

Standard Operating Procedures for Creating Map Layouts and Templates with ArcMap 10.3

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PURPOSE

ArcMap has made great strides in recent versions to create custom map layouts that can be used in journal publications and posters. Adobe Illustrator is still recommended for advanced graphics editing; however, for many researchers the capabilities in Arc are sufficient to produce maps complete with aesthetic legends, scale bars and other supplemental map elements. The following SOP addresses creating custom layouts, generating and editing map elements, as well as saving map templates for future use.

Required systems/software

ArcGIS Desktop 10.1 or higher

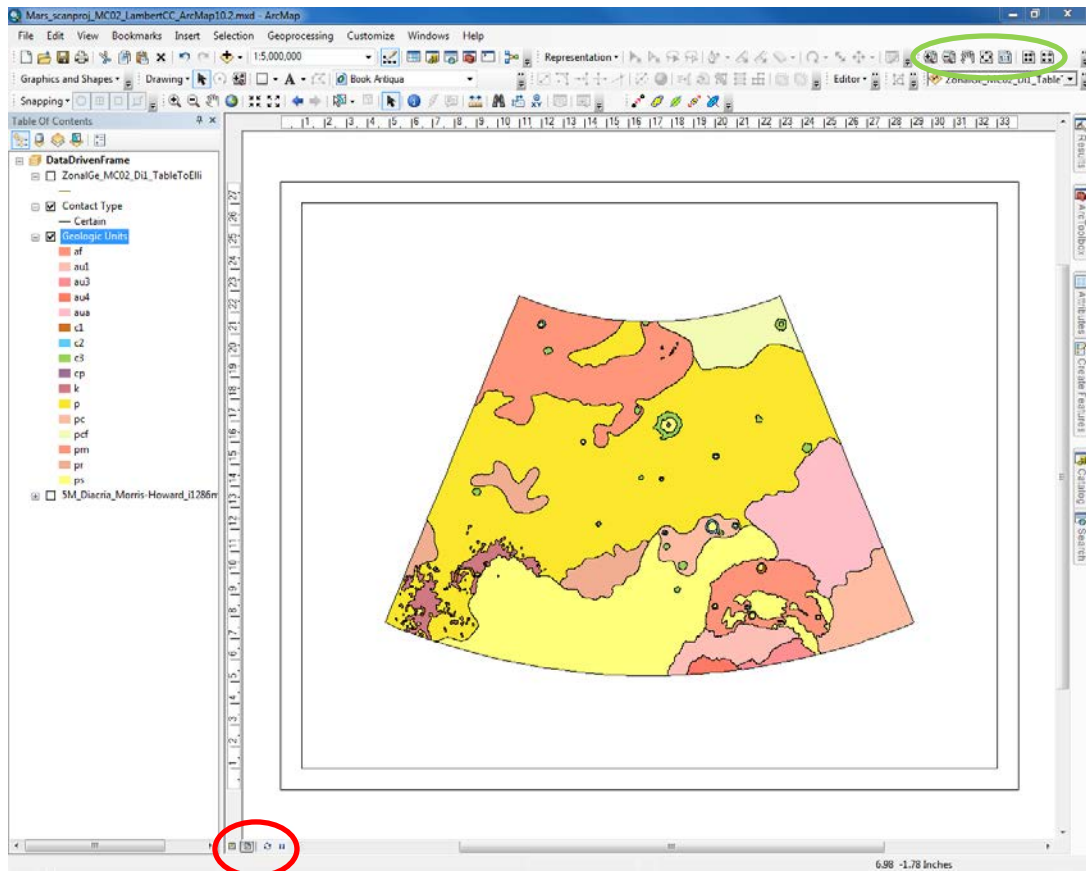
Basic ArcGIS features used in this SOP

[Layout View](#)

[Map Elements](#)

