Texas Commission on Environmental Quality—Water Quality Planning—Monitoring & Assessment

## Rio Grande Bacteria Special Study in Laredo, TX

Excerpts from articles by *Elizabeth Verdecchia International Boundary & Water Commission – United States Section (USIBWC)*

During the spring of 2011, the USIBWC Texas Clean Rivers Program, in collaboration with Texas A&M International University, TCEQ Region 16, Laredo Community College, and the City of Laredo Health Department, conducted an intensive bacteria monitoring of the Laredo/Nuevo Laredo stretch of the Rio Grande. This section of the Rio Grande in Segment 2304 has been included on the 303(d) impairment list for fifteen years with bacteria counts in the thousands and sometimes in the tens of thousands.

The objectives of the Laredo Bacteria Special Study were to survey all features and structures along both banks of the river as well as collect bacteria samples at approximately half mile intervals to identify possible point sources of bacterial contamination near the downtown Laredo/Nuevo Laredo area.

The first sampling event was conducted in May of 2011. The study received a great deal of local media attention with newspaper reporters from both the U.S. and Mexico conducting interviews of participants and taking photos of the sampling. At the first sampling event, the field crew collected 40 samples for *E. coli* bacteria analysis for comparison to U.S. water quality standards, as well as 40 samples for fecal coliform bacteria samples for comparison to Mexican standards. The field crew also surveyed over 90 features such as pipes, drains, tributaries, and trash piles along the banks of the Rio Grande.

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***Team preparing to launch at the Jefferson Water Treatment Plant Intake on the Rio Grande at Laredo***

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Preliminary results from the first sampling event point to a narrow spatial range where bacteria counts spiked. A handful of surveyed point discharges were investigated further during the second sampling event in August. USIBWC is currently working on a final report of the study. Mexican entities were also invited to participate in the sampling, and any results from the study affecting Mexico will be addressed through binational coordination.

*Sampling crews near the International Bridge and Port of Entry between Laredo and Nuevo Laredo, May 19, 2011*

## *Guadalupe-Blanco River Authority Pollution Kiosks*

By Debbie Magin
*Guadalupe-Blanco River Authority (GBRA)*

The Guadalupe-Blanco River Authority (GBRA) believes that the first step in reducing pollutant loads to the impaired streams in Texas is getting the public to understand their role in that task. What happens on the land does not stay on the land. The waste generated by each person, if not disposed of properly, can make its way into streams. Public education is key to getting the public to recognize that they are part of the environment, regardless of where they live or recreate. Over the years, GBRA has developed a strong public outreach campaign. The latest tools in that campaign include kiosks that bring the message of water quality protection to the public. The kiosks are being made available in school libraries, public libraries and community centers. Colorful, fun computer modules explain nonpoint source pollution, the pollutants that enter the waterways in rainfall runoff. By using the kiosk's touch screen the residents of a watershed, like Plum Creek, Geronimo Creek or Cypress Creek, can learn how a wastewater treatment plant operates, how to operate and maintain on-site sewage systems, and the best way to dispose of fats, oils and grease. In some locations, where available, each kiosk is linked to a continuous monitoring station in the watershed that gives real-time water quality data. The kiosks also provide a bird's eye view of the watershed in a "fly-over" using Google Earth. The kiosks have been funded in part by GBRA and with Clean Water Act Section 319(h) grants through the TCEQ and the Texas State Soil and Water Conservation Board (TSSWCB).

For more information on GBRA's other outreach and water quality monitoring activities go to <http://www.gbra.org/default.aspx >. See page 9 for information on additional training tools available on the GBRA website.

*GBRA educational kiosk on display at the Wimberly Community Center. The focus of this kiosk is Cypress Creek.*

*GBRA educational kiosk on display at the Lockhart Public Library. The focus of this kiosk is Plum Creek.*

## New Fact Sheet from USGS

A new fact sheet, *How Does a U.S. Geological Survey Stream Gage Work?*, is available online at <http://pubs.usgs.gov/fs/2011/3001/pdf/fs2011-3001.pdf>. For a list of proposed gages to be discontinued in Texas due to pending budget cuts and those that were saved due to alternate funding sources go to < http://tx.usgs.gov/ >.

