

Ocean Water Quality Challenges

Dominic Gregorio
Senior Environmental Scientist, Ocean Unit
Division of Water Quality
State Water Resources Control Board
www.waterboards.ca.gov

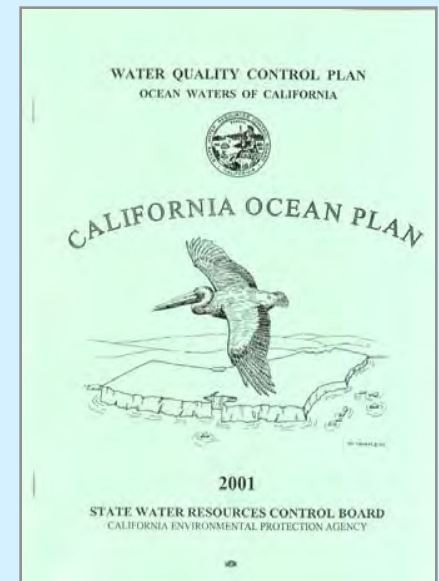


Water Quality Control Plans “Standards”

- NPDES Permits written to enforce standards
- Standards are in WQ Control Plans”
 - Regional Board Basin Plans
 - Nine Regional Boards
- Statewide Plans
 - California Ocean Plan: near coastal ocean
 - Thermal Plan
 - Enclosed Bays and Estuaries Plan – Sediment Quality Objectives
 - State Implementation Policy for CTR: bays and inland waters

California Ocean Plan

- EPA-approved Water Quality Control Plan
 - Near coastal ocean waters to 3 mile limit
 - Discharges outside are regulated to ensure “no violation” within state waters
 - Beneficial uses of ocean waters – human health and marine life receptors
 - Water quality objectives
 - Program of implementation



Ocean Plan cont'd

Water Quality Objectives

- Narrative Objectives
- Numeric Objectives
 - Marine Life Protection
 - metals, ammonia, etc.
 - acute and chronic toxicity
 - Human Health
 - seafood consumption/bioaccumulation
 - carcinogens
 - non-carcinogens
 - contact recreation at beaches
 - indicator bacteria

Beach Bacteria

- SB 482 directs State Water Board to administer beach monitoring program
- US EPA is working on new criteria
- SCCWRP has been working on development and testing of rapid indicators

Current Ocean Plan Amendment

- Vessel Discharges
 - Implements State Law
 - VGP
 - Vessel sewage “no discharge zone” awaiting promulgation by US EPA
- Monitoring
 - Statewide consistency using SCCWRP Model Monitoring approach
 - Regional Monitoring emphasis
 - Stormwater and Nonpoint Sources addressed

Shellfish Bacteria Standards

- Goal is statewide consistency
 - add fecal coliform?
 - add natural source exclusion and/or reference approach?
 - refine beneficial uses:
 - commercial aquaculture
 - recreational shellfish harvesting
 - better species (bivalve filter feeders) and geographic definitions

