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User Guide
Topo TNM Style Template
Last Update: May 2022

A GIS-ready topographic map style template is available from the U.S. Geological Survey (USGS) National Geospatial Program (NGP). The "Topo TNM Style Template" can be readily used with the Topo Map Vector Data products and other data available for download from The National Map (TNM). The template and TNM data are intended to be used together to quickly provide an advanced Geographic Information Systems (GIS) user with a fully customizable map in the style of US Topo maps using the most current TNM data available. This guide explains how to tailor the template to a specific 7.5-minute map cell.

The Topo TNM Style Template has been developed according to the 24,000-scale, 7.5-minute layout and cartographic design of published US Topo maps and is intended for use in any geographic location where data is available for download from TNM. The template is provided as an Esri-specific solution (ArcGIS v10.8 ArcMap Document) for the benefit of USGS earth scientists and other science professionals who have a requirement for symbolized and annotated topographic base map layers to support advanced GIS analysis and mapping. Symbolized map layers, links to Web Map Services, labeling rules, grids, standard map layout, and marginalia information are included in the template. The USGS recognizes that this solution only meets the needs of end users dependent upon Esri products. Research continues into alternative formats.

U.S. Department of the Interior
U.S. Geological Survey

Quickstart

Prerequisites

1. A computer with a recent Windows operating system, Esri® ArcGIS® v10.8 (or more recent), ArcMap®, and ArcCatalog® software.
2. Internet access (to download the template and data).

Download Data and Topo TNM Style Template

1. Go to The National Map (TNM) Download Client at TNM Download v2 (nationalmap.gov).
2. Check the box for Topo Map Data and Topo Stylesheet.
    a. To search for and download data:
        i. Pan and zoom to an area of interest in the Map Locator.
        ii. Click on the "Find Products" button and a list of Topo Map Vector Data products will be provided.
        iii. Click on the Download link next to the desired product and a ZIP (.zip) file containing the dataset will be automatically downloaded.
    b. To download the template:
        i. Click on the "Stylesheet Zip" link noted in the template thumbnail next to the Topo Map Data products in the TNM Download Client.
        ii. Alternatively, click on the Thumbnail Description, which will open the web page for the template (Topo TNM Style Template (nationalmap.gov)).
            1. Click on the link for the "Zip file" containing the template, tailoring data, and tailoring instructions. A ZIP file will be automatically downloaded.
    c. Hydrography, Structures, Transportation, and Woodland Tint may be used in place of the Topo Map Vector Data products if larger data download footprints are desired.
3. Unzip the ZIP files for the Topo Map Vector Data and the Template, ideally collocated into a single folder.

Tailoring the Template

1. Open the Topo TNM Style Template (TopoTNMStyleTemplate_v10.8.mxd) using ArcMap.
2. Connect Map Layers in the template with appropriate data sources in the Topo Map Vector Data product(s) or other TNM data that was downloaded.
3. Identify the 7.5-minute extent-specific map configuration details using the MapDetails table provided in the ancillary file geodatabase "MGRS_and_Table.gdb" provided with the template.
    a. Apply the 7.5-minute extent map configuration details to the template for the US National Grid, Grid Zone Designation, and Map Layers data frames.
        i. Set the Projection Property.
        ii. Set the Map Rotation Property (Map Layers data frame only).
        iii. Set the Data Frame Size Properties (Map Layers data frame only).
4. Pan the data frame to the 7.5-minute extent using the Map Indices data that was downloaded and reset the scale to 1:24,000 as needed.
5. Update the Marginalia Text.
    a. Update the Map Title.
    b. Update the Contour Interval using the information in the contour data that was downloaded.
    c. Identify and update Citation Dates and other marginalia text as needed.

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Topo TNM Style Template Users Guide

Prerequisites

Internet access is required to download the template and any associated TNM data; broadband access is highly recommended.

This guide is written primarily for Microsoft® operating systems; examples are from Windows 7, although other Windows versions will be similar. Because the template is currently provided only in an Esri ArcGIS compatible format, users should refer to the Esri website for information on supported platforms (*ArcGIS Desktop 10.8.x system requirements—ArcMap | Documentation*).

This guide is written with examples from Esri ArcGIS Desktop version 10.8, although other version 10.x installations of ArcGIS Desktop will be similar.

This document was revised in May 2022. Details of the instructions may vary between software versions. Staying current with software releases is recommended.

Download Data and Topo TNM Style Template

The template and associated TNM data are available free of charge from TNM Download Client (TNM Download v2 (nationalmap.gov) and from the Topo TNM Style Template website (Topo TNM Style Template (nationalmap.gov)).

The Topo TNM Style Template may be used with any TNM data source available from the TNM Download Client and can easily be extended with data layers supported by ArcGIS according to end-user needs. For best results in symbolization and labeling, it is recommended to be used with the Topo Map Vector Data products.

The Topo Map Vector Data products are one specific type of staged product intended for a variety of GIS and cartographic applications. These products are staged at a 7.5-minute footprint that corresponds with a single US Topo Map extent. They contain data from all TNM vector data themes, including Elevation Contours, Government Units (Boundaries), Woodland Tint polygons, Structures, Transportation, Hydrography, TNM Derived Names, and 7.5-minute map cells.

The National Map (TNM) Derived Names dataset is a multi-point feature class derived from the Geographic Names Information System (GNIS). The GNIS is the official repository of domestic geographic names data; the official vehicle for geographic names used by all departments of the Federal Government; and the source for applying geographic names to Federal electronic and printed products of all types. See U.S. Board on Geographic Names | U.S. Geological Survey (usgs.gov) for additional information. TNM Derived Names is a filtered and enriched dataset intended specifically to be used for labeling named features. TNM Derived Names data are provided only in conjunction with Topo Map Vector Data products.

Download Data

1. Go to The National Map (TNM) Download Client web page at TNM Download v2 (nationalmap.gov).
2. Check the box for Topo Map Data and Topo Stylesheet, or for any individual data theme as applicable.
3. Pan and zoom to an area of interest in the Map Locator.
4. Select a desired File Format, and Data Extent, as applicable.
5. Click on the “Search Products” button and a list of products that are available for the selected area of interest, File Formats and Data Extents will be provided.
6. Click on the Download link next to the desired product and a file containing the dataset will be

automatically downloaded. The data is delivered in a compressed ZIP file (.zip).

7. Detailed Help for finding and downloading data products can be found by clicking on the "Help" link in the top navigation bar, denoted in Figure 1.

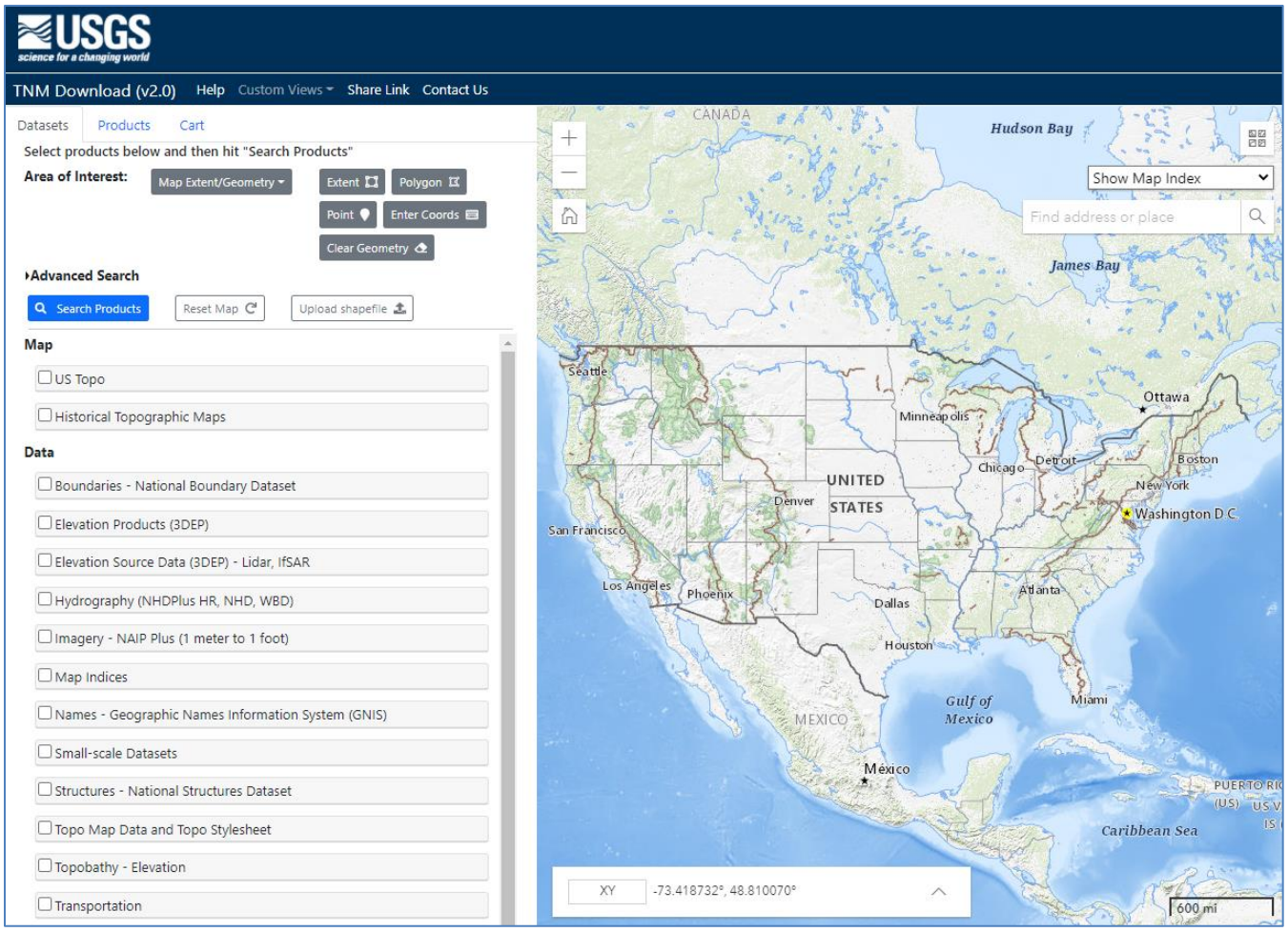


Figure 1: TNM Download Client: Arrow points to the "How to" link for more detailed instructions.

