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Texas Sea Grant

Program Guide 2005

Contents

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AT LEFT: Photo courtesy Texas Department of Transportation.

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From the Director: Texas Sea Grant Report Card

The time has come to develop new strategic and implementation plans for the Texas Sea Grant College Program.


Dr. Robert R. Stickney

That activity is currently under way for the period 2006-2010. As a part of this annual report, it seems appropriate to provide a summary of how well we succeeded in achieving the goals set forth in the strategic and implementation plans for 2002-2005.

The first goal in the 2002-2005 strategic plan related to research and was to "maintain and expand a high quality, targeted, yet flexible marine research program." The research priorities were in the areas of coastal ecosystem health, coastal ecosystem development and marine education. A fourth area was to respond to unanticipated problems and opportunities as they arose. Because we were in the midst of a funding cycle when the strategic plan was developed, the first opportunity to focus on the new research priority areas came in the cycle that began in March 2004 and will terminate in February 2006. We continued the same priority areas in the request for proposals that was developed for the 2006-2008 funding cycle, which begins in March of next year. We selected the final proposals for this period in August 2005. The only change in the priority areas for the 2006-2008 proposal cycle was that coastal ecosystem development was renamed coastal community and economic development to better reflect the types of proposals that were being sought.

As you will see by reviewing the summaries that follow, most research projects related to coastal ecosystem health (a term that encompasses a wide variety of topics) during the 2004-2006 proposal cycle. The coastal ecosystem development priority did not generate many proposals, so additional effort was made to increase the response for the 2006-2008 proposal cycle. While the response improved, it was still well below the more traditional submissions that relate to science and engineering. Texas Sea Grant was successful in funding a bathymetric mapping project with a strong educational component in the 2004-2006 proposal cycle and will fund one project in 2006-2008 that involves developing training materials for community planners.

The primary initiative in the unanticipated problems and opportunities area was a project development grant to investigate the extent to which drownings along the Texas coast may have been associated with rip currents. The results of that study, which was conducted with input from the National Weather Service, are included in this annual report.

One of the subgoals for our research agenda was to "achieve full integration of program elements." To that end, investigators are asked to identify one or more Sea Grant extension or communications personnel at the proposal development stage who would be involved with their project. The purpose was to provide a mechanism by which research information would be made available to interested individuals and groups in a timely manner. As a corollary to that approach, we initiated annual researcher conferences to bring funded researchers and our outreach and communications staffs together each fall. Sea Grant-supported researchers present their latest results and interact both with each other and with Sea Grant staff members. The process has worked well and will be retained in future funding cycles.

The other major goal in the strategic plan for 2002-2005 was programmatic in nature and was to "improve the effectiveness of Texas Sea Grant." That goal was to be approached in a number of ways, including increasing the number of meetings, workshops and partnerships involving Sea Grant. One of the major activities involved taking a leadership role in developing the "Next Steps in the Gulf of Mexico" meeting that was held in 2004. The purpose of the meeting was to bring scientists, agency personnel and others from the Gulf of Mexico states together to begin planning a regional response to recommendations in the report from the President's Commission on Ocean Policy. The "Next Steps" meeting was video recorded and is available from Texas Sea Grant on two DVDs.

The number of news releases produced by Texas Sea Grant

increased significantly over the past year following the addition of a new assistant editor. A series of articles on individuals who have made significant and long-term contributions to marine science and policy development in Texas — the Coastal Legends series — continued in *Texas Shores* magazine. Reports on results of research supported by Texas Sea Grant are also being more frequently highlighted in *Texas Shores*.

Speaking of our award-winning magazine, an element in the 2002-2005 strategic plan was to find additional funding for *Texas Shores* so we can expand the subscriber list. Those efforts have yet to produce results, but are continuing. We are seeking individuals or corporations that would be willing to sponsor single or multiple issues of the magazine or contribute to an endowment that would provide a revenue stream to ensure long-term funding of the magazine.

A few of the major accomplishments of the Marine Advisory Service (MAS) include:

- Worked on the Trade Adjustment Assistance program that brought close to $10 million dollars into the shrimp industry over the past two years. Staff involved with the effort won both Texas Cooperative Extension and Sea Grant regional awards.
- Conducted a workshop on shrimp fleet capacity at the request of the industry.
- Hosted a ports and waterways conference.
- Continued a Floating Classroom Program that has attracted some 14,000 students, teachers and adults and provided them with an on-the-water learning experience.
- Continued the series of annual Texas Shrimp Farming Short Courses that attracted significant numbers of domestic and international participants.
- Continued the Marine/Offshore Outlook Conference series, which is a one-of-a-kind annual event that brings together oil service and other offshore industry representatives to discuss the future of their industry.
- Worked with volunteers along the coast on restoration, education and public service projects through the Master Naturalists program.
- Worked with the leadership of the shrimp industry in developing a Mark of Quality program to assure domestic shrimp quality and domestic advantage.
- Continued to coordinate and promote a monofilament line recycling and recovery program to remove debris from the ecosystem.
- Continued leadership in developing the highly successful Clean Texas Marina Program that has certified 55 marinas.
- Introduced a new trawl door design to the shrimp industry that may provide significant fuel savings.
- Enhanced regional standing through the gubernatorial appointment of one staff member to the Gulf States Fisheries Management Council.

We had hoped to add personnel to the MAS and Marine Information Service (MIS) during the period covered by the current strategic plan, but a lack of additional funds interfered with that goal. We were able to fill a county agent vacancy in the MAS to fully staff that part of the program, but a competitive proposal to the National Sea Grant Office that would have added a recreational fisheries specialist to the MAS was not funded.

We are currently involved with developing a proposal to base a Sea Grant Extension Specialist at the University of Oklahoma who will, if the position is funded, work closely with Texas Sea Grant in conforming computer simulation models developed by the National Severe Storms Laboratory (NSSL) in Norman and others to the Galveston-Houston area. The models could, when fully developed, predict rainfall runoff and storm surges that would be useful to emergency management agencies.

Our extension work in the area of coastal community development has been significantly augmented through grants obtained by one of our extension specialists. Other extension agents and specialists have also been successful in obtaining grants and contracts from various state and federal agencies. Those grants have often included funds to hire soft money staff. Thus, we have added personnel capacity, though not on a permanent basis.

Legislation appointing the Sea Grant Director to the state's Coastal Coordination Council (CCC) in 2002 and allowing the director to appoint a Sea Grant staff member to the CCC's executive

Rising to the (Dolphin) Challenge

As part of its ongoing outreach and education efforts, Texas Sea Grant took over coordination duties for the National Ocean Sciences Bowl (NOSB) regional competition at Texas A&M University beginning with preparation for the March 4, 2006, meet.

The Dolphin Challenge, which is open to high school teams from the northern half of Texas, is held in College Station, while students in the southern part of the state can compete in the Loggerhead Challenge, hosted by Texas A&M University-Corpus Christi. Earlier this year, the previous coordinating department for the Dolphin Challenge, TAMU's Department of Oceanography, determined that it would be unable to coordinate the next competition.

