

ARC HYDRO GROUNDWATER TUTORIALS

Subsurface Analyst – Creating ArcMap cross sections from existing cross section images

Arc Hydro Groundwater (AHGW) is a geodatabase design for representing groundwater datasets within ArcGIS. The data model helps to archive, display, and analyze multidimensional groundwater data, and includes several components to represent different types of datasets, including representations of aquifers and wells/boreholes, 3D hydrogeologic models, temporal information, and data from simulation models. The *Arc Hydro Groundwater Tools* help to import, edit, and manage groundwater data stored in an AHGW geodatabase. *Subsurface Analyst* is a subset of the AHGW Tools that is used to manage 2D and 3D hydrogeologic data, and create subsurface models including generation of borehole representations, cross sections, surfaces, and volumes.

In this tutorial we will learn how to add images to your cross sections. Adding cross sections from reports may be useful for a number of purposes:

- Adding “legacy” knowledge to your cross sections. You can combine existing cross sections from reports/papers/map books with new information (boreholes, rasters, faults, etc.) to create new cross sections or update the old ones.
- Inclusion of data in existing cross sections from papers/reports/map books in the development of 3D hydrogeologic models.
- Archiving cross sections in a systematic way inside a geodatabase.

Subsurface Analyst includes tools for creating 2D cross sections by adding data to a new XS2D data frame and “sketching” cross sections based on borehole stratigraphy, outcrops, faults, etc. In addition *Subsurface Analyst* supports the creation of 3D cross sections and volumes from a set of surfaces. The 3D features can be viewed in ArcScene or can be transformed to 2D so they can be displayed in ArcMap. The workflow and tools for creating 2D cross sections and 3D features are described in separate tutorial.

1.1 Background

Data used in this tutorial are part of a USGS report describing the hydrogeologic units of the Coastal Plain in Virginia (<http://pubs.usgs.gov/pp/2006/1731/>). The cross sections shown in Figure 1 were digitized from the report.

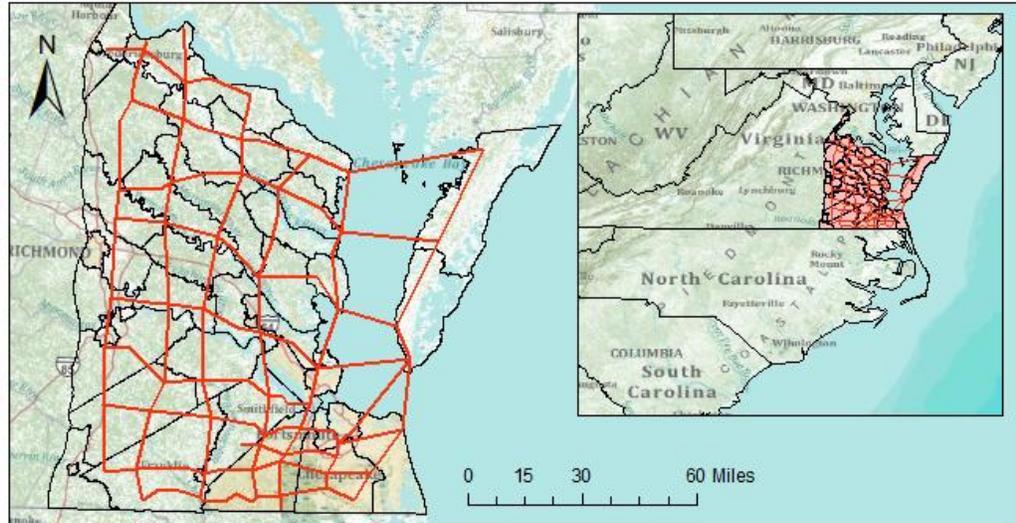


Figure 1 Location of the cross sections covering the Coastal Plain in Virginia.

The cross section lines shown in the map are related with a vertical cross section describing hydrogeologic units in the Coastal Plain Aquifer system. The vertical cross sections are detailed in a set of PDF files. Figure 2 shows an example of such a cross section. The solid colors represent aquifers and the white colors in between represent confining units.

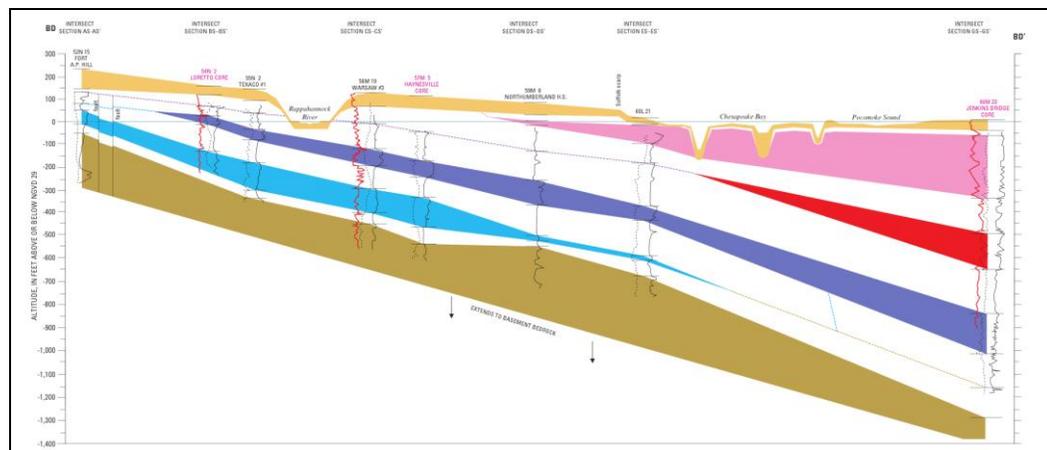


Figure 2 Example cross section showing hydrogeologic units along a cross section.

1.2 Outline

The objective of this tutorial is to introduce the basic workflow and tools for adding existing 2D cross sections (in the form of images) to a XS2D data frame in ArcMap. The tutorial includes the following steps:

1. Running the Import XS2D Image Wizard to create a new XS2D data frame and corresponding feature classes and georeference the cross section image in the XS2D data frame.
2. Digitizing XS2D panels based on the image.
3. Building 3D GeoSections from the panels and visualize in ArcScene.

1.3 Required Modules/Interfaces

You will need the following components enabled in order to complete this tutorial:

- Arc View license (or ArcEditor\ArcInfo)
- 3D Analyst
- Arc Hydro Groundwater Tools
- AHGW Tutorial Files

The AHGW Tools require that you have a compatible ArcGIS service pack installed. You may wish to check the AHGW Tools documentation to find the appropriate service pack for your version of the tools. *3D Analyst* is required for the last section of the tutorial for visualizing 3D features. If you do not have *3D Analyst*, you can skip these parts of the tutorial. The tutorial files should be downloaded to your computer and saved on a local drive.

2 Getting Started

Before opening the tutorial map, let's ensure that the AHGW Tools are correctly configured.

1. If necessary, launch *ArcMap*.
2. If necessary, open the *ArcToolbox* window by clicking on the *ArcToolbox* icon .
3. Make sure the Arc Hydro Groundwater Toolbox is loaded. If it is not, add the toolbox by right-clicking anywhere in the *ArcToolbox* window and selecting the *Add Toolbox...* command. Browse to the top level of the *Catalog* and then browse down to the *Toolboxes/System Toolboxes* directory. Select the toolbox and select the *Open* button.
4. Expand the *Arc Hydro Groundwater Tools* item and then expand the *Subsurface Analyst* toolset to expose the tools we will be using in this tutorial.

We will also be using the *Arc Hydro Groundwater Toolbar*. The toolbar contains additional user interface components not available in the toolbox. If the toolbar is not visible, do the following:

5. Right-click on any visible toolbar and select the *Arc Hydro Groundwater Toolbar* item.

When using geoprocessing tools you can set the tools to overwrite outputs by default, and automatically add results to the map/scene. To set these options:

6. Select the *Geoprocessing / Options...* command.
7. Activate the option: “*Overwrite the outputs of geoprocessing operations*” as shown in Figure 3.
8. Enable the option to “*Add results of geoprocessing operations to the display*” as shown in Figure 3.
9. Select *OK* to exit the setup.

