USGS
science for a changing world

US Topo

Topographic Maps for the Nation

U.S. Department of the Interior
U.S. Geological Survey

Accomplishments

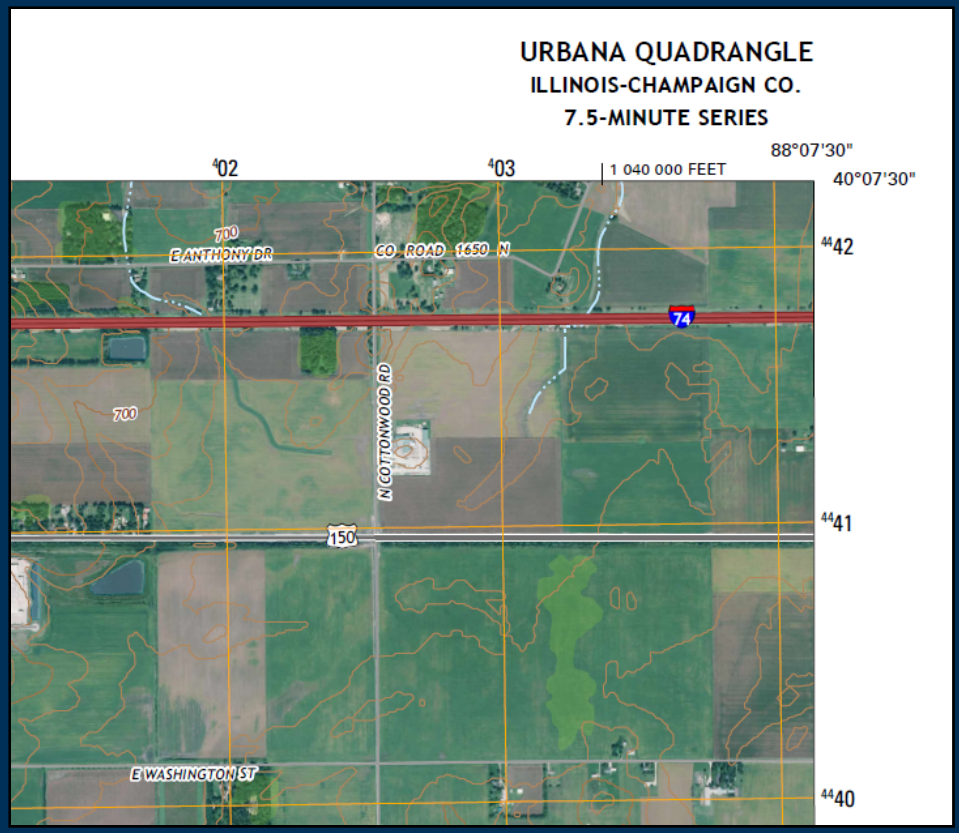
- Public launch of US Topo (December 2009)
- Completed US Topo for the 48 contiguous states in September 2012 totaling nearly 54,000 new maps
- Redesign in 2013 improved legibility and symbology
- Second round of US Topo map completion for continental U.S. completed in September 2015
- Hawaii, Puerto Rico, and US Virgin Islands added into second round production in 2013
- Alaska production started in 2013

National Geospatial Program

US Topo

The USGS topographic map product

- Built from The National Map data
- Digital
- GeoPDF® format
- Available free on the Web
- Image base
- Core feature layers
- Regular updates



USGS

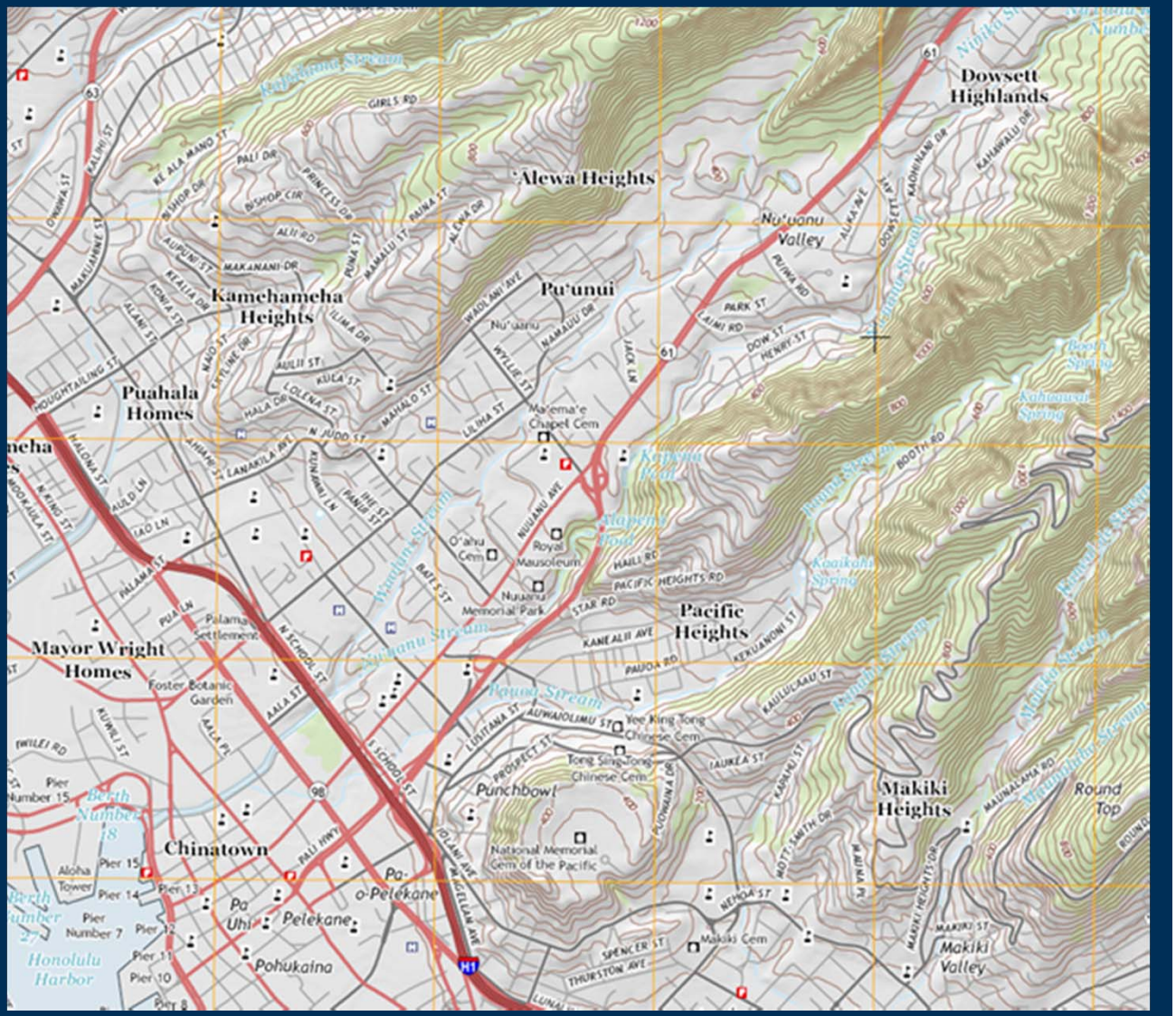
The National Map

US Topo Maps Content

2009, 2010, 2011, 2012, 2013, 2014, 2015 Feature Content

- Ortho-rectified Aerial Imagery
- Roads
- Names
- Elevation Contours
- Hydrography
- State/County/USFS Boundaries
- Runways
- Woodland
- Railroads
- PLSS
- Fire Stations
- Hospitals
- Schools
- Military Boundaries
- Cemeteries
- Post Offices
- Shaded Relief
- USFS Trails
- FWS Boundaries
- State Capitals
- Police Stations
- Correctional Facilities
- IMBA Trails
- National Scenic Trails
- Wetlands

USGS



Strategy

- **Evolution**
  - ✓ **Data layers added as they become available in The National Map**
  - ✓ **Features added as technical processes are perfected**
- **Three-year revision cycle**
  - ✓ **Linked to US Department of Agriculture's National Agriculture Imagery Program (NAIP) image acquisition schedule**

Data Sources

- **The National Map**
  - ✓ Transportation – roads from US Census TIGER files and US Forest Service
  - ✓ Boundaries – National Boundaries Dataset (via partnerships)
  - ✓ Names - Geographic Names Information System
  - ✓ Orthoimage – National Agriculture Imagery Program (NAIP)
  - ✓ Elevation – 3D Elevation Program
  - ✓ Hydrography – National Hydrography Dataset
  - ✓ Structures – National Structures Dataset (includes crowdsourcing)
  - ✓ Woodland – National Land Cover Dataset
- **Other Sources**
  - ✓ Public Land Survey System – Bureau of Land Management
  - ✓ Trails – National Scenic Trails, IMBA, US Forest Service

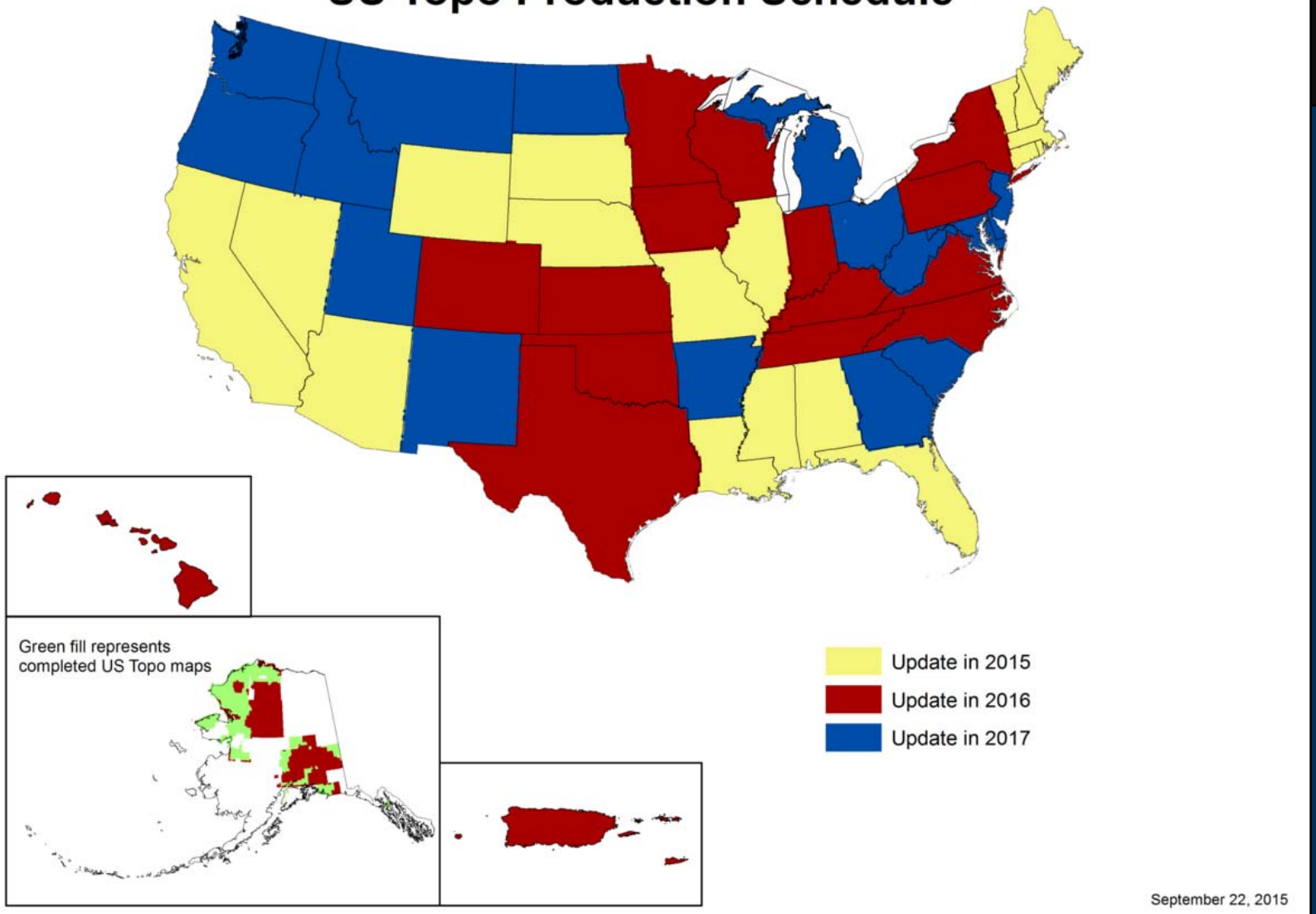
Product Characteristics

- Traditional USGS 7.5-minute topographic quadrangle format
- Nationally consistent and complete
- Can be used electronically or plotted
- Reference systems with traditional annotation:
  - ✓ Latitude/Longitude
  - ✓ U.S. National Grid

