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ND Department of Emergency Services

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Ensuring a safe and secure homeland for all North Dakotans

HAZARD MITIGATION & PUBLIC ASSISTANCE GIS GUIDE

Introduction

The ArcGIS Webapp service is an interactive visual database of sites, where different basemaps can be selected, layers of data can be turned on/off and queried results can be highlighted. By left-clicking a point on the map, data will be displayed for the site data pertaining to that location.

Base Maps:

- Are selected from the list after clicking the Basemap icon.

- Each basemap displays a different background image, whether it be topography, streets or photographic imagery.
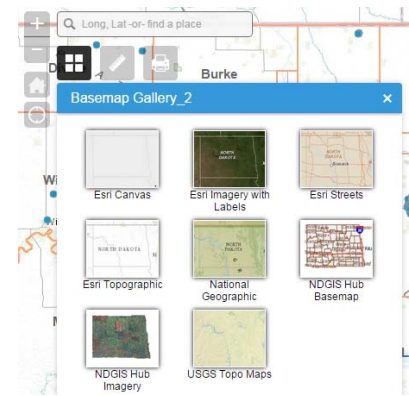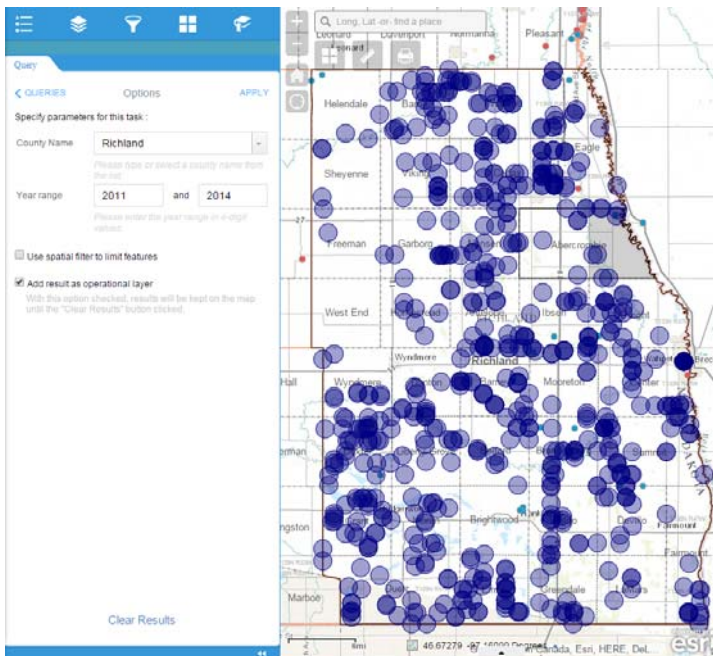
Layers:

- All checked layers from the Layer List will be displayed.

- Hazard Mitigation (HM) and Public Assistance (PA) data are separate layers, as are Counties, County labels, Civil Townships and Legal Townships.

Queries:

- Results can be filtered by clicking the Query icon.

- A query is a search of pre-determined fields within a layer (results will be highlighted).

- In addition, each query may be limited to the extents of the current screen or a user-defined area.

- Results can be as simple as outlining a specific County/Township or complex as highlighting sites, filtered by multiple criteria.

- A user has the option to create an operational layer based on a query result. This can be turned on/off or be used in conjunction with another query. The left image exemplifies multiple operational layers and queried result.

Other Key Capabilities:

- Ability to capture current GIS location or search a location and zoom the map to that area.
- Printing maps with a scale and legends corresponding with the map data.
- A measurement tool.
- The ArcGIS Webapp has the ability to be edited to add/modify queries, basemaps, layers or add other 'Widgets' to include other functions, such as data analysis or screen functionality.

INTRODUCTION

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Getting Started

To begin, first open the following link: http://drsgis.des.nd.gov

Alternatively, you may access it from the NDDES website: http://www.nd.gov/des

On this screen, click the "Disaster Recovery and Mitigation" link on the left, then scroll to the GIS Toolbox section and select Hazard Mitigation and Public Assistance GIS Tool.

This will direct you to http://drsgis.des.nd.gov.

Below that URL is the link to the GIS Guide.