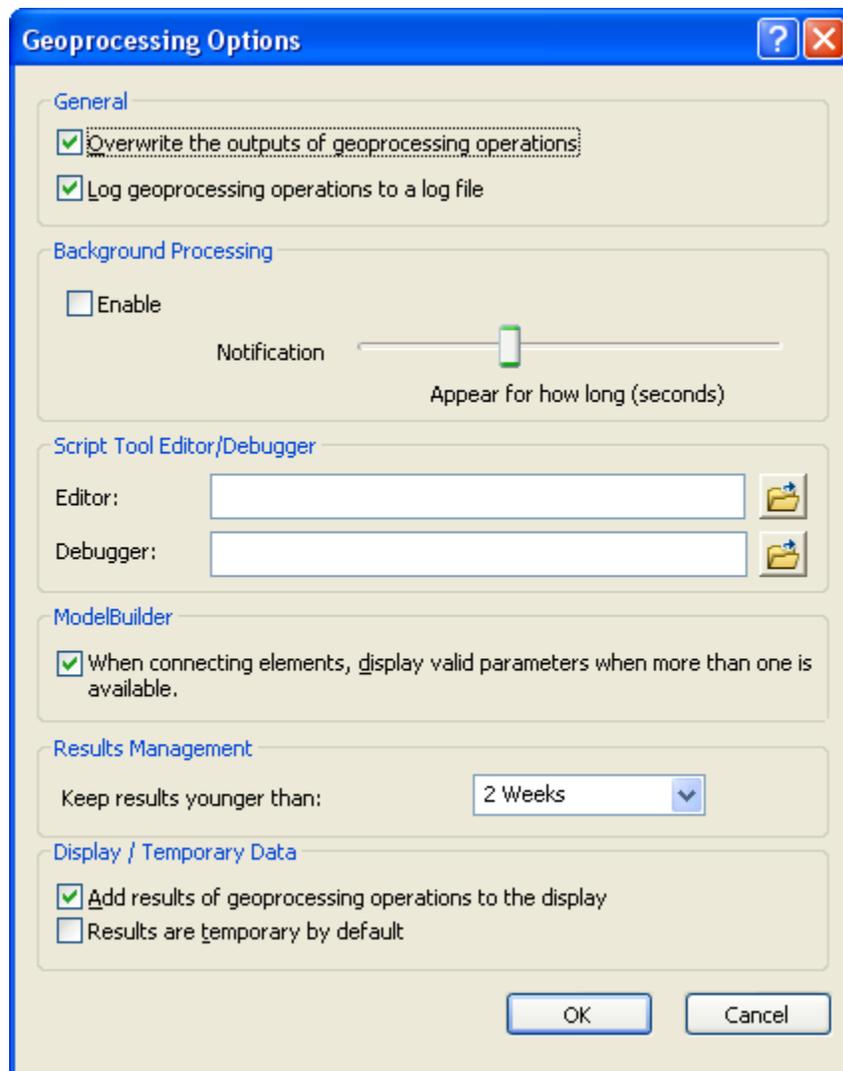


Figure 3 Setting Geoprocessing tools to overwrite outputs by default, and to add results of geoprocessing tools to the display.

3 Opening the Map

We will begin by opening a map containing some background data for the project.

1. Select the *File/ Open* command and browse to the location on your local drive where you have saved the AHGW tutorials. Browse to the *XS2D_Image* folder and open the file entitled *xs2d_image.mxd*.

Once the file has loaded you will see a map of Virginia with digitized cross section lines covering the Coastal Plain region. In a separate “images” folder there is a PDF document taken from the USGS report. There also are two JPG images representing cross sections AD-AD’ and BD-BD’ that were cropped from the PDF document. You can view these

files to get familiar with the cross section images. Locate these cross sections on the map.

The following section describes the concepts and datasets used to build a XS2D data frame. The same concepts are presented in other XS2D tutorials; if you are familiar with this material you can skip section 4.

4 Representing 2D cross sections in the AHGW Data Model

Before starting to create cross sections, it is helpful to review the component of the AHGW Data Model we will be using. The AHGW Data Model includes a number of components used for different purposes. The Hydrostratigraphy component includes data structures for representing 2D and 3D hydrostratigraphy, including the creation of 2D cross sections (Figure 4).

SectionLine is the central feature class used to manage cross sections. Each SectionLine represents a cross section in map view. SectionLine features are indexed with a HydroID, which uniquely identifies them within the geodatabase. To create a vertical (profile) view of the cross section along the SectionLine, each SectionLine feature is associated with multiple feature classes representing the two-dimensional cross section, and these are given the “XS2D” prefix.

Common XS2D feature classes are:

- XS2D_Panel – polygon features representing cross section “panels”.
- XS2D_BoreLine – vertical lines representing hydrostratigraphy along selected boreholes adjacent to the SectionLine.
- XS2D_PanelDivider – vertical guides showing the location where a SectionLine changes direction.
- XS2D_MajorGrid and XS2D_MinorGrid – grid lines showing the vertical and horizontal scales in an XS2D data frame.

Additional feature classes can be added to represent items such as land surface elevation, water table, faults, etc.

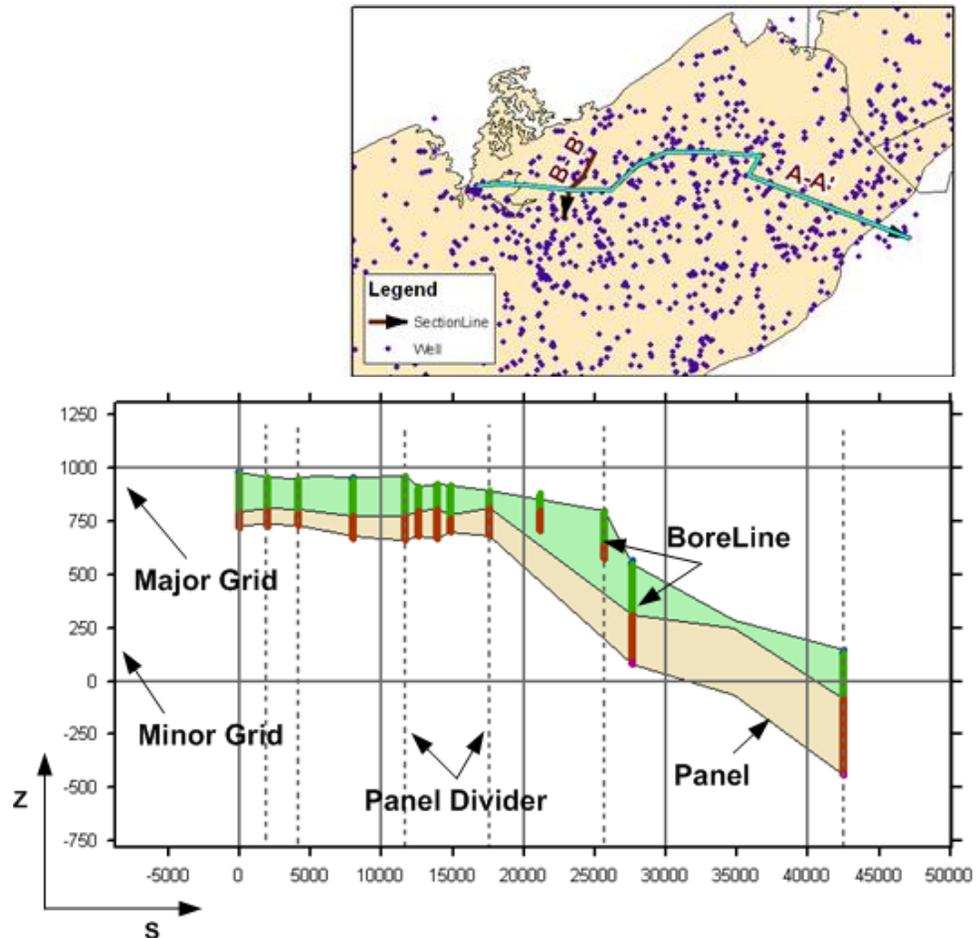
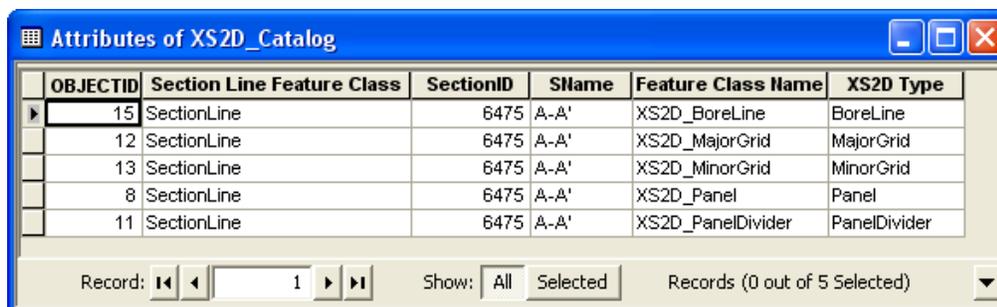


Figure 4 Datasets used for creating 2D cross sections.

