

***DRAFT RECOMMENDATIONS***

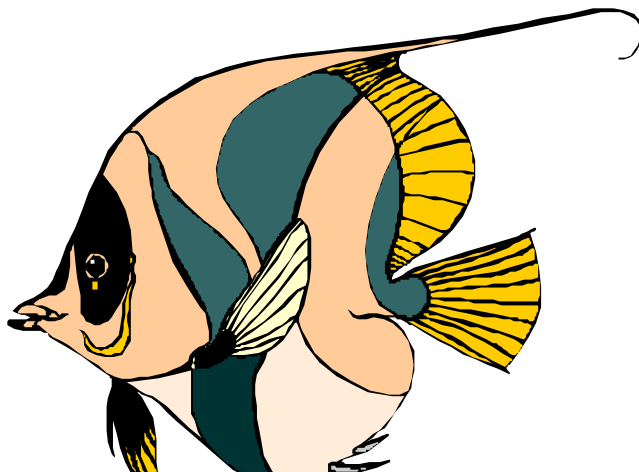
***OF THE***

***WATER & AIR QUALITY WORKING GROUP***

***TO THE***

***U.S. CORAL REEF TASK FORCE***

**NOVEMBER 2, 1999**



# **Draft Recommendations of the Water & Air Quality Working Group**

**November 2, 1999**

BACKGROUND: The centerpiece of the U.S. government's Year of the Ocean activities was the National Oceans Conference held in Monterey, California in June of 1998. Among the Administration initiatives announced at the conference was the Executive Order (E.O.) on coral reef protection, which was signed by President Clinton at the conference on June 11. It directed Federal agencies to expand research, preservation and restoration activities to protect coral reef ecosystems.

The Order also created the interagency Coral Reef Task Force to oversee implementation of the policy and Federal agency responsibilities set forth in the E.O. At the first meeting of the Task Force, which took place in October, 1998, members created five working groups to address issues relevant to the protection of coral reef ecosystems. The working groups are: Water and Air Quality (EPA lead); Coastal Uses (NOAA lead); Ecosystem Science and Conservation (DOI lead); Mapping and Information Synthesis (NASA and NOAA co-lead); and International (State Department lead). The working groups were charged with developing draft proposals to be presented at the second meeting of the Task Force, which was held in March, 1999. At that meeting, Task Force members endorsed the general direction and recommendations being proposed by the working groups, and directed them to more fully develop their proposals, including estimated budget needs and timeframes for implementation, for the third meeting of the Task Force, which is scheduled for November 2-3, 1999.

WATER & AIR QUALITY WORKING GROUP CHARGE: The Water & Air Quality Working Group is charged with developing, recommending, and seeking or securing implementation of measures necessary to reduce and mitigate coral reef ecosystem degradation due to water-borne and air-borne sources of pollution.

SUMMARY OF KEY ISSUES/THREATS/PROBLEMS: The Water & Air Quality Working Group is focusing its efforts on activities which will improve our ability to assess the biological and physical conditions of coral reefs to better address their degradation, and the major types of pollution impacting coral reef ecosystems. Threats to coral reef ecosystems were discussed at a one day seminar held in conjunction with the second meeting of the U.S. Coral Reef Task Force in March 1999. The major water quality problems identified as priorities by seminar presenters were sedimentation and nutrient overloading. These pollutants take on additional importance relative to coral reefs because they are also leading pollution problems in rivers, lakes, and estuaries, all of which eventually drain to the oceans, potentially affecting coral reef ecosystems. Compounding the problem is the fact that this nation has lost over half its historic wetland resources, including coastal marshes and mangroves which are important elements of the coral reef ecosystem, and serve as filters to remove pollutants before they reach coral reefs.

Consequently there are many efforts already underway to address these problems. They include better control of animal feeding operations, increasing buffer strips and wetland restoration to trap, filter and process pollutants, better management and technology for onsite sewage management, more effective stormwater regulation, and increased financial assistance to agricultural producers to reduce run-off of soil, nutrients and pesticides from farm fields. Coastal wetland restoration programs, such as the USDA-NRCS' Wetland Reserve Program, and many other cooperative efforts of the U.S. Fish & Wildlife Service and other agencies, are restoring many thousands of acres of valuable coastal marshes. A Clean Water Action Plan, issued by EPA and the U.S. Department of Agriculture in February, 1998, provides a framework for improved protection of aquatic resources, and was accompanied by a request to Congress for a substantial funding increase to advance these efforts.

While some of these proposed activities could entail rulemaking at the national level, it is anticipated that implementation often will occur through already established mechanisms involving State partners and programs; e.g. adoption, implementation and enforcement of State water quality standards, permit issuance, monitoring, and CWA Section 401 certification requirements. In addition, EPA favors, and many states have already adopted, implementation mechanisms that are developed and applied on a watershed basis. This approach allows for actions to be tailored to the particular needs and circumstances in that watershed. For control of nonpoint source pollution, the principal implementation mechanisms are voluntary and incentive-based, using a combination of State, EPA and U.S. Department of Agriculture programs and technical assistance being rendered to agricultural producers and others. These and many other efforts are described more fully at: <http://www.epa.gov/ow> and <http://www.cleanwater.gov>, and the recommendations in this report will build on many of these existing efforts.

Finally this report also focuses on several other types of chemical and biological pollutants that can impact coral reef ecosystems, as well as relevant education and outreach activities to help support activities protective of coral reef ecosystems.

## **Biological and Physical Degradation**

Threat/Issue: Loss of biological richness and physical degradation of coral reef ecosystems are due, in part, to degraded water quality and increased disease events. Environmentally insensitive development and land use practices, along with point and nonpoint sources of pollution that contribute toxic chemicals, sediments, nutrients, oil, sewage and debris to coastal waters, contribute to this degradation. Biological and physical degradation are even greater in areas where habitat loss has reduced nature's ability to filter nutrients and pollutants before they reach the reefs.

Summary of current activities/abilities to address threat: In addition to the many provisions of the Clean Water Act and USDA restoration programs (Environmental Quality Incentives Program (EQIP), Wetland Restoration Program (WRP), and the Wildlife Habitat Incentives Program (WHIP)) that can provide protection to coral reef ecosystems, the Clean Water Action Plan contains a number of actions that will help address, both directly and indirectly, some of the causes of biological and physical degradation to coral reef ecosystems. Relevant activities

include: development of nutrient criteria; stream corridor and wetlands restoration; establishment of agricultural buffers; development of guidance on onsite sewage disposal management programs; and issuance of additional storm water regulations.

Summary of primary impediments to addressing threat: Adequate criteria do not exist to measure coral ecosystem health. The development of narrative or physical guidelines that consider turbidity, light penetration, temperature, etc., are needed to establish baselines for gauging water quality. These standards can be combined with more sensitive biological indicators to assess changes and provide an early warning of stress.

## **Sediments**

Threat/issue: Sediments can be introduced to waters through a wide variety of activities, including dredging, development, agriculture and timber harvesting. Sediments can adversely impact coral reef ecosystems by smothering the reefs themselves, and by reducing light penetration. Upland or shoreline projects may reduce or alter critical habitat (e.g. wetlands, mangroves) that filters sediments. Water-based dredging and development activities, such as harbor expansion and maintenance dredging, can impact reefs by covering them with suspended sediments. Sedimentation can be reduced, in part, by buffers such as wetlands and streamside vegetation, which trap sediments and keep them from reaching waterways and coral reefs.

