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THE BEND

News of the
Coastal Bend's Bays and Estuaries

Vol. 4, No.1 - Winter 1998



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Caution Urged on Additional Wasteloads to Coastal Bend Estuaries

"Although the bays are relatively healthy, they are not without problems," - Dr. George Ward, Associate Director of the Center for Research in Water Resources, University of Texas.

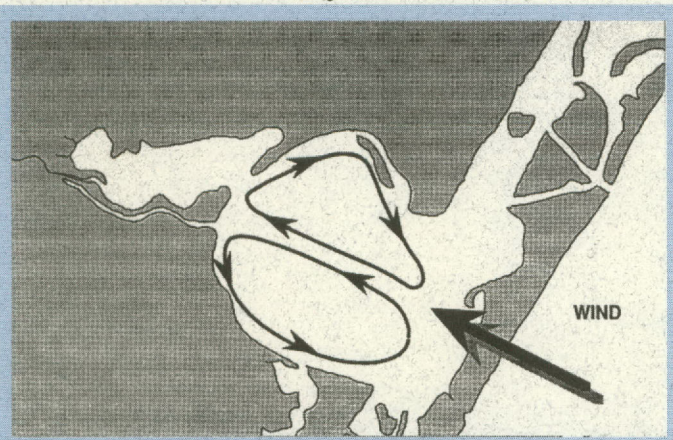
Coastal Bend estuaries are shallow, poorly flushed bays with few connections to the Gulf of Mexico. Studies show elevated levels of pollutants in the Inner Harbor and parts of Nueces Bay, Corpus Christi Bay, Redfish Bay, and the upper Laguna Madre. When considered together, these findings are cause for some concern.

tion within the CCBNEP Study Area" the researchers summarized historical meteorological and tidal data and characterized Coastal Bend bay circulation. "One of the reasons for conducting the study was to examine the role of circulation in governing the distribution of pollutants, nutrients, sediments, and biota," said Ward.

A recently completed CCBNEP study was conducted by a team of researchers led by Dr. George Ward, Associate Director of the Center for Research in Water Resources at the University of Texas. In the report, *"Processes and Trends of Circula-*

tion within the CCBNEP Study Area" the researchers summarized historical meteorological and tidal data and characterized Coastal Bend bay circulation. "One of the reasons for conducting the study was to examine the role of circulation in governing the distribution of pollutants, nutrients, sediments, and biota," said Ward.

Flushing is a natural process resulting in the net outflow of water from the estuaries. This function is important because it helps maintain water quality. Relative to the rest of Texas, Coastal Bend estuaries experience a much-reduced flushing effect. This means that bay waters tend to stay here longer than in other bays. For example, Nueces River inflows have an average residence time in Corpus Christi Bay of about four years.



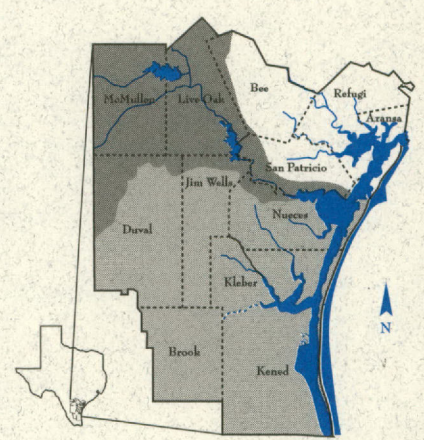
Generalized circulation model for Corpus Christi Bay. Prevailing winds and bathymetry tend to set up the two gyre system shown.

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Corpus Christi Bay National Estuary Program Project Area

Another report completed by Ward compiles sediment and

'Wasteloads' next page



water quality data. It indicates that portions of the project area exhibit elevated levels of pollutants. "Although the bays are relatively healthy, they are not without problems," said Ward.

An example is the elevated zinc concentrations found in Nueces Bay. This has forced the Texas Department of Health to close the bay to shellfish harvesting in the interest of public health. Studies also indicate elevated levels of zinc in sediments over wide areas of Corpus Christi and Baffin bays – and trends show increasing concentrations.

The assimilative capacity of south Texas estuaries is probably much lower than in the rest of the state. For example, the pollutant loads to Corpus Christi Bay are much smaller than in Galveston Bay, and yet they exhibit roughly the same level of metals in the water and sediment.