Each of the 2D cross sections is generated in a separate data frame in ArcMap. The XS2D feature classes are created in an {S, Z} coordinate system that is unique for each cross section. The S coordinate represents the length along the SectionLine (equivalent to the x-direction in the XS2D data frame) and the Z coordinate represents the vertical dimension (the y-direction in the XS2D data frame). In addition, XS2D features can be scaled (exaggerated) in the Z dimension for better visualization. *Subsurface Analyst* includes a number of tools for transforming features between a “real” coordinate system (X, Y, and Z) and a 2D coordinate system (S, Z), and for scaling features.

The XS2D_Catalog table is used for managing XS2D feature classes. The Catalog lists the XS2D feature classes related with each SectionLine feature. The SectionID field in the XS2D_Catalog references a HydroID of a SectionLine feature, thus creating a relationship between SectionLines (defined in real world coordinates) and XS2D feature classes. An example of a typical XS2D_Catalog table is shown in Figure 5.



OBJECTID	Section Line Feature Class	SectionID	SName	Feature Class Name	XS2D Type
15	SectionLine	6475	A-A'	XS2D_BoreLine	BoreLine
12	SectionLine	6475	A-A'	XS2D_MajorGrid	MajorGrid
13	SectionLine	6475	A-A'	XS2D_MinorGrid	MinorGrid
8	SectionLine	6475	A-A'	XS2D_Panel	Panel
11	SectionLine	6475	A-A'	XS2D_PanelDivider	PanelDivider

Record: 1 Show: All Selected Records (0 out of 5 Selected)

Figure 5 Example XS2D_Catalog used for managing XS2D feature classes and establishing a relationship between the XS2D features and a SectionLine feature.

5 Running the Import XS2D Image Wizard

The *Import XS2D Image Wizard* creates a new set of feature classes for representing a 2D cross section based on a specific SectionLine feature. The wizard creates a new data frame to which the XS2D feature classes (XS2D_Panel, XS2D_PanelDivider, XS2D_MajorGrid, and XS2D_MinorGrid) are added. In addition, the wizard georeferences a selected image so it can be displayed in the XS2D data frame.

The wizard is based on a selected section line (you run the wizard one cross section at a time). In this tutorial a SectionLine feature class is already provided. To create your own SectionLine feature class you can use the *Create SectionLine Feature Class* tool, in the *Subsurface Analyst | Features* toolset. You can then use the regular ArcMap editing tools to sketch your section lines. For this tutorial we recommend that you work with the existing section line features. To start the *Import XS2D image Wizard*:

1. Select the *Import XS2D Image Wizard* tool  in the *Arc Hydro Groundwater Toolbar*.
2. With the tool activated, click on **BD-BD'** *SectionLine* feature to start the creation of a new cross section.
3. Make sure the *XS2D Catalog Table* is specified.
4. Make sure the *Default output workspace* is specified correctly.
5. For the *Image File*, browse to the **images** folder and select the **BD-BD'.jpg** file.

At this point your inputs should be similar to the ones shown in Figure 6.

6. Select *Next* to move to the next step in the wizard.

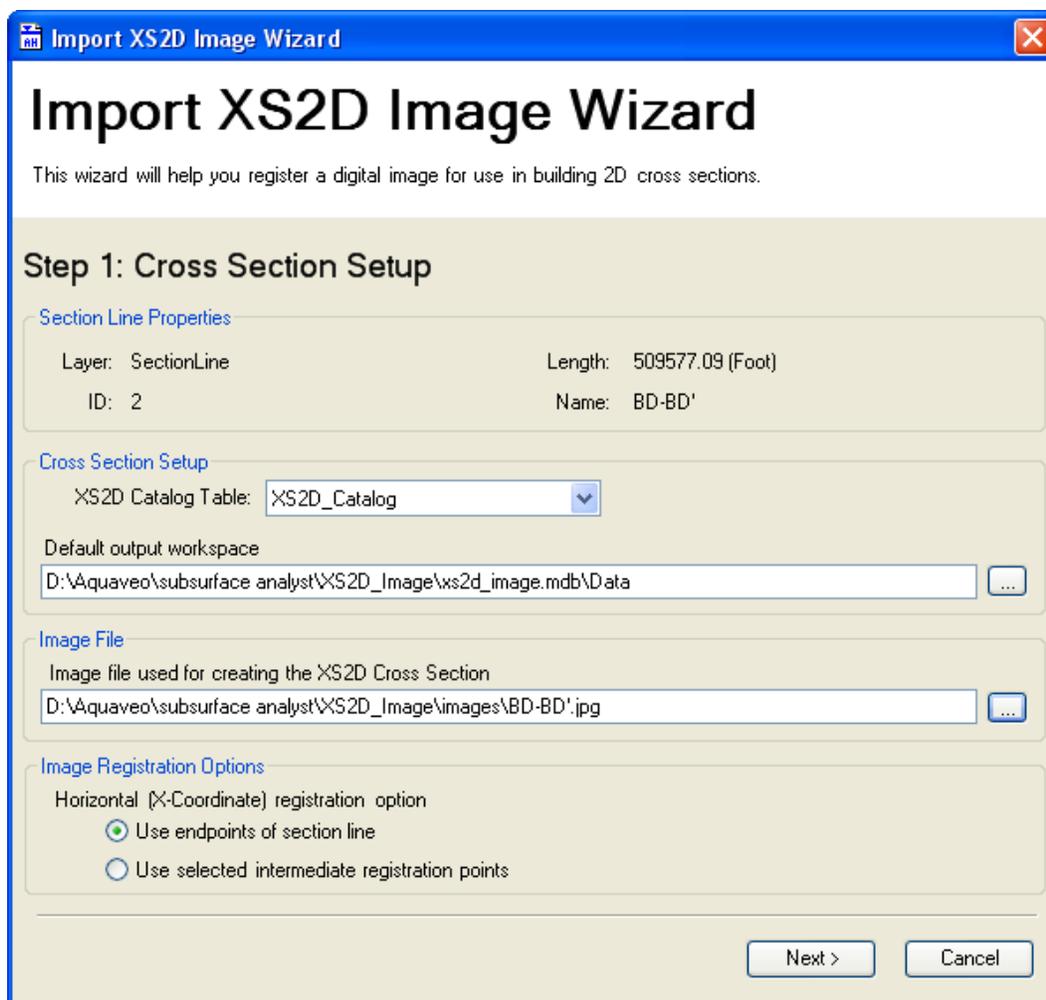


Figure 6 Settings for Step 1 in the Import XS2D Image Wizard.

Step 2 in the wizard is used to reference the imported image. You can resize the window to make it easier to view the cross section.

7. Use the sliders on the top, bottom, left, and right to move the referencing lines (in green and red) to the referencing locations on the image:
 - *XLeft* and *XRight* referencing lines should be located on the edge of the cross section features.
 - *ZTop* and *ZBottom* lines can be referenced to the vertical scale and tick marks on the left and right sides of the cross section.
 - Specify the *ZTop* and *ZBottom* values in the boxes at the bottom of the form.

