

Extending ArcIMS Using ArcXML

—Labeling

This is the second of three companion tutorials for “Extending ArcIMS MapServices using ArcXML,” an article that appeared in the January–March 2002 issue of *ArcUser* magazine. This tutorial discusses editing and adding ArcXML elements and attributes in a map configuration file to change the labeling properties of feature layers within a MapService. These edits can be typed into the map configuration file using a simple text editor or modified elements and/or attributes can be copied and pasted directly from a text file, Tutorial2.txt, that is included with the sample dataset and located in the C:\Tutorial\Axlfile folder. If you choose to cut and paste from this file, do not add any special formatting (e.g., bolded characters, special fonts).

What You Will Need

To successfully complete this tutorial, you must follow the instructions outlined in “Setting Up the Tutorials,” a PDF document available from the *ArcUser Online* Web site. When finished setting up, you will have

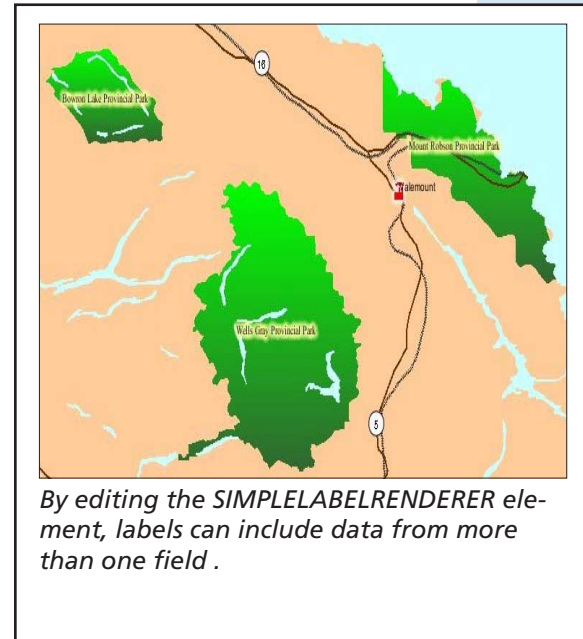
- ArcIMS Administrator opened with the BritishColumbia Image MapService running
- The Administrator Message Console opened
- A Web browser running the Bcsite HTML Viewer
- A text editor with the map configuration file (Bc.axl) open
- A version of the *ArcXML Programmer's Reference Guide* available

This tutorial assumes you have successfully completed the first tutorial. Refer to the first tutorial on rendering for instructions on refreshing the MapService or Web site.

Use Multiple Fields for Labeling Features

ArcIMS Author allows you to identify one attribute field for labeling feature layers. By making a simple edit to a label renderer element, you can concatenate values from two or more fields in the same label. You will edit the SIMPLELABELRENDERER element for the Parks' layer to label each park by name and type.

1. Open the map configuration file, Bc.axl, with the text editor.
2. Find the SIMPLELABELRENDERER element inside the Park's LAYER element.
3. Change the SIMPLELABELRENDERER element as shown in Figure 1 and save the



Bc.axl file.

4. In ArcIMS Administrator, refresh the BritishColumbia MapService.
5. In the Web browser, completely refresh the Bcsite Web site.

Figure 1

```
<SIMPLELABELRENDERER field="NAME TYPE">  
  <TEXTSYMBOL antialiasing="true" font="Times New Roman" ... />  
</SIMPLELABELRENDERER>
```

Zoom in to see the scale-dependent park labels. You can add several field names to the field attribute of the SIMPLELABELRENDERER element or the labelfield attribute of the VALUEMAPLABELRENDERER element.

Add Callout Labels

Label a feature with a callout box using the CALLOUTMARKERSYMBOL element. With this element, you can define font properties such as color and callout box properties such as pointer length. You will use callout boxes to label the cities layer.

1. In the text editor, reopen the map configuration file, Bc.axl.
2. Find the TEXTMARKERSYMBOL element inside the Parks' SIMPLELABELRENDERER element.
3. Delete or insert comment characters `<!-- and -->` around the TEXTMARKERSYMBOL element to remove this element from the map configuration file, add the CALLOUTMARKERSYMBOL with the attribute-value pairs as shown in Figure 2, and save the Bc.axl file.
4. In ArcIMS Administrator, refresh the BritishColumbia MapService.
5. In the Web browser, completely refresh the Bcsite Web site.

