Southern California Bight Regional Marine Monitoring Program

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Monitoring in the Southern California Bight

- More than $31M per year monitoring the SCB
  - Ca. 75% is by NPDES permittees
- Approximately 5% of the areas is routinely monitored
  - Inconsistency in the areas that are monitored
- Unable to answer basic questions about the health of the SCB

Development of Regional Marine Monitoring

- Regional Monitoring surveys every five years
  - aka the "Bight Program" (1994, 1998, 2003)
- Integrated, collaborative monitoring using existing local programs
  - Periodic "trade-off" for site-specific monitoring
- Address cumulative effects
  - Assess the range of natural variability

Bight ’03 as an Example

- 61 Organizations
- $7M Program
  - Less than $700K cash
- Three major components
  - Coastal Ecology
  - Shoreline microbiology
  - Water quality

Coastal Ecology Component

- What is the spatial extent and magnitude of impact in the SCB?
  - How does this vary among areas of interest?
- What is the mass of pollutants in the SCB?
  - Sediments, water, biota?
  - How does this compare to emissions from land-based discharges?

120°0'0"W
119°0'0"W
118°0'0"W
34°0'0"N
33°0'0"N
Santa Barbara
Ventura
Los Angeles
Orange
San Diego
Bight '03 Chemistry Sample Sites
by Subpopulation
Basin
Bays
Estuaries
Island Shelf
Mainland Shelf
POTW
Slope
3
0
30
60
120
Kilometers

