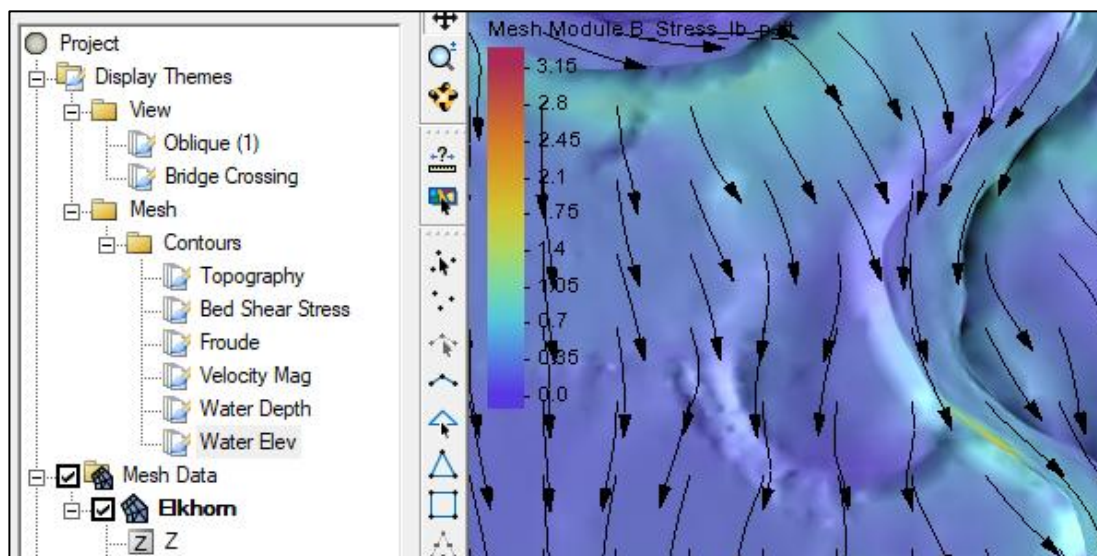




SMS 14.0 Tutorial

Display Themes

Using Display Themes in SMS

**Objectives**

Learn how to create and use display themes in SMS.

Prerequisite Tutorials

- None

Required Components

- SMS Core
- SRH-2D Model & Interface

Time

- 10–20 minutes

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1 Introduction

SMS has many display options. Display options are used to change how data appears without actually changing the data. Examples of this include:

- The contour options applied for visualizing spatially variable data (datasets).
- The view direction and zoom level.
- The color and style of entities such as feature points, arcs, and polygons.

Display themes are a way to save the current display options so that the user can quickly return to them again. This tutorial will show how to create a theme for mesh contours and then save it so it can be loaded later. It will also demonstrate the use of view themes.

This tutorial makes use of an SRH-2D model for a portion of the Elkhorn River near Fremont, Nebraska. The model has already been set up and the solution data generated. Display themes will be used to review the solution data.

To open the project:

1. Select *File* | **Open...** to bring up the *Open* dialog.
2. Select "All Files (*.*)" from the *Files of type* drop-down.
3. Browse to the *Display_Themes\data files* folder and select "Elkhorn.sms".
4. Click **Open** to import the project and exit the *Open* dialog.

The initial SMS project should appear similar to Figure 1. If nothing is visible in the Graphics Window, make sure that  "Elkhorn" is turned on.