"When we learned that the Department of Oceanography was having difficulty properly staffing the TAMU NOSB event for 2006, I thought the competition was so important that I volunteered Sea Grant to take it on," says Texas Sea Grant Director Dr. Robert Stickney. "Texas Sea Grant has been a supporter and has participated in the event in various capacities for several years. I've moderated in four of the past five years myself and thoroughly enjoyed interacting with the very bright students who will doubtless become leading scientists in the future."

NOSB is a college bowl-style competition that provides an opportunity for students to receive national recognition for excellence in math and science and stimulates their interest in marine science as a possible career. Teams of high school students compete by answering questions about the earth's oceans from a wide range of disciplines, including physics, geology, biology and the social sciences. Winners of the regional competitions go on to the national meet, which will be held in Monterey, California, in May 2006.

"NOSB represents a wonderful learning experience for the high school students who participate," Stickney says.

For more information on the Dolphin Challenge, contact NOSB Regional Coordinator Bianca Whitaker at whitakeb@tamug.edu or 979-204-2741. Additional information about NOSB is available on its Web site at www.nosb.org.

committee has provided an opportunity for Sea Grant to work much more closely with the state's natural resource agencies and the Coastal Management Program. Over the past three years, Sea Grant has arranged several presentations to the CCC to bring the members of the council up to date on such things as the Sustainable Coastal Margins Program at Texas A&M University and the Gulf Coast Global Ocean Observing Program. We believe that involvement with the CCC is a good way to help connect state agencies with researchers at Texas universities who have expertise needed by those agencies.

The CCC activity is only one among many local, statewide and national committees on which Sea Grant personnel serve or have served since 2002. Sea Grant staff have also served in leadership positions within the Sea Grant network.

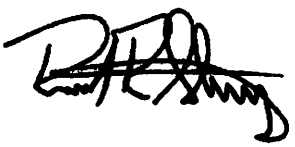
Sea Grant has been a strong proponent of the development of the National Estuary Research Reserve (NERR) that should become a reality in the Corpus Christi Bay area in the near future. Opportunities for Sea Grant researchers to conduct work in the NERR and for Sea Grant to partner in various activities at the NERR are apparent and should help strengthen both NOAA-funded programs.

A goal in the strategic plan was to expand the Texas Sea Grant Fellows program, which was initiated in 2001 to place individuals with one of the state's natural resources agencies for a one-year period. Lack of funding caused a hiatus in the program in 2003, but it was re-established in 2004 and continues in 2005. A 2006 fellow has been identified and will begin his fellowship with the Texas Parks and Wildlife Department in January. Texas Sea Grant has been quite successful in recruiting highly competitive applicants for the Knauss Fellowship program, which places fellows in Washington, D.C. The number of applicants awarded fellowships increased from one to two on average in prior years to four in 2005. An additional three Knauss Fellowship applicants will join the class of 2006.

Researchers have been relatively successful in national Sea Grant competitions, and we have made a strong effort to expand our list of potential researchers across the state so we can provide them with our requests for proposals as well as information on other grant opportunities (both within and outside NOAA). We expanded our public awareness program on rip currents by producing signage that can be placed on public beaches, posters to hang in retail outlets, and expanding the distribution of table tents for hotels and motels. The posters and table tents are in Spanish and English. All three types of informational materials instruct the public on the danger of rip currents and provide instructions on what to do if caught in a rip current. Special efforts to distribute information are made just prior to Spring Break each year when thousands of college students, many of whom are not familiar with rip currents, migrate to the Gulf beaches.

Low power radio has been used by Sea Grant to educate through public service announcements, curricular material has been developed and made available to teachers in the K-12 system, and new partnerships of various kinds have been developed through the efforts of dedicated MAS and MIS personnel. A great deal of effort has been and will continue to be expended in assisting community planners meet the challenges of a rapidly growing coastal population in Texas.

A great deal has been accomplished over the past few years, but much remains to be done. As we develop our new strategic plan, we will be hosting focus groups and convening our advisory committees to seek input. We also invite anyone else who would like to provide suggestions to do so. We want to know what you think the major marine-related issues facing the state are and which of them should become Sea Grant's focus. Feel free to send your ideas to me and I assure you they will be considered as we move forward with development of our objectives and goals for the next several years. The best way to reach me is via email: Stickney@tamu.edu.



Robert R. Stickney, Ph.D.
Director and Professor

Photo by Jean O'Dette.

Texas Sea Grant College Program: An Overview

The Texas Sea Grant College Program provides support, leadership and expertise for marine research, extension and education in coastal Texas. It addresses practical problems through focused research, maintains close contact with coastal communities and other groups whose activities impact the coast through a cadre of extension agents and specialists, and disseminates information in a wide variety of formats for a broad range of audiences.

Texas Sea Grant is a component of the National Sea Grant College Program of the National Oceanic and Atmospheric Administration and also part of the College of Geosciences at Texas A&M University. It is one of a network of 31 university-based programs in coastal and Great Lakes states. Through a partnership of industry, government and higher education, Sea Grant sponsors and promotes programs aimed at the understanding, wise use and stewardship of the nation's coastal and marine resources to develop and maintain a sustainable economy and a healthy environment.

The national program, established by Congress in 1966, was modeled after the Land Grant Colleges. In 1971, Texas established one of the nation's first four Sea Grant Colleges.

Today, Texas Sea Grant helps to maintain the United States' position as a world leader in marine research and sustainable development of marine resources by supporting competitive research projects by qualified investigators at universities throughout the state and by promoting and engaging in significant marine education and outreach activities, ranging from the creation of public school curriculum materials to coordinating conferences that make new information available to a wide range of constituents. It serves and assists a wide range of organizations and individuals, including federal, state and local governments, environmental and industry trade organizations, colleges and universities, K-12 teachers and students, special interest groups focused on coastal issues, coastal businesses, marine industries, tourists and the public.

To support these endeavors, the program is organized into three main components: Program Administration, the Marine Advisory Service and the Marine Information Service.

The Program Administration oversees the program's daily operations and is responsible for awarding about $800,000 in grants annually to the best marine researchers in the state. The program currently focuses on three much-needed research areas: coastal ecosystem health, coastal ecosystem development (recently renamed coastal community and economic development) and marine education. The administration solicits and evaluates research, outreach and education proposals and ushers them through a rigorous peer review process to select and prioritize projects to be funded by the program.

Texas Sea Grant also funds smaller research projects. These Mini-Grants are designed to take advantage of opportunities that are not anticipated during the two-year major research funding cycle, opportunities in which limited amounts of funding may produce significant results. They may be used to test concepts that could lead to development of larger proposals submitted to Sea Grant or other funding agencies, to support new faculty at Texas colleges and universities who are trying to initiate research programs, or to fund research demonstration projects for Marine Advisory Service agents and specialists.

