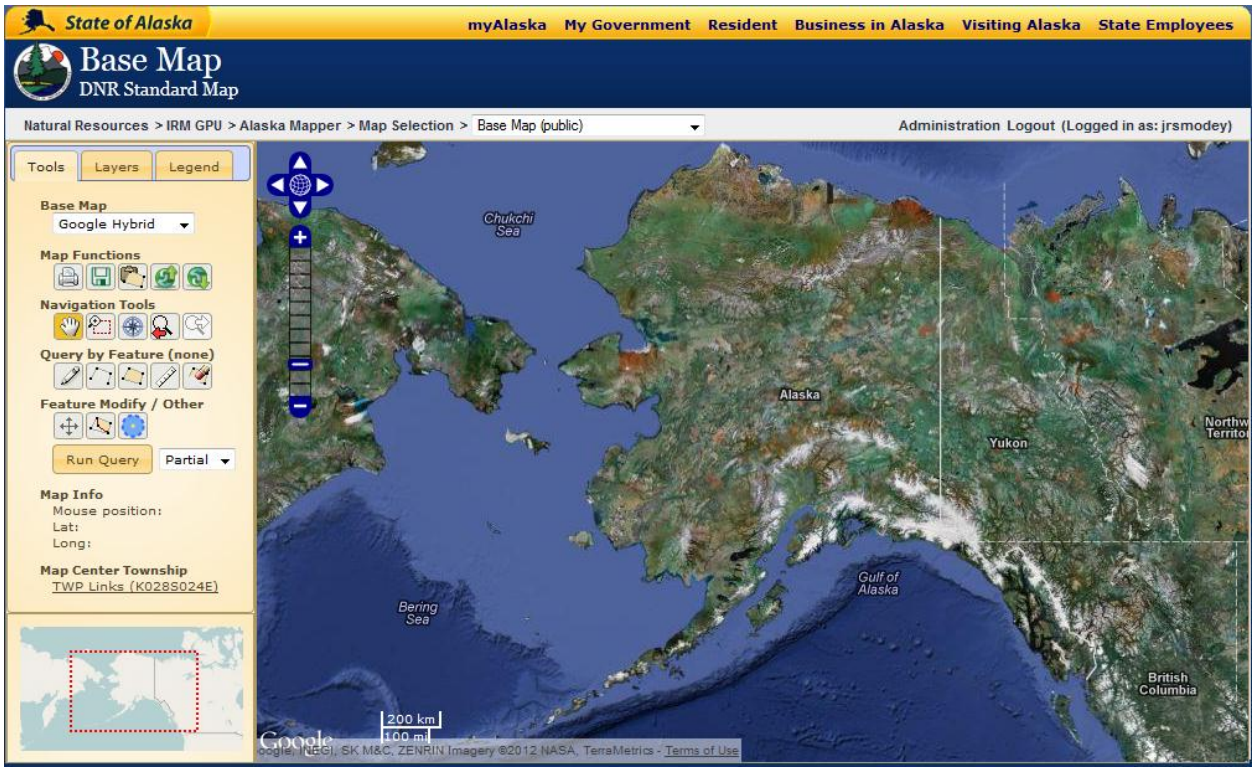
Alaska Mapper

Version 3.0

User Guide



http://dnr.alaska.gov/MapAK

August 6, 2013

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Overview

What's New in Version 3.0?

Alaska Mapper has been completely redesigned in a lightweight JavaScript-driven environment to improve the appearance and usability of the application. Most of the functions of the previous version of Alaska Mapper are available in version 3.0, although they now have an updated look and feel. Version 3.0 also includes a few new features, such as the use of maps provided by Google and the ability to upload map features in the form of shapefiles.

What is Alaska Mapper?

Alaska Mapper is a Web-based geographic information system (GIS) that allows you to locate Alaska land-records information by navigating an interactive map of the state. The land-records data provided by the system comes from the Department of Natural Resources (DNR) Land Administration System, the authoritative data source for all state land records. Land records may be displayed over a wide range of base maps, including Google maps, USGS topographic maps, satellite imagery, elevation models, Department of Transportation road centerlines, Department of Fish and Game anadromous streams, and NOAA nautical charts.

With Alaska Mapper, you can zoom to an area of interest, turn map layers on and off, make live queries to the Land Administration System, download selected data for use in other geospatial systems and even construct your own maps using available map layers.

Much of the information displayed in Alaska Mapper is also used to produce status plats, which are the state's official graphical land records. Although status plats have been accessible through the Land Records Web site (http://dnr.alaska.gov/Landrecords) since 1999, these documents are not interactive. Using state-of-the-art GIS technology, Alaska Mapper makes this information readily and easily available to the public.

Alaska Mapper's primary purpose is to provide information on state land ownership and use. The system is versatile enough to help you conduct in-depth analyses of land issues with the proper training and experience. If you require assistance, please refer to the Land Records Support Web page.

System Requirements

Supported Browsers

Alaska Mapper is compatible with recent versions of Microsoft Internet Explorer and Mozilla Firefox.

Recommendations for Best Performance

For best performance, we recommend that your system have the following:

- Screen resolution of at least 1024 x 768 pixels
- Ability to display at least 24-bit color video
- Adobe Acrobat Reader browser plugin

About Alaska Mapper's Geographic Data and Satellite Imagery

Alaska Mapper's spatial datasets use the North American Datum of 1983 (NAD 83). USGS base maps, NOAA nautical charts, elevation models, satellite imagery and aerial imagery

are obtained from the Alaska Statewide Digital Mapping Program, a joint program between the University of Alaska, the Department of Military and Veterans Affairs and the Department of Natural Resources. See http://www.alaskamapped.org for more information.

Getting Started

Accessing Alaska Mapper

To access Alaska Mapper, direct your Web browser to http://dnr.alaska.gov/MapAK, and then click the **Enter Mapping Application** link.

Using the Public Account

By default, Alaska Mapper will log you in to the public account, which gives you access to the full range of map layers and application functions, except for the ability to save maps.

Logging in with a Registered User Account

To log in with a registered user account, click the **Not You?** link in the upper-right corner of the window. With a user account, you can save maps that can be recalled later. All state employees automatically have a registered user account. The user ID and password are the same as those for your e-mail account. If you are unable to log in, contact your local computer support personnel or the Department of Administration.

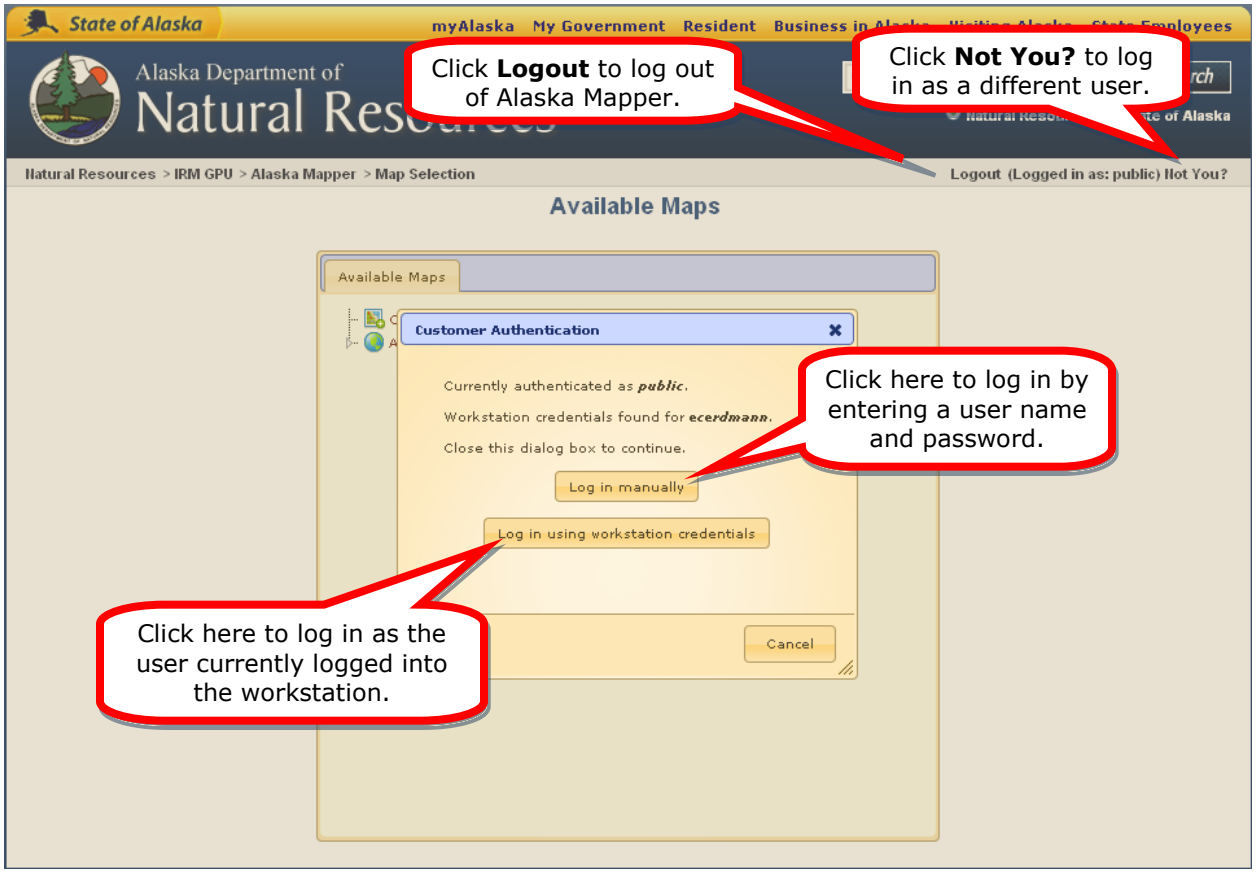


Figure 1 – Logging in and out

Logging out

When finished with the application, you should log out by clicking the **Logout** link in the upper-right corner of the window. Logging out closes the current session and helps eliminate the chance of someone tampering with your saved maps. Alaska Mapper will automatically log you out after two hours of inactivity and return you to the login screen.

Getting Help

Help tips are a quick and useful source of information about many functions in Alaska Mapper. To display a help tip, hover your mouse pointer over an icon or hyperlink on the **Tools** tab.

Training opportunities are available for Alaska Mapper. Please send your training requests via this contact form.

Quick Start Guide

The following steps provide a high-level outline of a typical usage scenario in Alaska Mapper. For more details refer to the sections that are referenced in these steps.

Tip: For best performance, do not use the browser's **Back** button or any other navigation options provided by the browser. Use only the navigation options that you see in the application interface.

To run a query:

1. From the Available Maps page, click the name of the map that you wish to view. You may need to expand the folders on the selection tree to find the map you need. To expand or collapse a folder, click the triangle to the left of it.

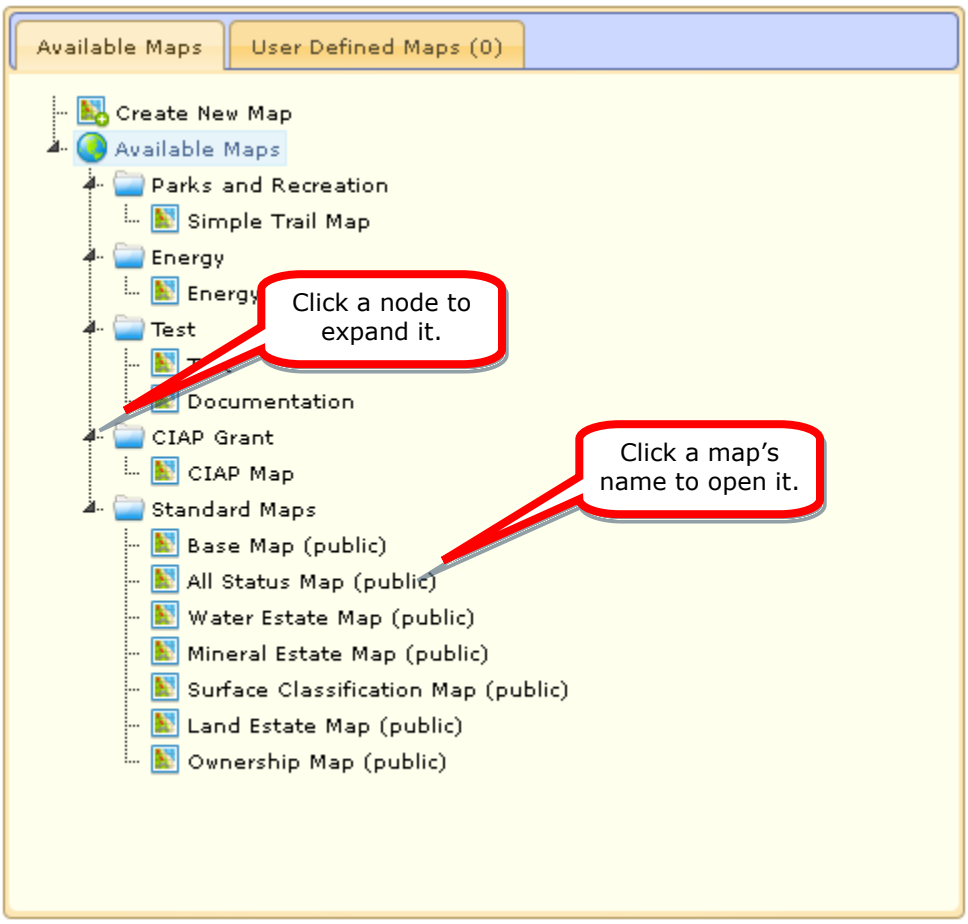


Figure 2 – Selecting a Map

   The selected map displays.

2. If necessary, select a base map. See "Base Map Options" on page 25.
3. Make sure the map contains the layers that you need and that they are visible or active. See "Map Layers" on page 21.
4. Navigate to a location on the map using either of the following methods:
   - Use the pan and zoom tools to manually navigate to a location. See "Pan Tool" on page 27 and "Zoom Tool" on page 28.

- To go directly to a specific location on the map, use the **Map Navigation** tool. See "Map Navigation Tool" on page 28.

5. Select an area of interest to use in a query using either of the following methods:
   - Use the **Query By Feature** tools to manually draw an area of interest. See Query by Feature Tools on page 33.
   - If you have navigated to a location using the **Map Navigation** tool, click **Use** to select the area. See "Map Navigation Tool" on page 28.

   Note: You may select multiple areas of interest for use in the query. See "Using Multiple Areas of Interest in a Query" on page 42.

6. Select a search type. See "Search Types" on page 41.
7. Click **Run Query**. The system generates the report using the specified criteria. See "Spatial Queries" on page 41.

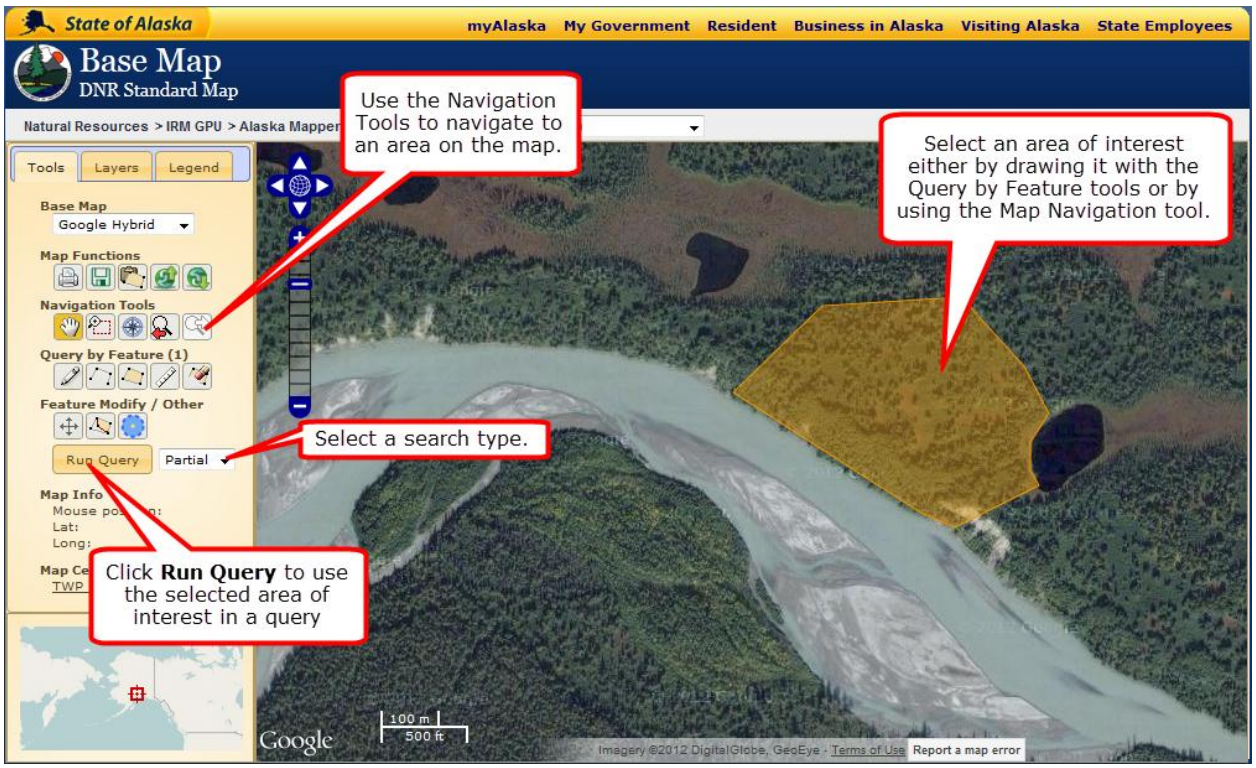


Figure 3 – Overview of How to Run a Query

8. From the Query Results window, organize the report by sorting the columns as you see fit. See "Sorting the Report" on page 43 for instructions.
9. If desired, print the report or export it to an Excel spreadsheet or PDF file. See "Exporting the Report" on page 44 for instructions.

Alaska Mapper Basics

Navigation Links

At the top of the Alaska Mapper pages, you will see navigation links, often called "breadcrumbs," that show a history of the pages you visited prior to the current page. You can quickly return to a previously visited page by clicking a link in the breadcrumb trail.

Tip: For best performance, use these navigation links instead of your browser's **Back** button.

