Description of Prevention, Control, and Mitigation (PCMHAB) Program (derived from Federal Register Notice 05/04/09[1])

The PCM HAB program will transition promising technologies and strategies for preventing, controlling, or mitigating HABs and their impacts from development through demonstration and technology transfer for field application by end-users. The technologies will arise from HAB research conducted by the two existing national HAB programs, ECOHAB and MERHAB, or other research programs such as Sea Grant, the NOAA Oceans and Human Health Initiative and the NSF/NIEHS Centers for Oceans and Human Health.

The goals of PCM HAB are as follows:

(1) Develop and make widely available new socially and environmentally acceptable strategies and methods for preventing, controlling, and mitigating HABs and their impacts; and

(2) Assess the social and economic costs of HAB events and the costs and benefits of prevention, control, and mitigation to guide future research and aid in the selection of the most appropriate management strategies and methods.

PCM research should address the following topics in order to meet the stated goals:

(1) Prevent HABs by
   (a) Using and modifying existing models to identify strategies to prevent HABs, for example by nutrient reductions or hydrodynamic modifications, and
   (b) Minimizing or preventing introductions of invasive HAB species, their cysts, and organisms that facilitate the success of HAB species;

(2) Control HABs and their impacts by
   (a) Eliminating or reducing the levels of HAB organisms through biological, chemical, or physical removal mechanisms, and
   (b) Eliminating or reducing the levels of HAB toxins through biological, chemical or physical removal mechanisms;

(3) Mitigate HABs and their impacts by developing or improving methods for
   (a) HAB cell and toxin detection,
   (b) Relocating or modifying aquaculture and wild-capture resources,
   (c) Harvesting bans and closures,
   (d) Fishing and processing practices,
   (e) Education and outreach,
   (f) Enhancing community capacity to respond to social and economic impacts, and
   (g) Intervening to reduce wildlife mortality;

(4) Enhance HAB response and ensure socially responsible development and effective implementation of PCM by
   (a) Measuring social and economic costs of HABs and their impacts and the costs and benefits of HAB PCM,
   (b) Improving communication strategies and approaches for facilitating changes in human behavior/attitudes, and
   (c) Improving coordination of researchers, decision-makers, and stakeholders in implementing PCM research.

The PCM HAB program will be a competitive, peer-reviewed program that supports projects in three stages. In the Development phase research will advance and evaluate unproven but promising PCM technologies and strategies. The Demonstration phase will test, validate and evaluate new technologies in the field across a broad temporal and spatial scale. Finally, the Technology/Information Transfer phase will facilitate the transition of technologies and strategies to end-user application. PCM HAB projects will be typically 2-3 years in duration. Proposals for projects can be submitted for any phase. A single proposal can cover one or more phases, depending on the magnitude of the project. All projects must specify the phase or phases of the research to be conducted for the project period and outline how additional phases will be conducted. End-users, including local, state, and Federal resource and public health managers, nonprofit organizations, and a variety of businesses, must be identified and will normally be involved in all three stages. Projects in the Technology Transfer phase will also need to have end-user support secured either for long-term operations or the application of the developed tool or technology.

Clarification of Appropriate Topics for proposals submitted to ECOHAB, MERHAB, and PCM HAB (adapted from Federal Register Notice 04/05/09[1])

Several research topics may fit more than one CSCOR extramural, national, competitive HAB program. Further, there are some topics that are more appropriate for other NOAA programs or programs in other agencies. The following section (A.) lists examples of appropriate programs for different components of potentially overlapping topics. Examples of topics which are not applicable to any of these three programs are provided in Section B.