At this point your inputs should be similar to the ones shown in Figure 7.

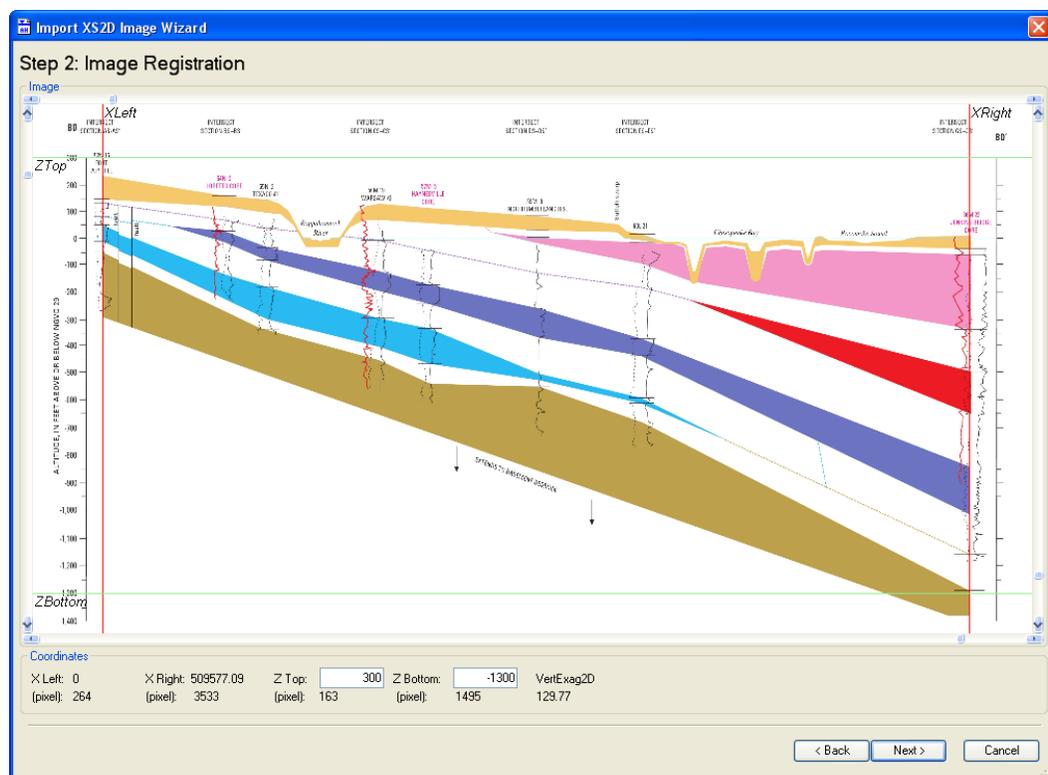


Figure 7 Settings for Step 2 in the Import XS2D Image Wizard.

8. Select *Next* to move to the next step in the wizard.

Step 3 in the wizard is used to create panels and panel dividers. The minimum and maximum elevations for drawing panel dividers can be modified manually.

9. Make sure the target location for the cross section panels and panel dividers are correct.
10. Specify the maximum and minimum elevations to draw panel dividers:
 - Maximum elevation: **600**
 - Minimum elevation: **-2000**

At this point your inputs should be similar to the ones shown in Figure 8.

11. Select *Next* to move to the next step in the wizard

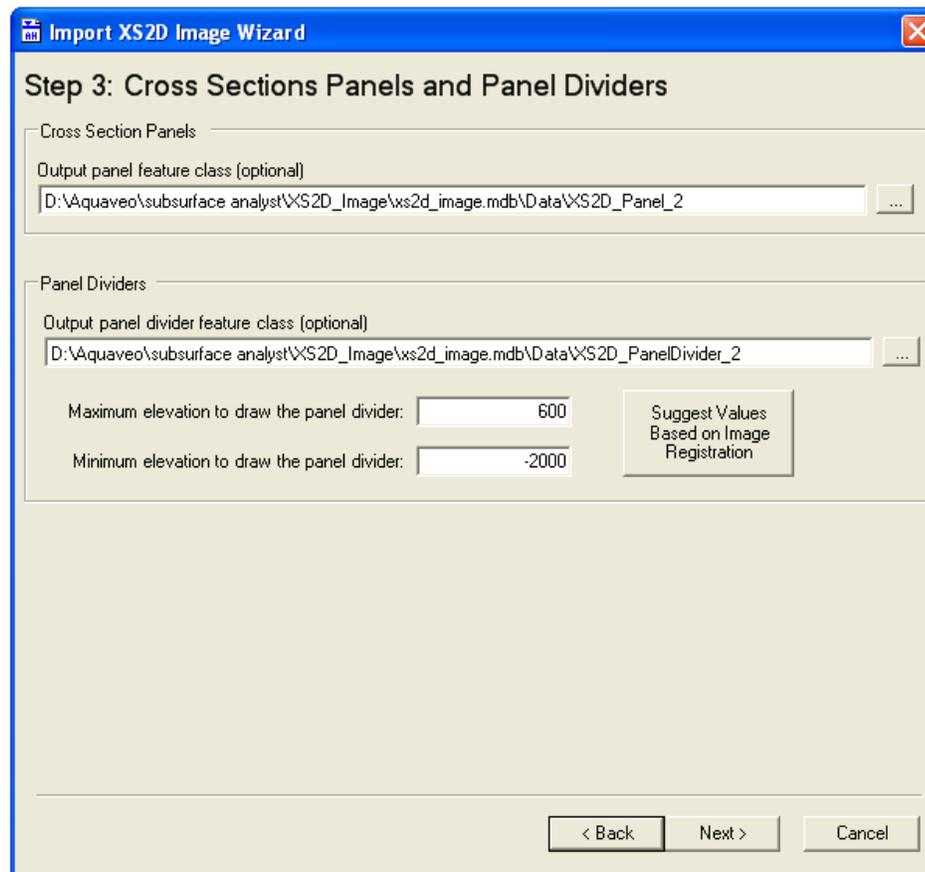


Figure 8 Settings for Step 3 in the Import XS2D Image Wizard.

Step 4 in the wizard is used to setup the construction of the grid lines. The grid extent and spacing can be automatically specified based on the length of the selected SectionLine and elevations specified in step 3, or they can be set manually. Default values are set for the left, right, minimum and maximum elevations, and spacing of the grid features. You can keep the default values or modify them.

12. Specify the following for the grid extent:

- Left: **-100,000**
- Right: **2,000,000**
- Maximum elevation: **600**
- Minimum elevation: **-2,000**

13. Specify the following for the grid spacing:

- Horizontal distance between vertical major grid lines: **200,000**
- Vertical distance between horizontal major grid lines: **200**
- Number of minor grid lines between major vertical grid lines: **3**
- Number of minor grid lines between major horizontal grid lines: **1**

At this point your inputs should be similar to the ones shown in Figure 9.

14. Select *Finish* to run the wizard.

Figure 9 Settings for Step 4 in the XS2D Wizard.

A new Data Frame (BD-BD') should be added to your map (make sure you are in layout view to be able to view data frames). You should see the grid lines, the panel dividers, and the referenced cross section image.

You can resize the BD-BD' data frame and move it within the map layout such that you can see both data frames. To better view the XS2D features created:

15. Select the Select Elements tool , move the BD-BD' data frame within the map layout and resize it.
16. Use the zoom tools () to focus on the data within the cross section.

17. You can control the grid properties (text size, color, etc.) by selecting the data frame, right clicking and selecting *Properties*, Select the *Grids* tab, and specify which grid lines you want to display and modify the labels, ticks, color, etc.

At the end of this process you should have a XS2D data frame that is similar to the one shown in Figure 10.