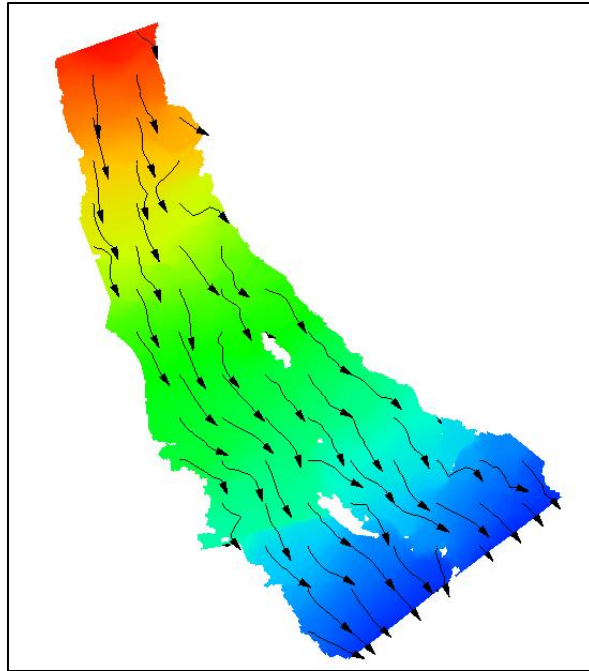


Figure 1 Initial project for the Elkhorn River in Nebraska

2 Selecting a Color Ramp

For this tutorial, we want to show water surface using the FHWA defined water surface color palette. To do this:

1. Select *Display* | **Display Options...** to bring up the *Display Options* dialog.
2. Select *2D Mesh* from the list on the left.
3. Select the *Contours* tab.
4. Click the **Color Ramp...** button to open the *Choose color ramp* dialog.
5. Expand the *FHWA* folder if it is not already open.
6. Select the *Water Surface* color ramp (or palette).
7. Click **OK** to close the *Color Ramp Options* dialog.
8. Click **OK** to close the *Display Options* dialog.

The project should appear similar to Figure 2.

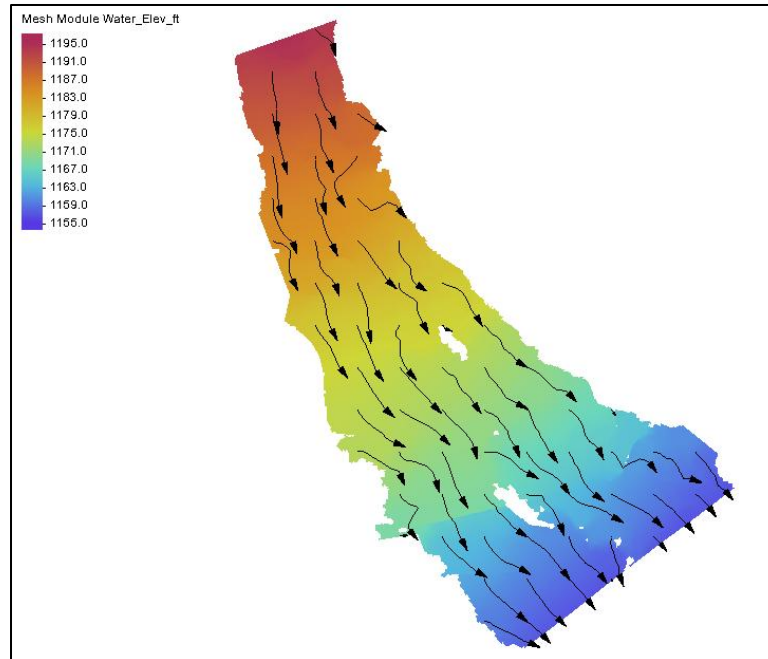


Figure 2 Project with FHWA water surface color ramp

3 Creating a New Display Theme

To create a new display theme, do the following:

1. In a blank area of the Project Explorer, right-click and select the **New Display Theme...** command to open the *Display Theme Properties* dialog.
2. Turn off the *Auto name* option.
3. For the *Name* enter "Water Elev".
4. Check on *Load this theme when objects with the following names are selected in the Project Explorer*.

This will allow entering a name that will associate the display theme with a particular dataset or object name in the Project Explorer.

5. In line 1 of the table, enter "Water_Elev_ft".
6. In the *Type* section, make sure *Contours* is selected and the *Module* is set to "Mesh".
7. Click **OK** to close the *Display Theme Properties* dialog.

