

Online Mapping Tools and Geographic Information System (GIS) Software

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Kansas State University

GIS – Geographic Information System

- What is a GIS? - a computer system for collecting, storing, displaying and analyzing geographical information
- Examples of GIS software
 - GIS software with complex analysis abilities
 - GIS software with basic analysis abilities
- Examples of Online Mapping Tools (great for displaying geospatial data)

Arc Pro Analysis Tools



The screenshot shows the ArcGIS Pro interface with the **Analysis** tab selected in the ribbon. The ribbon contains several tool groups: **Buffer** (Pairwise Buffer, Summarize Within), **Join** (Spatial Join, Pairwise Clip), **Hot Spot** (Optimized Hot Spot Analysis), **Feature Analysis** (Feature Analysis, Raster Analysis), **Data Engineering** (Data Engineering), **Suitability** (Suitability Modeler), **Visibility** (Visibility Analysis), **Exploratory 3D Analysis** (Exploratory 3D Analysis), **Network Analysis** (Network Analysis), **Geostatistical Wizard** (Geostatistical Wizard), **Business Analysis** (Business Analysis), and **Data Interop** (Data Interop). The main map area displays a topographic map with contour lines and elevation data. The map scale is 1:9,272, and the coordinates are 10,694,692.00W 4,706,391.50N m.

The screenshot shows the **Geoprocessing** pane in ArcGIS Pro. The **Find Tools** search bar is at the top. Below it, the **Favorites**, **Toolboxes**, and **Portal** sections are visible. The **Toolboxes** section is expanded, showing a list of toolboxes. The **3D Analyst Tools** toolbox is highlighted in blue. Other toolboxes listed include Analysis Tools, Aviation Tools, Business Analyst Tools, Cartography Tools, Conversion Tools, Crime Analysis and Safety Tools, Data Interoperability Tools, Data Management Tools, Data Reviewer Tools, Defense Tools, Editing Tools, GeoAI Tools, GeoAnalytics Desktop Tools, Geocoding Tools, Geostatistical Analyst Tools, Image Analyst Tools, Indoor Positioning Tools, Indoors Tools, Intelligence Tools, Linear Referencing Tools, Location Referencing Tools, Maritime Tools, Multidimension Tools, Network Analyst Tools, Network Diagram Tools, Parcel Tools, Public Transit Tools, Server Tools, Space Time Pattern Mining Tools, Spatial Analyst Tools, Spatial Statistics Tools, Territory Design Tools, Topographic Production Tools, and Truss Network Tools.

QGIS Analysis Tools

The screenshot displays the QGIS desktop environment. On the left, the 'Plugins | All (1324)' window is open, showing a list of plugins. A search bar is at the top of this window. The list includes various tools like '3D City Builder', 'A-Maps', 'AcATaMa', etc. A red circle highlights the 'All' button at the top left of the plugin list. In the center, a text box titled 'All Plugins' provides instructions on how to enable or disable plugins and notes that red text indicates loading issues. On the right, the 'Processing Toolbox' is open, showing a search bar and a list of tool categories such as 'Raster analysis', 'Raster creation', 'Raster terrain analysis', 'Raster tools', and 'Vector analysis'. The background shows a map with a green terrain and a network of pink lines, likely representing a watershed or stream network. The bottom status bar shows '100%' zoom, '0.0°' rotation, and 'EPSG:3857' projection.

All Plugins

On the left you see the list of all plugins available for your QGIS, both installed and available for download. Some plugins come with your QGIS installation while most of them are made available via the plugin repositories.

You can temporarily enable or disable a plugin. To *enable* or *disable* a plugin, click its checkbox or double-click its name...

Plugins showing in **red** are not loaded because there is a problem. They are also listed on the 'Invalid' tab. Click on the plugin name to see more details, or to reinstall or uninstall this plugin.

