS		10	50	36	63		18				
PER						25					
As (t)										14	
Cr (t)								13			
Cu(d)		10	88	36	88		64			14	
Zn(d)			38		25	25	9				
BaP							9				13
DEHP				9	13						
Simazine						13					
PCP										57	

High Priority	3
Concern	16
Low Priority	198
<b>217</b>	

# Program Accomplishments – New Data Visualization Website



## Water Quality / Stormwater Data Visualization





# Program Accomplishments – New Outreach Website



home



about us



vc watersheds



watershed protection



learning



outreach materials

## VENTURA COUNTY WATERSHEDS

### WELCOME

The beauty of all that surrounds us in Ventura County: from the hills, orchards, fields, creeks and to our neighborhoods and where we work, every bit of it is in our Watersheds. We invite you to join the cities' and county's efforts to protect Ventura County's Watersheds by being more aware of what is added to the land and the harm it can do as it is taken, through storm drains to the Ventura and Santa Clara Rivers, Malibu and Calleguas Creeks, the bays and estuaries – and eventually into the Pacific Ocean.



VENTURA COUNTY  
COMMUNITY FOR A CLEAN WATERSHED



KIDS  
CORNER



REPORT  
ILLEGAL  
DUMPING

SEARCH SITE

Search...



LINKS

VC STORMWATER  
QUALITY MANAGEMENT

VENTURA COUNTY  
RAINFALL REPORT

BEACH WATER  
QUALITY REPORT

RECYCLING/HOUSEHOLD  
HAZARDOUS WASTE  
EVENTS

EVENTS



EARTH DAY



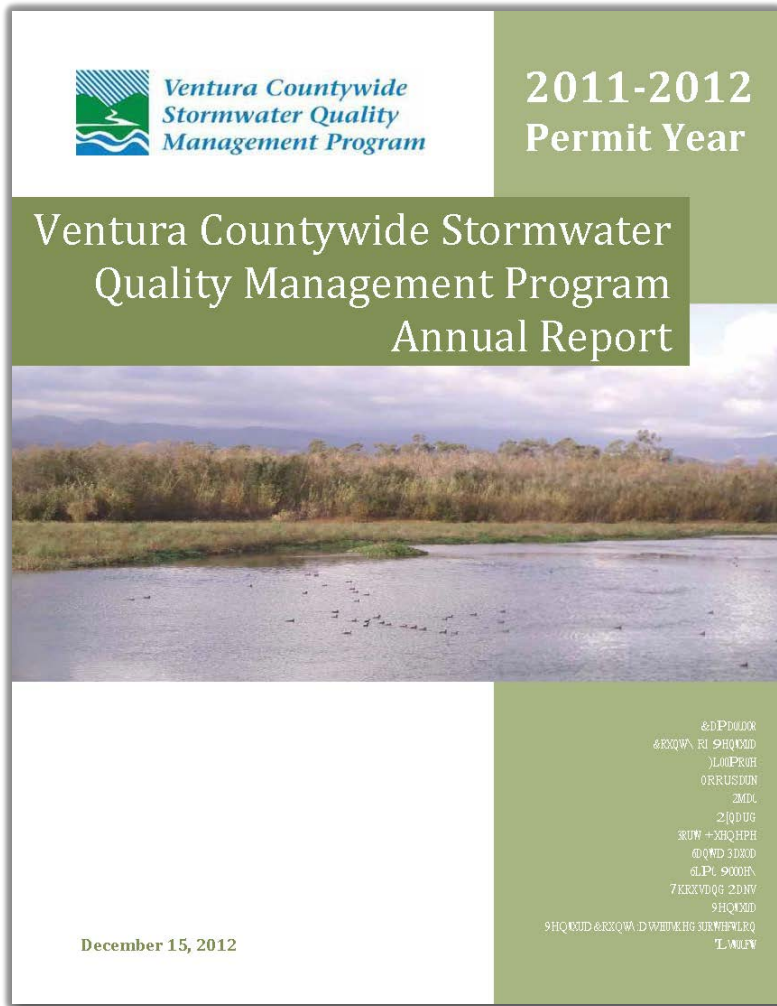
COASTAL  
CLEANUP



JOIN OUR EMAIL  
LIST



# Annual Report



- New Electronic Annual Reporting format
- Over 50 Performance Measures developed in conjunction with Regional Board staff to show compliance
- Effectiveness Assessment
- Complete picture of program (346 pages plus attachments)
- Available online at [www.vcstormwater.org/](http://www.vcstormwater.org/)



# Special Studies

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- So Cal Bight Participation
  - Dry Weather Bacteria Source Study
- Bacteria Marker Analysis
- Aluminum Source Study
- Natural Background Study
- Non-perennial Stream Bioassessment



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Stormwater Quality Program*





# Questions



## *Ventura Countywide Stormwater Quality Management Program*