

GIS Resources Hand-Out

Select GIS (Geographic Information System) Programs

- Free Online Viewer- Add and view geospatial data with some limited analysis
 - GeoPlatform: <https://viewer.geoplatform.gov/>
 - Add layers directly from the GeoPlatform, import or draw your own layers, measure distance and area, and share and export maps
 - USGS Streamer: <http://water.usgs.gov/streamer/web/>
 - Select a location on the NHD Steam map, trace upstream or downstream, and generate a summary report with characteristics
 - USGS The National Map Viewer: <http://viewer.nationalmap.gov/viewer/>
 - Choose from a range of base data, import or draw your own layers, measure distance and area, and select specific data from layers using filters or buffers
 - Map My Property from TAMU Forest Service: <http://tfsfrd.tamu.edu/MapMyProperty/>
 - Draw boundaries and labels, measure distance and areas, clip soil and vegetation layers, get summary information, and export maps

- Online Applications- Add, view, and analyze geospatial data including advanced capabilities like creating apps or interactive data visualizations
 - ArcGIS online: www.arcgis.com
 - Free 60 day trial. Free with ArcGIS Desktop Account
 - Carto: www.carto.com
 - Free for 250 MB storage and unlimited map views
 - Mapbox: www.mapbox.com
 - Free for unlimited storage and 50,000 map views/mo
 - MapMe: www.mapme.com
 - Free

- Desktop Programs- Add, view, and analyze geospatial data
 - Summary of GIS software: <http://gisgeography.com/mapping-out-gis-software-landscape/>
 - Google Earth: <https://www.google.com/earth/>
 - Free
 - Limited analyses. View KML/KMZ files. View change in imagery overtime.
 - Quantum GIS: <http://www.qgis.org/en/site/>
 - Free and Open Source
 - GRASS GIS : <https://grass.osgeo.org/>
 - Free
 - ArcGIS for Desktop : www.arcgis.com
 - Free 60 day trial. Both personal and organization licenses available
 - TerrSet by Clark Laboratories: <https://clarklabs.org/products/>
 - A range of personal and organization licenses available
 - Great for remote sensing and image processing

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Primary Data Sources by Data Type

Note about Download Source: Much of this data is hosted in multiple locations, but I've listed only the primary or easiest to use source for each data type. If the same data is available at both Texas and National extents, the sources are formatted... Texas/National.

- Hydrology
 - Watershed Boundaries (.shp)
 - 8, 10, and 12 digit hydrologic units (HUCS). Developed by TWDB with USDA-NRCS
 - Download Source: TNRIS / USDA-GDG
 - National Hydrograph Dataset (NHD) (.shp, .gdb)
 - 1:24k scale NHD. Developed by USGS and EPA
 - Download Source: USDA-GDG
 - Generalized Texas NHD (.shp, .gdb)
 - 1:100k scale NHD. Developed by TWDB with USGS and EPA.
 - Download Source: TNRIS
 - TPWD Major River Basins, Lakes and Bays, and Significant Stream Segments (.shp)
 - Download Source: TNRIS or TPWD
 - TCEQ Water Quality Monitoring Stations and Waterbodies (.shp, .kml)
 - Download Source: TNRIS or TCEQ (2014)
 - National Wetlands Inventory (.tiff)
 - 1:24k – 100 k scale. Developed by USFWS
 - Not updated since 1980s
 - Download Source: TNRIS / USFWS
- Geology / Soil
 - Geologic Database of Texas (.gdb)
 - 1:250k scale. Developed by the TWDB and USGS
 - Download Source: TNRIS
 - USGS Geological Map Database of Conterminous United States (.shp)
 - 1:100k + scale.
 - Download Source: USDA-GDG
 - Soil Survey Geographic Database (SSURGO) (.shp)
 - 1:12,000 – 64,000 scale. Developed by National Cooperative Soil Survey and USDA-NRCS
 - Download Source: TNRIS / USDA-GDG
- Topography / Elevation
 - USGS Topographic Map (Digital Raster Graphics) (.tiff)
 - 1:24k -250k scale. Digitized in 1996, but most maps not updated since 1980s.
 - Download Source: TNRIS
 - USGS National Elevation Dataset (NED) (.img, .dem)
 - 1/3 and 1/9 arc-seconds (10 and 3 meters) scale.
 - Download Source: TNRIS / USDA-GDG