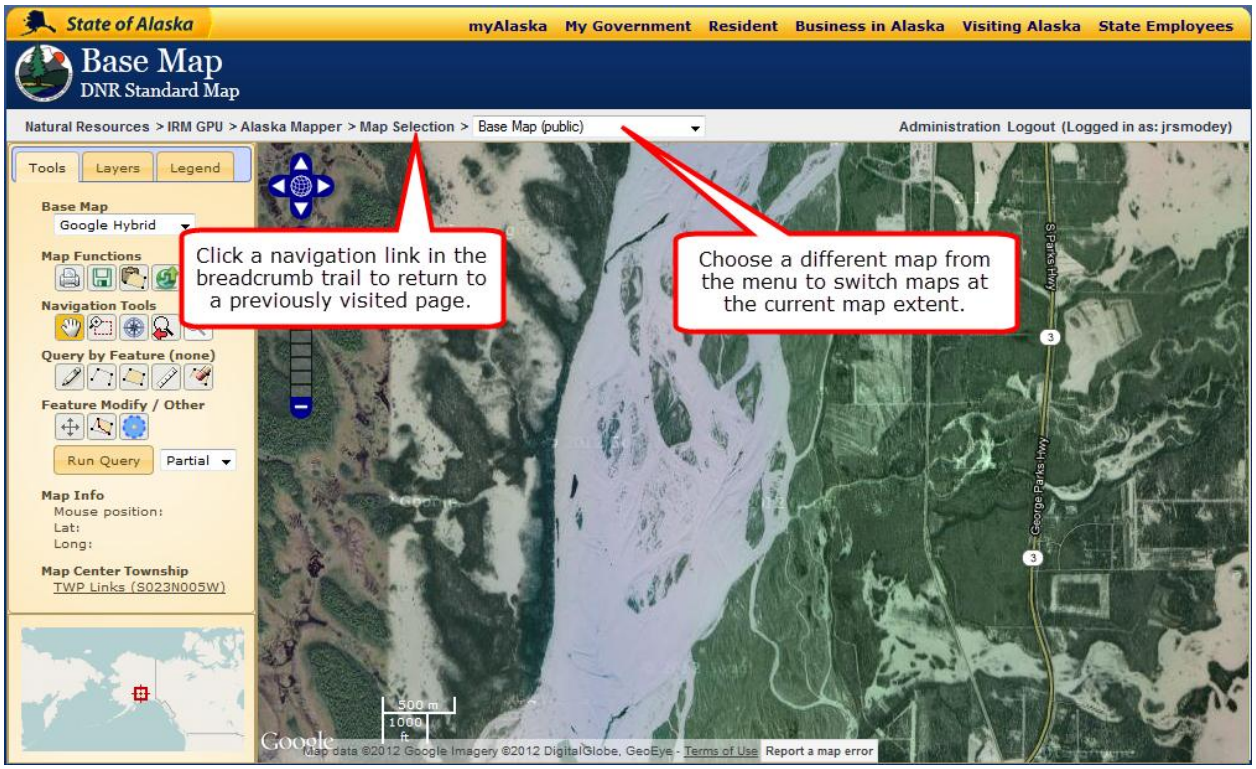


Figure 4 – Navigation Links

Overview of the Alaska Mapper Interface

The application interface is divided into the following main areas:

Area	Description
Tools Tab	The **Tools** tab contains links to navigation tools and other application functions and information. See "Overview of the Tools Tab" on page 12 for more information.
Layers Tab	The **Layers** tab lists all layers of the current map and allows you to control which are visible and active. See "Map Layers" on page 21 for more information.
Overview Map	The overview map indicates the area displayed in the map frame in relation to the entire state of Alaska. See "Overview Map" on page 14 for more information.

Map Frame	The map frame displays the selected map. Every time you use one of the navigation tools (**Pan**, **Zoom**, **Map Navigation**), the map will redraw to update the view.

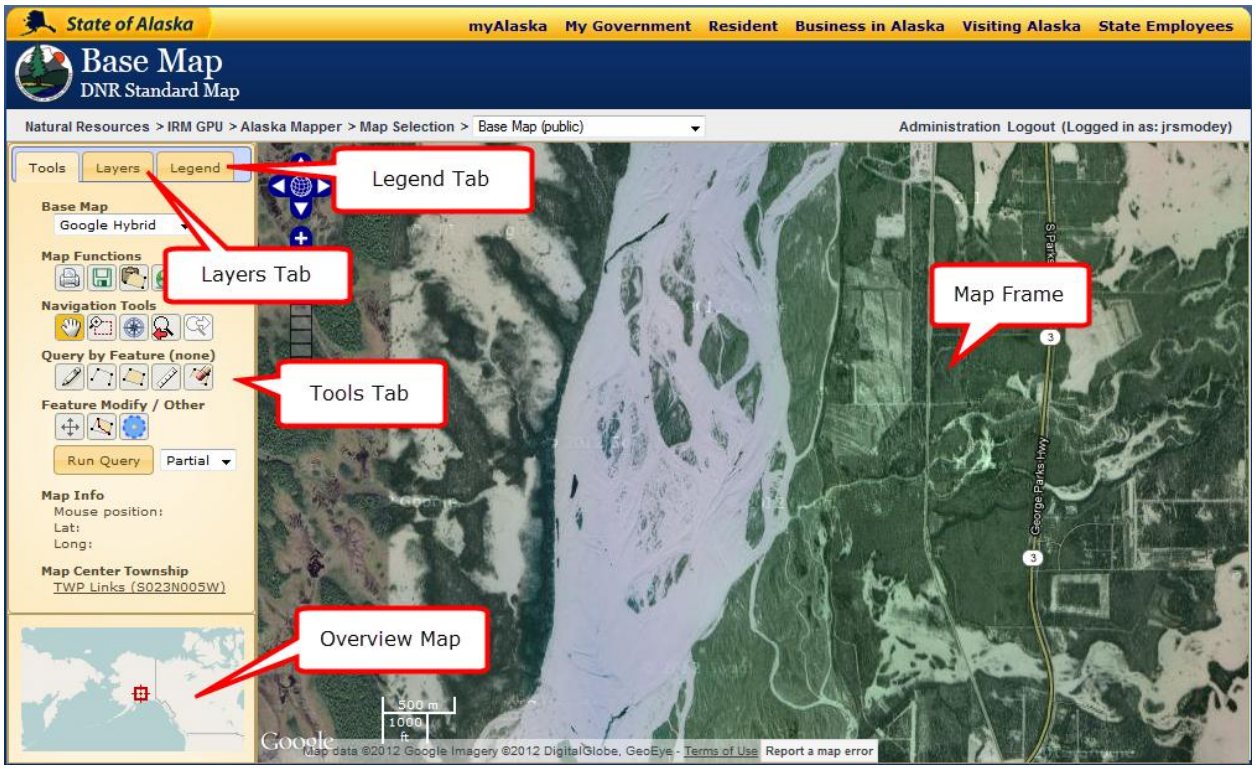
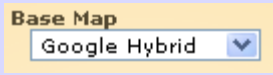


Figure 5 – Components of the Alaska Mapper Interface

Overview of the Tools Tab

The **Tools** tab provides a number of tools for navigating the map, selecting areas of interest, running queries and performing other functions. The following table summarizes the options found on the **Tools** tab:

Option	Description
	The **Base Map** selector allows you to select a background map for the current map view. See "Base Map Options" on page 25 for more information.
Map Functions	
	The **Print Map** tool generates a PDF document or image of the current map view. See "Printing a Map" on page 50.
	The **Save Map** tool saves the map as a user-defined map. See "User-Defined Maps" on page 17.
	The **Upload Shapefile** tool uploads an ESRI shapefile. See "Uploading Shapefiles" on page 48.
	The **Extract** tool extracts features of the current map as an ESRI shapefile. See "Extracting Selected Features" on page 49.
Navigation Tools	

	The **Pan** tool allows you to navigate the map by clicking and dragging it. See "Pan Tool" on page 27.
	The **Zoom** tool allows you to zoom in on the map. Click once to zoom in one level. Click and drag the pointer to zoom into a specific part of the map. See "Zoom Tool" on page 28.
	The **Map Navigation** tool allows you to navigate directly to a map feature using various navigation options, including latitude/longitude specification, selection of Alaska place names, and others. See "Map Navigation Tool" on page 28.
	The **Previous View** tool undoes a zoom in, zoom out, or panning of the map. This icon is inactive whenever there is no previous view to which you can return. You can return to multiple previous views, one by one, by repeatedly clicking this link. Alaska Mapper remembers all previous views for the current map.
	The **Next View** tool redoes the view alteration that was just undone. This icon is inactive whenever there is no next view to which you can return.
Query By Feature	
	The **Draw Point** tool creates a point. See "Draw Point Tool" on page 33.
	The **Draw Line** tool creates one or more lines. See "Draw Line Tool" on page 34.
	The **Draw Polygon** tool creates a many-sided feature that encloses an area of the map. See "Draw Polygon Tool" on page 34.
	The **Measure Distance or Area** tool measures the distance between two points that you draw on the map. See "Measure Distance or Area Tool" on page 35.
	The **Erase Feature** tool allows you to erase one or more features that you have drawn on the map. See "Erase Feature Tool" on page 37.
Feature Modify/Other	
	The **Move Feature** tool allows you to move a feature to a different location on the map by clicking and dragging. See "Move Feature Tool" on page 38.
	The **Modify Feature** tool allows you to change the shape of a feature. See "Modify Feature Tool" on page 38.
	The **Buffer** tool creates a buffer around a feature on the map. See "Buffer Tool" on page 39.
Map Info	This section displays the latitude and longitude coordinates of the current position of your mouse pointer.

Map Center Township	This section displays the township that is currently at the center of the map view and provides access to other DNR systems that contain information about that township. See "Viewing Township Information in Other Systems" on page 46 for details.

Overview Map

The overview map frame, located in the lower-left corner of the window, contains a small map image that indicates the area displayed in the map frame in relation to the entire state of Alaska. The current map bounds are indicated on the overview map with either a red rectangle or a red dot, depending on the map scale. This is particularly helpful when viewing the map at large scales.

You can change the current view in the map frame by clicking and dragging the red rectangle in the Overview Map to a different location.

Maps

Opening a Map

When you log in to Alaska Mapper, the Available Maps page displays a list of maps to which you have access. This list is organized according to DNR functional areas. To view the maps available in a particular folder (for example, **Parks and Recreation**), click the triangle to the left of the folder. Clicking the triangle a second time will collapse the folder.

To open a map, simply click its name. You can return to the Available Maps page at any time by clicking the **Map Selection** link in the breadcrumb trail at the top of the page (see Figure 7).

User-defined maps are available for selection on the **User Defined Maps** tab. For more information see "User-Defined Maps" on page 17.

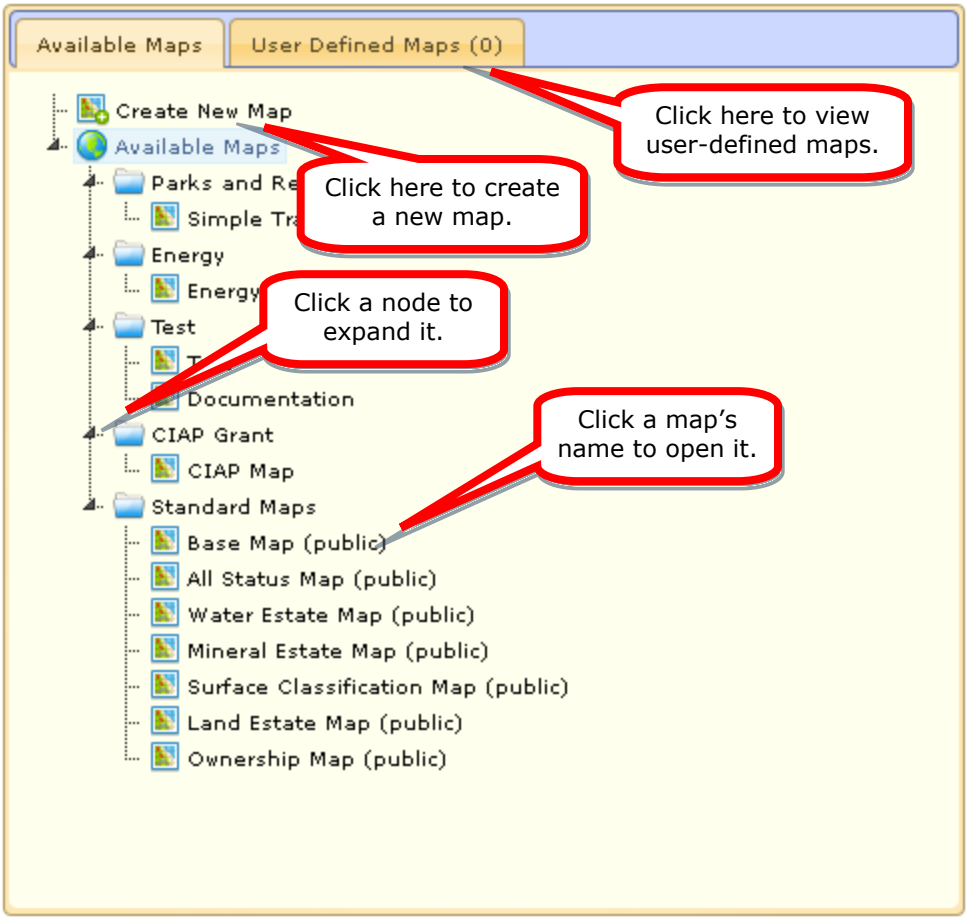


Figure 6 – Opening a Map

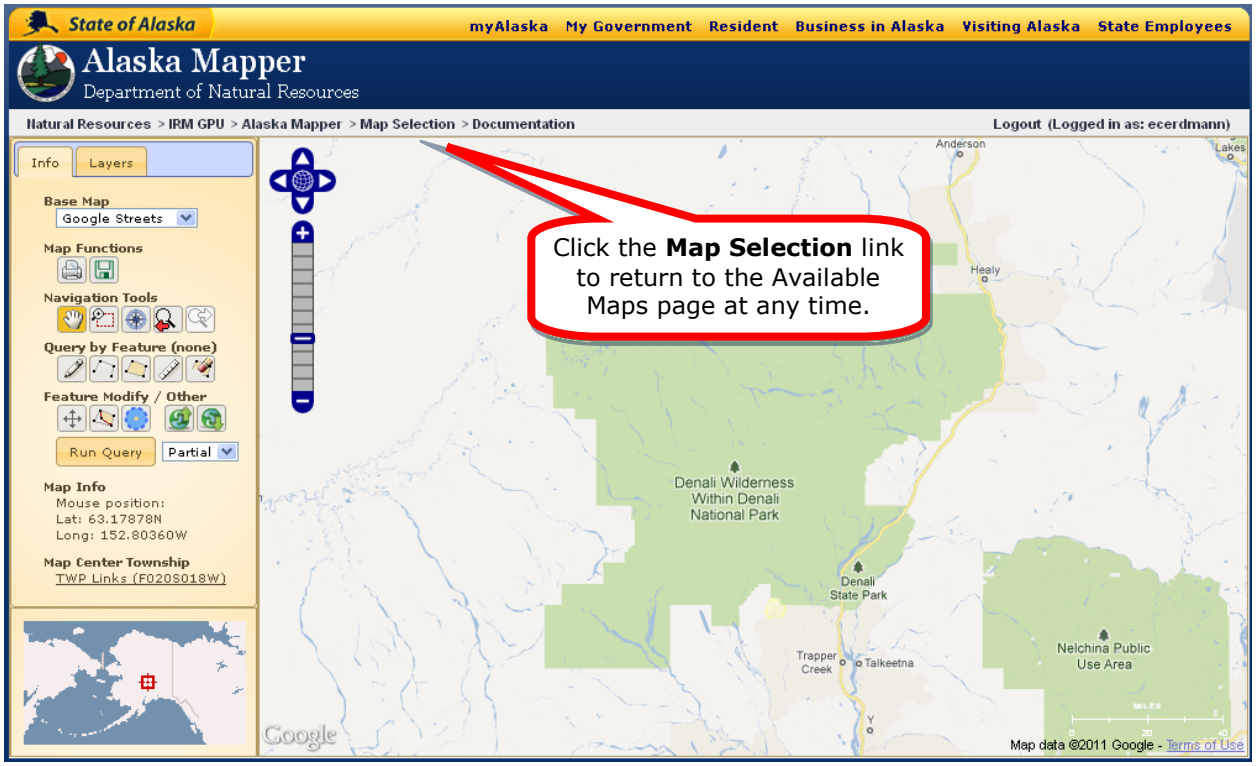


Figure 7 – Map Selection Link

Standard Maps

Seven standard maps are available to all Alaska Mapper users. These maps have the same content (layers) as the state status plats, the official graphical land records that describe the location of state land, the classification of the land and assignments of state interest in the land. These maps are found in the **Standard Maps** folder on the Available Maps page.

Following are descriptions of the standard maps:

Map	Description
Base Map	Contains the basic layers that are common to the other public maps, including hydrography, township and section grids, state outlines, roads, pipelines, etc. This is a good map to start with when designing your own maps.
All Status Map	Provides all of the layers found in the other six standard maps.
Water Estate Map	Displays the statewide locations for water rights, water authorizations, reservations and water management areas for surface and subsurface water sources.
Mineral Estate Map	A subsurface-use map that displays current oil and gas, mining and other subsurface resource uses on state uplands and tidelands. This map describes state lands as open or closed to mineral entry.

Surface Classification Map	Displays how state land may be used as a result of an area plan or site-specific classification.
Land Estate Map	A surface-use map that displays DNR authorizations or disposal of state uplands and tidelands to third party interests, such as individuals, businesses, municipalities, boroughs or other state agencies.
Ownership Map	Displays current state land ownership and the availability of those lands for use under specific rules and regulations of the State of Alaska.

User-Defined Maps

Note: You can save user-defined maps only if you are logged in as a registered user.

Alaska Mapper allows you to save your own customized maps. When you save a map, the system saves information such as the map name, the layers included on the map and the current zoom level and location. Alaska Mapper does not save the actual land-records data. Every time you open the map, it will be drawn using the latest land-records data available.

Maps that you edit and save are accessed on the **User Defined Maps** tab of the Available Maps page.