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ARCGIS LAYOUT

ArcGIS Layout
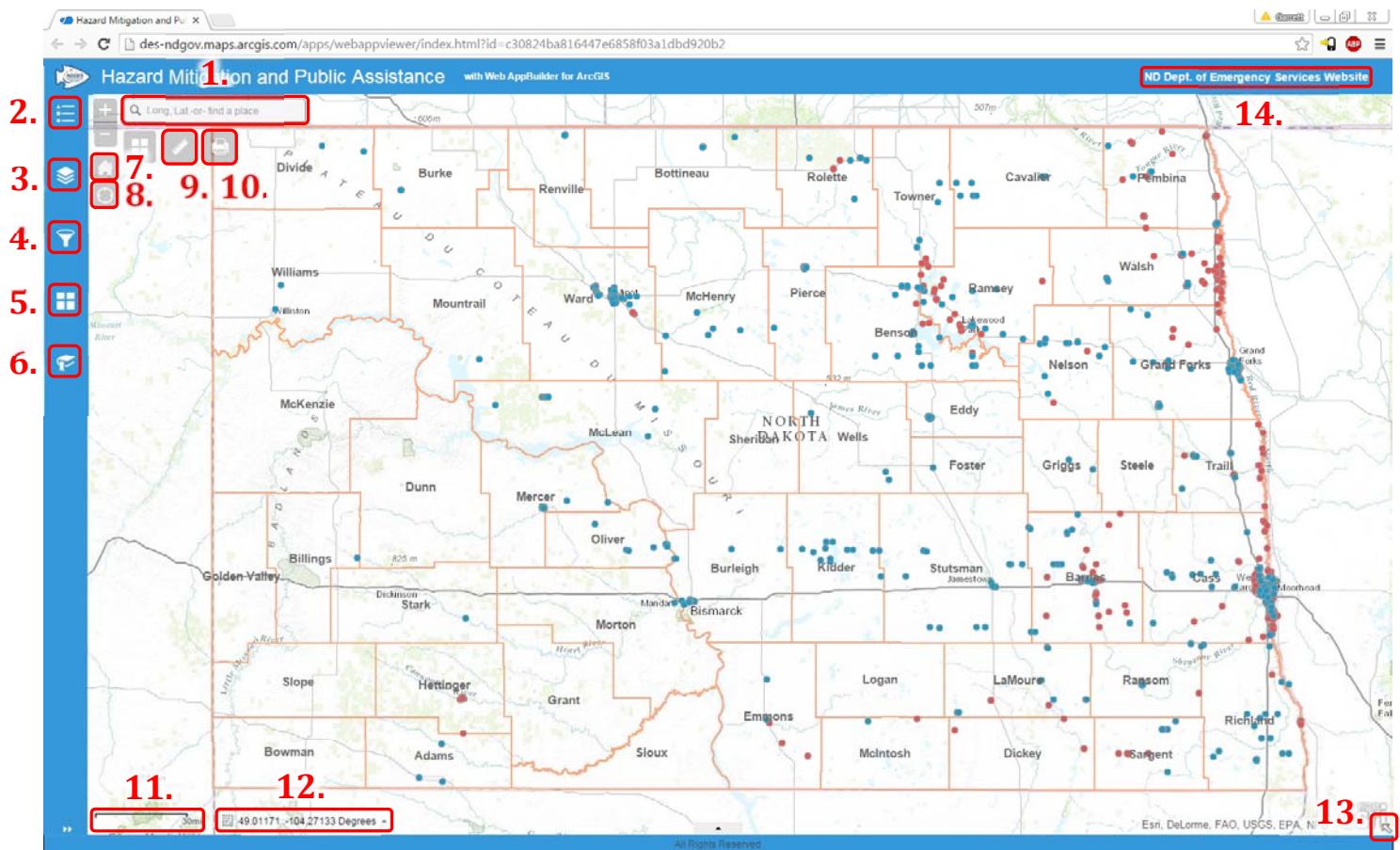
1. Location Search (by name or Long, Lat)

2. Legend Tab

3. Layers/Labels Tab

4. Filters Tab

5. Basemap Tab

6. Bookmarks

7. Home View (of North Dakota)

8. Current GPS (click to get location on map)

9. Measurement Tool

10. Print Button

11. Map Scale

12. GPS Coordinates of cursor on the map

13. Show/Hide Map Overview Pop-up

14. ND Dept. of Emergency Services link

NOTE: Features and order of the icons may change.

