

Read Me:

Model Name: TC-04_Yen&Lee_Sediment_7Across_Test_Case

Objective: Use EFDC+ Explorer (EE) and EFDC+ to simulate the test case described in the journal paper "Bed Topography and Sediment Sorting in Channel Bend with Unsteady Flow."

There are five runs (Run 1 to Run 5) corresponding to five different hydrographs of experiments in the journal paper. However, we use EEMS to replicate Run 1 for this test case.

The measured data, which is extracted from Figure 2 (a) of the article provided in the data folder, can be used to compare sediment deposition from laboratory experiments (Yen & Lee, 1995) with the Engelund & Hansen and Van Rijn option in the EFDC+ sediment model.

Model Grid: According to the size of the laboratory channel bend described in the article, an EFDC model grid is generated as 301 horizontal grid cells.

Layer: The model is configured with four vertical water column layers.

Sediment Layer: The sediment model is configured with eight sediment layers.

Model Boundaries: The model has two boundaries: Upstream and Downstream. Their locations are shown in Figure 1. The Upstream boundary is configured with a flow time series extracted from Run 1 in the article's Figure 1 (Hydrographs of Experiment), as shown in Figure 2. A rating curve is used for the Downstream boundary, as shown in Figure 3.

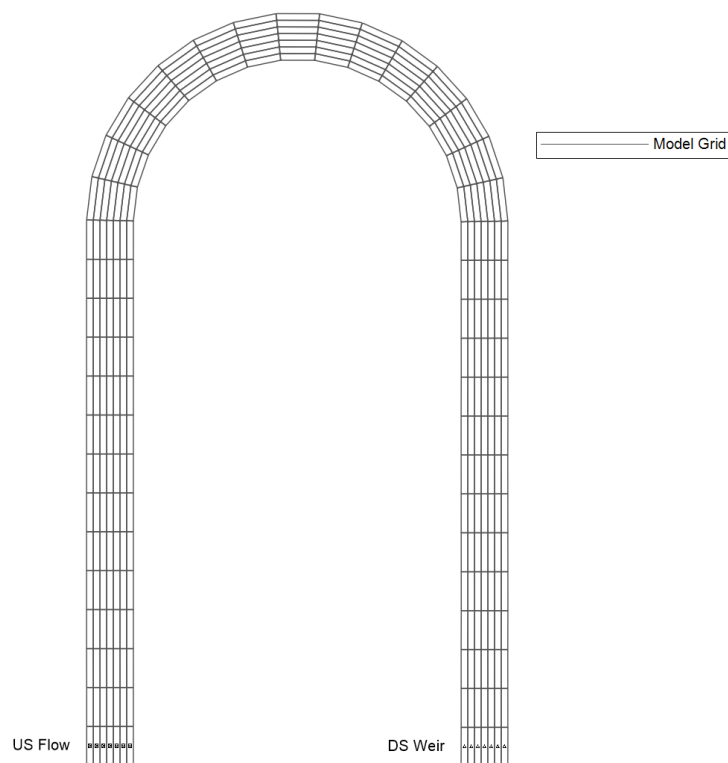


Figure 1 Model Grid and Boundaries

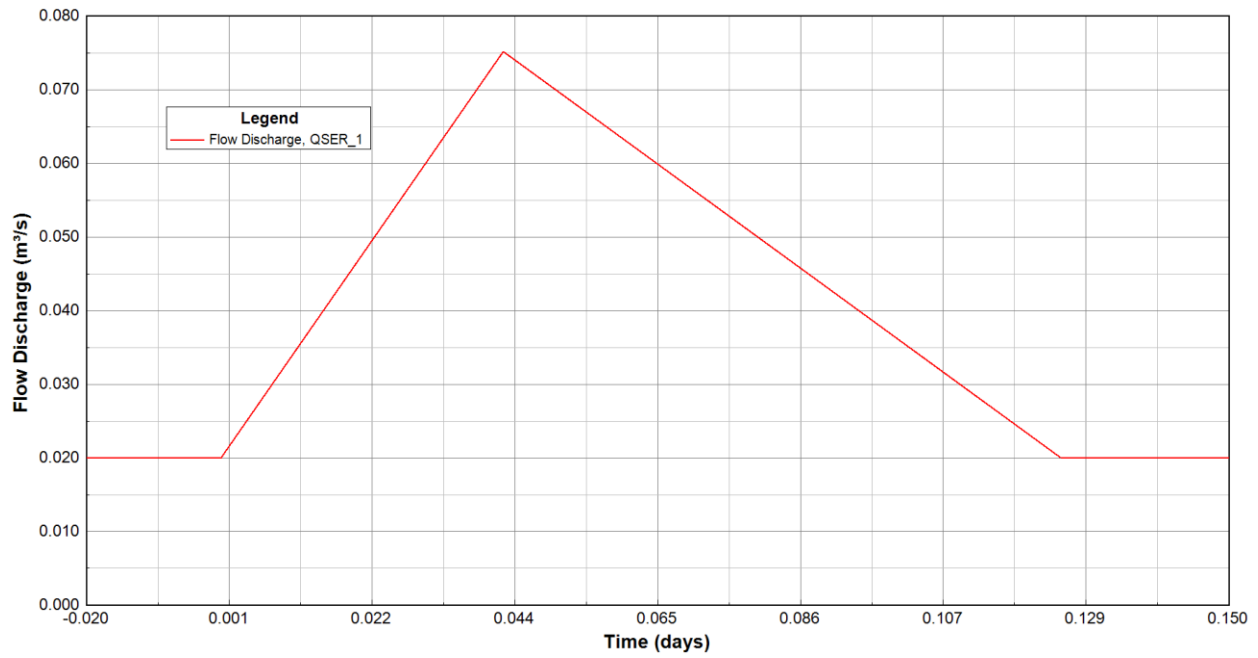


