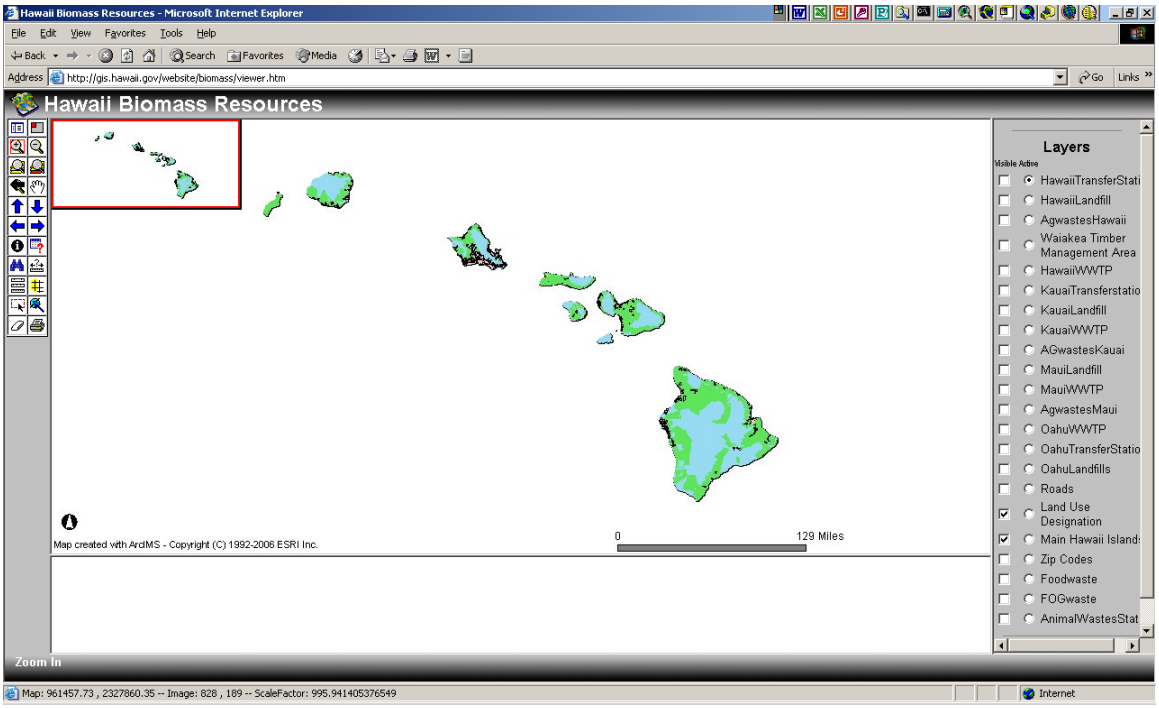
How to use the State of Hawaii "Biomass Resources" Online Mapping Application



http://gis.hawaii.gov/website/Biomass

Overview

The Office of Planning is the lead agency for the State of Hawaii's Geographic Information System (GIS). The Office of Planning GIS Program leads the State's multi-agency effort to establish, promote and coordinate the use of GIS technology among Hawaii State government agencies. The State Office of Planning is responsible for the planning and coordination of activities that are critical to the State's enterprise GIS. The primary goal of the Statewide GIS Program is to improve overall efficiency and effectiveness in government decision-making.

As a public service, the State GIS Program is making available a Biomass Resources on-line mapping application developed for the Department of Business, Economic Development, and Tourism, Strategic Industries Division. The application is available at http://gis.hawaii.gov/website/biomass.

The map layers presented in this internet mapping application were generated using data gathered during a statewide biomass resource assessment conducted in 2002, "Biomass and Bioenergy Resource Assessment" prepared by the Hawaii Natural Energy Institute for the Department of Business, Economic Development, and Tourism. The full report is available at http://www.hawaii.gov/dbedt/info/energy/publications/biomass-assessment.pdf. The maps are meant to supplement the above report and contain only a portion of the information presented therein. It is highly recommended that individuals interested in the maps download and read the full report to familiarize themselves with the data collection methods, data sources, and data points that are not covered by the supplementary maps.

The Geographic Information System (GIS) maps were developed to provide access to certain information contained in the resource assessment for alternative energy developers and state and county planners. The interface allows individuals who lack GIS training to access a portion of the information contained in these maps. Data that cannot be accessed using the on-line biomass application include some attribute values and descriptions along with comments provided by the map creator about the data and presentation. This information has been summarized and is available as a separate metadata document, and is available at http://www.hawaii.gov/dbedt/gis/data/biomass_metadata.pdf.

This document provides instructions for use of the Biomass Resources online mapping application.
There are two main sections to this document:

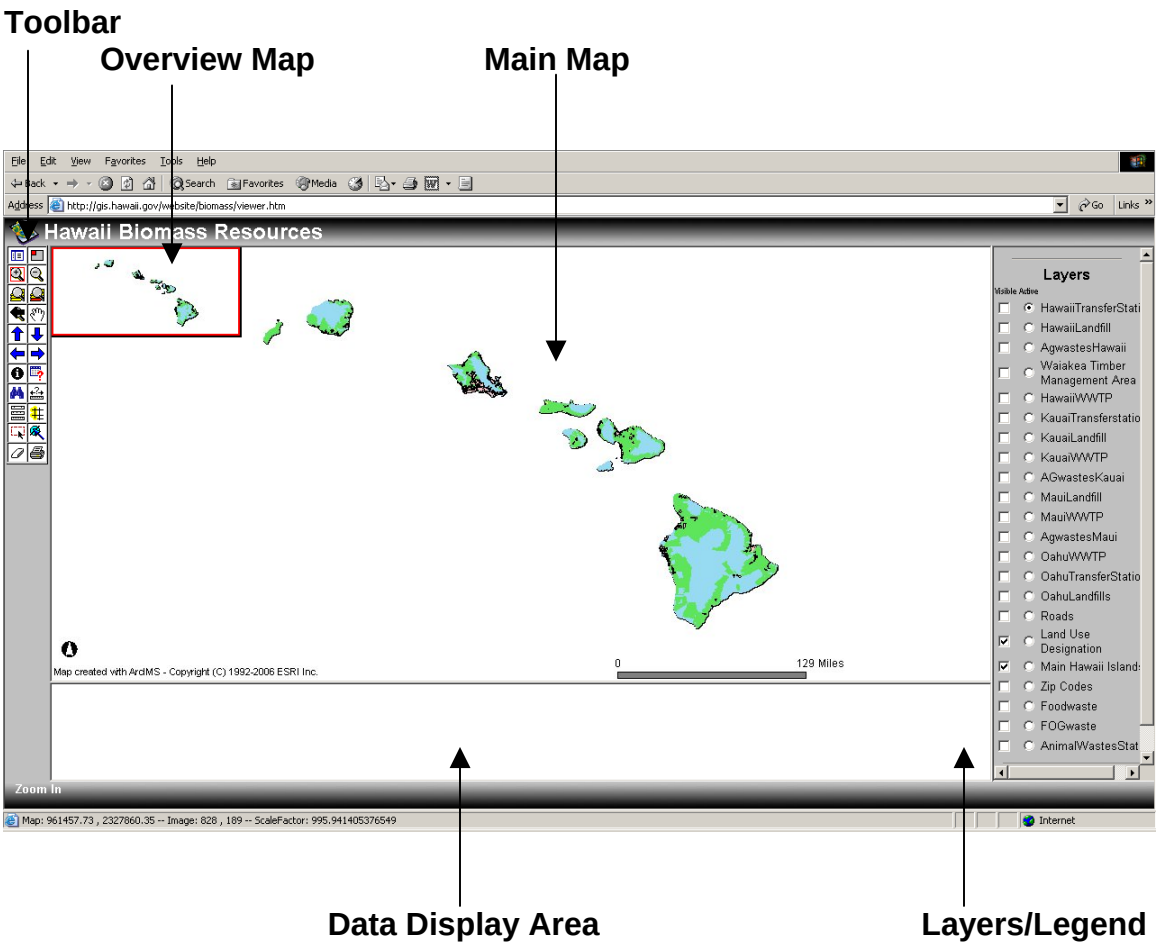
1. Screen Layout

    - Provides a view of the web mapping application and descriptions of each area on the screen. Review this section to learn where things are located on the page.

2. Tools
    - Describes the tools used to manipulate and get information from the map. Read this section to learn how to perform a specific task.

Screen Layout

A screenshot of the I-Map Hawaii web mapping application appears below:



Toolbar: The toolbar contains tools that allow you to interact with and change the map display.

