



Technical Note 23-01

# **Water Data Inventory Report**

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Edition 1

by

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## List of Acronyms

BRACS	Brackish Resources Aquifer Characterization System
RWPG	Regional Water Planning Group
SWP	State Water Plan
TWDB	Texas Water Development Board
WUG	Water User Group

# Texas Water Development Board

## Water Data Inventory Report

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### EXECUTIVE SUMMARY

In April of 2018, nearly 90 Texas water experts and stakeholders gathered for a “Connecting Texas Water Data Workshop,” held at the University of Texas in Austin, to identify critical water data needs and discuss what the design of a statewide system to connect Texas water data might look like. Through a full day of break-out sessions and discussion, organizers and participants learned that there is an overwhelming need to make Texas water data more accessible and better connected (Rosen and others, 2020). In other words, the Texas water community is interested in making water data more findable, accessible, interoperable, and reusable, or FAIR.

Momentum behind the need for improved access to robust water data continues to grow nationally, regionally, at the state level, and through smaller data hubs. The Internet of Water, US Geological Survey, Western States Water Council, California, New Mexico, and many others are defining what the water data landscape will look like moving forward. Texas – a state with booming population growth driving increased water stresses and the latitude to determine the form and substance of our water data efforts – is uniquely situated to contribute to and shape that conversation. A key project that will aid in that process is the development of the Texas Water Data Hub. However, before the Texas Water Data Hub can be fully developed, a detailed inventory of water data assets across the state needs to be created. This technical note furthers that process by cataloging all publicly available water data housed at the Texas Water Development Board (TWDB) and will be updated annually, with the current report serving as the first edition.

This project supports the buildout of a statewide Texas Water Data Hub, serves as an index of TWDB water data, and provides a valuable source of information for both external stakeholders and new employees alike. Ensuring that water data producers and users are aware of the myriad TWDB water data resources will help the TWDB move towards its goal of developing FAIR water data for Texas.

## INTRODUCTION

The TWDB creates a significant amount of water data and generates a variety of data-related reports each year. Though program areas and divisions are aware of the products they generate, this knowledge is not always transferred uniformly across all agency departments. To achieve the goal of making Texas water data more FAIR (findable, accessible, interoperable, and reusable), efforts must start at home. As such, the primary goal of the TWDB Water Data Inventory Report is to identify and catalog water resources data and related products developed and/or maintained by the agency. In doing so, the report will improve the findability of TWDB water data.

Additionally, cataloging TWDB data is the first step in developing consistent metadata that can be applied across the agency for datasets that will be included in the Texas Water Data Hub. Maintaining an up-to-date data inventory is critical to better information sharing and integration into comprehensive open data programs.

This report was created by meeting individually with staff from each department at the TWDB that creates and/or maintains water resources data to discuss current data, new projects, and any constraints limiting data availability. The report is the first edition and will be updated on an annual basis to include new data as it is made available and to ensure the ongoing accuracy of information on existing TWDB resources.

This report is organized by TWDB offices and divisions to make data easier to locate by content area. Within each area, data sources are separated by data that can be downloaded directly from the TWDB website and data that must be requested via email. Some departmental research reports are included if directly related to downloadable datasets, but written reports without data available for download are excluded.

The goals of the TWDB water data inventory process are to

1. Create an agency-wide report of all non-financial water resources data created and/or maintained by the TWDB;
2. Develop a catalog that allows employees to browse downloadable data or to search data naming conventions used in this report;
3. Identify agency data streams currently not available online to begin to estimate the workload required to digitize and publish these data streams, making them more accessible to the public;
4. Create a life cycle analysis of TWDB data, including whether data streams are updated, how often, by whom, and the QA/QC processes involved; and
5. Identify outdated datasets and determine if they should be updated where possible.

This report covers the first two goals in whole and goal three in part.

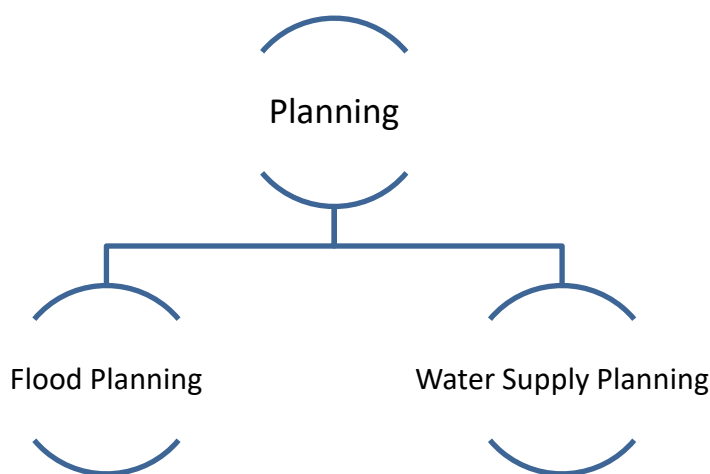
The types of data included in the inventory process are

1. Datasets collected or manipulated by the agency;
2. Web maps, online viewers, models, and any geographic information system (GIS) data produced by a team; and
3. One-time published reports containing water data developed or manipulated by the agency.

Note that individual reports are not cataloged unless raw data from the report is available. Additionally, if a dataset used in a study came from another authoritative source, it is not included in the inventory unless processing and analysis were conducted to create a new dataset

## OFFICE OF PLANNING

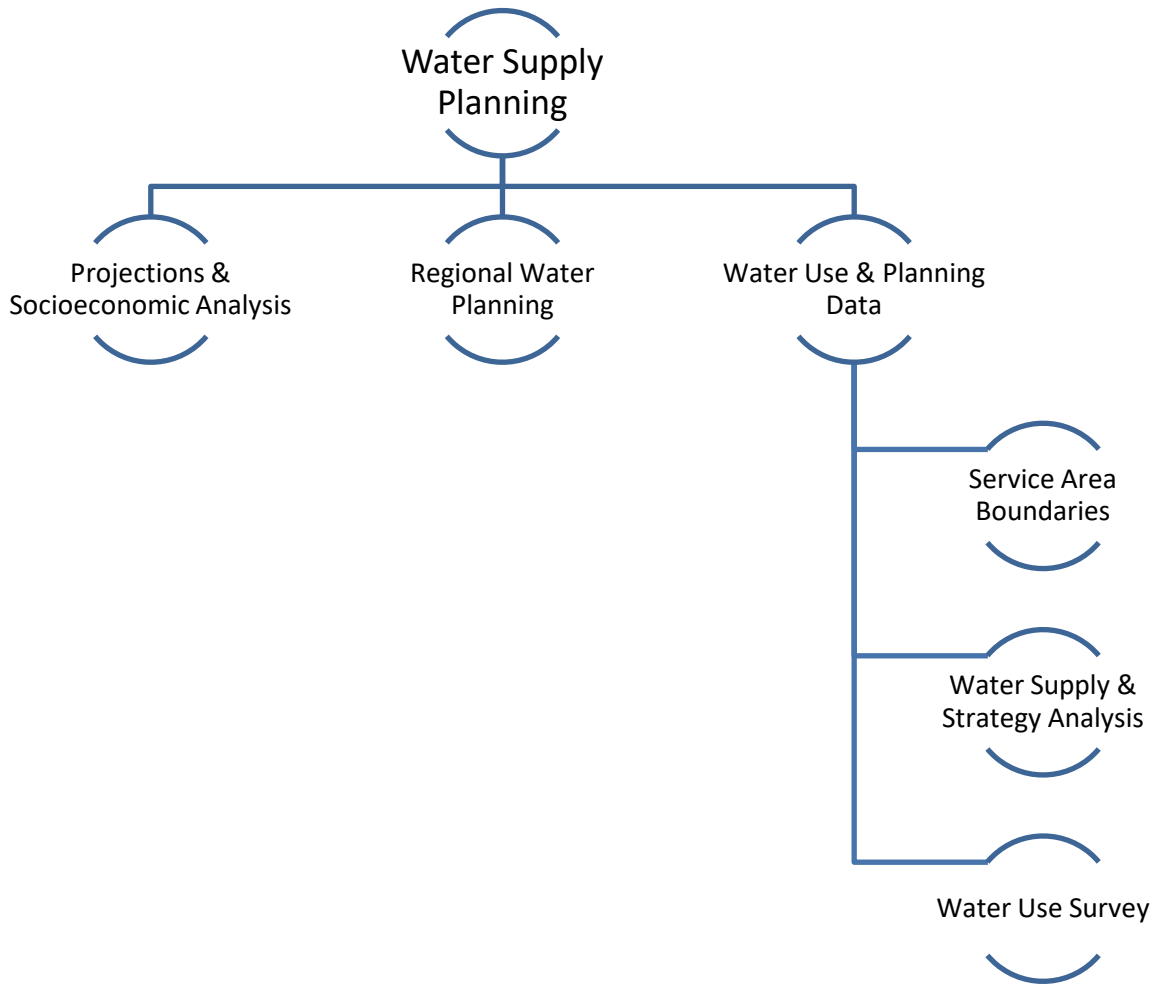
The Office of Planning at the TWDB consists of two divisions: Flood Planning and Water Supply Planning. The Office of Planning is responsible for administering water supply and flood planning processes that operate on independent five-year cycles. The TWDB has been administering the state water supply planning process since 1957, with the first plan released in 1961. In 1997, the water supply planning process shifted to a regionally driven approach that continues to guide the state's planning process today. Additionally, in 2019, the Texas Legislature expanded the TWDB's role to include administering a new state and regional flood planning process. The first state flood plan is due September 1, 2024. Once the first regional and state flood plans have been released, the associated data will be made publicly available and will be included in future editions of this report.



*Figure 1: Organizational chart of the divisions within the Office of Planning.*

## WATER SUPPLY PLANNING DIVISION

The Water Supply Planning Division consists of three departments: Projections & Socioeconomic Analysis, Regional Water Planning, and Water Use & Planning Data. The primary responsibility of the division is to guide and support the planning process for the state's water resources. Regional Water Planning department activities include providing administrative and technical assistance to the state's regional water planning groups. The data for the water supply planning process is developed and analyzed by the Projections & Socioeconomic Analysis and Water Use & Planning Data departments and is indexed in the sections below.



**Figure 2:** Organizational chart of the departments within the Water Supply Planning Division.

## PROJECTIONS & SOCIOECONOMIC ANALYSIS

The Projections and Socioeconomic Analysis Department is located within the Water Supply Planning Division. The department is responsible for developing annual population estimates for Water User Groups (WUGs) and population projections for the state water supply planning process. Projections and Socioeconomic Analysis also develops water demand projections for the regional and state water plans for water use categories including irrigation, livestock, mining, manufacturing, steam-electric, and municipal. Additionally, the department develops annual water use estimates for categories that are not surveyed, including livestock and the oil and gas sector, which is a subset of the mining



water use category. Note that the non-surveyed irrigation category annual estimates are produced by the Conservation & Innovative Water Technologies Division in the Office of Water Science and Conservation. Socioeconomic impact analyses are also developed for each regional water planning group to analyze the social and economic impacts of not meeting projected water demands.

### Data Available for Direct Download

1. [Projections and Socioeconomic Analysis Data Hub](#): Data hub of resources used to support the work of the Projections and Socioeconomic Analysis Department.
2. [Planning Data Dashboard](#): Interactive dashboard that displays historical water use estimates and water demand projections for the 16 regional water planning groups (RWPGs), counties, and water demand categories. Includes data from the 2002 - 2022 State Water Plans (SWP) and is updated each planning cycle with the relevant projections.
3. [Population Projections](#): Projections used for the SWP and updated on a 5-year cycle.
  - a. [2021 Regional and 2022 State Water Plan Population Data](#): Projections cover 2020-2070.
    - i. [County Population Projections](#): Complete table of population projections summarized by county.
    - ii. [Search by County](#): Population projections by county level selection.
    - iii. [Region, County, River Basin, and Population Projections](#): Complete table of all WUG population projections with river basin, planning region, and county information.
    - iv. [Search by Region](#): Population projections of WUG for selected planning regions with river basin, planning region, and county information.
    - v. [Statewide and Planning Region Population Projections](#): Population projections summarized by planning region.
    - vi. [Water User Group \(WUG\) Population Projections](#): Complete table of all WUGs' population projections.
    - vii. [Search by Water User Group \(WUG\)](#): Population projections by WUG selection. The WUG is the smallest planning unit for the state water plan.
  - b. [2016 Regional and 2017 State Water Plan Population Data](#): Projections cover 2020-2070.
    - i. [City Population Projections](#): Population projections by city selection.
    - ii. [County Population Projections](#): Population projections summarized by county.
    - iii. [Region, County, River Basin, and Population Projections](#): Complete table of all WUG population projections with river basin, planning region, and county information.

- iv. [Search by Region](#) : Population projections of WUG for selected planning regions with river basin, planning region, and county information.
- v. [Statewide and Planning Region Population Projections](#): Population projections summarized by planning region.
- vi. [Water User Group \(WUG\) Population Projections](#): Complete table of all WUGs' population projections.
- c. [2011 Regional and 2012 State Water Plan Population Data](#): Projections cover 2010-2060.
  - i. [City Population Projections](#): Complete table of all cities' population projections.
  - ii. [County Population Projections](#): Population projections summarized by county.
  - iii. [Region, County, River Basin, and Population Projections](#): Complete table of all city population projections with river basin, planning region, and county information.
  - iv. [Statewide and Planning Region Population Projections](#): Population projections summarized by planning region.
- d. [2006 Regional and 2007 State Water Plan Population Data](#): Projections cover 2010-2060.
  - i. [City Population Projections](#) : Complete table of all cities' population projections.
  - ii. [County Population Projections](#): Population projections summarized by county.
  - iii. [Region, County, River Basin, and Population Projections](#): Complete table of all city population projections with river basin, planning region, and county information.
  - iv. [Statewide and Planning Region Population Projections](#): Population projections summarized by planning region.
- e. [2001 Regional and 2002 State Water Plan Population Data](#): Projections cover 1990-2050.
  - i. [City Population Projections](#): Complete table of all cities' population projections.
  - ii. [County Population Projections](#): Population projections summarized by county.
  - iii. [Region, County, River Basin, and Population Projections](#): Complete table of all city population projections with planning region and county information.
  - iv. [Statewide and Planning Region Population Projections](#): Population projections summarized by planning region.

- f. [1996 Regional and 1997 State Water Plan Population Data](#): Projections cover 1990-2050.
  - i. [City Population Projections](#): Complete table of all cities' population projections.
  - ii. [County Population Projections](#): Population projections summarized by county.
  - iii. [Region, County, River Basin, and Population Projections](#): Complete table of all city population projections with planning region and county information.
  - iv. [Statewide and Planning Region Population Projections](#): Population projections summarized by planning region.
4. [Projections Methodology and Supporting Documentation](#): Data including methodologies, WUG bridge tables, historical WUG population and gallons per capita per day (GPCD), water efficiency savings, and historical water use by demand category for the 2021 Regional Water Plans and the 2022 State Water Plan.
  - a. [Projections FAQ](#): Frequently asked questions regarding the State Water Plan population and water demand projections.
5. [Socioeconomic Impact Analysis](#): An evaluation of the social and economic impacts of not meeting identified water needs for a single year within the drought of record.
  - a. [Regional Socioeconomic Impact Analysis for 2021](#): Impact analysis for the 2021 Regional Water Plans. Projected socioeconomic impacts are regional impacts, not county level.
  - b. [Regional Socioeconomic Impact Analysis for 2016 and Older](#): Impact analysis for the 2016, 2011, and 2006 regional water plans. Projected socioeconomic impacts are at the regional level, not the county level.
  - c. [Socioeconomic Impact Analysis Dashboard](#): Interactive dashboard that displays the impact in 2018 dollars of not meeting identified water needs within the 2021 Regional Water Plans. The dashboard includes planning regions, an economic summary, water use by demand category, projected water needs, population projection, economic impact to industries, job loss, and population loss.
  - d. [Socioeconomic FAQ](#): Frequently asked questions and methodology documents for the 2022 socioeconomic impact analysis.
6. [Water Demand Projections](#): Projections used for the State Water Plan, updated on a 5-year cycle. Water demand projections are in acre-feet and include irrigation, livestock, manufacturing, mining, municipal, and steam-electric power categories.
  - a. [2021 Regional and 2022 State Water Plan Water Demand Data](#): Projections cover 2020-2070.
    - i. [County Water Demand Projections](#): Water demand projections summarized by county.

