

receive adequate information about outbreaks. State monitoring programs have not kept pace with the expansion of the HABs problem. Tight state budgets and the need to monitor for more toxins in more organisms over larger areas have left many monitoring programs underfunded. Further, support of state monitoring efforts through the Federal Clean Water Program has not specifically addressed the need for increased HAB monitoring. The problem is exacerbated by managers' inability to quantify the benefits to human health, commercial fisheries, recreation and tourism of controlling HABs and to compare these to the costs of mitigation strategies.

NCCOS/CSCOR/COP Program Interest

Through the MERHAB program, NCCOS/CSCOR/COP intends to build capabilities of local, state, tribal, and private sector for regular and intensive measurement of HAB parameters. This will make existing monitoring programs more efficient while providing better coverage in time and space. MERHAB will enable rigorous field testing of state-of-the-art technology through targeted projects and will incorporate the new methods of detecting and tracking HABs into existing monitoring programs through regional, intensive monitoring projects. MERHAB will also develop event-response capabilities within affected regions to ensure trained and equipped personnel are able to mobilize quickly, conduct appropriate sampling and testing, and communicate effectively during HAB events.

With faster, less expensive, and more reliable detection methods for HAB cells and toxins, and stronger mechanisms in place to respond to outbreaks, programs will be better able to mitigate the impact of HABs on vital resources and will protect public health. As a result, managers will be able to better address the expanding HAB problems facing their coastal regions and, therefore, they will be better positioned to request long-term support from Federal and state agencies or from other funding entities.

MERHAB Goal

The primary goal of the MERHAB program is to incorporate products generated from past or ongoing HAB research programs into operational components of existing monitoring programs in HAB-impacted coastal regions. MERHAB is not intended to provide long-term support for routine monitoring efforts.

A. MERHAB-Targeted Research Project

(1) Objectives:

(a) Develop a technology that will enhance HAB monitoring activities in U.S. coastal waters; and (b) incorporate that technology into existing HAB monitoring programs.

(2) Characteristics:

(a) Should rigorously field-test new technologies to detect algal species, toxin, or toxicity and/or monitor the environmental conditions that support HABs. New technologies may include, but are not limited to, rapid field assays for shellfish, improved diagnostic techniques for in situ detection of HAB cells, and remote sensing technology to help target sampling efforts; (b) may be led either by an individual or by small investigative team; and (c) must address specified research needs of the HAB community.

Investigators should include in their work plans efforts to build support for the incorporation of technology into one or more existing state or regional HAB monitoring programs. (See Part II: Further Supplementary Information Section (11) "Project Funding Priorities.")

B. MERHAB-regional, Intensive Monitoring Projects

(1) Objectives:

(a) Develop new or increase existing regional capabilities for HAB monitoring; (b) incorporate new tools for HAB measurement into existing monitoring efforts; (c) include local, state, regional, Federal, or non-governmental entities as active partners in identifying environmental measurements and their importance to managing coastal resources and protecting human health (i.e. generating public advisories) in the area; (d) determine and work to secure long-term local, state, regional, or other funding that will support enhancements in HAB monitoring that result from MERHAB project funding; and (e) develop local and/or regional capabilities to respond to HAB events.

(2) Characteristics:

(a) Include a suite of annual studies and involve a multi-disciplinary, collaborative team of investigators. The team should represent groups with strong interests in improved HAB monitoring, including, but not limited to, the natural and social science research community, existing monitoring programs, communities dependent upon affected resources, business and industry associations, and non-profit organizations; (b) provide evidence that local, state, tribal, regional, and Federal representatives were consulted in the development of the proposal to ensure appropriate economic, regulatory, and management

issues are addressed; (c) include a plan for continued consultation with these representatives to facilitate the incorporation of research results into existing monitoring programs and to identify means to continue HAB monitoring efforts after MERHAB project funding has ended; and (d) form a management team with a designated chairperson serving as the main point of contact with the MERHAB Program Manager.

In similar NCCOS/CSCOR/COP research programs i.e. ECOHAB, management teams provide strong leadership and solid partnerships among principal investigators and collaborators. Teams serve to interpret results collected from the expanded suite of pilot studies, permitting acceptance or rejection of the approaches, techniques, or tools explored during each annual budget period. MERHAB management teams will also analyze results for application under local conditions and assess effectiveness under specific constraints so that application to other coastal systems or species may be determined.

Shared Research Project Characteristics

The following characteristics are shared by both MERHAB-targeted projects and MERHAB-regional, intensive monitoring projects.

(1) Project results will be distributed to stakeholders via scientific, peer-reviewed articles, synthesis documents, briefings, electronic web sites, and any other means defined by the proposers.

(2) Project proposals should clearly identify a timetable of accomplishments and major program elements that will lead to specific interim and final assessments of applicability and effectiveness of a number of monitoring approaches.

Continuation of funding will be contingent upon the availability of funds from Congress, satisfactory performance, and is at the sole discretion of the agency; and determination by the awarding agency that the selected project is on course to provide both interim and final products that will improve HAB monitoring capabilities in the local or national coastal environment impacted by HABs.

Expected Products and Outcomes

A. MERHAB-Targeted Projects

(1) Development and testing of new HAB monitoring tools;

(2) Demonstration of effective application of technology in an existing monitoring program; and

(3) Comprehensive data analysis and integration that advances the state of