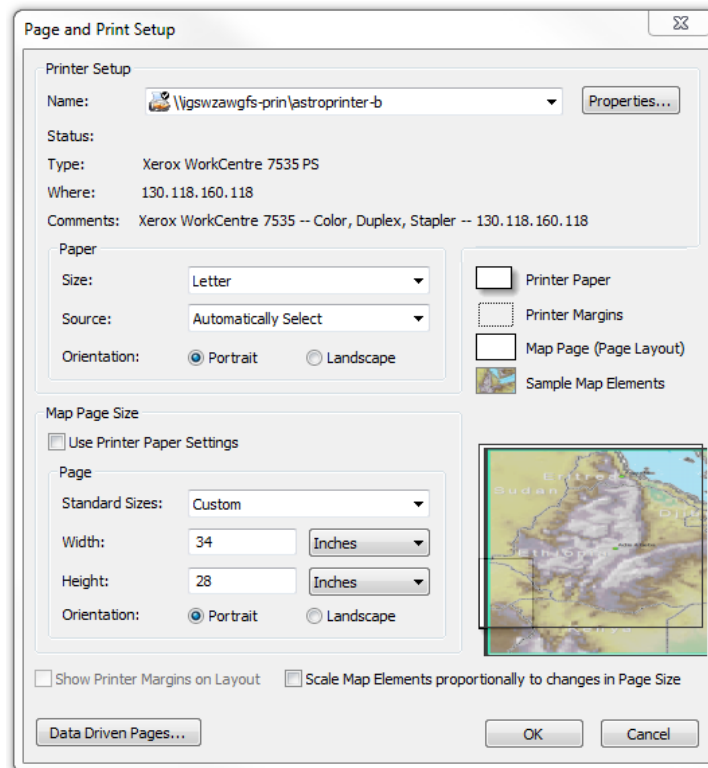
WALK-THROUGH

1) First, it is important to navigate ArcMap. The default view is Data view, which is used to analyze and edit data, but the program must be in Layout view to create and edit map elements. Also, there are a separate set of navigation buttons, the Layout toolbar, to zoom in/out and pan in Layout view that will not change the extent. If the Layout toolbar is not displayed go to the Customize menu > “Toolbars” > **Layout** toolbar.



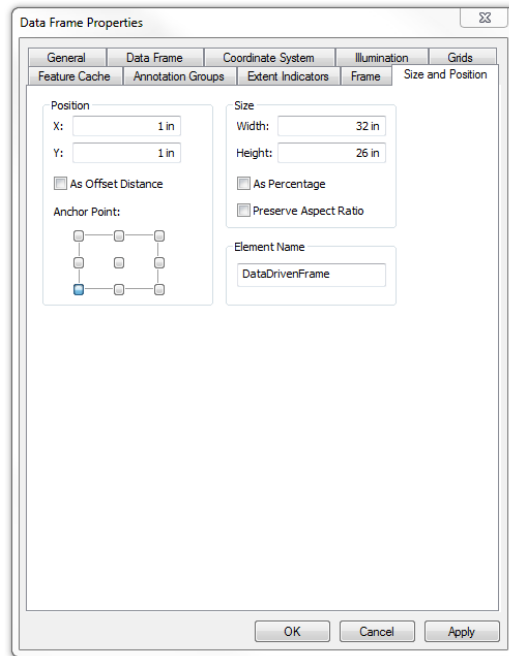
The Data/Layout view buttons are always located bottom left of the map (red), but the **Layout** toolbar can be docked anywhere along the top (green).

2) It is important to set the map layout before adding map elements – changing the layout will delete legends and scale bars. To change the map layout, select the “Change Layout” button in the Layout toolbar > My Templates tab or Templates tab to view available templates. If the size and layout desired is not available in the Select Template dialog box, then it must be changed manually via File menu > “Page and Print Setup”.