A display theme, "Water Elev" will appear in the Project Explorer. This theme contains the contour settings that were active when the theme was created.

4 Using a Display Theme

Once a display theme has been created, it can be applied to change the display options back to what they were when the display theme was created. In order to see how this works, start with changing the display.

1. Select *Display* | **Display Options...** to bring up the *Display Options* dialog.
2. Select *2D Mesh* from the list on the left.
3. Select the *Contours* tab.
4. Click the **Color Ramp...** button to open the *Choose color ramp* dialog.
5. Select the “Hue 1” color palette in the *Aquaveo* folder.
6. Click **OK** to close the *Color Ramp Options* dialog.
7. Click **OK** to close the *Display Options* dialog.

The display should change back to appear similar to Figure 1.

Now that the display has been changed, it can be changed back to the previous display setting by using a display theme. To activate the display theme, do the following:

8. Select the “ Water Elev” display theme in the Project Explorer.

The display options have returned to what they were in Figure 2.

9. Repeat steps 1–6 above to change back to the hue ramp.
10. Select the “ Water_Elev_ft” dataset.

The display theme was applied because it is associated with the dataset name and the contours have returned to what they were in Figure 2.

5 Using Previously Defined Display Themes

For working with a standard project, it can be useful to have a set of contour display themes for the standard outputs of a numerical engine. These themes can be saved to a file and imported into SMS.

Starting with SMS 13.4, the contour display themes apply to specific geometry type (mesh, scatter set, Ugrid), so the saved themes should match the geometry type for the numerical engine.

To import an existing display theme, do the following:

1. Select *File* | **Open...** to bring up the *Open* dialog.
2. Browse to the *Display_Themes\data files* folder and select “FHWA_Contour_Themes.xdt”.
3. Click **Open** to import the project and exit the *Open* dialog.

A message will appear indicating that the themes being read include a collision with the theme created in the previous section.

4. Select **Replace existing** to use the theme from the file.

Notice that several more display themes have been added to the project in the Project Explorer.

5. Select each dataset in the “ Q100” simulation “ Solution” folder.

The theme file includes a theme associated with each named dataset.

6 Editing a Display Theme

It may be desirable to edit a display theme. In this example, the “ Water_Depth_ft” dataset has an approximate range of -30 to 15 because of the initial condition that was used in the simulation. The low minimum value means the contour colors are not as contrasting as they could be. To edit the display theme to correct this:

1. Select the “ Water_Depth_ft” dataset.
2. Select *Display* | **Display Options...** to bring up the *Display Options* dialog.
3. Select *2D Mesh* from the list on the left.
4. Select the *Contours* tab.
5. Turn on the *Specify a range* option and set the range to 0.0–15.0.
6. Click **OK** to close the *Display Options* dialog.

The display should appear similar to Figure 3.

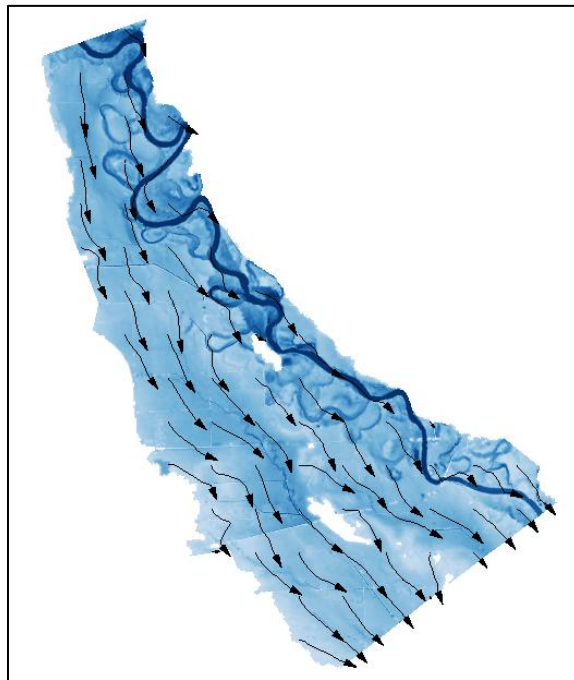


Figure 3 The new depth display contour options

Now, to update the “ Water Depth” display theme with these display options:

6. Right-click on the “ Water Depth” theme and select **Update With Current Display**.

The “ Water Depth” display theme has now been edited to use the new display settings. Selecting a different dataset and then going back to the “ Water Depth” display theme will show that the display theme has been changed.

