Southern California Bight 2018 Regional Monitoring Program

Presentation to California Water Quality Monitoring Council

Karen McLaughlin

May 30, 2018

Background on the Bight Program

- In 1989, the National Research Council did an assessment of monitoring in southern California
  - 70% was NPDES permit monitoring
  - Concluded that all this monitoring could not be used for regional condition assessment because it was too fragmented

- SCCWRP's Commission founded the Bight Program to address the data gap
  - NPDES data required a regional context
  - Rewrote permits to include regional monitoring

- Bight '18 will be the sixth regional survey
  - NPDES provides a base of effort leveraged by other organizations to enhance the program
  - Bight'13 had over 80 participating organizations from a range of sectors

Bight is a Continually Evolving Program

- Sediment Quality was the “foundational” element
  - Focal point of wastewater assessments
  - Sediments are an integrator for impacts
  - Bight program led to standardized methods for sediment quality assessment
- New elements have been added to address new management questions
  - Microbiology, Estuarine Eutrophication, Harmful Algal Blooms, etc.

Goals of Today's Talk

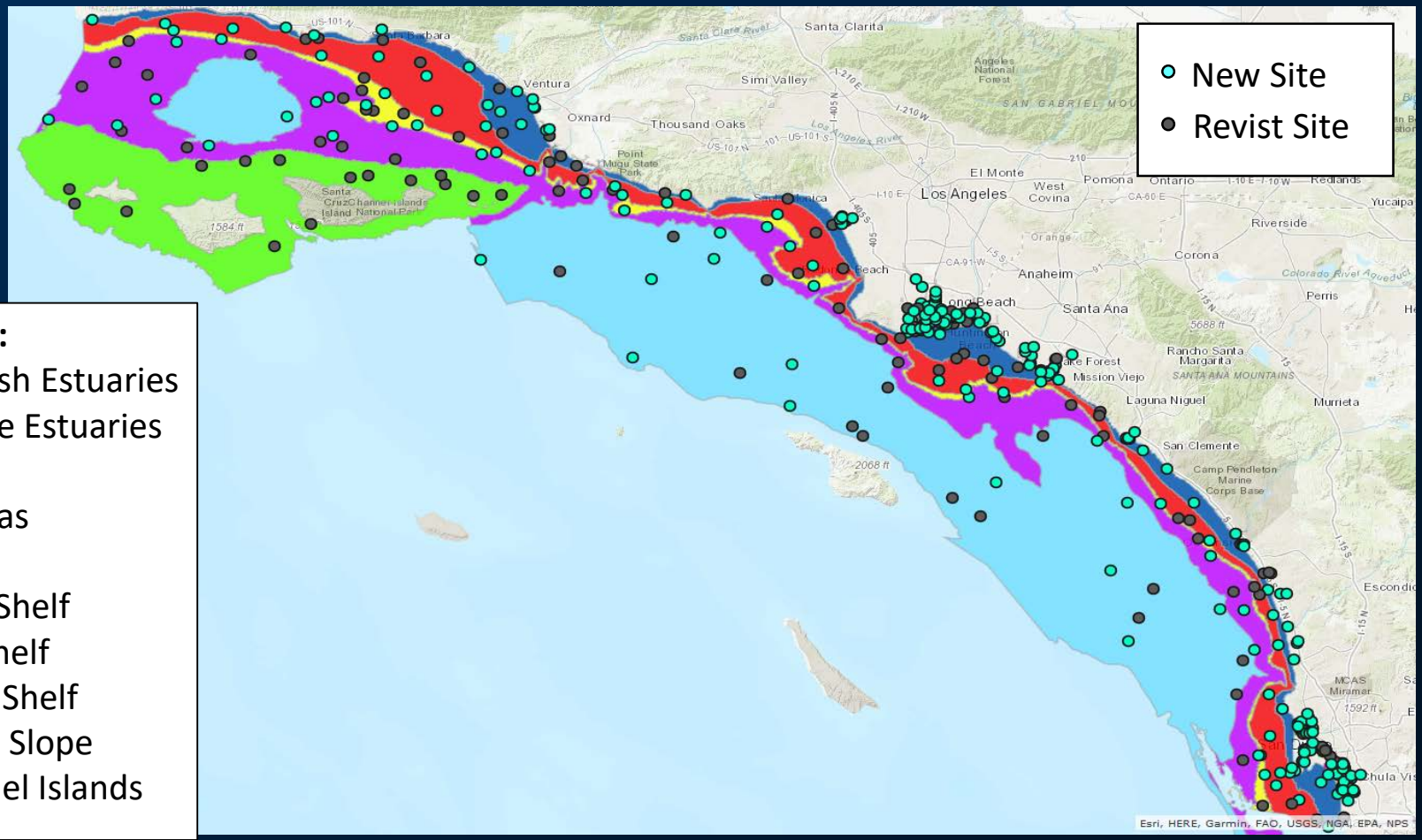
- Describe Bight '18 elements
- Identify opportunities for collaboration with Southern California's marine monitoring programs

Bight ‘18 Elements

- Sediment Quality
- Harmful Algal Blooms
- Ocean Acidification
- Trash
- Microbiology

