EnviroAtlas Interactive Map

User's Guide

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About EnviroAtlas

EnviroAtlas is a collection of tools and resources to provide data, research, and analysis on the relationships between nature, people, health, and the economy.

EnviroAtlas is designed for use by government, professional, academic, and community users as well as members of the public with an interest in ecosystem services, clean air, water resources, hazard mitigation, recreation, wildlife, conservation, climate, transportation, land use, health, and sustainable and healthy communities.

The EnviroAtlas interactive map displays spatial data layers grouped by category at the national level and for select communities. These data layers depict environmental metrics calculated or modeled by EPA and its partners, and may be referred to as "metrics" or "layers" in EnviroAtlas documentation. Map layer exploration is facilitated by the navigation toolbar (for zooming in and out, panning, and re-centering the map), bookmarks to commonly used locations, feature identification, and a locator (overview) map.

For additional information about EnviroAtlas, please see the EnviroAtlas home page.

Interactive Map Disclaimer

The EnviroAtlas interactive map initially opens with an EnviroAtlas use disclaimer. After several seconds the disclaimer pop-up window provides a button to agree to the terms and conditions of the disclaimer. This disclaimer pop-up contains two tabs: the **Main** tab with the user agreement, and the **Demo Video** tab which contains a link to the "Welcome to EnviroAtlas" video, explained below. After reading the terms and conditions for use on the **Main** tab, select the **Agree** button to proceed to the map. If desired, check the **Don't show again** box to bypass the disclaimer pop-up on subsequent visits to EnviroAtlas (bypass remains until the browser cookies and history are cleared). The **Contact Us** button opens a separate window to send comments to the EPA EnviroAtlas team (EnviroAtlas@epa.gov). Selecting the **Disagree** button opens the EnviroAtlas website.

The disclaimer may be viewed at any time from within the interactive map by clicking the **Mapping Tools** link and selecting **Re-open Introduction Page**.
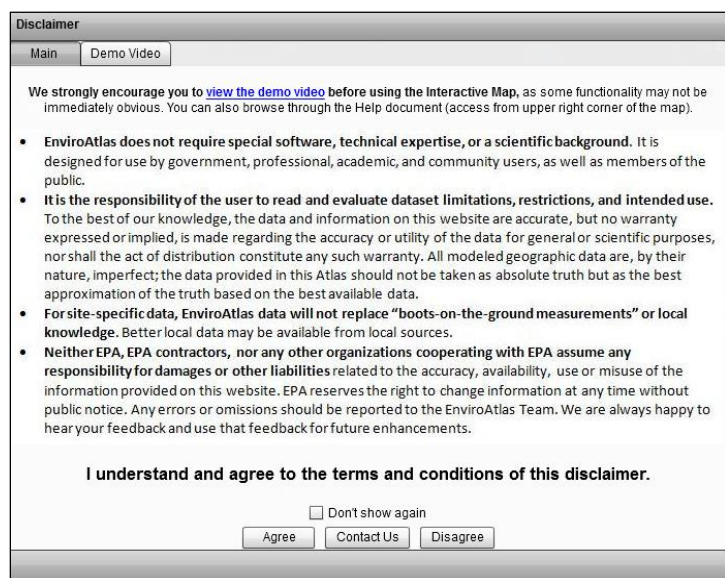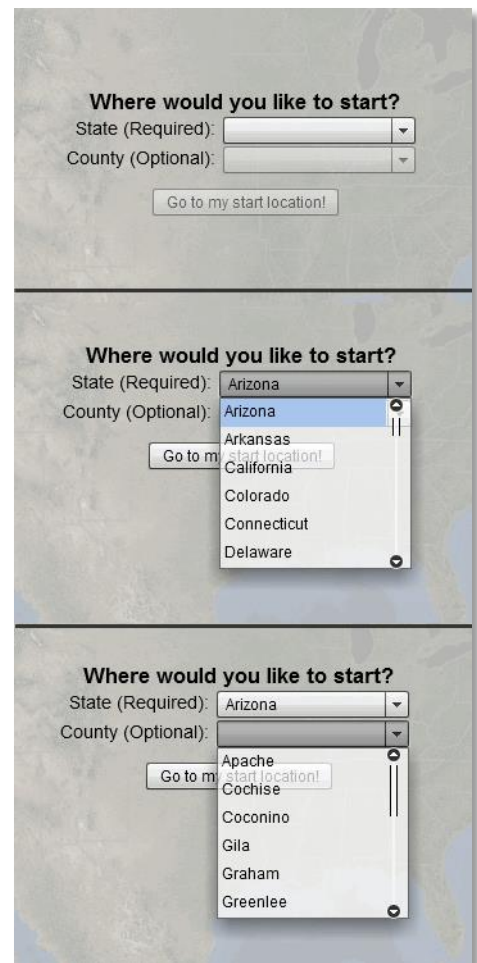
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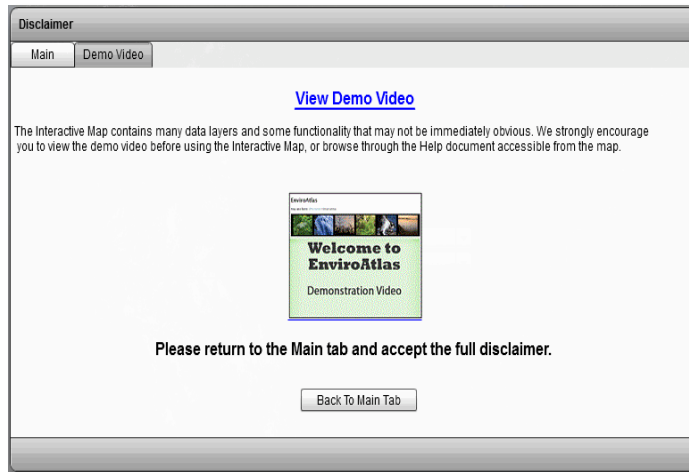
The **Demo Video** tab contains a link to a short video demonstrating some of the functionality within the EnviroAtlas Interactive Map. By clicking the blue "View Demo Video" text link or the "Welcome to EnviroAtlas Demonstration Video" image, the video file opens in a new browser window (browser pop-ups must be enabled). Return to the **Main** tab by selecting the **Back to Main Tab** button and then **Agree** to the terms and conditions of the disclaimer to continue to the EnviroAtlas Interactive Map.

Interactive Map Start Location

Once the disclaimer is accepted, the interactive map offers dropdown menus to select a starting location for the map. Select a state from the **State (Required)** dropdown (currently only the 48 contiguous states are available in the list) and, optionally, a county within the selected state. If no county is selected, the state boundary is used for the starting location.

When the selection box is empty, typing in the first letter of a state (or county for the optional county menu) scrolls in the list to that letter. For example, typing "i" in the blank **State (Required)** selection box moves the scroll list to "Idaho" – the first state in the list starting with "i". Once a state is selected, the county list is populated and one county may then be selected. Once the state or state and county have been selected, click the **Go to my start location!** button. The Interactive Map zooms to the selected location.

The map automatically displays state and county boundary lines for reference. To turn off these layers, click on **Supplemental Maps** in the ribbon above the map to access the Supplemental Maps table of contents, and uncheck the layers in the Boundaries category.

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Interactive Map Functionality

The EnviroAtlas Interactive Map contains links in the ribbon above the map which allow for exploration of mapped layers. The links include map visualization capabilities and analysis tools. Upon selection, each link provides a pop-up window with additional functionality.

The first two links, **Ecosystem Services and Biodiversity** and **People and Built Spaces**, allow for the display of map layers created specifically for EnviroAtlas. The third link, **Supplemental Maps**, contains data incorporated from EnviroAtlas and other sources designed to augment EnviroAtlas layers.
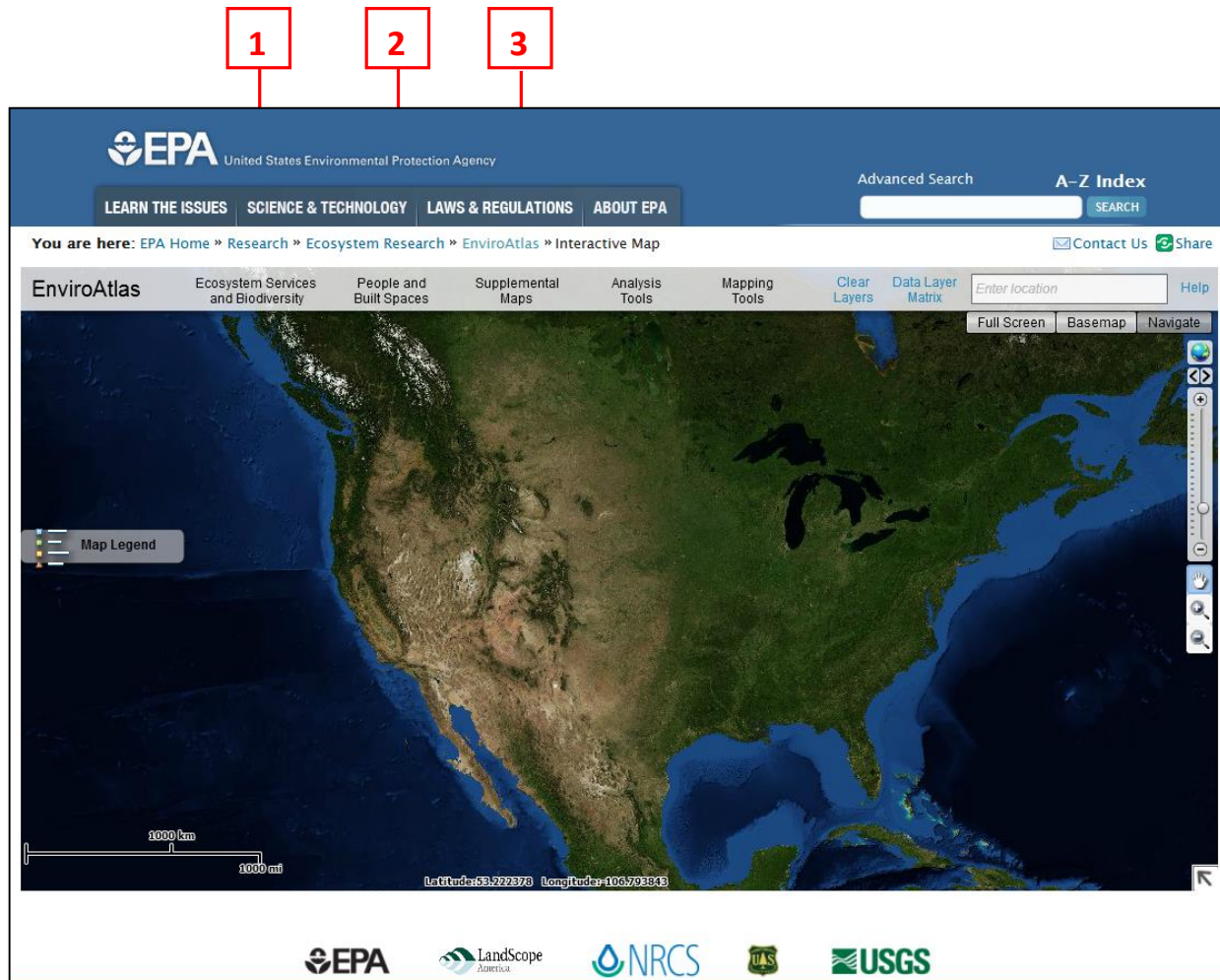
1. **Ecosystem Services and Biodiversity** – provides a selection of Ecosystem Services data at the national level and for select communities.
2. **People and Built Spaces** – provides a selection of national and community demographic data.
3. **Supplemental Maps** – provides a selection of a variety of supplemental geographic information from various sources.

Analysis, map navigation, and map display tools comprise the remainder of the links.

