

Background

Program Description

For complete program description and other requirements criteria for the NCCOS/CSCOR/Coastal Ocean Program, see the General Grant Administration Terms and Conditions for the Coastal Ocean Program annual notification in the **Federal Register** November 8, 2002(67 FR 68103) and at the COP home page. Unless stated otherwise, in this notice, the requirements and procedures contained in the November 8, 2002 annual notification are applicable to this solicitation.

This program is one of the Federal and state programs contributing to the Florida Bay and Adjacent Marine Systems Interagency Science Program, which is designed to understand and predict the effects of South Florida ecosystem restoration.

The activities conducted to restore the South Florida ecosystem occur predominantly upstream of Florida Bay, and restoration impacts may not be direct or immediate. Through funding of the research areas identified here, NCCOS/CSCOR/COP will fund an integrated suite of activities to better understand the coastal and marine ecosystem adjacent to the Everglades, comprising Florida Bay and the FKNMS. The Goal of the complete effort is to develop a capability to predict the impacts of proposed Everglades Restoration activities on the coastal system from the mangroves to the coral reefs.

Research Areas

To address the goal of developing a capability to predict changes in coastal ecosystems resulting from Restoration activities, this announcement has five specific areas of interest: nutrient inputs and dynamics, water quality, circulation and physical oceanography, fisheries and protected resources, and Florida Keys habitat characterization and research.

(A) Nutrient Inputs and Dynamics.

Proposals are solicited to address nutrient cycles within the water column and between the water column and benthos. Priority consideration for selection in this area will be given to nutrient proposals that cover the biogeochemical processes (including the microbial loop) governing the bio-availability of the organic forms of plant nutrients.

(B) *Water Quality*. The health of the coral reef community of the FKNMS depends upon the quality (temperature, salinity, nutrients, inorganic particulate load, light fields, and chemical contaminants) of the waters that flow

over them. With Everglades restoration, water quality throughout South Florida coastal waters will be changed.

Proposals are now solicited that address the chemical, biological, and optical characteristics of Bay waters that exit Keys passes and potentially reach the reef tract and protected areas in the FKNMS including the Dry Tortugas Ecological Reserve. These should address timely dissemination of information to the Interagency SFER science community and the public. Priority consideration for selection in this area will be given to projects coordinated with and complementary to physical oceanographic field studies.

(C) *Circulation and Physical Oceanography*. In the area of Circulation and Physical Oceanography, emphasis is placed on predicting the impacts of restoration scenarios and actions upstream and along the Keys, in the context of the physical variability of the natural system. Priority consideration for selection in this area will be given to proposals that address the following research topics:

- (1) Measuring oceanographic parameters needed to verify and initialize regional and interior Bay circulation models;
- (2) Determining the interconnections between the Gulf of Mexico loop and Florida currents and the Dry Tortugas Ecological Reserve (e.g., quantifying flows entering the Florida Bay interior along its western margin and those intermittently exiting through Keys passages and potentially reaching the reef tract);
- (3) Determining basin residence and turnover times, circulation, and flow within the Bay and across the banktops; or
- (4) Developing a hydrodynamic model of the coastal seas adjacent to Florida Bay and the Florida Keys for use in providing boundary conditions for coastal limited area models in the region and for evaluating simulations of restoration scenarios.

(D) *Fisheries and Protected Resources*. Ecosystem changes caused by South Florida Ecosystem Restoration activities have ultimate impacts on the sustainability of higher trophic level (HTL) species, including fishery and protected resources, which have widely recognized importance.

Proposals are solicited to build models and provide information to increase predictive capability in linking higher trophic levels to ecosystem restoration activities. Priority consideration for selection in this area will be given to proposals having a modeling component, or

interdisciplinary emphasis directed at the following research problems:

(1) Determining human (e.g., water management, fishing, excess nutrients, contaminants) and natural influences on biological processes affecting growth, survival, and recruitment of HTL species;

(2) Determining and modeling the major factors that influence distribution and abundance patterns and community, ecosystem and trophic structure;

(3) Identifying and modeling major pathways, mechanisms, and influencing factors in the transport of pre-settlement stages of offshore-spawning species onto nursery grounds; or

(4) Determining the processes impacting early settlement stage larvae and recruitment of important game fishes such as red drum, snook, tarpon, bone fish, and other estuarine and euryhaline dependent fish and macro invertebrates.

(E) *Florida Keys Habitat Characterization and Research*. Coral reefs, sea grass beds, and hard bottom communities comprise the submerged, biogenic habitats of the FKNMS that support diverse species assemblages. FKNMS management issues concerning these habitats cannot be fully addressed because of limited ecological research. Fully protected zones of the FKNMS, including the Dry Tortugas Ecological Reserve have been created to assist in the protection of biological diversity, disperse resource utilization in order to reduce user conflicts, and lessen the concentrated impact to marine organisms on heavily used reefs.

Emphasis in this area is placed on monitoring and research on sea grass beds, coral reef, and hard bottom communities to provide a basis for detecting potential changes associated with Everglades restoration and other anthropogenic and natural factors and evaluating the ecological benefits of FKNMS fully protected zones. Priority consideration for selection in this area will be given to proposals directed at the following research topics:

(1) Investigating the functional significance of hard bottom communities in the FKNMS ecosystem, particularly the roles of filter-feeding organisms and biogenic habitat structure.

(2) Monitoring and research on commercially important species (e.g. spiny lobster) and key depleted fishery species (e.g. queen conch);

(3) Creating ecosystem models of reef fish communities to predict the effects of zoning on species diversity, abundance, and trophic structure;