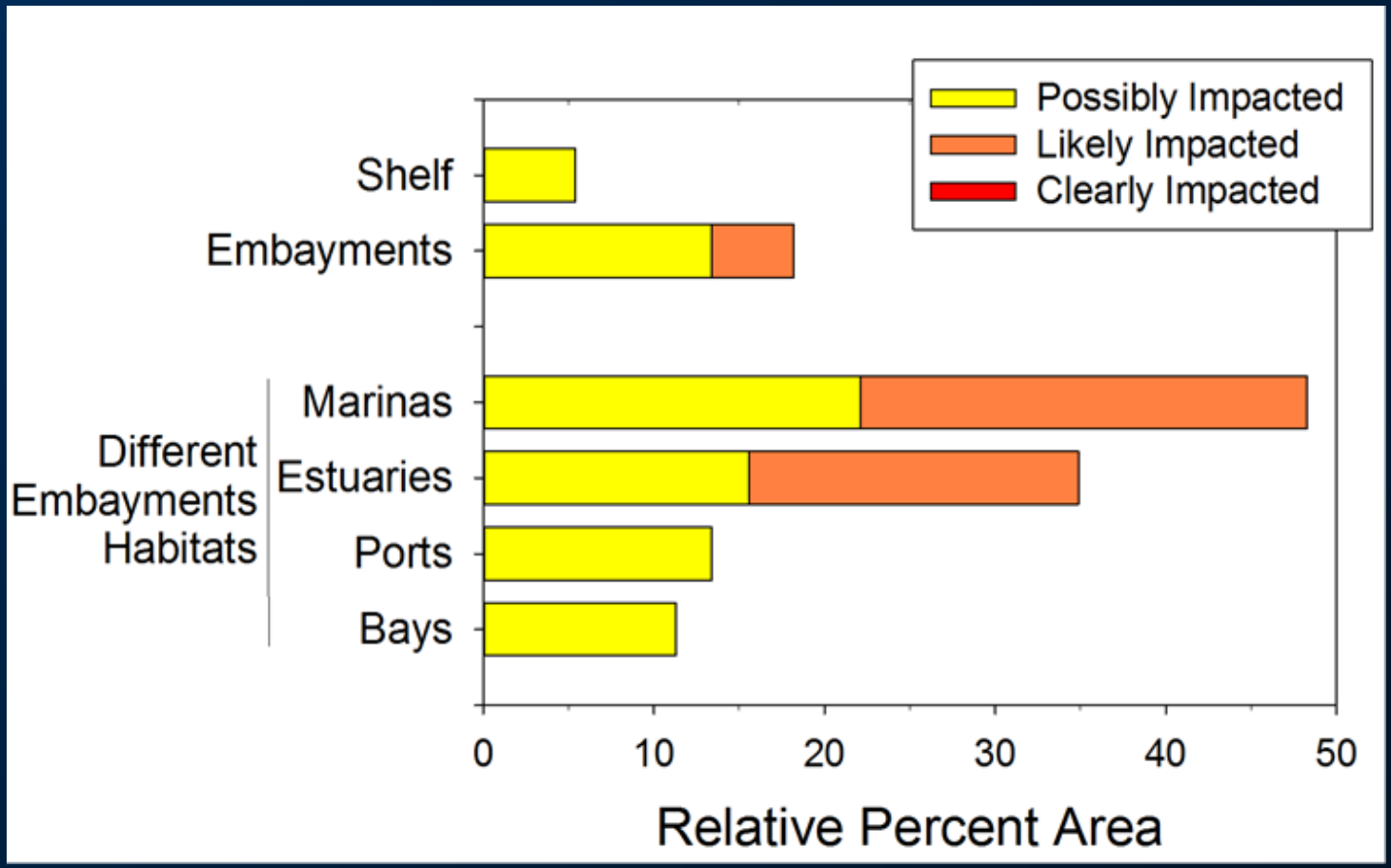
Sediment Quality

- Characterize sediment quality impacts by habitat type using multiple lines of evidence