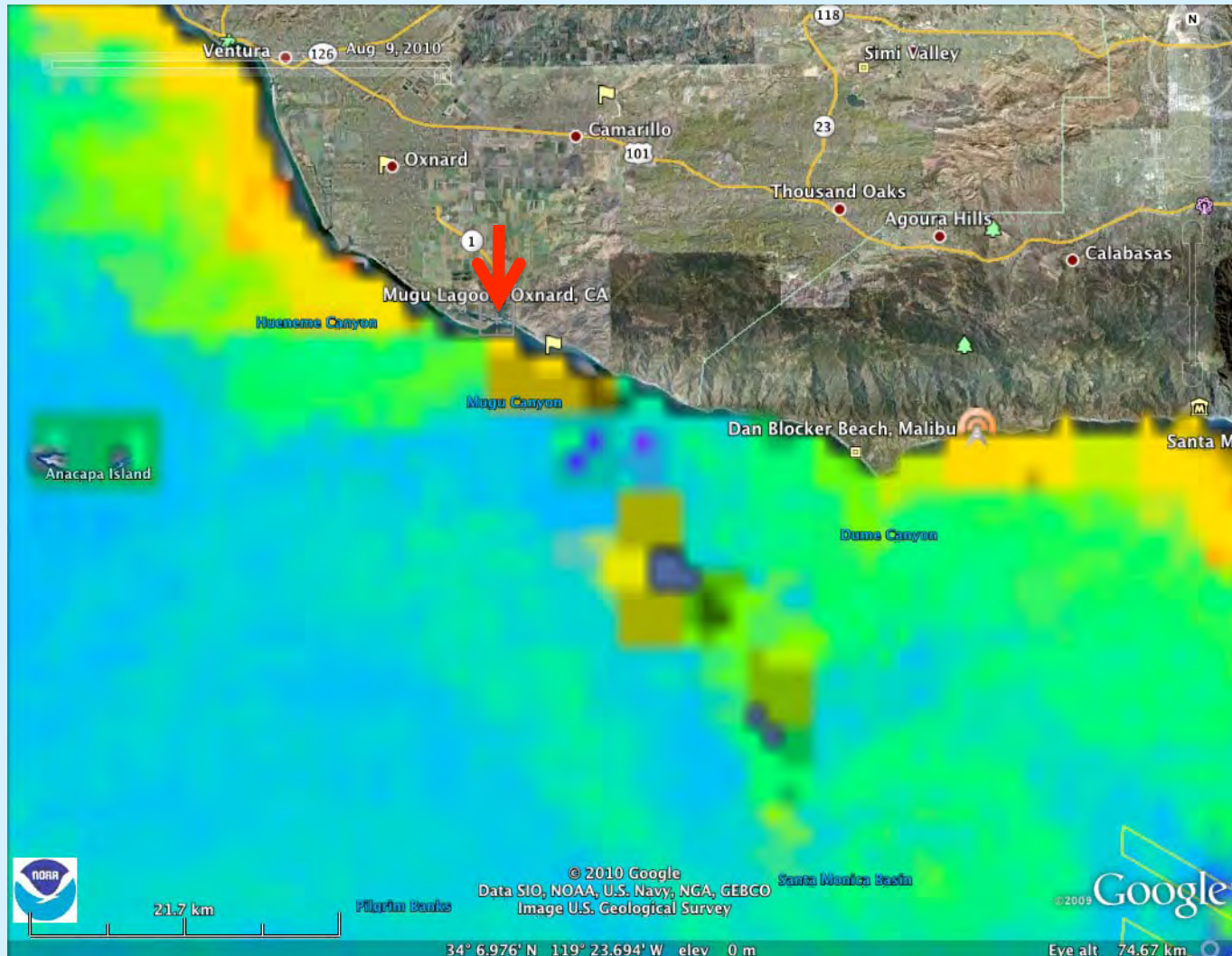
State Water Quality Protection Areas

- One of six types of Marine Managed Areas
- Areas of Special Biological Significance
 - Subset of SWQPAs, requiring special protections
 - **Waste discharge is prohibited**
 - Many ASBS in co-located with MPAs
- SCCWRP (2003): 1658 discharges identified statewide
- State Board issued Notices of Violation
 - Exception process

