Constructing an Electronic Atlas

with
TNTmips®

Before Getting Started

The HyperIndex® Linker tool is included with all current TNTmips® systems to provide all the functions you need to create electronic atlases, or HyperIndex stacks, for use with TNTmips, TNTedit™, TNTview®, TNTatlas®, and TNT-server™. You can publish and distribute the stacks you create for use with TNTatlas on any computer that has a CD-ROM drive. Or you can provide access to the HyperIndex stacks over an intranet or the Internet using TNTserver.

Prerequisite Skills This booklet assumes you have completed the exercises in the *Displaying Geospatial Data* and *Navigating* booklets. Those exercises introduce essential skills and basic techniques that are not covered again here. Please consult these booklets for any review you need.

Sample Data The exercises in this booklet use sample data distributed with the TNT products. If you do not have access to a TNT products CD, you can download the data from MicroImages' web site. The first exercises in this booklet use the HELLO and INDEX Project Files in the HYPER directory of LITEDATA. The objects in the UNTDSTAT Project File as well as the METADATA.TXT file in the HYPER directory are also used. The CB_DLG, CB_SOILS and CB_SPOT Project Files in the CB_DATA data collection of the DATA directory are also used. Make a read-write copy of this sample data on your hard drive so HyperIndex links can be saved with these objects.

More Documentation This booklet is intended only as an introduction to techniques for constructing a HyperIndex in TNTmips. You may also wish to consult the TNTmips reference manual for additional information.

TNTmips and TNTlite® TNTmips comes in two versions: the professional version and the free TNTlite version. HyperIndex Linker is available only to customers using the professional version of TNTmips. If you did not purchase the professional version (which requires a software license key), TNTmips operates in TNTlite mode, which limits the size of your project materials. You can use the HyperIndex Navigator in TNTlite to move through a previously constructed stack if the objects are lite size, but you cannot use the HyperIndex Linker tool to create a new stack or edit an existing stack. Most of the objects used in this booklet are not lite sized.

Merri P. Skrdla, Ph.D., 20 April 2005
© MicroImages, Inc. 2001–2005

Welcome to Constructing Atlases

HyperIndex Linker is an authoring tool used in conjunction with TNTmips to organize related geospatial data into a HyperIndex stack. HyperIndex Navigator, which is included with all TNT products, uses point and click navigation to move you through the stacks created with HyperIndex Linker. Although the professional version of TNTmips is required for the exercises in which HyperIndex Linker is used, the exercises that use the HyperIndex Navigator to access pieces from previously created atlases, can be done by anyone using TNTmips (pro or lite), TNTedit, TNTview, or TNTatlas.

The terms *atlas* and *stack* are used interchangeably throughout this booklet to refer to the products created with HyperIndex Linker. Neither term is entirely adequate because the connotation of atlas is geographic and omits other applications, such as electronic museums or parts catalogs. The term stack is inadequate because it has a linear connotation and, as you will see, stacks are not limited to simple linear or treelike structures, and can even be a single, complex layout. The content and structure of a HyperIndex stack can be whatever is necessary to deliver the information you want using whatever associations you think will make the information most accessible for the intended audience.

HyperIndex stacks can be created and used on your own computer or they can be organized for publishing on CD-ROM. You can also design your stack for use over an intranet or the Internet using TNTserver and its associated Java and HTML clients to provide access to the materials.

Five companion booklets assist with atlas design (*Designing Electronic Atlases*), acquaint you with the scope of projects you can undertake (*MERLIN: Enterprise-wide Geospatial Analysis*), introduce you to the features of *TNTserver and Clients*, and provide instructions for TNTatlas (*Using TNTatlas for X Windows* and *Using TNTatlas for Windows*).

STEPS
- ☑ launch TNT
- ☑ copy the files in the HYPER data collection and the specific files referenced on page 2 in the CB_DATA directory to your local drive

The exercises on pages 4–6 provide material to consider before authoring a stack. The exercises on pages 7–15 familiarize you with the graphic tools used to define areas active for point-and-click navigation and discuss cosmetic issues as well as specific linking methods including automated linking and linking to vector elements, and layouts. Pages 16–23 discuss hidden layers, editing links, customized tools, single layout atlases, metadata, and linking issues. Pages 24–28 describe linking to external files and URLs by element or by attribute, previously indexed objects in a stack, and inteface customization. Pages 29–33 discuss the TNTatlas Assembly Wizard. The remaining exercises concern atlases over the Internet, using JP2 files, updating stacks, using GPS, and additional parameters for TNTatlas.

Before Construction Begins

Vocabulary: A **HyperIndex stack** is a collection of graphically and geographically related objects that use the HyperIndex Navigator (in TNTmips, TNTview, TNTatlas, and TNTedit) or Navigation tool (in TNTclient, TNTbrowser, and TNTatlas for Windows) for point and click retrieval of objects using the links established with HyperIndex Linker.

The upper levels of two different stacks are illustrated here with the links between objects indicated by lines.

TNTatlas Sample

You don't need to have your entire atlas planned out, but you should have a good idea of what you will include and how it will be organized before you begin. You can, of course, make changes after an atlas is started, but if you haven't planned well, you may find artwork being redone or various other complications that increase the time and cost required for what could have been a very simple project.

The nature of the information you want to convey, your target audience, and whether the stack is intended for use in TNTmips and TNTview or for use with TNTatlas or TNTserver should also be considered in the design phase. If you are creating a stack comprised mostly of georeferenced imagery for professionals running TNTmips and TNTview, you may need very li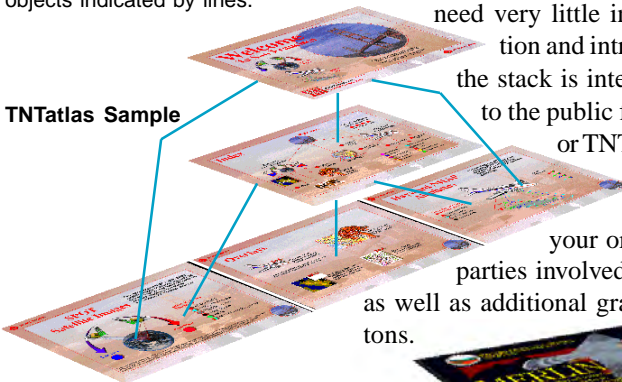ttle in the way of annotation and introductory material. If the stack is intended for distribution to the public for use with TNTatlas or TNTserver, you may want to prepare information that describes your organization and other parties involved in atlas preparation, as well as additional graphic navigation buttons.

Stack design can strictly maintain the level concept, as at the right where a click in the View window takes you down one level each time, or the level concept may be more loosely interpreted, as above where you can get to some of the objects in the third level from the first level.
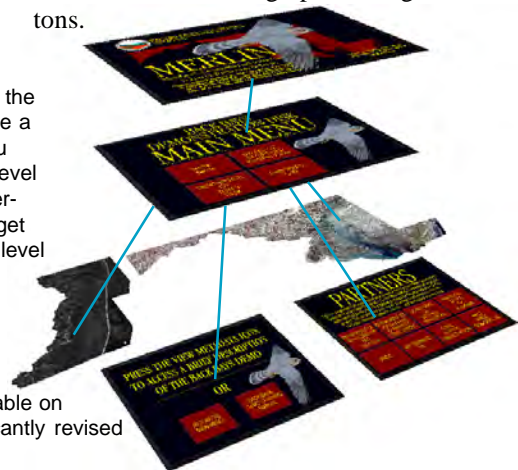
The original design of **Maryland's Coastal Bays atlas**, initially available on CD-ROM, has since been significantly revised (see www.mdmerlin.net).

Consider LegendView and DataTips

You have full control over how information is presented to the viewer of your atlas, but you may overlook some of the control features available because you don't routinely use them. Someone viewing an atlas can turn on LegendView whether or not you had this feature turned on when creating a stack (and it is the default display with TNTatlas and TNTserver). The Display process makes a "best guess" for legend samples based on the object type and drawing style, but some other option may produce a more appealing result. A raster area sample, for example, should be either representative or identifiable. If you can't find such an area, set the legend option to none. You should be sure to turn LegendView on and navigate through your atlas to see what comes up, and decide if you can improve it by using some other option.

Your DataTip setup is another feature that's easy to overlook but also important in helping the viewer get the most out of your atlas. (When using TNTserver this same information appears in the InfoTips panel.) You can select any field to provide the DataTip. You can also adjust units.

The lower left area sample is a better legend choice than a center sample for this raster graphic.

Sometimes the attribute values used for styling, which are the default legend labels, are somewhat cryptic. You can select another field to provide labels.

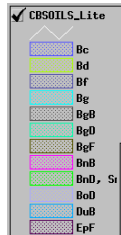The standard attributes table is the default choice for DataTips. Consider whether other information present in the database may be of more use to the viewer. You may also need to adjust units; square kilometers or square miles would be a better choice than square meters for state area.

Area: 200269354008 m^2

Nebraska
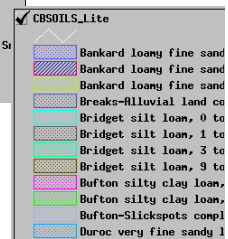
Providing a Welcome and an Index

Note: if you make an atlas for distribution or if your atlas will reside on a computer with other atlases, it is important that all associated files be contained in a single folder, which can have an internal, nested folder structure. The folder and main level file **names should suggest the atlas content**. Having a number of atlases in multiple unnested folders that all have files called StartHere is a problem.

Vocabulary: The **Home Level** is the first level of a stack. In a published atlas using TNTatlas or TNTserver, the Home Level is the Welcome screen. You can begin where you want when viewing a stack in TNTmips or TNTatlas, which makes the Home Level the object displayed when you begin navigating. In TNTclient and TNTatlas for Windows, the Home icon is on the toolbar rather than in a separate navigator window.

The complexity of your HyperIndex stack and its intended audience will determine whether you need both welcome and index graphics, whether these can be combined, or whether they're needed at all. The sophistication of your audience and the structure of your stack determine if you should provide a graphic means back to these or other pages from subsequent levels of the stack (you can always get back to the Home level using the Home button).

Take the example of a digital museum in which the Home level is an exterior photograph of the museum with annotations that provide its name and location and identify the organization that designed the stack. The next level is a floor plan of the museum that shows the various wings. A click here takes you to an enlarged view of the selected wing annotated with finer detail. There might be one more organizational level before getting to photographs of individual pieces in the collection. Many steps may be required to get from pieces in one collection to those in another if you rely only on the buttons in the Navigator window. You can incorporate a single graphic in multiple layouts that provides direct links to some other level of the stack, such as the index.

This graphic provides a direct link to the Index page. It appears on all the graphical levels below the level of the Index in this atlas.

Clicking on the Home Level button in the Navigator window always takes you to the level you started at.

These are the Home (welcome) and index levels for the TNTatlas sample shown on page 4. One of the layouts from the third level of the stack is shown at the far right.

Either the graphic indicated (above, right) or the Home Level button in the Navigator window will get you back to the Home Level in this stack.

Beginning Construction

Point-and-click object retrieval replaces the current View window contents with the object retrieved*. Any object type, including complex layouts that include many different objects and scale bars, legends, or other enhancements, can be retrieved. Because saved layouts can be a part of a HyperIndex stack, you need to be in display or hardcopy layout mode both to construct and to navigate through a stack. Display layout mode is the only display mode in TNTatlas.

The Home level of the stack is best designed without overlapping index areas. (An **index area** is the area linked to the next level of the stack, which is defined by an elastic box in this exercise.) If you click where index areas overlap when navigating through the stack, a list is presented so you can choose which object to view next. It is desirable to get the user further into a stack before you start giving them choices so they are not initially confused.

