

TECHNICAL PAPER SERIES

# GIS Resources for Local Governments

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NEW YORK STATE TUG HILL COMMISSION

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The Tug Hill Commission Technical and Issue Paper Series are designed to help local officials and citizens in the Tug Hill region and other rural parts of New York State. The Technical Paper Series provides guidance on procedures based on questions frequently received by the Commission. The Issue Paper Series provides background on key issues facing the region without taking advocacy positions. Other papers in each series are available from the Tug Hill Commission. Please call us or visit our website for more information.



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## What is a Geographic Information System (GIS)?

GIS is a computer system that captures, stores, analyzes, and displays geographically referenced information (i.e. tax parcels, water/sewer infrastructure, aerial imagery, streams, zoning, etc.); that is, data identified according to location. GIS can play an important role to help local government officials make informed decisions, in projects such as:

- Planning and zoning
- Emergency response
- Recreation
- Codes enforcement
- Asset management

## Map Viewers in Tug Hill Region

Many people are familiar with map viewers, such as Google Maps, that provide location viewing and driving directions. There are more specific map viewers in the four county Tug Hill region, that provide additional data layers that may be useful to local officials, municipal staff, and even property owners. Below is a diagram showing some of the regional and county map viewers in the Tug Hill region.

### *Tug Hill Commission Regional Map Viewer*

[www.tughill.giscloud.com](http://www.tughill.giscloud.com)

### *Jefferson County*

[www.jeffcountymaps.com](http://www.jeffcountymaps.com)

### *Lewis County*

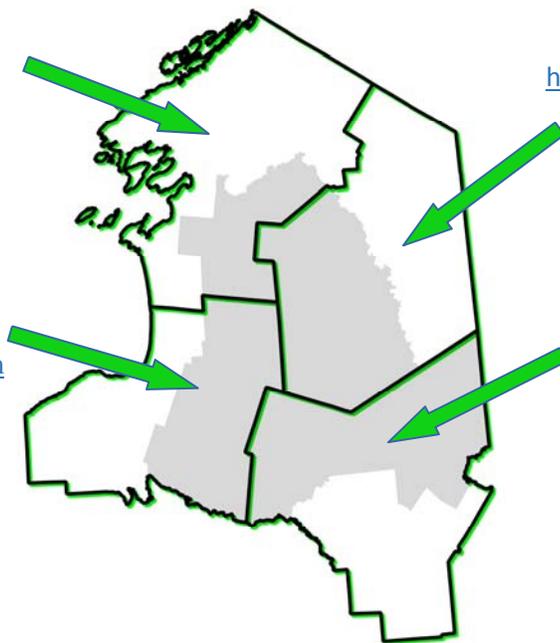
<http://lewiscountyny.org/content/Generic/View/162>

### *Oswego County*

<http://rptsgisweb.oswegocounty.com>

### *Oneida County*

<http://ocgov.net/planning/gis>



### *Development Authority of the North Country Map Viewer*

[www.dancgis.org/ima](http://www.dancgis.org/ima)

## Staffing a GIS Program

If your community or organization wants to go beyond just viewing data in an online mapper, to developing your own GIS program, identifying a specific person in your organization willing to be the lead in implementing GIS will be key to your success. This person may be the one learning how to use GIS and GPS technologies, or may be coordinating efforts with other organizations to help build your capabilities.

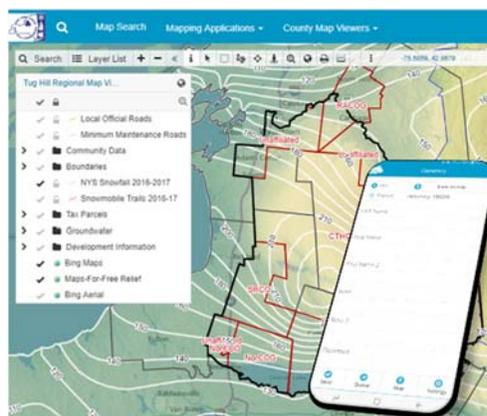
Interns can also be an important resource, as they may be able to help with data collection or even implementing a GIS. There are many organizations that can help provide funding for interns. Two of these organizations are the Pratt-Northam Foundation and the Environmental Finance Center at Syracuse University. In addition, some colleges may require their students to intern in their field of study, which may be paid for by the college. Check with local colleges or high schools about internship programs they can offer.