Summary of current activities/abilities to address threat: Clean Water Act Section 404 is the primary regulatory vehicle for addressing impacts of sediments on coral reef ecosystems from dredging and development activities. Persons proposing to conduct activities such as hotel or housing development in coastal wetlands or other waters, maintenance dredging of harbors, or building of bridges and roads, must obtain a Section 404 permit. This requirement also triggers other Federal environmental reviews, including evaluation under the National Environmental Policy Act, the Endangered Species Act, and coordination with the States under CWA Section 401 to ensure projects are consistent with State water quality standards. The Section 404 permit evaluation must consider any direct, indirect or cumulative impacts to coral reefs that could result from the proposed project. Section 319 of the Clean Water Act provides grants to States to help implement nonpoint source management plans that address sediments, along with other types of nonpoint source pollutants. Section 6217 of the Coastal Zone Amendments and Reauthorization Act provides guidance to States regarding the effective control of nonpoint source pollution, including sediments, in coastal areas. The U.S. Department of Agriculture has a number of programs designed to reduce sediment runoff from agricultural fields, including the Wetlands Reserve Program and the Environmental Quality Incentives Program.

Summary of primary impediments to addressing threat: Regarding the Clean Water Act Section 404 program, activities proposed in coastal areas that do not directly impact wetlands and other waters are not subject to Section 404, even though these activities may also have indirect effects on coral reefs. Regarding the Department of Agriculture's conservation programs, there is a lack of adequate funding to address all identified conservation needs. In addition, there are many potential barriers to the adoption of sound conservation practices in agricultural production,

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including lack of information, complexity of use, expense of implementing methods, availability and/or accessibility of support services, etc.

## **Nutrients**

Threat/issue: Nutrients can be transported to coastal and ocean waters through sewage treatment plant and vessel sewage discharges, agricultural and residential lawn runoff, and deposition from the air of pollutants such as automobile and electric utility emissions, some of which can travel hundreds or thousands of miles. Nutrients, in particular, may negatively impact coral reef ecosystems by inducing excessive algae growth, which, in turn, may decrease light penetration and result in lower levels of dissolved oxygen.

Summary of current activities/abilities to address threat: Section 312 of the Clean Water Act establishes performance standards for Marine Sanitation Devices that treat sewage discharges from vessels, and gives States the authority to establish No Discharge Zones - areas in which sewage discharges are prohibited. The Clean Vessel Act provides grant funds to States to construct sewage pumpout facilities in marinas. The Clean Water Act also requires permits for facilities, such as sewage treatment plants, that discharge to waterways. The Environmental Protection Agency and the U.S. Department of Agriculture recently released the Unified National Animal Feeding Operations Strategy which addresses, in part, the problem of nutrient loadings to waterways from livestock feeding operations. Both EPA and NOAA have activities to characterize air deposition to waterbodies. If air pollution from the U.S. is determined to be a significant cause of degradation of coral reefs, authorities under the Clean Air Act could be used to address the sources of pollution.

Summary of primary impediments to addressing threat: Resources to fully enforce vessel sewage discharge regulations are limited. Regarding air deposition, while there are large amounts of data showing that air deposition of pollutants affects terrestrial and estuarine ecosystems, there are far fewer data for open water where most reefs are located. Recent assessments by the World Meteorological Organization conclude that, depending on the pollutant in question, atmospheric deposition may be the dominant source of pollutant loading to the ocean. Before accurate assessments of atmospheric deposition impacts on coral reefs can be provided, however, more site-specific data are required to test and improve the models on which final conclusions will be based. The same barriers described relative to USDA's sediment management programs apply to the implementation of USDA's nutrient management programs.

## **Other Chemical and Biological Pollutants**

Threat/issue: Discharges of oil, garbage and ballast water from vessels, whether intentional or accidental, may negatively impact the health of coral reef ecosystems. In addition, trace metals and other pollutants can also be transported through the atmosphere and deposited to the areas surrounding reefs.

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Summary of current activities/abilities to address threat: Under the Uniform National Discharge Standards program, EPA and DOD are developing standards for operational discharges from armed forces vessels. The Act to Prevent Pollution from Ships implements the International Convention for the Prevention of Pollution from Ships (MARPOL) provisions to regulate the discharge of oil, noxious liquid substances and garbage from all ships in U.S. waters. Introduction of invasive species from ballast water is being addressed under the National Invasive Species Act, and through a recently issued Executive Order on Invasive Species. The Clean Air Act and its 1990 amendments could provide mechanisms to correct problems found to be associated with deposition from the air.

Summary of primary impediments to addressing threat: Resources to fully enforce various vessel discharge regulations are limited. In addition, there is not yet an environmentally safe and effective way to prevent the spreading of invasive species from ballast water. The role of atmospheric deposition remains unclear, with current estimates being based on model predictions only, rather than actual measurements.

IMPORTANCE OF USING A WATERSHED APPROACH TO PROTECTING CORAL REEF ECOSYSTEMS: The watershed approach involves people within a watershed in assessing natural resource conditions and needs, setting goals, identifying programs and other resources to meet those needs, developing proposals and recommendations for action, implementing solutions, and measuring their success, all at the local level. The watershed approach is a comprehensive, interrelated approach to watershed and natural resource management that examines and recognizes the needs of all resources--soil, water, air, plants, animals and people--in relation to local social, cultural, and economic factors. Using a watershed approach, local decision-makers can then make informed decisions on protecting the environment based on the objectives, priorities and needs of the people and natural resources in the area.

Managing water resources on a watershed basis makes good sense--environmentally, financially, and socially. Traditionally, water quality improvements have focused on specific sources of pollution, such as sewage discharges, or specific water resources, such as a river segment or wetland. While this approach may be successful in addressing specific problems, it often fails to address the more subtle and chronic problems that contribute to a watershed's decline. For example, pollution from a sewage treatment plant might be reduced significantly after a new technology is installed, yet the local river may still suffer if other factors in the watershed, such as habitat destruction or polluted runoff, go unaddressed. Watershed management can offer a stronger foundation for uncovering the many stressors that affect a watershed. The result is management better equipped to determine what actions are needed to protect or restore the resource.

The watershed approach can also have the added benefit of saving time and money. Whether the task is monitoring, modeling, issuing permits, or reporting, a watershed framework offers many opportunities to simplify and streamline the workload. For example, synchronizing monitoring schedules so that all monitoring within a given area (i.e., a watershed) occurs within

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the same time frame can eliminate duplicative trips and greatly reduce travel costs.

Efficiency is also increased once all stakeholders within a watershed begin to work together to improve conditions in that watershed. Watershed protection engages all partners within a watershed, including Federal, State, Tribal and local agencies. By coordinating their efforts, these agencies can complement and reinforce each others' activities, avoid duplication, and leverage resources to achieve greater results.

Watershed protection can also lead to greater awareness and support from the public. Once individuals become aware of, and interested in, their watershed, they often become more involved in decision-making as well as hands-on protection and restoration efforts. Through such involvement, the watershed approach builds a sense of community, helps reduce conflicts, increases commitment to the actions necessary to meet environmental goals, and, ultimately, improves the likelihood of success for environmental programs.

The members of this working group believe that the protection of coral reef ecosystems will best be accomplished through the use of the watershed approach. This means encouraging comprehensive, integrated activities at the local level that will preserve and restore coral resources. Many of the activities proposed in this report will help accomplish that. There are proposed activities that will take place at the national level as well, in order to create a stronger assessment and regulatory framework to protect coral reef ecosystems. While not immediately supportive of local watershed activities, these activities also will provide needed additional protection for coral reefs, and will help strengthen local efforts in the long run.

