National Perspective on HABs, HAB Programs, and HABHRCA Legislation Update

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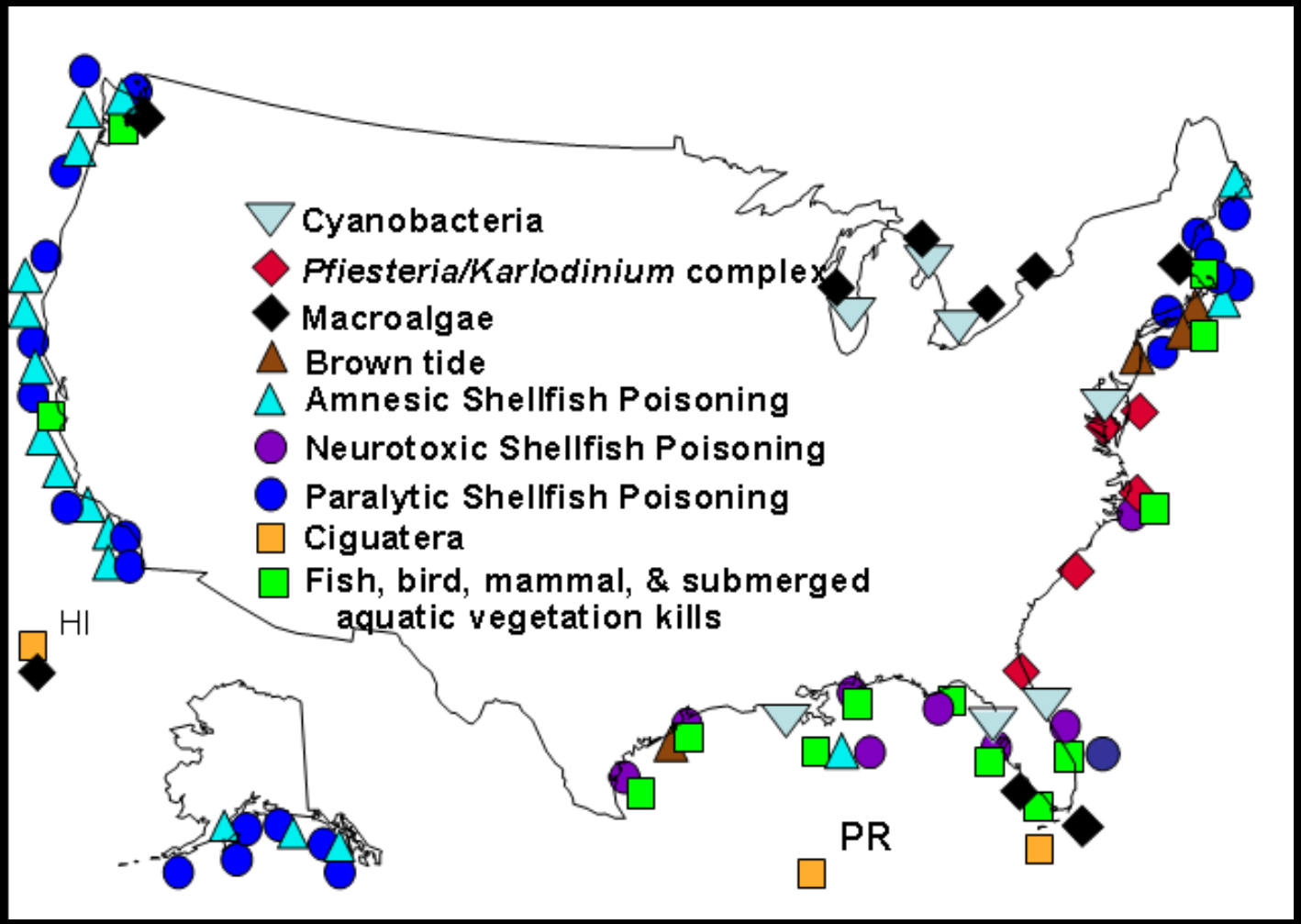
Overview of Presentation

- National problem, regional characteristics
- National programs for funding HAB research
- West Coast efforts
- HABHRCA and National HAB Program changes
- Expected HAB Summit outcomes and benefits

