

MX964239, “Dickinson Bay and Tabbs Bay Debris Removal and Restoration”

Recipient: Galveston Bay Foundation

GMPO Project Officer: Jerry Binninger

The Galveston Bay Debris Removal Project aimed to remove large marine debris from Galveston Bay, its sub-bays, and tributaries, thereby allowing safer access to open water areas for boaters and anglers; improving water quality by increasing water flow and circulation; enhancing marsh and open water habitats for fisheries production; and improving the Bay’s appearance for all users of the Bay.

As a direct result of this project 4 abandoned barges were removed from Dickinson Bay/Bayou and a previous island/wetland project was completed, Dickinson Bay Island. This project also had significant indirect results. The most important of which was bringing to the attention of GLO and USCG that one abandoned barge had close to 15,000 gallons of oil sludge onboard. GLO and USCG worked together to get the oil sludge removed, which allowed that barge to also be removed from the bay by a local shipyard. Also, GBF was able to work with Texas Parks and Wildlife to have two abandoned boats removed from or nearby one of its own properties, Sweetwater nature Preserve.

GBF removed 4 abandoned barges in Dickinson Bay and assisted in the removal of approximately 14, 569 gallons of oil sludge found in one of the barges holding tanks.

GBF experienced vessel abandonment on it’s own Sweetwater Nature Preserve on Galveston Island. In April a small Boston Whaler was reported (dumped) on the Preserve by residents of the adjacent neighborhood. Fortunately GBF was able to research the owner of the vessel and contacted them directly for removal from the Preserve Property.

Neighbors reported a home built houseboat abandoned in Sweetwater Lake within GBF’s Sweetwater Nature Preserve. Neighbors reported to GBF the person who placed the vessel within Sweetwater Lake and GBF worked with Galveston County Sheriffs Department Environmental Crimes Unit, and Texas Parks and Wildlife Department enforcement, to have the responsible party remove the vessel.

Completed the habitat restoration of Dickinson Bay Island. The initial restoration of Dickinson Bay Island was partially funded by EPA-Gulf of Mexico Program cooperative agreement MX-96401604-0. The completion of this restoration included shaping the remainder of the island’s NW arm and placing approximately 750 tons of rip-rap along the newly shaped arm for stabilization.

MX974503, “Reducing Onsite Sewage Treatment System Impacts in the Suwannee River Basin”

Recipient: FL Department of Health

GMPO Project Officer: Drew Puffer

The objectives of the study were to retrofit the two onsite systems investigated in Phase I of this study with nitrogen reducing systems and evaluate their performance and effect on groundwater. The following are some additional observations and conclusions:

This study benefited from and was influenced by upgrades the State Park implemented concurrently at the two bathhouses. Two changes relative to phase I stemming from these

upgrades were the use of low-flow fixtures in the bathhouses and the use of lift-dosing instead of gravity to feed the monitored drainfields. The use of low-flow fixtures has likely increased the concentration of nitrogen in the effluent, but is not expected to have changed the mass of nitrogen discharged in the sewage.

The treatment technologies eventually selected for this project represented the two approaches currently outlined in state law for the protection of the Suwannee River flood plain: an aerobic treatment unit with combined activated sludge/fixed film technology that has extensive documentation on its nitrogen reduction capability available and has been commonly installed as performance-based treatment system for this purpose, and an extended aeration aerobic treatment unit that is lacking such documentation.

Retrofitting of the existing systems had to contend with site constraints based on prior construction. The use of existing old drainfields was part of the design of the study to allow comparison to Phase I. The reuse of the existing septic tanks as trash compartments for the treatment units resulted in trash tanks that are about twice as large as would usually be the case for new system construction. There was no indication that the trash tanks resulted in a lack of food for the aerobic treatment units, though, and the experience over the course of the project suggested that campground bathhouses generate a large amount of solids appropriate for a larger trash tank.

A first attempt to install a treatment unit in the first chamber of the existing tank did not result in successful treatment. At least for situations such as encountered in this study, retrofitting for additional treatment appears to require at least an additional tank for the treatment unit. Thorough maintenance appears key to ensuring effective treatment by at least the extended aeration treatment unit at Magnolia II. Samples taken on three occasions in 2006 and 2007 showed that total nitrogen in the ATU-effluent ranged from 73 to 120 mg/L, with little evidence of cBOD5 and TSS removal, nitrification and nitrogen removal relative to septic tank effluent concentrations ranging from 71 to 150 mg/L total nitrogen at the same times. Two of three other aerobic treatment units of the same manufacturer that were installed at park restrooms were sampled in 2007 and showed a similar lack of nitrification. In contrast, a sample taken at Magnolia II after a thorough maintenance visit in June 2008 that addressed the functioning of air diffusers showed nearly complete nitrification and a total nitrogen concentration of 66 mg/L.

