

TOPO! for ArcGIS *Multi-Layer Edition*

User Guide

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1. Welcome to TOPO! for ArcGIS

Thank you for your interest in TOPO! for ArcGIS. Designed for the ArcGIS Enterprise Suite, this extension is compatible with ArcGIS 8.2 and higher, and is the premier topographic data set for the Geography Network.

We hope you find this extension useful as well as easy to use. This User Guide is designed to provide installation instructions, an overview of the extension's key features, and enough information to get you started as quickly as possible. Please contact us for information about other digital map products that we carry. We also appreciate any feedback and suggestions you may have.

About This Product

The Fastest, Most Accurate Way to Add TOPO! Maps, DEMs and Hillshades to Your Projects

TOPO! for ArcGIS is the only topographic map solution that integrates directly with ArcGIS. This extension adds a toolbar to ArcMap that directly accesses raster maps and data from the National Geographic TOPO! State CD-ROMs (sold separately). The toolbar also makes it easy to locate and manage maps and data in your project. With one click, you can select the maps and layer(s) you want and import them into your project as georeferenced data. Layers can be toggled on and off, and transparencies, color ramps, and visible scale ranges can be adjusted separately. Small file sizes make using TOPO! for ArcGIS fast and easy to use!

Designed for ArcGIS, TOPO! for ArcGIS gives you professional-level graphics, using next-generation DEM and topographic hillshade data. It's all you need to ensure that your project is run smoothly, economically and efficiently.

Getting More Help and Finding Out About Upgrades

The best way to find out if there is a more current version of this software available, or to get answers to questions that are not addressed by this User Guide, is to visit us online at www.nationalgeographic.com/topo. You can also contact us by phone, mail, or email.

Please refer to the last page of this guide to find out how to contact National Geographic Maps.

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3. System Requirements

TOPO! for ArcGIS is an extension that adds new functionality to ESRI software for Windows PCs. It works with ArcGIS versions 8.2 and later.

In order to use TOPO! for ArcGIS you must have:

- an IBM PC or equivalent computer
- Windows 95 or higher (ArcGIS currently requires Windows 2000, XP or NT 4.0)
- At least 24 MB RAM
- Color monitor (256 colors or better)
- CD-ROM drive (2x or faster)

Additional Requirements:

- ArcGIS 8.2 or higher
- TOPO! State Series CD-ROMs (sold separately -- visit www.nationalgeographic.com/topo)

4. Installation Instructions

Installing TOPO! for ArcGIS

Use the installer application (setup.exe) to install the extension and other files that TOPO! for ArcGIS requires onto your hard drive. Follow these steps:

1. Insert the TOPO! for ArcGIS CD-ROM
2. Choose the "Run" command from the Start Menu
3. Type "D:\setup.exe" (If your CD-ROM is not drive D: substitute the correct drive letter in place of "D")
4. Click "OK" and follow the instructions on the screen
5. Activate the extension from ArcMap (see instructions below)

NOTE: ArcGIS must already be installed on your PC or you will not be able to complete the installation of this extension.

Activating the TOPO! for ArcGIS Extension in ArcMap

To use this extension and its toolbar, you may need to turn it on. Follow these steps:

1. Launch the ArcMap application
2. Choose **Extensions...** from the **Tools** menu in ArcMap
3. Check the box next to **TOPO! for ArcGIS** and click **OK**
4. Choose the **Toolbars** sub-menu from the **View** menu in ArcMap
5. Check the box next to **TOPO! for ArcGIS** to toggle the Toolbar on

Optional: Loading TOPO! data CD-ROMs onto a local or network drive

If you plan to use this extension frequently, you may want to load one or more of the data CD-ROMs that came with the TOPO! State Series product you purchased onto your hard drive. This will give you faster and easier access to the topographic maps, but is not required - the extension can display data directly from the TOPO! CD-ROMs if you prefer. To copy a CD-ROM to a local or network drive, follow these steps:

1. Decide which TOPO! State Series CD-ROMs you wish to copy to your hard drive. The back of the CD-ROM pack has an index map showing which portions of the state are on each CD.
2. Insert one of the CDs you want to copy into your CD-ROM drive and view its contents.
3. If you have more than one hard drive, decide which one you want to place the data on. You will need approximately 600 MB (i.e. 0.6 GB) of drive space per CD-ROM.
4. Copy the entire directory that is on the CD (named something like "CA_D02") to the root level of your hard drive (i.e. directly to the drive - not into another subdirectory).
5. Repeat steps 2 thru 4 for any other TOPO! data CD-ROMs you want on the hard drive.
6. If you want to make this data available over a network, you will now need to locate this hard drive from each client PC, right-click its icon, and choose **Map Network Drive...**

(NOTE: This requires a Multi-User Network License from National Geographic Maps)

5. Using TOPO! for ArcGIS

Getting Started

To use this extension, you first need to install it and turn it on in ArcMap. See section 4 above for installation instructions.