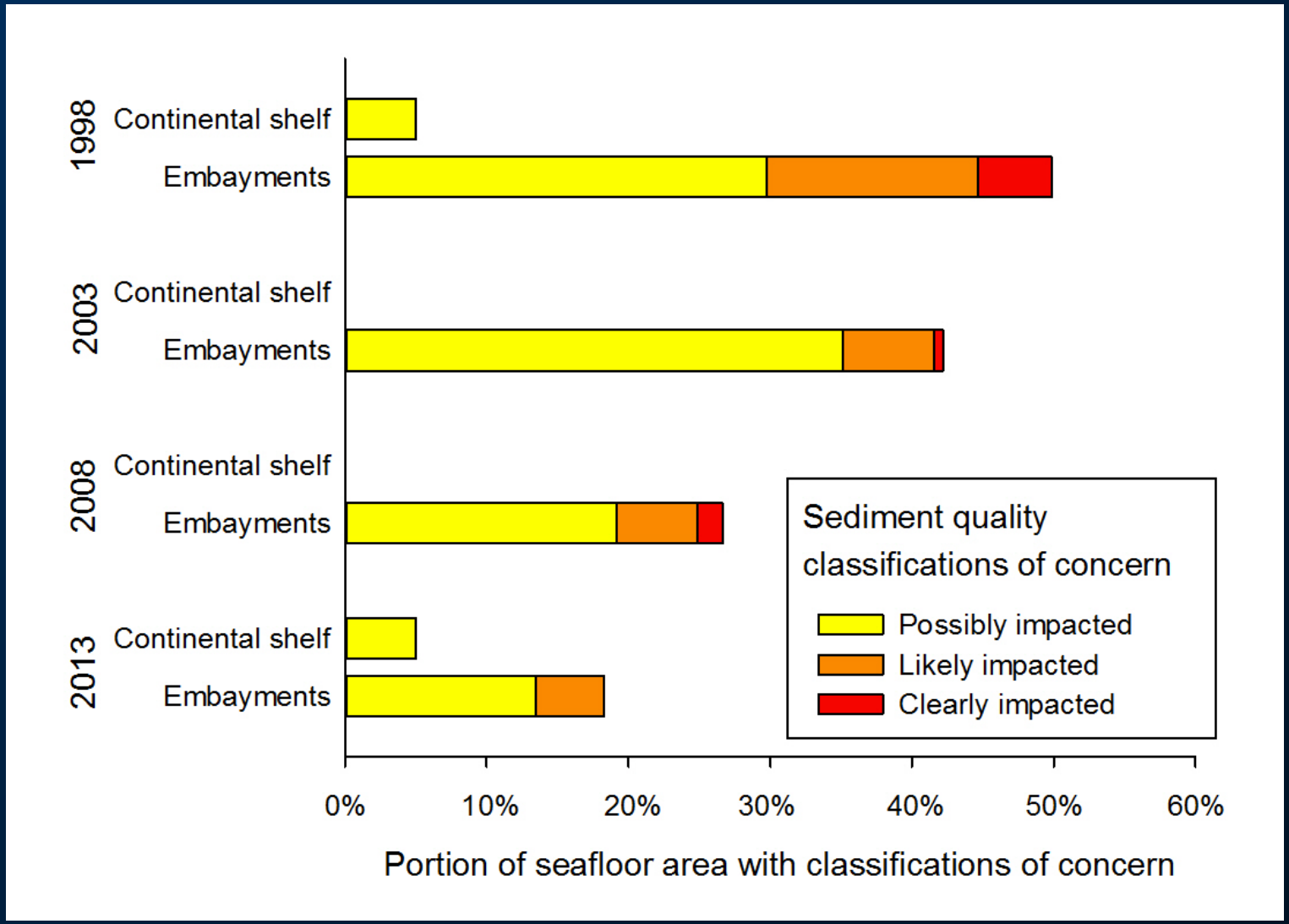


Strata:
Brackish Estuaries
Marine Estuaries
Ports
Marinas
Bays
Inner Shelf
Mid Shelf
Outer Shelf
Upper Slope
Channel Islands

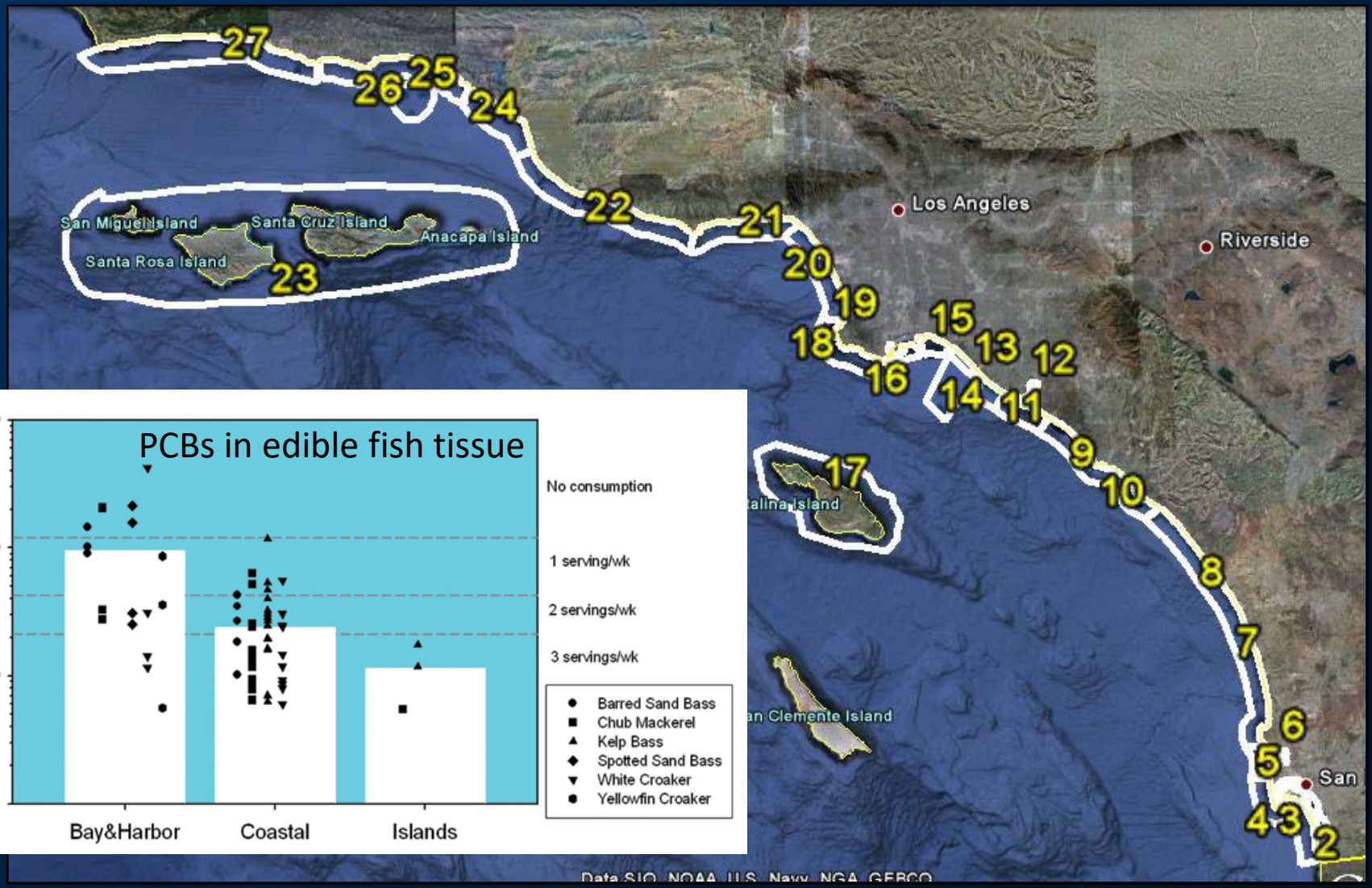
Status Assessment:
Bight '13 Impacts as a Percent of Area