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- Weather / Climate
 - Annual Average Maximum Temperature (.shp)
 - Download Source: USDA-GDG
 - Annual or Monthly Average Precipitation (.shp)
 - Download Source: TNRIS (1961-1990) or USDA-GDG
 - Weekly Drought Scores (.shp, .kmz)
 - Download Source: National Drought Mitigation Center
- Habitat / Ecosystems / Wildlife
 - TPWD Texas Ecological Systems Data (.shp)
 - 10 m resolution. Includes info about land use/management
 - Download Source: TNRIS or TPWD
 - TPWD Bailey's, Gould and Omernik Ecoregions and TX Biotic Provinces (.shp)
 - Download Source: TNRIS or TPWD
 - USFWS Critical Habitat for Threatened and Endangered Species (.shp)
 - Download Source: USFWS
- Land Cover / Land Use / Land Management
 - National Agriculture Imagery Program (NAIP) (.tiff, .jpeg)
 - Aerial imagery in natural color (leaf off) and/or color infrared (leaf-on).
 - 1m resolution. Developed by USGS
 - Download Source: TNRIS (1996+) or USDA-GDG (2004+)
 - SPOT (Satellites Pour l'Observation de la Terre or Earth-observing Satellites) (.tiff)
 - Satellite Imagery. Visible and multispectral
 - Taken every 4-5 days
 - Download Source: TNRIS (1991-2001)
 - National Land Cover Dataset (.img)
 - 30 m resolution. Developed by USGS, EPA, USFS, and NOAA
 - Download Source: TNRIS (2000, 2011) or USDA-GDG (2011)
- Demographics / Transportation / Boundaries
 - TIGER Census Data
 - Download Source: TNRIS (2000, 2010) or USDA-GDG (2010, 2015)
 - TxDOT Roadways (.shp)
 - Download Source: TNRIS
 - TIGER Primary and Secondary Roads
 - Download Source: USDA-GDG (2010)
 - Political Boundaries / Government Units (.shp)
 - State, county, city, and park boundaries.
 - Download Source: TNRIS (2012) / USDA-GDG


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Primary Data Sources


Texas Specific Data Sources

- Texas Natural Resource Information System (TNRIS)
 - Getting data: www.tnris.org/data-download
 - From link above, scroll down to view the data available at the state level. To view data at the county or quadrangle level use the dropdown or just select your area of interest on the map.
 - Relevant Data:
 - At the STATE level: Waterbodies, Aquifers, Watershed Boundaries, Land Cover (1992, 2001, 2006, 2011), Soils, Bathymetry (2004), Elevation, Geology, Temperature, Precipitation, Census data (2000, 2010), Political Boundaries, Transportation
 - At the COUNTY level: Aerial Imagery (2004+), Soils, Census data (2000, 2010), Political Boundaries, Transportation
 - At the USGS QUADRANGLE level: National Wetlands Inventory, Satellite Imagery (1998-2001), Aerial Imagery (1996+), Elevation (2007+), Geology
 - Statewide data from all Texas Agencies: <https://tnris.org/data-catalog/>
 - This page contains an easy way to directly download spatial data from other state agencies (GLO, TPWD, TCEQ) instead of going to each individual agency website (see below).
- Texas Water Development Board (TWDB)
 - Getting data: www.tpwd.texas.gov/gis/data
 - From the link above, click on links to download data in shapefile format
 - Relevant data: (Statewide only)
 - Major/Minor Aquifers, USGS Hydrological Units/Watershed Boundary, Reservoirs, Major Rivers, Well Locations, Groundwater Management Areas, River Authorities
 - List of Online Viewers: <https://www.twdb.texas.gov/mapping/>
 - TexMesonet, Texas FLOOD Viewer, Groundwater Data Viewer, Water Data for Texas
- Texas Commission on Environmental Quality (TCEQ)
 - Getting data: www.tceq.texas.gov/gis/download-tceq-gis-data
 - From the link above, click on links to download data in shapefile, geodatabase, or KML (Google Earth) format.
 - Relevant Data: (Statewide only)
 - Water Quality Monitoring Stations, Waterbodies used in TCEQ Assessment (Segments, Assessment Units), Land Use (select areas), Water Districts, Groundwater Conservation Districts, Wastewater Outfalls, Public Water System Intakes, Landfills, Petroleum Storage Tanks, Superfund and Radioactive Sites
 - List of Online Viewers: <https://www.tceq.texas.gov/gis/tceq-geographic-data-viewers>
 - Surface Water Quality, Water districts, Petroleum Storage Tank, Water Well


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- Texas Parks and Wildlife Department (TPWD)
 - Getting data: www.tpwd.texas.gov/gis/data
 - From the link above, click on the  links to download the data in shapefile format.
 - Relevant data: (Statewide only)
 - TPWD Basins, Lakes and Bays, Significant Streams Segments, Major/Minor Bays, Playas, Streams, Ecological Mapping Systems of Texas (2014), EcoRegions, Natural Regions, Biotic Provinces, Wildlife Management Areas, State Parks
 - List of Online Viewers: www.tpwd.texas.gov/gis/gallery
 - TX Watershed Viewer, Seagrass Viewer, Rare/Threatened/Endangered Species
 - LWRCRP Statewide Inventory (2012): <http://tpwd.texas.gov/gis/apps/lwrcrp/>
 - Lists governmental and non-governmental lands in Texas that allow public access. Developed by Land and Water Resources Conservation and Recreation Plan (LWRCRP).