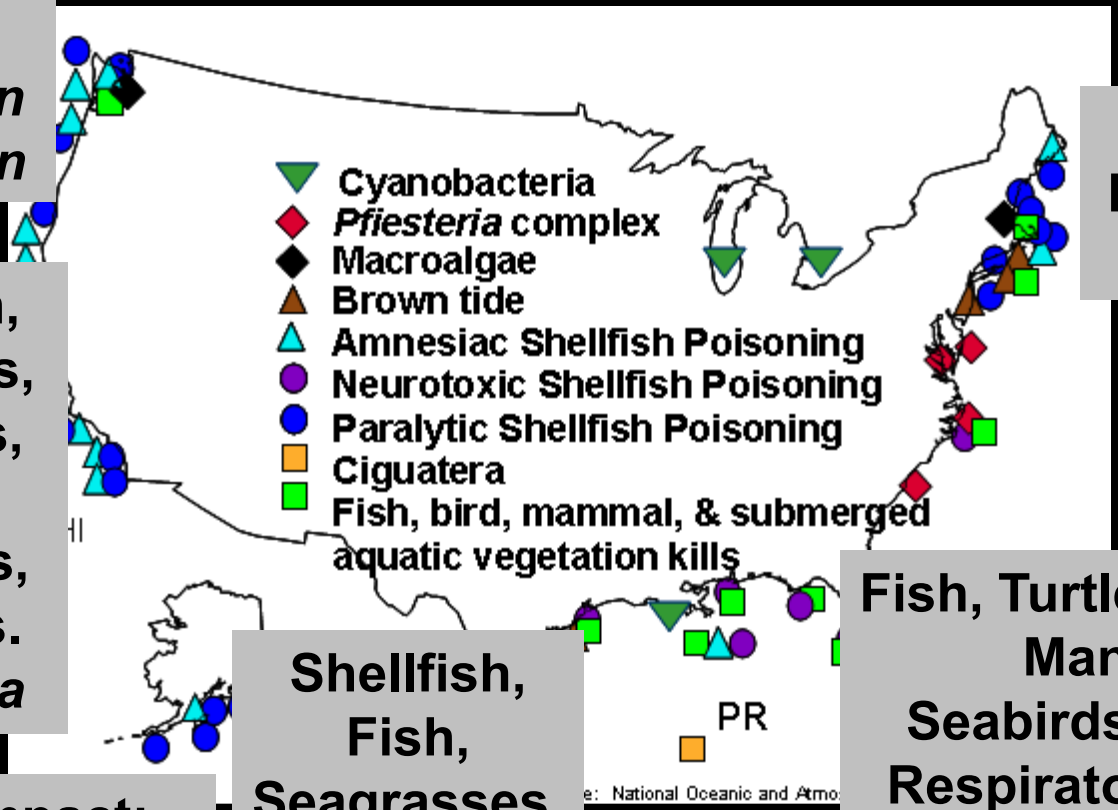
A National Problem



Regional Impacts

Shellfish, Seabirds. *Washington And Oregon*

Shellfish, Sea Lions, Dolphins, Otters , Fur Seals, Seabirds. *California*



Shellfish, Large Whales. *New England*

Shellfish, Fish, Seagrasses. *Texas*

Fish, Turtles, Dolphins, Manatees, Seabirds, Shellfish, Respiratory distress, Benthic mortalities. *Florida*

Economic Impact: A single event can exceed $40M

National HAB Programs

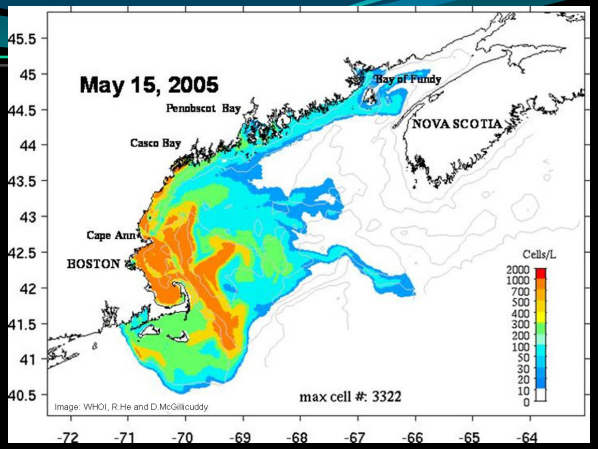
- Two National HAB research programs authorized by 1998 Harmful Algal Bloom and Hypoxia Research and Control Act (HABHRCA): ECOHAB & MERHAB