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Location Search

A specific location may be found by zooming the map into the desired extents, by a query (zooms the map to the extents of the filtered points), or by a search through the Location Search.

A Location Search is much like searching for a location on other mapping services, like Google Maps or MapQuest. Simply click your cursor in the location search bar, type in a keyword or GPS coordinate (Longitude followed by Latitude) and select the option that best suits your location.

By doing a Location Search by Longitude and Latitude, it gives the user the ability to see what sites are around that specific location, so they are able to do research on the previous site(s) to see if it is a matching repetitively-damaged site.

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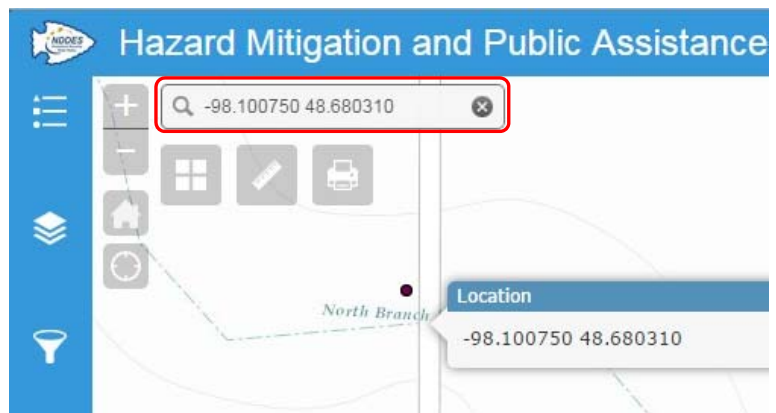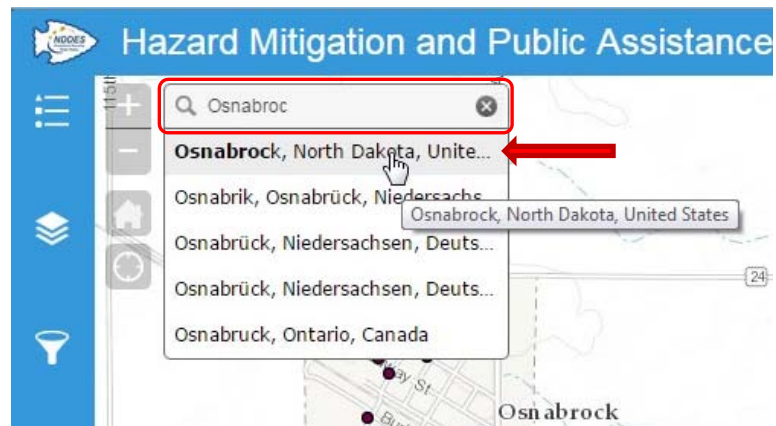
LEGEND

Legend

Once the Legend Tab is selected, a list of all symbology applicable to the current view in the Map will appear.

Displayed items will require the corresponding layer to be active. In this example, the HM, PA, Counties, Civil and Legal Township layers are all active.