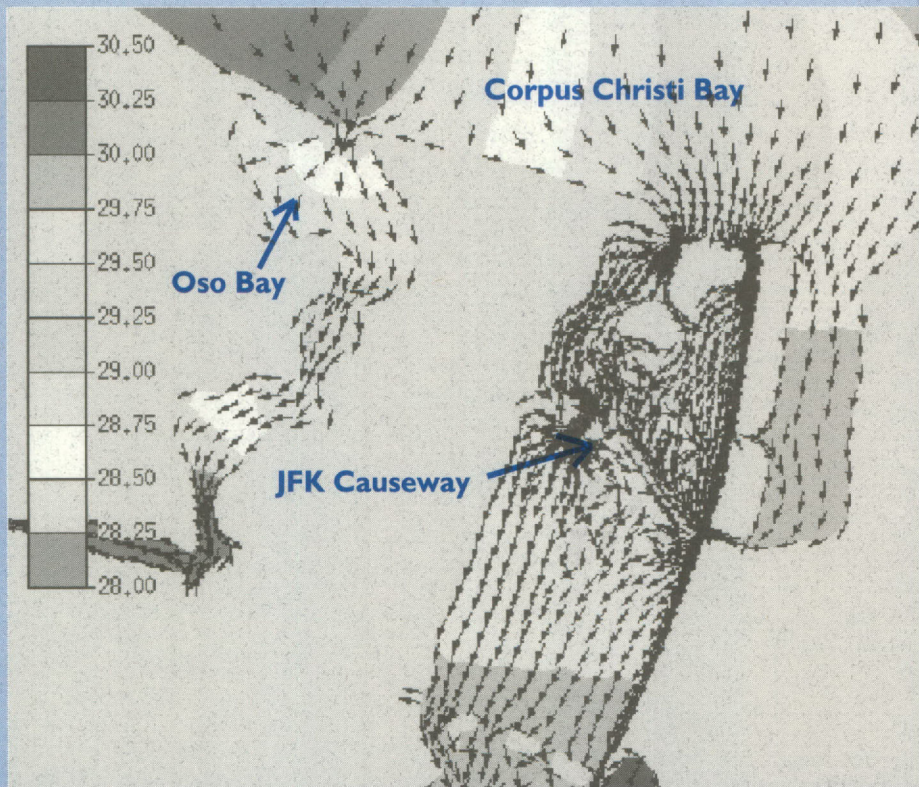
Another factor reducing the flushing rate is freshwater inflows. Flows from the upper and middle bays drive throughflow to the Gulf of Mexico. But construction of reservoirs and water consumptive practices reduce these flows. Historical inflows from the Nueces River have decreased by about 55 percent, which accounts for most of the 19 percent decrease throughout the Coastal Bend.

According to a new CCBNEP report by the Texas Water Development Board, human activities affect not only pollution but circulation patterns as well. The single most influential modification to circulation was the opening of the Corpus Christi Ship Channel. In the report, "Effects of Structures and Practices on the Circulation and Salinity Patterns of the CCBNEP Study Area" the TWDB described the modeled effects of structures such as the ship channel and the JFK Causeway on circulation and salinity patterns. One major result from the construction of

the Ship Channel was a change of the primary co-oscillating bay with the Gulf of Mexico from the Aransas/Copano system to Corpus Christi Bay system.

Together, the circulation and water and sediment quality studies indicate an ecological sensitivity to pollution loads in the Coastal Bend. As loads increase, the system's capacity to flush itself may be exceeded in the absence of sound management approaches.

Dr. Wes Tunnell of the Center for Coastal Studies at TAMU-CC has studied Coastal Bend estuaries for many years. "What the CCBNEP studies are showing us, is the impact we are having on a sensitive system. We need to be careful because there are many more people here now and we may not be able to disregard our actions as insignificant as we often have in the past," Tunnell said.



The vector diagram above shows net flow and salinity gradients for a typical flood tide in the upper Laguna Madre.

Around the Bend is produced quarterly by the Corpus Christi Bay National Estuary Program with funding from the U.S. Environmental Protection Agency and the Texas Natural Resource Conservation Commission. For more information about the Program, call 512/980-3420.