## Annual SWQM Workshop

The twenty-fifth annual Surface Water Quality Monitoring Workshop will be held ***December 12-15, 2011*** at the *Mayan Ranch Conference Center* in Bandera, Texas. The workshop will begin on Monday, December 12th at 1:00 PM with a half-day session for TCEQ staff only. The regular session opens to all participants on Tuesday the 13th. The workshop will end after lunch on Thursday the 15th.

The TCEQ welcomes any ideas for workshop topics or offers to present findings of recent studies, new technologies, interesting aspects of monitoring, or any related monitoring topics.

For additional workshop information, to suggest a topic, or to make a presentation, please contact Anne Rogers, at <anrogers@tceq.texas.gov>; 512-239-4597.

## New EPA Website for Nutrients

The U.S. Environmental Protection Agency (EPA) has developed a new and improved website about nutrients to provide the public with information about where they come from, their impacts on human health and aquatic ecosystems, and actions that people can take to help reduce them.

EPA's new website also includes updated information on states' progress in developing numeric water quality criteria for nutrients as part of their water quality standards regulations. The EPA recognizes that states and local communities are best positioned to restore and protect their waters, and the Agency is providing technical guidance and tools to help states develop numeric nutrient criteria for their water bodies.

The goal of the tool is to support states in their nutrient analyses by providing the most current data available on: the extent and magnitude of nutrients; water quality problems related to nutrients; and potential sources in a format that is readily-accessible and easy-to-use. With this comprehensive data, the EPA, states, and other stakeholders will be able to more quickly gather additional, less-accessible data for water quality standards development and effective source reduction strategies for nutrients. The website is available at: <http://www.epa.gov/nutrientpollution/>.

## Arundo Control in the Upper Nueces Basin

By Kati Carberry
*Nueces River Authority (NRA)*

In the spring of 2010, landowners in the upper Nueces Basin began noting the spread of a non-native, invasive, phreatophytic weed, *Arundo donax*, also called the giant reed or river cane. *Arundo* is a facultative plant, meaning the species can grow in both wetland and upland environments, but is most attracted to riparian areas and stream channels where unlimited access to water can fuel explosive growth. The plant quickly forms dense colonies and is rapidly able to outcompete native riparian vegetation. A thick fibrous root system enables the *Arundo* to create large monocultures and consume large quantities of water. In the 1990's the Upper Nueces and Sabinal Rivers offered a perfect *Arundo* growing environment with water-rich, alluvial streambeds and numerous exposed gravel bars for colonization. Over the next 15 years, the plant was able to flourish and expand virtually unnoticed until it engulfed 40% of the floodplain. By 2005 it had formed dense solid colonies around the towns of Vanderpool and Montell. Landowners downstream of the massive *Arundo* patches began to see dramatic diurnal fluctuations in river flows.

While there have been no formal conclusions that relate the fluctuations in flows and expansion of the *Arundo*, there is some evidence that these events are correlated.

A new relationship between *Arundo* and Nutria, a non-native rodent feeding in the water, appears to

*Arundo Control continued on page 4*

*Arondo Control continued from page 3*

be responsible for the recent expansion of the plant. Nutria cut the *Arundo* stalks, and portions float downstream. Each stalk contains many nodes and each node sprouts into a new plant. According to Sky Jones-Lewey, NRA's Resource Protection and Education Director, "this is a game changer for the riparian community and aquatic habitat along these pristine streams". In response to elevated concern, Lewey initiated what is known as *Project Arundo Control.* The project's goal of P*ull, Kill, Plant* aims to stop the spread of the *Arundo* while restoring native riparian plant communities.