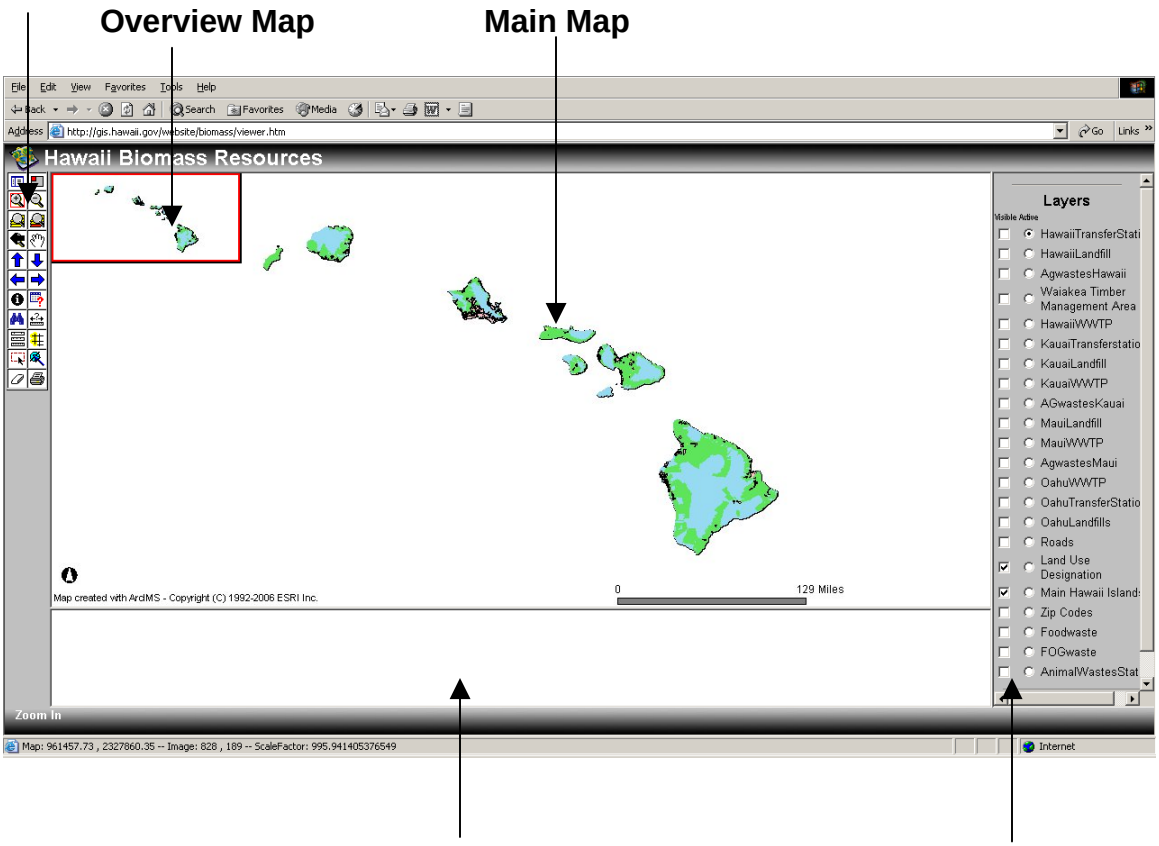
Overview Map: The overview map provides a small inset view of the main Hawaiian islands with a highlight of the area displayed in the main map.

Main Map: The main map displays the area of interest.

Data Display Area: The Data Display Area can show information for a selected feature when the **Identify** tool is used.

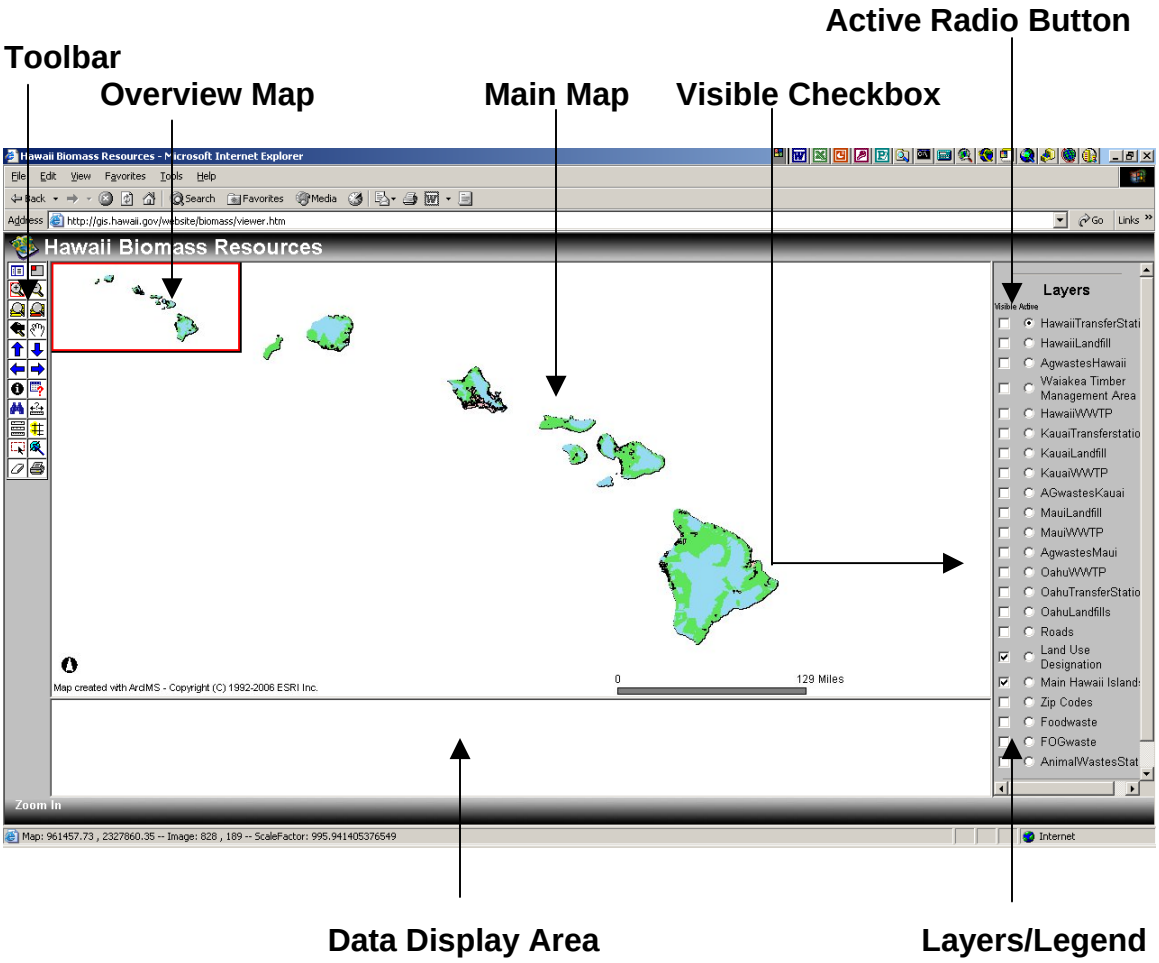
Screen Layout (continued)

Toolbar



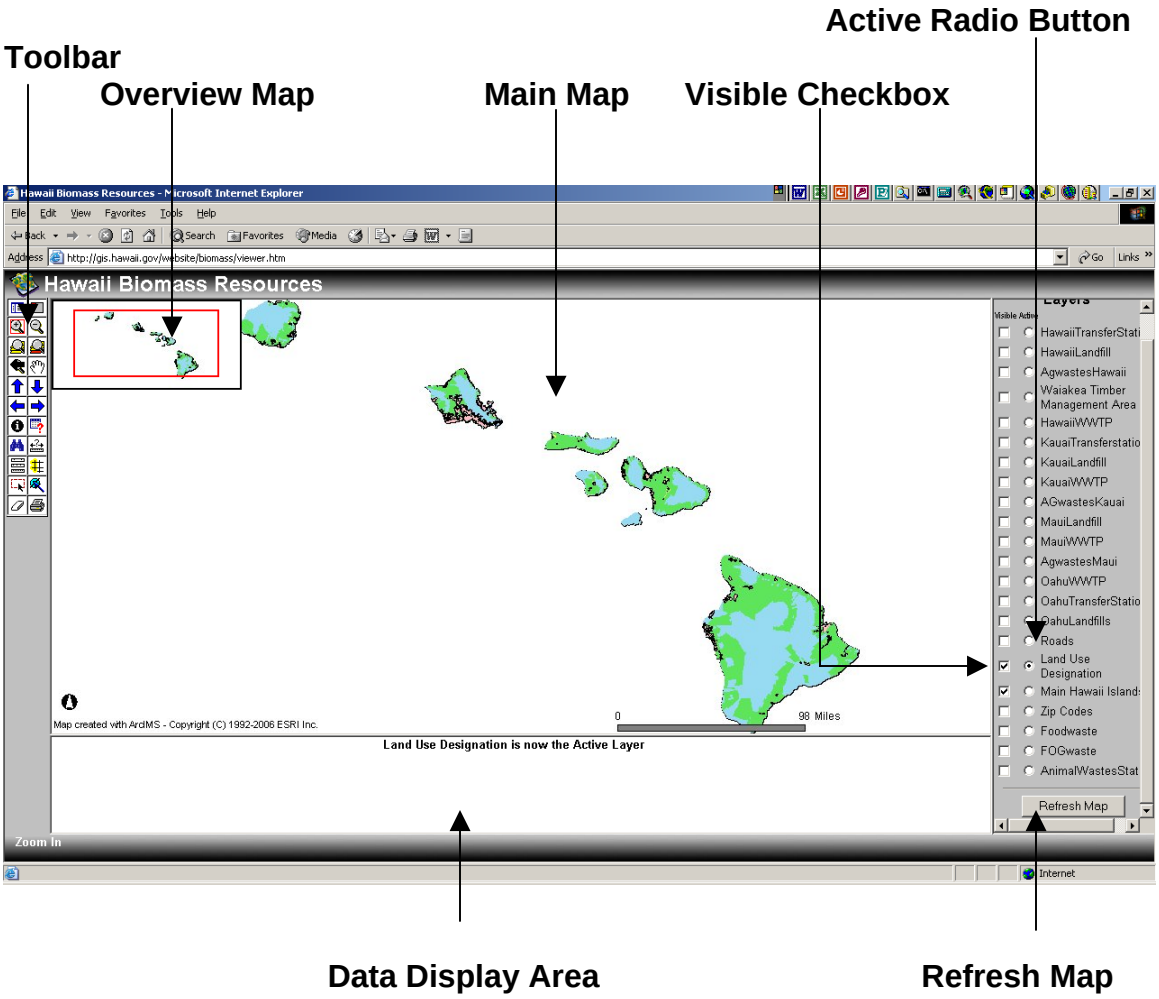
Layers/Legend: The Layers/Legend area displays the layers list or a map legend (depending on which of these has been selected with the **Toggle between Legend and Layer List"** tool). GIS maps are created by aggregating "layers," which are individual "maps" that can be turned on or off and combined to create a dynamic map. A specific map display can be created using a single layer or a combination of layers. For example, in this display, the layers for the main Hawaiian islands and State Land Use District Boundaries are shown.

