

# **Open-File Report 03-315**

## **Database of Historically Documented Springs and Spring Flow Measurements in Texas**

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### **Introduction**

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Springs are naturally occurring features that convey excess ground water to the land surface; they represent a transition from ground water to surface water. Water issues through one opening, multiple openings, or numerous seeps in the rock or soil.

The database of this report provides information about springs and spring flow in Texas including spring names, identification numbers, location, and, if available, water source and use. This database does not include every spring in Texas, but is limited to an aggregation of selected digital and hard-copy data of the U.S. Geological Survey (USGS), the Texas Water Development Board (TWDB), and Capitol Environmental Services.

### **Purpose and Scope**

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The USGS developed this database in cooperation with the TWDB to provide interested parties and the general public with a verified source of data regarding springs and spring flow in Texas. Collection of data was limited to digital data from the USGS, TWDB, and Capitol Environmental Services, and to hard-copy data of the USGS. These data were aggregated into a singular digital database. The Texas Parks and Wildlife Department (TPWD) provided additional support for the release of Version 1.2.

### **Approach**

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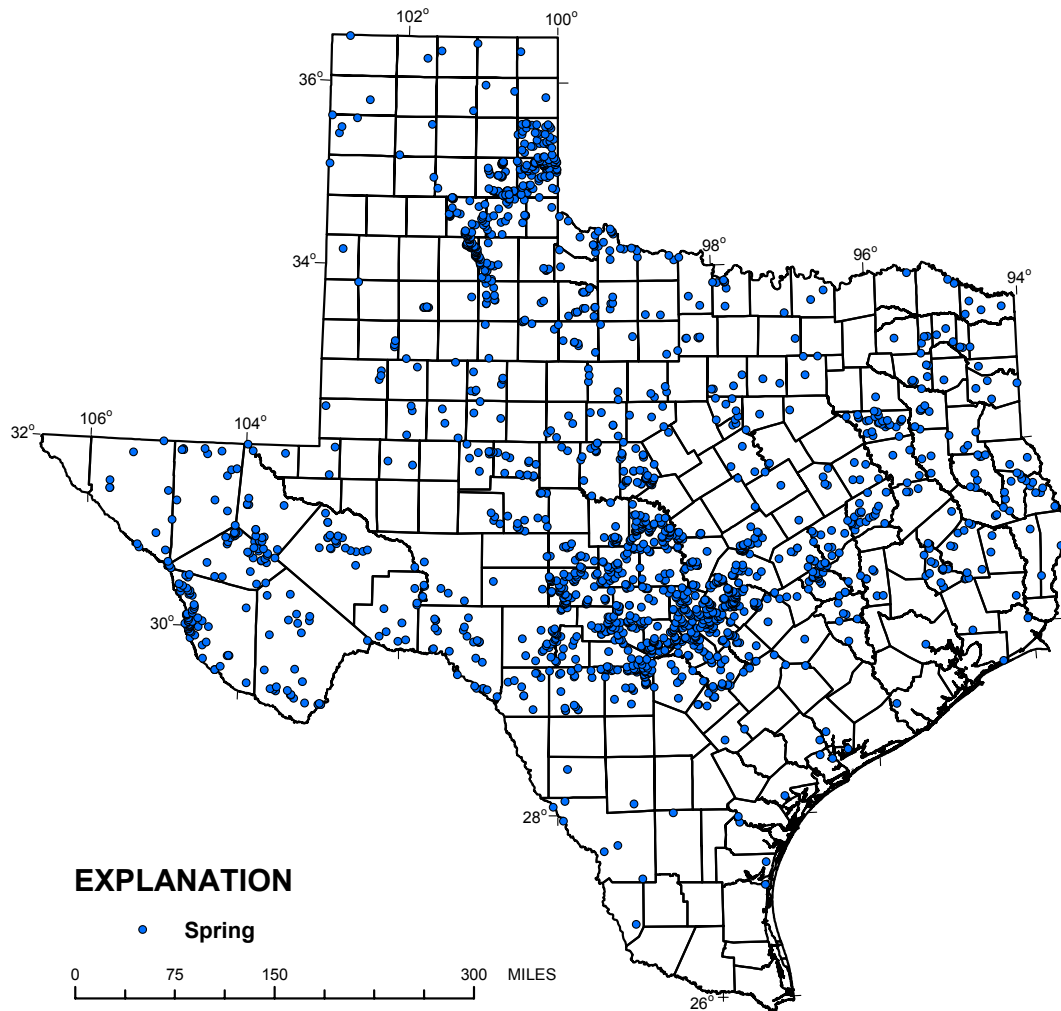
Data sources were limited to digital spreadsheets from the TWDB and Capitol Environmental Services, the USGS National Water Information System (NWIS), and hard-copy annual Water-Data Reports and Water-Supply Papers of the USGS. Digital sources were imported, and hard-copy sources were manually entered into a digital database.

To remove duplicate spring and spring flow records and improve the accuracy and precision of the data, a number of data quality assurance techniques were used. Database queries and geographic information system (GIS) proximity analyses were used to match duplicate spring records. Digital raster graphics (DRGs) (7.5-minute) were used to improve the accuracy of spring locations. Additionally, the attributes of spring records that match existing NWIS records were updated to improve accuracy; in some cases, NWIS attributes were updated if they were less accurate than those in the database. Spring flow measurements were limited to three significant figures when converting from cubic feet per second to gallons per minute.