**Incentive Program**: Approximately 67 acres of large *Arundo* stands were treated by aerial application of herbicide on 10 properties in the Montell area. This year Lewey has gathered a field crew of local volunteer organizations, a professional herbicide applicator with specialized equipment, and three summer interns. The students come with various levels of degreed study in Natural Resource and People Management from Pepperdine University, Yale University, and Texas A&M University.

*Arundo donax along the banks of the Nueces River*

By the end of this year approximately 200 acres of *Arundo* will be treated and approximately 1 million nodes will be physically pulled from the Sabinal and Nueces riverbeds. This work could not have been acomplished without funding from the Texas Parks and Wildlife Department (TPWD), TSSWCB, US Fish and Wildlife Service (FWS), the Rio Grande Nueces Resource Conservation & Development (RC&D), The Jacob and Teresa Hershey Foundation, The Tim and Karen Hixon Foundation, the Sarah Friend and Family and other private sector contributions.

**Additional Study:** The FWS and TPWD have established transects and designed vegetation studies to document changes in the plant community within the project area. To further investigate diurnal flows, and water quality impacts from the invasive weed the USGS has placed temporary gauges above and below the *Arundo* concentration areas and simultaneously the NRA has been collecting dissolved oxygen (DO), pH, temperature, and conductivity data at these same locations to compare flow with water qualilty. The final analysis will compare flow fluctuations and water quality before and after treatment of the *Arundo.* The results of the study will identify and evaluate possible relationships between *Arundo* and water quality and quantity.

## *Bacteria Improvements in the Rio Grande from Infrastructure Project*

By Elizabeth Verdecchia, *International Boundary & Water Commission – United States Section*

The USIBWC Clean Rivers Program (CRP) routine monitoring of Rio Grande Segment 2302 near Brownsville, TX, as well as last year's Brownsville Bacteria Special Study, has shown diminishing trends of bacteria counts over the last three years. The final report for the Brownsville Bacteria Special Study (published at <http://www.ibwc.gov/CRP/studies.htm>, under Lower Rio Grande section) documents the decreasing trend and attributes the improvements in water quality to the completion of the $76 million Matamoros Wastewater Treatment Plant, a project funded by the North American Development Bank (NADBank) and the Border Environment Cooperation Commission (BECC). The treatment plant was the first in Matamoros, Tamaulipas, Mexico and was accompanied by a Comprehensive

*Bacteria Improvements continued from page 4*

*Bacteria Improvements continued from page 4*

Water and Sanitation Project that is leading to the elimination of all discharges in to the Rio Grande. USIBWC will continue to monitor the bacteria in the area, and the water quality improvements are likely to lead to the de-listing of that assessment unit.

***Left:*** *The Rio Grande upstream of Brownsville, TX,*

***Right****; Discharges into the Rio Grande from Matamoros, Mexico, such as this one above documented in the Brownsville Bacteria Special Study, are being eliminated with infrastructure funds from NADBank and BECC.*

## *The Texas Water Journal*

The Texas Water Journal is an online, peer-reviewed journal devoted to the timely consideration of Texas water resources management and policy issues from a multidisciplinary perspective that integrates science, engineering, law, planning, and other disciplines. It also provides updates on key state legislation and policy changes by Texas administrative agencies.

The Texas Water Journal has published the first article in Volume 2, Number 1*: Statistical relations of precipitation and stream runoff for El Niño and La Niña periods, Texas Hill Country* by Raymond M. Slade Jr. and T. Edwin Chow. Additional articles will be added as well as summaries of water related issues from the 2011 Texas Legislature. For more information, visit: <http://journals.tdl.org/twj/index>

## *Meeting Reminders*

The **6th Symposium on Harmful Algae in the U.S.** will be held in **Austin, Texas November 13 – 17, 2011**. This is the sixth in a series of biannual meetings intended to provide a forum for scientific exchange and technical communication on all aspects of harmful algae bloom research in the United States. For more information, visit <http://oceanz.tamu.edu/~campbell/6thUSHAB/welcome.html>.