**ROLE OF FEDERAL, STATE AND LOCAL PARTNERSHIPS:** One of the challenges of this initiative is to tailor a national program that is useful and effective in places as different as Florida, the Gulf of Mexico, the Caribbean and the Pacific Islands. The success of efforts to reduce and mitigate coral reef ecosystem degradation due to water and air-borne sources of pollution will be enhanced by partnerships between the Federal government, State and local agencies, and the concerned public. The problems facing coral reefs, while similar in nature, differ with respect to their relative importance and management needs depending on location. The solutions to these problems are often site-specific, and can be most effective when they are community-based and incorporate cultural practices and values.

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A necessary component is the partnerships between Federal agencies and their State counterparts, e.g., EPA regions and State environmental agencies, NOAA's OCRM and State coastal zone management agencies, NRCS and State conservation agencies and local partners. The implementation of the working group's recommendations can be focused on locally important concerns through these formal partnerships and grant awards. The establishment of region-specific teams to address local water quality problems is a good approach. For example, this report recommends establishing regional sediment management teams in areas where reefs are stressed by sedimentation.

A first step is for Federal agencies and their State/local partners to collaborate on the development of locally relevant approaches for addressing water and air quality problems that affect coral reefs. Where new national funds are not provided to support coral reef protection, existing grants and environmental programs can target activities that benefit coral reef ecosystems as high priorities. Examples of how Federal funding and environmental programs can be targeted for projects that benefit coral reefs are listed below.

1. Provide incentives to empower locally-based efforts for monitoring, protecting and restoring coral reefs.
  - EPA regions could designate a portion of grant programs such as Environmental Education, Wetland Program Development and Five Star Restoration to benefit coral reefs.
  - Enforcement settlements could include funding for supplemental environmental projects related to coral reefs.
  - The Clean Water State Revolving Fund (SRF) could fund wastewater improvements, nonpoint source and storm water controls at marinas and other sites affecting coral reefs.
  
1. Review existing water quality programs to ensure that impacts to coral reefs are evaluated.
  - Review NPDES permits to ensure that permitted discharges protect coral reef ecosystems from pollutants of concern such as sediments, nutrients, and toxics.
  - Impaired waters that directly affect coral reefs can be given priority for development and implementation of TMDLs.
  - Emergency response plans can address protection and clean-up of critical coral reef ecosystems.
  
1. Evaluate how the development of new water quality management programs can benefit coral reef ecosystems.
  - Development and implementation of State CZARA 6217 programs can give priority to management measures or localities most likely to reduce impacts to coral reefs.
  
  - Implementation of Phase II storm water program can be coordinated with priority

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watershed restoration activities and target areas where reefs may be influenced by pollutants associated with storm water runoff.

1. Link watershed management efforts with protection of coral reef ecosystems.
  - Unified Watershed Assessments and Watershed Restoration Action Strategies under the Clean Water Action Plan can include assessment and protection of coral reefs.
  - Funding under CWA Section 319, NRCS' WRP, EQUIP, and WHIP can help protect water quality and restore coastal ecosystems in the priority watersheds.

#### LIST OF WORKING GROUP MEMBERS

J. Charles Fox, U.S. Environmental Protection Agency (Chair); Diane Gelburd and Howard Hankin, U.S. Department of Agriculture; Bill Brown, Department of the Interior; Roy Irwin and Richard Curry, National Park Service; Paula Allen, State of Florida; Joe Uravitch, Bruce Hicks, Mark Minton, Ben Haskell, and John Naughton, NOAA; Scott Newsham and Randy Clark, U.S. Coast Guard; Paul Souza, Jim Maragos, and Susan White, U.S. Fish & Wildlife Service; Nina Mendelson and Jessica Fehringer, Department of Justice; Dave Gulko, Athline Clark and June Harrigan, State of Hawaii; Billy Causey, Florida Keys NMS; Charles Chesnutt, Joe Wilson and John Studt, U.S. Army Corps of Engineers; Carmen Gonzalez, Puerto Rico ; Mike Gawel, Guam; Peter Barlas, Commonwealth of the Northern Marianas; Janice Hodge, U.S. Virgin Islands; Lelei Peau, American Samoa; Phil Taylor and Doug James, National Science Foundation; and EPA representatives from the Office of Water, the Office of Air and Radiation, the Office of Research and Development, the Office of Solid Waste and Emergency Response, the Office of General Council, and Regions 2, 4, 6, and 9.

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## **Water and Air Quality Working Group Draft Recommendations Assessment, Criteria and Standards**

### Background

It is widely accepted that the causes for most declines in coral reef ecosystems are the result of anthropogenic activities. Rapid increases in coastal population, declining water quality, overfishing, and poor land use practices are some of the contributing factors. Currently, adequate assessment programs which measure coral ecosystem health are not implemented in the majority of these habitats. Improved assessment methodologies, especially ones sensitive enough to measure at chronic and sub-chronic levels, would greatly enhance the ability to respond to impacts before it is too late.

EPA's regulatory mandates provide a structure which can target impacts to the coastal zone through assessments, monitoring and water quality standards. Assessment and monitoring are important tools for characterizing and tracking the ecological health of coral reef communities. Assessment and monitoring protocols will need to be habitat specific (i.e. hard coral, soft coral, back reef) and regionally specific (i.e. Caribbean, Pacific). Ideally, the metrics selected for these protocols will be scientifically valid and not require much expensive equipment or extensive taxonomic identification, and be relatively rapid to apply in the field.

State Water Quality Standards play a central role in a State's water quality management program. They are used by States to assess and manage their various water bodies (lakes, streams, rivers and coastal waters). Additionally, there is also an increased emphasis on utilizing watershed concepts to consider actual and potential threats to these water bodies. Historically, EPA has focused on the development of chemical specific numerical criteria. As the water quality protection program evolved, it was recognized that criteria for physical (turbidity, temperature, etc.) and biological (aquatic ecosystem) components were needed. These criteria are ecosystem based and provide a more sensitive approach to assess, monitor and manage water quality. Criteria for coral reef protection will need to be ecosystem-based.

EPA is developing nutrient criteria and criteria to protect wildlife, assess sediments, and consider physical and habitat components. These criteria, in combination with ecosystem protection approaches, can form the basis of enforceable standards upon which the public policy and legal framework of regulatory controls can be developed. This framework can provide controls over the human induced actions which are adversely impacting coastal habitats. Some of the activities proposed in this section are intended to establish the broad regulatory structure to mitigate harmful activities affecting coral reef ecosystems.

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**Activity #1:** Develop guidance on biological assessment methods and biological indicators for coral reef protection based on the document: “Development of Biological Criteria for Coral Reef Ecosystem Assessment.” Status: underway and proposed.

Description:

- a. EPA is developing technical guidance documents for development of biological assessment methods. These will lead to narrative criteria for coral reefs. Status: underway.

Proposed time line: Begun in 1998 – Publish in 2003.

Budget estimate: total of \$200 K, 1 FTE for 3 years

Participants/Possible Partners: EPA lead with NOAA, DOI and States.

Potential barriers to successful implementation: Need to take geographical variations into consideration when developing guidance and indicators; e.g. Atlantic v. Pacific, tropical v. sub-tropical. Need relevant data and information.

- b. EPA will generate an approach for developing and establishing biocriteria for coral reefs in State water quality standards, and for integrating biological assessment and criteria into the TMDL and NPDES permit programs. Status: proposed.

Proposed time line: 2001 - 2005.

Budget estimate: \$700 K, average 1.2 FTE per year for 5 years

Participants/Possible Partners: EPA lead with NOAA, DOI and States.

Potential barriers to successful implementation: same as in “a” above.

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**Activity #2:** Develop general narrative and/or numeric physical guidelines for coral reef health, as opposed to more complex chemical and biological factors, that a State or the Federal government could use in the near-term to better manage activities with the potential to damage coral reefs. Status: proposed.

