

The Water Monitor

Texas Commission on Environmental Quality- Monitoring and Assessment Section

Welcome to *The Water Monitor*, a quarterly newsletter focusing on issues related to monitoring, evaluating, and protecting surface water quality.



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Texas Work on National Rivers and Streams Assessment Gets Underway

The EPA's national monitoring studies are designed to report on the condition of the nation's lakes, streams, rivers, wetlands, and coastal waters. In 2008, TCEQ and Texas Parks and Wildlife Department (TPWD) staff began work in Texas portion of the National Rivers and Streams Assessment (NRSA). The EPA assigned Texas 32 NRSA sites to complete over a two year period.

The survey will measure a wide variety of variables intended to characterize the chemical, physical, and biological condition of the Nation's flowing waters. These include water chemistry, nutrients, chlorophyll a, sediment enzymes, enterococci, fish tissue, physical habitat characteristics, and biological assessments including phytoplankton, periphyton, benthic macroinvertebrates, and fish communities.

In April 2009, TCEQ and TPWD staff attended a three-day refresher training in southeastern Oklahoma. Field work is set to resume in May. Staff from the TPWD River Studies team led by Roy Kleinsasser and staff from TCEQ SWQM Program in Austin and field staff from Austin, Houston, Tyler, DFW, and Waco will be participating again this summer.

Water bodies currently on the list to be sampled include, Home Creek, Colorado River, Paint Creek, Prairie Dog Town Fork of the Red River, Canadian River (three sites), Little Wichita River, Brazos River, Rio Grande (eight sites), Nueces River, Frio River, and Pecos River. These sites may change based on access and water quantity. For more information, contact Bill Harrison, NRSA Project Lead, bharriso@tceq.state.tx.us

EPA Office of Water Online Newsletter

Water Headlines is a weekly on-line publication that announces publications, policies, and activities of the U.S. Environmental Protection Agency's Office of Water. To subscribe to the Water Headlines listserve: Send an email message, leave the subject line blank, and address it to: waterheadlines-join@lists.epa.gov. In the body of the message write: Subscribe Water Headlines first name last name (Please leave one blank space between each word, do not include any other message, and use your actual name - i.e. Subscribe Water Headlines Robert Jones).



EPA National Rivers and Streams Assessment

www.epa.gov/owow/riverssurvey/

Staff practicing physical habitat and fish collection methods on an Oklahoma stream.

The Origin of Caddo Lake

By Art Crowe, TCEQ Region 5, Tyler

There are a number of myths that surround Caddo Lake. **Myth Number 1:** It's the only natural lake in Texas. There are a number of small natural oxbows and resacas associated with every river system in Texas—albeit none as large as Caddo. Along the Coast Bend, there is Green Lake in Calhoun County. At 10,000 acres, it is considerably smaller than Caddo's 26,800 acres. Although there is a levee around part of Green Lake, it is a natural lake. Some suggest that Sabine Lake was a natural lake prior to the ship channel being dredged. If you agree with any of these, then Caddo is not the only natural lake in Texas.

Myth Number 2: One often repeated and that is surely incorrect is that Caddo was formed by the New Madrid earthquake of December 1811. I've been on two different paid tours of Caddo Lake and on each my guide passed this information on as fact. The Caddo Indian legend says the lake was called *Tso'to* (anglicized to Soda), which translated into something like, "Water thrown up into the drift along the shore by a wind." What follows are two accounts of early expeditions to the area which discount an earthquake being the origin of Caddo.

Thomas Jefferson was one of our greatest presidents. Besides politics, his interests included architecture, science and exploration. He convinced Congress to fund the Lewis and Clark expedition of 1802-06 in part to find a navigable passage to the Pacific. Of equal importance to Jefferson, was the Freeman and Custis Southwestern Expedition to find a navigable passage to Santa Fe—the largest city in the west at the time.

Freeman and Custis departed Natchitoches LA on June 2, 1806 and headed up the Red with a small military detachment, two flat bottom boats and a pirogue. Along the way, Custis documented the natural history of the countryside as well as the Native American villages they encountered. What they found in Northwestern Louisiana was something unique to river systems in North America: a raft of trees and logs so extensive that it blocked navigation and changed the surrounding countryside. The raft was not one single unit, but many different rafts of varying lengths that formed in bends and runs. The rafts themselves were dynamic. They moved upriver at a slow but steady pace as new trees caved into the river from upstream while the older, downstream end of the raft decomposed and broke apart. When a raft moved upstream below the mouth of a tributary stream, it would back water up and form extensive swampy areas. Custis noted in his journal that at the time of their expedition the raft was just downstream of the mouth of Twelve-Mile Bayou—the confluence of the Cypress Bayou watershed with the Red River (Flores, 1984).