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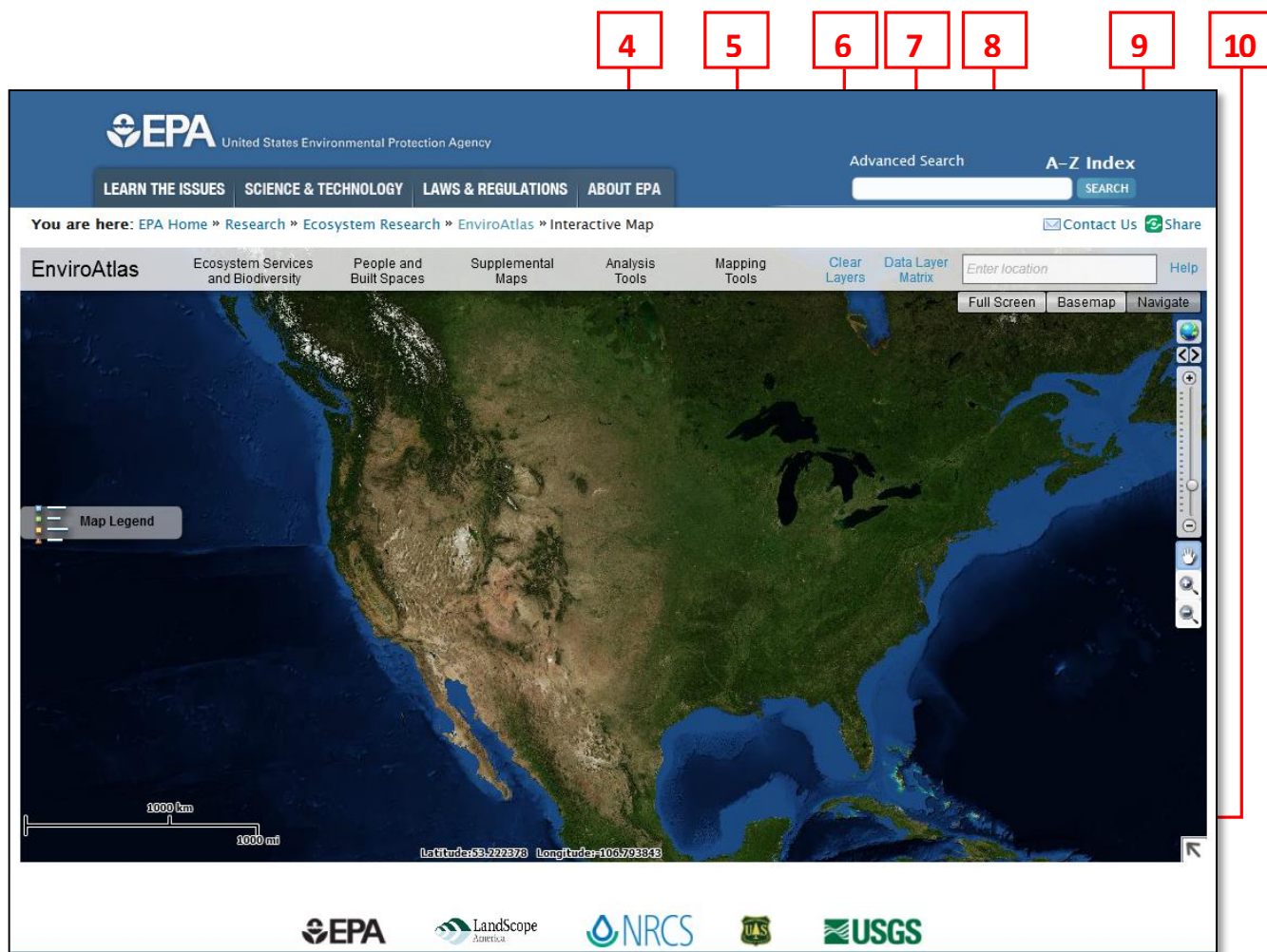
4. **Analysis Tools** – facilitates geospatial analysis and visualization of EnviroAtlas and related data.
5. **Mapping Tools** – provides resources for map navigation, draw and measure, adding local data, display, printing, and EnviroAtlas disclaimer.
6. **Clear Layers** – removes all layers currently displayed in the map with one mouse click.
7. **Data Layer Matrix** – opens a PDF table displaying all available EnviroAtlas national and community layers and the categories in which the layer is available.
8. **Location Search Box** – navigates the map to a location by entering the location name or address.
9. **Full Screen/Basemap/Navigate** – provides three additional options for map display and navigation, which are explained in detail in the next section of this document.
10. **Overview Map** – opens an overview map with an inset box showing the current geographic extent of the main map. Click the **arrow** to open and close the overview map.

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EnviroAtlas Layers and Other Map Layers

To access map layers, click the link for **Ecosystem Services and Biodiversity**, **People and Built Spaces**, or **Supplemental Maps**. In each case, a pop-up provides a selection of layers to display in the interactive map. This pop-up is referred to as the Table of Contents (TOC). For detailed guidance on TOC functionality, please see the section titled "How to Interact with Map Table of Contents (TOC)."
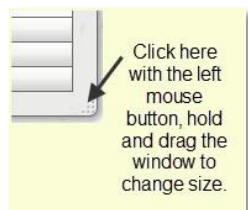
NOTE: To move most pop-up windows in EnviroAtlas, simply click and drag the title bar. To resize, click and drag the lower right corner of the pop-up.

Ecosystem Services and Biodiversity Layers

The **Ecosystem Services and Biodiversity** link provides layer choices developed for the National and selected Community geographic extents. After selecting the geographic extent of interest, the TOC pop-up will appear with layer choices.

The geographic extent of the National layers includes the conterminous 48 United States. EPA and EnviroAtlas partners have developed these layers to help governments, researchers, and other interested parties understand the status and impacts of Ecosystem Services within a watershed or region. As shown earlier, National layers are arranged in seven categories:

1. Clean Air
2. Clean and Plentiful Water
3. Natural Hazard Mitigation
4. Climate Stabilization
5. Recreation, Culture, and Aesthetics
6. Food, Fuel, and Materials
7. Biodiversity Conservation

Most of the National layers available in the interactive map through the Ecosystem Services and Biodiversity link are summarized by 12-digit hydrological unit code (HUC).

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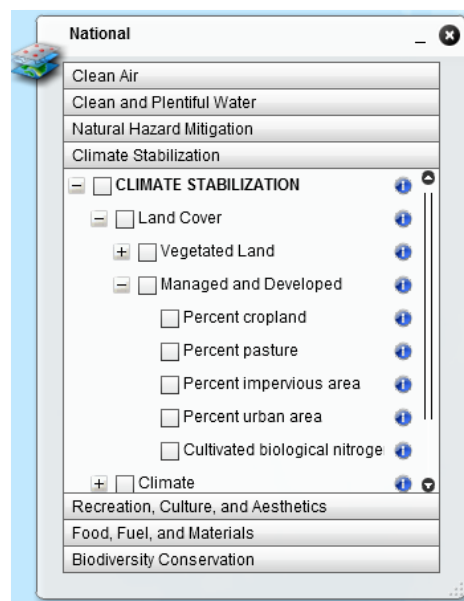
Community layers are continually being created. Layers are arranged by community, and are organized in the same categories as the National layers. The Community layers are designed to be used in conjunction with the national-scale layers. Each community includes layers that have been summarized by US Census Bureau block group. The defined boundaries for the community are based on selected block groups within the 2010 US Census Bureau Urban Area boundary for the community.
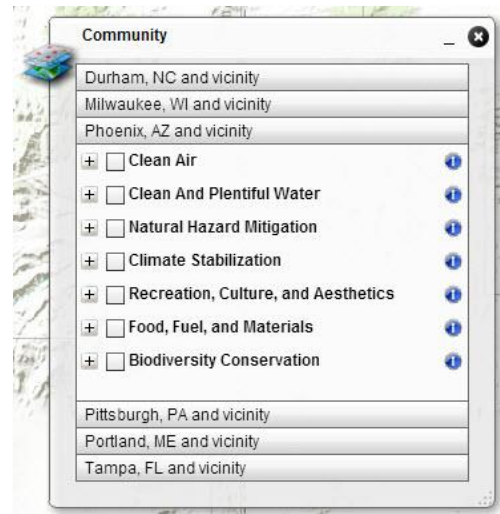
People and Built Spaces Layers

The **People and Built Spaces** link contains layers associated with demographics and built environments. Demographic layers make up the majority of these datasets. They are displayed as National census tract level polygon data and Community census block group point (centroid) data.

The National American Community Survey (ACS) category includes layers with information about population (race, poverty, age, and education) and housing units for the entire US by census tract from 2010.

The Community layers display information about populations vulnerable to detrimental impacts to the environment due to age or economic disadvantage. Also, information relating to schools and day care facilities are included.
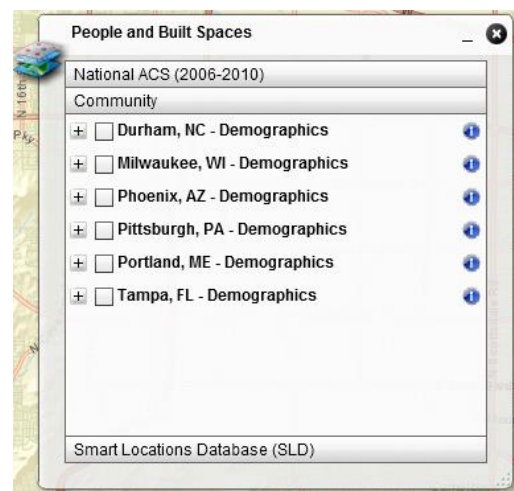
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Supplemental Maps Layers

The **Supplemental Maps** link contains layers that provide context and additional information for exploring Ecosystem Services along with natural and human-altered landscape features. Supplemental Maps layers are divided into:

1. Boundaries
2. Biophysical Data –Vector
3. Biophysical Data – Raster
4. EPA WATERS Data

A variety of layers including rivers, wetlands, political and other boundaries, USGS Gap Analysis Program (GAP) data, EPA Ecoregions, high-resolution land cover data for communities, impaired stream reaches, etc. are included under **Supplemental Maps**. Unlike most other layers, these layers are mapped with unique boundaries and may not be organized by HUC or Census Bureau boundaries. More information about each layer may be accessed by clicking the **blue circular "i" icon** and selecting the **Data Fact Sheet** link.

Layer Functionality

The EnviroAtlas interactive map includes a variety of functions which act upon the map layers. These functions range from simple tasks such as turning layers on and off, to more complex functions such as modifying the appearance of a layer in the map (also called "change symbology"). In addition, detailed information about the contents of individual layers may be obtained. Much of this functionality is accessible through the TOC.

How to Interact With Map Table of Contents (TOC)

Within each TOC pop-up, layers are arranged by category. For example, the Ecosystem Services and Biodiversity – National layers are arranged in seven categories:

1. Clean Air
2. Clean and Plentiful Water
3. Natural Hazard Mitigation
4. Climate Stabilization
5. Recreation, Culture, and Aesthetics
6. Food, Fuel, and Materials
7. Biodiversity Conservation
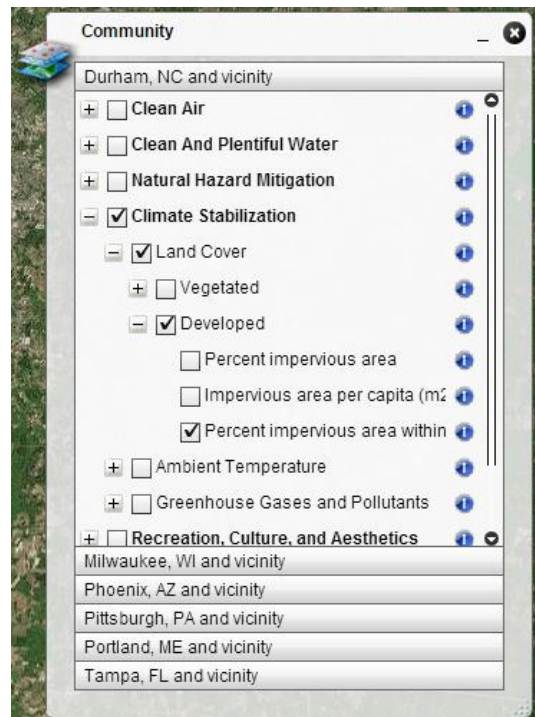
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Click on a category name to reveal a list of map layers that belong to that category. In the example at right, the Clean Air category displays a subset of Clean Air map layers.
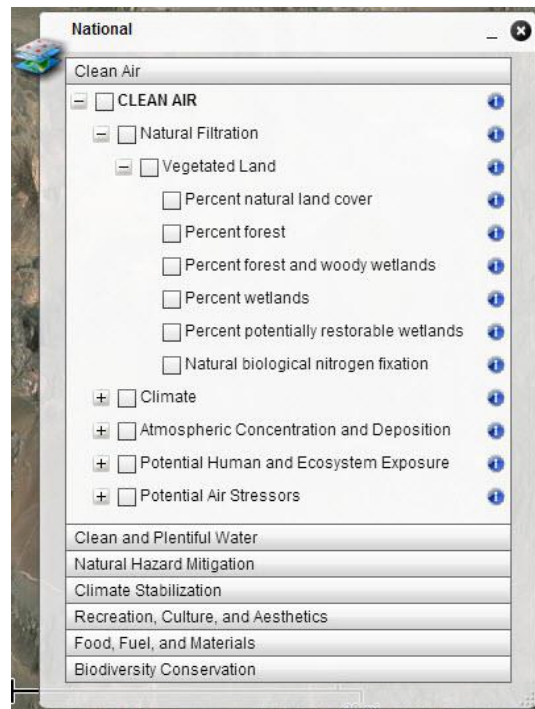
Users may interact with the named items in each TOC via the **plus/minus sign**, the **checkbox**, and the **blue circular "i" icon**.
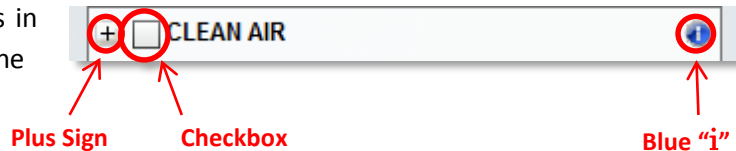
The **plus sign** ("+") indicates that individual layers are collapsed into the category to save space in the TOC and to provide thematic grouping. Many of the categories contain additional levels of subcategories which further refine the layer(s) within the overall category. Once clicked, the plus sign becomes a **minus sign** ("-") and reveals the subcategory or theme names or individual layers in the category. To view the available layer names, click the plus signs to expand the TOC. The example at the right shows that the Climate Stabilization category is comprised of three subcategories (Land Cover, Ambient Temperature, and Greenhouse Gasses and Pollutants), the Land Cover subcategory contains two additional subcategories (Vegetated and Developed), and the Developed subcategory contains three EnviroAtlas layers.

