

NOAA COASTAL OCEAN PROGRAM

Project NEWS Update



Scientists Studying Effects of Natural and Anthropogenic Stressors on South Florida Coastal Ecosystems

Scientists with the Rosenstiel School of Marine and Atmospheric Science of the University of Miami, are currently in the fourth year of a six-year research project that is examining the ecological effects of natural and human activities on Biscayne Bay, and the Florida Keys reef tracts. Supported by NOAA's Coastal Ocean Program, the "Human-Environment Linkages in the South Florida Coastal Ecosystem: Effects of Natural and Anthropogenic Stressors" research program will also help to assess the effects of the proposed modifications of the Central and South Florida Flood Control Project.

The overall goal of the South Florida Stressors project is to advance the scientific understanding of the coastal ecosystems of South Florida and their anthropogenic risks, focusing on integration across biological, chemical, and physical systems, integration of field and experimental research with model development, and integration of scientific research with the policy needs for managing the coastal environment. Further, this project seeks to advance generic methodologies for assessing coupled physical-biological-human systems and to develop policy-relevant modeling tools that can be used to address real-world management questions. Consequently, the studies on the South Florida environment provide a case study for advancing our ability to bring science to bear on regional environmental management and decision-making. This policy-relevant perspective is based on application of the frameworks of ecological risk assessment and ecosystem management.

The South Florida environment consists of unique and highly valued ecosystems, connected by the flow of freshwater from the Kissimmee River watershed, through Lake Okeechobee and the Everglades, to the estuaries of Florida Bay, Biscayne Bay, and out to the largest coral reef ecosystem in the U.S. Biscayne Bay is a highly diverse estuary with high water quality and mostly healthy ecological communities, in spite of being adjacent to the major urban areas of South Florida. Changes in salinity, turbidity, and nutrients are potential risks to Biscayne Bay, as is the extensive overfishing of the South Florida coastal waters. There is a clear need to understand these anthropogenic risks to Biscayne Bay, how the Bay may respond to those stressors, and what management alternatives could reduce risks. The Florida Keys supports a rich tropical marine ecosystem, productive multi-species coral reef fisheries, and a billion dollar tourist economy. The major anthropogenic stressors to this (continued on Page 4)

South Florida Canal System



Source:
University of Miami, Center for Marine and Environmental Analyses

From the Director's Desk.....

Good science is essential for sound environmental decision-making. However, time is not always on the side of the policy maker because science and public policy often work on different time scales. Science tends to work over long time scales, where knowledge is gradually accumulated through a series of discoveries that are supported or refuted through a peer-review process. On the other hand, public policy decisions are made over a much shorter time frame, where decisions are often made quickly to address human health or resource concerns. Unfortunately, the speeds at which the two processes operate are not synchronous. Thus, policy makers are often left with limited scientific information when making important policy decisions.

With this dichotomy in mind, the Coastal Ocean Program was formed in 1989 to provide relevant science to managers in time for important policy decisions. Research priorities are set in a collaborative effort by members of the research and policy community, in an attempt to provide the scientific information needed before critical coastal policy issues emerge. For example, COP supported research projects such as the Nutrient Enhanced Coastal Ocean Productivity (NECOP) program in the Gulf of Mexico, and the Ecology and Oceanography of Harmful Algal Blooms (ECOHAB) have advanced the understanding of hypoxia and harmful algal blooms before these issues became front page headlines. More importantly, the research findings from COP's research programs are translated into accessible information for coastal managers, planners, lawmakers, and the public.

To ensure that the flow of information continues in a timely and understandable manner, COP is sponsoring workshops designed to develop strategies to ensure the most successful transfer of scientific results to the management community. The focus of the first workshop, held this past Fall, was to strengthen the science-management interface by allowing COP scientists and program managers the opportunity to exchange information on this aspect of their programs. While there were several recommendations that came out of this workshop, participants felt very strongly that there not be a single framework for integrating management outcomes and tools into the research programs. In addition, participants also stated that each research/management issue should be addressed on a case by case basis. Lastly, participants felt that strong communication between the scientific and management communities is critical.

In the coming year, two workshops are planned with the first focusing on management's perspective on improving its role in COP funded research, and the last workshop will integrate the recommendations of the previous workshops. You will find more information on the first workshop on page 7 of this newsletter.