Product Characteristics

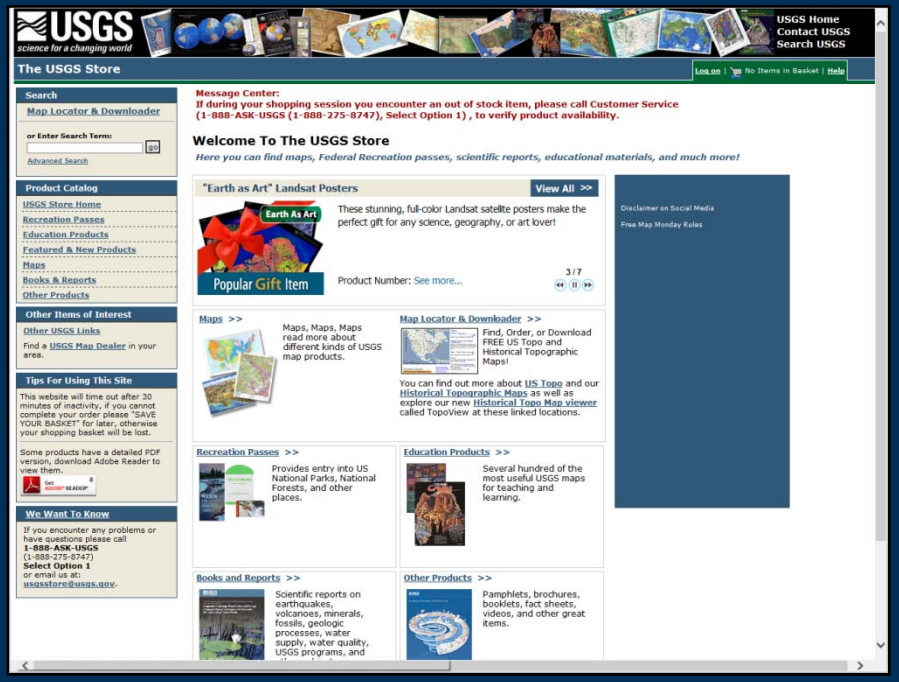
- **GeoPDF format**
  - ✓ **A TerraGo Technologies® published extension to the Adobe® PDF file format (free download)**
- **File size varies - about 18 to 35 Mb**
- **Georeferenced**
  - ✓ **Locations defined in terms of map projection and coordinate systems**
- **Layered (select layers, turn layers on/off)**
- **Limited interactive capabilities, free tools**

US Topo Production Schedule

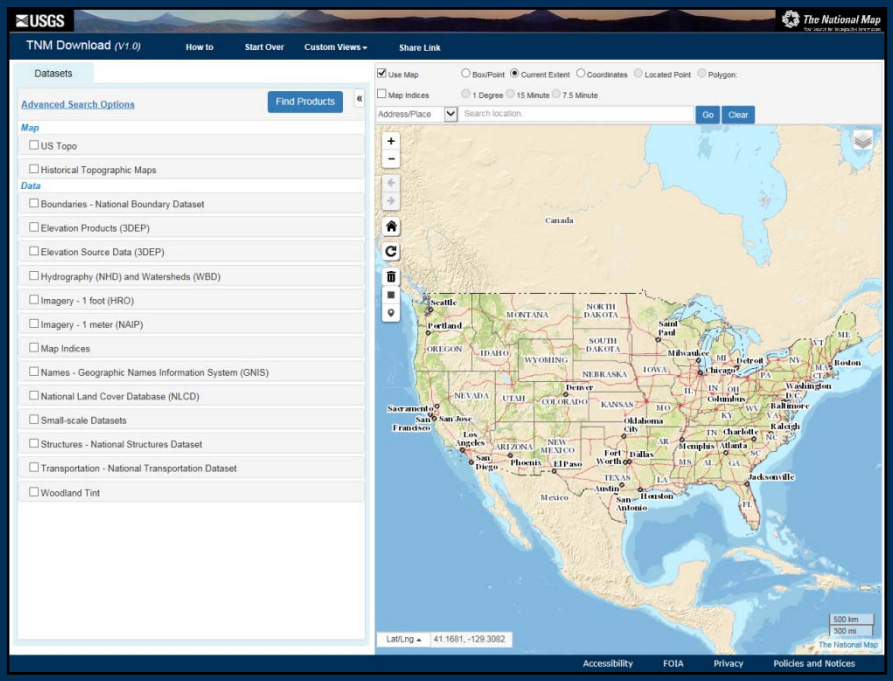


Internet Access Pathways

USGS Store
(store.usgs.gov)



TNM Download Client
(viewer.nationalmap.gov/basic)

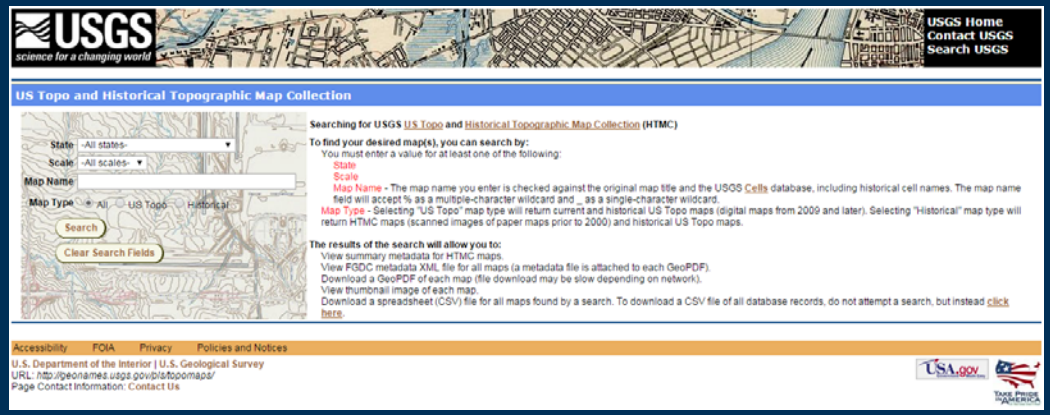


USGS

The National Map

Internet Access Pathways (cont)

Geonames
(geonames.usgs.gov/pls/topomaps)



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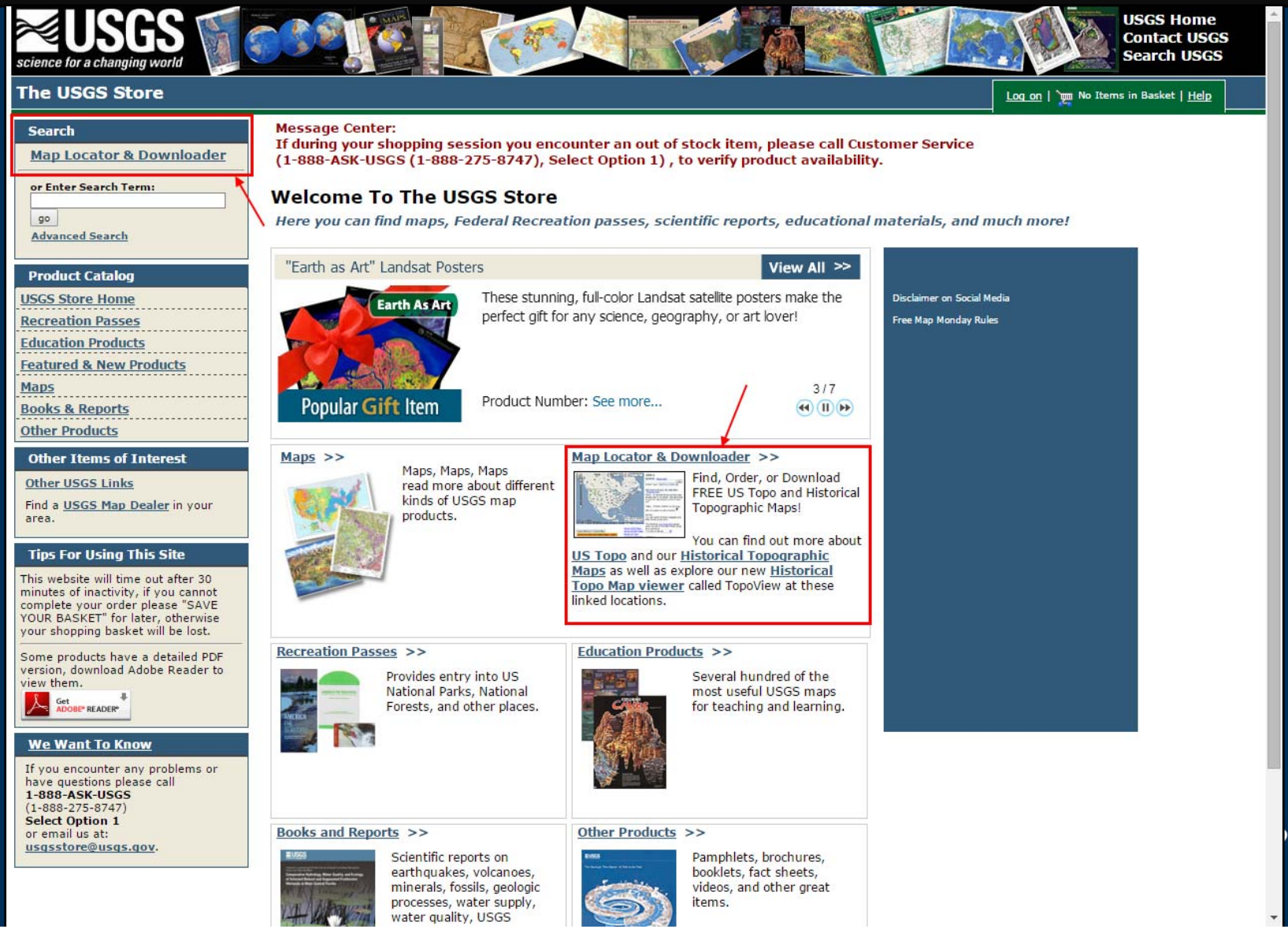
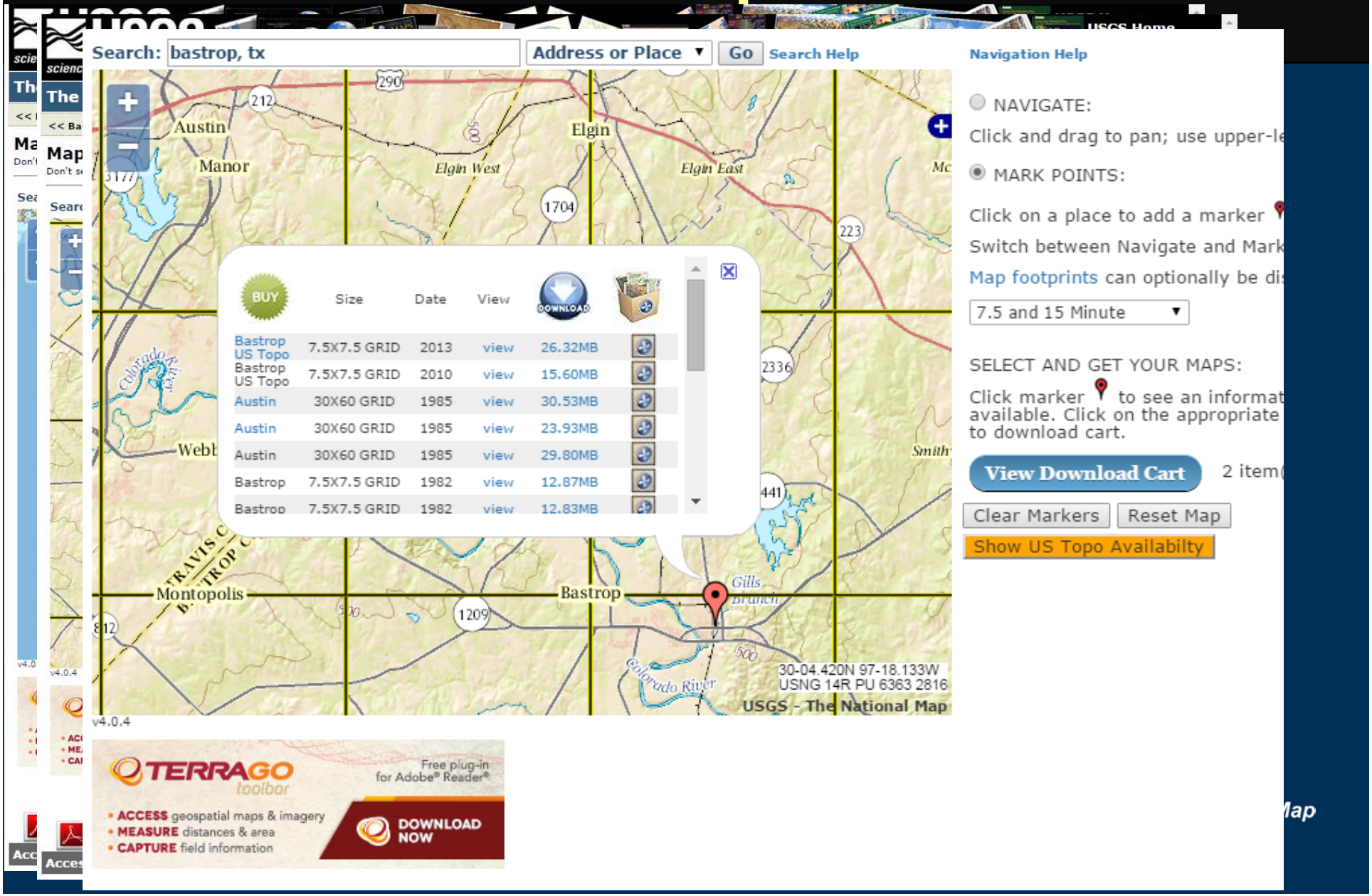
Accessing US Topo