- ii. [Search by County](#): Water demand projections by county selection.
  - iii. [Search by Demand Category](#): Water demand projections by demand category (irrigation, livestock, manufacturing, mining, municipal, and steam-electric power).
  - iv. [Regional Water Demand Projections](#): Water demand projections summarized by planning region.
  - v. [Region, County, River Basin, and Water Demand Projections](#): Complete table of all WUGs' water demand projections with planning region, county, river basin, and demand category information (irrigation, livestock, manufacturing, mining, municipal, and steam-electric power).
  - vi. [Statewide Water Demand Projections](#): Water demand projections summarized for the state.
  - vii. [Search by Water User Group \(WUG\)](#) : Water demand projections by WUG selection.
  - viii. [Water User Group \(WUG\) Water Demand Projections](#): Water demand projections summarized by WUG.
- b. [2016 Regional and 2017 State Water Demand Projection Data](#): Projections cover 2020-2070.
- i. [City Water Demand Projections](#): Complete table of all city water demand projections with planning region, county, and demand category information.
  - ii. [Search by City](#): Water demand projections by city selection.
  - iii. [County Water Demand Projections](#): Water demand projections summarized by county.
  - iv. [Search by County](#): Water demand projections by county selection.
  - v. [Regional Water Demand Projections](#): Water demand projections summarized by planning region.
  - vi. [Region, County, River Basin, and Water Demand Projections](#): Complete table of all WUGs' water demand projections with planning region, county, river basin, and demand category information (irrigation, livestock, manufacturing, mining, municipal, and steam-electric power).
  - vii. [Statewide Water Demand Projections](#): Water demand projections summarized for the state.
- c. [2011 Regional and 2012 State Water Demand Projection Data](#): Projections cover 2010-2060.
- i. [City Water Demand Projections](#): Water demand projections by city selection.

- ii. [County and Region Water Demand Projections](#): Water demand projections summarized by planning region and county.
- iii. [County Water Demand Projections](#): Water demand projections summarized by county.
- iv. [Regional Water Demand Projections](#): Water demand projections summarized by planning region.
- v. [Region, County, River Basin, and Water Demand Projections](#): Complete table of all WUGs' water demand projections with planning region, county, river basin, and demand category information (irrigation, livestock, manufacturing, mining, municipal, and steam-electric power).

[Statewide Water Demand Projections](#): Water demand projections summarized for the state.

- d. [2006 Regional and 2007 State Water Demand Projection Data](#): Projections cover 2010-2060.
  - i. [City Water Demand Projections](#): Water demand projections by city selection.
  - ii. [County and Region Water Demand Projections](#): Water demand projections summarized by planning region and county.
  - iii. [County Water Demand Projections](#): Water demand projections summarized by county.
  - iv. [Regional Water Demand Projections](#): Water demand projections summarized by planning region.
  - v. [Region, County, River Basin, and Water Demand Projections](#): Complete table of all WUGs' water demand projections with planning region, county, river basin, and demand category information (irrigation, livestock, manufacturing, mining, municipal, and steam-electric power).
  - vi. [Statewide Water Demand Projections](#): Water demand projections summarized for the state.
- e. [2001 Regional and 2002 State Water Demand Projection Data](#): Projections cover 2010-2060.
  - i. [Irrigation Water Demand Projections](#): Water demand projections summarized by planning region and county for irrigation.
  - ii. [Livestock Water Demand Projections](#): Water demand projections summarized by planning region and county for livestock.
  - iii. [Manufacturing Water Demand Projections](#): Water demand projections summarized by planning region and county for manufacturing.
  - iv. [Mining Water Demand Projections](#): Water demand projections summarized by planning region and county for mining.

- v. [Municipal Water Demand Projections](#): Water demand projections summarized by planning region and county for municipal.
  - vi. [Steam-electric Water Demand Projections](#): Water demand projections summarized by planning region and county for steam-electric.
  - vii. [Statewide Water Demand Projections](#): Water demand projections summarized for the state.
- f. [1996 Regional and 1997 State Water Demand Projection Data](#): Projections cover 1990-2050.
- i. [Irrigation Water Demand Projections](#): Water demand projections summarized by planning region and county for irrigation.
  - ii. [Livestock Water Demand Projections](#): Water demand projections summarized by planning region and county for livestock.
  - iii. [Manufacturing Water Demand Projections](#): Water demand projections summarized by planning region and county for manufacturing.
  - iv. [Mining Water Demand Projections](#): Water demand projections summarized by planning region and county for mining.
  - v. [Municipal Water Demand Projections](#): Water demand projections summarized by planning region and county for municipal.
  - vi. [Steam-electric Water Demand Projections](#): Water demand projections summarized by planning region and county for steam-electric.
  - vii. [Statewide Water Demand Projections](#): Water demand projections summarized for the state.

## WATER USE & PLANNING DATA

The Water Use & Planning Data Department is located within the Water Supply Planning Division. The Water Use & Planning Data Department is comprised of the Service Area Boundaries, Water Supply and Strategy Analysis, and Water Use Survey teams. The Service Area Boundaries team is responsible for maintaining the Texas Water Service Boundary application and the Service Area Boundary Editor application. Public water systems fill out the Service Area Boundary Editor in tandem with the Water Use Survey. The water planning process is based on public water system's boundaries and the team is responsible for collecting and maintaining these boundaries, which are used for planning and population estimates. The Water Supply and Strategy Analysis team manages the databases and applications used by the regional water planning group consultants to enter data related to the regional water plans. The regional water planning databases are used to develop the state water plan every five years. The Water Use Survey team is responsible for collecting and disseminating the annual Water Use Survey for all public water systems, commercial, steam-electric, and some mining facilities within the state. The Water Use Survey team maintains and provides quality assurance for the survey data, which is in turn

used in the state and regional water plans. The team also provides technical and non-technical assistance to survey participants. Additionally, the Water Use Survey team develops the annual water use estimates for the surveyed categories of municipal, manufacturing, and power generation.

### **Data Available for Direct Download**

1. [Historical Groundwater Pumpage Estimates](#): Annual estimates of groundwater pumped from an aquifer.
  - a. [Groundwater Pumpage Estimates](#): Covers years 1980-present. Data is split by county, aquifer, and water use category.
  - b. [Groundwater Pumpage Estimates by County](#): Covers present year data only. Data is split by groundwater pumping entity and includes water use category, intake type, county, basin, and aquifer.
2. [Historical Water Use Estimates](#): Annual survey of ground and surface water used by municipal and industrial entities.
  - a. County Estimates: Historical water use estimates summarized by year.
    - i. [County Water Use, 1999 and earlier](#): Covering years 1974, 1980, and 1984-1999. Estimates are split by groundwater, surface water, and water use category.
    - ii. [County Water Use, 2000-2014](#): Covering years 2000-2014. Estimates are split by planning region, groundwater, surface water, and water use category.
    - iii. [County Water Use, 2015 -Present](#): Covering years 2015-present. Estimates are split by planning region, groundwater, surface water, reuse, and water use category.
  - b. Major River Basin Estimate: Historical water use estimates for major river basins summarized by year.
    - i. [Basin Water Use, 1999 and earlier](#): Covering years 1974, 1980, and 1984-1999. Estimates are split by major river basin, groundwater, surface water, and water use category.
    - ii. [Basin Water Use, 2000-2014](#): Covering years 2000-2014. Estimates are split by major river basin, groundwater, surface water, and water use category.
    - iii. [Basin Water Use, 2015 -Present](#): Covering years 2015-present. Estimates are split by planning region, groundwater, surface water, reuse, and water use category.
  - c. Regional Water Planning Water User Group Utility Gallons Per Capita per Day Estimates: Historical water use estimates for gallons per capita per day summarized by year.

- i. [Water User Group Water Use, 2016 -Present](#): Covering years 2016-present. Estimates are split by water user group and include population, intake, sales, and gallons per capita per day information.
    - ii. [Detailed Water User Group Water Use, 2016 -Present](#): Covering years 2016-present, select by year and water user group. Includes detailed information about sales, purchases, and intake volumes.
  - d. Statewide Estimates: Historical water use estimates for the state summarized by year.
    - i. [Statewide Water Use, 1999 and earlier](#): Covering years 1974, 1980, and 1984-1999. Estimates are split by groundwater, surface water, and water use category.
    - ii. [Statewide Water Use, 2000-2014](#): Covering years 2000-2014. Estimates are split by planning region, groundwater, surface water, and water use category.
    - iii. [Statewide Water Use, 2015 -Present](#): Covering years 2015-present. Estimates are split by planning region, groundwater, surface water, reuse, and water use category.
  - e. [Surveyed Industrial Water Intake by Planning Regions](#): Select planning region to view total industrial intake by facility. Includes population served, water type, county, region, major river basin, and source water.
  - f. [Water Reuse Facility Intake Volumes Only](#): Covering years 2000-present. Includes intake volumes and split by use in landscape, agriculture, and industrial gallons. Tables include facility name, reuse type, seller (if purchased), planning region, county, and major river basin.
  - g. [Water Reuse by Water Planning Region Intake Volumes Only](#): Select planning region to view water reuse total for years 2000-present.
  - h. [Water Use by Industry Type](#): Covering years 2000-present. Industries are split by a 3-digit NAICS code. Includes intake total, sales, net use, and surveyed facility count.
3. [Regional Water Planning Data](#): The 2012, 2017, and 2022 state water plan data are summarized in three online interactive state water plan applications.
  - a. [2012 Interactive Texas State Water Plan Application](#): Data from the 3<sup>rd</sup> planning cycle's DB12 database.
  - b. [2017 Interactive Texas State Water Plan Application](#): Data from the 4<sup>th</sup> planning cycle's DB17 database.
  - c. [2022 Interactive Texas State Water Plan Application](#): Data from the 5<sup>th</sup> planning cycle's DB22 database.
    - i. [2022 State Water Plan Summary Workbook](#): Excel formatted data summaries from the 5<sup>th</sup> planning cycle's DB22 database.



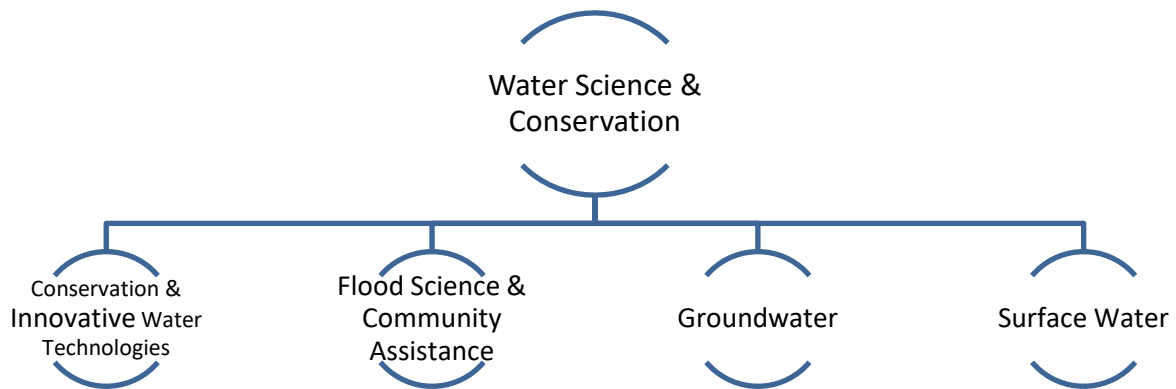
4. [Water Service Boundary Viewer](#): Statewide public water system service area mapping application. Boundaries are updated annually by utilities when filling out the water use survey.

**Data Available by Request:**

1. [Regional Water Planning Data](#): Data collected for the water planning cycles that can be requested from [WRPdatarequest@twdb.texas.gov](mailto:WRPdatarequest@twdb.texas.gov).
  - a. Data from the 2<sup>nd</sup> planning cycle and DB07 database.
  - b. Data from the 1<sup>st</sup> planning cycle and DB02 database.
  - c. Custom data from any of the planning databases.

## OFFICE OF WATER SCIENCE & CONSERVATION

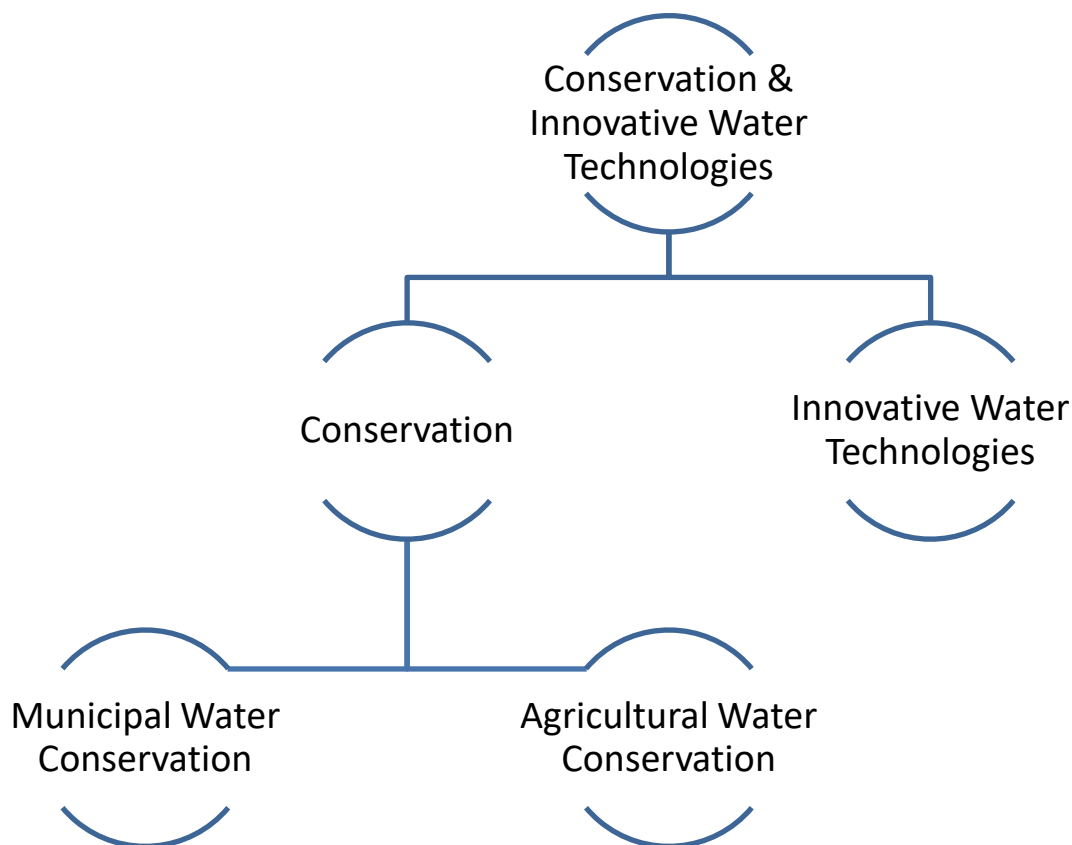
The Office of Water Science & Conservation consists of four divisions: Conservation and Innovative Water Technologies, Flood Science and Community Assistance, Groundwater, and Surface Water. The mission of the office is to provide assistance, information, and education for the conservation, management, and understanding of water in Texas. Each division consists of departments that collect and produce data for their respective programs to aid in supporting that mission. The following portion of this report describes the data available from the Office of Water Science & Conservation by division.



**Figure 3:** Organizational chart of divisions within the Office of Water Science & Conservation.

### CONSERVATION AND INNOVATIVE WATER TECHNOLOGIES DIVISION

The Conservation & Innovative Water Technologies Division consists of two departments. The Conservation Department provides leadership, technical assistance, and agricultural financial assistance to support water conservation in Texas. The Innovative Water Technologies Department conducts research to demonstrate and advance technology on alternative water supplies.



**Figure 4:** Organizational chart of the department and teams within the Conservation & Innovative Water Technologies Division.

## AGRICULTURAL WATER CONSERVATION

The Agricultural Water Conservation Team is part of the Conservation Department, which is within the Conservation and Innovative Water Technologies Division. Agricultural Water Conservation is responsible for developing annual irrigation water use estimates that are included in the Water Use Survey's annual estimates of state water use. Other duties include administering agricultural grants and loans as well as providing outreach, education, and technical assistance.

### Data Available for Direct Download

1. Historical Agricultural Irrigation Maps and Surveys
  - a. [Historical Agricultural Irrigation Maps](#): Historical maps were updated by hand to include total irrigated acres (including information on total acres irrigated by surface water, groundwater, and irrigated by sprinklers). Maps

are digitally scanned and available as PDFs for years 1979, 1984, 1989, 1994, and 2000.