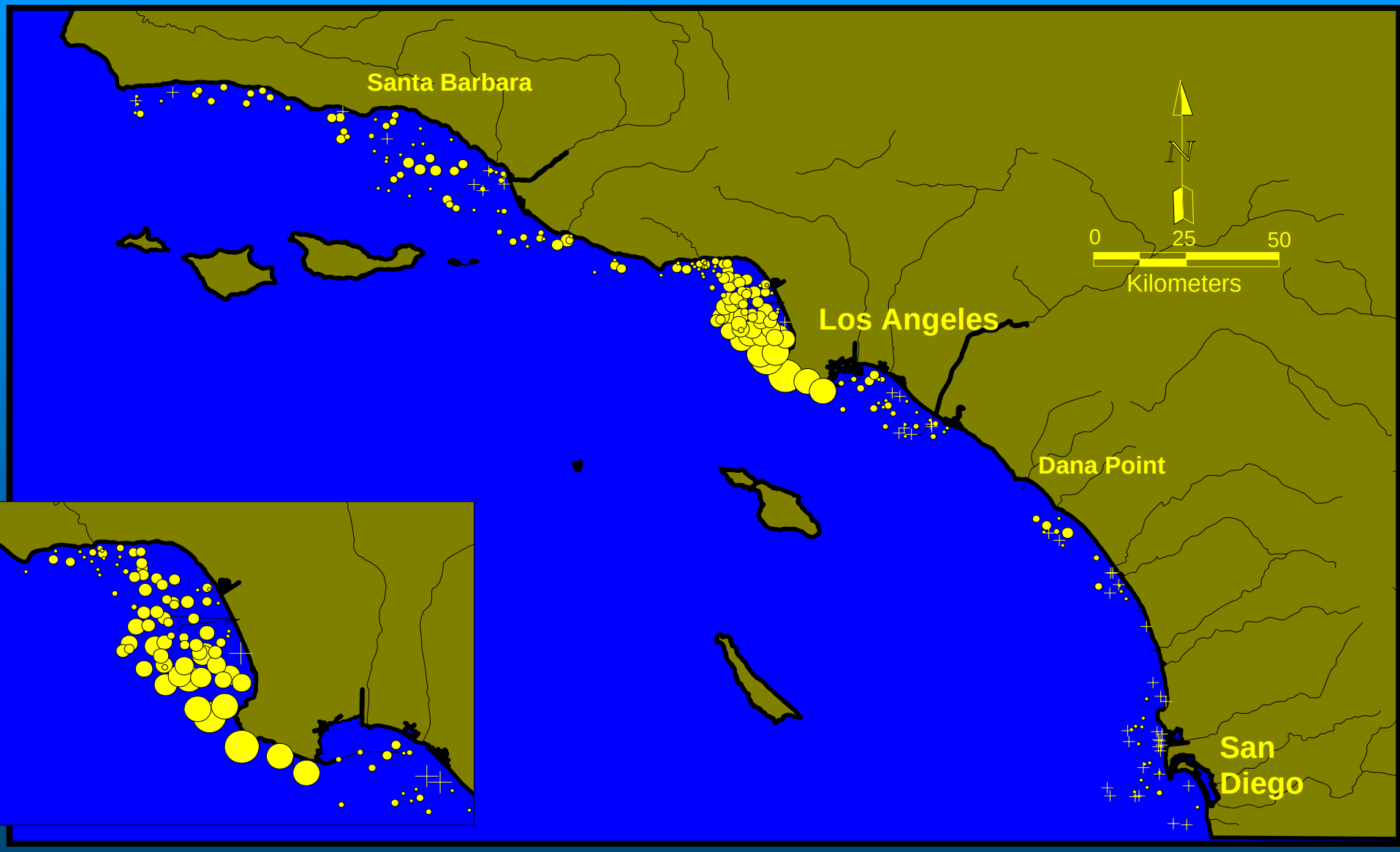
Indicators

- Sediment characteristics
- Sediment chemistry
- Sediment toxicity
- Infaunal biological community
- Fish community
- Fish bioaccumulation
- Fish pathology
- Debris and trash