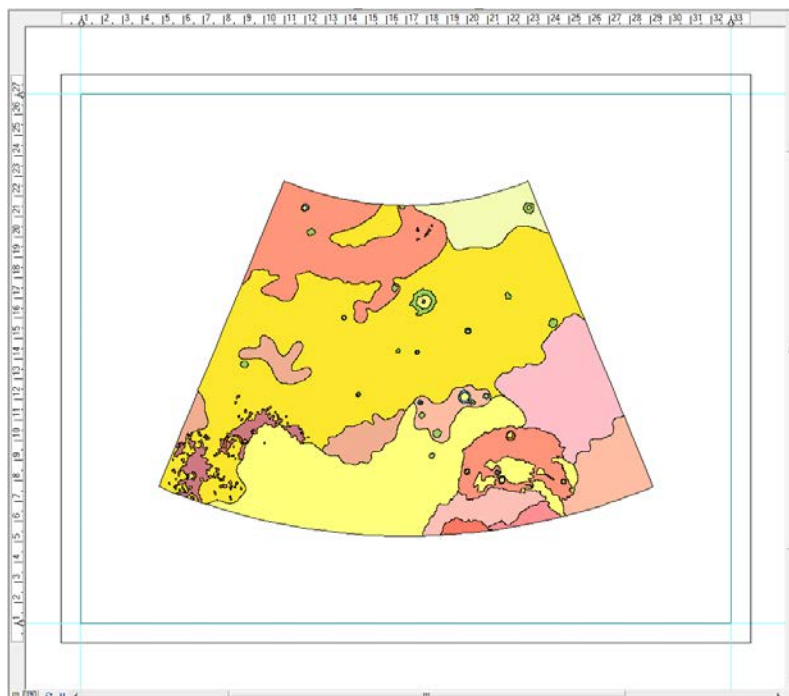


Page and Print Setup dialog box.

After setting the map document size, the data frame size can be changed either through right-clicking on *Data Frame* > “Properties...” > Size and Position tab, or by dragging the data frame border to guides (see below). When viewed at full extent the map scale should match the printed scale.



Size and Position tab of the Data Frame Properties dialog box.



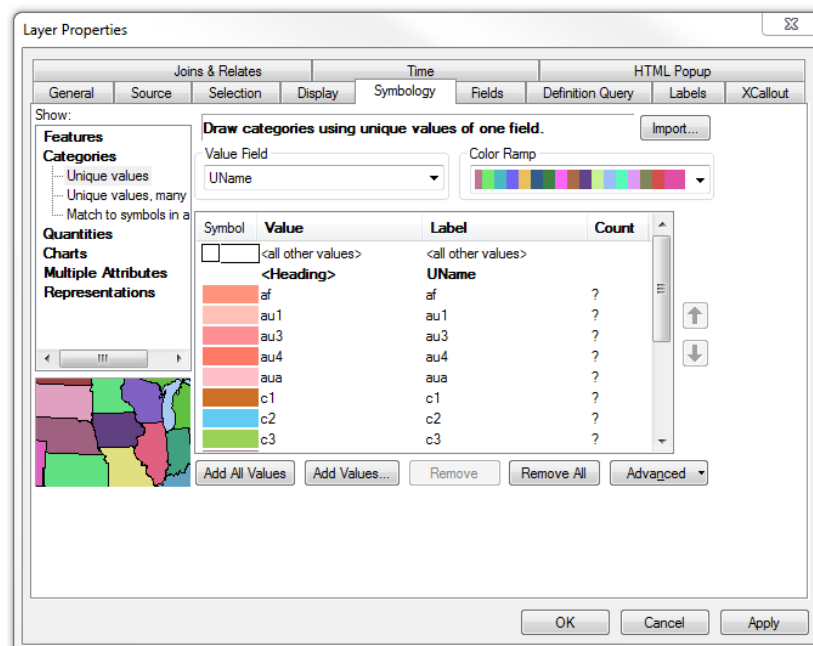
Guides can be added on either axis and are used to organize map elements.

NOTE: Guides help to organize and align map elements, and are created by clicking in the rulers in Layout view (right-click > “Clear Guide” to remove).