Description: General narrative and/or physical criteria subset of biological criteria - develop model criteria focused on general condition or physical parameters, potentially addressing issues such as (1) a narrative standard regarding general protection of reef resources, based on narrative standards already existing in States' water quality programs; and (2) guidelines for light penetration, sedimentation, salinity, temperature, dissolved oxygen, et.al.

Proposed time line: Start: 2000 – Publish 2002.

Budget estimate: (included in budget for Activity 1a: \$50 K, 0.5 FTE for 1 year)

Participants/Possible Partners: EPA lead with NOAA, DOI and States. Important to work with the Florida DEP, and others, early.

Potential barriers to successful implementation: Need to take geographical variations into consideration when developing guidance and indicators; e.g. Atlantic v. Pacific, tropical v. sub-tropical, etc.

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**Activity #3:** Develop nutrient guidance documents explaining methodologies that can be used to calculate nutrient criteria for coral reef protection. Status: underway and proposed.

Description:

- a. Before the end of June 2000, EPA intends to publish nutrient guidance documents explaining methodologies that can be used to develop narrative nutrient criteria for coastal waters which could be beneficial to coral reefs in the Atlantic region. Delineations of nutrient ecoregions for Hawaii, Puerto Rico, Gulf of Mexico and the Pacific Island Territories is scheduled to begin in the first quarter of 2001. Delineation will be followed by development of nutrient guidance documents explaining methodologies that can be used to develop nutrient criteria for protection of coral reefs in these ecoregions. Status: underway and proposed.

Proposed time line: Summer/Fall 2000 - 2002.

Budget estimate: Total of \$200 K, 1 FTE for 2 years

Participants/Possible Partners: EPA lead with NOAA, DOI and States. Important to work with the Hawaii DLNR, and others, early.

Potential barriers to successful implementation: Need to take geographical variations into consideration when developing guidance; e.g. Atlantic v. Pacific, tropical v. sub-tropical.

- b. EPA will work with States and Territories to assess the availability of data to develop numeric nutrient criteria to protect coral reef ecosystems. Present indications are that serious data shortfalls exist. Where data are currently available, EPA will develop a consistent approach for developing and establishing numeric criteria in State water quality standards and integration into Total Maximum Daily Load and National Pollutant Discharge Elimination System permits. This activity must be closely coordinated with Activity 4 which follows. Status: proposed.

Proposed time line: Implementation from 2001 - 2005.

Budget estimate: \$600 K, average 1.2 FTE per year over 5 years.

Participants/Possible Partners: EPA lead with NOAA, DOI and States.

Potential barriers to successful implementation: same as in “a” above.

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**Activity #4:** Research and develop methodologies and default chemical and physical criteria for marine regions. Status: proposed.

Description: Based on an assessment of available science, conduct additional research as needed to produce guidance documents explaining methodologies that can be used to calculate chemical and physical criteria for coral reef protection. Publish default EPA numeric nutrient and biological criteria for marine eco-regions. Assess need for revised or additional numerical chemical criteria.

Proposed time line: Start: 2001 -- Publish: 2004.

Budget estimate: Total of \$5 M, 1.0 FTE for 5 years.

Participants/Possible Partners: EPA lead (ORD, OW co-leads) with NOAA, DOI and States. Important to work with others early.

Potential barriers to successful implementation: Define research needs to enable development of methodologies for chemical and physical criteria. Need to take geographical variations into consideration when developing guidance and indicators; e.g. Atlantic v. Pacific, tropical v. sub-tropical, etc.

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**Activity #5:** Enhance the Clean Water Act Section 403(c) program for Federal waters, including the Exclusive Economic Zone (EEZ) by: identifying relevant outfalls; assessing impacts of those outfalls on coral reef ecosystems; and revising permits as necessary. Coral reefs are already identified as Special Aquatic Sites under the Section 403(c) regulations. Permit revisions might reflect more specific concerns for Special Aquatic Sites and new water quality-based standards and indicators. Status: proposed.

Description: A NPDES permit cannot be issued for discharges to waters beyond the 3 mile limit unless the permittee complies with special criteria established under Section 403(c) of the Clean Water Act, and it is determined that the discharge will not result in “unreasonable degradation of the marine environment”. Under this activity, EPA will increase its support for the collection and evaluation of monitoring data, the identification of specific areas that are Special Aquatic Sites, and will provide training to permit writers.

Proposed time line: initiate in 2000.

Budget estimate: \$3 million annually for monitoring ocean outfalls in areas that impact coral reef ecosystems. Additional resources may be required for identifying Special Aquatic Sites.

Participants/Possible Partners: EPA, NOAA, States and territories.

Potential barriers to successful implementation: Lack of funding.

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## Timeline and Cost Summary Information for Assessment, Criteria and Standards Section

Activity/Status	Proposed timeline	Cost estimate
<p>#1a: Guidance for development of biological assessment methods. <u>Status</u>: underway.</p> <p>#1b: Generate approach for developing coral reef biological criteria. <u>Status</u>: proposed.</p>	<p>1a: begun in 1998; publish 2003.</p> <p>1b: Implementation 2001 - 2005.</p>	<p>1a: \$200K; 1 FTE for 3 years</p> <p>1b: \$700K; average 1.2 FTE per year for 5 years.</p>
<p>#2: Develop general narrative and/or numeric physical guidelines for coral reef health. <u>Status</u>: proposed.</p>	<p>Start 2001; publish 2002.</p>	<p>Included in budget for Activity 1a (\$50K, 0.5 FTE for 1 year)</p>
<p>#3a: Publish guidance for development of nutrient criteria for coastal waters. <u>Status</u>: underway and proposed.</p> <p>#3b: Assess availability of data to develop numeric nutrient criteria. Where data are available, create consistent approach for development and establishment of nutrient criteria in State water quality standards. <u>Status</u>: proposed.</p>	<p>3a: June 2000 - 2002.</p> <p>3b: Implementation from 2001 - 2005.</p>	<p>3a: \$200K, 1 FTE for 2 years</p> <p>3b: \$600 K, average 1.2 FTE per year over 5 years.</p>
<p>#4: Research/development of methodologies and default chemical and physical criteria for marine regions. <u>Status</u>: proposed.</p>	<p>Start 2001; publish 2004.</p>	<p>\$5M; 1.0 FTE for 5 years.</p>
<p>#5: Enhance 403(c) program for Federal waters and the Exclusive Economic Zone. <u>Status</u>: proposed.</p>	<p>Initiate in 2000.</p>	<p>\$3M annually for monitoring ocean outfalls in areas that impact coral reef ecosystems.</p>

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## **Water and Air Quality Working Group Draft Recommendations Physical Impacts to Coral Reefs**

### Background

Direct physical destruction or alteration of coral reefs can result from a number of human-induced activities, such as dredging, coastal development, and shoreline stabilization. These activities need to be reduced, if not eliminated, if our coral reefs are to survive. There are limited instances, however, in which human-induced reef destruction is unavoidable or accidental, and in those cases, reef restoration will be needed if we are to have healthy reef ecosystems.

**Activity #1:** As part of the U.S. Army Corps of Engineers (Corps) proposed new and modified Nationwide Permits (NWP), EPA and the Corps will propose prohibiting the use of the new NWPs and other existing NWPs in coral reefs, by designating them “critical resource waters”.  
**Status:** underway.

**Description:** The Clean Water Act Section 404 Nationwide permit program provides general authorization for minimal impact activities in wetlands and other waters of the U.S. In July 1999, the Corps published in the Federal Register its proposal to replace Nationwide Permit 26 with five new permits and modifications to six existing permits. This proposal includes a new general condition that prohibits activities in designated critical resource waters. Coral reefs are explicitly proposed as critical resource waters. The use of existing NWPs in critical resource waters require notification to the district engineer through the pre-construction notification process.