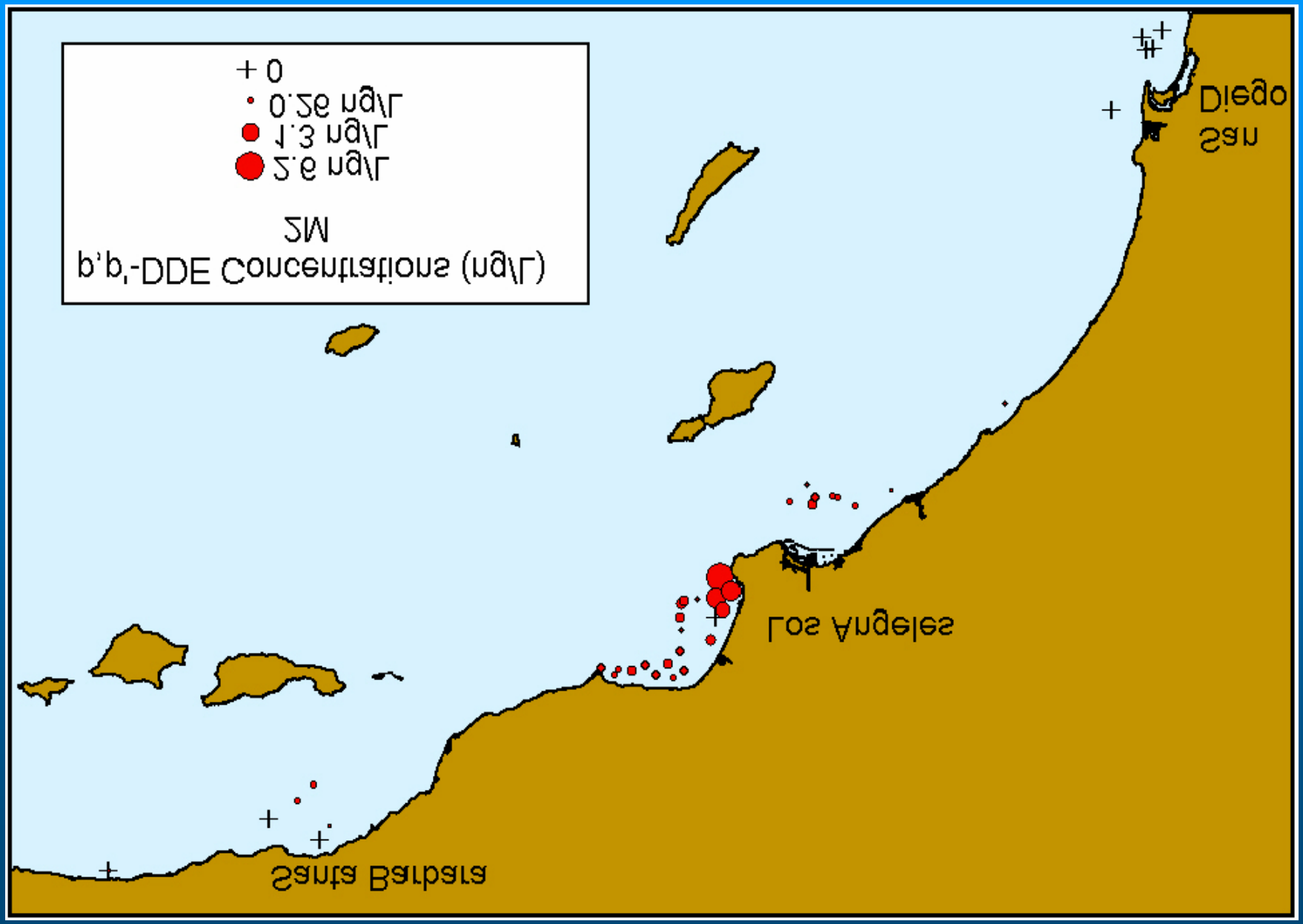
Cumulative Effects

Strata	Percent of SCB Total		
	Area	Copper Mass	Total DDT Mass
Embayments	0.7	2.1	0.5
Mainland Shelf	22.4	10.1	13.7
POTWs	1.3	1.0	9.9
Slope and Basin	67.8	84.6	75.5
Islands	8.0	2.2	0.4

