

# Regional Permit 2013

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# Overview

- Introduction
- State of the Environment
- Summary
- Conclusion

# Introduction

*Facts are stubborn things; and whatever may be our wishes, our inclinations, or the dictates of our passions, they cannot alter the state of facts and evidence.*

John Adams, 1770

# State of the Environment

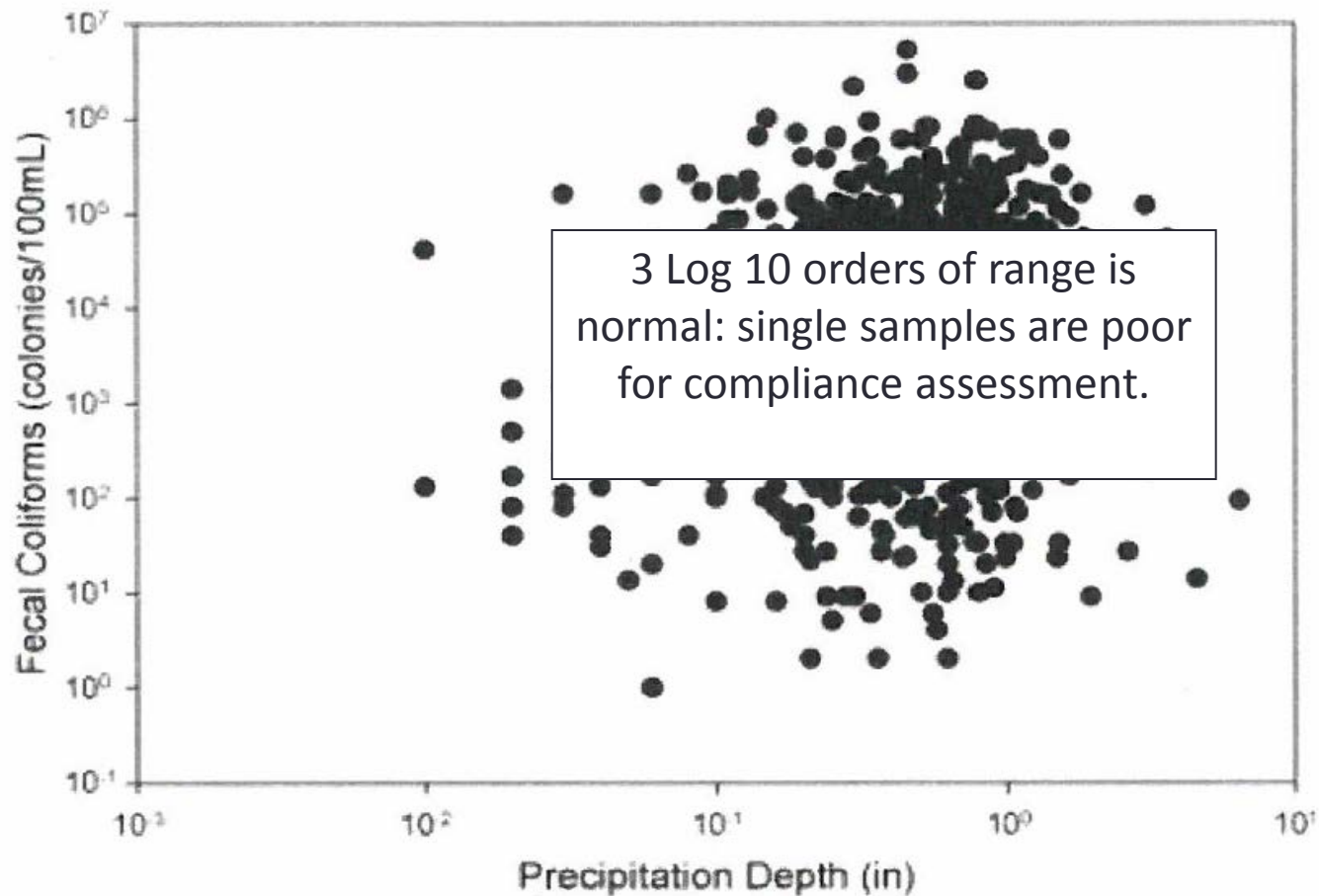
2014 REPORT OF WASTE DISCHARGE  
SAN DIEGO REGION  
STATE OF THE ENVIRONMENT



ORANGE COUNTY STORMWATER PROGRAM

# FECAL INDICATOR BACTERIA (FIB)

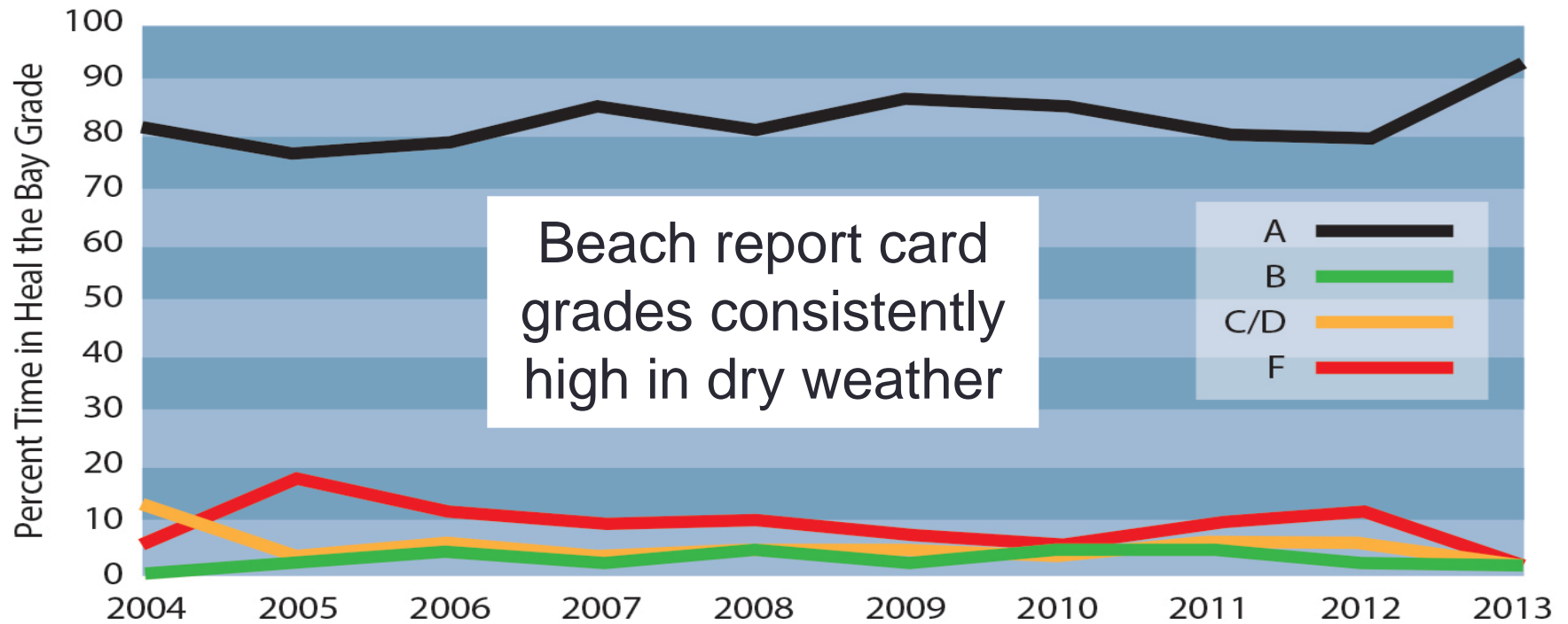
# TMDLs – FIB



Data (Outfall samples) from National Stormwater Quality Database presented in ASCE, 2014.