* When the link is to an external file type or a web site, a separate window for that application opens.

This list is blank when you create a new index area. This same window opens when you choose to edit an existing link, and all objects linked to the index area are listed.

In addition to letting you specify all options for a new link, this window opens when you click on [Edit] in the HyperIndex Link Selection window, so you can change existing link parameters.

Construction and TNTatlas Assembly Wizard exercises cannot be completed in TNTlite.

STEPS

☑ choose Spatial Data from the Display menu

☑ click on the New Display Layout icon on the Display Spatial Data toolbar

☑ click on the Add Raster icon in the Layout Controls window, and choose Quick-Add Single

☑ select the WELCOME object from the HELLO Project File

☑ click on the HyperIndex Linker icon then on the Box icon in the HyperIndex Linker window that opens

☑ pull out an elastic box that contains the SPOT View graphic and text as shown, then click the right mouse button

☑ click on [Add] in the HyperIndex Link Selection window

☑ click on [Object] in the HyperIndex Link Editor window that opens and select the SPOTINDX object from the INDEX Project File

☑ set the Position option menu to Image Center, click [OK] in the HyperIndex Link Editor window and close the HyperIndex Link Selection window

☑ repeat steps 6–9 except draw the box around the airplane graphic and Aerial View label, and select the AIRPHOTO object in the INDEX Project File
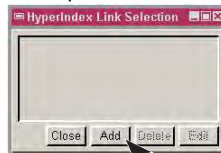
Finishing Home Level Links

STEPS

☑ repeat steps 6–9 from the previous exercise except draw the box around the MicroImages logo and text at the lower left and select the PRODUCTS object

☑ repeat steps 6–9 from the previous exercise except draw the box around the home index graphic and text at the lower right and select the INDEX object

☑ click on the Circle tool, position the cursor at about the middle of the circular image of the Golden Gate Bridge and draw out a circle that roughly corresponds to the circular outline, then click the right mouse button

☑ repeat steps 7–9 from the previous exercise except select the INDEX object (same object as in step 2 on this page)

Home level with index areas shown.

When you finish this exercise, you will have a Home Level with five index areas linked to four different objects. Each index area is linked to only one object so there are no choices involved; when you click, the next level is automatically and immediately displayed. This is about the right amount of complexity for a Home Level. It could be simpler, for example just one index area that inscribed the full initial graphic, or more complex, but the purpose of the Home Level is to provide the users with some information about the nature of the stack and to draw them further in. When further into the stack, you can begin offering choices for individual index areas that will seem logical because of information already gleaned from the stack.

One important feature of the Home Level that hasn't been addressed is appearance. You want this graphic to be professional and pleasing. You might consider hiring a graphic artist if layout and design are not your strong points. However, unlike graphic design for high resolution printed materials, more is not better for Home Level graphic design. You want the full graphic to fit in a window at 1X zoom. You may be running at 1280 x 1024 in 24-bit mode, but what are the odds the user of the stack will be?

Make sure any graphics designed in 24-bit color also look good when displayed in 8-bit mode. All of the graphics used for the first levels of the stacks illustrated on page 4 are under 800 x 600. The geographic layers that follow can be as large as necessary because all of the zooming and locator features are available, but you don't want the user to have to zoom or pan around to see your initial graphics.

Although we are starting atlas construction at the top level of the stack, it is really a bottom up process—all of your data should be assembled and organized first.

Making Index Areas Transparent

Index areas often detract from the appearance of your graphics or may even be confusing when they overlap. There are two methods to control whether index areas are visible: the Show Index Areas toggle and assignment of transparency.

Index areas are always drawn when using the HyperIndex Linker tool (transparent index areas are outlined in medium gray); these options apply when using Hyper-Index Navigator. The presence of index areas is also indicated by a context sensitve cursor.

If you don't want any index areas to show, turn the Show Index Areas option off. If you want the index areas to show on some layouts but not on others, turn the Show Index Areas option on and assign Transparent as the index area color for those you don't want to show. The user can always choose to reveal the index areas by turning on the Show Index Areas toggle* while running the atlas even if you've made them transparent (turn on Show Hidden Index Areas). In order for transparent index areas to be shown, both the Show Index Areas and Show Hidden Index Areas toggles must be on.

The last choice on the Options / HyperIndex menu turns on a selection prompt even when only one link to an index area exists so you can cancel if you decide you don't want to look at that object after all. The selection prompt always appears if there is more than one link to the index area. (TNTserver prompts only when there is a choice of links.)

STEPS

☑ click on the Existing icon in the Hyper-Index Linker window

☑ select any of the index areas you added by clicking inside it

☑ click on [Color] in the HyperIndex Linker window and turn on the Transparent button at the top of the Color Editor window, then click [OK]

☑ repeat steps 2 and 3 for three of the other four index areas

☑ in the Layout View window, choose Options / HyperIndex and turn on the Show Index Areas toggle (if not on)

☑ click on the Hyper-Index Navigator tool and note that all but one index area disappears

☑ turn on the Show Hidden Index Areas toggle on the Options / Hyper-Index menu and note the appearance of the four additional index areas

☑ turn off the Show Hidden Index Areas toggle

☑ click on the HyperIndex Linker icon and repeat steps 2 and 3 for the one index area that isn't transparent

* This option is not currently available in TNTatlas for Windows.

Lateral Links and the Navigator

STEPS

☑ click on the Hyper-
Index Navigator
icon

☑ note that the Hy-
perIndex Naviga-
tor window has
all of its direc-
tional buttons dimmed

☑ click in the index area
surrounding the earth
and SPOT satellite image

☑ note that some of the
directional buttons are no
longer dimmed, and
pause the cursor over
each to see the ToolTip,
which is a descrip-
tion of the object
displayed if you left-
click

Hayward Airphoto index screen
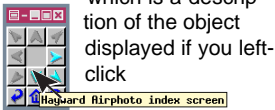
☑ right-click on the down
button and note
there are two
choices in
that direction

Hayward Airphoto index screen
MicroImages TNT Products screen

☑ release the mouse button
without making a selec-
tion and left-click on the
arrow that points right

☑ click on the Bay Area
SPOT satellite on this
index screen
and
note that
the object dis-
played is
the same as
that after
step
3, but the
active buttons in the
Navigator window are
different, why?*
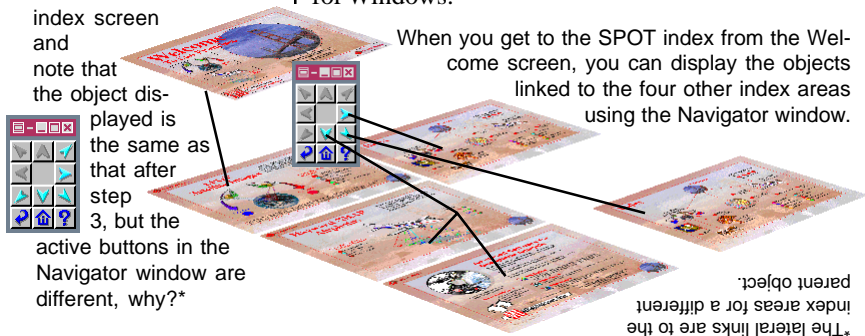
Lateral links make it possible to use the directional buttons in the HyperIndex Navigator window to move between all other objects linked to index areas in the object on the previous (higher) level. This feature is more easily described if you take the simplistic view of a stack in which a click on a parent object causes one of its daughter objects to be displayed. In such terms, lateral links would move you between any of the daughter objects of a single parent. This explanation is too simplistic because links can have a more complex organization than a simple branching diagram.

Lateral links are created automatically for you. The process looks at the previous object displayed and provides access to all the objects linked to it by the relative position of index areas. Thus, objects linked to index areas above (north of) the last one you clicked in are accessed from the directional button that points up in the Navigator window.

There may be more than one lateral link in any of the eight directions. Right-clicking on a directional button lists the description of all links in that direction so you can choose which to display. Left-click-ing on a directional button displays the nearest link. When using TNTserver, you automatically get the closest lateral link, if there is one, when you scroll beyond the boundaries of the current object. Use of lateral links has not been developed in TNTatlas for Windows.

When you get to the SPOT index from the Wel-
come screen, you can display the objects
linked to the four other index areas
using the Navigator window.

*The lateral links are to the
index areas for a different
parent object.

Automatic Linking

The Auto-Add feature lets you select any number of objects that are then automatically linked to the currently displayed object using the geographic extents of each selected object to generate its index area. It takes about two minutes of your time to set up a TNTlite-sized stack that provides access to county outline maps for each state with DataTips that provide county names (the DataTips at the state outline level provide polygon areas).

You can make a more elegant stack for the same purpose by using the polygons themselves as index areas, which is the topic of a later exercise. However, that technique is more time consuming. Linking to individual elements eliminates the areas of overlap inherent in using the geographic extents of contiguous, irregular shapes to define index areas. Clicking in the middle of most states will get you to the county level without having to specify which link you want even in this case; you will have to choose nearly every time if you click near a border.
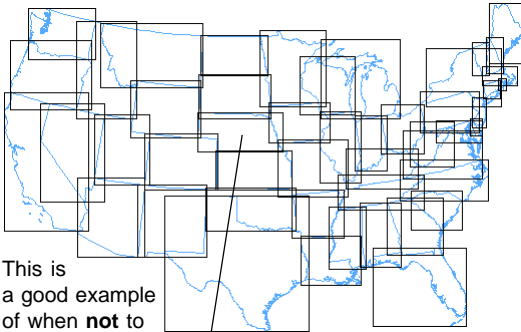
This is
a good example
of when **not** to
show index areas.

CNTY_NAME: Cherry
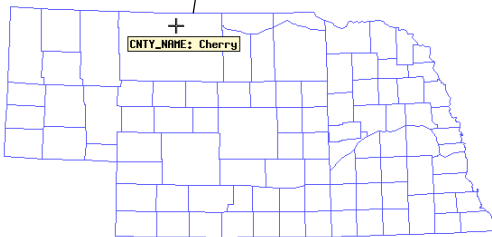
STEPS

☑ open a new
display layout

☑ click on the Add
Vector icon, choose
Quick-Add Vector and
select the STATES object in
the UNTDSTAT Project File
(HYPER directory)

☑ turn off the Options /
HyperIndex / Show In-
dex Areas toggle in the
View window

☑ click on the Hyper-
Index Linker icon,
then on [Auto Add] in the
HyperIndex Linker win-
dow

☑ click on the Add All
icon in the UNTDSTAT
Project File then select
the STATES object in the
righthand list and
click the Remove
icon

☑ click [OK] and watch the
progress of the auto-add
as index areas appear in
geographic position in
the order selected

☑ click on the Hyper-
Index Navigator
icon, then click in the
middle of Nebraska

☑ pause the cursor over
different counties and
note the DataTip

 You can use the Navigator
window to get to the county
level of any other state.

Missouri county outlines
Arkansas county outlines
Mississippi county outlines
Tennessee county outlines
Louisiana county outlines
Alabama county outlines
Georgia county outlines
Florida county outlines

Link Selection and Descriptions

STEPS

☑ with the HyperIndex Navigator tool still active and one of the county outline maps displayed from the previous exercise, click on the Home Level icon in the Navigator window

☑ click on the Hyper-Index Linker icon and then on the Existing icon if not already selected

☑ click in the middle of Nebraska (or some other state), click on [Edit Links], then click on [Edit] in the Link Selection window that opens

☑ change the Description field to *Nebraska counties* (remember that the cursor must remain over the window when you type)
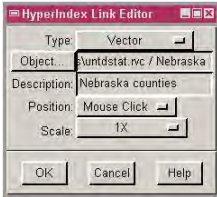
☑ click [OK] and note that the description in the Link Selection window is now also changed

☑ repeat for other states as desired*

Object descriptions are often paid little attention in TNTmips and may be omitted altogether, or you may accept a default description that is the same for all output from a process. Object descriptions are important when you start constructing HyperIndex stacks. The object description appears in the Link Selection window when you click in overlapping index areas. The object descriptions also appear as the ToolTips for directional arrows and as the right-mouse button menu entries for lateral links in the Navigator window.