Google Earth - Basic Analysis Tools

Google Earth Pro

File Edit View Tools Add Help

Search

Restaurants

Get Directions History

Places

- SoilWeb
- Stay Dry and Flood Smart!
- National Flood Hazard Layer (FEMA)
- USGS_Topo/USGStopo_DRG
- Public Land Survey System
- David Lassen.kmz
- Generate KML
- US Counties
- wwc5/wwc5_v2
- USGSImagery_Topo
- Layers
- Legend
- z14_spp_layers
- 2ft_cont
- s_2
- KDHE_SurfaceWaterRegisterStreams
- F and O floodingfrequency
- 10 ft contours
- NG911_Imagery/NG911_Imagery_2018_SID
- Untitled Path
- Temporary Places

Layers

- Primary Database
- Announcements
- Borders and Labels
- Places
- Photos
- Roads
- 3D Buildings
- Weather
- Gallery
- More
- Terrain

1985

Imagery Date: 8/9/2022 39°14'32.03" N 96°28'11.85" W elev 1246 ft eye alt 1883 ft

Graph Min, Avg, Max Elevation: 1224, 1234, 1250 ft
Range Totals: Distance: 630 ft Elev Gain/Loss: 22.1 ft, -32.4 ft Max Slope: 27.2%, -32.2% Avg Slope: 2.9%, -16.3%

1250 ft
1245 ft
1246 ft
1238 ft
1230 ft
1224 ft

50 ft 100 ft 118 ft 150 ft 200 ft 250 ft 300 ft 350 ft 400 ft 450 ft 500 ft 550 ft 600 ft 630 ft

