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GIS IN THE CLOUD

GIS 101

ArcGIS Online

by Kent Tupper, Dakota County Office of GIS

ArcGIS Online is Esri's Cloud-based GIS solution. It allows you to view and share GIS information through web maps, GIS applications and tools.

Make your own web map

At a very basic level you can go to Esri's ArcGIS Online site, create an account and immediately make a simple web map of any area of interest in the world. You can then access this map from your PC, Tablet or Smart Phone using only a web browser, and share it with the public for anyone to access. It doesn't require any special GIS software or data, as Esri supplies a catalog of GIS basemaps covering the World. Included with your Web Map is an Esri geocoding service to help find locations by address.

You can add additional GIS layers from numerous GIS formats, such as ArcGIS Server web services, OGC WMS or WMTS services, a KML file, a shapefile, even a CSV file. You can find many GIS layers for free by searching on the internet or use your own GIS data. You can create view and query applications or editing applications that can be used in the field. There are numerous web application templates you can choose from based on preferred function and look.

One very exciting part of ArcGIS Online is the ease with which you can create Mobile applications by simply publishing web maps using these templates. These mobile friendly maps can be used in web browsers or can be consumed by a free downloadable application called ArcGIS, available from Esri for your mobile device, giving it an interface designed for your mobile platform.

If you wish to use ArcGIS Online commercially you need to purchase a subscription from Esri. With a subscription you can access additional functionality and services from ArcGIS Online to help you organize and manage your GIS data. Additionally if your organization doesn't have access to your own ArcGIS Server you can utilize ArcGIS Online hosted services. Also with a subscription you receive technical support from Esri.

There are more features and capabilities of ArcGIS available through ArcGIS Online for those with an Organizational Account. These include additional services and template applications for use with ArcGIS products, and other software that help you integrate GIS into your business solutions.



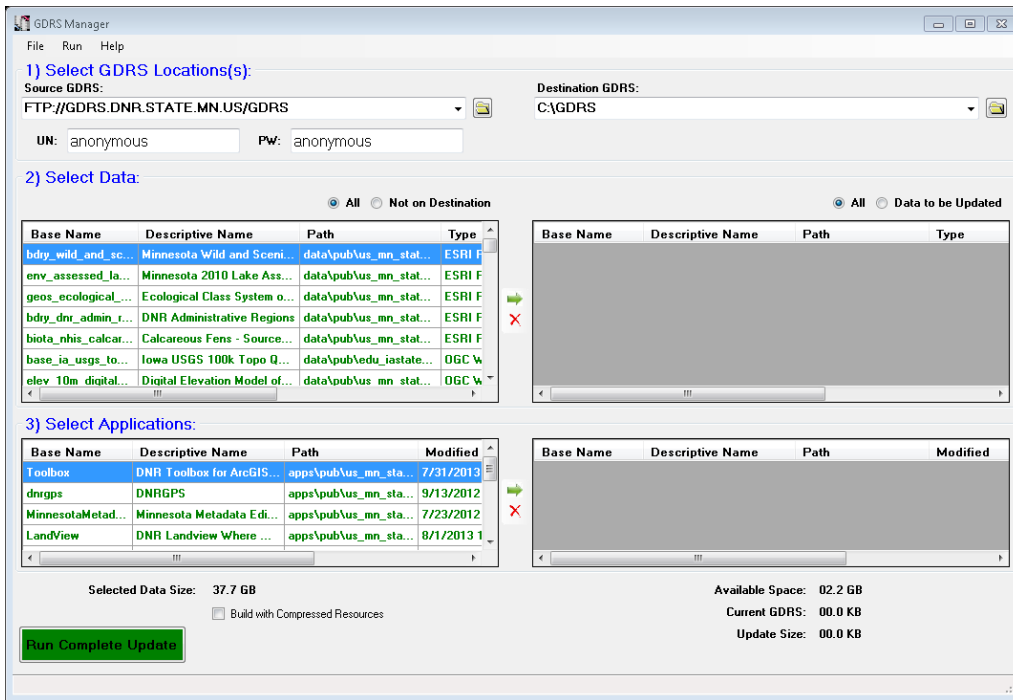
ArcGIS for iOS or Android

The most powerful part of ArcGIS Online is the ease with which you or your organization can make and publish web maps. Go to Esri's site and try it for yourself.

<http://www.esri.com/software/arcgis/arcgisonline>

GIS News

Fall 2013



EASY DATA DOWNLOAD

SPOTLIGHT

Geospatial Data Resource Site (GDRS)

by Joe Sapletal, GISP, Dakota County Office of GIS

What is GDRS?