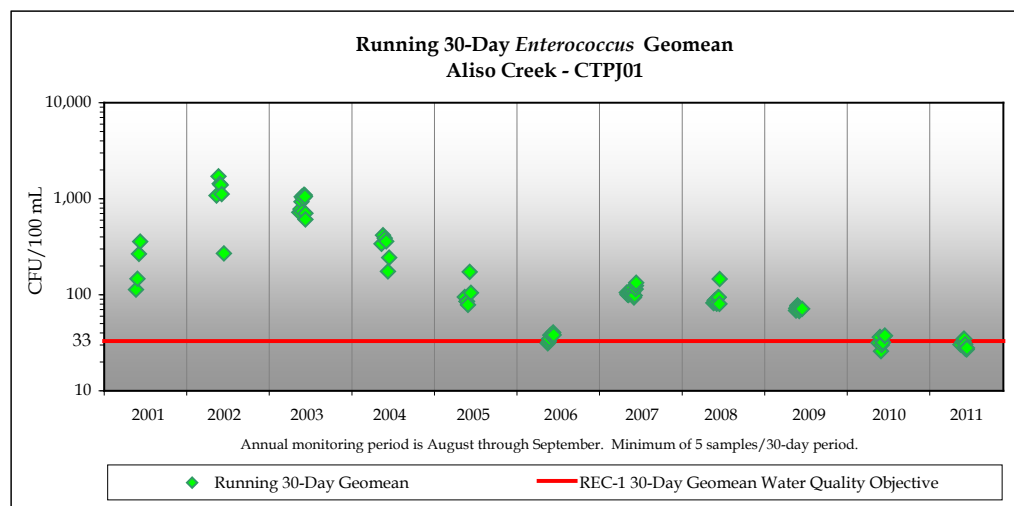
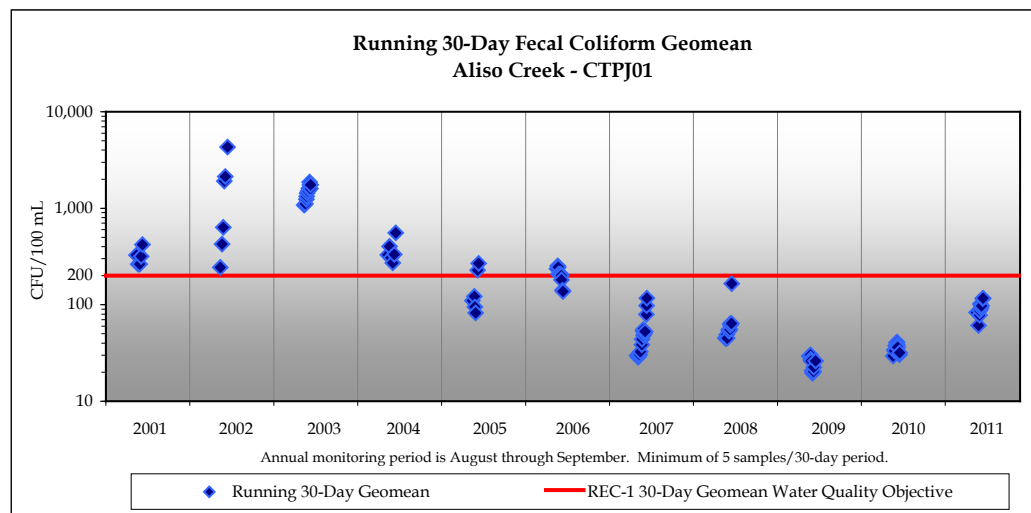
# FIB: Report Card Grades