Screen Layout (continued)



Each layer has a "**Visible**" checkbox and an "**Active**" radio button. Selecting or deselecting the Visible checkbox turns the layer on or off.

Screen Layout (continued)



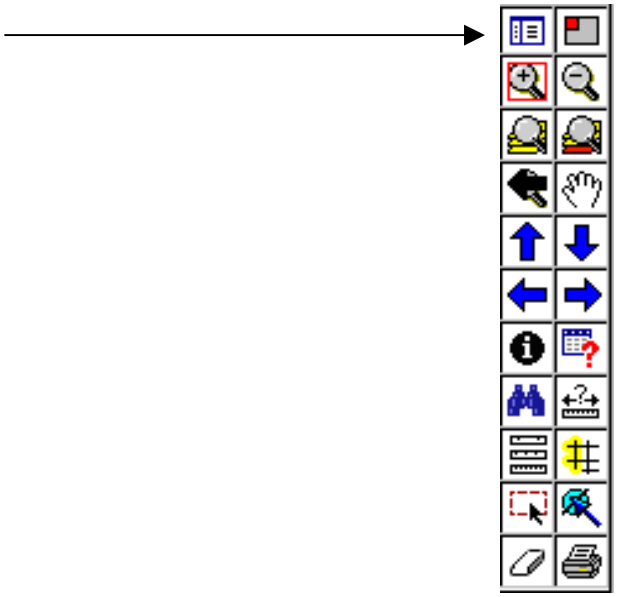
When you select or deselect a layer (turn a layer on or off), you must also click the "**Refresh Map**" button to update the map display. You may have to use the Scrollbar on the right side of the map in order to scroll down to see the Refresh Map button.

Select the **Active** radio button to tell the map which layer you want to interact with when you select a tool from the toolbar (located on the left of the display). In the illustration, "*Land Use Designation*" is currently the Active Layer. Note that only one layer can be active at a time.

Tools

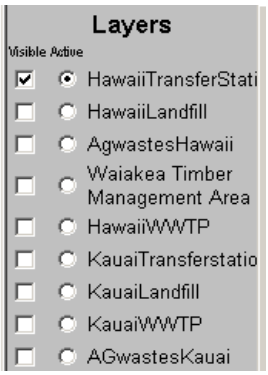
The tool bar (located to the left of the screen) allows you to manipulate and get information from the map. Descriptions of each tool are listed below. When you are working with the map, and want a "hint" of what a particular tool does, you can hold the mouse over a tool to view a hint/description of that tool. For each of the tools listed below, a copy of the hint for that tool is provided, along with a more detailed description of the tool and how to use it.

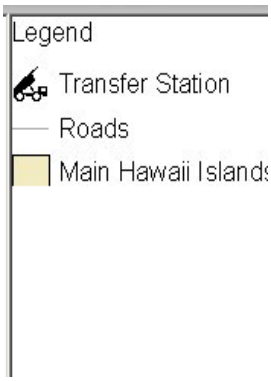
Toggle between Legend and Layer List



Hint: Toggle between Legend and LayerList

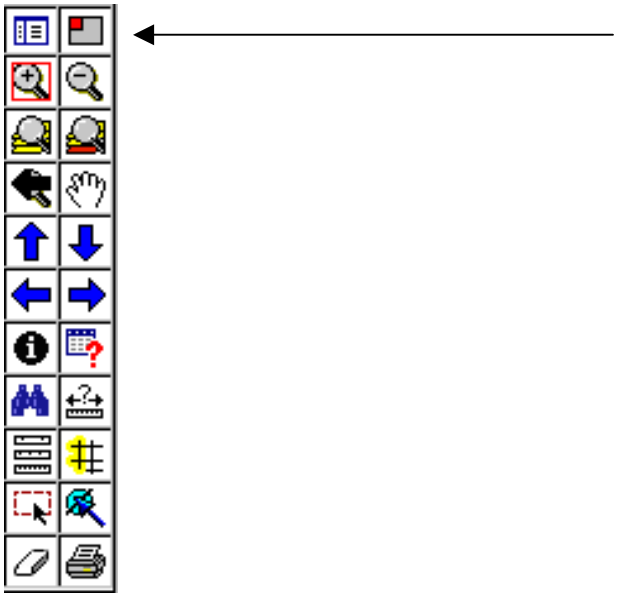
The **Toggle between Legend and Layer List** tool changes the display on the right side of the screen. The Layer List view allows you to work with, select and deselect layers. The Legend view displays a map legend.





Tools (continued)

Toggle Overview Map



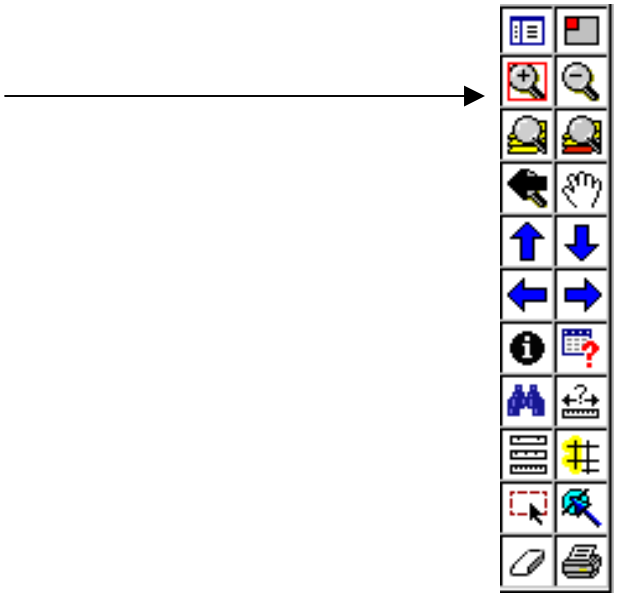
Hint: Toggle Overview Map

The **Toggle Overview Map** tool allows you to display or hide the overview inset map (smaller “locator” map in the upper left hand corner of the screen).

Overview Map

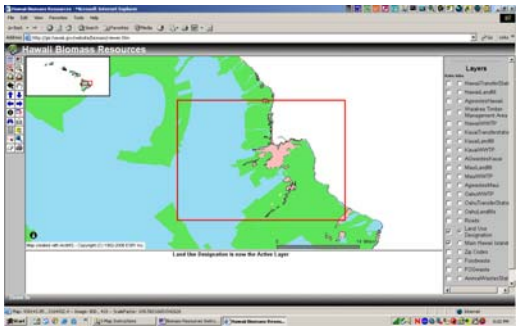
Tools (continued)

Zoom In



Hint: Zoom In

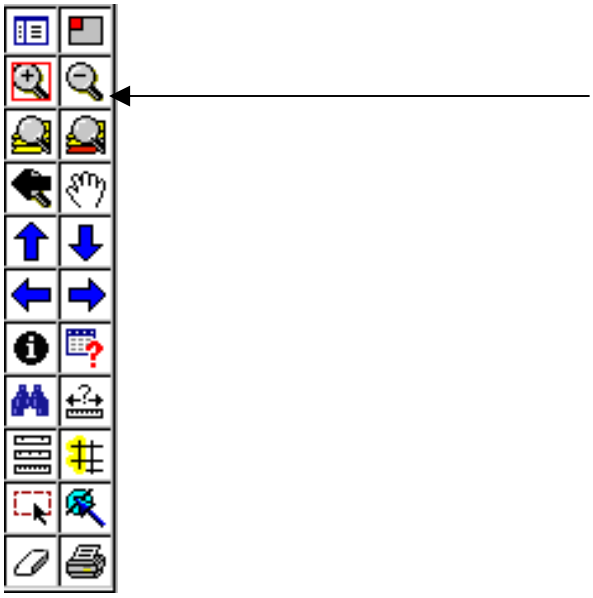
The **Zoom In** tool allows you to focus on and *increase magnification* for an area of the map. To view detail in a specific area, select the tool, then click and drag across the area of interest (without taking your finger off of the mouse button). A red box will appear as you drag the mouse, and when you release the mouse button, the map will zoom in to the area outlined by the box. You can also click once on any point on the map to zoom in by a fixed ratio (2:1) to that area of the map.



Click and drag to highlight area of interest

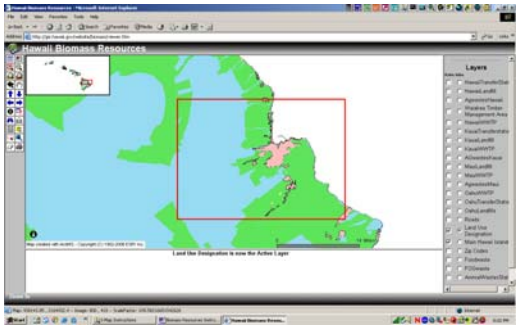
Tools (continued)

Zoom Out



Hint: Zoom Out

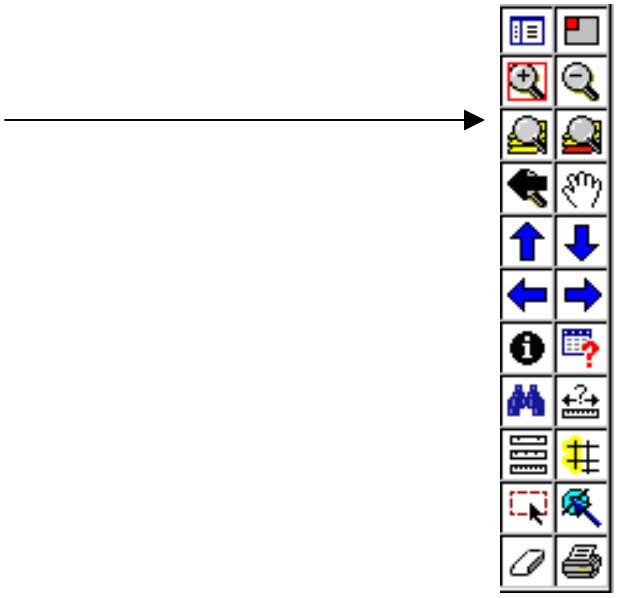
The **Zoom Out** tool allows you to focus on and *decrease magnification* for an area of the map. To move out to a wider scale, select the tool, then click and drag across the area of interest (without taking your finger off the mouse). As with the Zoom In tool, a red box will appear as you drag the mouse, and when you release the mouse button, the map will zoom out around and centered on the area defined by the box. You can also click once on any point on the map, and the display will zoom out by a fixed ratio (2:1) around the point that you clicked. Note that if you make your red box too small, the map display may zoom out too far. In this case, simply click on the "Back to Last Extent" tool (described below) to return to your previous map display.



