

The Status of Brackish Aquifer Studies in Texas

2019 Annual Report to the 86th Texas Legislature on Brackish Groundwater Production Zone Designation

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Introduction

The Texas Water Development Board (TWDB) Innovative Water Technologies Department was created in 2005 to advance innovative water supply and storage strategies, including aquifer storage and recovery, brackish groundwater, desalination, and water reuse. In 2009, the 81st Texas Legislature appropriated funding to the TWDB to establish the Brackish Resources Aquifer Characterization System (BRACS) Program. The goal of the program is to map and characterize the brackish portions of the aquifers in Texas and provide useful data to regional water planning groups and other entities interested in developing and desalinating brackish groundwater as a new water supply.

In 2015, the 84th Texas Legislature passed House Bill 30, directing the TWDB to identify and designate brackish groundwater production zones in areas of the state with moderate to high availability and productivity of brackish groundwater that can be used to reduce the use of fresh groundwater and that met certain criteria.

In 2019, the 86th Texas Legislature restored funding for the BRACS Program with the passage of Rider 24 in House Bill 1, which appropriated \$2 million to the TWDB for contract and administrative costs to support designation of brackish groundwater production zones in aquifers of the state, excluding the Dockum Aquifer. The 86th Texas Legislature also passed Senate Bill 1041 that extended the deadline to complete zone designations from December 1, 2022, to December 1, 2032, and House Bill 722 that established a permitting framework for developing water supplies from TWDB-designated brackish groundwater productions zones.

Studies on brackish aquifers

In total, legislative appropriations to the TWDB have provided funding for staff to complete studies internally and 10 contracts for additional studies in the BRACS Program. In 2010, the TWDB contracted three research projects totaling \$449,500 to support the initiation of the BRACS Program. In 2015, the TWDB funded seven contracts totaling less than \$1.7 million for eight aquifers or portions of an aquifer.

Overall, the TWDB has completed 12 studies and has four ongoing studies (Figure 1). Of the completed aquifer studies, TWDB staff completed five internally and contractors completed seven. Of the ongoing studies, TWDB staff are working on three and will need to evaluate one aquifer for zone designation. The TWDB has planned for future studies, which will include seven aquifers that meet House Bill 30 criteria and are eligible for zone designation (Figure 2). The remaining 13 aquifers that do not meet House Bill 30 criteria will be mapped and characterized

after meeting the December 1, 2032, legislative deadline for completing the zone designations for qualifying aquifers.

Designation of brackish groundwater production zones

To date, the TWDB has designated a total of 31 brackish groundwater production zones (Figure 3). On October 20, 2016, the TWDB designated eight brackish groundwater production zones in the following aquifers: no zones in the Blaine Aquifer, one zone in the Carrizo-Wilcox Aquifer south of the Colorado River, four zones in the Gulf Coast Aquifer and bordering sediments, and three zones in the Rustler Aquifer. Summaries of each aquifer study were included in the 2016 Biennial Report on Seawater and Brackish Groundwater Desalination submitted to the Texas Legislature by December 1, 2016.

On March 28, 2019, the TWDB designated a total of 23 brackish groundwater production zones in the following aquifers: three zones in the Blossom Aquifer, no zones in the Lipan Aquifer, five zones in the Nacatoch Aquifer, and fifteen zones in the Northern Trinity Aquifer. Summaries of each aquifer study will be included in the 2020 Biennial Report on Seawater and Brackish Groundwater Desalination due to the Texas Legislature by December 1, 2020.

Status of legislative implementation

The \$2 million appropriation in Rider 24 is divided into two funds: (1) \$318,554 for two additional staff positions in the BRACS team and (2) \$1,681,446 for contract costs to support studies related to designating zones in aquifers of the state, excluding the Dockum Aquifer. The funding is from General Revenue and lapses on August 31, 2021.