Dry All Shoreline Sites



Source: Heal The Bay

# FIB: Dry Weather – Aliso Creek





# FIB: Model Control Program

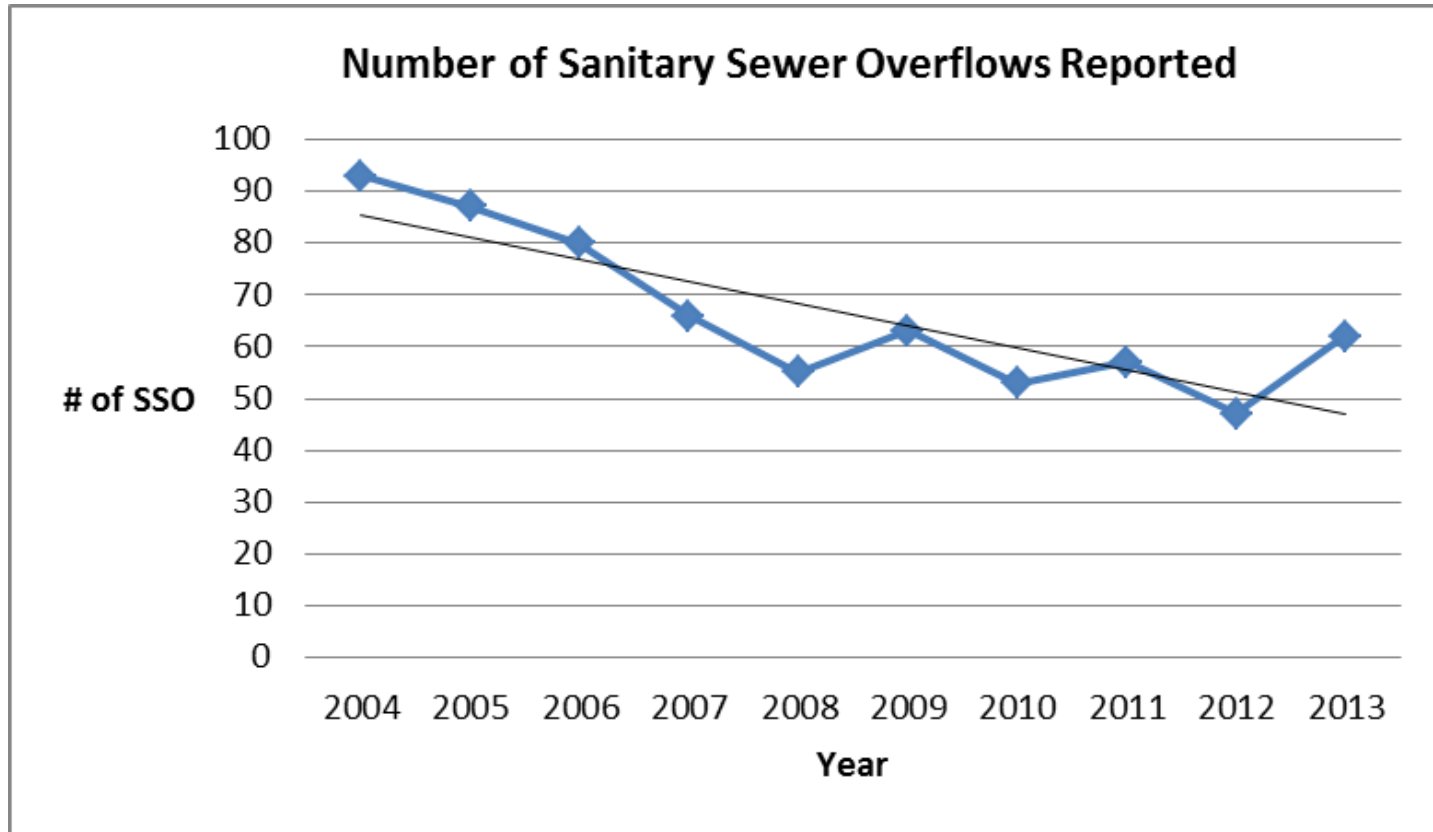
## Sources

- SSOs
- Sanitary Infrastructure
- Pet Waste
- ID/IC
- Homeless
- Trash Receptacles
- Equine Facilities
- Wildlife
- Vegetation
- Channel substrates