Click and drag to highlight area of interest

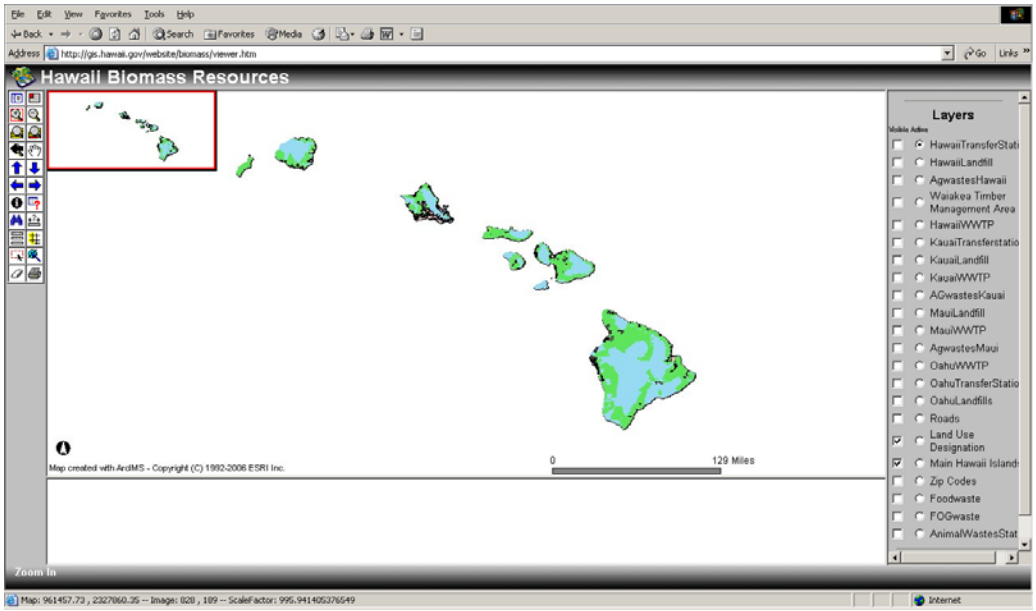
Tools (continued)

Zoom to Full Extent



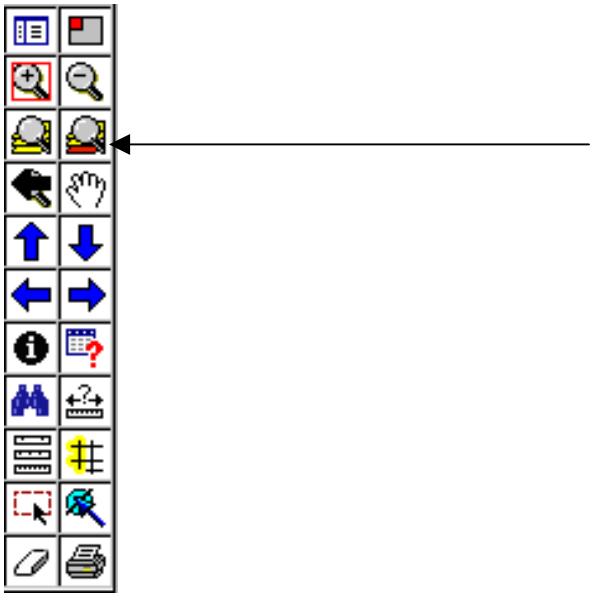
Hint: Zoom to Full Extent

The **Zoom to Full Extent** tool resets the map area of interest to the original map extent (i.e., the extent of the 8 main Hawaiian islands).



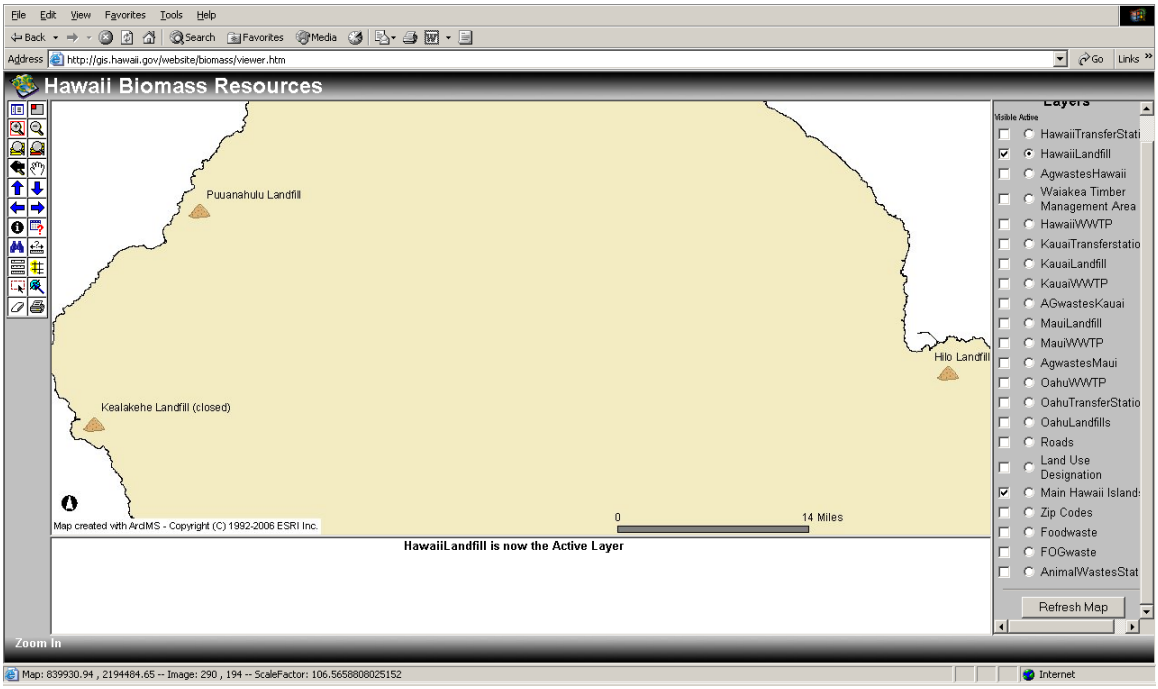
Tools (continued)

Zoom to Active Layer



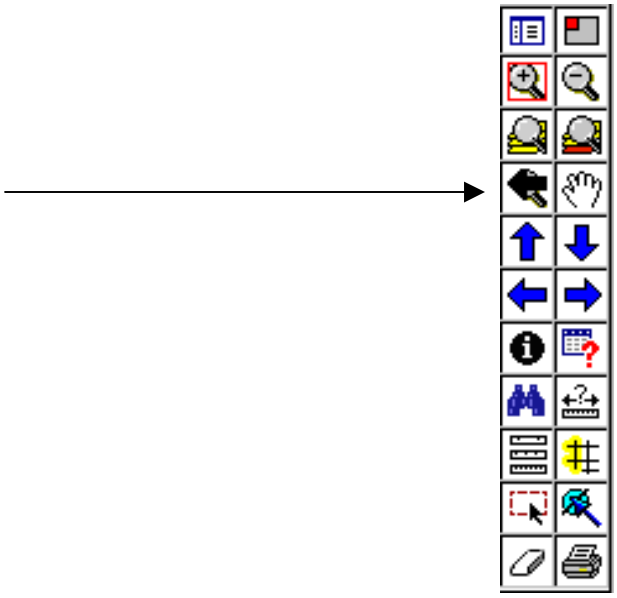
Hint: Zoom to Active Layer

The **Zoom to Active Layer** tool zooms in to the extent of whichever layer you've chosen as the Active Layer (by clicking on that layer's radio button). In the example below, the map is zoomed in to the extent of the Active Layer (Hawaii Landfills).



Tools (continued)

Back to Last Extent

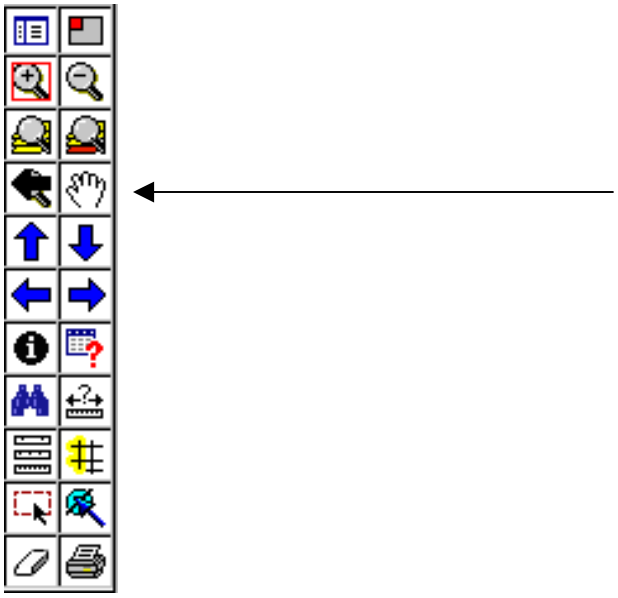


Hint: 

The **Back to Last Extent** tool allows you to move back one step to the area of interest that you were previously viewing. Use this tool to return to the previous map area after zooming in or out or panning across the map (the Pan tool is described below). Please note that only one move back is allowed – you cannot view your entire history.

