

CE 3372 – Water Systems Design
Exercise Set 19

Exercises

1. Water flows at a steady rate of $192 \text{ ft}^3/\text{s}$ through a concrete-lined rectangular channel 16 ft wide as depicted in Figure 1. The water enters the 0.35% sloped channel ($S_0 = 0.0035$) at location 1 and is flowing at 110% normal depth ($1.1 \times y_n$). The water exits over a 3-foot tall weir (assume sharp-crest weir) at location 2.

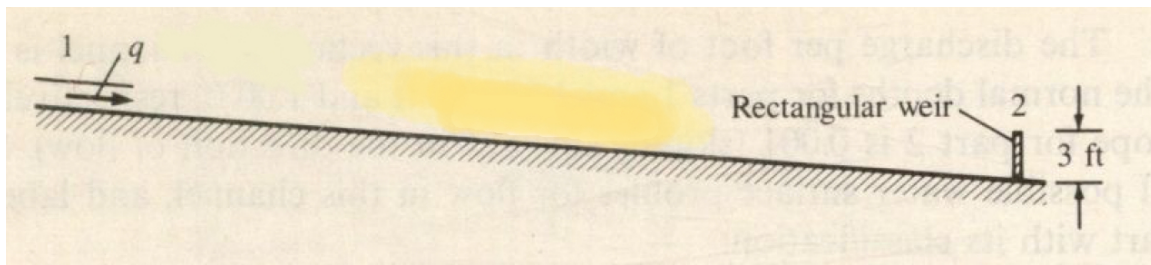


Figure 1: Profile of concrete-lined rectangular channel.

Use SWMM to repeat the exercise where you computed the backwater curve by hand (spreadsheet). The problem set-up is repeated above. Use the average Δx from your prior solution as the spatial step in SWMM to use.

- a) Make your SWMM model have conduits that are the average Δx from ES-19.
- b) Set the **FIXED** outfall boundary condition as the pool elevation you determined in ES-19.
- c) Run the SWMM model using **DYNAMIC WAVE** routing.
- d) Include a screen capture of your SWMM model showing the computed water-surface-profile.
- e) Export the water surface profile from SWMM and demonstrate that the computed profile in SWMM and in ES-19 (by-hand) are essentially the same.