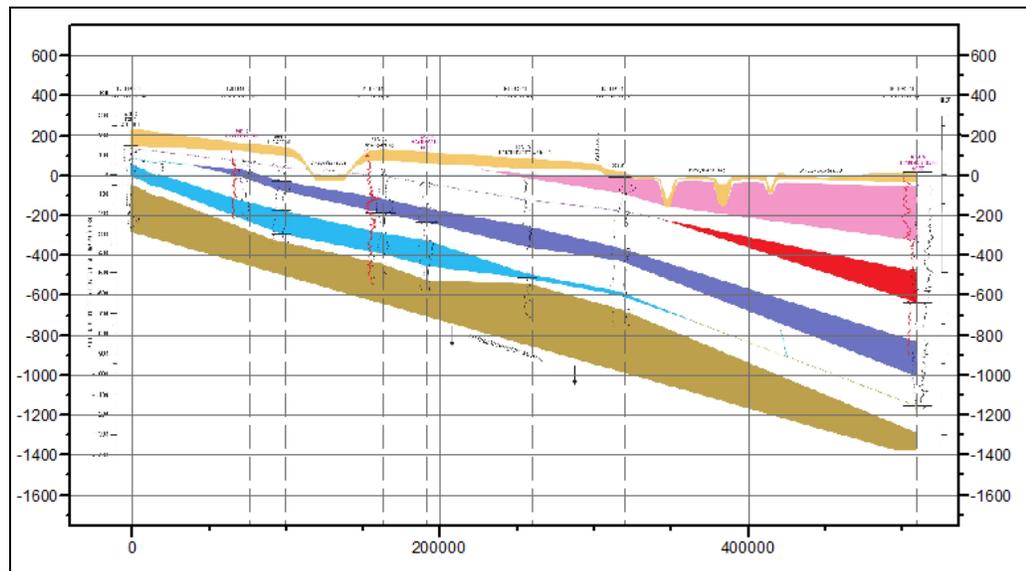


Figure 10 Initial XS2D data frame with the referenced cross section image.

This is a good starting point for digitizing cross section panels by tracing over the image. You can also add additional data such as faults, borehole stratigraphy, outcrops, land surface, and water levels using the XS2D tools (the process of adding data to a XS2D data frame is explained in separate tutorials). The following legend in Figure 11 shows the major units described in the cross section.



Figure 11 Aquifer units and confining layers in the Coastal Plain Aquifer system. Confining units are symbolized in cross sections as white panels and their boundary is defined by a dashed line.

6 Sketching cross section panels

In this section you will sketch new cross section panels. You will use the referenced image and can utilize any of the advanced editing capabilities available in ArcMap. The following steps (6.1 through 6.4) apply specifically to ArcGIS 10, if you are using ArcGIS 9.2 or 9.3 then browse to the *subsurface analyst\XS2D_Image* folder and open the file entitled *ArcGIS 9 Sketching.pdf* and follow the steps outlined in that document. After you have completed all the steps return to Section 7 of this document and continue with the tutorial. If you are using ArcGIS 10 continue as outlined below.

6.1 Creating a new template for editing XS2D Panel features

In ArcGIS 10 the concept of feature templates is introduced. This allows us to predefine different types of features with symbology and default attributes that are automatically updated as we edit. We will first create a template for the XS2D Panel feature class:

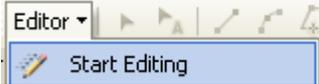
The first steps will be to set the editing environment:

1. Make sure the BD-BD' data frame is activated.
2. In the BD-BD' data frame, select the XS2D_Panel_2 layer, right click and select *Properties*. Select the *Symbology* tab to reach the symbology interface.
3. Select the Import option on the top right  .
4. In the *Import Symbology* dialog, browse to the *XS2D_Panel.lyr* file located in the *Symbology* folder of the tutorial files.
5. In the “*What do you want to import?*” section select the *Complete symbology definition* option.
6. Select *OK*.
7. In the “*Import Symbology Matching Dialog*” specify the *HGUID* field in the *Value Field* section.

Select *OK*, and *OK* again to finish specifying the symbology. Your XS2D Panel should have 11 classes based on the HGUID field.

Next we will define a new feature template:

8. If necessary, add the *Editor* toolbar to your map. You can load it by right clicking on any toolbar and selecting the *Editor* toolbar.

9. Select the *Editor / Start Editing* option . If you get a warning message select Continue to continue editing.

Notice that the Create Features editing window opens. The Create Features window should include a template for the XS2D_Panel_2 feature class, as shown in Figure 12. If the template does not exist proceed with step 10. If the template does exist then skip to Section 6.2 below.

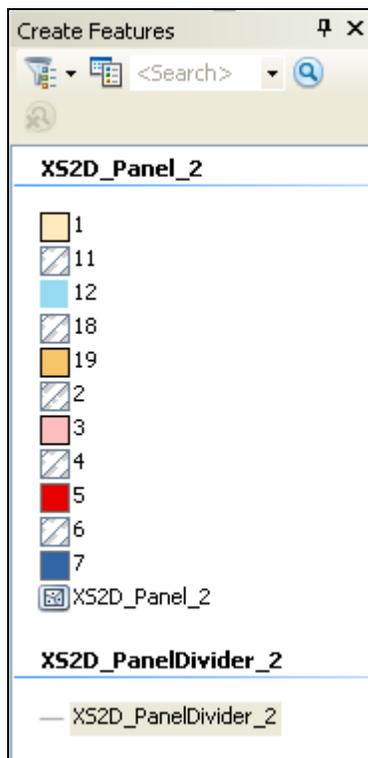


Figure 12 The Create Feature window with a template for XS2D Panel features.

10. Select the *Organize Templates* button  located at the top of the *Create Features* window.
11. In the *Organize Templates* window select the XS2D_Panel_2 layer. You will notice that no template is associated with this layer.
12. Select the *New Template* button  to open the *Create New Template Wizard*.
13. Make sure the XS2D_Panel layer is the only one selected as shown in Figure 13.

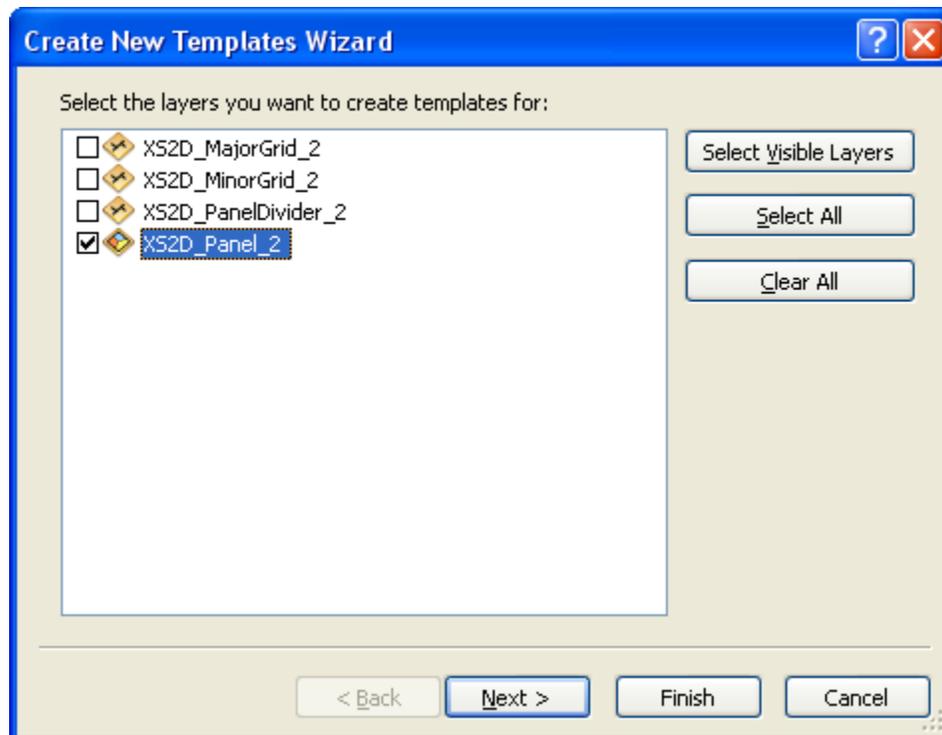


Figure 13 Creating a new template for the XS2D_Panel_2 feature class

14. Select *Next* to view the symbology of the features in the template.
15. Select *Finish* to create the template.
16. Select *Close* to exit the interface.