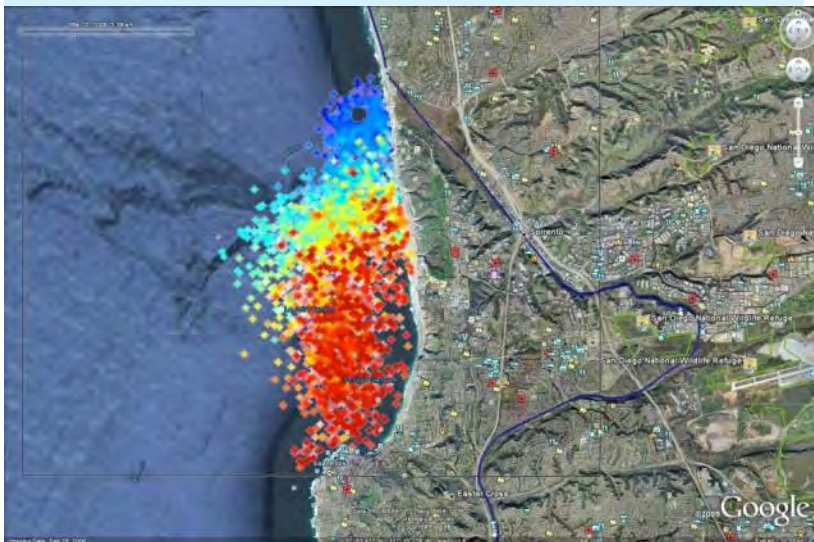
Coastal Currents 12/14/2009



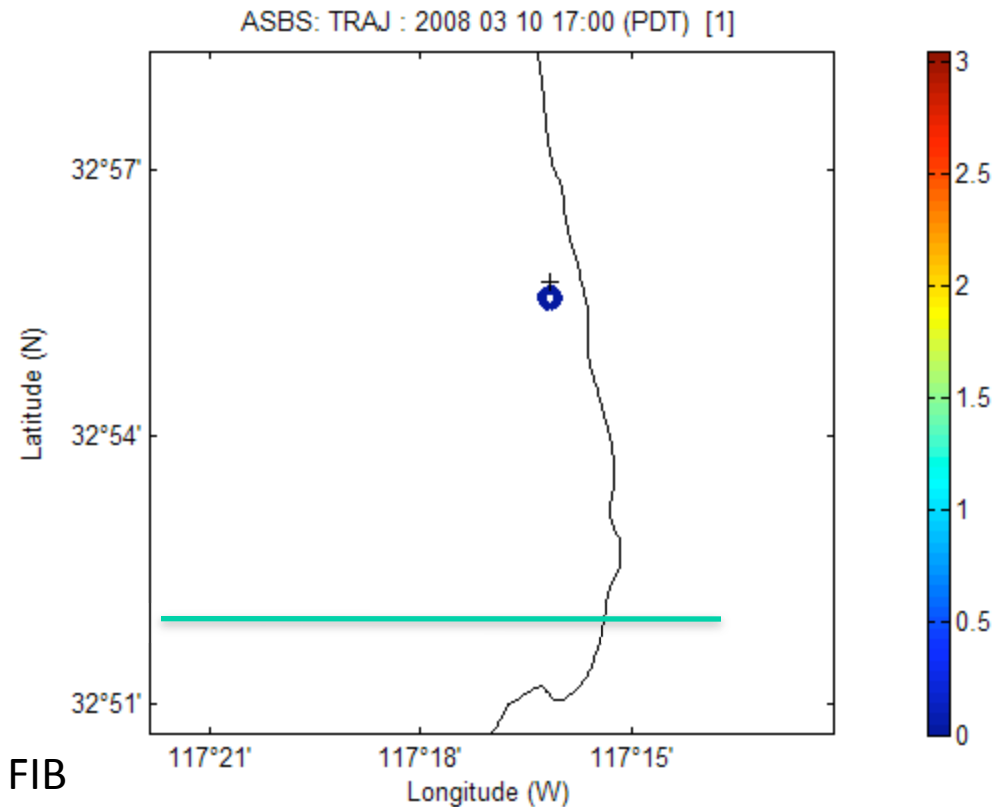
Dec 14, 2009 (2 days after event)



HF radar surface currents used to compute trajectories from Los Penasquitos river inlet. 5-day discharge example below.