Thus far, the TWDB has hired two full-time employees that started in November 2019. We have drafted two Requests for Qualifications (RFQs) for targeted technical contract support. The first RFQ will be for consulting firms qualified to perform specific tasks for future aquifer studies such as data collection and entry, stratigraphy and lithology, water quality sampling, and core testing. Once a shortlist of consulting firms is approved, we will place task orders for certain targeted technical tasks, which will help improve efficiency and reduce processing time. The second RFQ will be for consulting firms qualified to complete an injection well buffer study to model the distance injected fluids may have traveled both laterally and vertically from injection wells (Class I, II, III, IV, and V) and determine the appropriate buffer distance needed to prevent production of injectate by groundwater wells in designated brackish groundwater production zones. TWDB staff have also met with state agencies to discuss technical and regulatory research topics related to brackish groundwater development.

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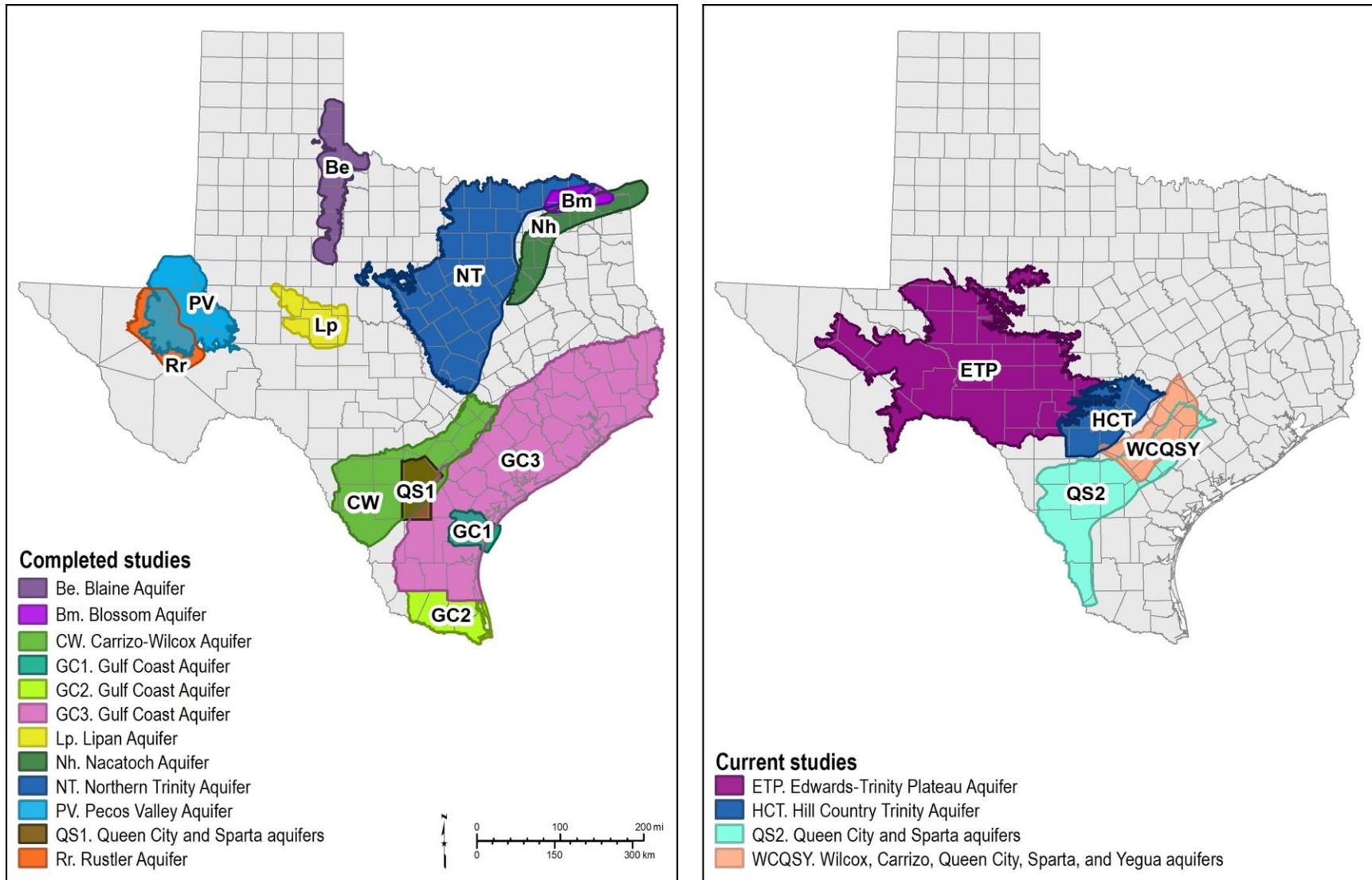


Figure 1. Completed aquifer studies (left side) and ongoing aquifer studies (right side) of the Brackish Resources Aquifer Characterization System Program.