Trends Assessment



Bioaccumulation in Sport Fish

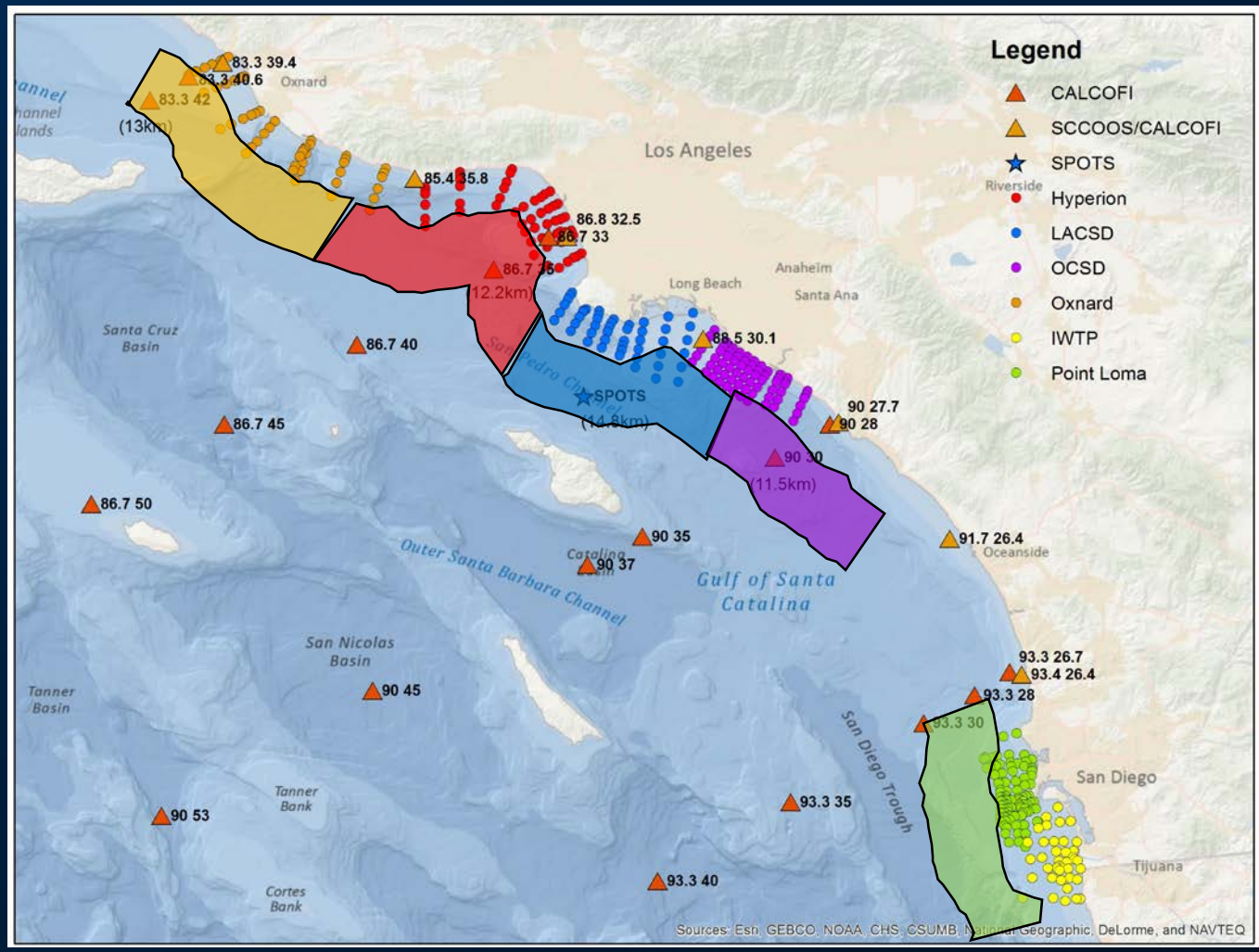


Evolution of the Bight Sediment Quality Element

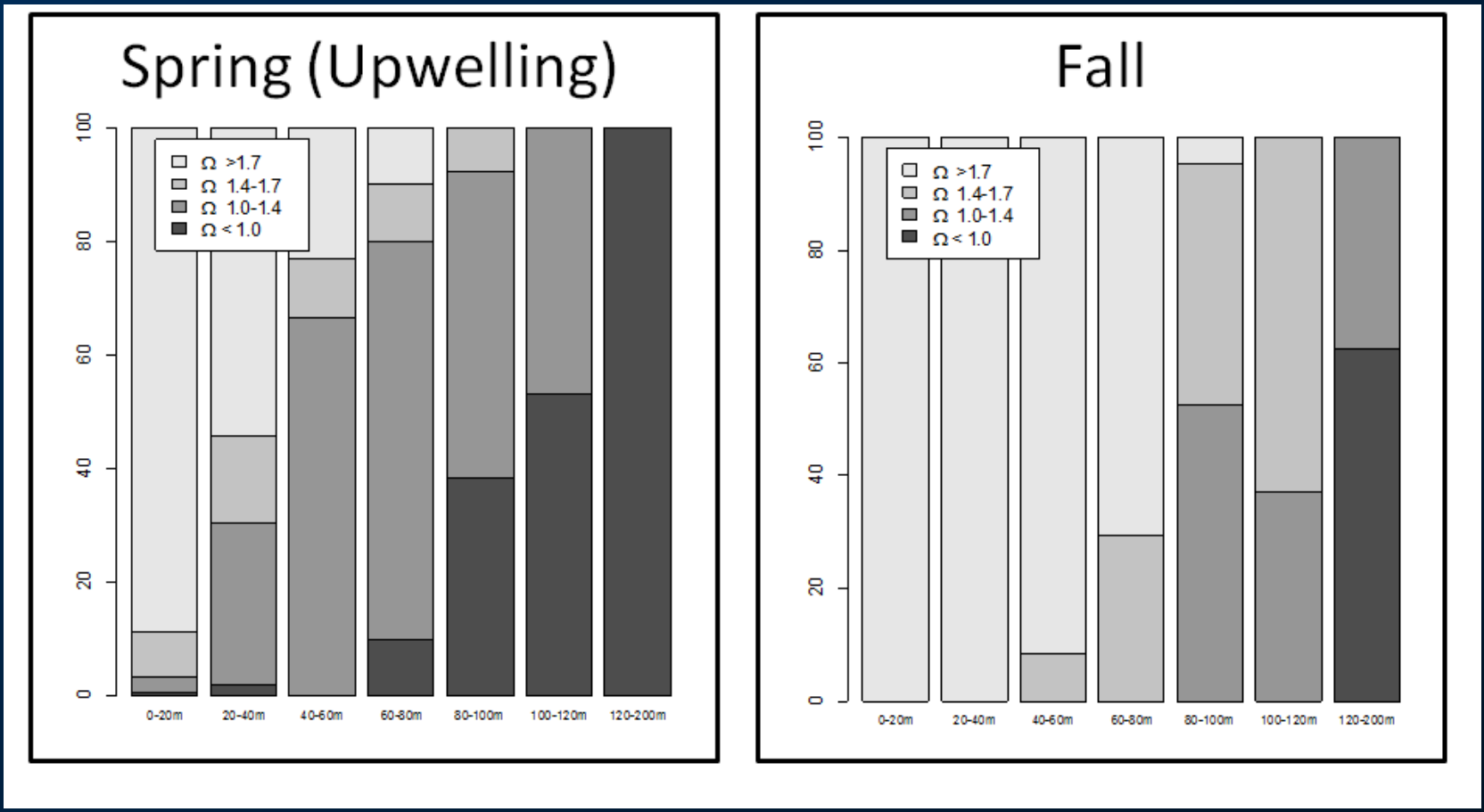
- New habitats
  - Started with shelf sites only
  - Expanded to deep ocean habitats and embayments
- Bioaccumulation
  - 2008- fish; 2013- birds; 2018-fish
- New contaminants
  - List evolves to include new pesticides
- Piloting new tools and indicators
  - Bight ‘18 will pilot a bioanalytical screening tool for CECs
  - Pilot application of a brackish water assessment tool for estuaries