Creating a User-Defined Map

You can create a new map either by starting from scratch with no selected layers or by modifying the layers of an existing map. To create a new user-defined map:

1. From the Available Maps page, click **Create New Map**. The new map displays.

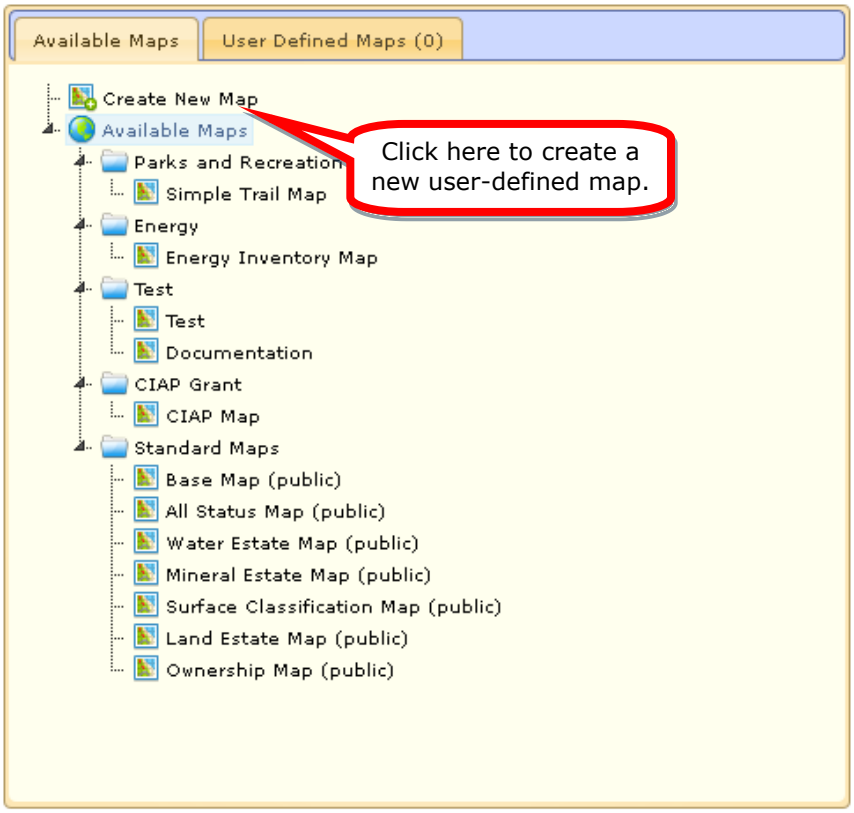


Figure 8 – Creating a New Map

2. Add layers to the map as you see fit. See "Adding and Removing Map Layers" on page 22.
3. Using the options found on the **Tools** tab, navigate and modify the map as you see fit.
4. Save the map by clicking the **Save Map** icon found on the **Tools** tab. The Save Map window displays.
5. On the **Save As** tab, complete the fields described in Table 1.

   Note: To save the map using the same name and map information as the original, simply click **Apply** on the **Save** tab instead of modifying the **Save As** tab.

Table 1 – Map Information Fields

Map	Description
New Map Name	The name that will appear in the list of user-defined maps.
Page Title	The title that will appear in your browser's title bar.
Title	The title of the map, which will appear in the upper-left corner of the map.
Subtitle	The subtitle of the map, which will appear under the title.
Logo URL	The URL of the image that you would like to use as a logo to the left of the map title.

6. Click **Apply**. The map is saved and is now available on the **User Defined Maps** tab (see Figure 10).

To create a user-defined map from an existing map:

1. From within an existing map, click the **Save Map** icon found on the **Tools** tab. The Save Map window displays.

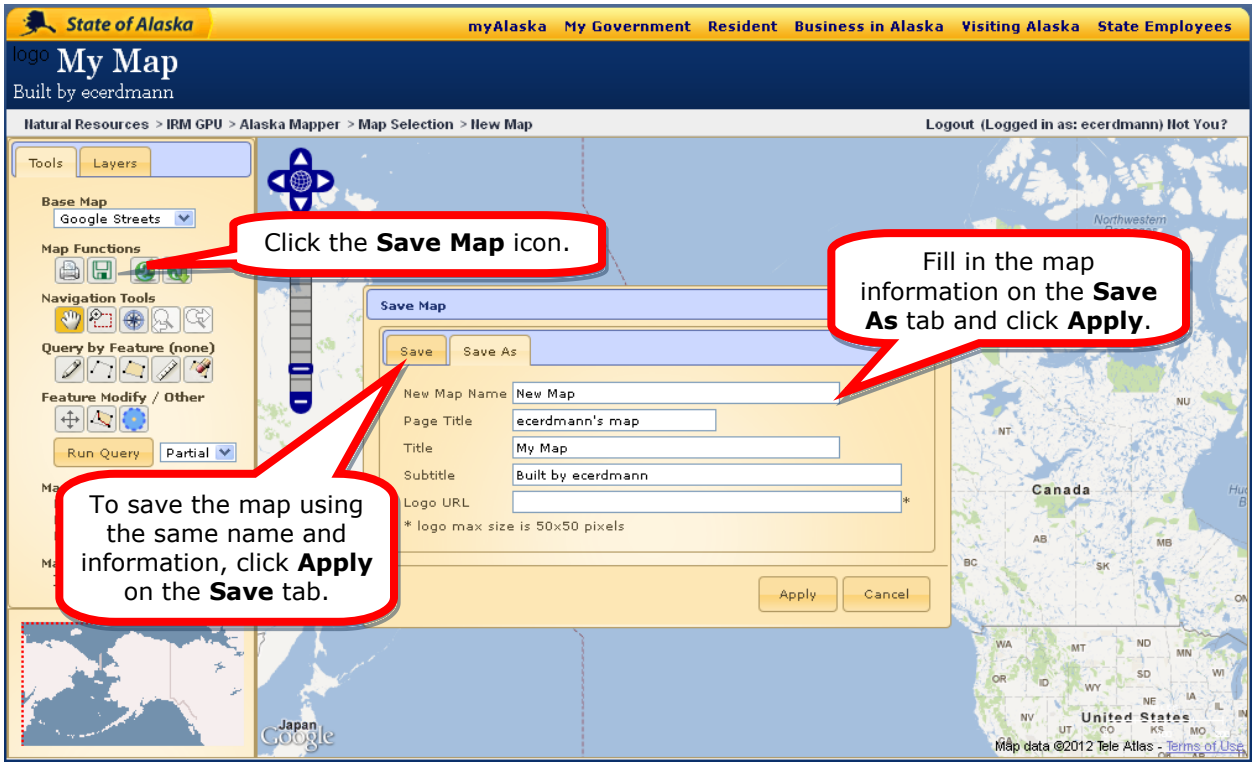


Figure 9 – Saving a Map

2. On the **Save As** tab, complete the map information fields as you see fit. Refer to the field descriptions in Table 1 on page 18.

   Note: To save the map using the same name and map information as the original, simply click **Apply** on the **Save** tab instead of modifying the **Save As** tab.

3. Click **Apply**. The map is saved and is now available on the **User Defined Maps** tab (see Figure 10).

Deleting User-Defined Maps

To delete a saved map, click the **Delete** icon next to the map name.

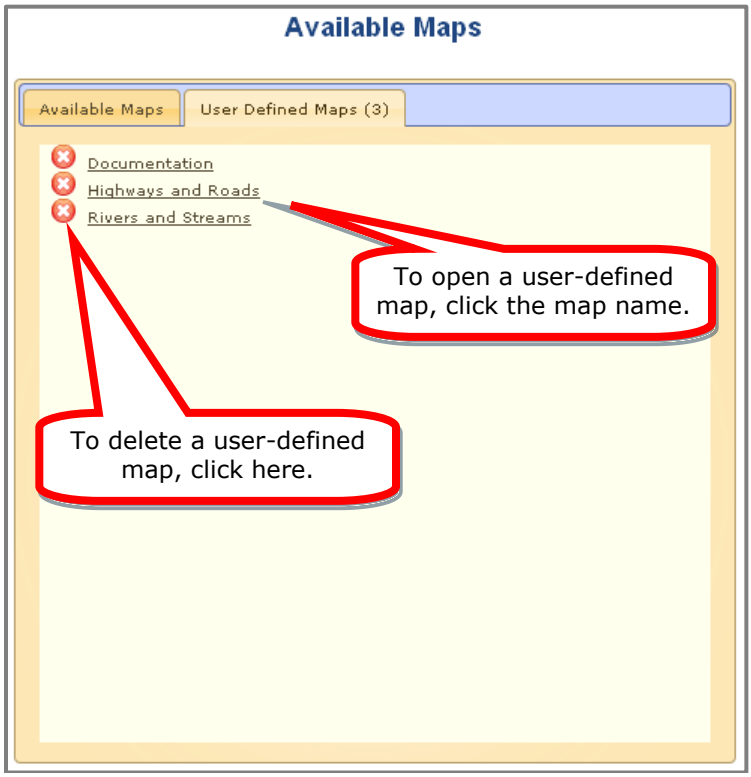


Figure 10 – User-Defined Maps

Map Layers

A map layer is a dataset that contains information about related map features. For example, one layer may contain all major lakes in the state, while another contains municipal boundaries. Each map has a number of layers available.

Viewing Current Map Layers

The **Layers** tab lists all layers available in the current map. From this tab, you can make layers visible or invisible, as well as active or inactive.

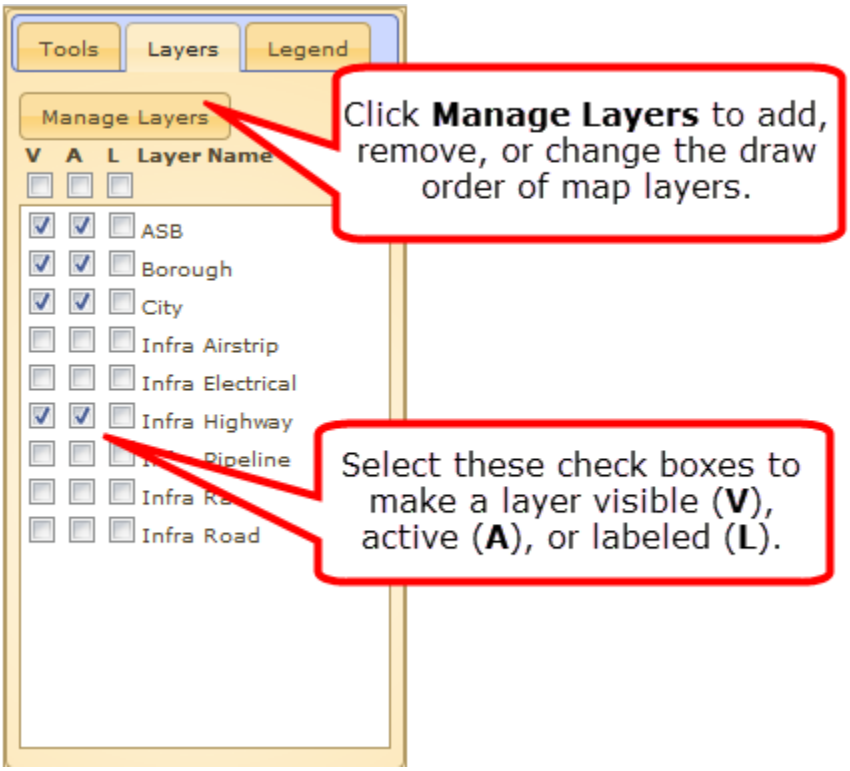


Figure 11 – Layers Tab

For each layer listed on the **Layers** tab, you see the following options:

Option	Description
V (Visible)	Select the **V** checkbox to make the layer visible on the map. Deselect this checkbox to hide the layer. **Note:** Some map layers are visible only within a certain zoom range.
A (Active)	Select the **A** checkbox to include the layer in queries. Deselect this checkbox to exclude the layer from queries.
L (Labeled)	Select the **L** checkbox to turn on labels for a visible layer. Deselect this checkbox to hide layer labels.

The **Manage Layers** button allows you to add and remove map layers, as explained in the next section.

Adding and Removing Map Layers

To add or remove map layers, click the **Manage Layers** button on the **Layers** tab. This will open the Manage Layers window.

The Manage Layers window is divided into two panels. The left panel displays the layers that are currently on the map, and the right panel displays all available layers. To add a layer to the map, click the green plus sign to the left of the layer name. (You may have to expand the Available Layers list by clicking the triangles next to the folder names.) To remove a layer from the map, click the red minus sign to the left of it.

Click **Apply** to save your changes to the map layers.

Ordering Layers

The order of the layers in the map determines the order in which they are drawn. The layer at the top of the list has the highest drawing priority, meaning that it is drawn last. The layer at the bottom of the list has the lowest priority and is drawn first. You must order the layers so that part of one layer is not obscured by another layer that is drawn on top of it.

To order map layers:

1. Click a layer, and while holding down the mouse button, drag it up or down in the list.
2. Release the mouse button to drop the layer into its new location.
3. Repeat steps 1 and 2 to move other layers.

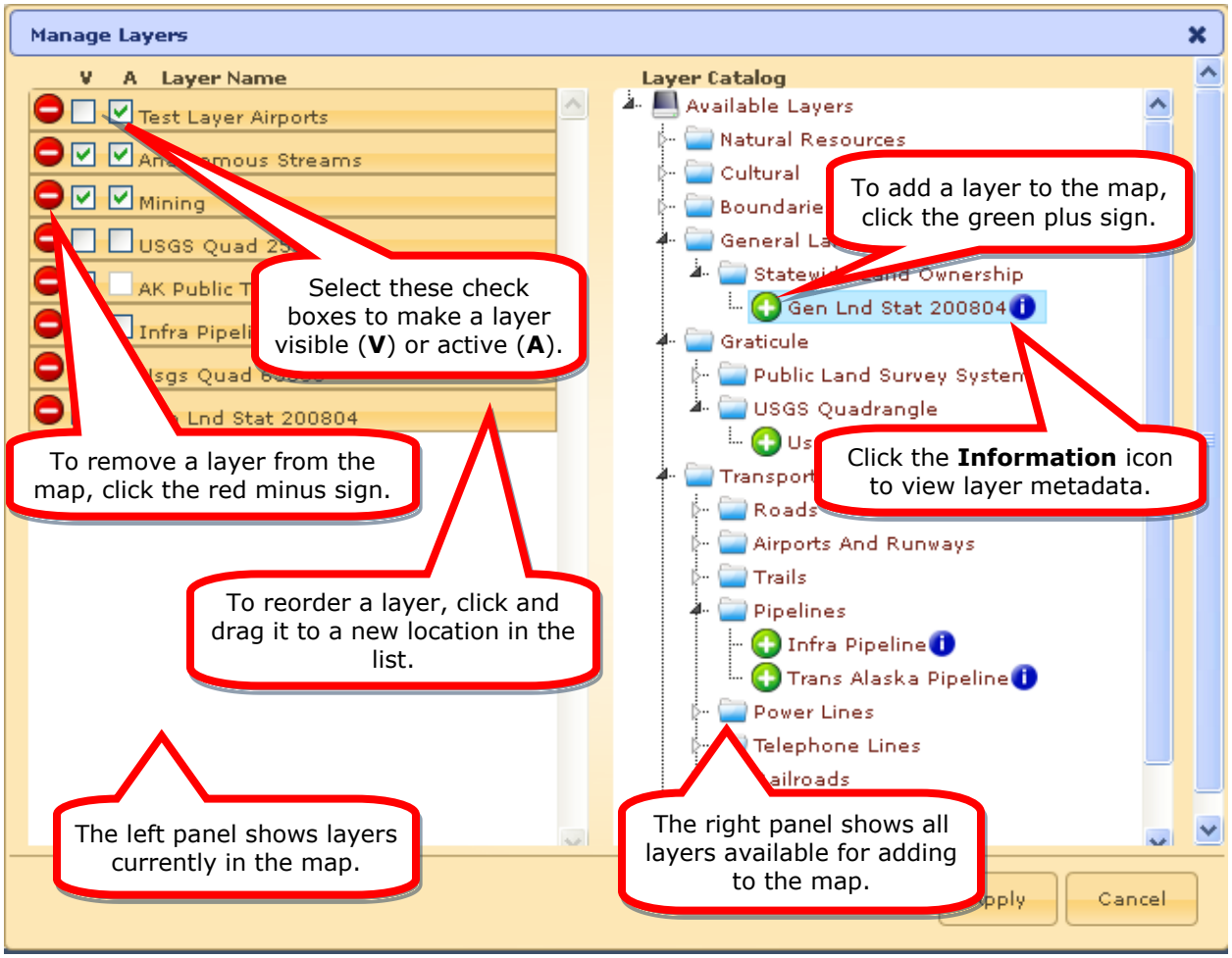


Figure 12 – Managing Map Layers

Viewing Layer Metadata and Extract Layer Data

Information about the data contained within the layers is called layer metadata or dataset metadata. You can view this information by clicking the **Information** icon to the right of a layer name in the Manage Layers window. A new window will appear containing the layer metadata (see Figure 13).

You can extract all the data in the layer by clicking the link identified in Figure 13 and then entering your e-mail address. An e-mail will be delivered to your inbox when the extraction is complete. Depending on the size of the layer dataset, this process may take a number of hours to complete. Please do not retry the extract until you receive an e-mail response.

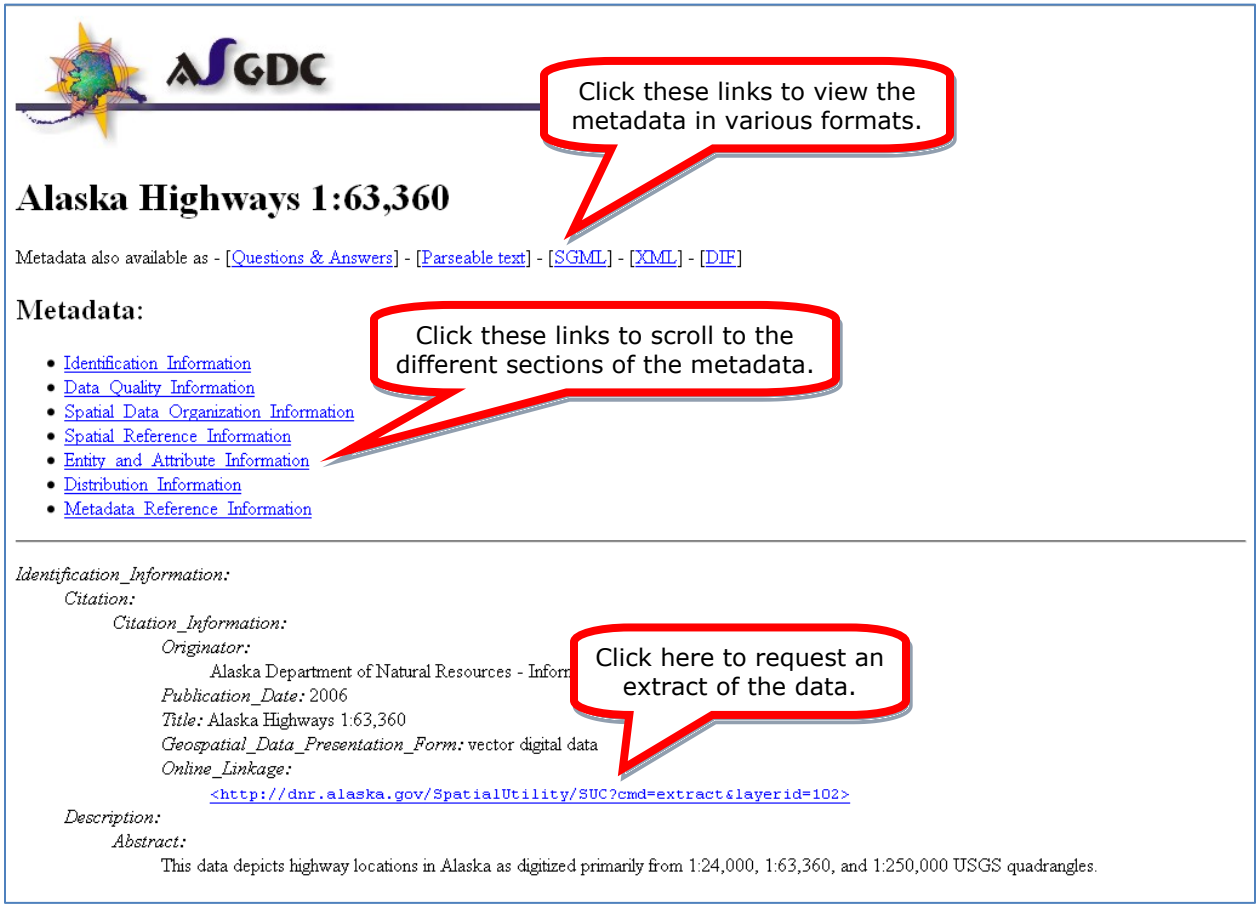


Figure 13 - Layer Metadata

Base Map Options

The **Base Map** selector on the **Tools** tab allows you to select a background map.