The Program Administration also hosted a conference in 2004 to plan the next steps for the Gulf of Mexico in response to recommendations from the U.S. Commission on Ocean Policy. The "Next Steps in the Gulf of Mexico" conference, attended by about 130 representatives from marine industry, academia and government, was the first conference to address the findings of the report from a regional perspective and focused on research priorities, funding sources, administration and management, and ecosystem-based and regional approaches.

The Marine Advisory Service (MAS) is supported by the Texas

Photo by Jean O'Dette.

Shrimpers eligible for federal assistance thanks to MAS agents

Efforts by a team of five Texas Sea Grant Marine Advisory Service specialists and agents led to Texas shrimp fishermen becoming eligible for the first-ever USDA Economic Benefits Program to include commercial fishermen.

Mike Haby, Texas Sea Grant seafood specialist, headed up the Texas Shrimp Industry Trade Adjustment Assistance Education Team of Russell Miget, environmental quality specialist; Gary L. Graham, marine fisheries specialist; Terrie Looney, Jefferson and Chambers counties marine agent; and Tony Reisinger, Cameron County marine agent.

In response to falling seafood prices caused by record imports, particularly farm-raised shrimp and salmon, Congress granted commercial fishermen standing to apply for U.S. Department of Agriculture Trade Adjustment Assistance (TAA) — if they could demonstrate that growing imports had contributed to low prices.

The TAA process begins with a statewide Petition for Eligibility submitted to the Foreign Agricultural Service. If the petition is approved, individual producers can then apply for benefits through their local Farm Service Agency. Haby, at the request of the Texas Shrimp Association, drafted the petition that won approval for TAA participation for Texas shrimpers.

As a partial requirement for receiving funds and education and training benefits, all applicants are required to attend a technical assistance workshop specifically designed to help them understand what operational changes are necessary to adjust to global competition. The team created reference and teaching resources and organized and implemented the technical assistance training.

Haby and Miget prepared a curriculum and resources to be used at the workshops. Graham organized 13 technical assistance workshops, which were conducted by Haby, Miget and Graham, that trained more than 1,800 fishermen, and Looney and Reisinger collectively offered more than 15 additional workshops to train the remaining 350 applicants. By the end of the project, the five-person team had trained about 2,200 owners, captains and crews, satisfying the technical assistance workshop certification requirement.

"Participation was somewhere in the neighborhood of 97 to 98 percent. That was the highest percentage in the fishery, either in the Gulf or the South Atlantic," Haby says. "I'm also proud of the fact that we were able to present the training in the three major first languages of the industry — English, Spanish and Vietnamese."

In recognition of their effort, the five agents received Superior Service Awards from Texas Cooperative Extension of the Texas A&M University System and also were regional winners and finalists for a Superior Outreach Programming Award from the Assembly of Sea Grant Extension Program Leaders.

Marine agents spread word about growth choices to coastal city leaders

In late 2004 and early 2005, three members of Texas Sea Grant Extension met with government officials and other leaders in the coastal communities of Bay City (Matagorda County) and Rockport (Aransas County) to promote awareness of how choices made now will affect future quality of life and environmental issues in their cities.

The program is a response to growing concerns that current development patterns, especially urban sprawl, are not in the long-term best interests of cities and towns and the areas surrounding them.

John Jacob, environmental quality/coastal community development specialist, and Aransas and Matagorda county agents Logan Respess and John O'Connell had introductory meetings in the two communities, including a discussion of how more compact development would apply in each city.

"Compact development promotes a more pedestrian-friendly environment that is kinder to both humans and the environment," Jacob says. "Walkable, mixed-use communities are vibrant economic centers and consume much less space than the more common, completely automobile-dependent developments. There is increasing evidence that compact communities can also be built in ways that are far more resilient to coastal hazards, such as hurricanes, than conventional developments.

"We focused on what the choices are that coastal communities have about growth. We were helping them think about how they're going to deal with growth, whether as standard suburban sprawl or as some other form.

"It was a pretty broad group of citizens," he says of the participants. "We had city officials, including a mayor or two and city council members, master naturalists, some community development corporation people, developers — it was a cross-section of people interested in growth."

In the second phase of the program, the three Sea Grant Extension members held a joint meeting in Victoria of the participants from both communities. They had Dan Burden, a nationally known authority on walkability and smart growth, discuss pedestrian-friendly or human-scale cities and led the group on a walking tour in Victoria, which Jacob characterizes as having "good examples of sustainable growth — growth before automobiles."

Jacob says the 45 to 50 participants were quite positive in their response to the program.

"They were happy to know that choices can be made — there's not just one kind of growth — and that some are better for both people and the environment."

He emphasizes that the principles of what make a sustainable city are the same everywhere, but compact growth is even more important in coastal areas.

"After Hurricane Katrina and Hurricane Rita, these things are on our minds: What makes a more resilient coastal city? First, don't build in the wrong place — and barrier islands and flood plains are not good places to build. Second, you'd better build some pretty good resistant structures wherever you do build. And third, we need to build cities that are convivial, that are more conducive to interaction, that are compact and require less protection — if you're spread out all over creation, you can't build a seawall to protect that."

The agents have already had a follow-up meeting in Rockport and plan to continue their dialogue with the two cities and expand their efforts to include other communities along the Texas coast.

"We'll be up and down the coast, trying to build capacity in this area," Jacob says. "We will continue to engage our Texas coastal citizens in more and better conversations about this issue."

Sea Grant College Program in cooperation with Texas Cooperative Extension, Texas A&M University, the Texas Transportation Institute and certain coastal county commissioners' courts. Its seven county extension marine agents directly serve eight coastal counties, while its eight extension marine specialists, including a National Sea Grant Ports and Harbors Specialist, support the county agents and carry out their own individual projects. Texas Sea Grant specialists focus on the areas of aquaculture; marine business; environmental quality; coastal community development; seafood quality, marketing and economics; marine fisheries; marine education; and marine policy.

Recent activities by the MAS include helping the Texas shrimp industry meet the technical assistance training required for shrimp fishermen to obtain federal trade adjustment benefits, coordinating Clean Marina and Clean Boater programs, promoting and assisting with watersmart landscaping projects, training the state's aquaculture industry, providing a wide variety of marine education opportunities, and providing expertise on coastal community growth and development that balances the economy, public health and the environment.

The Marine Information Service (MIS) communicates the results of Texas Sea Grant research projects and marine safety and other important information to the people of Texas through media releases, public service announcements, brochures, posters, pamphlets, conference and workshop proceedings, books, and its award-winning quarterly magazine, *Texas Shores*. MIS staff members support the administrative, research and advisory functions of Texas Sea Grant through the writing, editing, design, reproduction and distribution of publications; directing a concerted media relations effort; maintaining the program's Web site; preparing reports and proposals; and assisting with seminars, workshops, and exhibits.