The Geospatial Data Resources Site (GDRS) was created by the Minnesota Department of Natural Resources (DNR) as a way of organizing and distributing over 400 core data layers from the DNR and other state departments such as the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Agriculture (MDA).

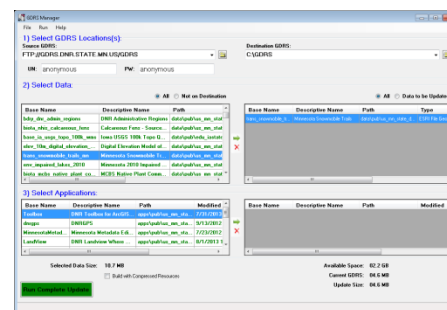
Where do I download GDRS Manager?

Go to the [DNR GDRS FTP](#) site.

How do I get started?

By default, when you start GDRS Manager (double click on gdrsmanager.exe) it logs on to the DNR GDRS FTP node that serves as a host to many data layers, mostly in the Esri file geodatabase format. These are all displayed on the left side (Source GDRS) of the window, while on the right side (Destination GDRS) is where you will download the data to. You can scroll through the many layers, click on the ones you'd like to download and click the green arrow to have it downloaded. Then click the "Run Complete Update" button to download. Now at your destination location you will have a series of folders that hold the data

you download for use in ArcGIS for Desktop, complete with an already symbolized layer file.



Downloading Snowmobile trails

How do I get updates?

There are two ways to get updates: manually or through automation. First, manually, simply open up GDRS Manager, make sure your Source GDRS site is the DNR GDRS FTP site and that the Destination GDRS is the folder where you originally downloaded to. Data that you need to update appears in blue text on the Destination GDRS (right) side of the window. If you have many layers downloaded and just want to see the data sets that need to be updated, you can select "Data to be Updated" on the right side. Now only those datasets or tools that need to be updated appear in the list on the right. Then

click on the "Run Complete Update" and the appropriate data is updated.

Automating updates

To set up an automated update is fairly easy. Once you have the datasets at your destination location you can click on File > Save To > Update Existing BAT File Then you will be prompted for a location to save the batch file (.bat). That file contains a one line command that starts the GDRS Manager, stating the source (DNR GDRS FTP site) and the destination site, as well as the switch to run in update mode. This batch file can be set up to run whenever you want it to by configuring it to run in Task Scheduler (Windows computers). This is perfect for downloading updates overnight when you aren't in the office.



Internet Map Services

by Randy Knippel, Dakota County Office of GIS

Web mapping services are widely available, published by a variety of organizations. These offer a convenient technique for viewing data without the need to download and store it. Essentially, web mapping services are accessed through a sequence of URL requests which return map images generated on the fly to represent a requested area of interest. To manage these requests effectively, some kind of interactive mapping application is needed. This can be off-the-shelf software, like ArcMap, or custom software and web applications.

DCGIS & Property Information Online

The Dakota County Interactive GIS Map (DCGIS) and Dakota County Property Information (DCPI) online applications use such map services and provide the capabilities for manipulating them. However, these map services can also be accessed directly using ArcMap and other software, providing a convenient mechanism for creating custom maps that include the same information that is familiar in the custom applications. Using these map services provides the added benefit of creating uniformity in custom maps created

by multiple people or among different organizations.

Dakota County map services can be browsed using this URL in a web browser: <http://gis2.co.dakota.mn.us/arcgis/rest/services>. Alternatively, they can be accessed by adding an ArcGIS Server connection under GIS Servers in ArcCatalog, using the same URL. There are many services available, but not all are equally useful, since some were created to support custom applications in very special ways.

What's available?

Map services named DC_Basemap and DC_Basemap_OrthoPlus are the "Street Map" and "Aerial Map" used in the Dakota County Property Information (DCPI) online application. Using these services in ArcMap allows you to very easily create maps that look like what is displayed in the Dakota County Property Information (DCPI) online application, with the added flexibility of overlaying your own layers and formatting the maps as you wish. These are "cached" map services, meaning they perform efficiently when panning and zooming because all the cartography is prebuilt and stored on the server as a series of image tiles. However, this means they will display best at

predetermined scales, while intermediate scales may appear a bit fuzzy. You can control this by using the "Zoom To Nearest Cache Resolution" option after right-clicking on the layer in the table of contents. You can also overcome this by using the similar "Live" (non-cached) services with the same name (e.g. "DC_Basemap_Live", "DC_Basemap_OrthoPlus_Live"), which generate the same cartography on the fly, with an accompanying reduction in performance.

There are also services related to "Operational Layers", signified with an "_OL_" in their name, that are typically overlaid on a basemap service and provide additional capabilities to view attributes. The services called "DC_OL_DCPI" and "DC_OL_DCPIAdvanced" are the services used by Dakota County Property Information (DCPI) online to display parcel lines and related layers and labels.