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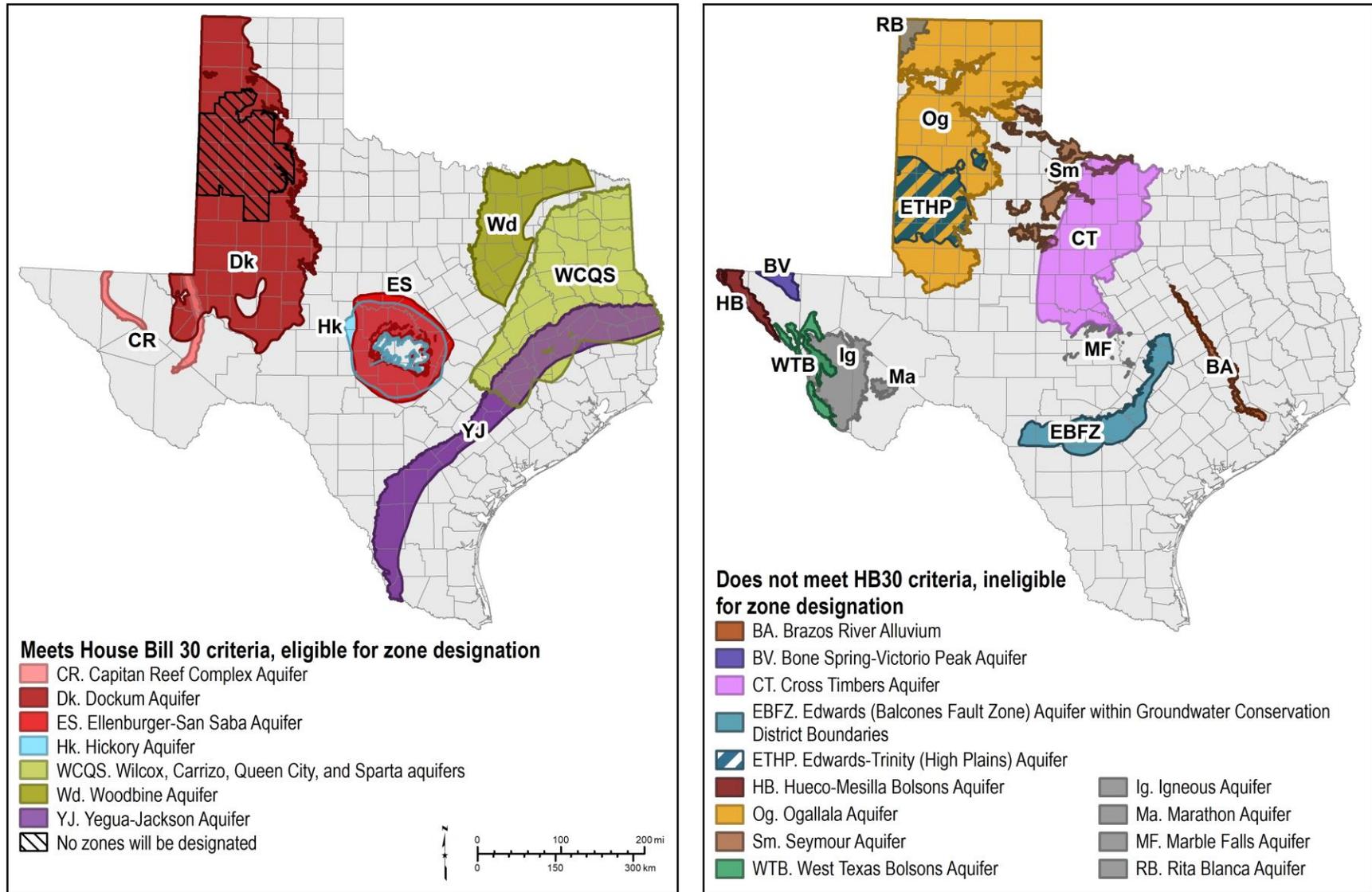


Figure 2. Future aquifer studies that will be evaluated for zone designation (left side) and characterized after the legislative deadline (right side).