3 day lifetime used to replicate efficacy of FIB



SWQPAs and MPAs

- MLPA initiative has proposed new MPAs along all coastal regions in the State
 - Most have been designated by DFG
 - North coast still in progress
- Ocean Plan amendment in progress to address
 - Existing waste water treatment outfalls near MPAs
 - Criteria for new SWQPAs to protect water quality in MPAs

Statewide Plastic & Trash Survey

- First scientific survey statewide
- SCCWRP contract
- Plastic Pellets
- Trash Rapid Assessment



Pellets: First Year Draft Results by County

County	Total Density (m⁻²)	% of Total
Los Angeles	281	62
Orange	137	30
San Diego	17	4
San Francisco	9	2
Ventura	6	1
Sonoma	1	<1
Total	451	100

Trash: Statewide Draft Results by Category

Category	Total Count (Est. for CA)	Avg/m²
Foamed Plastics	350,846	9.5
Plastics	331,641	9.0
Organics/Vegetation	50,827	1.3
Paper	19,692	0.5
Glass	7,376	0.2
Other	6,397	0.2
Land Use Materials*	6,253	0.2
Rubber	4,451	0.1
Metals	2,419	0.1
Total Debris	779,902	

* e.g. lumber, concrete

Trash Policy Being Developed

- Possible Components:
 - Definition of Trash
 - Narrative Objective
 - Prohibition of Pellet Discharges
 - Trash Full Capture Devices
 - in high density residential, industrial, and commercial land uses
 - Implementation in Storm Water Permits

Water Quality Policy

Once-Through Cooling (OTC)

- Implements Section 316(b) of the Clean Water Act
- “Best Technology Available” for cooling coastal power plants to minimize “entrainment and impingement”
 - Implementation schedule to phase out once-through cooling
- Implemented by NPDES Permits

Desalination Policy Development

- Ocean Plan amendment
- Three components
 - Control entrainment and impingement
 - Building on OTC Policy for power plants
 - Set elevated salinity objective
 - Protect marine life from toxicity/osmotic stress
 - Brine discharge implementation provisions
 - To meet objective

Desalination Policy Development

- Three funded science projects in support
 - Brine laboratory toxicity study
 - UC Granite Canyon Laboratory
 - Expert panel on Intakes
 - Moss Landing Marine Labs
 - Expert panel on discharges
 - Southern California Coastal Water Research Project

Ocean Acidification

- Current narrative objective: must be within 0.2 pH units of “natural”
- Request for 303(d) listing denied by State Board, insufficient data
- Objective and monitoring methods not sensitive enough
- More sensitive monitoring and research is needed

Nutrients and Algal Blooms

- SCCWRP working on narrative objectives with nutrient numeric endpoints
 - Focus on secondary indicators
 - Streams – policy process has been started by SWRCB
 - Estuaries still in development
- SWRCB has been working on cyanobacteria blooms
 - Watershed effects on ocean waters
- Ocean Plan Narrative: “Nutrient materials shall not cause objectionable aquatic growths or degrade indigenous biota.”
 - Difficult to determine which blooms are natural and which are not
 - Triennial Review Issue: define “objectionable aquatic growths”

Enclosed Bays

some work in progress

- Sediment Quality Objectives
 - Indirect effects – human health
- Toxicity Policy (all inland waters as well)
 - Numeric objectives
 - Effluent limits for wastewater
 - Storm water monitoring
- Nutrient Endpoints