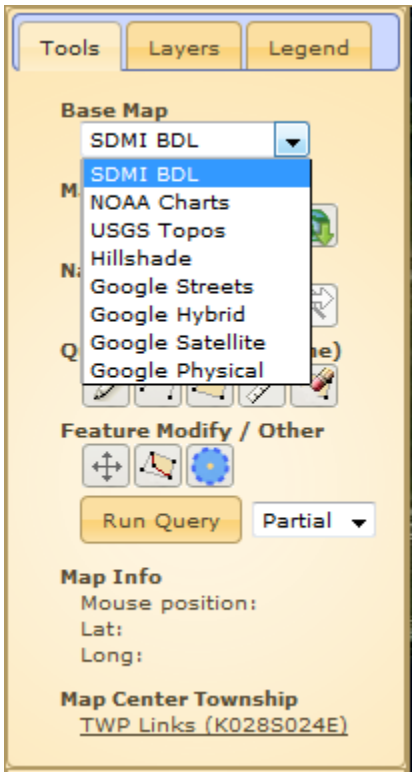


Figure 14 – Base Map Selector

Following are explanations of the available base maps.

Google Maps

Alaska Mapper provides the following Google maps:

- Google Streets
- Google Hybrid
- Google Satellite
- Google Physical

SDMI BDL

Satellite and aerial imagery are obtained from the Alaska Statewide Digital Mapping Initiative (SDMI) (http://www.alaskamapped.org) through the University of Alaska. The imagery has been orthorectified, a process that removes distortions so that the images are geometrically correct and able to be used as planimetric maps. The detail of the imagery is set by the viewing scale of your map. As you zoom into an area, higher resolution images will appear if they are available for that portion of the state. The SDMI's goal is to provide new statewide data layers for imagery and elevation models that are more detailed than imagery presently available.

NOAA Nautical Charts

The NOAA base map option is composed of scanned images of the National Oceanic and Atmospheric Administration's (NOAA) Raster Navigational Chart for Alaskan waters. This

chart is a graphic portrayal of the marine environment showing the nature and form of the coast and the general configuration of the sea bottom. **Note:** This chart is not intended for navigational use.

USGS Topographic Map

The USGS Topos base map option uses digital raster graphics (DRG), which are scanned images of United States Geological Survey (USGS) standard-series topographic maps. These images were originally georeferenced to the Universal Transverse Mercator (UTM) projection. Since then, they have been converted into a seamless layer and served under various projections (for example, Alaska Albers NAD 83). This map ranges in scale from 1:250,000 to 1:24,000.

Viewing Elevation Models as Hillshade Imagery

The Hillshade base map option uses shading to indicate features such as mountains, valleys, plateaus and canyons. Areas that are flat or have few features are smooth on the map, whereas areas with steep slopes and mountains appear rougher. This map is derived from the digital elevation models (DEMs) in the USGS's National Elevation Database. This map is suitable for use at scales greater than 1:63,000.

Map Tools

This section provides detailed explanations of many of the tools found on the **Tools** tab.

Hints and Tips

Following are some hints and tips on using the map tools:

- Only one tool can be used at a time.
- Once a tool is selected it will highlight in orange.
  - This is how the **Pan** tool looks when it is not selected: .
  - This is how the **Pan** tool looks when it is selected: .

Navigation Tools

Pan Tool

The **Pan** tool allows you to move the map view by clicking and dragging with the pointer. This tool also allows you to use the mouse scroll button to zoom in and out. The faster you scroll, the faster the map will zoom in or out. You can use the **Previous View** and **Next View** tools to move back and forth through previous zoom levels.

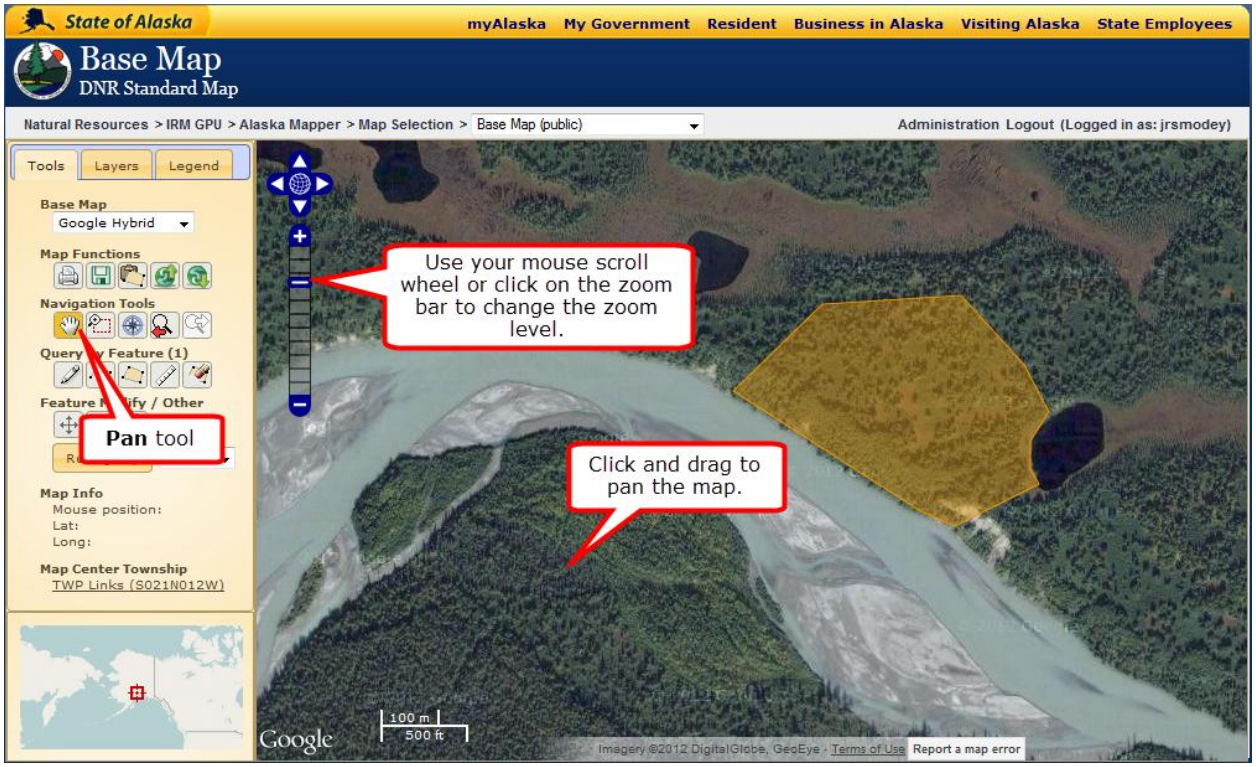


Figure 15 – Pan Tool

Zoom Tool

When the **Zoom** tool is selected, you can click the map once to zoom in by an approximate factor of two. The map will also recenter on the point on which you click.

You can also zoom in by drawing a rectangle. To do so, click the map, and while holding down the mouse button, drag the pointer. A red rectangle will appear. When the rectangle is the desired size, release the mouse button. The map will zoom into the area enclosed in the rectangle. The smaller the rectangle you draw, the more the map will zoom in.

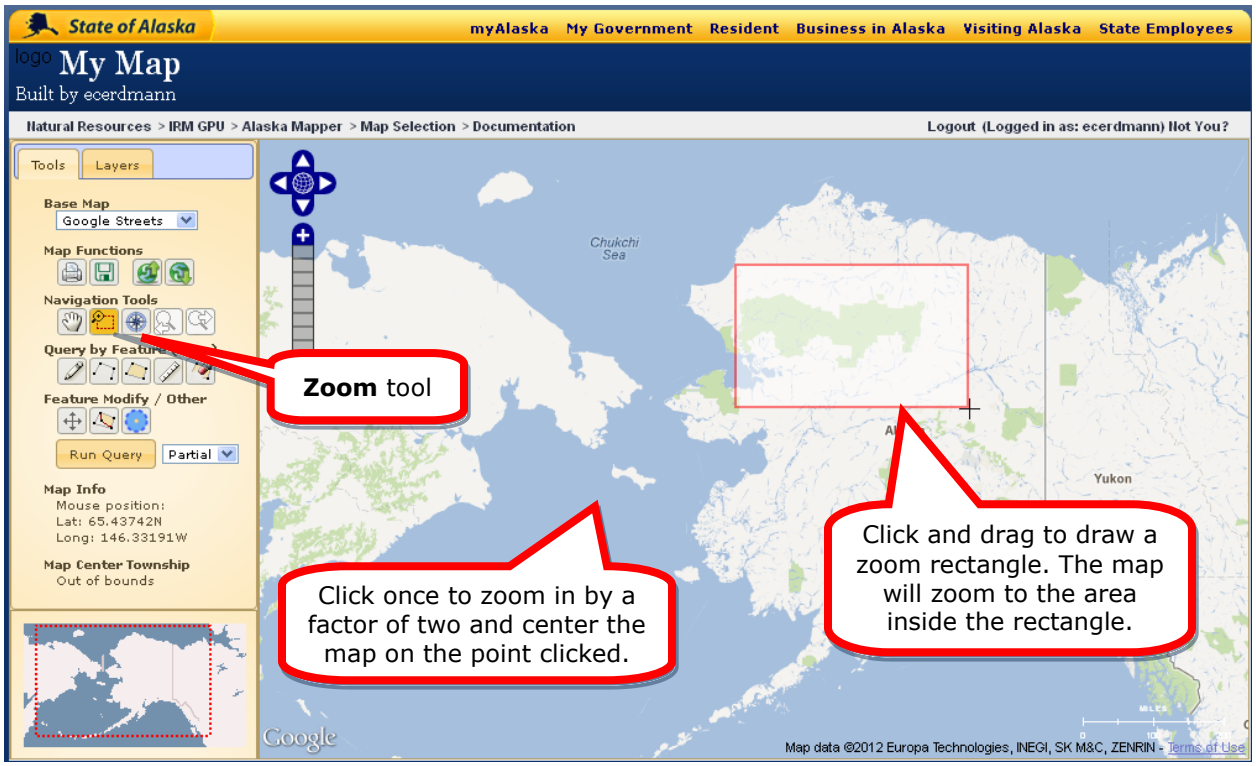


Figure 16 – Zoom Tool

Map Navigation Tool

The **Map Navigation** tool is a quick way to navigate to an area of interest on the map and use that area in a query. The tool offers a variety of options that allow you to navigate directly to features such as Alaska place names, boroughs, municipalities, and latitude and longitude coordinates.

To navigate to an area of interest and use it in a query:

1. Click the **Map Navigation** icon. The Go to Area of Interest window displays.
2. Select a navigation option from the list box (see Table 2 on page 31 for more information about these options).

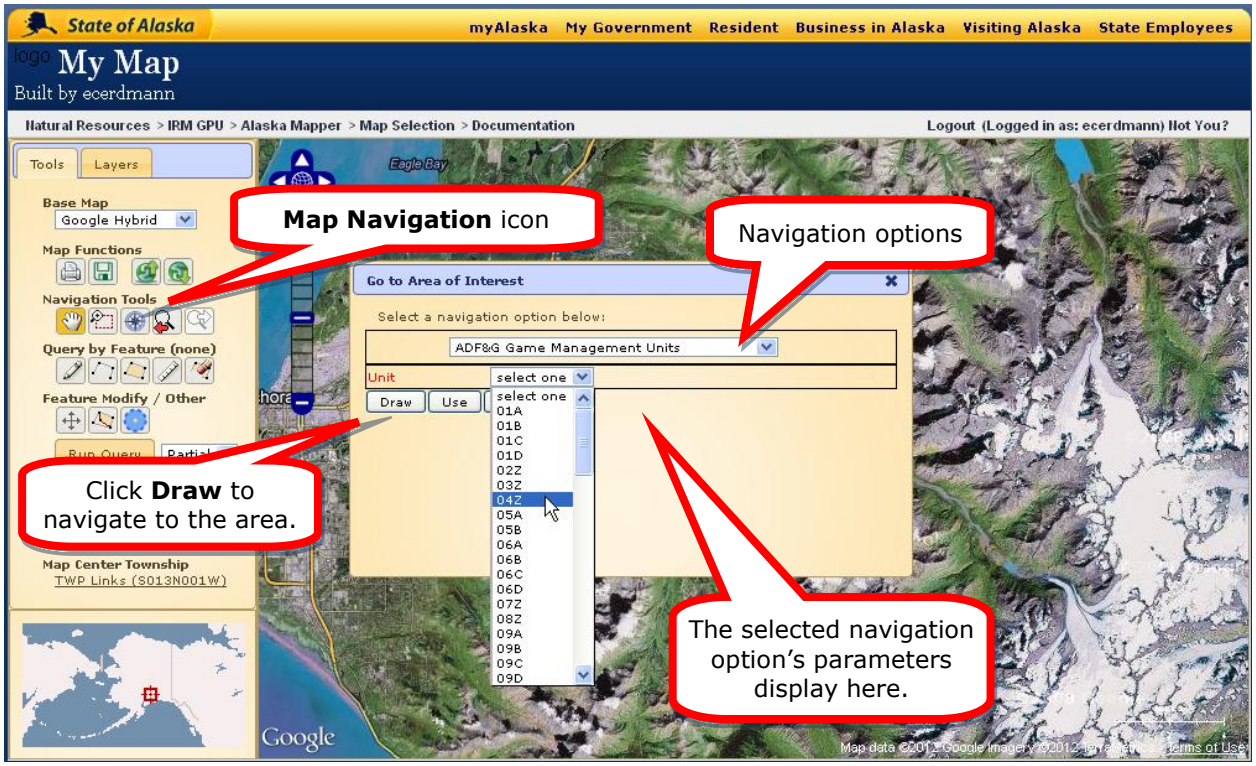


Figure 17 – Map Navigation Tool (Entering Parameters)

3. Enter the required parameters for the selected navigation option. Each option requires different information. For example, in Figure 17 we have selected the "ADF&G Game Management Units" option, which requires us to select a value from the **Unit** dropdown menu.

4. Click **Draw** to preview the area of interest on the map. Queries cannot be run on this preview.

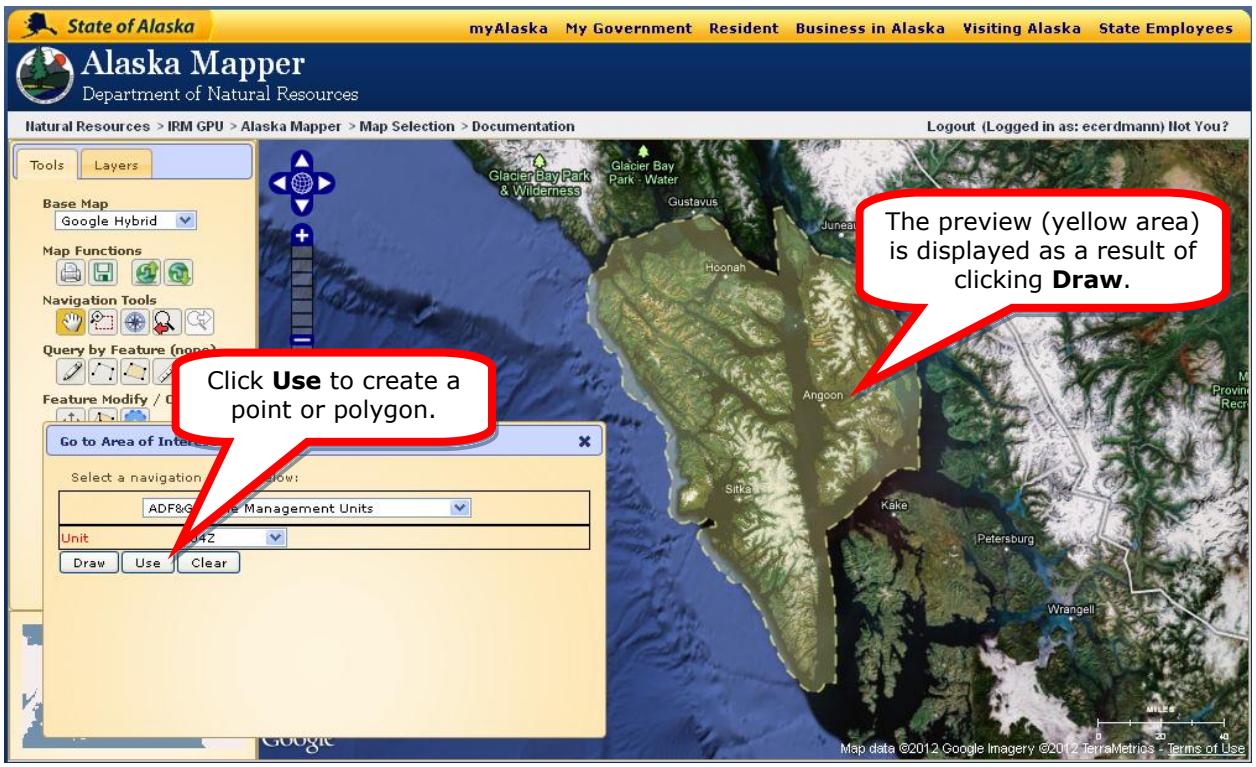


Figure 18 – Map Navigation Tool (Previewing the Area of Interest)

5. To be able to run queries against the selected area of interest, click **Use**. This will create a point or a polygon using the previewed area.