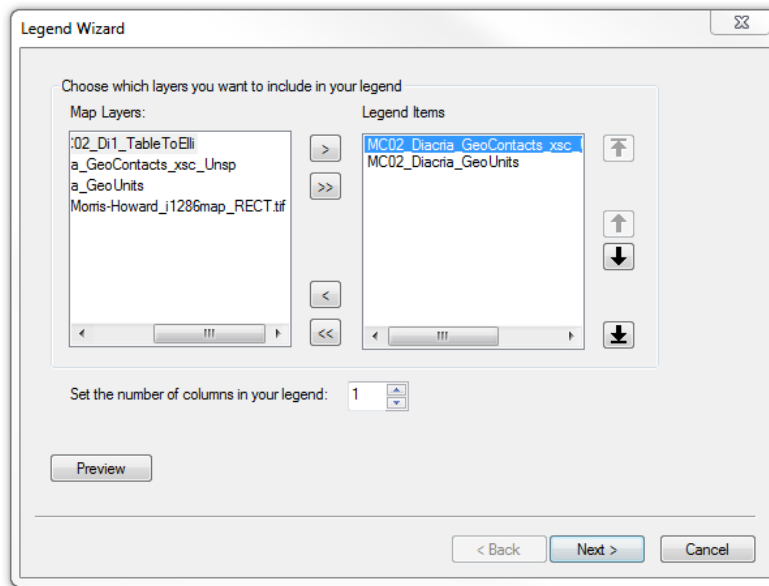
3) With the map layout finalized, desired map elements may be added through the Insert menu. From here users may add a title, text, dynamic text, neat lines (simple borders placed around selected objects), legend, north-seeking arrow, scale bar, scale text, pictures, or objects. Right-clicking on an object in the map layout will bring up many commonly used options available in Adobe Illustrator, such as grouping, drawing order, alignment, distribution and rotation. To edit titles and text fonts, activate the **Draw** toolbar from the Customize menu.

4) The most common complaint about exporting maps directly from ArcMap is the poor quality of the legend generated by the Legend Wizard. While Illustrator is still the most capable graphics editing program, many issues can be addressed by changing fonts, naming styles and spacing.

Because the legend propagates the naming convention used in the table of contents, elements may be given plain-English names by right-clicking the layer > “Properties...” > Symbology tab in the “Label” column (changing the names does not affect the source data) and deselect the <All Other Values> symbol.

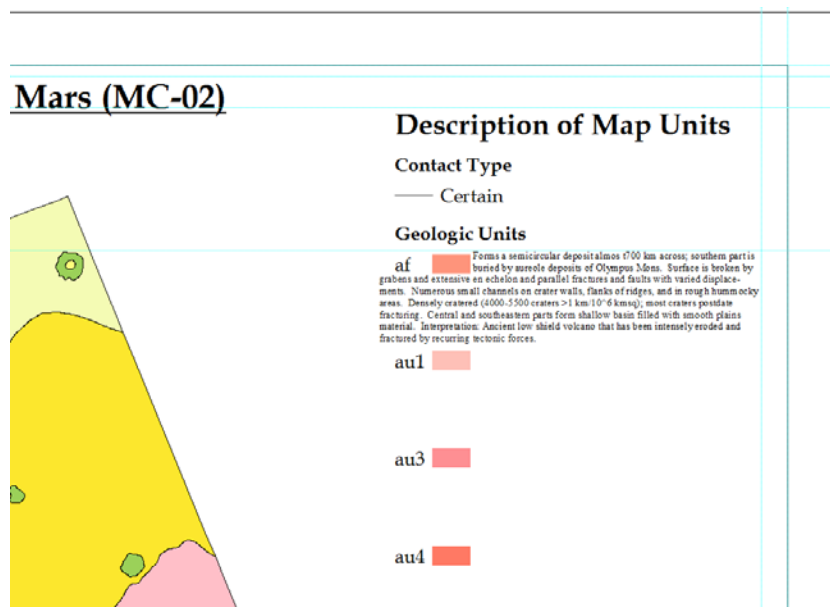


The <all other values> symbol can be turned off, and “Labels” can be modified to provide a plain-English name for coded values.



