Geo-referencing Resources

Tools that we have found especially useful are marked with a . Note training resources at the end of this page.

1. **Essential Tool for Locations and Radius of Uncertainty**
    a. Geolocate - Tool linked to Specify locations. Now supported by Yale rather than Tulane. Note that it is often better to paste a location description into the tool directly, rather than relying on the link in Specify. That link will often not include the county and state information. This tool also provides a convenient means of drawing a radius of uncertainty by hand. When searching for a county, it will draw a radius of uncertainty around the entire county. *Note*: You can specify a location using township, range and sections - formatted like t2n r6e section 10. Supports multiple maps (current USGS topos, Google streets, ..) with overlays for historical topos and geology (though the geology doesn't give you as much information on the formation as Explore Texas Geology (see below).
    b. Geolocate Development version. Nelson Rios recommends released version as more stable. Though as of 12 Dec 2021, this version scales better on a large display.
2. **Name Search**
    a. USGS Geographic Names Information System - Any name (almost) that has appeared on one of their maps. Includes 1100+ oil field names in TX.
    b. Handbook of Texas History - Can be useful for old names.
    c. Texas Historical Sites Atlas - Includes text from historical markers.
    d. Geonames - World search, also does fuzzy match. Can limit by country, but not by state.
3. **Current & Historical Topos and Lidar**
    a. USGS Topoview - Main Search for Historical Topos. Use this one or the following.
    Note that clicking on the button with a mountain in the center at the bottom of the page sets the elevation and GPS coordinate data at the bottom middle of the page based on the center of the map. Which allows you to cut and paste this data. In the other modes, when you move your mouse the GPS data changes according to where the mouse is, making it impossible to cut and paste.
    b. USGS Historical Topographic Map Explorer - Nice interface to historical topos. One advantage is that it will tile multiple maps, whereas Topoview will only show one map at a time. However, it doesn't seem to have a way to read out lat/long.
    c. USGS Lidar - **a**. Tap the "Layers List" Icon. **b**. Uncheck all and check "3DEP Elevation - Hillshade". **c**. Exit the "Layers List". **d**. Type in a location and go to it (hidden by the layers list). **e.** Tap the "Layers List" icon. Zoom in and out. **NOTE**: Transparency is in the Ellipsis of the layer. The "3DEP Elevation - Hillshade Stretched" may sometime be more useful.
    d. Lab Maps - **IMPORTANT**. Includes BEG Quads. Stored in the main room in 122 in the map drawers under the table by Curation Room. These are all indexed in Zotero, the NPL Library Lookup. One reasonable search is for 'map' and county name. Which may turn up a map or a publication with 'map' in the name.
    e. USGS current and Historical Topographic Map Collection (HTMC) - Search by state, scale, map name, or map type.
    f. USGS Name Search. Complicated interface, but a lot of power.
    g. USGS Topo Maps - download collared maps.
    h. Texas Topo Maps - UT PCL Collection - Excellent source for old Army quadrangle maps.
    i. Texas Historical Sites Atlas - Great resource for historical sites including cemeteries and homesteads.
    j. USGS Topo Map Symbols - Several editions. Current Map Symbols (more readable).
    k. Old US Topo Map Symbols - Topographic instructions of the United States Geological Survey. See page 130-138 of the pdf.
    l. National Geodetic Survey Data Explorer - for finding old survey monuments and marks. May help with older quadrangle names used by geologists. E.g. "Harrel Quadrangle" corresponds to a survey mark "Harral" in Culberson County. Have not figured out how to search by name. I had to go to the approximate location and search to get the list of marks.
    m. Historical Soil Survey Maps - University of Alabama. A collection of 1,612 Soil Survey Maps produced from 1899 to 1950 by the U.S Department of Agriculture.
    n. The National Map - Historical - Historical Topographic Map Collection
    o. The National Map - Current - Current National Topos
    p. USGS Maps Overview
    q. USGS Data, Tools, and Technology FAQ
    r. USGS FAQ - On finding current and historical US topographic maps.