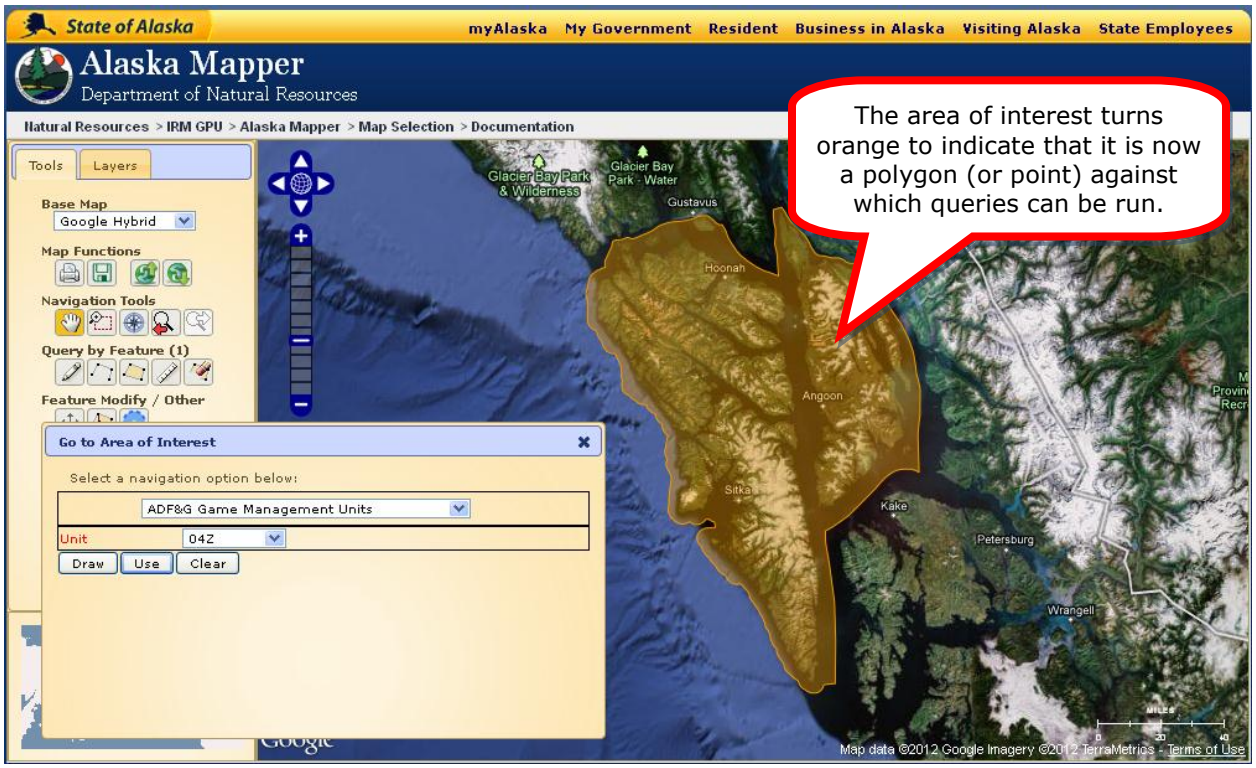


Figure 19 – Map Navigation Tool (Creating a Polygon)

6. You can now use the area of interest in a query. See "Spatial Queries" on page 41 for more information.

Table 2 – Map Navigation Options

Navigation Option	Description
Latitude and Longitude Decimal (WGS84)	Enter a latitude and longitude and click the **Draw** button to navigate directly to those coordinates. See the Appendix on page 53 for some tips on using this navigation option. **Note: Latitude** and **Longitude** accept up to five decimal places. Additionally, **Longitude** accepts negative numbers.
Latitude and Longitude DMS (WGS84)	Enter a latitude and longitude in Degrees Minutes Seconds format, and click the **Draw** button to navigate directly to those coordinates. See the Appendix on page 53 for some tips on using this navigation option.
ADF&G Game Management Units	Select a game management unit from the list box and click the **Draw** button to navigate to the unit.
ANCSA Corporation Boundaries	Select an ANCSA Boundary from the list box and click the **Draw** button to navigate to the boundary.
Alaska Place Name	Enter a place name (e.g., "Juneau", "Kenai River" or "Knik Glacier"). As you type, a list of matching database entries will appear below the text box. When you see the location you are seeking, select it by clicking it, and then click the **Draw** button to navigate to the location.
Borough/Municipality	Select a borough or municipality from the list box and click **Draw** to navigate to it.
Coastal District	Select a coastal district from the list box and click **Draw** to navigate to the coastal district.
DNR Case (File Type and Number)	Select a file type and enter part or all of a file number, then click the **Go** button to navigate directly to the case on the map.
DNR Recording District	Select a recording district from the list box and click **Draw** to navigate to the recording district.
DOT Centerline Milepost	Select a route and a milepost from the list boxes, then click **Draw** to navigate to the specified location.
Election District (2002)	Select an election district from the list box and click **Draw** to navigate to the election district.
Legislatively Designated Area (LDA)	Select a LDA name from the list box and click **Draw** to navigate to the LDA.
PLSS Land	Enter a meridian, township, township direction, range, range direction, section number (optional) and aliquot part (optional), then click the **Draw** button to navigate directly to a township.

National Geodetic Survey (NGS) monument	Enter the name of the NGS monument. As you type, a list of matching database entries will appear below the text box. When you see the monument you are seeking, select it by clicking it, and then click the **Draw** button to navigate to the location.
Rural Education Attendance Areas (REAA)	Select an REAA name from the list box and click **Draw** to navigate to the REAA.
USGS 1:250,000 Topo Map Extent	Select a quadrangle name from the list box and click **Draw** to navigate to the specified quadrangle.
USGS 1:63,360 Topo Map Extent	Select a quadrangle name from the list box and click **Draw** to navigate to the specified quadrangle.
Address Geocoding (2004 TIGER/Line)	Enter a street address, including city and state, and click **Draw** to navigate to the location.

Query by Feature Tools

Draw Point Tool

The **Draw Point** tool is used to draw a single point on the map. Because of its specificity, this tool is most useful when you are seeking a single feature, and you know exactly where that feature resides.

After drawing a point, click **Run Query** to determine which layer features interact with the point. See "Spatial Queries" on page 41 for more information.

Note: When using this tool, make sure you are zoomed in sufficiently. If you are zoomed out too far, your point may be off the mark.

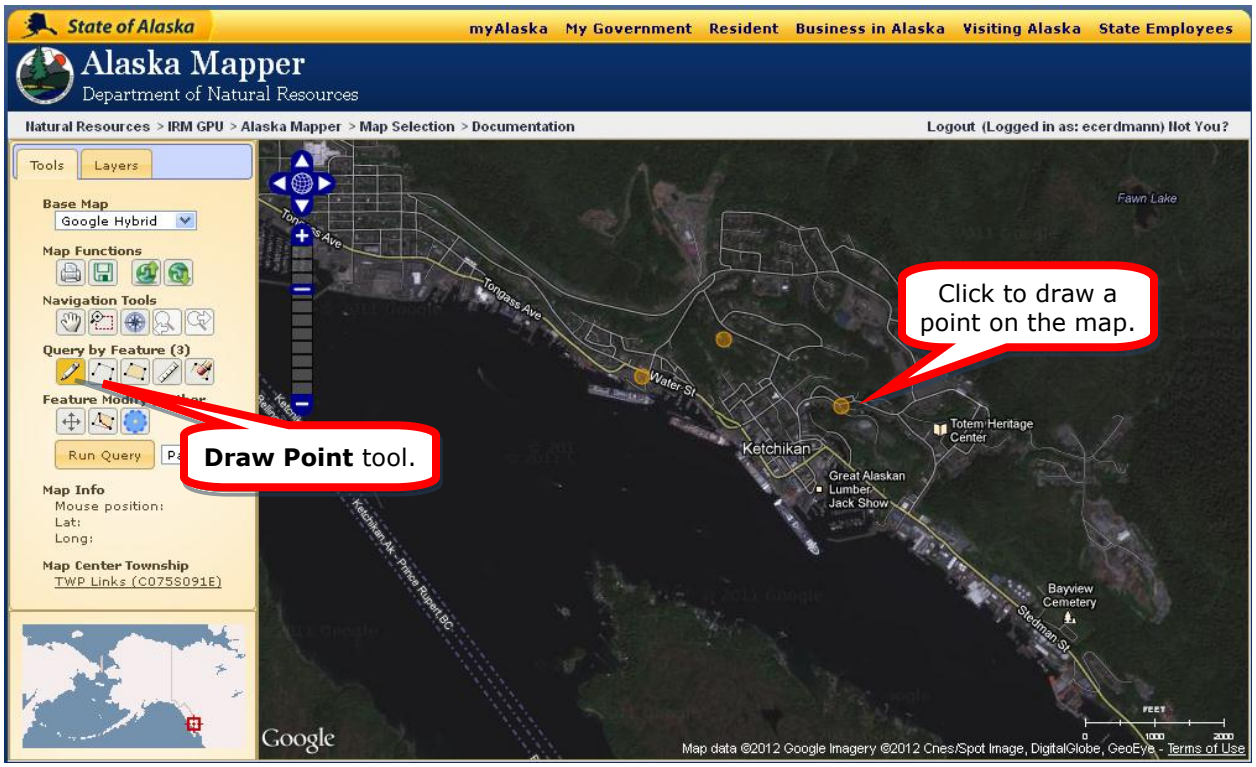


Figure 20 – Draw Point Tool

Draw Line Tool

The **Draw Line** tool allows you to draw a line on the map. To begin drawing a line, click once on the map, and then move the pointer to draw. To create a corner, click once and then continue drawing. Double-click to complete the line.

After drawing a line, click **Run Query** to determine which layer features interact with the line. See "Spatial Queries" on page 41 for more information.

Figure 21 – Draw Line Tool

Draw Polygon Tool

The **Draw Polygon** tool allows you to draw a multi-sided shape on the map. To begin drawing, click once on the map, and then move the pointer to draw. To create a perimeter point, click once again and then continue drawing. As you create perimeter points, the polygon forms like a rubber band snapping around the points. Double-click to complete the polygon.

After drawing a polygon, click **Run Query** to determine which layer features interact with the polygon. See "Spatial Queries" on page 41 for more information.

Note: Using the **Draw Polygon** tool from a zoomed out view may result in too many returned features in the query results. To avoid this, zoom in closer on the map view.

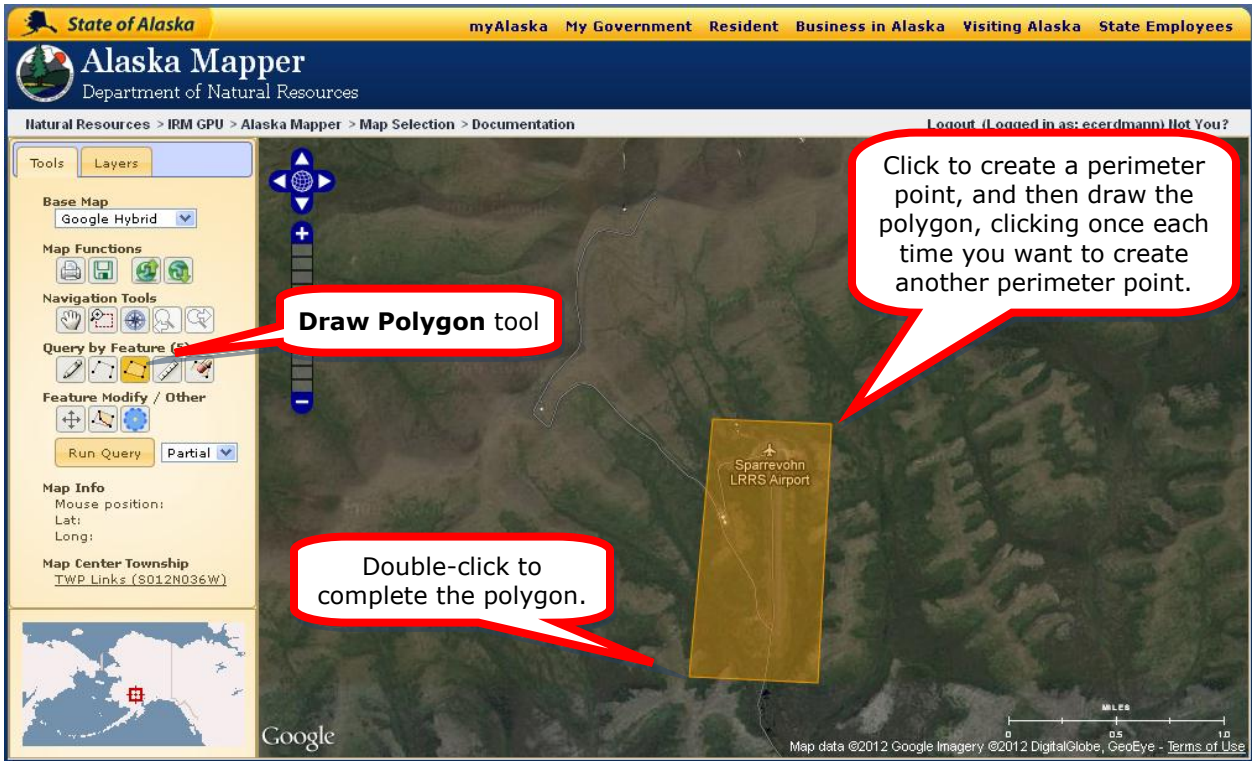


Figure 22 – Draw Polygon Tool

Measure Distance or Area Tool

The **Measure Distance or Area** tool allows you to measure the length of a line or the area of a polygon drawn on the map. When you select this tool, the Distance Measuring Tools window displays, allowing you to select **Measure Distance** or **Measure Area**. When using this tool, lines and polygons are drawn in much the same way as they are with the **Draw Line** and **Draw Polygon** tools.

If you select **Measure Distance**, you can then draw a line on the map, and the total distance of the line will display in the Distance Measuring Tools window (see Figure 23).

If you select **Measure Area**, you can draw a polygon on the map, and the area of the polygon will display (see Figure 24).

Measure Tool Options

show segments length – display the length of the segment's between the nodes (clicks).

show the area perimeter length – display the total length of all the segments that makes up the boundary of the polygon drawn.

show segments heading – display the heading (in degrees) of the angle in which the pointer is relative to the last node (click). Note: it is not recommended to have **show vertices** selected at the same time as they will obstruct each other.

show vertices – display the node (click) coordinates in WGS84. Export the coordinates by clicking the "Export" button. This will display a dialog which the text can be copied & pasted. Note: it is not recommended to have **show segments heading** selected at the same time as they will obstruct each other.

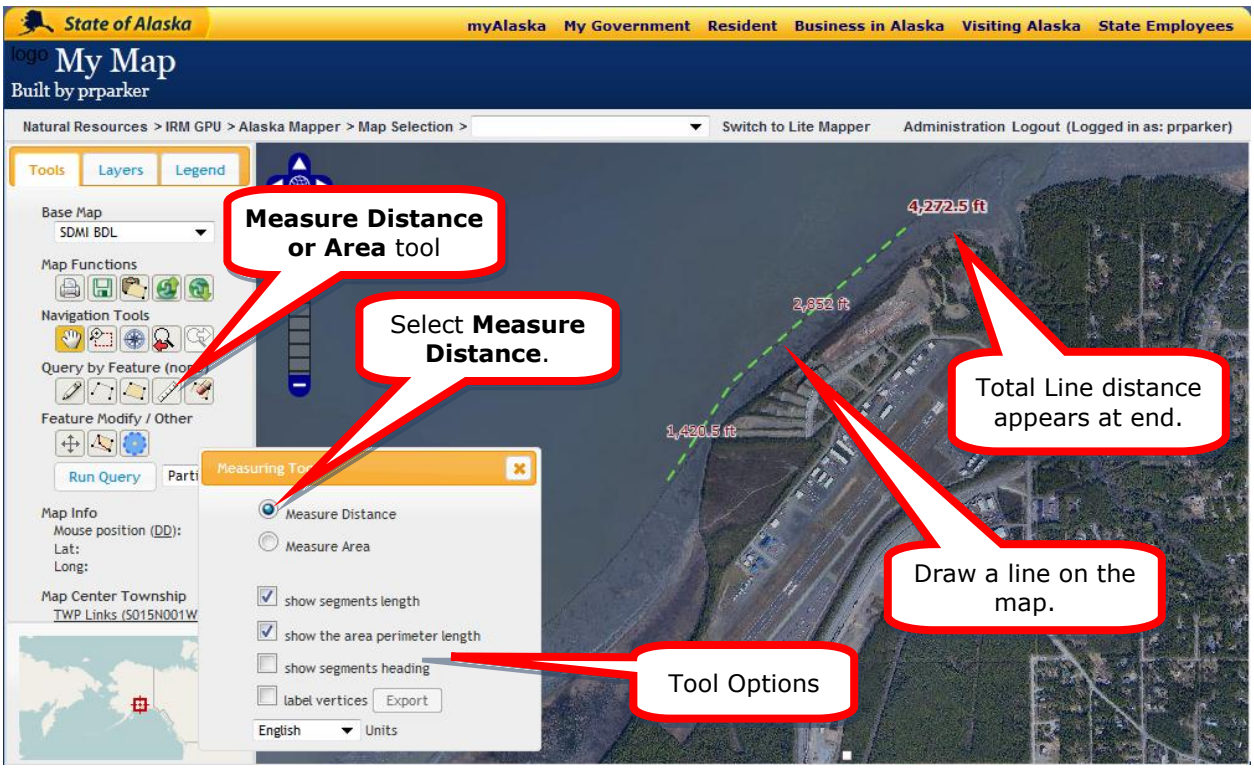


Figure 23 – Measure Distance

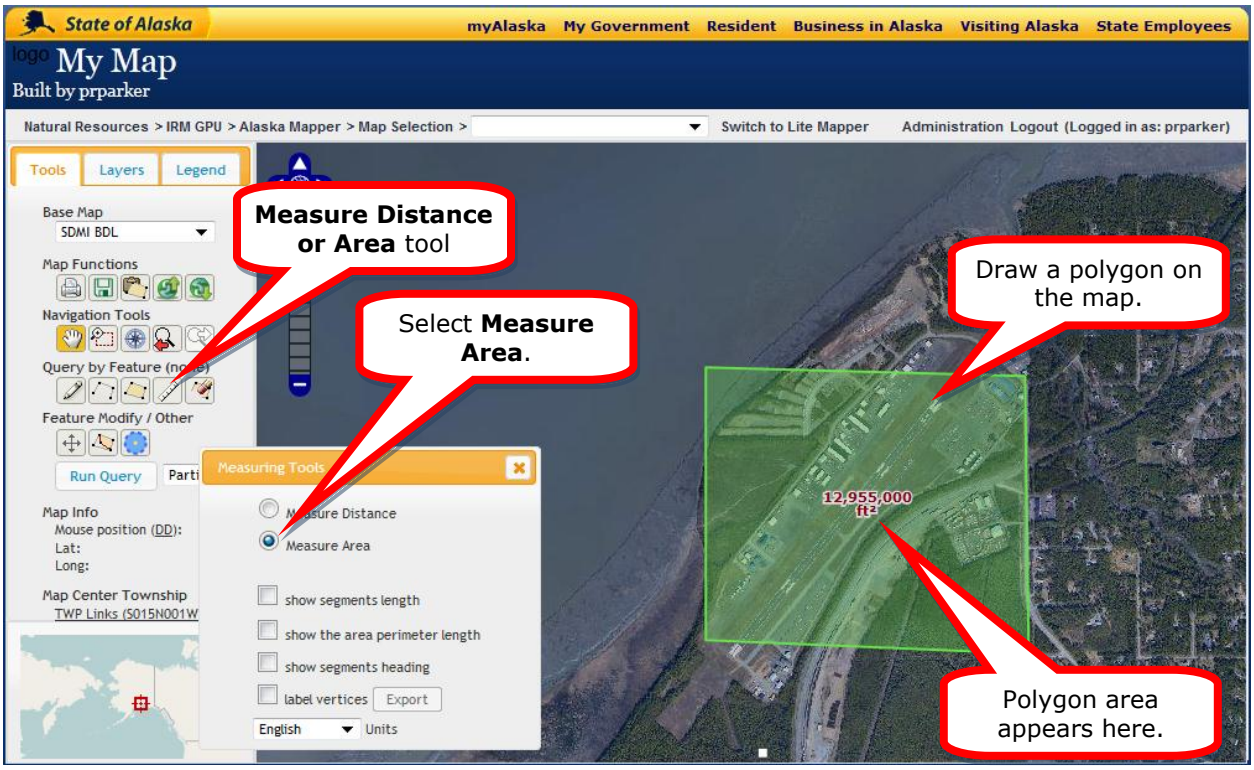


Figure 24 – Measure Area

Erase Feature Tool

The **Erase Feature** tool allows you to remove points, lines and polygons that you have drawn on the map. After selecting the **Erase Feature** tool, you can erase a feature simply by clicking it. To erase multiple features at once, click and drag a rectangle over the features. Any feature that touches the rectangle will be deleted when you release the mouse button. For example, in Figure 25, two points and a polygon will be erased from the map.

