

## Core Monitoring Is Useful, But...

- Regional monitoring gives the "big picture"
- Regional monitoring is a vehicle for exploring issues
- Regional monitoring sets the bar for quality
- Regional monitoring is a test bed for new technology
- Regional monitoring focuses assessment tool development
- Regional monitoring is the catalyst that brings disparate agencies together

# Bight Regional Monitoring Is the National Leader

- Focused on questions of greatest concern to managers
  - Answers are translated into management actions
- Collaborative, rather than top down
- Adaptable study design
- Sheer size



# **Bight Has Grown Up**

- Started in 1994 with 12 agencies
  - Focus on sediment contamination
- New cycle about every 5 years
- Now 120 agencies and five distinct elements
  - Large and small POTWs
  - Municipal Stormwater
  - State and Federal regulators
  - Ports and Power Generating Stations
  - Nongovernmental Organizations
  - Universities and Research Labs
  - Industry

### **The Five Bight '13 Elements**

- Contaminant Impact Assessment (CIA)
- Nutrients and Water Quality
- Shoreline Microbiology
- Trash and Debris
- Rocky Reefs





### **Cross Section of Our Coastal Zone**



# Contaminant Impact Assessment Questions

- What is the extent and magnitude of pollutant impacts in the Southern California Bight?
- How does the extent and magnitude of impact differ between habitats of concern?
- Are the impacts increasing or decreasing with time?

# Contaminant Impact Assessment Answers

- Vast majority of Bight sediments are considered unimpacted
- Where impacts occur, they are disproportionately found in embayments
  - Particularly in estuaries and marinas

Embayments have been improving over last 15 years



# Contaminant Impact Assessment Focuses on Sediment Quality

#### Sediment quality triad

- Sediment chemistry
- Sediment toxicity
- Infauna
- Bottom dwelling fish
- Bioaccumulation in birds





Sediment Quality Triad Assessment 2013







## **Examples Of Bight '13 Benefits**

- Emerging contaminants
- Ongoing quality assurance
- New habitats and indicators
- Test new technology



#### **Split Sediment Sample for Total PCBs**



### Seabird Eggs Are a New Indicator

- Bight has always measured bioaccumulation in fish
  - The challenge is predicting impacts to predators
- Measured contaminants in the abandoned eggs of four seabird species
  - First time ever for a Bight-wide bird egg assessment
- Results indicate seabird bioaccumulation is widespread, but concentrations are generally low

### **Bioaccumulation In Seabird Eggs**

Contaminant	Total Number of Samples	Percent of Samples Exceeding Thresholds	
		No Effects	Lowest Effects
PCBs	101	0	0
PBDEs	101	19	0
DDTs (eggshell thinning)	101	61	0
DDTs (reproductive effects)	101	18	2
Mercury	99	4	2
Selenium	49	<1	0
Arsenic	49	0	0



#### **Bight 2013 Sediment Grab Event**



#### Click a dot on the map for more information



#### **Better, Faster, Cheaper**



### **Recommendations From Bight '13**

- Continue to focus on embayments
- Expand the assessment toolbox
  - Important areas of the Bight remain unassessed
- Identify the specific contaminants causing impacts
  - Causal assessment

#### **Toxicity in Submarine Canyons**



# Finishing Contaminant Impact Assessment

We are more than 6 months ahead of schedule

Finishing the last of the technical reports

Already thinking about Bight '18

### **The Five Bight '13 Elements**

- Contaminant Impact Assessment (CIA)
- Nutrients and Eutrophication
- Shoreline Microbiology
- Trash and Debris
- Rocky Reefs

# **Bight '13 Rocky Reef Element**

- Rocky reefs extend across one-third of the Bight coastline
- Important habitat from both ecological and economic perspectives
  - Declines in many fish populations
- Are declines in fish due to water quality or fishing?

### What we learned from Bight '08

- Where all the reefs are
- Natural variables drive big changes in reef ecology
- Human perturbations also contribute to changes in reef ecological integrity



# Bight '13 Rocky Reef Emphasized Assessment Tool Development

 Create an assessment tool to score fishing pressure

 Create an assessment tool for water quality pressure

 Create an assessment tool for reef biological response

# Fishing Pressure Assessment Tool

Utilize fishing data from State Fish and Wildlife

- 30 years, dozens of species
- Downscale from 10 mi<sup>2</sup> blocks to individual reefs

 Estimate catch rates for recreational and commercial take

### Average Landings 1980 – 2009 (metric tons/year/km<sup>2</sup> reef area)



### Water Quality Assessment Tool

- Use new technology to detect plume presence/absence
  - Stormwater and treated wastewater
- Combine plume occurrence with contaminant load

 Average over the last 10 years to create Plume Exposure Index

#### Using High Frequency Radar to Track Buoyant Wet Weather Plumes





# Biological Response Assessment Tool

Uses both fished and unfished species

- Scores reefs on what's observed vs. what's expected
  - Scores from 0 to 1, threshold for too different

84% of the reefs are similar to what's expected

- Where dissimilar, more correlated to fishing than water quality

#### **Rocky Reef Biological Response Index Results**



# Rocky Reef Is Completed, but There's More to Be Done

 All three assessment tools can be improved

 Upcoming shared post doc with Ocean Science Trust

 Inclusion in MPA Monitoring Enterprise South Coast Reports



### **Bight '13 is on the Home Stretch!**

Finishing up the last of the five elements

 Already started interacting with CTAG on Regional Monitoring

- All day intersessional planning meeting next month

 Kick off meeting for Bight '18 participants about one year from now