

The Arroyo Colorado Watershed Partnership Newsletter



December 2017

EPA accepts updated Arroyo Colorado watershed protection plan

The U.S. Environmental Protection Agency recently accepted the *Update to the Arroyo Colorado Watershed Protection Plan*, developed by the Arroyo Colorado Watershed Partnership, Texas Water Resources Institute and the Texas Commission on Environmental Quality.

The updated watershed plan was accepted as it met the agency's national guidelines for watershed-based plans and effectively outlined a strategy to improve the watershed's two water body segments impaired by bacteria and low dissolved oxygen, said Jaime Flores, Texas A&M AgriLife Extension Service program coordinator for the institute and the partnership's watershed coordinator.

"The Arroyo Colorado Watershed Partnership has been working with local stakeholders and project partners for the last five years to conduct baseline monitoring, model best management practices and management measures, and complete the updated plan," he said.

The Arroyo Colorado runs through the center of the Lower Rio Grande Valley from Mission to Arroyo City and eventually flows out to the Lower Laguna Madre, an estuary and nursery for many fish and shrimp species.

The tidal segment of the watershed has been included on Texas' list of impaired water bodies since 1978, due to periods of low dissolved oxygen levels. In addition, both the tidal and above-tidal segments are impaired by high levels of bacteria that exceed the state's contact recreation standard.

Flores said the first Arroyo Colorado Watershed Protection Plan was published in 2007, with guidance measures to carry through 2015.

"But that was only the first phase of a long-term plan," Flores said. "While great progress has been made in both urban and agricultural areas to reduce pollutant loads, we have not reached our goal of removing the Arroyo Colorado from the list of impaired water bodies. This updated plan will guide us in that effort."

Dr. Jude A. Benavides, Arroyo Colorado Watershed Partnership and Steering Committee chairperson, said the updated plan reflects the progress made within the watershed since 2007 and outlines the next phase of efforts to improve the water quality in the Arroyo Colorado.

"This update to the plan represents the quintessential marathon effort," said Benavides, an associate professor at the University of Texas Rio Grande Valley. "It is not the work of any one single individual. It is instead a direct outcome of the long-term commitment, continuous support and goal-oriented work of numerous individuals and organizations. We all look forward to helping put this plan into action in order to preserve and best manage the Arroyo Colorado for our current and future stakeholders."

Dr. John Tracy, Texas Water Resources Institute director, said those involved in the plan's development are pleased with the EPA's acceptance. *(cont. on back)*



Update to the
Arroyo Colorado
Watershed Protection Plan

August 2017
TWRI TR-504



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TWRI, AgriLife Extension and others host training, field days for LRGV producers

Irrigation Training Program

On Sept. 12, the Texas Water Resources Institute (TWRI) coordinated an Irrigation Training Program at the Texas A&M AgriLife Extension and Research Center at Weslaco with 38 participants attending. Speakers for the program were irrigation experts from across Texas, including Lubbock, College Station and Mission. They gave presentations on irrigation management practices and water delivery.

With drought looming on the horizon, it was the dominant issue in the water irrigation discussion. Dr. Luis Ribera, AgriLife Extension economist, College Station, presented on the economic impact irrigation has on different crops such as regular field crops and specialty crops.

Dr. Dana Porter, AgriLife Extension agricultural engineering specialist, Lubbock, discussed irrigation management practices to conserve more when irrigating each crop and farm water conservation including the use of polypipe, lined canals, soil moisture probes and other practices to help reduce runoff and leaching.

Dr. Juan Enciso, Texas A&M AgriLife Research irrigation engineer, Weslaco, spoke on irrigation technologies such as soil moisture sensors and weather stations to help improve when and how much water to use per irrigation, per crop. His focus was to educate producers on using new technologies to gain a better understanding of when to irrigate. He explained that the plant makes best use of irrigation when it is at its most stressed point before wilting. By waiting to irrigate until the plant needs the water, it also improves the intake of nutrients by the plant and therefore reduces the amount of excess nutrients in irrigation return flows.