Ocean Acidification

- Characterize carbonate chemistry
- Assessment of biological impacts

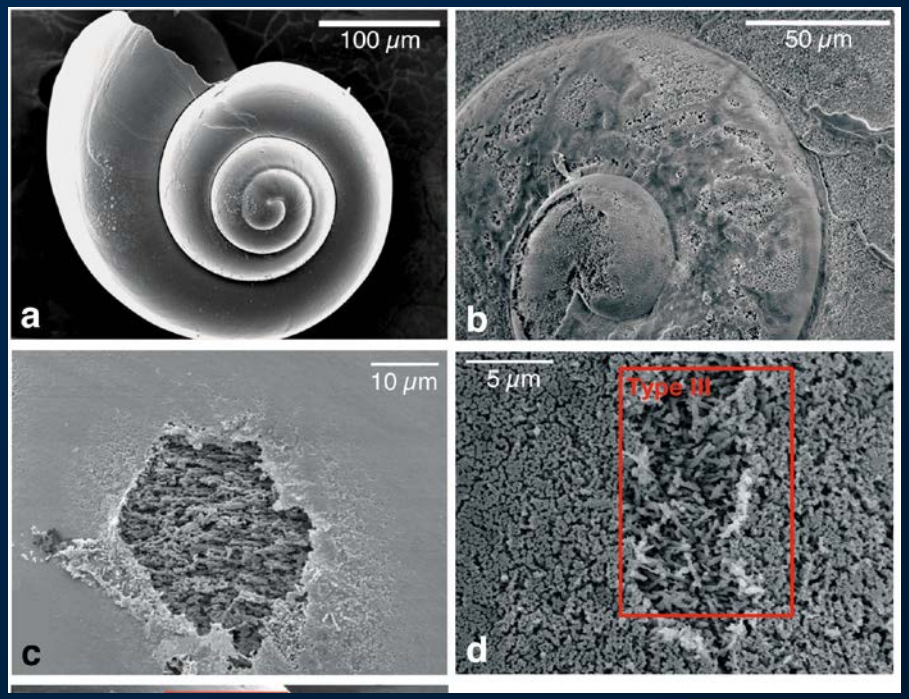


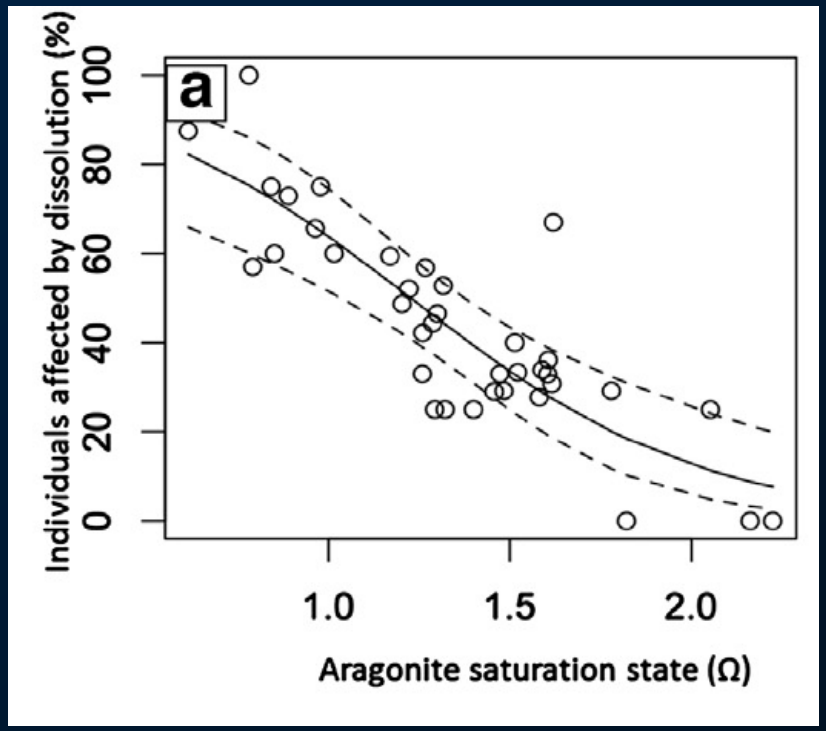
Bight ’13: Characterization of Aragonite Saturation State on Bight Shelf



Biological Impacts Assessment

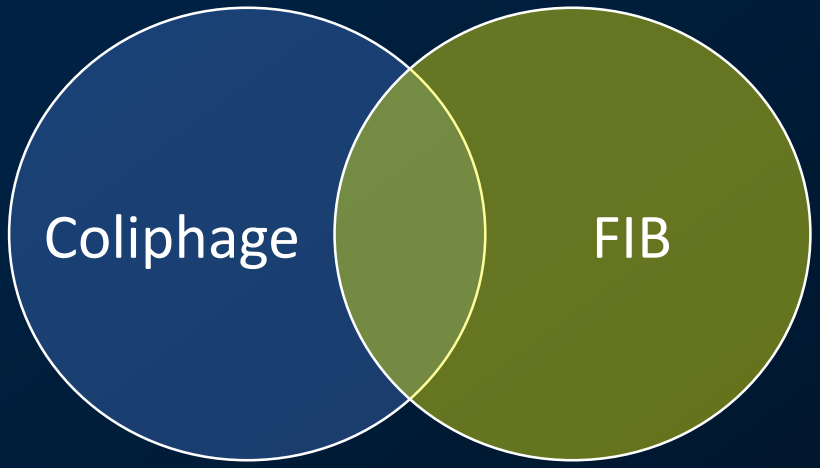
- Primary metric: Extent of pteropod shell dissolution
  - Shell dissolution as a function of Ω
- Additional indicators/metric will be evaluated