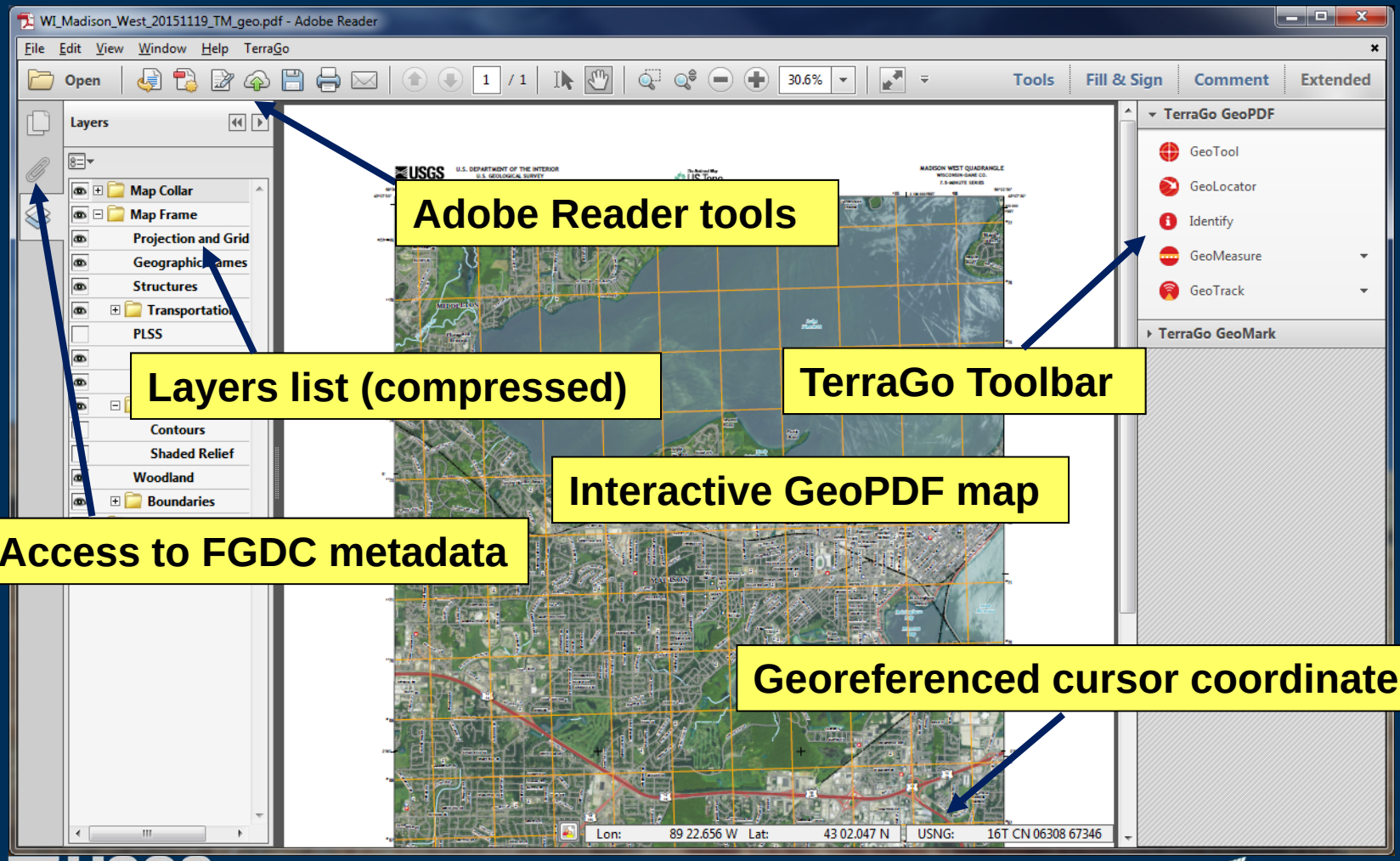
USGS Store – US Topo Download



System Requirements

- **Recent operating system**
  - ✓ Microsoft ® Windows 7 or higher recommended
  - ✓ Mac OS®
  - ✓ Broadband Internet access
  - ✓ Highly recommended
- **Adobe Reader® software**
  - ✓ Free download on Internet
  - ✓ Will also work with Adobe Acrobat ® ($$)
- **TerraGo Technologies Toolbar (Windows only)**
  - ✓ Not required, but recommended for enhanced functions
  - ✓ Free download

Downloaded Map
Adobe Reader with TerraGo Toolbar



Adobe Reader tools

Layers list (compressed)

