



World Water Monitoring Day™

Where in the world are you monitoring?

Sept. 18 to Oct. 18 is the window of opportunity for water quality monitoring to be highlighted worldwide. The coordinators of WWMD, the Water Environment Federation (WEF) and the International Water Association (IWA) plan to expand participation to 1 million people in 100 countries by 2012.

Some 46,000 people participated in 43 countries last year, which represents a 61 percent increase over participation in 2006. Sites in the United States accounted for approximately 63 percent of the 3,544 monitored worldwide. After the United States, Taiwan (444) and Spain (343) led global WWMD efforts in the number of sites monitored. Some of the other countries that participated include the following:

- | | |
|-----------|----------------|
| Argentina | Nigeria |
| Canada | Poland |
| China | Singapore |
| Indonesia | Swaziland |
| Iran | United Kingdom |
| Namibia | |

Your participation

Please participate in typical Texas fashion so we can demonstrate how many people in the state are involved in protecting their waterways. We'll enter the data as a CRWN group, but do ask that you include watershed descriptions in your comments section.

Watershed Descriptions

The watershed descriptions should include: "nearest city or town," "watershed," "water-body type," i.e. reservoir, stream, estuary, bay, etc.; "surrounding land use," i.e. agricultural, commercial, parkland, etc.; and "type of terrain," i.e. hilly, flat, coastal, etc. You also may want to read other countries' stories about water quality monitoring at www.worldwatermonitoringday.org.

Local data sources

Hopefully you are all familiar with the CRWN Web site at which you can view data collected by Colorado River Watch Network volunteers. LCRA's professional monitoring data is also available for your use at <http://waterquality.lcra.org/>



For those of you who sample and test at water quality index sites, the report that is generated by your submittals can be viewed at <http://www.lcra.org/water/quality/state.html>

HOT TOPIC

If you are following the Gilleland Creek TMDL and Implementation Plan process, upcoming items of note include:

A team of volunteer water quality monitors is being trained by Elisabeth Welsh, Austin Youth River Watch. They will be testing in the Gilleland Creek watershed and results will help assess the effectiveness of the TMDL Implementation Plan (I-Plan).

A draft of the I-Plan will be available in January 2009. The I-Plan will be submitted to TCEQ commissioners in February for approval scheduled in August 2009. Check the LCRA Web site for updates: <http://waterquality.lcra.org/gill/>

Government Publications
Texas State Documents

FEB 11 2009

Depository
Dallas Public Library



Suzette Ermler and Elisabeth Welsh engage Austin area high school students in water quality monitoring and environmental career exploration. Read the Monitor Spotlight on page eight to learn more about their efforts with the Austin Youth River Watch Program.

Worldwide Water Quality Data,
Local Data and Hot Topics.....1

Help wanted, Farewell,
New Monitors, Stewardship
in Action.....2

Upcoming events.....3

Clean Rivers Quarterly:
Review of Designated Uses.... 4-5

Tech Corner: Bacteria
sample size5

Q and A: Dissolved oxygen
filtration.....6

Monitor Spotlight: Austin Youth
River Watch Expands7

Monitor Activity Report: 8

Aqua Vitae is a newsletter published by LCRA for Colorado River Watch Network volunteers, Clean Rivers Program steering committee members and citizens concerned with the environmental quality of the Colorado River and its tributaries. If you want to be added to our mailing list, or if you do not want to continue receiving this publication, please contact Robin Dorrough Berry, editor, at 1-800-776-5272, Ext. 2416, or in Austin at 473-3333, Ext. 2416 (e-mail robin.berry@lcra.org). Visit LCRA's Web page at <http://www.lcra.org/water/crwn.html>.



PLEASE WELCOME:

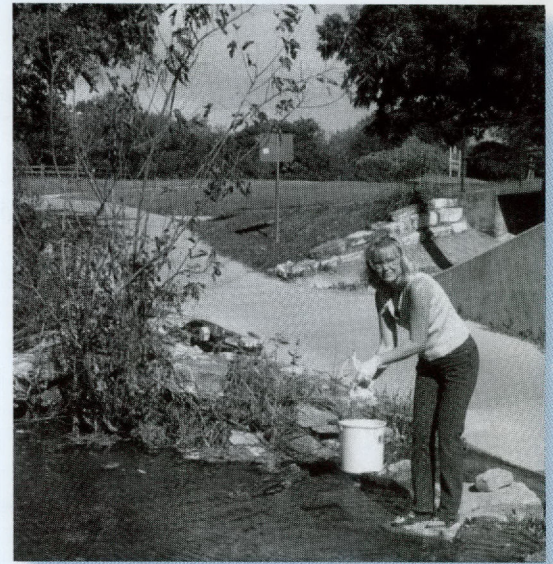
Suzette Ermler.....See Monitor Spotlight page 7.

