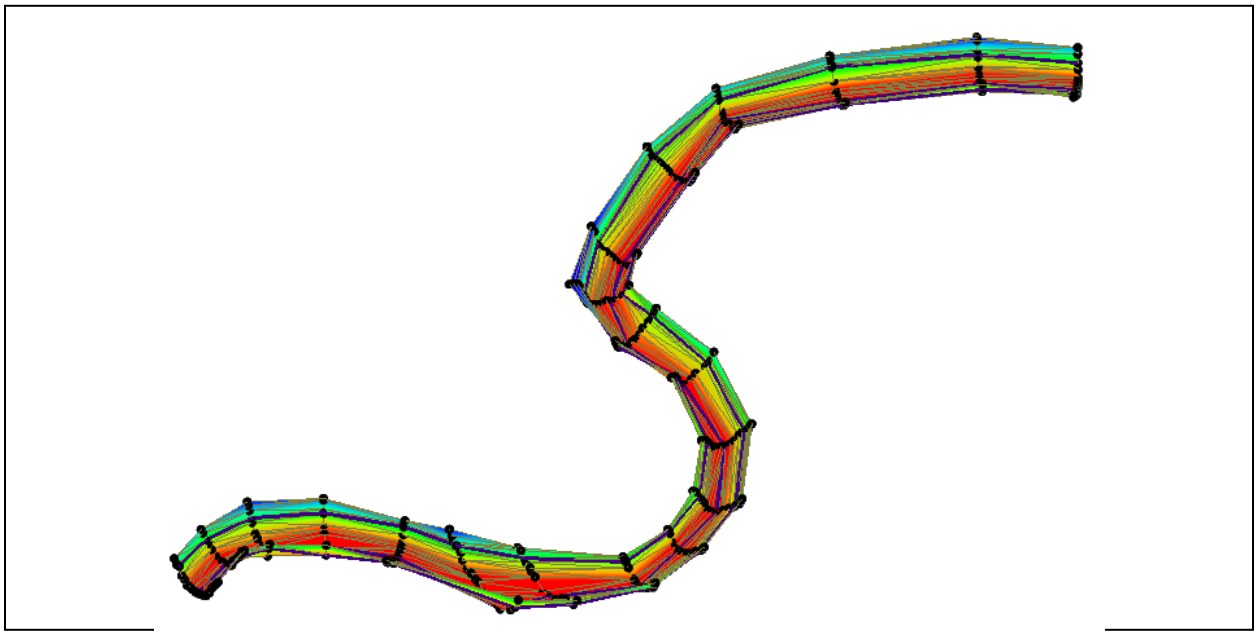
SMS

v. 13.0

SMS 13.0 Tutorial

Scatter Data – Breaklines



Objectives

How to use the scatter module in SMS to add breaklines to a scatter dataset in order to control the shape of the surface.

Prerequisites

- SMS Overview
- Scatter Data Import
- Scatter Data Extents

Requirements

- Scatter Module
- Map Module

Time

- 10–15 minutes

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1 Introduction

When scatter data is triangulated into a TIN, it doesn't always preserve some features of the data. To resolve this issue, breaklines can be added to help the scatter set better conform to the surface. Breaklines are a series of edges to which the scatter data should conform.

This tutorial will demonstrate how to add breaklines to an existing scatter set in SMS in order to define the talweg and bank toes of a channel.

2 Load Starting Project

A set of scatter data consisting of cross sections across a river provides the basis for this tutorial. Open the SMS project which includes the data by doing the following:

1. Select *File* | **Open…** to bring up the *Open* dialog.
2. Browse to the *data files* folder for this tutorial.
3. Select "ScatterBreaklines.sms" and click **Open**.

This opens the project which includes the scatter set named "  xs". The points in the cross section were previously triangulated to define a TIN. The project should appear similar to Figure 1.

In this scatter set, the contour colors have been defined so that the warm colors represent the lowest elevations of the channel. Notice that the triangles defined for the TIN don't connect the warm colors from one cross section to the next in all cases. This means that the channel thalweg is not preserved through the TIN.

Figure 1 Imported scatter set

3 Adding Breaklines

Since the channel thalweg is not preserved through the TIN, adjustments should be made before using the data in a project.