A more thorough inspection and possibly training protocol that is shared between the owner of the system, the maintenance entity and the regulatory agency may help to detect sub-optimal performance more quickly. The lack of treatment discussed in the previous point occurred even though the aerobic treatment unit appeared to be working as indicated by the running of the aerator, except for some overheating problems observed by park staff.

Outside the direct scope of this project, park management reported and DOH staff observed a variety of problems related to the functioning of the pressure dosing system installed as part of the park service-initiated upgrade. Some of these problems appeared unique to the size and design of the particular systems involved.

For the continued operation of the bathhouses it proved useful to have the research project drainfields remaining as a gravity-fed backup to the pressure-dosed systems. This benefit has to be considered against the lack of treatment obtained during such periods. In addition, the

continued use of the old existing drainfield resulted in residual nitrogen concentrations in the monitoring wells that had the potential to confound an evaluation of the treatment effect. Septic tank effluent contained nearly exclusively reduced forms of nitrogen (TKN) with 56 to 95% of that concentration being present as ammonia-nitrogen.

Nitrogen concentrations in septic tank effluent from the two systems frequently exceeded Florida's limit of 100 mg/L TKN for domestic sewage and was by a factor of two to four higher than average values in domestic sewage found in prior Florida studies. In part this high concentration is due to the use of low-flow fixtures and may indicate a broader change in domestic sewage composition. Total phosphorus concentrations ranged from 9 to 33 mg/L and showed some elevation relative to previous study results. cBOD5, ranging from 92 to 220 mg/L, and TSS, ranging from 38 to 126 mg/L did not show a similar increase, indicating that septic tanks retain their effectiveness for the reduction of these parameters with more concentrated sewage.

MX964660, "Arkansas NRC Lower Mississippi River Basin"

Recipient: Arkansas Natural Resources Commission

GMPO Project Officer: Phil Bass

The objectives in this review of information related to the Gulf of Mexico hypoxia situation were: 1) To identify watersheds which drained to the Mississippi in its lower region which included portions of Tennessee, Missouri, Arkansas, Mississippi, and Louisiana; 2) To identify sources of data from either EPA (Environmental Protection Agency) or states that could be used to estimate loads of phosphorous or nitrogen be transported to the Mississippi River and the Gulf of Mexico; 3) To summarize data found, identify strengths or weaknesses in data sets, and report by watershed, season, and month each variables related to water quality parameters of interest; 4) To use such data to identify which watersheds were greatest contributors of these nutrients; 5) To select a watershed to try to identify discharge point contributions to nutrient loading and to estimate what fraction of loading comes from both point source and nonpoint source contributors; and, 6) To identify practices being implemented within watersheds to reduce nutrient loading.

Efforts resulted in various challenges as we worked to assemble data on nitrogen and phosphorus nutrients that would impact the Mississippi River system and contribute to the hypoxia problem in the Gulf of Mexico. This narrative will basically walk the reader through the many steps that have been taken and the results of the searches, along the way.

To start, the recipient worked through state maps, identifying all the streams and their tributaries within watersheds that would directly feed into the Mississippi River in Missouri, Arkansas, Tennessee, Mississippi and Louisiana. These streams were followed step by step through each of the counties they crossed. All the counties associated with those streams and their watersheds were identified and recorded. At this point, the recipient went to the EPA STORET, a data base that states and agencies, both federal and state can contribute to, to search and download information related to water quality monitoring efforts in each identified watershed. It was then found that the website itself is not particularly user friendly but a call to the website help line proved beneficial. Downloading the information into an Excel file takes several involved steps and no directions for downloading into an Excel file are available on the website. We searched and downloaded the information, by initially finding the HUC (watershed)

codes for each county and then searching by county, and then later by searching by watershed. As our searches progressed, it became apparent that the best method was to not involve county information but instead focus on entire watersheds associated with the Mississippi River or its tributaries. All the associated HUC data were recorded for the areas queried and any streams with overlapping HUC codes were noted. Then all EPA STORET data for the HUC codes were downloaded and converted to Excel files. It was determined after searching several ways, that the most efficient way to search the EPA data was to search by watershed, and then select any and all parameters for nitrogen and phosphorus from the STORET dropdown menu, as they were often entered in many different forms; for example Nitrogen as N, Nitrates, Nitrites, Total Ammonia as N etc. This method insured that there was actually data returned from the search. Otherwise data would often not be returned simply due to a discrepancy in semantics.