MIS publications are distributed across the country and internationally. *Texas Shores* is used in classes at three universities nationally and is distributed to high schools across the state. Recent issues have focused on development in coastal metropolitan areas, Civil War battles fought along the Texas coast, ocean ecology, liquiefied natural gas imports, the findings of the U.S. Commission on Ocean Policy, and the Harte Research Institute for Gulf of Mexico Studies. The magazine's "Coastal Legends" series highlights the contributions of individuals who have played a pivotal role in the development of the marine sciences in Texas, while the "Sea Science" column examines research projects on topics of importance to the Gulf of Mexico.

Other recent publications have included a bilingual poster and table tent describing the dangers of rip currents and how to survive them; a beach safety brochure; a collection of publications — a guidebook, certificate, brochures, reference card, and clean boating tips handout — to support the Clean Texas Marina initiative; *Texas Coastal Ecosystems: Past, Present and Future; Investigating the Marine Environment in the 21st Century*, an 818-page middle school curriculum resulting from a research grant; and collaborative projects with the Texas Commission on Environmental Quality, the Texas Parks and Wildlife Department, the Armand Bayou Partnership, the Galveston Bay Estuary Program, Texas A&M University and the National Sea Grant College Program, to name a few.

Texas Sea Grant file photo.

Research

Texas Sea Grant College Program-sponsored research has revealed much new information about the Gulf of Mexico and coastal Texas, and new and ongoing projects continue to shed light on these important areas.

Texas Sea Grant currently has three main research priorities: coastal ecosystem health, coastal ecosystem development (which has been renamed coastal community and economic development for the next funding cycle) and marine education. Project proposals are submitted by researchers from universities and agencies throughout the state, and are selected for funding through a vigorous peer-review process.

Proposals are being finalized and edited for the next funding cycle, which begins in March 2006 and continues through February 2008. Current, ongoing projects funded during the 2004-2006 biennium, which focus on several areas, including inflow to Texas' bays and estuaries, coastal mapping and hatchery production, are listed below.

Coastal Ecosystem Health

Physical Control of Nutrient Fluxes in Galveston Bay

Ayal Anis and Gary Gill, Texas A&M University at Galveston, and James Pinckney, University of South Carolina

Although there are periodically high influxes of nutrients through the rivers entering the bay, Galveston Bay does not suffer from the large or persistent algal blooms commonly found in other estuaries. The key may be the shallowness of the bay, in which physical processes, such as winds, waves and tides, could have a greater impact. The researchers conducted 11 sampling cruises through July 2005, taking physical, biological and chemical measurements. Each cruise lasted 24 hours to ensure that the researchers captured the daily cycle of surface forcing and tide action; the cruises were also timed to include neap and spring tides. The researchers have begun analyzing the data, which are expected to provide information about physical/biological/chemical interactions that can be used to develop strategies for moderating the impact of harmful algal blooms and for evaluating the effectiveness of current EPA standards for maximum pollutant inflow levels.

Quantifying Groundwater Inputs to South Texas Bays Using a Multiple Tracer Approach

Henrietta Edmonds, The University of Texas Marine Science Institute

Given the aridity of most of the Texas coast and the low amount of surface runoff, the effects of groundwater inflow may be significant to the ecology of Texas' bays. Edmonds is leading a regional study to measure the amount of groundwater — and the chemicals contained therein — flowing into Nueces, Baffin and Mission-Copano bays. In the first year of the project, the researchers sampled all three bays multiple times using naturally occurring geochemical tracers, such as radium isotopes and methane, and direct measurement including seepage meters. They have analyzed the earliest samples, and in the second year of the project they will focus on data analysis and interpretation while continuing the fieldwork and sample analysis. The information from this project will be crucial to effective coastal management and for predicting the impacts of potential future changes in aquifer use or aquifer contamination.

Freshwater Inflows, Productivity and Plankton Community Structure in the Guadalupe Estuary: Use of High-resolution Spatial Mapping and Fixed Station Sampling

Daniel Roelke and Steve Davis, Texas A&M University

As Texas' cities grow, the demand for freshwater increases, resulting in reduced freshwater inflow to Texas' estuaries. Roelke and Davis are studying the effects of varied freshwater inflows in the San Antonio and Galveston bay systems. The researchers are conducting monthly sampling trips to the two bay systems, which began in January 2004 in San Antonio Bay and January 2005 in Galveston Bay. The parameters they are measuring at the fixed stations include phytoplankton and zooplankton community

Photo courtesy Texas Department of Transportation.

structure, primary productivity, community respiration, chlorophyll *a*, dissolved organic carbon, dissolved oxygen, temperature, salinity, turbidity, nitrate, nitrite, ammonium, phosphate and silicate. System-wide parameters measured using high-resolution spatial mapping include chlorophyll *a*, salinity, dissolved organic carbon, transparency and temperature. The researchers will document changes in these parameters as a result of freshwater inflows — pulses that would decrease in frequency and size if the flow of water to these bay systems decreased. Findings from the study will be valuable to water managers and state officials setting policy on water diversion as they work to balance human demands against flows needed to maintain ecosystem health.

Effects of Environmental Variation and Feed Quality on Juvenile Red Drum Performance

William Neill and Delbert Gatlin, Texas A&M University, and Robert Vega, Texas Parks and Wildlife Department

Annually since the mid-1980s, about 30 million juvenile red drum have been grown in hatcheries operated by the Texas Parks and Wildlife Department (TPWD) and released into Texas bays in an attempt to maintain the stock of this important sport and food fish. Among the most difficult problems of juvenile production is exhaustion of forage in the hatchery ponds, leading to the need for premature release of undersized fish that have relatively low survival rates. The researchers are testing predictions from Ecophys.Fish, an ecophysiological simulation model developed in previous Sea Grant projects, about the effects of environmental variation and feed quality on red drum growth and health. Results from the first year of laboratory tests indicate that the low digestible energy of feeds mimicking natural forage can be limiting to the growth of juvenile red drum under conditions of constant high temperature (28-30 degrees Celsius) and air-saturated dissolved oxygen (DO) levels, but that low-energy feeds may promote faster growth than high-energy feeds under a diurnal cycle of temperature and DO. Feed additives such as brewer's yeast, nucleotides and a commercial yeast-based supplement had no major impact on growth. Data from experiments with fish caged in culture ponds operated by TPWD are still being analyzed, but preliminary results seem generally consistent with those observed in the laboratory. Experiments are ongoing, and the results of this project will benefit state and federal agencies responsible for managing marine resources, commercial red drum producers, the scientific community and the public.