## Pathways

- Irrigation
- Dry weather Flow
- Wet weather flows

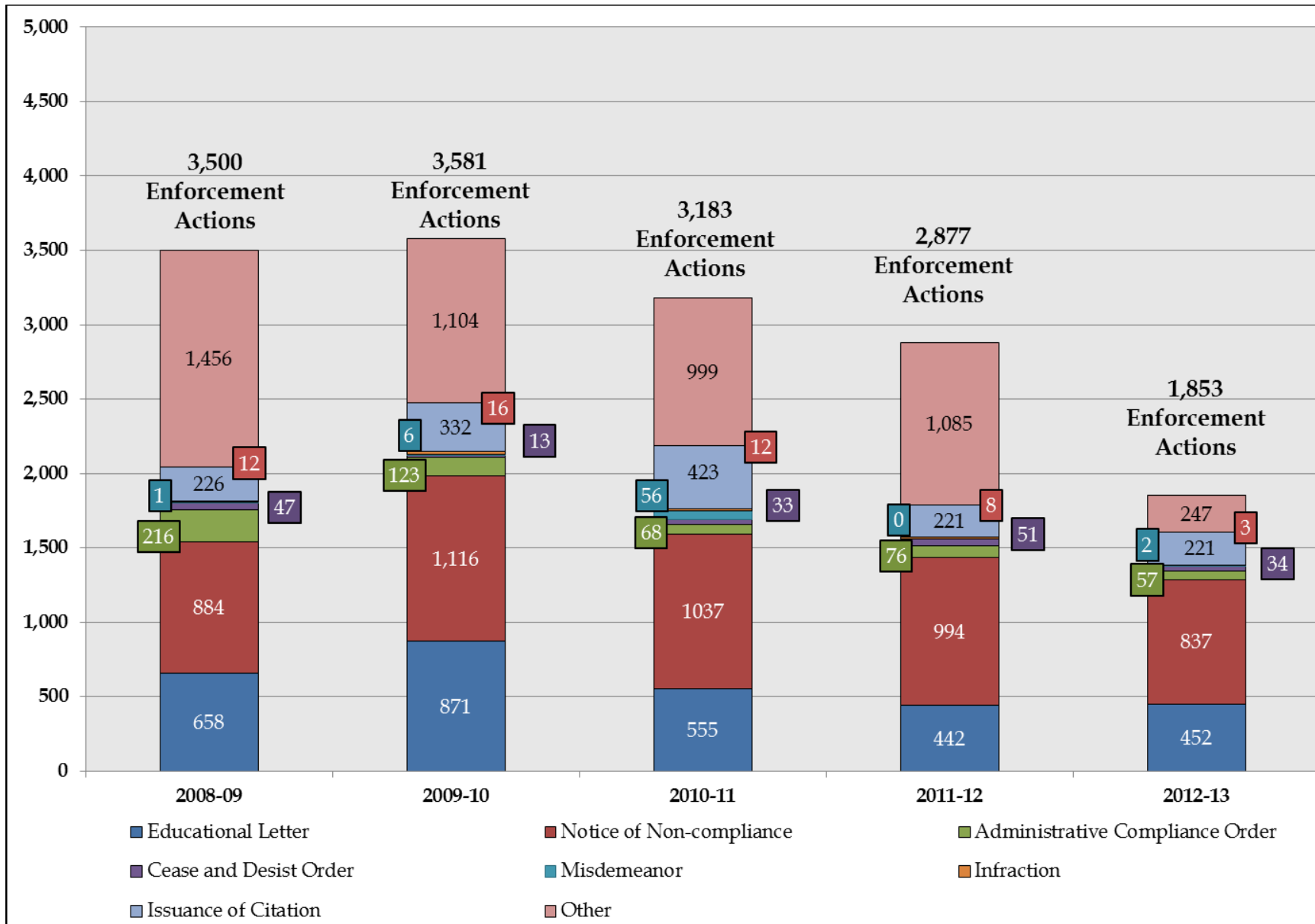
# FIB: SSO Reduction



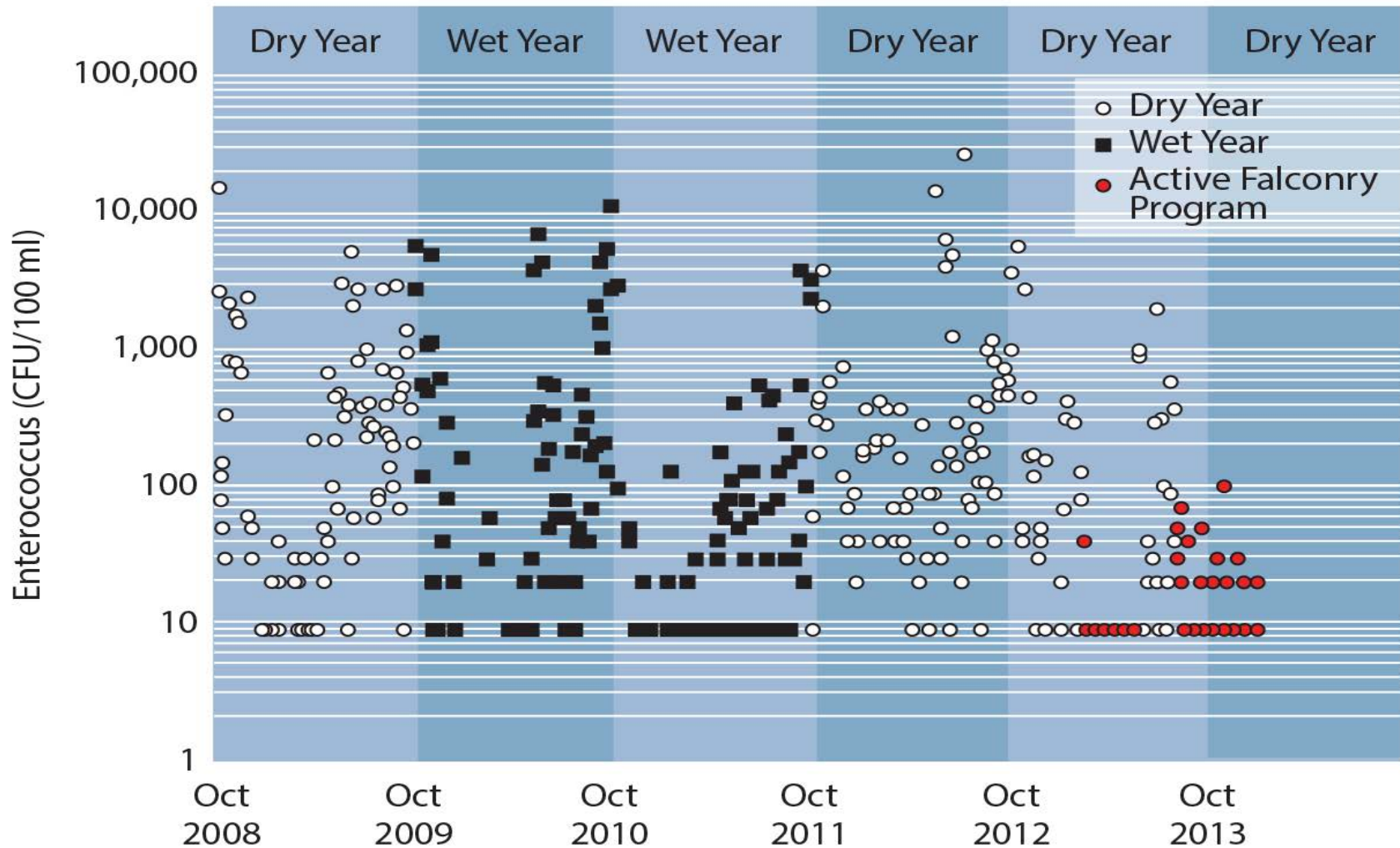
# FIB: SSO Recovery

Incident Triggering CASC Activation	Receiving Waters	Date	Type	Volume Diverted to Sanitary Sewer (Gallons)
Sanitary sewer force main rupture	Tijeras Creek/San Juan Creek/Doheny Beach	March 23, 2010	SSO (public)	2,500,000
Mobile home community, Lake Forest	Aliso Creek	June 25, 2010	SSO (private)	2,400
Sanitary sewer force main rupture	Buck Gully Creek/Little Corona Beach	July 2 , 2010	SSO (public)	710,000
Manufacturer corporate HQ, Irvine	Peters Canyon Channel	January 13, 2011	Other (fountain discharge)	100,000
Residential apartment complex, Anaheim	Santa Ana River	April 12, 2012	SSO (private)	1,900
Residential apartment complex, Anaheim	Santa Ana River	April 18, 2012	SSO (private)	77,500
Packaging products manufacturer, Buena Park	Fullerton Creek/Coyote Creek/San Gabriel River	July 25, 2012	Other (clarifier discharge)	355,000
Ammonia refrigeration leak, Santa Ana	Santa Ana Delhi Channel	February 4, 2013	Other (ammonia discharge)	200
Industrial chemical facility fire, Santa Ana	Greenville-Banning Channel	August 28, 2013	Other (fire suppression runoff)	~3,000,000
Sanitary sewer pump station failure, Newport Beach	Santa Ana-Delhi Channel/Upper Newport Bay	August 31, 2013	SSO (public, mixed with channel water)	45,000
Hotel facility HVAC system discharge	Lane Channel	December 16, 2013	Other (HVAC discharge w/ dye)	140,000
			<b>Total:</b>	<b>6.932.000</b>

# FIB: ID/IC Investigation & Enforcement



# FIB: Wildlife Control



# FIB: Overwatering Is Out



Hi OC!



Follow OC's spokesgnome on his adventure to help keep water in the yard, not the sidewalk.

[OverwateringIsOut.org](http://OverwateringIsOut.org)

H2OC.org is a stormwater initiative of the County of Orange and its 34 cities.

## Overwatering Is OUT. Efficient Watering Is IN.



**Overwatering is OUT.** When we give our landscape more water than it needs, it not only wastes our precious drinking water supplies, it also pollutes the environment. That's because the runoff from your sprinkler system carries fertilizers, pesticides, and pet waste out into our waterways and the ocean.

**Efficient watering is IN.** You can help preserve our drinking water supplies and protect the environment by giving your plants the correct amount of water. The devices below can help you water your landscape efficiently and effectively. Plus, the rebate levels often cover most or all of the cost of the device.

### SMART IRRIGATION TIMERS



Take control of your sprinkler system with a weather-based irrigation controller. These "smart" timers use information about your plants, soil, and weather conditions to give your landscape the right amount of water year-round.

**REBATE LEVEL:** Up to \$300 per controller for properties < 1 acre, or \$25 per station for properties > 1 acre.

### ROTATING SPRINKLER NOZZLES



Rotating nozzles can help you reduce harmful water runoff that flows off your landscape and eventually enters the ocean. Rotating nozzles water more uniformly than traditional sprinkler heads, and they can reduce your outdoor water use by up to 30%.

