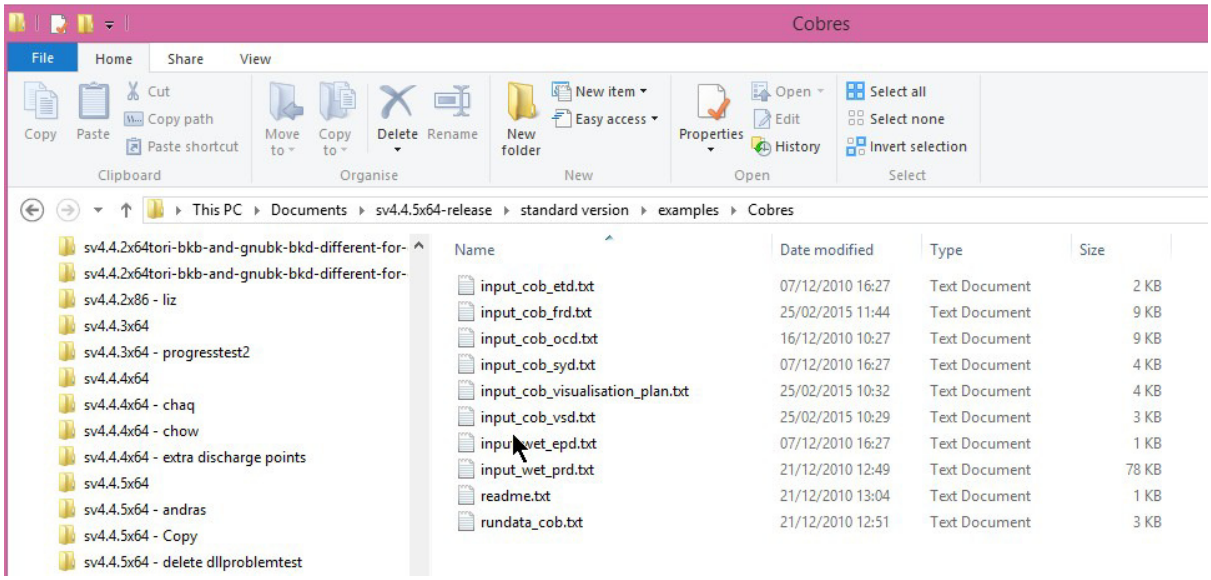
Shetran Standard Version

See Video at https://youtu.be/ptimgTkRz0I

This document tells you how to run the standard version of Shetran. It takes the standard Shetran input files (and a rundata file) runs a simulation and produces the Shetran output files. Setting up the Shetran input files is really difficult and time consuming so for a new catchment it is much, much better to start with the "Easy Setup". However, there are various things (such as boundary conditions) that can only be done in the standard version.

1. **Go to folder "standard version\examples\Cobres"**

There are nine inputs files and the file "rundata_cob.txt"



2. **Open "rundata_cob.txt"**

This is the key file. It is the first one selected and points to the location of all the other input files and output files. For example the first file is

10: frame ---------- INPUT DATA
input_cob_frd.txt

There are no folders specified which means the file is in the same folder as the rundata file.

The lists of input files used here is:

Input_cob_frd.txt - frame file. Start and end times. Size and shape of catchment. Location of channels. Land-use and weather station grids

Input_cob_etd.txt - evapotranspiration file.

Input_cob_ocd.txt - overland flow and river channel file.

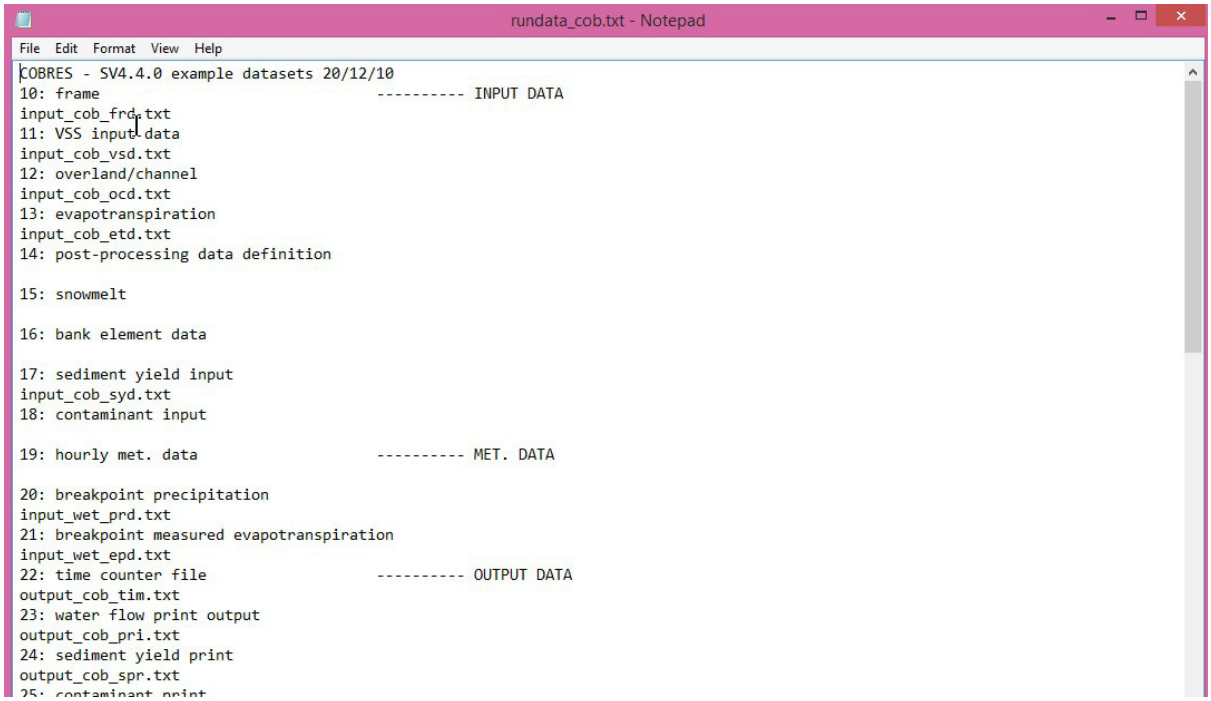
Input_cob_vsd.txt - variably saturated subsurface file. Everything below ground