- b. [Historical Agricultural Irrigation Surveys](#): Surveys completed with the historical maps that include the total irrigated acres by crop type (including information on total acres irrigated by surface water, groundwater, and irrigated by sprinklers). Surveys are digitally scanned for years 1958, 1964, 1969, 1974, 1979, and 1984-2000.
2. Irrigation Water Use Estimates:
    - a. [Historical Agriculture Irrigation Water Use Estimates](#): Estimates are split by county and crop type and include information on acreage irrigated and total volume in acre-feet, including groundwater, surface water, and reuse. Estimates cover years 1985-2013 and include sorghum, corn, rice, wheat, other grain, forage hay pasture, peanuts, soy oil, vineyard, orchard, alfalfa, sugarcane, vegetables, other, golf courses, cotton, and failed crops. Estimates for years 2014-2020 will be available in early 2023.

### Data Available by Request

1. Historical Irrigation Maps from 1958, 1969, and 1974 are available by request from [agconservation@twdb.texas.gov](mailto:agconservation@twdb.texas.gov).
2. Historical Agricultural Irrigation Water Use Estimates from 2014 -2019 are available by request from [agconservation@twdb.texas.gov](mailto:agconservation@twdb.texas.gov).

## MUNICIPAL WATER CONSERVATION

The Municipal Water Conservation Team is part of the Conservation Department, which is within the Conservation and Innovative Water Technologies Division. Municipal Water Conservation provides planning, education, information, and technical assistance to support municipal water conservation across Texas. Municipal Water Conservation staff are responsible for collecting, reviewing, and providing quality assurance on required Water Conservation Plans, Water Conservation Plan Annual Reports, and Water Loss Audits. This information is made available on the Conservation Department website and provided to regional water planning groups and other interested parties.

### Data Available for Direct Download

1. [Historical Water Loss Audit and Conservation Annual Report Data](#): A summary of annual data for water loss audits and conservation annual reports submitted by utilities.
  - a. [Summary of Water Loss Audits Reports](#): Summaries of annual water loss audit data can be generated by category (county, population, TWDB region, and utility). Reports cover years 2010-2020.

- b. [Summary of Water Balance Data Reports](#): Summaries of annual water loss audit data in water balance format can be generated by category (county, population, TWDB region, and utility). Reports cover years 2010-2020.
  - c. [Water Conservation Annual Reports](#): Summaries of water conservation annual report data can be generated by type (Annual Report GPCD by Category, Connections Data by Category, Water Use Data by Category, Utility 5-Year and 10-Year Water Conservation GPCD Targets, and Goals Stacked Line Chart). Reports cover years 2012-2020.
2. [Municipal Water Conservation Planning Tool](#): Pre-loaded data to assist in the development of water conservation plans.
    - a. [Municipal Water Conservation Planning Tool User Guide](#): Description of how to use the planning tool for different users with different levels of expertise. Completed November 2018.

### **Data Available by Request**

1. Information and data on Water Conservation Plans, Water Conservation Utility Profile, and Municipal Water Conservation Annual Reports can be requested from [wcpteam@twdb.texas.gov](mailto:wcpteam@twdb.texas.gov).
2. Information and data on Water Loss Audits can be requested from [wla-group@twdb.texas.gov](mailto:wla-group@twdb.texas.gov).

## **INNOVATIVE WATER TECHNOLOGIES**

The Innovative Water Technologies Department is within the Conservation and Innovative Water Technologies Division. Innovative Water Technologies focuses on advancing the implementation of desalination, aquifer storage and recovery, and water reuse. Innovative Water Technologies conducts and/or participates in research and demonstration projects needed to advance these technologies. Staff develop publications and educational materials and disseminate information to the public through presentations, active participation in organizations, and other outreach activities. Their data deliverables include raw and analyzed data, geographic information system (GIS) files, maps, databases, and reports.

### **Data Available for Direct Download**

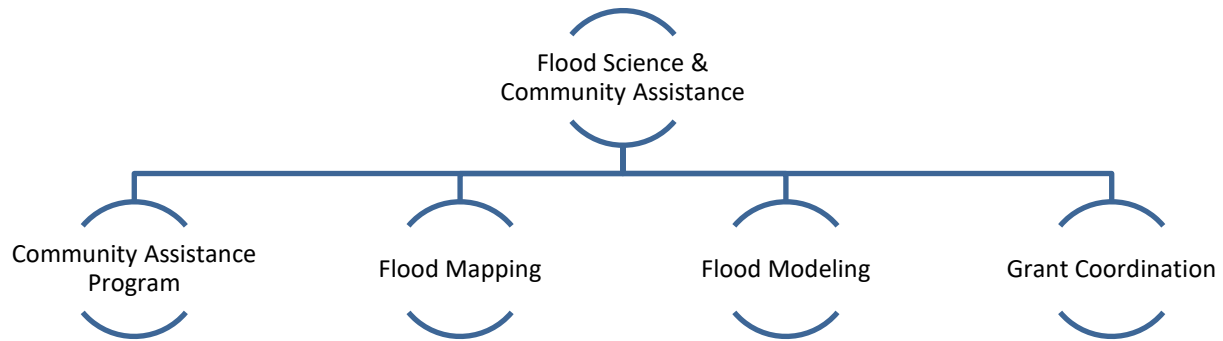
1. [Aquifer Storage and Recovery Projects Summary](#): Links to reports and information on completed and current projects funded by the TWDB.
  - a. [An Assessment of Aquifer Storage and Recovery in Texas Summary](#): Investigation of the technical, financial, policy, and legal issues that may obstruct the more widespread use of aquifer storage and recovery. Completed February 2011.
    - i. [Final report](#)

- b. [Corpus Christi Aquifer and Storage and Recovery Feasibility Project Summary](#): Conducted an exploratory drilling program near the city of Corpus Christi for geochemical analysis of the subsurface environment for aquifer storage and recovery suitability. Completed August 2019.
    - i. [Final report](#)
  - c. [Identification of Geographic Areas in Texas Suitable for Groundwater Banking Summary](#): Investigation to identify regions in Texas that are potentially suitable for groundwater banking. Completed December 2002.
    - i. [Final report](#): Part 1
    - ii. [Final report](#): Part 2
    - iii. [Final report](#): Appendix
  - d. [Lane City Reservoir Project: An Innovative Approach to Water Supply Development Summary](#): Overview of a new 40,000 acre-foot off-channel reservoir. Completed June 2018.
    - i. [Final report](#)
    - ii. [Regulatory Considerations for Permitting an Off-Channel Reservoir](#)
  - e. [New Braunfels Aquifer Storage and Recovery Demonstration Project Summary](#): Overview of a project to drill one wireline core hole and one monitor well into the brackish zone of the Edwards Aquifer to be analyzed for storage and recovery compatibility. Completed May 2019.
    - i. [Final report](#)
  - f. [Stormwater Harvesting Guidance Document](#): Evaluate the feasibility of stormwater harvesting as a water management strategy in Texas. Completed March 2010.
  - g. [Statewide Aquifer Suitability for Aquifer Storage and Recovery Projects and Aquifer Recharge Projects Summary](#): Statewide survey to identify the relative suitability of major and minor aquifers for storage and recharge projects. Completed November 2020.
    - i. [Final report](#)
    - ii. [Story map](#)
    - iii. [Web application](#)
    - iv. [GIS datasets](#)
  - h. [Victoria Aquifer Storage and Recovery Demonstration Project Summary](#): Overview of a project to convert an existing groundwater production well to an aquifer storage and recovery well. Completed July 2019.
    - i. [Final report](#)
2. [Desalination Plant Database Summary](#): Contains detailed information on public water supply desalination plants currently operating in Texas. Updated in 2020.
    - a. [Desalination Plant Database](#): Database of Texas desalination plants that includes plant name, county, plant production capacity design, water source, total dissolved solids, operating status, and desalination process. The record for each desalination plant also includes a desalination report with additional information such as mailing address, year built, design production capacity,

- average production volume, and pretreatment information. The database is updated every 5 years and was most recently updated in 2020.
- b. [Desalination Plant Viewer](#)
  3. [Reuse Projects](#): Links to reports and information on completed and current projects funded by the TWDB.
    - a. [Advancing Water Reuse in Texas Summary](#): Comprehensive review of the history of reuse in Texas, current state of knowledge relating to water quality, and prioritized key research topics. Completed April 2011.
      - i. [History of Reuse Report](#)
      - ii. [State of Technology of Water Reuse Report](#)
      - iii. [Water Reuse Research Agenda Report](#)
    - b. [Brazos Research Wetland Summary](#): Project to construct a wetland to study and evaluate how endocrine disrupting compounds can be reduced or removed from treated wastewater effluent. Completed May 2017.
      - i. [Fact sheet](#)
    - c. [Evaluating the Potential for Direct Potable Reuse in Texas Summary](#): A resource document that provides scientific and technical information on the implementation of direct potable reuse projects. Completed March 2015.
      - i. [Final report](#): Volume 1
      - ii. [Final report](#): Volume 2
    - d. [Stormwater Harvesting in Texas Summary](#): Study to assess the viability of stormwater reuse as a water management strategy. Completed March 2010.
      - i. [Final report](#)
    - e. [Testing Water Quality in a Municipal Wastewater Effluent Treated to Drinking Water Standards Summary](#): Project to test the quality of wastewater effluent that has been treated to drinking water standards at the Raw Water Production Facility, a full-scale potable water reuse facility in Big Springs, Texas. Completed March 2017.
      - i. [Final report](#): Volume 1
      - ii. [Final report](#): Volume 2
      - iii. [User's Manual for Integrated Treatment Train Toolbox - Potable Reuse](#)
      - iv. [Integrated Treatment Train Toolbox - Potable Reuse](#)

## FLOOD SCIENCE AND COMMUNITY ASSISTANCE

The Flood Science & Community Assistance Division consists of four departments: Community Assistance Program, Flood Mapping, Flood Modeling, and Grant Coordination. The 2019 Texas Legislature greatly expanded TWDB's role in flood planning and financing. Part of those expanded responsibilities include collecting more flood-related data to advance modeling and flood information. The Grant Coordination Department administers state and federal funds related to flood community assistance.



**Figure 5:** Organizational chart of the departments within the Flood Science & Community Assistance Division.

## COMMUNITY ASSISTANCE PROGRAM

The Community Assistance Program is part of the Flood Science and Community Assistance Division. The Community Assistance Program is responsible for administering the Federal Emergency Management Agency’s National Flood Insurance Program within the state, providing technical assistance to communities, and providing floodplain management and other types of trainings. The Community Assistance Program provides educational reports and other resources that did not meet the criteria to be indexed in this report.



## FLOOD MAPPING

The Flood Mapping Department is within the Flood Science and Community Assistance Division. Flood Mapping and Flood Modeling are responsible for mapping and modeling flood risk across the state.

### Data Available for Direct Download

1. [Floodplain Quilt](#): The floodplain quilt consists of multiple layers of data from various sources available throughout the state to ‘quilt’ together a single flood hazard dataset.
  - a. [Data by TWDB flood planning region](#)
  - b. [Floodplain quilt data source viewer](#)
2. [Base Level Engineering Data](#): Base Level Engineering is an efficient modeling and mapping approach that aims to provide technically credible flood hazard data at various geographic scales such as community, county, watershed, and/or state level. This data is meant to complement the current effective Federal Emergency Management Agency’s Flood Insurance Rate Map data but not replace it. For areas where no flood hazard data exists, the Base Level Engineering dataset may be the only source of flood risk data.

## FLOOD MODELING

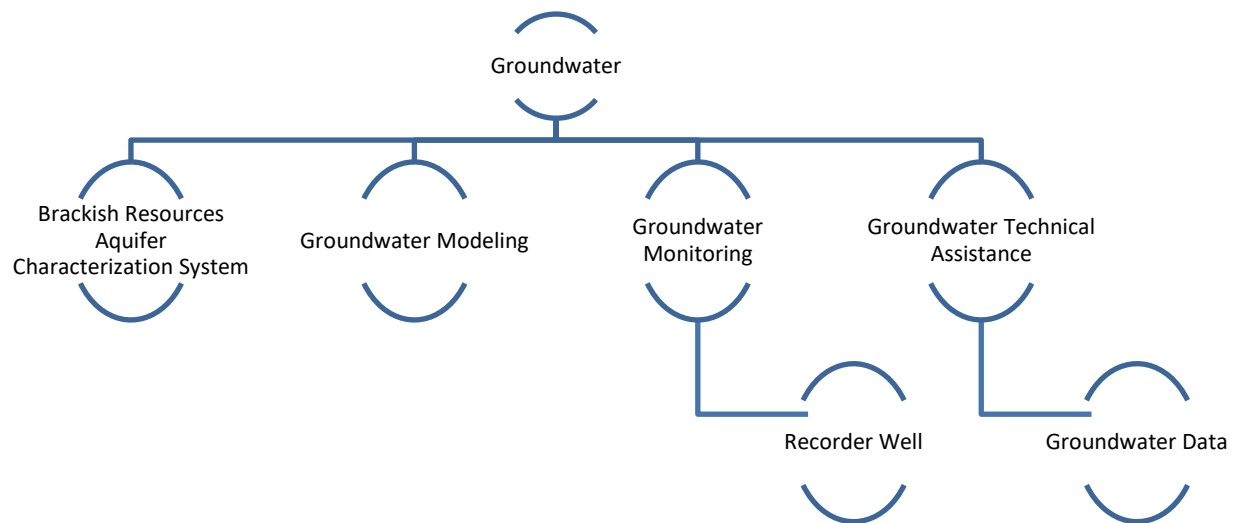
The Flood Modeling Department is within the Flood Science and Community Assistance Division. Flood Modeling works to develop improved modeling across the state and participates in flood research activities. The Base Level Engineering data indexed under the Flood Mapping Department is developed in cooperation with the Flood Modeling Department.

## GRANT COORDINATION

The Grant Coordination Department is part of the Flood Science and Community Assistance Division. Grant Coordination is responsible for administering the Federal Emergency Management Agency’s Flood Mitigation Assistance Program, which has the goal of eliminating or reducing repeated claims under the National Flood Insurance Program, as well as components of state grant programs. The Grant Coordination Department provides reports and other resources that did not meet the criteria to be indexed in this report.

## GROUNDWATER

The Groundwater Division consists of four departments: Brackish Resources Aquifer Characterization System (BRACS), Groundwater Modeling, Groundwater Monitoring, and Groundwater Technical Assistance. The Groundwater Division is responsible for all aspects of groundwater studies within the state. Their work includes monitoring and modeling aquifers, assisting groundwater management areas, and conducting investigations to inform the water planning process.



**Figure 6:** Organizational chart of the departments within the Groundwater Division.

### BRACS

The Brackish Resources Aquifer Characterization System (BRACS) Department is part of the Groundwater Division. Program staff map aquifer salinity from outcrop to approximately 35,000 mg/L total dissolved solids for the major and minor aquifers of Texas. Staff study the aquifers by mapping stratigraphy, lithology, and estimates of aquifer salinity from geophysical well logs to characterize and map brackish aquifers.

In addition to mapping aquifer salinity, the BRACS Department maps potential Brackish Groundwater Production Zones for the TWDB to consider designating. The BRACS

Department accomplishes this by mapping statutory criteria like existing fresh water and existing brackish groundwater use and by mapping injection wells.