FOND FAREWELL:

Laura Varney worked with Pflugerville Science Olympiad students and submitted 29 data sheets from Gilleland Creek near Pflugerville High School.

Sheri Forbes also submitted 29 data sheets from Lady Bird Lake above the South First Street Bridge.

Retiring volunteer Laura Varney sampled on Gilleland Creek. Ms. Varney included Pflugerville Science Olympiad students in the monitoring and supported them in this extracurricular endeavor.



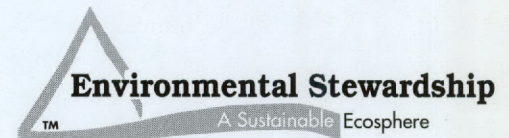
HELP WANTED:

Volunteers needed for the Colorado River at Wharton Riverfront Park. Must be willing to commit to monthly data submittals for a minimum of two years.

STEWARDSHIP IN ACTION

Environmental Stewardship attains 501(c)(3) status

By CRWN volunteer Steve Box
who monitors the Colorado River below Smithville



We are very pleased to announce that Environmental Stewardship is now officially a federal tax exempt 501(c)(3) public charity. With this in hand, Environmental Stewardship is in a much better position to continue our work in the lower Colorado River basin by bringing outreach and education to the communities that enjoy this tremendous natural resource.



Sandy Shaw was picking up trash at sunrise at the "Slab" on the Llano River near Kingsland.

Llano River's "Slab" near Kingsland. The Llano River volunteer water quality monitors were featured in the last issue of Aqua Vitae. Their only complaint about water quality at their site involved large amounts of trash left by river-goers.

Though not a park, the Slab is a favorite destination for river goers in the area and Llano County continues to allow residents to access the water at this low-water crossing. Please support the Llano River monitors' efforts to keep the Slab trash free.

Kingsland's Slab Cleans Up

Volunteer monitors Sandy Shaw, Robert and Sheryl Yantis, and other area residents participated in a trash-off event spearheaded by local resident and FEMA disaster coordinator Eddie McGee at the

Contact Keep Texas Beautiful (KTB) <http://www.ktb.org/programs/twc/index.htm> for more information about how you can host a "clean up" of your own.

Keep Texas
Beautiful



UPCOMING EVENTS

NatureFest and Texas Parks and Wildlife's "Wilbarger" Paddling Trail Launch

Saturday, Sept. 27, 2008

9 a.m. - 4 p.m.

Fisherman's Park – Bastrop, Texas

Events include environmental booths by nonprofit organizations, retail booths and food vendors, canoe and kayak launch, kids' games and contests including "newbie" float trips, dip netting, fishing clinic, archery, nature walks, live animals, and more. For more information: <http://environmental-stewardship.org/NatureFest.aspx>



Bastrop County Household Hazardous Waste Collection

Saturday, Oct. 18, 2008

8:30 a.m. - 12:30 p.m.

Bastrop, Elgin and Smithville Counties

There will be three collection sites, one in each community. Volunteers are needed to assist with the collection of recyclables (latex paint, used oil, batteries, electronics).

All volunteers will be fed a great barbecue lunch following the collection. Your participation will be greatly appreciated and acknowledged. If you can help, please contact Jack Ranney by e-mail, jack.ranney@lcra.org, or by phone, (512) 473-3200, Ext. 7651 or 1-800-776-5272, Ext. 7651. Please indicate which collection site you prefer. Jack will contact you to confirm and answer any questions you may have.

Or, if you prefer, drop off your recyclables at:

- City of Bastrop Public Works
1209 Linden
- Elgin Park and Ride Lot
Hwy 95 North and Main Street
- Smithville Public Works Warehouse
1000 S.E MLK Blvd.

For details: <http://www.lcra.org/community/conservation/hhw.html>

Texas Mussel Watch Workshop

Saturday, Nov. 15, 2008, 9 a.m. – 3:30 p.m.

Austin Nature Science Center

301 Nature Center Drive

Lecture in the morning, field work in the afternoon at a local creek. Learn how to identify freshwater mussel species in Texas and participate in scientific research. Sponsored by the Capital Area Master Naturalists (<http://grovesite.com/page.asp?o=tmn&s=cac&p=168789>) and Texas Parks and Wildlife

Water will be provided, but bring your own snacks or lunch and hat, sunscreen, boots or sandals. SBEC and TEEAC credit is available for educators.