    s. USGS topo symbols 1918 and 1993. See Z:\DocLib\GeoReferencing\Resources\1918-TopoSymbols.pdf and 993-TopoSymbols.pdf
4. **Texas Geology**
    a. Explore Texas Geology - Can input location names and GPS (tab says USGS - Pocket Texas Geology)
    b. Geologic Atlas of Texas - Display quads online with collar showing formation names
    c. Google Earth Maps of Formations (KML/KMZ files) - See Z:\DocLib\GeoReferencing\Resources\KMZ-GoogleEarth for txgeol.kmz. There is also an OK file. The advantage of these is that in Google Earth you can search for a formation and see it highlighted. You can download the Texas KMZ file from here (USGS.gov)
    d. .
    e. TX Nat. Resources Information System - Including Geologic Atlas of Texas. Can search by county or quad name. Under *Geology* downl oad full TX geologic quads. Under *Digital Raster Graphics* , download topos.
    f. Index to Geology Maps of Travis County area. Index of best available Geologic Maps Compiled for Phase 1 of Barton Springs Edwards Aquifer Conservation District Central TX GIS Biologic Map Project. Some of these are images of old tops with overlays of hand drawn geology.
    g. Correlation Chart of TX formations. Interesting, hand drawn from 1938 with included references for many of these.
5. **National Geology**
    a. USGS Geology of the conterminous United States (beta) - new and better version of b. Note that if you want to cut and paste coordinates, drop a point at a location and in the upper left hand corner under the *'# maps at this point'* you will see something like **Near: Austin, TX, 78734 (Lng: -97.933, Lat: 30.422, Elev: 758 ft.)**
    b. USGS Geology of the conterminous United States - maps at the level of groups/series for all US including Texas.
    c. USGS National Geologic Map Database (Geolex) - look up a formation name by state and/or age
    d. USGS / AASG Mapview - Visualization. Click on a location to find all geological maps for that point. Covers entire US courtesy of USGS and the Association of Amercan State Geologists.
    e. NM Geology Maps - Geology maps for New Mexico.
    f. Oklahoma Geology Maps - Quads for OK.
    g. Oklahoma Historical Society Search Page - Research Center Page has a number of links, including Land Resources.
6. **Texas Government Land Surveys and Ownership**

a. Interactive Land Lease Mapping Program - Use to identify Surveys. Requires Adobe Flash. At the bottom of the page there is an orange Query button that allows you to search County for 'Block - Section', 'Survey Name' and 'Grantee'. If you click on 'GIS Report Page' you get a summary with the relevant information. And, if there is an archived image of the original grant you will see an 'Archived Record' button in the upper left.
b. Texas Natural Resources Information System - GIS and imagery datasets are available at four levels: State, County, Quadrangle, and Quarter-Quadrangle.
c. Texas Land Parcel Data - Can be opened with QGIS and Google Earth Pro. With QGIS, download the county and unzip. Then in QGIS open the fgdb/xxx.gdb/landparcel file. It's the file that has an icon that looks like a peanut shaped lake. Presumably works with ARCGIS as well. You can click on a parcel and get data. You can open at tabular view and sort. See the little table looking icon approx. 7 to the right on the top line. Make sure the icon on the lower left is set so it displays as a table. I've tried searching it and it gets into a state that I can't undo. Missing something. For now I am sorting fields in order to find things. Might need to read the documentation. I was able to do control-A to the table and paste it into Excel where I could do a search. But there has to be a better way. NOTE: Not all counties have data in this hub. See the next entry.
d. In order to find 'headrights' go to the GLO Historic County Maps . Here you can search for hold county maps that show these land grants.
e. The other way to **lookupparcel data** is by searching in your browser for "<county name> CAD", where CAD = Central Appraisal District. Many of the counties I've looked at in Texas seem to use the same software. Note that missing data regarding a particular parcel in the Texas Land Parcel Data seems to be missing here as well. **However**, counties that do not have data in the Texas Land Parcel hub do seem to have a Central Appraisal District site. E.g. search for "Mason CAD".
f. Historic TWDB Groundwater Reports - Texas Water Development Board historic list of water wells. Report series from 1936 to 1961. Includes Travis Co.
See also *Bulletin 5708 Record Of Wells in Travis County, Texas* , Ted Arnow, United States Geological Survey, July 1957.
g. History of Texas Public Lands. Great reading re the tangled history of the distribution of land in Texas.
h. Texas Fire Lookout Towers. Only of few of these remain. This is a weird site. Its under Tennessee Landforms. But, if you enter http://tnlandforms.us/google.php?trk=txtowers you get Texas. trk=latowers give you Louisiana, altowers, Alabama, vatowers, Virginia. So, if looking for a lookout tower in another state, you might guess the attribute.
i. Existing and Historic Fire Lookout Towers. See also Forest Fire Lookout Association. The historic ones are incomplete. See preceding.

