

Principles of Hydrologic Modeling

Preparation

These are instructions to get prepared for the short course on “Principles of Hydrologic Modeling.”

Task 1: Install the hydrologic modeling framework RAVEN

During the course we will use the hydrologic modeling framework RAVEN. This is the instructions to setup and test that your RAVEN executable is running on the machine you will use during the course.

1. Go to the RAVEN webpage (<http://raven.uwaterloo.ca/Downloads.html>) and download the executable for your operating system (Windows, Linux, MacOS).
2. Download also the tutorial files (under “Raven Example / Tutorial Files” link).
3. [Optional] Test if the RAVEN executable is running by:
 - a. Copy the executable to the tutorial folder Irond.
 - b. Open the command prompt.
 - c. Change to the tutorial folder Irond.
 - d. Execute RAVEN and run it for this example catchment: by typing
Using the Windows command prompt:
RAVEN.exe Irond
Under Linux/ MacOS:
./Raven.exe Irond

A successful simulation will finish with:

Exiting Gracefully: Successful Simulation

Model results can be found in Hydrographs.csv.

Task 2: Install the calibration toolbox OSTRICH

During the course we will use the calibration toolbox OSTRICH to perform calibration of our hydrologic models. This is the instructions to setup and test that your OSTRICH executable is running on the machine you will use during the course.

1. Go to the OSTRICH webpage (<http://www.eng.buffalo.edu/~lsmatott/Ostrich/OstrichMain.html>) and click the OSTRICH icon to download the user manual, demos, source code, and executables for Windows and Linux.
2. Rename the executable fitting your operating system to My_OSTRICH.exe.
3. You can find demos in the folders "Windows" and "Linux".
4. [Optional] Test if the OSTRICH executable is running by:
 - a. Copy the executable My_OSTRICH.exe to the demo folder Demo1.
 - b. Open the command prompt.
 - c. Change to the tutorial folder Demo1.
 - d. Execute RAVEN and run it for this example catchment: by typing
 Under Windows:
 My_OSTRICH.exe
 Under Linux/ MacOS:
 ./My_OSTRICH.exe

A successful calibration should finish without any error message. You should be able to find files like OstModel.txt , OstOutput.txt, and OstErrors.txt . The latter one should be empty.

Task 3: Install R & RStudio

1. Install R: <https://cran.r-project.org/> (this has to be done prior to the next step)
2. Install RStudio Desktop: <https://www.rstudio.com/products/rstudio/download/> (the free version is fine)
3. From R or Rstudio, run the R script ("install_R_packages.r") provided with this document in order to install the necessary R libraries. This may be done by first opening the file (File→Open File...) then by clicking the "Run" button at the top of the opened file.

Task 4: Programming tool of choice

During the course we will need to do some post-processing of model results, e.g., plotting. Therefore you will need to have a tool setup to do that. Something appropriate would be Excel, Matlab, Python, R, etc. It is your choice but you should be familiar with the tool.

Thank you!

We are looking forward to see you soon!