Laboratory Studies of Exchange Processes through Tidal Inlets on the Texas Coast

Scott Socolofsky and Kuang-An Chang, Texas A&M University

The circulation of water between the Gulf of Mexico and Texas' estuaries through tidal inlets controls the biology and ecology of the estuaries and impacts numerous native species. The researchers are using the shallow wave basin of the Reta and Bill Haynes '46 Coastal Engineering Laboratory at Texas A&M to investigate large-scale eddy formation and the resulting mixing in tidal inlets as influenced by beach slope and inlet geometry. They have constructed an artificial barrier island and inlet in the lab and recorded the water movement and direction. Future experiments will vary the geometry of the island and inlet, add the effects of a longshore current and surface waves, and mimic the basic geometry of Port Aransas. The analysis of the lab results will help coastal engineers and scientists understand the dominant mechanisms of exchange between open waters and estuaries, assist with fine-tuning of existing computer circulation models, and help with predictions and control of such exchanges.

Coastal Ecosystem Development

Design of Ecologically Rich and Sustainable Tidal Channels within Beneficial Use Marshes

Thomas Ravens and Vijay Panchang, Texas A&M University at Galveston

Many beneficial use islands and marshes are now under development in Texas to mitigate ecosystem losses elsewhere and

PAST AND PRESENT TEXAS SEA GRANT RESEARCH — From top left, Christa Speekmann and Dr. Edward Buskey at The University of Texas Marine Science Institute (photo by Stephan Myers); Dr. Sammy Ray of Texas A&M University-Galveston (Texas Sea Grant file photo); and Dr. Scott Socolofsky and Dr. Kuang-An Chang of Texas A&M University (photo by Cindie Powell).

to provide a place to deposit dredged material. Channels or creeks that allow the inundation and circulation of bay waters through such marshes and that provide plenty of interface between land and water generate healthy and productive ecosystems. However, some preliminary marsh designs in the Galveston Bay area have had insufficient circulation and have been choked by siltation. The researchers' goal is to design tidal creeks for the Bolivar beneficial use marshes, just north of Bolivar Peninsula, with water velocities that are neither too fast — leading to excessive sediment erosion — nor too slow — leading to siltation of the channels. They have studied water velocity and suspended sediment levels in nearby Elm Grove Marsh to develop models of the circulation and sediment transport, have adapted those models to beneficial use marshes and have conducted tests to compare natural marsh sediments to the dredge material that makes up the sediment in beneficial use marshes. They are currently using their models to examine different tidal creek networks, comparing single entrance tidal creek systems such as those seen in natural marshes against multiple entrance creek systems; preliminary results indicate the latter may have better circulation and thus fewer siltation problems.

Quantitative Analysis of Short-term Shoreline Changes Using High-resolution Satellite Imagery and GIS Techniques

Hongxing Liu and Douglas Sherman, Texas A&M University

The combined effect of sea level rise and coastward population migration has made the Texas coastal zone more vulnerable to coastal erosion, floods and frequent hurricanes and tropical storms. Using high-resolution satellite imagery combined with tide gauge data and beach profiles, the researchers are analyzing shoreline change along the Texas coast. In the first year of the research project, they conducted beach profile surveys every two weeks for seven sites along the upper Texas coast. They also developed and tested methods for extracting shoreline information from digital remote sensing images and airborne LIDAR data. In the coming months the researchers will conduct additional field surveys, especially before and after tropical storms and hurricanes, continue to improve the algorithms for shoreline mapping and shoreline change analysis, and complete a software package, freely available to coastal researchers, that will automatically delineate shoreline features from satellite imagery and high-resolution LIDAR data. The project will improve understanding of the magnitude and causes of short-term shoreline variations and provide a scientific basis for formulating coastal management policies.

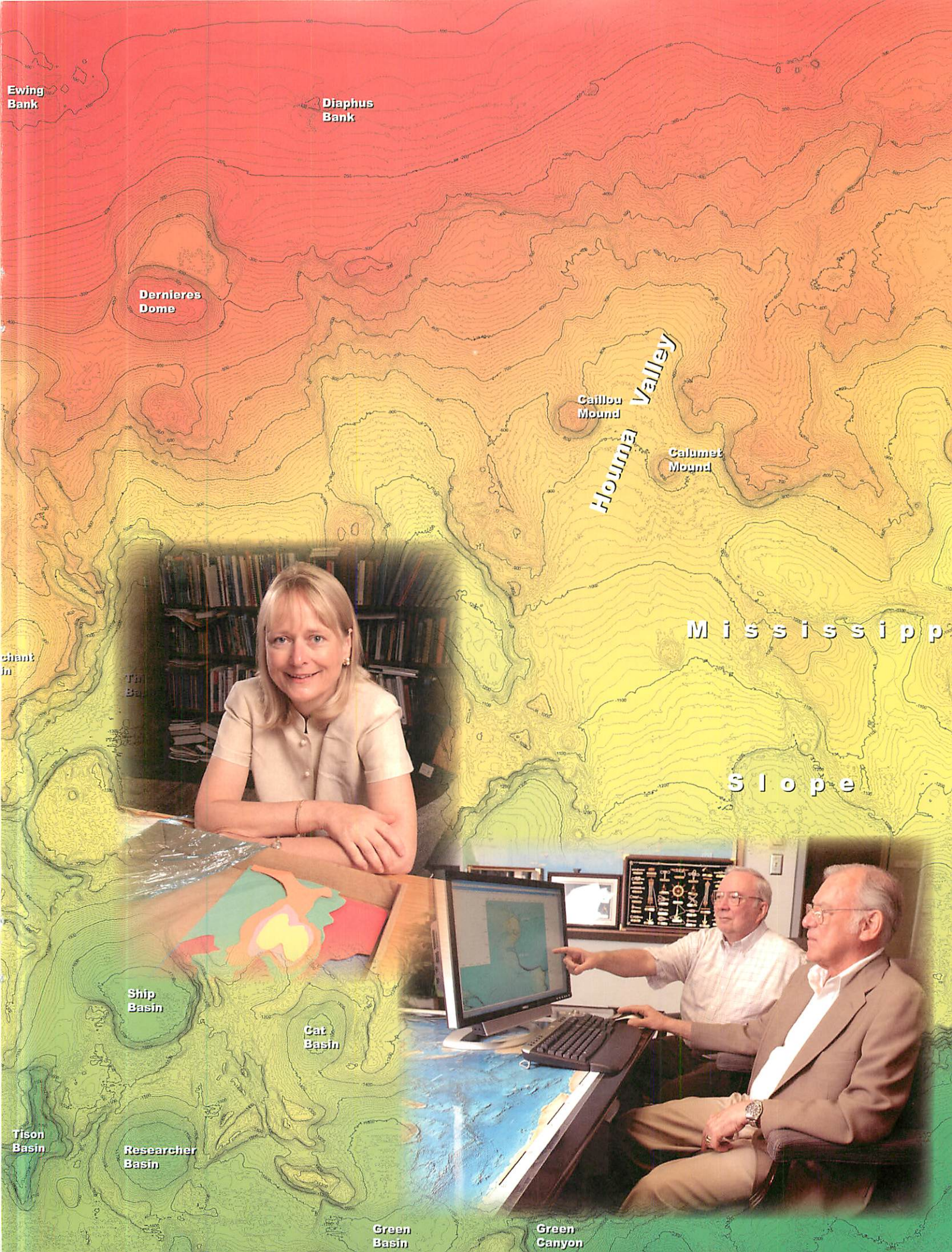
Marine Education

New Bathymetry of the Texas-Louisiana Continental Slope: Education, Research, Engineering, Decisionmaking