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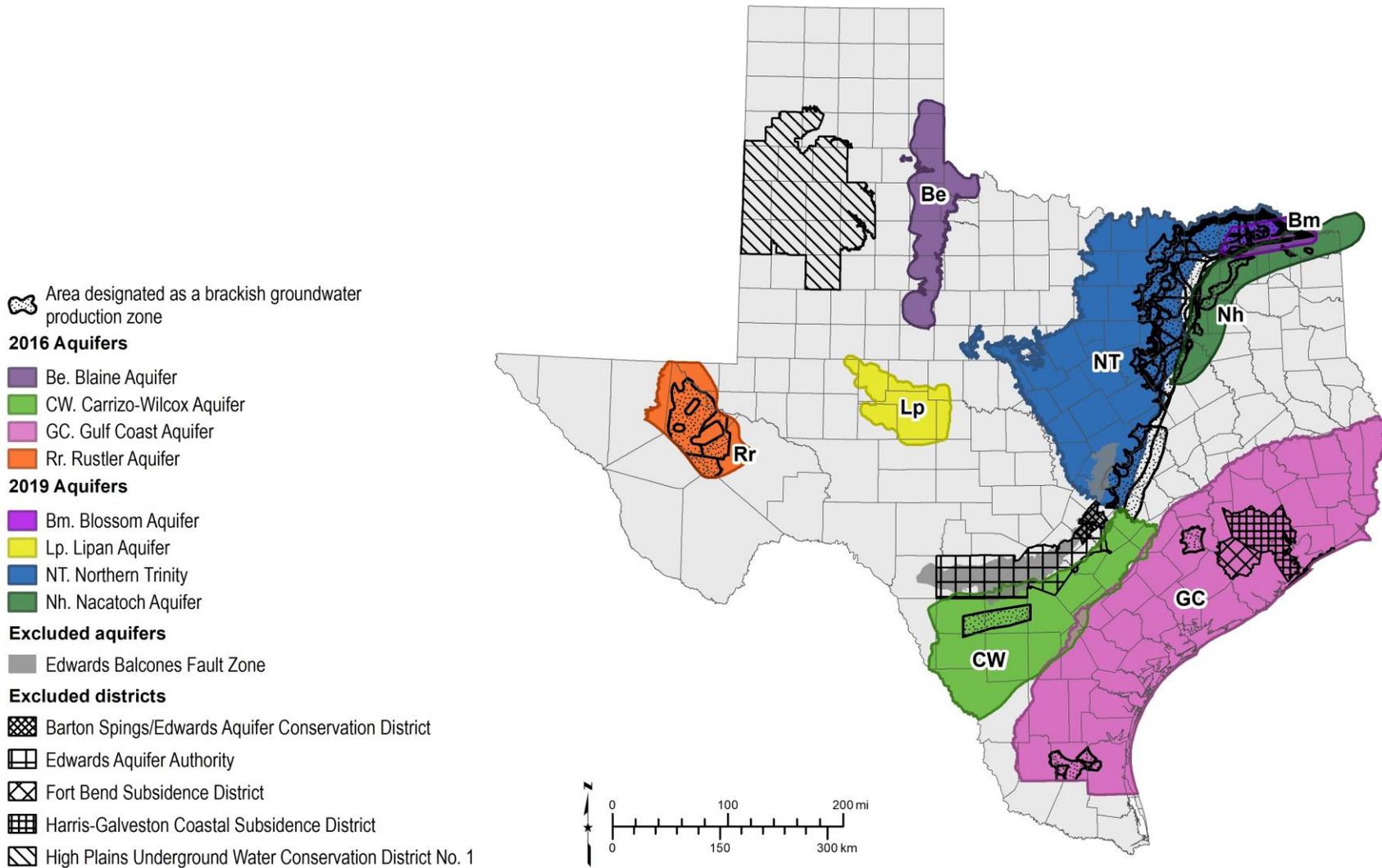


Figure 3. Aquifer studies evaluated for brackish groundwater production zones designation and excluded aquifers and districts per legislation.