Data for each watershed is placed under the appropriate state category and displayed by HUC Code. A map precedes each summary of water quality data displaying the location of the watershed within the appropriate state(s). STORET data were used to calculate mean values and numbers of measurements taken (n) by season for each variable for each watershed where data were available. Following each set of seasonal statistics, data are presented for each variable with monthly means and n values. Arkansas data were not collapsed into an overall watershed value, but are reported as described above for STORET data, except mean values and n values are reported for each water quality station within the HUC code. These data indicate that no consistency in how many times a stream is sampled within a month, season or year exists. In most cases only a single data point is collected in any given month, if at all. Hence we combined data for all years in the STORET data and the Arkansas data to be able to derive a mean. Following the information presented for each watershed, we have included a table which lists all watersheds reviewed. For each listing the seasonal minimum values, maximum values, and standard deviations are provided. These data were derived from the same data sets used to calculate the seasonal averages and n values displayed for each parameter for each watershed. Hence for any entry within the watershed presentation, there is a row of data in the table referenced which contains additional statistical information (minimum, maximum, standard deviation). We were unable to ascertain which watersheds might be the greatest contributors of nutrients from these data sources. Another problem with the data was that there was no measure of stream flow during the monitoring event. One would have to review U. S. Geological Survey records of stream flow to be able to identify volumes of water passing a stream point during the sample period. We had hoped to be able to look at water quality data for a specific watershed and compare nutrient volumes at monitoring sites with dischargers above each water quality station and thereby gain some idea of loading from individual sources. Once this was to be accomplished and measures of nutrient amounts determined, we hoped to be able to ascertain what remaining nutrient loading values were then contributed by nonpoint source pollution. However due to lack of reporting requirements for dischargers, this effort proved to be futile.

MX964256, "Louisiana Exotic Invasive Species Symposium"

Recipient: LA Universities Marine Consortium

GMPO Project Officer: John Bowie

The Invasive Species Symposium funded by this Grant was a natural followup to the Invasive Species Assessment. The symposium and workshop. "Aliens in the Estuary", was held on June 30 and July 1, 2009 at Barataria National Refuge south of New Orleans. It provided the perfect

opportunity to raise awareness of K-12 educators and public about aquatic invasive species in general, to teach about the species threatening the Estuary, and to suggest that every individual has a responsibility to prevent and control their spread. While we might not have enough funding or controls to completely eliminate these species and prevent change within the ecosystems, through education and outreach, we can raise awareness and stimulate understanding of resource impacts and use of "best practices" to control the introduction and spread of invasive species.

MX964490, "Coastal Expos: Increase Public Awareness of the LLM, CCB, and GB Ecosystems"

Recipient: Texas Parks & Wildlife Department

GMPO Project Officer: Jerry Binninger

Goal I: Educational material and activities will be developed and tailored for the classroom to be used in conjunction with Coastal Expos. These can also be tailored for the rest of the Gulf of Mexico. These materials will be correlated to the TEKS.

Outcome:

Educational materials and activities were tailored for the classroom and were correlated to the TEKS for 4th, 5th, and 6th grades in Science, English Language Arts and Reading, Mathematics, Social Studies, Physical Education, and Career Orientation (See Appendix I). Correlating these lesson plans/activities to the TEKS allows them to be utilized in the classroom. These components are available to teachers and environmental educators for their use prior to their classes or youth groups participating in a Coastal Expo event. This creates the opportunity to promote an even greater awareness and understanding of coastal ecosystems by being able to preview and review these concepts.

One of the milestones/final products that were supposed to be achieved with this grant was to translate some if not all of these materials and activities into a second language. TPWD originally made arrangements with the Gulf of Mexico Foundation to translate materials into Spanish. However, the Gulf of Mexico Foundation decided not to translate these materials without a substantial fee which was not feasible within the constraints of this budget. Since most of these materials were developed for the classroom and would be predominantly utilized by teachers who spoke English or were bi-lingual it was deemed not necessary at this time to translate these materials into Spanish. There are materials that were developed specifically to use at Coastal Expo events for the public and these should be translated into Spanish. The coordinator is currently working with TPWD staff to ensure these materials will be translated into Spanish in the near future.

Goal II: Pre- and post- event tests will be given to students to measure the effectiveness of the educational materials.

