Statewide HAB Projects
(from a SCCOOSie perspective)

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Expansion of HAB presence in SCCOOS
(Win-Win Relationship)

• Expansion of ‘user community’ for SCCOOS data.

• Expansion of OOS dataset to provide (1) high resolution on very small scale and (2) observations to very nearshore.
  • Many HAB programs can contribute at these scales.

• Focal point (virtual repository) for viewing and exchanging scientific information for HAB researchers

• ‘One stop shopping’ for HAB-related issues for a variety of other groups
  • For science, government, management, public
  • Organized from ‘very local’ to ‘truly regional’ scales
  • Stress palatability/appropriateness to specific users

From June, 2007 SCCOOS Meeting
SoCal HAB Projects/Partnerships with SCCOOS Involvement

- SCCOOS HABs
- SCCOOS HAB Outreach
- Bight ’08 Study
- California HABMAP
- Cal. Sea Grant – OPC
- MERHABs & EcoHABs past, present and ?future?
- Misc Sea Grant projects
SCCOOS HABs program
(5-member group: UCSB, UCLA, USC, UCSD, CalPoly)
Parameter measurements
(Weekly pier-based measurements)

1) **Live and preserved specimens for major HAB species.**
   (a ‘HABMAP’ format)

2) **Domoic acid concentrations in plankton samples.**
   ELISA
   (Samples processed at USC)

3) **Primary inorganic nutrients.**
   Nitrate + nitrite
   Phosphate
   Silicate
   (Samples processed at UCSB)

4) Extracted chlorophyll from plankton samples.

5) Temperature, salinity.
Southern California HAB Monitoring Program (SCCOOS - HABs)

Mark Moline (Cal Poly, SLO)
Mark Brzezinski (UCSB)
Rebecca Shipe (UCLA)
Burt Jones (USC)
David Caron (USC)
John McGowan (UCSD)
Melissa Carter (UCSD)
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SCCOOS HAB Outreach

11 aquaria & informal learning centers

Weekly sampling at localities (Dana Point to Ventura)

Modeled after Cal HABMAP

This Location is a Member of the SoCal Community HABwatch Network
University of Southern California & Southern California Coastal Ocean Observing System

A network of organizations supporting science, monitoring and education regarding Harmful Algal Blooms (HABs) in the southern California area.

For more information on the SoCal HABwatch Network please visit us at www.usc.edu/org/cosee-west/habwatch.html
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The Bight Study

Partnership between SCCWRP, water districts of Southern CA Bight, multiple academic partners.

HAB perspective: Focus on coastal nutrient budgets and response of algal populations.
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HABMAP
(Harmful Algal Bloom Monitoring and Alert Program)

• Partnership of HAB researchers and Southern California Coastal Water Research Project
• Serving water managers and end users of HAB information in California
• Listserv-based, hosted by SCCWRP
• Steering committee (Raphe Kudela chair)

**SAMPLE COLLECTION INFORMATION**

**LOCATION:** Scripps Pier, La Jolla CA
**DATE:** 28-Nov-2001

**NET TOW PHYTOPLANKTON OBSERVATIONS QUALITATIVE**

Dinoflagellates regain dominance in today's diverse net tow microplankton community as Akashiwo sanguinea abundance increases to common (15%) and Dinophysis spp. (7%), L. polyedrum (7%), Ceratium spp. (6%) and Prorocentrum spp. (6%) slightly increasing. Overall abundance at low to medium levels with detritus common (1%). Other potential HAB species observed in net tow sample include: Pseudo-nitzschia spp (rare) and Alexandrium spp (rare).

**DOMINANT GROUP**

- Dinoflagellates

**POTENTIALLY TOXIC SPECIES**

- Alexandrium: rare
- Dinophysis: present
- Pseudo-nitzschia delicatissima: none observed
- Pseudo-nitzschia seriata: none observed

**OTHER HAB SPECIES**

- Akashiwo sanguinea: common
- Cylindrionema: none observed
- Lingulodinium polyedrum: present
- Protoceratium: present

**RELATIVE ABUNDANCE SCALE:**

- None, Rare (R) <1%; Present (P) 1-5%; Common (C) 10-24%; Abundant (A) 25-69%; Dominant (D) >70%

**OTHER INFORMATION**

- **TIME (PST):** 905
- **COLLECTOR:** Melissa Carter / Mary Hillem

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Researchers committed to HABMAP have begun taking steps to create a HABMAP network. A HAB列数 has been generated that currently has over 100 subscribers from a variety of sectors, including federal agencies, ocean observing systems, commercial shellfish industries, public health, wildlife rescue, management and HAB research. The listserve has recently been expanded to include participants from Oregon and Washington with the goal of expanding the network in the future to include all three U.S. west coast states.

The February 2009 West Coast Regional Harmful Algal Bloom Summit focused on the concept of a coast-wide HAB monitoring and alert program. Additionally, the CalHABMAP group initiated a national workshop, sponsored by the Alliance for Coastal Technologies (ACT), the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET) and the Florida Fish and Wildlife Conservation Commission, on analytical methods comparison for toxins detection and species identification that occurred in October 2008. The outcome of that workshop is a national comparison of methodologies that will be conducted by four regional groups, including the U.S. West coast.
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California Sea Grant - OPC
Forecasts and Projections of Environmental and Anthropogenic Impacts on Harmful Algal Blooms in Coastal Ecosystems (UCSC, USC, UCLA, JPL, SCCWRP, CeNCOOS, CDPH)

Figure 2. Venn diagrams illustrating the shared and unique variables included in models of Pseudo-nitzschia ecophysiology presented within Lane et al. (2009), Anderson et al. (2009), and Blum et al. (2006) (A), and included in the Annual, Spring, and Fall-Winter 844 models from Lane et al. (2009) (B). Nutrient abbreviations for Blum et al. (2006) are as follows: phos (phosphate); si (silicic acid); and nitr (nitrate). Abbreviations from Anderson et al. (2009) include $a_p$ (particulate absorption); $a_g$ (gelbstoff absorption); $R_{rs}$ (remote sensing reflectance).

Figure 7. Flowchart of model design, development, integration, and outcomes.
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MERHABs & EcoHABs past, present and future?

Past

• MERHAB: “California Program for Regional Enhanced Monitoring of Phyco-Toxins (Cal-PReEMPT)” (UCSC)

• MERHAB: RAPDALERT “Rapid Analysis of *Pseudo-nitzschia* & Domoic Acid, Locating Events in near-Real Time” (USC, UCLA, SCCWRP)

• EcoHAB: “Regulation of *P. australis* by C, N, Si Interactions” (UCSC, SFSU)

• EcoHAB: “Domoic Acid in a Coastal Food Web” (UCSC, NOAA, UC Davis)

• EcoHAB: “A New Chemosenser for Domoic Acid Based on Molecular Imprinting.” (UCSC)

• EcoHAB: “The Role of Trace Metals in Regulating Domoic Acid Production and Release by Toxigenic Diatoms.” (UCSC)

• EcoHAB: “Dynamics and Mechanisms of HAB Dinoflagellate Mortality by Algicidal Bacteria” (UCSD)

• EcoHAB: “A Regional Comparison of Upwelling and Coastal Land Use Patterns on the Development of HAB Hotspots Along the California Coast” (UCSC, USC, MLML, MBARI, SCCWRP, UCLA, NOAA)

*Does not include assorted Sea Grant projects.

**Future MERHABs?**