The Create Features window should now include a template for the XS2D_Panel_2 feature class, as shown in Figure 12.

Next we will set the snapping environment.

6.2 Setting the snapping environment options

1. Make sure the BD-BD' data frame is activated.
2. Make sure the *Snapping* toolbar is loaded in the map. You can load it by right clicking on any toolbar and selecting the *Snapping* toolbar.
3. If necessary, select the *Editor / Start Editing* option  Start Editing .

For this tutorial we will activate the classic snapping option. To enable this option:

4. Open the *Editing Options* window by going to *Editor / Options* on the *Editor* toolbar. Select the *General* tab.

5. Enable the “*Use classic snapping*” option. Select *OK*.
6. Open the *Snapping Environment* window by going to *Editor /Snapping / Snapping Window...*
7. Specify the snapping environments for the *XS2DPanel_2* and *XS2D_PanelDivider_2* layers, as shown in Figure 14.

The order of the layers within the snapping environment interface determines the snapping priority. You can move the layers by selecting them and moving them up or down.

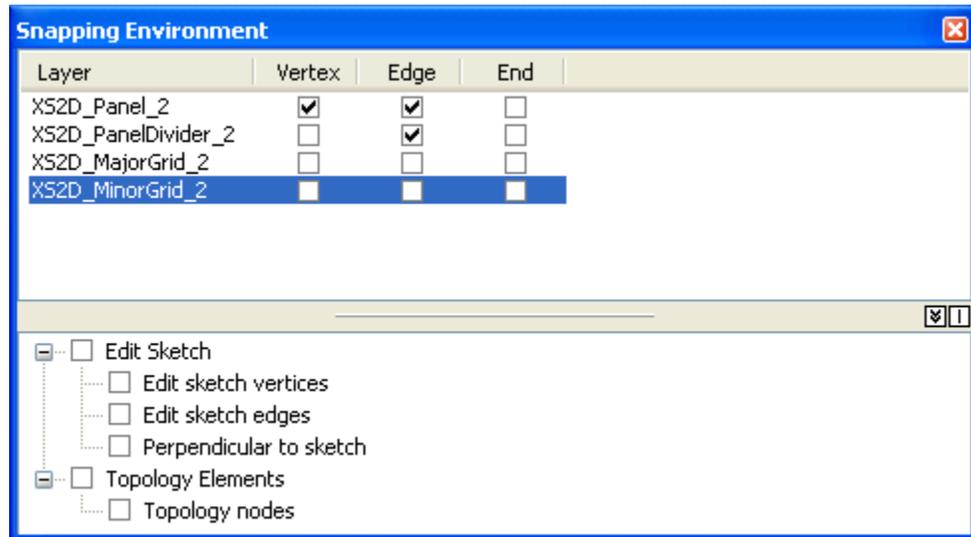


Figure 14 Snapping environment settings.

While editing you can enable Snap Tips that will show you the features to which your new features are being snapped.

8. If necessary, add the *Snapping* toolbar to your display. In the *Snapping* toolbar select *Snapping / Options*. Enable the Snap Tips as shown in Figure 15.

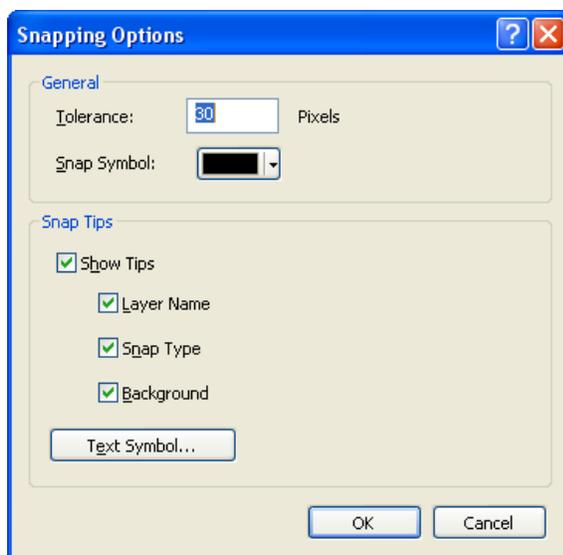


Figure 15 Snapping options settings.

6.3 Sketching panels

You can use any of the editing tools in ArcMap to sketch XS2D Panels.

First we will sketch the upper surficial aquifer unit.

1. If necessary, change from Layout to Data view.
2. At the bottom of the *Snapping Environment* window, select the *Create Features* tab  *Create Features*.
3. In the *Create Features | XS2D_Panel_2* template, select the feature symbology for HGUID = 1.

Notice that in the *Construction Tools* window you get a list of the available tools you can use for creating new panels (Figure 16).

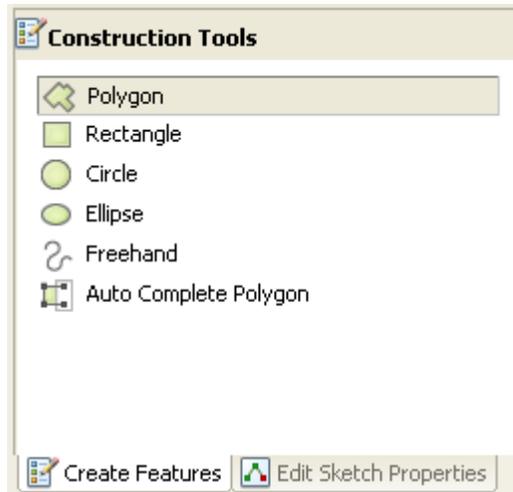


Figure 16 Construction tools available for sketching XS2D Panels.

4. Make sure the *Polygon* tool is selected.

Tip: while you are digitizing you can use the zoom and pan tools to focus on certain elements of the cross section.

5. Select the *Straight Segment* editing tool in the *Editor* menu .
6. Start tracing the panel of HGUID = 1.
7. Make sure to snap to the panel dividers on the right and left sides of the cross section.
8. Select *Finish Sketch*  to close the panel you digitized.

Your sketch should be similar to the one shown in Figure 17.

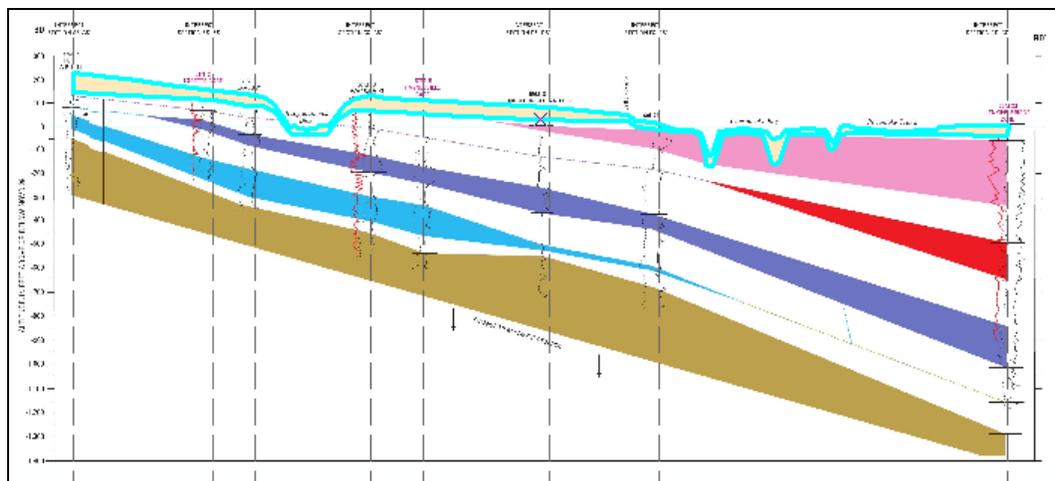
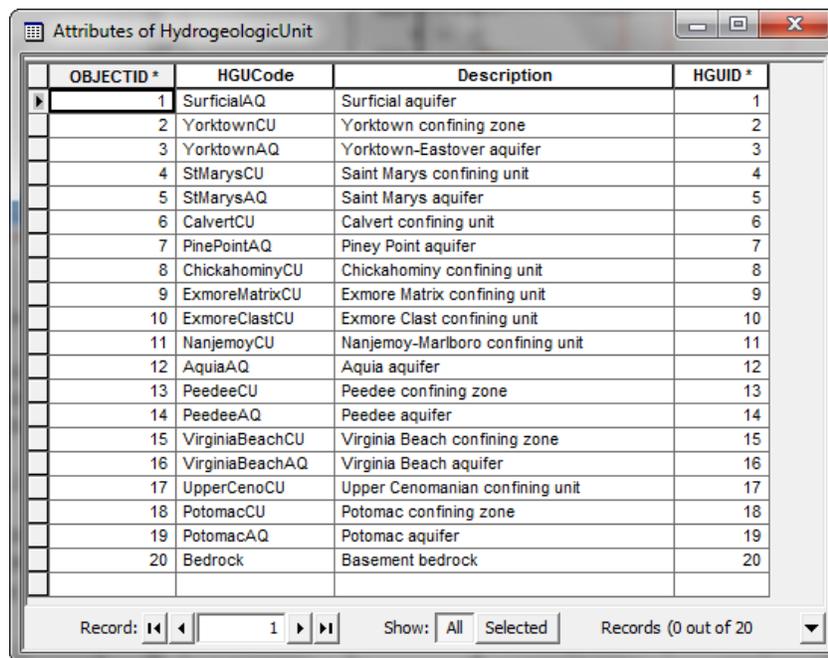