All layers used in DCGIS (Dakota County Interactive GIS Map) have corresponding map services, too. They are named with a prefix "DCGIS_OL_" and text similar to their folder name in DCGIS. The DCGIS basemap services are there, too, which are similar to the Dakota County Property Information

(DCPI) online ones, without some of the detail that is available in other layers, like schools, police stations, and fire stations.

These map services are useful for quickly and easily creating cartographically pleasing maps that are consistent with maps created by other people using the same services, and those created by DCGIS and Dakota County Property Information (DCPI) online. Interactively, the cached services are more efficient than connecting to a series of individual database layers, while providing the added benefits of sophisticated symbolization, like road shields, and consistent labeling.

Similar map services are increasingly being published by other organizations, as well. Search for them using your favorite search engine and keywords like "map service" with an organization's name. This should lead to instructions for adding appropriate connections to the services in ArcCatalog, and, ultimately, displaying in ArcMap.

Some examples

[MnGeo Imagery](#)

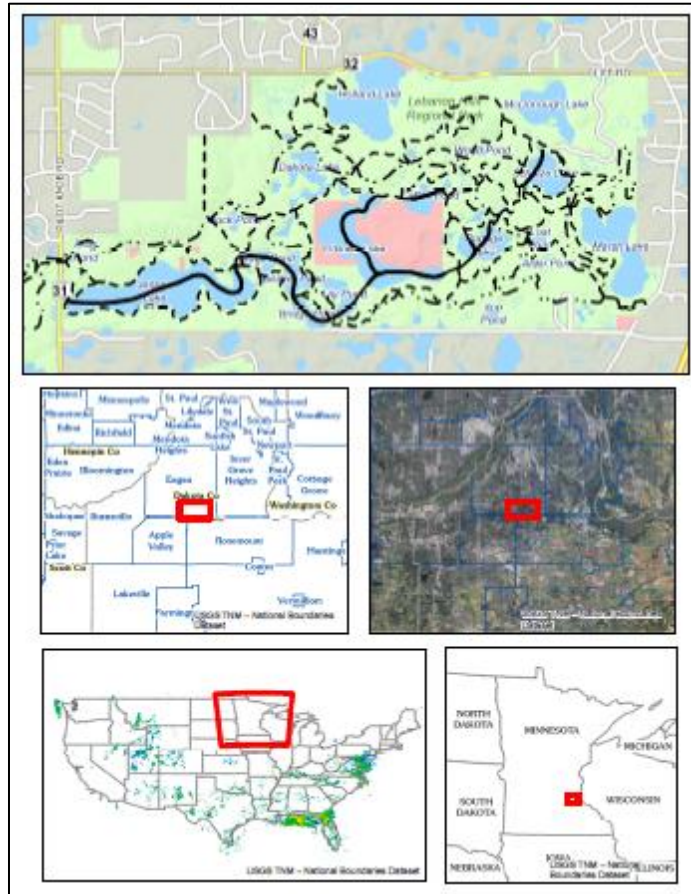
Aerial photography covering entire state of Minnesota, including a combination of imagery determined to be best available for specific areas.

[USGS](#)

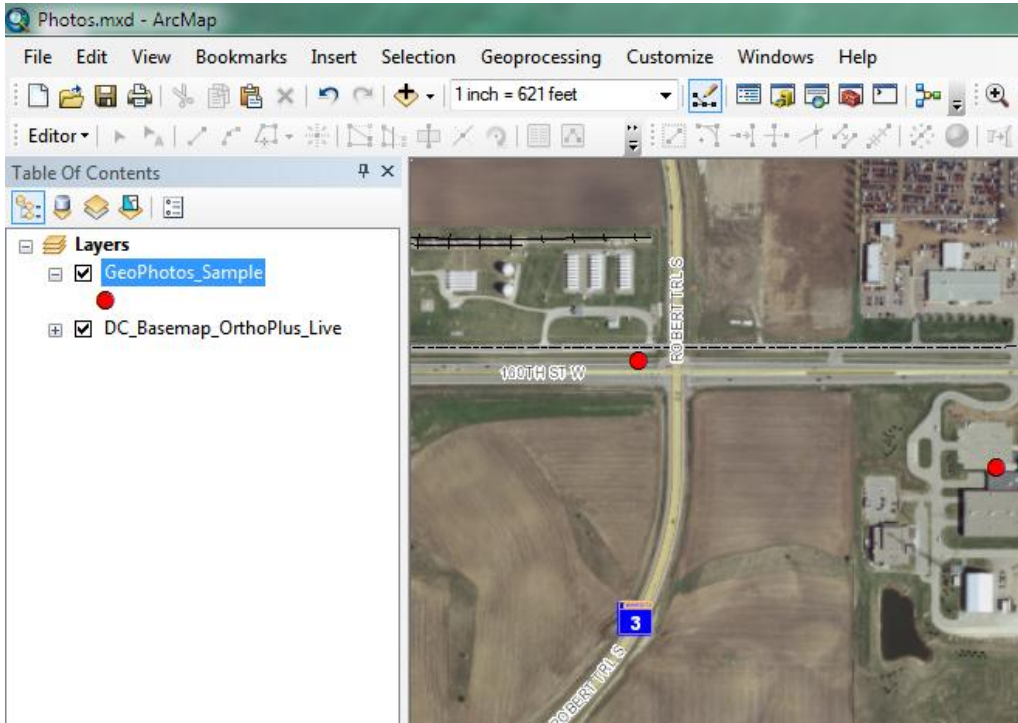
Map services with layers covering entire United States and included in the National Map.

