Managing Custom Base Maps for Geomashups

The Assemble Geomashup process in TNTmips (Main / Assemble / Geomashup) allows you to mashup your own tilesets with geodata layers from remote sources for viewing in a web geobrowser (Google Maps, Bing Maps, Google Earth, or Open Layers). An overview of this process is provided in the Technical Guide entitled *Geomedia Publishing: Introduction to Geomashups*. A geomashup consists of *base maps* and *overlays*. A *base map* is a background reference map or image tileset. Proprietary base maps are automatically available for use in several of the web geobrowsers, and you can also add one or more custom tilesets from local or web sources. A geomashup can include more than one base map, but only one can be displayed at a time in a geobrowser. Overlays provide more viewing flexibility, as multiple overlays can be displayed simultaneously, and each overlay can be provided with controls allowing the viewer to toggle it on/off and to dynamically vary its transparency. Setting up overlays for a geomashup is discussed in the TechGuide entitled *Geomedia Publishing: Managing Custom Overlays for Geomashups*.

Base Maps

You can create geomashups with one or more base maps consisting of:
*   proprietary base map tileset layers provided by the geobrowser whose Web Mapping API you have selected
*   proprietary plus your custom base map tileset layers (web or local)
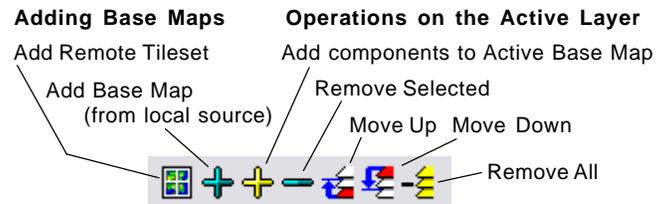*   your custom base map tilesets alone (Google Maps or Open Layers).

The Assemble Geomashup window has separate tabbed panels for managing Base Maps and Overlays. Each panel can list multiple layers in the geomashup. The controls for adding and managing layers on the Base Maps panel are illustrated above right. You can add tilesets as base maps to the geomashup from remote (web) or local sources. Clicking on a layer entry in either list makes it the active layer (highlighted in red; see illustrations to the right). The active layer is the one operated on by the controls for moving a layer up or down in the list or removing a layer. The order of base map layers in the list in Assemble Geomashup is not significant, as it does not specify the layout of base map controls presented in the geobrowser. (Layer order *is* important for overlays, however.)

Each layer in the Base Maps list in Assemble Geomashup is provided with a checkbox in the far left column of the list that you can use to set whether the layer is to be included in or excluded from your previews and subsequently in the geomashup. All newly added base maps are initially set to be included. You can also completely remove any base map layer from the list on the Base Maps panel by highlighting the layer and pressing the Remove Selected icon button.

One base map is always visible when a geomashup is viewed in a geobrowser. A geomashup that includes multiple base maps is automatically provided with controls for switching between them in the geobrowser. The Options panel in Assemble Geomashup allows you to choose the style of base map selection control to be used (see the TechGuide entitled *Geomedia Publishing: Geomashup Map Control Options*). To designate the base map layer to be shown when the geomashup is first displayed, click on the Use for Initial Base Map icon for the desired layer (the green ball icon marks the initially visible base map).

When you add your custom base map, the Min Zoom and Max Zoom fields automatically show the minimum and maximum zoom level values available in the selected tileset. You can edit these values to further restrict the allowed zoom range if desired. For your custom base maps you can also add copyright or descriptive information that is shown in the geobrowser view when that basemap is visible (see illustration on reverse).

Selecting more than one local tileset at a time using the Add Base Map icon button adds the selected tilesets as components of a single base map layer in the geomashup. (You can also highlight an existing custom base map layer and use the Add Components to Active Base Map icon button.) For

Adding Base Maps   **Operations on the Active Layer**

Add Remote Tileset   Add components to Active Base Map

Add Base Map   Remove Selected
(from local source)   Move Up Move Down

Remove All

Layer control tools for adding and managing base maps.

Sample of Base Maps panel with three proprietary Google base map layers and a custom orthoimage base map of the state of Oregon (bottom).

Left-click on the Layer Name field of a layer (or any of its other text fields) to make the layer active, which highlights it in red.

Two of the proprietary Google base map layers have been excluded from the geomashup (checkboxes turned off). The custom base map layer is now set as the initial base map (green ball marker), and the name of this layer has been edited to shorten it to better fit in the geobrowser controls.

Use for Initial Base Map

Exclude from / Include in Output

Below, preview of the resulting Google Maps geomashup with Oregon 2011 as the default base map and the default "box" control for choosing a base map to display.
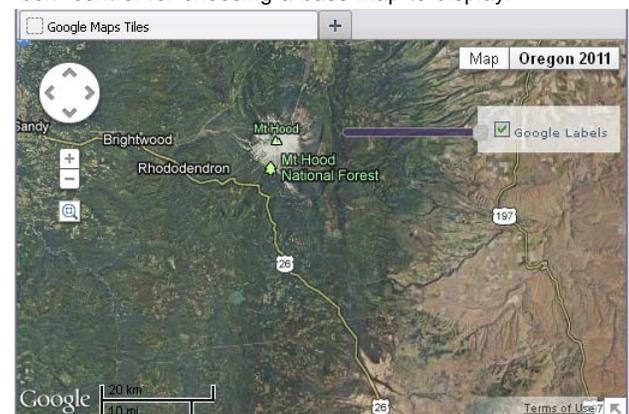
example, for one geomashup layer you could select several tilesets covering the same area that were created with different ranges of zoom levels from imagery or maps with different spatial detail. These components are listed sepa-
(over)

rately in the Base Maps panel and highlighted in yellow below their master layer name (see illustrations below).