### **Data Available for Direct Download**

1. [BRACS Database](#): A Microsoft Access database that includes information on location and well IDs, lithology and stratigraphy, digital well logs, total dissolved solids analysis using geophysical well logs, aquifer test information, water quality, static water level, and well construction.
  - a. [Data Dictionary](#): Fifth edition updated April 2020. Report on database reports, definitions, and table relationships.
2. [BRACS Database Viewer](#): Includes information on well owners, well use, elevation, well depth, water level observation type, water quality availability, aquifer code, well log availability, and well type. Wells within the viewer are mostly comprised of oil and gas wells used for mapping in BRACS studies. Most of the water wells within the viewer are fresh and some are brackish. Individual geophysical well logs can be downloaded from the well viewer.
  - a. [Total Dissolved Solid Values for Wells from the Groundwater Database](#): Geographic information system (GIS) point location data including total dissolved solids, year sample, and total dissolved solids range. Data was created October 2011.
3. [BRACS Studies Summary](#): Links to in-house or contracted studies on a variety of brackish water aquifer characterizations.
  - a. [An Assessment of Modeling Approaches to Brackish Aquifers in Texas](#): Analyses of the portions of aquifers containing brackish groundwater in Texas. Completed in November 2011.
    - a. [Final report](#): Assessment of Groundwater Modeling Approaches for Brackish Aquifers.
    - b. [GIS datasets](#)
  - b. [Brackish Groundwater Bibliography for Texas Summary](#): Comprehensive list of literature references for all the major and minor aquifers in Texas. Completed November 2011.
    - a. [Final report](#)
    - b. [GIS datasets](#)
  - c. [Identification of Potential Brackish Groundwater Production Areas: Blaine Aquifer Summary](#): Collection and mapping of existing water quality information and identification of candidate well logs to supplement water quality delineation within the Blaine Aquifer. Completed September 2016.
    - a. [Final report](#)
    - b. [GIS datasets](#)
      1. [Instructions on data](#)

- d. [Identification of Potential Brackish Groundwater Production Areas: Blossom Aquifer Summary](#): Study to delineate fresh, brackish, and saline groundwater, both vertically and horizontally within the Blossom Aquifer. Completed August 2017 and updated December 2019.
  - a. [Final report](#)
  - b. [Final report](#): Updated December 2019.
  - c. [GIS datasets](#)
    - 1. [Instructions on data](#)
- e. [Identification of Potential Brackish Groundwater Production Areas: Gulf Coast Aquifer Summary](#): Study to delineate fresh, brackish, and saline groundwater both vertically and horizontally within the Gulf Coast Aquifer. Completed September 2016.
  - a. [Final report](#)
  - b. [GIS datasets](#)
    - 1. [Instructions on data](#)
- f. [Identification of Potential Brackish Groundwater Production Areas: Nacatoch Aquifer](#): Collection and mapping of existing water quality and stratigraphy delineation within the Nacatoch Aquifer. Completed January 2017 and updated December 2019.
  - a. [Final report](#)
  - b. [Final report](#): Updated December 2019.
  - c. [GIS datasets](#)
    - 1. [Instructions on data](#)
- g. [Identification of Potential Brackish Groundwater Production Areas: Rustler Aquifer Summary](#): Study to delineate fresh, brackish, and saline groundwater, both vertically and horizontally within the Rustler Aquifer. Completed September 2016.
  - a. [Final report](#):
  - b. [GIS datasets](#)
    - 1. [Instructions on data](#)
- h. [Lipan Aquifer- Structure and Brackish Groundwater Summary](#): Characterization of the brackish parts of the major and minor aquifers in the study area and development of a database to be used for groundwater exploration of aquifer productivity. Completed September 2017.
  - a. [Final report](#)
  - b. [GIS datasets](#)
- i. [Northern Trinity Aquifer- Structure and Brackish Groundwater Summary](#): Characterization of the brackish parts of the major and minor aquifers in the study area and development of a database to be used for groundwater exploration of aquifer productivity. Completed December 2019.

- a. [Final report](#)
  - b. [GIS datasets](#)
- j. [Wilcox, Carrizo, Queen City, Sparta, and Yegua Aquifers, Central Texas - Structure and Brackish Groundwater Summary](#): Characterization of the brackish parts of the major and minor aquifers in the study area and development of a database to be used for groundwater exploration of aquifer productivity. Completed December 2020.
  - a. [Final report](#)
  - b. [GIS datasets](#)
4. [Lateral Extent of Brackish Aquifers in Texas](#): GIS polygon data representing regions in Texas underlain by one or more aquifers where total dissolved solids are between 1,000 and 10,000 milligrams per liter. Completed 2003.
  - a. [Final report](#)
  - b. [GIS datasets](#)

## GROUNDWATER MODELING

The Groundwater Modeling Department is part of the Groundwater Division. Groundwater availability modeling is the process of developing and using computer programs to estimate future trends in the availability of groundwater based on policy decisions by groundwater conservation districts. Models are based on hydrogeologic principles, actual aquifer measurements, and input from stakeholders.

### Data Available for Direct Download

1. [Alternative Groundwater Flow Models Summary](#): Links to access alternative groundwater flow models, related reports, and data.
  - a. [Edwards BFZ Aquifer \(Barton Springs Segment\) Summary](#): Recalibration of the groundwater availability model following a request from Groundwater Management Area 10. Completed June 2011.
    - i. [Model report](#): *Recalibration of the Edwards (Balcones Fault Zone) Aquifer- Barton Springs Segment- Groundwater Flow Model.*
  - b. [Edwards-Trinity \(Plateau\) and Pecos Valley Aquifers Summary](#): One layer groundwater flow model that is calibrated for a longer period. Completed January 2011.
    - i. [Model report](#): *Update of the Groundwater Availability Model for the Edwards-Trinity (Plateau) and Pecos Valley Aquifers of Texas.*
  - c. [Groundwater Management Area 16 Summary](#): Updated to encompass the footprint for Groundwater Management Area 16. Work is ongoing to develop an update to the existing groundwater availability model for the Central and



- c. [Central Portion of the Gulf Coast Aquifer System](#): This model is being combined with the southern portion of Gulf Coast Aquifer System and will be released in 2022 in combination with the Southern portion of the Gulf Coast Aquifer.
  - i. [Model download files](#): Includes data, model, fully penetrating wells model, and model grid.
  - ii. [Numerical model report](#): *Groundwater Availability of the Central Gulf Coast Aquifer: Numerical Simulations to 2050, Central Gulf Coast, Texas (2003)*.
  - iii. [Numerical model report](#): *GAM of the Central Gulf Coast Aquifer System: Numerical Simulations Through 1999 (2004)*.
  - iv. [Other report](#): *Estimation of Groundwater Recharge to the Gulf Coast Aquifer in Texas (2011)*.
- d. [Edwards and Trinity Regional Model](#): Update to the model began in 2020 and will be completed in 2023.
  - i. [Model download files](#): Includes data, model, and model grid.
  - ii. [Model report](#): *Draft Conceptual Model of Groundwater Flow in the Pecos Valley and Edwards-Trinity (Plateau) Regional Aquifers (2022)*.
- e. [Gulf Coast Aquifer System for Groundwater Management Areas 15 and 16 Summary](#): Model is currently under development and is scheduled to be released in 2023.
  - i. [Model download files](#): For Groundwater Management Area 16; includes model and GIS and ancillary data.
  - ii. [Model Report](#): *Draft Conceptual Model Report: Gulf Coast Aquifer System in Groundwater Management Areas 15 and 16 (2020)*.
  - iii. [Report Data](#): Summary of hydraulic conductivity values from pumping and specific capacity test, as well as summary of storability and specific yield values from pumping test.
- f. [High Plains Aquifer System Summary](#): Model was developed in 2012 and released in 2015.
  - i. [Conceptual model report](#): *Final Conceptual Model Report for the High Plains Aquifer System Groundwater Availability Model (2015)*.
  - ii. [Model download files](#): Includes data, model, and model grid.
  - iii. [Numerical model report](#): *Numerical Model Report for the High Plains Aquifer System Groundwater Availability Model (2015)*.
- g. [Hill Country Portion of the Trinity Aquifer Summary](#): Model was developed in 2009. In 2017 the Groundwater Modeling Department began updating the model, which was later released in 2019.
  - i. [Conceptual model report](#): *Conceptual Model Report for the Hill Country Trinity Aquifer Groundwater Availability Model (2018)*.

- ii. [Model download files](#): Includes data, model, and model grid.
- iii. [Model Report](#): *Groundwater Availability of the Trinity Aquifer, Hill Country Area, Texas: Numerical Simulations Through 2050 (2000)*.
- iv. [Model Report](#): *A Comparison of the Old and New Groundwater Availability Models for the Hill Country Portion of the Edwards and Trinity Aquifers (2009)*.
- v. [Model Report](#): *Groundwater Availability Model: Hill Country Portion of the Trinity Aquifer of Texas (2011)*.
- h. [Hueco-Mesilla Bolsons Aquifer Summary](#): Model was developed by the USGS in cooperation with El Paso Water Utilities. Completed in 2002.
  - i. [Model download files](#): Includes Hueco Bolson model and Mesilla Bolson model.
  - ii. [Model report](#): *Documentation of Files for Steady State and Annual Versions of Groundwater Flow Model of Hueco Bolson (2002)*.
  - iii. [Model report](#): *Final Report: Groundwater Modeling of the Cañutillo Wellfield (2002)*.
  - iv. [Model report](#): *Simulated Groundwater Flow in the Hueco Bolson, and Alluvial Basin Aquifer System Near El Paso, Texas (2003)*.
  - v. [Model report](#): *Documentation of Files for Cañutillo Wellfield Groundwater Flow Model (2004)*.
- i. [Northern Portion of the Carrizo-Wilcox Aquifer Summary](#): Model created in 2003 and was updated in 2017. Completed in April 2021.
  - i. [Conceptual model report](#): *Conceptual Model Report: Groundwater Availability Model for Northern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers*.
  - ii. [Model download files](#): Includes data (two files), model, and model grid.
  - iii. [Numerical model report](#): *Groundwater Availability Model for the Northern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers*.
- j. [Northern Portion of the Gulf Coast Aquifer System Summary](#): Model was created in 2013. Updates to the model began in 2019 and will be released in 2023.
  - i. [Model download files](#): Includes data, model, and model grid.
  - ii. [Model report](#): *Hydrogeology and Simulation of Groundwater Flow and Land Surface Subsidence in the Northern Part of the Gulf Coast Aquifer System, Texas (2004)*.
  - iii. [Model report](#): *Evaluation of Groundwater Flow and Land Surface Subsidence Caused by Hypothetical Withdrawals in the Northern Part of the Gulf Coast Aquifer System, Texas (2005)*.
  - iv. [Model report](#): *Review Comments for USGS SIR 2005-5024*.



- v. [Model report](#): *USGS Houston Area Groundwater Model (Version 1.1, 2012)*.
- vi. [Other report](#): *Estimation of Groundwater Recharge to the Gulf Coast Aquifer in Texas*.
- k. [Northern Portion of Ogallala Aquifer Summary](#): Model was developed in 2001 with updates in 2004, and 2010. This model has been superseded by the High Plains Aquifer System model which was released in 2015.
  - i. [Model report](#): *Saturated Thickness in the Ogallala Aquifer in the Panhandle Water Planning Area - Simulations of 2000 Through 2050 Withdrawal Projections (2001)*.
  - ii. [Model report](#): *Adjustment of Parameters to Improve the Calibration of the Og-n Model of the Ogallala Aquifer, Panhandle Water Planning Area (2004)*.
  - iii. [Model report](#): *Northern Ogallala GAM Update to Support 2011 Water Plan (2010)*.
- l. [Northern Portion of the Trinity Aquifer and Woodbine Aquifer Summary](#): Model was developed and released in 2015.
  - i. [Model download files](#): Includes data, model, appendix log, and aquifer data and model grid.
  - ii. [Model report](#): *Assessment of Groundwater Use in the Northern Trinity Aquifer Due to Urban Growth and Barnett Shale Development (2007)*.
  - iii. [Numerical model report](#): *Northern Trinity/Woodbine Aquifer Groundwater Availability Model (2004)*.
  - iv. [Numerical model report](#): *Updated Groundwater Availability Model of the Northern Trinity and Woodbine Aquifer (2014)*.
- m. [Northern Segment of the Edwards \(Balcones Fault Zone\) Aquifer Summary](#): Model created in 2003 and is currently being updated, with a 2023 release.
  - i. [Draft conceptual model report](#): *Northern Segment of the Edwards (Balcones Fault Zone) and Associated Trinity Aquifers of Texas (2020)*.
  - ii. [Model download files](#): Includes data, model, and model grid.
  - iii. [Numerical model report](#): *Groundwater Availability Model Northern Segment of the Edwards Aquifer, Texas (2003)*.
- n. [San Antonio Segment of the Edwards \(Balcones Fault Zone\) Aquifer Summary](#): Model developed by the U.S. Geologic Survey, in cooperation with the U.S. Department of Defense, and maintained by the TWDB. Completed 2004.
  - i. [Model download files](#): Includes model and model grid.
  - ii. [Model report](#): *Conceptualization and simulation of the Edwards Aquifer, San Antonio Region, Texas (2004)*.
  - iii. [Model report](#): *Plates 1 through 3 (2004)*.

- iv. [Model report](#): *Plates 4 through 7 (2004)*.
- v. [Model report](#): *Model Refinements and Applications for the Edwards (Balcones Fault Zone) Aquifer in the San Antonio Region, Texas (1992)*.
- vi. [Model report](#): *Summary of a GWSIM-IV Run Simulating the Effects of the Edwards Aquifer Authority Critical Period Management Plan for the Regional Water Planning Process (1999)*.
- o. [Seymour and Blaine Aquifers Summary](#): The model was developed in 2004 and updates to the model were released in 2012. A refined model for the Seymour Aquifer in Haskell, Knox, and Baylor counties was released in 2014.
  - i. [Model download files](#): Includes data, model, and model grid.
  - ii. [Model report](#): *Groundwater Availability Model for the Seymour Aquifer (2004)*.
- p. [Seymour Aquifer in Haskell, Knox, and Baylor Counties Summary](#): Conceptual model was developed in 2012 and a numerical model was released in 2014.
  - i. [Conceptual model report](#): *Conceptual Model for the Refined Seymour Aquifer Groundwater Availability Model: Haskell, Knox, and Baylor Counties (2012)*.
  - ii. [Model download files](#): Includes data, model, and model grid.
  - iii. [Numerical model report](#): *Final Report: Groundwater Availability Model of the Seymour Aquifer in Haskell, Knox, and Baylor Counties (2014)*.
- q. [Southern Portion of the Carrizo-Wilcox Aquifer Summary](#): Contract for update initiated in 2019 with a release planned for 2023.
  - i. [Draft conceptual model report](#): *Update to the Groundwater Availability Model for the Southern Portion of the Carrizo-Wilcox, Queen City, and Sparta Aquifers (Draft, 2021)*.
- r. [Southern Portion of the Gulf Coast Aquifer System Summary](#): Model was created in 2003 and updates were completed in 2007. Additional updates to the model began in 2019 and will be released in 2022 in combination with the Central portion of the Gulf Coast Aquifer System.
  - i. [Model download files](#): Includes draft model, model, and model grid.
  - ii. [Model report](#): *Groundwater Resource Evaluation and Availability of the Gulf Coast Aquifer in the Lower Rio Grande Valley of Texas (2007)*.
  - iii. [Other report](#): *Estimation of Groundwater Recharge to the Gulf Coast Aquifer in Texas (2011)*.
- s. [Southern Portion of the Ogallala Aquifer Summary](#): Model was developed in 2003 and the Edwards-Trinity was added to the model in 2009. This model has been superseded by the High Plains Aquifer System model that was released in 2015.
  - i. [Model report](#): *Groundwater Availability of the Southern Ogallala Aquifer in Texas and New Mexico: Numerical Simulations Through 2050 (2003)*.

- ii. [Model report](#): *Groundwater Recharge in the Southern High Plains (2003)*.
3. [Groundwater Availability Models for Minor Aquifers](#): Links to access groundwater availability models for minor aquifers, related reports, and data.
  - a. [Blossom Aquifer Summary](#): The model is under development with an expected release date in 2022.
  - b. [Bone Spring-Victorio Peak Aquifer Summary](#): Based on a 2008 El Paso Utilities study in support of the regional water planning process. A hybrid model was selected by stakeholders in the regional planning process and was released in 2016.
    - i. [Model download files](#): Includes model and model grid.
    - ii. [Model report](#): *Preliminary Groundwater Flow Model Dell City Area, Hudspeth, and Culberson Counties, Texas (2008)*.
  - c. [Brazos River Alluvium Summary](#): The model was developed and released in 2017.
    - i. [Conceptual model report](#): *Final Conceptual Model Report for the Brazos River Alluvium Aquifer Groundwater Availability Model (2016)*.
    - ii. [Model download files](#): Includes data, model, geodatabase, predictive flux tool, and model grid.
    - iii. [Numerical model report](#): *Final Numerical Model Report for the Brazos River Alluvium Aquifer Groundwater Availability Model (2016)*.
  - d. [Capitan Reef Complex Aquifer Summary](#): The model was developed and released in 2016.
    - i. [Conceptual model report](#): *Conceptual Model: Capitan Reef Complex Aquifer of Texas (2016)*.
    - ii. [Model download files](#): Includes structure, model, geodatabase, and model grid.
    - iii. [Numerical model report](#): *Groundwater Availability Model: Eastern Arm of the Capitan Reef Complex Aquifer of Texas (2016)*.
    - iv. [Related report](#): *Capitan Reef Complex Structure and Stratigraphy (2009)*.
  - e. [Cross Timbers Aquifer Summary](#): The model was developed and released in 2021.
    - i. [Model report](#): *Conceptual Model Report for the Cross Timbers Aquifer (2021)*.
  - f. [Lipan Aquifer Summary](#): Model was developed and released in 2005.
    - i. [Model download files](#): Includes data, model, and model grid.
    - ii. [Model report](#): *Groundwater Availability Model for the Lipan Aquifer in Texas (2004)*.