The workshop fee is \$10 per person for materials. For more information on the program, check the TWPD Web site at: http://www.tpwd.state.tx.us/learning/texas_nature_trackers/mussel/. To register, or for more questions, contact Kathy McCormack at (512) 698-9880 or VEFL21@yahoo.com.



Texas hosts more than 50 species of native freshwater mussels, one of the most imperiled groups of animals in the U.S. CRWN volunteer, Kathy McCormack will be coordinating the Texas Mussel Watch Workshop at which you might find the Giant Floater, *Pyganodon grandis*.

Changes to the Surface Water Quality Standards for Contact Recreation

by David Cowan, LCRA Clean Rivers Program Coordinator

CLEAN RIVERS QUARTERLY

Prior to the enactment of the 1972 Clean Water Act and the subsequent development of water quality standards, it was not uncommon to find sewage outfall pipes discharging poorly treated effluent into water bodies used for public recreation. Today, water quality standards provide limits to the amount of waste that can be discharged into our nation's waters. They are the foundation of regulatory protection for our rivers, streams, lakes, bays and estuaries.

Texas Surface Water Quality Standards stakeholder meetings are open to the public. You can receive electronic notice of meeting times and agendas by visiting <http://www.tceq.state.tx.us> and clicking on the "sign up for email updates" button. Or to learn more about proposed changes to the current standards, visit the TCEQ Web site at http://www.tceq.state.tx.us/nav/eq/eq_swqs.html

In the last three and a half decades the U.S. Environmental Protection Agency (EPA) has worked with the Texas Commission on Environmental Quality (and its predecessor agencies) to develop protective standards. And because the standards are tied to discharge permit limits, the regulated community has come a long way toward efficient treatment of its discharges. Like all government efforts, though, the system is neither perfect, nor set in stone. The system of water quality standards established in the 1970s is continuously tweaked and adjusted as new technology becomes available and new expectations are set.

One such adjustment was recently proposed by TCEQ to address the growing number of water bodies that do not meet state water quality standards for contact recreation. Currently, Texas Surface Water Quality Standards lump all water bodies, regardless of size, depth, flow rate or "swimability" (the ability to put one's head under water or ingest water) into the same category. For example, Waller Creek, which flows through downtown Austin and offers very few recreational opportunities, is

afforded the same protection as Lake Travis, which supports thousands of water recreationalists each year.

Classification Proposal

Recognizing that all water bodies are not the same, the state has proposed to expand the existing recreational use categories.

Under the new proposal, TCEQ defines water bodies based on their classification as a segment, proximity to parks, hydrology and physical limitations to contact recreation. If approved by EPA, the new rules would create a less stringent set of standards for those water bodies where contact recreation is not possible (or at least not likely). The proposed contact recreation limits look like this:

- a) Primary 1: Applies to all classified segments and those unclassified freshwater streams located or adjacent to national or state parks that have perennial flow or perennial pools. The proposed standard for Primary 1 is a geometric mean of 126 cfu/100 ml (Same as the current standard for most other water bodies).
- b) Primary 2: Applies to unclassified freshwater streams that have perennial flow or perennial pools (except as defined by Primary 1). The proposed *E.coli* standard for Primary 2 is a geometric mean of 206 cfu/100ml.
- c) Secondary: Applies to intermittent streams without perennial pools. The proposed *E.coli* standard for secondary contact recreation is a geometric mean of 630 cfu/100 ml.
- d) Noncontact: Applies to water bodies, such as the Houston Ship Channel, with physical conditions that would limit normal recreational activities. The proposed *E.coli* standard for noncontact is a geometric mean of 1,260 cfu/100 ml.

There are 16 water bodies in the Colorado River basin that do not meet state standards for contact recreation (often referred to as impaired water bodies). Statewide, there are 274 water bodies that are impaired due to elevated bacteria levels. Adjusting the standards to reflect differences based on the above categories will lessen the number of impaired water bodies in the state.

There is still a debate over how the changes should be applied. Reservoirs will remain protected at the most stringent level. For streams, the TCEQ proposes intensive data collection efforts be performed prior to assignment of a contact recreation category.

The Approval Process

Rule changes are not (and should not be) made hastily. TCEQ may send the proposed changes to EPA for approval by the end of 2009. TCEQ projects that the state's recommended changes will be determined by the end of 2009. The standards changes would then need to be approved by the EPA.