Contributors to this issue include Sandra Alvarado, Doug Baker, Tom Calnan, Van Fischer, Lonnie Jones, Dave Sullivan, and Richard Volk. Illustrations: Dinah Bowman.

News items, photographs, and letters are welcome and may be submitted to the CCBNEP office, Natural Resources Center, Suite 3300, TAMU-CC, 6300 Ocean Drive, Corpus Christi, Texas 78412.

Printed on recycled paper.

CCBNEP-100/98-1

This project has been funded in part by the United States Environmental Protection Agency (EPA) under assistance agreement #CE-996363-01 to the Texas Natural Resource Conservation Commission (TNRCC). The contents of this document do not necessarily represent the views of the EPA or the TNRCC. The mention of trade name or commercial products does not in any way constitute an endorsement or recommendation for use.



Wetland Restoration Sites Identified

Joint Project Addresses Wetlands Management from Landscape-level

Statewide about 210,000 acres of Texas coastal wetlands were lost between 1955 and 1992. This is not surprising when you consider that more than one-third of the state's population, and about 70 percent of its industrial base, commerce, and jobs are located within 100 miles of the Texas coast. In addition, millions of tourists travel to the coast each year imposing seasonal pressures on coastal resources. In response to losses and degradation of coastal habitats, greater attention is being directed to wetland restoration, enhancement, and creation.

Efforts are being made to approach wetland projects on a landscape-level. The recently completed CCBNEP report, *Potential Sites for Wetland Restoration, Enhancement, and Creation: Corpus Christi/Nueces Bay Area* examines regional opportunities to reduce, stop, and/or reverse the loss of Coastal Bend wetlands.

The project was a cooperative effort by state and federal agencies including the Environmental Protection Agency (EPA), Texas General Land Office (TGLO), Center for Coastal Studies Texas A&M University-Corpus Christi (TAMU-CC) and the CCBNEP. Funding was provided by EPA Region 6, through a grant to the Coastal Division of the TGLO.

The purpose of the project was to develop a conceptual

plan to assist state and federal agencies, conservation organizations, and other resource managers locate restoration, enhancement, or creation areas on a watershed scale. The project focused on the Corpus Christi/Nueces Bay area including portions of Nueces County and San Patricio County. Thirty-nine wetland sites were identified and evaluated for existing and potential functions and values. A conceptual plan was created for each site with recommendations regarding construction, hydrology, and living resource restoration and/or protection options.

Each site plan also includes cost estimates. Potential partnerships and funding mechanisms were suggested



for implementation and monitoring, with principal contacts included for each project.

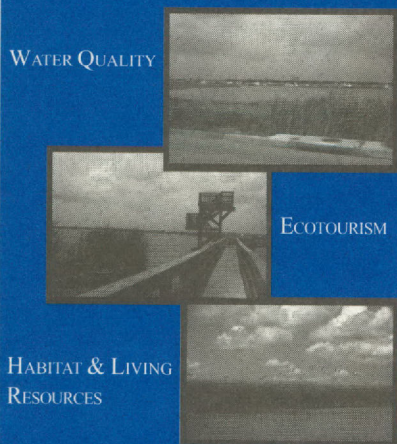
The next step will be for communities to take this information and **implement** the restoration plans as they work to restore wetlands within this watershed area. Successful implementation may depend on establishing goals early in wetland projects.

Dr. Elizabeth Smith, Research Scientist for the Center for Coastal Studies at TAMU-CC and the report's lead author stressed the significance of setting appropriate goals. "Approaching restoration projects with the goal of integrating the restored site with adjacent habitats often results in increasing project success," said Smith.

Defining an appropriate monitoring strategy, particularly in regard to wetland functions was cited as an essential element for success. The report includes recommendations for monitoring, functional design criteria and assessments.

For more information, contact Sandra Alvarado at 512/980-3420.

Potential Sites for Wetland Restoration, Enhancement, and Creation: Corpus Christi/Nueces Bay Area



Corpus Christi Bay National Estuary Program
CCBNEP-15 July 1997





Economic Report Completed

An assessment of the economic impacts generated by various categories of bay-related industries and activities was recently published by the CCBNEP. The report was produced by Lonnie Jones, Aysen Tanyeri-Abur, and Kang Yu of Texas A&M University, and Catherine Hanson of the Texas Water Development Board.