1246 ft
-8.3%

Ruler

Line Path Polygon Circle 3D path 3D polygon

Measure the distance between multiple points on the ground

Length: 0.00 Feet

Show Elevation Profile

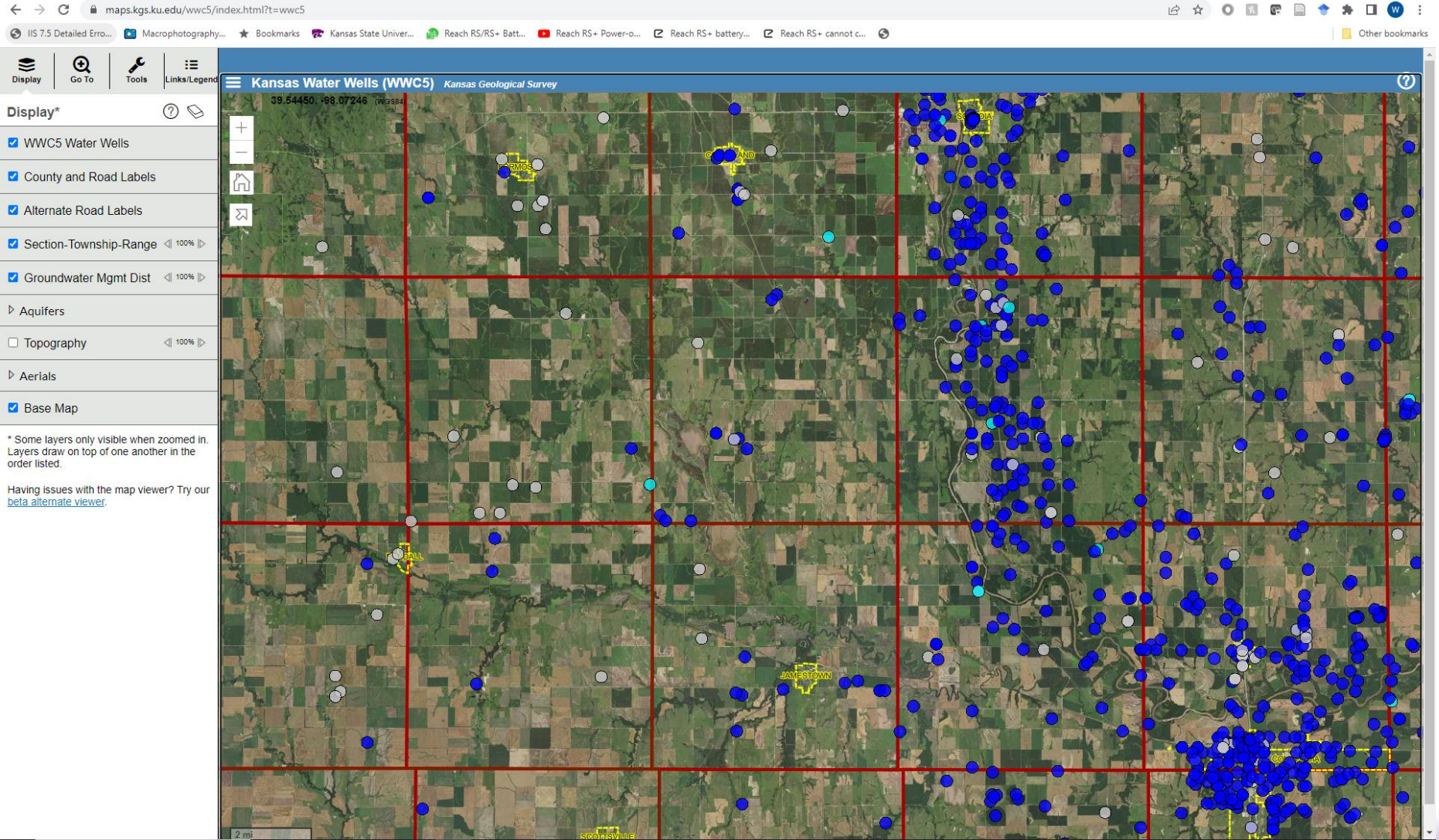
Mouse Navigation Save Clear

Google Earth

Type here to search

62°F Mostly cloudy 3:27 PM 5/15/2023

Online Mapping Tools – KS Water Wells



Online Mapping Tools – KS Floodplains

gis2.kda.ks.gov/gis/ksfloodplain/

Kansas Current Effective Floodplain Viewer
Last updated 12-16-2022. See also [Mapping Projects](#) for floodplains in development or the [FEMA MSC](#) to check for recently issued LOMRs.

Search:

Basemaps

Legend

- Floodplain Data
 - DFIRM Status
 - Effective DFIRM
 - Not Modernized
 - Streams
 - Profile Baseline
 - Stream Centerlines
 - Base Flood Elevations
 - Lettered Cross Sections
 - Unlettered, Mapped Cross Sections
 - LOMR Areas
 - Special Flood Hazard Area
 - AO
 - AH
 - AE, FLOODWAY
 - AE
 - A
- Layers
- Search by Township, Range, Section
- Draw
- Measurement
- Print
- Directions
- Google Street View

Online - Soil data viewer and download

The screenshot displays the USDA Web Soil Survey application interface. At the top, the browser address bar shows the URL: `websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx`. The page header includes the USDA logo and navigation links such as "Contact Us", "Subscribe", "Archived Soil Surveys", "Soil Survey Status", "Glossary", "Preferences", "Link", "Logout", and "Help".