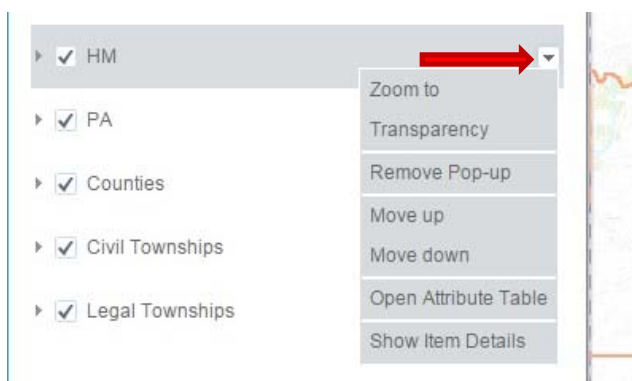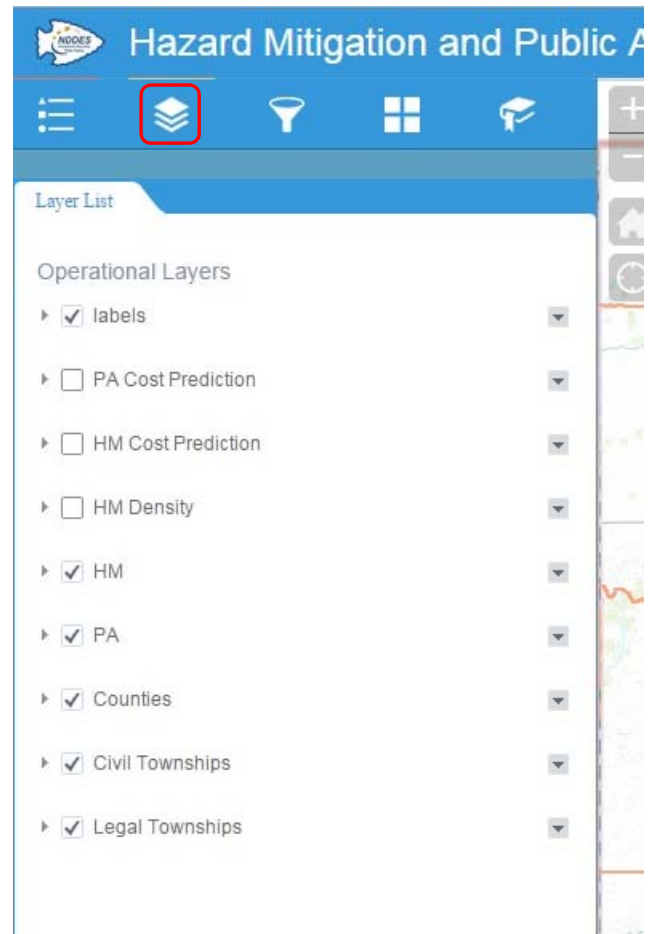To hide the Legend Tab, or any open, simply click the double left arrows.
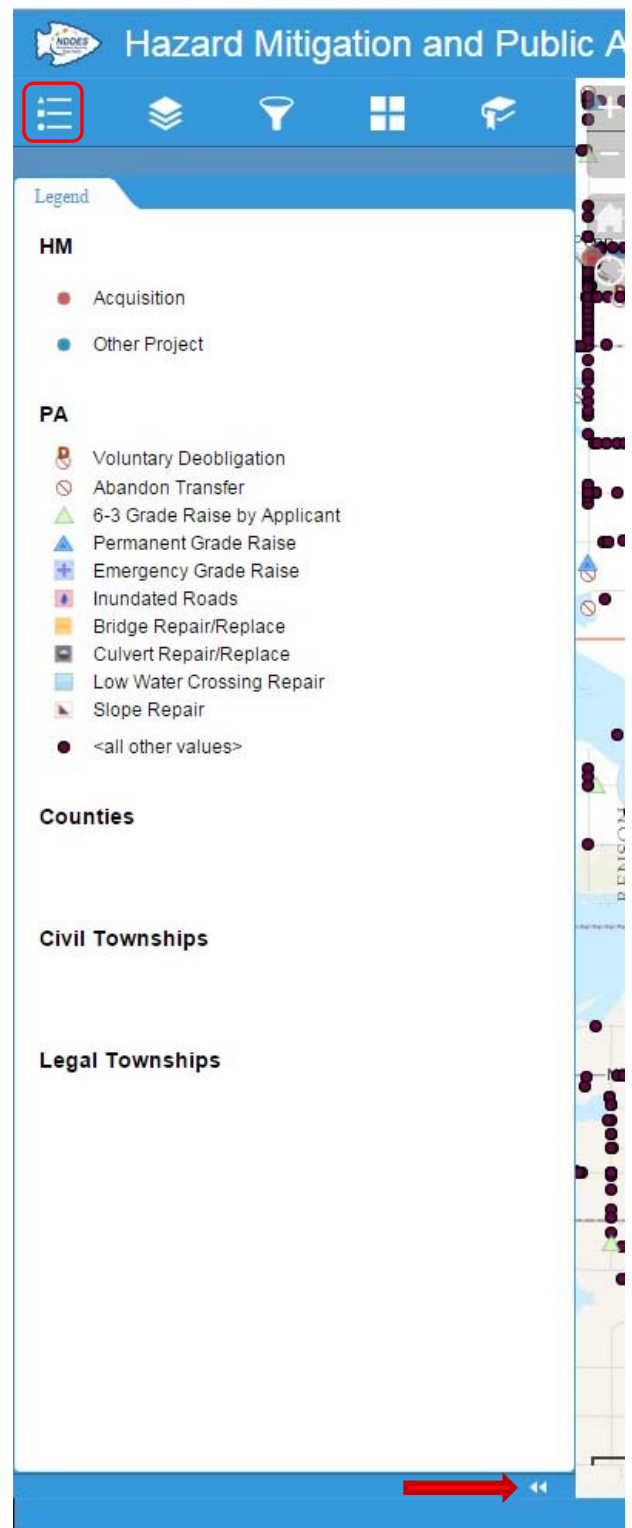
Layers/Labels