- Research and management needs identified through workshops like this one, which then form basis of competitive announcements

- Partnerships established between researchers and managers in federal, state and local agencies, tribes, academia, and private industry

- Result is development of tools and strategies to protect human and ecosystem health and coastal economies

Ecology and Oceanography of HABs (ECOHAB)



Model output predicting Alexandrium abundance in the Gulf of Maine, Image: D.McGillicuddy, WHOI

- Improve understanding of HAB ecology to develop new management tools, predictive models, and prevention strategies
- Develop understanding of trophic transfer of toxins, biosynthesis and metabolism of toxins, and impacts of toxins on higher trophic levels to guide management

Monitoring and Event Response for HABs (MERHAB)

- Builds capacity of local, state, and tribal governments, and the private sector for less costly and more precise and comprehensive HAB monitoring and response

ORHAB
Photo: Vera Trainer

West Coast Regional Efforts

- ECOHAB & MERHAB:
  $16.6 million
- ECOHAB PNW
- ORHAB, Cal-PReEmpt, MERHAB RAPDALERT, MERHAB coastal Oregon

Preparing a shellfish sample for analysis

Photo: Gregg Langlois , CA DHS

West Coast Targeted Efforts

- ECOHAB & MERHAB: $10 million
- 20 ECOHAB projects; include research on causes and controls, food web impacts, macroalgae
- 6 MERHAB projects; include development of instruments and assays for detection