Note: There is no **Undo** function for the **Erase Feature** tool. Once you clear a feature, it is lost permanently.

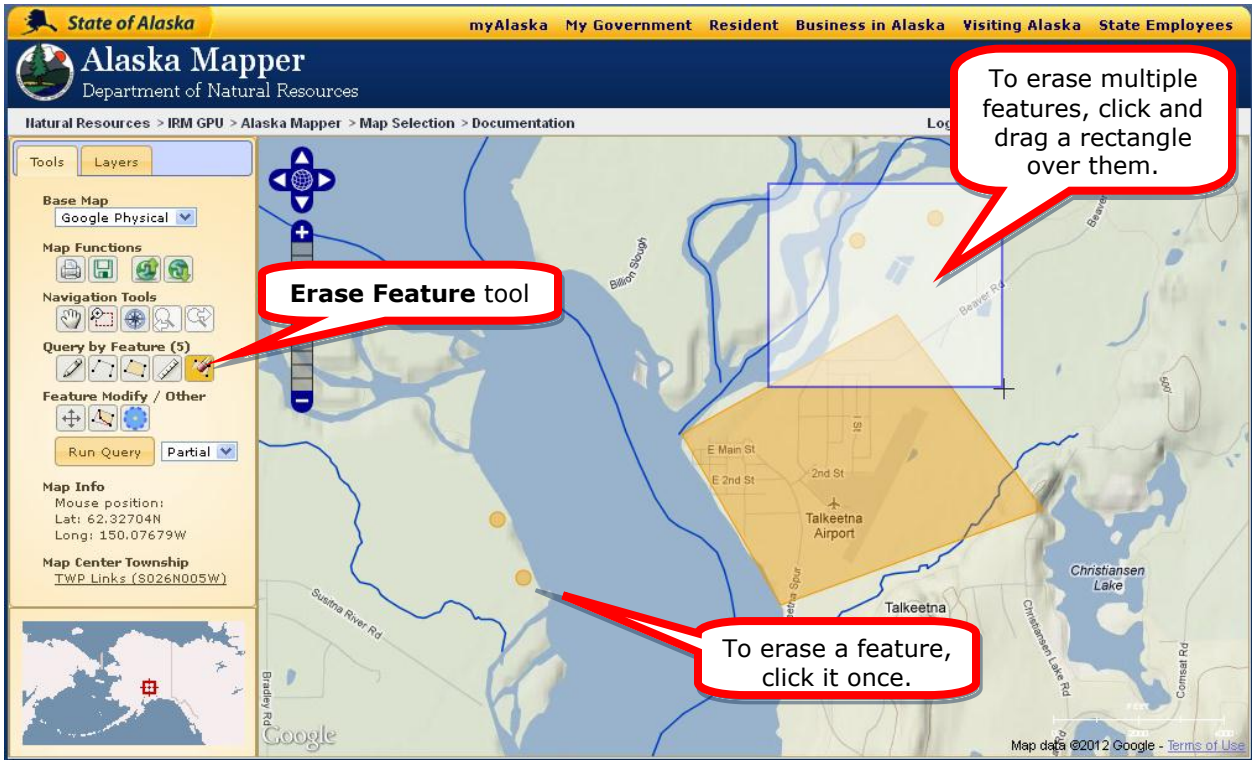


Figure 25 – Erase Feature Tool

Feature Modification Tools

Move Feature Tool

The **Move Feature** tool allows you to move a point, line or polygon to a different location. After selecting this tool, click the feature you want to move and drag it to its new location.

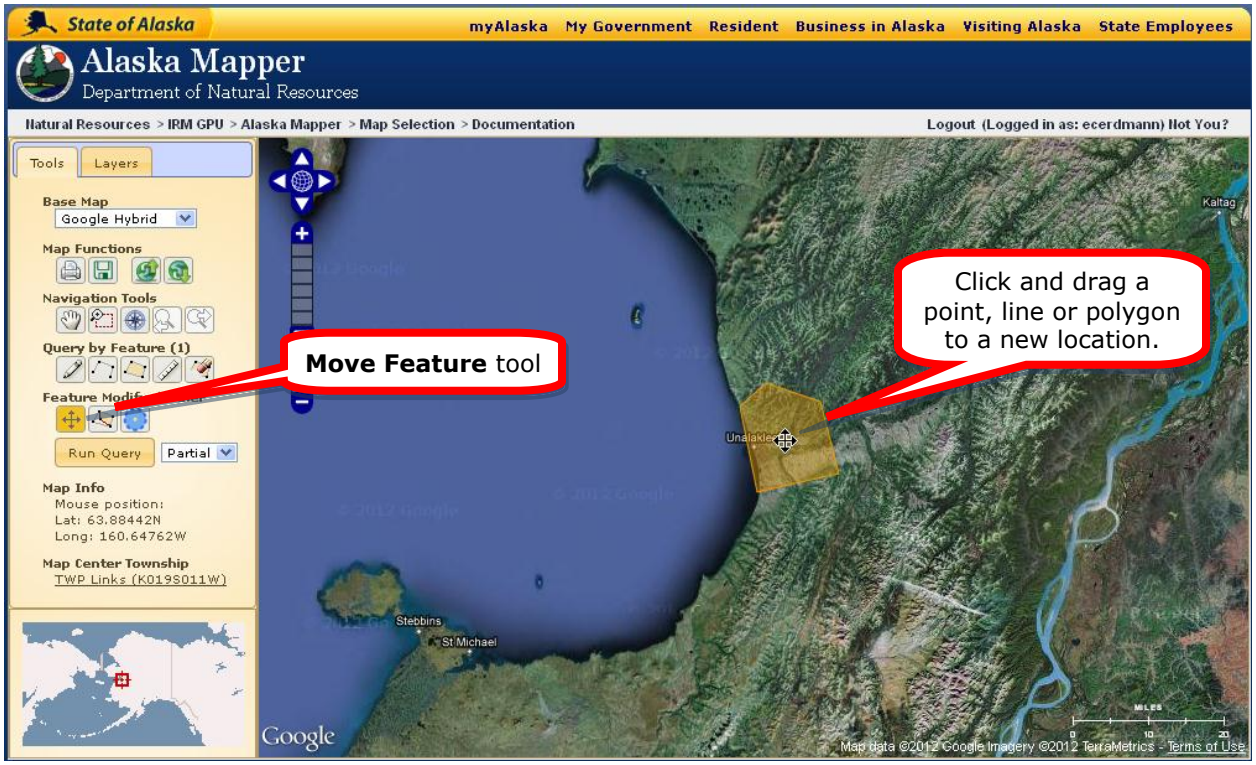


Figure 26 – Move Feature Tool

Modify Feature Tool

The **Modify Feature** tool allows you to alter an existing point, polygon or line. After selecting this tool, click the feature that you wish to modify. The feature will turn blue. If the feature is a line or polygon, several orange points will appear on it. To alter the feature, click and drag one of the orange points, as shown in Figure 27. If the feature is a point, the **Modify Feature** tool provides the same functionality as the **Move Feature** tool, allowing you to click and drag the point to a new location.

When you are finished modifying the feature, click outside of the shape to make your changes final.

Tip: To see how your feature modification has affected a previously run query, rerun the query by clicking **Run Query**.

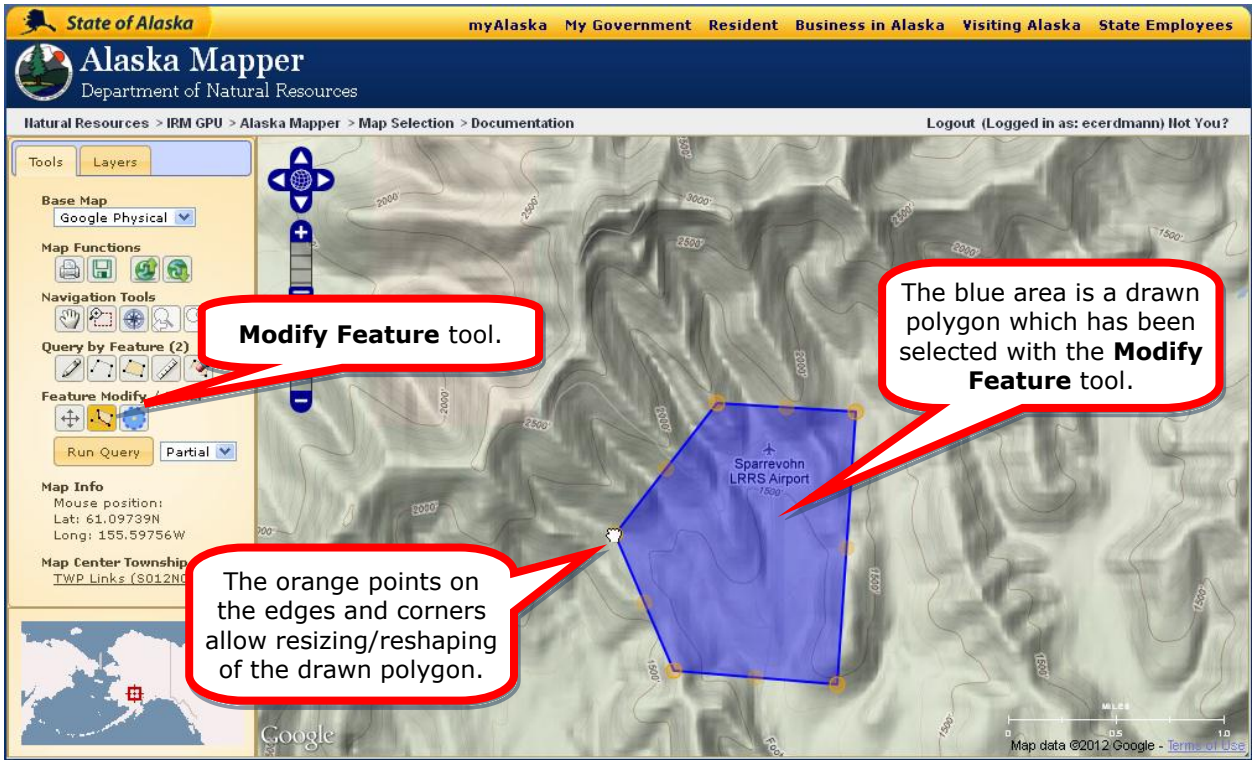


Figure 27 – Modify Feature Tool

Buffer Tool

The **Buffer** tool allows you to extend the area of a point, line or polygon by creating a buffer area around the shape. The buffer can be converted to a polygon that can then be used in queries.

To create a buffer for use in a query:

1. Using the map tools, draw the feature around which you wish to create a buffer.
2. Click the **Buffer** tool icon. The Buffer Feature window displays.
3. Enter a number in the **Outer Buffer** field.

   Tip: If necessary, you can select a different unit of measurement from the **Distance Units** dropdown.
4. If necessary, enter a value in the **Inner Buffer** field. Doing so will create an empty area in the center of the buffer.
5. Click **Draw** to preview the buffer on the map. The buffer appears with a blue-green dotted border and fill. Queries cannot be run on this preview.

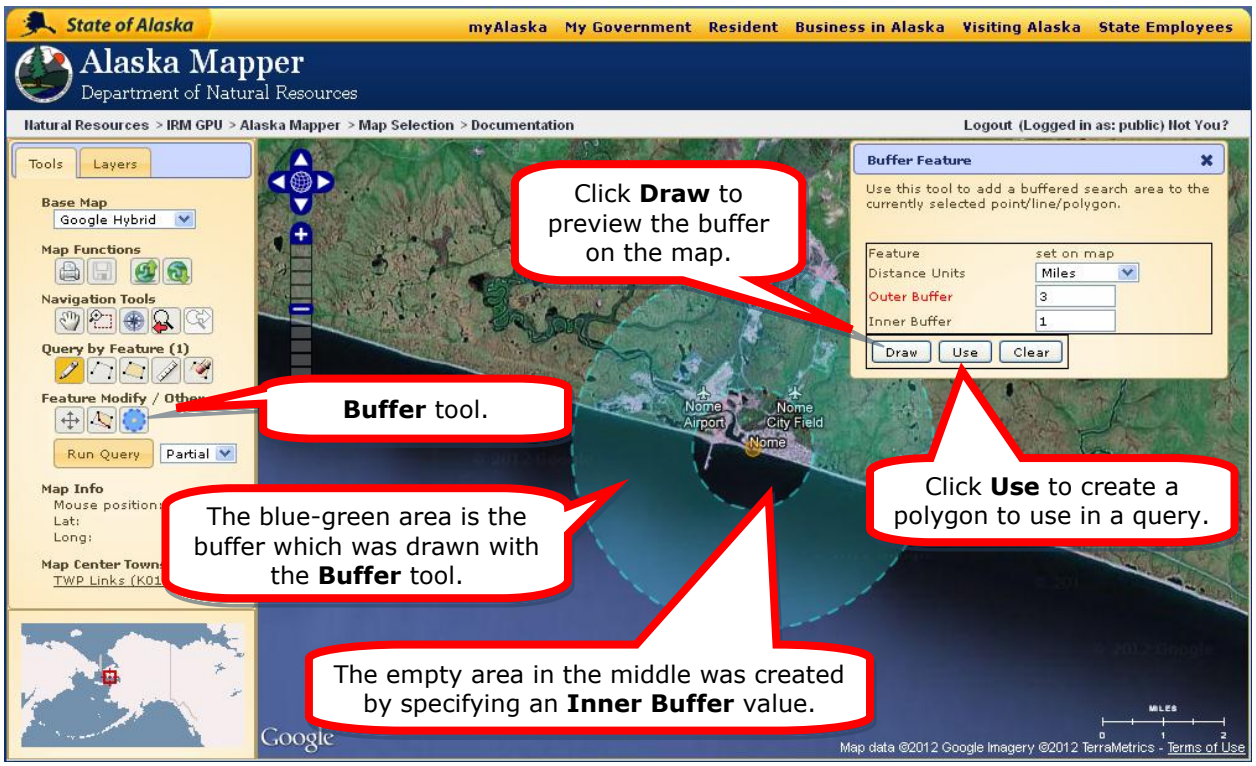


Figure 28 – Drawing a Buffer

6. If the drawn buffer is sufficient, click **Use**. A new polygon is created from the buffer area. (If you would like to redraw the buffer, repeat steps 3 – 5.) **Tip:** To remove a buffer, click **Clear**.

   You can now use the polygon in a query. See "Spatial Queries" on page 41.

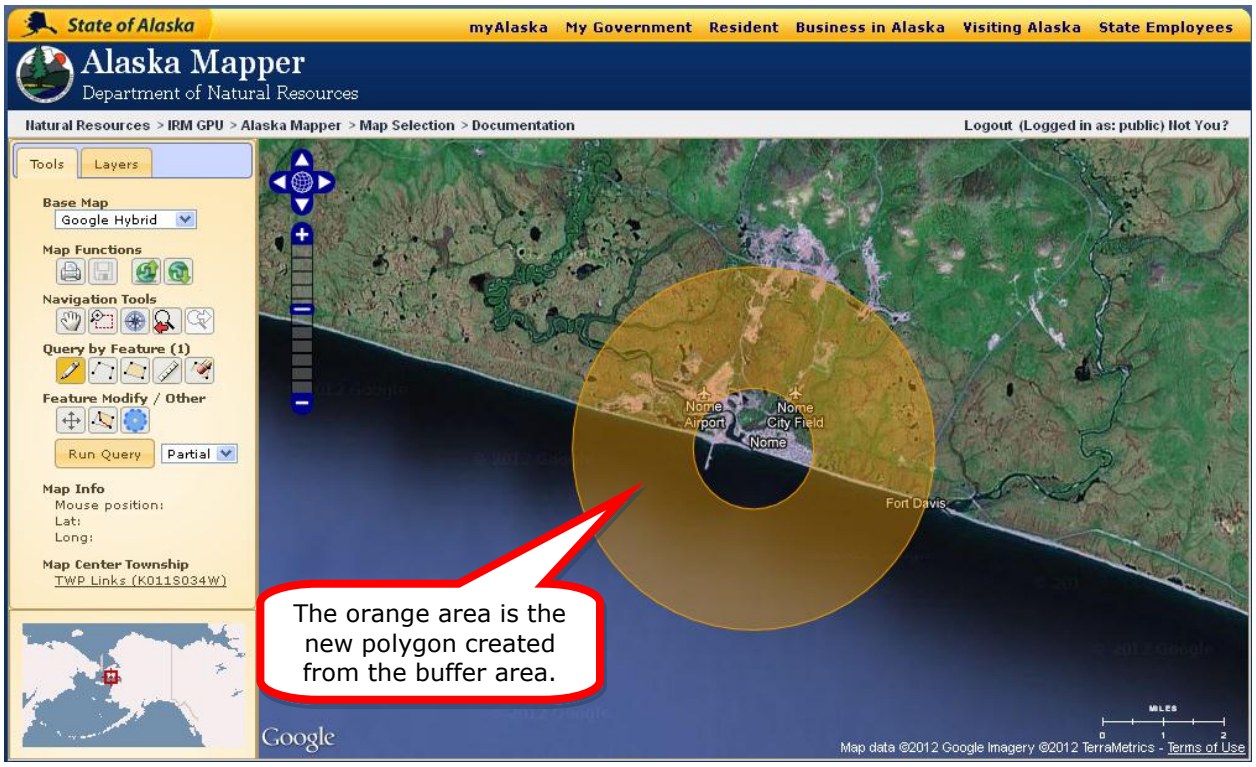


Figure 29 – Creating a Polygon with the Buffer Tool

Spatial Queries

Alaska Mapper's query function allows you to determine if any features found in the active map layers interact with a feature that you have drawn on the map.