The Corps of Engineers notes that this alone wasn't enough to form the extensive system of natural lakes referred to as the Soda Lake complex that extended 70 miles to the west of the Red River. Caddo was the western most lake in the complex. The COE suggests that the whole system came into existence as a result of a break in the natural levee system at the first major bend north of present day Shreveport. This would have caused water from the Red to flow into the lower elevation of the Cypress Creek Basin (COE, 1991). The raft was the cause of the breach since the Red was no longer able to carry winter and spring high flows through its main channel.

William Darby was the second person to come into the Caddo Lake area with cartographic skills. He was a true Renaissance Man. Darby was a self-taught surveyor, planter, historian, geographer, publisher, political commentator, short story writer, and professor. He was a deputy surveyor for the USGS and was the first to map the Atchafalaya Basin. He was an officer under Andrew Jackson and did topographic work during the Battle of New Orleans. He also helped survey the US-Canada border. When he came to northwest Louisiana in 1811 (prior to the New Madrid earthquake), he found Twelve-Mile Bayou blocked and Caddo Lake already in existence. Darby's map of the area was later important in establishing the boundary between the United States and New Spain set in 1819 (COE, 1991).

Myth Number 3: Another myth that surrounds Caddo and the raft is that Captain Henry Miller Shreve broke the raft and established navigation to Northwest Louisiana—a feat that got the fledgling town on the river named after him. Shreve really just got the project underway. John Quincy Adams' administration first appropriated funds for the raft's removal in 1828. Shreve began work in 1832 and through 1839 he spent nearly \$250,000—only to see the raft reform every spring. Colonel Stephen Long assumed direction of the project in 1841 with no better results. Another \$100,000 was placed at the disposal of Col. Joe E. Johnson, of Civil War fame, in the early 1850's; but again nature prevailed. It wasn't until nitroglycerine and dynamite were invented in the 1860's, allowing the base of the raft to be destroyed. The raft was finally cleared in 1873. The total cost was \$633,000 (Flores, 1984).

[The Origin of Caddo Lake \(continued on page 3\)](#)

The Origin of Caddo Lake (continued from page 2)

Caddo Lake supported extensive steamboat traffic until just after the removal of the raft. Jefferson was a major cotton port to New Orleans for the East Texas region. Some of the larger paddle wheelers carried up to 2,000 bales. There was an iron works at Jefferson which was important during the Civil War. As the Union army took control of the Mississippi, many steamboats fled up the Red and were hidden in smaller tributaries such as Caddo. The removal of the raft spelled the end of steamboat traffic on Caddo. It is even suggested that as a result of the raft's removal the Red River at Shreveport became too shallow to support navigation as it once had. The Soda Lake complex may have worked as a self regulating reservoir, which drained slowly back into the Red through Twelve-Mile Bayou helping maintain navigation year around (Dahmer, 1995).

After the raft was removed, Caddo returned to swamp and agriculture for the next forty years until a dam was constructed in 1914. Caddo Lake provided an area where some of the first underwater drilling techniques were developed. The rotary drilling bit developed by Howard Hughes Sr. was tried out in Caddo (Dahmer, 1995). The height of the dam was increased in 1971 to its current level. If this current dam were removed, Caddo Lake would cease to exist.

Sources:

Dahmer, Fred. 1995. *Caddo Was...A Short History of Caddo Lake*. University of Texas Press. Austin.

Flores, Dan. 1984. *Jefferson & Southwestern Exploration. The Freeman and Custis Accounts of the Red River Expedition of 1806*. University of Oklahoma Press. Norman.

COE. 1991. *Waterwise. The Newsletter of the Shreveport to Daingerfield Study*. No 1 & 6. Vicksburg District, Corps of Engineers.

Wikipedia. [http://en.wikipedia.org/wiki/Red_River_Expedition_\(1806\)](http://en.wikipedia.org/wiki/Red_River_Expedition_(1806)).