You can also set up a composite custom base map layer that is a visual merge of multiple tilesets by setting transparency values in the layer list for each of these components. For example, your custom base map layer could include a fully opaque shaded-relief tileset (no transparency) overlaid by a color elevation tileset with partial transparency to produce a color shaded-relief base map. You can only edit the Transparency field for components in a multicomponent basemap; a base map layer as a whole has a mandatory transparency of 0% (completely opaque).

## Managing Proprietary Base Maps

When you select Google Maps as the Web Mapping API, three proprietary Google base map layers are shown by default: Google Map (map base), Google Satellite (satellite/aerial imagery base), and Google Terrain (shaded-relief map base; see illustration above right). The Google Maps API allows the HTML/JavaScript code created by Assemble Geomashup to specify which of these base maps to make available for viewing in the geobrowser. All three Google base map layers are checked on for inclusion by default; you can turn off the checkbox for any of these base map layers to exclude it from the geomashup. You can enter Min Zoom Level and Max Zoom Level values for the proprietary Google Maps base maps to restrict their zoom level range to that of a custom base map or overlay that you are also using in the geomashup. You can also remove any of the Google Base Map layers from the list on the Base Maps panel by highlighting the base map layer and pressing the Remove Selected icon button. Should you wish to add back a Google Maps base map you previously removed from the list, press the Add Remote Tileset icon button and select the desired Google proprietary base map from the Web/ProprietaryTilesets folder in the Select Objects window.

When you choose the Bing Maps the Web Mapping API, the Base Maps panel shows three base map layers by default: Road (map base), aerial (satellite/aerial imagery base), and Bird's Eye (oblique aerial images). The Bing Maps API does not allow a geomashup HTML file to exclude any of these base map layers from the geomashup, so you cannot turn off the Include/Exclude checkbox for any of the proprietary Bing Maps base map layers. You also cannot highlight and remove any of these Bing Maps base map layers from the Base Maps list. You can, however, set the Use for Initial Base Map marker for any of these proprietary layers.

Google Earth uses a single imagery base map and its API allows custom imagery and maps to be added to a geomashup only as overlays, not as base maps. The Base Maps panel is therefore inactive when you choose Google Earth as the Web Mapping API.
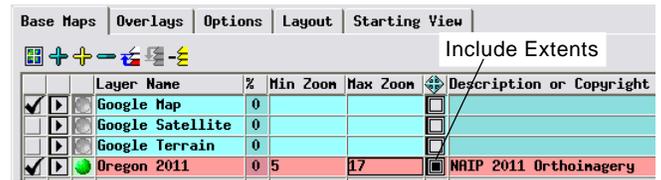
Custom base map layer (red highlight) with Min Zoom and Max Zoom fields automatically set from the range of zoom levels in the tileset. For a custom basemap you can also enter information in the Description or Copyright field as illustrated above. This text is shown in the geobrowser view when that base map is visible. In this example the Include Extents toggle has been set for the custom base map tileset, so that its spatial extents control the initial extents of the geomashup when it opens in the geobrowser (see the TechGuide *Geomedia Publishing: Managing Overlays for Geomashups*).
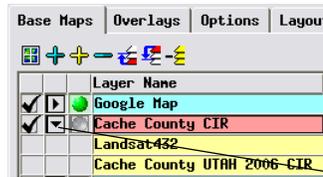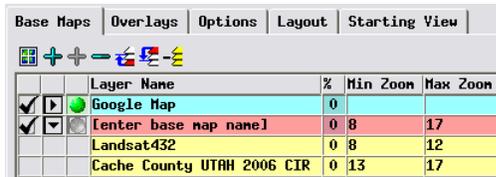
You can add multiple tilesets as components of a single base map layer. Components are listed separately (highlighted in yellow) beneath their master layer name (above left). In this example, the two tilesets cover the same area with different ranges of zoom levels and were produced from parent imagery of different resolution (Landsat for the less detailed zoom levels and aerial orthoimages for the more detailed zoom levels). You can enter a name for a multicomponent layer (above center) or edit the default name for any custom base map or overlay layer. The Hide/Show Components arrow icon button collapses/expands the component listing.

Above, setting up a composite custom base map with a partially-transparent elevation tileset displayed over a shaded-relief tileset to produce a color shaded-relief image in the geobrowser (preview at right).

Three base map layers are shown by default when you choose Bing Maps for the Web Mapping API. Due to the design of the Bing Maps API, you cannot exclude any of the proprietary Bing Maps base map layers from the geomashup.

Public OpenStreetMap Base Maps

Global base maps created by the OpenStreetMap project are available for use in geomashups and can be selected from the Web/Global/OpenStreetMap browse directory in the Select Objects dialog. The selections include Mapnik, Mapnik Transparent, and Osmarender, which are all street map tilesets created using different styling and filtering of the underlying street map data. The Cycle base map provides a street map base with cycling routes highlighted. The OpenStreetMap base maps are particularly useful in geomashups using the Open Layers API, which does not provide proprietary base maps.