Note: When you query map data, only the active layers are included in the query results. You can make layers active and inactive on the **Layers** tab.

Running a Query

To query map data:

1. Draw a feature on the map using one of the following methods:
    - Use the **Draw Point**, **Draw Line** or **Draw Polygon** tool to manually draw the feature. See "Query by Feature Tools" on page 33 for details.
    - Use the **Map Navigation** tool to navigate to an area of interest and create a polygon feature around it. See "Map Navigation Tool" on page 28 for details.
    - Use the **Buffer** tool to create a buffer area around an existing feature and generate a polygon from it. See "Buffer Tool" on page 39 for details.
2. Select a search type from the **Search Type** list box to the right of the **Run Query** button. See "Search Types" below.
3. Click **Run Query**. Results are displayed in the Query Results window. See "Query Results" on page 43.

Search Types

Alaska Mapper offers three search types that govern how features are selected when you run a query. You can select the search type from the list box next to the **Run Query** button on the **Tools** tab.

Following are descriptions of the search types:

Search Type	Description
Entire	When you are querying a polygon, a feature must be fully contained within the polygon to be included in the search results. When you are querying a point, the point must be fully contained in the feature for the feature to be selected. This search type is the most accurate.
MBR	A minimum bounding rectangle (MBR) is the smallest rectangle required to fully enclose a feature. With this search type, Alaska Mapper examines each feature's MBR to determine if it intersects the query boundary. This search type is a quick approximation that simplifies the features (reduces a feature to a simple rectangle) to allow much faster comparisons. This will often result in a large number of search results. This search type is the least accurate but can be useful when a more precise boundary is not known.
Partial	If a feature interacts (touches or falls within) the query boundary at all, it is selected.

Using Multiple Areas of Interest in a Query

If you run a query with multiple drawn features on the map, the Feature Selector dialog will display to allow you to select the features you would like to use in the query.

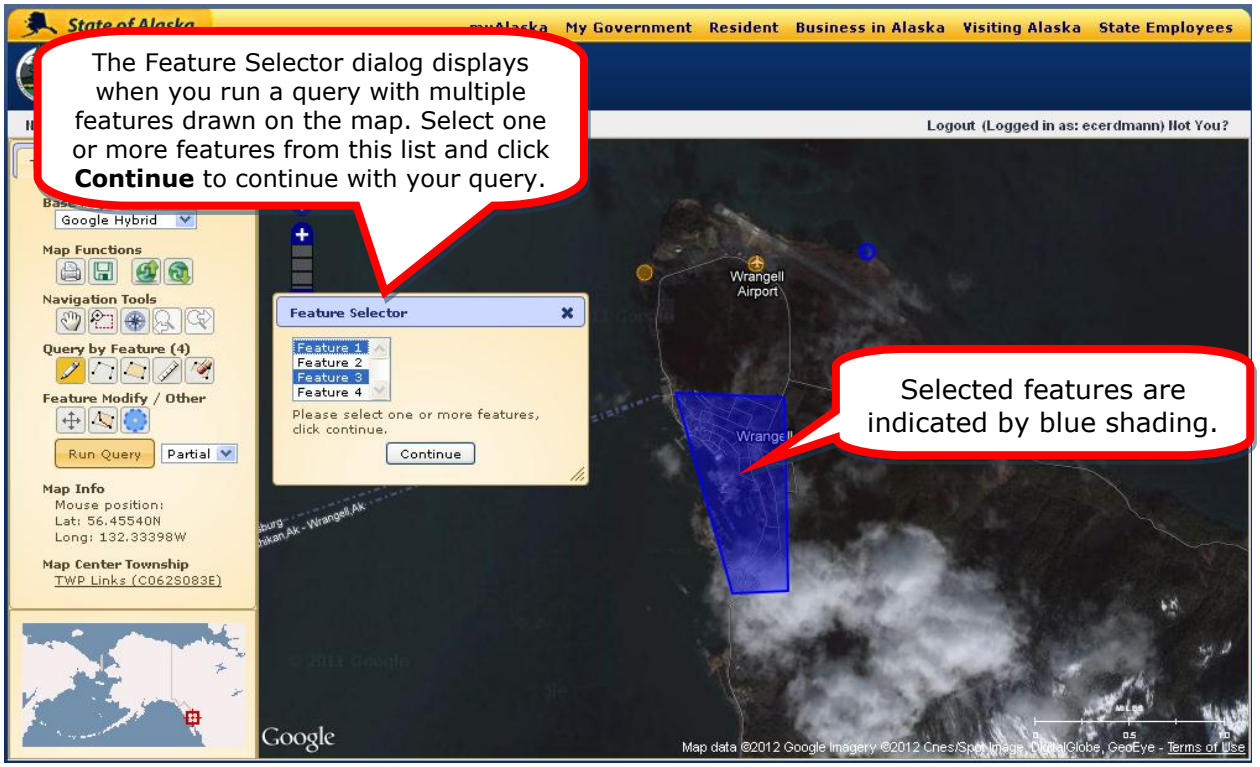


Figure 30 – Feature Selector Dialog

To use the Feature Selector dialog, select one or more features and click **Continue**. The query will run using the selected features. For example, in Figure 30 the query will be run on both the point and the polygon that are selected.

Note: To select multiple features, hold down the **Ctrl** or **Shift** key while clicking.

Query Results

The Query Results window displays the results of the query in tabular format and allows you to sort the results, export them as a spreadsheet or PDF, print them and view additional information about the report analysis.

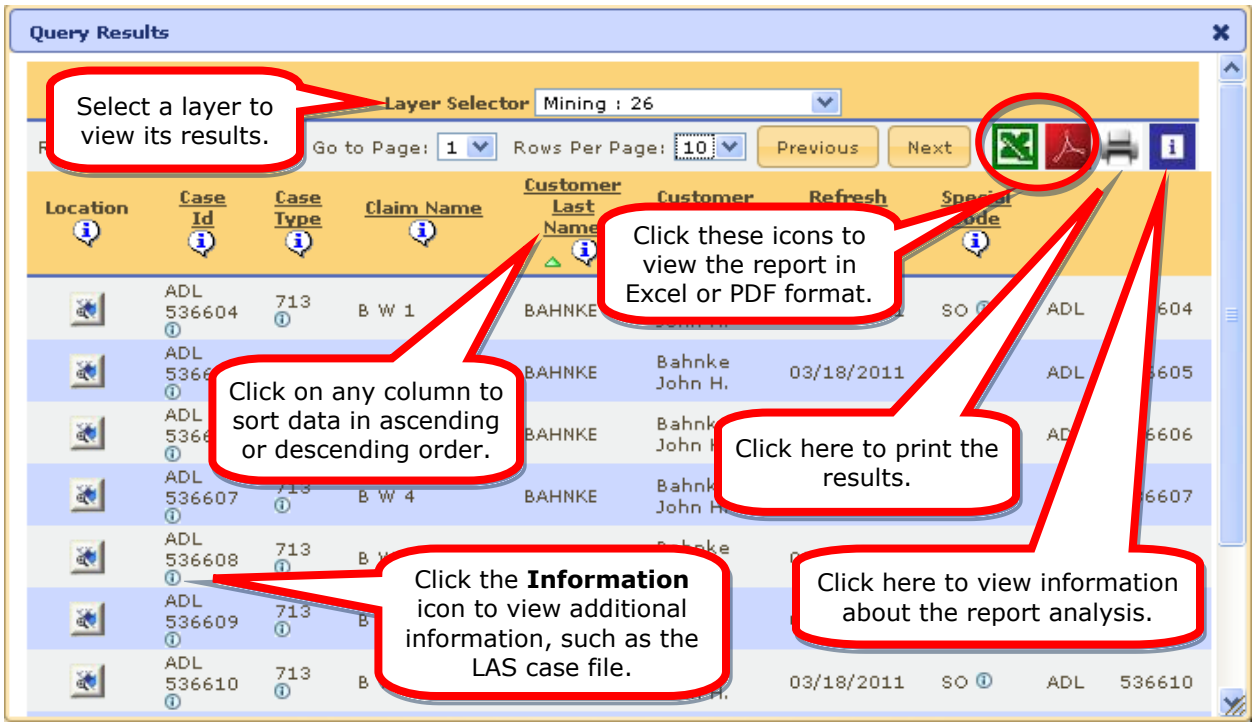


Figure 31 – Query Results Window

Layer Selector

Query results are grouped by layer. To view the results for a particular layer, select the layer from the **Layer Selector** dropdown.

Paging Options

Rows Per Page

The **Rows Per Page** selector allows you to limit the number of rows that display on each page of the report. To change this number, click the **Rows Per Page** dropdown and select a value.

Moving from Page to Page

If there is more than one page of results, you can step back and forth through the pages using the **Previous** and **Next** buttons. You can also navigate directly to a specific page by clicking the **Go to Page** dropdown and choosing the page number.

Sorting the Report

To sort the results by a particular column, click that column's header. For example, in Figure 31 we have sorted the results by customer name by clicking the **Customer Last Name** column header. The results are sorted in ascending order as indicated by a green triangle under the column header. Clicking the column header a second time would result in a

descending sort order, which would be indicated by an upside-down green triangle. Clicking the header a third time would remove the sorting (no triangle).

You may sort the report by up to three columns. When you use multiple sort columns, the sort order of the columns is always from left to right. That is, the report is sorted by the leftmost sort column first, followed by the next sort column to the right of the first, followed by the next sort column to the right of the second.

Exporting the Report

Save to Excel

The **Save to Excel** button is used to open and save the report in a Microsoft Excel spreadsheet format. This spreadsheet can be edited as you see fit. If the search results include more than 5,000 records, the system will warn you that the report size needs to be smaller. The report will still export, but it may take several minutes or more.

Save to PDF

The **Save to PDF** button is used to open and save the report in a PDF format (this format may take a few moments to generate). If you have the appropriate Adobe software, this document can be edited as you see fit. As with the **Save to Excel** function, the system will warn you whenever the search results include more than 5,000 records.

Hyperlinks in the Query Results

Values in the columns of the query results will sometimes display with an **Information** icon ⓘ that, when clicked, displays useful information or connects you to other DNR systems.

Following are some examples of the hyperlinks that you may see:

Column	Result of Clicking the Information Icon ⓘ
File Number	You will be directed to the Land Administration System (LAS), which will display the case abstract that applies to that particular file number.
MTRS	You will be directed to the Alaska Land Records website, where you can search state and federal land records related to that township designation.
Case Type	A window will display a definition of that particular case type.
Case Subtype	A window will display a definition of that particular case subtype.
View Trail	A window will display information about that particular trail.

Viewing Features from Query Results

The **Location** column in the Query Results window contains a **Show Feature** button for each feature returned by the query. Click this button to zoom in and highlight the selected feature as show in Figure 32.

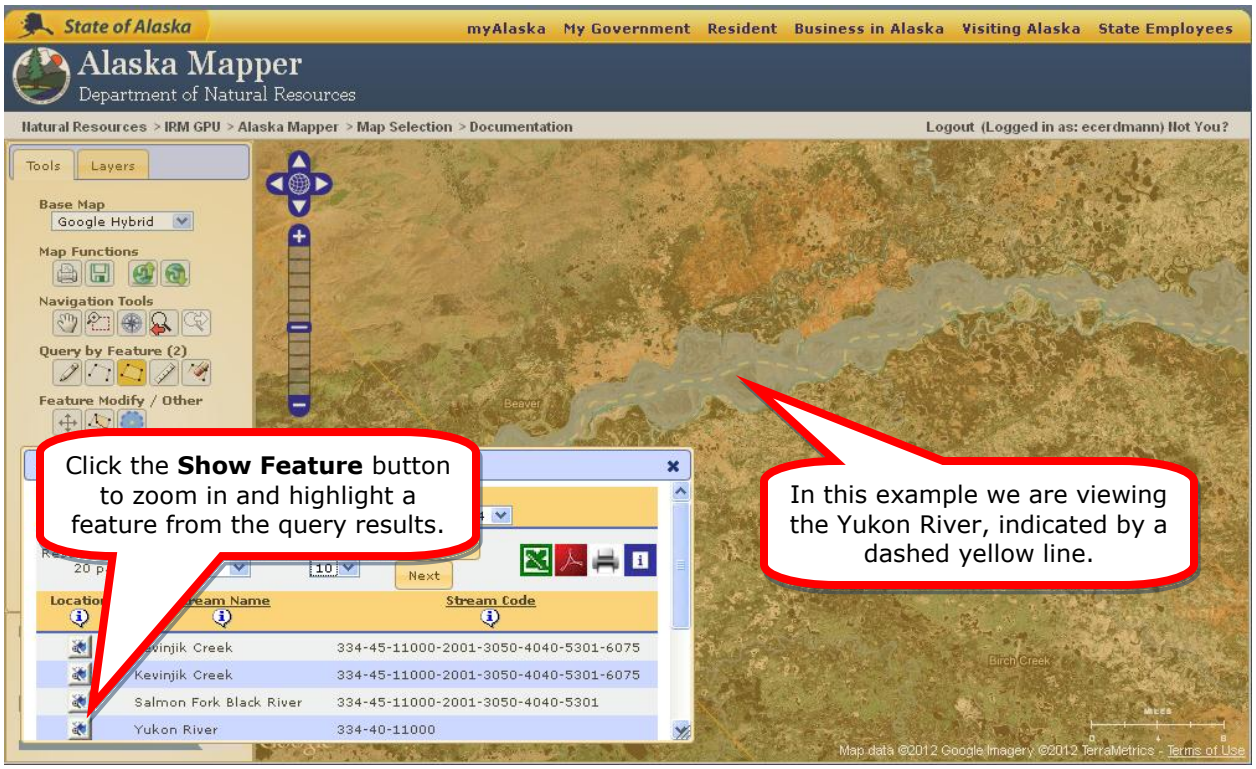
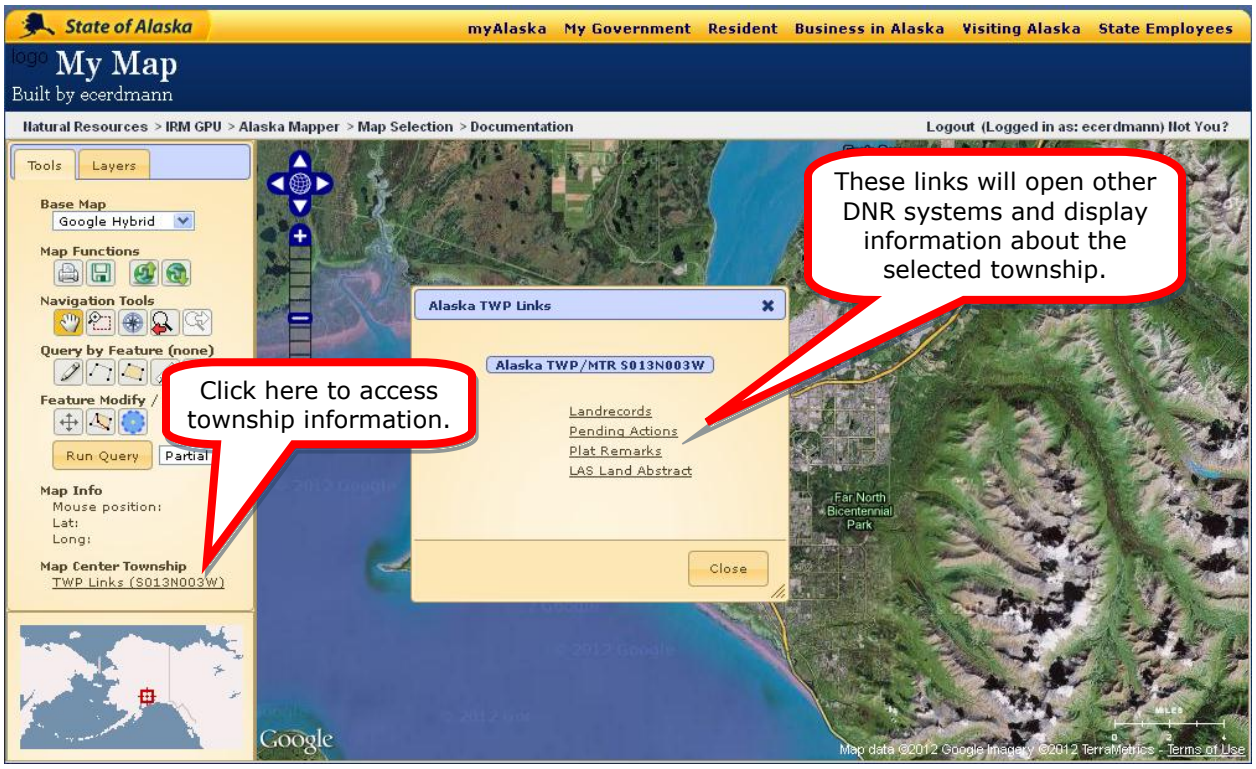


Figure 32 – Viewing a Feature from the Query Results

Viewing Township Information in Other Systems

At the bottom of the **Tools** tab, Alaska Mapper displays the township that is currently at the center of the map view. You can click this link to gain access to information about that township in other DNR systems.