Figure 17 Sketch of the surficial aquifer (HGUID = 1).

Once you digitize panels, you can edit attributes. The HGUID values should be automatically assigned from the feature template created earlier. The HGUID values are based on a HydrogeologicUnit table. Figure 18 shows an example table with units of the Coastal Plain aquifer system.



OBJECTID *	HGUCode	Description	HGUID *
1	SurficialAQ	Surficial aquifer	1
2	YorktownCU	Yorktown confining zone	2
3	YorktownAQ	Yorktown-Eastover aquifer	3
4	StMarysCU	Saint Marys confining unit	4
5	StMarysAQ	Saint Marys aquifer	5
6	CalvertCU	Calvert confining unit	6
7	PinePointAQ	Piney Point aquifer	7
8	ChickahominyCU	Chickahominy confining unit	8
9	ExmoreMatrixCU	Exmore Matrix confining unit	9
10	ExmoreClastCU	Exmore Clast confining unit	10
11	NanjemoyCU	Nanjemoy-Marlboro confining unit	11
12	AquiaAQ	Aquia aquifer	12
13	PeedeeCU	Peedee confining zone	13
14	PeedeeAQ	Peedee aquifer	14
15	VirginiaBeachCU	Virginia Beach confining zone	15
16	VirginiaBeachAQ	Virginia Beach aquifer	16
17	UpperCenoCU	Upper Cenomanian confining unit	17
18	PotomacCU	Potomac confining zone	18
19	PotomacAQ	Potomac aquifer	19
20	Bedrock	Basement bedrock	20

Figure 18 HydrogeologicUnit table.

9. Use the *Edit* tool  in the editor toolbar to select the feature you just created.
10. Select the Attributes button on the *Editor* toolbar to open the Attributes window  (you can also right click with the feature selected and select the Attributes command).
11. In the Attributes window edit the following attributes:
 - Make sure a value of **1** is in the HGUID field. This value should be created automatically as you are using a template for editing.
 - Set the SectionID attribute to be equal to the HydroID of the section line (**SectionID = 2**).
12. After editing the attributes, close the attributes window, and save the edits by selecting the *Save Edits* option in the *Editor* menu  *Save Edits*.

Next, you will digitize the panel for the Yorktown confining unit (HGUID = 2):

13. Zoom to the right side of the cross section.
14. Select the HGUID = 2 symbology in the XS2D_Panel template.
15. In the Construction Tools window select the *Auto Complete Polygon* task, as shown in Figure 19.

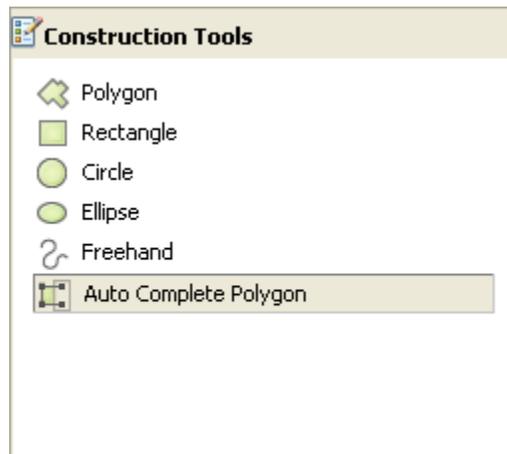


Figure 19 Selecting the Auto Complete Polygon Task in the Construction Tools window.

16. Use the *Straight Segment* tool , tool to sketch the panel.
17. Now we will begin sketching the Yorktown confining unit (symbolized as the white area between the yellow and pink units in the cross section image) by sketching from the bottom right corner of the surficial aquifer panel (make sure your sketch snapped to the panel corner). Sketch along the upper boundary of the Yorktown aquifer unit (symbolized in pink in the cross section image) until you reach the point where the confining unit interests the surficial aquifer panel, as shown in Figure 20. Make sure you snap to the surficial aquifer panel edge.

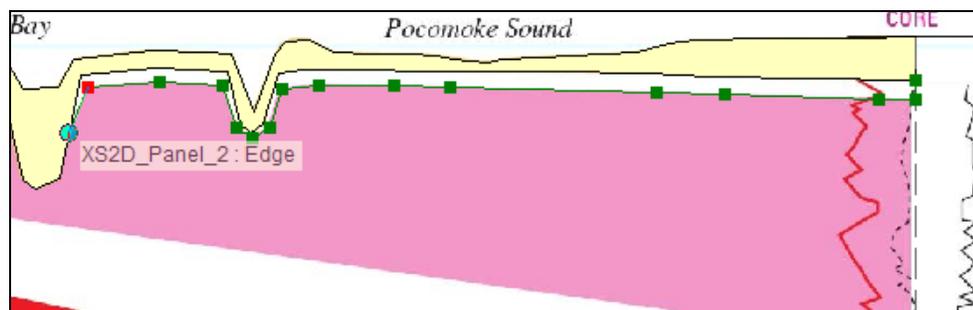


Figure 20 Sketching the Yorktown confining unit.

18. Select Finish Sketch  to close the panel you digitized (or press the F2 key). A new polygon representing HGUID = 2 should be created. The

polygon's upper boundary should match the boundary of the polygon representing HGUID = 1.

Your sketch should be similar to the one shown in Figure 21.

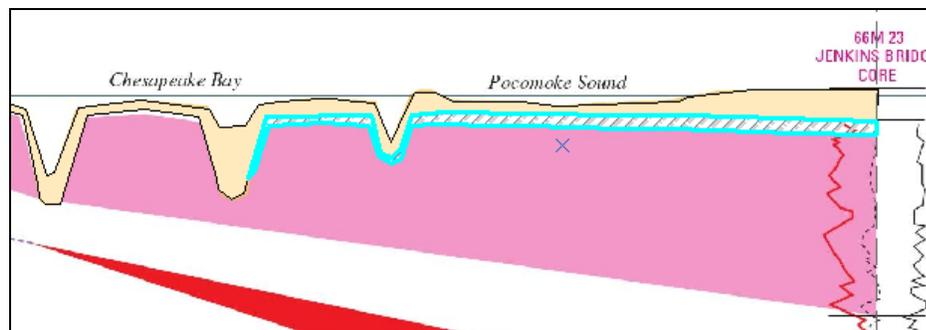
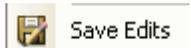


Figure 21 Cross section panel of the Yorktown confining unit (HGUID = 2) created using the Auto Complete Polygon task.

19. Use the *Edit* tool  in the editor toolbar to select the feature you just created. Select the *Attributes* button  to open the *Attributes* window. Edit the following attributes:

- Make sure a value of **2** is in the HGUID field. This value should be created automatically as you are using a template for editing.
- Set the SectionID attribute to be equal to the HydroID of the section line (**SectionID = 2**).