**REBATE LEVEL:** \$4 (or more) per nozzle

### SOIL MOISTURE SENSOR CONTROLLERS



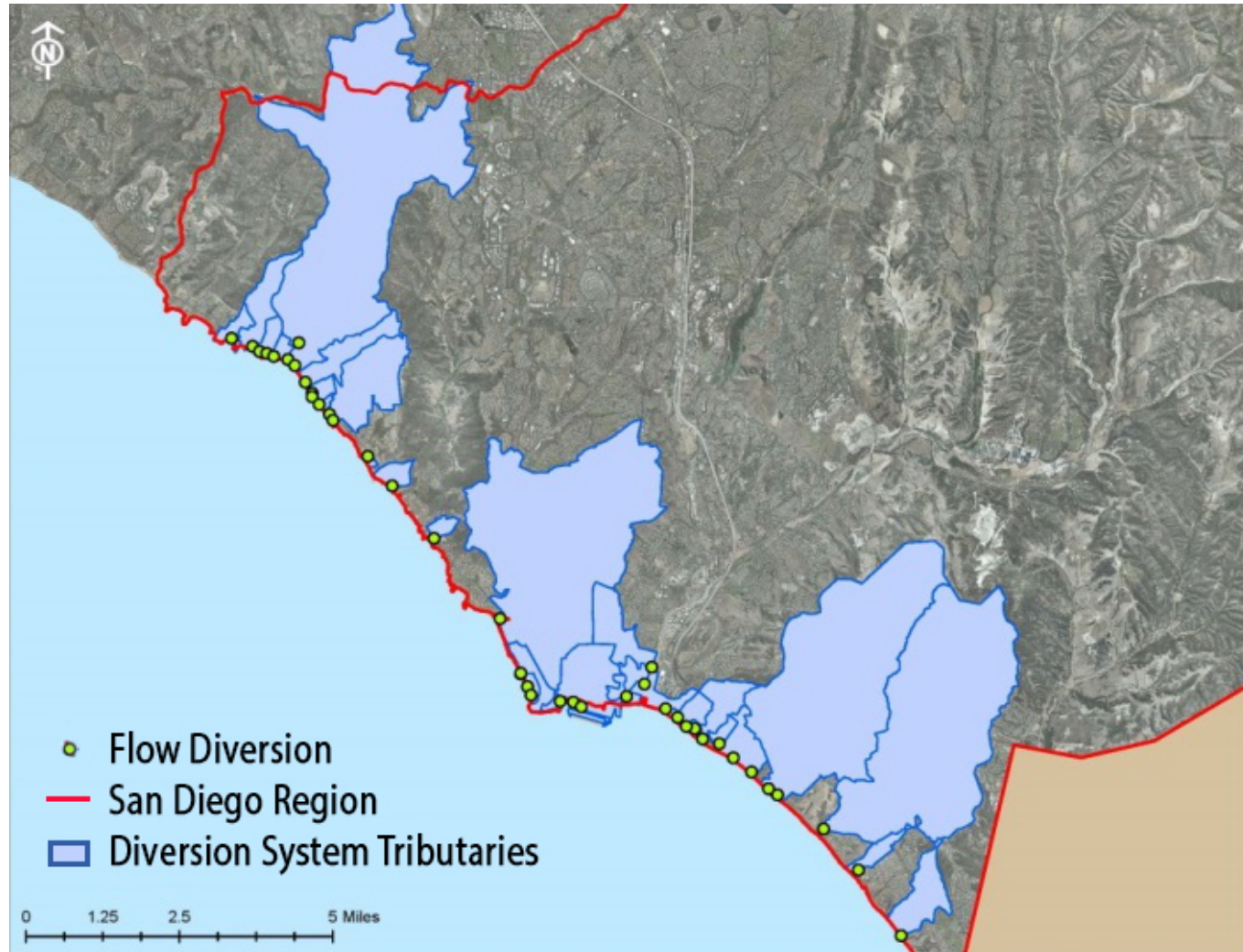
Soil moisture sensors are placed below ground in the root zones of lawns and landscapes to determine if and how long to water. Sensor-based products are available as stand-alone controllers or add-on devices to existing controllers. They have been shown to reduce outdoor water use by up to 70% without sacrificing the quality or health of your landscape.

**REBATE LEVEL:** Up to \$300 per controller for properties < 1 acre, or \$25 per station for properties > 1 acre.

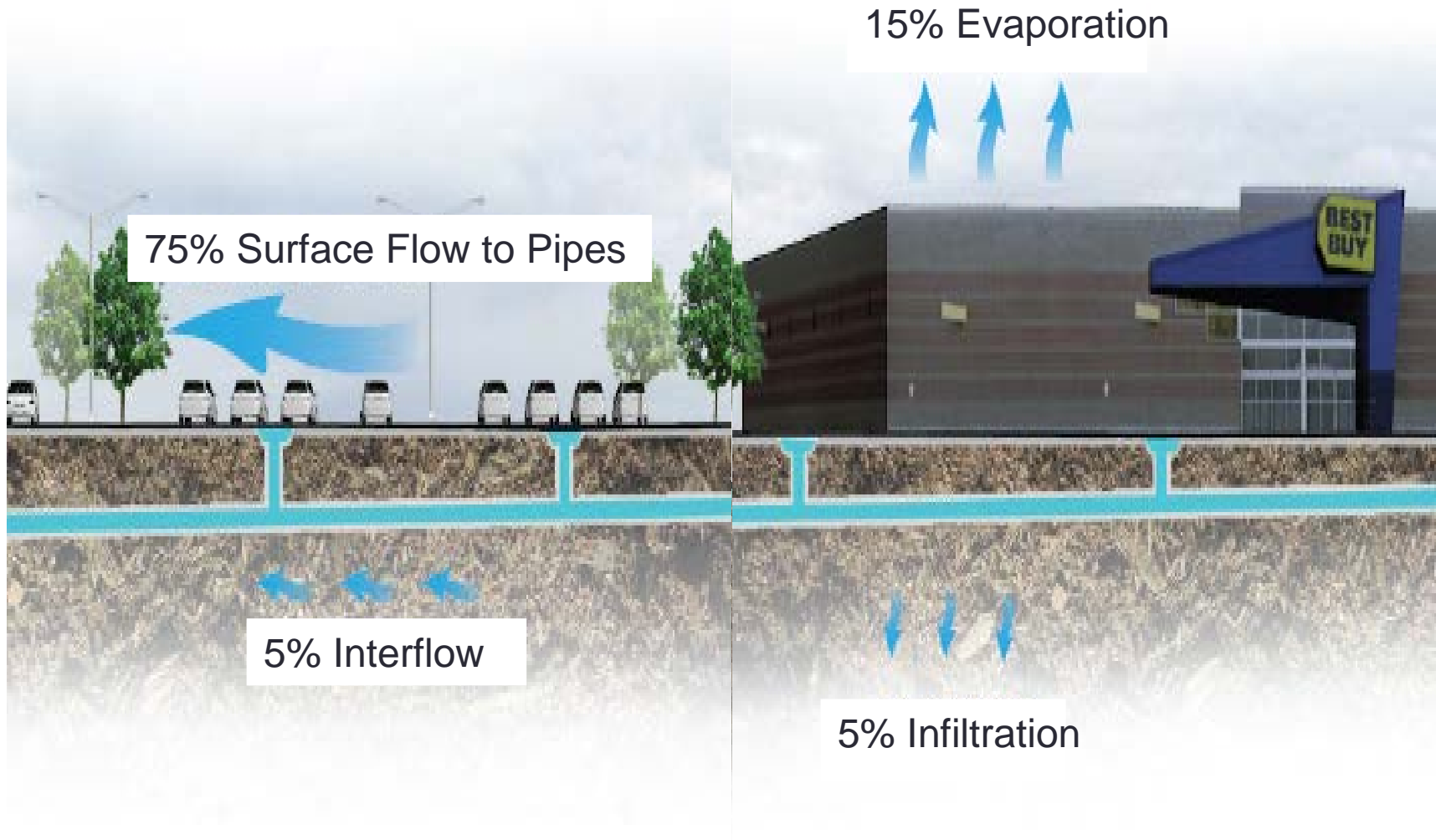


Visit [mwdoc.com/rebates](http://mwdoc.com/rebates) or call (888) 376-3314 for more information.