7 Display Themes for Views

SMS allows creating display themes that set the display to a specific view. Two examples will be given in this tutorial: a rotated view and a specific view of a location.

7.1 Display Theme for a Rotated View

To create a display theme for a rotated view, complete the following:

1. In the “ Elkhorn” mesh folder, select the “ Z” dataset.
2. Using the **Rotate**  tool, click on the bottom of the Graphics Window and drag up towards the top to rotate the display to be similar to Figure 4.

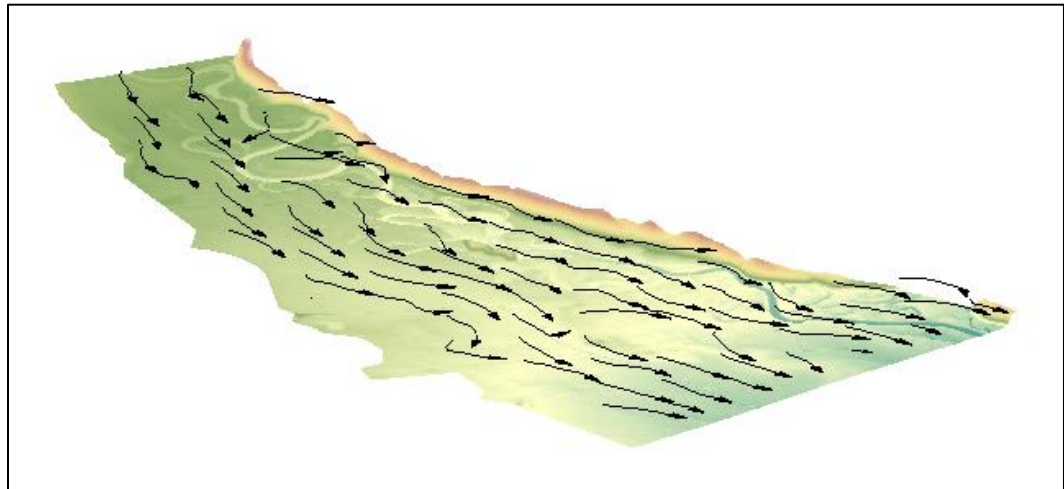


Figure 4 Rotated view

3. In a blank area of the Project Explorer, right-click and select the **New Display Theme...** command to open the *Display Theme Properties* dialog.
4. Turn off the *Auto name* option.
5. For the *Name* enter “Oblique (1)”.
6. In the *Type* section, turn on the “View” option.
7. Click **OK** to close the *Display Theme Properties* dialog.

Notice the new “ Oblique (1)” display theme under the “ View” folder. A display theme for the rotated view has been created.

8. To demonstrate the function of this theme, click the **Plan View**  macro icon to reset the view.
9. Click the “ Oblique (1)” display theme to see that the display theme has been saved.

7.2 Display Theme for a Zoomed View

A display can also be set for a specific window range and location. In this case, a display theme will be made of the view of the river crossing on the lower portion of the reach. To see this, do the following:

1. Right-click on “ Oblique (1)” and select **Duplicate**.
2. Right-click on “ Oblique (2)” and select **Rename**.
3. Enter “Bridge Crossing” for the name and press *Enter* when done.
4. Select *Display | View | View Options...* to bring up the *Display Options* dialog in the *View* tab. (Note: *Shift+V* will do the same thing.)
5. Under *View angle*, set the *Bearing* to “52.5” and set the *Dip* to “33.5”.
6. Under *Looking at point*, set the *X* to “2636625.0”, *Y* to “607361.0”, and *Z* to “1155.0”.
7. Under *Defined view bounds size*, set *Width* to “3015.0”.
8. Click on the **Lighting** tab.
9. Toggle on the **Enable lights** option to add shadow highlighting to the view.
10. Click **OK** to close the *Display Options* dialog.