Download the Topo TNM Style Template

1. Go to The National Map (TNM) Download Client web page at TNM Download v2 (nationalmap.gov).
    a. Alternatively, go directly to the Topo TNM Style Template web page.
2. Within TNM Download Client web page, check the box for Topo Map Data and Topo Stylesheet (Figure 2).

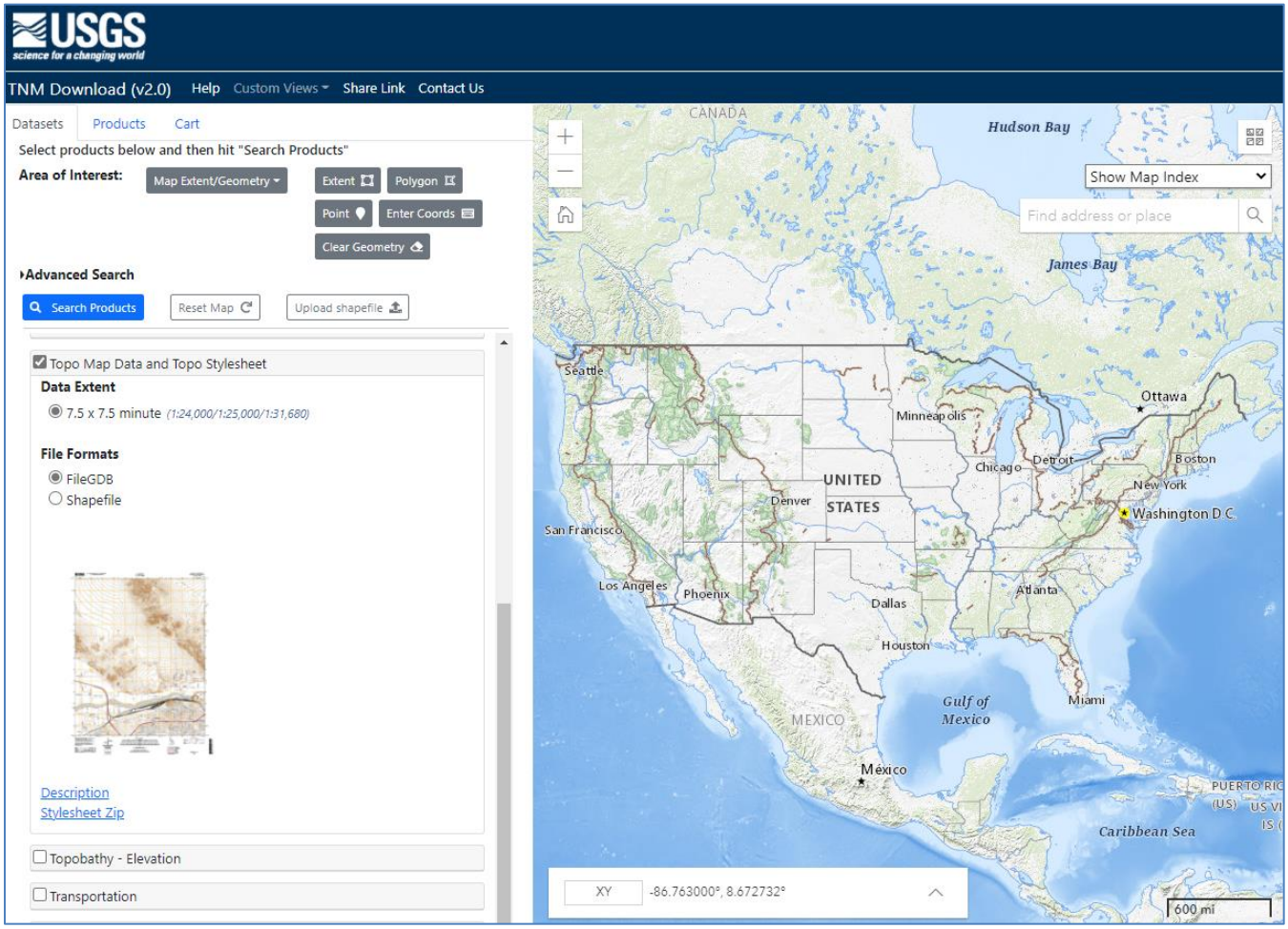


Figure 2: TNM Download Client: Check the box next to "Topo Map Data and Topo Stylesheet".

Unzip

Zip and unzip functions are built into Windows 7 and later. A favorite third-party compression utility can be used to unzip and extract files. Please follow their instructions on how to properly unzip and extract files.

More information about using compressed ZIP files in the Windows environment can be found in Windows help. Additional information about the .zip file format is available at ZIP (file format) - Wikipedia. The data and the Topo TNM Style Template files downloaded will all need to be unzipped.

Topo TNM Style Template ZIP File Contents

The Topo TNM Style Template ZIP file (Figure 3) contains an Esri ArcMap document (TopoTNMStyleTemplate_v_10_8.mxd) that is used to configure a 7.5-minute extent's worth of TNM data to a US Topo-like layout. An Esri File Geodatabase (MGRS_and_Table.gdb) is also included that contains an mgrs_region feature class used for several map marginal elements and a MapDetails table that contains US Topo 7.5-minute extent-specific information for customizing the template. Lastly, this instructional document (Topo TNM Style Template Tailoring Instructions.pdf) is included to assist in customizing the Topo TNM Style Template to a 7.5-minute extent. The instruction document is intended to be used in a digital format to preserve hyperlinked content. Remember that to use the template, the contents of the ZIP file need to be extracted.

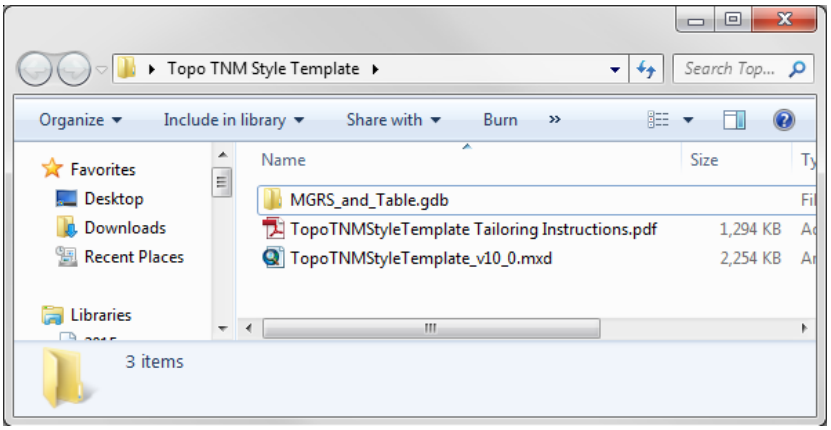


Figure 3: Extracted contents of the Topo TNM Style Template ZIP file.

Overview of the Template Contents and Organization

The Map Frame of a fully configured Topo TNM Style Template is shown in Figure 4. Before starting to configure the template, it is important to understand how the template MXD file is organized. As seen in Figure 4, the map marginalia includes five data frames. All the data frames are linked together and are driven by the area displayed in the Map Layers data frame. The purposes of the data frames are:

1. Quadrangle Location data frame shows the extent of the Map Layers data frame within a State or Territory.
2. Adjoining Quadrangles data frame shows the names of the eight surrounding 7.5-minute cell extents.
3. US National Grid data frame shows the 100,000-meter Military Grid Reference System region. This data comes from the MGRS_and_Table file geodatabase packaged with the Topo TNM Style Template.
4. Grid Zone Designation data frame shows the Universal Transverse Mercator (UTM) projection grid value of the current map display. This data comes from the MGRS_and_Table file geodatabase packaged with the Topo TNM Style Template.
5. Map Layers data frame shows TNM data stylized to US Topo specifications. This data comes from TNM data downloaded from TNM Download Client. It is suggested that a Topo Map Vector Data product be used to simplify the setup process, but any TNM data can be used with the template.