Bays and estuaries in the Coastal Bend support a wide range of economic activity. The purpose of the study was to estimate economic impacts of sectors within the study area that either use or have a potential effect on the quality of bay and estuary resources.

Some industries produce goods and services that utilize bay resources that are sold in private markets. These include petroleum refining and natural

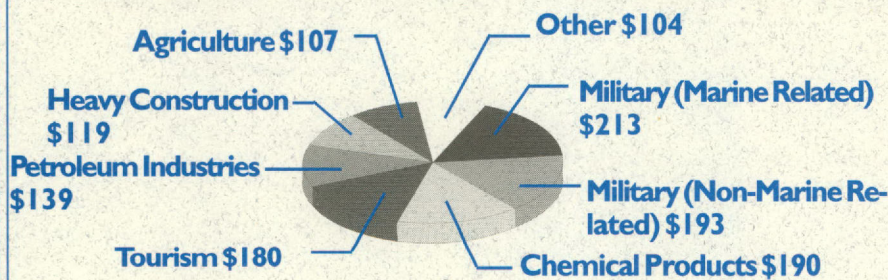
gas industries, chemical processing, agriculture, and commercial fishing. These are examples of industries that contribute to the local economy by converting the region's resources into consumer goods and exporting them to other regions. The economic impact of these industries – and many others – has been calculated and expressed in terms of regional sales and other economic variables reflecting worth as determined by the private market.

Other activities do not harvest or consume bay resources, but rather depend upon the quality and quantity of resources to attract non-consumptive activities such as boating, fishing, and other recreational activities. For these activities, there exists no organized market by which they may be marketed on a per-unit basis. Open access of bay and es-

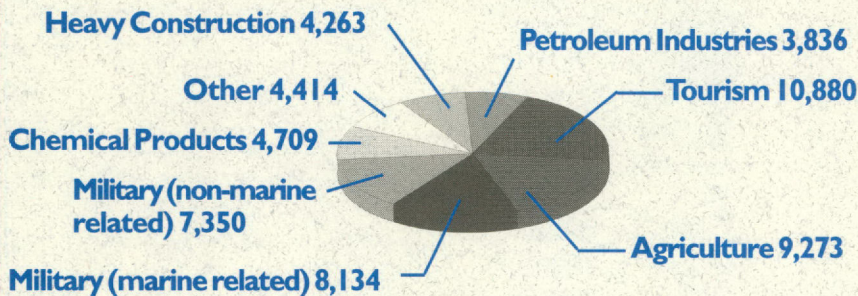
tuary waters, beaches, and general aesthetics of the coastal region are public goods shared by users without exclusion. While there is no doubt about the value of these public goods, that value cannot be expressed through private market exchanges.

Given the lack of organized markets, economic values of public uses of bays and estuaries are generally unknown, and the economic impacts of these resource uses in their natural state are undervalued. To achieve a comprehensive analysis of human uses of bay and estuary resources, economic impacts of all uses are identified and estimated in this study. Estimates are made of direct impacts on the regional economy from each industry in terms of regional sales or expenditures. Then, economic impacts are estimated using an input-output model, which provides information on the regional and state level impacts of these economic activities.

Estimated Impacts of Bay Related Economic Activities



Personal Income (\$ millions)



Employment (jobs)

Local Government Wetlands Handbook Available

The Texas General Land Office recently published a booklet titled "Texas Coastal Wetlands: A Handbook for Local Governments."

The Handbook, is a practical guide for coastal officials interested in voluntary initiatives to conserve, restore, or create coastal wetlands. It addresses the role of local governments in coastal wetlands management and identifies a variety of tools that municipalities, counties, conservation and reclamation districts, ports and navigation districts, river authorities, and regional councils of government can use to keep wetland systems intact.

To request a copy of the Handbook, please contact Claire Randle at 1-800 85-BEACH (in Texas only) or (512)475-2330 or e-mail: claire.randle@glo.state.tx.us

Nature Area Enhances Park

Aransas Pass to Build Boardwalk and Enhanced Wetlands for Birds and Bird Watchers

What do ecotourism, municipal wastewater, and the Coastal Management Program (CMP) have in common? According to Rick Ewaniszyk, Aransas Pass City Manager, they are all part of a community effort to develop a nature area which will attract birds and bird watchers.