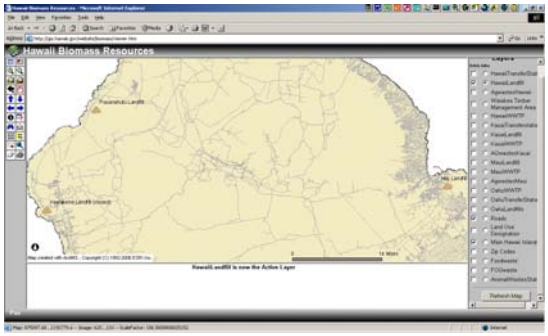
Tools (continued)

Pan



Hint: Pan

The **Pan** tool allows you to move the map around while staying at the same scale (i.e., move north, south, east, west or diagonally without zooming in or out). Select the tool, then click and drag the mouse (without lifting your finger from the mouse button) to move the map.

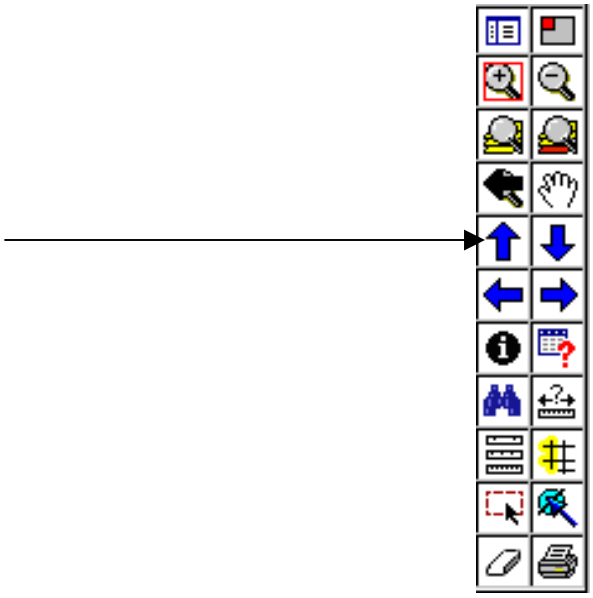


Before Pan

After Pan

Tools (continued)

Pan to North

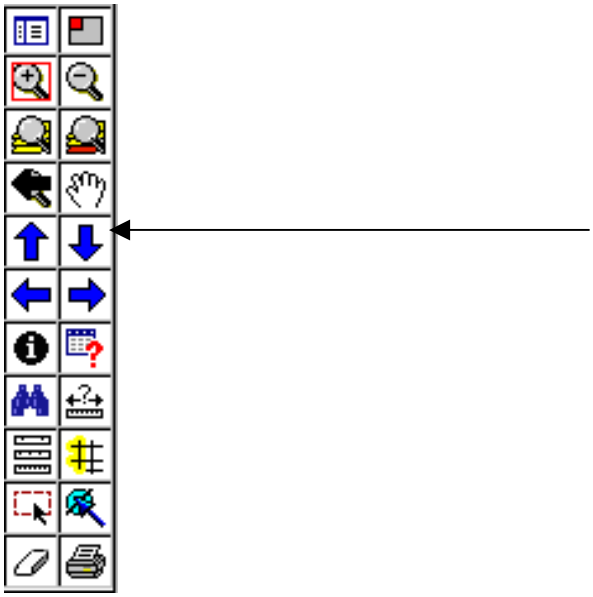


Hint: Pan to North

The **Pan to North** tool refocuses the map to the north of the currently displayed area. Click the icon once to refocus the map.

Tools (continued)

Pan to South

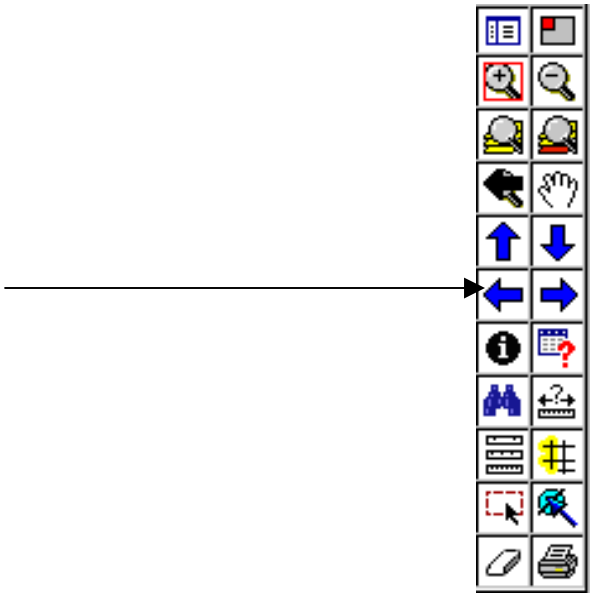


Hint: Pan to South

The **Pan to South** tool refocuses the map to the south of the currently displayed area. Click the icon once to refocus the map.

Tools (continued)

Pan to West

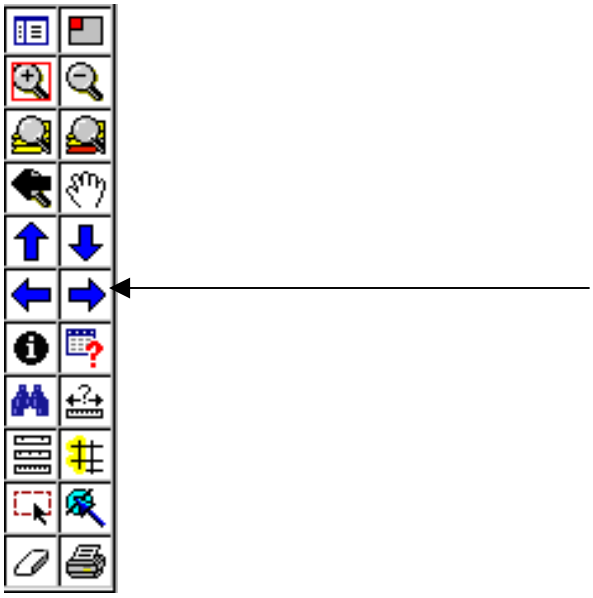


Hint: Pan to West

The **Pan to West** tool refocuses the map to the west of the currently displayed area. Click the icon once to refocus the map.

Tools (continued)

Pan to East

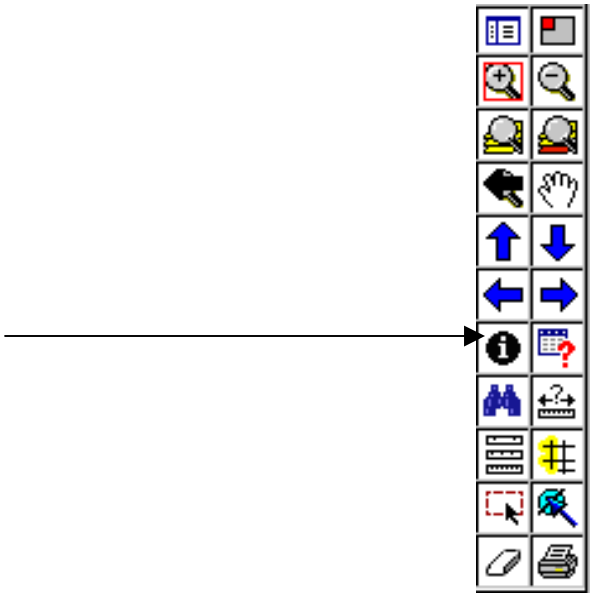


Hint: Pan to East

The **Pan to East** tool refocuses the map to the east of the currently displayed area. Click the icon once to refocus the map.

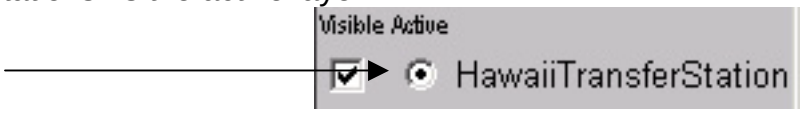
Tools (continued)

Identify



Hint: Identify

The **Identify** tool displays information for a particular feature (or features) on a map. To use it, first activate the layer that you are interested in by clicking the "Active" radio button next to the layer. In this example, "Hawaii Transfer Stations" is the active layer.



Make "Hawaii Transfer Stations" the Active Layer

Next, select the Identify tool and click on a feature on the map from the Active Layer. For the Hawaii Transfer Stations example here, simply click on the center of one of the transfer stations.

The Data Display area of the screen (bottom center) will display the information from the GIS database for the selected feature. Note that not all fields will be informational – some are used by the GIS to display the data.

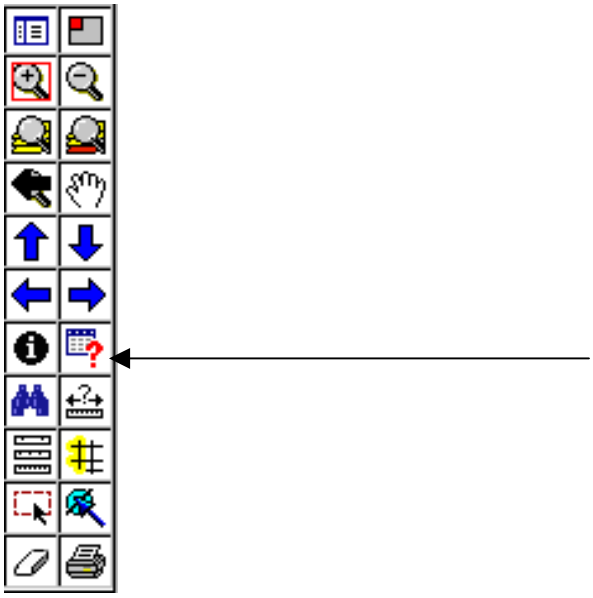
HawaiiTransferStation

Rec	FID	#SHAPE#	TMK	NAME	PARCEL_SIZ	Pop_SRVD	AVG_TPY
1	0	[point]	321013150	Hilo T/S	72.7	4200	1180

Display from Identify tool
(Selected feature is Hilo Transfer Station)

Tools (continued)

Query



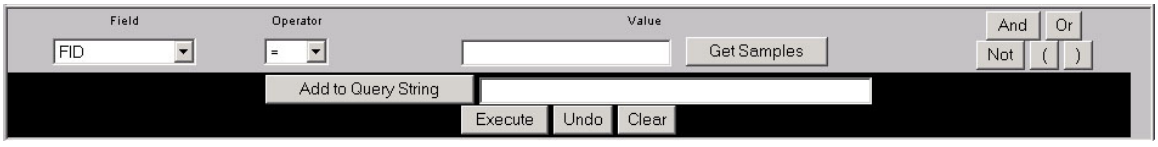
Hint: Query

The **Query** tool provides an advanced search capability. A basic knowledge of SQL is required to use it.