Once the TOPO! for ArcGIS extension is enabled, you will have access to a new toolbar when you are working with a Data Frame in ArcMap. This toolbar has been designed to make it easy to create a base map that includes separate layers for the topographic map, the hillshade, and the elevation data.

The section on the following page gives a good introduction to this new toolbar. Even if you don't plan to follow along with the step-by-step tutorial, reading through that section may help you to get started with your own project.

About the Maps and Data

The maps on the TOPO! CD-ROMs are stored in a proprietary format called ".tpq" files. They have been created by National Geographic Maps from the most current USGS paper maps and digital elevation data available. True 24-bit color imaging and pixel-accurate georeferencing make these maps ideally suited as background imagery in a wide range of GIS applications.

The TOPO! for ArcGIS extension includes software that allows ArcGIS to treat this .tpq format just like any other raster image format, such as .tif or .jpg. The extension also enables you to access the 3 layers in the .tpq files as separate layers, giving you independent access to the topographic map, the hillshade, and the DEM elevation data.

The DEM information has been compiled from the 1 arc-second USGS NED dataset. This dataset was an improvement on the 30m DEMs, as it corrected numerous problem areas and filled in missing holes of data, while maintaining the same level of detail and accuracy. The hillshade layer was created by National Geographic Maps from this same elevation data.

NOTE: The TOPO! maps and data in the .tpq format are stored unprojected. If the data in your Data Frame is projected, the base maps will be reprojected to the same projection as the first Layer when they are being displayed by ArcMap.

Step-by-Step Tutorial Using Sample Data

1. Creating a set of layers with TOPO! data starts by identifying the right TOPO! CD-ROM. If you want to try the extension with some sample maps and data, leave the CD-ROM you used to install TOPO! for ArcGIS in your drive. If you want to view maps of a particular area, use the index map on the back of the wallet that contains your TOPO! CD-ROMs to determine which CD-ROM to load in your drive.
2. Open the sample file called “Rainier.mxd” in ArcMap. This file is located in a directory called “Tutorial” on the TOPO! for ArcGIS CD-ROM, and contains some sample shape files for Mount Rainier National Park. If you cannot locate the “Rainier.mxd” document, run ArcMap and start a new empty map document instead.
3. Open the ‘TOPO! for ArcGIS’ Toolbar (see section 4 for help).
4. Click on the pull-down menu called “TOPO! for ArcGIS” on this toolbar and choose the item called “New TOPO! 24K Layer...” (or, if you prefer to view USGS 100K maps, choose the item called “New TOPO! 100K Layer...”).
5. If instructed to choose a directory for TOPO! metadata files, choose a location on your hard drive that you would like to use for TOPO! layers, projection information, and any “raster pyramids” that ArcGIS might build for these layers (see ArcGIS documentation to learn more about metadata and/or pyramids). The pyramids are the only files that will consume significant amounts of disk space (roughly 2 MB per 7.5’ map).
6. When asked for a name for this TOPO! Group Layer, just click “OK” to accept the default.
7. You should now be in “Edit Mode” for this TOPO! layer. When in Edit Mode, each TOPO! map that is currently accessible will be represented as a rectangle. Grey rectangles represent maps that are **not** in the TOPO! layer, and red rectangles represent maps that **are** in the layer.

If you do not see any rectangles in the Data Frame window but do have a TOPO! CD-ROM in your drive, try choosing the item called “Zoom to Extent of Available TOPO! Maps” from the ‘TOPO! for ArcGIS’ menu.

8. New layers start out empty, with no maps in them. Try adding a map to the layer by clicking on one of the grey rectangles with the ‘Add Maps’ tool from the ‘TOPO! for ArcGIS’ Toolbar (this tool has an arrow with a + sign next to it).
If the rectangles are very small, you may wish to zoom in closer before choosing a map.
9. The grey rectangle you clicked on should now be red, indicating that this map is now part of your TOPO! layer.
10. Click on the pull-down menu called “Editor” on the toolbar and choose the item called “Stop Editing”.
11. When asked if you want to “Save Edits?”, click “Yes”.
12. The map you toggled on in step 8 should now appear in the Data Frame, with the TOPO! map, hillshade, and DEM appearing on 3 separate layers. Try toggling layers on and off and experimenting with display properties such as “transparency” and “color ramp” (see ArcGIS documentation for help).
13. To add more maps to this layer, or to remove maps from it, click on the pull-down menu called “Editor” on the toolbar and choose the item called “Start Editing” to return to Edit Mode.