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COP Working with Federal Partners to Develop National Harmful Algal Bloom Plan

The term “harmful algal blooms” was only known to a handful of scientists and coastal residents until fish kills on the Pocomoke River last year galvanized federal and state agencies into action. Since last year, federal and state agencies have increased their efforts into determining the potential reasons for the increase of harmful algal blooms (HABs) in our coastal waters. The COP has taken a lead role in the federal response by supporting long-term research through the Ecology and Oceanography of Harmful Algal Blooms (ECOHAB) program, working with States to coordinate monitoring efforts, and developing the “National HAB Research & Monitoring Strategy.” COP, with its other federal partners, is now taking the steps to implement this Strategy by initiating the National Harmful Algal Bloom Program, a three-pronged approach comprised of research, monitoring and assessment, and event response components.

Research - The COP is currently supporting two HAB research programs: ECOHAB and the Brown Tide Research Initiative (BTRI). The primary goal of ECOHAB is to develop a means to predict when and where HABs might occur, how long they might last, and their potential impacts on coastal resources. This year through ECOHAB, NOAA, EPA, NSF, ONR, and NASA are investing in research on: *Pfiesteria* in the mid-Atlantic states; red tides in the Gulf of Mexico; brown tides in Long Island; paralytic shellfish poisoning in the Gulf of Maine and Alaska; amnesic shellfish poisoning in California’s coastal waters; and potential methods of controlling harmful algal blooms.

The BTRI, in its fourth research year, is studying the persistent brown tides that occur in Long Island’s embayments. Researchers are working towards develop a predictive capability based on an understanding of how physical and (continued on Page 5)

COP Project Coordinator Profile



Dr. Kevin Sellner, ECOHAB and National Centers for Coastal Ocean Science (NCCOS) HAB Coordinator, has left his research position of 20 years to oversee the HAB Program. Kevin has actively investigated HABs in the U.S. and coastal regions of the

world since his graduate research at the University of South Carolina (MS’73) and Dalhousie University in Halifax, Nova Scotia, Canada (Ph.D., ’78). His primary research interest is determining the fate of HAB primary production, focusing on coastal HABs off Peru, in the Baltic, and the Eastern seaboard of the U.S. as well as actively participating on coastal eutrophication research and monitoring projects for the last 15 years in the Chesapeake Bay.

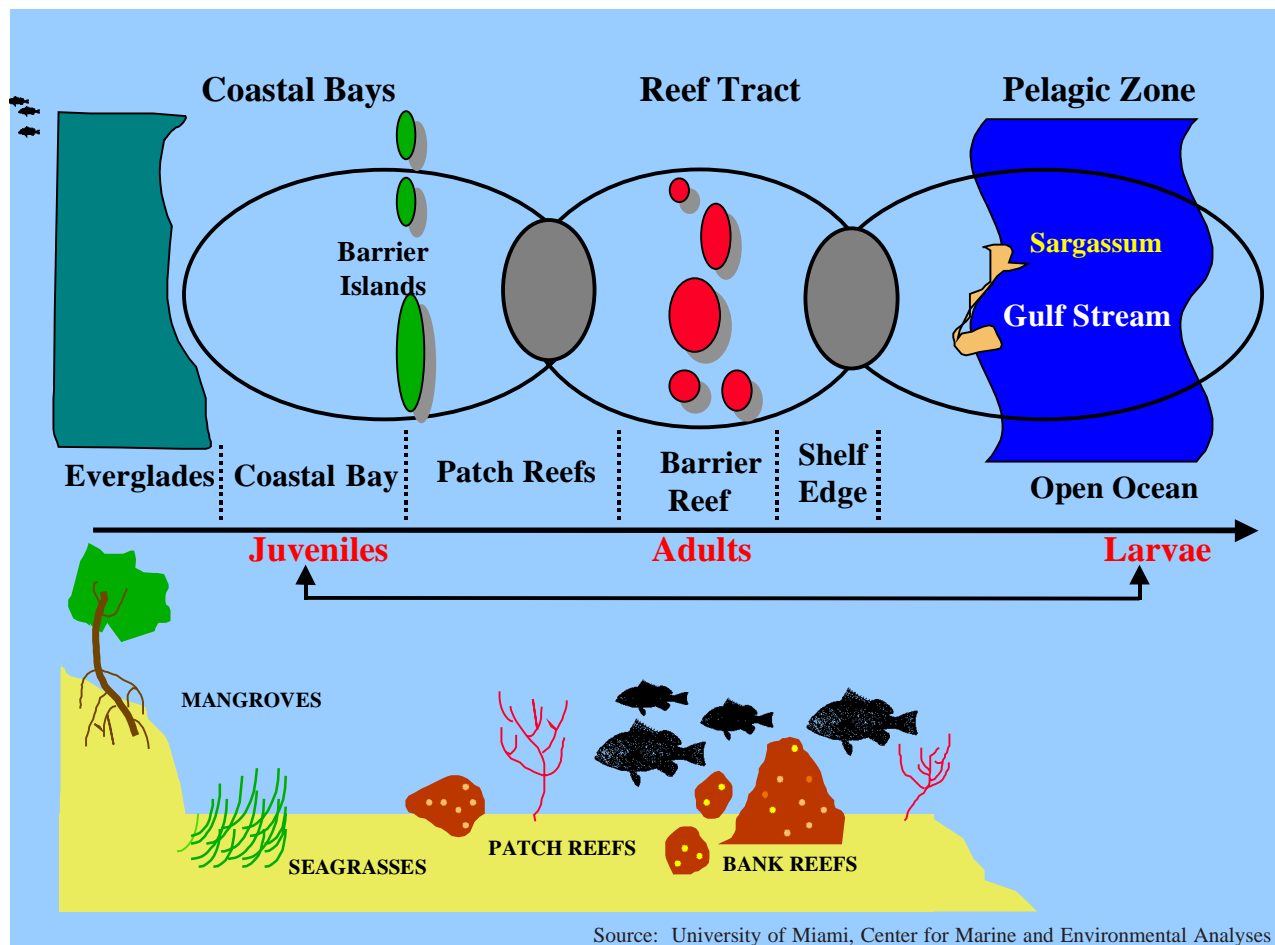
Kevin continues his active role in the HAB research community through continued publication and presentation of HAB research results, reviewing and editing manuscripts and proposals for journals, societies, and agencies, and through administering the interagency research program ECOHAB, which provides Federal support for peer reviewed research projects on coastal U.S. HABs. Additionally, in his new role as NCCOS HAB Coordinator, Kevin is developing an integrated, collaborative HAB Program for NCCOS which will combine intra- and extramural research, monitoring and assessment activities and results, and event response capabilities in NCCOS with the expertise of other NOAA offices and agencies in outreach/education/advisory components, seafood safety and public health. When not at work, Kevin entertains two -preteen girls, plays ball with his family’s two dogs, coaches soccer, jogs, and likes impressionist art.

