Assignment 8

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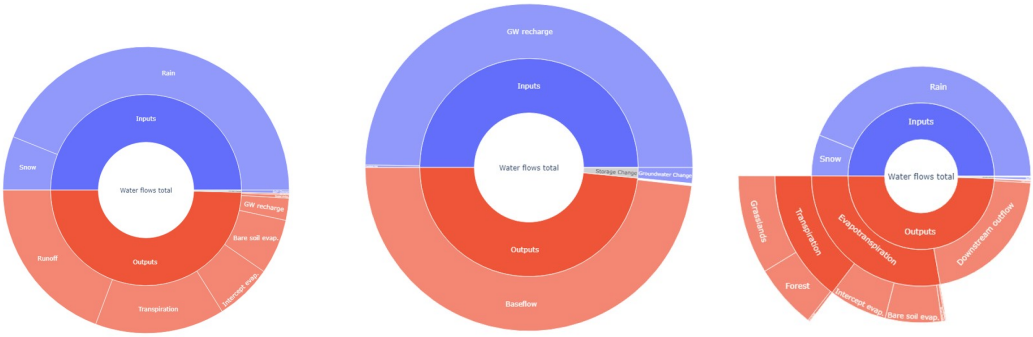
Simulation period:
- Spin up: 1/1/1999 - 1/1/2004
- Simulation period: 1/1/2004 - 31/12/2006

Gauging station coordinates:
- 6.25 51.75
- 7.75 49.75

1 Plots for water balance



(a) Soil (b) Groundwater (c) The whole system

Figure 1: Water balance circle graphs for the Rhine basin: blue is water input to the system, red is water output

Reflection segment:
1) From the three circle graphs, the water balance is closed with a storage change. More specifically, the storage change is positive meaning that there is more water input than output.

2) Major water components:
- Input: Rain and Snow
- Output: Runoff, Transpiration, Evaporation, GW recharge, and interception evaporation

2 Hydrographs for Manning understanding

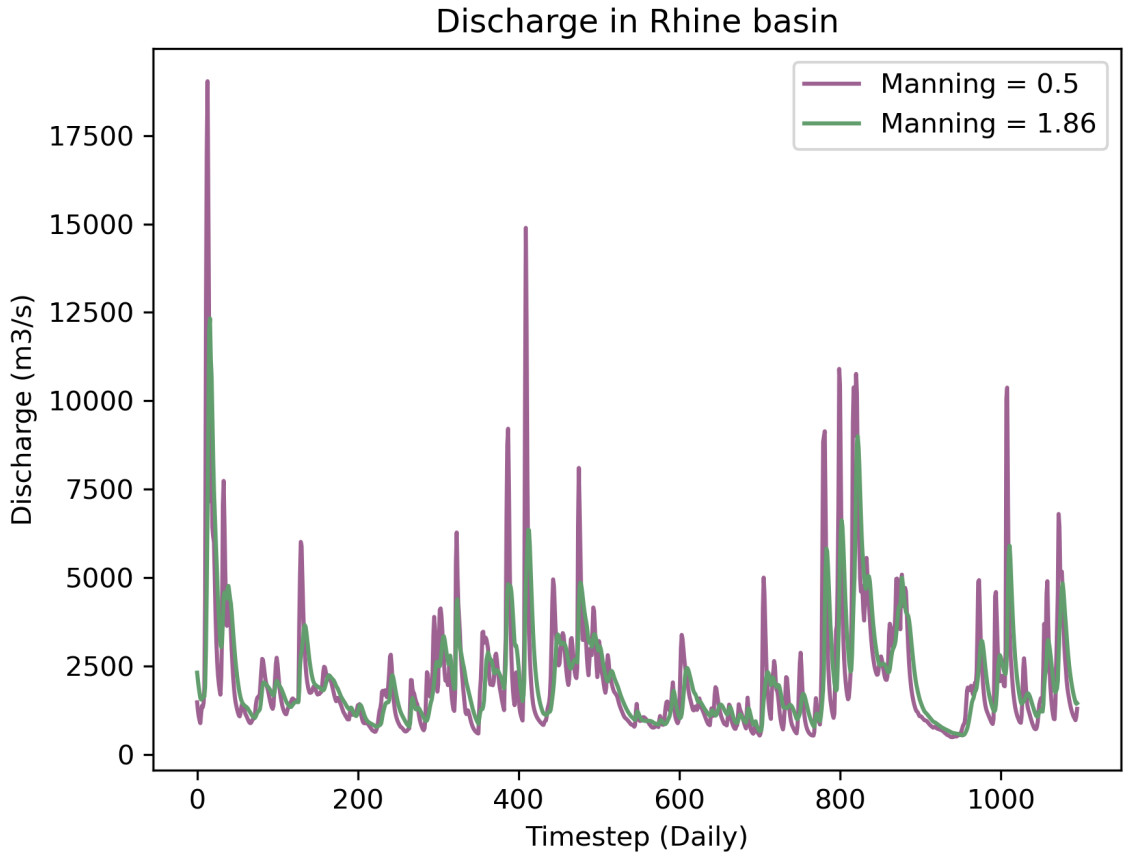


Figure 2: Hydrographs for the same gauge = 6.25, 51.75; comparing two different manning coefficient of roughness (0.5 and 1.86)

Reflection segment:
Manning's roughness coefficient is a coefficient to measure roughly how rough is the surface and in turn will affect how the water flows–as in velocity. This coefficient is impacted by the streamflow in the gauging station, the harder the flow for water–some causes can be by tree roots, large stones, and woody surface–the later it is for the peak discharge, and lower volumes of water. Although it is barely visible, the discharge peaks for 1.86 is delayed a little bit after the 0.5, and generally there are smaller peaks.

3 Additional info

Additional information and the code provided can be found on my Github account.

Github