Each layer contains data associated with points that can be turned on/off, or moved up and down on the layer list. The layer on the top of the list will display over the one below it. This is why the labels layer is located at the top of the layers listing.

Each layer has its own visibility range setting. What this means is that data on a specific layer is only visible between a certain scale range (how far zoomed in/out you are).

The HM layer displays all the Hazard Mitigation data, the PA layer displays all the Public Assistance data and the County and Township layers display the their boundaries. These analytical layers, such as cost prediction or density layers, are turned off by default and the "labels" layer displays the County labels.
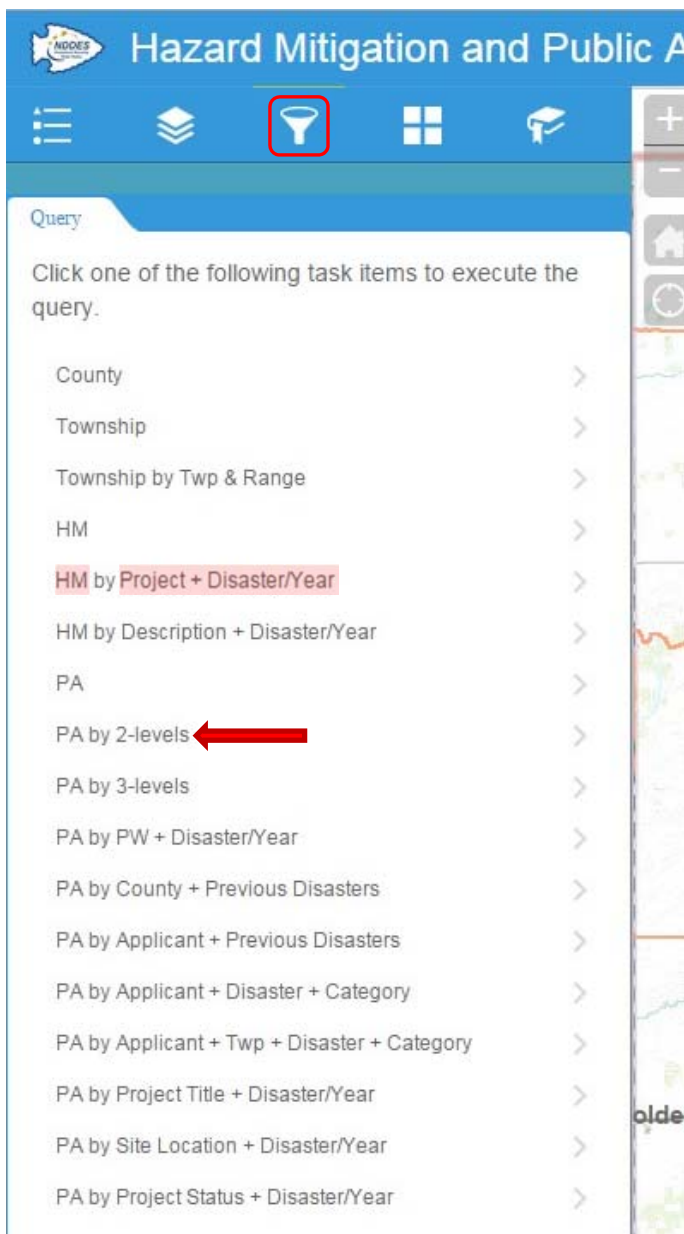
By clicking the down arrow to the right of the specified layer, a list of options for the layer will appear. The below image exemplifies this operation with the HM layer. This is how one would move a layer up or down the list as well as to remove/enable the layer's ability to produce pop-ups.