NOAA National Mussel Watch Program

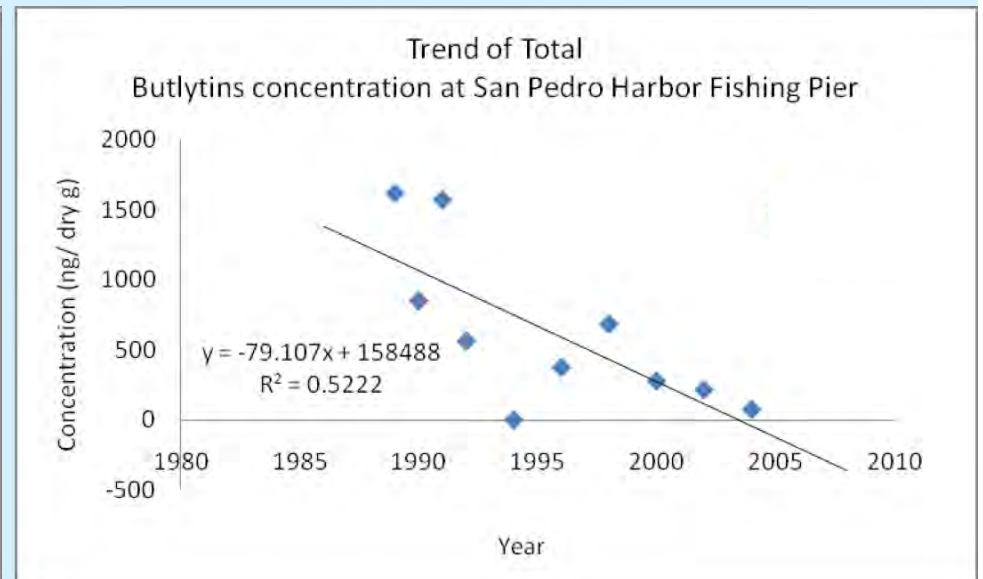
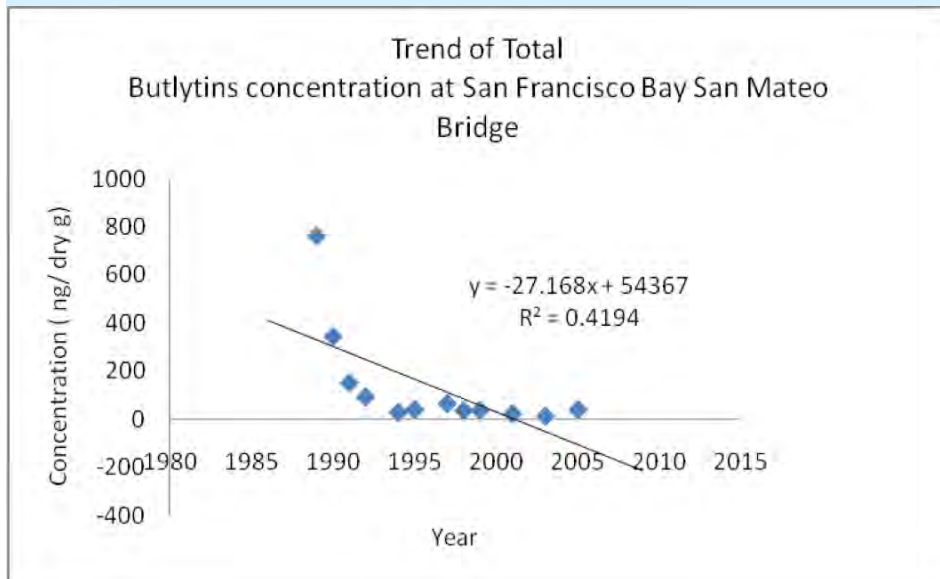
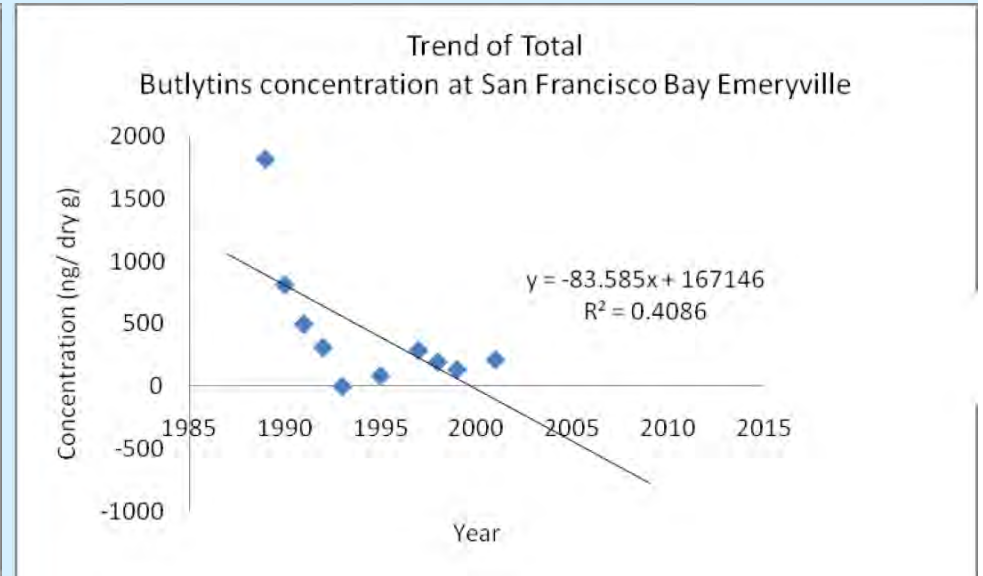
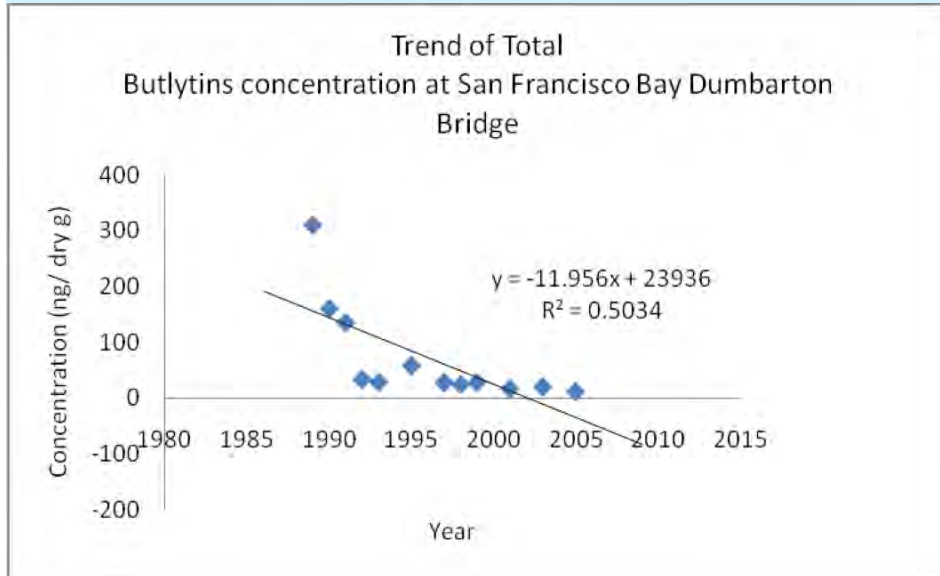
- Historic data, years 1986-2009
- Currently 71 sites (historic data 65 sites) along CA coastline
- Resident mussels
- 150 contaminants monitored

To support ecosystem-based management and describe the status and trends of contaminants

Most traditional pollutants are decreasing at most sites!



Total BT trend (downward) in SF Bay



Mussel Watch CEC Pilot Study

- Most traditional pollutants decreasing
- New focus on Contaminants of Emerging Concern (CECs), e.g.
 - Pharmaceuticals
 - Personal care products
 - Current use pesticides
- Collaborative effort
 - NOAA Status and Trends
 - SCCWRP
 - State Water Board
 - San Francisco Estuary Institute

Information Transfer is Essential

- Most Water Board staff are unaware of ocean observing systems, capabilities and resources.
- Many potential applications
- We need to educate potential state agency users

Questions?