The Graphics Window should be similar Figure 5.

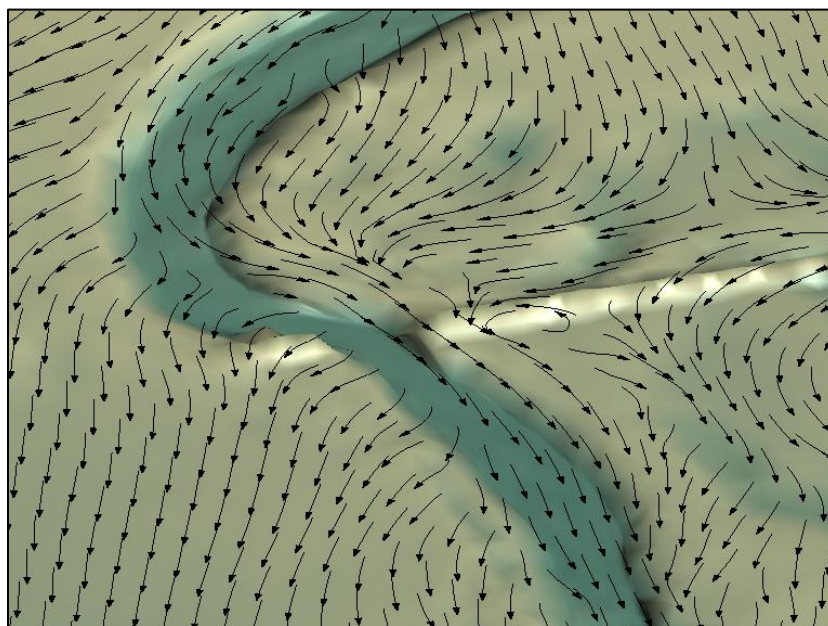


Figure 5 River crossing view

With the view of the river crossing defined, the display theme can be created.

11. Right-click on “ Bridge Crossing” and select **Update with Current Display**.

To see the updated display theme, do the following:

12. Select the “ Oblique (1)” display theme to change back to the rotated view.
13. Select the “ Bridge Crossing” display theme to return to the view of the river crossing.

Note that the lighting setting is preserved across both views.

8 Saving a Display Theme

Display themes are saved with the project file. However, display themes can also be exported into a separate file for use in other projects. (This was illustrated above when the theme file was imported.) To export the display themes, do the following:

1. Right-click on “ Display Themes” folder and select the **Export...** command to open the *Output Display Themes* dialog.
2. For the *File name*, enter “elkhorn_display_themes”.
3. Click **Save** to export the display theme file and close the *Output Display Themes* dialog.

9 Deleting a Display Theme

If a display theme is no longer wanted, it can be deleted. To illustrate this:

1. Right-click on the “ Bridge Crossing” display theme and select **Delete**.
2. In the warning dialog that appears, select **Yes** to confirm the deletion.

The “ Bridge Crossing” display theme is no longer listed among the available display themes.

10 Organizing Display Themes

It is possible for a project to have a large number of display themes. Therefore, SMS organizes themes by default into folders based on the display theme type. SMS also allows for creating custom folders to organize display themes in the Project Explorer. This works using right click commands to create a folder just as when organizing datasets. Starting with SMS 13.4, the use of folders is also available for meshes and simulations.

11 Conclusion

This concludes the “Display Themes” tutorial. The following key concepts were discussed and demonstrated:

- Using display themes
- Creating display themes
- Editing display themes
- Saving and deleting display themes
- Organizing display themes

Continue exploring display themes in SMS or exit the program.