7. **Mines, Oil Wells, Drilling and Samples**
   a. ShaleXP - Terrific set of tools for wells, especially for searching for well names, operators, etc. Multiple filers allowed, including by county.
   b. Bureau of Economic Geography - Samples and logs (cores) from wells. We often find the well, but without additional location data. **New version**, vastly improved has both logs and samples. Click on the lab to the left side of the screen and you can select whether to search logs or specimens. More importantly, you can select an entire county and then select the 'Download to table' button on the right of the screen and search it for well #'s and names.
   c. Railroad Commission GISViewer - for wells. **Important**: you can download a csv file with data on the wells within a specified radius up to 2.5 miles. Click on the target icon next to the globe. Hovering gives you "Download wells within a defined radius". If you open the csv file you can easily search for name matches. Rather than clicking on each well icon.
   d. Railroad Commission Drilling Permits - Seems to go back to the 1970's.
   e. Texas Oil Leases - Site provide quite a bit of potential data, though much of it seems to be behind a paywall.
   f. Drilling Edge - Subscription required to get full use, but some data is free.
   g. US Mines and Mining Companies
   h. JOIDES - Deep Sea Drilling Project Reports. Includes sites, some of which are locations in Specify.
8. **Texas History, Railroads and Old Austin**
   a. Handbook of Texas History - Can be useful for old names.
   b. Texas Historical Sites Atlas - Great resource for historical sites including cemeteries and homesteads.
   c. All Post Offices in Texas (and the USA) **Here is another** site with only the names of post offices.
   d. The Portal to Texas History
   e. Texas Historical Sites Atlas - Includes text from historical markers
   f. USGenweb Archives for Texas - includes a variety of sources by county: census images, marriages, maps, ... a diverse assortment, varied by county.
   g. Census Enumeration District Maps - E.g. 1940 Census maps Travis Texas.
   h. Perry-Castaneda Library Map Collection - PCL Historical maps of Texas. See index to the old Texas topo maps in Z:\DocLib\GeoReferencing\Resources\Maps-Texas-Topo-PCL. Sortable by date and county (where the county is known). For TX specific topos see this sub-page at PCL.
   i. Abandoned Railroads - Old rail lines.
   j. Ed Bradford's Google Earth TX Railroads KMZ file - See Z:\DocLib\GeoReferencing\Resources\KMZ-GoogleEarth for egbRR-V0.kml
   k. Southern Pacific Lines - Route from 1933 with dated TX geology.
   l. City of Austin - GIS and Maps
   m. Cotton Gins in Texas - The Texas Cotton Gin Museum database of gins is in Z:\Doclib\Georeferencing\Resources\Data\.
9. **Texas Counties & Highways**
   a. TXDOT allows you to search for Highway Designation Files. See http://www.dot.state.tx.us/tpp/
   b. Many details about old highways can be found in Wikipedia by simply searching for something like *Texas Highway 81*
   c. Old Texas Highway Maps - (1917-1973)
   d. All Texas County Maps - (1993-1996)
   e. 1940-60 County Maps of Texas - County highways as well as Surveys and other maps.
   f. Old Texas County Maps - Texas State Library and Archives Commission.
   g. More old Texas county maps - Texas Land Office.
   h. Atlas of Historical County Boundaries - The Newberry Library. Dynamic map of changes to all counties in the US over time.
10. **NPL and UT Data Sources**
    a. NPL Library Lookup - Includes things like old Geological Society field trips. Though these may be in boxes in the SW Cage.
    b. NPL Lab Wiki - Lab procedures, Specify database information, etc.
    c. UT Libraries - Supports search for papers in journals, dissertations and theses. For electronic versions of these either select "--Electronic Resources" in place of "ALL collections" , or go directly to UT Scholarworks.
    d. Also, for Theses and Dissertations in general, see ProQuest. However, if your have an EID, the best access to this is via the UT Libraries. Otherwise ProQuest is not free.
    e. UT Scholarworks - For scanned UT Dissertations and Theses, old UT Bulletins, etc. We have downloaded many of the relevant local ones in Z:/Doclib/Georeferncing/Resources.