20. Save the edits by selecting the *Save Edits* option in the *Editor* menu



Notice that the Yorktown confining unit (HGUID = 2) is composed of a number of polygons. Repeat the process to create more panels representing the Yorktown confining unit. At the end of this process your cross section should have panel representations for units 1 and 2 as shown in Figure 22.

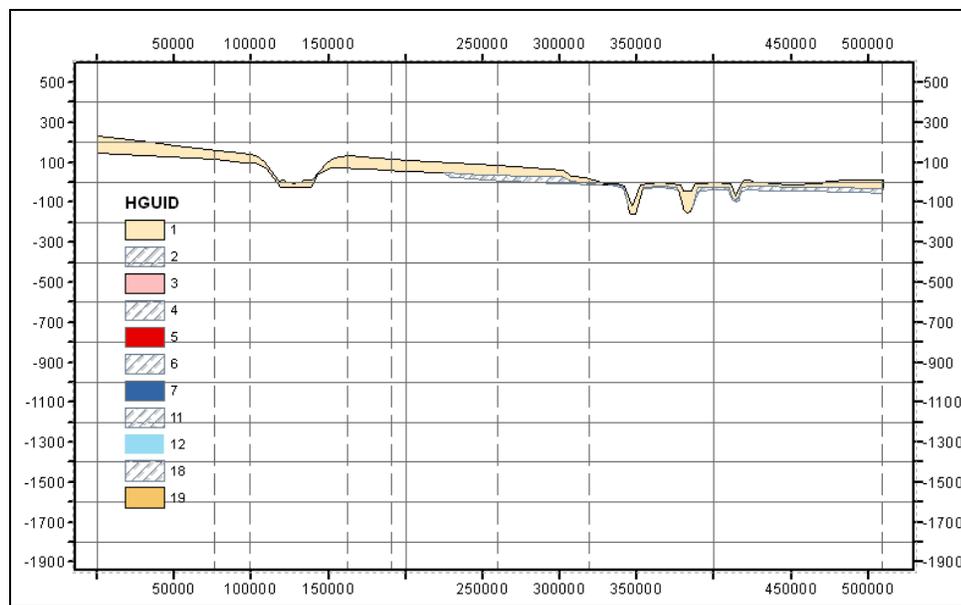


Figure 22 Panel features representing units 1 and 2.

You can repeat this process to digitize the rest of the hydrogeologic units. Or, to save time you can use a set of pre-defined panels in the *XS2D_Panel_2_solution* feature class located in the *xs2d_image.mdb\data* feature dataset. At the end of this process you will have a set of panels representing the units from the referenced image, as shown in Figure 23.

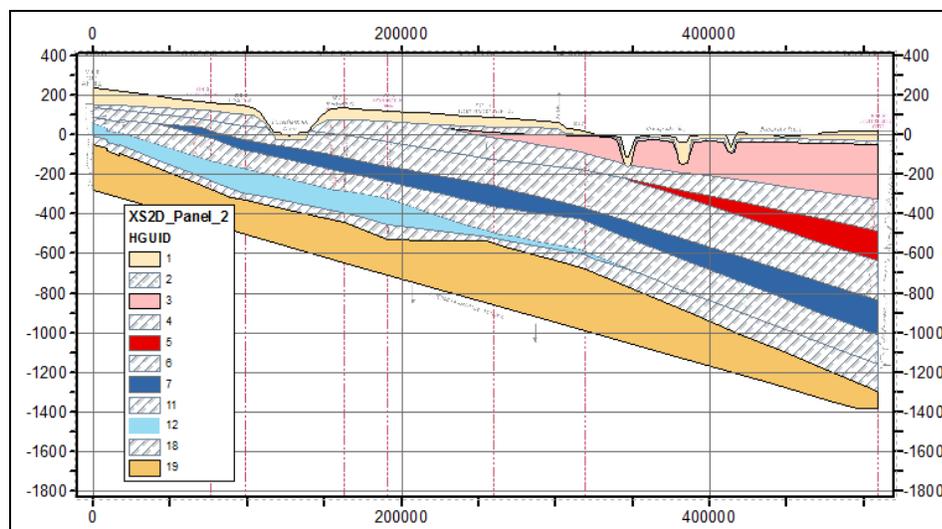


Figure 23 XS2D panel features representing units in a cross section.

6.4 Adjusting the symbology and display

If you use the solution file, *XS2D_Panel_2_solution*, you may also want to adjust the symbology of the panels to match the colors shown throughout this tutorial:

1. Use the Import option to import the symbology from the *XS2D_Panel.lyr* file located in the tutorial files folder.

2. Specify HGUID as the Value Key Field.

You should see a set of predefined symbols for the different hydrogeologic units.

7 Transforming 2D cross section to 3D GeoSections

Once the 2D cross sections are created, it is possible to transform them to 3D features (GeoSections) and visualize them in ArcScene. This part of the tutorial requires 3D Analyst.

First we will create the GeoSection feature class:

1. Activate the *Layers* data frame.
2. Open the **Create GeoSection Feature Class** tool, located in the *Subsurface Analyst / Features* toolset.
3. For the *Output GeoSection Features* browse to the *xs2d_image.mdb\Data* feature dataset and enter **GeoSection** as the feature class name (as shown in Figure 24).
4. Select *OK* to run the tool.

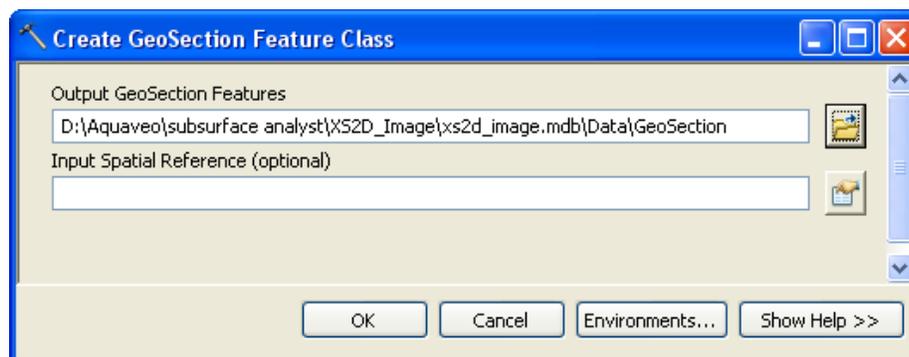


Figure 24 Settings for the Create GeoSection Feature Class tool

Next, we will create the GeoSection features by transforming 2D panels to 3D GeoSections:

5. Open the **Transform XS2D Panel To GeoSection** tool located in the *Subsurface Analyst / XS2D Editor* toolset.
6. Specify the **SectionLine** layer for the *Input Section Line Features*.
7. Specify the **XS2D_Catalog** table.
8. Select the **GeoSection** layer for the *Input GeoSection Features*.

At this point your tool settings should look as shown in Figure 25.

9. Select *OK* to run the tool.



Figure 25 Settings for the *XS2D_CrossSection To GeoSection* tool

We will use ArcScene to visualize the 3D GeoSections just created.

10. Launch ArcScene and open the *xs2d_image.sxd* file.
11. Add the GeoSection feature class you created to the scene using the *Add Data* tool .
12. You can symbolize the GeoSection layer by HGUID to better visualize the different units.

Your scene should be similar to the one shown in Figure 26.



Figure 26 Scene including the GeoSection features transformed from the 2D cross section.

You can also add a complete set of GeoSection features created for the BD-BD' cross section. The features are in the GeoSection_Solution feature class located in the *xs2d_image.mdb\Data* feature dataset.

8 Conclusion

This concludes the tutorial. Here are some of the key concepts in this tutorial:

- The Arc Hydro Groundwater data model includes XS2D feature classes that provide the framework for working with 2D cross sections in ArcMap.
- The Import XS2D Image Wizard is used to reference an existing cross section image, set up a new data frame, and create the basic XS2D feature classes.
- ArcGIS editing tools are used to help digitize cross sections based on the referenced image.
- 2D cross section panels can be transformed to 3D features and visualized in ArcScene.