You can, of course, change the description when adding or editing a link with HyperIndex Linker, but you may want to pay attention to making it uniquely descriptive when the object is imported, created, or edited, particularly if you are going to use the Auto-Add feature described in the previous exercise. Originally, the objects used in the previous exercise were all in separate files, named for the state, but the objects in each of these files had the same name and description ("county" "county outlines"). The Link Selection window that opens when you click on an area of overlap is shown above when the Auto Add was done before (upper) and after (lower) editing the object descriptions to include the state name. In this case the editing was done in Project File Maintenance (Support / Maintenance / Project File / [Edit]) when the data was prepared for use with this booklet.
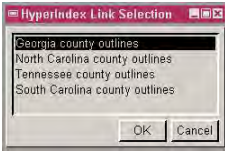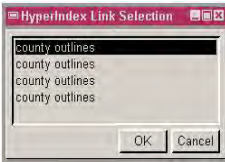
Changing the description in the HyperIndex Link Editor, as you do in this exercise, changes only the link description, not the object description.

* You do not have to close the HyperIndex Link Selection window before selecting another state to edit its description.

Index Elements

You can easily avoid overlapping index areas when establishing links to a vector object if you choose vector elements rather than drawing index areas (or using Auto Add) for linking. Polygons are the most obvious index element, but you can also create links to lines and points. A line element might bring up a graphic of the kinds of fish found in a stream or highway maintenance information for the line you click on. Typical point element links include photographs of a monument or service information for the site.

A click in a polygon index element or near a line or point index element will take you to the next level of the stack, just like any index area you draw. Lateral links are also generated for objects linked to index elements. The one difference between index areas and index elements is that index elements are not displayed differently when the Show Index Areas button is toggled on.

The HyperIndex Link Selection window opens automatically when you click on an element with the polygon, line, or point button turned on in the HyperIndex Linker window. You can then add a new link or edit or delete an existing link.
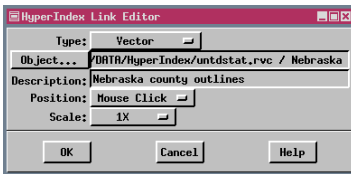
Set these options for each of the links you add in this exercise.

upper and lower Michigan

Because there are two separate polygons (upper and lower Michigan) linked to the Michigan county outlines, Michigan will appear twice in the list of lateral links. It may appear twice on one directional arrow (left) or once each on two different directional arrows (right) depending on the state displayed at the time.

 from Florida counties

from Nebraska counties
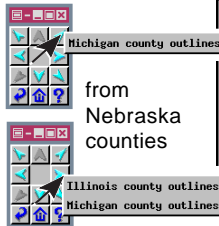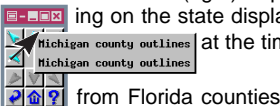
STEPS

☑ make a fresh copy of the original STATES object in the UNTDSTAT Project File (if you used the only STATES vector object you have for the previous exercises, make a copy of the object and delete its HYPERINDEX subobject using Project File Maintenance)

☑ open a new display layout and add the new copy of the STATES vector object

☑ click on the Hyper-Index Linker icon

☑ click on the Vector Polygon icon and then click on Nebraska

☑ click on [Add] in the Link Selection window

☑ set the Type option menu to Vector then click on [Object] and select the county outline map for the state you clicked on (UNTDSTAT Project File)

☑ click [OK] in the Hyper-Index Link Editor window

☑ select another state outline and repeat steps 5–7; keep selecting state outlines and adding links until you have about five states done (include upper and lower Michigan among them)

☑ click on the Hyper-Index Navigator icon then click on a state you added a link to

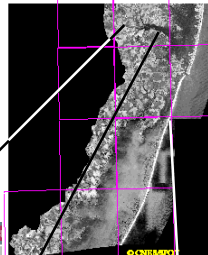☑ hold down the right mouse button over all active directional arrows and note your options
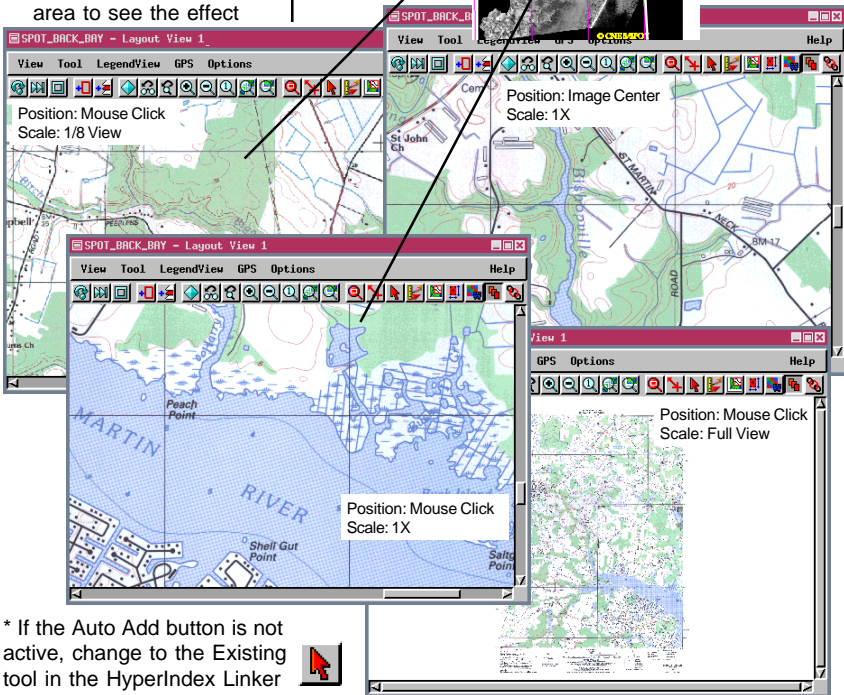
Other Link Editor Features

STEPS

☑ navigate to the Nebraska counties level in either the stack you made on p. 11 or 12

☑ resize the View window to 600 x 400 pixels

☑ click on the Hyper-Index Linker icon, then on [Auto Add]*, and select SPOT_PAN in the CB_SPOT Project File

☑ try different combinations of the Position and Scale settings (step 3 on p. 12 will get you to the right window), switching between the HyperIndex Linker and Navigator tools and clicking in different parts of the index area to see the effect

The Position and Scale options apply only to rasters and layouts because vector and CAD objects are always initially displayed to fit in the window. The Position and Scale settings interact: the Position setting has no effect with Scale set to Full View. At other settings, it only matters for large rasters. Why? Because with Scale set to Full View, it doesn't matter where you click; the next level will be the image sized to fit the View window. And even with the scale at 1X, you will see the full image unless the raster or layout is larger than the area of the View window.

Each grid cell is linked to a separate map quad sheet.

All of the views below are of the same map quad sheet.

Position: Mouse Click
Scale: 1/8 View

Position: Image Center
Scale: 1X

Position: Mouse Click
Scale: 1X

Position: Mouse Click
Scale: Full View

* If the Auto Add button is not active, change to the Existing tool in the HyperIndex Linker window.

Using Layouts in an Atlas

Displaying vectors over imagery generally conveys a much richer picture than displaying vectors alone. If you want to display more than one object at a time in a HyperIndex stack, you need to have previously saved the collection of objects as a layout. You can also link to layouts with multiple groups if desired. In this exercise, you simply save the layout; you will add it as part of the atlas in a subsequent exercise.

Note as you do this exercise that even with the HyperIndex Navigator tool active you have all the features of display available, such as adding more layers and saving the layout. You also have this capability when using HyperIndex Navigator in TNTview, but not in TNTatlas or TNTclient.

STEPS

☑ with the SPOT image still on the screen from the previous exercise, click on the Add Vector icon and choose Quick-Add Vector

☑ select CBSOILS from the CB_SOILS Project File and all six vectors from the CB_DLG Project File

☑ click on Full View, then choose Layout / Save in the Layout Controls window

☑ save the layout in a new file in the CB_SIM folder in the HYPER data collection and name it SPOTAND OVERLAYS
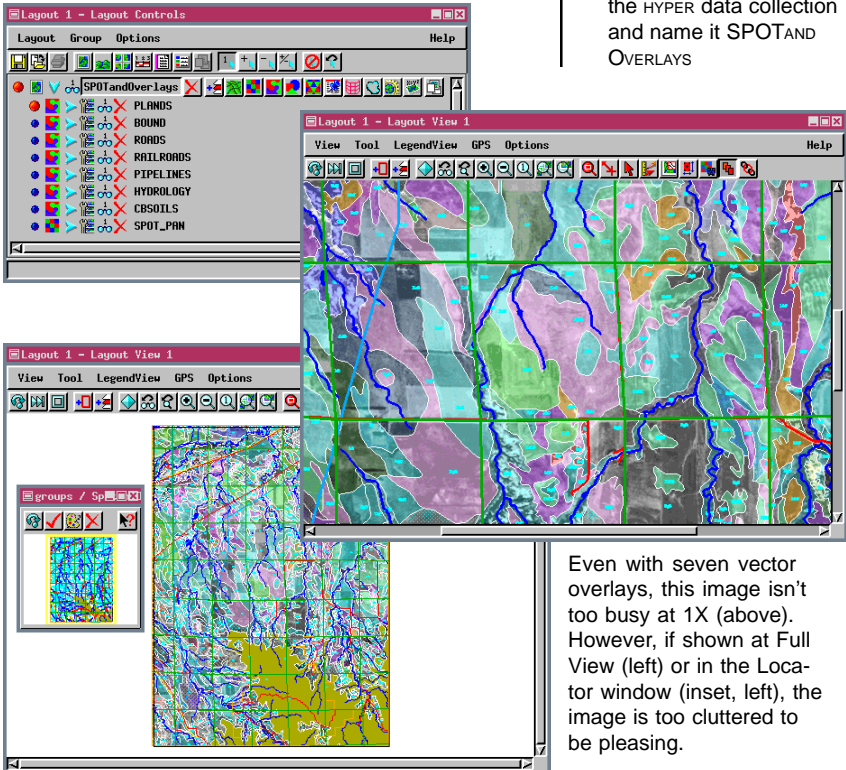
Even with seven vector overlays, this image isn't too busy at 1X (above). However, if shown at Full View (left) or in the Locator window (inset, left), the image is too cluttered to be pleasing.

Making Use of Hidden Layers

STEPS

☑ with the layout still open from the preceding exercise, click on the Hide / Show (View 1) icon for all layers except the raster and the HYDROLOGY vector (this turns viewing off and the icon should appear in shades of gray)

☑ choose Locator from the View menu in the View window if the Locator window isn't open

☑ click on the Hide / Show in Locator icon to hide all layers except the SPOT raster

☑ choose Layout / Save in the Layout Controls window

The amount of information you want to provide in your atlas should help determine your presentation strategy. Often for geospatial data you will have one or more base images and a number of vector overlays representing a variety of themes.