Troy Holcombe, William Bryant and Sarah Bednarz, Texas A&M University

The researchers are combining decades of digital bathymetric data and a smaller number of paper records to produce the first detailed, easily readable bathymetric maps of the Texas-Louisiana continental shelf and upper continental slope, including bays and land topography along the coast. In the first year of the project they have worked up much of the bathymetry and are assembling the completed data sets into seamless coverage and smoothing out the contours to correct for digital "noise." The completed bathymetry will be transitioned into the mainstream K-16 education in both Texas and Louisiana through curriculum materials currently being developed, and it will also be made available on CD-ROM and on the Web for applications in ocean engineering and construction, coastal zone planning, environmental decisionmaking, storm impact forecasting, the monitoring of transport/deposition of toxic wastes and the regulation of fishing.

FROM LEFT: Dr. Sarah Bednarz; Dr. Troy Holcombe and Dr. William Bryant. Photos by Mark Beal. Bathymetry image courtesy Holcombe and Bryant.


Ewing Bank
Diaphus Bank
Dernieres Dome
Houma Valley
Caillou Mound
Calumet Mound
Mississipp
Slope
Ship Basin
Cat Basin
Tison Basin
Researcher Basin
Green Basin
Green Canyon

Texas Sea Grant partners with South Padre Island for beach safety awareness

Visitors to South Padre Island are finding it easier to learn more about the dangers of the beach, thanks to an arrangement between the Town of South Padre Island and the Texas Sea Grant College Program.

Texas Sea Grant is responding to a request from the town for 10,000 copies of its bilingual beach safety publication, "Have Fun: But know the dangers of the beach/*Diviértase: Pero conozca los peligros de la playa*," which the town began distributing in summer 2005 to hotel and motel rooms, condos, and numerous retail establishments. Plans call for the city to distribute 10,000 copies each summer.

South Padre Island Mayor Robert Pinkerton Jr. says the brochures are given to everyone who checks in, "and they walk away reading it."

"It is our intention to make this brochure readily available to tourists and other beachgoers throughout the year as part of our effort to communicate effectively with the public, in this instance by providing preventive information about beach safety and thus hopefully decreasing the number of occurrences where medical attention might be needed," Pinkerton says.

South Padre Island City Manager Dewey Cashwell says the publication "helps us do a better job of letting folks know the whole picture of the environment here, and the things that you need to be careful about."

"The brochure captures the message that we need to convey to our guests and visitors — the beach is a wonderful place to recreate and to enjoy the sun and the surf, but with respect for all of the animals and the environment in order to fully have a good time," Cashwell says.

"I just got off the phone with one (hotel manager) this morning who expressed his appreciation for the fact that we've taken such an initiative. The folks at the front desks of the hotels have a good deal to learn as well, and this brochure is extremely helpful for them as well as the visitors. They can learn about the subject matter...and be able to answer questions as well as hand out the material to the people who come to the desk."

Texas Sea Grant also has produced bilingual posters and table tents about the dangers of rip currents that include instructions on how to escape from one. These currents of water cause at least 100 deaths each year at United States coastal and Great Lakes beaches and can sweep even the strongest swimmer out to sea.

A rip current is a horizontal current that does not pull people under the water — it pulls people away from shore. Drowning deaths occur when people pulled offshore are unable to keep themselves afloat and swim to shore.

The rip currents table tents are being distributed to hotels, motels and condominiums and the posters are being distributed to retail locations all along the Texas coast.

These and other safety publications are available from Texas Sea Grant by calling 979-862-3767 or with the order form available online at texas-sea-grant.tamu.edu/pubs/pubcat/catalog.php.

Mini-Grants

The Texas Sea Grant College Program uses Rapid-Response Mini-Grants and Marine Advisory Service Mini-Grants to fund smaller, short-term projects that cover topics that were not anticipated during the approval process for the two-year research funding cycle. They allow the program to respond quickly to problems or opportunities in which a small amount of funding can leverage significant results, including larger research studies in the future.

One research project was funded through Mini-Grants in the past year.

Study of a Possible Link between Drowning and Near-drowning Events and Surf Conditions in South Texas

Philippe Tissot, Texas A&M University-Corpus Christi

An attempt to determine if a relationship exists between meteorological and surf conditions, and drownings and near drownings over the past 20 years along the South Texas coast from Port O'Connor to the Mexican border found that other factors may have a greater impact. The analysis, conducted in collaboration with local National Weather Service staff and beach managers, indicates that while strong and life-threatening rip currents do form along the South Texas coast, particularly near piers and jetties, the meteorological and surf conditions most likely to lead to their formation do not correlate with most of the reported instances of swimmers in distress, drownings and near drownings in the region. The results suggest that other factors, such as the frequent local strong alongshore currents and the consumption of alcoholic beverages before swimming or walking in the surf, may have a greater role in these incidents. The study recommends that the overall beach safety outreach message be broad and include not only the important rip current awareness but also being watchful for strong alongshore currents and a warning to not consume excessive alcoholic beverages before entering the water, not just before swimming.

Photo courtesy Texas Department of Transportation.

Fellowships

Texas Sea Grant College Program fellowships at both the state and national levels offer outstanding opportunities for graduate students to gain valuable experience while providing expertise to government agencies to aid their marine policy or natural resource efforts.

Dean John A. Knauss Marine Policy Fellowship

This year, the National Sea Grant College Program selected four Texas graduate students to participate in the Dean John A. Knauss Marine Policy Fellowship.

Students apply to become Knauss Fellows through one of the 31 Sea Grant programs, which select candidates to sponsor. The final decision is made by a review panel convened by the National Sea Grant Office. While the number of fellowships offered varies with the availability of positions, the Texas Sea Grant College Program has had at least one accepted each year. This is the first time four Texas fellows have been chosen.

Since beginning her fellowship in the office of Dr. William J. Brennan, the National Oceanic and Atmospheric Administration's Deputy Assistant Secretary of Commerce for International Affairs, Kate Willis has traveled to Ulsan, South Korea, for the 57th Annual Meeting of the International Whaling Commission, to St. John's, Newfoundland, Canada, for the Conference on the Governance of High Seas Fisheries and U.N. Fish Stocks Agreement, and to Bali, Indonesia, for the Asia-Pacific Economic Cooperation 2nd Oceans Ministerial Meeting.

Willis, who spent a few years living abroad in Vancouver, B.C., Canada, before applying for the fellowship, said at the time of her selection that she thought her international experiences would help her at International Affairs.

"I thought I could be sensitive to other perspectives, and having worked here has only enhanced that as I have traveled to other countries as a representative of this office and of the U.S. government through this office," she says.