If you are comfortable with SQL, then you can select fields from the Active Layer and build complex SQL search strings in an interactive manner. If, on the other hand, you are not conversant with SQL, then you will most likely get much better results with the **Find** tool (described on the following page).

A tutorial on SQL is beyond the scope of this document.

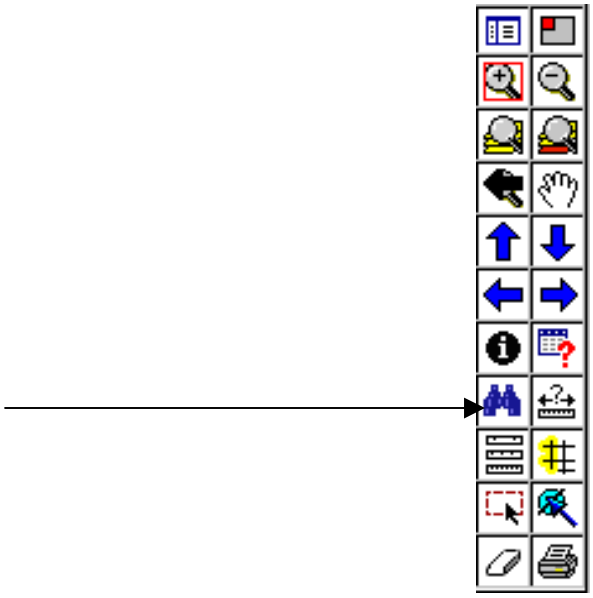
When you use the **Query** tool, the Data Display Area (bottom center of the screen) looks like the figure below. If it looks self-explanatory to you, then you are probably familiar enough with SQL to use the Query tool. If not, please try the **Find** tool instead.



Query (Interactive SQL)

Tools (continued)

Find



Hint: Find

The **Find** tool provides a basic search capability. It is much easier to use than the Query tool, but also produces more limited results. To use it, first activate the layer that you are interested in by clicking the “Active” radio button next to the layer. In this example, “Hawaii Transfer Stations” is the active layer.

Make “Hawaii Transfer Stations” the Active Layer

Next, select the Find tool. The Data Display area (bottom center of the screen) will look something like the figure below.

Find tool (Hawaii Transfer Stations layer)

Tools (continued)

Find (continued)

Next, enter the search string in the box, and click the “Find String” button. In this search, we will look for all Transfer stations that have the string ‘Ho’ in their name.

Find tool (Hawaii Transfer Stations layer)

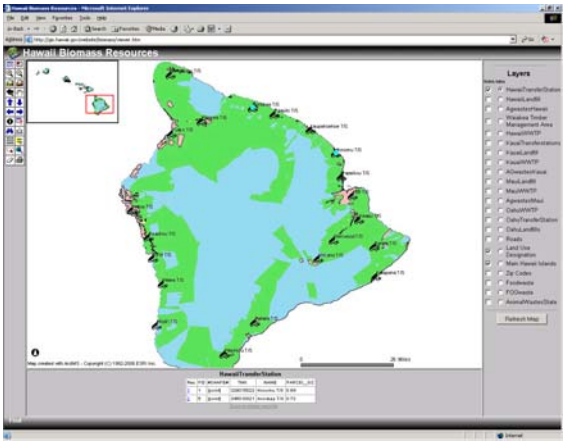
The GIS will search the database to find all stations that begin with the letters ‘Ho’, and will return a list of the stations meeting the criteria you requested, with the selected records (in this case, transfer stations) highlighted on the map.

HawaiiTransferStation

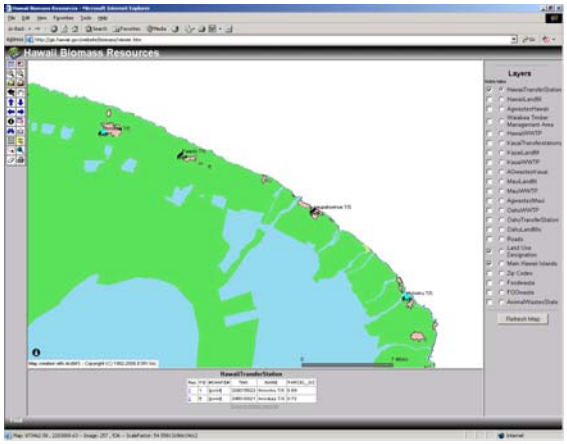
Rec	FID	#SHAPE#	TMK	NAME	PARCEL_SIZ
1	1	[point]	328015023	Honomu T/S	0.84
2	5	[point]	345010021	Honokaa T/S	0.73

Zoom to these records

From here, you can either zoom to the extent encompassing all of the selected features (by clicking on “Zoom to these records”) or zoom to one of the selected features (by clicking on the ‘Rec’ field of the feature that you want to zoom to).



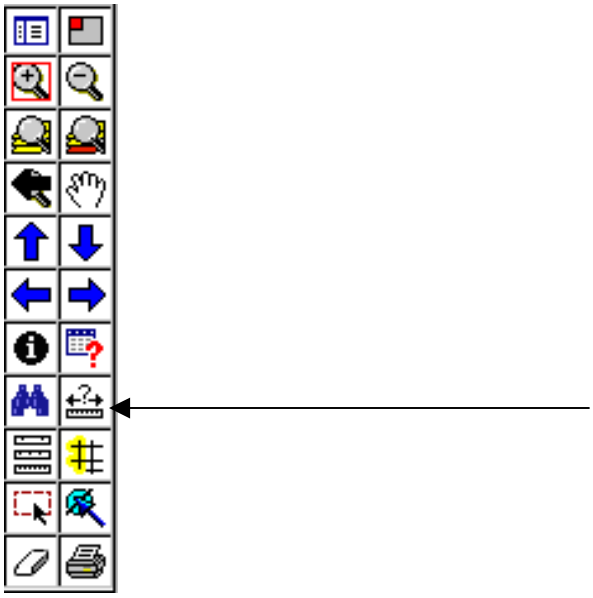
Find tool (selected stations highlighted)



Find tool (zoomed to selected stations)

Tools (continued)

Measure



Hint: Measure

The **Measure** tool allows you to measure distance on the map. It can be used with the **Set Units** tool to generate a distance measurement in feet, meters, miles, or kilometers.

To use the tool, click anywhere on the map. A distance measurement will appear in the upper left corner of the screen.

Distance information – top left of screen

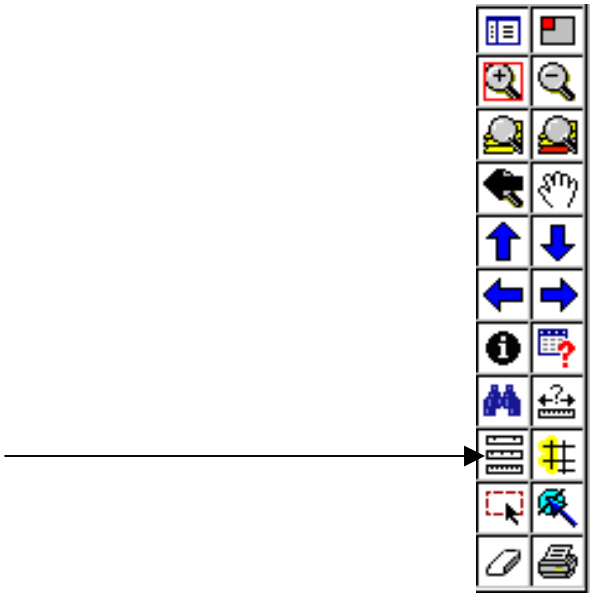
Distance Measurement

There are two boxes: one each for total measurement and segment measurement. If you move the mouse across the map, the **segment** measurement will update. Click again to create a line segment. The **total** number will update, and the **segment** number will reset to zero. You can trace an area on the map to calculate detailed measurements.\

Note: To clear the line you've drawn from the map, use the "Clear Selection" Tool, described below.

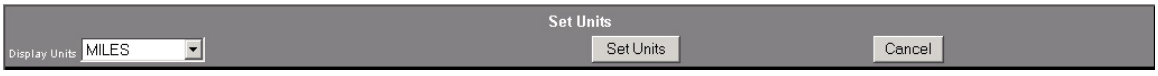
Tools (continued)

Set Units



Hint: Set Units

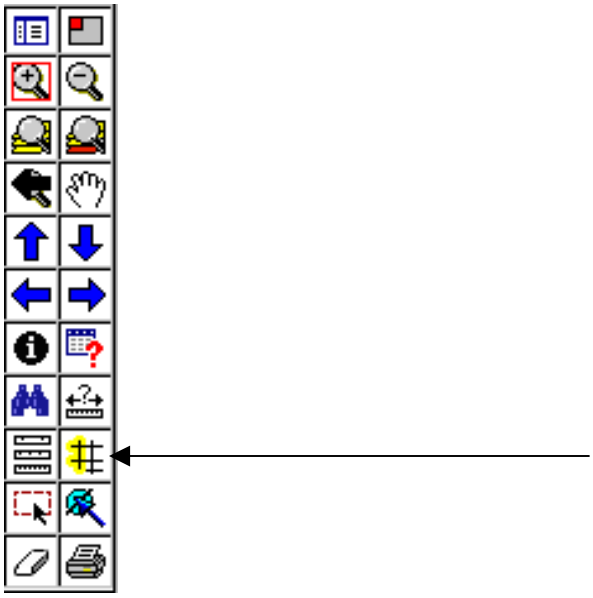
The **Set Units** tool changes the units used in distance measurements on the map. Available units include feet, meters, miles, and kilometers. The default units are miles.