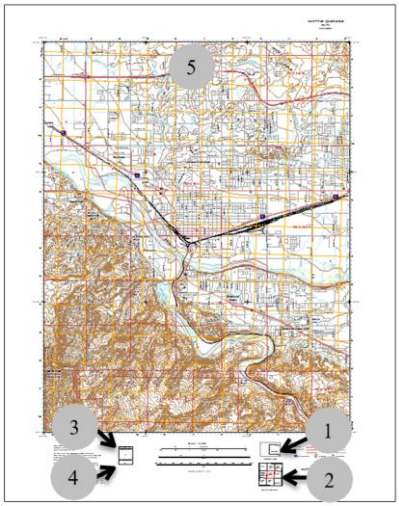


Figure 4: Data Frames included in the Topo TNM Style Template

The Map Layers data frame shows the main content of the map, including US Topo-like symbology and

labeling. The Map Layers data frame is broken into two Group Layers, "Features" and "Images" (Figure 5, page 9). The Images Group Layer contains web map services (Table 1). The wetlands service is provided by the U.S. Fish and Wildlife Service (USFWS) while the imagery and shaded relief services are from TNM Services (Services (nationalmap.gov)). The wetlands service contains a cartographic representation of National Wetland Inventory (NWI) freshwater emergent and forested/shrub wetlands that mimic the historic USGS symbols. Note that NWI data may not integrate perfectly with the USGS hydrographic data. The Imagery – 1-meter (plus) services is a dynamic web service that hosts the best available National Agriculture Imagery Program (NAIP) orthoimagery. The USGS Imagery Only web service is a cached service that uses NAIP imagery at large scales and changes imagery sources as scale decreases. The Shaded Relief web service provides a hill-shade representation of 10-meter 3D Elevation Program (3DEP) data.

Services included in the Topo TNM Style Template and appropriate scales-of-use for each.

- WetlandsTopoService
  - Recommended Scale: Larger than 1:100,000
  - URL: WetlandsTopo/WetlandsTopoService (MapServer) (fws.gov)
- USGS Shaded Relief – Primary Tile Cache (Tiled)
  - Recommended Scale: Smaller than 1:18,000
  - URL: USGSShadedReliefOnly (MapServer) (nationalmap.gov)
- Imagery – 1 meter (plus)
  - Recommended Scale: Larger than 1:18,000
  - URL: USGSNAIPPlus (MapServer) (nationalmap.gov)
- USGSImageryOnlyBaseMap (Tiled)
  - Rcommended Scale: Smaller than 1:18,000
  - URL: USGSImageryOnly (MapServer) (nationalmap.gov)

The Features Group Layer contains all the vector data for the map that must be obtained separately from the Topo TNM Style Template download package. It is recommended to use the *Topo Map Vector Data product* with the TNM Style Template as this is the sourcing structure used throughout the template. However, any TNM data can be connected to these layers. Note that when connecting a Topo TNM Style Template to a Topo Map Vector Data product, some data layers may remain broken (e.g.,, Airport Runway). This is normal as feature classes are only included in the Topo Map Vector Data product if data exists within the 7.5-minute extent. Also note that the TNM Derived Names are only distributed within the Topo Map Vector Data products. This is a filtered and enriched, multi-point version of the GNIS points to support improved labeling results in US Topo maps. Downloaded GNIS data can be substituted for the TNM Derived Names, though labeling placement and hierarchy of this layer will not be the same quality as seen in US Topo maps.

The Topo TNM Style Template has all the Group Layers (e.g.,, Features, Boundaries, Transportation, Roads, etc.) expanded to show all the layers, but hides the symbology of the layers to conserve space. In the US Topo maps, Bureau of Land Management and Native American Lands boundaries are only shown in some areas of Alaska. The data for the NWI Wetlands w/ US Topo Symbology layer is intended to be connected to NWI vector data and contains the current US Topo symbology for freshwater emergent and forested/scrub wetlands. However, NWI data is not distributed through TNM. It is recommended that the Wetlands Topo Service be used in its place, though NWI data can be obtained directly from the USFWS (National Wetlands Inventory | U.S. Fish & Wildlife Service (fws.gov)) and connected to the Topo TNM Style Template.

Topo TNM Style Template Users Guide

Tailoring Instructions

The following sections provide a step-by-step tutorial on configuring the Topo TNM Style Template to one of the 65,000 7.5-minute extents used in US Topo map production. These instructions do not discuss how to configure the directory structure to use the Topo TNM Style Template. This is because any TNM data used with the Topo TNM Style Template can result in a wide range of file structures as well as personal storage location preferences.

The following breaks the configuration into seven major tasks. First, data sources will be connected in the Topo TNM Style Template. A Topo Map Vector Data product will be used in the example. It has been downloaded and extracted to the same file folder as the Topo TNM Style Template. Second, the specific 7.5-minute map extent configuration details will be identified. This uses a table provided alongside the Topo TNM Style Template that contains information on all the 7.5-minute extents and the required projection and page information. Third, the projection property will be applied to appropriate data frames within the Topo TNM Style Template. Fourth and fifth, the map rotation and data frame size properties will be applied to the Map Layers data frame. Sixth, the map data will be centered and scaled within the Map Layers data frame once the data frame parameters are set properly. Last, map marginalia will be set up, including map titles, contour intervals, and citation dates.

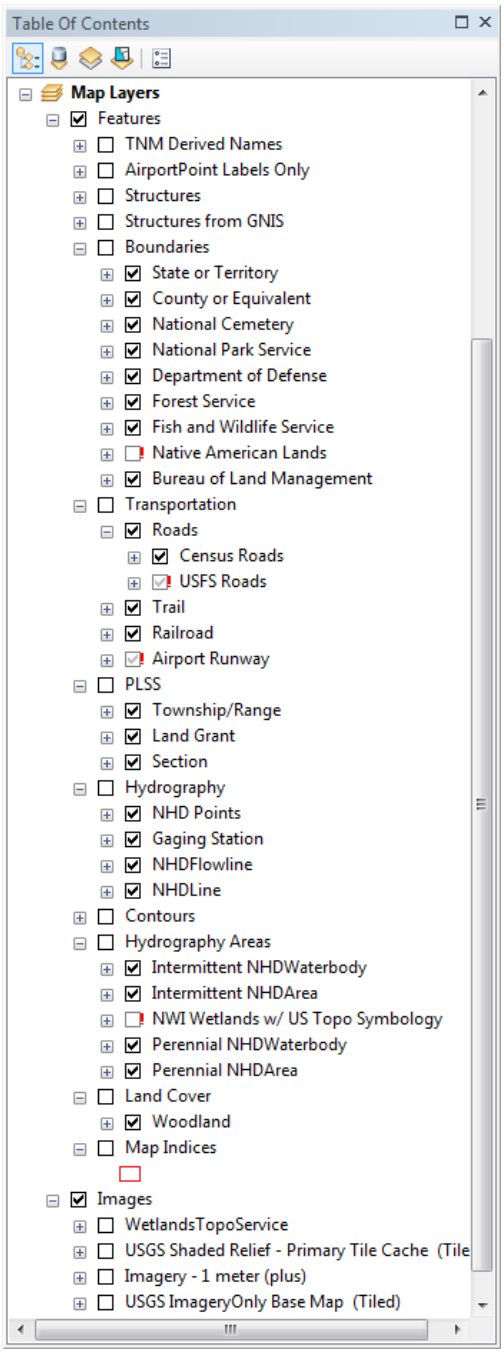


Figure 5: Map Layers Data Frame Table of Contents

Task 1: Connect Map Layer Data with Appropriate Data Sources

When opening the template for the first time, map layers will not be linked to the downloaded data. The first task in tailoring the template is to connect these layers.

1. Open the template (TopoTNMStyleTemplate_v10_8.mxd) with ArcMap version 10.0 or newer.
2. Investigate the layers in the template to determine what layers in the Table of Contents link to which feature classes in the data.
    a. Open the Source Tab (Figure 6) of the State Outline layer, located in the Quadrangle Location data frame to understand its intended data source.
        i. **Tip:** To open the Source Tab, right click on the Layer Name (e.g.,, State Outline) in the Table of Contents (Figure 5), select Properties. When the Layer Properties window opens, click on the Source tab.