During his presentation, Dr. Askarali K. Karimov, Texas A&M AgriLife Research associate, College Station, helped educate producers on how water is pumped from the Rio Grande and into reservoirs to be distributed to the irrigation districts and eventually out to producers. He explained that sometimes irrigation water can take some time to get to where it is needed due to availability of push water, evaporation and cracks in canals that result in losses of the original amount of water being delivered.



During the 2017 Seminar on Water Rights and Public Policy – The Waters of the Rio Grande, International Boundary and Water Commission Commissioner, Edward Drusina talks about United States-Mexico 1944 water treaty.

Water Rights and Public Policy Seminar

A Water Rights and Public Policy seminar was held on Oct. 25 at the McAllen Convention Center to inform irrigation district personnel, municipalities, water treatment facility operators, water supply corporations, water right users and water professionals how water from the Rio Grande is allocated and distributed among the Lower Rio Grande Valley. Irrigation water comes from the Rio Grande, which has its headwaters in the Colorado Rocky Mountains and is also fed by water systems from Mexico. During this seminar, the issues between the United States and Mexico concerning water debt were discussed, including how the United States is collecting its water debt from Mexico and how irrigation water is delivered to each irrigation district. Personnel from Texas Water Development Board, Texas Commission of Environmental Quality and Hidalgo Irrigation District #2 all discussed the importance of how water is being administered and allocated.

Lower Rio Grande Valley Forage Production Field Day

Some 106 attendees participated in the Lower Rio Grande Valley (LRGV) Forage Production Field Day Oct. 11 in Combes. TWRI and its partners, Cameron County Soil Water Conservation District, U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS), USDA Agricultural Research Service, Prairie View A&M University, Texas State Soil and Water



Conservation Board (TSSWCB) and AgriLife Extension county agents, organized the educational program to inform producers on the Bermuda stem maggot, forage fertility, incentive programs, and the annual soil testing campaign kickoff.

Since pastures and hay land have different issues than row crops in terms of irrigation, pests, fertility, etc., this field day was focused on major points dealing with these issues. Dr. Robert Bowling, AgriLife Extension entomologist, Corpus Christi, discussed information about the Bermuda stem maggot, a pest that affects Bermuda grass in pastures and hayfields by leaving no nutritional value for consumption when the grass would be harvested and fed to cattle. Dr. Josh McGinty, AgriLife Extension agronomist, Corpus Christi, spoke on weed management and fertility. He emphasized how to properly manage forages by soil testing, knowing how much fertilizer is needed, how to control weeds and how to keep and maintain healthy pastures and hay fields.

Victor Gutierrez, AgriLife Extension assistant for TWRI, announced the 2017 Soil Testing Campaign. With the soil testing campaign, producers can have a free soil analysis conducted on their selected plots until Jan. 31, 2018.

USDA-NRCS and TSSWCB gave presentations about their cost-share incentive programs and how each could help producers implement conservation practices.

Lower Rio Grande Valley Irrigation Conference and Trade Show

The LRGV Irrigation Trade Show was held on Oct. 26 at the LRGV Livestock Show grounds in Mercedes to exhibit the latest in irrigation practices and technologies to help improve on-farm water conservation. The use of unmanned aerial vehicles (UAVs) was a focus at this event because of its ability to show producers where water leaks are occurring in irrigation canals and where plants look the most stressed due to lack of water in the field. UAVs can be used instead of manual inspections, which take more time and manpower.

Soil moisture probes were also a big topic because in many cases, producers irrigate their crops even when there is no need to because they do not have the necessary information to make accurate decisions or they irrigate out of habit. Detecting soil moisture helps with water conservation because not overwatering will help prevent runoff and leaching. Most water conservation practices keep irrigation water on the field, which in turn keeps sediments and nutrients in the field, which reduces runoff and promotes

cleaner water in the local watershed.

Other irrigation systems such as polypipe, surge irrigation valve, gated pipe, weather-monitoring stations and different soil moisture sensors were also discussed at this event.

With more than 70 attendees at this program, producers were able to interact and ask questions to agency personnel on how the new technologies work, understand how they can help improve on-farm water conservation and improve the water quality of irrigation return flows entering the Arroyo Colorado watershed. 