While SMS includes a **Swap Edge** tool that allows individual edges to be swapped to manually edit the surface, this method is labor intensive and cannot be standardized, repeated or preserved. Using breaklines to edit the surface is more efficient. The breakline approach allows linear features such as the bottom of the channel, a toe of a slope or the edge of an embankment to be defined and then enforced into the triangulation.

3.1 Thalweg Breakline

To create a breakline along the thalweg or lowest point of the channel, do the following:

1. **Zoom** into the lower section of the channel as shown in Figure 2.

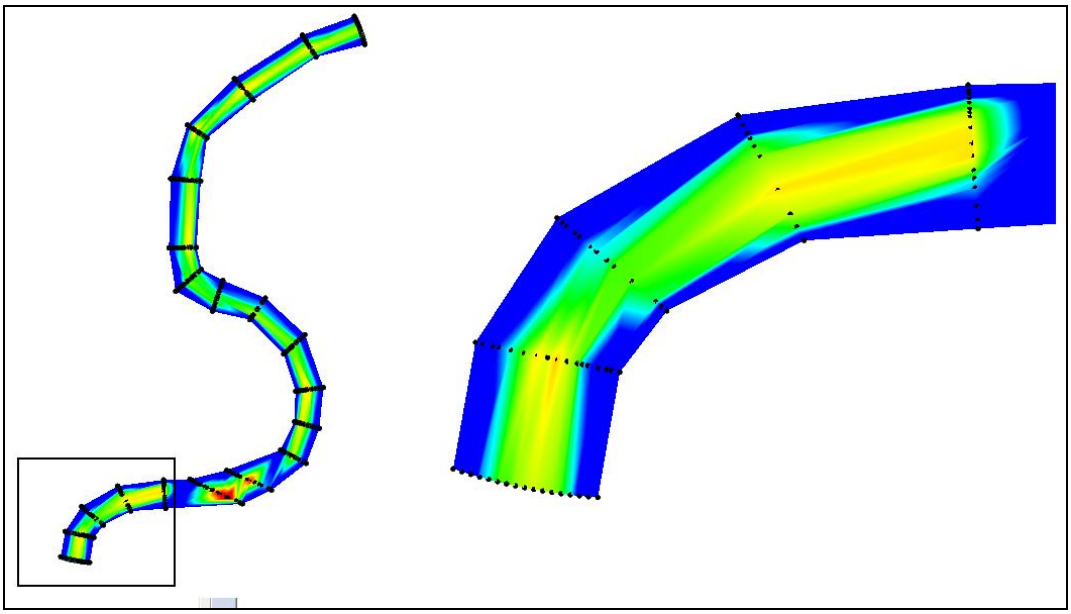

Figure 2 Zoomed view to lower section of the channel

2. Select the **Create Breakline** tool to activate it.
3. Click on the lowest point (warmest color) on the bottom cross section, then click on the lowest point on each of the next four cross sections.

The breakline will appear as shown in Figure 3

Note: the contours have been set to be partially transparent so that the breakline will be visible even when it goes behind a triangle.