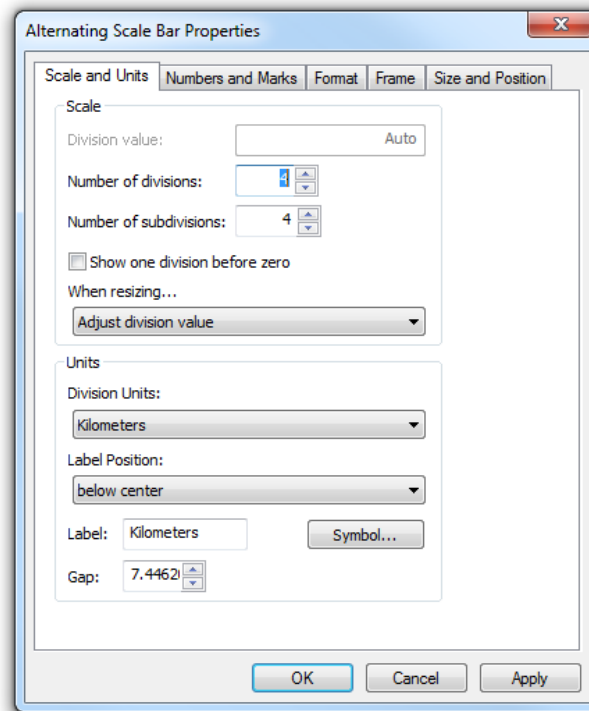
The Legend Wizard walks through four steps to customize a legend, but these can all be changed through the legend properties window after it is created.

After the legend is generated, it can be modified further by right-clicking the legend > “Convert to Graphics”. The legend can then be ungrouped into individual parts for placement similar to Illustrator. But once the legend has been converted to graphics it is no longer linked to the geodatabase and therefore will not update itself when changes are made to features in the geodatabase.



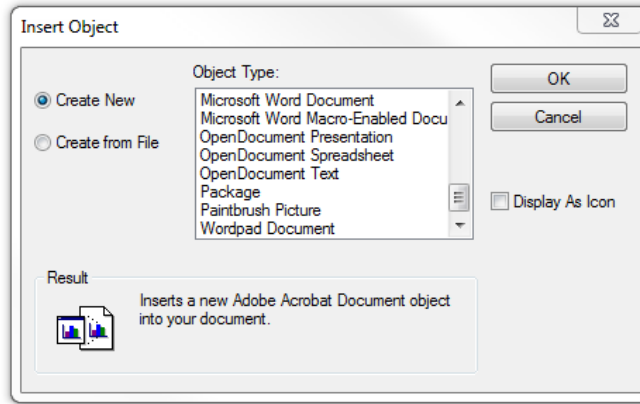
This legend was customized to allow for text to be inserted between symbols, much like a DoMU created in Illustrator.

5) Creating a quality scale bar is more simple and, like the legend, can be modified through its Alternating Scale Bar Properties dialog box after it has been created. For the “Scale” section under the Scale and Units tab, it is recommended to initially set “When Resizing...” to “Adjust division value”, that way both the overall bar and font sizes can be adjusted by hand to fit the map layout. If a latitude-dependent scale bar has been generated it can be brought in as a graphic and adjusted to fit the known scale.

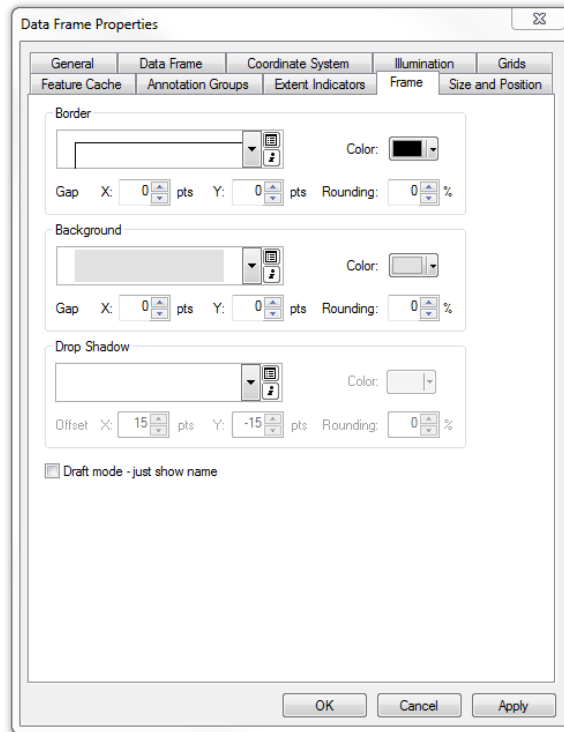


Like the legend properties, scale bar properties can all be modified to fit the map after it is created.