*2017 Tug Hill area interns, in partnership with the Pratt-Northam Foundation and Syracuse University Environmental Finance Center.*

## Partnerships & Assistance

Finding partners to assist in the development of a GIS for an organization can also be beneficial. Partners can include state agencies, county government, other local governments, non-for-profits, and other regional organizations. In the Tug Hill region, the NYS Tug Hill Commission is a regional/state partner that works with municipalities in the Tug Hill region at no cost. The commission provides online, mobile, and desktop GIS services, as well as map creation and printing.



Working together with a partner can provide initial cost savings as well as future savings, including:

- **Purchasing power** (i.e. if you have more than one community purchasing a GPS receiver, you may get a better price from the dealer.)
- **Shared resources** (intern cost sharing, sharing a GPS receiver, etc.)
- **Support** (If you have more than one person using the same type of system, you have a knowledge base to draw from when you have questions.)

Grants to local governments for financial assistance with GIS implementation have become more competitive. One of the remaining grant opportunities is the Local Government Records Management Improvement Fund (LGRMIF) grants ([www.archives.nysed.gov/grants/grants\\_lgrmif.shtml](http://www.archives.nysed.gov/grants/grants_lgrmif.shtml)). The best way to be competitive with these grants is to submit a shared application to the State Archives grant program.

## Data Types

A GIS is only as good as the data it contains. Finding sources of data, or collecting your own data, will be a top priority. There are three primary types of data:

- **Vector data (points, lines, & polygons).** Common Vector Data Files include: Esri shapefiles (.shp, .dbf, & .shx) most widely used, Google Map & Earth (.kml & .kmz), GPS (.gpx).
- **Raster data (made up of pixels).** Common Raster Data Files include: GeoTiff (.tiff), Grid (.grd), Digital Elevation Model (.dem).
- **Web services (accessed online through URL link).** Common Web Services include: Web Map Service (WMS) viewing data only, Web Feature Service (WFS) viewing and editing capabilities, and Basemaps.

## Data Repositories

Significant amounts of data are available online and available free of charge. Some places to start are listed below:

### New York State

- **NYS GIS Clearinghouse** - <http://gis.ny.gov/gisdata/> (Some county tax parcels can be accessed here, but if they are not available for your county, contact your real property tax office.)
- **CUGIR** - <http://cugir.mannlib.cornell.edu/>
- **Open Data NY** - <https://data.ny.gov/>
- **NYS Department of State** - <http://opdgig.dos.ny.gov/#/home>
- **Adirondack Park Agency** - <https://apa.ny.gov/gis/>

### United States

- **Data.gov** - [www.data.gov](http://www.data.gov)
- **USGS National Map Viewer** - <https://viewer.nationalmap.gov/launch/>
- **USGS Earth Explorer** - <https://earthexplorer.usgs.gov/>
- **Census** - <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>

### Miscellaneous

- **Geolode** - <http://geolode.org/>

## Data Collection

The most user-friendly way to collect new data is by utilizing a Bluetooth GPS with a smartphone or tablet. Most of these units achieve a high level of accuracy utilizing a technique known as RTK (Real Time Kinematic). The learning curve on RTK systems is less than traditional GPS setups, and Bluetooth GPS devices are generally lower cost.