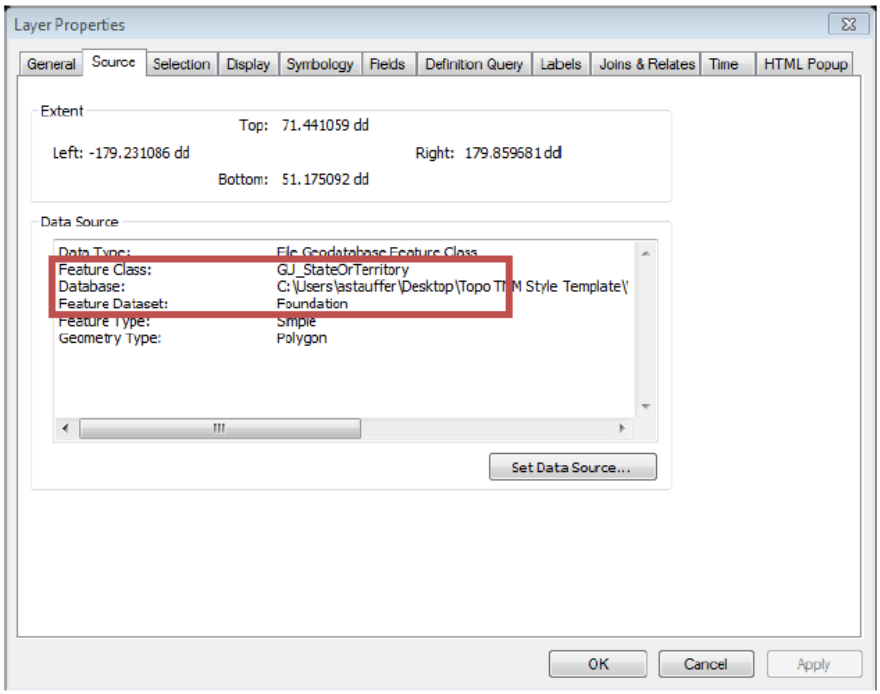
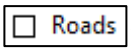


Figure 6: The State Outline layer references the GU_StateOrTerritory feature class within the Foundation Data Set of the Topo Map Vector Data product.

3. Reconnect all the broken data layers (e.g.,, 

) in the Table of Contents.
    a. Left click on the red exclamation point  next to a layer in the Table of Contents.
    b. When the Set Data Source Window opens, navigate to the file location-with the unzipped downloaded data and select the appropriate feature class.
        i. For example, the State Outline layer in the Table of Contents references the GU_StateOrTerritory feature class contained in the data as noted in Figure 6.
4. Save the map by left clicking on the File menu and selecting "Save As". When the Save As menu opens, navigate to the file location, and click on Save.

    Tip: It is recommended to frequently save the map to prevent a loss of work through the following exercises.

Task 2: Identify and Fix Possible Schema Change Errors

This document is organized to reflect the current US Topo layout and layer management. Overtime schemas are changed which could cause some drawing (Figure 7), symbology (Figure 8), or labeling errors. These errors could emerge when using TopoMapVector data that is older than the mxd template. Layer definition queries, SQL sequences, and the layer symbology tab can provide possible locations for these errors.

Data Does Not Draw or Draws Incomplete

1. Expand each layer for each drawing error.
    a. Examine the symbology rules and SQL statements.
    b. Syntax for those datasets may have changed since this data was published to The National Map (TNM).
2. Open the Attribute Table for each dataset that has an error.
    a. Explore the data fields and modify the SQL statement to reflect how the dataset is being used.

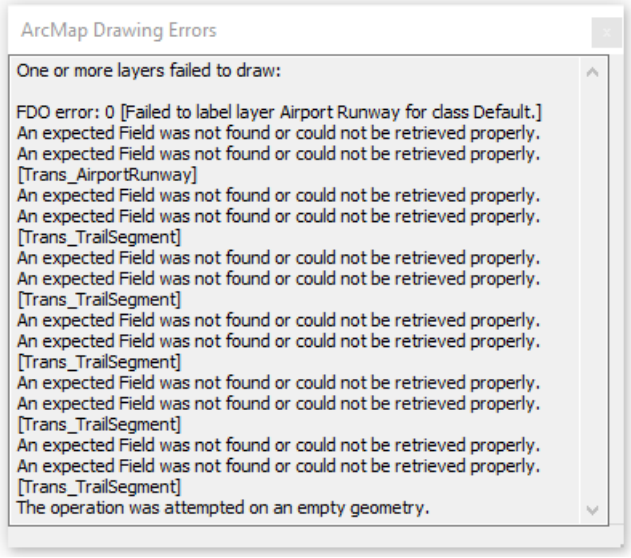


Figure 7: Displaying drawing errors due to changes with schema or SQL statements.

Symbology Removed After Sourced to Data

1. Expand each layer.
2. Left click the plus sign next to the layer in the Table of Contents.
    a. If the symbology is different than what is expected, this could be caused by schema changes.
    b. The field that is used for symbology could have been added after this dataset was published to The National Map (TNM). When this occurs, ArcMap will revert to a simple symbology for the layer.

        Tip: To use US Topo symbol, but symbology is removed once the layer is sourced, save the symbol prior to sourcing it. Open the Symbol Selector window by clicking the symbol in the Table of Contents pane and click "Save As". This will save the symbol to a style file and then used to replace the simple symbology.
3. Open the Attribute Table for each dataset that has an error and modify SQL statement as needed.

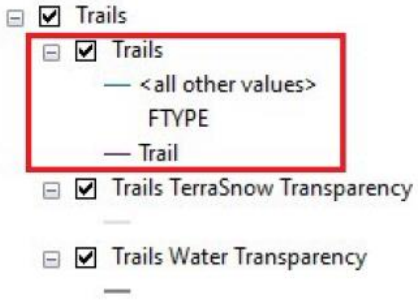


Figure 8: Displaying simple symbology instead of US Topo symbology.

Task 3: Identify the 7.5-Minute Extent-Specific Map Configuration Details

In addition to connecting the template layers to the data, it's necessary to set the Data Frames in the template to the appropriate UTM zone, map rotation angle, and frame width and height for the Area of Interest (AOI) specific to the downloaded data. These mapping factors vary from north to south and from east to west according to the AOI of the downloaded data. The MapDetails table within the MGRS_and_Table file geodatabase packaged with the Topo TNM Style Template contains the required information for tailoring the template.

1. Open the Attribute Table of the Map Indices layer in the Map Layers Data Frame.
    Tip: Open the attribute table by right clicking on the Layer Name (e.g.,, Map Indices) and selecting "Open Attribute Table".

2. Locate the 7.5-minute extent of interest in the Attribute Table (Figure 9).

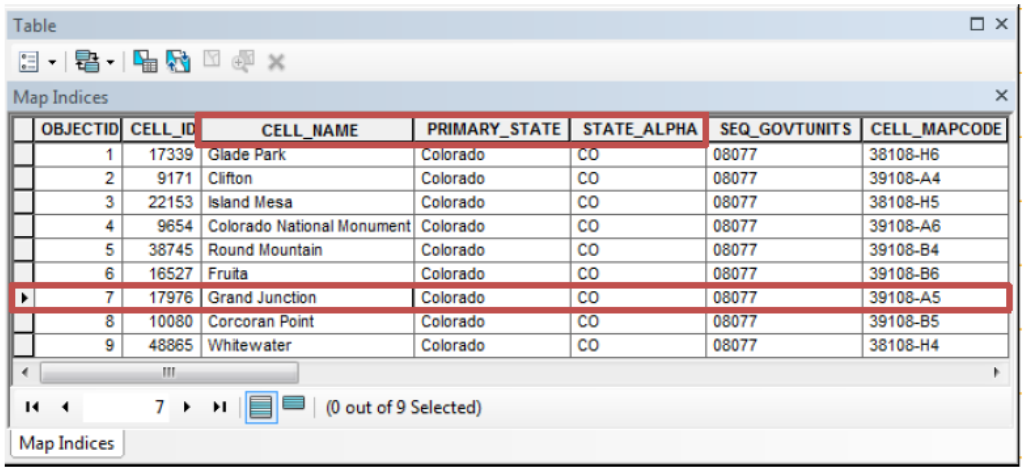


Figure 9: Attribute Table for Map Indices from the Grand Junction, CO, Topo Map Vector Data Product.

3. Write down the CELL_ID, CELL_NAME, and PRIMARY_STATE of the 7.5-minute extent, as this information will be needed in the steps that follow.
    a. The CELL_ID field references the unique identifier of each 7.5-minute extent.
    b. The CELL_NAME references the authoritative US Topo map name of each 7.5-minute extent. This is only unique when combined with the PRIMARY_STATE field.
4. Change the Table of Contents view to List By Source  at the top of the Table of Contents.
5. Open the MapDetails table within the Table of Contents (Figure 10).

    Tip: To do this, right click on the table name (e.g.,, MapDetails) and select Open.

    Note: The MapDetails table comes from the MGRS_and_Table file geodatabase packaged with the Topo TNM Style Template.

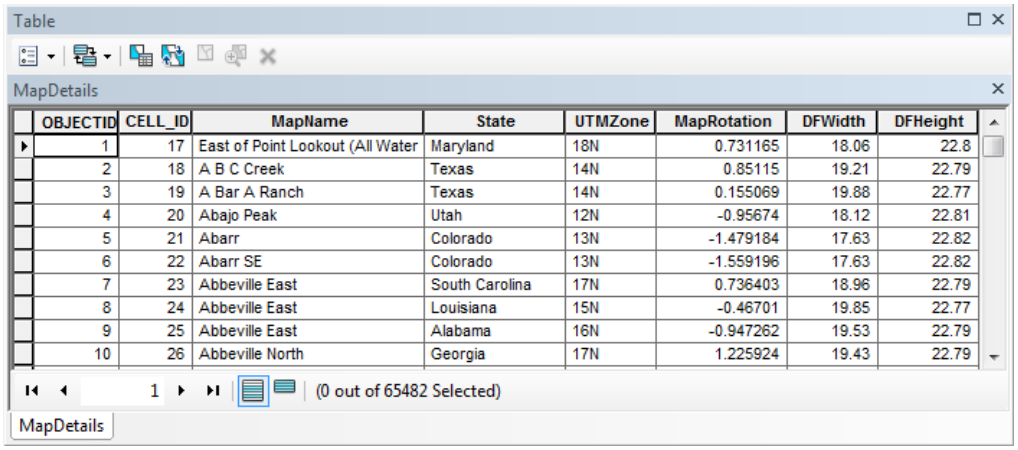


Figure 10: MapDetails Attribute Table, containing all 7.5-minute extent specifications.