6) Adding objects, graphics, and setting background colors help to round-out the map and provide a cohesive look. Objects (Adobe Illustrator files, Microsoft Word/Excel/PowerPoint, and others) are created or imported via Insert menu > “Object...”, and are edited as usual. To access all of the features for graphic and shapes ensure the **Graphics** and **Draw** toolbars are activated.

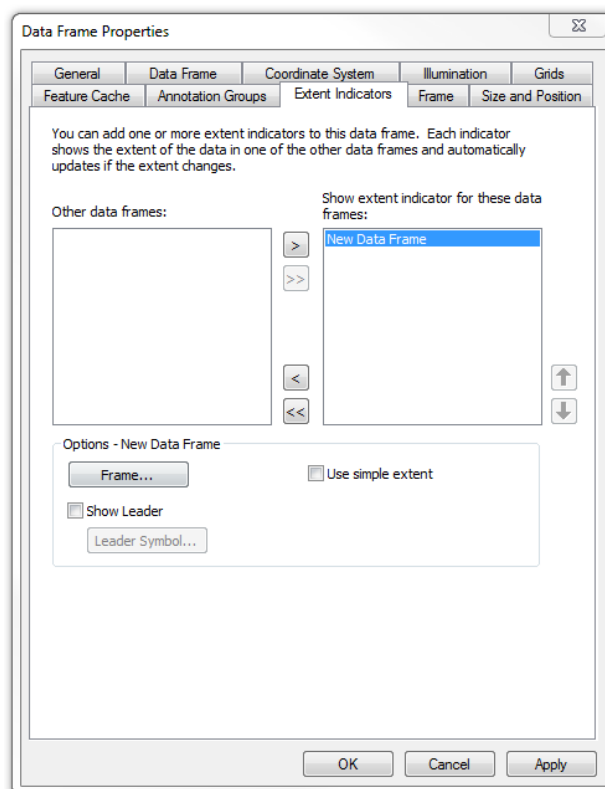


Like the data in a map document, objects imported into Layout View point to the source, and it must keep the file path intact for the object to remain visible.

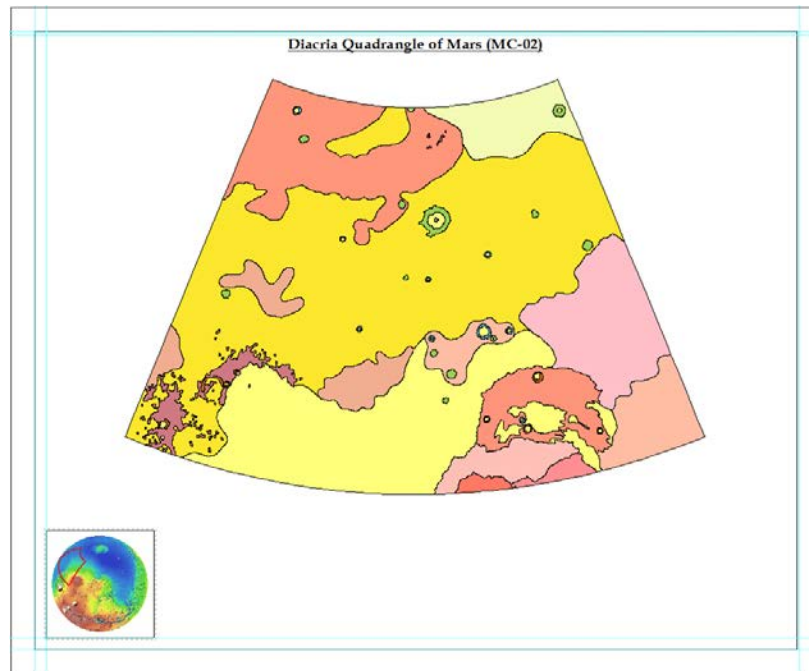


Background color and border are accessed through the Frame tab of the Data Frame Properties dialog box.

