

# CORAL DISEASE AND HEALTH CONSORTIUM

## Draft Implementation Plan

**Mission:** Preserve and protect the health of coral reef ecosystems through an understanding of the effects of natural and anthropogenic stressors on reef-building coral communities.

**Background:** Coral reef ecosystem decline, as evidenced by reduced coral reef growth rates, bleaching, disease outbreaks, and increased mortality, is increasing in frequency and distribution worldwide. An increasing number of coral species, and the associated coral reef community of organisms, are affected. Human induced stressors are believed to be the direct or indirect cause of many observed reef ecosystem declines and coral mortalities, often in concert with natural disease-causing organisms. Cause-effect relationships have not been well documented but new disease syndromes, caused by the interaction of biotic and abiotic stressors, appear to be emerging. Coral health and coral diseases have not been thoroughly characterized and disease etiologies, including the causative agent(s), remain uncertain.

The purpose of the Coral Health and Disease Consortium (CDHC) is to organize and coordinate the scientific resources of the U.S. and its territories to:

1. Document the condition of our coral reef ecosystems.
2. Determine the cause(s) of declines in coral reef health, including diseases, bleaching, mortalities, abiotic factors, and human stressors.
3. Define exposure-response threshold values and associated criteria, as appropriate.
4. Provide technical information and assistance to managers and scientists regarding the health of coral reefs and possible causes and remedies.

**Organization:** Technical facilities, scientific expertise, and financial resources of three federal agencies [National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS) Department of the Interior (DOI), and the U.S. Environmental Protection Agency, Office of Research and Development (EPA-ORD)] devoted to coral research will be coordinated to form the operational core of the CDHC. It will be guided by an **Interagency Council** consisting of a senior representative from each cooperating federal agency who is a member of that agencies research community (three total); the chair will rotate annually with the first chair being determined by agreement of the members. The Interagency Council will organize and coordinate activities among the cooperating agencies, recommend research priorities and funding to their respective agencies, represent research and development activities of their parent organizations, and coordinate in-house and extramural research activities related to the mission of the CDHC.

A **Technical Advisory Committee**, comprised of 6-12 recognized scientific experts from U.S. federal, state, and territorial organizations, will assist the Interagency Council by:

1. Identifying the major technical issues related to accomplishing the stated mission of CDHC.
2. Describing the greatest scientific uncertainties related to understanding and solving the technical issues.
3. Recommending annual research priorities
4. Providing scientific overview of research proposed and in progress.

The CDHC will build on and integrate the strengths of three existing federal research facilities with relevant missions, expertise and resources to perform critical functions in support of the Consortium's mission:

1. EPA's ORD NHEERL Gulf Ecology Division, Gulf Breeze, FL.
2. NOAA's NOS Center for Coastal Environmental Health and Biomolecular Research, Charleston, SC.
3. DOI's USGS Florida Caribbean Science Center, Gainesville, FL, National Wildlife Health Center, Madison, WI, National Wetlands Research Center, Lafayette, LA, and Pacific Island Ecosystems Research Center, Honolulu, HI.

The EPA Gulf Ecology Division will oversee a **Health Assessment Unit** to conduct and support research and development activities to assess the condition of the Nation's coral reefs in concert with the other two agencies (NOAA and USGS). Research by EPA scientists in cooperation with scientists from other federal and non-federal agencies will determine cause(s) of diseases and mortalities, the influence of stressors on coral diseases, bleaching, and mortalities, and establish cause-effects threshold values.

The NOAA Center for Coastal Environmental Health and Biomolecular Research will oversee a **Clinical Pathology Unit**. Research by NOAA scientists in cooperation with scientists from other federal and non-federal agencies will develop and apply diagnostic procedures to determine cause(s) of diseases and mortalities, develop and maintain a registry of coral diseases including tissue and slide collections and an electronic atlas, and apply these diagnostic services to assist the scientific community in documenting and understanding diseases of corals. Biomarkers development could be used to predict decreases in health.

The DOI USGS Research Centers will oversee an **Epizootiological Function**. USGS scientists will work with others to collect and to compile data on the occurrence and location of coral reef ecosystem declines, coral diseases and mortalities, and natural and anthropogenic factors considered potential causal factors — acting alone or in combination to use in risk assessment to predict potentially sensitive sites. USGS could develop maps which illustrate the location and intensity of various coral diseases and bleaching, and potential stressors, conduct spatial analyses to develop hypotheses regarding cause(s), and develop a CDHC Web Site to advertise and make such information electronically available to the managers, public and scientists.