**Proposed timeline:** The coral reef critical resource waters provision was proposed in July 1999. The proposed new and modified Nationwide permits are scheduled to be effective in January 2000.

**Budget estimate:** Portion of an FTE.

**Participants/Possible Partners:** U.S EPA and the U.S. Army Corps of Engineers.

**Potential barriers to successful implementation:** None.

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**Activity #2:** EPA will work with the U.S. Army Corps (Corps) to develop regulatory guidance to reinforce Clean Water Act, Marine Protection Research and Sanctuaries Act, and Corps planning provisions on protection of coral reefs. Status: completed.

Description: The Corps and EPA regulate the discharge of dredged or fill material into waters of the U.S., including coral reefs and wetlands. Coral reefs, wetlands, and other special aquatic sites are highlighted in the Clean Water Act Section 404(b)(1) Guidelines, which contain a presumption that less damaging practicable alternatives exist to impacting these sites. The guidance will not only highlight coral reefs and facilitate implementation of this provision under the Clean Water Act, but also will be expanded to emphasize similar protections under Corps planning projects and proposed activities under the Marine Protection Research and Sanctuaries Act.

Proposed timeline: Draft guidance developed in August, 1999; final guidance by October 1999.

Budget estimate: Portion of an FTE.

Participants/Possible Partners: EPA, Corps of Engineers.

Potential barriers to successful implementation: Achieving interagency agreement.

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**Activity #3**: Assess the success of recent coral reef mitigation projects in Puerto Rico, the U.S. Virgin Islands, Hawaii, and the Pacific Island Territories, and share lessons learned. Status: proposed.

Description: There are several projects underway in Puerto Rico and the U.S. Virgin Islands, among other locations, to mitigate the impacts on reef ecosystems from Section 404 authorized activities. This activity would assess the success of mitigation activities and transfer the lessons learned from those efforts to other locations. While the first priority in issuing a Section 404 permit is to avoid impacts to coral reef ecosystems, in those cases where impacts are deemed unavoidable, it is important to be able to undertake effective mitigation efforts. This activity will collect data to help increase the likelihood of success in mitigation projects, and could provide information to help guide future coral reef permit decisions as well as potential coral reef restoration.

Proposed timeline: TBD.

Budget estimate: Portion of an FTE; \$130,000 for contract support to complete the analysis/study.

Participants/Possible Partners: U.S. EPA, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Marine Fisheries Service, States and territories.

Potential barriers to successful implementation: Financial resources to undertake the study.

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## Timeline and Cost Summary Information for Physical Impacts Section

Activity/Status	Proposed Timeline	Cost Estimate
#1: EPA and the Corps will propose prohibiting the use of the new NWP's and other existing NWP's in coral reefs by designating them Acritical resource waters. @ <u>Status</u> : underway.	New permits in place by January 2000.	Portion of FTE
#2: Develop regulatory guidance to reinforce Clean Water Act, Marine Protection Research and Sanctuaries Act, and Corps planning provisions on protection of coral reefs. <u>Status</u> : completed.	Final guidance by October, 1999.	Portion of FTE
#3: Assess success of recent coral reef mitigation projects and share lessons learned. <u>Status</u> : proposed.	TBD	Portion of FTE/\$130,000 contract support

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## **Water and Air Quality Working Group Draft Recommendations**

### **Pollution Problems - Sediments**

Background: Excess sediment smothers coral tissue, impeding diffusive gas exchange through the tissues and reducing the amount of light available for photosynthesis. As the sediment load increases, the polyps become unable to slough it off fast enough and tissue death occurs. Most corals that die from excessive sedimentation become reef rock, and in a few years many of these colonies are reduced to rubble through bioerosion caused by sponges and other boring organisms (Dustan, 1999). Sedimentation can occur as a result of activities such as agriculture, clear cutting forestry practices, and development and roadway construction.

#### Proposed activities:

Activity #1: Through the establishment of geographically specific teams (e.g. Atlantic, Caribbean, Pacific), pursue coordinated sediment management in areas with stressed reef resources. Examples of relevant tools that could be brought to bear include EPA's wetlands restoration and conservation efforts (through its Wetland Program Development and Five Star Restoration grant programs); Department of the Interior's coastal programs; USDA's Wetlands Reserve Program; DOT road construction; COE; 319/6217, etc. Status: proposed.

Description: A number of government and non-government programs address pollution prevention and habitat restoration through a watershed approach in partnership with communities. In areas with coral reefs, Federal agencies could team with State, territorial, and local management agencies and community conservation groups to identify priority restoration and pollution prevention projects. Each restoration and pollution prevention program can use their unique characteristics to implement the priority projects identified by the coral reef regional teams.

For example, USDA's Wetlands Reserve Program can work with private landowners in coral reef watersheds and reduce non-point source runoff from agricultural land. Another example is the FWS coastal program, which partners with local governments and local conservation organizations to complete priority habitat restoration projects in coastal watersheds. For more costly, critical projects, the regional teams can pool their resources to implement successful initiatives. The regional teams could help communities draft proposals for EPA, NOAA, and FWS grant programs, and guide Federal resources to areas in greatest need.

Two regional teams could be formed. One could be situated in south Florida or the Caribbean, and focus on the reefs in the Atlantic and Caribbean. The other could be based in Hawaii or one of the Pacific Island Territories, and consider the coral reefs found in the Pacific. Each team could meet biennially to set priorities, target resources in particular areas, and evaluate projects. Focusing on prioritizing and implementing local projects, the regional teams could pool and help direct Federal resources to coral reefs in particular need.

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Proposed Timeline: In January, 2000, regional teams convene, share information, and begin developing a schedule to identify priority projects.

Budget estimate: One person from each relevant Federal agency in the Task Force could dedicate half their time to regional team priorities. In addition, an annual appropriation of \$250,000 could complement existing programs and help facilitate regional team partnerships.

Participants/Possible Partners: All relevant members of the Task Force and non-Federal stakeholders could be participants. Mirroring the Coral Reef Task Force, the regional teams could be chaired by NOAA and DOI initially. In subsequent years, the teams could have a rotating chair policy, allowing each agency to assume the coordinator position.

Potential Barriers to Successful Implementation: Regional teams will require commitments from Federal agencies and non-Federal partners. Without adequate resources and a commitment to identify priorities and implement projects, the regional teams will not succeed.

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**Activity #2:** Continue to assist private landowners and landusers with conservation, technical and financial assistance to implement natural resources conservation systems in a voluntary, incentives based, watershed approach. Status: underway and ongoing.

Description: Identify agricultural watersheds having direct and indirect impacts to coral reef ecosystems and target these areas as “high priority” for receiving financial and technical assistance.

Agricultural lands have been identified as one of the sources of sediments impacting freshwater aquatic ecosystems. Because of the interconnectivity of aquatic systems, it is presumed that sedimentation from agricultural lands potentially has impacts on coral reef ecosystems. USDA conservation, technical and financial assistance programs are provided to landowners on a voluntary basis to reduce erosion to adjacent and down stream water bodies. Programs such as the Environmental Quality Incentives Program offers financial assistance to landowners to implement conservation measures based on identified priority watersheds. Other financial programs such as, the Wetland Reserve Program and the Conservation Reserve Program provide incentives that allow farmers to implement additional conservation measures that reduce erosion and sedimentation.

Proposed Timeline: On-going

Budget Estimate: To be determined.