One presentation method repeats the base image in a number of different screens that include just a few vector overlays all of which are selected for viewing when the level opens. This method is probably best suited for the casual user who would then pick between overlay themes, such as transportation or hydrology, when navigating to that level. Another strategy includes the base image just once with all its overlays in a single layout, but the overlays are hidden for initial display. The user then decides which overlays are relevant to their current task and unhides them.
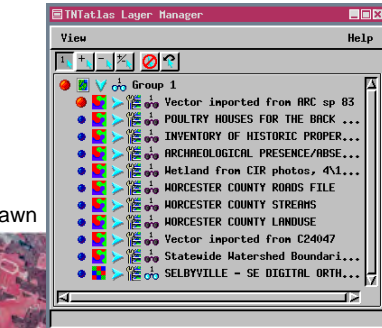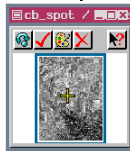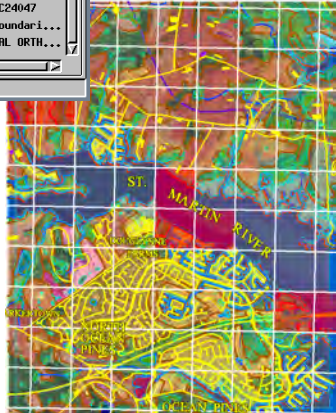
The current MERLIN atlas has many more initially hidden layers than listed here. (URL provided on p. 4)

only bottom layer drawn
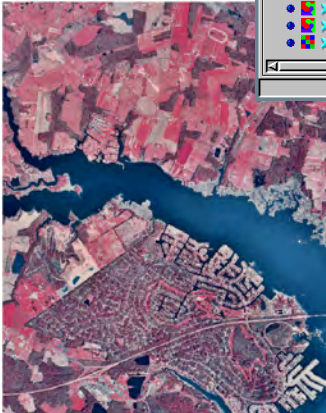
all layers drawn

The MERLIN atlas has orthophoto coverage of the entire state of Maryland with a number of vector overlays similar to the layout shown.

Adding and Deleting Links

Now that you have created a layout with more area information than just the SPOT image, you can replace the original image in the stack with your layout. The techniques used in this exercise are the same as used whenever an existing index area has a link added or removed.

You should also gain insight into your own preferences for hidden layers and Full View or 1X scale when using the Navigator after adding the multilayer layout created in the previous exercises.

When you have the Position and Scale set to Mouse Click and 1X, it is a good idea to have the Locator window open so you can see what part of the object you're viewing and move around easily.
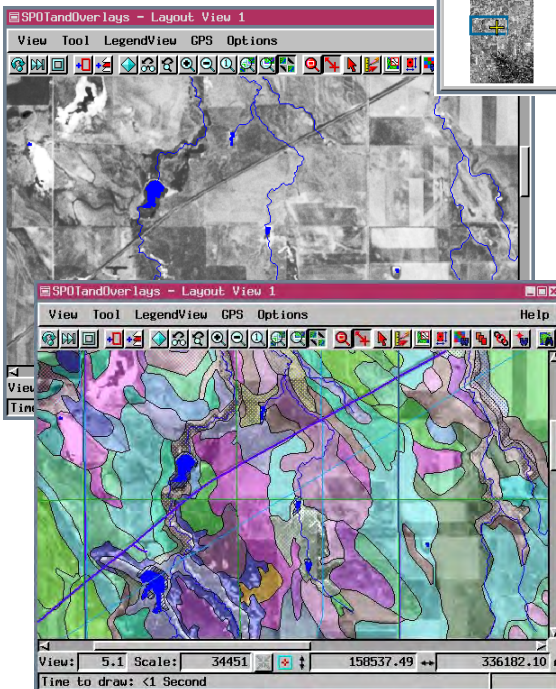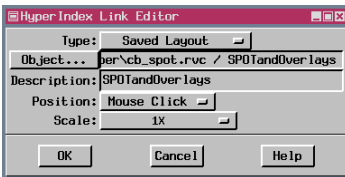
STEPS

☑ click on the Previous Level icon in the HyperIndex Navigator window

☑ click on the Hyper-Index Linker icon

☑ click on the index area in Dawes county (created in the exercise on p. 14)

☑ click on [Edit Links] in the HyperIndex Linker window, then on [Add] in the Link Selection window

☑ set the Type to Saved Layout, then click on [Object] and select the SPOTANDOVERLAYS layout created in the exercises on pages 15 and 16

☑ set the Scale to 1X and click on [OK] in the Link Editor window

☑ with the SPOT image alone highlighted in the Link Selection window, click on [Delete] and [Yes] in the Verify window

☑ close the Link Selection window then click on the HyperIndex Navigator icon

click in the index area for the Crow Butte layout you created

use the Hide / Unhide icons to see how your view is altered

The View is shown as it opens when navigated to (just the SPOT image and hydrology, upper left) and with all layers shown (left).
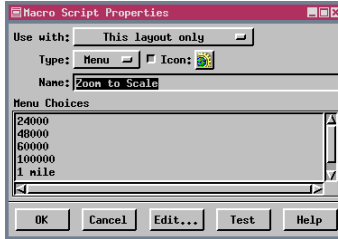
page 17

Custom Tools with Layouts

STEPS

☑ with the SPOTAND OVERLAYS layout open, choose Options / Scripts / Macro Scripts (View window)

☑ click on the Add icon and select ZOOMTO.SML ➕

☑ set the Use with option button to This layout only

☑ enter *Zoom to Scale* in the Name field

☑ click in the Menu Choices text box and type in the entries shown, then click [OK] in both windows

☑ choose Options / Show Scale Ranges (Control window) and enter 50000 in the right column for CBSOILS, and make CBSOILS visible if hidden

☑ click on the new icon at the right of your toolbar and select 60000

☑ click on the same icon and select 48000, then note the difference in scale and what is displayed

☑ choose Layout / Save, then return to the top level of the atlas

☑ note the absence of the Zoom to Scale icon on the Toolbar

☑ navigate back to the SPOTANDOVERLAYS layout

☑ use the Zoom to Scale Macro Script again

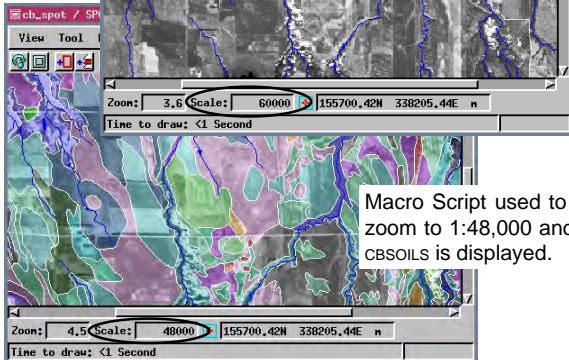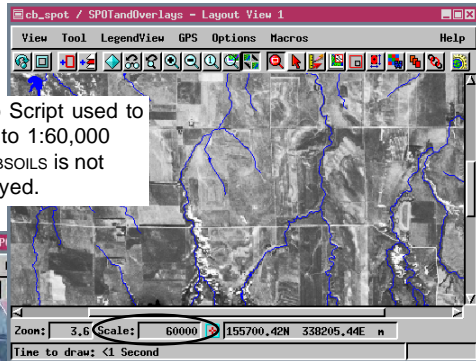* Tool Scripts and Macro Scripts are not yet supported in TNTatlas/W.

Many Tool Scripts* and Macro Scripts are data dependent. Other scripts may be useful with a variety of layouts, but only if the data is at approximately the same map scale. The Macro Script used as an example here gives reasonable displays with the Crow Butte data shown but the scale choices are inappropriate for the United States and Nebraska levels of the atlas used to navigate to this layout—viewing the United States or Nebraska outline map at any of these map scales gives you nothing but background color with the occasional line.

When you save a Macro or Tool Script for use with a particular layout, it automatically is added when the layout is navigated to or opened directly in TNTatlas. A later exercise describes further customization of the user interface for TNTatlas.

Macro Script used to zoom to 1:60,000 and CBSOILS is not displayed.

Macro Script used to zoom to 1:48,000 and CBSOILS is displayed.

Launch TNTsim3D from a TNTatlas

The technique for adding Tool Scripts is the same as that for adding Macro Scripts except there is not a menu or simple button type choice. Macro Scripts have no further user input after they are selected to run. Tool Scripts require additional user input supplied through windows and tools created by the script. The Macro Script used in this exercise requires that the script, atlas, and simulation files all be in the same directory.

Although this script seems like it would be useful for a variety of layouts, you choose "This layout only" because the script specifies the name of the TNTsim3D file to launch. However, this script is very readily adaptable for use with other data and layouts included in an atlas—you simply need to change the name of the .sim file specified in the script (in two places). You can make other changes to the script if desired, such as rate of rotation and pitch of the initial view. Using the mouse, keyboard, or joystick gives you control of the simula-

STEPS

☑ with the layout open from the last exercise, choose Options / Scripts / Macro Scripts, then click on the Add icon and select LAUNCHSIM.SML in the CB_SIM folder

☑ set Use with to This layout only, enter *Launch Simulation* in the Name field, and enter the menu choices shown at the left

☑ click on the Icon button and select a different icon to distinguish it from the Zoom to Scale Macro Script

☑ click [OK] in all three windows

☑ click on the Launch Simulation icon and select Orbit from the menu

☑ choose DirectX or OpenGL and click OK (if you have not already configured the TNTsim3D Graphic System)
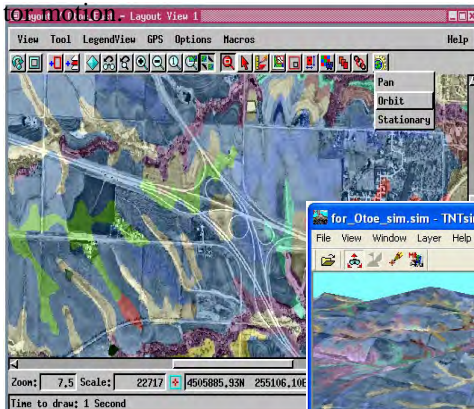
The illustrated layout (above) and simulation (right) are not those you work with in this exercise, but make it easy to see the correspondence between the atlas and simulation because of the highway interchange.
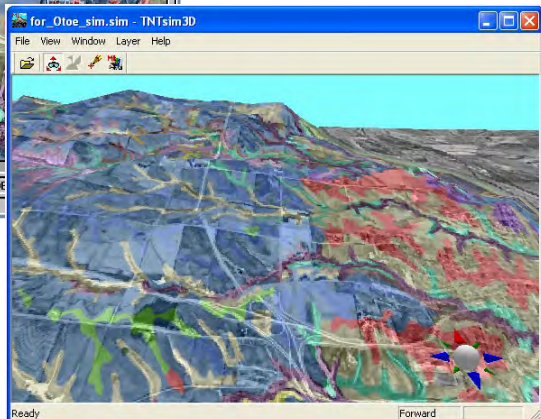
An Atlas with a Single Layout

STEPS

☑ with the SPOTANDOVER-LAYS layout still open, unhide all layers and turn on the Show Scale Ranges toggle on the Options menu in the Layout Controls

☑ enter minimum and / or maximum scale values for layers as shown
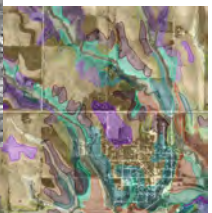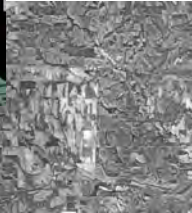

☑ type 192000 into the scale field at the bottom of the View window and press <enter>, then click on Zoom In three times; note the difference in objects displayed each time

A single-layout atlas is available for viewing at http://www.microimages.com/tntserver (then choose Nebraska Statewide from the online atlases).

The shaded relief DEM with roads and county boundaries that starts the atlas is replaced by a scanned map, which in return is replaced by a mosaic of DEMs to which soil maps are added as you zoom in further. Be sure you zoom in incrementally rather than jumping to full resolution immediately so you can see the intermediate objects.