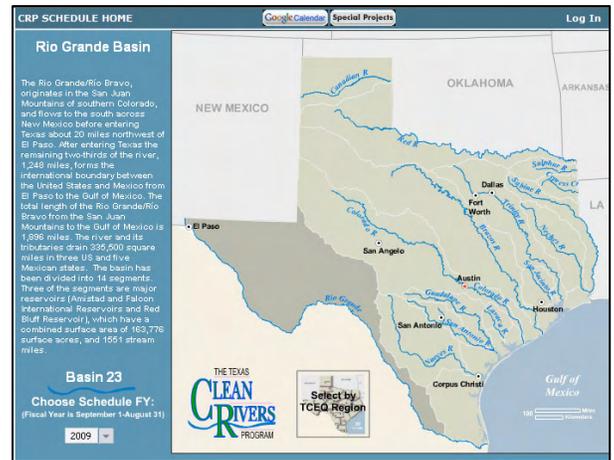


Caddo Lake at Government Ditch. This area was dug by slave and prison labor to help bring steamboat navigation through Caddo Lake to Jefferson.



FY2010 Coordinated Monitoring Meetings

Coordinated monitoring makes collecting and analyzing data on surface water more efficient for the SWQM Program and its participants—TCEQ, CRP, other state and federal agencies, municipalities, and others. The coordinated monitoring schedule (CMS) is planned and developed from March through May of the preceding fiscal year. The TCEQ supports coordinated monitoring with guidance for site selection and for sampling requirements for routine monitoring, special study, and targeted monitoring. The most recent information on all surface water monitoring being conducted by participants can be found on the CMS. Information on special studies across the state can also be found on the CMS web site. The FY2010 coordinated monitoring meetings have been completed and monitoring schedules for the next fiscal year are being finalized. To view the CMS online, go to cms.lcra.org.



Mark your calendars for the annual TCEQ Environmental Trade Fair & Conference

The TCEQ is hosting the annual Environmental Trade Fair & Conference May 12 - 14, 2009 at the Austin Convention Center. Choose from over 100 sessions to earn continuing education credits. Early registration fees are offered on or before April 13, 2009.

Presentations of Interest for Water Quality Monitoring

The New Water Quality Planning Division—Assessing, protecting, and improving surface water quality for Texans.

Texas Water Quality Assessment—Biennial report detailing the extent to which the state's waters meet the Texas Surface Water Quality Standards

The Texas Surface Water Quality Standards—Criteria and uses that define water quality goals for Texas water bodies.

Texas Environmental Laboratory Accreditation Program Update—Update on the environmental laboratory accreditation program in Texas

Water Quality of the Rio Grande from a Binational Perspective—Overview of surface water quality in the U.S. and Mexico.

Please visit the Trade Fair web site for detailed information!

www.tceq.state.tx.us/assistance/events/etfc/etf.html

SWQM Procedures Manual Updates

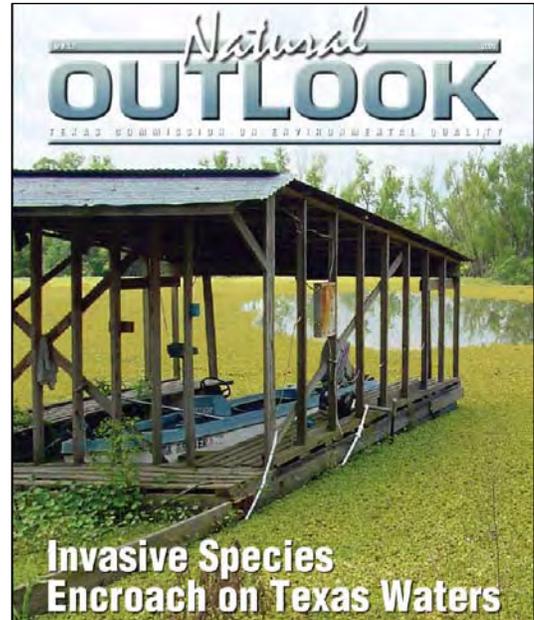
The *SWQM Procedures Manual* describes methods for collecting and analyzing biological-community and habitat data and physical and chemical monitoring methods for water, sediment, and tissue. The manual was most recently published in 2007 (Volume 2) and 2008 (Volume 1). As methods change interim updates will be provided. Three new updates to Volume 1 were recently posted on the TCEQ website. These updates are either new methods or supersede methods and tools described in Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue (RG-415) (October 2008). The updates are provided in PDF format and can be downloaded and added to the appropriate chapter of the manual or saved electronically. To access these updates go to www.tceq.state.tx.us/compliance/monitoring/swqm/swqm_manualupdate.html.