Outcome:

Pre- and post- assessment tools were developed to measure the effectiveness of the educational materials (See Appendix II). However, one of the issues that arose during this grant period was the poor economy. As a result, most schools severely limited or completely cut their funding for field trips. This was an unforeseeable issue and few schools actually participated in these events. The tests were not given to students to effectively measure the educational materials.

Goal III: Three new Coastal Expo kits will be developed specifically for Lower Laguna Madre, Texas Coastal Bend & Bays, and Galveston Bay and will be available to local communities to host their own Coastal Expos.

Outcome:

The Coastal Expo kit contains instructions and educational materials necessary for conducting Coastal Expo activities. It is ideal for teachers wanting hands-on educational activities for their classrooms, organizations that would like to include coastal activities in their event, or a community interested in hosting its own Coastal Expo. Coastal Expos are designed for the target audience of children in 4th-6th grades, but kids of all ages can enjoy the activities. These resources are available in the Coastal Expo Protocol (See Appendix III) which is provided with each kit.

Additionally, the Coastal Expo kit contains a Coastal Expo Additional Information CD. This CD contains the following information to assist with specific activities: Take Me Fishing Guide (Backyard Bass activity); Coastal Wetlands Species Fact Sheet Set (Beach Goodies activity); Bug Picking Data Sheet and Instruction Sheet (Bug Picking activity); and 30 Years of Investigating Fish and Wildlife Kills in Texas (Mystery Fish Kill activity), Kills and Spills Team Information; and Red Tide Mystery Fish Kill (with additional and background information for the Mystery Fish Kill Game).

Four new Coastal Expo kits were created for this project. These kits are located in Brownsville, Dickinson and Matagorda, TX. The fourth kit is located at the Gulf of Mexico Foundation with the Science & Spanish Club program (<http://www.gulfmex.org/multiculture.htm>) because these clubs are utilizing this kit to host Coastal Expo events in their local communities. These additional kits bring the total kits that TPWD has available to provide to the public to nine. The other kits are located in Austin, Corpus Christi, Lake Jackson and Weslaco. During this grant period, Coastal Expo kits were loaned out to conduct 12 outreach events ranging from school festivals, classroom programs, Boy Scout projects, church festivals, museums and summer camps.

Goal IV: Fifteen Coastal Expos will be held during the project period. Five will be held in each of the project areas.

Outcome:

Over the period of this grant, 21 Coastal Expo events were conducted across Texas reaching over 38,000 Texans with 60% being minorities. This was made possible because of the commitment of time and resources from our partners and volunteers (See Appendix IV).

Five Coastal Expo events were conducted in the Lower Laguna Madre coastal area reaching 13,250 people. These events were held in Harlingen, Edinburg, and Killeen. Killen is not located directly in the designated coastal area. However, it is a part of the Lower Laguna Madre watershed. It is very important to also educate those living upstream about the effect they have on coastal areas downstream (See Appendix V).

In the TX Coastal Bend & Bays coastal area, conducted 8 events in Bay City, Kingsville, Victoria, and Marble Falls. As a result, TPWD reached 9,450 community members. Bay City and Kingsville

are within the designated coastal areas. Victoria and Marble Falls are within the TX Coastal Bend & Bays watershed (See Appendix VI).

Eight outreach events were also conducted in Waco, Kemah, Freeport, Crosby, Houston, and Sugar Land within the Galveston Bay watershed. Overall, 13, 610 people attended the Coastal Expo events (See Appendix VII).

These outreach events were successful in part because of building strong partnerships with local government agencies, nonprofits and other community groups. Through partnerships with 15 different agencies in local communities, TPWD fostered stewardship to protect, restore, and responsibly utilize valuable Gulf resources. These partners included U.S. Fish & Wildlife Services (USFWS), Lower Colorado River Authority (LCRA), Galveston Bay Foundation, Dow Chemical, and the Freeport and Bay City Lions Club. Using these partnerships, TPWD was able to leverage in-kind contributions to assist with funding the Coastal Expos. These events would not even be possible without the in-kind contributions provided by our volunteers. Volunteers included Texas Master Naturalists, Texas Master Gardners, Lions Club members, and college and high school students. Over 1,080 volunteers provided 4,200 hours of service. This is valued at \$85,596.75 based upon the Independent Sector's value of a volunteer hour at \$20.25 (See Appendix VIII).

Coastal Expo also partnered with other TPWD programs to foster stewardship of our natural and cultural resources along the Texas coast. Internal partners include Sea Center Texas, Angler Education, Boater Education, Hunter Education, Urban Outdoor Programs, Aquatic Education and local Coastal Fisheries, Inland Fisheries, Wildlife, State Park and Law Enforcement staff. All of these partnerships allow Coastal Expo to provide the public with opportunities to learn from experts about environmental and conservation issues.