Figure 2 Flow Time Series of Upstream Boundary

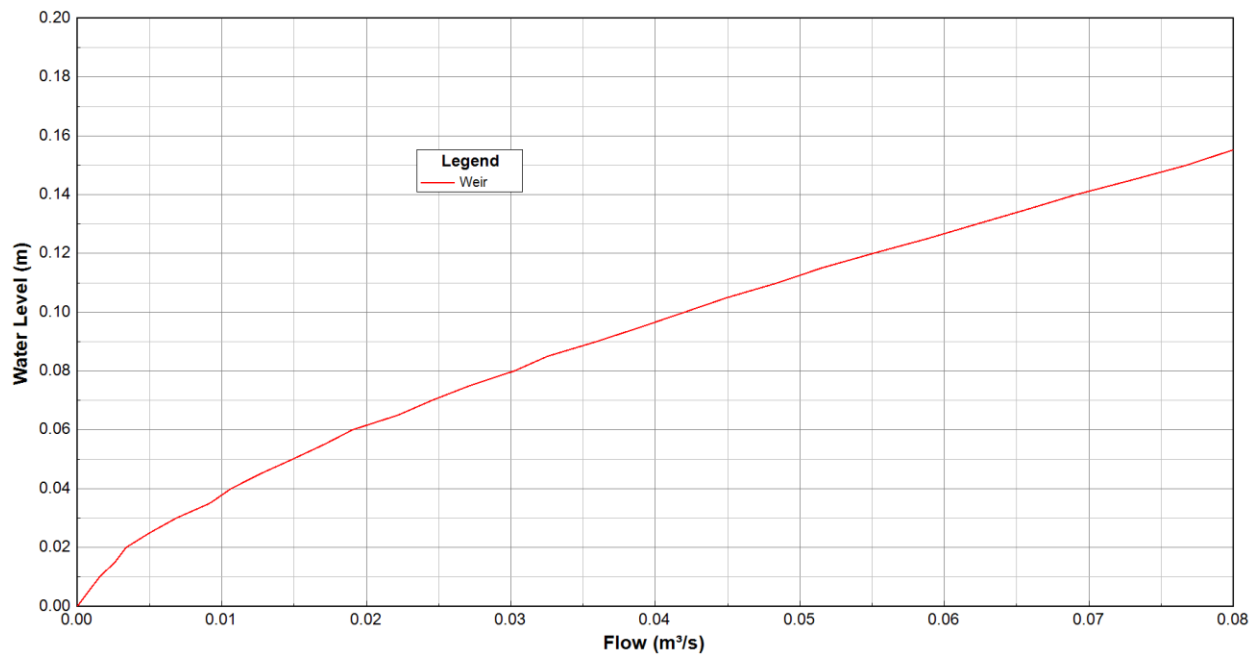


Figure 3 Rating Curve of Downstream Boundary

Folder Structure:**Article**

1. Yen_Lee_1995.pdf: The paper of authors which is referenced to build an EFDC model

Data

1. Contours of Bed Topography_Run 1.p2d: Contours extracted from Figure 2(a) of the paper
2. Model Outline.p2d: Outline of the model domain

Map-Images

1. Scour Results-Run 1.gif: Image of contours of bed deformation for Run 1 (captured from Figure 2(a) of the paper.
2. Scour Results-Run 1.geo: Geo-reference file to display contours of bed deformation for Run 1.

Models

1. HydroOnly: This is a base model with an activated hydrodynamics module.
2. Engelund-Hansen: This is a sediment model with the Engelund & Hansen option in the EFDC+ sediment model. It is built based on the HydroOnly.
3. Van-Rijn: This is a sediment model with the Van-Rijn option in the EFDC+ sediment model. It is built based on the HydroOnly.

Disclaimer: The model is provided to our users to demonstrate that EFDC_Explorer and EFDC+ can be used to understand better how to build this kind of model. The model is running as expected; however, it should not be considered final, as the model can be modified/refined to obtain improved results.

Citation for the paper:

Yen, C. and Lee, K. (1995). "Bed Topography and Sediment Sorting in Channel Bend with Unsteady Flow." *Journal of Hydraulic Engineering*, 10.1061/(ASCE)0733-9429(1995)121:8(591), 591-599.