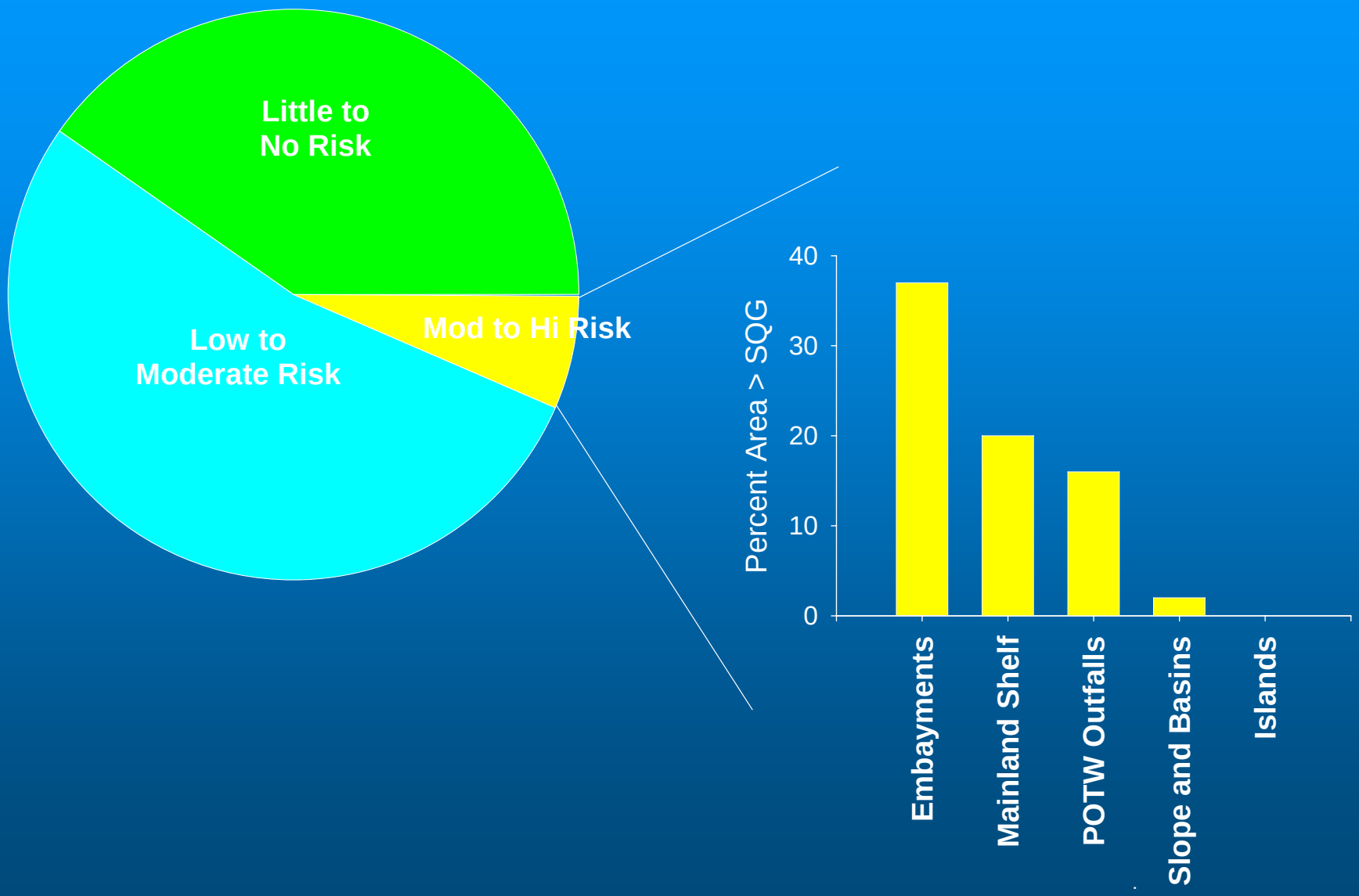
Total DDT in Sediments of the SCB



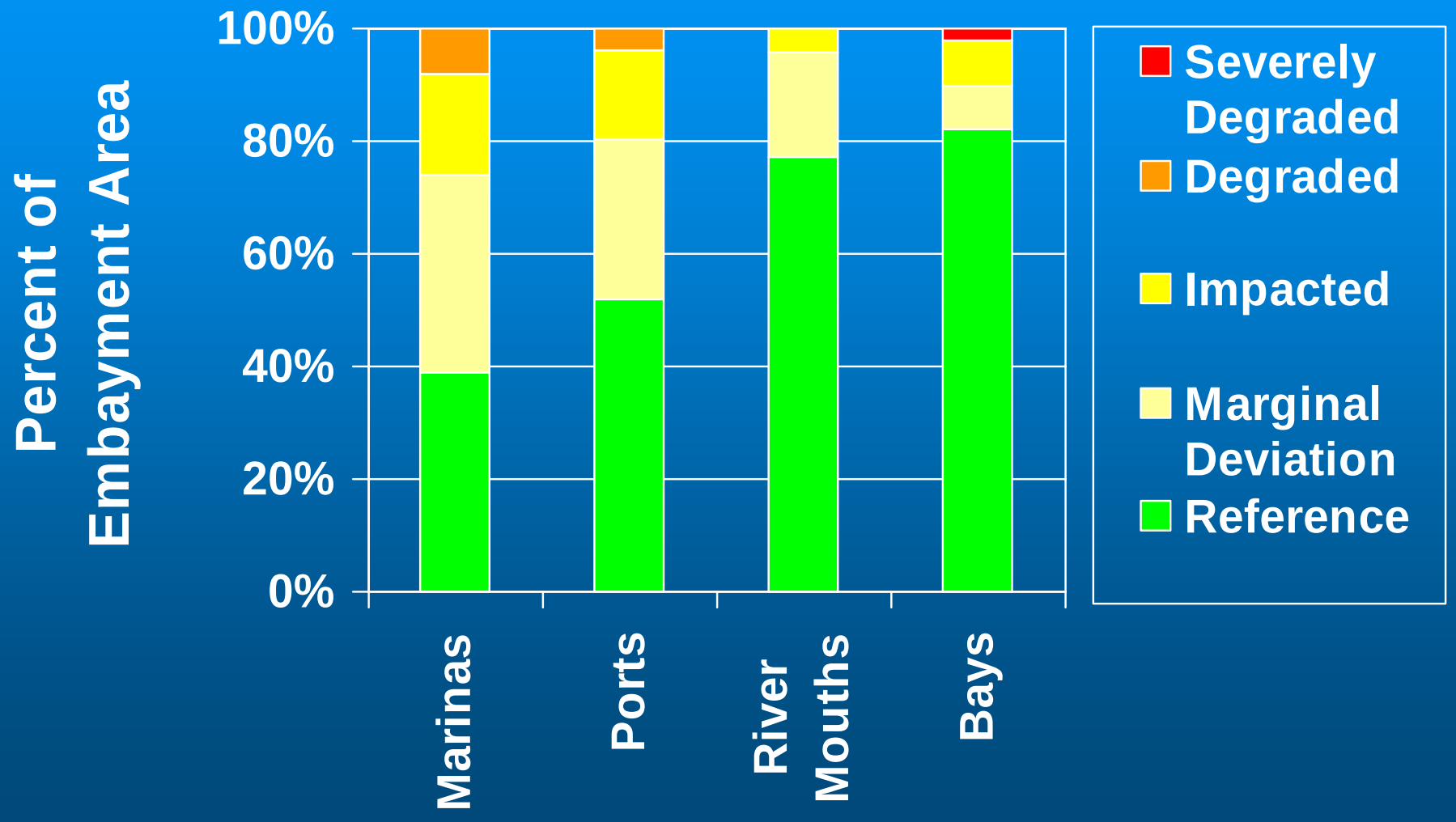
Total DDT in Water Column of the SCB



Percent Area Exceeding Sediment Quality Guidelines



Biological Effects in Embayments (Benthic Response Index)