- iii. [Model report](#): *Quick Reference for the Groundwater Availability Model of the Lipan Aquifer (2009)*.
- g. [Llano Uplift Aquifer System Summary](#): Model includes the Ellenburger-San Saba, Hickory, and Marble Falls aquifers. Model was developed and released in 2016.
  - i. [Conceptual model report](#): *Conceptual Model Report: Minor Aquifers in Llano Uplift Region of Texas (2016)*.
  - ii. [Model download files](#): Includes data, model, and model grid.
  - iii. [Numerical model report](#): *Numerical Model Report: Minor Aquifers of the Llano Uplift Region of Texas (Marble Falls, Ellenburger-San Saba, and Hickory)(2016)*.
  - iv. [Related report](#): *Llano Uplift Aquifers Structure and Stratigraphy (2007)*.
- h. [Marathon Aquifer Summary](#): Conceptual model and report are currently under development and will be available in 2022.
- i. [Nacatoch Aquifer Summary](#): Model was developed and made available in 2009. An update to the model is underway and does not have an anticipated completion date at present.
  - i. [Model download files](#): Includes data, model, and model grid.
  - ii. [Model report](#): *Final Report Nacatoch Aquifer Groundwater Availability Model (2009)*.
- j. [Parts of the West Texas Bolsons \(Presidio and Redford Bolsons\) Aquifer Summary](#): Model was developed and released in 2013.
  - i. [Conceptual model report](#): *A Conceptual Model of the Groundwater Flow in the Presidio and Redford Bolsons Aquifer (2011)*.
  - ii. [Model download files](#): Includes data, model, and model grid.
  - iii. [Numerical model report](#): *Groundwater Availability Model of West Texas Bolsons (Presidio and Redford) Aquifer (2013)*.
- k. [Parts of the West Texas Bolsons \(Red Light, Green River, and Eagle Flat\) Aquifer Summary](#): Model developed and released in 2009.
  - i. [Model download files](#): Includes data, model, and model grid.
  - ii. [Model report](#): *Final Report Groundwater Availability Model for the West Texas Bolsons (Red Light Draw, Green River Valley, and Eagle Flat) Aquifers in Texas (2008)*.
- l. [Parts of the West Texas Bolsons \(Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat\) Aquifer and Igneous Aquifer Summary](#): Model developed and released in 2004.
  - i. [Model download files](#): Includes data, model, and model grid.
  - ii. [Model report](#): *Groundwater Availability Model for the Igneous and Parts of the West Texas Bolsons (Wild Horse Flat, Michigan Flat, Ryan Flat, and Lobo Flat) Aquifers (2004)*.

- iii. [Model report](#): *Quick Reference for the Groundwater Availability Model of the Igneous and Parts of West Texas Bolsons Aquifer (2009)*.
  - m. [Rustler Aquifer Summary](#): Model developed and released in 2012.
    - i. [Model download files](#): Includes data, model, and model grid.
    - ii. [Model report](#): *Final Groundwater Availability Model Report for the Rustler Aquifer (2012)*.
  - n. [Yegua-Jackson Aquifer Summary](#): Model was developed and released in 2010.
    - i. [Model download files](#): Includes data, model, structure, and model grid.
    - ii. [Model report](#): *Final Report Groundwater Availability Model for the Yegua-Jackson Aquifer (2010)*.
- 4. [Other Project Downloads](#): Links to access research projects in support of groundwater models.
  - a. [Applications of Surface Water Geophysical Methods, with Emphasis on Magnetic Resonance Soundings, to Characterize the Hydrostratigraphy of the Brazos River Alluvium Aquifer](#): A pilot study to characterize the hydrostratigraphic properties of the Brazos River Alluvium Aquifer. Completed July 2007.
    - i. [Project data files](#): Includes geospatial database.
  - b. [Aquifer Test and Related Well Information from Public Supply Wells in Groundwater Management Area 8](#): Project to develop a database and a suite of visualization tools to support the analysis of the information aquifer test and public water supply wells located within Groundwater Management Area 8. Completed July 2012.
    - i. [Project data files](#): Includes all data and the model for the project.
  - c. [Digital Climate Atlas of Texas](#): Defines the climate in terms of major climatic parameters, precipitation, maximum and minimum temperatures, and lake evaporation for Texas. Completed May 2005.
    - i. [Project data files](#): Includes all data and the model for the project.
  - d. [Estimation of Groundwater Recharge to the Gulf Coast Aquifer in Texas](#): Quantification of spatial variability in recharge in the outcrop zones of the Gulf Coast Aquifer in Texas. Completed October 2011.
    - i. [Project data files](#): Includes all data and the model for the project.
  - e. [Evapotranspiration Estimates with Emphasis on Groundwater Evapotranspiration in Texas](#): Study to compile existing information on evapotranspiration rates and processes, evaluate the relationships between vegetation types in different settings, and translate information collated in the study on groundwater evapotranspiration rates process into groundwater availability modeling. Completed December 2005.

- i. [Project data files](#): Includes all data and the model for the project.
- f. [Geodatabase of Groundwater Availability Models File Version 4.3.1](#): Geospatial database of data and models used in groundwater availability models.
- g. [Groundwater Recharge Model Calibration and Validation for Remotely-Sensed Dual Coefficient \(RDC\) Groundwater Management Area 8 Estimation](#): A model to predict annual groundwater recharge across North Central Texas. Completed August 2012.
  - i. [Project data files](#): Includes all data and the model for the project.
- h. [Hydrogeochemical Evaluation of the Texas Gulf Coast Aquifer System and the Implication for Developing Groundwater Availability Models](#): Review of geochemical data in the Gulf Coast Aquifer system, the Yegua-Jackson Aquifer, and the Brazos River Alluvium Aquifer to identify relationships for evaluating the conceptual flow model for the Gulf Coast Aquifer System. Completed April 2014.
  - i. [Project data files](#): Includes all data and the model for the project.
- i. [Hydrostratigraphy of the Gulf Coast Aquifer from the Brazos River to the Rio Grande](#): Structure, lithology, and depositional framework for the Gulf Coast Aquifer system from the Brazos River to the Rio Grande. Completed April 2010.
  - i. [Project data files](#): Includes all data and the model for the project.
- j. [Llano Uplift Aquifers Structure and Stratigraphy](#): Structural elevation contour surfaces and dip of the Llano Uplift area. Completed November 2007.
  - i. [Project data files](#): Includes all data and the model for the project.
- k. [Lower Rio Grande Valley Groundwater Transportation Model Summary](#): Model developed and released in 2017.
  - i. [Numerical model report](#): *Lower Rio Grande Valley Groundwater Transportation Model (2017)*.
  - ii. [Predictive numerical model report](#): *Lower Rio Grande Valley Groundwater Transport Model (2017)*.
  - iii. [Project data files](#): Includes all data and the model for the project.
- l. [PMWin updated water budget](#): PMWin (Processing Modflow for Windows) water budget project deliverables.
- m. [Structure of the Yeuga-Jackson Aquifer of the Texas Gulf Coast Plain](#): Development of the structure, lithology, and depositional framework for the Yegua-Jackson Aquifer. Completed September 2007.
  - i. [Project data files](#): Includes all data and the model for the project.
- n. [Updating the Hydrogeological Framework for the Gulf Coast Aquifer System](#): The development of the structure, lithology, and depositional framework for

- the Gulf Coast Aquifer system from the Brazos River north to the Sabine River and into Louisiana. Completed June 2012.
- i. [Project data files](#): Includes all data and the model for the project.
  - o. [Vulnerability of Texas Aquifers to Pumping-Induced Subsidence Summary](#): Identification and characterization of areas within Texas' major and minor aquifers that are susceptible to land subsidence related to groundwater pumping. Completed 2017.
    - i. [Final report](#): *Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Pumping Groundwater. (2017)*
    - ii. [Subsidence Prediction Tool](#): Includes prediction tool and user guide.

### Data Available by Request

1. Model files for Dockum, Edwards Balcones Fault Zone, Edwards-Trinity, and Groundwater Management Area 16 can be requested by contacting [GAM@twdb.texas.gov](mailto:GAM@twdb.texas.gov).

## GROUNDWATER MONITORING AND RECORDER WELL TEAM

The Groundwater Monitoring Department is part of the Groundwater Division, and the Recorder Well Team is part of the Groundwater Monitoring Department. The primary function of the Groundwater Monitoring Department is to conduct groundwater monitoring and collect groundwater data. Groundwater Monitoring staff collect, interpret, and disseminate information on the groundwater resources within the state. Staff sample a representative number of wells from each major and minor aquifer. Additional data are provided by cooperative groundwater conservation districts (GCDs), the USGS, and municipalities. These data are analyzed and incorporated into the groundwater database by the Groundwater Technical Assistance Department's Groundwater Data Team, totaling 8,000 data points annually.

The Recorder Well Team maintains wells equipped with near real-time water level recorders and data loggers. Data collected at these wells is made accessible online via the Water Data for Texas website. As of December 2022, the Recorder Well Team maintains 255 recorder wells.

The Groundwater Data Team works closely with Groundwater Monitoring staff to incorporate field data from the Groundwater Monitoring Department and from cooperators into the groundwater database and to publish daily water level data from recorder wells.

## Data Available for Direct Download

1. [Groundwater Database Summary](#): Contains information on selected water wells, springs, oil/gas test wells (that were originally intended to be or were converted to water wells), water levels, and water quality data.
  - a. [Automated Groundwater Level Wells](#): Daily recorder measurements of high-water level (feet below land surface) through an interactive mapping application. Reports on recorder wells include graphs of recorded water levels, well pictures, and a summary table of records.
  - b. [Full Groundwater Database](#): File contains 65 tables which include lookup tables. Tables have not been connected nor linked.
  - c. [Full Groundwater SQL Server](#): File contains 16 tables with lookups connected and linked between the tables.
  - d. [Groundwater Database Well Location Shapefile](#): GIS shapefile of well locations updated daily.
  - e. [Groundwater Well Records by Aquifer](#): Select well records based on aquifer classification (major, minor, combination, other, and unknown), aquifer name, and county.
  - f. [Groundwater Well Records by County](#): Select well records based on county and aquifer name.
  - g. [Groundwater Well Records by Well](#): Review well records by state well number.
  - h. [Water Data Interactive Groundwater Data Viewer](#): Search and download well records, including plugging reports, based on geographical location.
  - i. [Water Levels by Aquifer](#): Select water level records by aquifer classification, aquifer name, county, and observation type (TWDB current observation wells, groundwater conservation district current observation wells, historical observation wells, groundwater conservation district recorder wells, TWDB recorder wells, USGS current observation wells, miscellaneous measurements, public water system or other current observation wells, other cooperator observation wells, and none).
  - j. [Water Levels by County](#): Select water level records by county, aquifer, and observation type.
  - k. [Water Levels by Well](#): Select water level records by state well number.
  - l. [Water Levels Advanced Search](#): Select water level records by observation type, measurement status, grid number, county, river basin, aquifer, groundwater conservation district, measuring agency, groundwater management area, method of measurement, regional water planning area, measurement remark, measurement year, or range. Users can select any of the above categories and all matching records will be displayed.



- m. [Water Quality by Aquifer](#): Select water quality reports from year sampled, aquifer classification, aquifer, county, and water quality parameter.
- n. [Water Quality by County](#): Select water quality report from sampled year, county, aquifer, and water quality parameter.
- o. [Water Quality by Well](#): Select water quality report by state well number.
- p. [Water Quality Pivot Table by County](#): Spreadsheet with all water quality parameters displayed in one row by well record and sample year.

## GROUNDWATER TECHNICAL ASSISTANCE AND GROUNDWATER DATA TEAM

The Groundwater Technical Assistance Department is part of the Groundwater Division. Groundwater Technical Assistance provides technical assistance to groundwater conservation districts in developing groundwater management plans; provides impartial guidance to groundwater management areas on technical modeling results, groundwater data, interpreting agency rules, and procedural tasks; conducts groundwater research projects in cooperation with local groundwater conservation districts, other state and federal agencies, or at the request of the Texas Legislature; and monitors developments in groundwater law associated with legislative actions.

The Groundwater Data Team is part of the Groundwater Technical Assistance Department. The team maintains the driller report database in cooperation with the Texas Department of Licensing and Regulation (TDLR). The database began in 2001 and hosts over half a million water well reports. Technical support is also provided for the drilling database, including providing assistance navigating the registration process, approving requests for access, and entering reports and amendments.

### Data Available for Direct Download

1. [Desired Future Conditions](#): The desired, quantified conditions of groundwater resources (such as water levels, spring flows, or volumes) within a management area at one or more specified future times as defined by participating groundwater conservation districts within a groundwater management area as part of the joint planning process.
  - a. [2021 Adopted Desired Future Conditions Summary](#): All units are in acre-feet.
    - i. Groundwater Management Area 1: Desired future conditions were adopted on 08/26/2021.
    - ii. Groundwater Management Area 2:
      1. [Explanatory Report](#): *Desired Future Conditions for Ogallala, Edwards-Trinity (High Plains), and Dockum Aquifers Groundwater Management Area 2 (August 2021)*.

2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- iii. Groundwater Management Area 3:
  1. [Desired Future Conditions](#)
    - a. [Modeled Available Groundwater Sorted by County](#)
    - b. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
  2. [Explanatory Report: Capitan Reef Complex Aquifer \(March 2021\).](#)
  3. [Explanatory Report: Dockum Aquifer \(March 2021\).](#)
  4. [Explanatory Report: Igneous and Ogallala Aquifer \(February 2021\).](#)
  5. [Explanatory Report: Pecos Valley and Edwards-Trinity \(Plateau\) Aquifer \(March 2021\).](#)
  6. [Explanatory Report: Rustler Aquifer \(February 2021\).](#)
- iv. Groundwater Management Area 4:
  1. [Desired Future Conditions](#)
    - a. [Modeled Available Groundwater Sorted by County](#)
    - b. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
  2. [Explanatory Report: Groundwater Management Area 4 \(June 2021\).](#)
- v. Groundwater Management Area 5: Groundwater management areas without conservations districts do not adopt desired future conditions or have associated data.
- vi. Groundwater Management Area 6: Desired future conditions were adopted on 11/18/2021 but data are not yet available.
- vii. Groundwater Management Area 7:
  1. [Desired Future Conditions](#)
  2. [Explanatory Report: Aquifers of the Llano Uplift Region \(Ellenburger-San Saba, Hickory, Marble falls\) \(August 2021\).](#)
  3. [Explanatory Report: Edwards-Trinity \(Plateau\), Pecos Valley, and Trinity Aquifers \(August 2021\).](#)
  4. [Explanatory Report: Ogallala and Dockum Aquifer \(March 2021\).](#)
  5. [Explanatory Report: Rustler Aquifer \(November 2021\).](#)
- viii. Groundwater Management Area 8: Desired future conditions were adopted on 11/04/2021 but data are not yet available.
- ix. Groundwater Management Area 9: Desired future conditions were adopted on 11/15/2021 but data are not yet available.

