# Elemental Atmospheric Pollution Assessment
Via Moss-Based Measurements in Portland, Oregon
Demetrios Gatziolis, Sarah Jovan, Geoffrey Donovan, Michael Amacher, and Vicente Monleon

User's guide to interactive Web-mapping application

The application is accessible from http://www.fs.fed.us/pnw/research/moss. When activated, the application presents its initial screen:
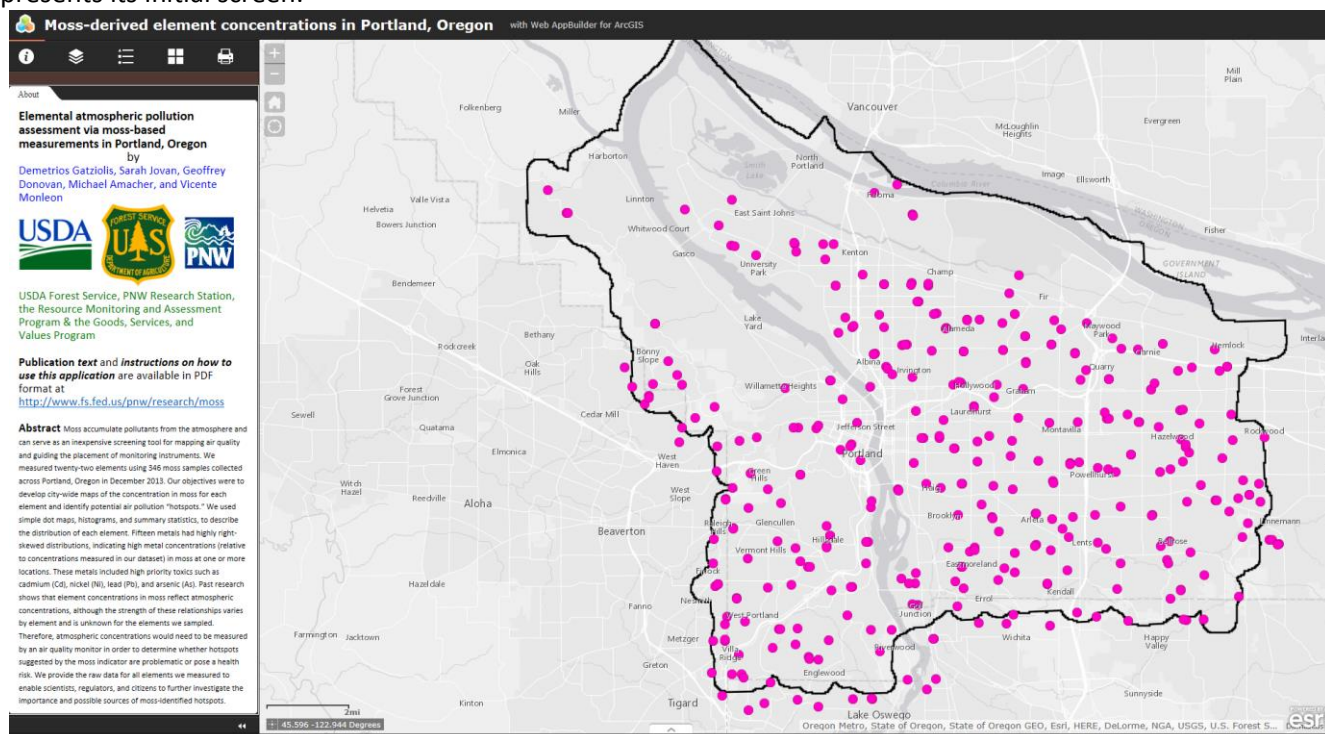
The application contains two panels: The left panel provides information such as the study title, the authors and their affiliations, and the study abstract. The right panel is the actual mapping area.

There are five functions accessible by corresponding buttons at the top of the left panel.

About: Activates the information presented in the left panel. It has no effect on the map panel to the right.

Layer list: Shows a list of layers that can be selected for display.

Legend: Retrieves the legends of selected layer(s).