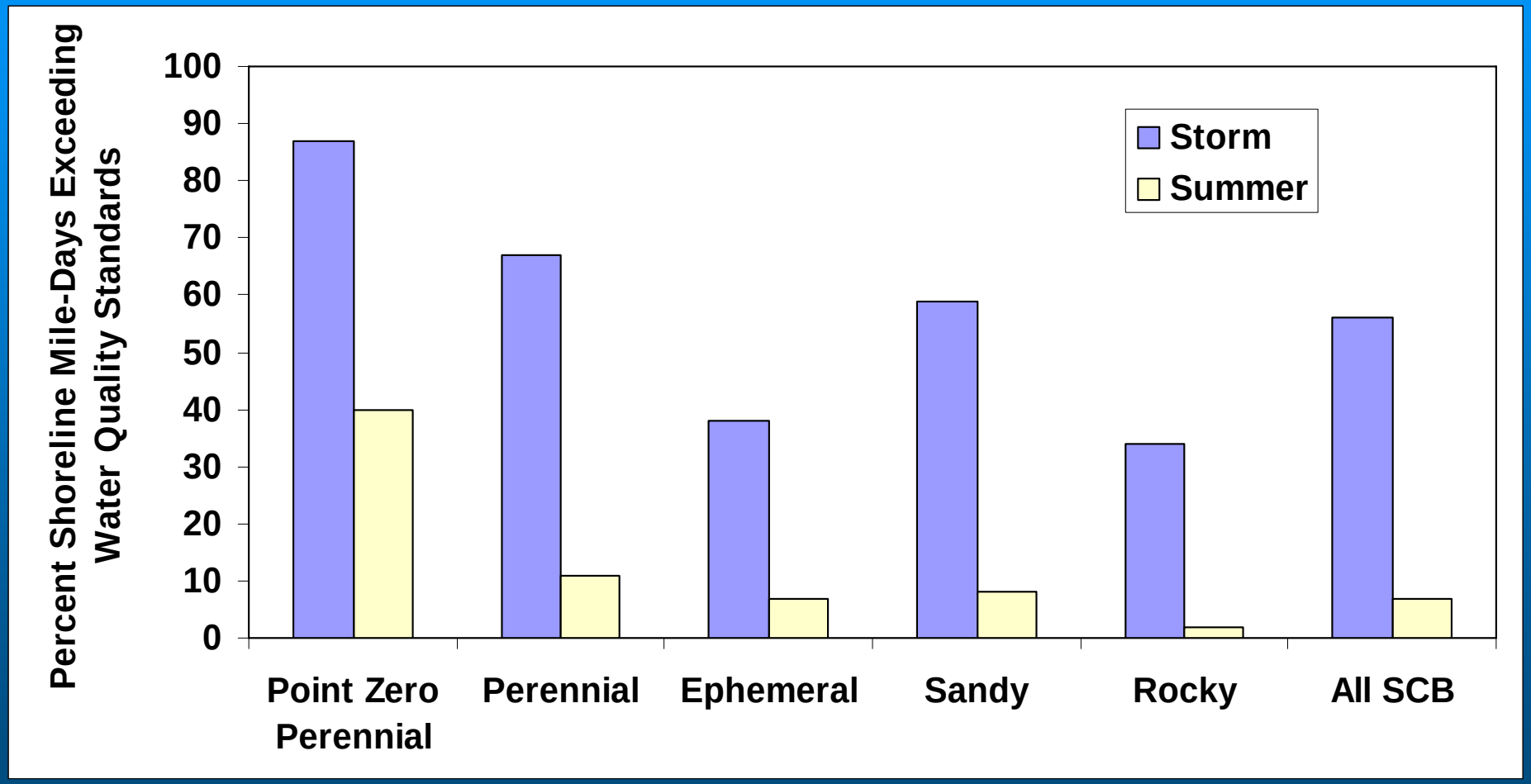
Shoreline Microbiology Component

- What is the extent and magnitude of shoreline impacted by bacteria?
  - How does it vary by area?
- Are fecal indicator bacteria correlated with human specific virus?
- What is the relationship between shoreline concentrations and surfzone concentrations?

Indicators

- Fecal indicator bacteria
  - Total coliforms, fecal coliforms, enterococci
- New methods
  - Rapid indicators
- Human specific virus