Closer to home, she has made several trips to the United Nations in New York City and has helped with preparations for events such as a NOAA briefing for African embassy staff on regional collaboration and activities for disaster reduction in Africa. She is the point of contact for Brennan's office on the status of legislation concerning the *R.M.S. Titanic*, and she is involved with marine debris-related activities, including helping to coordinate responses to questionnaires, assisting with proposals for NOAA's Marine Debris Program in the Wider Caribbean region, and attending interagency meetings on the subject.

"The goal of the fellowship is to expose recent graduates to a whole other side of marine policy, and I have just learned so much about how things function at this level in government," she says. "It's a whole new world."

Willis, who claims both New York City and Minnesota as home, received a bachelor of arts from Wesleyan University in American studies and a master's degree from Texas A&M University in wildlife and fisheries sciences, which included independent research she conducted on Stellar sea lions in Alaska and British Columbia.

Chad McNutt, who completed his Ph.D. this year from the Department of Biology and Biochemistry at the University of Houston and also holds a bachelor of science degree in marine biology from Texas A&M University at Galveston, is learning the policy side of ocean science in his time in the Office of the Undersecretary, who is the head of NOAA.

In his time in Washington, McNutt has written speeches and made presentations for the NOAA leadership, with subjects ranging from oyster restoration to ecosystem approaches to management, and is providing a staff presence on subcommittees formed as a result of the U.S. Ocean Action Plan, the administration's response to the report from the U.S. Commission on Ocean Policy. He also has written a manual for the Program Coordination Office.

"The office I'm in is a conduit from the head administration to all of the line offices within NOAA," McNutt says. "I wrote the manual on how we perform our jobs — the position is a one-year detail so we have a lot of turnover."

The native Texan says there has been a learning curve in adjusting from his marine science background to the marine policy focus of the Office of the Undersecretary.

"You have to change the way you think about things. In the policy realm, you don't concentrate on the details of the science, you're concentrating on the implications of the science."

Dwight Gledhill is spending his internship at the National Environmental Satellite, Data, and Information Service (NESDIS), Office of Research and Applications Division, Marine Ecosystem and Climate Branch.

"I've been involved in a couple of workshops and meetings involving the impact of rising atmospheric CO_2 on ocean chemistry and its effects on coral reefs," Gledhill says. "I've been working here at Coral Reef Watch in that capacity, since I have a pretty strong background in carbon chemistry. I'm working on developing a coral reef calcification index using satellite data."

Gledhill, who is originally from Connecticut, recently completed a Ph.D. in oceanography from Texas A&M University and has a master of science in the same discipline, also from TAMU. He received a bachelor of science degree in environmental earth science from Eastern Connecticut State University. Like McNutt, he found it necessary to adjust to the different focus in marine policy from his marine science background.

"It's been extremely enlightening to see how a government agency like NOAA applies a business model to direct marine science," he says.

"It is a great experience. For those of us finishing up our degrees, if you're looking for alternatives to academia, this (Knauss Fellowship) is a good avenue to get into a government agency. It opened a lot of doors."

This year's group includes the first Knauss Fellow assigned to work at the National Aeronautics and Space Administration, Jean Ellis, who will defend her a Ph.D. in geography at Texas A&M University in spring 2006. She holds a bachelor of science degree in environmental studies and biology and a master of science in geography from the University of Southern California. Ellis is working at NASA's Science Mission Directorate, Sun-Earth Connection Division.

Ellis is primarily working in two main areas, the coordination of NASA's ocean-related issues and personnel and the NASA research grant process.

"NASA HQ only has five people who work on oceans — I make six — and two of them are administrators," she says. "Given the Ocean Action Plan and all the working groups, committee meetings and reports now required, it is necessary to have someone who is able to be dedicated to these myriad actions. I also attend almost all the interagency meetings and participate in the conference calls, so I am able to brief the NASA officials who were not able to attend or participate."

She has participated in the NASA grants process at all stages from planning and selection of research proposals to fund, to the issuing of grants to scientists and disseminating the results of the research.

"What has been most valuable and most enjoyable to me has been serving on review panels, communicating with the principal investigators and visiting the NASA centers," Ellis says. "In the process I have learned an incredible amount about NASA research and that has broadened my perspective of scientific research in general."

The Dean John A. Knauss Marine Policy Fellowship was established by Congress in 1979 to give a unique educational experience to graduate students enrolled in marine or Great Lakes studies. The program is named in honor of a former NOAA administrator who was one of Sea Grant's founders.

Texas Sea Grant Fellowship Program

Ben Rhame, the fourth recipient of the Texas Sea Grant Fellowship, was headquartered at the Texas General Land Office (GLO), where he worked with the Coastal Resources Division and the Coastal Management Program (CMP) staff on projects ranging from monitoring of beach projects for possible disruption of sea turtle nesting to helping lay the groundwork for regular responses to new federal reporting requirements.

"I was working with the Coastal Management Program, helping them with programs like the Section 309 assessment and strategies — which is the assessment and subsequent planning for nine enhancement areas, including wetlands and coastal hazards, that the CMP does every five years — and the National Coastal Management Performance Measurement System," he says.

The latter is a new federal requirement from NOAA.

"NOAA wanted to develop a measurement system they could use to determine the national impact of the Coastal Zone Management Act (CZMA)," Rhame says. "Congress asked for a tangible product to illustrate program effectiveness, so they developed these performance measures for different areas, like public access."

The project is in its early stages, so Rhame has been getting clarification on NOAA's requirements and researching what will need to be done to comply.

"We have to set up a database to report all of the data and work with all the network agencies that are involved in the CMP, like the Texas Parks and Wildlife Department, to report on their activities."

Rhame spent the first half of his fellowship working on projects involving the endangered Kemp's ridley sea turtle, which in recent years has begun to nest on the beaches of the upper Texas coast. His charge included developing recommendations for sea turtle monitoring programs to prevent potential impacts from beachfront construction projects conducted during sea turtle nesting season and education and outreach efforts.

"I talked to a lot of members of the public and local government along the coast before the sea turtle nesting season this year. I told them about the recent increase in nesting that the Texas coast is seeing, what they should be looking for and who they should call if they do see anything.

"A member of one of the beach maintenance crews I talked to out of the Galveston Parks Board found a nesting sea turtle this year and reported it. The responders were able to recover the nest, which was sent down to the Padre Island National Seashore for incubation and hatching. We at GLO also had arranged to give Texas A&M University at Galveston some funds to do some satellite tagging with nesting sea turtles, and they were able to put the satellite tag on the turtle that was found."

Rhame, who grew up in San Antonio, recently completed a master's degree in marine resources management at Texas A&M University at Galveston and also received his bachelor of science degree in marine biology from TAMUG in 2001. He concluded his fellowship by accepting a permanent position as a program specialist with GLO in September.