6. Find the 7.5-minute extent of interest by using the Select By Attribute  tool (Figure 11).

    Example: Use the CELL_ID, taken from the Map Indices Attribute Table to query the desired cell.

- CELL_ID = 17976

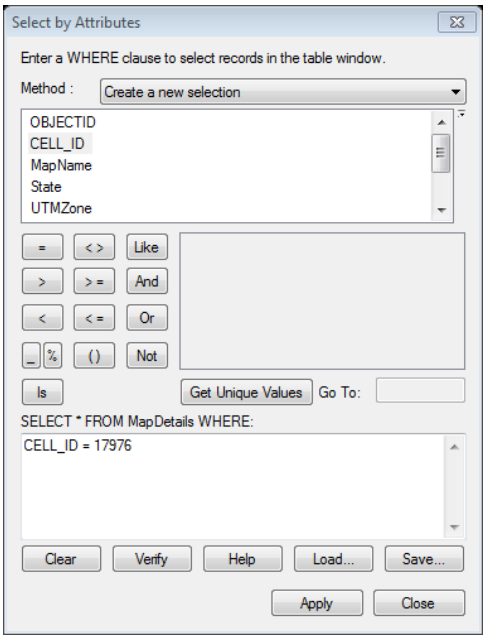


Figure 11: Build an SQL query to identify the 7.5-minute extent of interest.

Tip: After entering the query and clicking Apply, use the Show Selected Records button at the bottom of the attribute table to quickly see the results of the query (Figure 12).

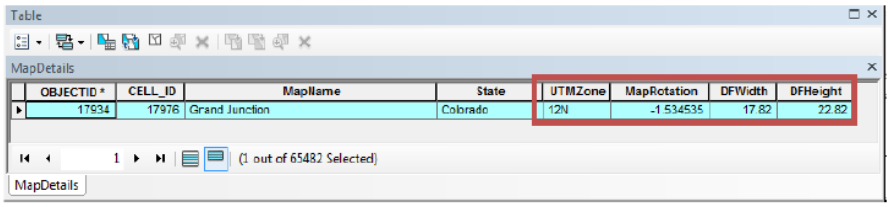


Figure 12: Review and Write Down the UTMZone, MapRotation, DFWidth, and DFHeight

7. Write down the UTMZone, MapRotation, DFWidth, and DFHeight values for the desired 7.5-minute extent as this information will be needed in the steps that follow.
    a. The UTMZone field defines the appropriate UTM projection of the 7.5-minute extent.
    b. The MapRotation field defines the rotation (in degrees) for the 7.5-minute extent to be square with the page when using the appropriate UTM projection.
    c. The DFWidth field defines the width (in inches) of the Map Layers Data Frame when the map is projected and rotated based on the previous attributes.
    d. The DFHeight field defines the height (in inches) of the Map Layers Data Frame when the map is projected and rotated based on the previous attributes.

Task 4: Set the Projection Property

The information written down in the previous step (UTMZone) will be used in Task 3 to set the projection in three of the five data frames contained in the Topo TNM Style Template. The US National Grid, Grid Zone Designation, and Map Layers Data Frames must be set to the appropriate UTMZone for the Topo Map Vector

Data 7.5-minute cell that is being used with the template for the data in each of these frames to display appropriately. This mapping factor varies from north to south and from east to west according to the AOI of the downloaded data. Note that Quadrangle Location and Adjoining Quadrangle Data Frames should remain in the template's default WGS84 Geographic Coordinate System.

1. At the top of the Table of Contents, change the view back to List by Drawing Order  .
2. Open the US National Grid Data Frame Properties (Figure 13).

   Tip: Do this by Right Clicking on the Data Frame Name (e.g.,, US National Grid) in the Table of Contents and selecting Properties. Note that ArcMap warnings about differing coordinate systems are normal; click 'Yes' to close the warning box.

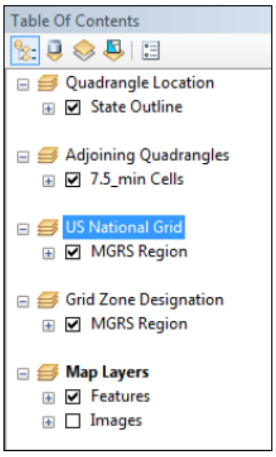


Figure 13: Set the projection properties for the National Grid Fata Frame

3. Select the Coordinate System Tab.
4. Select the NAD 1983 UTM Projection written down in step 7 from Task 2 and click "OK" (Figure 14).

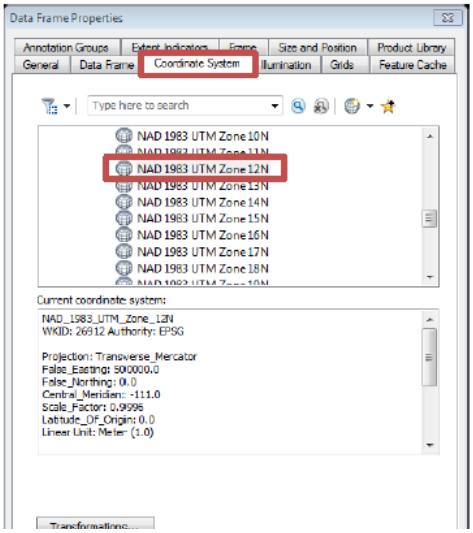


Figure 14: Coordinate System Properties for the US National Grid Data Frame

5. Repeat steps 2 through 4 for the Grid Zone Designation Data Frame (Figure 15)

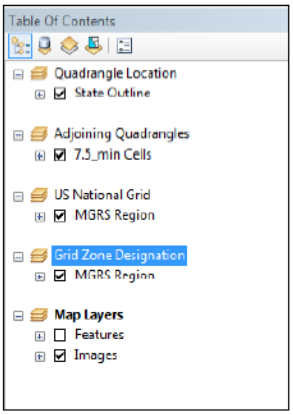


Figure 15: Set the projection properties for the Grid Zone Designation data frame

6. Repeat steps 2 through 4 for the Map Layers Data Frame. Leave this Data Frame Properties menu open by clicking on "Apply" rather than "OK". Task 5 and Task 6 will continue to update the Map Layers Data Frame properties.

Task 5: Set the Map Rotation Property

The information written down in Task 2, step 7 (MapRotation) will be used in Task 5 to set the map rotation angle in the Map Layers Data Frame. This must be accomplished so that the specific Topo Map Vector Data 7.5-minute cell that is being used with the template will display appropriately in conjunction with the UTM zone. This mapping factor varies from north to south and from east to west according to the AOI of the downloaded data.

1. The Map Layers Data Frame properties menu should still be open from the previous step. If not, then re-open the menu.
   Tip: Do this by Right Clicking on the Data Frame Name (e.g.,, Map Layers) in the Table of Contents and selecting Properties.
2. Select the General Tab in the Map Layers Data Frame.
3. Enter the MapRotation value found in the MapDetails table (documented in step 7 from Task 3) into the "Rotation" text box and click "Apply" to leave the Data Frame Properties menu open (Figure 16).

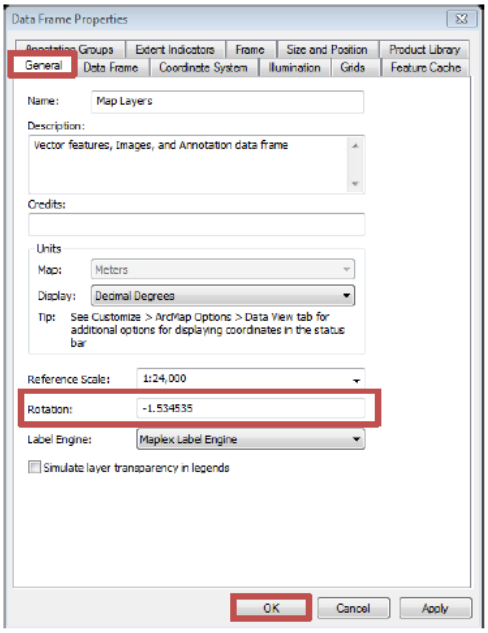


Figure 16: General Properties for the Map Layers Data Frame.

Task 6: Set the Data Frame Size Properties

The information written down in Task 2, step 7 (DFWidth and DFHeight) will be used in Task 6 to set the data frame size properties in the Map Layers Data Frame. This must be accomplished so that the specific Topo Map Vector Data 7.5-minute cell that is being used with the template will display appropriately in conjunction with the UTM zone. These mapping factors vary from north to south and from east to west according to the AOI of the downloaded data.