Goal V: The number of participants will be counted to determine the number of people and the number of minorities reached during these events.

Outcome

Over the period of this grant, 21 Coastal Expo events were conducted reaching over 37,000 Texans. Sixty percent of these participants were minorities; predominantly Hispanic, African American, and Asian.

MX964235, "Conservation Area Plan For The Lower Pearl River Watershed"

Recipient: MS Department of Environmental Quality

GMPO Project Officer: Lael Butler

The Mississippi Department of Environmental Quality (MDEQ) is working to continue its support of the U.S. Environmental Protection Agency's (USEPA) initiatives to improve water quality in coastal areas by developing plans for watershed restoration actions to restore beneficial uses for impaired coastal water body segments. MDEQ completed a Conservation Area Plan (CAP) for the Pearl River with support from other funding sources. The CAP was formulated as a first iteration to identify important conservation elements within the system. The primary boundary conservation area for the CAP included the Pearl River floodplain and along the major tributaries within the Pearl River watershed, and South to the Rigolets. The area also captured adjacent slope forest to conserve an important conservation target. The secondary boundary included

the Pearl River, its tributaries and the entire watershed up to the Ross Barnett Reservoir. The conservation targets included species and communities that were representative and measurable. They included resident riverine aquatic fauna, anadromous/catadromous fishes, lateral aquatic habitats, swallow-tailed kite, bottomland forest complex, emergent marsh complex, and slope forest complex. The threats or sources of stress are conditions or activities that negatively impact conservation targets.

MDEQ worked to implement the Conservation Action Plan developed for the Pearl River and several of its tributaries. The scope of TNC's contract included collaboration with other groups and agencies to begin implementing five of the top strategies for the Conservation Action Plan. These strategies included: conducting a watershed assessment (geomorphic and sediment assessment); formation of a Lower Pearl River Conservation Alliance; implementation of Best Management Practices (BMPs) by the sand and gravel mining industry; research on the removal or adaptation of the low water sills in the Lower Pearl River; and acceptable hydrological flow management by dams and reservoirs on the Pearl River.

The major outcome of this project was the completion of a watershed assessment to effectively target BMPs and identify the reach location and sources of excess sedimentation and channel instability.

MX954138, "Gulf of Mexico Alliance Coastal Monitoring Survey"

Recipient: FL Department of Environmental Protection

GMPO Project Officer: Jeanne Allen

The GOMA Water Quality Monitoring Catalog application, referred to as the GOMA WQM Catalog application, consists of a database, a data connection layer, a plug-in module for the NASA COAST Geobrowser and the necessary servers, services and supporting software to give the components connectivity and communication capabilities. The data was supplied by the various organizations and programs obtained through the Water Quality Team's State Leads and consisted of 72 programs run by 23 organizations with 1574 reporting stations throughout the Gulf of Mexico.

The GOMA WQM Catalog application was iteratively designed and built to test functionality and incorporate user input. The final version of this phase (I) of the application was put into service in April, 2009. The application is capable of displaying the following three categories of analytes for monitoring programs per the requirements of the GOMA Nutrients Team: programs collecting chlorophyll, physical/chemical, and/or nutrient parameters, as well as the relative frequency of collections for each program. This information (metadata) is provided in the application both as a graphic, iconic representation on a map and also as text. An on-screen search menu enables a user to enter search criteria based on the geospatial location, analyte category and frequency of monitoring which will return a set of geo-located icons to the COAST mapping interface, an on-screen text block of summary metadata, and a comma-delimited file with text query results from the database.

MX964230, “Remote Sensing of Onsite Sewage System Impacts on Surface Water Quality”

Recipient: FL Department of Health

GMPO Project Officer: Drew Puffer

Optical brighteners, found in most laundry detergents, give off visible light when exposed to ultraviolet light (a form of fluorescence) and do not occur in unpolluted waters. Therefore, positive identification of optical brighteners in water can provide indisputable evidence of human wastewater sources. This project was designed to evaluate the potential of using this technique in the field before using remote sensing by aircraft. Water samples were excited with light of various wavelengths and the resulting fluorescent light emitted was measured. Optical properties of several detergents and spikes of detergents in samples were also determined. The results suggested that most detergents had a specific response that could be used as a tracer of wastewater, however that response was not necessarily caused by the optical brightener. Additional work is needed to identify the class of compounds responding. Further analysis found that field methods based on two factors, one representing the detergent signal of wastewater and one adjusting for colored dissolved organic matter, are feasible. The field, laboratory and data analysis work of this project was implemented in two phases by the Southwest District Office of the Florida Department of Environmental Protection (Sampling) and Mote Marine Laboratories (Analysis of Optical Properties): Phase I extended from January 2006 through December 2007 (Appendix A and B). Phase II extended through August of 2008 (Appendix C and D). The final report incorporates summaries of the reports provided to the Florida Department of Health over the course of this project.