Invasive Species Highlighted in the TCEQ's *Natural Outlook*

"Almost every part of Texas is affected by some kind of invasive plant or animal species. Several scientific organizations estimate that there are 67 terrestrial plants, 43 aquatic or wetland plants, 10 mammals, 4 birds, 7 fishes, 11 insects, and 11 mollusks and crustaceans.

Most of these uninvited species originated in South America, Eurasia or Africa, but all have adapted easily to Texas turf, often flourishing and even out-competing native flora and fauna."

This is an excerpt from the TCEQ's *Natural Outlook*. The Winter 2009 cover story highlights the effects of invasive species on water quality and quantity in areas across the state. From the salt cedar and giant reed of west Texas to giant salvinia in Caddo Lake, invasive species are thriving.



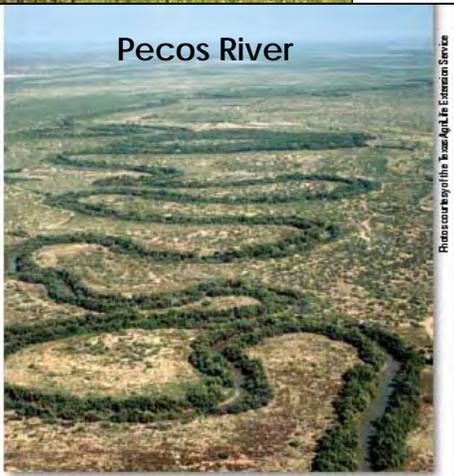
To access the *Natural Outlook* on www.tceq.state.tx.us/comm_exec/pubs/pd/020/08-03/index.html



Giant salvinia (*Salvinia molesta*)
Texas locations: Several lakes, such as Caddo, Toledo Bend, Conroe, Sam Rayburn, Texana, and Sheldon
Origin: Central and South America
Arrival: Introduced to U.S. in the 1920s; arrived in Texas in late 1990s.
Problems caused: Damages aquatic ecosystems by outgrowing and replacing native plants. Dense mats are known to grow up to 3 feet thick, reducing dissolved oxygen levels and blocking sunlight, which kills fish and other aquatic species. Clogs intakes for drinking water, power generation, and irrigation.

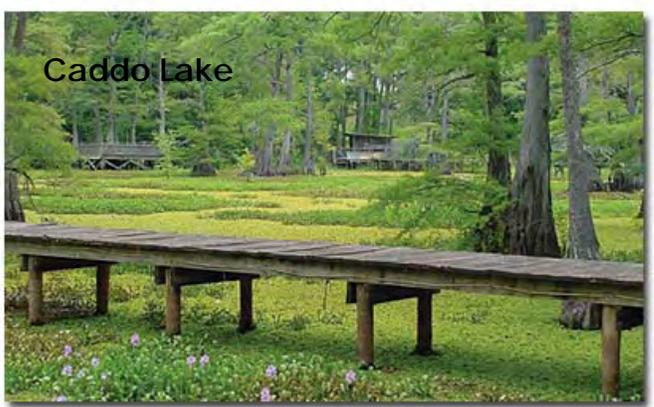


By the late 1990s, thirsty saltcedars lined the banks of the Pecos River in West Texas. The non-native tree takes up so much water that it can lower the water table. This band of trees, which stretched for miles, has since been eradicated by local irrigation districts, working with state and federal agencies. Saltcedar was brought to the United States in the 1800s as an ornamental shrub and shade tree.