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When expanded beyond the size of the TOC window, the TOC displays a scroll bar to view the list of additional subcategories and layers. Use the scroll bar or scroll arrows to view all available choices, or change the window size by clicking and dragging the lower-right corner of the pop-up. Click the **minus sign** ("-") to return the TOC to the collapsed state for the selected category or subcategory.

The **checkbox** controls whether the layer is displayed in the interactive map. Click the **checkbox** to display a layer on the map. The upper level theme, subcategory and category checkboxes will be checked on automatically. *Multiple layers may be selected simultaneously, but only the top layer will be visible on the map.*
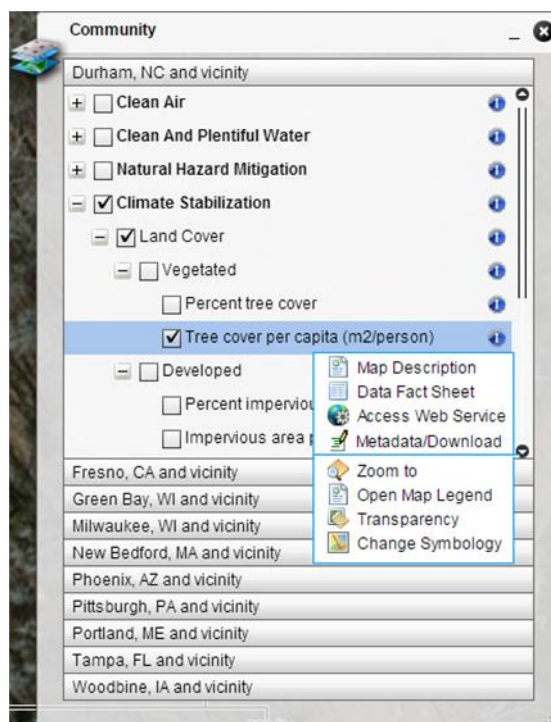
When a layer is displayed, the Map Legend pop-up displays automatically. Legend and map display is delayed slightly when first loading the layer. This is normal behavior. Legends for each displayed layer appear in the pop-up. Use the scroll bar or scroll arrows on the right of the pop-up, or click and drag to resize the legend pop-up to view more information.
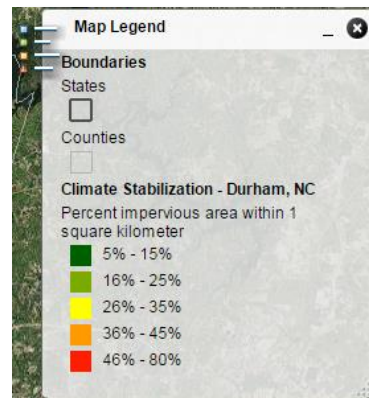
To minimize most pop-ups, click the "**_**" in the upper right corner of the pop-up. To open the minimized pop-up, click the icon on the left side of the minimized pop-up (shown at left for National TOC). To dismiss the TOC or other pop-ups, click the "**X**" in the upper right corner.

The **blue circular "i" icon** to the right of the category or layer name indicates that supporting information and display modification settings are available for the layer or category. Clicking the icon reveals these possible choices:

- **Map Description** – provides a short description of the layer or category.
- **Data Fact Sheet** – displays the layer's EnviroAtlas Fact Sheet PDF (if one is available) in a new browser window or tab.
- **Access Web Service** – opens a new browser window showing the layer's web service REST page.
- **Metadata/Download** – opens a new browser window to the EPA Environmental Dataset Gateway (EDG) metadata for the

layer. A download link is available on this page. The metadata is also uploaded to and available from Data.gov.

- **Zoom to** – zooms the map to the extent of the highlighted layer (*not available for every layer*).
- **Open Map Legend** – displays a pop-up with the map legend if the legend is not already open.
- **Transparency** – provides a slider bar to set transparency for the layer or category (*not available for every layer*).
- **Change Symbology** – displays a separate pop-up with options for changing map symbols on the selected layer. This option is explained in greater detail in the "Change Symbology" section. ***Note: Change Symbology is not available for every layer. Change Symbology is available for most layers in "Ecosystem Services and Biodiversity" and is not available for "Supplemental Maps" or "People and Built Spaces".***

Change Symbology

For most layers in the Ecosystem Services and Biodiversity TOCs, the **Change Symbology** tool is available to facilitate modifying the appearance of the map layers. The tool provides options to reclassify the map layer and adjust its transparency of the reclassified map. The tool is accessed by clicking on the **blue circular "i" icon** next to a layer name in the Table of Contents. The Change Symbology pop-up menu displays the modified legend and the following setting options for the layer:
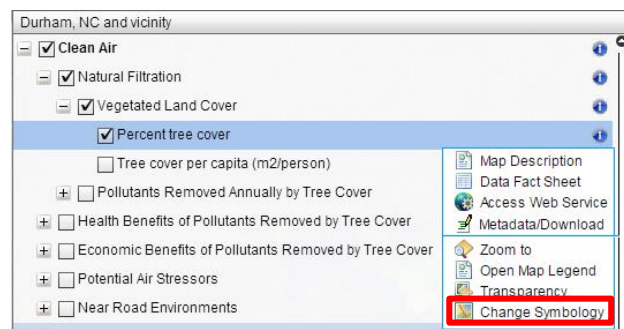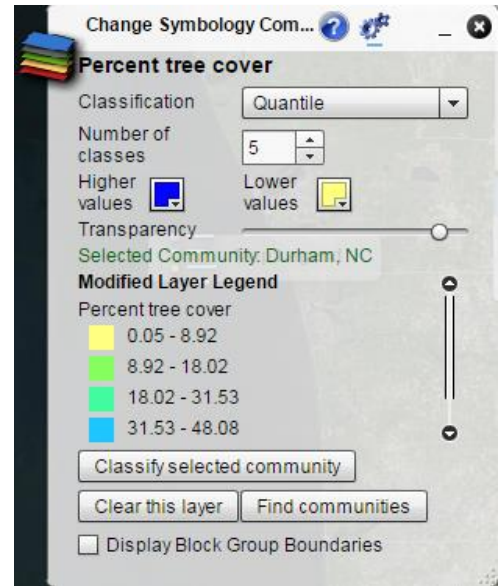

- Classification – provides three classification methods:
  - **Natural Breaks** (Jenks method) – classes are based on natural groupings in the data, maximizing differences between classes.
  - **Quantile** – classes are created by assigning an equal number of features per class. The default EnviroAtlas layer classification in the TOC uses five-class quantile (or quintile) classification.
  - **Equal Interval** – classes are split into equal value ranges based on the minimum and maximum values.
- Number of classes – provides the number of classes in the classification, with a minimum of four and a maximum of 12.
- Higher values – the color assignment of the highest values in the classification.
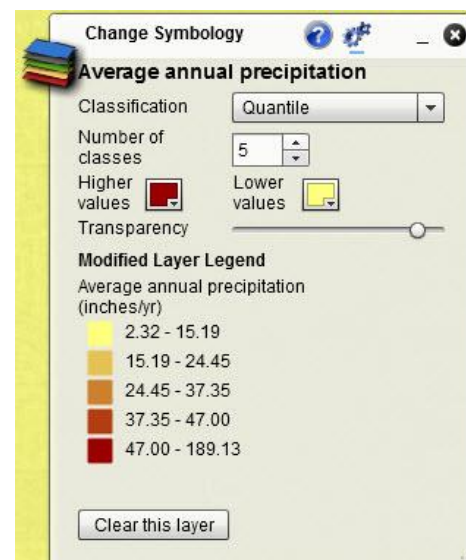
National Change Symbology menu

- Lower values – the color assignment of the lowest values in the classification. Each class between the highest and lowest values is assigned an intermediate color between the two.
- Transparency – assigns a transparency of the layer from 0.00 (completely transparent) to 1.00 (completely opaque).
- Clear this layer – button turns the layer off and closes the Change Symbology pop-up window.
- **FOR COMMUNITY LAYERS ONLY:** Classify all communities – the **Classify all communities** button classifies the values across all communities in the TOC rather than just the selected community. Once the **Classify all communities** button is clicked, the button toggles to **Classify selected community**, which returns the map to the originally selected layer and symbology. The graphic (right) shows Durham, NC as the selected community while the classification is displaying data for all communities. When classifying all communities, an option to click on the **Find communities** button is provided. This button opens the Bookmarks window. Click on the desired community in the Bookmarks tool (described in the Mapping Tools section). Once a community is selected, the map will pan and zoom to the selected community.

Community Change Symbology menu

- **FOR COMMUNITY LAYERS ONLY:** Display Block Group Boundaries – check this box to display Census Block Group boundaries.

Changed symbology persists until the Change Symbology pop-up is dismissed.

*NOTE: The **Change Symbology** legend in the current version of EnviroAtlas limits the number of digits after the decimal place to two. For some layers, this limitation may result in class values not displaying accurately. For these layers, the range of values can be obtained by looking at the map legend classification for the layer in the TOC.*
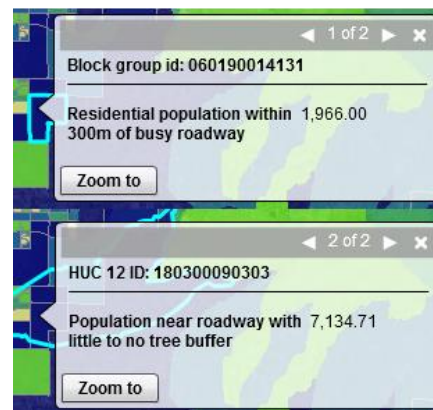
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Identify Tool

Identifying values for features displayed on the map is available for select map layers. When a layer in either the **Ecosystem Services and Biodiversity** TOC (both National and Community) or **People and Built Spaces** (Community layers only) TOC is selected for display, left-clicking on a mapped feature highlights the feature (HUC or census block group) and invokes a new pop-up showing the layer's data value for the feature.

Example of identify pop-up pages for two displayed layers.

When more than one layer is displayed, multiple features may be selected when a map location is interactively queried. Data values for each feature in each layer are populated in the pop-up and may be viewed by clicking on the forward and backward arrows in the top bar. The text between the arrows indicates how many "pages" of values are visible. Dismiss the pop-up for all pages by clicking the "**X**" in the upper right corner.

*NOTE: The **Identify** pop-up limits the number of digits after the decimal place to two. For some layers, this limitation may result in data values appearing incomplete. For these layers, the range of values can be obtained by looking at the map legend classification for the layer in the TOC.*

Map Navigation and Display Tools

EnviroAtlas provides multiple methods to navigate within the map, modify the display, and obtain map extent and coordinate information.

Clear Layers

Clear Layers on the menu bar removes all layers from the Interactive Map – including any open tool. Clicking **Clear Layers** refreshes the map without reloading layers or adjusting the map extent. This function is useful when a clean start with the map layers is desired without restarting the Interactive Map page.

Data Layer Matrix

The **Data Layer Matrix** item on the menu bar opens a new browser tab containing a table (PDF format) listing all EnviroAtlas Ecosystem Services and Biodiversity layers and the categories in which the layers reside. A link to the associated metadata is also provided in the table. This same table is accessible through the EnviroAtlas Data website as a PDF, text file, or MS Excel® xls spreadsheet.

Help Document

Clicking **Help** in the menu bar opens this help document – "EnviroAtlas Interactive Map User's Guide."

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Location Search Box

The location search box located in the upper-right corner of the interactive map allows for navigation of the map to a location by entering the place name, street address, city and state, or ZIP Code.

For common place names, several choices are displayed. The scroll bar or scroll arrows may be used to find the exact location needed.

Full Screen/Basemap/Navigate

The **Full Screen** button expands the map to the full extent of the computer screen. This is particularly useful when
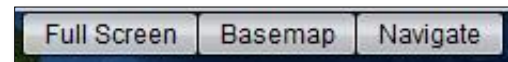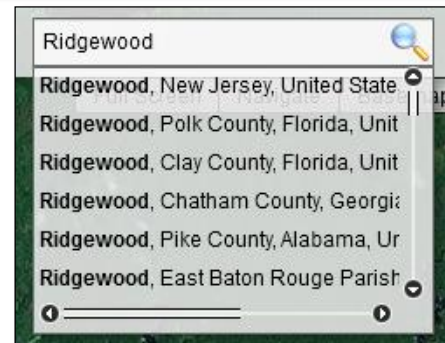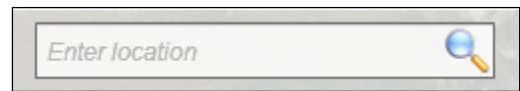
viewing a large geographic area. In Full Screen mode, the EnviroAtlas website borders and browser tools are removed to maximize the map size on the computer screen. To switch back to regular viewing, click **Full Screen** again, or the use the Escape (Esc) key on the computer keyboard. **NOTE:** Full Screen mode limits keyboard functions for most characters.

The **Basemap** button offers several options for changing the base map, which is the underlying map image for all EnviroAtlas layers. Different sources of aerial imagery, topographic, and street maps are available. To aid in the discovery of the a suitable base map, the slider bar at the bottom of the pop-up window cycles through options of individual or combined base maps.

The **Navigate** button displays navigation tools directly on the interactive map. These tools provide most navigation functions in a convenient, compact group.

- Full Extent – sets the map extent to the conterminous United States.
- Previous Extent – sets the map extent to the previous location and zoom level.
- Next Extent – sets the map extent to the next location and zoom level (active if the previous extent tool has been used).