South Florida, cont.,

system include nutrient additions, freshwater pulses from South Florida’s canal system, increased turbidity, extensive diving and other recreational uses, and overfishing.

The South Florida Stressors project has evolved through a series of phases. Phase I involved a large number of individual research tasks seeking to identify and develop ecological endpoints and measures to characterize the ecological effects of human activities on coastal systems. Phase II is focused on selected endpoints and stressors, and on developing a set of coupled physical and ecological models that can be used to assess ecological effects on Biscayne Bay and the coral reef tract. An extensive field and experimental program is ongoing to assist in the model parameterization and calibration. This includes characterization of the seascape habitat of Biscayne Bay, the fish community structure and dynamics of Biscayne Bay and the reef tract, the physical characteristics and water movement of the Bay and reef systems, and microcosm and mesocosm experiments on seagrasses, corals, macroalgae, and fish. (continued on Page 5)

Conceptual Diagram of Reef Fish “Coastal Bay to Coral Reef” Interconnections



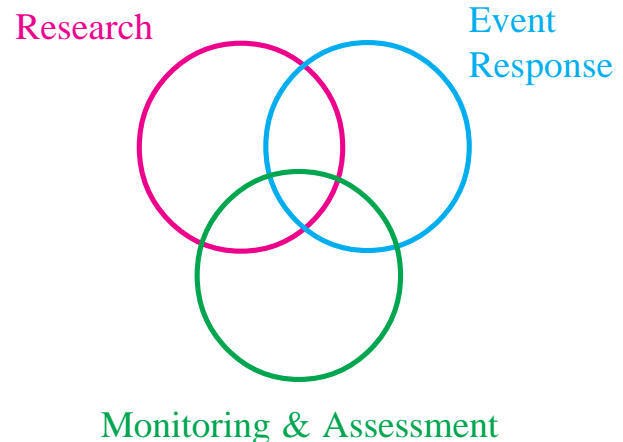
Above: Adult biomass of the multispecies reef fish community is concentrated on the thin coral reef line. Mature adults spawn at the deep-reef edge. Larvae are advected shoreward into coastal bays like Biscayne Bay. As juveniles mature, they migrate seaward to coral reefs. Reef fishes are used as indicators of environmental stress and system changes, because during their ontogenetic migrations from coastal bays to coral reefs, fishes integrate stressors found across the coastal ocean ecosystem (Ault and Luo 1998).

Harmful Algal Bloom Plan, cont.

biological processes interact to promote bloom development, affect bloom dominance, and contribute to bloom maintenance or decline. Knowing the causes of these blooms will lead to identifying means to prevent them. Research is focused on: 1) isolating the organism which is an important prerequisite for further study; 2) identifying the factors that cause, maintain, and dissipate blooms; and 3) determining the genetic diversity of the organism which could lead to subsequent control strategies.