An atlas can be created as a single layout with different layers hidden and revealed according to the current map scale of the display. You use the zoom tools rather than the Hyper-Index Navigator to move through such an atlas. The scope of a single layout, "visible by map scale range" atlas can be as large as you like and have as many display layers as needed. This type of atlas requires a bit more initial planning to determine the appropriate map scale ranges for each object.

This exercise introduces you to the mechanics of preparing such an atlas. The example is simplistic, but the method is the same for all cases. There are four possibilities when displaying by map scale range: always visible, visible from full view of the layout to the set map scale, visible within a specified scale range (and presumably not at full view or when zoomed in significantly), and visible only when zoomed in beyond the set scale.

The visible scale range can be set for an individual layer in the Layer Controls window, or you can turn on the Show Scale Ranges option and set the range for as many objects as desired directly in the Layout Controls window. If you want a layer to be hidden as you zoom in past some scale, enter that scale in the left field. Enter the scale in the right field if you want the object visible when zoomed in, but hidden when zoomed out beyond the entered scale.
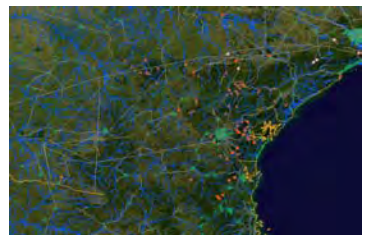
Additional Map Scale Control Methods

There are two other methods to apply map scale controls to your atlas layouts: by group and by element. When an atlas contains more than 10 or so layers, it is a good idea to organize the layers into separate groups by theme and use geographic attachment for positioning the groups. You can make some of these groups mutually exclusive if desired with or without map scale control.

In the previous exercise, the atlas example uses map scale control primarily to change image resolution and content. The soils layer is the only layer that appears without replacing another layer. The atlas example for this exercise has 11 groups. One of these groups, the political boundaries, is on at all map scales although many layers are initially hidden. One group contains the imagery, which displays from full view until a little beyond 2X zoom. Some of the vector map feature layers come on before the imagery is no longer displayed and other layers do not appear until the imagery is absent.

You can also assign elements within the same layer to display at different map scales according to their attached attributes. A database table with the designated scale ranges is set up when you choose Select: By Map Scale. This table can be altered like any other database table.

STEPS

☑ with the SPOTANDOVER-LAYS layout still open, click on the Vector icon for the HYDROLOGY layer

☑ click on [Object] and select HYDROLOGY from the DLG_HYDRO Project File in the HYPER folder

☑ click on the Lines tab, set Select to By Map Scale, click on [Specify], select CLASS.DESCRIPTION, and click [OK]

☑ enter 60000 in the Maximum column for the two records that include "intermittent," and click [OK] in the Select By Scale, New Table Name, and Vector Layer Controls

☑ zoom in/out to see the intermittent streams come and go

☑ show details for the HYDROLOGY layer, show tables for the lines, and note the SCALE_SELECTION table

The single layout atlas of World Data can be accessed from microimages.com. It opens with only the World Image and political boundaries displayed (above), but shows an increasing number of layers as you zoom in (right).

Metadata

STEPS

☑ with the SPOTand Over-
lays layout from the pre-
vious exercise still open,
click on the Tools
icon for the SPOT
layer and choose Meta-
data from its menu

☑ choose Edit / Insert File
in the Metadata Editor
window

☑ select the METADATA.TXT file
you copied with the data
for this booklet

☑ delete the default text
that says there is no
metadata and choose
File / Save

Any raster, vector, CAD, or
TIN object can have associ-
ated metadata, which may
be viewed when the object
is displayed. Metadata is
accessed from the right-
mouse menu for a layer in
the Layer Controls panel of
the Java client and from the
object type icon of the
HTML client with TNT-
server.

The Metadata Editor
window for this object
initially displays the
message "No meta-
data is available for
this object."

Metadata is text that describes the content, source, accuracy, and other characteristics and attributes of your geospatial or other objects. It can be as simple as acknowledgment of the graphic artist for your welcome screen or as detailed as you like including projection information and parameters as well as the names of associated attribute tables. TNTmips manages metadata by storing it as a subobject so that it is carried along with an object whenever the object is copied or otherwise processed.

Metadata can be used to provide instructions for use of any stack you create by associating it with the welcome or index screen, although such information that does not directly describe an object may be better provided as an externally linked file. Any descriptive text you want associated with individual objects in a stack can also be provided by this method. For example if your stack concerns campgrounds in a national park, the layer that is specific to each campground might have associated metadata that contains information about the number of campsites, other facilities and services available, nearby points of interest, and so on.
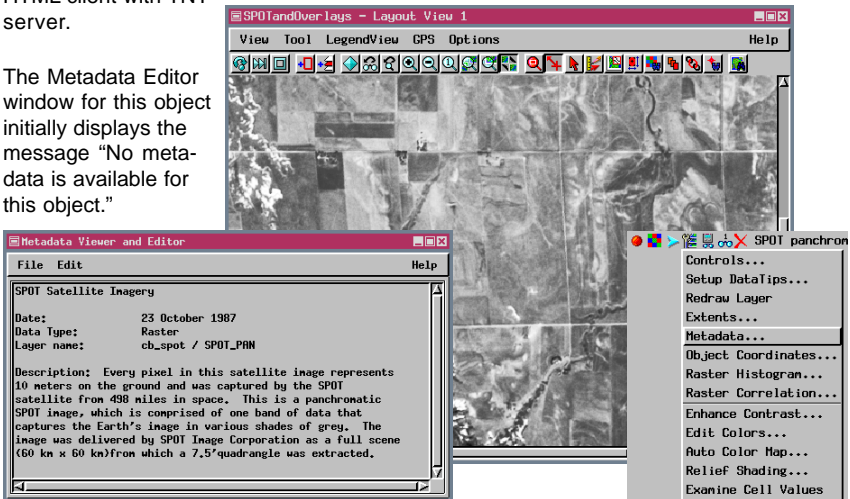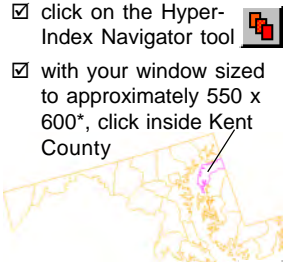
More On Position and Scale

All of the preceding examples use scale options picked directly from the menu that require no further input. The Fractional View and Map options let you determine the scale of the linked object with a greater degree of flexibility. When you make either of these selections, a field appears to the right of the scale menu so you can enter the desired value. You can enter any value between 1.0 (Full view) and 0.0039 (1/256 view) for the Fractional View option. The number you enter for the Map option represents the scale portion of the map scale at which the linked object will be displayed. The default value of 10000 is not a good choice for the SPOT image; 48000 will show somewhat more of the object than a 1X view at the window size specified on this page.

While doing the exercise on page 14 you should have noticed that one of the scale and position settings (As Stored) was unavailable. This choice is available only if the link type is Saved Layout. The As Stored option uses the scale and position information from the layout. You do not use the Hyper-Index Link Editor to change how such a layout is displayed, but rather you reposition and scale the layout as desired and save it again. The next time the atlas is used, the layout will appear as newly saved.

Your initial view of the layout linked to Kent County should look like that at the immediate right. When you return to Kent County after saving the Millington layout, the results of navigating should appear as at the far right.
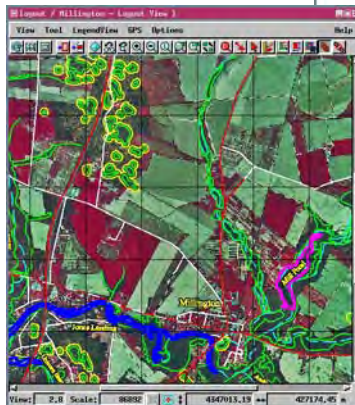
STEPS

☑ click on New Display Layout and Quick-Add the MARYLAND vector from the UNTDSTAT Project File

☑ click on the Hyper-Index Navigator tool

☑ with your window sized to approximately 550 x 600*, click inside Kent County

☑ click on Full View

☑ choose Layout / Save in the Layout Controls window

☑ click on the Previous Level icon in the Navigator window

☑ click in Kent County again

☑ note the difference from the initial display
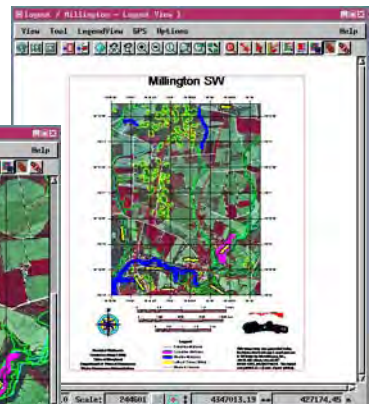
* Window dimensions are shown at the upper left of the X Server when resizing in X Desktop mode.

Linking to External Files and URLs

STEPS

☑ with the SPOT_{AND}O_{VER-}L_{AYS} layout open at Full View, click on the Hyper-Index Linker icon then on the Box tool in the HyperIndex Linker window

☑ draw a box around the entire SPOT image, then click the right mouse button

☑ click on [Add], set the Type to External File, then click on [Object], and select C_BUTTE.DOC*

☑ change the Description to *Why Crow Butte?*, and click [OK]

☑ click on the Hyper-Index Navigator icon, then click over the SPOT image, and read the material

☑ click on the HyperIndex Linker icon again, then on the Existing icon, click over the SPOT image, then click on [Edit Links] and [Add]

☑ set the Type to URL, click on [Object], and type the web address below into the URL window

http://www.weather.com/weather/local/69339

☑ change the Description to *Crow Butte weather*, click [OK], change to the HyperIndex Navigator, click over the SPOT image and choose this newest link if connected to the Internet

The ability to link to external files or web addresses opens up a whole world of possibilities for information to be accessed from your atlas. You could, for example, provide mpeg movies linked to various locales (for example, link Inyo and / or Tulare County in California to the 3D simulation of a Mount Whitney flyby available with the TNT products).

Again, you need to keep your viewer in mind because they have to have the applications that will launch the external files you link to and, obviously, they have to have an Internet connection for any URLs included in the atlas. This exercise provides equivalent text in both Microsoft Word and text file format to be certain you can use it. The Word version may have a few features not available in a straight text file, such as continuous word flow, but as a text file it is available to all atlas viewers using either the Text Editor if running with the X Server or your system's text editor if not. These programs are used to open linked text files (*.txt).
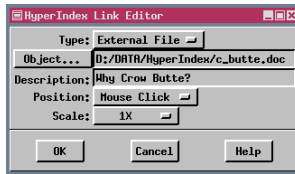
An atlas that incorporates Project Files, external files, and web addresses can put everything you need for a number of applications at your fingertips. For example, imagine yourself as a farmer in the field monitoring your planting progress on a portable PC by GPS displayed over an airphoto while having point-and-click access to the local weather by wireless Internet.

---

* If you do not have an application that will open a Microsoft Word .doc file, set the type to Text File and select C_BUTTE.TXT.

Preparation to Link By Attribute

The method presented in the previous exercise for linking to files and URLs would be quite tedious if you intended to link a large number of elements to unique files or URLs. The ability to create a URL or file link using element attributes takes care of the tedious entry of URLs or file paths for each element if you can create a computed field that will generate the entries for you as is done in this exercise.