TerraGo Toolbar

Interactive GeoPDF map

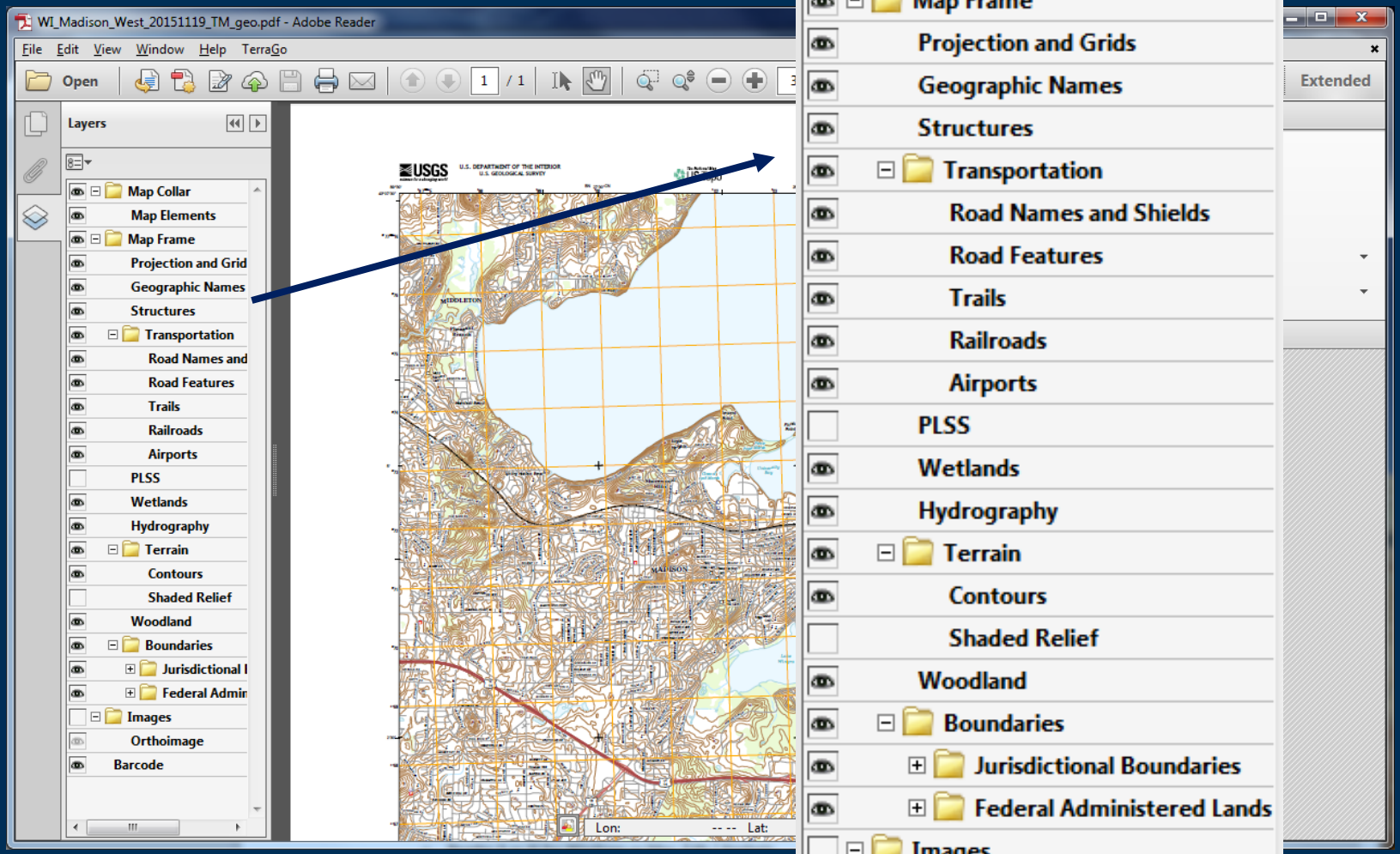
Access to FGDC metadata

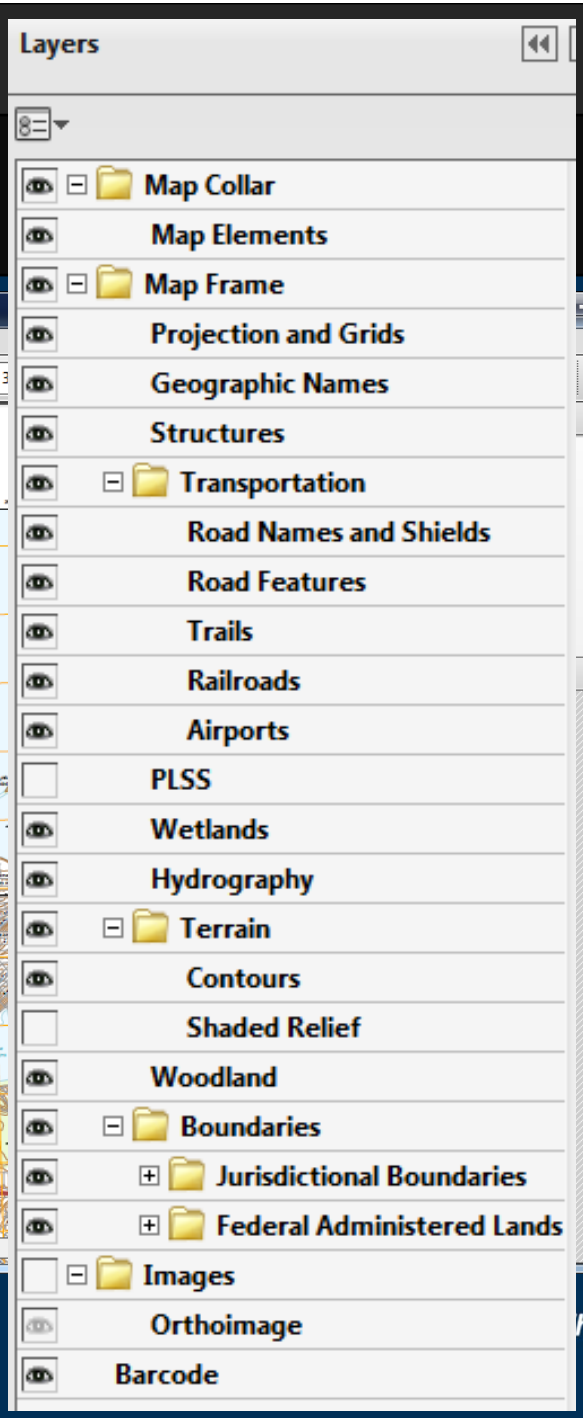
Georeferenced cursor coordinates

USGS

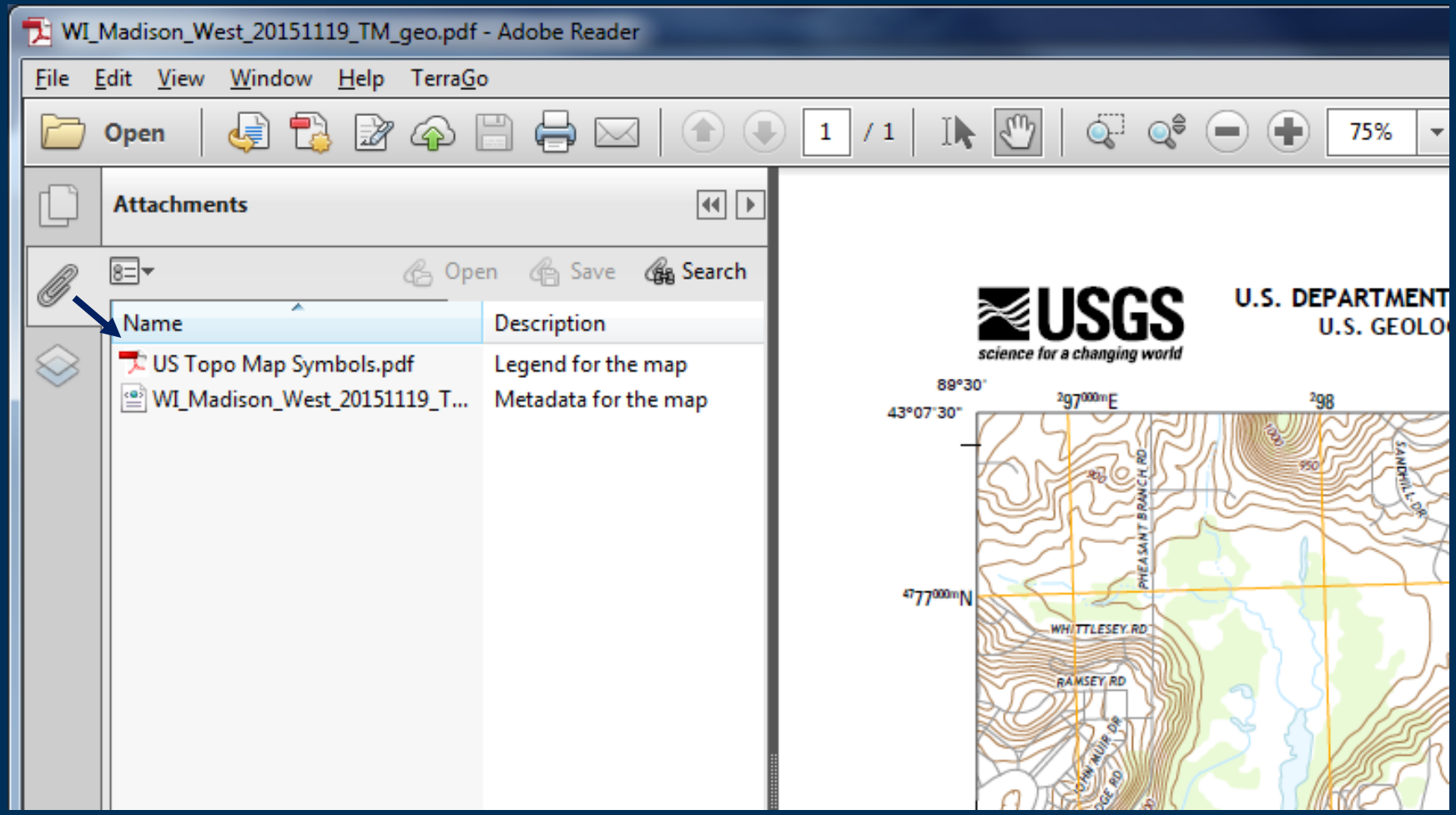
The National Map

Downloaded Map Layer List (expanded)

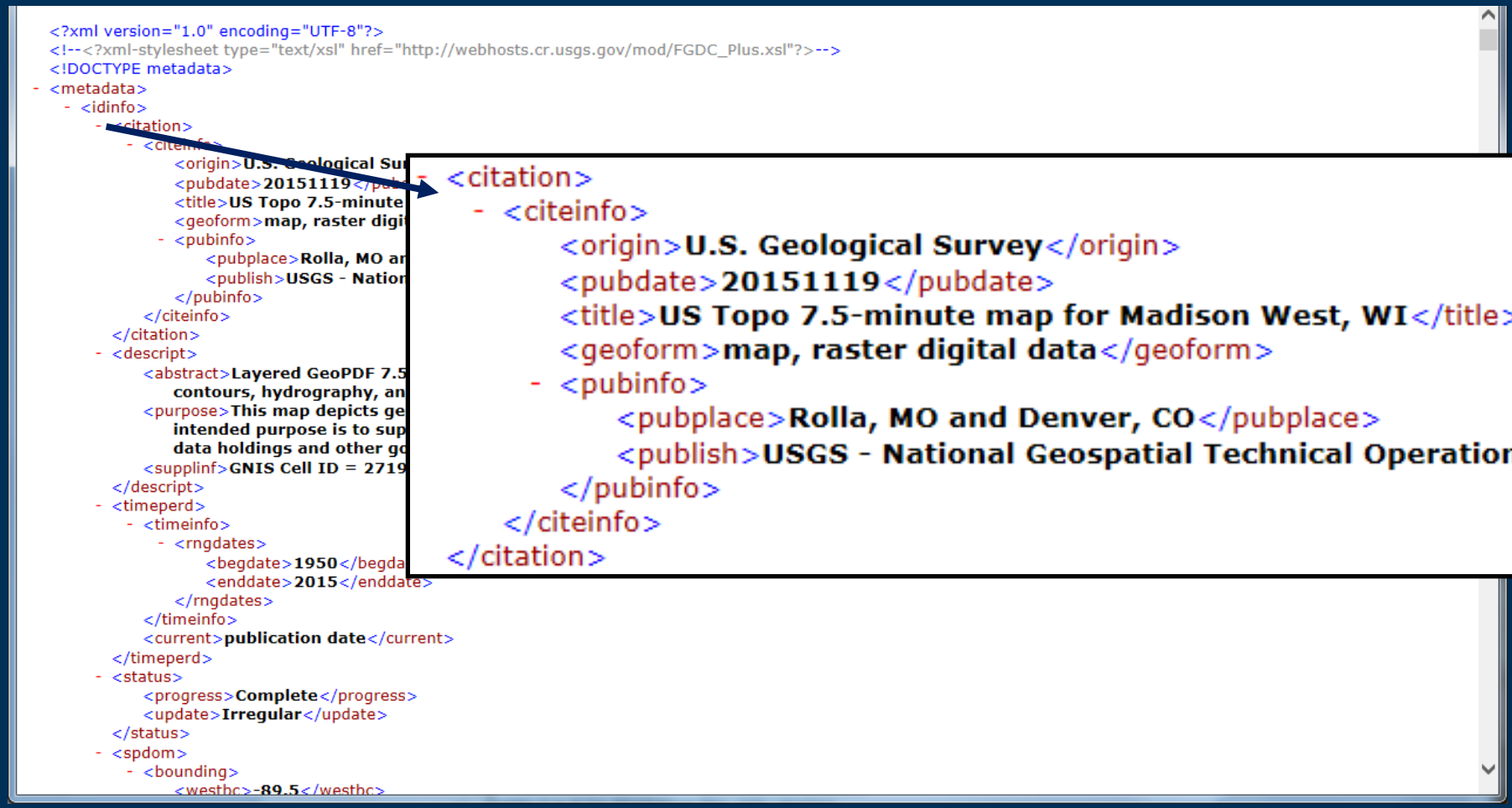




Metadata and Map Symbols



Metadata Reader



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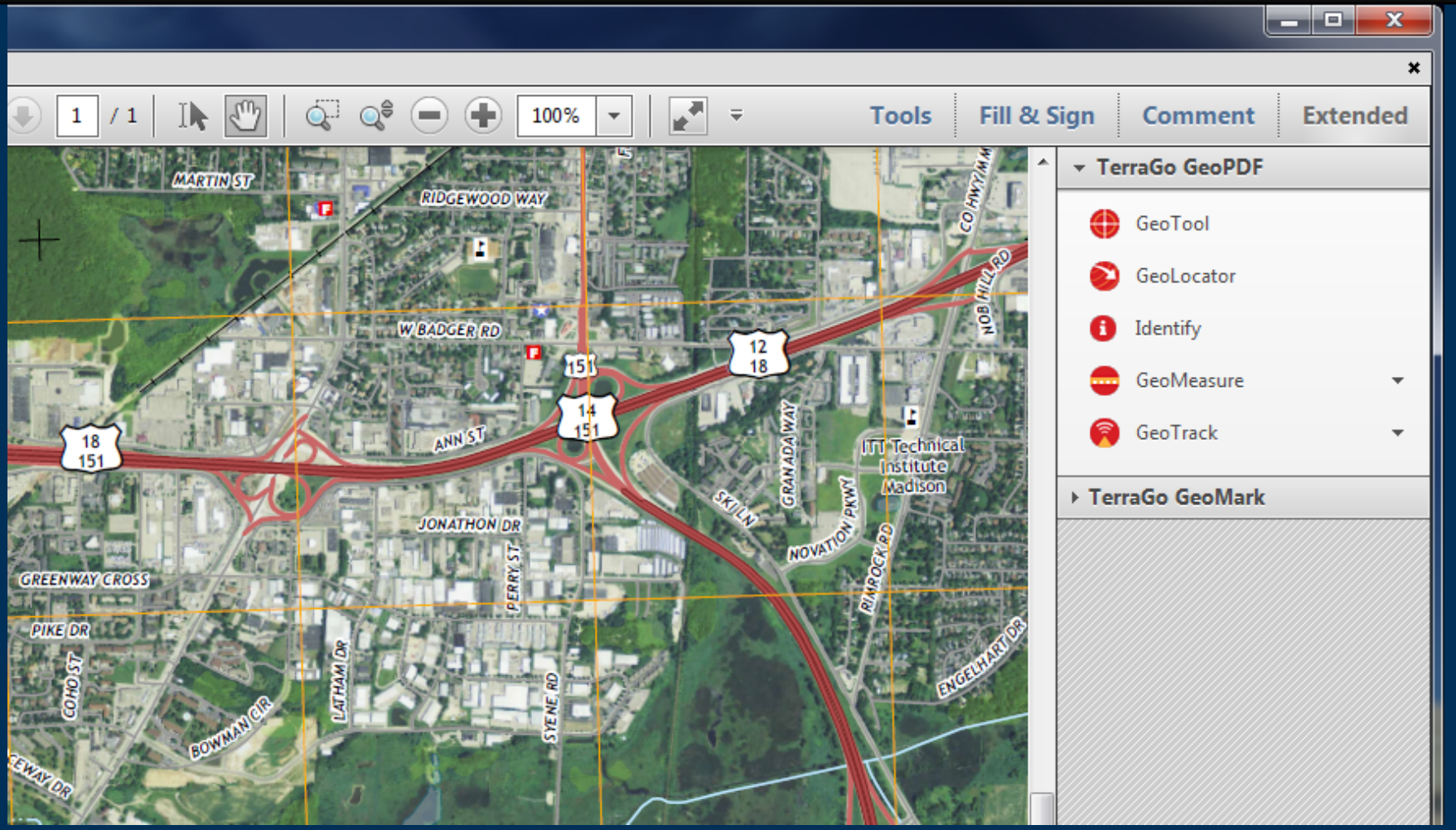
TerraGo Toolbar Options