Participants/Possible Partners: USDA, Local Soil and Water Conservation Districts, Non-Government Organizations and Federal partners.

Potential barriers to successful implementation: lack of funding to address all of the identified conservation needs.

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**Activity #3:** Complete Phase II of EPA's regulation for storm water management. Status: underway.

Description: This proposed rule will require owners and operators of small municipal separate storm sewer systems in urbanized areas and owners and operators of construction activities that disturb from 1 to 5 acres of land to apply for a permit under EPA's National Pollutant Discharge Elimination System (NPDES) program, and to implement storm water management controls. Medium and large municipal systems, construction projects larger than 5 acres, and 10 categories of industrial sources, were covered under Phase I of the Storm Water Program.

Proposed timeline: Proposed rule published in Federal Register on January 9, 1998; publication of final rule in Federal Register expected in November, 1999.

Budget estimate: N/A - project already underway at EPA.

Participants/Possible Partners: EPA; Federal Advisory Committee was convened, as was an advisory process under the Small Business Regulatory Enforcement Fairness Act. States and municipalities were participants in this process as well.

Potential barriers to successful implementation: Inadequate resources at the State and municipal level for implementation.

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## Timeline and Cost Summary Information for Sediments Section

Activity/Status	Proposed Timeline	Cost Estimate
#1: Through establishment of geographic teams, pursue coordinated sediment management in areas with stressed reef resources. <u>Status</u> : proposed.	Convene regional teams in January 2000.	One person from each relevant Federal Task Force agency - half time; annual appropriation of \$250,000 to complement existing programs and help facilitate regional team partnerships.
#2: Continue to assist private landowners and landusers with conservation technical and financial assistance. <u>Status</u> : underway and ongoing.	Ongoing.	To be determined.
#3: Complete Phase II of EPA's regulation for storm water management. <u>Status</u> : underway.	Final regulation in October 1999.	N/A - project already underway at EPA.

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## **Water and Air Quality Working Group Draft Recommendations Pollution Problems - Nutrients**

Background: Nutrients can be transported to coastal and ocean waters through sewage treatment plant and vessel sewage discharges, agricultural and residential lawn runoff and air deposition from automobile and electric utility emissions. Nutrients may negatively impact coral reef ecosystems by inducing excessive algae growth, which, in turn, may decrease light penetration and result in lower levels of dissolved oxygen. Algal growth increases even more when the numbers of herbivores are reduced or altered as with the massive die-off of the sea urchin (*Diadema antillarum*) in the Caribbean and western Atlantic (Dustan, 1999). Algal growth due to these causes are a major problem in the Caribbean and western Atlantic waters. The following activities will further address and assess the delivery of nutrients from various sources and increase the opportunities for States, local watershed entities, and local citizens to address nutrient runoff to aquatic ecosystems.

### Proposed activities:

**Activity #1:** Continue to assist private landowners and landusers with conservation, technical and financial assistance to implement natural resources conservation systems in a voluntary, incentives based, watershed approach. Status: underway.

Description: Identify agricultural areas having direct and indirect impacts to coral reef ecosystems and target these areas as “high priority” for receiving financial and technical assistance.

Agricultural lands have been identified as one of the sources of nutrients impacting freshwater aquatic ecosystems. Because of the interconnectivity of aquatic systems, it is presumed that agriculturally based nutrients also have impacts on coral reef ecosystems. USDA conservation technical and financial assistance programs are provided to landowners on a voluntary basis to reduce non-point source pollution runoff which impacts adjacent and down stream water bodies. Technical assistance provided to farmers to reduce nutrient runoff is varied, but includes providing the latest technical information on animal waste management systems and assisting with the design and layout of vegetative and structural practices to insure that conservation systems are installed and functioning properly.

The Environmental Quality Incentives Program offers financial assistance to landowners to implement conservation measures based on identified priority watersheds. Other financial programs such as the Wetland Reserve Program and the Conservation Reserve Program provide incentives that allow farmers to implement additional conservation measures that reduce nutrient runoff.

Proposed Timeline: On-going

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Budget Estimate: To be determined.

Participants/Possible Partners: USDA, Local Soil and Water Conservation Districts, Non-Government Organizations and Federal partners.

Potential barriers to successful implementation: lack of funding to address all of the identified conservation needs.

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**Activity #2:** Encourage further establishment of boat pump-out facilities and No Discharge Zones by: 1) encouraging States to apply for Clean Vessel Act (CVA) grants to construct sewage pump-out stations in areas close to coral reefs; 2) educating States on the availability of No Discharge Zones under Clean Water Act Section 312; and 3) identifying/developing State and local model ordinances to establish NDZs. Status: underway and proposed.

Description: Sewage discharges can contribute to nutrient overenrichment, which in turn can potentially affect coral reef ecosystems in a number of ways; e.g. eutrophication, algal blooms, decreased light penetration, etc. The provision of pump-out facilities, as provided under the Clean Vessel Act, and the establishment of No Discharge Zones, as provided under Section 312 of the Clean Water Act, in areas containing coral reefs can help reduce sewage discharges to reef ecosystems. Targeted information describing these programs needs to be made available to States and territories, boaters and marina operators in areas that contain coral reef resources.

Proposed timeline: Education/outreach materials for No Discharge Zones can be completed by January 2000: fact sheet (draft late 1999; final early 2000), web page (Fall 1999), brochure (draft late 1999). Model State and/or local ordinances for establishing No Discharge Zones is a longer term action with no set time for completion.

Budget estimate: Approximately 25K to develop, print and distribute fact sheets on No Discharge Zones. No cost information is currently available for developing model ordinances. Note - under the Clean Vessel Act grant program, a total of \$9,400,000 was available for States to construct pump-out and dump stations for boaters in FY 1999.

Participants/Possible Partners: EPA, U.S. Fish & Wildlife Service, States, territories.

Potential barriers to successful implementation: States interested in establishing No Discharge Zones must have adequate pumpout facilities in place first in order to handle the sewage that would no longer be discharged directly to waterways.

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**Activity #3:** Conduct modeling to identify areas where air deposition of nutrients and other pollutants may impact reef resources in the Florida Keys. Status: underway.

Description: Use the REMSAD model to determine deposition rates of nitrogen and other pollutants up to 200 km offshore of the continental U.S. Likely emission scenarios would reflect current status (e.g., 1996), and status after multiple control requirements take effect in the U.S. (e.g., 2010).

Proposed timeline: Draft model runs will be completed by the end of December 1999.

Budget estimate: N/A - project already underway at EPA.

Participants/Possible Partners: EPA (OW, OAR, Regions 4 and 6), NOAA, State of Florida.

Potential barriers to successful implementation: Emissions inventory information from EPA's Office of Air and Radiation is incomplete.

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**Activity #4:** Assess feasibility and cost of conducting modeling and/or monitoring to identify areas where air deposition of nutrients and other pollutants may impact island reef resources in Puerto Rico, the Caribbean, Hawaii and the Pacific Island Territories. If determined to be feasible and needed, initiate monitoring of atmospheric deposition and water quality in these areas to quantify actual deposition and identify its ecosystem-level consequences. Status: proposed.

Description: At selected sites where water quality programs are in place under the National Undersea Research Program (NURP), install atmospheric deposition monitoring instrumentation based on the measurement principles of the NOAA Atmospheric Integrated Research Monitoring Network (AIRMoN). At first, three sites will be targeted: one in the Caribbean, and two in the Pacific. The work will be directly coupled with a sub-program of model refinement, so as to produce a next-generation capability to link reef-level effects to distant upwind emission sources. This work is a collaborative program of NURP and the Air Resources Laboratory, both of NOAA's Office of Oceanic and Atmospheric Research.