- Zoom Slider Bar – sets the map extent as circle moves up (zoom in) or down (zoom out) the bar. Also displays the map scale.
- Pan – sets the map extent without changing the zoom level.
- Zoom In Box – zooms in by interactively drawing a box around the area of interest. Click on the tool first, then draw the box on the map.
- Zoom Out Box – zooms out by using the same method as the Zoom In Box.
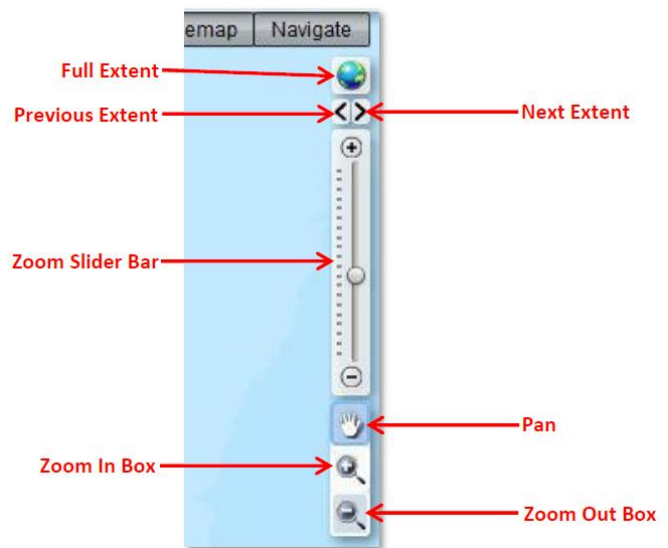
Overview Map

The **arrow** at the bottom-right corner of the interactive map provides access to an overview map. Click the **arrow** to open the overview map. A red-shaded inset box appears in the overview map showing the geographic extent of the main map. To pan to a different area in the main map, move the red-shaded inset box within the overview map to the desired area. Clicking the **arrow** on the upper-left side hides the overview map.
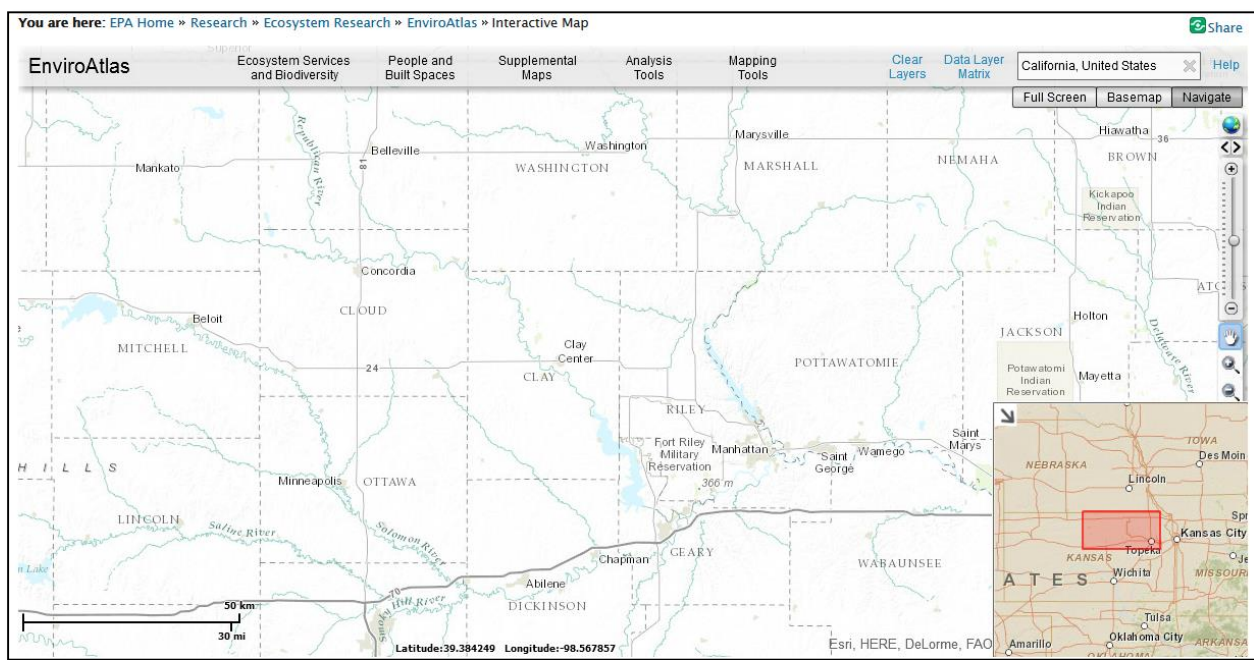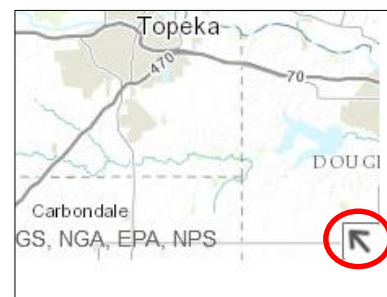
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Coordinate Tools

Several options are available for interactively obtaining location coordinates from the map and navigating the map with known location coordinates. Right-click on the map to access these options.

Copy Map XY Coordinates To Clipboard – captures the coordinates of the mouse cursor position on the map at the time of the right click. The coordinates are copied to the computer clipboard and may be pasted into another computer application. The coordinates are reported in the EnviroAtlas native map projection (Web Mercator Auxiliary Sphere, WGS 1984, units in meters).

Copy Projected XY Coordinates To Clipboard – captures the coordinates of the mouse cursor position on the map at the time of the right click and reports them in three coordinate systems in a pop-up:
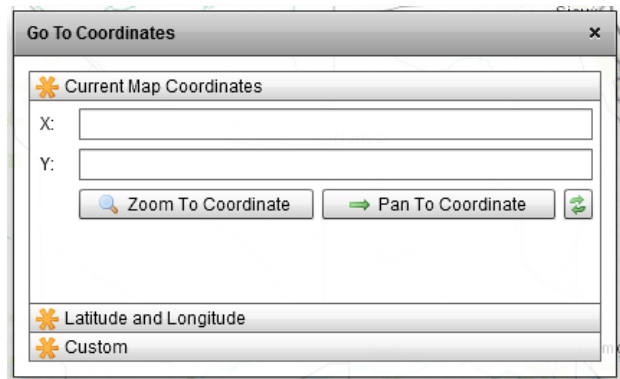
- WGS 1984 - Latitude/Longitude in decimal degrees in the WGS 1984 datum.
- DMS - Latitude/Longitude in degrees-minutes-seconds in the WGS 1984 datum.
- Map - Web Mercator Auxiliary Sphere coordinates (in meters) in the WGS 1984 datum.

Copy the coordinates to the computer clipboard by clicking the **copy icon** ( ) to the left of the coordinate system name. Once copied, the coordinates may be pasted into another computer application. Future versions of the EnviroAtlas interactive map will contain additional projected coordinate systems which may be selected from the **Coordinate System** dropdown.
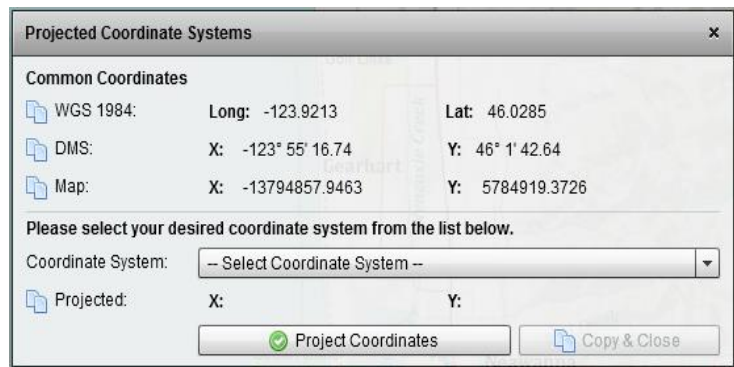
Go To XY Coordinates – navigates to a location on the interactive map based on coordinate input. The three options for coordinate input are:

- Current Map Coordinates – input coordinates must be in the EnviroAtlas native coordinate system (Web Mercator Auxiliary Sphere, WGS 1984 datum, units in meters).

- Latitude and Longitude – input coordinates must be in decimal degrees. This input assumes the coordinate datum is WGS 1984.
- Custom – future versions of the EnviroAtlas Interactive Map will allow for input of coordinates collected in coordinate systems other than Web Mercator and Latitude/Longitude.

After entering the X and Y coordinate values, press either **Zoom To Coordinate** to zoom the Interactive Map to a larger scale centered on the coordinate location, or **Pan To Coordinate** to pan the Interactive Map so that it is centered on the coordinate location without changing the zoom level.

Get Map Extent – opens the Extent Grabber pop-up which reports the minimum and maximum X and Y coordinates of the map as currently displayed. The coordinates are displayed in the EnviroAtlas native coordinate system (Web Mercator Auxiliary Sphere, WGS 1984 datum, meters).
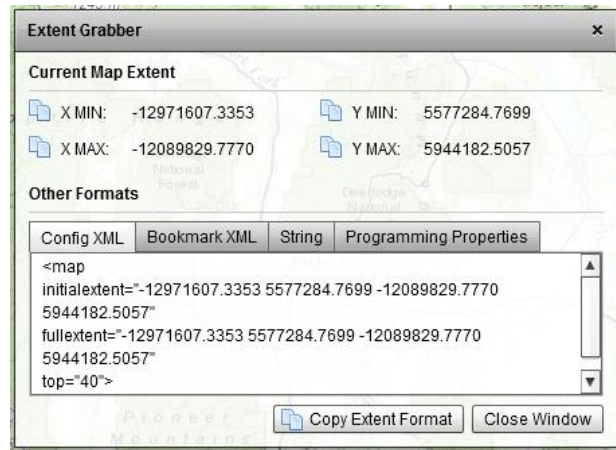
Extent is reported in four different formats which can be reused for other mapping applications: Config XML, Bookmark XML, String, and Programming Properties. For simple text of the current map extent (x min, y min, x max, and y max) select the String tab. Select the desired format and click **Copy Extent Format** to copy the format to the computer clipboard.

Analysis Tools

The **Analysis Tools** link provides three tools to assist in exploring and analyzing the data:

1. **Analyze Ecosystem Services**
2. **Raindrop Tool**
3. **Elevation Data**

NOTE: Some of these tools are still under development and are for demonstration purposes only. The tools and data are provided as an example of the tool functionality.
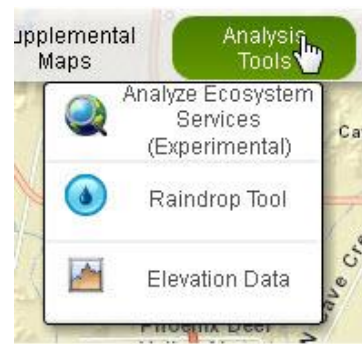
Analyze Ecosystem Services Tool

Analyze Ecosystem Services is an interactive mapping tool that displays index values for the seven ecosystem services within a selected 12-digit HUC. The index values for each ecosystem service, which range from 0 to 1.5, represent the degree to which certain ecosystem attributes within the HUC, when analyzed together, are able to mitigate stressors and maximize human health benefits. Separate index values are displayed for each ecosystem services category in graphical and tabular formats.

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To use the **Analyze Ecosystem Services** tool, open the tool and click the **Activate Tool** button to enable HUC selection. Move the mouse pointer (🔍) over the location of interest on the map and click.

The **Analyze Ecosystem Services** tool displays the selected HUC in the map along with a pop-up window. The pop-up initially shows a radar chart depicting the index value for each of the ecosystem services along the seven spokes of the chart.
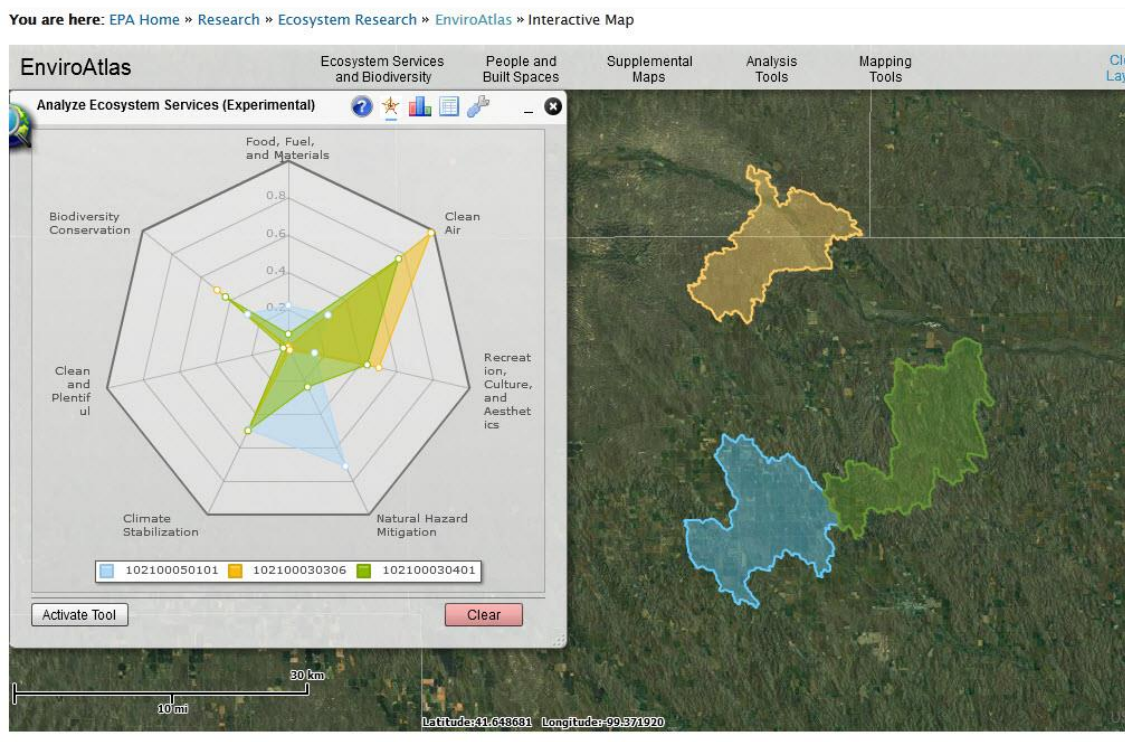
Multiple HUCs may be displayed simultaneously to facilitate comparison. Select another location on the map to display another HUC. The radar graph for the each newly-selected HUC is superimposed on the previous graph. In the example above for HUC 102100030306 and 102100030401, the index value is lowest for the Food, Fuel, and Materials and the Clean and Plentiful Water ecosystem services categories. This indicates that ecosystem attributes which are known to provide human benefits in the Food, Fuel, and Materials and Clean and Plentiful Water categories are lacking. The highest index value is in the Clean Air ecosystem services category which indicates that ecosystem attributes in these HUCs offer comparatively better human benefits in that category. In this example, HUC 102100050101 is comprised of ecosystem attributes showing a higher index value for the Natural Hazard Mitigation ecosystem services category.