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Data can be collected by existing staff, or can be collected by a contractor or intern. Using a contractor may make sense if a local government does not have staff with the knowledge, willingness, or time to learn how to use a GPS. Also, if the local government does not plan to use a GPS to relocate assets after their location has been determined (for example, finding a buried shutoff in the future for maintenance), then a contractor or intern can be the better option.

However, if a town or village is interesting in using GPS as a management tool for their staff, collecting the data with staff may be more effective in the long term. Also note that, if data collection is contracted out, municipal staff will need to mark the assets for collection. .

For municipalities that want to purchase a Bluetooth GPS receiver, options include:



<https://eos-gnss.com/>



[www.trimble.com](http://www.trimble.com)



[www.sxbluegps.com](http://www.sxbluegps.com)

## Data Storage

A well-organized structure for storing data, either found online or collected in the field, is important for the data users. Data can be stored on a hard drive or cloud based server in folders. Data can also be stored in a database, in a centralized location that is accessible online. A database structure allows the GIS user to control the type of access (read-only, editing, etc.) users within the organization have to the data.

The commission has successfully used a database for GIS data called postgresql (PostGIS). The databased platform is free, but online hosting through Amazon Web Services RDS costs approximately \$250/year.



Make sure to back up your data. It is important to have an established backup schedule.

## Mobile Applications

To use a smartphone or tablet to collect data, a mobile data collection application that is compatible with your operating system (i.e. Android or iOS) needs to be installed. Some potential applications that could be utilized include:

GIS Cloud MDC



Collector for ArcGIS



Fulcrum



## Desktop GIS

For advanced editing of your data and map creation, it will be important to have a desktop GIS. QGIS is a desktop GIS program that is growing in popularity ([www.qgis.org](http://www.qgis.org)) because it is free and has all the functionality you will need in a desktop application to get started. There are also paid applications like ESRI and MapInfo.



Training on whatever GIS desktop program chosen is important. Local governments will want to identify staff that will be the power user/s of the desktop application and get them trained. If using QGIS, training resources include:

- **QGIS Training Manual:** [http://docs.qgis.org/2.14/en/docs/training\\_manual/index.html](http://docs.qgis.org/2.14/en/docs/training_manual/index.html)
- **American Red Cross QGIS Training:** [http://americanredcross.github.io/QGIS\\_Training/](http://americanredcross.github.io/QGIS_Training/)
- **Cornell University QGIS Training:** <https://mannlib.cornell.edu/help/research-support/tutorials/gis>
- **GeoAcademy QGIS Training:** <https://fossgeo.org/>

## Online Map Viewing

An online map viewer is a user-friendly way to display data. It can be accessed from any location where there is an internet connection. Online map viewers make information easily available to decision makers, and have an easy learning curve for the non-GIS user. Some online map viewers allow you to share maps privately, so sensitive/restricted maps cannot be publicly viewed.

Local governments may want to reach out to state, regional, or academic organizations already providing online map viewers. In the Tug Hill region, the Tug Hill Commission has an online map viewer ([www.tughill.giscloud.com](http://www.tughill.giscloud.com)) that local governments may access. The viewer has public and private capabilities for local governments.

For communities looking for other options, here are some sites to help you get started:

GIS Cloud  
[www.giscloud.com](http://www.giscloud.com)



ArcGIS Online  
[www.arcgis.com](http://www.arcgis.com)



esri

Google My Maps  
[www.google.com/mymaps](http://www.google.com/mymaps)



### Assistance

For more information on ways to get involved in GIS, contact one of the organizations below, or another regional partner that works in your area of New York.



**NYS GIS**  
association

[www.nysgis.org](http://www.nysgis.org)

**NYS GIS Program Office**  
Office of Information Technology Services  
10B Airline Drive, Albany NY 12235  
(518)242-5036  
[www.its.ny.gov](http://www.its.ny.gov)

**NYS Tug Hill Commission**  
317 Washington Street  
Watertown, NY 13601  
(315)785-2380  
[www.tughill.org](http://www.tughill.org)