1. The Map Layers Data Frame properties menu should still be open from the previous step. If not, then re-open the menu.

   Tip: Do this by right clicking on the Data Frame Name (e.g.,, Map Layers) in the Table of Contents and selecting Properties.
2. Select the Size and Position Tab.
3. Enter the DFWidth value found in the MapDetails table (documented in Task 3, step 7) into the “Width” text box.
4. Enter the DFHeight value found in the MapDetails table (documented in Task 3, step 7) into the

"Height" text box and click "OK" to close the Data Frame Properties dialog (Figure 17).

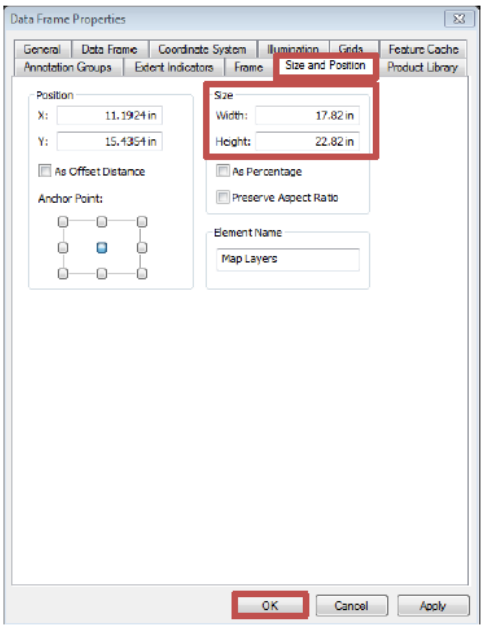


Figure 17: Size and Position Properties of the Map Layers Data Frame

5. Ensure the Map Scale is set to 1:24,000 in the Standard Toolbar (Figure 18), because the map scale changes when the data frame size is adjusted.

   Warning: The representative fraction in the Standard Toolbar shows the current scale for the active data frame. Ensure the Map Layers data frame is active by right clicking on the data frame name in the Table of Contents and selecting Activate.

   Tip: Don't forget to save!

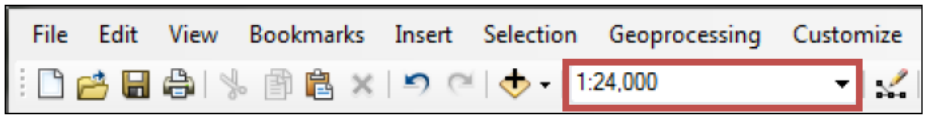


Figure 18: Map Representative Fraction Scale on the Standard Extent Toolbar.

Task 7: Pan to the 7.5-minute Extent in the Map

After completing the tasks to tailor the template to the appropriate UTM zone, rotation angle, and data frame size, pan the Map Layers Data Frame to the AOI according to the Topo Map Vector Data 7.5-minute cell that was downloaded.

1. Open the Attribute Table of the Map Indices layer in the Map Layers Data Frame.

   Tip: Open the attribute table by right clicking on the Layer Name (e.g., Map Indices) and selecting "Open Attribute Table".
2. Locate the 7.5-minute extent of interest in the Attribute Table.

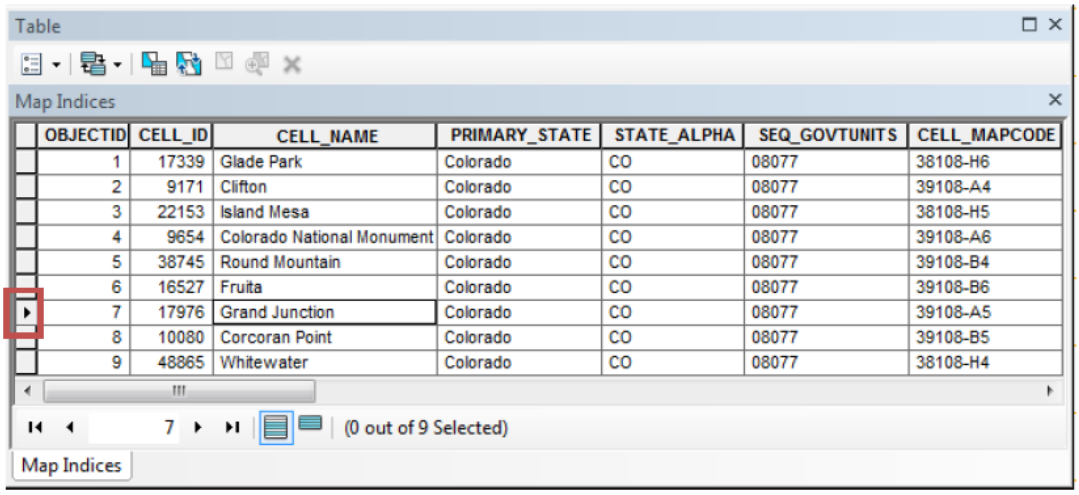


Figure 19: Attribute table of the Map Indices Layer

3. Right click the gray square to the left of the 7.5-minute extent and select "Pan To" (Figure 19).
4. Turn the data layers on (check the boxes in the Table of Contents) to ensure that data is displayed and labeled (Figure 20).

   Tip: Turn the data layers back off prior to proceeding with the instructions. This will improve performance while completing the next task.

   Tip: Don't forget to save!

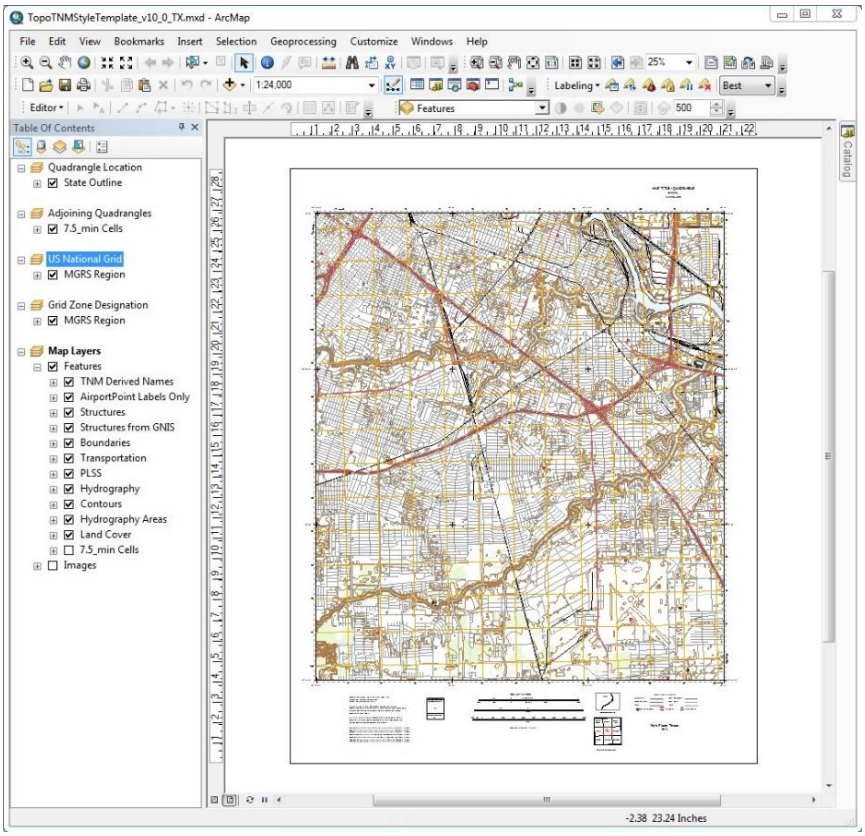


Figure 20: View of the template data layers turned on after setting projection, map rotation, and data frame properties.

Task 8: Update the Marginalia Text

Marginalia components are a standard part of map construction. Components can be added to what is already available in the template or remove components according to a specific project.

1. The first item to edit is the Map Title block in the upper right portion of the map. Use the Zoom In tool on the Layout Toolbar to zoom into the top-right portion of the map layout (Figure 21).

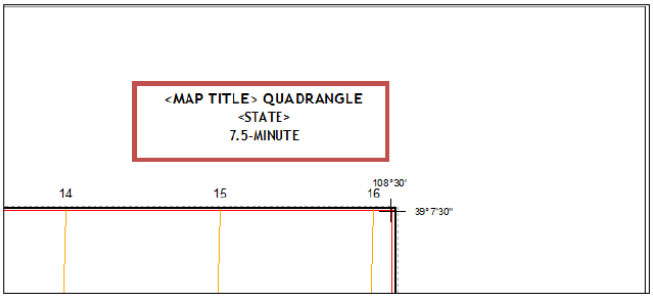


Figure 21: Upper right corner of the Map Frame where the Map Title block resides.

   a. Double click on "<MAP TITLE> QUADRANGLE" to open the Properties dialog.
   b. Replace "<MAP TITLE>" with the Cell Name value in the Map Indices table (documented in Task 3, Step 3) and click "OK" (Figure 22).

      Note: Replace the Map Title text with any custom Map Title that best suites the intended purpose of the map.