[MetroGIS DataFinder](#)

Map services for the Twin Cities Metro Area.



Sample custom map using only map services including a Dakota County basemap service, DCGIS operational layer, and map services from MnGeo and USGS.



SMART PHOTOS

GIS
News

Fall 2013

TECH TALK

GeoTagged Photos in ArcMap

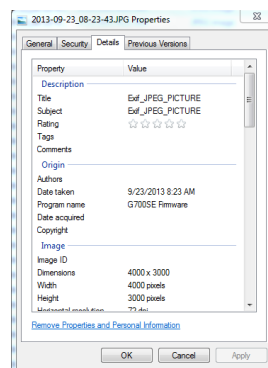
by Dan Castaneda, City of St. Louis Park

Many people have smartphones and other mobile devices today that allow them to take digital photos very quickly and easily. Many of these devices also allow you to capture the longitude and latitude coordinates of the location where each photo was captured, similar to a GPS camera. These photos are known as geotagged photos, and can be incorporated into ArcMap, allowing the individual to take advantage of the rich data photos provide.

Geotagged photos have become very common in the past few years, and in version 10.1 of ArcMap, a new tool called **GeoTagged Photos to Points** is included to help you extract the coordinate information from each photo. The coordinate information is stored as a part of the Exif (exchangeable image file format) metadata of each photo. Other metadata included as a part of the Exif data are items such as resolution, camera manufacturer, date and time, etc. To view the Exif data in Windows, right click on your photo, click properties, and click on the Details tab.

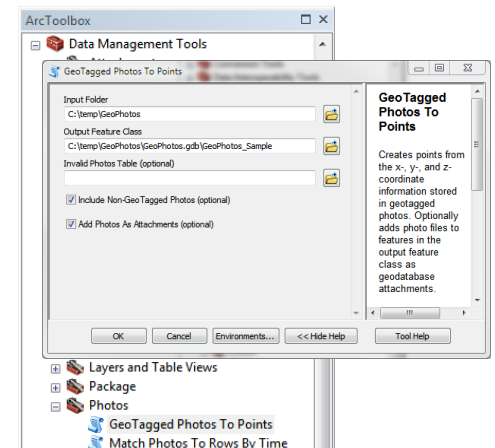
There's a tool for that

The **GeoTagged Photos to Points** tool is a part of the **Data Management Toolbox**, in



Exif metadata

the Photos toolset. To use the tool, you will need to copy all of your photos from your mobile device into a folder on your computer or network drive. The tool will then extract the coordinate metadata stored with each photo and create a point feature class with attachments to use within ArcMap. Options included in the tool will allow you to store additional attribute data about the photo as a part of the feature class. The additional attribute data will be stored in separate fields and include the date and time the photo was captured, the file name of the photo, and the directory location of the photo on your



Geotagged Photos to Points tool

computer. The tool will also allow you to save the actual photo as an attachment to the point feature class. In order for this to work, you must be using a version 10 file geodatabase and have a Standard or Advanced level license for ArcMap. Storing the photo as an attachment in the geodatabase will allow you to share both the feature class and the photo by distributing only the geodatabase. This is a convenient solution as all of the information is contained in a single file and location.

How do you see them?

Once you have created your point feature class, you can use the Identify tool in ArcMap to view your photos. In the middle of the Identify window, there will be a paper clip, which shows the attachment (photo) for each point. You can also open the Attachment Manager in ArcMap. Click on the attached photo, and it will open in your default photo viewing application.

By using this tool, you will be able to capture all of the details and conditions of your features more accurately, without having to sort through field notes or worrying that you may have forgotten something. Most importantly, you will have a photographic record and a matching location.