Applying a shellfish sample to a field test for PSP toxins

Photo: Gregg Langlois , CA DHS

HABHRCA and the Future

- 2004 HABHRCA – added a new program:
- RDDTT

  Research,

  Development,

  Demonstration, and

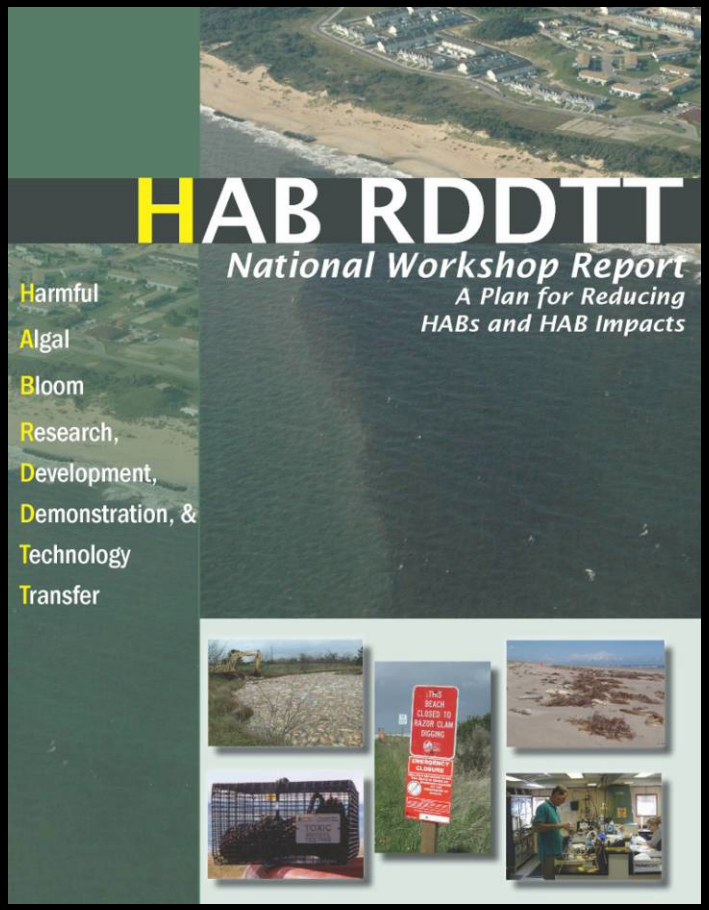
  Technology Transfer

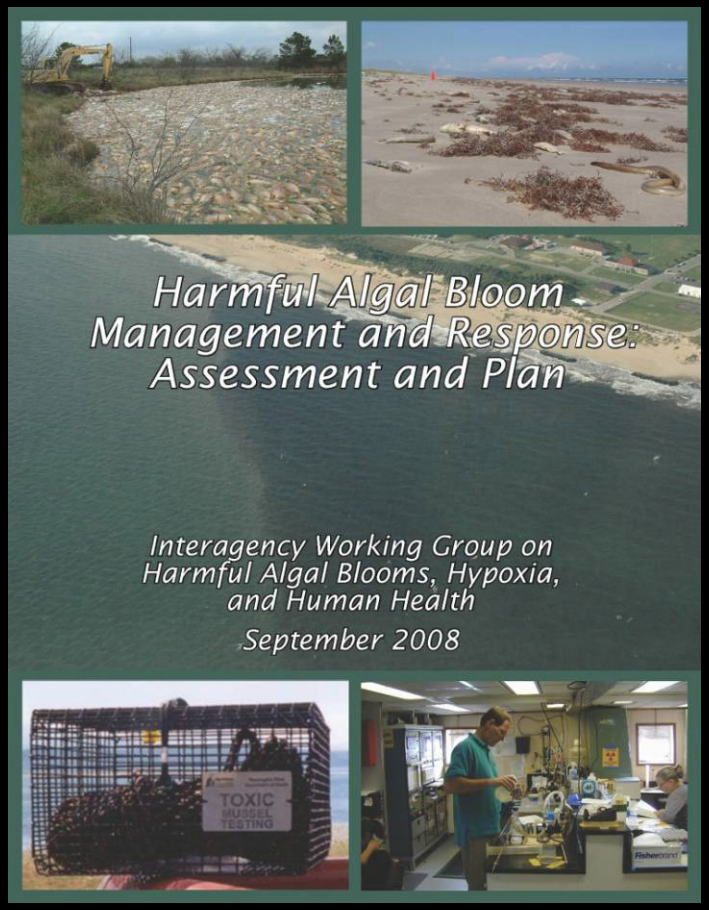
  …to Reduce HAB Impacts

Photos: Fish kill in Texas, The Facts, *Brazoria County*;
Shellfish closure sign, *J. Kleindinst WHOI*

Reports describing RDDTT

published 2008





Elements of RDDTT

(Research, Development, Demonstration and Technology Transfer)

- Establish Prevention, Control and Mitigation (PCM) Program
- Expand Event Response
- Develop Core Infrastructure Program

Photos: R. Pierce (Mote), J. Glass (TPWD), NOAA CCEHBR

Prevention, Control , and Mitigation of HABs – **PCM HAB**

- New, peer-reviewed competitive research program
- Develop , demonstrate and transfer new technologies, strategies, and methods for HAB PCM

Photos: J.Culter & D. Ayers

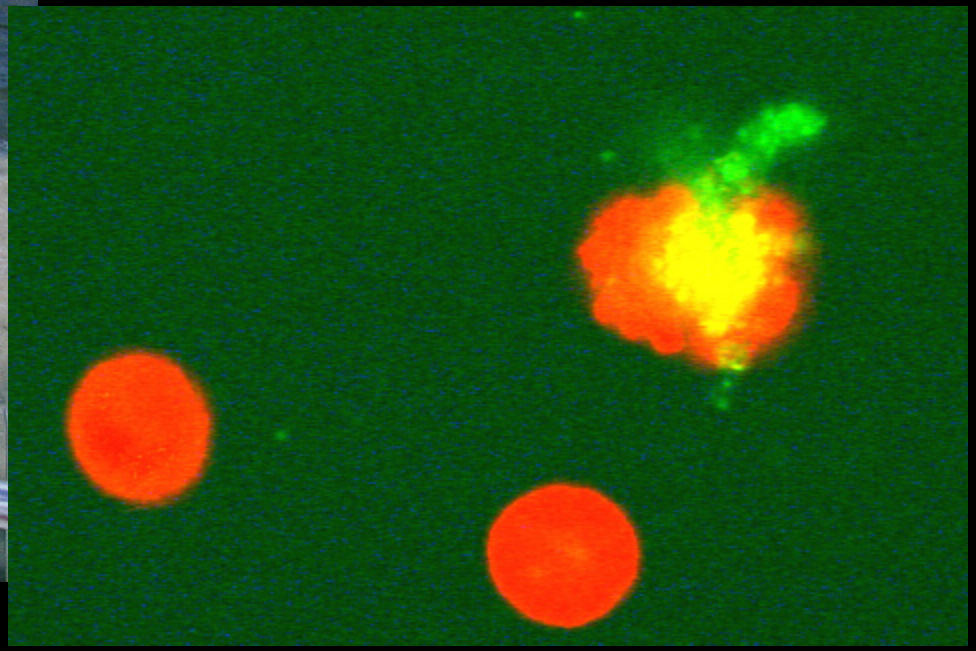
PCM – Prevention

Change environmental conditions such as nutrients/hydrodynamics; minimize or prevent introductions of invasive HAB species and their cysts

