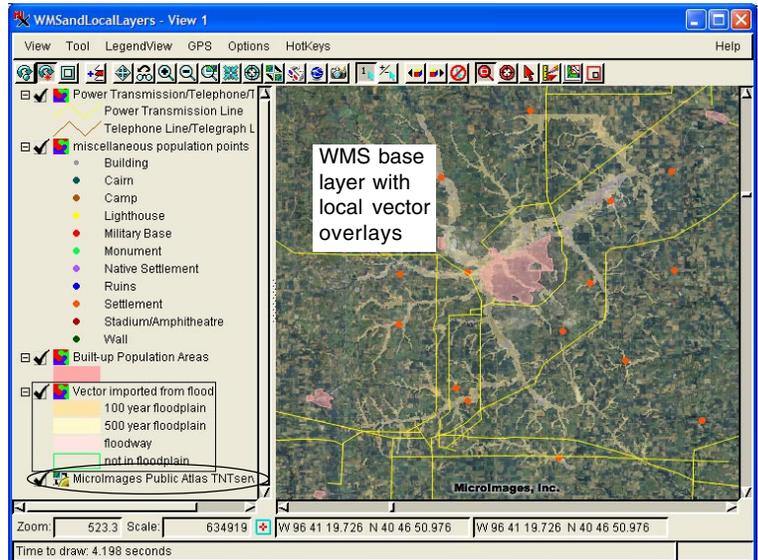


Spatial Display

Select WMS Layers for Viewing

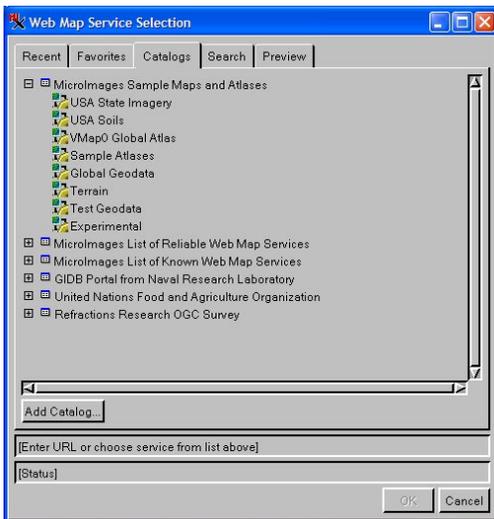


The ability to select Web Map Service (WMS) layers for viewing alone or in conjunction with layers found locally (on your computer or private network) is available in the TNT products. All Display tools, such as sketching, measuring, and GPS tracking, are available for use with WMS images whether alone or in combination with other layer types. These same tools are available for use with WMS layers in the free TNTAtlas product (see the Technical Guide entitled *TNTAtlas: Viewing WMS Layers in Layouts*). WMS images can also be used in the Editor as reference layers (see the TechGuide entitled *Spatial Editor: Using WMS Layers as Reference Layers*). The ability to use WMS layers provides you access to unlimited terabytes of reference images published on the Internet by many organizations.



To begin viewing WMS layers, simply select Main/Display from the TNT menubar and click on the Add WMS icon (shown above left, also see the TechGuide entitled *Spatial Display: Viewing WMS Layers*).

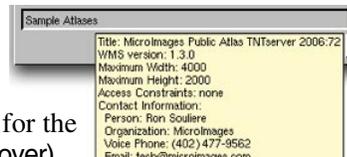
You can select one or more layers from a single WMS to define each WMS layer in the TNT products. You can create a display that uses layers from multiple WMSs by adding multiple WMS layers. When multiple layers are selected to create one WMS layer, the WMS you are requesting the layers from will combine them and return a single, composited layer. If you want to turn WMS layers from a single WMS on/off individually in the Display process, you need to add them to your view as separate WMS layers. Clicking on the Add WMS icon as soon as you open the Display process will open a new 2D Display with the WMS layer you select. You can also use the Add WMS icon to add layers to an existing group or layout that includes locally available or other WMS layers.



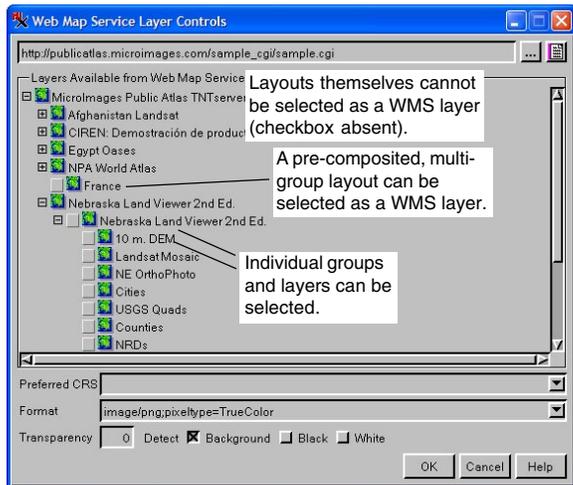
If you are familiar with WMSs and you know the URLs for your favorites, enter the URL, and continue on. For those who are not so familiar with WMSs or who are interested in reviewing and using the geodata published by the WMS sites that MicroImages and others have located by scanning the Internet, click on the Catalogs tab. Just as you can add to the Favorites list, you can add catalogs and catalog collections to the Catalogs list.