f. Some UT Dissertations have been downloaded to the Z: drive.
   Z:\DocLib\Literature pdfs\Thesis and Dissertations
   Z:\DocLib\GeoReferencing\Resources\Theses
g. UT Geology and Paleontology Dissertations and Theses.
h. NPL Catalogs - Only available when on the NPL network. These pdf files in z:/DocLib/Catalogs/
i. are scans of the earlier text catalogs that have been (largely) captured within Specify. However, sometimes there is more information here than has been recorded in the DB. We have also found both transcription errors and hand written notes.
j. Old BEG Locations - Only available when on the NPL network. *BEG Book 1* contains an odd mix of locality and accession numbers. If you find an old reference to BEG location 209, you might check here.
k. GIS & Geospatial Data Services LibGuide Homepage - links to all of the UT Libraries' GIS related resources. Includes numerous, well-organized links to external (non-UT) GIS resources as well.
l. Old Maps of the UT Campus.

11. **Converting Land Survey Locations to GPS**
    a. Meridians & Baselines - townships and ranges - **Map** showing meridians and baselines.
    b. In Geolocate you can used township, range and sections formatted like t2n r6e section 10. That's Township 2 South, Range 1 East, Section 30. You may get multiple results, I don't see any way to specify the meridian. But you can specify the county.
    c. Utilities for Township and Range - Louisiana, California, Texas Land Survey are listed on the left side.
    d. Public Land Survey System (PLSS) - Township and Range to GPS; produces **KML** file viewable in Google Earth; see Resources/Logins /TownshipRange.txt for how to login.
    e. Convert between Lat/Long Coordinate systems - E.g. WGS 84 to NAD 27
    f. Georeferencing Calculator - Not sure how useful this is, given our use of Geolocate.
12. **Other Data Sources**
    a. TDWG Earth Science and Paleobiology Interest Group - geospatial resources that may be useful for georeferencing.
    b. UT Geologists - To figure out rough time periods
    c. COLEMAN COUNTY - Known Schools of Coleman County - 1860 - 2004. There is also a General Coleman County Research Information and Vital Statistics that has lot of useful information. (egb)
    d. C.C. references. These are to the "Contributions to the Cushman Laboratoryfor Foraminiferal Research" archives.
    e. Natural Earth - Natural Earth is a public domain map dataset available at various scales. Featuring tightly integrated vector and raster data, "with Natural Earth you can make a variety of visually pleasing, well-crafted maps with cartography or GIS software."
    f. Shoal Creek Conservancy Map - includes old springs, some old homesteads.
    g. Sanborn Fire - Insurance maps of Texas
    h. Sanborn Maps for other states. Huge collection at Library of Congress (updated 2020-05-12)
    i. Austin Historical Aerial Photos
    j. USGS Aerial Photos - A wide variety of images. Accessible by location using Earth Explorer (below).
    k. Abandoned & Little Known Airfields:
    l. USGS Earth Explorer - Numerous USGS Data sets, including Aerial, Digital Maps, Land Cover, Landsat, and many more.
    m. Bridge Inspections - I found a creek I could not find elsewhere in this dataset. Select a county and then search for your creek name. The reports are of the form "Hwy 22 over Henderson Creek". More for interest than georeferencing.
    n. Library of Congress Maps - Filter to Texas. Old county maps, Sanborn Fire Insurance maps, etc.
    o. David Rumsey Map Collection Database - Stanford University. Historical map collection with over 82,000 maps and images online. Includes rare 16th through 21st century maps of America, North America, South America, Europe, Asia, Africa, Pacific, Arctic, Antarctic, and the World. We found 1888 Rand McNally maps of TX there, downloadable.
13. **Georeferending Training**
    a. iDigBio Georeferencing Working Group Videos - Videos that focus on skills and software for georeferencing locality data from natural history museum specimens.
    b. MaNIS/HerpNet/ORNIS Georeferencing Guidelines - information about assigning geographic coordinates, and maximum error distances for those coordinates. Useful guidance.
    c. GBIF Georeferencing Best Practices - useful information on writing locations as well as interpreting them.
    d. GBIF Georeferencing Quick Reference Guide - "a practical guide"