7) Geographic context is vital to the readability of a geologic map, especially with the emergence of large-scale mapping. An inset map is created by adding a new *Data Frame* through the Insert menu, adding the base dataset, setting the extent, and defining the desired projection. The Extent Indicators tab in the Data Frame Properties dialog box for the inset map creates a simple border from the geologic map data frame, but if a more precise extent is required then the mapping area boundary may be used instead. Quadrangle and other regional maps are well served to use the World from Space projection (searchable in the Coordinate Systems tab of Data Frame Properties dialog box) modified with the body's radius and center longitude/latitude.



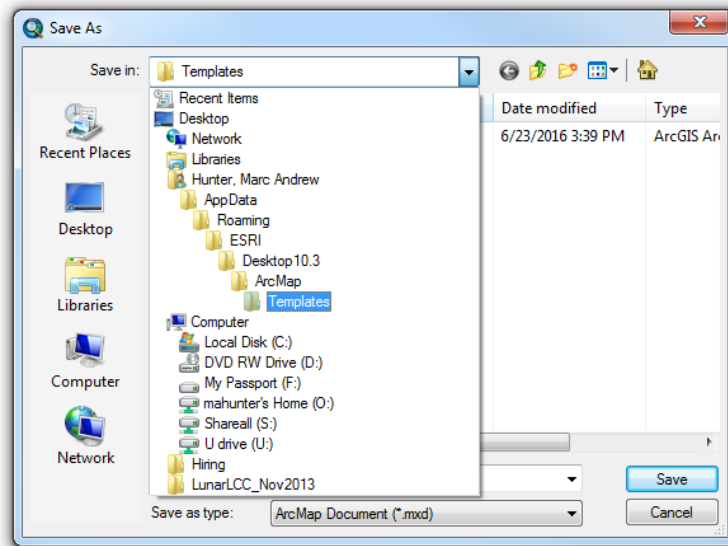
The Extent Indicator tab in the Data Frame Properties window can create automatic extents for map insets.



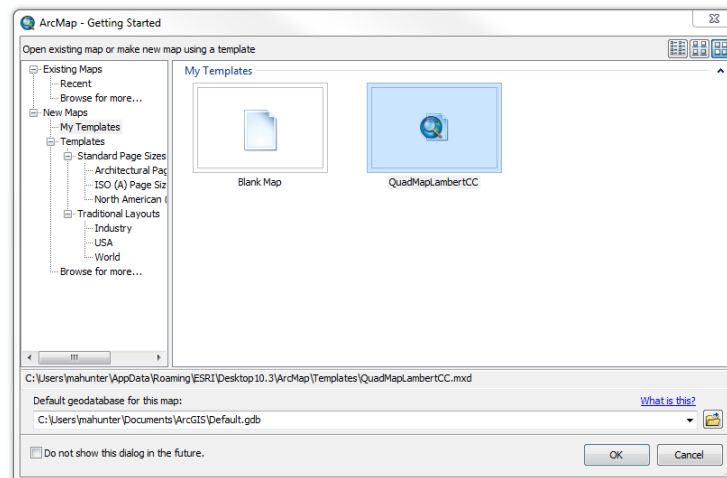
Example map inset with The World from Space projection applied to the Mars 2000 GCS; the boundary file for the mapping area was used to identify the inset.

8) Perhaps the greatest advantage of creating complete maps in ArcMap is the ability to save custom map templates for future use, significantly reducing the amount of time needed to create another, similar map. Once the final map has been exported, File menu > “Save As...” > users Templates folder to save the map layout as an *.mxt file that will retain the layout and base maps for future sue. Templates can be shared easily, but must be saved in the proper directory which can differ for each user. For example:

C:\Users\%user%\AppData\Roaming\ESRI\Desktop%version%\ArcMap\Templates



The file path for the Templates folder can differ for each user, but is typically located in the users AppData folder



Saving a map document to the users Templates folder will create a template that will be available in "My Templates" when opening ArcMap.

Please direct any questions, comments or improvements to:

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