Set Units Tool

Tools (continued)

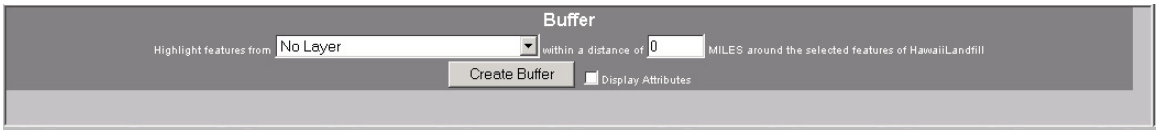
Buffer



Hint: Buffer

The **Buffer** tool selects features within a set distance from the selected feature. For example, it is possible to select a particular landfill (in this example we will use Hilo Landfill), then select all transfer stations that fall within a certain distance of that landfill (in this case, we will find all stations within a ten-mile radius of Hilo Landfill).

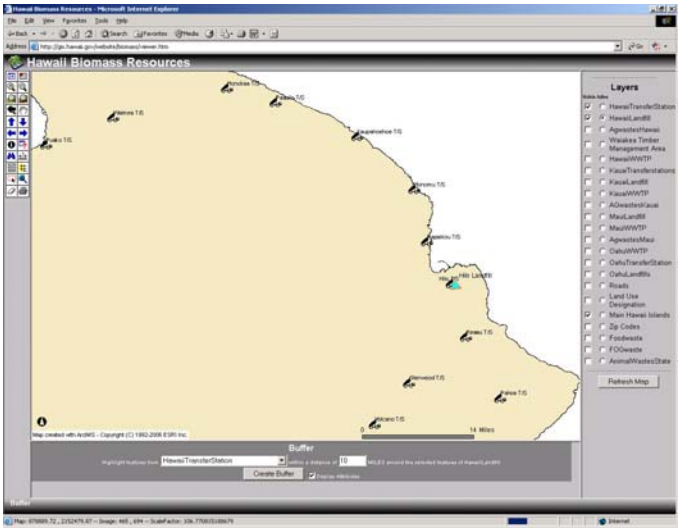
To use the tool, first select a feature using either the Query or Find tool. Then select the Buffer tool. The Data Display area (bottom center) of the screen will look similar to the figure below.



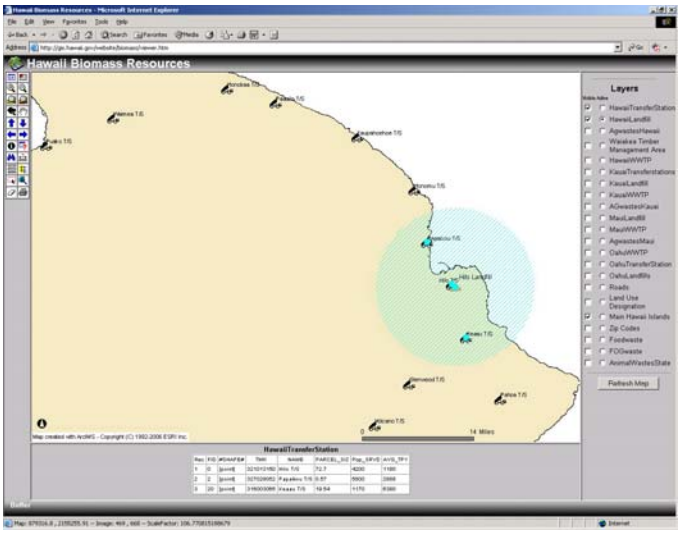
Tools (continued)

Buffer (continued)

Next, choose a layer from the drop-down list (labeled “Highlight features from…” in the Data Display area) and enter a distance for the buffer. In this example, we are asking to see all features from the Transfer Stations layer that fall within ten miles of features that we’ve selected from the landfill layer (Hilo Landfill). If you want to see the data associated with the features that fall within the buffer area, click on the “Display Attributes” box. When you have finished making your selections, click on “Create Buffer” to run the command and see the results.



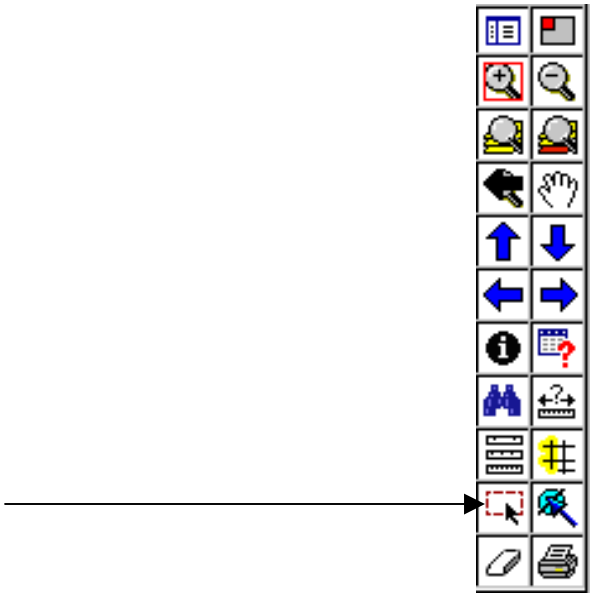
Select all Transfer Stations within ten miles of Hilo Landfill



Results of Buffer

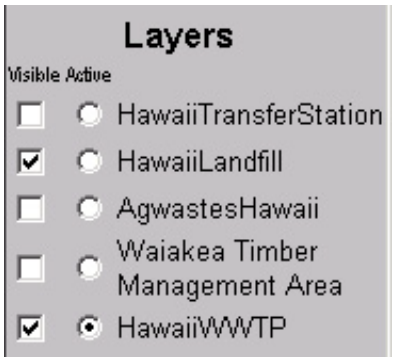
Tools (continued)

Select By Rectangle



Hint: Select by Rectangle

The **Select by Rectangle** tool allows you to select one or more features on the map by creating a rectangle around the features you want. To use it, first activate the layer you are interested in by clicking the **Active** radio button next to the layer. (For a description of the term “layer” and its use in GIS, please see the **Screen Layout** section of this document).

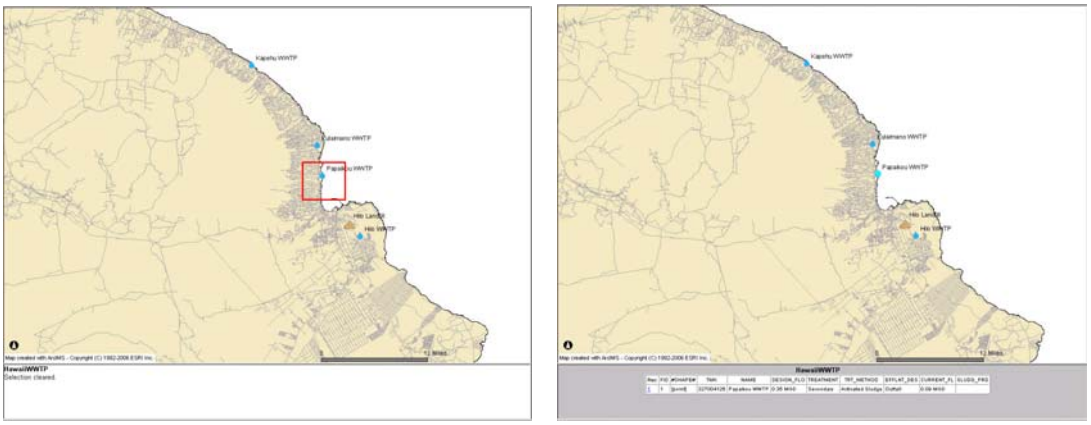


Activating the Wastewater Treatment Layer

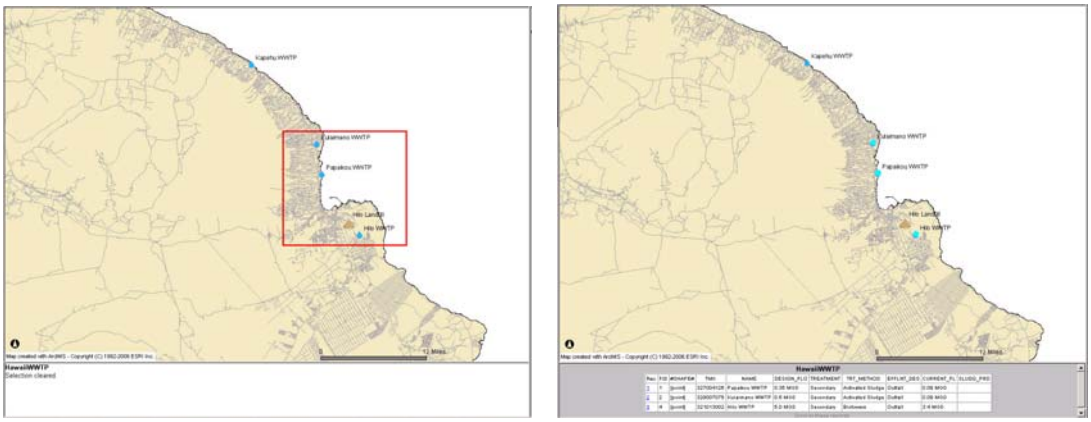
Tools (continued)

Select By Rectangle

Next, select the **Select by Rectangle** tool, then click and drag across one or more features on the map. A rectangle will appear while you drag the cursor. Release the mouse button to select all features within the box. The Data Display (bottom center) area of the screen will show information for all selected features, and the map will highlight the selected features in yellow.