Selecting WMS layers requires communication with the WMS to discover its capabilities, such as what layers and map projections are available. The list on the Catalogs panel is stored on your machine and communication with the WMSs specified by these catalogs is not necessary when you first view the panel. Expanding a catalog to reveal the WMSs listed requires communication with the WMS to obtain its list. Communication to discover the capabilities of a WMS is initiated when you click on one of the WMSs in the list. Just as when using your web browser to search the Internet for information, it is possible that your Internet connection is not functioning properly or that there are problems with the site you are trying to reach or the server it is operating. There is never a guarantee that a specific web page can be displayed. The same is true when choosing a WMS. If an appropriate response is received, the OK button in the Web Map Service Selection window becomes active. Click on the OK button to see the layers available from the selected WMS and continue the selection process. If the OK button does not become active, the selected WMS is not responding, and you should look elsewhere for layers to display or try again later.

When you select a WMS from a catalog, its URL is shown in the box near the bottom of the window. Once a response is received from the WMS, the title of the WMS is provided in the field below the URL and the OK button becomes active. At this point, contact and other information for the WMS is provided as a DataTip when you pause the mouse over the field with the WMS title. (over)



Click the OK button to open the Web Map Service Layer Controls window, which provides a listing of all atlases/layers available from the selected WMS. The presentation of layers available for selection varies from one WMS to the next. As a TNT products user, you should be familiar with the concept of individual layers organized into groups, and groups organized into layouts, which is used in display processes throughout the TNT analytical products and in TNTserver. WMSs provided by a TNTserver present layers for selection using this hierarchy: layouts/atlases are listed and can be expanded to show the groups they contain, which can



be further expanded to list their individual layers. Some other WMSs list only individual layers; some may have groups that can be expanded in the Web Map Service Layer Controls window, but these layers are not intended for display together (for example, the Blue Marble Next Generation, Global MODIS derived image group from the JPL Global Imagery Service expands to list multiple versions of the same imagery collected on different dates and their United States elevation, 30 m group provides a choice of data type and units). This Web Map Service Layer Controls window is the window that opens when you click on the WMS layer icon in the Display Manager. When opened from the Display Manager, the Web Map Service Layer Controls window also has an Apply button so you can modify your choices and check the results in the View before electing to close the window. When you open the Web Map Service Layer Controls for a WMS layer already added to your view, you are changing the content of that layer, not adding a new one.

Remember you are selecting one or more WMS layers to comprise a single layer for display in the TNT products. You can select a single layer or a group, which will be composited into a single layer. You cannot select a multigroup layout as a layer unless it has been precomposited into a single layer by TNTserver or some other means. You can add WMS layers to your own multigroup layouts as shown at the right with the floodplains layer. If layout attachments have been made to the group you want the WMS layer(s) to display with and the selected WMS layer has greater extents than your base group, add the WMS layers in a separate group that is geographically attached to your base group. Adding WMS layers to a separate, geographically-attached group avoids changing the base group's extents, which will affect the positioning of other attached groups. A toggle in the Group Settings window lets you match the clipping of the WMS group to the base base group clipping.

Your initial successful acquisition of the capabilities from a WMS does not insure your continued communication with that WMS. Creating a view that uses only local geodata files and TNT objects is totally under the control of the TNT process and the local operating system. The layer buffers are all filled and only then does the composite view show. If a layer is not found, this is immediately known and you are prompted to locate it. But TNT display does not know when a WMS layer will be available in its local buffer as this is under the control of the remote site publishing the WMS and your communication rate with that site, which are affected by additional factors, such as hardware, priority, connection speed and are not under the control of local software, such as your TNT product. As a result, when all the local layers are buffered, your view with all the local layers will be shown and will later be redrawn when the WMS layer is available. This uses a new multithreaded capability incorporated into the TNT Graphics Rendering Engine (GRE). Using this capability your viewing activity will not be stalled waiting for a WMS layer that may never arrive, and you can use all the tools and actions as if the final view is complete.