Photo: USDA

PCM – Control

Eliminate or reduce the levels of HAB organisms and their toxins through mechanical or biological mechanisms



Photos: J. Culter and Mario Sengco

PCM – Mitigation

Forecasting to allow proactive management measures

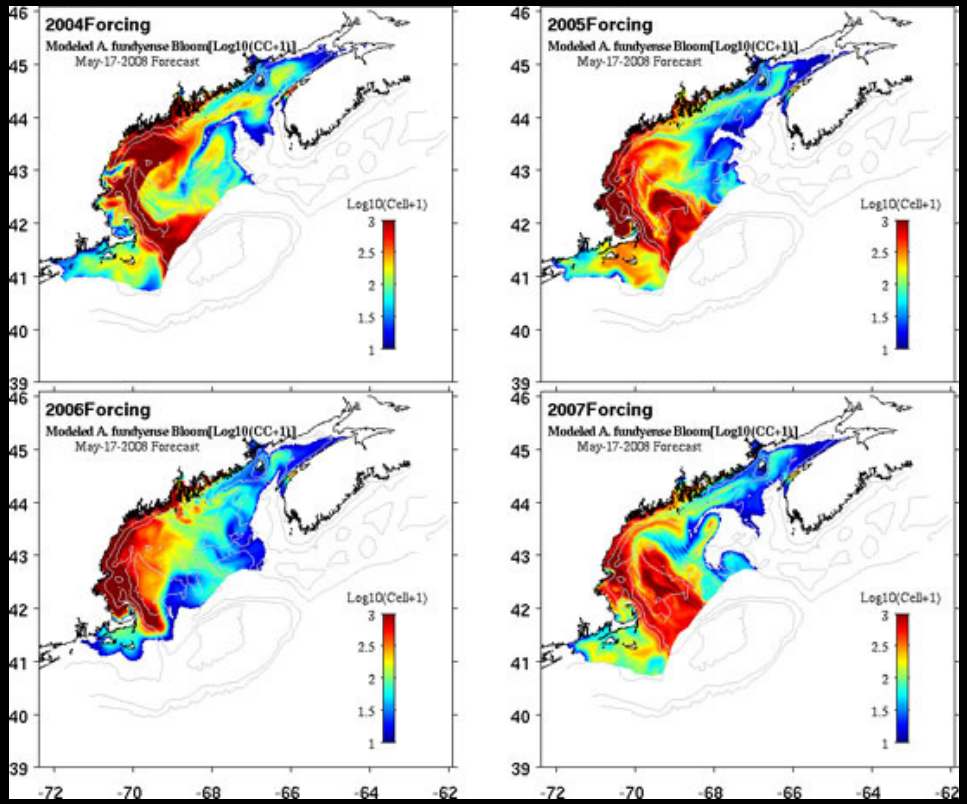


Image: D. McGillicuddy and R.He, WHOI

PCM – Mitigation

Monitoring of recreational waters and drinking water sources - improve drinking water treatment and protect public health

Photos: Greg Boyer

PCM – Mitigation

Understanding social and economic impacts of HABs and human responses to HAB management

Photo: D. Ayers, State of WA

Future: Focus on Regional Research and Implementation

Region	2010	2011	2012
Gulf of Mexico, Caribbean, Pacific Islands	MERHAB	ECOHAB	PCM
West Coast, Alaska, Great Lakes	ECOHAB	PCM	MERHAB
South Atlantic, Mid-Atlantic, Gulf of Maine	PCM	MERHAB	ECOHAB

West Coast HAB Summit – Expected Benefits to Region

- *West Coast Regional HAB Research and Action Plan to guide resources*
- *Fostering of partnerships to implement recommendations*
- *Greater protection of human health, marine resources and coastal economies*