Outdated wastewater treatment facility transformed into efficient facility with wetlands

In 2012, the Texas Water Resource Institute (TWRI) initiated a wastewater reuse and tertiary treatment project (Phase II) with the city of San Benito. In Phase 1, completed in 2010, the city had installed a high-capacity discharge pump and 2,200 linear feet of 8-inch diameter effluent discharge pipe from the treatment plant to the lowest pond of 14, 1-acre ponds that made up the final treatment train in the wastewater treatment facility (WWTF). These abandoned ponds were part of the old lagoonal pond WWTF that was in use prior to the city building its modernized, mechanical WWTF. The city also made improvements to the cells by planting native wetland plants and trees and adding walking trails and viewing areas.



Map of San Benito wetlands

In Phase II of this project, TWRI worked with the city to extend the pipeline installed as part of Phase I to the top of the 14-cell pond system to use all the existing ponds for tertiary treatment of effluent before the effluent was discharged into the Arroyo Colorado and to provide a



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coastal wetland habitat. The city of San Benito installed another high-capacity discharge pump and 1,600 linear feet of 8-inch diameter effluent discharge pipe to the No. 1 pond in the system and a discharge outfall in the cell. The city also refurbished the ponds, levee berms and water control structures by removing dilapidated pilings and walkways, and grubbing and clearing the ponds of invasive grasses and trees to re-establish the flow of water through the entire 14-cell pond system. Strategic cuts in the levee berm system were also made to allow the water to flow from one pond to the next pond, completing the tertiary treatment system.

After all construction activities were completed, TWRI hosted three educational workshops. Two of the workshops, Aug. 23 and Aug. 30, 2017, were planting workshops at the San Benito wetlands site. At the workshops, Jaime Flores, TWRI project manager, gave participants a description of the project and its impact on water quality as well as an additional benefit of providing 10 new acres of wetland habitat. Everyone broke into two- or three-person planting teams to plant native trees. There were 15 participants at the first workshop and 32 participants at the second workshop. At the end of both workshops, 101 native trees had been planted.



Clearing and leveling is undertaken in one of the San Benito wetland cells before filling with water.

The San Benito Chamber of Commerce hosted a presentation by Flores on Aug. 7 at its “Coffee with -” meeting. “Coffee with -” is a monthly meeting hosted by the chamber that brings together the city commission and community members to discuss different issues, concerns and city projects with a local expert or volunteer every month. Flores gave a detailed presentation of Phase II to approximately 20 people. Some of the attendees were San Benito’s new mayor, three city commission members and one Cameron County constable. The local newspaper, Valley Morning Star, published an article about the project:

http://www.valleymorningstar.com/news/local_news/article_e5db0688-a4bd-11e7-9aa9-4b57b590b771.html.

The city and Flores are also working with local volunteer groups to design and paint homemade interpretative signage at the wetlands. To date, two of the local signs have been completed with one installed. Flores will work with the city to install an additional five local signs at the project site. Additionally, TWRI has purchased professional interpretative signage from iZone Imaging to install at the project site: two 24-by-36 inch signs about the birds/wetlands and five plant identification signs. Flores is working with Keep San Benito Beautiful, South Texas Master Naturalist and Master Gardeners volunteers on the content of the signs. An ongoing bird count/bird list for the project site dating back to 2012 lists 146 bird species at the ponds with the potential of attracting 250. The professional signs will be installed by the end of 2017.

It is a great success to be able to change an abandoned portion of a wastewater treatment facility into a 14-acre wetland habitat for native plants, animals and birds that also serves as a pond system for tertiary treatment of millions of gallons of effluent before being discharged into the Arroyo Colorado. The project benefits the habitat, environment, city of San Benito, Arroyo Colorado Partnership and Arroyo Colorado. 

Ramsey Park wetlands expanded; parking lot incorporates bio-retention basin

The Arroyo Colorado Watershed Partnership (ACWP) and the Texas Water Resources Institute (TWRI) along with the city of Harlingen, Texas A&M University-Kingsville (TAMUK) and the Texas General Land Office (GLO) partnered together to expand the wetlands at Ramsey Park. The project was funded by a grant awarded through the GLO’s Coastal Impact Assistance Program. The project’s goals were to expand the existing ponds into a 5-acre wetland system at Ramsey Park and to conduct education and outreach workshops to highlight the benefits and advantages of developing and implementing a phased approach for a regional wetland system.