MX964514, “A Study of the Benefits of Landscape-Scale Oyster Restoration in East Mississippi Sound”

Recipient: The Nature Conservancy

GMPO Project Officer: Drew Puffer

This Final Report from The Nature Conservancy (TNC) covers the project period of December 1, 2006 through November 30, 2009, representing Phase 1 and Phase 2 of this grant project. Phase 1 involved a 14-acre subtidal oyster reef restoration project in Back Bay, Biloxi, MS and Phase 2 involved the installation of 100 meters of oyster reef breakwater along an eroding shoreline at Helen Wood Park, Mobile, AL . In conclusion, this project restored approximately twenty-four acres of oyster reef habitat over two project sites: one in Back Bay Biloxi, Mississippi and the other in Mobile Bay, Alabama. The Alabama project site had four outreach events, used 30 volunteers to help install alternative reef structures, and was featured in a front page article in the Mobile Press Register newspaper.

MX964836, “Strengthening the Gulf of Mexico Alliance: Enhancing Local Capacity to Reach Underserved and Underrepresented Populations”

Recipient: LA Universities Marine Consortium

GMPO Project Officer: LaKeshia Roberston

This project gave birth to four mini-grants that focused on improving environmental literacy among the underserved and underrepresented students/communities. The mini-grant recipients were successful in exposing the students/communities to activities that increased their understanding of the environment. However, it was noted that additional projects that focus on underserved and underrepresented populations are needed. The mini-grant recipients gained much insight on the process involved in writing strong funding proposals to advance their

work. The PI developed an underserved and underrepresented website to maintain continuity among all parties involved in this cooperative agreement. The website also contained information on projects that invited public participation. In short, results of this project is an enhanced understanding of citizens in the targeted communities in FL, LA, MS, and TX and a conclusion that additional projects that advance environmental understanding of underserved and underrepresented populations are needed.

MX964486, "Lake Pontchartrain Basin Water Quality Monitoring Program"

Recipient: Lake Pontchartrain Basin Foundation

GMPO Project Officer: Troy Pierce

The Bogue Falaya, Tchefunte & Tangipahoa Rivers were removed from LA impaired water bodies list [303(d) list] via this project's monitoring results and partnerships to bring small sewer package plant owners into compliance as well as promoting dairy lagoon installation and management. Previous Gulf of Mexico Program Funding helped remove Lake Pontchartrain from the impaired list as well in 2006. Pontchartrain Beach is now tested under the LDHH Beach Program.

Public outreach with results of monitoring reaches approximately the following: www.saveourlake.org 10,000 visitors with 30,000 page views per month; WWL TV 75,000 to 100,000 viewers/month (beach results on TV); and, The Times-Picayune Weather Page-weekly (daily circulation 159,000). Media inkind estimated at \$50,000/year.

MX964761, "Gulf Alliance Estuarine Nutrient Criteria Workshop"

Recipient: MS Department of Environmental Quality

GMPO Project Officer: Lael Butler

This Cooperative Agreement (CA) was funded to support the Gulf State representatives for their travel, attendance and interaction to advance the development and implementation of regional nutrient characterization studies in support of pilot numeric nutrient criteria.

The CA funded approximately seventy-five State personnel participation (at a total of eleven separate) workshops or conferences where significant interaction, partnership and work sharing occurred. For example, a key result of this CA and the diligent work of the State participants and Federal partners is the development of a "Nutrient Criteria Research Framework" - a scientific document created by the participants to standardize (where possible) the scientific field work needed to support the development of pilot nutrient criteria for an estuary. See <http://www2.nos.noaa.gov/gomex/nutrients/welcome.html> for more information.

The workshops and conferences also produced a "Coastal Nutrient Reduction Strategy Template" for possible application by the coastal States. It can also be viewed at the website listed above. By providing needed funding, this CA was an integral part in bringing the States together to work on a common goal with shared ideas, experience, data and accomplishments; thus advancing the development of nutrient criteria for all participating states.

