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The Water Monitor Newsletter

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The Water Monitor Newsletter is back and better than ever! After a hiatus, we've returned to bring you updates on water monitoring activities in the TCEQ Monitoring and Assessment section and our partners state-wide. We plan to distribute this biannually to all those who participate in and are curious about the sampling, monitoring, and research activities TCEQ and its partners engage in to promote the protection, restoration, and wise use of surface water in Texas.

In this issue we spotlight the benthic macroinvertebrate Psephenus (the water penny). We review the results of a microbenthic community recovery project in the Medina River and preview projected sampling efforts for a coastal seagrass monitoring program. We also describe the Lake Arlington Master Plan (to address watershed protection elements in this water body) and report on a recent binational workshop between Texas and Mexico regarding research and monitoring efforts along the Rio Grande. Finally, we give you a preview to the upcoming SWQM Workshop in Fall 2016.



Have a story to share? We'd love to hear from you. Please contact Randi Belz (TCEQ CRP, randi.belz@tceq.texas.gov) or Lauren Pulliam (lauren.pulliam@tceq.texas.gov) and tell us what's going on in your watershed!

Fish/Bug Spotlight

This “note” is provided each issue of the SWQM Newsletter and is meant to highlight a critter that is found in or near freshwater and coastal systems in Texas. There are two primary groups of aquatic organisms that will likely be featured most often. Fish and benthic macroinvertebrates which are invertebrate animals that tend to spend most of their life cycle on, or near the bottom of aquatic systems. However, we will also endeavor to include other groups such as freshwater mussels, algae, water fowl, reptiles, etc. We hope to present information briefly describing the critter as well as information on where it is found in Texas and other interesting facts.

- Class: Insecta
- Order: Coleoptera (Common Name: Beetles)
- Family: Psephenidae
- Genus: Psephenus (Common Name: Water Penny Beetle)

The larval/aquatic stage of this insect lasts one to two years, is fully aquatic, and typically inhabits riffles in flowing water. The adult favors margins of riffles, especially splashed rocks that stick out of the water, where they mate and deposit eggs. The larval stage gets its common name from the shape, flat and round, which resembles a penny. This shape enables Psephenus larvae to cling closely to stones in riffles and inhabit areas of swift current. Presence of the water penny generally indicates good water quality. With the notable exception of Europe, the family Psephenidae is well represented in rapidly flowing, stony bottom streams worldwide. In Texas, water pennies are found statewide but are especially common in clear, rocky bottom streams of the Edwards Plateau.



Recovery of Benthic Macroinvertebrate Communities in the Medina River Following a Historic Flood



Flooding can have significant impacts on benthic macroinvertebrate communities. They are generally considered to have low resistance to scouring events, but high resilience due to life history characteristics that have developed in highly variable river systems, including short generation times which allow rapid recolonization. Benthic macroinvertebrate recovery is dependent on their recolonization ability (via flight, downstream drift, etc.), life histories (development time), access to refugia during high flows, and the magnitude of the flood event.

The Medina River (Segment 1905) was first listed on the 303(d) list in 2012 for impaired fish community and a concern for physical habitat quality. An Aquatic Life Monitoring (ALM) event was scheduled in May to investigate the fish community impairment on the Medina River near Bandera. On May 24, 2015 water levels at the USGS gaging station on the Medina River in Bandera reached 24.74 feet, the fourth highest level on record. Peak discharge at the gaging station reached approximately 45,700 cfs. Due to the extensive floods in the area, the ALM had to be rescheduled. SWQM staff began post flood reconnaissance on the Medina and N. Prong Medina Rivers to track the recovery of the benthic assemblages and to determine an appropriate time to reschedule the ALM event to ensure collection of a representative sample.

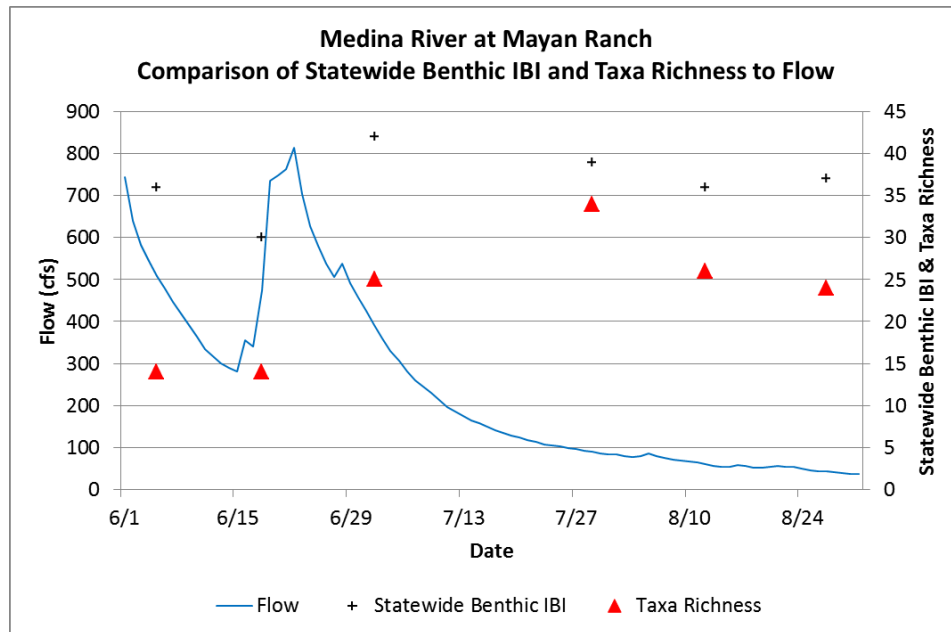
Guidance in the TCEQ Surface Water Quality Monitoring Procedures Volume 2: Methods for Collecting and Analyzing Biological Assemblage Data, May 2014 (RG-416) indicates that all biological samples should be collected during stable, unscoured flow conditions. After significant scouring, guidance indicates that samples should be collected after a minimum of two weeks of normal flow, and after one month of normal flow following extreme weather conditions. There is substantial literature to support this timeframe, however, data specific to recovery times of benthic assemblages in Texas river basins is lacking. Data from this project will assist in determining whether the recommended timeframe to postpone biological sampling for two weeks to one month following extreme weather events is appropriate.