Monitoring and Assessment - In 1998, COP partnered with EPA to provide support for state monitoring and assessment efforts in coastal mid- and South Atlantic states. Specifically, funding was used for expanding watershed field programs, investigating the potential connection between agricultural practices and runoff, and toxic *Pfiesteria*-like events, and expanding lab capacities to support state monitoring programs. These funds also supported workshops and training sessions to train State personnel, transfer new technologies and monitoring protocols, and develop and apply new field identification techniques for *Pfiesteria piscicida* and their toxins.

In addition, a National *Pfiesteria* Clearinghouse was established at the National Office of Marine Biotoxins and Harmful Algal Blooms at the Woods Hole Oceanographic Institution as a resource for state



management agencies. This Clearinghouse provides emergency response expertise, access to event data, advisories, and summaries of on-going and past research on *Pfiesteria* and related organisms.

Event Response - COP, in partnership with EPA, the Food and Drug Administration, the U. S. Geological Survey, and the Centers for Disease Control, are currently developing a detailed Federal contingency plan for HAB events which will provide individual states with Federal expertise, and support to immediately respond to HAB events. The plan will coordinate available Federal assistance requested by States when the investigation and management of suspected toxic *Pfiesteria* events exceeds the capacity of their resources. Currently, the plan focuses on *Pfiesteria* and *Pfiesteria*-like organisms. However, it will be expanded in the future to include strategies for responding to other HAB events nationwide.



South Florida, Cont.,

Phase III will be initiated next year to conduct a series of initial ecological risk assessments on specific stressors affecting Biscayne Bay and the reef ecosystems. The Biscayne Bay risk assessments will be conducted on two environmental stressors: a) the ecological risks to Biscayne Bay from potential alterations in the salinity regime caused by water management changes associated with the South Florida restoration, and b) the ecological risks to Biscayne Bay caused by overexploitation of fisheries resources. The following year, an ecological risk assessment will be done on the risks of fisheries exploitation on the coral reef ecosystem of the Keys. Researchers will be working with environmental managers and decision-makers in conducting the risk assessments and communicating the implications of their of results. For more information on this project, visit: <http://www.rsmas.miami.edu/research.html>

COP Releases “Change in Pacific Northwest Coastal Ecosystems” Report

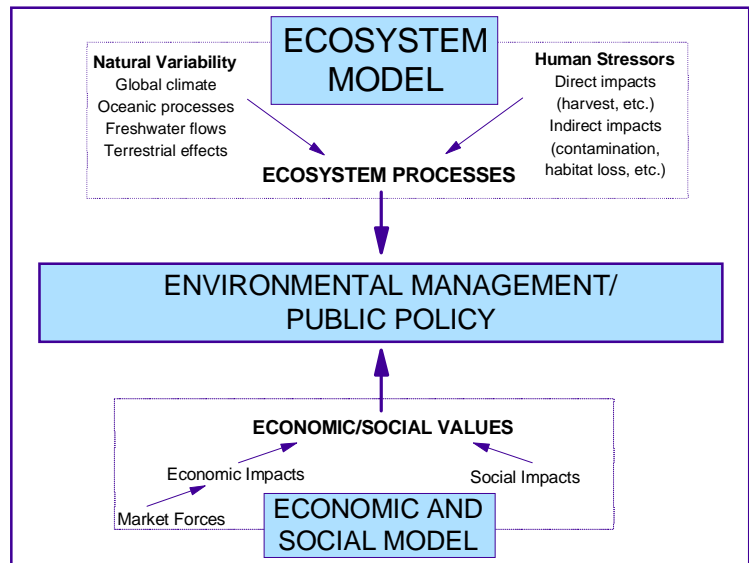


Over the past one-hundred fifty years, the landscape and ecosystems of the Pacific Northwest coastal region, already subject to many variable natural forces, have been profoundly affected by human activities. In virtually every coastal watershed from the Strait of Juan de Fuca to Cape Mendocino, settlement, exploitation and development of resources altered natural ecosystems, particularly those parts of the ecosystem that support salmon. In response to these changing coastal ecosystem conditions, NOAA’s Coastal Ocean Program (COP)

is funding the Pacific Northwest Coastal Ecosystem Regional Study (PNCERS), a six year research program to investigate how coastal ecosystems in the region respond to natural variability and human activities. (For more information on PNCERS, visit - <http://seagrant.orst.edu/~pncers/>)

PNCERS was initiated because there have been significant declines in salmon and other species populations, and increasing demands on ocean and coastal resources of the Pacific Northwest. The PNCERS goal is to provide managers of coastal and ocean resources with information needed to maintain ecosystem health and resource viability while adding to the overall knowledge-base about the coastal ecosystem. It is hoped that the findings from PNCERS will help citizens, public agencies, and communities effectively manage resources, protect species, and carry out restoration programs. To better target PNCERS research funds, a highly structured workshop was held in August, 1996, that supported development of a research program. The results of the workshop are contained within COP’s eleventh report in the Decision Analysis Series. The report, “**Change in Pacific Northwest Coastal Ecosystems,**” was edited by Gregory R. McMurray, and Robert J. Bailey.