Country Wide Data Sources

- ESRI from ArcGIS for Desktop (ArcMap)
 - Getting Data: In ArcMap, use the “Add Data” button  and select ‘Add data from ArcGIS Online’ from the drop down.
 - Relevant Data: Provides a wide range of data, including many the data sources listed below
- USDA Geospatial Data Gateway (USDA-GDG)*
 - Getting data: <https://gdg.sc.egov.usda.gov/GDGOrder.aspx>
 - Select the State, then County(s) from the dropdown. Select the type(s) of data, then scroll down to the bottom to select the green continue button. Select your format (shapefile or geodatabase) and projection (State Plane-Texas is a good option) then select continue. Finally fill in your contact information and select continue. Review your request, check the estimated time to complete, and hit place order. A zipped file of your data will be emailed to you when your order is complete.
 - Relevant Data:
 - USGS Hydrological Units/Watershed Boundary, National Hydrography Dataset (1:24K), Land Use/Land Cover (2014), Soils, Imagery (2004+), Elevation, Geology, Temperature, Precipitation, Census data (2010, 2015), Political Boundaries, Transportation (2010), Conservation Easements
- US Geospatial Platform
 - Getting Data: <https://www.geoplatform.gov/>
 - In the left-hand column, use location search box or map to define your location. Further refine your search using the other categories. (Selecting the format = shapefile, kml, or file gdb is a great way to narrow your search)
 - Relevant Data: A search for Texas data, returned more than 15,000 datasets, so you’ll want to use the filters on the left to refine your search as much as possible.

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- USGS Earth Explorer
 - Getting Data: <http://earthexplorer.usgs.gov/>
 - From the link above, use the search box or the map to zoom in on site location, then select 'use map' from the second box on the left. Select a date range to further narrow your search results. To increase the number of results the search returns (default is 100), select 'results options'. Click 'data sets', and you select the data sets from the dropdowns. Click on 'Additional Criteria' and fill in any additional filters. Click results. View your search results and click  to download your data. (Must create a login)
 - Relevant Data:
 - Land Cover (1992, 2001, 2006), Vegetation Monitoring, Satellite Imagery, Aerial Imagery, Radar, Elevation
- The National Map
 - Getting Data: <http://viewer.nationalmap.gov/basic/>
 - Use the box to refine the extent for your datasets. The easiest way is to select 'current extent' and position the map to include your site location. Select data set(s) on the left column, and then refine your search, select the file format, and data extent. Select the blue 'find products' box. The next page returns the product(s) that match your search. Select 'download' under 'actions' to download the shapefile.
 - Relevant Data: National Hydrography Dataset, Elevation, USFWS data, Watersheds, Imagery
- USGS National Hydrography Dataset by State
 - Getting Data:
<ftp://rockyftp.cr.usgs.gov/vdelivery/Datasets/Staged/Hydrography/NHD/State/>
 - The link above is a directory. Select the resolution (high or medium), file type (geodatabase or shapefile), and then the state (select the .zip file) to download the file.
- National Drought Mitigation Center
 - Getting Data: <http://droughtmonitor.unl.edu/MapsAndData/GISData.aspx>
 - From the link above, click on the left links to select a year then at the top of the table click where it is says 'Download all Drought Monitor Shapefiles for 2016'. For data from specific weeks, click on the specific links in the table below to download data in shapefile or KML (google earth) format for each weekly period.
- Additional Lists of Data Sources:
 - List of GIS Data by State: <http://lib.guides.umd.edu/c.php?g=326454&p=2192919>
 - USGS list of resources: <http://water.usgs.gov/maps.html>
 - USGS list of shapefiles: <http://water.usgs.gov/lookup/getgislist>
 - US Fish and Wildlife Services GIS Data: <https://www.fws.gov/gis/data/national/>
 - NOAA Critical Habitat Fisheries Data: <http://www.nmfs.noaa.gov/gis/data/critical.htm>
 - NRCS Soil Viewer: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>