There are alternate ways to view the index values for the selected HUC. Click the **bar chart icon** ( ) to display the index values for the HUCs in a bar chart format.
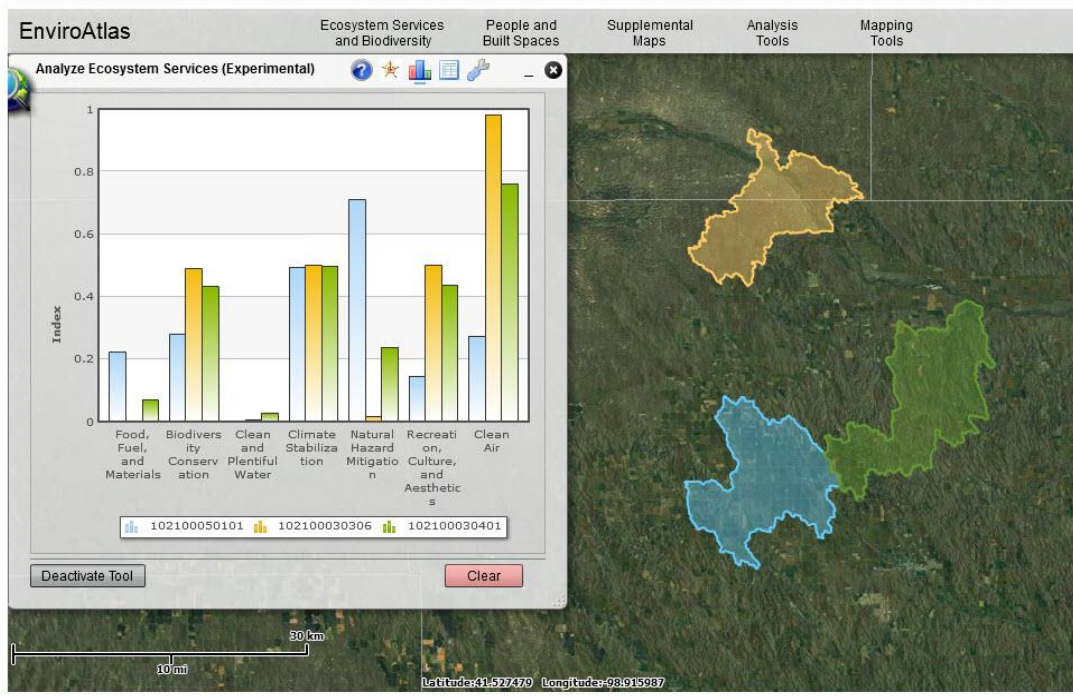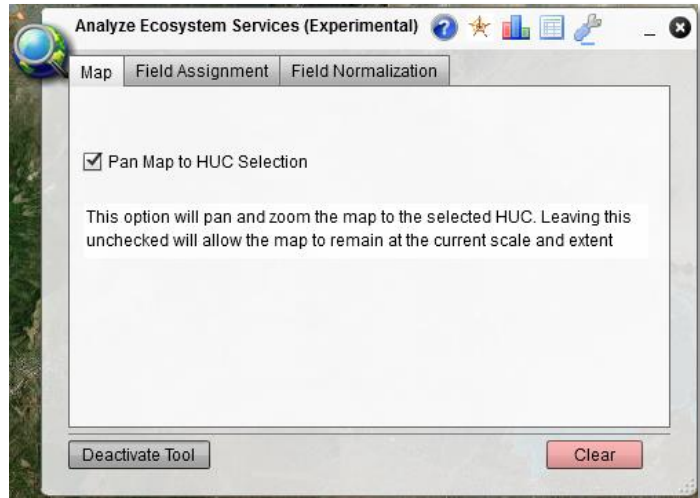

Click the **table** icon ( ) to display a table with the values for the individual ecosystem attributes that are used to calculate the index for each ecosystem service.

The **settings** icon ( ) has three tabs of information:

- **Map** – clicking on the checkbox allows the map to automatically pan and zoom to the selected HUC**.**
- **Field Assignment** – by placing values from 0 to 1 in a variable column and the associated Ecosystem service category row, the selected HUC will display the graph using the fields assigned**.**
- **Field Normalization** – by modifying the minimum and maximum values of the variable, the field normalization in conjunction with the field assignment create a weighting used to populate the graph for each HUC selected after the changes are made. For information about the calculations, please contact the EnviroAtlas team.

Only 12 distinctly colored HUCs are able to be displayed on the map simultaneously, however, the graphs can display additional HUCs. As HUCs are added to the map and graphs, the ability to discern them may become difficult. Graphs for any of the HUCs may be turned off by clicking the HUC number in the widget's legend.

Raindrop Tool

The **Raindrop Tool** generates a raindrop flow path (linear feature) based on the interactive selection of a location and returns the distance to the nearest water feature as depicted in National Hydrography Dataset Plus (NHDPlus). The tool pop-up window includes three icons at the top: **Results** ( ), **Settings** ( ), and **Help** ( ).
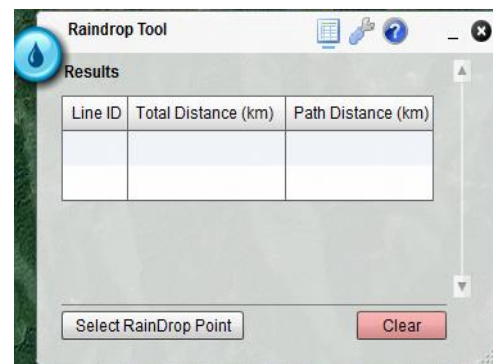
NOTE: It may be helpful to display the NHD Flowlines layer while using this tool to provide context. The NHD Flowlines layer is in the Supplemental Maps link, within the Biophysical Data – Vector category. This tool is built using nationally available 30 meter elevation data; it does not account for buildings or engineered stormwater infrastructure (such as culverts and pipes) and is not for use in heavily engineered locations.
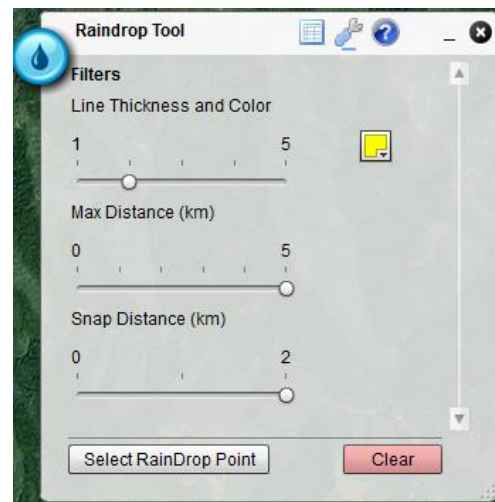
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To use the **Raindrop Tool** with default settings, simply click the **Select Raindrop Point** button, move the mouse pointer (🔍) over the location of interest on the map and click. The tool returns a line showing the flow path of water from the point selected to the nearest water body. The map zooms to the scale and location where the flow path line is returned.
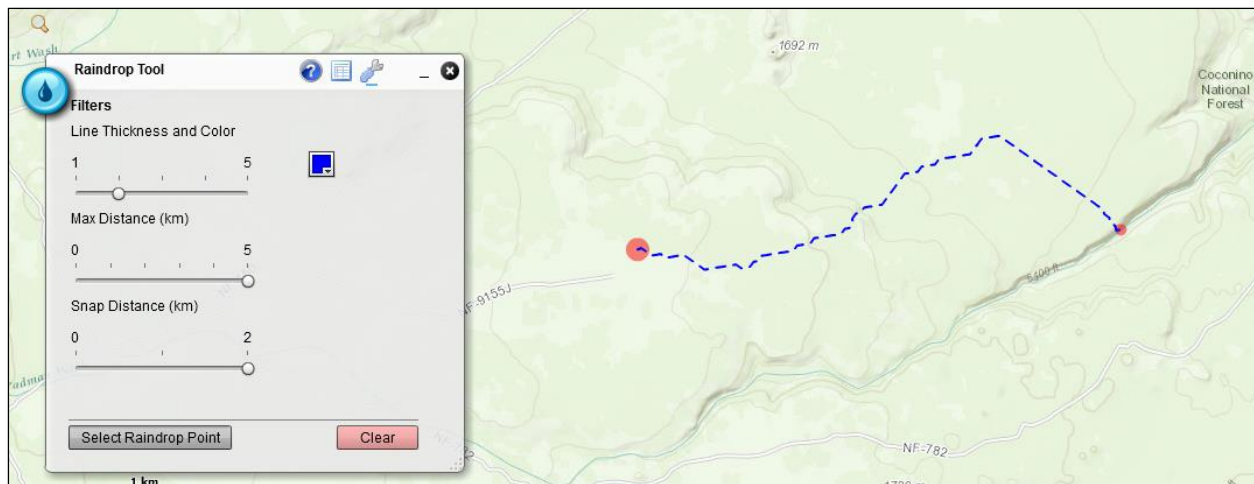
Raindrop Tool settings may be adjusted if the default settings do not provide the desired results. Click on the **Settings** icon (🔧) to access these:

- **Line Thickness and Color:** Use the slider bar to set the line thickness. Click the color box to select the line color. The default is a 2-point yellow line.
- **Max Distance (km):** Use the slider bar to set the maximum distance the raindrop will travel, from 0 to 5 kilometers. The default is 5 kilometers.
- **Snap Distance (km):** Use the slider bar to set the distance the raindrop will travel before snapping to the nearest NHDPlus water feature. The default snap distance is 2 kilometers.

Once the filters are set, click the **Select Raindrop Point** button. Move the mouse pointer (🔍) over the location of interest on the map and click. If the Max Distance and Snap Distance criteria are met, the flowline displays on the map with red circles indicating the starting point (large red circle at the selected point) and ending point (smaller red circle).

Click the **Results** icon ( ) to find the total and path distance values from the selected point to the nearest NHDPlus water body. *Several points may be selected and flowlines displayed on the map simultaneously, however only the last raindrop point is reported in the Results table.* To remove the graphic features from the map, click the red **Clear** button.