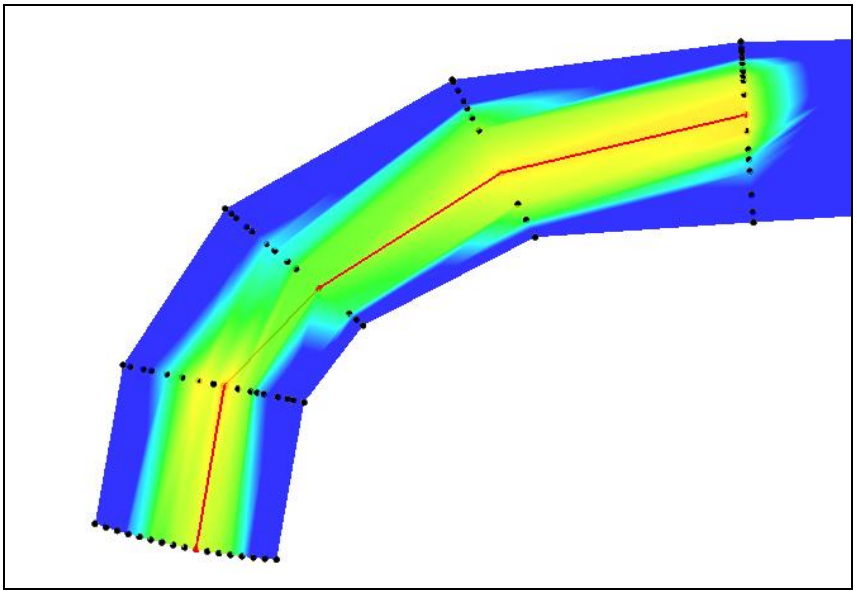

Figure 3 Creation of a thalweg breakline.

4. Hold down the mouse wheel and **Pan** the view to the left so that the next cross sections on the channel become visible (this is further down stream).

5. Continue clicking on the lowest point of each cross section while panning through the remaining poriton of the TIN.
6. After selecting the lowest point on the last cross section, press the *Enter* key to terminate the breakline.
7. Select the *Breaklines* | **Force Breaklines** command to force the breakline into the TIN.

The result should appear as shown in Figure 4

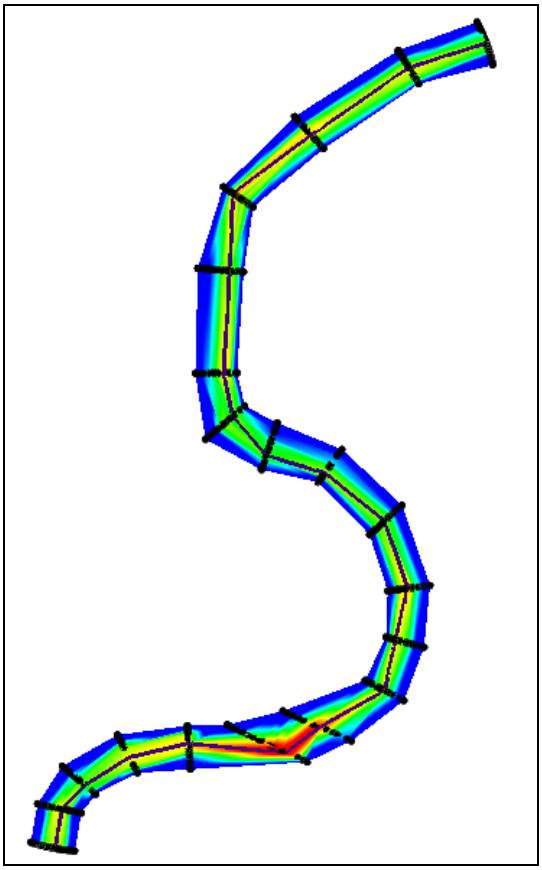

Figure 4 Forced thalweg breakline

3.2 Bank Toe Breakline

The edges of this set of cross sections represent the shoulder of the channel bank. The jagged shape of the light blue or cyan contour indicates an inconsistent triangulation of the toes of the channel. Breaklines along the bank toes can further define the channel,

To define breaklines along the toes, do the following:

1. **Zoom** into the lower section of the channel as shown in Figure 2.
2. Using the **Create Breakline** tool, click on the right light blue/cyan contour color on the bottom cross section, then click on the lower toe of the channel (light blue contour) at each of the of the next four cross sections as in Figure 5.