MX964493, “A Northern Gulf of Mexico Coastal Observing System”

Recipient: Dauphin Island Sea Lab

GMPO Project Officer: Diane Altsman

Project Results: The primary goal of web access to real time information on meteorological and hydrographic conditions in Mobile Bay from early 2007 to the end of 2009 was accomplished, with data continuously available from stations at Dauphin Island, Meaher Park and Middle Bay. This groundbreaking access to real time data on hydrographic conditions within the bay extended one year beyond the original proposal at no extra cost to the Gulf of Mexico Program. The extra year of monitoring was made possible by the generous support of several agencies that supplemented the GOMP funding:

Mobile Bay National Estuary Program (\$45,000+data management)

USA Oyster Restoration Project (\$49,869)

USA’s Dept. of Meteorology (\$5,000 in equipment and recalibration)

ADCNR Marine Resources Div. (\$91,302)

Many organizations could not contribute funding but still were able to provide and receive significant support through partnerships.

Louisiana Universities Marine Consortium (programming, moral support and an outstanding example of how to do it)

Gulf Coast Mesonet (data and technology sharing)

Alabama Lighthouse Assn. (permission to install station at Middle Bay Light)

YSI Endeco (training and technical assistance)

MX964491, “Mercury Analyses in Marine and Estuarine Fishes of Coastal Mississippi”

Recipient: MS Department of Environmental Quality

GMPO Project Officer: Phil Bass

This project examined levels of mercury in marine and estuarine fishes in Mississippi’s coastal waters. The recipient, the MS Department of Environmental Quality (MDEQ), has been intensively monitoring mercury in fish since 1994. However, most of this work was performed in freshwater because of personnel and equipment limitations. This project provided an avenue for an inter-agency partnership that helped fill this data gap for mercury in marine and estuarine fishes in Mississippi. This work supplemented an existing Gulf-wide monitoring project by the National Seafood Inspection Laboratory (NSIL) and EPA/Gulf of Mexico Program Office (GMPO). It provided additional species and site specific data that was needed by MDEQ and the Mississippi Department of Health, for protecting the health of the fish consuming public of Mississippi. In addition, data collection efforts were conducted according to the same protocols that are used in the Gulf-wide survey, so these data can be combined with the overall data set and used for developing Gulf-wide advisories where appropriate.

The EPA/GMPO and NSIL agreement provided initial funding to begin a synoptic survey of mercury in fishes in selected Gulf estuaries. At the beginning of this project, four estuaries had been sampled with an additional twenty-four (24) estuaries (identified in the NOAA National Estuarine Inventory) selected for study. Estuaries with existing data included: Tampa Bay, FL, Mobile Bay, AL, and Galveston and Matagorda bays, TX. This project provided data on Mississippi Sound and its adjoining bays and offshore waters. Target species included both

commercially and recreational important species, plus species often utilized by subsistence fishermen. In addition, some less common species, which were collected incidental to the primary target species, were also analyzed to broaden the database coverage of mercury concentrations in Gulf fish. Species selected for study complemented the ongoing NSIL and GMPO efforts.

In addition, this project compared and evaluated the results obtained from the two analytical methods: EPA Method 7473 (direct mercury analyzer) and EPA Method 245.6 (traditional cold vapor technique).

Seventy-five different species were collected with 1,507 tissue samples analyzed. Some of the offshore species collected were uncommon. These “species of opportunity” were sampled because they provided information on the deep shelf ecosystem and many of them are consumed by recreational anglers fishing aboard charter boats. Average total mercury levels in most species were below 1 mg/kg. Seventeen species had an average level or individual levels of total mercury exceeding 1 mg/kg, nine species had average or individual levels exceeding 2 mg/kg, and seven species had average or individual levels above 3 mg/kg. Blue marlin had the highest individual reading (12.6 mg/kg) and the highest average value (5.8 mg/kg).

MX964760, “Implementation of a Spatial Catalog to Characterize and Identify Habitats in the Gulf of Mexico”

Recipient: FL Fish & Wildlife Conservation Commission
GMPO Project Officer: Diane Altsman

The goals set for this project were to identify, inventory, and catalog existing data sets and information related to coastal and marine habitats in the U.S. and Mexican waters of the Gulf of Mexico. Scientists and managers from Mexican states bordering the Gulf of Mexico were encouraged to contribute information to the database that comprises the metadata catalog.