Figure 2

```
<SIMPLELABELRENDERER field="NAME">  
  <!-- <TEXTSYMBOL antialiasing="true" font="Arial" ... font-size="10" /> -->  
  <CALLOUTMARKERSYMBOL font="Arial" fontstyle="italic" boundary-color="0,0,255"  
    fontsize="10" transparency="0.7" interval="20"  
    fontcolor="0,0,255" />  
</SIMPLELABELRENDERER>
```



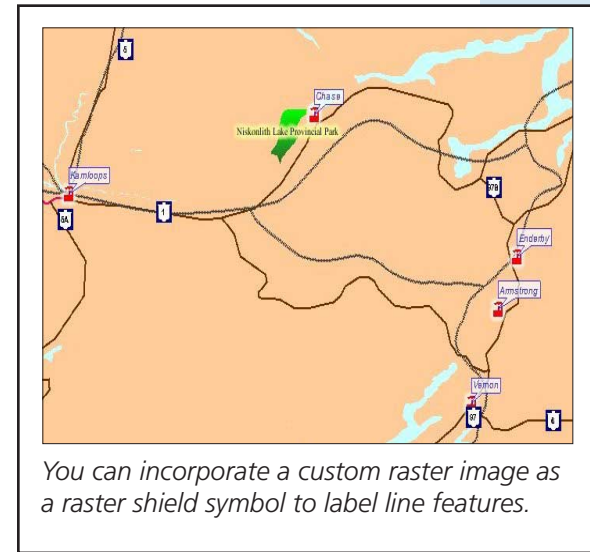
You can add and define callout box labels using the CALLOUTMARKERSYMBOL element.

The cities should now be labeled with callout boxes. The interval attribute defines the length of the pointer. Refer to the *ArcXML Programmer's Reference Guide* for additional information on the attributes and default values for the CALLOUTMARKERSYMBOL element.

Use Custom Highway Shields

Although ArcIMS Author provides several predefined shield symbols (e.g., Interstate, U.S. highways, rectangle), you can incorporate custom shield symbols based on a JPG or GIF image. In this example, you will use a GIF image as a raster shield symbol. This image was copied to the Output folder as part of the preparations for this tutorial described in the "Setting Up the Tutorials" document.

1. In the text editor, reopen the map configuration file, Bc.axl.
2. Find the SIMPLEMARKERSYMBOL element inside the Highways' SIMPLELABELRENDERER element.
3. Delete this element or insert comment characters around the SHIELDSYMBOL element (a child of the SIMPLELABELRENDERER element) to remove it from the map configuration file.
4. Add the RASTERSHIELDSYMBOL with the attribute-value pairs shown in Figure 3 and save the Bc.axl file.
5. In ArcIMS Administrator, refresh the BritishColumbia MapService.
6. In the Web browser, completely refresh the Bcsite Web site. Zoom in to see the scale-dependent highway shield labels.



You can incorporate a custom raster image as a raster shield symbol to label line features.

Figure 3

```
<SCALEDEPENDENTRENDERER lower="1:1" upper="1:2500000">
  <SIMPLELABELRENDERER field="RTE_NUM1"
    linelabelposition="placeontop">
    <!-- <SHIELDSYMBOL antialiasing="true" font="Arial" ...
    minsize="2" /> -->
    <RASTERSHIELDSYMBOL font="Arial" fontstyle="bold" font-
    size="8"
      fontcolor="0,0,0" labelmode="full" antialiasing="true"
      url="http://localhost/output/provincial.gif"
      image="c:\arcims\output\provincial.gif" />
    </SIMPLELABELRENDERER>
  </SCALEDEPENDENTRENDERER>
```

The url attribute points to the URL used by client to retrieve the image. The image attribute refers to the location of the image on the server's machine. Both attributes are pointing to the same GIF image in the default location of C:\ArcIMS\Output.

Localhost is a generic word that refers to your local machine. The labelmode attribute is set to true so both numeric and string text can be shown on the shield symbol (i.e., highways with designations such as 5A or 97C). Consult the *ArcXML Programmer's Reference Guide* to learn more about the attributes and restrictions associated with the RASTERSHIELDSYMBOL element.