- x. Groundwater Management Area 10: Desired future conditions were adopted on 10/26/2021 but data are not yet available.
- xi. Groundwater Management Area 11:
  - 1. [Desired Future Conditions](#)
    - a. [Modeled Available Groundwater Sorted by County](#)
    - b. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
  - 2. [Explanatory Report: Carrizo-Wilcox/Queen City/Sparta Aquifers \(August 2021\).](#)
- xii. Management Area 12: Desired future conditions were adopted on 11/30/2021 but data are not yet available.
- xiii. Groundwater Management Area 13:
  - 1. [Desired Future Conditions](#)
  - 2. [Explanatory Report: Groundwater Management Area 13 \(January 2022\).](#)
- xiv. Groundwater Management Area 14: Desired future conditions were adopted on 01/05/2022 but data are not yet available.
- xv. Groundwater Management Area 15: Desired future conditions were adopted on 10/14/2021 but are data not yet available.
- xvi. Groundwater Management Area 16: Desired future conditions were adopted on 11/23/2022 but data are not yet available.
- b. [2016 Adopted Desired Future Conditions Summary](#): All units are in acre-feet.
  - i. Groundwater Management Area 1:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
    - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
  - ii. Groundwater Management Area 2:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
    - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
  - iii. Groundwater Management Area 3:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
    - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
  - iv. Groundwater Management Area 4:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
    - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)

- v. Groundwater Management Area 5: Groundwater management areas without conservations districts do not adopt desired future conditions or have associated data.
- vi. Groundwater Management Area 6:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- vii. Groundwater Management Area 7:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- viii. Groundwater Management Area 8:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- ix. Groundwater Management Area 9:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- x. Groundwater Management Area 10:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- xi. Groundwater Management Area 11:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- xii. Groundwater Management Area 12:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- xiii. Groundwater Management Area 13:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- xiv. Groundwater Management Area 14:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
  - 3. [Modeled Available Groundwater Sorted by Subsidence District.](#)

- xv. Groundwater Management Area 15:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- xvi. Groundwater Management Area 16:
  - 1. [Modeled Available Groundwater Sorted by County.](#)
  - 2. [Modeled Available Groundwater Sorted by Groundwater Conservation District.](#)
- c. [2010 Adopted Desired Future Conditions](#): all units are in acre-feet
  - i. Groundwater Management Area 1:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - ii. Groundwater Management Area 2:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - iii. Groundwater Management Area 3:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - iv. Groundwater Management Area 4:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - v. Groundwater Management Area 5: Groundwater management areas without conservations districts do not adopt desired future conditions or have associated data.
  - vi. Groundwater Management Area 6:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - vii. Groundwater Management Area 7:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - viii. Groundwater Management Area 8:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - ix. Groundwater Management Area 9:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - x. Groundwater Management Area 10:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - xi. Groundwater Management Area 11:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - xii. Groundwater Management Area 12:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - xiii. Groundwater Management Area 13:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - xiv. Groundwater Management Area 14: No summary report available.
  - xv. Groundwater Management Area 15:
    - 1. [Modeled Available Groundwater Sorted by County.](#)
  - xvi. Groundwater Management Area 16:

1. [Modeled Available Groundwater Sorted by County.](#)
2. [Groundwater Management Area Maps and Other Information Summary](#): Links to Ground Water Management area summary pages that include maps and other information. There are 16 groundwater management areas in Texas. All groundwater conservation districts are part of at least one groundwater management area.
  - a. [Groundwater Management Area 1 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
    - i. [Administrative Map](#)
    - ii. [Groundwater Conservation District Map](#)
    - iii. [Major Aquifer Map](#)
    - iv. [Minor Aquifer Map](#)
  - b. [Groundwater Management Area 2 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
    - i. [Administrative Map](#)
    - ii. [Groundwater Conservation District Map](#)
    - iii. [Major Aquifer Map](#)
    - iv. [Minor Aquifer Map](#)
  - c. [Groundwater Management Area 3 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
    - i. [Administrative Map](#)
    - ii. [Groundwater Conservation District Map](#)
    - iii. [Major Aquifer Map](#)
    - iv. [Minor Aquifer Map](#)
  - d. [Groundwater Management Area 4 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
    - i. [Administrative Map](#)
    - ii. [Groundwater Conservation District Map](#)
    - iii. [Major Aquifer Map](#)
    - iv. [Minor Aquifer Map](#)
  - e. [Groundwater Management Area 5 Summary](#): Links to access information, maps, major aquifers, county information, and related reports for the groundwater management area.
    - i. [Administrative Map](#)
    - ii. [Major Aquifer Map](#)

- f. [Groundwater Management Area 6 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
  - i. [Administrative Map](#)
  - ii. [Groundwater Conservation District Map](#)
  - iii. [Major Aquifer Map](#)
  - iv. [Minor Aquifer Map](#)
- g. [Groundwater Management Area 7 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
  - i. [Administrative Map](#)
  - ii. [Groundwater Conservation District Map](#)
  - iii. [Major Aquifer Map](#)
  - iv. [Minor Aquifer Map](#)
- h. [Groundwater Management Area 8 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
  - i. [Administrative Map](#)
  - ii. [Groundwater Conservation District Map](#)
  - iii. [Major Aquifer Map](#)
  - iv. [Minor Aquifer Map](#)
- i. [Groundwater Management Area 9 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
  - i. [Administrative Map](#)
  - ii. [Groundwater Conservation District Map](#)
  - iii. [Major Aquifer Map](#)
  - iv. [Minor Aquifer Map](#)
- j. [Groundwater Management Area 10 Summary](#): Links to access information, maps, groundwater conservation districts, major aquifers, county information, and related reports for the groundwater management area.
  - i. [Administrative Map](#)
  - ii. [Groundwater Conservation District Map](#)
  - iii. [Major Aquifer Map](#)
- k. [Groundwater Management Area 11 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
  - i. [Administrative Map](#)
  - ii. [Groundwater Conservation District Map](#)
  - iii. [Major Aquifer Map](#)

- iv. [Minor Aquifer Map](#)
    - l. [Groundwater Management Area 12 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
      - i. [Administrative Map](#)
      - ii. [Groundwater Conservation District Map](#)
      - iii. [Major Aquifer Map](#)
      - iv. [Minor Aquifer Map](#)
    - m. [Groundwater Management Area 13 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
      - i. [Administrative Map](#)
      - ii. [Groundwater Conservation District Map](#)
      - iii. [Major Aquifer Map](#)
      - iv. [Minor Aquifer Map](#)
    - n. [Groundwater Management Area 14 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
      - i. [Administrative Map](#)
      - ii. [Groundwater Conservation District Map](#)
      - iii. [Major Aquifer Map](#)
      - iv. [Minor Aquifer Map](#)
    - o. [Groundwater Management Area 15 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
      - i. [Administrative Map](#)
      - ii. [Groundwater Conservation District Map](#)
      - iii. [Major Aquifer Map](#)
      - iv. [Minor Aquifer Map](#)
    - p. [Groundwater Management Area 16 Summary](#): Links to access information, maps, groundwater conservation districts, major and minor aquifers, county information, and related reports for the groundwater management area.
      - i. [Administrative Map](#)
      - ii. [Groundwater Conservation District Boundaries Map](#)
      - iii. [Major Aquifer Map](#)
      - iv. [Minor Aquifer Map](#)
- 3. [Submitted Drillers Report Summary](#): The Submitted Drillers Report database is a cooperative program with the Texas Department of Licensing and Regulation that allows registered water-well drillers to submit required reports. The system began



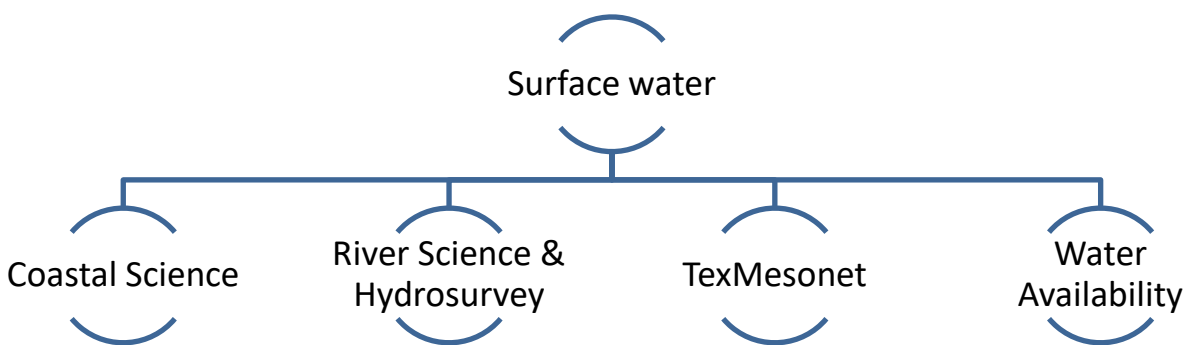
collecting reports in 2003, and previous reports are stored within the Texas Commission on Environmental Quality (TCEQ) [Water Well Report Viewer](#).

Note: The Submitted Drillers Report Database is not verified by the TWDB and may be inaccurate.

- a. [Full Submitted Drillers Report database download](#): File contains 18 tables with lookups connected and linked between the tables. Updated daily.
- b. [Plugging Reports Search by County](#): Search and download well plugging reports by county.
- c. [Plugging Reports Advanced Search](#): Select well records by plugging date (start and end), owner name, well address, county, well city, well zip code, license number, driller name, drilling company, grid number, well type (domestic, stock, irrigation, public supply, rig supply, fracking supply, test well, industrial, monitor, environmental soil boring, closed-loop geothermal, extraction, injection, de-watering, other and unknown), or well plugging report tracking number.
- d. [Submitted Drillers Report plugging report shapefile](#): GIS shapefile of submitted drillers report (SDR) plugged well locations. Updated daily.
- e. [Submitted Drillers Report well location shapefile](#): GIS shapefile of well locations. Updated daily.
- f. [Well Reports Search by County and Use](#): Select well records based on county and proposed use (domestic, stock, irrigation, public supply, rig supply, fracking supply, test well, industrial, monitor, environmental soil boring, closed-loop geothermal, extraction, injection, de-watering, other, and unknown).
- g. [Well Reports Search by Map or Tracking Number](#): Search and download well records, including plugging reports based on geographical location.
- h. [Well Reports Advanced Search](#): Select well records by drilling date (start and end), owner name, well address, county, well city, well zip code, license number, driller name, drilling company, grid number, proposed use, or well report tracking number.

## SURFACE WATER

The Surface Water Division consists of four departments: Coastal Science, River Science & Hydrosurvey, TexMesonet, and Water Availability. The division supports water resources planning and management and flood science through data collection, analysis, and modeling of hydrometeorological and surface waters in the state.



**Figure 7:** Organizational chart of the departments within the Surface Water Division.

## COASTAL SCIENCE

The Coastal Science Department is part of the Surface Water Division. Coastal Science maintains a data collection, modeling, and analytical program to support water resources planning, environmental flow (freshwater inflow) science and management, flood science, and emergency oil spill response.

Coastal Science provides the only source of freshwater inflow estimates for Texas' estuaries; maintains hydrodynamic and salinity transport models; maintains a long-term coastal water quality monitoring network; and conducts hydrographic bay surveys to monitor and evaluate estuary conditions. Coastal Science utilizes this information to evaluate the freshwater inflow requirements necessary to maintain a sound ecological environment in Texas' bays and estuaries for use in water resources planning. Coastal Science also provides operational modeling support for oil spill response including near real-time and forecast simulations of tides and water circulation. To support state and regional flood planning, the program is working to develop standards and guidelines for monitoring, modeling, visualizing, and communicating compound coastal flood risk.

### Data Available for Direct Download

1. [Bays and Estuaries Continuous Water Quality Monitoring Stations Viewer](#): Viewer to explore water quality monitoring stations actively maintained but not reporting live observations. Instruments are deployed for several weeks at a time at one station, and data is then reviewed and updated.
  - a. [Bolivar RoadsI](#): Parameters reported: salinity, estimated salinity via TxBLEND hydrodynamic model, water depth, dissolved oxygen

- concentration, dissolved oxygen saturation concentration, and water temperature. Data available from 1990-present.
- b. [Chicken Foot Reef](#): Parameters reported: salinity, water depth, dissolved oxygen concentration, dissolved oxygen saturation concentration, and water temperature. Data available from 2008-present.
  - c. [EMB](#): Parameters reported: salinity, water depth, and water temperature. Data available from 2017-present.
  - d. [Fishers Reef](#): Parameters reported: salinity, estimated salinity via TxBLEND hydrodynamic model, water depth, dissolved oxygen concentration, and water temperature. Data available from 2010-present.
  - e. [Guadalupe Delta](#): Current conditions reported: humidity, atmospheric pressure, air temperature, chlorophyll-a-cells, Chlorophyll-a, eastward water velocity, northward water velocity, salinity, water bearing (degrees), blue green algae- PE cells, blue green algae- PE, water depth, and dissolved oxygen concentration. Data available from 2008-present.
  - f. [Mosquito Point](#): Parameters reported: salinity, water depth, and water temperature. Data available from 2008-present.
  - g. [Lower Sabine](#): Parameters reported: salinity, water depth, dissolved oxygen concentration, dissolved oxygen saturation concentration, pH level, and water temperature. Data available from 1990-present.
  - h. [Upper Sabine Station 2](#): Parameters reported: salinity, water depth, dissolved oxygen concentration, dissolved oxygen saturation concentration, pH level, and water temperature. Data available from 1990-present.
  - i. [SOPA](#): Parameters reported: salinity, water depth, and water temperature. Data available from 2014-present.
  - j. [TPAL](#): Parameters reported: salinity, water depth, dissolved oxygen concentration, dissolved oxygen saturation concentration, and water temperature. Data available from 2018-present.
  - k. [Mid-Trinity](#): Parameters reported: salinity, estimated salinity via TxBLEND hydrodynamic model, water depth, dissolved oxygen concentration, dissolved oxygen saturation concentration, pH level and water temperature. Data available from 1990-present.
  - l. [Old Trinity \(Trinity Delta\)](#): Parameters reported: salinity, estimated salinity via TxBLEND hydrodynamic model, water depth, dissolved oxygen concentration, dissolved oxygen saturation concentration, pH level, turbidity, and water temperature. Data available from 1998-present.
2. [Estuarine Hydrographic Surveys Summary](#): Intensive hydrographical surveys of all major Texas bays. Studies feature synoptic measurements of water velocity, water level, and water quality data in navigation channels and other representative locations through a bay over several tidal cycles.

- a. Aransas Bay
  - i. [Aransas Bay Study - 1995](#): Study conducted from September 29-October 2, 1995.
- b. Brazos River
  - i. [Brazos River Survey - 2001](#): Study conducted from November 10-11, 2001.
- c. Christmas Bay
  - i. [Christmas Bay Field Study - 1992](#): Study conducted from June 12-15, 1992.
- d. Copano Aransas Bay
  - i. [Copano Aransas Bay Field Study - 1988](#): Study conducted from August 7-10, 1988.
- e. Corpus Christi Bay
  - i. [Corpus Christi Bay Intensive Inflow Survey - 2000](#): Study conducted from May 5-7, 2000.
  - ii. [Corpus Christi Field Study - 1987](#): Study conducted from August 4-7, 1987.
  - iii. [Corpus Christi Field Study - 1994](#): Study conducted from June 21-24, 1994.
- f. Galveston Bay
  - i. [Galveston Bay Field Study - 1989](#): Study conducted from May 7-10, 1989.
  - ii. [Galveston Bay 2001 Intensive Inflow Survey - 2001](#): Study conducted from May 23-24 and July 18-19, 2001.
- g. Laguna Madre
  - i. [Laguna Madre Field Study- 1991](#): Study conducted from June 10-13, 1991.
  - ii. [Lower Laguna Madre Field Study - 1997](#): Study conducted from June 19-22, 1997. Rating study conducted June 3-7, 1997.
  - iii. [Upper Laguna Madre Field Study - 1995](#): Study conducted from June 12-15, 1995.
- h. Matagorda Bay (East)
  - i. [East Matagorda Bay Intensive Inflow Survey - 2000](#): Study conducted from September 20-22, 2000.
- i. Matagorda Bay
  - i. [Matagorda Bay Field Study - 1988](#): Study conducted from June 14-17, 1988.
  - ii. [Matagorda Bay Field Study - 1993](#): Study conducted from June 30-July 3, 1993.

- iii. [Matagorda Bay Intensive Inflow Survey- 2003](#): Study conducted from March 24-26, 2003.
  - j. Sabine Lake
    - i. [Sabine Lake Field Study- 1990](#): Study conducted from June 20-23, 1990.
    - ii. [Sabine Lake Field Study- 1996](#): Study conducted from June 1-4, 1996.
  - k. San Antonio Bay
    - i. [San Antonio Bay Field Study- 1988](#): Study conducted from April 19-22, 1988.
- 3. [Freshwater Inflow Estimates Summary](#): Basin-wide inflow summaries. Surface flows consist of gaged streamflow, modeled streamflow in ungauged watersheds, and diversions and returns in ungauged watersheds. The freshwater inflow balance consists of the estimated surface inflows plus precipitation minus evaporation from the surface of the estuary.
  - a. Aransas Bay:
    - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
    - ii. [Report](#): *Coastal Hydrology for the Mission-Aransas Estuary (2012)*.
    - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1941 - 2015.
  - b. Brazos River Estuary:
    - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
    - ii. [Report](#): *Coastal Hydrology for the Brazos River Estuary (2011)*.
    - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1975 - 2015.
  - c. Corpus Christi Bay:
    - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
    - ii. [Report](#): *Coastal Hydrology for the Nueces Estuary: Hydrology for Version #TWDB201101 with Updates to Diversion and Return Data for 2000-2009 (2011)*.
    - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1941 - 2020.
  - d. Galveston Bay:
    - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
    - ii. [Report](#): *Coastal Hydrology for the Trinity-San Jacinto Estuary (2012)*.
    - iii. [Report](#): *Coastal Hydrology for the Trinity-San Jacinto Estuary (2021)*.