# FIB: Dry Weather Flow Diversions



# FIB: Wet Weather Flows

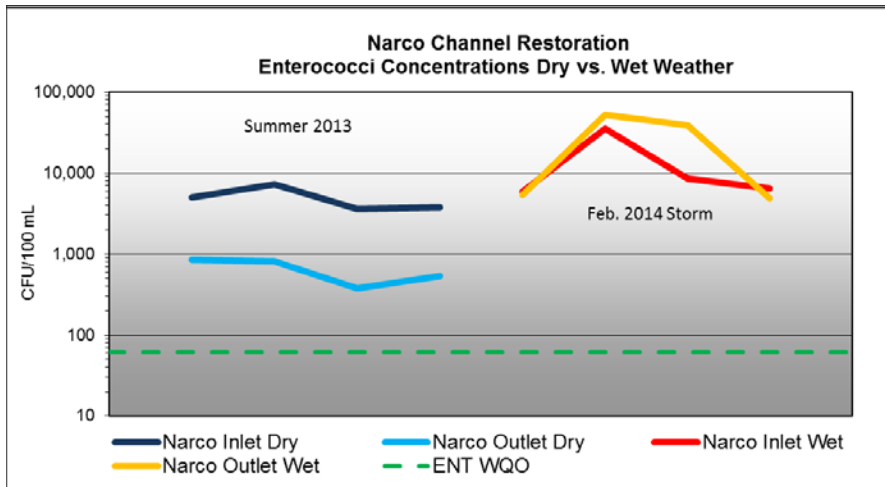
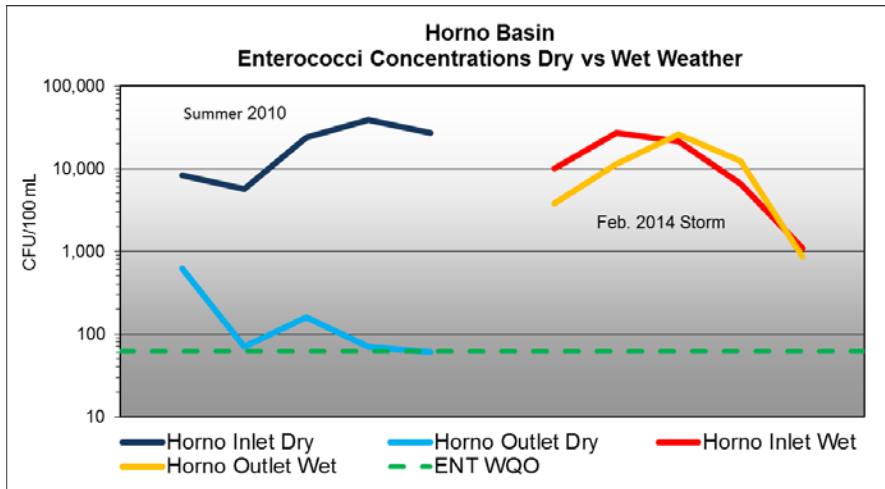


Credit: Illustrations from San Mateo County



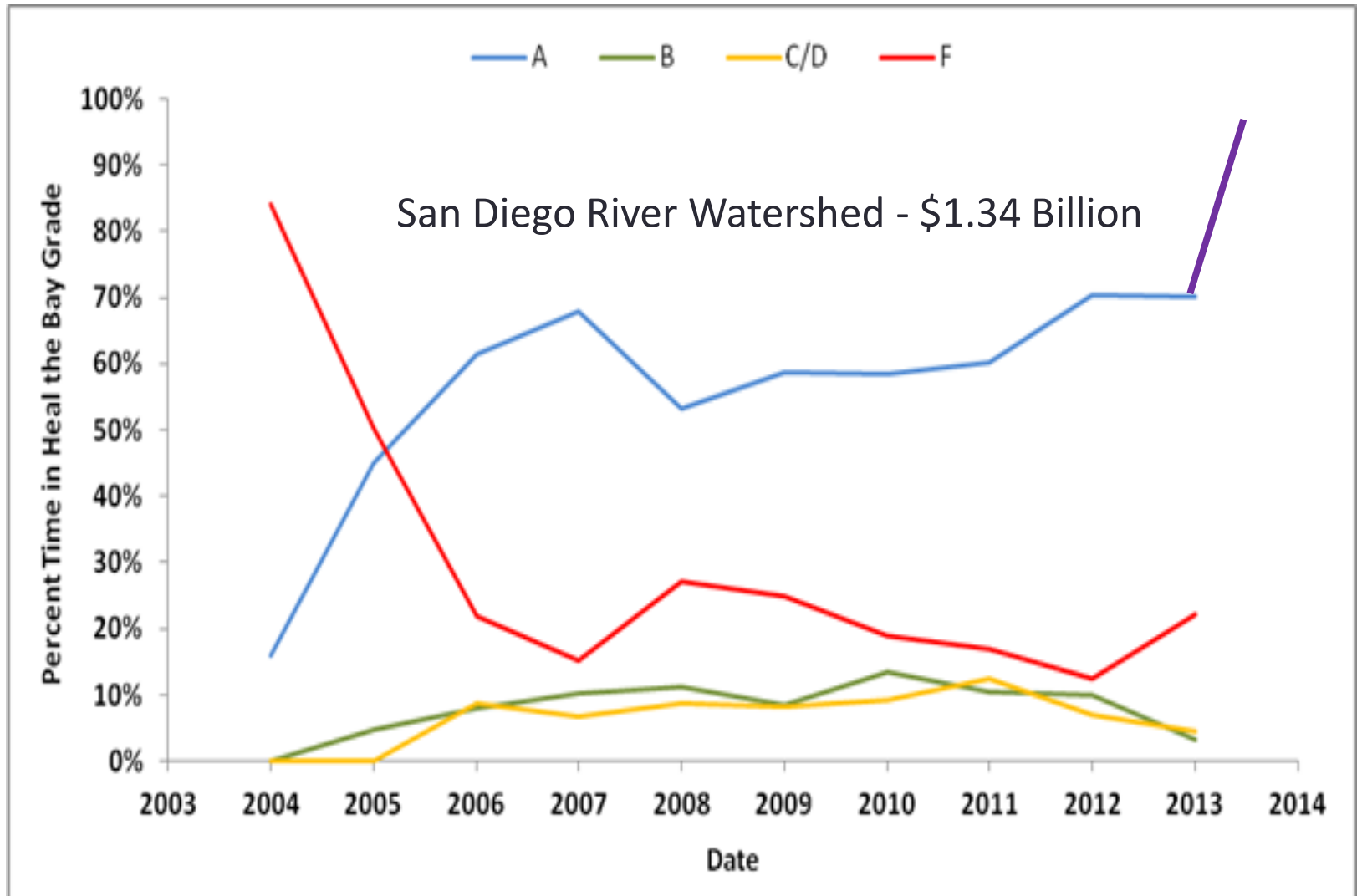
# FIB: BMP Effectiveness Study

## BMP Effectiveness - Enterococci



Credit: K. Clapper, OCPW

# FIB: Wet Weather Challenges



Source: Heal The Bay

# FIB: Summary (ROWD)

- BMPs and overall flow reductions resulting in significant reductions in dry weather
- Successful dry weather bacteria BMPs appear ineffective in providing meaningful wet weather reductions
- Overall reduction in the number of sewage spills correlates with lower number of beach closures and increased recreational water use.
- Decrease in the total number of beach mile days posted due to AB411 standards violations has increased beneficial use. Example: Doheny

# The FIB Dilemma

E. Coli and enterococci emanating from naturalized of non-fecal sources may result in the waterbody being incorrectly classified as impaired.... The development of BMPs and treatment technologies for removing FIB from waters where there are no obvious fecal inputs could be costly, destructive to natural ecosystems, and not substantially reduce the health risk.