Microbiology

- Understand implications of new EPA coliphage standards for beach water quality assessments
  - Compare coliphage to fecal indicator bacteria
  - Wet season vs. dry season



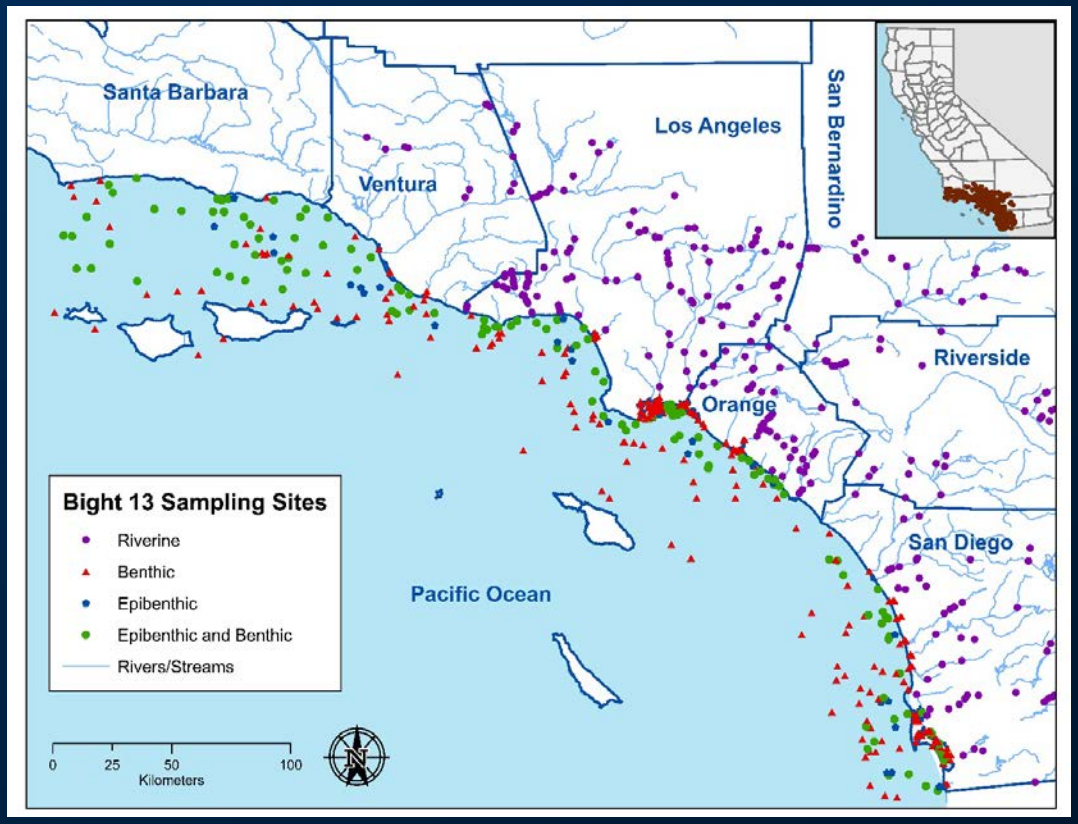
Evolution of Microbiology Element

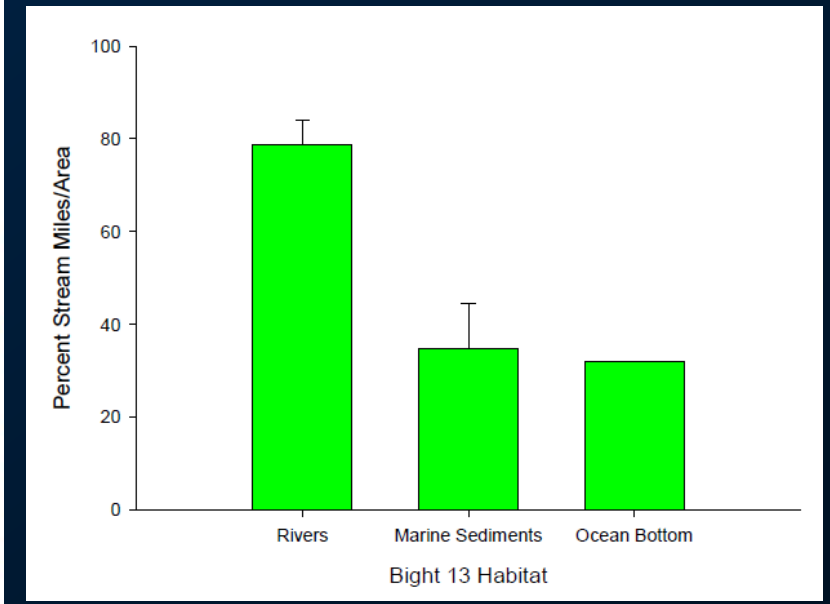
- How we assess microbiology is rapidly changing as scientific methods improve

