Alaska Mapper

A web-based tool to access land ownership and other state-wide geospatial data

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Introduction to Alaska Mapper

Alaska Mapper is a web-based application that provides access to the Alaska Department of Natural Resources (AKDNR) Land Administration System (LAS) and other geospatial data (Fig.1). Much of the information displayed in Alaska Mapper is also used to easily access the State Status Plats. Although status plats have been accessible through the Land Records web site (http://plats.landrecords.info) since 1999, these are not interactive. With the Alaska Mapper, users can zoom to an area of interest, turn data layers off and on, make live queries to the database of records (LAS), view each layer's metadata, and download selected data for use in a GIS. To access Alaska Mapper, point your web browser to http://mapper.landrecords.info.

Status Plats are maintained by the Status Graphics Unit (SGU), while DNR Case File data is maintained by other DNR staff. It's important to note that since the Alaska Mapper is a representation of LAS, it's only as current and complete as the records maintained in LAS. Additionally, the advent of the Alaska Mapper does not change the fact that land ownership issues are complicated and require training and experience to understand. It can only help the user try to answer the question, "Who owns the land?"

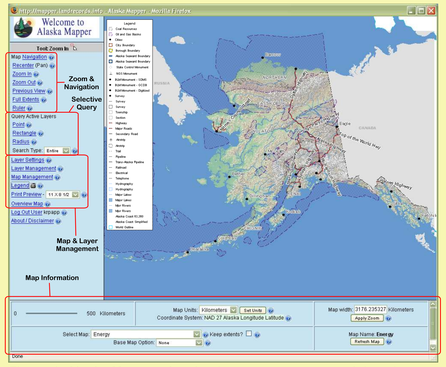

Figure 1. Alaska Mapper showing two energy resource data sets.

"Under the Hood"

SGU is using a custom built ESRI application to edit DNR's status data (http://plats.landrecords.info). The application, made up of ArcDesktop and VB, is highly sophisticated and very customized to the Status Plat production. The data is then transformed from the ESRI feature datasets to an Oracle materialized view and then out to MapInfo TAB files for the Alaska Mapper. Much of this work can now be automated and the data will eventually be as current as 24 hours.

The application is 100% Java-based, using MapInfo's MapXtreme for Java at its rendering core. The original intent was to use an Oracle database to directly "feed" the system, but this work flow offered substandard performance. So on a regular basis, the data is exported to MapInfo TAB files. The data is actually stored in Oracle Spatial and is registered via SDE which allows ESRI clients to manipulate it. A two node, SUN Intel x86 cluster, running Solaris, serves the application with four distributed (through Apache) Tomcat containers (version 5.0.x). This combination was key to achieving the system's current optimal performance.

AKDNR is also working with, but have not yet implemented, another means of distributing the data through open protocols such as Web Map Service (WMS) and Web Feature Service (WFS), implemented by the OpenGIS Consortium. This would allow efficient distribution of the data and leave it up to the user to use whatever client they wish to view the data (Google Earth, Alaska Mapper, ESRI Desktop etc.).

Accounts and Map Types

The public account may be used by anyone who wants to view or create maps, but does not need to save a map. These maps have the same map content (layers) as the State Status Plats. All users have access to these maps.

Registered user accounts are currently only available to State of Alaska employees. These accounts do not provide access to additional layers; they only allow a user to save maps (including public maps) to a database that can be recalled later. AKDNR is considering a policy that will permit non-state employees to have registered user accounts. All the layer information, zoom settings, map units, and extents are saved with the map.

Map Name	Purpose
Ownership	This map displays current state land ownership and the availability of those lands for use under specific rules and regulations of the State of Alaska.
Surface Classification	This map displays how state land may be used as a result of an area plan or site specific classification.
Land Estate	This is 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.
Mineral Estate	This is 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.
Water Estate	This map displays the statewide location for water rights, water authorizations, reservations, and water management areas for surface and subsurface water sources.
Base	This map contains just the basic layers that are common to the above mention maps. Common layer would include hydrography, township and section grids, state outlines, roads, pipelines, etc. It is a good map to start with when designing your own map.

Table 1. Alaska Mapper predefined map types.

Features and Usability

Advantages of the web-based Alaska Mapper tool include (1) integrating energy resources data, for example, with existing statewide data and infrastructure in ways that were not possible before, (2) having the choice of downloading the source data and using it locally on your computer, (3) not having to download any programs or data to use the service, and (4) the data is updated on a regular basis, including land status, ownership, and water rights.

Map Navigation
By selecting the "Map Navigation" link, a new window appears (Fig. 2). A number of navigation tools are available including: Latitude/Longitude, National Geodetic Survey Monument, Township/Section, USGS Quarter Million Quadrangle Name, USGS Inch to Mile Quadrangle Name, USGS Geographic Place Name, and AKDNR Case File.

Layer Management
It is possible to add to or change the contents of a map (layers) by using the Layer Management screen (Fig. 3). All the layers that can be added to a map can be found in the Available Layers frame (left hand side). Layers in the current map or layers selected to be in a new map can be found in the Selected Layers frame (right hand side). A map must contain at least one layer before it can be created. Features include adding, deleting, ordering, expanding/collapsing, and searching layers.