Proposed timeline: Initial measurements could be made in FY 2000, funding permitting.

Budget estimate: Approximately \$1 million.

Participants/Possible Partners: NOAA (NURP, ARL), relevant States and territories.

Potential barriers to successful implementation: Lack of funding.

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**Activity #5:** Develop voluntary national standards for onsite wastewater management systems that address siting, performance, design and maintenance needs and requirements. **Status:** underway.

**Description:** EPA's Response to Congress on Use of Decentralized Wastewater Treatment (EPA 832R97001B, April, 1997) indicates that decentralized treatment systems can be a viable, long term and cost-effective alternative to centralized treatment, particularly in rural and small communities. For this to be realized, however, these systems must be properly managed and certain barriers must be addressed. The barriers include, but are not limited to, public perception that these systems do not meet public health and water quality goals; legislative and regulatory constraints; and lack of adequate management and maintenance programs.

The Clean Water Action Plan, published in February, 1998, by EPA, USDA and a number of other agencies, includes several specific initiatives targeted at decentralized and onsite wastewater systems to reduce their potential to cause pollution of the nation's waters. One of these initiatives is the development of voluntary national standards for onsite wastewater management systems that address siting, performance, design and maintenance needs and requirements. The standards will provide information and tools for local and State-level managers and regulators, helping them to develop and implement programs to address long-term maintenance and management of onsite, cluster and small wastewater systems. Topics to be addressed in the standards include: assessment of water quality needs and choosing corresponding technologies to achieve required levels of treatment; functions which need to be performed by a management program to achieve adequate long-term performance; examples and options for management programs; legislative options for supporting creation of management programs; funding sources; and levels of management corresponding to various levels of treatment and environmental sensitivity.

**Proposed Timeline:** In September 1999, a concept paper was developed and reviewed by a group stakeholders, and final draft standards are scheduled for completion and will be available in the Federal Register by December 31, 1999.

**Budget Estimate:** N/A - project already underway at EPA.

**Participants/Possible Partners:** A stakeholder meeting was held in May, 1999, and another will be held in the winter of 2000 to receive input to this effort. Comments will also be solicited through Federal Register publication. Over 200 stakeholders and representative organizations are involved.

**Potential Barriers to Successful Implementation:** Lack of staff at EPA for implementation.

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**Activity #6:** Update EPA's 1980 design manual for onsite sewage disposal systems with new information on available technologies, costs, management options and site evaluation methods.  
**Status:** underway.

**Description:** The manual will provide information on management requirements (planning, site evaluation, design, construction, operation and maintenance requirements, and retrofitting), fate of pollutants, residential wastewater characteristics, treatment technologies available and in development (characteristics, modifications, energy requirements, performance, residuals), strategies for design, and estimated cost ranges for onsite sewage disposal systems.

**Timeline:** Completed and published in spring-early summer, 2000.

**Budget estimate:** N/A - project already underway at EPA.

**Participants/Possible Partners:** In addition to EPA's Office of Research and Development and EPA's Office of Water, all EPA regional offices serve on advisory boards, along with all impacted Federal agencies, and several State, local and regional regulatory agencies.

**Potential barriers to successful implementation:** Major barriers identified in EPA 832-R-97-001b Response to Congress On Use of Decentralized Wastewater Treatment Systems, i.e., public misperception, legislative/regulatory constraints, lack of centralized management programs, liability and engineering fee structures, and a lack of financing programs.

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## Timeline and Cost Summary Information for Nutrients Section

Activity/Status	Proposed Timeline	Cost Estimate
#1: Continue to assist private landowners and landusers with conservation technical and financial assistance. <u>Status</u> : underway and ongoing.	Ongoing.	To be determined.
#2: Encourage further establishment of boat pump-out facilities and No Discharge Zones. <u>Status</u> : underway and proposed.	Education/outreach materials can be completed in FY99. Model ordinance development is a longer term project.	25K for CVA/NDZ fact sheets; no cost information available for developing model ordinances.
#3: Conduct modeling re: air deposition of nutrients and other pollutants to reef resources in the Florida Keys. <u>Status</u> : underway.	Draft model runs in September 1999.	N/A - project already underway at EPA.
#4: Assess feasibility and cost of conducting monitoring re: air deposition and water quality in selected reef environments. <u>Status</u> : proposed.	Initial measurements in FY2000.	\$1 million
#5: Develop voluntary national standards for onsite wastewater management systems. <u>Status</u> : underway.	Initial draft standards due September 30, 1999; final draft standards by December 31, 1999.	N/A - project already underway at EPA.
#6: Update EPA's 1980 design manual for onsite sewage disposal systems. <u>Status</u> : underway.	Revised manual completed and published by late spring/early summer, 2000.	N/A - project already underway at EPA.

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## **Water and Air Quality Working Group Draft Recommendations Pollution Problems - Other Chemical and Biological Pollutants**

Background: Discharges of oil and other noxious liquids, and the introduction of aquatic invasive organisms through ballast water exchange, whether intentional or accidental, may negatively impact the health of coral reef ecosystems. Coral reefs around the world are subject to these pollutants as a result of nearby discharges and transport by local and global currents. The following activities will address current regulations and pursue other alternatives to reduce or eliminate the release of these pollutants from their respective sources.

Proposed activities:

**Activity #1:** Explore the establishment of voluntary partnerships with the shipping industry, in particular the cruise ship industry, to better manage various types of vessel discharges. Status: proposed.

Description: There are many potential opportunities to work with shipping industry partners; e.g. the Chamber of Shipping of America and the International Council of Cruise Lines, to reduce the impacts of shipping on the marine environment, including coral reef ecosystems. For example, EPA is putting in place a grant with the Chamber of Shipping of America to produce an environmental handbook for ships. Targeting ship owners and operators, management companies, cargo interests, agents, port officials, environmental groups and others, the handbook is likely to address issues such as compliance mechanisms relating to existing laws and regulations, good management practices, maritime air pollution concerns, and ballast water management. Another example of the type of activity that might occur through a partnership approach is to equip ships with monitoring devices to record the locations of sewage and gray water discharges during cruises to determine whether or not coral reef resources might be impacted.

Proposed timeline: Not identified.

Budget estimate: Dependent on partnership projects identified.

Participants/Possible Partners: EPA, U.S. Coast Guard, and representatives of the maritime industry.

Potential barriers to successful implementation: Not identified.

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**Activity #2:** Explore opportunities to strengthen coral reef protection under the Act to Prevent Pollution from Ships (APPS), which is the domestic legislation that implements the International Convention for the Prevention of Pollution from Ships (MARPOL). MARPOL is the primary international agreement aimed at preventing or reducing intentional and accidental discharges from ships into the marine environment. Status: proposed.

Description: MARPOL Annex I (oil discharges), Annex II (noxious liquid substances in bulk), and Annex V (garbage) are implemented in the U.S. by APPS. Annex IV addresses sewage and gray water discharges, and Annex VI addresses emissions from ships. The U.S. is not a signatory to Annex IV because its language is not in line with current domestic law and standards, and APPS is currently being amended as a step toward ratification and implementation of Annex VI. This activity would explore the feasibility of providing additional protection (either direct or indirect) to coral reef resources under these annexes, in particular by proposing language making Annex IV acceptable to the U.S. and by implementing Annex VI.

Proposed timeline: Unknown.

Budget estimate: not available.

Participants/Possible Partners: EPA, Coast Guard, DOJ, U.S. Department of State.