The International Lake Environment Committee (ILEC) and the River Systems Institute–Texas State University will co-sponsor the **14th World Lake Conference**, to be held in **Austin, Texas, October 31- November 4, 2011**. The conference provides an interactive international forum for the exchange of knowledge and experiences on important lake and reservoir science, management and governance issues. For more information, visit <http://www.wlc14.org/>.

The Harte Research Institute's **State of the Gulf of Mexico Summit (SGM) December 4-8, 2011** in **Houston, Texas** is an event committed to ecological and economic interests in the Gulf of Mexico. Focused on action, SGM 2011 brings together leaders in government, industry, science, and non-governmental organizations to assess current conditions and build sound strategies for the future. For more information, visit <http://www.sgmsummit.org/>.

The National Water Quality Monitoring Council (NWQMC) will host its **8th National Monitoring Conference–Water: One Resource–Shared Effort–Common Future** on **April 30 – May 4, 2012** in **Portland, Oregon**. This national forum provides an opportunity for federal, state, local, tribal, volunteer, academic, private, and other water stakeholders to exchange information and technology related to water monitoring, assessment, research, protection, restoration, and management. For more information, visit: http://acwi.gov/monitoring/conference/2012/index.html.

# *Harte Research Institute's Gulf of Mexico Report Card*

Excerpts from the Prospectus Gulf of Mexico Report Card Initiative
*By Larry McKinney, Wes Tunnell, Mark Harwell, Jack Gentile, Heath Kelsey and Bill Dennison*

The Harte Research Institute for Gulf of Mexico Studies of Texas A&M University-Corpus Christi and its partners propose to develop a comprehensive framework for a Report Card on the health of the Gulf of Mexico.

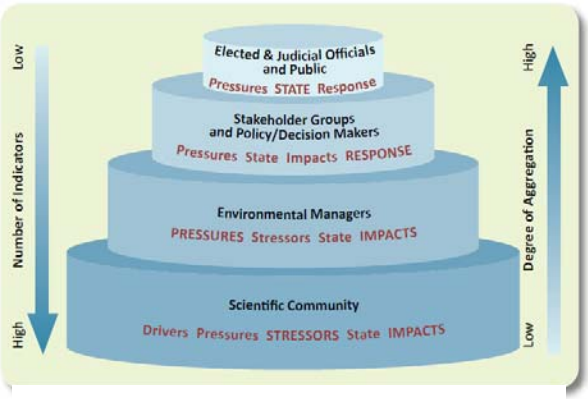
The *Gulf of Mexico Report Card* is unequaled in its scope and potential utility. The Report Card will provide a graphical representation of the environmental condition of the Gulf that will be scientifically based, widely accessible, and readily understandable by policy-makers, stakeholders, scientists, and, most importantly, the American public. Such a Report Card will provide the scientific information and understanding necessary to evaluate the health of the Gulf, clearly demonstrate how well it is or is not progressing towards desired long-term goals, and inform the entities involved of the decision making process and the policies and resources needed to achieve sustainability of a healthy Gulf of Mexico.

The Report Card, when fully developed, will be directed at variety of audiences, from the highest levels of decision-making to the most-detailed scientific investigations.