Layer Metadata/Extract Data
To learn about the data contained in a layer, simply click on the layer name in either of the lists. A new window will appear containing the layer/dataset metadata (Fig. 4, below). The upper frame of this window contains the information about the data. It is possible to extract all the data (see "Serving Up the Data", right) in this layer by simply entering your email address in the text box in the lower frame and then clicking the Extract button. An email will be delivered to your inbox when the extraction is complete. Depending on the size of the layer/dataset, this process may take hours to complete.

Layer Settings
Each layer of a map has a set of attributes (Fig. 5). These attributes include "visible", "active", "label" and "zoom." Settings are saved with the map. If any of the attributes have been modified, click on the Apply Settings button. This will save the settings to the map, close the Layer Settings window and refresh the map.

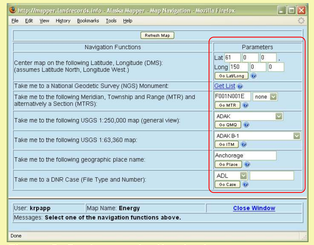

Figure 2. Custom navigation tools.

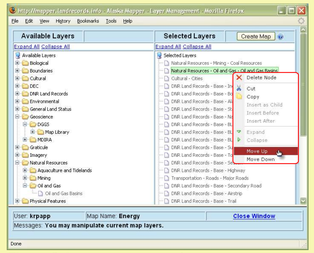

Figure 3. Layer management.

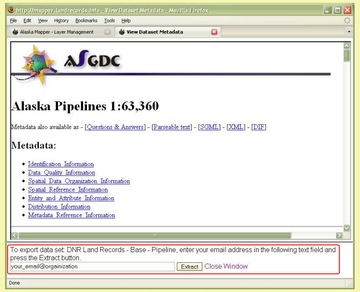

Figure 4. Layer metadata and extracting data.

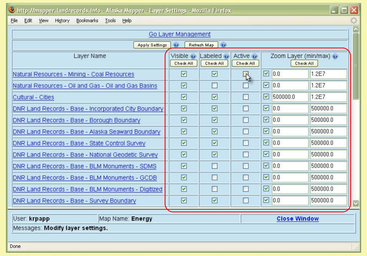

Figure 5. Layer settings.

Serving Up the Data

In addition to providing a map depicting land status and geographical features, it is also possible to see the attribute data associated with the features.

Query the Data
A query is based on a user-specified boundary, which can be a Point, Rectangle, Radius or even a geographic feature itself. To specify a query boundary, first select the tool (click on the action link) then click on the map. The query will only search active layers (Fig. 5). Features that are selected during a query will be highlighted in yellow in the map image after the map is redrawn (Fig. 6). After a query is performed, the total number of features (from each "Active" layer) is displayed in the Status Area.

Search Results
The Search Results screen appears after clicking on the View Results action link in the Status Frame after a query. A new browser window will open to display the attributes of the features selected in the query (Fig. 7). Features returned from the query are grouped by layer. The results page shows only the results for the layer shown in the Layer Selector at the top of the page. To see the features for a different layer, select another layer name from the drop-down list.

Abstracts, Land Records, and Status Plat Remarks
For features that are related to LAS (Land Administration System), the Case File Type and File Number are displayed as feature attributes. When the LAS Case Report Submit action button is clicked, the attributes are forwarded to another web application that displays that case's complete LAS Case Abstract (Fig. 8). This data comes directly from LAS, which is the system of record for all AKDNR land records. Online help is available for that system at its web site (http://las.landrecords.info).

Based on the query bounds center point, a link is provided at the top of the Search Results screen that allows the user to do a location search for plats, surveys, and other scanned documents. Clicking on this link will open a new browser window and the Land Records web site (http://plats.landrecords.info) will display the search results, based on latitude and longitude.

It is possible to view Status Plat Remarks for the given township in which the map is currently centered by clicking on the "Get [township designation] plat remarks" link provided. By simply clicking this link, a new browser window will be opened and the plat remarks if any will be displayed.

Extract Features (Data Download)
It is also possible to download an entire layer or a selection of features within a layer or layers to an ESRI shape file(s). If the dataset(s) you selected contains multiple feature types (e.g. points, lines or polygons), a shape file will be present for each type. Along with the shape file there will also be a projection file and, if available, a metadata file for each dataset and feature type. After you initiate a download request, an email will be sent to the address you specify. The email will contain a link to a zip file containing all the files that make up the requested dataset.

Current Version and the Next Release
The current version of Alaska Mapper is 1.8.8 (07-Feb, 2007). Version 2.0 will be available on 01-Jun, 2007.

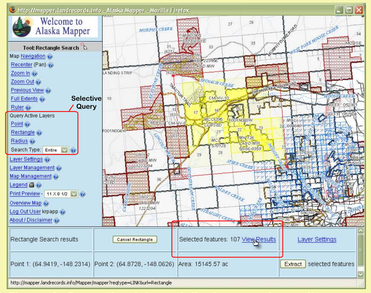

Figure 6. Query the data and display search results.

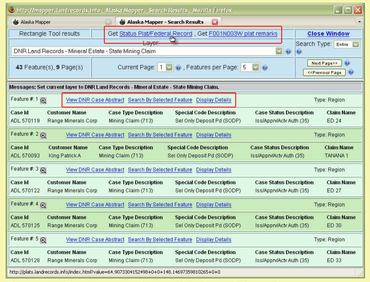

Figure 7. Feature attributes displayed from the query.

Figure 8. Land Administration System case report.