*NOTE: Raindrop points can continue to be selected while the mouse pointer shows the magnifying glass. To return to EnviroAtlas map functions, close the **Raindrop Tool** or click on the **Select Raindrop Point** button to leave the tool open. The mouse pointer reverts to an arrow.*
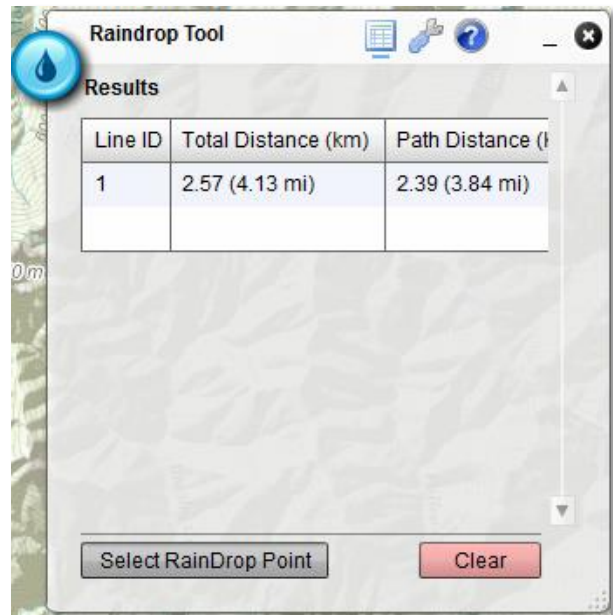

Elevation Data Tool

The **Elevation Data** tool provides the elevation at a selected point on the map or generates an elevation profile graph based on an interactively-drawn line. The elevation data are reported in meters above mean sea level and are based on topographic data collected by the NASA Shuttle Radar Topography Mission (SRTM).
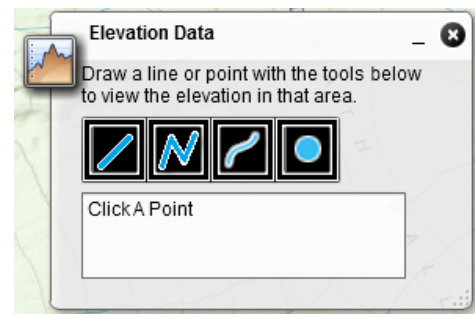
To obtain an elevation value at a point on the map, select the **point** icon ( ) then click on the map location. A pop-up displays the elevation at the point.
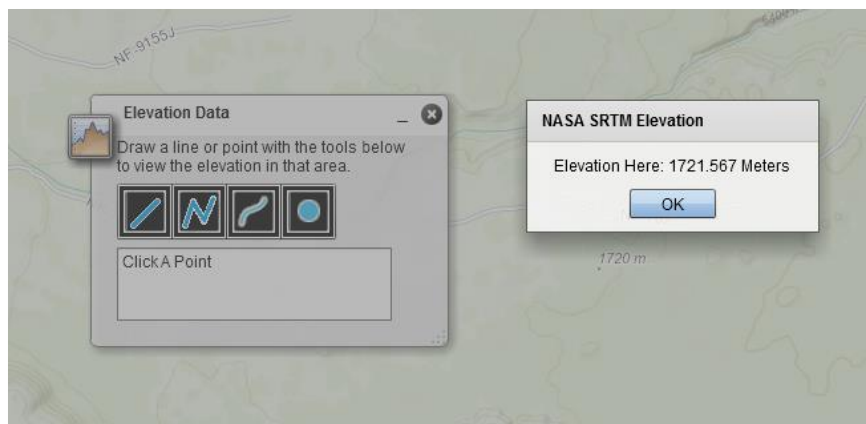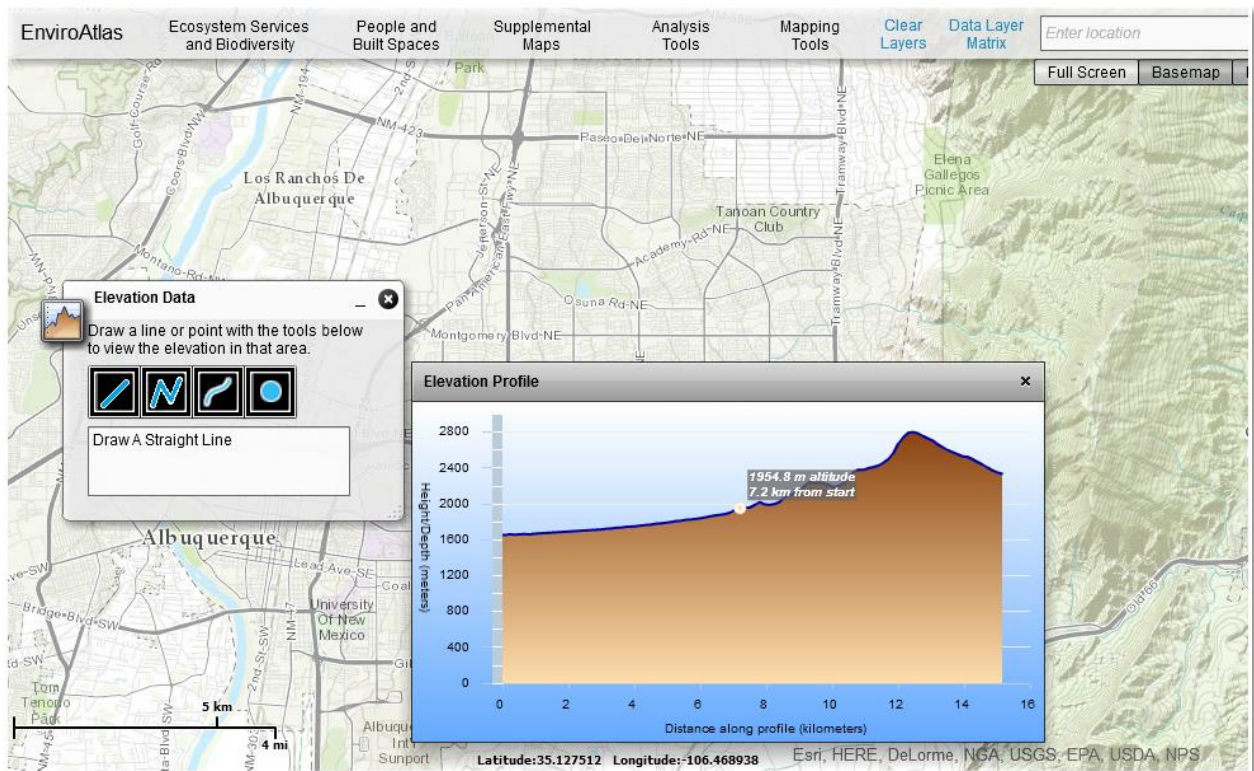
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Three methods are available to generate an elevation profile graph:

- **Draw A Straight Line** (⬜) – draw a single straight line along the desired profile transect by clicking and holding the mouse button at the beginning point of the profile, then releasing the mouse button at the end point of the profile.
- **Draw A Polyline** (⬜) – starting with a single click at the desired beginning point of the profile transect, draw a single line consisting of a series of straight lines connected with mouse clicks. Double click at the end point of the profile.
- **Draw A Freehand Line** (⬜) – draw a single line (which may contain curves) along the desired profile transect by clicking and holding the mouse button at the beginning of the profile, then releasing the mouse button at the end point of the profile.

The elevation profile graph displays in a pop-up window. Hover the mouse pointer over the profile line to see the distance along the profile and the elevation value at a particular point.
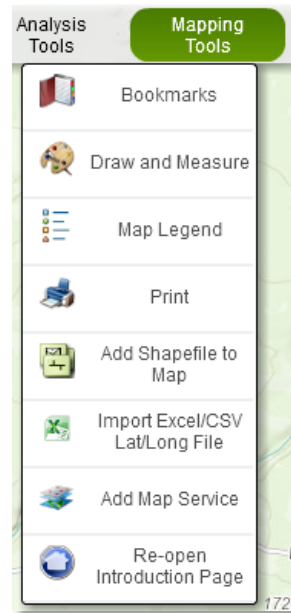
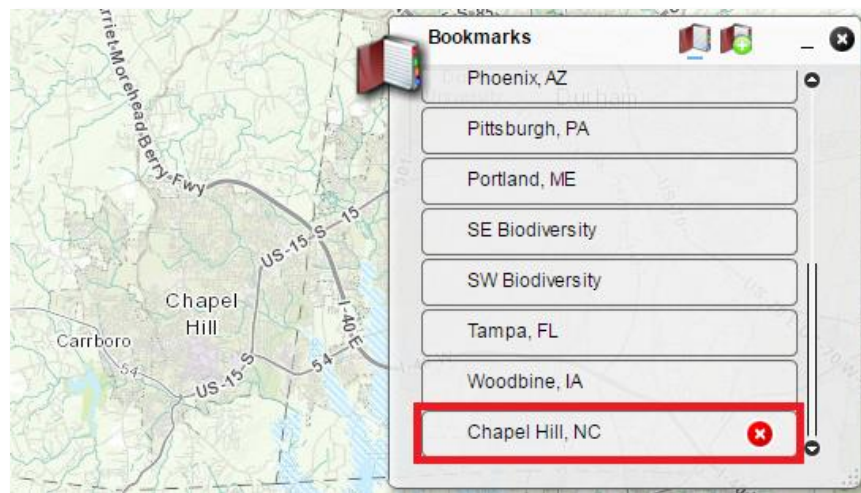# EnviroAtlas Interactive Map User's Guide

Mapping Tools

The **Mapping Tools** provides utilities for additional map interactions:

1. **Bookmarks**
2. **Draw and Measure**
3. **Map Legend**
4. **Print**
5. **Add Shapefile to Map**
6. **Import Excel/CSV Lat/Long File**
7. **Add Map Service**
8. **Re-open Introduction Page**

Bookmarks

The **Bookmarks** tool provides the ability to save and move to a location on the map. Several geographic areas are pre-configured in the EnviroAtlas Bookmarks pop-up. Click a geographic location name to reposition the map at the location, scaled to the extent of the geographic area. To add a new bookmark, zoom and/or pan to the desired area, click the **Add Bookmark** tool ( ), type a name for the bookmark, and click **Add Bookmark**. The new bookmark will be added to the bottom of the Bookmarks list and is stored locally in the browser cache (in the user's browser settings). Note: if the browser cache is cleared, the bookmarks created will no longer be saved. To permanently save the spatial extent, use the Coordinate tools that are available by right-clicking on the map.

To delete a bookmark, click on the red '**x**' ( ) next to the bookmark name. Pre-configured bookmarks cannot be deleted.

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Draw and Measure

The **Draw and Measure** tools allow points, lines, polygons, and text to be placed on the map. Measurement values (if activated) for the features drawn can also be displayed: lengths for lines, and areas and perimeters for polygons. To discover the function of each feature creation tool, hover the mouse over a tool to see a pop-up describing the tool.


Point Feature Properties

To add a feature, click on the desired feature creation tool. When the feature creation tool is selected, its icon displays with a blue highlight. Before creating a new feature, the feature properties can be customized for the feature being created. Note that line and polygon features also support measurement values, which must be activated by checking the **Show Measurements** check box.

To add a new line or polygon feature, click the map at the desired location and define the feature extent, then double-click to finish the feature. To add a point feature, click the map at the desired location.

Line Feature Properties

In the case of the text tool, the text string needs to be specified in the Text input box first, then click the map to place the text. Note: For measurements to display for a feature, the feature must be activated and units must be set before a feature is created to display on the map.

Click **Clear drawings** to remove added features or text.

Created features and text are temporary and only visible when the Draw tools are active or minimized. The drawings are located on a graphics layer which is automatically instantiated when the widget is opened for the first time. These features are removed from the map display when the **Draw and Measure** tools are closed. Features and text will reappear when the **Draw and Measure** tools are reactivated.

Polygon Feature Properties

Text Feature Properties
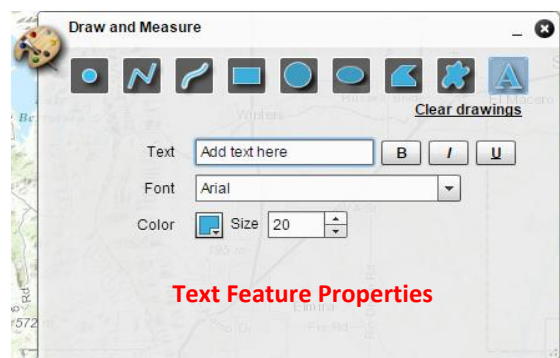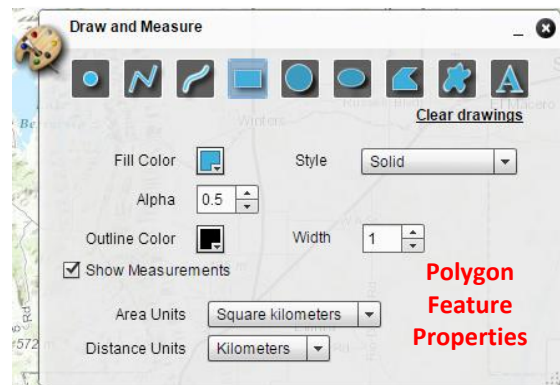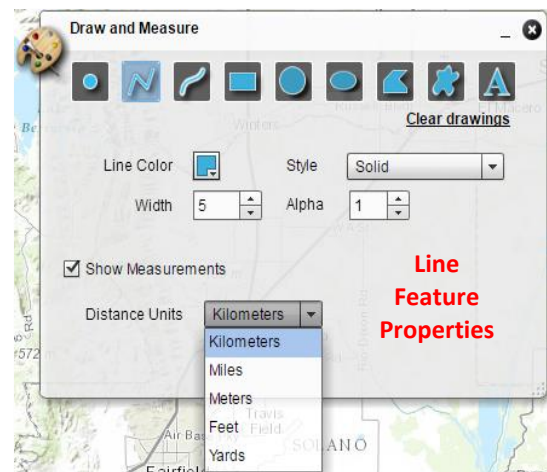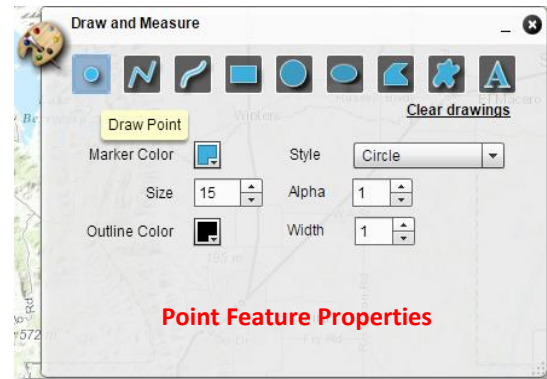
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Map Legend

The **Map Legend** tool provides a dynamic legend that automatically updates if the visibility of a layer or sublayer changes. The order in which layers appear in the Legend corresponds to the layer order in the TOC. <u>Note</u>: Basemaps are not shown in the Legend. This Map Legend will display with selected layers in the TOCs and is provided here for convenience if the widget is closed or removed from the display. **Change Symbology** creates a separate legend within the tool.

