Basin Profile: Nueces River Basin
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Water Scarcity Status

- The Nueces River basin experiences severe water scarcity, particularly during droughts.
- If all of the water-use rights granted in the Nueces River Basin were to be used to their full extent, there would be no water remaining in the Nueces during many years.

Basin Overview

Texas, United States of America
Area: 42,968 square kilometers
Climate: Arid to Semi Arid
Basin population: 613,863

Figure 1. Map of Nueces River Basin (https://en.wikipedia.org/wiki/Nueces_River)

The Nueces River begins at the confluence of two forks in Edwards County and Real County, Texas. It then flows for approximately 315 miles (507 kilometers) in a southeasterly course until it eventually reaches the Nueces Bay. The landscape surrounding the river changes over its meandering course, from a canyon as the river runs alongside Ranch Road 335, through a plateau, and onward to the coastal plains. The Nueces River travels directly through the Balcones Escarpment, which is a geologic fault zone that separates the plateaus of the west from the Gulf coastal plains. Large concentrations of freshwater marshes are also found in the Nueces River delta.

Most of the river's course is through rural areas, the only major city on its route being Corpus Christi. With a population of 262,092, Corpus Christi is situated at the mouth of the Nueces River basin. The second largest city in the Nueces watershed is Uvalde, which has a population of 15,086. The Nueces River has been impounded by two major dams built along its course, the Choke Canyon Reservoir and Lake Corpus Christi.

While groundwater is owned by landowners, surface water in Texas is owned by the state, who grants perpetual rights to use the water to corporations, individuals and cities. 22 million acre feet (27 cubic kilometers) worth of water rights have already been allocated. Water management is based on a "prior appropriation system," where the oldest water rights have first claim on the available water. Within some sections of Texas' river systems, the government has actually issued more permits to take out water, than what water will actually be in the basin. In 2007, the Texas Senate enacted the Environmental Flows Allocation Process. With this process, the state can set aside water rights that are not already allocated to maintain flow patterns. Additionally, citizens who already own water rights can donate them to the Texas Water Trust, who in turn will make sure that aquatic life and habitats

are preserved. Citizens who would rather sell their permits to protect inflow within the river basin can sell their rights to conservation interests.

Together, the agricultural uses of the river, along with the industrial and recreational uses of the reservoirs, serve as the two main forms of economic production that the Nueces River Basin provides. The largest agricultural crops produced in the Nueces River basin are wheat, maize, potatoes, sorghum, groundnut, and cotton Because of its natural beauty, the Nueces River is a large attraction for outdoorsmen who travel to its banks to hunt, camp and fish. Two locations that receive a lot of attention are the Lost Maples State Natural Area, and the Garner State Park, where hiking, camping and nature study are popular.

Water Scarcity Impacts

Environmental Impacts

The depletion of river flows has led to increase salinity, affecting many species.

Economic and Social Impacts

Economic consequences have resulted from water scarcity in the Nueces River basin. Currently (2011), Texas is in a drought which many are saying could break the record of the longest drought to date. The Amarillo Globe-News recently reported that the current drought has increased the amount of money needed for Texas to meet its current and future water needs. The cost was at $31 billion in 2007 and is now at $53 billion. The loss of between $5 and $6 billion in agricultural production due to wildfires and drought will also wreak havoc on areas which are unrelated to agriculture.

Documented consequences due to dam construction include the unearthing of historical sites. Prior to the construction of the Choke Canyon Reservoir, little archeological fieldwork had been done in the Nueces River Basin. This project unearthed over 500 archeological and historical sites which have now been recorded. These sites were composed of cemeteries, homesteads and prehistoric Native American campgrounds. The most important ones were excavated; while the most important site, the Nichols House, had to be moved.

References

Bays in Peril. A Forecast for Freshwater Flows to Texas Estuaries. (2004). http://texaswatermatters.org/projects/bays-in-peril/bays-in-peril_report_summary.pdf. accessed 31 October 2011.

Clayton, M.E; Stillwell, AS and Webber, ME. (2011) Technical analysis of river basin-based model of advanced power plant cooling technologies for mitigating water management challenges. *Environmental Research Letters*. 6. (July-September 2011).

Mekonnen, M.M. and Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, *Hydrology and Earth System Sciences*, 15(5): 1577-1600.

Mekonnen, M.M. and Hoekstra, A.Y. (2010) The green, blue and grey water footprint of crops and derived crop products, Value of Water Research Report Series No.47, UNESCO-IHE.

Montagna, P.A. (2011). Nueces Estuary Ecosystem Management Initiative. *Coastal Bend Bays and Estuaries Program.* Publication CBBEP-72. Harte Research Institute for Gulf of Mexico Studies.

Nueces County Water Supply Plan. (2009) *Coastal Bend Regional Water Plan.* http://www.nueces-ra.org/CP/RWPG/ipp/pdfs/v1_section4b_11.pdf. Accessed 18 October 2011.

Nueces River Authority. (2011) Items of Interest. http://www.nueces-ra.org/CP/CITY/faq.php. Accessed 2 November 2011.

Rangel, Enrique. (2011) Wildfires, drought will plague Texas. *Amarillo Globe-News.* 1 November 2011.

Smith, Courtney. (2011). Drought Perspectives-Nueces River Authority. *Drought in Texas in 2011*. http://twri.tamu.edu/publications/drought/2011/september/drought-perspectives-nueces-river-authority (Accessed 31 October 2011)

Texas Water Resource Institute. (2011). http://twri.tamu.edu/. Accessed 15 October 2011.

Weddle, Robert S. "NUECES RIVER," *Handbook of Texas Online.* Published by the Texas State Historical Association.(http://www.tshaonline.org/handbook/online/articles/rnn15), accessed 18 October 2011.

U.S. Dept of the Interior Department of Reclamation. (2009) The Water Conservation Initiative and Implementation of the Secure Water Act. 1-6. http://www.usbr.gov/lc/region/programs/crbstudy/SWA.pdf. Accessed 31 October 2011.