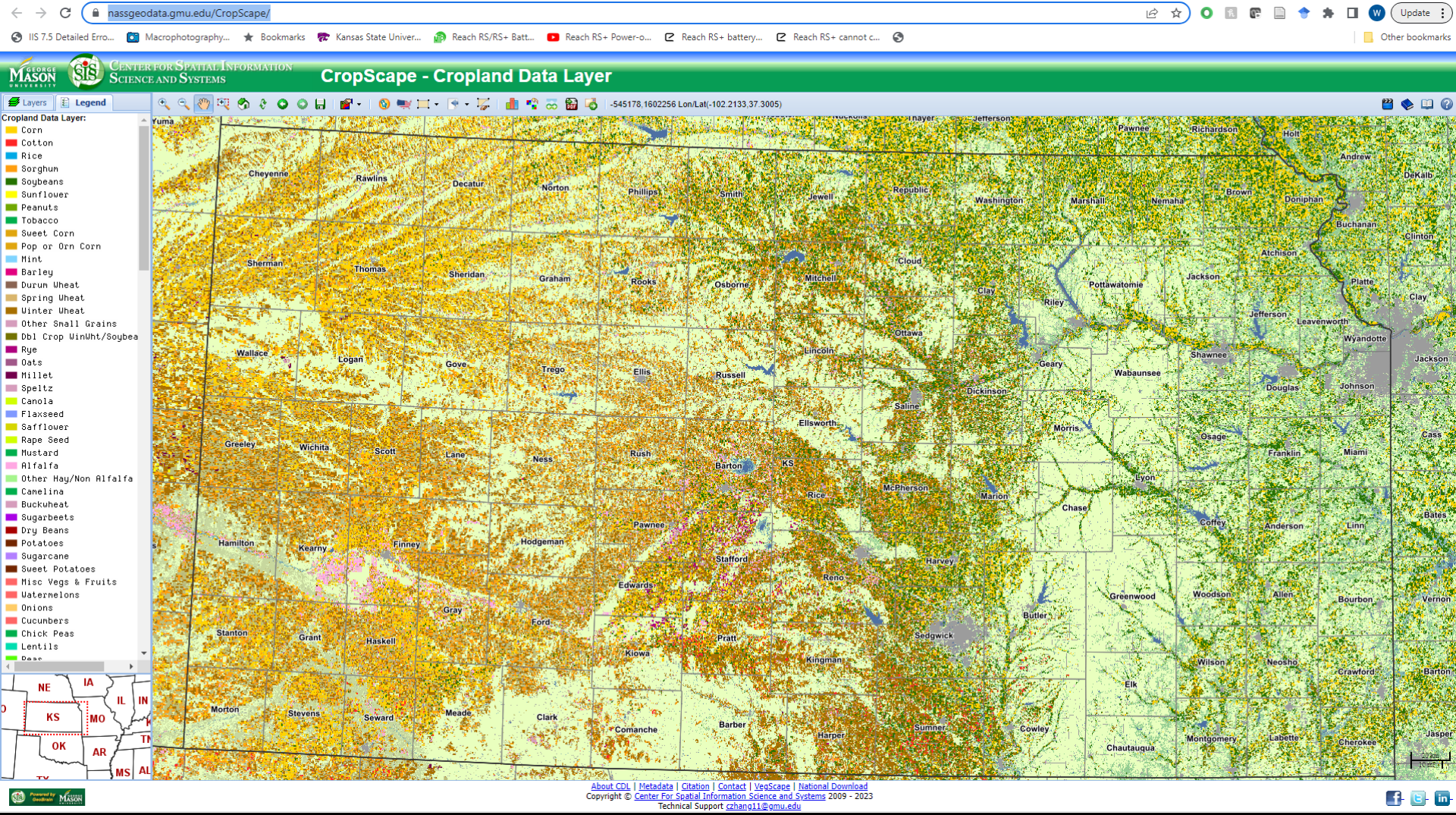
The main navigation bar features tabs for "Area of Interest (AOI)", "Soil Map", "Soil Data Explorer", "Download Soils Data", and "Shopping Cart (Free)". The "Area of Interest (AOI)" tab is currently selected.

The interface is divided into several sections:

- Search:** A search bar for finding specific soil data.
- Area of Interest:** A section for defining the AOI, including options to "Import AOI" from a Shapefile or Zipped Shapefile, and a "Quick Navigation" section with dropdown menus for "State" (set to "Kansas") and "County (optional)" (set to "Douglas").
- Area of Interest Interactive Map:** A large map of the United States showing state boundaries and a network of red lines representing the AOI. The map includes a legend, a "View Extent" dropdown (set to "Contiguous U.S."), and a "Scale" dropdown (set to "not to scale").