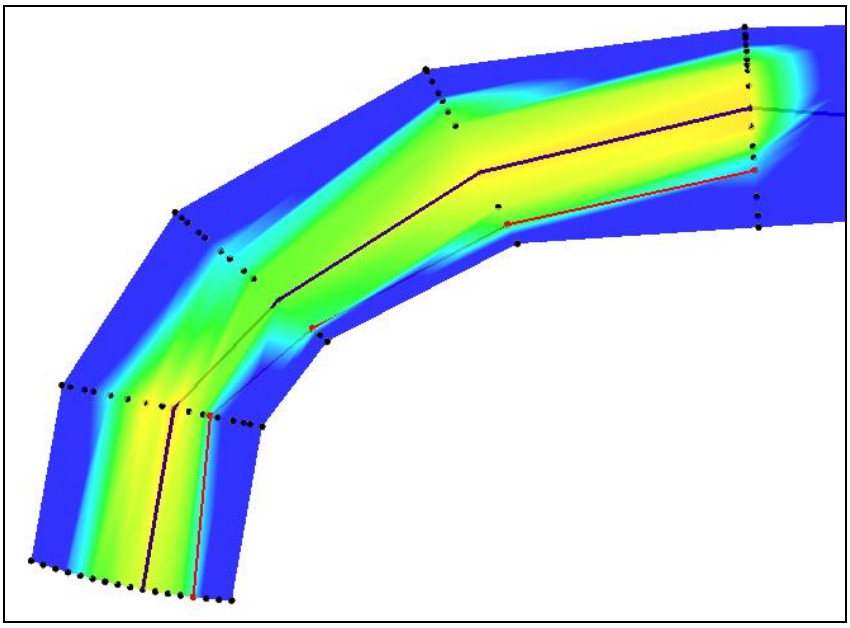

Figure 5 Creating the right bank toe

3. Hold down the mouse wheel and **Pan** the view to the left so that the next cross sections on the channel become visible.
4. Continue clicking on the right toe point of each cross section while panning through the remaining poriton of the TIN.
5. After right toe point on the last cross section, press the *Enter* key to terminate the breakline.
6. Select the *Breaklines* | **Force Breaklines** command to force the breakline into the TIN.
7. Repeat steps 1–6 above for the left bank toe.

After defining the two breaklines and forcing the breaklines into the TIN as described in the previous section, the channel should appear as shown in Figure 6.

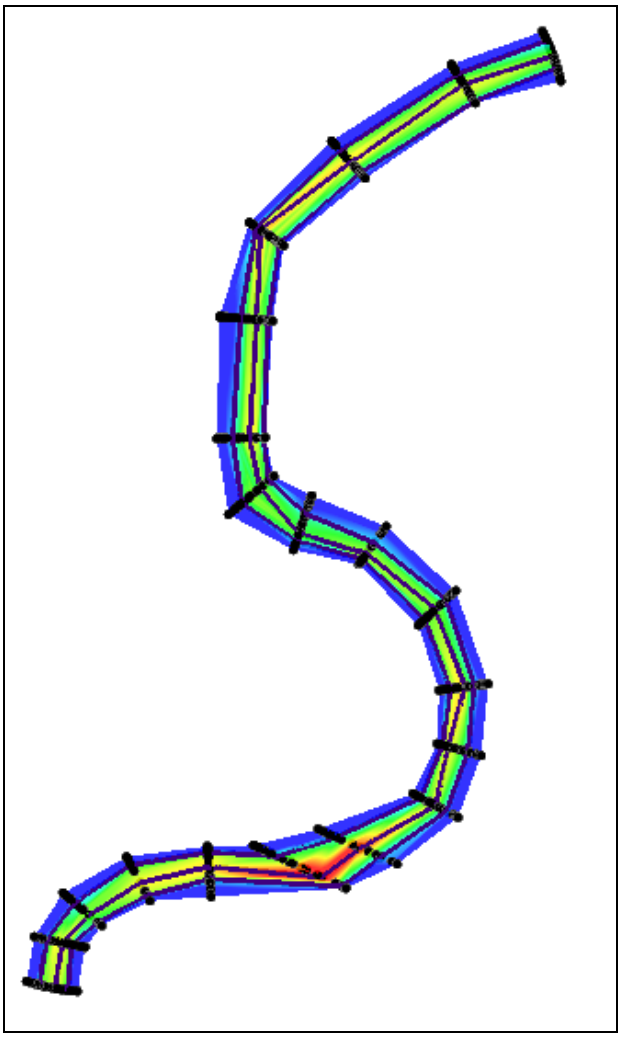

Figure 6 Scatter Set with three breaklines

Rotating the view into an oblique view and panning along the channel allows for further evaluation of the TIN that is representing the channel. Refer to the "Data Visualization" tutorial for instructions on how to do that.

4 Conclusion

This concludes the "Scatter Breaklines" tutorial. It has shown how to sculpt the shape of a TIN using breaklines. Continue to experiment with adding breaklines or exit the program.