Using Filters

A user can use filters to display a specific set of results. The result of filtered data is a Query. Filters are constrained to the data within a single layer.

Only one Query can be active at a time; however, a Query may be saved as a layer by clicking the box for "Add result as operational layer." This would allow the user to save multiple queries as well as turn on/off each of the queries until the "Clear Results" link is clicked.

The first word of the Filters (see left image) lets a person know what layer they are searching within. Subsequent words are the fields or search criteria the filter will query. The plus sign (+) designates the filter will search by more than one field to get a more accurate result. A multiple level filter will search that many different fields.

In the left example, "PA by 2-levels" will search data by two (2) fields. In this option, there will be lots of fields to choose from, but a user is required to enter two (2) filters. The first filter will go in one of the first-level (L1) field set and the second needs to go in the second-level (L2) set. (See next page for more information on multiple level filters)

By the way the software is designed, certain fields cannot be included in the multiple level searches, so specific field searches will be necessary to conduct queries of this nature. These are listed below the Layer-level filters.

After a filter option is selected, one will be prompted with a new menu similar to the right image. This is an example of "PA by 2-levels" to illustrate how a multiple level query works. Since this is a 2-level filter, there will be two (2) filters needed. One of the filters needs to be entered in one of the "L1" fields and the other in one of the "L2" fields. A couple of the fields include ranges.

By use of "Use spatial filter to limit features" option, a person has the ability to only have queried results in a user-defined area. There are different ways to select areas once the box is checked.

Checking the "Add result as operational layer" saves the query to the Layers list, giving the ability to move it up and down the layers list and to turn it off or on. When the Clear Results is clicked, all query operational layers will be cleared.

There can be only one active (non-operational layer) query active at a time; however, a user has the ability to have multiple operational layer queries and one active query displayed if desired. This is useful when a Project Specialist is wanting to keep all county data active, but will be viewing/printing multiple townships. In this example, it would make logical sense to have the Township query be the active query and the highlighted points be the operational layer.

NOTE: When the query results are over 1,000 items long, the user will need to scroll to the bottom of the query list in order to display the additional queried results on the map.
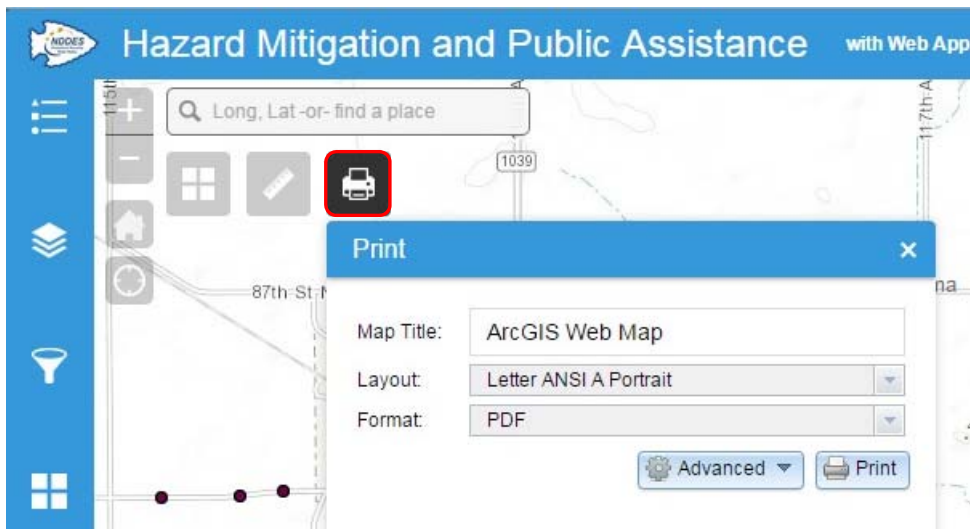
Basemap Selection

Different basemaps will display visual data behind the GIS point data. The Imagery basemaps are photos taken of the actual ground all stitched together, while other basemaps may show legal data, topography, or street data.