Benthic macroinvertebrate kick-net samples, algae estimates, and environmental data (instantaneous stream flow, water velocity, riffle width/length/depth, water temperature, conductivity, dissolved oxygen and pH) were collected at a site on the Medina River at the Mayan Ranch in Bandera (TCEQ 21631) and the North Prong Medina River at State Highway 16 (TCEQ 18447). Approximately 1-3 samples were collected per month starting in early June 2015 and continuing through mid-November 2015.

Preliminary results indicate that recovery times were relatively rapid. Samples collected in June had a low number of individuals collected in kick-net replicates (less than 50 on average), and it took approximately 5-7 weeks to collect a sufficient number of organisms for a representative sample (guidance recommends collecting 140-210 individuals). Taxa richness, which is one metric used to calculate the Benthic Index of Biotic Integrity (IBI), remained low through June at the Medina River site. Overall, the preliminary IBI scores at the Medina site attained an

“Exceptional” Aquatic Life Use category (>36) by early July, but additional sample processing is necessary before final recommendations can be made. More information on this project is available at the following website:

https://www.tceq.texas.gov/assets/public/waterquality/swqm/monitor/training/swqmworkshop29/03Thursday/Thurs_Pulliam.pdf



EPA Approves 2014 Integrated Report, 2016 Integrated Report is Underway

The Texas Integrated Report of Surface Water Quality (IR) describes the status of Texas surface waters based on historical water quality data and identifies water bodies that are not meeting standards set for their assigned uses, which include aquatic life, recreation, fish consumption and water supply. The IR satisfies the requirements of federal Clean Water Act Sections 305(b) and 303(d), and is based on a seven-year period of record. A new IR is produced by the TCEQ every two years in even-numbered years and must be approved by EPA. The Commission adopted the Draft 2014 Texas 303(d) List on June 3, 2015, and it was approved by EPA on November 19, 2015. The final report documents for the 2014 IR including the assessment guidance, list of impaired waters, and water body assessments by river basin can be found at:

<https://www.tceq.texas.gov/waterquality/assessment/14twqi/14txir>.

Surface Water Quality Monitoring (SWQM) staff are currently developing the draft 2016 IR. The SWQM Guidance Advisory Workgroup met on July 27, 2015 to discuss proposals and advise the TCEQ on revisions to the Guidance for Assessing and Reporting Surface Water Quality in Texas, which is used to evaluate data for development of the IR. For additional

information on the topics discussed at the July meeting of the Guidance Advisory Workgroup go to <https://www.tceq.texas.gov/waterquality/assessment/swqmgawg.html>.



Seagrass Monitoring in Texas

Establishment of a coast-wide seagrass monitoring program was one of the major objectives of the state Seagrass Conservation Plan approved in 1999. Since then, seagrass monitoring has been primarily conducted by academic researchers. TCEQ Region 12 Surface Water Quality Monitoring and central office staff have cooperated with Texas Parks and Wildlife on several seagrass projects beginning in 2010. These preliminary studies developed sampling techniques and gauged the level of effort necessary to implement a seagrass survey component into the routine monitoring program.



Dr. Kenneth Dunton, a professor at the University of Texas Marine Science Institute, has established a comprehensive probabilistic monitoring program for the Texas lower coast. To maximize resources, Surface Water Quality Monitoring staff, with Texas Parks and Wildlife participation, will focus our routine program on the upper coast, beginning in September 2016 (FY 17) with 19 sites in West Bay/Christmas Bay. We will sample using the same techniques as the Dunton program for coast-wide comparability. Primary observations at each site will include:

- total water depth
- sonde field parameters
- photosynthetically active radiation (PAR)
- water collection for Total Suspended Solids determination
- seagrass percent coverage and species presence from four replicate 0.25 m² quadrats
- seagrass leaf length from the four replicates
- bag of shoots for elemental analysis (C:N:P)

Seagrass sampling efforts beyond FY 17 may include revisiting West Bay/Christmas Bay or adding East and West Matagorda Bays into a three-year rotation. A recon/sampling technique trip is planned for May/June 2016. Participation from additional TCEQ regions or CRP partners is always welcomed. Please contact Pat Bohannon (Pat.Bohannon@tceq.texas.gov) for further information.