Input_cob_prd.txt - precipitation data file. Time series of precipitation data

Input_cob_epd.txt - evapotranspiration data file. Time series of potential evapotranspiration

Input_cob_visulisation_plan.txt - specifies what will be produced in the HDF5 (H5) output file.

Input_cob_syd.txt (optional)- sediment yield file



3. Open "Input_cob_frd.txt"

All the Shetran input file are text files. They are not intuitive and to work out what is going on you need to read the files with the manual (http://research.ncl.ac.uk/shetran/SHETRAN%20V4%20User%20Guide.pdf)

Another thing to note is that sometimes the formatting matters (the user guide contains this information). So an extra space can make all the difference (tabs also should be avoided). For example for the Cobres the grid sizes are 2000m and Shetran is reading this assuming each column has seven spaces (F7.0 in the user guide).

So

2000.002000.0020000.002000.002000.00… Is correct

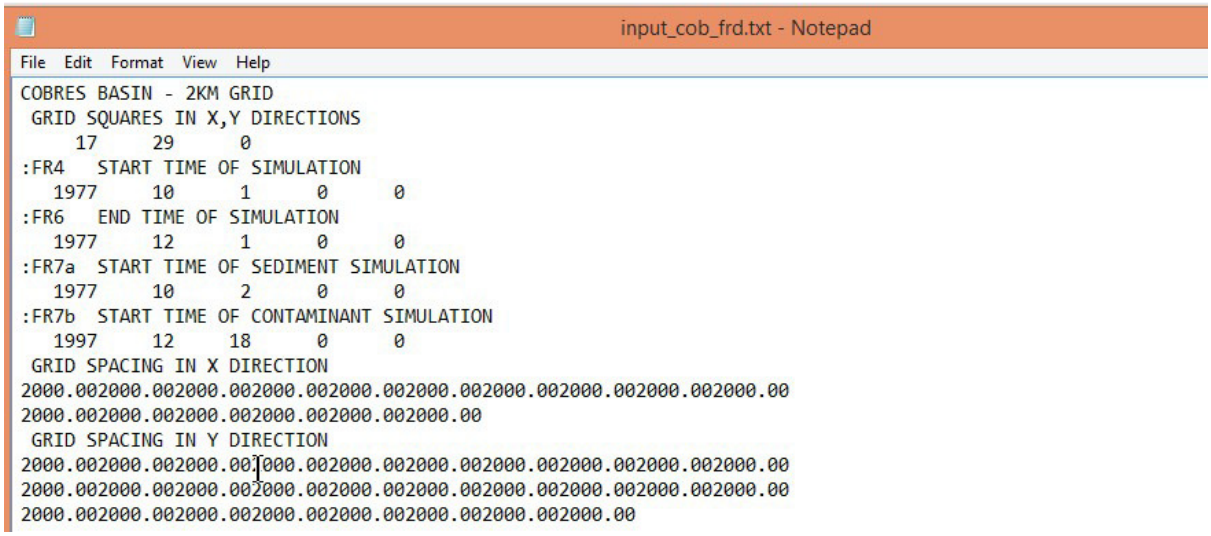
2000.0 2000.0 2000.0 2000.0 2000.0…. Is correct