- iv. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1941 - 2020.
- e. Laguna Madre Estuary:
  - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
  - ii. Report: In progress at time of publishing this report.
  - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1941 - 2020.
- f. Lower Laguna Madre Estuary
  - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
  - ii. [Report](#): *Coastal Hydrology for the Laguna Madre Estuary with Emphasis on the Lower Laguna Madre (2011)*.
  - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1941 - 2020.
- g. Upper Laguna Madre Estuary
  - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
  - ii. [Report](#): *Coastal Hydrology for the Laguna Madre Estuary with Emphasis on the Upper Laguna Madre (2011)*.
  - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1941 - 2020.
- h. Matagorda Bay (East)
  - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
  - ii. [Report](#): *Coastal Hydrology for East Matagorda Bay (2011)*.
  - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1975 - 2015.
- i. Matagorda Bay:
  - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
  - ii. [Report](#): *Coastal Hydrology for the Lavaca-Colorado Estuary (2011)*.
  - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1941 - 2020.
- j. Sabine Lake:
  - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
  - ii. Report: In progress at time of publishing this report.
  - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1941 - 2020.

- k. San Antonio Bay
  - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
  - ii. [Report](#): *Coastal Hydrology for Guadalupe Estuary: Updated Hydrology with Emphasis on Diversion and Return Flow Data for 2000-2009 (2010)*.
  - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1941 - 2015.
- l. San Bernard River Estuary:
  - i. [Hydrology Data](#): Download daily data, monthly data, yearly data, and statistics.
  - ii. Report: In progress at time of publishing this report.
  - iii. [Time Series Chart](#): Displays volume of freshwater inflows, gage, model, diversion, or return from 1975 - 2015.
- 4. [Freshwater Inflow Needs of Texas Summary](#): Links to reports and resources related to the bays and estuaries of the state. The TWDB, the Texas Parks & Wildlife Department (TPWD), and the Texas Commission on Environmental Quality (TCEQ) jointly established long-term data collection and analytical study programs focused on determining the effects of and needs for freshwater inflows to the state's bays and estuaries.
  - a. Aransas Bay (Mission-Aransas Estuary):
    - i. Aransas Bay (Mission-Aransas Estuary) Reports:
      - 1. [Freshwater Inflow Recommendation for the Mission-Aransas Estuarine System](#): Summarizes studies that were used to formulate the freshwater inflow recommendations for the Mission-Aransas system. Completed September 2010.
      - 2. [Nueces and Mission-Aransas Estuaries - A Study of the Influence of Freshwater Inflows](#): Analyzes the interrelationships between freshwater inflow and estuarine productivity. Completed January 1981.
    - ii. Texas Estuarine Mathematical Programming (TxEMP) Results for the 2010 Mission-Aransas Estuary Recommendation.
      - 1. [Fisheries Harvest vs. Inflow - Modeled Solutions](#): Modeled solutions of fisheries harvest based on TxEMP modeled inflow.
      - 2. [Inflow Tables](#): Freshwater inflows and TxEMP modeled solutions for 1941-1996.
      - 3. [Monthly Inflows - Modeled Solutions](#): Reported in thousand acre-feet.
  - b. Coast-wide Studies

- i. [Freshwater Inflows to Texas Bays and Estuaries - Ecological Relationships and Methods for Determination of Needs](#): Report to demonstrate the effects of freshwater inflows on living and non-living components of estuarine ecosystems and to present a methodology for assessing the freshwater inflow needs of Texas bays and estuaries. Completed December 1994.
  - ii. [The Influence of Freshwater Inflows upon the Majority of Bays and Estuaries of the Texas Gulf Coast](#): Findings and studies on the relationships between inflow, salinity, and biological activity in the seven largest estuaries on the Texas coast. Completed September 1982.
  - iii. [Methods for Determining Minimum Freshwater Inflow Needs of Texas Bays and Estuaries](#): Overview of methods used to determine the effects of and needs for freshwater inflows across the state. Completed December 2002.
  - iv. [A New Concept - Water for Preservation of Bays and Estuaries](#): An exploration, from the coastal engineering and tidal hydraulics standpoint, to evolve some new concepts that would permit both reasonable maximum river development and preservation, plus enhancement, to the Texas coastal bays and estuaries. Completed April 1967.
- c. Corpus Christi Bay (Nueces Estuary):
- i. Corpus Christi Bay (Nueces Estuary) Reports:
    1. [Freshwater Inflow Recommendation for the Nueces Estuary](#): Recommended freshwater inflow targets that sustain the unique biological ecosystem characteristics of an ecologically sound and healthy Nueces Estuary. Completed September 2002.
    2. [Nueces and Mission-Aransas Estuaries - A Study of the Influence of Freshwater Inflow](#): Analyzes the interrelationships between freshwater inflow and estuarine productivity for the Nueces and Mission-Aransas estuaries of Texas and establishes the seasonal and monthly freshwater inflow needs for a range of management policies. Completed January 1981.
  - ii. TxEMP Results for the 2002 Mission-Aransas Estuary Recommendation:
    1. [Fisheries Harvest vs. Inflow- Modeled Solutions](#): Modeled solutions of fisheries harvest based on TxEMP modeled inflow.
    2. [Inflow Tables](#): Freshwater inflows and TxEMP modeled solutions for 1941-1996.



3. [Monthly Inflows- Modeled Solutions](#): Reported in thousand acre-feet.
- d. Galveston Bay (Trinity-San Jacinto Estuary):
- i. Galveston Bay (Trinity-San Jacinto Estuary) Reports:
    1. [Freshwater Inflow Recommendations for the Trinity-San Jacinto Estuary of Texas](#): Analyzed historical fish community data to determine whether the mathematical model estimates were reasonable. Completed February 2001.
    2. [Galveston Bay Freshwater Inflow Re-Study](#): Developed productivity-inflow regression equations for commercial fisheries harvest data and the exploration of new methodologies related to freshwater inflows and the health of estuarine ecosystems. Completed November 2008.
    3. [Guidelines for Water Resources Permitting - Nutrient Requirements for Maintenance of Galveston Bay Productivity](#): Provides new data and synthesis of existing data to aid in management of the Galveston Bay. Completed March 1996.
    4. [Trinity-San Jacinto Estuary: A Study of the Influence of Freshwater Inflows](#): Analyzed the interrelationships between freshwater inflows and estuarine productivity and established seasonal and monthly inflow needs. Completed April 1981.
  - ii. TxEMP Results for the 2001 Sabine Lake Recommendation
    1. [Contribution by Basin](#): Contribution of freshwater inflows into the estuary.
    2. [Cumulative Inflows](#): Cumulative inflow from 1941-1990.
    3. [Fisheries Harvest vs. Inflow- Modeled Solutions](#): Modeled solutions of fisheries harvest based on TxEMP modeled inflow.
    4. [Inflow Tables](#): Freshwater inflows and TxEMP modeled solutions for 1941-1990.
    5. [Monthly Inflows- Modeled Solutions](#): Reported in thousand acre-feet.
    6. [Potential East-West Diversions](#): Percentage of average combined inflows to the estuary by water source.
- e. Laguna Madre Estuary:
- i. Laguna Madre Estuary Reports:
    1. [Freshwater Inflow Recommendations for the Laguna Madre Estuary System](#): Summarizes studies conducted by the Texas Parks and Wildlife Department to determine the freshwater inflow needs for the estuary. Completed September 2004.

2. [Laguna Madre Estuary - A Study of the Influence of Freshwater Inflows](#): Analysis of the interrelationships between freshwater inflow and estuarine productivity as well as seasonal and monthly inflow needs. Completed February 1983.
- ii. TxEMP Results for the 2004 Laguna Madre Estuary Recommendation (including Baffin Bay):
  1. [Fisheries Harvest vs. Inflow- Modeled Solutions](#): Modeled solutions of fisheries harvest based on TxEMP modeled inflow.
  2. [Inflow Tables](#): Freshwater inflows and TxEMP modeled solutions for 1941-1996.
  3. [Monthly Inflows- Modeled Solutions](#): Reported in thousand acre-feet.
- iii. TxEMP Results for the 2004 Laguna Madre Estuary Recommendation (including South Bay):
  1. [Fisheries Harvest vs. Inflow- Modeled Solutions](#): Modeled solutions of fisheries harvest based on TxEMP modeled inflow.
  2. [Inflow Tables](#): Freshwater inflows and TxEMP modeled solutions for 1941-1996.
  3. [Monthly Inflows- Modeled Solutions](#): Reported in thousand acre-feet.
- f. Matagorda Bay (Lavaca-Colorado Estuary):
  - i. Matagorda Bay (Lavaca-Colorado Estuary) Reports:
    1. [Freshwater Inflow Needs of the Matagorda Bay System](#): Analysis of freshwater inflow needs to determine estuarine productivity through alternative methods. Completed December 1997.
    2. [Lavaca-Tres Palacios Estuary - A Study of the Influence of Freshwater Inflows](#): Analysis of the interrelationships between freshwater inflows and estuarine productivity as well as seasonal and monthly inflow needs. Completed June 1980.
  - ii. TxEMP Results for the 1997 Matagorda Bay Recommendation:
    1. [Fisheries Harvest vs. Inflow- Modeled Solutions](#): Modeled solutions of fisheries harvest based on TxEMP modeled inflow.
    2. [Inflow Tables](#): Freshwater inflows and TxEMP modeled solutions for 1941-1987.
    3. [Monthly Inflows- Modeled Solutions](#): Reported in thousand acre-feet.
  - iii. TxEMP Results for the 2006 Matagorda Bay Recommendation:
    1. [Fisheries Harvest vs. Inflow- Modeled Solutions](#): Modeled solutions of fisheries harvest based on TxEMP modeled inflow.

2. [Inflow Tables](#): Freshwater inflows and TxEMP modeled solutions for 1941-2000.
  3. [Monthly Inflows- Modeled Solutions](#): Reported in thousand acre-feet.
- g. Sabine Lake (Sabine-Neches Estuary):
- i. Sabine Lake (Sabine-Neches Estuary) Reports:
    1. [Freshwater Inflow Recommendation for the Sabine Lake Estuary of Texas and Louisiana](#): Modeled relationship between freshwater inflow, salinity, and fisheries for Sabine Lake. Completed March 2005.
    2. [Sabine-Neches Estuary - A Study of the Influence of Freshwater Inflows](#): Analysis of the interrelationships between freshwater inflows and estuarine productivity and establishing seasonal and monthly freshwater inflow needs. Completed July 1981.
  - ii. TxEMP Results for the 2005 Sabine Lake Recommendation
    1. [Fisheries Harvest vs. Inflow- Modeled Solutions](#): Modeled solutions of fisheries harvest based on TxEMP modeled inflow.
    2. [Inflow Tables](#): Freshwater inflows and TxEMP modeled solutions for 1941-1997.
    3. [Monthly Inflows- Modeled Solutions](#): Reported in thousand acre-feet.
- h. San Antonio Bay (Guadalupe Estuary):
- i. San Antonio Bay (Guadalupe Estuary) Reports:
    1. [Freshwater Inflow Recommendation for the Guadalupe Estuary of Texas](#): Summarizes studies that form the basis of recommended target freshwater inflows. Completed December 1998.
    2. [Guadalupe Estuary - A Study of the Influence of Freshwater Inflows](#): Analysis of the interrelationships between freshwater inflows and estuarine productivity and establishing seasonal and monthly freshwater inflow needs. Completed August 1980.
  - ii. TxEMP results for the 1998 San Antonio Bay Recommendation.
    1. [Fisheries Harvest vs. Inflow- Modeled Solutions](#): Modeled solutions of fisheries harvest based on TxEMP modeled inflow.
    2. [Inflow Tables](#): Freshwater inflows and TxEMP modeled solutions for 1941-1987.
    3. [Monthly Inflows- Modeled Solutions](#): Reported in thousand acre-feet.

5. [Tide Forecast and Hindcast by Days Summary](#): Links and overview of select Texas Coastal Ocean Observation Network (TCOON) stations within bays or along the Gulf coastline for which forecasts and hindcasts are produced.
  - a. Statewide Interactive Map of all forecast and hindsight TCOON station locations.
    - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
    - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
    - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
    - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
    - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
  - b. [TCOON Station 3](#): Rincon de San Jose, Texas.
    - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
    - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
    - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
    - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
    - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
  - c. [TCOON Station 8](#): USS Lexington, Corpus Christi Bay, Texas (Formerly Texas State Aquarium).
    - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
    - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
    - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
    - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
    - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
  - d. [TCOON Station 9](#): Port Aransas, Texas.

- i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- e. [TCOON Station 13](#): Bird Island, Texas
- i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- f. [TCOON Station 14](#): Bob Hall Pier, Corpus Christi, Texas.
- i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- g. [TCOON Station 15](#): Rockport, Texas.
- i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.

- iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
- v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- h. [TCOON Station 16](#): Sabine Pass North, Texas.
  - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- i. [TCOON Station 17](#): Port Mansfield, Texas.
  - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- j. [TCOON Station 18](#): Port Isabel, Texas.
  - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- k. [TCOON Station 31](#): Seadrift, Texas.
  - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.

- ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- l. [TCOON Station 33](#): Port Lavaca, Texas.
- i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- m. [TCOON Station 57](#): Port O'Connor, Texas.
- i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- n. [TCOON Station 126](#): Texas Point, Sabine Pass, Texas.
- i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.

- v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- o. [TCOON Station 185](#): Nueces Bay, Texas.
  - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- p. [TCOON Station 503](#): Morgan's Point, Barbours Cut, Texas.
  - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- q. [TCOON Station 504](#): Rainbow Bridge, Texas.
  - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- r. [TCOON Station 507](#): Eagle Point, Galveston Bay, Texas.
  - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.



- iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
- iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
- v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- s. [TCOON Station 529](#): Galveston Bay Entrance, North Jetty, Texas.
  - i. [1-day](#): Preliminary observation data from the previous day, and the forecast for the next day.
  - ii. [2-day](#): Preliminary observation data from the previous two days, and the forecast for the next two days.
  - iii. [4-day](#): Preliminary observation data from the previous four days, and the forecast for the next four days.
  - iv. [7-day](#): Preliminary observation data from the previous week, and the forecast for the next week.
  - v. [14-day](#): Preliminary observation data from the previous two weeks, and the forecast for the next two weeks.
- 6. [TxBLEND Modeled Currents with Associated Winds and Tides Summary](#): Links and overview of the TxBLEND hydrodynamic model for oil spill prevention and response efforts.
  - a. [Corpus Christi Bay](#): Speed and directional water movement (i.e. currents) in Corpus Christi Bay.
    - i. [Currents](#): Modeled currents associated with winds and tides, wind vector time series, scalar displays of wind, and wind direction vs. time. Models updated daily.
    - ii. [Tide Forecast and Hindcast](#): Station 14 – Bob Hall Pier.
  - b. [Galveston Bay Summary](#): Speed and directional water movement (i.e. currents) in Galveston Bay.
    - i. [Currents](#): Modeled currents associated with winds and tides, wind vector time series, scalar displays of wind, and wind direction vs. time. Models updated daily.
    - ii. [Tide Forecast and Hindcast](#): Station 529 – Galveston North Jetty.
  - c. [Matagorda Bay Summary](#): Speed and directional water movement (i.e. currents) in Matagorda Bay.
    - i. [Currents](#): Modeled currents associated with winds and tides, wind vector time series, scalar displays of wind, and wind direction vs. time. Models updated daily.
  - d. [Sabine Lake Summary](#): Speed and directional water movement (i.e. currents) in Sabine Lake.

- i. [Currents](#): Modeled currents associated with winds and tides, wind vector time series, scalar displays of wind, and wind direction vs. time. Models updated daily.
- ii. [Tide Forecast and Hindcast](#): Station 16 – Sabine Pass.

## RIVER SCIENCE AND HYDROSURVEY

The River Science and Hydrosurvey Department is part of the Surface Water Division. River Science and Hydrosurvey maintains a data collection, modeling, and analytical program to support water resources planning, environmental flow (instream flow) science and management, hydrographic reservoir surveys, and flood science. The program generally provides services to evaluate the hydrologic, hydraulic, sediment transport, and ecological conditions of Texas rivers and streams, which are needed to maintain a sound ecological environment for use in water resources planning. This may include studies of surface water-groundwater interaction, geomorphic analyses, or bathymetric surveys. The Hydrographic Survey program within the department is authorized to generate revenue when conducting bathymetric and hydrographic surveys of reservoirs, specifically, to determine current storage capacity, sedimentation levels, rates of sedimentation, projected water supply availability, or potential mitigative measures, or to collect information on water-bearing formations. As of the publishing of this report, the Hydrographic Survey program has performed over 194 surveys on 117 unique reservoirs in Texas.