PNCERS Conceptual Model



The results of the workshop are contained within COP’s eleventh report in the Decision Analysis Series. The report, “**Change in Pacific Northwest Coastal Ecosystems,**” was edited by Gregory R. McMurray, and Robert J. Bailey.

This report contains seven chapters, an extensive glossary of terms, and references by chapter. Five chapters were originally developed as “theme” papers for a summer, 1996, workshop sponsored by PNCERS to summarize current scientific understanding and identify key research issues as a prelude to developing a multi-year science plan to meet PNCERS objectives. Chapter 1 is an Introduction. Chapters 2 and 3 describe the effects of human intervention in the coastal environment and resulting socioeconomic changes. Chapters 4, 5, and 6 provide a conceptual framework for describing, assessing and synthesizing present understanding of the physical and biotic parts of the Pacific Northwest coastal ecosystem and, in particular, how salmon relate to these various parts. Chapter 7 is a summary report of the discussion and results of the workshop.

To receive a copy of this report, please contact Mike Murphy at 301-713-3338 or mmurphy@cop.noaa.gov

COP Holds Science-Management Workshop

On September 24 and 25, in Silver Spring, MD, COP sponsored the first of three workshops designed to develop strategies to ensure the most successful transfer of scientific results to the management community. The first workshop focused on the concerns of scientists and included principal investigators from previous and current funded projects and program officers from the COP office. In addition to presentations of their programs approach to management concerns, the principal investigators participated in general discussions which addressed several topics including but not limited to: when and how to involve coastal and resource managers in the research program; the timeliness of tool development, mechanisms and frequency of communication with managers and users; and should specific management concerns drive research initiatives. A document of the results is in preparation. The second workshop, which is in the initial planning stages, will focus on management and user concerns by inviting representatives of the coastal and resource management community, while the third will attempt to integrate all concerns by inviting representatives of both the scientific and management communities.

COP Now Has Grant Processing Ability

The Coastal Ocean Program has hired a full-time grants coordinator which is good news for COP researchers. Grants will now be awarded by COP and processed more quickly than was previously possible. You can find detailed information about applying for grants through COP at our web site: This website contains the necessary instructions and forms for preparation of an application package for a NOAA Coastal Ocean Program (COP) proposal submission. The information package provided here is taken from the standard NOAA Grants Management Division Application Package for FY 1999. If you have any questions, please contact Ms. Leslie McDonald at (301)713-3338, ext. 137, or *Leslie.Mcdonald@noaa.gov*.

Program Notes

Project News Update Going On-line - This edition of COP's Project News Update will also be available on COP's web page at: <http://www.cop.noaa.gov/>. All future Update editions will only be offered on-line. This is to reduce costs, increase circulation, and reduce the time needed for Update processing and printing. An email will be sent out to COP constituents to notify when a new edition is released. If you would still like to receive a hard copy, please notify Mike Murphy and he will be happy to send you a copy (*mmurphy@cop.noaa.gov*).

COP Moves to the National Ocean Service - As of April 1998, the COP officially moved under the authority of the Assistant Administrator in NOAA's National Ocean Service. This move resulted from a recommendation by the Coastal Stewardship Task Force, convened by Commerce Under Secretary, D. James Baker. In moving to NOS, The Task Force concluded that COP could better support NOS' coastal management missions, while still maintaining its emphasis on independent, peer-reviewed research.



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For More Information



Contacts about specific COP projects should be made to the person(s) listed in each news item. General inquiries, comments on the newsletter, information on the COP, and requests for copies of publications may be directed to the Update Editor, Michael Murphy, in any of the following ways: Telephone (301) 713-3338; Fax (301) 713-4044; E-mail; mmurphy@cop.noaa.gov; or by mail to NOAA Coastal Ocean Program (NCOP), 1315 East-West Highway, Room 9700, Silver Spring, MD 20910.

Additionally, updated program information and links to COP-related projects may be accessed at our website: <http://www.cop.noaa.gov/>