The Interagency Council will be responsible for developing and annually updating a research strategy for their specific area of responsibility which identifies the major issues

(e.g., what is the condition of U.S. coral reefs?) and their priority research needs (e.g., what are the most appropriate indicators of condition?), relevant on-going or planned research, and research progress during the previous year. Each Agency will be responsible for developing and updating research implementation plan for each area of responsibility which provides sufficient details for peer review (objectives, experimental design, approach, and anticipated research outputs) for research in progress or planned for support. Collectively, the Agency representatives are responsible for integrating their plans into a comprehensive CDHC research plan. This plan will be peer reviewed prior to implementation and biennially thereafter by an independent peer review panel selected/approved by one representative from each cooperating agency, one level of management above members of the Interagency Council; research progress will also be reviewed.

A **CDHC Grants Program** will be proposed and designed by the cooperating agencies and managed by one agency (e.g., EPA’s STAR program and ECOHAB). Requests for proposals (RFPs) will be developed annually by the Interagency Council based on the highest priority research and development needs of the CDHC. Funding is available to all non-profit organizations, including the federal partners and funding decisions will be based on independent scientific peer review. The importance of this program is to coordinate funding the most important coral reef research needs of the Nation.

While each research facility will be overseen by a specific agency, scientists from all three agencies will be encouraged to interact with each other and other experts at non-federal facilities. It is imperative that scientists in each of the three federal agencies currently involved in coral reef health-related research maintain their active research programs irrespective of the Agency appointed to oversee that particular function. It is expected that the lead Agency will cooperate by sharing talents, expertise, and facilities with others already actively involved with relevant research. Those possessing current expertise will be given leadership roles in such endeavors.

Proposed Implementation of CDHC: The importance of coral reefs to the economic and ecological condition of certain U.S. states and territories, their apparent decline in condition, and the numerous uncertainties involved make it necessary that federal research continue, as planned by the participants, during the developmental phases of the CDHC. Senior representatives of the cooperating federal agencies will discuss and agree on immediate research priorities and coordinate research activities to ensure efficiency and effectiveness, while pursuing the activities listed below to better plan, coordinate and integrate national research activities.

- Approval of CDHC by cooperating Agencies . . . . . 1st quarter, Year 1
- Interagency Council appointed . . . . . 1st quarter, Year 1

(Director or designee from each cooperating agency/organization that has committed approximately equal resources to support the CDHC: EPA, DOI, and NOAA.)

- Technical Advisory Committee named . . . . .2nd quarter, Year 1  
(6-12 technical experts representing the appropriate breadth of expertise)
- Peer Scientific Review Panel named . . . . .2nd quarter, Year 1
- First Annual CDHC Workshop . . . . . 3rd quarter, Year 1  
  
(Workshop organized by Interagency Council to include technical experts active in coral reef research and federal, state, and territorial clients of the consortium. The first workshop will be held at Gulf Breeze, FL; future workshops will be held at a location decided by consensus of the Interagency Council. Two major products will be produced: CDHC FY'200? Research Strategy (NOAA & EPA) and an Atlas of Coral Diseases of the U.S. (DOI)) . . . . .4<sup>th</sup> quarter, Year 1
- National FY'200? Coral Reef Research Plan developed and peer reviewed. . . .4th quarter, Year 1  
  
(Research implementation plans developed by the three research and development Agencies of CDHC and integrated and consolidated into a National Implementation Plan for Coral Reefs)
- National FY'200? Coral Reef Research Plan Implemented . . . . .1st quarter, Year 2
- CDHC Grants Program advertises first RFP . . . . .1st quarter, Year 2
- Second Annual CDHC Workshop . . . . .2nd quarter, Year 2  
  
(Review research progress and important new findings and reach consensus on priority research needs. Two major products will be produced: Revision to the Coral Reef Research Plan and The First Annual Coral Reef Annual Research and Development Accomplishments Report)
- Annually, repeat the cycle of planning, reviewing, revising, implementing, and reporting.

**Agency Participation:**

U.S. Geological Survey  
 Environmental Protection Agency  
 National Oceanic and Atmospheric Administration  
 State Agencies  
 Universities