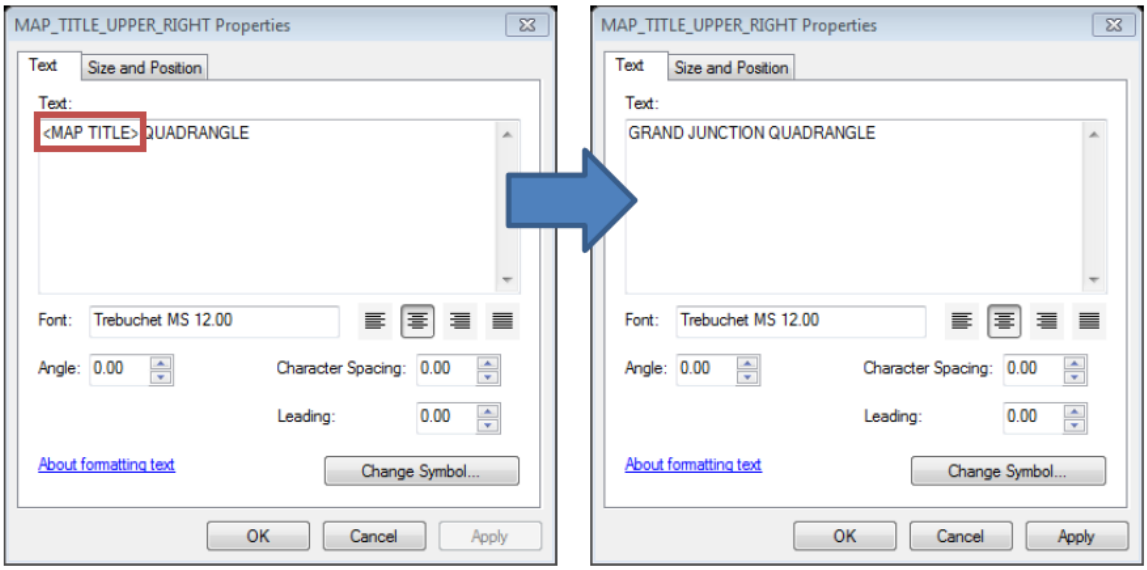


Figure 22: Before (left) and after (right) of Text Box Properties for the Map Title.

   c. Double click on "<STATE>" to open the Properties dialog.
   d. Replace "<STATE>" with the Primary State value in the Map Indices table (documented in Task 3, Step 3) and click "OK".

2. Next, edit the title block in the bottom right portion of the map. Use the Zoom Whole Page tool in the Layout Toolbar to first zoom back to the extent of the map. Then use Zoom In tool to zoom into

the bottom right corner of the Map Frame (Figure 23).

a. Double click on "<MAP TITLE>, <STATE ABR>" to open the Properties dialog.
b. Replace "<MAP TITLE>" with the Map Title text placed in the top right text box (documented in Task 2, Step 3).
c. Replace "<STATE ABR>" with the State text placed in the top right text box (documented in Task 2, Step 3).

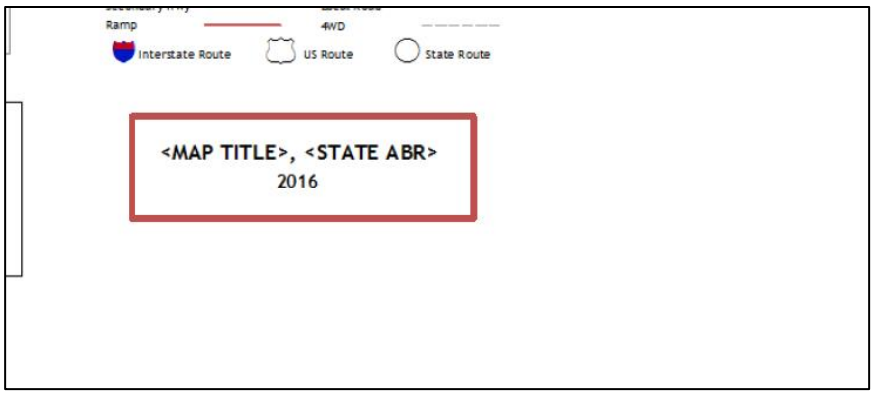


Figure 23: Lower right of the Map Frame where a secondary Map Title resides.

3. Next, edit the Contour Interval text in the bottom center portion of the map marginalia. First, look at the Contour data layer to determine what the contour interval is for the downloaded data.
   a. In the Table of Contents, open the Attribute Table for the Contours Layer in the Map Layers Data Frame.

Tip: Open the attribute table by right clicking on the Layer Name (e.g., Contours) and selecting "Open Attribute Table".

   b. Scroll to the far right of the Attribute Table and locate the ContourInterval Field (Figure 24).

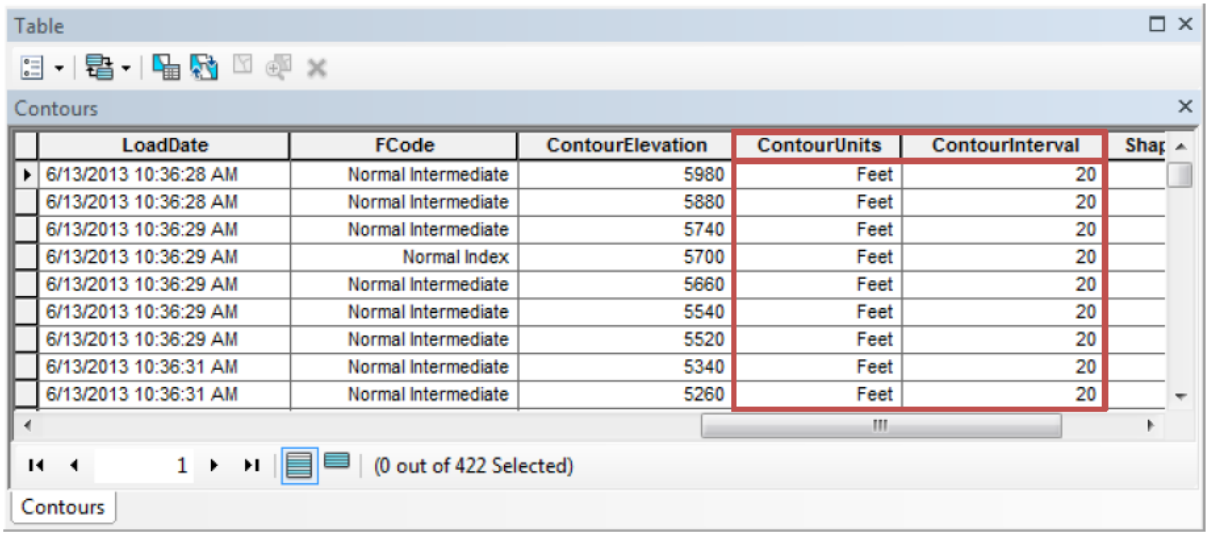


Figure 24: Contours Attribute Table, containing the contour interval of the data.

   c. Write down the Contour Interval found in the attribute table.

      Note: All Contour Intervals are reported in Feet. The ContourUnits field specifies the units of measure for the ContourInterval field.

d. Zoom or Pan to the bottom center of the Map Frame (Figure 25).

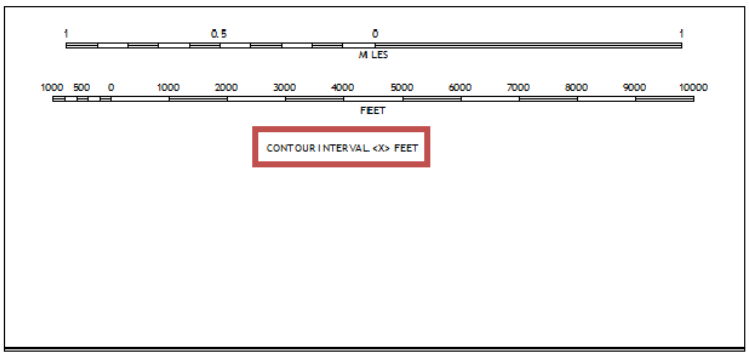
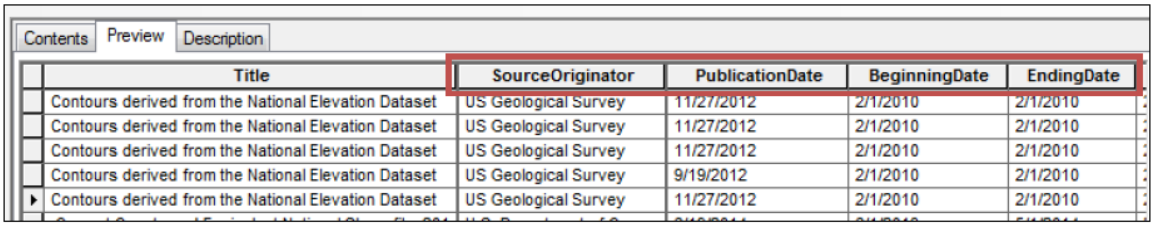


Figure 25: Bottom, center of the Map Frame where the Contour Interval resides.

e. Double click on "CONTOUR INTERVAL <X> FEET" to open the Properties dialog.
f. Replace "<X>" with the contour interval value found in the Contours Attribute Table (documented in Step c., above) and click "OK".