Pecos River

Photos courtesy of the Texas Dept. of Transportation Services

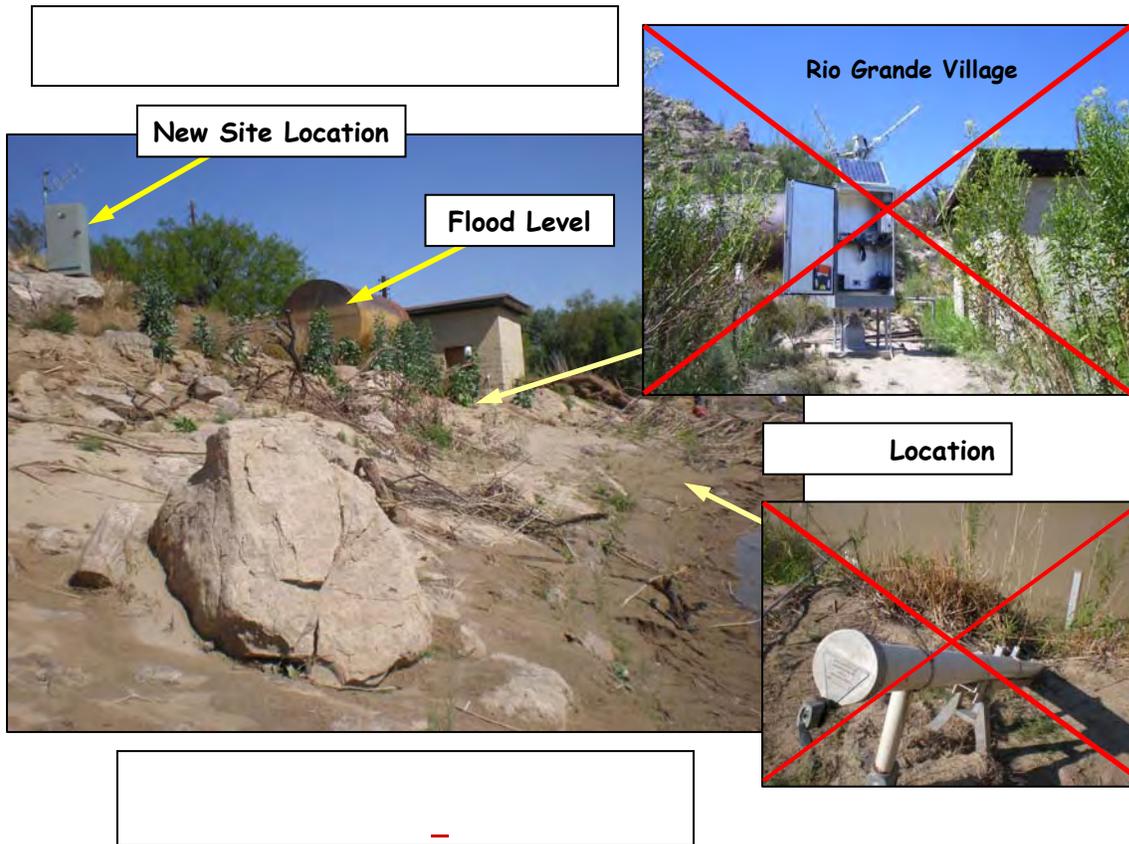


Caddo Lake

Given the chance, invasive plants like these water hyacinths and giant salvinias will run rampant, as happened at this inlet of Caddo Lake in East Texas. The plant mat is so thick that the water's surface is not even visible.
Photo courtesy of Howard Elder, Texas Parks and Wildlife Department

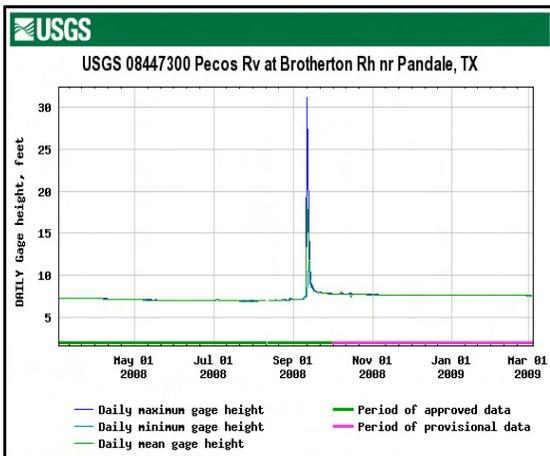
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Continuous Water Quality Monitoring Issues



CWQM site on the Rio Grande at Rio Grande Village, Big Bend National Park. The effects of extended high flows. This is one of two sites lost during the flooding.