Basemap gallery: Provides the user with the option to change the map background. The choices include high-resolution aerial photography, topography, the road network, and others.

Print: Can be used to print the map shown on the right panel.

These buttons are placed on the upper left corner of the mapping window and control the scale of the map. The "+" button increases the scale, or "zooms in." The "−" button reduces the scale, or "zooms out." How much the map scale changes each time one of the two buttons is selected depends on several

parameters, including the size of your monitor and Web browser window. Unlike other GIS applications, the scale cannot be customized to an exact level.

The latitude/longitude coordinates pertaining to the position of the cursor on the map are shown on the lower-left corner of the mapping panel, just below the map scale.
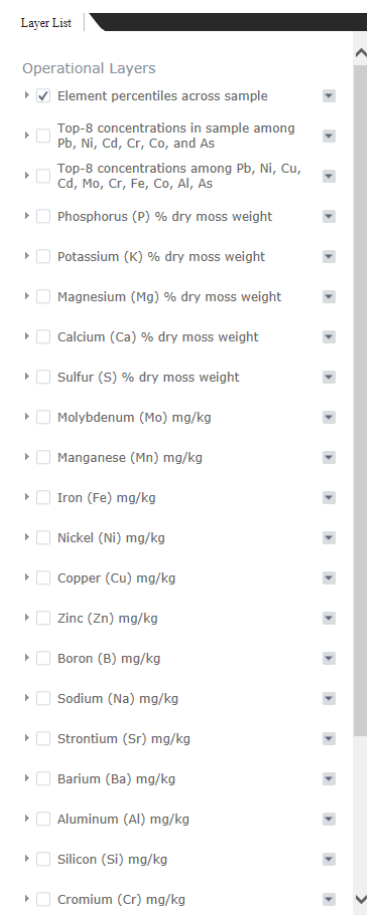
Clicking the **layer list button** brings up, on the left panel, a list of 25 selectable layers. On large displays in portrait orientation, a few of the layers may remain hidden to the bottom of the list. To access them, the user must use the scroll bar to the right of the list. Clicking on the down-pointing triangle to the right of each layer name offers view-customization choices, such as altering transparency levels, viewing underlying data in table format, or changing the order in which the layers are arranged. The small square to the left of the layer name controls whether the layer is visible (if it is, checkmark will appear in the square). Note that with the exception of the layer depicting the City of Portland boundary, when more than one layer is selected, the one nearer the top of the list is displayed. All the others are "hidden" below the top layer. Clicking the small triangle to the left of the check boxes shows the layer's legend.
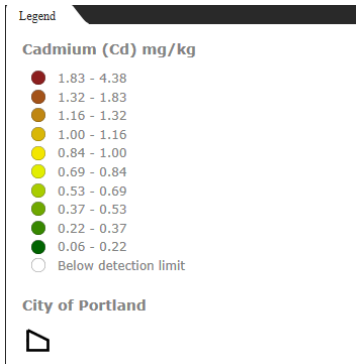
Selecting the **Legend Button** shows the legend of all selected layers on the left panel. Legend titles describe the layer, and, in the case of individual elements, their name, symbol, and unit of observed concentration values.

Clicking on any sample location on the map panel activates a pop-up window that shows the data for that particular sample. For individual elements, the pop-up includes the element's concentration with its measuring unit, the percentile of the concentration compared to the concentration of the element in question across the entire sample, and a histogram showing the distribution of the element's concentrations across the sample. Note that if more than one layer is selected, the pop-up window will include a small arrow at its top, which can be used to cycle through the pop-up information for each selected layer. More than one pop-up page is possible when you select a sample placed very closely to another sample. To ensure that a pop-up contains information on only one sample, use the zoom-in button to increase the scale of the map until there is no spatial overlap between adjacent samples. The pop-up for the layer named "Element-specific percentiles across sample" contains an interactive barplot showing the percentile of each element concentration at the sample location relative to the concentrations across all samples. The percentile value appears when clicking on or hovering above a barplot line.

Note that because the information and data are stored on a remote server, the application's response speed to user selections may be slow.