Print

The **Print** tool provides a simple map printing function. Options include the ability to add a title and, if desired, a subtitle to the map. <u>Note</u>: For best results, set the layout for the map to Landscape.
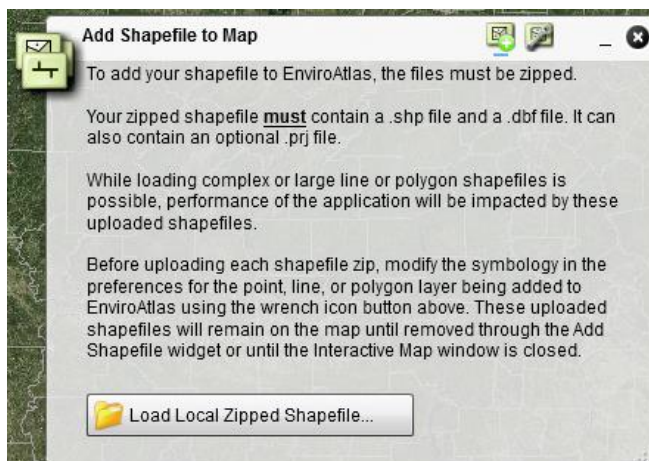
Add Shapefile to Map

The **Add Shapefile to Map** tool allows the uploading of a GIS shapefile dataset into the EnviroAtlas interactive map. Symbols and labels for the shapefile features are configurable in the tool.

The following preliminary steps must be taken before the shapefile is loaded:

1. Review the shapefile to ensure that the .shp and .dbf component files are present.
2. Verify the shapefile projection is defined.
   - If the projection is undefined, a projection must be accurately defined so EnviroAtlas can reproject into the native map projection (Web Mercator Auxiliary Sphere, WGS 1984, units in meters).
   - A shapefile with a defined projection will include a .prj component file. While not essential to loading a shapefile in EnviroAtlas, the .prj component file is highly recommended to avoid unexpected results.
3. Compress (zip) the shapefile component files (including the .shp, .dbf, .prj and any other component files as well) using a file compression application that results in a .zip file output. The zip file should contain only one shapefile and must contain one .shp file and one .dbf file.

To load the zipped shapefile into EnviroAtlas, click **Add Shapefile to Map**.

The **Add Shapefile to Map** pop-up appears. The two icons at the top of the pop-up provide options for adding the shapefile. The **Load Shapefile** icon ( ) provides guidance on loading a shapefile into EnviroAtlas, along with the button to **Load Local Zipped Shapefile**. The **Preferences** icon ( ) provides options for shapefile feature labels and symbology.

The guidance text on the Load Shapefile screen provides four pieces of helpful

information about preparing a shapefile for loading. Details about the zip format and the shapefile component files are addressed at the beginning of this section.

Many simple shapefiles load easily into the EnviroAtlas map. However, shapefiles with complex line or polygon geometry or with a large number of features may be problematic and take an excessive amount of time to load. EnviroAtlas may return an error during the loading process, or performance may slow after loading a large or complex shapefile. If this is the case, consider removing the shapefile from the EnviroAtlas map and editing the shapefile using GIS software to simplify the polygons or lines and/or removing records that are unnecessary for visualization. Once edited, ZIP the shapefile and reload.

Symbology can be modified before loading the shapefile (via the **Preferences** button) or after loading the shapefile (via the **Configure this Shapefile** button).

To modify the symbology before loading the shapefile, click the **Preferences** icon ( ). The pop-up shows options for labels and symbology. The symbology options are divided into the three shapefile geometry types: Point, Line, and Polygon. Set the desired label configuration preferences, and set symbology configuration preferences for the geometry type that matches the shapefile being loaded.

NOTE: All features in the shapefile are represented with a single symbol. Classifying symbols by type and using varied symbology is not available.
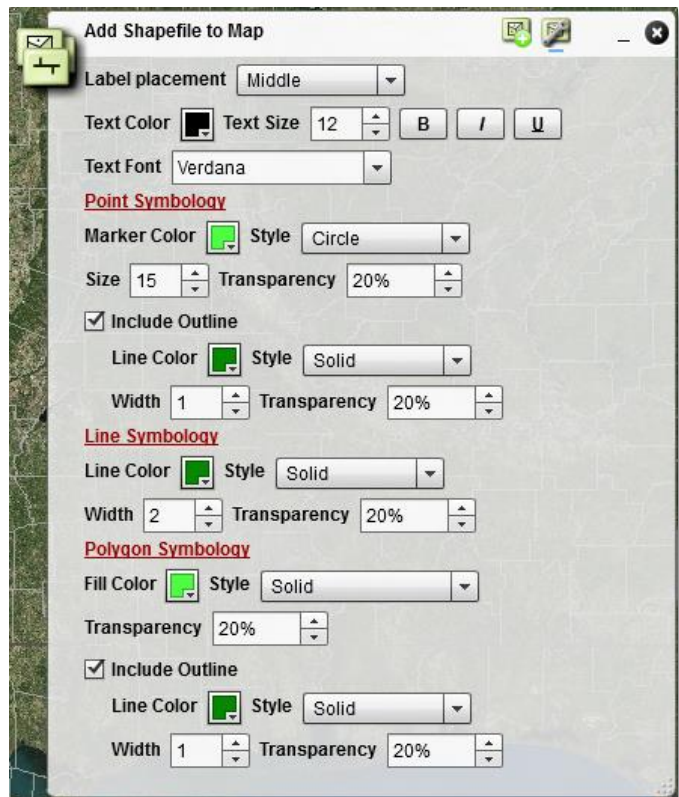
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Once the symbology is set, return to the Load Shapefile screen by pressing the **Load Shapefile** icon ( ). Click **Load Local Zipped Shapefile** and Windows Explorer will open. Navigate to your zipped shapefile and click **Open**. EnviroAtlas will reproject the shapefile, load it into the map, and zoom to the extent of the shapefile features.
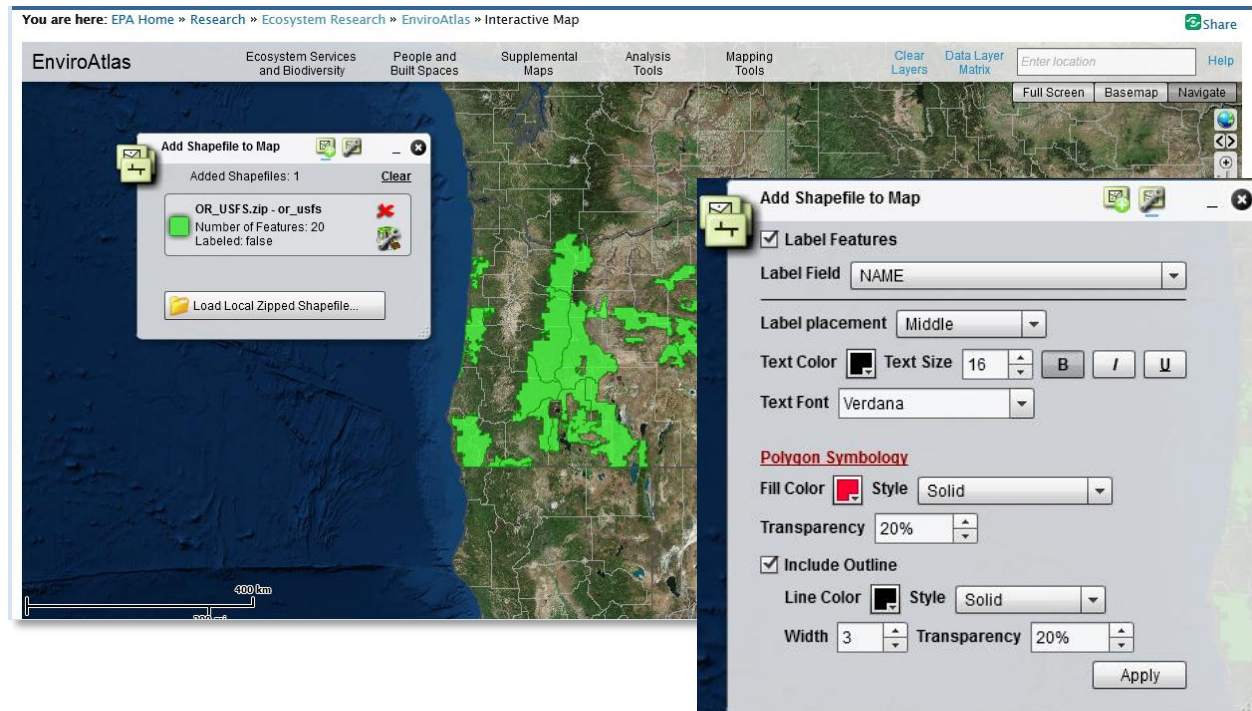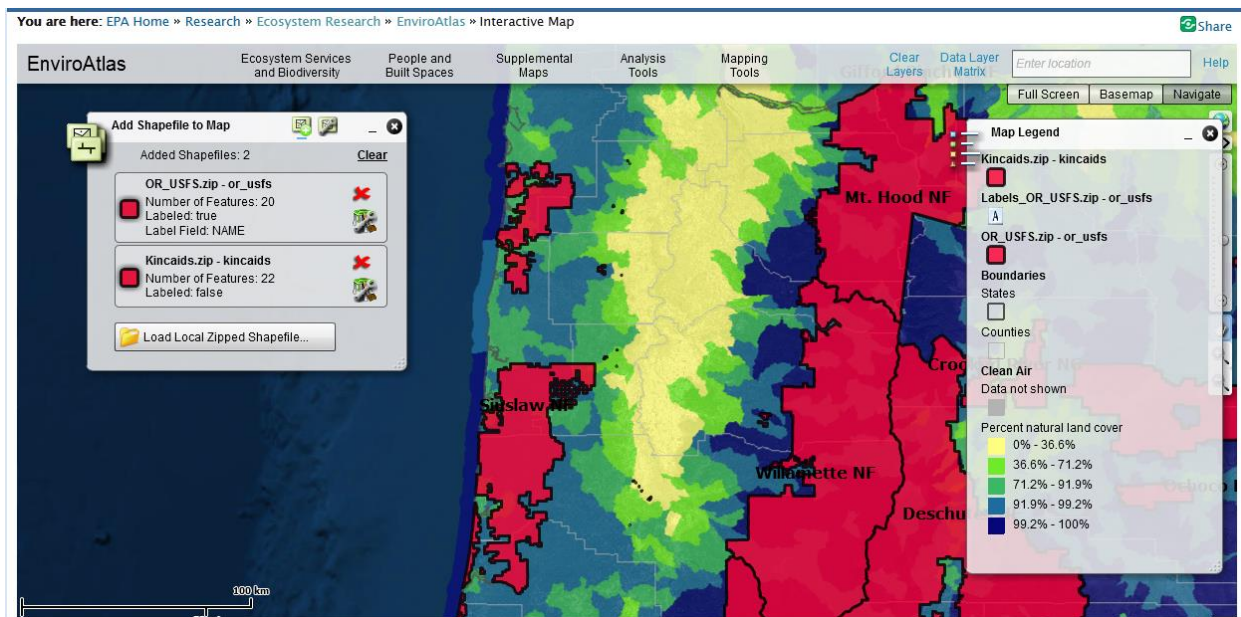

Labeling and symbology may be adjusted after the shapefile is loaded in the EnviroAtlas map. Click the **Configure this Shapefile** icon ( ) next to the shapefile name in the Add Shapefile to Map pop-up. The pop-up screen changes to resemble the Preferences screen, with configuration options based on the geometry type of the shapefile. In this example, **Label Features** is turned on, the **Label Field** "NAME" is selected from the dropdown (which is populated from the attribute table), the **Text Size** is adjusted, and the text has been bolded. The **Label Placement**, **Text Color**, and **Text Font** are the defaults. The Polygon Symbology is adjusted so the **Fill Color** is red and the **Line Color** is black with a **Width** of 3. The other settings may be adjusted, but in this example the fill **Style** and **Transparency** and line **Style** and **Transparency** are the defaults. Once the label and symbology settings are set, click **Apply**.

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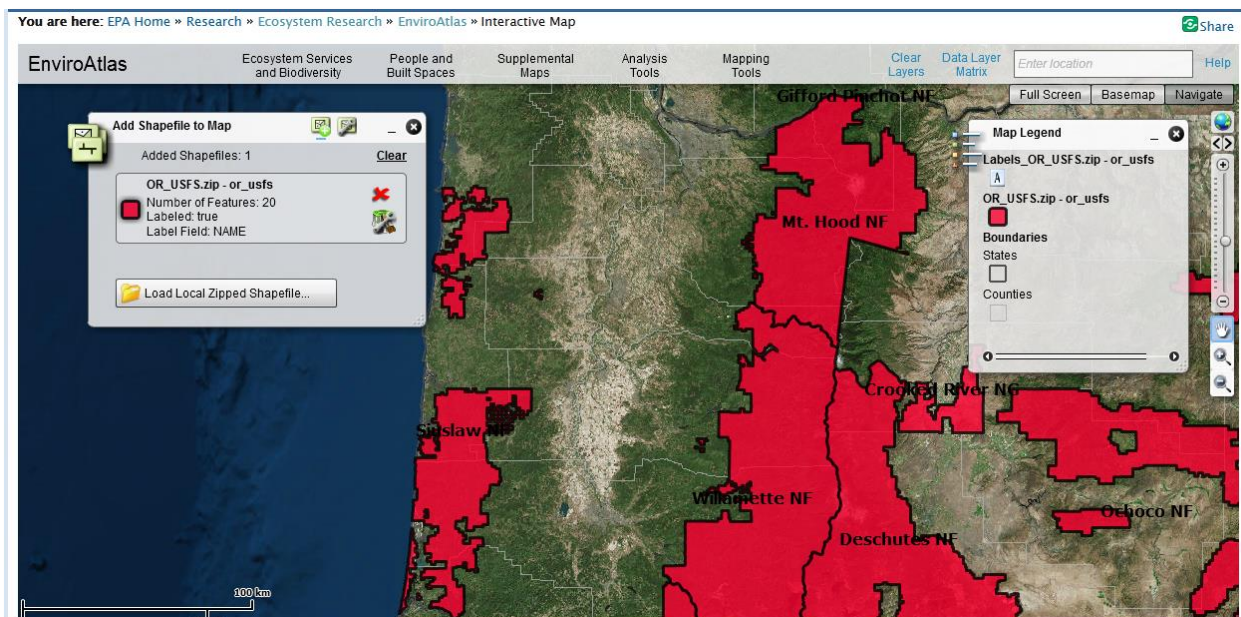
When a shapefile is added to the EnviroAtlas map, the Map Legend updates to include the shapefile.