Trinity River Authority Village Creek Senate Bill 2 Work

Village Creek was first listed as an impaired water body on the TCEQ 2010 Texas Integrated Report of Surface Water Quality due to elevated levels of bacteria. While it is not currently listed as impaired, Lake Arlington was included in the 2012 Integrated Report for nitrate and chlorophyll-a concerns.

In December 2009, the City of Arlington began putting together a long-term plan that would guide growth and development around the Lake. Under the guidance of this Lake Arlington Master Plan (LAMP), several studies have already been conducted for various water quality constituents, with several best management practices recommended as results. The recommendations of the LAMP are intended to address watershed protection elements that are not addressed by Federal or State regulations, recommendations which will be studied for feasibility through the development of a watershed protection plan (WPP) for the Lake Arlington-Village Creek watershed. The primary water quality sampling effort will begin in May 2016 (FY 16) with (up to 11) sites along the main stem of Village Creek and in several of its tributaries. Field staff will employ a combination of routine and flow-biased sampling strategies throughout the course of the sampling effort. In addition to flow, several water quality parameters will be observed at each site:

- Conventional sonde field parameters (temp, DO, pH, SC)
- Conventional grab field parameters (TDS, TSS, VSS)
- Bacteria (E. coli)
- Nutrients (NO₂, NO₃, TKN, TP, OP)

It is possible that additional water quality studies may also be conducted to benefit this WPP, although these will most likely be funded externally. This plan will be a stakeholder-driven process that will incorporate water quality data studies and local knowledge to create watershed-specific strategies that will improve water quality in Village Creek, and in turn protect the water quality of Lake Arlington while meeting the socio-economic needs of those that live, work, and play in the watershed.



Binational Workshop on Surface Water Quality Monitoring

On November 19 and 20 of 2015, three Water Quality Planning Division staff participated in a Binational Workshop on Surface Water Quality Monitoring held on the U.S.-Mexico border at Amistad Dam in Del Rio. This workshop was organized by several entities on both sides of the border: TCEQ-Border Affairs, International Boundary and Water Commission/Comisión Internacional de Límites y Agua, and Secretaría de Medio Ambiente de Coahuila. This workshop was aimed at establishing binational communication among water quality monitoring entities, sharing methods for monitoring, and describing each side's rules and regulations surrounding the monitoring of surface water quality.

Jill Csekitz provided a presentation on the state and federal regulatory framework for the protection of surface water quality in Texas. Sarah Eagle gave a presentation on surface water quality monitoring programs in Texas and the Clean Rivers Program. Roger Miranda gave a presentation on the status of the Binational Water Quality Initiative in the lower Rio Grande. In addition to these classroom presentations, Leslie Grijalva of the Clean Rivers Program at the International Boundary and Water Commission, assisted by Roger Miranda of TCEQ, hosted a field demonstration on methods for surface water quality monitoring. These presentations and activities were well received by our Mexican colleagues. On the Mexican side, the State of Coahuila has expressed interest in establishing a statewide coordinated monitoring program and several nature conservation areas and parks gave presentations on their respective monitoring programs. CILA (Comisión Internacional de Límites y Agua) also presented on rules and regulations concerning surface water quality in Mexico. A photo from the binational meeting is shown below.



Surface Water Quality Monitoring Workshop 2016

The Water Quality Planning Division will be hosting the 30th Annual Surface Water Quality Monitoring (SWQM) Workshop in November 2016! The workshop generally spans three days and provides a forum for aquatic scientists from TCEQ and partner agencies to receive training and see presentations on sampling and field techniques, biological monitoring and other aquatic studies, emerging water quality issues such as water re-use and drought, data management, program updates, and quality assurance.



Participants include mainly Regional and Central Office TCEQ Surface Water Quality Monitoring and Clean Rivers staff along with our partnering River Authorities. However, other participants and presenters include TCEQ staff such as Data Management and Water Quality Standards, Texas Parks and Wildlife Department, the Texas State Soil and Water Conservation Board, United States Geological Survey, academic institutions, and local government entities such as cities and counties.

Though training and current events in our field are a big focus, a major success of the workshop over the years has been the promotion of collaboration between the agency and its partners. Getting to know each other and talking about studies that we are conducting or issues in our river basins over a meal has gone a long way in making our programs successful. Because of this quality time, coordinated monitoring efforts across the state are better ensured appropriate prioritization and water bodies being monitored are receiving adequate coverage while minimizing sampling redundancies.

To know more information regarding the workshop please contact Michele Blair (Michele.Blair@tceq.texas.gov) or Alex Smith (Alexandra.Smith@tceq.texas.gov).