## Results

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After removal of duplicate spring records, 1,891 springs populate the final database (fig. 1). All spring locations have been assigned an NWIS site identification number. In addition, 6,924 spring flow measurements, 543 alternate names, and 295 alternate identification codes are contained in the database. Unless modified through use of DRGs as described above, data accuracy is dependent on the original source. This database should not be used to make final decisions on the existence of springs in Texas. Other springs exist in Texas, but were not recorded in this project, because of the few sources of data. Additional data sources currently are being developed by Capitol Environmental Services, but were not complete at the time of publication of this report.



**Figure 1.** Locations of springs in Texas.

## References

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Brune, Gunnar, 1975, Major and historical springs of Texas: Texas Water Development Board Report 189, 95 p.

\_\_\_\_\_ 1981, Springs of Texas, volume 1: Fort Worth, Tex., Branch-Smith, Inc., 566 p.

Meinzer, O.E., 1927, Large springs in the United States: U.S. Geological Survey Water-Supply Paper 557, 94 p.

U.S. Geological Survey [various years], Surface water supply of the United States, part 7, lower Mississippi River Basin [For the years 1910–60, one Water-Supply Paper (WSP) per year]: U.S. Geological Survey WSP 287, 1910; WSP 307, 1911; WSP 327, 1912; WSP 357, 1913; WSP 387, 1914; WSP 407, 1915; WSP 437, 1916; WSP 457, 1917; WSP 477, 1918; WSP 507, 1919-20; WSP 527, 1921; WSP 547, 1922; WSP 567, 1923; WSP 587, 1924; WSP 607, 1925; WSP 627, 1926; WSP 647, 1927; WSP 667, 1928; WSP 687, 1929; WSP 702, 1930; WSP 717, 1931; WSP 732, 1932; WSP 747, 1933; WSP 762, 1934; WSP 787, 1935; WSP 807, 1936; WSP 827, 1937; WSP 857, 1938; WSP 877, 1939; WSP 897, 1940; WSP 927, 1941; WSP 957, 1942; WSP 977, 1943; WSP 1007, 1944; WSP 1037, 1945; WSP 1057, 1946; WSP 1087, 1947; WSP 1117, 1948; WSP 1147, 1949; WSP 1177, 1950; WSP 1211, 1951; WSP 1241, 1952; WSP 1281, 1953; WSP 1341, 1954; WSP 1391, 1955; WSP 1441, 1956; WSP 1511, 1957; WSP 1561, 1958; WSP 1631, 1959; WSP 1711, 1960.

U.S. Geological Survey [various years], Surface water supply of the United States, part 8, western Gulf of Mexico [basins] [For the years 1910–60, one Water-Supply Paper (WSP) per year]: U.S. Geological Survey WSP 288, 1910; WSP 308, 1911; WSP 328, 1912; WSP 358, 1913; WSP 388, 1914; WSP 408, 1915; WSP 438, 1916; WSP 458, 1917; WSP 478, 1918; WSP 508, 1919-20; WSP 528, 1921; WSP 548, 1922; WSP 568, 1923; WSP 588, 1924; WSP 608, 1925; WSP 628, 1926; WSP 648, 1927; WSP 668, 1928; WSP 688, 1929; WSP 703, 1930; WSP 718, 1931; WSP 733, 1932; WSP 748, 1933; WSP 763, 1934; WSP 788, 1935; WSP 808, 1936; WSP 828, 1937; WSP 858, 1938; WSP 878, 1939; WSP 898, 1940; WSP 928, 1941; WSP 958, 1942; WSP 978, 1943; WSP 1008, 1944; WSP 1038, 1945; WSP 1058, 1946; WSP 1088, 1947; WSP 1118, 1948; WSP 1148, 1949; WSP 1178, 1950; WSP 1212, 1951; WSP 1242, 1952; WSP 1282, 1953; WSP 1342, 1954; WSP 1392, 1955; WSP 1442, 1956; WSP 1512, 1957; WSP 1562, 1958; WSP 1632, 1959; WSP 1712, 1960.

U.S. Geological Survey [various years], Water resources data, Texas, water years 1961–2002 [one multiple-volume set per year]: U.S. Geological Survey Water-Data Report TX-61, v. 1; TX-62, v. 1; TX-63, v. 1; TX-64, v. 1; TX-65, v. 1; TX-66, v. 1; TX-67, v. 1; TX-68, v. 1; TX-69, v. 1; TX-70, v. 1; TX-71, v. 1; TX-72, v. 1; TX-73, v. 1; TX-74, v. 1; TX-75, v. 1-3; TX-76, v. 1-3; TX-77, v. 1-3; TX-78, v. 1-3; TX-79, v. 1-3; TX-80, v. 1-3; TX-81, v. 1-3; TX-82, v. 1-3; TX-83, v. 1-3;

TX-84, v. 1-3; TX-85, v. 1-3; TX-86, v. 1-3; TX-87, v. 1-3; TX-88, v. 1-3; TX-89, v. 1-3; TX-90, v. 1-3; TX-91, v. 1-3; TX-92, v. 1-3; TX-93, v. 1-3; TX-94, v. 1-3; TX-95, v. 1-3; TX-96, v. 1-3; TX-97, v. 1-3; TX-98, v. 1-3; TX-99, v. 1-5; TX-00, v. 1-5; TX-01, v. 1-5.