Refining Label Location

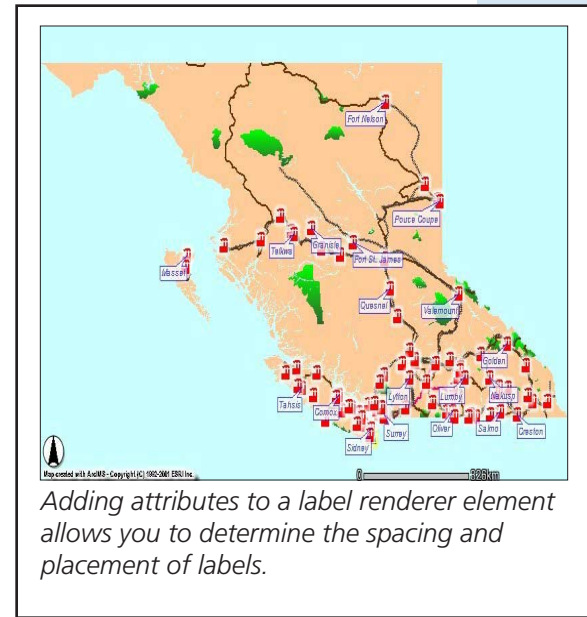
ArcIMS places labels based on the default attribute values of the label renderer elements. You can control how labels will be drawn on your map image by editing some of these attribute values. When the British Columbia map is viewed zoomed to the full extent, notice how closely packed the callout labels for the cities appear. Zooming in causes each callout label to be positioned on the top-right corner of the point symbol for the city. Adding attributes to the SIMPLELABELRENDERER element for the cities layer will manipulate label placement.

The labelbufferratio attribute creates a buffer around each label that prevents other labels from being placed within a certain proximity of a label. Setting the labelbufferratio attribute to 1.0 creates a buffer twice size of the label around the label. The labelpriorities attribute controls the location of labels relative a point. In this example, all labels will be set to display below the city point symbol and the location will be prioritized with the bottom-left corner as most desirable followed by the bottom-right corner. Setting the other position values to zero will prevent labels from being placed in any position other than the two bottom corners.

1. In the Web browser, completely refresh the Bcsite Web site.
2. In the text editor, reopen the map configuration file, Bc.axl.
3. Find the SIMPLELABELRENDERER element inside the Cities' LAYER element.
4. Open the *ArcXML Programmer's Reference Guide*.
5. Use the Index to locate the help page for the SIMPLELABELRENDERER element.
6. View the documentation for this element and note the descriptions of the labelbufferratio and labelpriorities attributes.
7. In the text editor, add the attribute-value pairs to the existing SIMPLELABELRENDERER element as shown in Figure 4 and save the Bc.axl file.

Figure 4.

```
<SIMPLELABELRENDERER field="NAME" labelbufferratio="1.0"
  labelpriorities="0,0,0,0,2,0,1,0" >
  <!-- <TEXTSYMBOL ... /> -->
  <CALLOUTMARKERSYMBOL ... />
</SIMPLELABELRENDERER>
```



7. In ArcIMS Administrator, refresh the BritishColumbia MapService.
8. In the Web browser, completely refresh the Bcsite Web site.
9. In the Web browser, zoom in on Greater Vancouver, an area north of the City of Victoria.

Limiting the Number of Labels

You will now add attributes that will determine the number and placement of shield labels on the highways layer. In addition to making a larger buffer area around each label, these modifications will limit the number of labels displayed to one per shape. Zoom in to see the scale-dependent highway shield labels. The `howmanylabels` attribute could also be set to one label per feature part or one label per feature name. By setting this attribute to one label per shape, a highway shield should appear for each highway segment except when the label falls within the label buffer.

1. In the text editor, reopen the map configuration file, `Bc.axl`.
2. Find the `SIMPLELABELRENDERER` element inside the Highways' `SCALEDEPENDENTRENDERER` element.
3. Add the attribute-value pairs shown in Figure 5 to the existing `SIMPLELABELRENDERER` element and save the `Bc.axl` file.
4. In ArcIMS Administrator, refresh the BritishColumbia MapService.
5. In the Web browser, completely refresh the Bcsite Web site.

Figure 5

```
<SCALEDEPENDENTRENDERER lower="1:1" upper="1:2500000">
  <SIMPLELABELRENDERER field="RTE_NUM1"
lineLabelPosition="placeontop"
  howmanylabels="one_label_per_shape" labelbufferratio="3.0" >
  <!-- <SHIELDSYMBOL ... /> -->
  <RASTERSHIELDSYMBOL ... />
</SIMPLELABELRENDERER>
</SCALEDEPENDENTRENDERER>
```

Summary

In this tutorial, you added ArcXML elements and attributes to the map configuration file that changed the style, placement, and number of labels displayed. The third and final tutorial in this series discusses how to add objects to an acetate layer and use the `SPATIALQUERY` element to create a data subset and a tabular join. For more information on ArcXML elements, see the *ArcXML Programmer's Reference Guide*, available as part of the ArcIMS installation or online at the ArcOnline Web site (arconline.esri.com).