Understanding the 'TOPO! for ArcGIS' Toolbar

The previous section gives an overview of the steps necessary to create a TOPO! layer in ArcMap. This section describes the function of each menu item and button on the “TOPO! for ArcGIS” toolbar.

Items on the pull-down menu called “TOPO! for ArcGIS”:

1. “New TOPO! 24K Layer...”

Choose this item to create a new group layer of TOPO! data using the most detailed USGS 7.5’ maps (1:24,000 scale). Before choosing this, insert the TOPO! CD-ROM for the area of interest in your CD drive (or, load one or more CD data folders on your hard drive – see section 4 for more details). You will be asked to name this group layer, and then you will be put into “Edit Mode” (see the item below called “Start Editing...”).

2. “New TOPO! 100K Layer...”

Choose this item to create a new group layer of TOPO! data using less detailed USGS maps (1:100,000 scale). Before choosing this, insert the TOPO! CD-ROM for the area of interest in your CD drive (or, load one or more CD data folders on your hard drive – see section 4 for more details). You will be asked to name this group layer, and then you will be put into “Edit Mode” (see the item below called “Start Editing...”).

3. “Zoom to Extent of Available TOPO! Maps”

This item is only accessible when you are in Edit Mode for a layer (see the item below called “Start Editing...”). When you choose it, the data frame will be zoomed so that you can see the rectangular outlines of all TOPO! maps that are either in the layer or available to be added.

4. “Set Local Directory for TOPO! Metadata Files...”

Click this item to specify the location on your hard drive that you would like to use for TOPO! layers, projection information, and any “raster pyramids” that ArcGIS might build for these layers (see ArcGIS documentation to learn more about metadata and/or pyramids). The pyramids are the only files that will consume significant amounts of disk space (roughly 2 MB per 7.5’ map). NOTE: Changing this setting does not move existing TOPO! metadata files, but only changes the default location for new TOPO! layers that you create in the future.

5. “Copy All Maps for this Layer to a Local Directory”

If you have added maps to a layer from a TOPO! CD-ROM, you can use this option to copy those maps to your hard drive. This is useful if you want to have all the maps and data stored locally, without requiring the CD-ROM in the future. Once maps are copied in this manner, they will be accessed from this local directory, not only for this particular layer, but also for all new layers you create that use these maps.

6. “Help...”

Choose this item to open this User Guide.

(continued)

Items on the pull-down menu called “Editor”:

1. “Start Editing”

Choose this item to add more TOPO! maps to an existing layer (or to remove maps). First, specify which layer you wish to edit by selecting it from the “Layer” pull-down list on the toolbar. Then, choose “Start Editing” to enter “Edit Mode”. The extension will search for TOPO! data on your CD-ROM drives and/or hard drives. Once it has found all available data, it will display them using rectangular outlines. Grey rectangles represent maps that are **not** in the TOPO! layer, and red rectangles represent maps that **are** in the layer. Use the ‘Add Maps’ tool and ‘Remove Maps’ tool to toggle maps in or out of the layer (see descriptions of these below), then choose “Stop Editing” from the “Editor” menu to return to the normal display of maps.

2. “Stop Editing”

Choose this item to return to the normal display of maps once you are done editing. You will be asked whether you wish to “Save Edits?”. Choose “Yes” to proceed with any changes you have made to this TOPO! layer, or choose “No” if you wish to exit without saving these changes. Choose “Cancel” to continue editing.

The “Layer” pull-down list:

This lists the names of all TOPO! Group Layers you have created in this Data Frame. Choose a layer from this list before you click on “Start Editing”.

The ‘Add Maps’ tool:

This tool is only available when you are in Edit Mode for a TOPO! layer (see the item above called “Start Editing...”). With this tool, click on a grey rectangle that represents a TOPO! map that is **not** currently in this layer, and it will be added to the layer (and now displayed in red). To add multiple maps at once with this tool, hold the mouse button down while you drag a rectangle the encompasses them all, then release the mouse.

The ‘Remove Maps’ tool:

This tool is only available when you are in Edit Mode for a TOPO! layer (see the item above called “Start Editing...”). With this tool, click on a red rectangle that represents a TOPO! map that **is** currently in this layer, and it will be removed from the layer (and now displayed in grey). To remove multiple maps at once with this tool, hold the mouse button down while you drag a rectangle the encompasses them all, then release the mouse.

TIP: You can switch to other ArcGIS tools while editing a TOPO! layer. For example, you may wish to use the Pan and Zoom tools to navigate around the map before you stop editing.

6. Contacting National Geographic Maps

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By Email: topo@ngs.org

By Phone: (800) 962-1643

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