Following are explanations of the links found in the Alaska TWP Links window:

Option	Description
Land Records	Opens the Alaska Land Records website, providing you access to a variety of information about the township, including state status plats, Web LAS reports, state surveys, federal land records and more
Pending Actions	Opens the Plat Information Management System and displays all pending actions for the township
Plat Remarks	Status plat remarks provide you with information about a township or a specific case file that may not be clearly represented on the map, including the following: • Coordinate information for the southeast corner of the township • Hydrography source used during the creation of the township • State and/or federal surveys in the township (not all federal surveys may be referenced) • Reference to the recording district and/or borough within which the township may fall • Special notations to help clarify the depiction of

	certain case files represented on the map Status plat remarks are updated on a regular basis during the update of the township data. We recommend that you check the remarks for updates that may have been added since the last map update.
LAS Land Abstract	Opens Web LAS and displays the township's land abstract. Web LAS is the system of record for all DNR land records. Help manuals and training guides for Web LAS are available on the DNR's Web site at http://dnr.alaska.gov/projects/las/lasmenu.cfm.

Uploading Shapefiles

Alaska Mapper allows you to upload map features in the form of shapefiles. Four files are required to upload a map, one in each of the following formats:

- .SHP
- .SHX
- .DBF
- .PRJ

To upload a shapefile:

1. Click the **Upload Shapefile** icon . The Upload Shapefiles window displays.
2. Click **Browse** and select one of the four required files. The selected file's name appears in the file list. Repeat this step until all four files are selected.
3. Click **Upload Documents**. The files are uploaded, and the map displays.

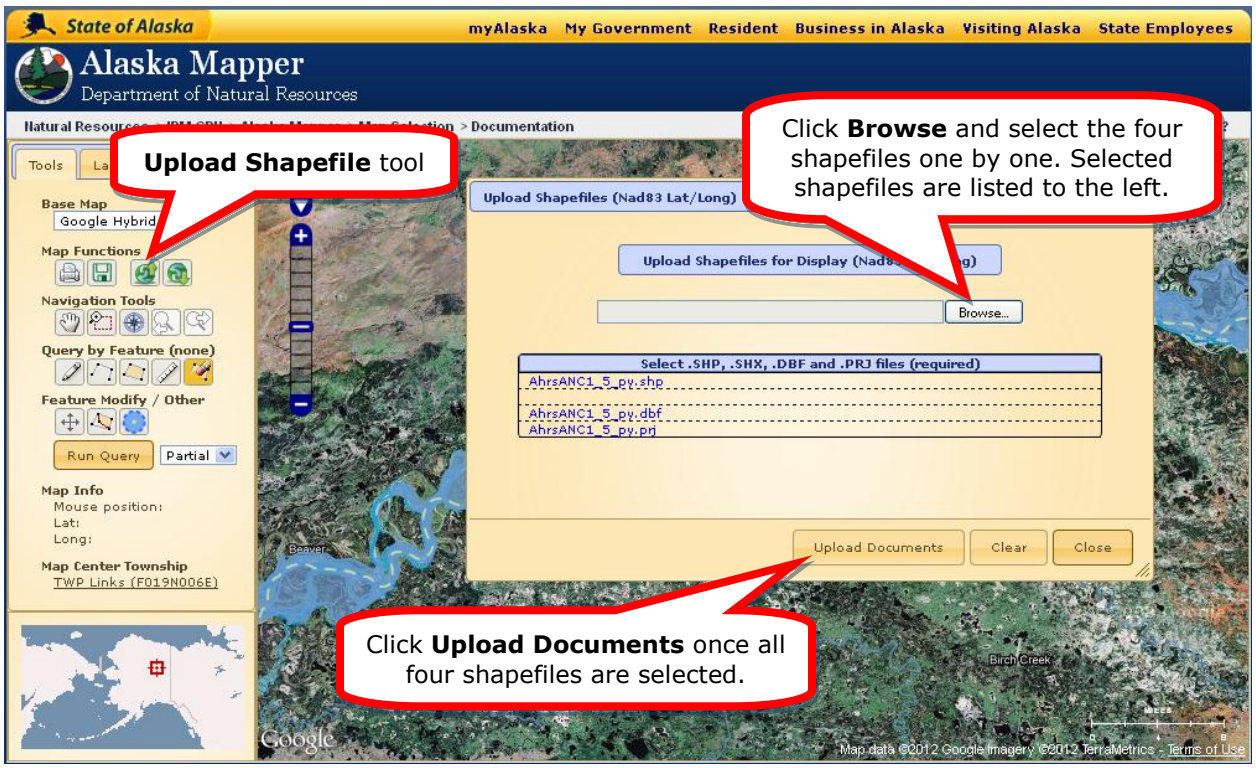


Figure 33 – Uploading Shapefiles

Note: Shapefiles must contain fewer than 50 features and fewer than 1,500 vertices.

Extracting Selected Features

After performing a query, you can extract the selected features into an ESRI or Google shapefile that can be used with GIS software. If the datasets you have selected contain multiple feature types (e.g., points, lines and polygons), a shapefile will be created for each type. A projection file will also be created, along with a metadata file for each dataset and feature type, if available. **Note:** You can also extract a layer's entire dataset. For details refer to "Viewing Layer Metadata and Extract Layer Data" on page 23.

Note: At a minimum, you should at least navigate to an area of interest before extracting a map. Although not required, it's a good idea to run a query as well before the extract. See "Spatial Queries" on page 41 for instructions.

To extract a map:

1. Click the **Extract** icon . The Data Extract window displays.
2. Enter your e-mail address.
3. Select a search type (**Entire**, **MBR** or **Partial**).
4. Select a format for the extract (**ESRI Shapefiles** or **Google KMZ/KML**).
5. Select a coordinate system for the extract (**Database Table Coordinate System**, **NAD83 Lat/Long** or **WGS84 Lat/Long**).
6. Click **Submit Extract Request** to submit your request. Once the extract is complete, you will receive an e-mail with a link to a zip file that contains the requested dataset. The files will remain on the server for five days hours before they are automatically deleted.

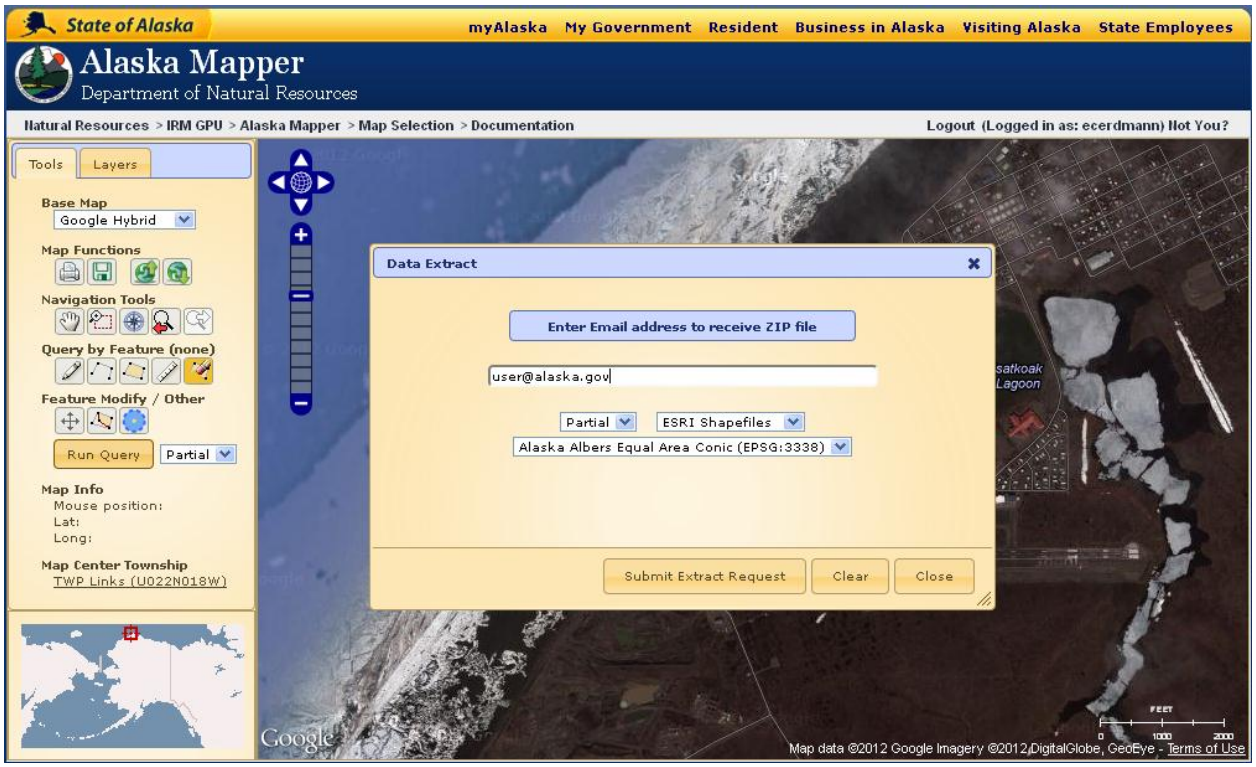


Figure 34 – Extracting Map Data

Printing a Map

The **Print Map** option on the **Tools** tab allows you to create a PDF, PNG or JPG version of the currently displayed map.

Note: Due to licensing restrictions, Google base maps are not printable.

When you click the **Print Map** icon, you will be presented with the options in Figure 35.

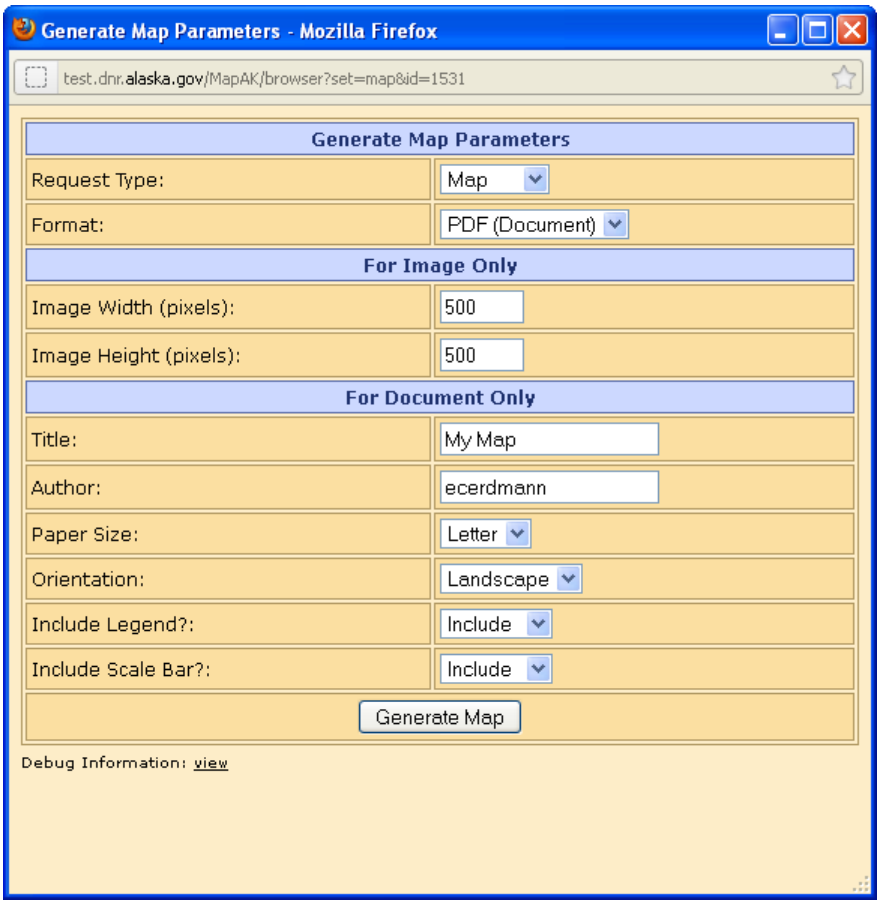


Figure 35 – Print Map Parameters

Following are descriptions of these parameters.

Table 3 – Print Map Parameters

Option	Description
Request Type	This dropdown list provides the following options: • **Map** – Prints the map and legend • **Legend** – Prints only the legend

Format	This dropdown list provides the following options: • **PDF (Document)** – Prints the map as a PDF document • **PNG (Image)** – Prints the map in the PNG image format • **JPEG (Image)** – Prints the map in the JPEG image format
For Image Only (The following parameters apply only to PNGs and JPEGs)	
Image Width	The width of the image (applies only to PNG or JPEG)
Image Height	The height of the image (applies only to PNG or JPEG)
For Document Only (The following parameters apply only to PDFs)	
Title	The title that appears in the upper left corner of the map
Author	The author's name, which appears in the lower-left corner of the map
Paper Size	The paper size of the PDF document, either letter or legal
Orientation	The orientation of the PDF document, either landscape or portrait
Include Legend?	Includes or excludes the map legend in the PDF document
Include Scale Bar?	Includes or excludes the scale bar in the PDF document

After entering the map parameters, click **Generate Map** to create the PDF or image of the map. You can then save or print the generated map. Figure 36 is an example of a PDF map.

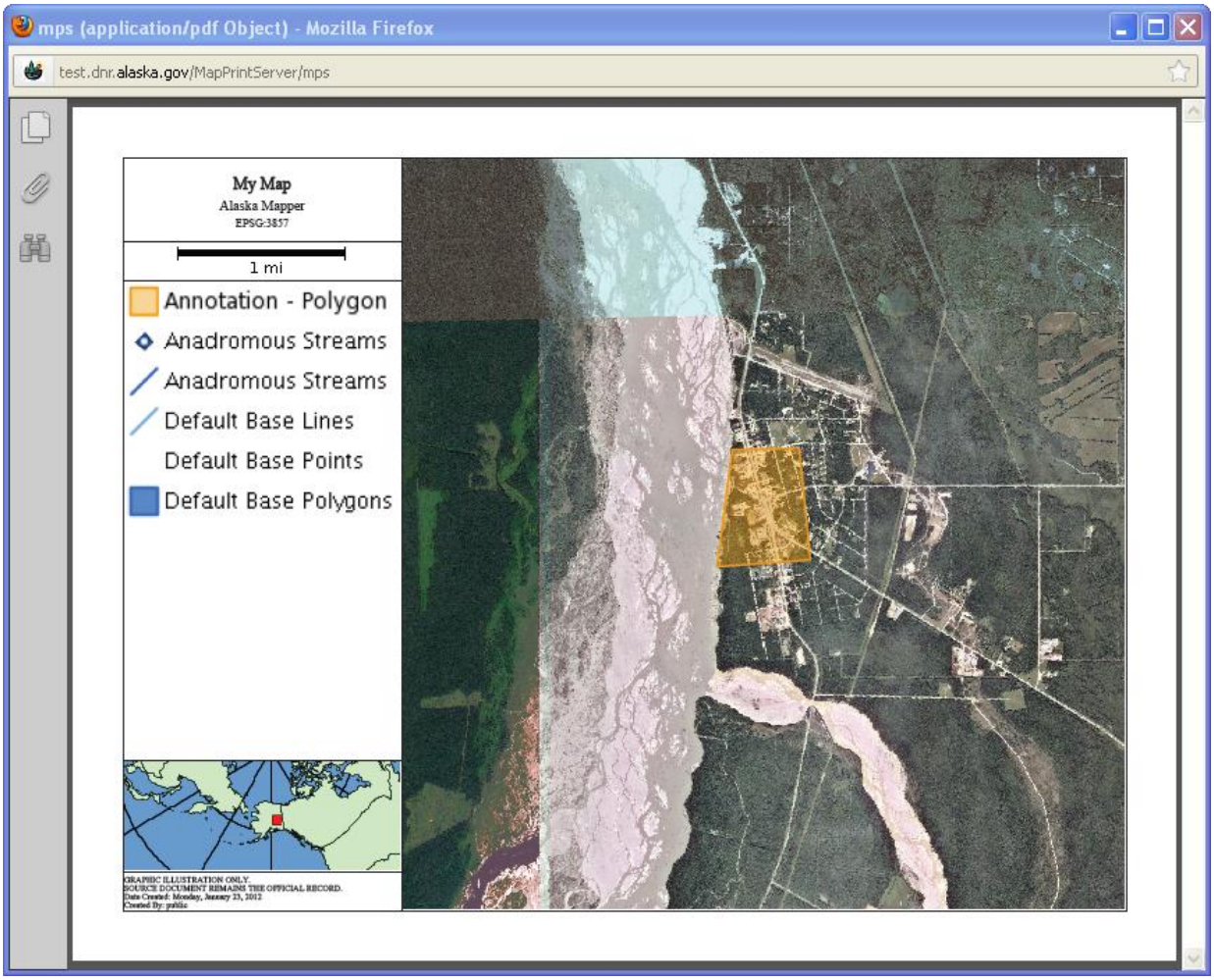


Figure 36 – PDF Version of a Map

Appendix

Tips on Navigating by Latitude and Longitude

Following are some tips and hints on using the **Map Navigation** tool's latitude and longitude navigation options:

- To enter values in decimal degrees, select Latitude/Longitude (Decimal) from the dropdown menu in the Go to Area of Interest window. To enter values in degrees, minutes and seconds (DMS), select Latitude/Longitude (DMS).
- Alaska Mapper interprets all latitude and longitude values as being in the NAD83 format. See "About Alaska Mapper's Geographic Data and Satellite Imagery" on page 5 for more information.
- When entering values in decimal degrees, one-tenth of one degree of latitude is approximately 36,400 feet (6.9 miles). When using DMS, one degree equals 364,000 feet (69 miles), one minute equals 6,068 feet (1.15 miles), and one second equals 101 feet.
- The distance between degrees of longitude varies as one nears the North Pole due to the convergence of the meridians. The following table provides approximations of this distance for different locations in the state:

Location	One Degree Latitude	One Minute Latitude	One Second Latitude	0.10 Degree
Juneau	36.29 miles	3,194 feet	53 feet	19,160 feet (3.6 miles)
Anchorage	33.30 miles	2,930 feet	49 feet	17,580 feet (3.3 miles)
Fairbanks	29.41 miles	2,588 feet	43 feet	15,530 feet (2.9 miles)
Barrow	22.18 miles	1,952 feet	33 feet	11,710 feet (2.2 miles)

- You must use a negative value for west longitude and south latitude values.

Using Text Searches to Locate Areas of Interest

Some navigation functions that you see in the Map Navigation window, such as **Alaska Place Name**, allow you to search for features by entering text. Here are a few useful tips for doing text searches:

- As you type, a list of matching database entries will appear below the text box. When you see the location you are seeking, select it by clicking it, and then click the **Draw** button to navigate to the location.
- You do not need to place quotes around names made up of multiple words (for example, Yukon River).
- Text searches are case-insensitive.