- Regional assessments of shoreline microbiology
  - 1998 & 2002- fecal indicator bacteria
  - 2008- differentiate human/non-human sources
  - 2013- qPCR techniques for rapid assessment
  - 2018- coliphage

Trash

- Characterize distribution of trash on the seafloor and in streams





Harmful Algal Blooms

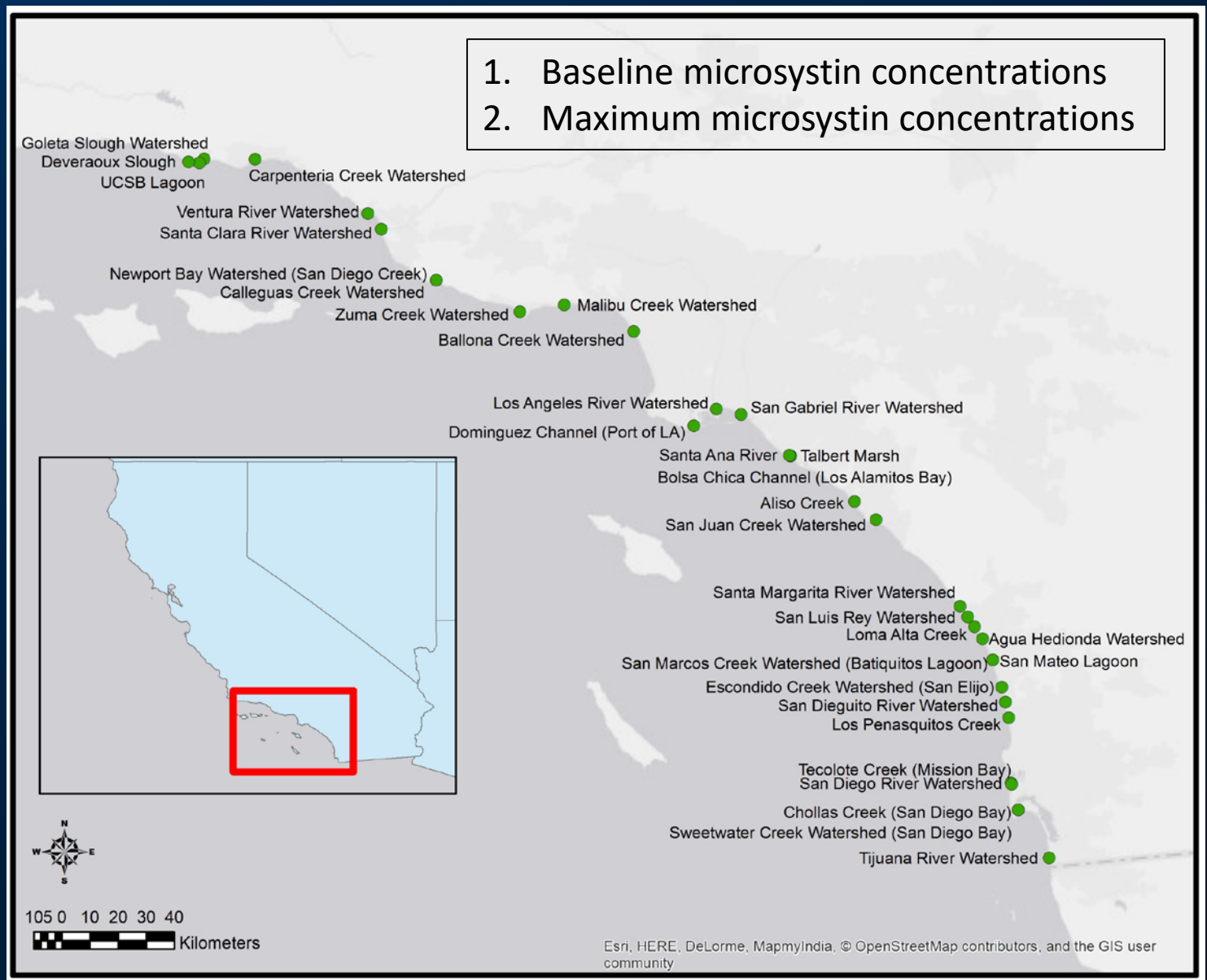
- Marine HABs: Measure Domoic Acid concentrations in shelf sediments
  - Are sediments a source of DA?

- Freshwater HABs: Characterize impact of cyanotoxins on shellfish at the marine/freshwater interface
  - What is the risk of cyanotoxins on the marine environment?

Domoic Acid in Sediment

- Integrate with Bight ‘18 Sediment Quality Group
  - Samples from 3 shelf strata: Inner, Mid, Outer
- Context will be important for interpreting results
  - Episodic nature of HAB bloom events; put 2018 into context
  - DA degrades over time; characterize the degradation

Cyanotoxins in Shellfish



Summary

- Bight is constantly evolving; lots of opportunities to integrate across programs
  - Program structure welcomes collaboration

- HABs and Ocean Acidification are likely candidates for integration across programs

For More Information…

Karen McLaughlin

karenm@sccwrp.org