The basic strategy is to create a string expression field, which generates the file name or URL, in a table already linked to the elements. This string expression has a constant component and a value pulled from the database (such as a ZIP code or farm name), which often need to be concatenated with an additional string

that specifies the file extension. Having a constant component in the string expression requires some organization if you are linking to files, particularly if you have files for the same elements over multiple years. The constant component should contain all the path or URL information to the left of the information acquired by attribute.
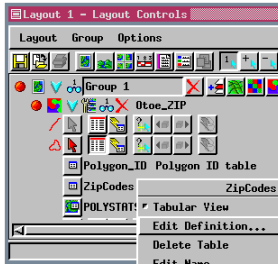
The constant component in this example is represented by web$. It contains the complete

web address to the left of the individual zip code, which is pulled from the table according to the polygon selected. To easily link to files containing farm information for two separate years, the files for the same farm in separate years should be named exactly the same and also match the name of the farm provided in the database. You can then use the same expression to link to either set of data just by changing the year in the expression.

STEPS

☑ open a new display layout

☑ click on the Add Layer(s) icon and choose ELEVATIONS, OTOE_CITIES, and OTOE_ZIP (in that order) from URL_LINK

☑ click on the Show Details icon for the OTOE_ZIP layer

☑ click on the Show Tables icon for the polygons, right-click on the ZipCodes table name, and choose Edit Definition

☑ click on the Add Field icon, then click on the newly added field in the list of field names and change the name from *Field* to *URL*

☑ set the Field Type to String Expression and enter 60* for the Width

☑ click on [Edit Expression] and type in the expression below exactly as shown

```
web$ = "http://www.weather.com/weather/local/"
zip$ = NumToStr(ZipCodes.Zipcode)
url$ = web$ + zip$
return url$
```

the same for all elements

attribute value for selected element

places concatenated string in string expression field

☑ click on [OK] in the table definition window

* Make sure the width entered is sufficient to contain the complete URL; 60 may not be enough for some sites.
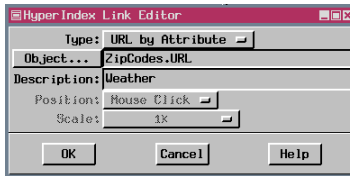
Linking to URLs and Files By Attribute

STEPS

☑ continuing from the pre-
ceding exercise, choose
the HyperIndex
Linker tool

☑ click on the Vector
Polygon icon in the
HyperIndex Linker win-
dow (OTOE_ZIP must be
the active layer)

☑ click inside any of the
ZIP code polygons*, then
click on [Add] in the
HyperIndex Link Selec-
tion window

☑ set the Type to URL
by Attribute

☑ click on [Object] and
select ZipCodes in
the Table list then
URL in the Field list

☑ type *Weather* in the de-
scription field, click [OK]
in the HyperIndex Link
Editor window and close
the Link Selection win-
dow

☑ connect to the Internet,
then choose the Hyper-
Index Navigator tool
and click in any of
the ZIP code polygons

* When you add a link by
attribute, you initially
choose the vector point,
line, or polygon tool and
select one of the ele-
ments. If you later want to
edit this link, use the Ex-
isting arrow tool to select
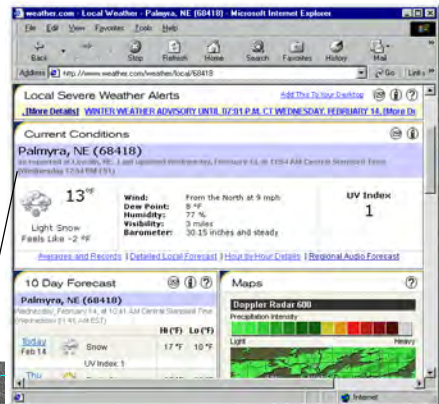any of the same type of
element.

If you are preparing an atlas for use with TNTatlas
on CD-ROM and with TNTserver and that atlas has
links to external files, such as PDF files, the links
need to be set up differently for the two applica-
tions. Making the change is quite simple. All files
accessed by TNTserver must have a web address.
There are only two changes you need to make to
change links that point to files on the CD-ROM to
links that point to the corresponding web-based
files. You need to change the link type and the file
reference. If the link is from a drawn index area or
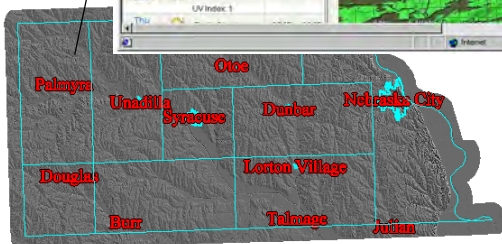an individual vector element, both changes are
made in the Hyper-
Index Link Editor win-
dow. If the link is by
attribute, you change
the link type in the
HyperIndex Editor
window and the file reference in the string expres-
sion. If you rename the field that contains the string
expression, you have to add the link again.
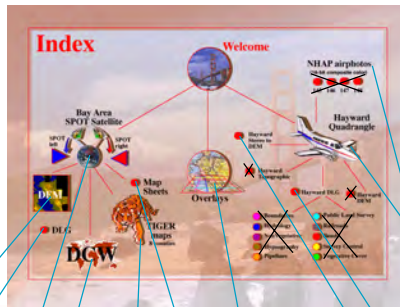

click and
get the
weather

Construction Exercises Revisited

You added the necessary links to hook up the San Francisco Welcome screen as intended in the exercises on pages 7 and 8. The Index screen you linked to already had index areas with links established to a variety of other objects. Ten of these linked objects are found in the Project File with the Index screen. Clicking on any of these index areas will display the next level of the atlas provided you gave the Project File the same name as the original when copied. You can satisfy the prompt to locate the object if the file is now differently named if you are running TNTmips or TNTview, but TNTatlas will not use objects in a differently named file. The object itself must have the original name in any case. Clicking on the index areas for objects you don't have (index areas crossed out in illustration below) will give you a selection prompt you cannot satisfy.

The point here is that whenever you link to an object that is part of a HyperIndex stack, all of the linking information previously established comes along. This information may be unwanted in part, in which case you can edit the existing index areas, or entirely, in which case you should make a copy of the object and delete the Hyper-Index subobject before beginning a new stack that includes the object.

Keep this stack open for the next exercise.

STEPS

☑ open a new Display Layout

☑ click on the Add Raster icon, choose Quick-Add Single, and select the INDEX object from the INDEX Project File

☑ click on the Hyper-Index Navigator icon

☑ click on index areas shown to have links and then, after the next level is displayed, click on the Previous Level icon in the Navigator window

☑ click on one or more of the index areas you don't have the linked objects for to see what occurs when objects can't be located

Remember that clicking on the Home icon in the Navigator window for this exercise will take you to the Index screen rather than the Welcome screen since the index screen is the level you were viewing when you began navigating.

Customizing the TNTatlas Interface

☑ if you launch TNTmips from your start menu, go to the same menu cascade and choose TNTatlas for X; if you start TNTmips from a shortcut, check the shortcut properties, go to the same directory, and double-click on TNTATLAS.EXE; if you start TNTmips by double-clicking on TNTSTART.EXE, go to the same directory, and double-click on TNTATLAS.EXE

☑ choose Options/Hidden Features

☑ note that all icons are listed first as they are grouped in the window, then the menus and all choices are listed

☑ change the options selected in a thoughtful manner and click [OK]

☑ you may want to further change your options

We have discussed layout-specific Macro and Tool Scripts as a means of customizing atlases, but you can also customize the interface to eliminate icon and menu choices you think are unnecessary for your atlas. The number of choices in the default configuration of TNTatlas may be overwhelming for a novice user. You may want to remove icons and leave menus intact, reduce choices of both, or even increase the choices available from the default for TNTatlas (not all icons and menu choices are on by default). Remember that customization applies only to TNTatlas for X windows.
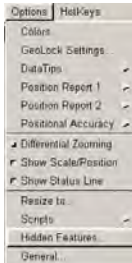
In order to customize TNTatlas so that the customization will be transmitted to any atlas you publish, you need to make the customization settings while running the version of TNTatlas that matches the version of TNTmips you use to run the atlas through the TNTatlas Assembly Wizard. There are now options in the Assembly Wizard, which will be described in a later exercise, that determine whether your customization settings will be transmitted to the atlas and whether the atlas user can further customize their atlas interface.

Remember that you are customizing the icons and menus only. Removing such options as Show Status Line and Position Report 1 or 2 do not remove the status line or position report from the window but rather remove the ability to turn them on and off from the menu.
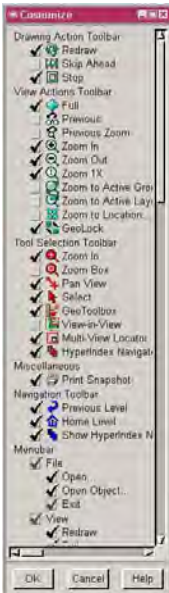
default icons and menus
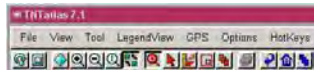
all icons and menus

fewer icons

Making an ATL File for Atlas Distribution

The HyperIndex stacks you have made can be used on your computer with TNTmips, TNTview, or TNT-atlas at any time. They can also be used on anyone else's computer that has these products. However, to make an atlas that can be distributed on CD-ROM so that it can be run by anyone using the free TNT-atlas product, you need to create a .atl file. This file tells TNTatlas where to find the home page for the stack. The same .atl file can be used with TNTserver to provide access to your atlas over the Internet.

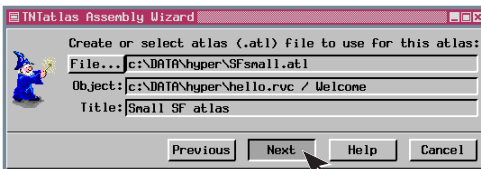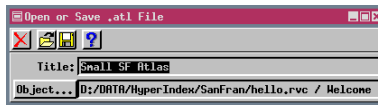While any atlas you create will run smoothly on your machine, distributing an operational atlas may be another matter because it relies on your having found all the linked files and objects and having copied them with appropriate names to the directory used to burn your distribution CD-ROM. If you did not find all files, the atlas user will likely stumble on index areas that produce the same results you encountered for the index areas that are crossed out in the exercise on p. 27. To assure the completeness of your atlas, TNTmips supplies an Atlas Assembly Wizard.

You can create your ATL file either in HyperIndex Linker, as you do in this exercise, or directly in the TNTatlas Assembly Wizard. If your ATL file was created before opening the Assembly Wizard, you simply select the file. If you have not previously saved the .atl file, you click on the New File icon in the Select File window, name the file, then select the object for the opening screen.