As TCEQ and the standards stakeholder group (made up of representatives from industry, agriculture, municipal and environmental interests) pursue this new approach to state standards for contact recreation, the pros and cons of implementing the change will become apparent. Eventually, a balance will be struck between water quality protection, sound science and political desire.

The 2008 Colorado River Basin Clean Rivers Program Basin Highlights Report was mailed to volunteer monitors in early August. If you did not receive a report, which identifies all impaired water bodies in the Colorado River basin, visit <http://www.lcra.org/water/quality/crp/crpreports.html> or you can contact your CRWN representative for a complimentary copy.

E.coli sample size

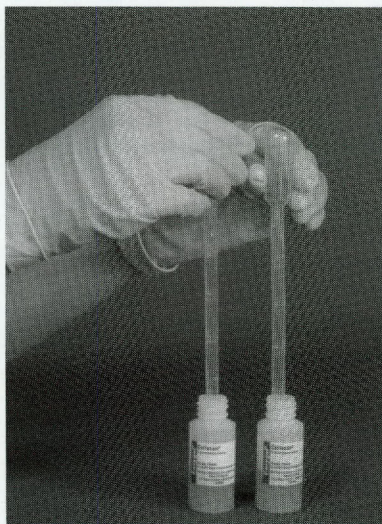
In the Winter 2007 issue of Aqua Vitae, CRWN staff recommended plating both a 1 mL and a 3 or 5 mL, sample depending on the weather.

A subsequent technical committee review of the issue revealed that the same sample size should be used in replicates. Review the manual on page 3 of the *E.coli* section. Two plated samples should produce similar results and the duplicates should reinforce the validity of the findings.

If significant rainfall has occurred in the past 24 hours, or if bacteria readings at your site have historically been high, plate 1 mL or 3 mL samples. Otherwise, two – 5 mL samples should be plated.

Sample sizes should be consistent within an event but vary according to your site's *E.coli* history and weather.

TECHNICAL CORNER



Q AND A: What's the chemical process that occurs in the Winkler dissolved oxygen titration?

Q: Most of the CRWN water quality tests seem straight-forward, but the dissolved oxygen test involves a lot of steps and reagents. What is happening chemically to determine how much oxygen is present in the water sample?

A: The first step in a DO titration is the addition of Manganous Sulfate and Alkaline Potassium Iodide Azide. These reagents react to form a white precipitate, or flocc, of manganous hydroxide, $Mn(OH)_2$.

$MnSO_4 + 2KOH$	\rightarrow	$Mn(OH)_2 + K_2SO_4$
Light + Carbon Dioxide + Water	\rightarrow	Manganous Hydroxide + Potassium Sulfate

Upon formation of the precipitate, the oxygen in the water oxidizes an equivalent amount of the manganous hydroxide to brown-colored manganic hydroxide. For every molecule of oxygen in the water, four molecules of manganous hydroxide are converted to manganic hydroxide.

$4Mn(OH)_2 + O_2 + 2H_2O$	\rightarrow	$4Mn(OH)_3$
Manganous Hydroxide + Oxygen + Water	\rightarrow	Manganic Hydroxide

When sulfuric acid is added to the sample, the acid converts the manganic hydroxide to manganic sulfate. At this point the sample is considered "fixed" and concern for additional oxygen being introduced into the sample is reduced.

$2Mn(OH)_3 + 3H_2SO_4$	\rightarrow	$Mn_2(SO_4)_3 + 6H_2O$
Manganic Hydroxide + Sulfuric Acid	\rightarrow	Manganic Sulfate + Water

Simultaneously, iodine from the potassium iodide in the Alkaline Potassium Iodide Azide is oxidized by manganic sulfate, releasing free iodine into the water. The amount of iodine released is directly proportional to the amount of oxygen present in the original sample. The release of free iodine is indicated by the sample turning a yellow-brown color.

$Mn_2(SO_4)_3 + 2KI$	\rightarrow	$2MnSO_4 + K_2SO_4 + I_2$
Manganic Sulfate + Potassium Iodide	\rightarrow	Manganous Sulfate + Potassium Sulfate + Iodine

When sodium thiosulfate is added it reacts with the free iodine to produce sodium iodide. A starch indicator is added, turning the sample dark blue to enhance the final endpoint. When all the iodine has been converted the sample changes from blue to colorless.