This cataloging effort supplied the means for the identification of information gaps. In collaboration with NOAA-NCDDC a Web portal (Ecowatch) was created to allow the user community to query a comprehensive database by keyword and geographic location. This tool provides links that permit accessing and retrieving metadata from local, state, and federal host organizations. Information gaps were identified and maps produced specifically for seagrass information.

This project serves as a foundation to develop a spatial framework for ecosystem-based management associated with regulatory and planning programs and areas of governmental coordination.

MX964003, “Water Quality Survey for and Correction of Septic/Sewage Pollutants”

Recipient: Charlotte Harbor County Health Department
GMPO Project Officer: Drew Puffer

Sampling areas were established in those areas of the Charlotte County region that OSTDS systems are known to occur. Eight sampling areas were established. Additional evaluation targeted four of the eight areas as high priority areas. This study found a significant correlation between Fecal ColiformC/Enterococcus ratios (septic versus sewer/natural areas) in three of

nineteen comparisons. This study also found a detection of Human polyomaviruses at eight of twenty-two sample sites. Additional conversation and research efforts should focus on a better human influenced analyte that is easily detectable in both fresh and marine waters. Also, additional research into the water quality background of the canal systems that drain into the Charlotte Harbor is needed for accurate assessment. A better understanding of the actual human influence directly related to Charlotte County, and the surrounding areas, could allow a better management plan to be put into place for the water quality of the Charlotte Harbor.

MX964756, “Coordinating and Developing a Public Awareness Campaign for the Gulf of Mexico Alliance”

Recipient: LA Marine Environmental Sciences Consortium

GMPO Project Officer: LaKeshia Robertson

The Governors’ Gulf of Mexico Alliance (GOMA) is preparing to mount an environmental education and public awareness campaign. The two primary priorities for this effort are nutrient loading reduction and development of a branding campaign to improve community participation in improving Gulf health. GOMA and the Dauphin Island Sea Lab (DISL) have contracted with the University of South Florida, Center for Social Marketing (CSM) to develop a strategic marketing plan to address these needs. This plan will guide the development of a branding strategy and marketing interventions to enhance GOMA’s position among partner groups and communities and encourage reduction in nutrient loading throughout the Gulf States.

This summary represents the completion of the qualitative research phase of the project. Qualitative data were collected in each of the five Gulf of Mexico Alliance member states. Four primary audience groups were sampled: residents living in the five states, policy makers, environmental advocates, and other opinion makers. All data was collected prior to the occurrences of Hurricanes Gustav and Ike. Residents or members of the general public were interviewed primarily in small focus group discussions. Ten focus group interviews were conducted; three with Spanish speakers. A total of 74 individuals participated in focus groups. On average, 7 individuals participated in each group. In addition, 56 key informant interviews were conducted. Three individual interviews were conducted with members of the general public. With the exception of Alabama, the average age of residential respondents was 45 years of age or older. Across states, with the exception of Texas, most participants had at least some college education.

In all states, as expected, more females than males participated in focus group discussions. Recruitment efforts resulted in a wide range of income levels. With the exception of Mississippi, participants were more likely to be married or partnered. Finally, most participants were Caucasian, with the exception of Florida and Texas, where participants were most likely to be Hispanic. Individual in-depth interviews were conducted with policy makers and environmental advocates. Other opinion makers (environmental scientists, Gulf of Mexico Alliance members, Business Council members, homeowners’ association board members, and media representatives) were interviewed individually, in person or by telephone.

The overarching theme of the qualitative research is that people will adopt behaviors to protect the Gulf of Mexico when they feel those changes will improve the local environment and benefit them personally. Thus, problems related to the Gulf’s health need to be communicated in local terms, should clarify how respective problems affect local residents and what they can do to

protect their interests. The use of local spokespersons and locally viable solutions are also important. Environmental awareness campaign messages need to be conveyed in simple, everyday language that is supported by solid scientific evidence.

Solutions need to be framed in simple terms with local community orientation. Messages also should be framed in economic terms (e.g. how much money it will save or cost) in order to motivate people to take action. Protecting the Gulf for future generations is also as a strong motivational factor for many people. Most audience groups believe educational and awareness campaigns should focus on children. Children are highly motivated and frequently can elicit their parents' involvement. All audience segments agree that the best way to raise awareness is to get people involved in hands-on environmental education.

Finally, the Gulf of Mexico Alliance (GOMA) should build on the view of the Gulf as a vital, omnipresent force that impacts all facets of life in surrounding communities. Consistent with this view and people's personal connections to the Gulf, GOMA should strive to brand itself as an inclusive, moderate, environmental group capable of transforming scientific information into policy level action relevant to local needs and issues.