STEPS

☑ click on New Display Layout then Add Raster, choose Quick-Add Single, then select WELCOME from the HELLO Project File

☑ click on the Hyper-Index Linker icon

☑ click on [Save ATL File] in the HyperIndex Linker window

☑ click on [Object] in the Open or Save .atl File window

☑ select the WELCOME object in the HELLO Project File

☑ click in the Title field and enter Small SF Atlas

☑ click on the Save icon, navigate to the folder with the files you've used for this booklet, click on the New File icon, and enter SFSMALL as the new file name

☑ click on the Close icon in the Open or Save .atl File window

☑ choose Support / TNTatlas Assembly Wizard from the main menu

☑ click on [Next] in the window that opens

☑ click on [File] in the next window and select SFSMALL.ATL

☑ click on [Next]

Open or Save .atl File
Title: Small SF Atlas
Object... D:/DATA/HyperIndex/SanFran/hello.rvc / Welcome

TNTatlas Assembly Wizard
Welcome to the Atlas Assembly Wizard...
Previous Next Help Cancel

TNTatlas Assembly Wizard
Create or select atlas (.atl) file to use for this atlas:
File... c:\DATA\hyper\SFsmall.atl
Object: c:\DATA\hyper\hello.rvc / Welcome
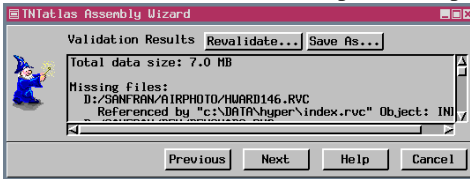Title: Small SF atlas
Previous Next Help Cancel

Validating Your Atlas Before Distribution

STEPS

☑ note atlas validation occurs automatically before the next window opens

☑ after the validation steps are done, click on [Save As] and name the text file

☑ review the errors found either in the TNTatlas Assembly Wizard window or from the text file created by using [Save As]*

☑ return to Display with the HyperIndex tool active and the INDEX raster displayed

☑ click on the NHAP airphotos index area at the upper right, then click on [Delete Index Area] in the HyperIndex Linker window, and [OK]

☑ repeat step 5 for each of the four index areas immediately below

☑ click on the Exit icon for Spatial Data Display

☑ click on [Revalidate], then compare the list of missing files with that in the saved text file

☑ take note of the space required for your atlas data (first line of validation report)

The Validate step runs through a stack to check that all the objects referenced by all the index areas can be located and used. Missing files, missing objects, and other errors found, such as the inability to read a file, are recorded and displayed in the scrolling text panel of the TNTatlas Assembly Wizard. The referenced files that passed the validation step without problem are also listed. You can review the report directly or save it as a text file for further review and reference.

It is advisable, but not necessary, to remedy errors found before completing atlas assembly. Any errors you don't resolve are likely to be encountered by subsequent users of the stack. To resolve errors, delete the index area if an appropriate object for linking cannot be found, or edit the link and redirect it to another suitable object or file. You do not need to reconcile the remaining problems reported for this exercise.

Windows is the only platform supported for creation of an installable atlas using the TNTatlas Assembly Wizard that can be run in the absence of any other TNT products. You can choose whether you want the setup package to install TNTatlas for X or TNTatlas for windows. An atlas created without the platform-specific installation components can still be run by selecting the starting screen or .atl file and using the HyperIndex Navigator tool in the Spatial Data Display process of TNTmips, TNTedit, TNTview, or with TNTatlas on any platform that can read the CD or other media that contains the atlas. When the installation components are selected along with the atlas files and the product is installed, an icon is created so that the atlas can be launched directly from the desktop.

Components and Features

The Atlas Assembly Wizard copies all the atlas files and creates the files for installation in a single folder so they are ready to be transferred for CD mastering, copying for use with TNTserver, or other distri-
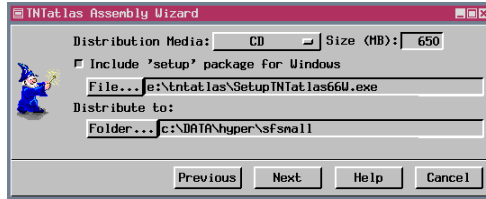
bution methods. This folder should be a new folder so that you don't inadvertently place unneeded materials with the copies of your atlas files the Wizard creates. You do not need to select a setup package unless you intend to distribute the atlas to people without access to other TNT products. There is an additional step in the Assembly Wizard if you elect to include the setup files. In this step you select the splash screen that comes up when the CD is inserted and the desktop icon for the CD. You can choose the files provided for you on the TNT products CD or substitute files of similar size and type.

You need a TNT products V6.60 or later CD-ROM to create a stand alone atlas for either Microsoft Windows or X windows. There are different setup files for these two versions of TNTatlas. If you create a TNTatlas on CD with the setup package included, a splash screen will come up when the CD is inserted with the choices Install, Browse, and Exit.

If you turn on the *Include current customization settings* option, the changes you made for the exercise on p. 28 will be transmitted to the .atl file created by the Wizard and will be used if you select that .atl file to open the atlas (provided you use TNTatlas/X). The *Allow end user to customize interface* option provides the Hidden Features choice on the Options menu when running this same atlas (in TNTatlas/X).

Permissions for Use of Atlas Files

☑ continuing from the previous exercise, leave the default permissions toggled on in this panel; turn on additional product permissions if desired
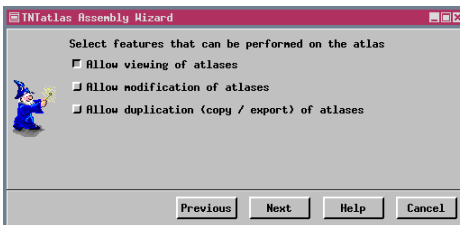
The first Wizard panel concerning permissions determines which TNT products are allowed access to the atlas you create. The default choices turned on allow just TNTatlas and TNTserver to access the atlas you create, which means that TNTmips' users can view the atlas only in TNT-atlas, not in the Spatial Data Display process of TNTmips. If you want your atlas to be distributed over the Internet only, you can turn off the *Allow TNTatlas access to atlas* option. Conversely, if you want only local use of your atlas and do not want it distributed over the Internet, turn off the Allow TNTserver access to atlas option. However the permissions are set, you, as the atlas creator, can still access the atlas in any of the products as long as you run on a machine with the same TNT product license key used to create the atlas.

☑ click [Next]

☑ leave the default choice toggled on and toggle on additional choices if desired

The second permissions panel lets you set the level of usage within the allowed products for the data in your atlas including whether it can be changed or duplicated using the TNT products. If you turn off the first option (*Allow viewing of atlases*), the data will only be viewable on the machine with the TNT license key that assembled the atlas, which is not likely to be what you want. The *Allow modification of atlases* option lets any of the TNT products that you gave access to the atlas save modifications to the data. Such modifications may be as minor as alteration of assigned drawing styles, but also include changing database entries and altering other objects, such as existing sketch layers. The Allow duplication (copy/export) of atlases option would also need to be on to allow others to use the Spatial Data Editor on the atlas objects.

☑ click on [Next]

☑ click on [Finish] and note the process status

It is recommended that you start from your master Project Files each time you modify an atlas rather than starting with files that have already been run through the TNTatlas Assembly Wizard. Such files may give unexpected results because of previously set permissions that you do not remember and cannot detect when using TNTmips with the authorization key originally used for atlas production.

Assembling Your Distributable Atlas

You have to give some product other than TNT-atlas and TNTserver permission to access the data on the first permissions panel for the settings for the third option on the second panel to matter. You cannot prevent duplication of data by using the operating system to copy the files from the CD, but the *Allow duplication (copy / export) of atlases* option prevents copying files or objects with Project File Maintenance and export of objects when toggled off. Files copied by the operating system will only be usable in the TNT products specified on the first permissions panel.

If *Allow modification of atlases* is toggled on, the TNTatlas user will be able to change the field selected for DataTips, modify metadata, and edit database tables. Drawing styles cannot be changed from within TNTatlas. If this option is toggled off, the TNTatlas user can change the field used to provide DataTips for the current display session, but cannot modify database tables or metadata.

The defaults set for permissions assume that you want your atlas to be distributed and viewed as you designed it, but you do not want those viewing your atlas to be able to copy and use your data for their own purposes. If your intention is to distribute your Project Files to be used freely as well as to provide an introduction to the available objects using an atlas presentation format, you should turn on all the permissions toggles on both of the panels shown in the previous exercise.

The contents of the folder created by the TNTatlas Assembly Wizard, not the folder itself, should be copied to the CD or other media you will use for atlas distribution. Be sure you copy the files at the root level of this folder as well as the folders created within.

A default splash screen, which appears when your stand alone atlas CD is inserted, and icon for launching your atlas after it is installed are provided. Other graphics of your choice can be substituted (for example the version number was edited out of the splash screen below).

Serving Up an Atlas on the Internet

STEPS

☑ open the atlas you created on p. 32—launch TNTatlas for X, then choose Open and select the .atl file in the destination folder you chose on p. 31 (double-clicking on the .atl file will launch TNTatlas for Windows, which does not use the customization settings)

☑ check to see that the icons and menus are as you set them when customizing your atlas interface (p. 28)

☑ try your atlas on a colleague's computer to verify that the permissions you set are enforced

☑ if you have Internet access and an appropriate browser, go to http://www.microimages.com/tntserver and choose an atlas from the public atlases list so you can see how TNTserver could work for you

Any atlas you make with HyperIndex Linker (or any single layout atlas) can be accessed worldwide over the Internet from your site if you purchase TNTserver. Such an atlas is not restricted to the number of files that will fit on a DVD; the data can be spread across multiple drives at your location. For example, the MERLIN atlas maintained by the Maryland Department of Natural Resources provides access to more than 180 Gb of data.

TNTserver requires a Windows 2000 server or XP-based platform at your site for operation. The atlas information is delivered via an HTML or Java client, which requires that the viewer have the latest version of Internet Explorer, Netscape, or an equivalent UNIX browser and the Java 1 virtual engine that matches the browser.

In addition to navigating through the atlas data, the viewer can request metadata, make measurements, view coordinates, and retrieve database information.
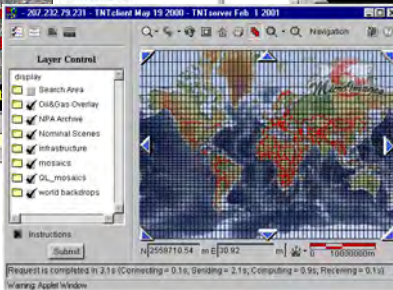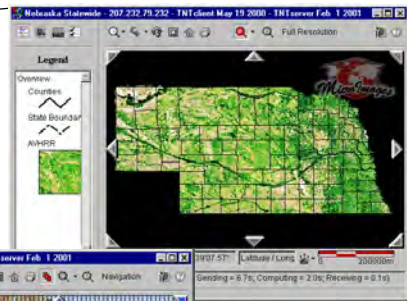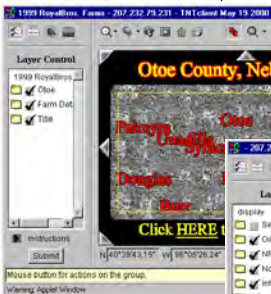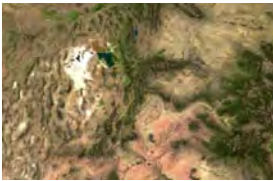

The welcome pages for three of the sample atlases currently posted are shown here.

See the companion booklet *Introduction to: TNTserver and Clients* for more information.
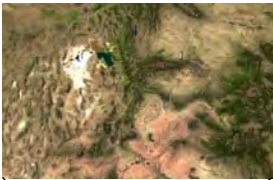
JPEG2000 Compression for Atlases

You can greatly increase the amount of atlas imagery that can be fit on a CD or DVD by exporting your raster objects to JP2 files using JPEG2000 lossless or lossy compression. Additionally, if you have acquired your imagery as JP2 files, the files can be used directly in the TNT products without the need for import. Selecting a JP2 file automatically and transparently creates a link file* in Project File format. This link file lets you use features available for raster objects in TNTmips that are not supported by JP2, such as null values and masks.
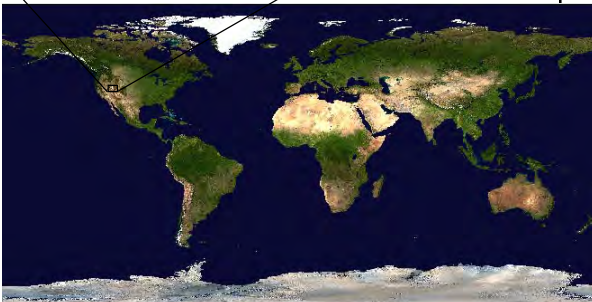
JP2 files created by the Landscape Builder automatically have a null mask created if the texture raster needs to be padded because of rotation to match a projection during resampling or if the input texture raster has null values. This mask is stored as a subobjectof the texture raster.