A user is able to change the basemap at any time. To select one, simply click either of the Basemap Gallery icons and click the desired map.

Printing

The print will include the current view or most recent area query, active basemap, actively displayed layer points and active query highlights.
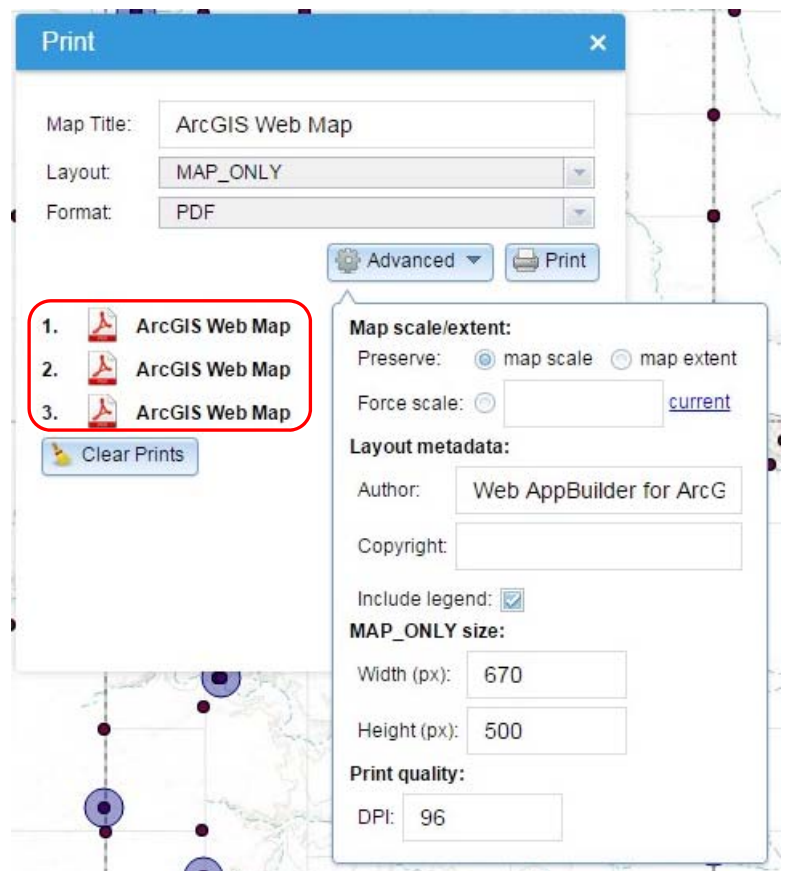
To print a map, click the Printer icon below the Location Search bar, fill in the Map Title, select the desired Layout & Format from the drop-down menus and click the Print button.

By default the Layout is set to ANSI A (8.5" x 11") Portrait. If an 8.5" x 11" Landscape option is needed, select the Letter ANSI A Landscape from the drop-down menu. ANSI B is 11" x 17", A3 is 11.7" x 16.5" and A4 is 8.3" x 11.7". The MAP_ONLY option will print only a map (with no legend or scale) of the current view.

It is possible to do a more advanced print configuration. To do so, click the Advanced button, enter in the desired options into the displayed fields and click the Print button when finished.

This will print to a digital file and will be displayed below the Print button. The example to the right shows three (3) prints have been made, the most recent being #3.

To open/print/download a printed digital file, simply click on the file to the right of the number and it will open. Once the digital file is opened, one has the ability to save or print the file.

Resources

ND DES HM/ PA GIS Site	http://drsgis.des.nd.gov
Online FEMA PA Guide	https://www.fema.gov/public-assistance-policy-and-guidance/public-assistance-guide
Online FEMA Eqpt. Rates	https://www.fema.gov/schedule-equipment-rates
2011 FEMA Cost Codes	https://www.nh.gov/safety/divisions/hsem/documents/cost-codes.pdf
ND DOT Cost Codes	http://www.dot.nd.gov/pacer/AABP2013E.pdf
ACME Mapper	http://mapper.acme.com/
ND Travel Info Map	https://www.dot.nd.gov/travel-info-v2/
ND DES Website	http://www.nd.gov/des