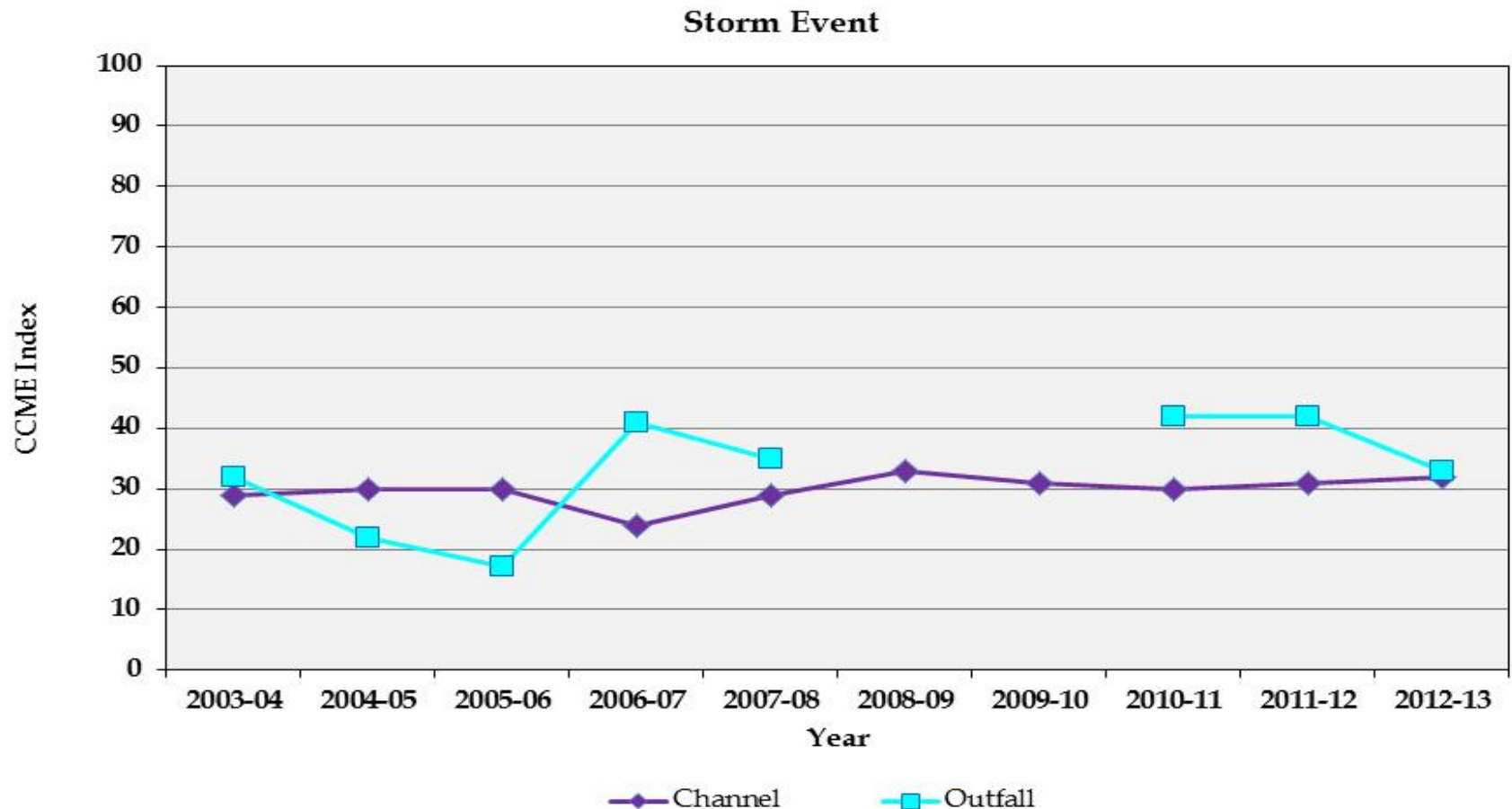
(Boehm et al. 2009, in ASCE, 2014)

# TOTAL DISSOLVED SOLIDS (TDS)

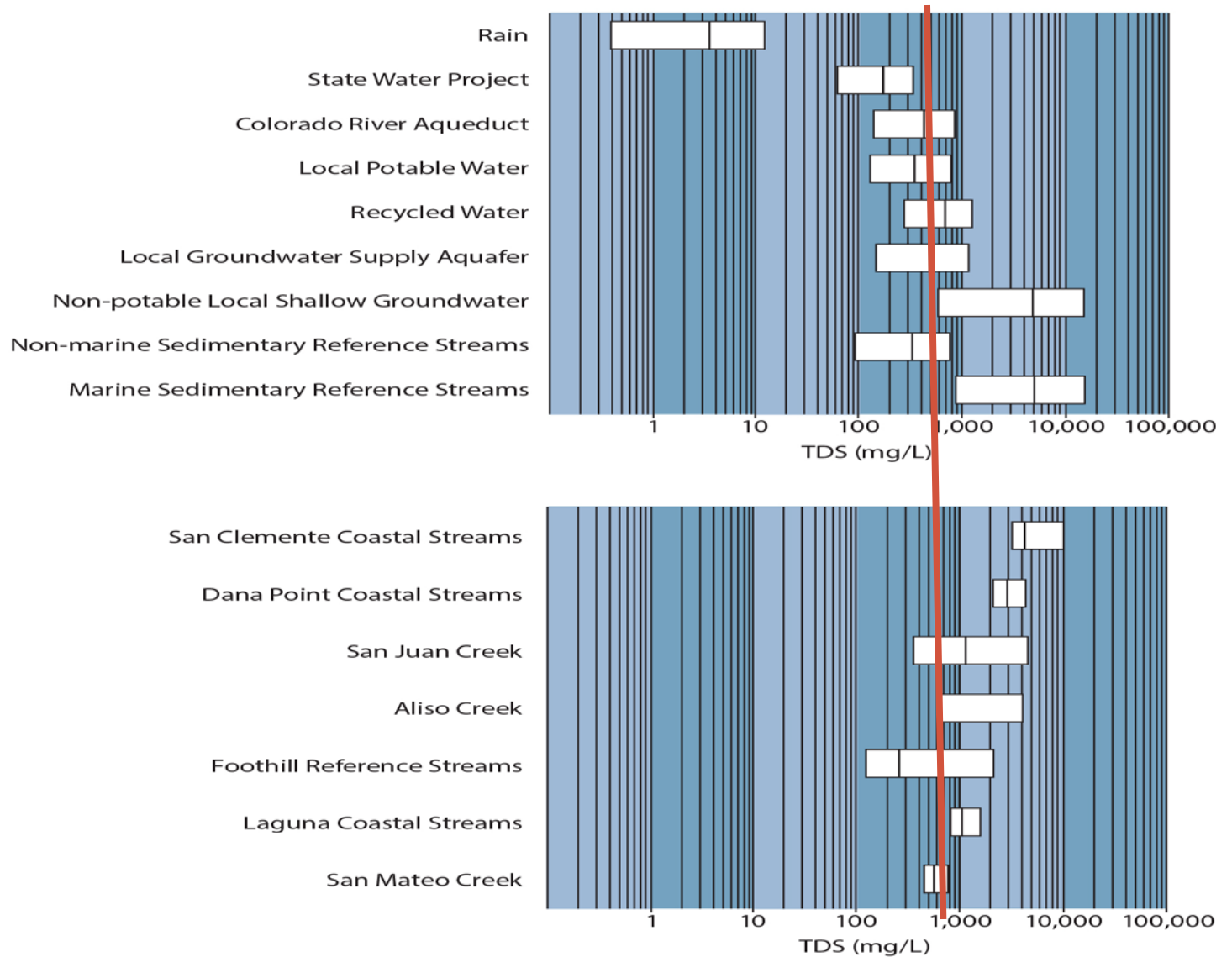
Total amount of mobile charged ions, including minerals, salts or metals dissolved in a given volume of water, expressed in units of mg per unit volume of water (mg/L).