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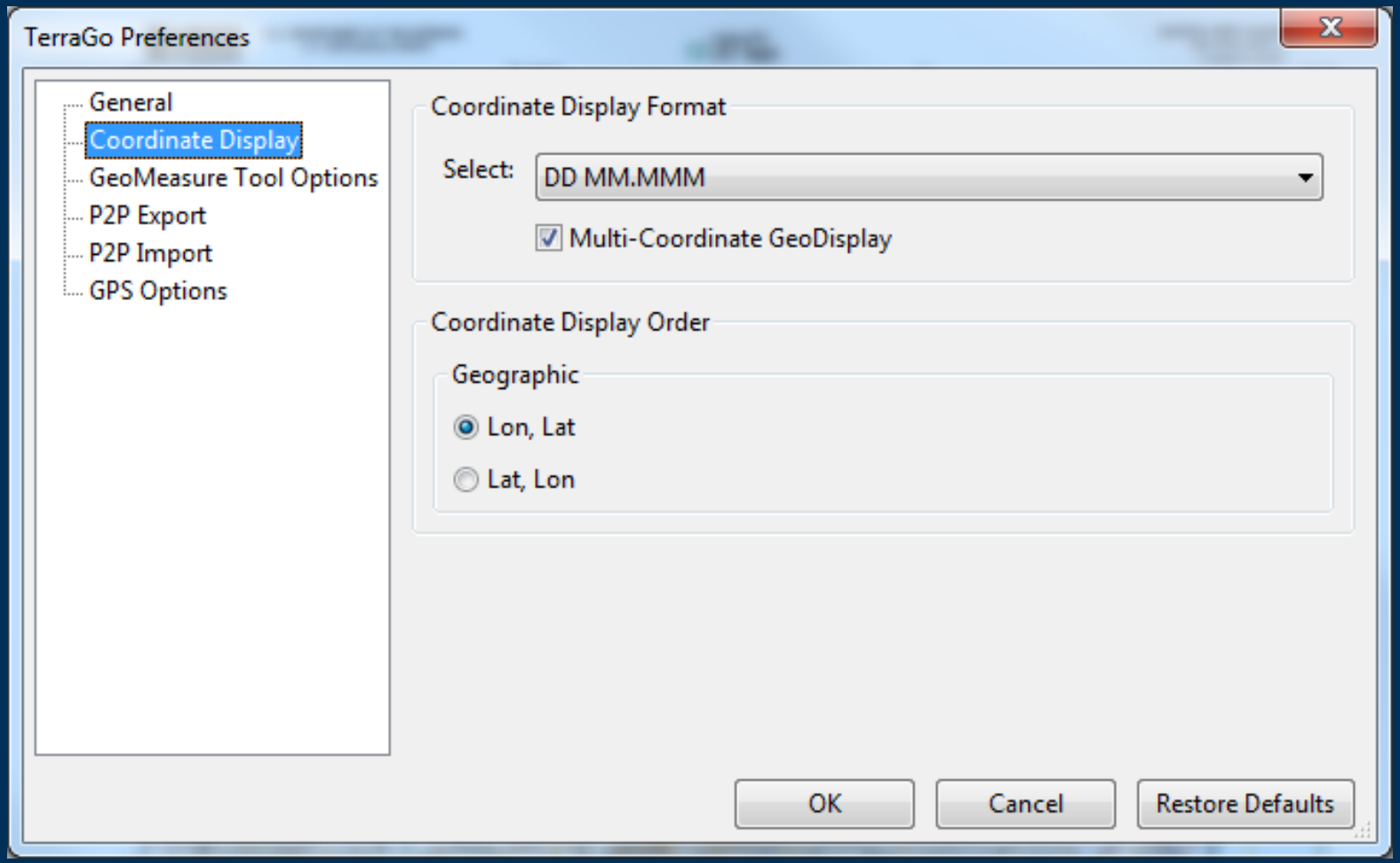
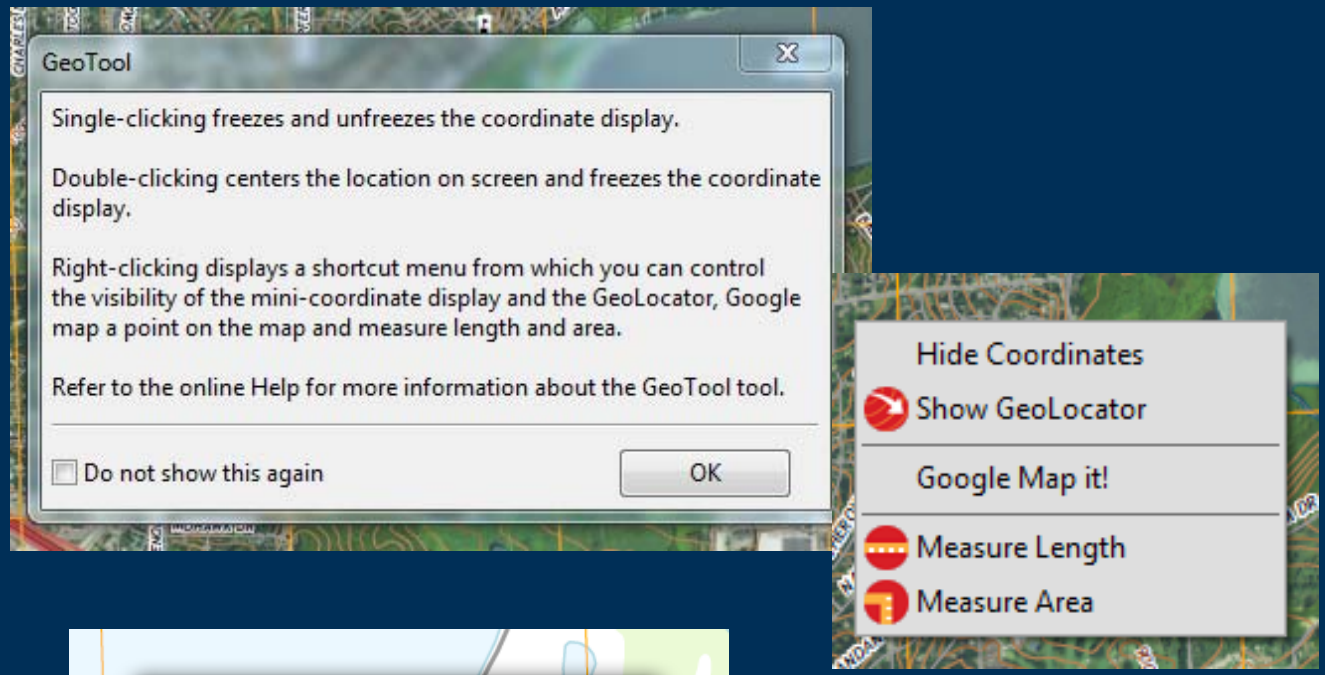
Terrago Preferences

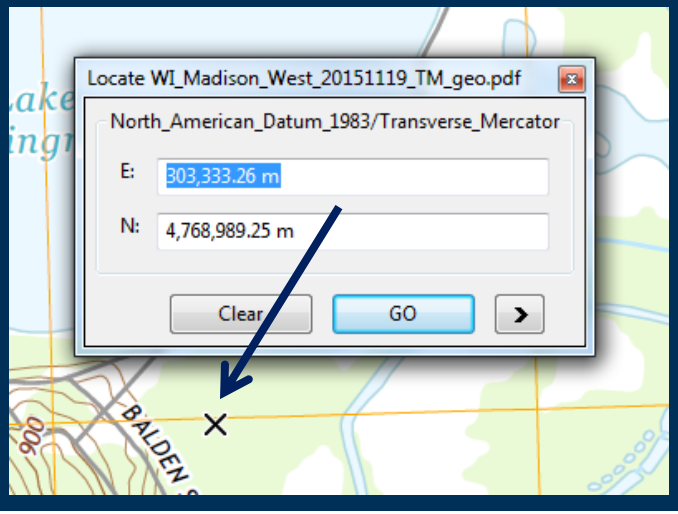


TerraGo Toolbar Options

- GeoTool



- GeoLocator



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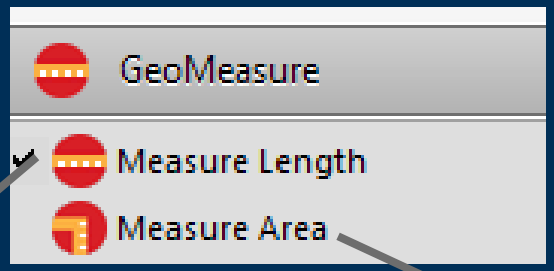
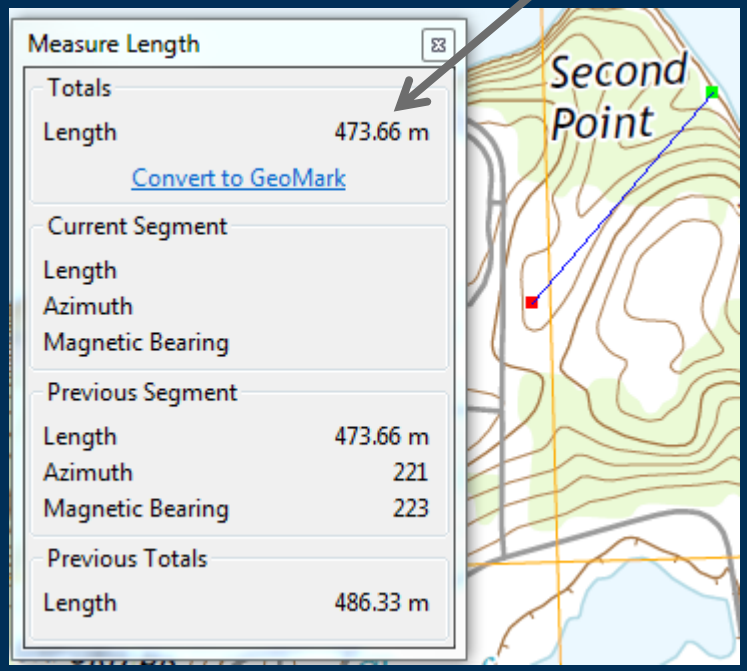
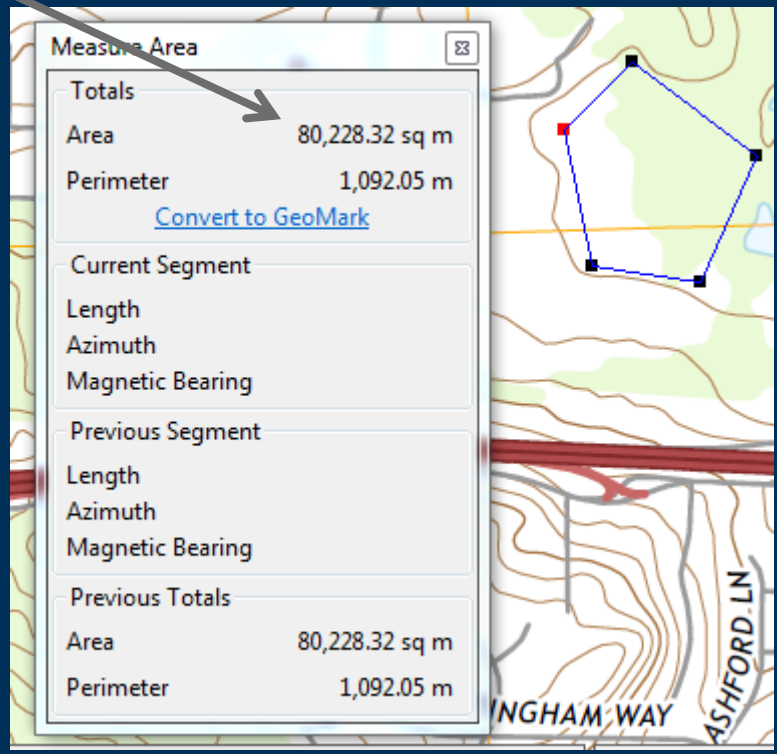
TerraGo Toolbar Options

- GeoMeasure







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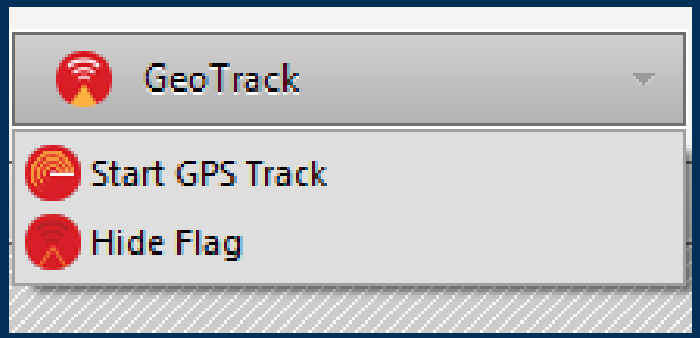
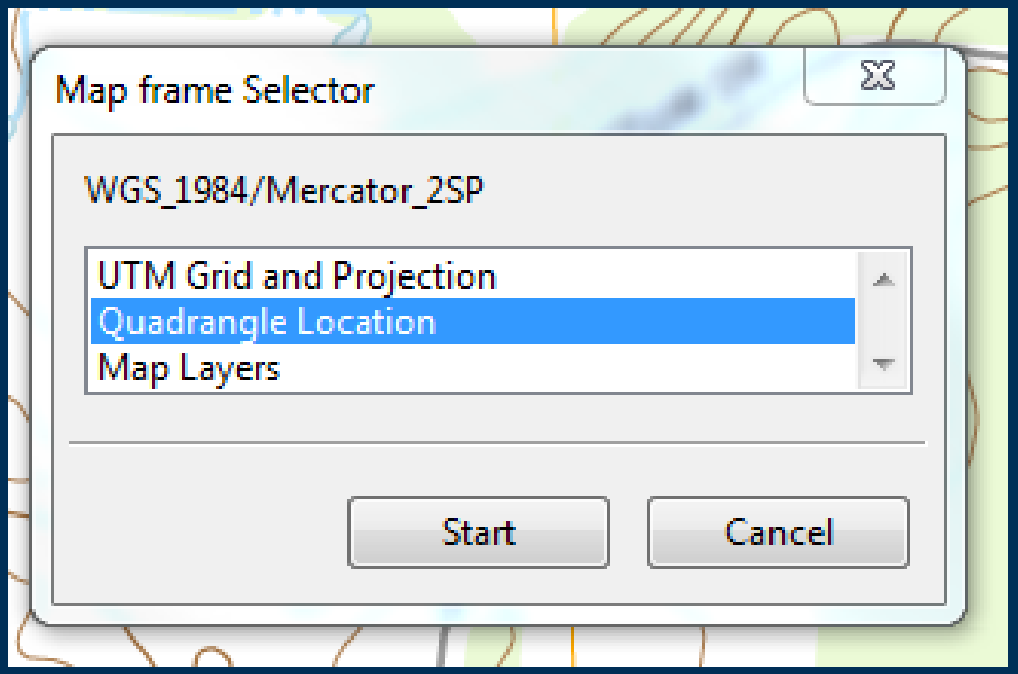
TerraGo Toolbar Options