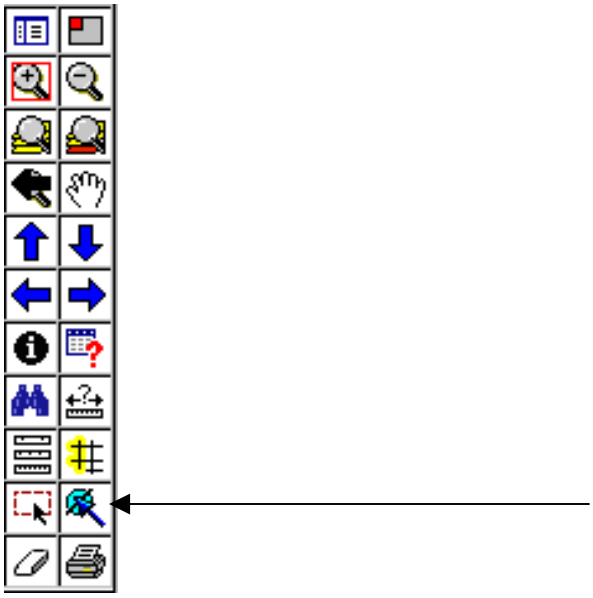
Select by Rectangle (box around single feature)



Selecting Multiple Features by Rectangle

Tools (continued)

Select by Line/Polygon



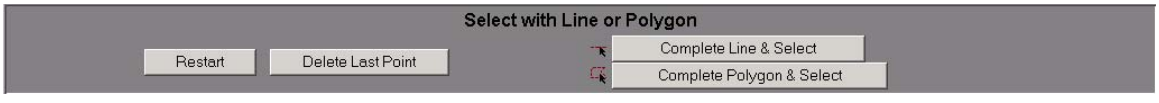
Hint: Select by Line/Polygon

Like the **Select by Rectangle** tool, the **Select by Line/Polygon** tool allows you to select one or more features on the map. However, rather than drawing a fixed rectangle shape around all features, it allows you to create a line and connect adjacent features.

To use this tool, first activate the layer you are interested in by clicking the **Active** radio button next to the layer. (For a description of the term “layer” and its use in GIS, please see the **Screen Layout** section of this document).

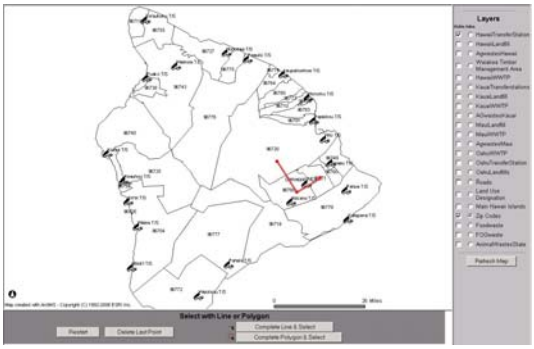
Activating the Zip Code Layer

Then select the tool. The Data Display (bottom center) area of the screen changes to a display similar to this:

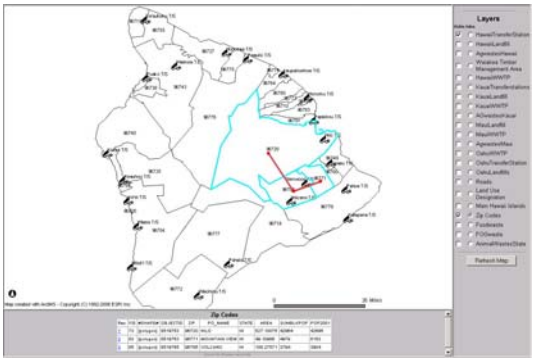


Select by Line/Polygon

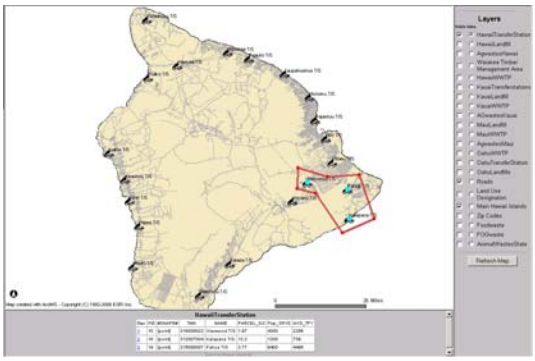
Click anywhere in the map to create a point, then click anywhere else to create a line connecting the new point to the original point. The map will update and the display to change to something similar to this:



When you have connected the features you are interested in, you can select either the **Complete Line & Select** button to select all features connected by the line you have created or the **Complete Polygon & Select** button to select all features connected by the lines and all features between within the line. In either case, the Data Display (bottom center) area of the screen will show information for all selected features, and the map will highlight the selected features in blue.



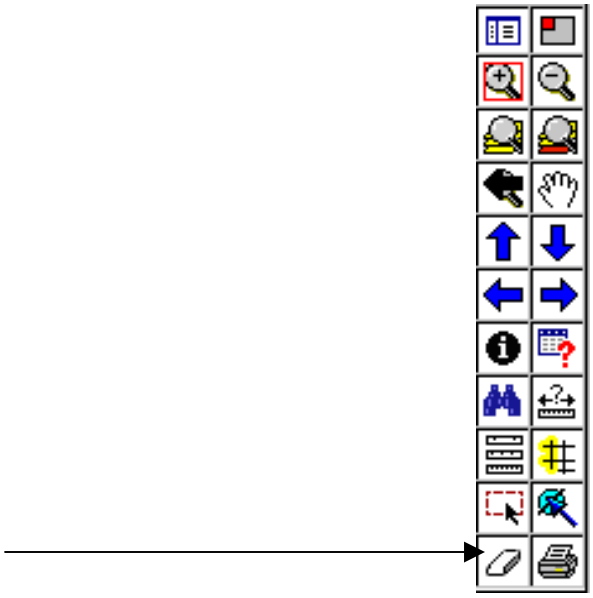
Zip Codes - Complete Line & Select



Transfer Stations - Complete Polygon & Select

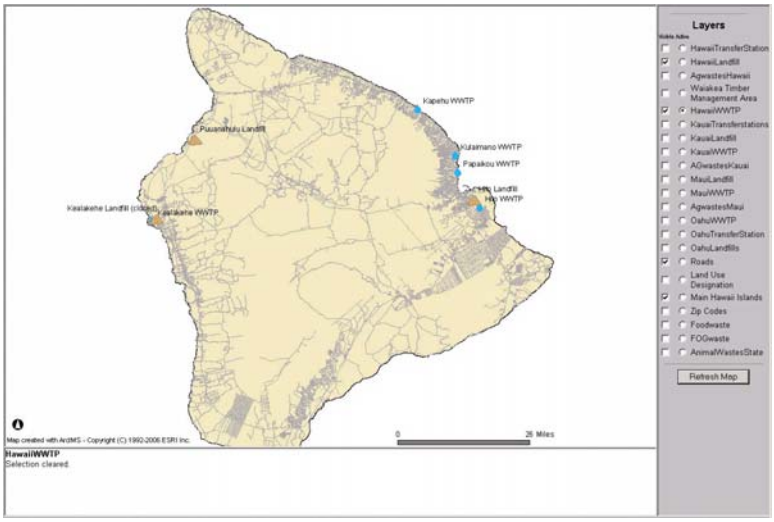
Tools (continued)

Clear Selection



Hint: Clear Selection

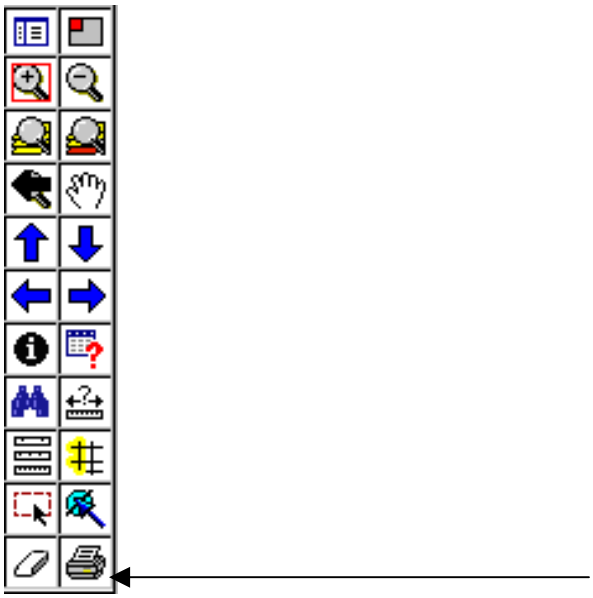
The **Clear Selection** tool clears any selected feature(s). Use it to clear information and reset the Data Display area (bottom center) of the screen after you have selected one or more features (for example, by using the Find tool).



Clear Selection Message

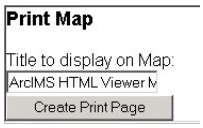
Tools (continued)

Print

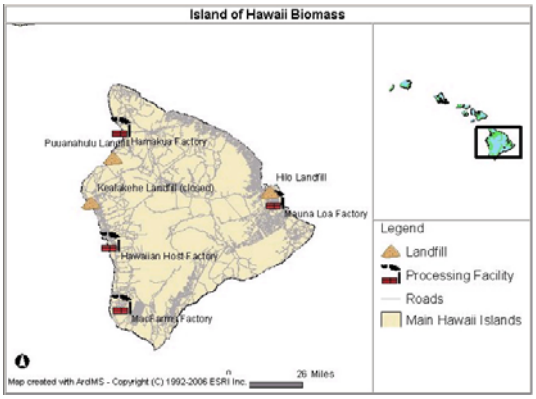


Hint: 

The **Print** tool allows you to create a printer-friendly version of the map's focus area. When you select this tool, you will see a message similar to the one displayed below.



You can accept the default map title or enter a new title for your map. Then, click the "Create Print Page" button to create a printer-friendly map.



"Create Print Page" Results