A recently awarded CMP grant will enable Aransas Pass to begin Phase II of the Aransas Pass Community Park and Nature Area. It is an ambitious effort to improve degraded coastal wetlands and improve accessibility to birding areas.

Eddie Arnold is a member of the Aransas County Bird and Nature Club and has been birding since 1974. He has also been involved with park development for several years. "As a community, we have supported wildlife habitat improvements in the park area for a long time," says Arnold. "Now we have the opportunity to make it happen."

Improved habitat equates to attracting more birds – and bird watchers – which

will be a boon to local economies. Recent studies indicate that birding is an important sector of tourism, generating about \$4.5 million per year in the Coastal Bend.

In addition to habitat improvements, the Nature Area calls for a birding boardwalk and kiosk with interpretive signage. "The boardwalk will make the park more enjoyable and keep people from wandering through feeding or nesting areas," says Arnold. "It can also be used by the local schools as an outdoor educational area."

The grant will also fund wetland enhancement in the park. This includes efforts to increase circulation in the ponds around the Nature Area. One technique under consideration is the diversion of treated wastewater to augment normal freshwater runoff. Under this proposal, up to 160,000 gallons/day of treated effluent would be discharged near the Nature Area.

Reusing treated wastewater to supplement freshwater inflows is not a new idea - there are several examples in the Coastal Bend. But because of the difficulty in predicting the results, the practice is not without detractors. Obviously, to

be successful, it will require adequate planning and design considerations.

Dave Sullivan of Naismith Engineering, is consulting on this project. "If done correctly, the additional water will support a diverse mix of vegetation and attract many different species of birds. It is important that we don't replace productive habitat with less desirable species, such as a cattail stand for example."

The community has supported improving the wetlands near the park for many years according to Ewaniszyk. "The City of Aransas Pass is taking a proactive approach to meet the needs of our community and continue to protect our coastal habitats." The City is using the Texas General Land Office handbook, "Texas Coastal Wetlands: A Handbook for Local Government," as a guide for their efforts. (See page 4 for more information about the handbook.)

For more information about this project, contact Dave Sullivan at 512/814-9900.



Aerial photo shows proposed effluent discharge locations and boardwalk



Broken glass is evidence of previous 'dumping' practices, common along the coast. The project includes efforts to remove some of these materials.

Calendar of Upcoming Events

- January 22 Joint Management & Scientific and Technical Advisory Committee Meeting
- February 1 Begin 60-Day Public Comment Period for Draft Coastal Bend Bays Plan
- February 19 Joint Management & Scientific and Technical Advisory Committee Meeting
- March 19 Joint Management & Scientific and Technical Advisory Committee Meeting
- March 23-24 Coastal Issues Conference (Galveston)
- April 7 Regional Monitoring Strategy Workshop
- April 17-18 Red Tide Workshop (Port Aransas)
- April 27-28 Bay Summit and All-Conference Workshop

For More Information Call: 512/980-3420



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CCBNEP
Natural Resources Center, Suite 3300
TAMU-CC
6300 Ocean Drive
Corpus Christi, TX 78412

Education Station

'Rare and Wild Texas' Teachers' Workshop

'Rare and Wild Texas' is a workshop for elementary and middle school teachers that focuses on Texas wildlife and biodiversity. The course includes background information, materials and interdisciplinary activities with TAAS and TEKS objectives in mind. Participants will receive free instructional materials and TEEAC credit and certificates.

The workshop will be held on Saturday, February 7, from 9:00 a.m. to 3:30 p.m. at the TAMU-CC Natural Resources Center, room 1009. For more information, call Chris Connor at 512/980-3240. Sponsored by the Texas Parks and Wildlife Department.

Draft Coastal Bend Bays Plan Available February 1st

The Management Conference is proud to announce the beginning of a 60-day public comment period for the *Draft Coastal Bend Bays Plan*. If you would like a copy, call the CCBNEP office at 512/980-3420

Next Newsletter

★ SPECIAL BAYS PLAN EDITION

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