- GeoTrack





TerraGo Toolbar – GeoTool
Google™ Map it! Tool

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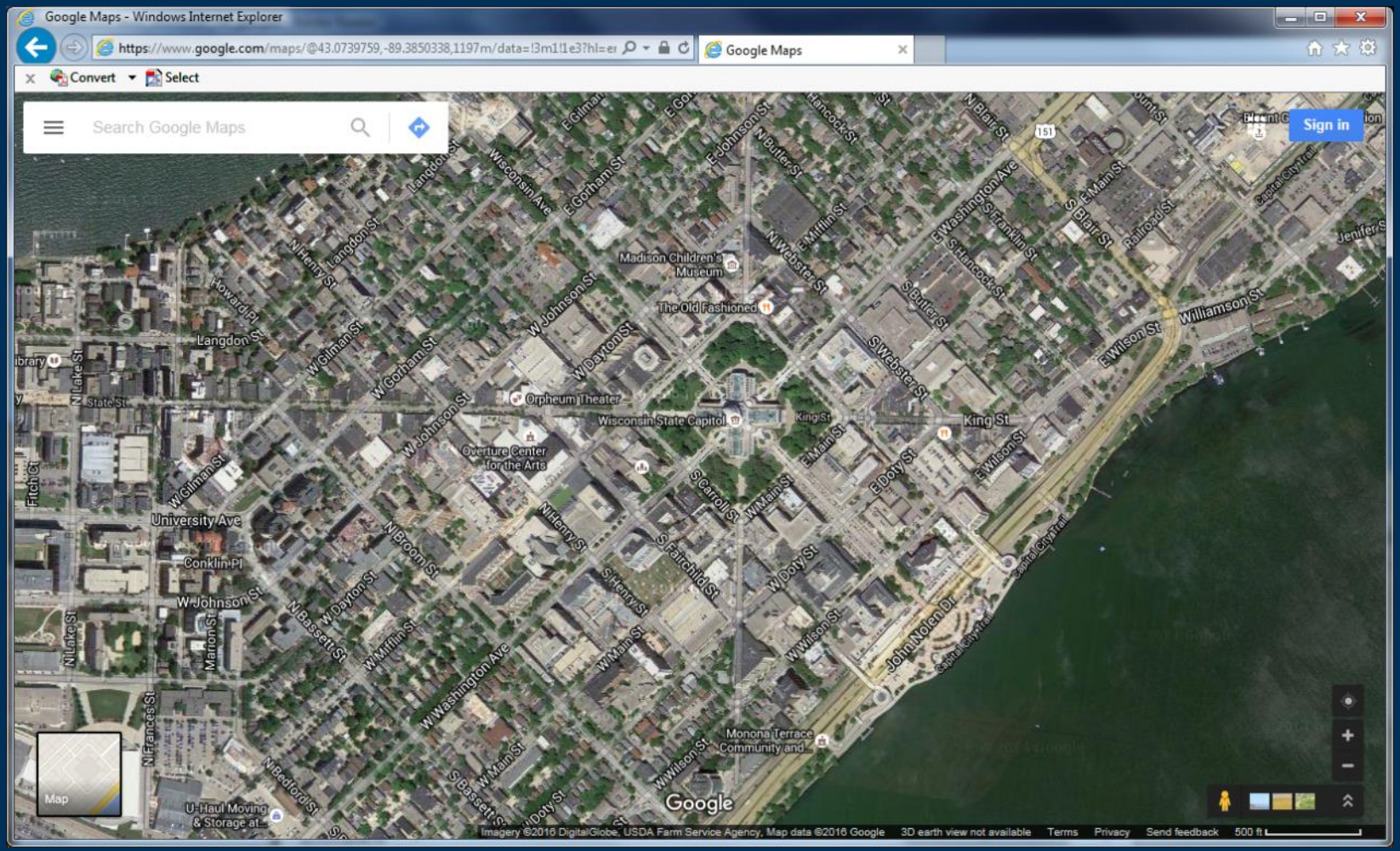
The National Map

Google Maps



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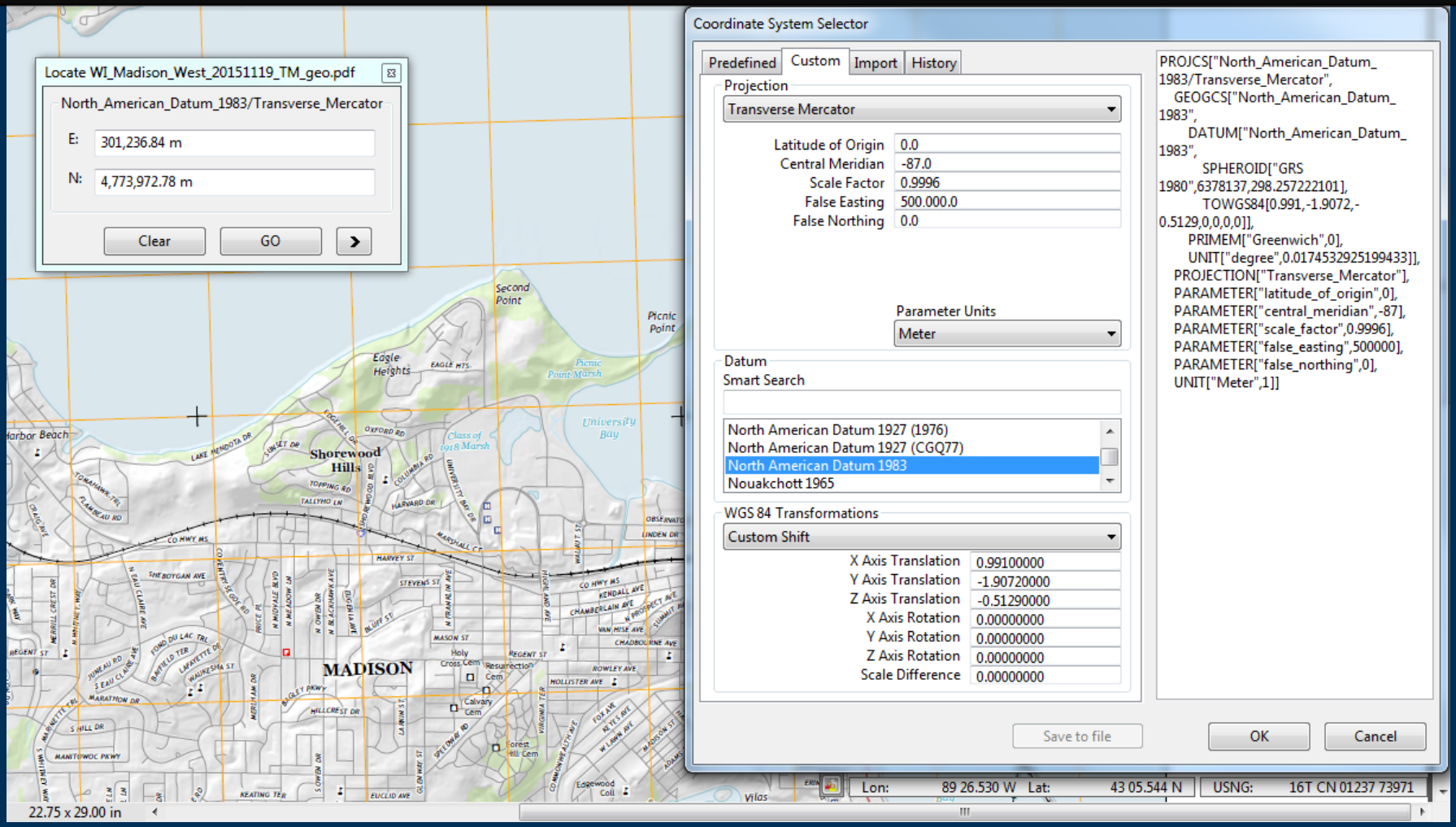
Coordinate System Change



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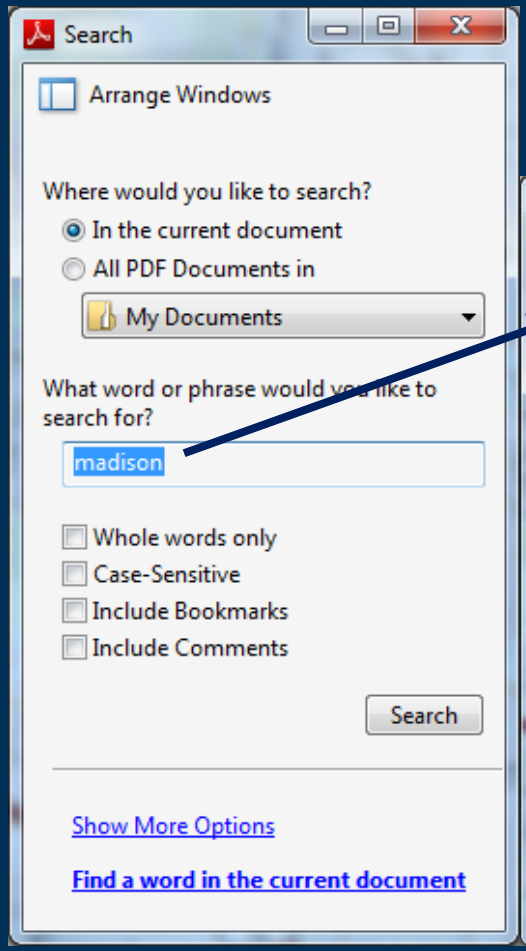
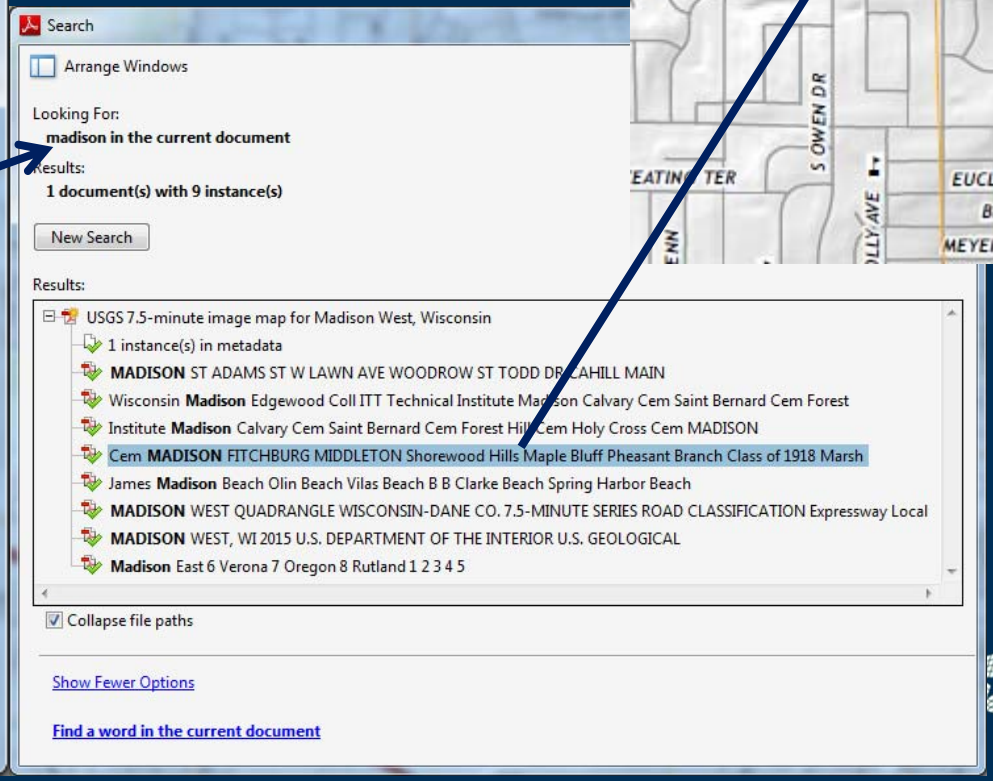
Text Searching