In 2012, the city initiated a “purple pipe” project, where the city constructed a pipeline from its wastewater treatment facility (WWTF) to several of the parks to use the facility’s treated effluent for landscape irrigation and to fill ponds at the parks. Ramsey Park was the last park in the project to receive the treated effluent. The effluent is used for the

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bathroom facilities and for filling three existing wetland ponds at the park.

When discussing the expansion of the wetlands, the city mentioned that the park's parking lot was in need of repair, which affected people enjoying the park. The team decided to incorporate the parking lot into the overall goals of the project by installing a bio-retention basin in the parking lot to capture and treat stormwater and then divert it to the park's wetlands. The city's Engineering Department completed the designs for a bio-retention basin measuring 100 feet long, 8 feet wide and 4 feet deep for a total of 3,200 square feet. Construction of the bio-retention basin began on Dec. 15, 2015 and was completed on Jan. 20, 2016. Native plants and trees were planted in the basin to help remove nutrients from the runoff, and as the runoff percolates through the underlying layers of sand and bull rock in the basin, sediment and additional pollutants are filtered out. The treated water is then channeled into the expanded wetland system where it evaporates over time. Before the basin was completed, the city entered into an agreement with Cameron County to construct the new parking lot around the basin. Construction of the parking lot began on Jan. 21, 2016 and was completed on March 2, 2016.



A bio-retention basin was built at Ramsey Park and planted with native plants and trees.

After the bio-retention basin and parking lot were complete, the project team turned its attention to completing the expansion of the wetlands. Grubbing and clearing of wetland expansion areas began March 28, 2016 and continued through May 24, 2016. The liner installation was completed on Sept. 24, 2016. The city was able to construct a water transportation feature that resembles a river between ponds No. 2 and No. 3, expanding the wetland area by 9,150 square feet. Pond No. 3 was expanded by

9,600 square feet; pond No. 3a is a new pond constructed for a total of 1,800 square feet. Pond No. 4 was expanded by 5,750 square feet and No. 4a is a new pond constructed for a total of 2,000 square feet.



The bio-retention basin at Ramsey Park filters stormwater runoff from the parking lot into a newly expanded wetland area in the park.

Project partners hosted four education and outreach workshops. The first workshop consisted of a native tree and plant-planting workshop for the bio-retention basin. Twenty-two volunteers showed up to landscape the entire basin. Many of the volunteers were members of the Arroyo Colorado Audubon Society and South Texas Master Naturalists. The volunteers planted native trees, shrubs and ground cover and completed the landscaping with native mulch. The next three workshops were designed for the wetland expansion portion of the project. Two of the workshops were train-the-trainer-type workshops where team leaders were provided training on how to lead their group of volunteers during the final wetland planting event on Oct. 22, 2016. Approximately 180 volunteers from Texas State Technical College planted over 6,000 wetland plants and trees around the perimeter of the newly expanded wetland ponds.

During the project period, the project team also wrote grant proposals to fund another regional wetland project. TWRI and ACWP were able to partner with the city of San Benito to submit a grant proposal to the GLO, Coastal Management Program for the San Benito Wetlands Phase II project. TWRI and ACWP and the city of San Benito were awarded a grant and began working on the San Benito Wetlands Phase II in October 2014. The goal of that project is to use treated effluent to fill ten 1-acre ponds at the San Benito WWTF site for tertiary treatment of the effluent before being discharged in the Arroyo Colorado and to provide coastal, wetland habitat. These ponds are abandoned and were part of the old lagoonal pond WWTF that was in use prior to the city building their modernized, mechanical WWTF.





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“Much work has gone into compiling the plan and I believe it sets forth an effective approach to restoring the water quality in the Arroyo Colorado,” Tracy said.

The watershed plan is currently available for download at <http://arroyocolorado.org/>.

Development of the updated plan was funded through a Clean Water Act grant to the Texas Water Resources Institute, administered by the Texas Commission on Environmental Quality from the U.S. Environmental Protection Agency. The institute is part of Texas A&M AgriLife Research, AgriLife Extension and the College of Agriculture and Life Sciences at Texas A&M University.



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