Texas Sea Grant launched its statewide fellowship program in 2000. It is patterned after the highly successful Dean John A. Knauss Marine Policy Fellowship program, which is sponsored by the National Sea Grant Program. The Texas program provides a one-year fellowship for a graduate student nearing the completion of a master's or doctoral degree to serve with one of the state's natural resource agencies. Other participating agencies include the Texas Parks and Wildlife Department, the Texas Water Development Board and the Texas Commission on Environmental Quality.

AT RIGHT: KNAUSS AND TEXAS FELLOWS — Clockwise from top left, Knauss Fellow Jean Ellis (photo courtesy NASA/Renee Bouchard); Texas Fellow Ben Rhame (photo courtesy Texas General Land Office); Knauss Fellow Chad McNutt (photo courtesy NOAA/David Brenner); Dr. William J. Brennan, NOAA's Deputy Assistant Secretary of Commerce for International Affairs, with Knauss Fellow Kate Willis (photo courtesy Willis); and Knauss Fellow Dwight Gledhill (photo by Tyler Christensen).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Directory

2700 Earl Rudder Freeway South, Suite 1800
College Station, Texas 77845
(979) 845-3854
FAX (979) 845-7525
http://texas-sea-grant.tamu.edu

ADMINISTRATION

Dr. Robert R. Stickney (979) 845-3854
Director
stickney@neo.tamu.edu

Peggy Foster (979) 845-1245
Assistant to the Director
pfoster@neo.tamu.edu

Lynn Propes (979) 845-3854
Staff Assistant
lpropes1@neo.tamu.edu

Terry Poehl (979) 845-3854
Fiscal Officer and Business Manager
tlpoehl@neo.tamu.edu

Jennifer Channing (979) 847-8978
Financial Assistant
jen_channing@neo.tamu.edu

Bianca Whitaker (979) 204-2741
NOSB Regional Coordinator
whitakeb@tamug.edu

Alan Bunn (979) 845-3855
Regional Manager NOAA/NOS/Sea Grant
alan.bunn@noaa.gov

MARINE INFORMATION SERVICE

Amy Broussard (979) 845-3854
Associate Director and MIS Director
abrouss@neo.tamu.edu

Jim Hiney (979) 862-3773
Texas Shores *Editor*
bohiney@neo.tamu.edu

Cindie M. Powell (979) 862-3770
Assistant Editor
cpowell@neo.tamu.edu

Eric Graham (979) 862-3774
Webmaster and Computer Technician
egraham@neo.tamu.edu

Crispin Morin (979) 862-3767
Distribution Manager
fatboy2005@neo.tamu.edu

MARINE ADVISORY SERVICE

Ralph Rayburn (979) 845-7526
Associate Director and MAS Leader
Marine Policy Specialist
ralph-rayburn@tamu.edu

Marine Agents

Logan Respess (361) 790-0103
Aransas County
301 North Live Oak
Rockport, Texas 78382
FAX (361) 729-3937
l-respess@tamu.edu

Richard Tillman (979) 864-1558
Brazoria County
21017 County Road 171
Angleton, Texas 77515
FAX (979) 864-1566
r-tillman@tamu.edu

Bill Harvey (361) 552-9747
Calhoun County
P.O. Box 86
Port Lavaca, Texas 77979
FAX (361) 552-6727
wdharvey@ag.tamu.edu

Tony Reisinger (956) 361-8236
Cameron County
650 East Business Highway 77
San Benito, Texas 78586
FAX (956) 361-8240
e-reisinger@tamu.edu

Julie Massey (281) 534-3413
Galveston County
5115 Highway 3
Dickinson, Texas 77539
FAX (281) 534-4053
jk-massey@tamu.edu

Terrie Looney (409) 835-8461
Jefferson and Chambers Counties
1295 Pearl Street
Beaumont, Texas 77701
FAX (409) 839-2310
tslooney@tamu.edu

John O'Connell (979) 245-4100
Matagorda County
2200 7th St., 4th Floor
Bay City, Texas 77414
FAX (979) 245-5661
j-oconnell@tamu.edu

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Marine Specialists

Granvil Treece (979) 845-7527
Aquaculture Specialist
Texas Sea Grant College Program
2700 Earl Rudder Freeway South, Suite 1800
College Station, Texas 77845
FAX (979) 845-7525
g-treece@neo.tamu.edu

John Jacob (281) 218-0565
Environmental Quality/Coastal Community Development Specialist
17000 El Camino Real, Suite 301
Houston, Texas 77058
FAX (281) 218-6352
jjacob@tamu.edu

Russell Miget (361) 825-3460
Environmental Quality Specialist
Natural Resource Center 2800
6300 Ocean Drive
Corpus Christi, Texas 78412
FAX (361) 825-3465
rmiget@falcon.tamucc.edu

Dewayne Hollin (979) 845-3857
Marine Business Management Specialist
Texas Sea Grant College Program
2700 Earl Rudder Freeway South, Suite 1800
College Station, Texas 77845
FAX (979) 845-7525
dhollin@neo.tamu.edu

William Younger (979) 863-2940
Marine Education Specialist
P.O. Box 18
Matagorda, Texas 77457
FAX (979) 863-2598
w-younger@tamu.edu

Gary L. Graham (979) 345-6131
Professor and Marine Fisheries Specialist
Texas Sea Grant College Program
P.O. Box 1125
West Columbia, Texas 77486
FAX (979) 345-6131
taex-grahamg@wcnet.net

Jim Kruse (713) 686-2971
Ports and Harbors Specialist
710 North Post Oak Boulevard, Suite 430
Houston, Texas 77024
FAX (713) 686-5396
j-kruse@ttimail.tamu.edu

Michael Haby (361) 265-9203
Seafood Specialist
Texas A&M Agricultural Research and Extension Center
10345 Agnes Street
Corpus Christi, Texas 78406
FAX (361) 265-9434
m-haby@tamu.edu

RESEARCHERS

Contact information for the lead Principal Investigator of each research project.

Texas A&M University

Dr. Troy Holcombe (979) 845-3528
tholcombe@ocean.tamu.edu

Dr. Hongxing Liu (979) 845-7998
honxing-liu@tamu.edu

Dr. William Neill (979) 845-5759
w-neill@tamu.edu

Dr. Daniel Roelke (979) 845-0169
droelke@tamu.edu

Dr. Scott Socolofsky (979) 845-4517
socolofs@tamu.edu

Texas A&M University at Corpus Christi

Dr. Philippe Tissot (361) 825-3776
philippe.tissot@tamucc.edu

Texas A&M University at Galveston

Dr. Ayal Anis (409) 740-4987
anisa@tamug.tamu.edu

Dr. Thomas Ravens (409) 740-4919
ravenst@tamug.tamu.edu

The University of Texas Marine Science Institute

Dr. Henrietta Edmonds (361) 749-6772
edmonds@utmsi.utexas.edu

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For additional copies, contact:
Texas Sea Grant College Program
2700 Earl Rudder Freeway South, Suite 1800
College Station, Texas 77845
or visit the web site at http://texas-sea-grant.tamu.edu

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