$2Na_2S_2O_3 + I_2$	\rightarrow	$Na_2S_4O_6 + 2NaI$
Sodium Thiosulfate + Iodine	\rightarrow	Sodium Tetrathionate + Sodium Iodide

The Austin Youth River Watch Program Expands

By Jacob Daniel Apodaca, CRWN program coordinator

MONITOR SPOTLIGHT

Recently, the Austin Youth River Watch Program (AYRWP) expanded its capacity to reach more students in the Austin Independent School district by hiring Suzette Ermler as an additional program coordinator. Ermler will be working with Elisabeth Welsh, coordinator of the program for the past nine years, to provide environmental learning opportunities for local high school students.

The AYRWP, a 501(c)3 non-profit organization, was established in 1991 under the umbrella of the Colorado River Watch Foundation as an environmental outreach program targeting high school students considered to be at risk of dropping out of school. The program's mission is to promote community-based environmental monitoring, awareness, and education while inspiring and advancing personal and scholastic achievement. The AYRWP receives funding primarily from the Austin Water Utility and from the City of Austin Watershed Protection and Development Review Department.

A Typical Day

On a typical day during the program, students meet after school to test water quality at about 15 different sites on Austin's creeks or on the Colorado River. AYRWP monitoring data is submitted to the Colorado River Watch Network. The students not only test for CRWN core parameters, they also conduct macroinvertebrate assessments and stream surveys.

Newer students to the program learn the testing procedures from the more experienced students and from the program coordinators. After conducting the water quality tests and field observations, they do their homework at the program's center, assisting each other or receiving tutoring from interns and volunteers. They are also provided with opportunities to learn about environmental careers and keep personal journals.



Suzette Ermler and Elisabeth Welsh engage Austin area high school students in water quality testing. The transparency tube measures water clarity in rivers and streams.

Experiential Opportunities

Students go on camping trips at least twice each semester. At least one of the camp-outs each year revolves around a diel study during which students conduct water quality tests every hour for 24 hours. This hands-on experience illustrates temporal cycles in water quality.

River Watch participants are offered numerous travel experiences, traveling to places like Russia, Wisconsin, Washington D.C., Big Bend National Park and many state parks in Texas. The students' field trips emphasize environmental career paths and are designed to expand students' horizons, and provide a better understanding of physical and cultural geography, ecology and natural processes.



Colorado River Watch Network
P.O. Box 220 • Room L421
Austin, Texas 78767-0220

PRST STD
US POSTAGE
PAID
AUSTIN TX
02957

MONITOR ACTIVITY REPORT

Between May 16, 2008 and August 15, 2008, 84 monitors submitted 204 data points. Thank you for your dedication to the protection of our water resources.

John Ahrns	Valerie Busselman	Keith Kaan	Diane Nousanen	Sandy Shaw
Maria Alonso	Ann Clift	Meredith Keelan	Marcus O'Connor	Terri Siegenthaler
Jeff Bauknecht	Melissa Cole	Laura Kelly	Charles O'Dell	Jim Simmons
David Bennett	Nicholas Cowey	Mike Kersey	Dan Opdyke	Therese Simmons
Landon Bippert	Sam Crowther	Sue Kersey	RoxAnne Parker	Leo Slaton
Larry Bippert	Douglas DeVidal	Roger Kew	Heather Podlipny	Heidi Sosinski
Jennifer Blossom	Mary Eastberg	Susan Kleinman	Jennifer Prihoda	Joanie Steinhaus
Donna Blumberg	Kevin Ferguson	Linda Lowenthal	Heather Rein	Carolyn Stripling
Lenny Blumberg	Wayne Foster	Russell Lueders	Shaun Robertson	Cliff Stripling
Steve Box	Meggan Georgas	Jayson May	Chris Rugaard	Betsy Terrel
Rusty Brandon	Marsha Hardy	Kathleen McCormack	Timothy Ryan	Edward Wells
Peggy Breshers	Sherry Head	Judy McCoy	Winston Schroeder	Elisabeth Welsh
William Brock	Jeff Helser	Joe Monahan	Geraldine Schwartz	Douglas Wierman
Alison Bullington	Michal Hubbard	Gary Montgomery	Chris Schwarz	Robert Yantis
Jay Bullington	Steven Hubbell	Casey Mulcihy	Jeff Schwarz	Sheryl Yantis
Carrie Burns	Brett Hulboy	Seay Nance	Charlene Sefcik	Terry Young
Greg Busselman	Vera Janes	Ravina Nelson	Warren Sefcik	



Printed on recycled paper with soy-based ink.

LCRA.WS.0908