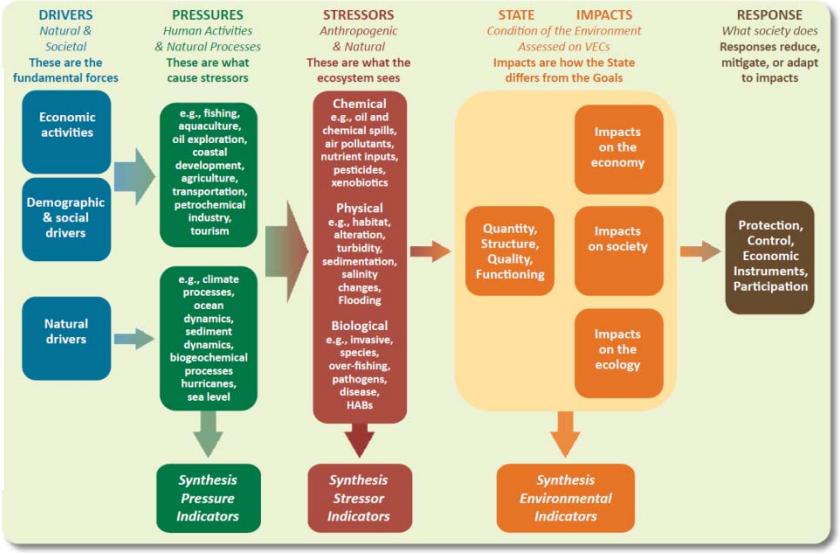
The team has integrated two existing approaches to create a new Drivers-Pressures-Stressors-State-Impacts-Response (DPSSIR) conceptual framework, designed not only to reach decision-makers and stakeholders, but also to guide and focus scientific research on identifying and addressing the most important risks to the ecosystem.

The DPSSIR conceptual framework is comprehensive, providing the scientific foundation and structure to organize and report information across the broad spectrum of needs for regional-scale environmental management, as well as reaching the breadth of audiences with interests in the health of the Gulf of Mexico.

A more detailed explanation of the *Report Card Initiative* and complete article can be found online at <http://www.harteresearchinstitute.org/newsletter/spring2011/docs/gom_report_card_initiative.pdf >




*The DPSSIR conceptual framework*




*The different layers in the DPSSIR conceptual framework used to address targeted audiences*

TEXAS A&M UNIVERSITY CORPUS CHRISTI | HARTE RESEARCH INSTITUTE FOR GULF OF MEXICO STUDIES

Harwell Gentile & Associates, LC

University of Maryland CENTER FOR ENVIRONMENTAL SCIENCE

## *Critter Corner–Jaguarundi (Herpailurus yaguarondi)*

The Jaguarundi is a medium-sized wild cat that ranges from southern Texas to South America. Jaguarundis move in a quick weasel-like manner. Their coat is a solid color; either rusty-brown or charcoal gray. Jaguarundis hunt during early morning and evening. They hunt mostly on the ground, but also climb trees easily. Jaguarundis have been seen springing into the air to capture prey. Historical accounts from Mexico suggest that Jaguarundis are also good swimmers and enter the water freely. They are solitary (live alone) except during the mating season of November through December.

*Photo by TPWD*

**Size:** Slightly larger than a domestic cat (8-16 lbs.)

**Diet:** Birds, rabbits, and small rodents.

**Habitat and Range:** Dense, thorny shrublands of the South Texas Brush Country and Lower Rio Grande Valley.

**Life Span:** 16 to 22 years in captivity.

**Reproduction:** 2 to 4 kittens born once or twice a year.

**Interesting Fact:** Jaguarundis are active mainly at night, but also move around during the day, often going to water to drink at midday.

**Reason for Concern:** Jaguarundis are endangered because the dense brush that provides habitat has been cleared for farming or for the growth of cities. Jaguarundis still exist in Mexico, but they are now very rare in Texas. People in the Lower Rio Grande Valley are working together to plant native shrubs and restore habitat for the Jaguarundi, Ocelot, migrating songbirds, and other animals.