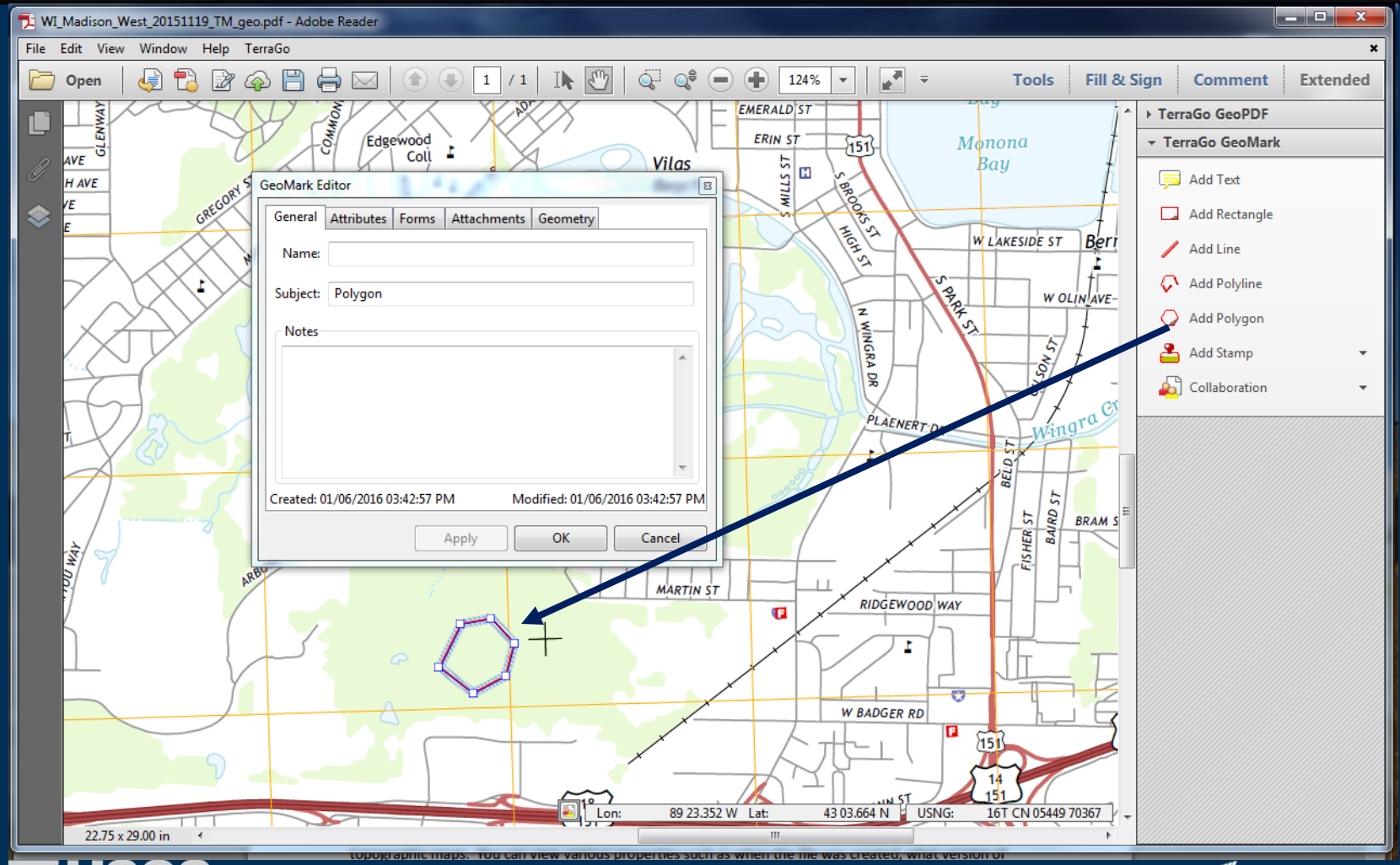
Using “Advanced Search” to find all occurrences of names containing “madison”





The National Map

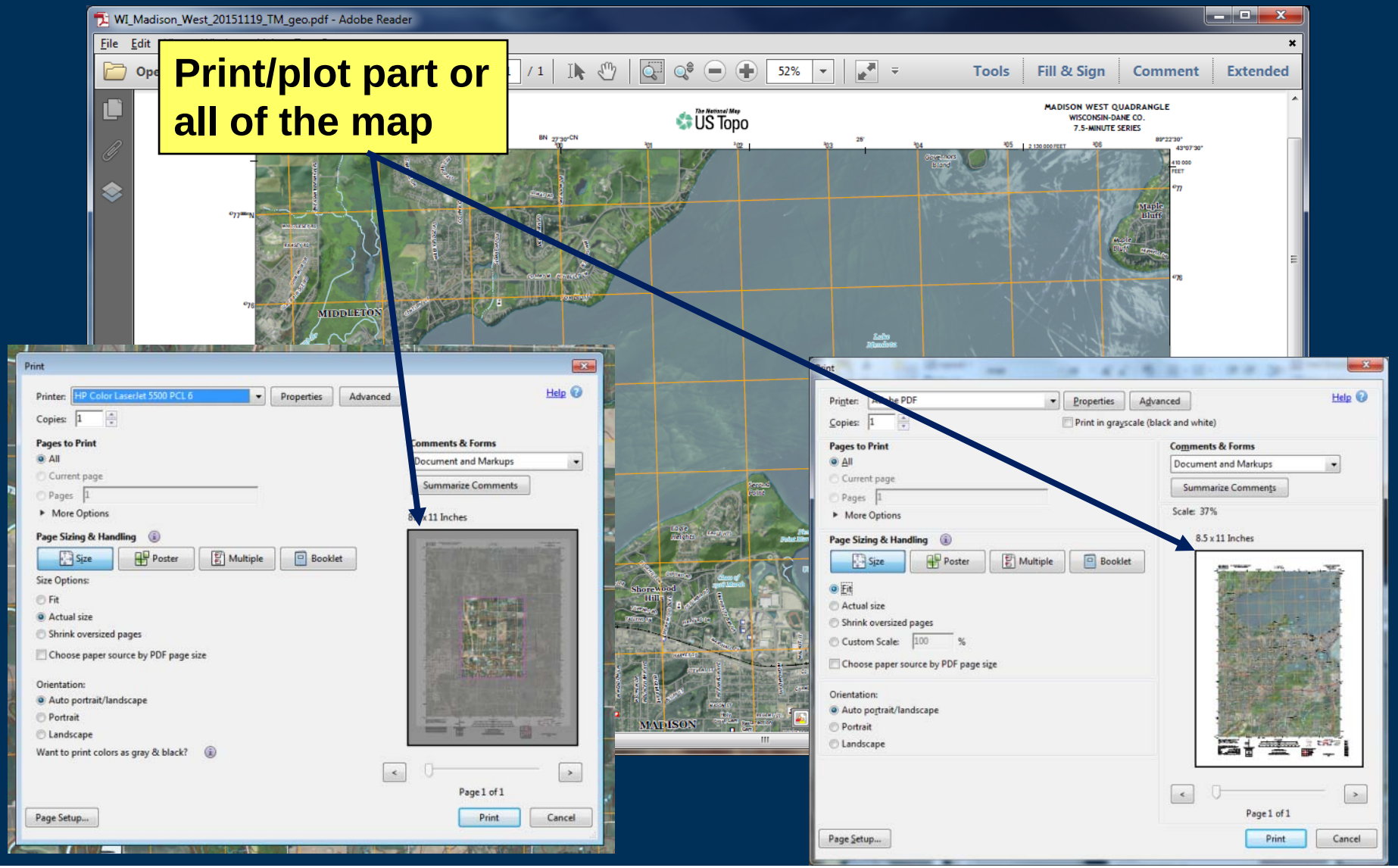
TerraGo GeoMark



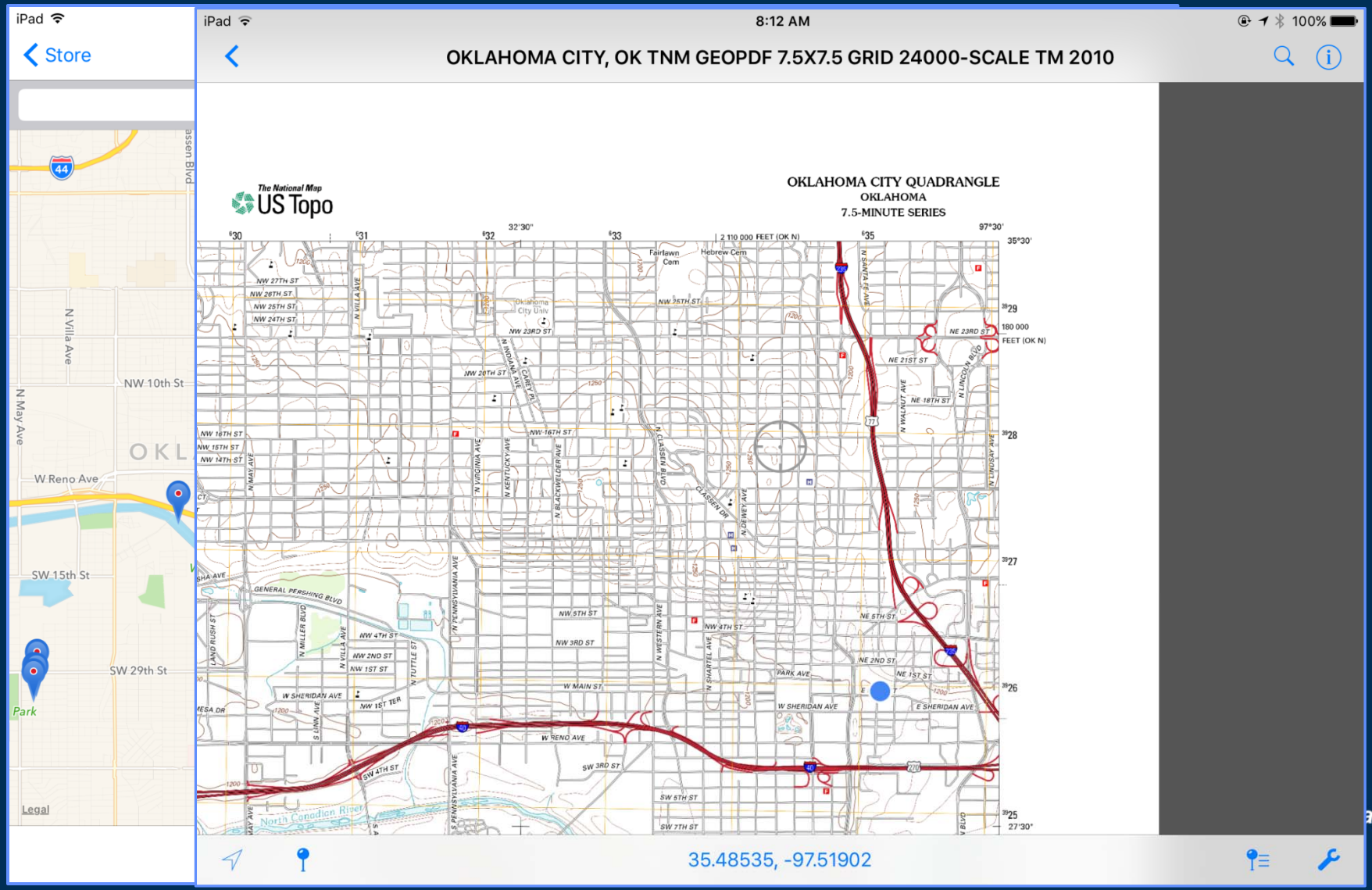
USGS

The National Map

Printing/Plotting



Avenza PDF Maps app



Website – Homepage

nationalmap.gov/ustopo

Website - Frequently Asked Questions

USGS science for a changing world

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Basics About USGS
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Maps and Mapping
Oceans
Publications and Photographs
Recreation
Remote Sensing and Imagery
Severe Storms
Tsunamis
Volcanoes
Water
Wildfires

US Topo

How do I find and download US Topo and HTMC maps?