4. Next, update the Citation Date text block in the lower left portion of the map. It is standard cartographic practice to include source information in the margin of a map.
   a. This example demonstrates how to locate source information associated with TNM data specifically for contours.
   b. Open ArcCatalog and navigate to the location of the unzipped downloaded data from the TNM Download Client.
   c. Included with the Topo Map Vector Data products is a Meta_DatasetDetail table that contains source information for the datasets included in the product. Select the Meta_DatasetDetail table and click on the Preview tab. Source Originator and Date information can be found in this table (Figure 26).


Contents | Preview | Description

Title	SourceOriginator	PublicationDate	BeginningDate	EndingDate
Contours derived from the National Elevation Dataset	US Geological Survey	11/27/2012	2/1/2010	2/1/2010
Contours derived from the National Elevation Dataset	US Geological Survey	11/27/2012	2/1/2010	2/1/2010
Contours derived from the National Elevation Dataset	US Geological Survey	11/27/2012	2/1/2010	2/1/2010
Contours derived from the National Elevation Dataset	US Geological Survey	9/19/2012	2/1/2010	2/1/2010
Contours derived from the National Elevation Dataset	US Geological Survey	11/27/2012	2/1/2010	2/1/2010

Figure 26: Source Originator and Data information taken from the Meta_DatasetDetail table in a Topo Map Vector Data product.

Note: Source information may also be found in the XML metadata file that is delivered with all TNM data.

d. Write down the unique SourceOriginator and appropriate Date information from the Meta_DatasetDetail table for use in updating the marginalia information.
e. Return to the Topo TNM Style Template in ArcMap.
f. Zoom or Pan to the bottom left of the Map Frame (Figure 27).

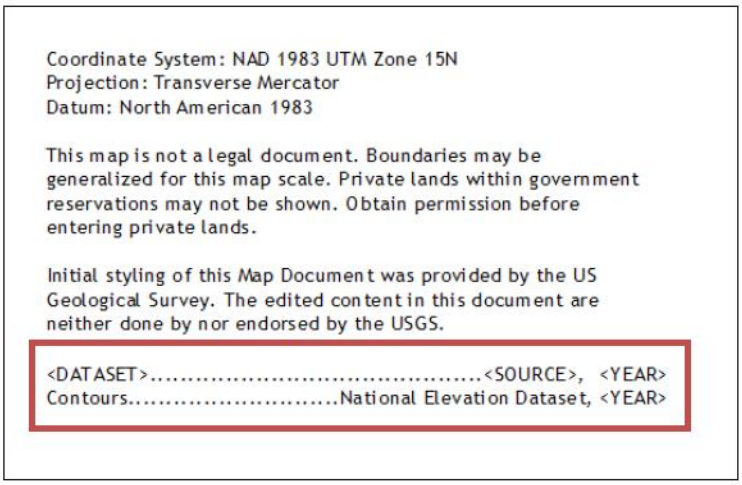


Figure 27: Lower left corner of the Map Frame where the citation dates reside.

g. Double click on the citation date text box to open the Properties dialog.
h. Replace "<SOURCE>" and "<YEAR>" with information written down from the Meta_DatasetDetail table in step 4d above.
i. Add additional source information as applicable.
j. When complete, click "OK" to close the CITATIONS_USGS Properties dialog box.

Tailoring the Topo TNM Style Template to a single 7.5-minute map extent is now complete and a US Topo-like design is now available within a GIS. The remaining sections discuss methods to further customize the Topo TNM Style Template to meet specific user needs and provide a few troubleshooting tips and tricks.

Customizing the Map to Meet a Specific Purpose

Alter Label Rules and Hierarchy

The labeling design and placements have been set up to mimic those on the US Topo. The labeling placement uses Esri's Maplex labeling engine. All the label design or placement properties can be altered in one of the following locations:

- The Label Manager
- The Labels Tab of each map Layer Properties

It is recommended that the Label Manager be used since all labeled features are readily accessible from one menu. The Label Manger is available on the Labeling Toolbar by selecting the  button. To access the Labeling Toolbar, go to Customize > Toolbars and check "Labeling".

Once in the Label Manger, select a Label Class and alter the Text Symbol or the Placement Properties to meet any specific map needs.

Alter Map Symbology

The map symbology is configured to layer and represent all data as it is seen on the US Topo maps. Any layers can be reordered to develop a map hierarchy that meets any specific needs. Note that by altering the drawing order of map layers, label placement may be impacted.

The symbology of the map layers can also be altered by accessing the Symbology Tab within a map Layer Properties window. Many of the layers have multi-layer symbologies, so editing specific parts of a symbol may require access to the Symbol Property Editor, accessible from the "Edit Symbol" button in the Symbol Selector dialog.

Add and Remove Layers

The Topo TNM Style Template is supposed to provide a quick base map using US Topo specifications for users to build on. As such, non-TNM data source can easily be included in the Map Layers data frame to convert the map to a general purpose topographic map to a highly customized, special-purpose map. By adding, removing, or substituting layers with those provided in the Topo TNM Style Template, the template can become mechanism to communicate a specific message with underlying topographic data.

Troubleshooting

Q. The scale of my map is very small (e.g.,, 1:10,000,000).

A. Ensure that the Map Layers data frame is active. Do this by right clicking on "Map Layers" and checking the Activate option.

Q. The map is taking a long time to place labels.

A. Allow ArcMap to label and draw all the labels. Once labels are placed, click the "Lock Labels" button  in the Labeling Toolbar.

Q. There are multiple contour intervals in my map extent.

A. Insert the following SQL statement into the Definition Query Tab of the Contours Properties:
Mod(ContourElevation, MAXINTERVAL)=0
where MAXINTERVAL is the largest contour interval within the dataset

Q. The services aren't working.

A. Check that an active internet connection is available. If problems continue to persist, check if the Services are experiencing problems (TNM Service Status (uptimerobot.com).

Q. Can the Topo TNM Style Template only create a map over a standard 7.5- minute extent?

A. No. The template can be used over any area where TNM data exists. Pan the Map Layers data frame to a custom center point. The other data frames are linked to the Map Layers and will adjust accordingly.

Q. How do I show a larger map extent?

A. First, Merge (located in ArcToolbox's Data Management Toolset) any TNM Data or Topo Map Vector Data products. Topo Map Vector Data products have most data clipped to a 7.5-minute extent. Data that is not clipped may result in duplicate/overlapping features and may require manual edits to remove conflicting data. This includes Hydrography (NHDLine, NHDFlowline, NHDWaterbody, and NHDArea) and

Governmental Units (GU_CountyOrEquivalent, GU_PLSSFirstDivision, GU_PLSSTownship, GU_PLSSSpecialSurvey, GU_Reserve, and GU_StateOrTerritory).

Next, locate the 7.5-minute extents of coverage within the MapDetails table. Add the DFHeight and DFWidth fields together. Average the MapRotation field values.

Finally, change the page size (File > Page and Print Setup) to fit the data frame and marginalia. Apply the aggregated parameters to the Map Layers data frame. Reposition any map marginalia to fit on the page.

Q. This is a MXD Map Document file. How can it be used as a template?

A. The MXD can be used as a template. First, store all data required to assemble the MXD in a central location, so that any user can access it. Begin to configure the MXD to meet the needs of the map goal (we recommend to only source the data and add any additional layers to the map document). By placing the map document in the following location on all local computers, ArcMap will read it as a template and display it on the Getting Started Splash Screen when ArcMap starts up.

- Version 10.0: C:\Users\[user]\AppData\Roaming\ESRI\Desktop10.0\ArcMap\Templates
- Version 10.1: C:\Users\[user]\AppData\Roaming\ESRI\Desktop10.1\ArcMap\Templates
- Version 10.2: C:\Users\[user]\AppData\Roaming\ESRI\Desktop10.2\ArcMap\Templates
- Version 10.3: C:\Users\[user]\AppData\Roaming\ESRI\Desktop10.3\ArcMap\Templates

Additional Information

US Topo project home page: US Topo: Maps for America | U.S. Geological Survey (usgs.gov).
US Topo Frequently Asked Questions (FAQ): Mapping, Remote Sensing, and Geospatial Data | U.S. Geological Survey (usgs.gov).

FAQs and project pages address more advanced topics such as mapped features and program and policy matters that are outside the scope of this Users Guide.

For references to USGS GIS datasets and services, see

1. The National Map home page, The National Map | U.S. Geological Survey (usgs.gov), Products and Services link.
2. The National Map Download platform: TNM Download v2 (nationalmap.gov).
3. Web map services list: Services (nationalmap.gov).

The USGS values your interest in our digital topographic maps. Comments, corrections, and suggestions for this document can be sent to ustopo@usgs.gov. General comments and questions can also be sent to this email box, or click the Contact Us link on the US Topo home page.

The US Topo and Topo TNM Style Template projects are part of the USGS National Geospatial Program. For general information see these web pages:

1. National Geospatial Program: USGS.gov | Science for a changing world.
2. The National Map: The National Map | U.S. Geological Survey (usgs.gov).

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