STEPS
☑ open a new 2D group and select the TEXTURE raster in CB_HYDRO.SIM
☑ click on the Raster icon in the Group Controls to open the Raster Layer Controls
☑ check that the Null Cells Transparent button is toggled off on the Options tabbed panel
☑ note the black areas at the margins of the raster
☑ reopen the Raster Layer Controls
☑ turn on the toggle to the left of the Mask button in the Object tabbed panel
☑ click on [Mask], navigate into the same file you selected the TEXTURE raster from, and click on the Look in Raster icon for the TEXTURE raster, then select the NULL_MASK subobject
☑ click [OK]
☑ click on Redraw (if not redrawing automatically)
☑ notice the absence of black areas at the raster's edge

This enlargement is from direct display of the 481 MB JP2 file with lossless compression.

This enlargement is from the 2.78 GB, uncompressed raster object.

* If your JP2 file does not contain different resolution levels, you may want to create the link in the Import process so that pyramid tiers, which will be saved in the link file, can be generated for use.
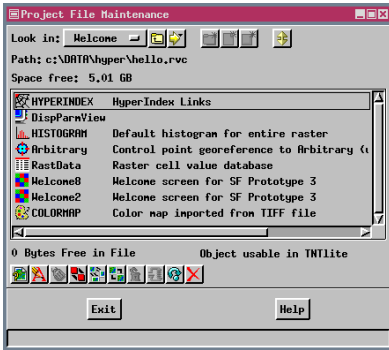
page 35

Updating Stacks

All HyperIndex stack information (where the index areas are and what they're linked to) is stored in a HyperIndex subobject with the active layer*. This subobject is automatically created or added to when you use HyperIndex Linker.

You have already used the techniques necessary to update HyperIndex stacks. The exercises for linking up the Welcome screen follow exactly the same procedure you would use if replacing an earlier version of the graphic. The exercise on deleting and adding links was also an update exercise; you had a newer more complete object, in this case a layout, to replace an earlier object.

When updating a screen in the middle of a stack, you want to keep the Project File and object names the same so that index areas the object is linked to can still locate the object. It is not generally recommended, but in cases where a screen needs to be updated and has many index areas not generated simply by Auto Add, the HyperIndex subobject can be copied from the original object to the new object. This process requires that the original and replacement objects have the same dimensions (in object coordinates) and that all components are more or less in the same place. A legitimate use of this copying procedure would be if, after making the more than 30 index areas with manual links that are associated with the Index screen in the previous exercise, you discovered there was a typographical error in one of the labels. You might be tempted to leave the error if it meant you had to redo all the index areas and links, but copying the HyperIndex subobject provides a simple alternative for cases such as this one.


* When editing HyperIndex links in a complex layout, you need to have the same layer active that was active when the links were created in order to edit them.

GPS "Moving Map" Measurements

Because TNTatlas is a free product, anyone with a GPS device can use imagery you provide as a base for their position when driving or walking around. As you move, the base image automatically scrolls with your GPS position. With appropriate GeoToolbox options turned on, you can also make measurements of your path and any enclosed areas, such as a field. Your GPS position can be displayed in real time, or you can create a log file and play it back later at a speed you control. Measurements can be recorded as you move or later when playing back the log file. When you drive around an area, you can also save the polygon created as a region. The same GPS capabilities are provided in all TNT products.

CONCEPTS

☑ choose your GPS input (device or log file) from the GPS menu in the View window
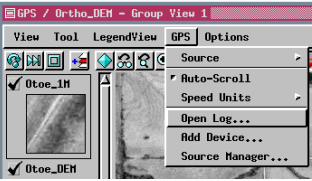
☑ you can view multiple GPS sources at the same time; each has its own GPS Status and Control window, and each can have a different style
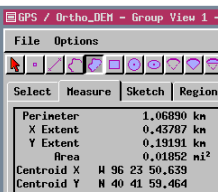
Measurements are continuously updated as you drive around a field with a GPS source selected and tracking turned on for the polygon tool in the GeoToolbox.

☑ a number of symbols well suited to GPS tracking are supplied with the TNT products (select the ARROWS object in the SYMBOL folder in the STDSTYLE Project File (in the same folder as your TNTmips executables)
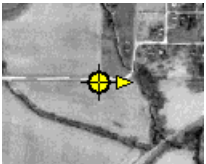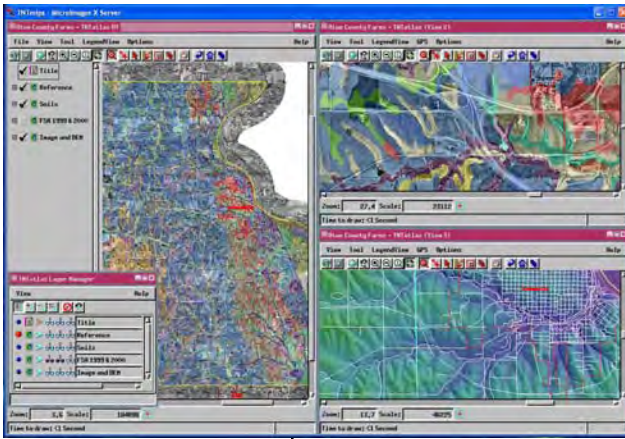
The speed of the unit is reported when displaying from a GPS source.
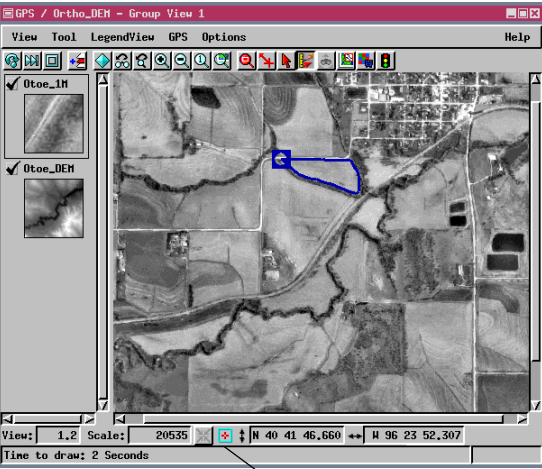
Turn off Auto Repeat when measuring.

Icon indicates source of coordinates, below GPS and above View center (log playback complete).

Additional Parameters for ATL Files

There are a number of additional parameters that can be stored in the *.atl file, such as background color for the TNTatlas window, position and scale for the initial display, and the number of Views to open. These parameters are used only by TNTatlas/X. When you choose to open more than one View, you can specify additional parameters for each View independently. If you set up the layout used for the atlas with different layers on in View 1 and View 2, that is how they will open in TNTatlas. A combination of these features lets you open multiple geolocked views with different layers visible in each at different geolocked scales if desired. You need to add these parameters to the atl file for your atlas using a text editor.

You can open multiple Views in TNTatlas/X at a specified location with a designated relative zoom and different visible layers.

These three lines are filled in when the .atl file is created in TNTmips.

[TNTatlas]
Title=
File=
Object=
BackgroundColor=[view background color] — any color name in RGB.TXT
StartCenterLat=[initial center latitude in decimal degrees]
StartCenterLon=[initial center longitude in decimal degrees]
StartZoomWidth=[initial zoom width in meters]
StartZoom1X=[Yes|No]
DisableOpen=[Yes|No] — "yes" prevents user from opening any other atlases or objects
CustomizeFile=[name of customization file]
NumViews=##
[View##] [## can range from 1 to NumViews value above]
ShowLegend=[Yes|No]
GeoLockMode=[0=none, 1=scale, 2=extent, 3=both]
GeoLockScale=[relative geolock scale]
Position=xinit,xwidth,xrange,yinit,ywidth,yrange

For Position, the "range" values are used to scale to the width/height of the screen, and the "init" and "width" values are relative to range. So, to make a window appear on the left half and full height of the screen you'd use Position=0,1,2,0,1,1. For the right half you'd use Position=1,1,2,0,1,1. If Position values are not specified or are not reasonable then defaults are used to split the screen based on the number of views specified.

Launching TNTatlas/W from CD

Your TNTatlas can start automatically from a CD or DVD in Windows if you copy an installed version of TNTatlas for Windows to the CD and create an autorun file. The file must be a plain text file and be named autorun.inf. You also need RUNAPP.EXE, which is provided with your TNTmips installation, along with your data and .atl file.

The contents of your autrun file should be as shown assuming the folder with the copy of your installed TNTatlas/W is called atlaswin.

```
[autorun]
OPEN=RUNAPP.EXE -graphic=splash.bmp -time=5 atlaswin\atlaswin.exe Start.atl
ICON=atlaswin\MI.ICO
```
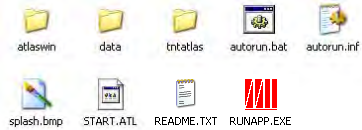
The contents at the root level of the CD should be approximately as shown at the right. The contents of your readme file and whether you include one are up to you. We recommend that you also include a folder with the TNTatlas set up files so the software can be installed for later use. This folder is called tntatlas in the illustration. Installation can be launched by double-clicking on the setup file in the folder. If desired you can include the setup files for both TNTatlas/X and TNTatlas/W. The size of your atlas may determine if you want to include these files—together they are approximately 28 Mb. The splash screen that appears when the CD is inserted to autorun can be anything you like, but must be in .bmp format.

This splash graphic is for an atlas that contains soils information and aerial images of Otoe county with additional specific information about the farm illustrated.
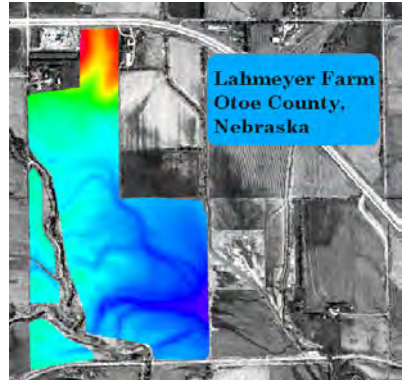
Some CD drives are reluctant to autorun CDs. To get around the problem of finicky drives, you can also include a batch file at the root level of the CD with the contents shown. If your atlas fails to autorun, you can simply double-click on the batch file and your atlas will open.

```
RUNAPP.EXE -graphic=splash.bmp -time=5 atlaswin\atlaswin.exe Start.atl
ICON=atlaswin\MI.ICO
```

Your batch file should contain the information shown above. Be sure it has the extension .bat.

The technique described on this page works only for the Windows platform. TNTatlas/X must be installed before it can be run.

Advanced Software for Geospatial Analysis

MicroImages, Inc. publishes a complete line of professional software for advanced geospatial data visualization, analysis, and publishing. Contact us or visit our web site for detailed product information.

TNTmips TNTmips is a professional system for fully integrated GIS, image analysis, CAD, TIN, desktop cartography, and geospatial database management.

TNTedit TNTedit provides interactive tools to create, georeference, and edit vector, image, CAD, TIN, and relational database project materials in a wide variety of formats.

TNTview TNTview has the same powerful display features as TNTmips and is perfect for those who do not need the technical processing and preparation features of TNTmips.

TNTatlas TNTatlas lets you publish and distribute your spatial project materials on CD-ROM at low cost. TNTatlas CDs can be used on any popular computing platform.

TNTserver TNTserver lets you publish TNTatlases on the Internet or on your intranet. Navigate through geodata atlases with your web browser and the TNTclient Java applet.

TNTlite TNTlite is a free version of TNTmips for students and professionals with small projects. You can download TNTlite from MicroImages' web site, or you can order TNTlite on CD-ROM.

Index

®

MicroImages, Inc.

www.microimages.com