US Topo maps and the maps of the Historical Topographic Map Collection (HTMC) can be downloaded free of charge, in PDF fo

MORE

Is it possible to obtain USGS PDF topographic maps in bulk -- say, for a State or the entire country?

Yes.

MORE

The new topo maps aren't as good as the old maps!? The new ones don't have xxxx....

Traditional national mapping programs gathered data from primary sources, including direct field observation. Such maps were compiled, drawn, and edited by hand.

MORE

Can I still get the older topographic maps?

Yes.

MORE

Can I convert a US Topo from GeoPDF to GeoTIFF

Popular Media

Rio Grande, San Luis Hills, and Blanca Peak in San Luis Basin - Photo captures the Rio Grande, volcanic San Luis Hills, and Blanca Peak massif in the San Luis Basin, part of the Rio Grande rift. The basin currently being studied by the USGS - is of interest for groundwater, petroleum, and mineral resources.

MORE

2013 USGS Releases Latest Bakken Oil and Gas Assessment - On April 30, 2013, USGS released an updated assessment of the Bakken Formation of North Dakota and Montana as part of the National Oil and Gas Assessment. We are joined by USGS Energy Resources Program Coordinator Brenda Pierce and Bakken Assessment Lead Stephanie Gaswirth to learn more about the assessment itself; why it was performed; and some context for the Bakken Formation.

USGS

The National Map

Website - Users Guide

USGS science for a changing world — The National Map

US Topo Map and Historical Topographic Map Users Guide

May 2015. Based on Adobe Reader XI version 11.0.10 and TerraGo Toolbar version 6.6.02

This guide explains how to access and use two types of USGS digital topographic maps: US Topo maps and USGS historical topographic maps.

US Topo maps are the current generation of USGS topographic maps. The first of these maps were published in 2009. They are modeled on the legacy 7.5-minute series of the mid-20th century, but unlike traditional topographic maps they are mass produced from GIS databases, and are published as PDF documents instead of as paper maps. US Topo maps include base data from *The National Map* and other sources, including roads, hydrography, contours, boundaries, woodland cover, structures, geographic names, an aerial photo image, Federal land boundaries, and shaded relief. More information about this series is available on at http://nationalmap.gov/ustopo.

The **Historical Topographic Map Collection (HTMC)** includes all editions and all scales of USGS standard topographic quadrangle maps originally published as paper maps in the period 1884-2006. Lithographic copies of these maps have been scanned and published as PDF documents. The best-known USGS topographic map series is the 7.5-minute series, published primarily at 1:24,000 scale in the period 1947-1992; images of these maps are now part of the HTMC. More information on the HTMC is available at http://nationalmap.gov/historical.

US Topo and HTMC maps are available on the Web at no cost, in PDF format with geospatial extensions (GeoPDF®). Free tools allow users to read coordinates, measure distances and angles between points, measure areas, track positions using a GPS device, display coordinates in various map projections and datums, turn layers on and off (US Topo maps only), zoom in and out, and print the map image. As of May 2015, the HTMC maps are also available in GeoTIFF format.

This guide applies to both US Topo and HTMC PDF maps, though there are some differences between the two series. US Topo maps are layered PDFs with both vector and raster data, while HTMC maps are a single-layer raster file. US Topo maps are all georeferenced to the UTM coordinate system on the NAD83 datum, while HTMC maps are georeferenced to the spatial reference system of the original published map. For the most part, only advanced users will notice these differences. Navigation and other tools generally work identically for all GeoPDF maps.

HTMC maps only are also available (as of April, 2015) in GeoTIFF format; this format requires different viewing software, which is not discussed in this document.

Users Guide – Detailed Instructions

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USGS — The National Map

Website - Fact Sheet

Revised Sept 2013

USGS science for a changing world

The National Map US Topo

US Topo—Topographic Maps for the Nation

Building on the success of 125 years of mapping, the U.S. Geological Survey (USGS) created the US Topo, a georeferenced digital map produced from *The National Map*[1] data. Georeferencing provides the capability to display the ground coordinate location as the user moves the cursor around the map. US Topo maps are designed to be used like the traditional 7.5 minute quadrangle paper topographic maps for which the USGS is so well known. However, in contrast to paper-based maps, US Topo maps provide modern technological advantages that support faster, wider public distribution and basic, on-screen geospatial analysis for all users.

What is New about US Topo?

A significant design change is being phased in during 2013. The goal of the first cycle of US Topo maps for the 48 conterminous states was to use *The National Map*[1] databases to create a digital image-based cartographic map that retained the look and feel of the traditional USGS 7.5 minute quadrangle map. This approach served as a transitional step into digital map production and delivery, product recognition, and customer acceptance. However, a major issue that needed to be resolved was the readability of the map symbols superimposed on a digital orthoimage (aerial photograph) background (fig. 1). To resolve the readability issue, the USGS worked with The Pennsylvania State University to redesign the US Topo maps so that map elements are visually distinguishable with the imagery turned on and off, while keeping the file size as small as possible (fig. 2). The US Topo map redesign includes improvements to various display factors, including symbol definitions (color, line thickness, line symbology, area fills), layer order, and annotation fonts. Adjusting the transparency of some features also has enhanced the visibility of multiple competing layers. For example, the lake area fill symbol is layered on top of the imagery, but is partially transparent so that the user can see the imagery through the blue lake area symbol (fig. 3).

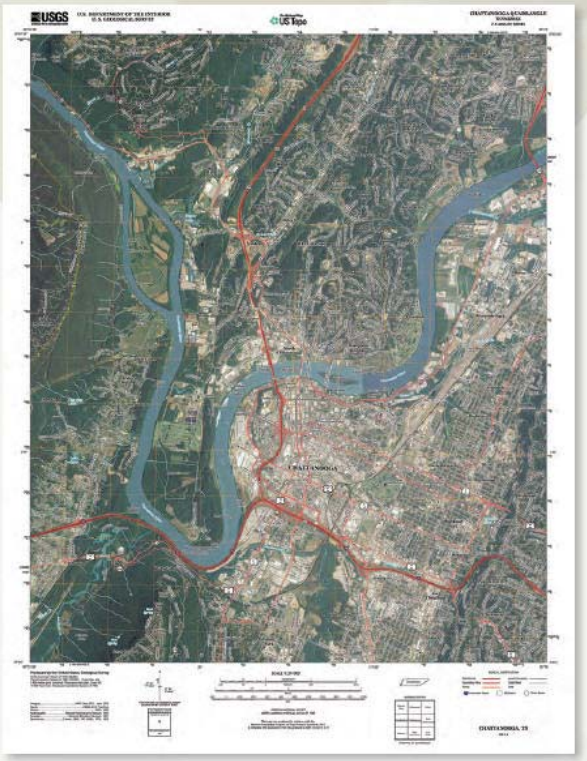


Figure 1. US Topo map of the Chattanooga, Tennessee quadrangle.

US Topo maps are available online for free download.[2] Each map is constructed in a Portable Document Format (PDF) with a geospatial extension called Georeferenced PDF (GeoPDF®) using key layers of geospatial data (orthoimagery, transportation, geographic names, topographic contours, boundaries, hydrography, woodland, and structures) from *The National Map*[1] databases. New features for 2013 include the following: a raster shaded relief layer, military boundaries,

U.S. Department of the Interior
U.S. Geological Survey

Printed on recycled paper

Fact Sheet 2013–XXXX
September 2013

USGS

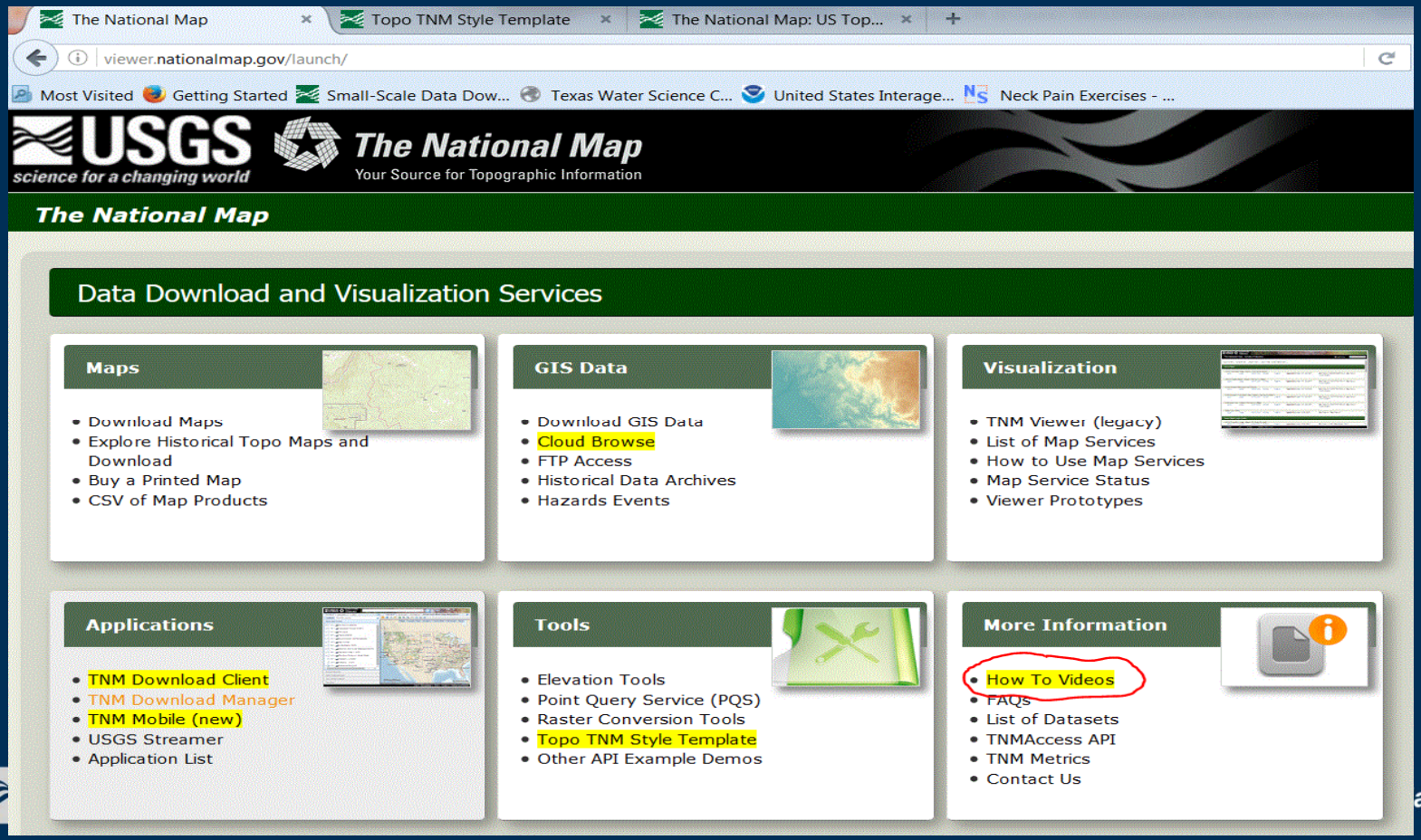
The National Map

Topo TNM Style Template

- A new GIS-read topographic map style template!
- Provides the GIS user with a fully customizable map in the style of US Topo maps using the most current TNM data
- http://viewer.nationalmap.gov/tools/topotemplate/

Training Videos

- http://training.usgs.gov/TEL/TheNationalMap/TNM-TEL-Index.html
- From TNM Viewer Launch Page, click “How To Videos” link



Future Goals

- Committed to a third 3 year cycle (2016 – 2018)
  - Significantly more recreational trails, especially in National Forests
  - Federally designated Wilderness areas
  - PLSS coverage for all PLSS states
  - Improved text placement for natural landform features
- Complete US Topo coverage for Alaska by 2018
- Continuing Research
  - Transition to production based on change detection
  - Topo TNM Style Template
  - Alternative formats, scales, and customized content/AOIs

Graphic Products Contacts

- **Bob Davis**
  - ✓ Chief, Cartographic Data Services
  - ✓ 573-308-3554
  - ✓ lrdavis@usgs.gov

- **Kristin Fishburn**
  - ✓ Cartographic Content Lead (Acting)
  - ✓ 303-202-4405
  - ✓ kafishburn@usgs.gov

US Topo

Topographic Maps for the Nation

USGS

The National Map