### Data Available for Direct Download

1. [Lake Hydrographic Surveys and Data](#): Completed hydrographic surveys and data. Data can include final reports, shapefiles (sedimentation and volumetric), contour maps, elevation-area-capacity tables, and other data. Note: Not all surveys will have all data types.

**Table 1:** List of lakes surveyed and years surveyed.

Lake	Survey Years			
Alan Henry	2005	2017		
Anahuac	2006			
Aquarena Springs	1996			
Aquila	1995	2002	2008	2014
Arlington	1994	2007		
Arrowhead	2001	2013		
Athens	1988			
Austin	1999	2008		
Bachman	2015			

Bardwell	1999			
B.A. Steinhagen	2003	2011		
Belton	1994	2003	2015	
Benbrook	1998			
Bob Sandlin	1988	2008	2018	
Bonham	2004			
Bridgeport	2000	2010	2022	
Brownwood	1997	2013		
Bryan	2016			
Buchanan	2006	2019		
Canyon	2001			
Cedar Creek	1995	2005	2017	
Cherokee	1996	2003	2015	
Choke Canyon	1993	2012		
Coleman	2006			
Conroe	1996	2010	2020	
Copan (Oklahoma)	2002			
Corpus Christi	2002	2012	2016	
Crook	2003			
Cypress Spring	1998	2007		
Diversion	2013			
Eagle Mountain	2001	2008	2018	
Eufaula (Oklahoma)	2004			
E.V. Spence	1999			
Fairfield	1999			
Fork	2001	2009		
Fort Phantom Hill	1993			
GCWA	2004			
Georgetown	1995	2005	2016	
Gibbons Creek	2008			
Gladewater	2000			
Graham	1998			
Grandbury	1993	2002	2015	
Granger	1995	2002	2008	2013
Grapevine	2002	2011		
Guadalupe River	2010			
Halbert	1999			
Houston	1994	2011	2018	
Houston County	1999			

Hubbard Creek	1997	2018		
Hubert H. Moss	1999			
Hugo (Oklahoma)	2003			
Hulah (Oklahoma)	2002			
Inks	2007			
Jacksonville	2006			
J. B. Thomas	1999			
Jim Chapman	2007			
Kemp	2006			
Kickapoo	2001	2013		
Kurth	1996			
Lady Bird	1999	2008		
Lavon	2011			
Leon	2015			
Leon River	2010			
Lewisville	2007			
Limestone	1993	2002	2012	
Livingston	2019			
Lyndon B. Johnson	2007	2020		
Marble Falls	2007	2020		
Martin	1999	2914		
Medina	1995			
Meredith	1995			
Mexia	1996	2008		
Millers creek	1993			
Mineral Wells	2015			
Monticello	1998			
Murvaul	1998			
Nacogdoches	1994			
Nasworthy	1993			
Navarro Mills	2008			
New Terrell City	1997			
Nimitz	2015			
Nocona	2001			
Olney	2014			
O' the Pines	1998	2009		
Palestine	2003	2012		
Palo Pinto	2007			
Pat Cleburne	1998	2998		

Pat Mayse	2008			
Possum Kingdom	1994	2005	2016	
Proctor	1993	2002	2012	
Ray Hubbard	2005	2015		
Ray Roberts	2008			
Red Bluff	2011			
Richland Chambers	1994	2007	2018	
Sabine Lake	2007			
Sam Rayburn	2004			
Somerville	1995	2003	2012	
Squaw Creek	1997	2007		
Samford	1999			
Stillhouse Hollow	1995	2005	2015	
Stricker	1996	2022		
Tawakoni	1997	2009		
Texana	2000	2010		
Texoma	2002			
Travis	2008	2019		
Tyler	1997	2013		
Waco	1995	2011		
Waxahachie	2000			
Weatherford	1998	2008		
Welsh	2001			
White River	1992			
White Rock	1993	2015		
Whitney	2005			
Winters/Elm Creek	2013			
Worth	2001			
Wright Patman	1997	2010		

2. [Water Weekly Report](#): One-page report on drought conditions and water-related issues across the state.

### Data Available by Request

1. Data from environmental flow models can be requested by contacting [tifp@twdb.texas.gov](mailto:tifp@twdb.texas.gov).
2. Historical cross sections (not currently digitized) can be requested by contacting [tifp@twdb.texas.gov](mailto:tifp@twdb.texas.gov). Data are only available at select locations where work has been completed.

3. Hydraulic model outputs can be requested by contacting [tifp@twdb.texas.gov](mailto:tifp@twdb.texas.gov). Data is only available at select locations where work has been completed.
4. Sediment data related to average daily flow and suspended sediment can be requested by contacting [tifp@twdb.texas.gov](mailto:tifp@twdb.texas.gov). Data are only available at select locations where work has been completed.
5. TIN models and raster data for hydrographic surveys can be requested by contacting [hydrosurvey@twdb.texas.gov](mailto:hydrosurvey@twdb.texas.gov).

## TEXMESONET

The TexMesonet Department is part of the Surface Water Division. TexMesonet aggregates the state's existing weather station networks into a central repository and is building a network of automated weather stations across the state to fill gaps in existing network coverage. The resulting network-of-networks provides coverage at dense enough spacing to observe and monitor meso-scale weather events, such as individual thunderstorm super-cells, in near real-time. TexMesonet provides support for severe weather events including floods, fire, and drought, as well as public safety, agricultural productivity, and research efforts. TexMesonet stations complement existing monitoring systems maintained by the National Weather Service, the Federal Aviation Authority, the U.S. Forest Service, and other state and local organizations.

### Data Available for Direct Download

1. [TexMesonet](#): Statewide earth observation data collection network. Aggregating data into a central location that includes stations maintained by the TWDB, the National Water Service, and other regional and local entities. Data collection includes precipitation (24, 48, and 72 hours), air temperature, wind chill, dew point, humidity, wind, sea level pressure, soil saturation, soil temperature, and solar radiation. Not all stations have all data collection capabilities.
  - a. [API Data String Codes](#): Retrieve data from an Application Programming Interface (API) for any of the following: all TWDB stations, name and location, most recent data, or station-specific time series data for all fields, temperature and humidity values, barometric pressure, precipitation, or wind speed.
  - b. [Custom Data Downloads](#): Data can be downloaded by station, county, or bounding box for precipitation, temperature, or a time-series. Start date, end date, interval (daily or monthly), and units can also be selected. Note: There are time limits associated with queries for specific product request. A table of the limitations is available.
  - c. [Precipitation Maps and Data Summary](#): Overview of surface maps available for different data variables and time.

- i. [24-hour maximum temperature map](#): Maximum temperature values across the state for the last 24 hours.
  - ii. [24-hour minimum temperature map](#): Minimum temperature values across the state for the last 24 hours.
  - iii. [24-hour precipitation map](#): Rainfall totals across the state for the previous 24 hours.
  - iv. [48-hour precipitation map](#): Rainfall totals across the state for the previous two days.
  - v. [72-hour precipitation map](#): Rainfall totals across the state for the previous three days.
  - vi. [7-day precipitation map](#): Rainfall totals across the state for the previous week.
  - vii. [14-day precipitation map](#): Rainfall totals across the state for the previous two weeks.
  - viii. [30-day precipitation map](#): Rainfall totals across the state for the previous month.
  - ix. [90-day precipitation map](#): Rainfall totals across the state for the previous three months.
  - x. [180-day precipitation map](#): Rainfall totals across the state for the previous six months.
  - xi. [365-day precipitation map](#): Rainfall totals across the state for the previous year.
  - xii. [Fall precipitation map](#): Seasonable precipitation totals across the state for the months of September-November.
  - xiii. [Spring precipitation map](#): Seasonable precipitation totals across the state for the months of March-May.
  - xiv. [Summer precipitation map](#): Seasonable precipitation totals across the state for the months of June-August.
  - xv. [Winter precipitation map](#): Seasonable precipitation totals across the state for the months of December-February.
- d. [TWDB Station Data Summary](#): Data on precipitation, temperature, and soil moisture for TWDB specific stations.
- i. [Precipitation station data](#): Covering 1-hour, 3-hour, 6-hour, 12-hour, 48-hour, 72-hour, 1-week, 2-week, and since midnight (Central time) precipitation totals.
  - ii. [Temperature station data](#): Covering current, minimum, and maximum temperatures as well as humidity.
  - iii. [Soil moisture station data](#): Covering 5cm, 10cm, 20cm, and 50cm depth measurements for soil moisture and temperature.

## Data Available by Request

1. Custom data downloads from TexMesonet outside of the annual time limit can be requested from [texmesonet@twdb.texas.gov](mailto:texmesonet@twdb.texas.gov).

Note: A table of the query limitations is available through the TexMesonet custom download link.

## WATER AVAILABILITY

The Water Availability Department is part of the Surface Water Division. Water Availability is responsible for providing technical support to the regional and state water planning process. It undertakes water availability and hydro-climatological studies to inform the assessment of surface water availability in the state. It reviews hydrologic variance requests from regional water planning groups and regional water plan drafts to ensure methodological accuracy in the assessment of future surface water availability. Water Availability is also responsible for providing water supply and drought condition updates to the Texas State Drought Preparedness Council. Additionally, Water Availability provides information resources on current and forecast near-term drought conditions that can be used to prepare for potential drought-induced shortages in water supply. The program is responsible for collecting, compiling, and disseminating reservoir evaporation data. In addition, the department compiles, analyzes, and reports on rainfall, reservoir storage, streamflow, and soil moisture conditions, and disseminates this information through the monthly Texas Water Conditions Report.

## Data Available for Direct Download

1. [Drought Dashboard](#): Interactive data displays of different conditions and data related to drought.
  - a. Drought Indices: Different drought indices used to evaluate and quantify drought severity across the state using different data parameters.
    - i. [Daily Keetch-Byram Drought Index](#): A 4km x 4km index used to determine forest fire potential. Data statistics and time series provided as county-averaged values.
    - ii. [Monthly Modified Palmer Drought Severity Index](#): Modified Palmer index by climate region based on the sum of wet and dry terms weighted by probability values.
    - iii. [Monthly Palmer Drought Severity Index](#): A 4km x 4km current drought severity index based on precipitation, temperature, and information on soil water holding capacity.
    - iv. [Monthly Palmer Hydrological Drought Index](#): Long-term drought index by climate region used to quantify hydrological impacts.



- v. [Monthly Palmer “Z” Index](#): Drought index by climate region showing how monthly moisture conditions depart from normal.
  - vi. [Standard Precipitation Index](#): A 4km x 4km drought index used to quantify precipitation deficits at varying intervals, including:
    - 1. [1-month](#)
    - 2. [2-month](#)
    - 3. [3-month](#)
    - 4. [6-month](#)
    - 5. [9-month](#)
    - 6. [12-month](#)
    - 7. [24-month](#)
  - vii. [Weekly Palmer Drought Severity Index](#): Drought index by climate region based on recent precipitation and temperature used to assess the severity of dry or wet periods of weather.
  - viii. [Weekly Quick Drought Response Index](#): A 4km x 4km drought index designed to detect rapid onset ‘flash drought’ events as an indicator of short-term dryness.
- b. [Drought Monitor](#): Current drought conditions by county or hydrologic unit code (HUC) 8 and statewide percent of area in drought conditions. Data covering 2000 to present.
  - c. [PRISM Monthly Precipitation](#): Statewide PRISM data displayed as monthly normal, monthly anomaly, or monthly total precipitation. Maps and detailed data can be downloaded by county or HUC 8 covering 1981 to present.
  - d. [PRISM Monthly Temperature](#): Statewide PRISM data displayed as monthly normal, monthly anomaly, or monthly mean temperature. Detailed data can be downloaded by county or HUC 8 covering 1981 to present.
  - e. [USGS Daily Streamflow Percentiles](#): Statewide percentiles from record low to record high stream flow for reference (i.e., minimal anthropogenic influence) gages. Time series data available for gages; history depends on specific gages site.
  - f. [USGS Monthly Streamflow Percentiles](#): Statewide percentiles from record low to record high stream flow by HUC 8.
- 2. [Evaporation Forecast for May-July](#): Interactive map to compare predicted and observed reservoir evaporation.
    - a. [Comparison of Past Observations and Forecast](#): Prediction comparisons go back to 2018.
  - 3. [Forecast for May-July](#): Developed statistical forecast for the months of May-June which have been historically difficult to predict.
    - a. [Comparison of Past Observations and Forecast](#): Prediction comparisons go back to 2010.

4. [Lake Evaporation and Precipitation](#): Compiled monthly and annual precipitation, net, and gross lake evaporation rates data. Data can be downloaded by quadrangle for a selected date range. Data can be downloaded for a selected quad, quad statistics, precipitation, gross evaporation, net evaporation, and pan-to-lake coefficients. Interactive data views are available for annual and monthly gross and net evaporation as a pie or line graph. Also includes an option for data downloads in various file formats (e.g., text, JSON, etc.)
5. [Original Reservoir Survey Sheets](#): Map series of reservoir basin plates. Displays reservoir engineering drawings and pertinent data.
6. [Texas Water Conditions Report](#): Reports created monthly providing information on rainfall, reservoir storage, conservation storage, streamflow conditions, soil moisture, groundwater levels, and observation well hydrographs.
  - a. [Report Archive](#): Reports are published monthly. Archive goes back to November 1996.

### **Data Available by Request**

1. [Texas Lakes and Reservoirs](#): Historical information such as construction, purpose, storage capacity, conservation surface, and drainage area above dam is prepared for each reservoir in the state. Data may be requested by contacting Dr. Nelun Fernando at [nelun.fernando@twdb.texas.gov](mailto:nelun.fernando@twdb.texas.gov).
2. Monthly cooperators pan evaporation data can be requested by contacting Dr. Nelun Fernando at [nelun.fernando@twdb.texas.gov](mailto:nelun.fernando@twdb.texas.gov).

## APPENDIX

An Excel file of the data indexed in this report is included as a separate table for download ([https://www.twdb.texas.gov/publications/reports/technical\\_notes/doc/TechnicalNote23-01-AppendixA.xlsx](https://www.twdb.texas.gov/publications/reports/technical_notes/doc/TechnicalNote23-01-AppendixA.xlsx)).

Including a table cataloging TWDB data alongside the report empowers users to explore data resources provided by TWDB through different methods. The table allows for sorting and filtering using several criteria to narrow down the data resources of interest or to explore data produced by different divisions. Descriptions of data resources are not included within the table, as it is intended to be a quick reference guide.

<b>Field Name:</b>	<b>Description:</b>
Office	TWDB Office responsible for producing the data
Division	TWDB Division responsible for producing the data.
Name	General name or theme of the data resource and how related to Sub-Name. This field uses the same naming convention and names used in the body of the report. The Name field may be repeated if there are several different data resources related to the theme. <i>For example, the Name '2021 Regional and 2022 State Water Plan Water Demand Data' is related to several data resources that are split out by Sub-Name.</i>
Sub-Name	A more specific description of the data resource and how related to the Name field. This field uses the same naming convention and names used in the body of the report. The Sub-Name field may be blank if there is only one related data resource to the Name field. <i>For example, the Name '2021 Regional and 2022 State Water Plan Water Demand Data' is related to several data resources that are split out by Sub-Name, such as Regional Water Demand Projections or County Water Demand projections among others. Another example, the Name "Planning Data Dashboard" is only related to itself and has a blank Sub-Name.</i>
Summary URL	A link to the data resource. This field uses the same naming convention and names used in the body of the report. This field is called a summary URL because it is not a direct link to the data, but rather to the page where the data can be accessed. All records in the table will include a Summary URL to direct users to the specific report or webpage where the data can be extracted.
Data URL 1	A direct link to the downloadable data related to a resource. The link will be named based on the data contained in the file (such as GIS, grid, or Data). Note this link will directly download files on to your computer. Not all data resources will have Data URLs.
Data URL 2	A direct link to the downloadable data related to a resource when more than one dataset link is available.
Data URL 3	A direct link to the downloadable data related to a resource when more than two dataset links are available.
Data URL 4	A direct link to the downloadable data related to a resource when more than three dataset links are available.