## *Texas Drought Information*

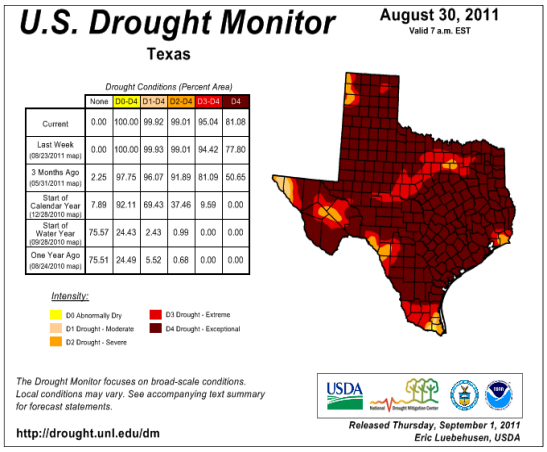
Compiled by Christine Kolbe, (*TCEQ - SWQM)*

What is a drought? A drought is a period of abnormally dry weather that persists long enough to produce a serious hydrologic imbalance. Droughts have wide-ranging adverse environmental, economic, and social impacts as rivers, reservoirs, groundwater levels, and soil moisture all drop.

There are actually four different ways that drought can be defined;

- Meteorological—a measure of departure of precipitation from normal.
- Agricultural—a situation where the amount of moisture in the soil no longer meets the needs of a particular crop.
- Hydrological—occurs when surface and subsurface water supplies are below normal.
- Socioeconomic—a situation that occurs when physical water shortages begin to affect people.

Currently, more than 99% of Texas is in the midst of a drought, with more than 90% in extreme drought and 75% in an exceptional drought.




| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| Current | 0.00 | 100.00 | 99.92 | 99.01 | 95.04 | 81.08 |
| Last Week (08/23/2011 map) | 0.00 | 100.00 | 99.93 | 99.01 | 94.42 | 77.80 |
| 3 Months Ago (05/31/2011 map) | 2.25 | 97.75 | 96.07 | 91.89 | 81.09 | 50.65 |
| Start of Calendar Year (12/28/2010 map) | 7.89 | 92.11 | 69.43 | 37.46 | 9.59 | 0.00 |
| Start of Water Year (09/28/2010 map) | 75.57 | 24.43 | 2.43 | 0.99 | 0.00 | 0.00 |
| One Year Ago (08/24/2010 map) | 75.51 | 24.49 | 5.52 | 0.68 | 0.00 | 0.00 |

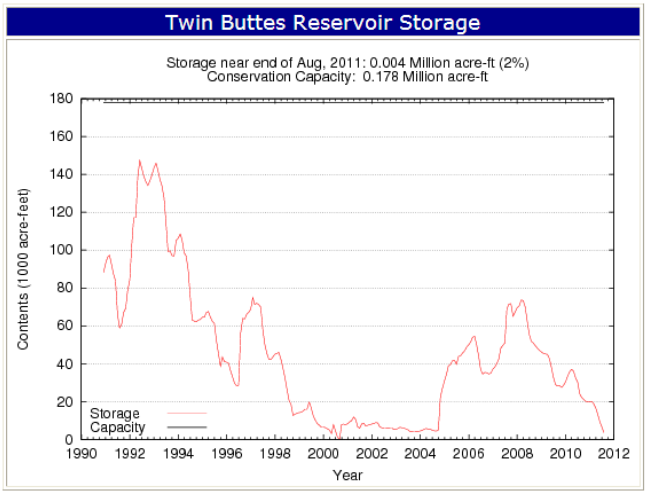
**Sources**: *Office of the State Climatologist* <http://www.met.tamu.edu/osc/>; *Texas Extension Disaster Education Network (EDEN)* <http://texashelp.tamu.edu/004-natural/droughts.php>; *Texas Water Resource Institute* <http://twri.tamu.edu/resources/drought>; *U.S. Drought Monitor for Texas* <http://droughtmonitor.unl.edu/DM_state.htm?TX,S>.

## *Texas Water Development Board Drought Resources*

The Texas Water Development Board (TWDB) monitors water supply throughout the state. The *Texas Water Conditions Report* is created monthly for selected reservoirs, streamflow sites, and ground-water wells.

Current and past reports may be accessed at <http://midgewater.twdb.state.tx.us/Reservoirs/TWC/twcr.html>. This site also contains information on individual reservoir conservation storage and capacity.

TWDB also provides a *Drought Information Summary* in a table format searchable by date. <http://www.twdb.state.tx.us/apps/droughtinfo/default.aspx>.