In September 2008, the upper Rio Grande Basin had some extreme flows. Due to heavy rains in northern Mexico large releases had to be made from a reservoir on the Rio Conchos. This caused high flows and subsequent flooding from Presidio downstream to Lake Amistad for several weeks. During this time two of the continuous water quality monitoring stations on the Rio Grande (operated by USGS under contract with TCEQ) were lost and have since been reinstalled. At the same time heavy rain in the Pecos River Basin caused a 30 ft rise and wiped out the site near the Terrell-Val Verde County line. This site is also back in operation. For additional information on the Rio Grande CWQM sites and associated projects contact Christine Kolbe at ckolbe@tceq.state.tx.us, 512-239-5831. For information on other CWQM sites go to www.texaswaterdata.org.



CWQM site on Pecos River following a 30 foot rise in September 2008. (A) site before and (B) site after the rise.

Upcoming Events

TCEQ Environmental Trade Fair and Conference

May 12-14, 2009. Please visit the Trade Fair web site for detailed information!
www.tceq.state.tx.us/assistance/events/etfc/etf.html

Seagrass Conservation Workshop

On June 11-12, 2009, the Texas Parks and Wildlife Department, in partnership with the Coastal Bend Bays and Estuaries Program and the Port of Corpus Christi, will host the **2009 Seagrass Conservation Workshop**. Upon the 10-year anniversary of the implementation of the *Seagrass Conservation Plan for Texas*, signed into action by the Texas Parks and Wildlife Department, Texas Commission on Environmental Quality, and the Texas General Land Office, this workshop will provide a comprehensive look at the accomplishments of the original Plan, identify unfulfilled and new objectives, and explore future actions and partnerships to further the protection and conservation of seagrass communities along the Texas coast. For workshop details go to www.cbbep.org/seagrass/Workshop09.html.



The 11th Annual Municipal Storm Water Operators Conference

The 11th Annual EPA MS4 Operators Conference is scheduled for June 22 - 25, 2009 at the George R. Brown Convention Center at 1001 Avenida de las Americas in Houston. This conference is recommended for storm water managers and staff of Phase I and Phase II municipalities, federal facilities, regulatory officials and environmental professionals. If you would like an opportunity to share success stories, discuss challenges and meet new partners working with municipal storm water programs, please plan to attend. Multiple educational sessions will be offered on topics such as sustainable development, watershed management, stream restoration, conducting audits, writing reports and educating the public.

In partnership with EPA Region 6 (Arkansas, Louisiana, New Mexico, Oklahoma, and Texas), the event is hosted by the Texas Department of Transportation, the City of Houston, the City of Pasadena, Harris County, the Harris County Flood Control District, the Port of Houston Authority, and Keep Houston Beautiful. Registration forms and additional information found online at: www.houstonbeautiful.org/ or www.epa.gov/region6/6wq/npdes/sw/ms4 >.



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Upcoming Events (continued)



National Environmental Monitoring Conference

This year's National Environmental Monitoring Conference (NEMC) will be held from August 10-14, 2009, in San Antonio, Texas. The conference will focus on "New Frontiers in Environmental Monitoring," and the program will feature over 100 technical presentations on recent developments in environmental monitoring.

The NEMC brings together scientists and managers from federal and state agencies, the regulated community, and laboratory and engineering support communities. It includes technical sessions, training courses, exhibits, and networking opportunities. This year's conference is being combined with the Forum on Laboratory Accreditation and will consist of meetings of a number of committees of **The NELAC Institute (TNI)**. The **Environmental Laboratory Advisory Board (ELAB)**, a Federal Advisory Committee to the USEPA, will also be having an open public meeting to discuss their efforts on topics such as the performance approach and laboratory accreditation.

For more information on the NEMC and to view a schedule of events, visit: <www.nemc.us/>.



Texas Watershed Planning Short Course

Registration is now open for the Texas Watershed Planning Short Course at the Mayan Ranch in Bandera, Texas on August 17-21, 2009. Don't miss out on this excellent opportunity! There are a limited number of seats available, so reserve your seat by registering today. This week-long course will familiarize participants with EPA's nine key elements of a watershed protection plan and the general principles of and tools for:

- Building Partnerships
- Assessing Watersheds
- Identifying Solutions
- Designing an Implementation Program.

For more information, or to register online, visit: <watershedplanning.tamu.edu/>. Registration closes August 3, 2009. Upon course completion, participants will receive CEUs from the National Registry of Environmental Professionals.

To contribute articles, updates, or photographs to the newsletter contact:

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