NASS – Cropland Data Layer

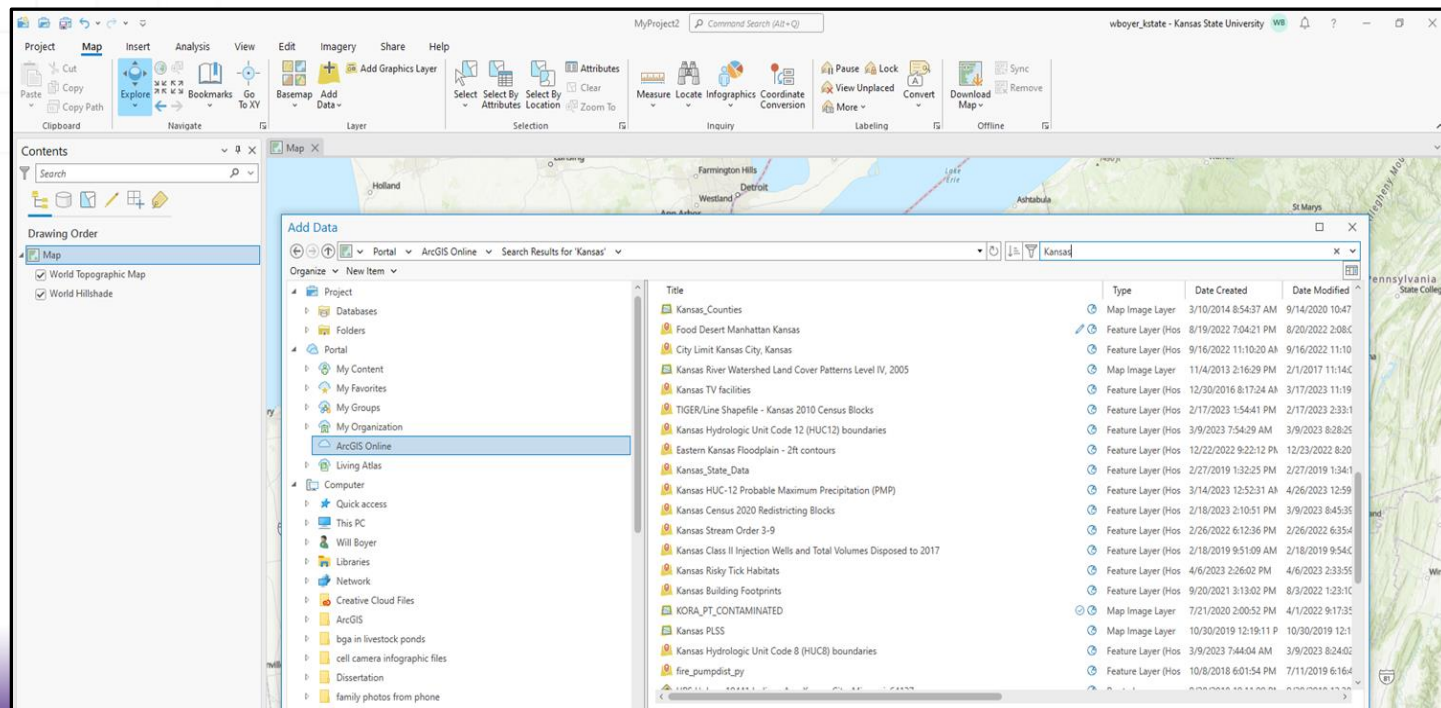
1997-2022, 30m resolution



Download Data or Access Servers?

- If you are analyzing large datasets, it is good to work with them on your hard drive
- If you are using a dataset that gets frequent updates, then it is good to access through a server.

– Where?



GIS Server Connection and Download

- Server Examples
 - ArcGIS Online Portal
 - Google: _____ ArcGIS REST Services Directory
 - Kansas GIS Data Center
- Download Site Examples
 - Kansas GIS Data Center <https://www.kansasgis.org/>
 - USDA Geospatial Data Gateway
<https://datagateway.nrcs.usda.gov/>
 - Cropland data layer
<https://nassgeodata.gmu.edu/CropScape/>
 - Google: _____ GIS data download

GIS – Geographic Information System

- What is a GIS? - a computer system for collecting, storing, displaying and analyzing geographical information
- Examples of GIS software
 - ArcPro and QGIS have complex analysis abilities
 - Google Earth Pro has basic analysis abilities
- ArcGIS Online gives you great potential for for displaying geospatial data in Web Maps

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