# TDS

- Persistent and widespread exceedances of total dissolved solids occur in channels and at discharge outfalls.

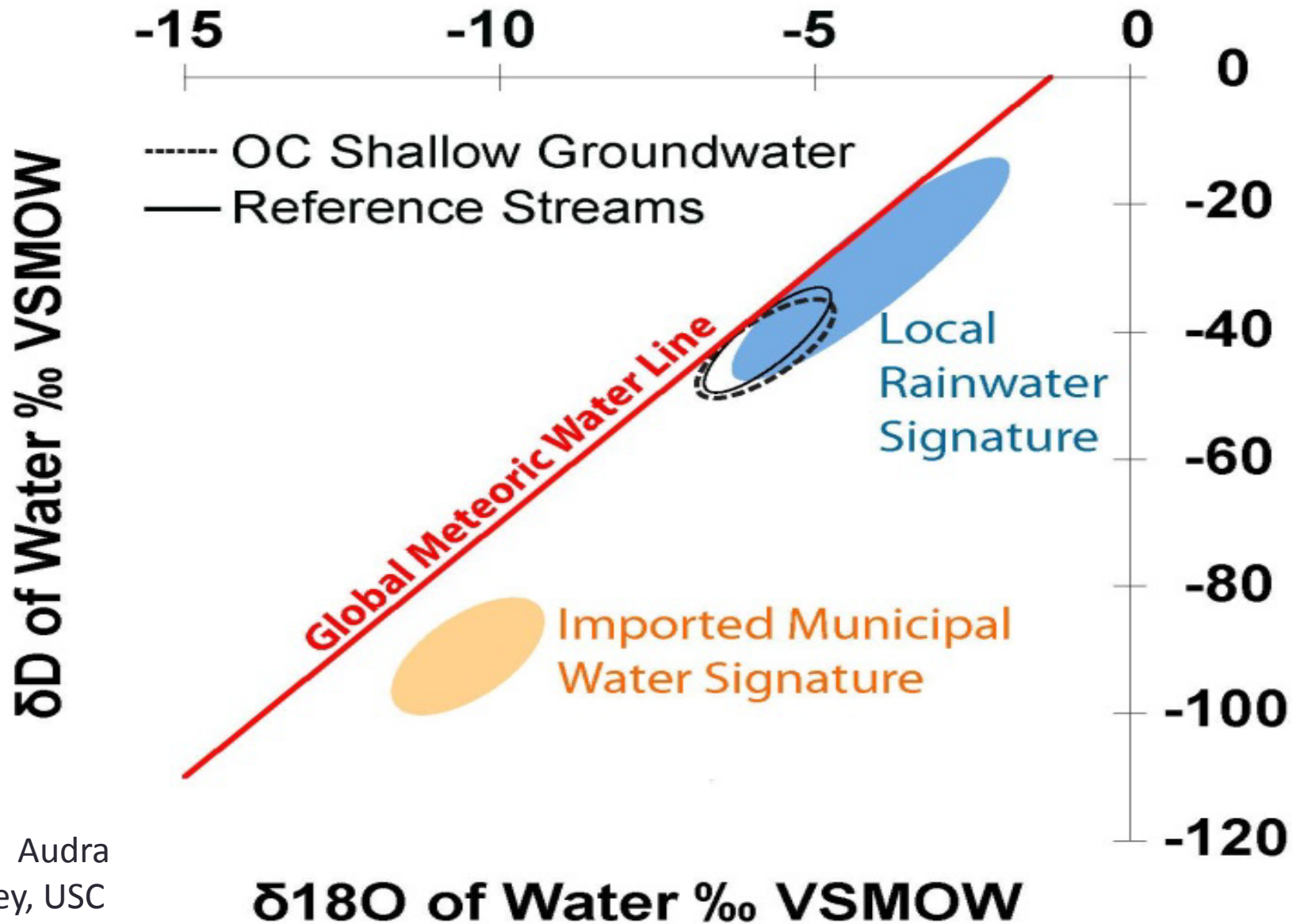


# TDS



Credit: Ted Von Bitner, AMEC

# TDS: SOURCE IDENTIFICATION



Credit: Audra Bardsley, USC



# DISSOLVED SOLIDS: SUMMARY

- Natural sources in regional groundwater represent a large portion of elevated dissolved solids.
- Understanding local geology is key to understanding sources of dissolved solids and the pathways they travel in the watershed.
- While the flood control system provides one pathway for dissolved solids in groundwater to reach the surface, other natural pathways (such as artesian springs) exist and there is evidence of historically elevated dissolved solids levels in surface water in the region.
- Determine significance of TDS as a stressor.

# NUTRIENTS

# Nutrients Are a Regional Problem

- Exceedances widespread
- Algal overgrowth less so but occurs in undeveloped areas as well
- May contribute to harmful algal blooms
- Continue to reduce dry weather flows



# Toxicity

- Toxicity widespread but sporadic & at low levels
- No apparent trends over time

	% Stream Miles	
Ceriodaphnia Reproduction	Open	Urban
Toxic	63.0	37.4
Nontoxic	37.0	62.6

# Toxicity: Summary

- Reassess management concerns about metals
- Improve information on the use of pesticides in the County;
- Expand and focus cooperative outreach efforts about proper pesticide application;
- Continue productive relationships with University of California Cooperative Extension and CASQA

# In Summary

The central questions that elected officials, regulators, NGOs, and regulated parties must somehow reach agreement on are:

What level of control for FIB is practical and attainable and reflects “acceptable” levels of public health protection?

How can measureable water quality compliance metrics be expressed so that practical constraints are recognized, while still promoting meaningful water quality improvement?

ASCE, 2014 (paraphrased)

# In Conclusion

- South Orange County is a model stormwater program
- The environment is responding
- The WQIP is a necessary framework for answering key questions and ensuring that science informs the attainment of further positive environmental outcomes

Questions (?)