A. Examples of Appropriate Research Topics for Each Program

1. Developing methods of measuring and monitoring HAB cells and toxins. The purpose of the research and the stage of development will determine which program is appropriate.
   (a) ECOHAB will fund method development when it is necessary to conduct research.
   (b) MERHAB will fund method development when it is needed to improve or test an existing method for use in monitoring HAB cells or toxins or environmental conditions that foster HABs.
   (c) PCM HAB Phase 1 will fund novel method development where the concept is so new that it is unknown whether it will be suitable for research or monitoring.
   (d) PCM HAB will also fund efforts to make existing technologies more widely available.
2. Use of models for forecasting and prediction
   (a) HAB forecasting and prediction through the development of models, is covered by the ECOHAB program.
   (b) Development of partnerships to test and utilize models for forecasting as part of specific monitoring programs is under the purview of MERHAB.
   (c) Transfer of models for HAB forecasting and prediction to end users will be covered by PCM HAB.
   (d) Modification or use of models to develop prevention strategies will be funded by PCM HAB.

3. HAB-related human dimensions research will be conducted as part of the PCM HAB program, including socio-economic impacts of HABs. However, an ECOHAB or a MERHAB proposal may have a socio-economic component as part of a larger study.

B. Examples of Non-Applicable Research Topics

1. Prevention of HABs by implementation of nutrient reductions or hydrodynamic modifications is a possible strategy, but numerous other programs in other agencies address implementation issues. PCM HAB will not fund, for example, research to develop new methods of nutrient removal or develop land use practices that may reduce nutrient inputs. However, if actual nutrient reductions or hydrodynamic changes are implemented, PCM HAB may fund research to monitor and model the consequences of those activities if they will be transferable to other situations.
2. Disease surveillance, clinical characterization, and therapeutic guidance in humans are the purview of other agencies, such as NSF/NIEHS COHH, CDC and FDA.
3. Drinking water monitoring and treatment is under the purview of EPA.

Authorization and Research Prioritization for PCMHAB Program

Legislation:

The PCMHAB program was authorized by the Harmful Algal Bloom and Hypoxia Research and Control Act (HABHRCA) of 1998 (Pub.L. 105-383) and was reauthorized in 2004 (Pub.L. 108–456). Continuation of the competitive programs was included when HABHRCA was reauthorized in 2014 (Pub.L. 113–121)

Reports

HAB RDDTT National Workshop Report: A Plan for Reducing HABs and HAB Impacts (2008)[2].
Harmful Algal Bloom Management and Response: Assessment and Plan (2008)[3].
Harmful Algal Research and Response: A Human Dimensions Strategy (2006)[4]
Prevention, Control, and Mitigation of Harmful Algal Blooms: A Research Plan (2001)[5]
Harmful Algal Blooms in Coastal Waters: Options for Prevention, Control, and Mitigation (1997)[6].
Comprehensive Research and Action Plan for HABs and Hypoxia (in review, 2016)

Federal Register Notice

Implementation of New Competitive Prevention, Control, and Mitigation of Harmful Algal Blooms (HAB) Program and Regional Rotation of the Existing and New National Competitive HAB Programs A Notice by the National Oceanic and Atmospheric Administration on 05/04/2009[1]

References

1. Federal Register Notice HAB Programs A Notice by the National Oceanic and Atmospheric Administration on 05/04/2009 https://www.federalregister.gov/articles/2009/05/04/E9-

10187/implementation-of-new-competitive-prevention-control-and-mitigation-of-harmful-algal-blooms-hab

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5. Prevention, Control, and Mitigation of Harmful Algal Blooms: A Research Plan, 2001. NOAA National Sea Grant College Program, 28pp. http://www.whoi.edu/science/B/redtide/pertinentinfo/PCM_HAB_Research_Plan
6. Boesch, D.F., Anderson, D.M., Horner, R.A., Shumway, S.E., Tester, P.A. and Whitledge, T.E. 1997. Harmful Algal Blooms in Coastal Waters: Options for Prevention, Control, and Mitigation. NOAA/COP/Decision Analysis Series No.10. Silver Spring, MD: NOAA Coastal Ocean Office, 61 pp. http://www.whoi.edu/fileserver.do?id=24161&pt=10&p=19132