Shoreline Water Quality

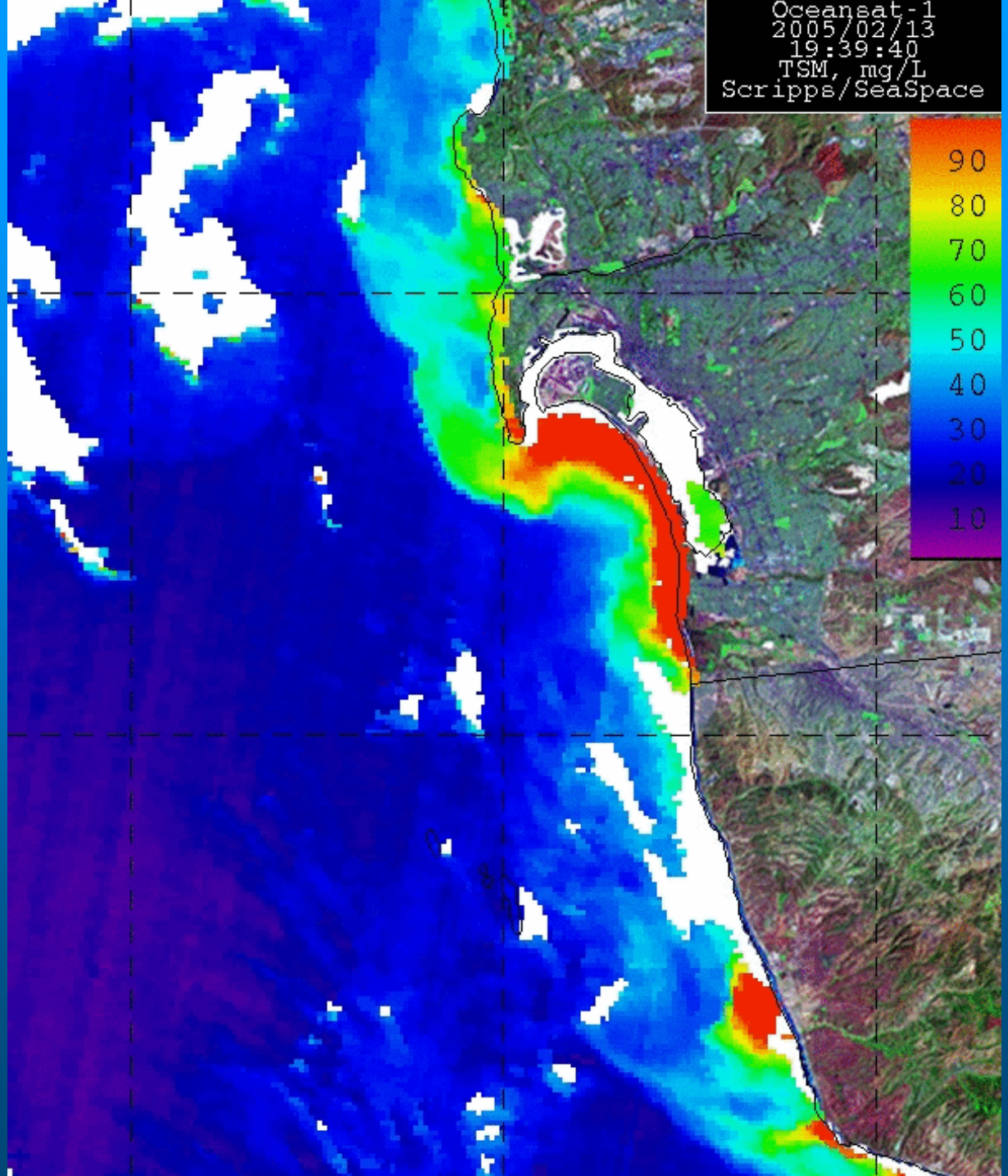


Water Quality Component

- What is the extent of stormwater plumes in the coastal oceans?
  - What is the temporal lifecycle of plumes?
- What is the impact of stormwater plumes ?
- Is remote sensing a useful monitoring technique?
  - Use boats for groundtruthing

Indicators

- Remotely sensed data
  - space, air, ground, water
- Water quality data
  - Physical data
  - Nutrients, trace metals, trace organics, toxicity
- Biological data
  - Plankton, domoic acid


Oceansat-1
2005/02/13
19:39:40
TSM, mg/L
Scripps/SeaSpace
90
80
70
60
50
40
30
20
10

Collaboration is a Powerful and Positive Force

- Greater perspective of environmental condition
  - More than any single agency can accomplish
- Development of regional scale assessment tools
  - Biocriteria, Sediment quality objectives
- Excellent platform to test new ideas and technology
  - Remote sensing, in situ samplers, others
  - New chemicals of concern, improved methodology

Collaboration is a Powerful and Positive Force

- Requires work to assure comparability
  - Quality assurance, information management, etc
- Fosters communication
  - Regulated, regulatory, environmental communities must agree on data assessment
- Results are directly integrated into the management framework
  - Regional monitoring being written into NPDES permits