*Basic graph available from TDWR on reservoir storage capacity.*

## *Western Waters Digital Library*

The Western Waters Digital Library (WWDL) <http://www.westernwaters.org/index.php/index/> provides free public access to a wide range of significant resources on water in the western U.S. Available resources include classic water literature, legal transcripts, maps, reports, personal papers, water project records, photographs, audio recordings, videos, and other material. The WWDL also includes selected collection guides that describe a collection's content, significance, and relevance to a particular research topic.

## *Online Training Resources from GBRA*

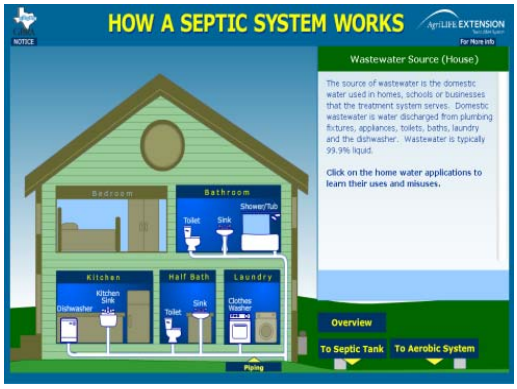
With grant funding from the EPA and TCEQ, the GBRA has created four unique, interactive online trainings that can be found online at, <http://www.gbra.org/education/outreach.aspx>.

### Wastewater Treatment Facility Training

An informational wastewater treatment module shows the procedures involved in wastewater treatment and explains why it is important to properly manage wastewater at all steps in the process.

### Septic System Training

An online training program that illustrates proper septic system function and maintenance.




### Fats, Oils, and Grease Training

An online training program to address management practices for handling fats, oils, grease, and household chemical use and disposal. The training is intended for both businesses and homeowners.

*Online Training continued on page 9*

*Online Training continued from page 8*

## Stormwater Management Training

An online training tool for municipal operations employees to encourage proper stormwater management. This module addresses stormwater control practices and includes information for entities that must satisfy municipal stormwater regulations.

# *Phytoplankton Identification App*

A free phytoplankton iPhone application called Phyto app can help you learn to identify marine phytoplankton and the proper name pronunciation. It includes the most common salt water phytoplankton. The program consists of two main modes. The first mode is a listing of the different species and includes different images taken with a light microscope and the ability to hear the correct pronunciation. The second mode is a flash card game to help you improve your phytoplankton identification skills.

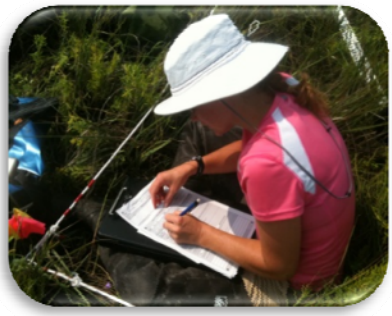
This application was developed by a volunteer member of the Phytoplankton Monitoring Network which is sponsored by the Center for Coastal Environmental Health and Biomolecular Research division of the U.S. National Oceanic and Atmospheric Administration (NOAA). This app can be downloaded from the iTunes store.

## Newsletter Contacts

To sign-up for automatic notification of new issues of the "The Water Monitor" online newsletter, go to <www.tceq.texas.gov>, click on the "sign up for e-mail updates" icon and follow the instructions.

Previous issues are also available on the web at, <http://www.tceq.texas.gov/compliance/monitoring/water/newsletter.html>

If you have any suggestions for future newsletters or to contribute an article contact Christine Kolbe <christine.kolbe@tceq.texas.gov> or Julie Mcentire <julie.mcentire@tceq.texas.gov>.

***Ocean**: A body of water occupying about two-thirds of a world made for man-who has no gills.* Ambrose Bierce, Journalist, 1842-1914

## *Photo Gallery-National Wetlands Condition Assessment in Texas-2011*