Potential barriers to successful implementation: Enforcement of APPS is difficult due to the ever increasing number of vessels on U.S. waters and funding constraints for both Federal and State compliance efforts. In addition, discharges incidental to the normal operation of ships that do not consist of oil, noxious liquid substances or garbage are not covered by MARPOL and APPS. An additional barrier to implementing Annex IV, in particular, is the need to get international agreement on language that makes the provision acceptable to the U.S. Until that occurs, the U.S. will not be a signatory to Annex IV.

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**Activity #3:** Explore the extent to which invasive species are impacting coral reef ecosystems.  
**Status:** proposed.

**Description:** Ballast water discharges from ships can introduce non-native, invasive species into U.S. waters. Drifting marine debris can also serve as a mechanism for introducing invasive species. Some of these species are extremely harmful, outcompeting native species, upsetting the food web, and causing millions of dollars in economic impacts to a wide variety of industries. This proposed activity will help determine the extent to which invasive species, introduced through ballast water discharges and other means, are having harmful effects on coral reefs and their associated ecosystems, including seagrass communities, coastal wetlands, and mangroves.

**Proposed timeline:** Unknown.

**Budget estimate:** Unknown.

**Participants/Possible Partners:** EPA, Coast Guard, NOAA, DOI, the maritime industry.

**Potential barriers to successful implementation:** The current state of understanding of this problem, as it relates specifically to coral reef ecosystems and the marine environment, is unknown.

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**Activity #4:** Support efforts to develop methods for addressing invasive species in ballast water.  
**Status:** underway and proposed.

**Description:** Effective, efficient, environmentally sound methods for addressing invasive species in ballast water do not exist at a scale that is viable for widespread use. This activity would support efforts to develop both vessel-based and shoreside treatment technologies to treat ballast water for invasive species. An example of the type of activity that might be supported under this recommendation is a grant EPA currently is putting in place with the California Association of Port Authorities to assess the technical, operational and economic feasibility of on-shore treatment of ballast water for public port facilities in California. It is intended that the results of this assessment will be applicable to facilities in other jurisdictions.

**Proposed timeline:** Unknown.

**Budget estimate:** Unknown.

**Participants/Possible Partners:** EPA, Coast Guard, NOAA, DOI, the maritime industry.

**Potential barriers to successful implementation:** Adequate funding to support technology development and application.

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**Timeline and Cost Summary Information for Other Chemical and Biological Pollutants Section**

Activity/Status	Proposed Timeline	Cost Estimate
#1: Establish a voluntary partnership with the cruise ship industry to help further protection of coral reef ecosystems. <u>Status</u> : proposed.	Not known at this time.	Not known at this time.
#2: Explore opportunities to strengthen coral reef protection under the Act to Prevent Pollution from Ships. <u>Status</u> : proposed.	Not known at this time.	N/A.
#3: Explore the extent to which invasive species are impacting coral reef ecosystems. <u>Status</u> : proposed.	Not known at this time.	Not known at this time.
#4: Support efforts to develop methods for addressing invasive species in ballast water. <u>Status</u> : underway and proposed.	Not known at this time.	Not known at this time.

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## **Water and Air Quality Working Group Draft Recommendations Education and Outreach Activities**

### Background

In order to adequately protect coral reefs, people must understand the importance of these ecosystems and feel strongly about the value of coral reef protection. In addition, people must be informed about how their actions may affect coral reefs and what they can do in both personal and professional arenas to help protect coral reefs. Many people do not know about the loss of these systems, or do not understand why the destruction of coral reefs is an issue that should concern them. If people are well informed about why coral reefs are important to their lives, how humans affect coral reef health, and what individual actions they can take to protect coral reefs, it will be much easier to protect coral reefs.

**Activity #1:** Launch RECON (Reef Ecosystem Condition) volunteer diver reef monitoring program in the Wider Caribbean, with future application in the Pacific. Status: underway and ongoing.

Description: The program will provide a large pool of certified volunteer divers who will be trained to conduct monitoring activities on coral reefs.

Proposed timeline: The program will be implemented in phases over a 5 five year time period, beginning in 1998. Phase II, which involves activating an interactive website and conducting training for pilot sites, will be in place by fall 1999.

Budget estimate: \$75K-\$100K annually.

Participants/Possible Partners: EPA, Center for Marine Conservation, and the Professional Association of Diving Instructors.

Potential barriers to successful implementation: Lack of consistent funding over the life of the program.

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**Activity #2:** Implement the National Marine Debris Monitoring Program in Hawaii. Status: underway and ongoing.

Description: The National Marine Debris Monitoring Program is a statistically designed protocol that engages trained volunteer monitors to record information on the sources and amounts of marine debris found on U.S. shores. The data will be available to Federal, State, and local level decision makers, as well as volunteers. Implementation of this program has been phased, with monitoring already occurring on the East, Gulf and West coasts of the continental U.S.

Proposed timeline: The first set of 10 monitoring sites in Hawaii will be established by December 1999; second and final set of 10 sites scheduled for summer 2000.

Budget estimate: approximately \$150K per year.

Participants/Possible Partners: EPA, Center for Marine Conservation.

Potential barriers to successful implementation: Lack of consistent funding over the life of the program. There may also be some difficulty, in some areas, in locating enough monitoring sites that meet the protocol's criteria.

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**Activity #3:** Assist citizen or community groups involved in various community-based efforts to protect coral reefs, including education, assessment and monitoring, and clean up activities.  
**Status:** proposed.

**Description:** Community-based efforts in the areas of education, outreach, monitoring, protection and restoration are vital to re-establishing or maintaining the health of coral reef ecosystems. Locally-based groups are often in the best position to know what is needed most to protect and restore coral resources. This activity will establish a competitive grant program to fund relevant activities over the next 2 years.

**Proposed timeline:** Program designed by June 2000; begin funding proposals in Fall, 2000.

**Budget estimate:** \$30,000 from each Coral Reef Task Force agency in FY2000 and FY2001.

**Participants/Possible Partners:** all Coral Reef Task Force agencies.

**Potential barriers to successful implementation:** availability of adequate funding in FY2000 and FY2001.

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**Activity #4:** Distribute a matrix showing relevant Federal assistance programs available to address the types of environmental threats discussed in this working group report; e.g. Section 319 grants, SRF funding, EPA's National Capacity Development Project to demonstrate the successful elimination of barriers to the wider use of decentralized wastewater treatment, USDA's Conservation Operations Program, Environmental Quality Incentives Program, Wildlife Habitat Improvement Program, and other programs for priority watersheds. Status: underway.

Description: There is a wide array of Federal assistance programs which can be accessed to help support coral reef ecosystem protection efforts. This matrix will provide relevant information on those programs, including program titles, eligibility requirements, types of problems the programs can address, and contact information.

Proposed timeline: January, 2000.

Budget estimate: staff time to compile the information.

Participants/Possible Partners: all working group member agencies.

Potential barriers to successful implementation: none.

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## Timeline and Cost Summary Information for Education and Outreach Section

Activity/Status	Proposed Timeline	Cost Estimate
#1: Launch RECON in the Wider Caribbean. <u>Status</u> : underway and proposed.	Implemented in phases over 5 five year period, beginning in 1998. Phase II will be in place by fall 1999.	\$75K-\$100K annually.
#2: Implement National Marine Debris Monitoring Program in Hawaii. <u>Status</u> : underway and proposed.	First set of 10 monitoring sites established by December 1999; second and final set of 10 sites scheduled for summer 2000.	\$150K annually.
#3: Support citizen groups involved in efforts to protect coral reefs. <u>Status</u> : proposed.	Launch program in June, 2000.	\$250-300K (30K from each TF agency in FY2000 and FY2001).
#4: Distribute matrix showing relevant Federal assistance programs available to address reef issues. <u>Status</u> : underway.	January, 2000.	Staff time.

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