Multiple shapefiles may be added to the EnviroAtlas Map. Click **Load Local Zipped Shapefile** to add them. EnviroAtlas map layers may be displayed along with the added shapefiles, as shown below.

Subsequent shapefiles match the symbology of any previously-added shapefiles with the same geometry type. The symbology may be adjusted by clicking the **Configure this Shapefile** icon (   ). To remove any of the added shapefiles, click the **Remove Shapefile** icon (   ) next to the shapefile name. To remove all of the added shapefiles, click **Clear** in the Add Shapefile to Map pop-up.

Import Excel/CSV Lat/Long File

The **Import Excel/CSV Lat/Long File** tool allows for the loading of a Microsoft Excel® (MS Excel®) spreadsheet file or comma-separated values (CSV) file into the EnviroAtlas interactive map to display point locations.

The following preliminary steps must be taken before a MS Excel® file or CSV is loaded:

1. Review the file to ensure that coordinates exist. The coordinates may be either latitude/longitude (expressed in decimal degrees) or Web Mercator coordinates.
2. The MS Excel® file must be in 97-2003 format and the file name must have an ".xls" extension. MS Excel® files with the newer ".xlsx" extension are not compatible. To save a ".xlsx" file as a ".xls", open the file in MS Excel® and perform a **Save As** to the "Excel 97-2003 Workbook" format.

SiteID	Latitude	Longitude	Site Type	Site URL
A-05B	33.12951	-117.19251	Field	http://epa.gov

To load the MS Excel® file or CSV into EnviroAtlas, click **Import Excel/CSV Lat/Long File**. The Import Excel/CSV Lat/Long File pop-up appears. Three icons at the top of the pop-up provide options for the loaded file:

-   The **Search** icon ( ) opens the Load File (main) page.

-   The **Preferences** icon ( ) provides options for point symbology.

-   The **Results** icon ( ) provides a summary of the MS Excel®/CSV file importing and includes the number of features added to the new layer, a transparency control for the new layer, and the ability to remove the new layer by clicking on the red '**x**' or **Clear All Layers**.

Once an MS Excel® or CSV file is loaded, the following settings must be set:

-   The appropriate Coordinate System for the new layer must be assigned by choosing "Geographics" or "MGRS". Because "Geographics" is the more common coordinate system, it is assumed that "Geographics" will be chosen for the rest of this guidance.
-   Choose the Projection of the data on file: Lat/Long, US Albers, or Web Mercator. If the projection of the data is unknown, try choosing Lat/Long first. If the layer is created, but a basemap does not load and the map shows "Map data not yet available", the projection of the data is most likely incorrect.
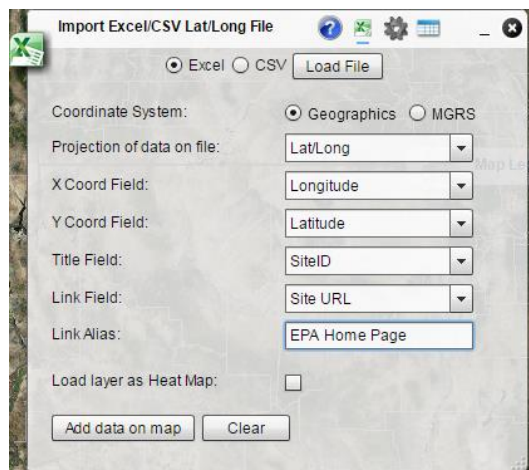
- The X Coord Field and Y Coord Field are the longitude and latitude, respectively. Choose the appropriate columns in the MS Excel® or CSV file that hold the X and Y coordinate values.
- Title Field is optional – this displays a title in the pop-up window for each point on the map.
- Link Field is optional – this displays a hyperlink in the pop-up window for each point on the map.
- Link Alias is optional – this will replace the hyperlink with text written in the textbox.

Once the file is imported, click the **Results** button and double-click on the results file name to zoom to the new layer. To delete the created layer, click on the Delete Results red '**x**' ( ) or to clear all of the newly created layers, click on the "Clear All Layers" button.
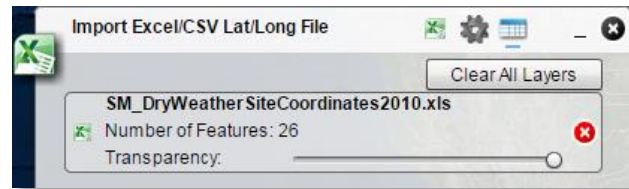
Once created, the map will display a point layer of the records in the imported Excel® or CSV file. When a point is clicked on in the map, a pop-up window will show all of the fields and associated values for that point from the imported Excel® or CSV file.

In addition to creating a point layer, the imported Excel® or CSV file can be loaded as a heat map. If the checkbox is clicked for **Load layer as Heat Map**, additional options will be available in the Results window, such as Theme for the color ramp (Thermal, Rainbow, Red-White-Blue) and Heat Radius. To view the points along with the Heat Map, click on the **Show Points** checkbox. Double-click on the results to zoom to the resulting Heat Map.
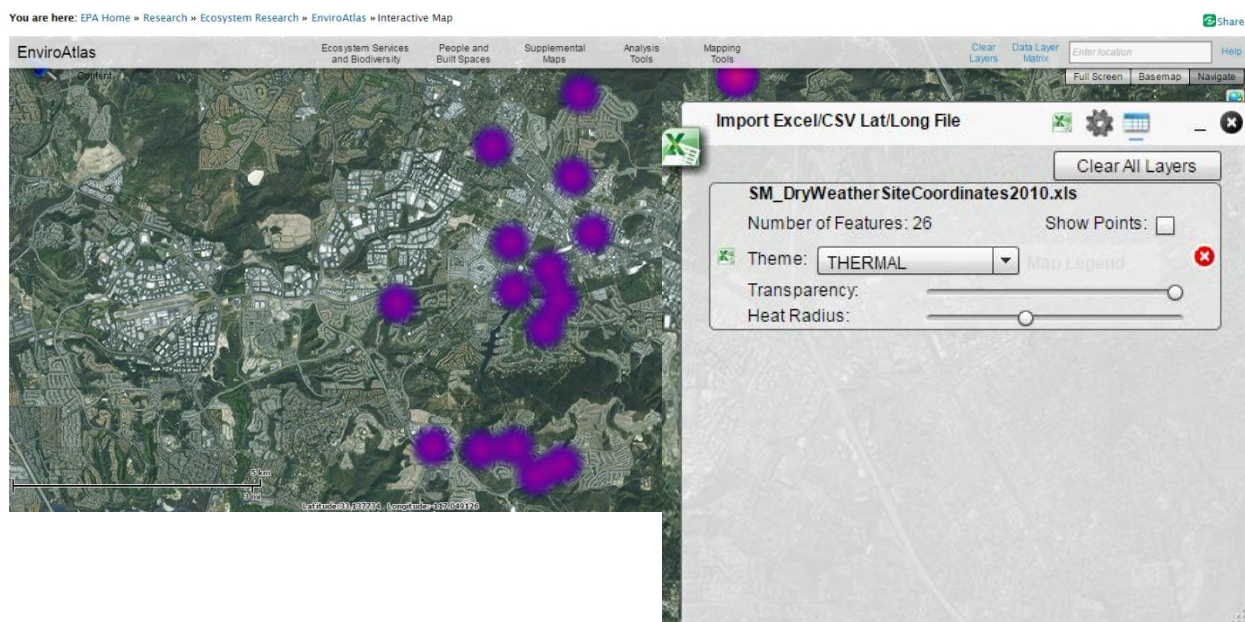
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Add Map Service

The **Add Map Service** tool allows ArcGIS dynamic map services, image services, feature services, tiled services along with Open Source WMS and KML services to be added to the EnviroAtlas interactive map.

To add a map service into EnviroAtlas, click **Add Map Service**. The pop-up will display the Help text. Click on the **Add Map Layers** tool ( ) to open the add map service window. Select the appropriate type of map service that is being added to the map, i.e. ArcGIS Server Dynamic Web Service, KML Layer Service, or WMS Layer Service (<u>Note</u>: WMS services will not overlay well if the service does not have a Mercator projection). Add an optional Layer label for the map service. This label will display in the Legend. If a Layer label is left blank, a default name will display in the Legend. Next, add the map service URL in the "Layer URL (Ending in /Mapserver)" textbox. For ArcGIS services, the URL should end with the text "/Mapserver", i.e. http://gispub.epa.gov/arcgis/rest/services/AgSTAR/EPA_AgSTAR_AD_Projects/MapServer. Click on the **Add Layer** button to add the map service to the EnviroAtlas map.
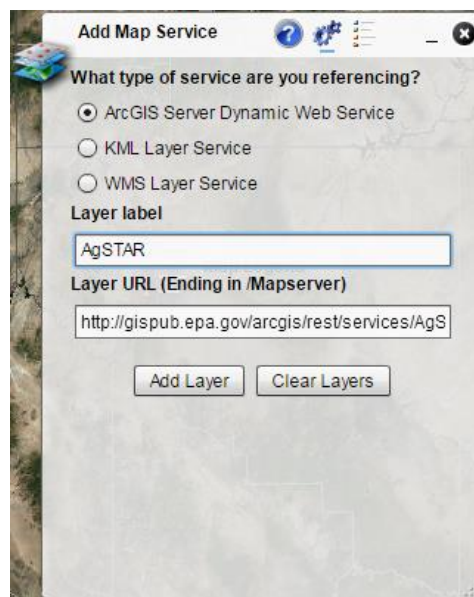
After the map service is added, the Add Map Service pop-up will automatically display the legend for the newly-added map service layers (<u>Note</u>: the added map service legends come directly from the services and cannot be modified). The legend can also be accessed by clicking on the **Visibility Settings and Legend for Added Layers** icon ( ). The visibility of the layers can be set by clicking the check boxes on and off next to the layer name.

Clicking on the small down arrow to the right of the map service (Layer label) in the Legend opens a menu with the ability to set map service transparency, move map services up and down, and access the REST endpoint of an ArcGIS map service (KML and WMS may not have this functionality enabled).
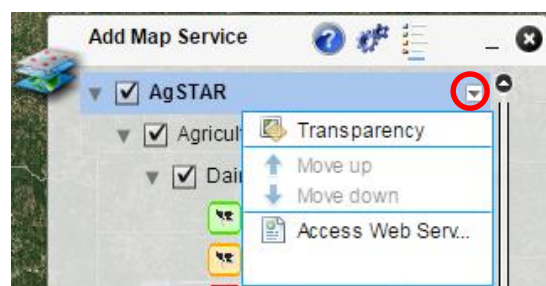
Transparency is only available at the map service level, not for the individual map layers if there are multiple map layers in a particular map service. To modify the transparency, click on the drop-down arrow to the right of the service name and select **Transparency**. Move the slider bar to the preferred transparency level. When finished, click on the drop-down arrow again to close the pop-up window.

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If more than one map service is added to the EnviroAtlas map, the order in which the map services display can be modified by selecting **Move up** or **Move down**. If only one map service has been added to the map, the **Move up** or **Move down** options will not be available.

To access the REST endpoint of the added ArcGIS map service, select **Access Web Service**. The REST endpoint will display in a new tab in the browser window.

To remove the added map services, select the **Add Map Layers** tool ( ) and click on the **Clear Layers** button. Closing or minimizing the Add Map Service window will not remove the added layers and services. If the window was closed, open the window again and Clear Layers button to remove only the added map services. The **Clear Layers** on the menu bar will remove all layers from the Interactive Map.

Additional EnviroAtlas Notes

For additional comments or information about EnviroAtlas, please see the EnviroAtlas home page.

To watch a demo on the EnviroAtlas Interactive Mapping Tool:

> https://www.youtube.com/watch?v=ZMU8ZLsCmUM
> or
> http://enviroatlas.epa.gov/enviroatlas/Howtouse/Demo/InteractiveMap_Demo_release.swf

For accessing EnviroAtlas Fact Sheets:

> http://enviroatlas.epa.gov/enviroatlas/DataFactSheets/index.html

For frequently asked questions about EnviroAtlas:

> http://enviroatlas.epa.gov/enviroatlas/FAQs/index.html

EnviroAtlas currently requires Adobe Flash® to display the Interactive Map. Certain devices such as mobile phone or tablets may need additional software installed to run Flash web pages. EnviroAtlas may be best viewed in a desktop or laptop browser window (for example Internet Explorer, Google Chrome, Firefox, or Safari).