But

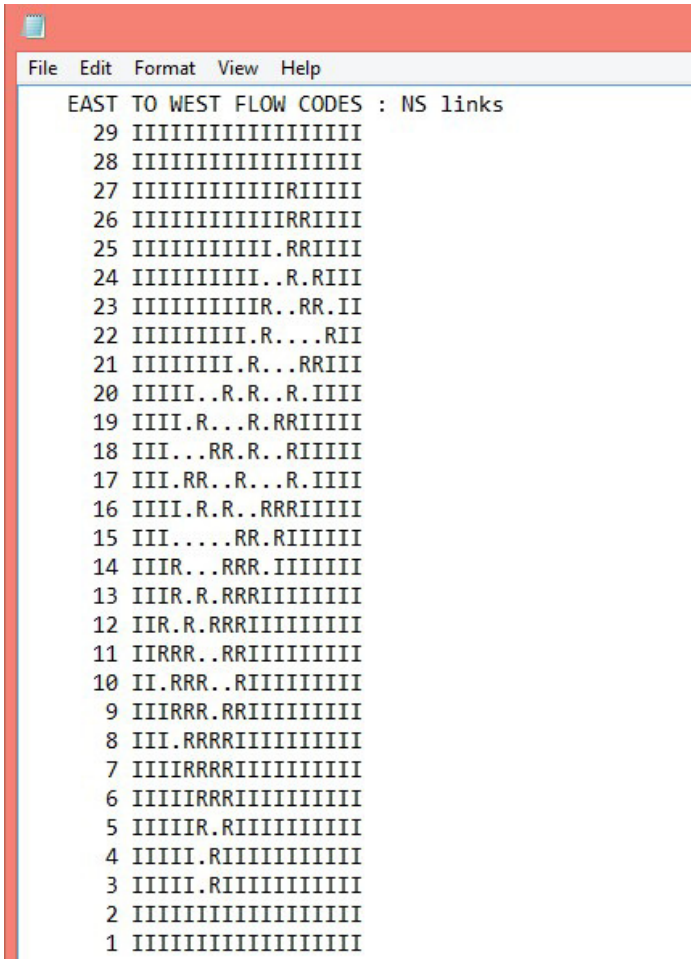
2000.00 2000.00 2000.00 2000.00 2000.00…. Is incorrect.

It reads the next 7 characters. So “2000.00”, ” 2000.0”, ”0 2000.”, ”00 2000”, ”.00 200”

It thinks the 5th value is .002 and this then causes the model to crash (although it would be very hard to guess this looking at the error messages)



The river channels are the worst to set up manually. These flow around the edge of the grid squares. These can be seen below for the channel flowing in a north south direction. “I” means it is outside the catchment, “.” Means there is no channel and “R” means there is a channel. There is a similar grid for the channels flowing east west.



4. Run the simulation

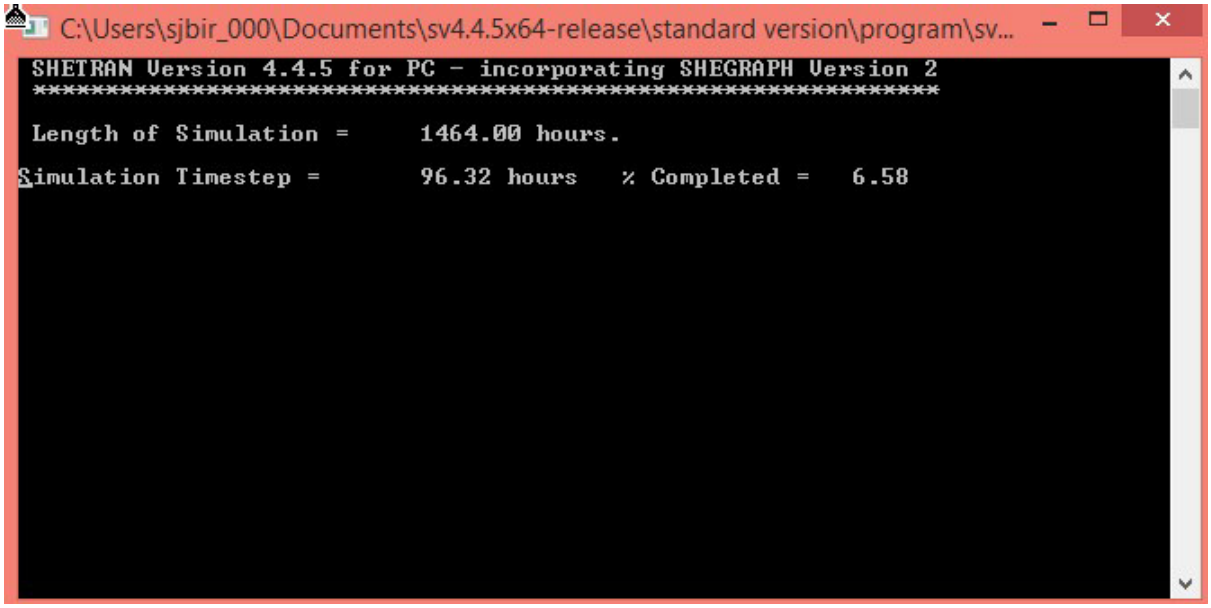
Go to “standard version\program”

Double click on “sv4.4.5x64.exe”

Select the rundata file for the example catchment. Go to “examples” and “cobres” and select “rundata_cob.txt”

The simulation will start and as its progress can be seen. When completed successfully the window will disappear. Normally if there are any messages these are shown on the Window and the simulation pauses. Press “Enter” to go through the messages, these will also be seen in the “output_cob_pri.txt” file.

If the simulation crashes and the window also disappears then open a “command Prompt” window. Go to “File Explorer” and drag the “sv4.4.5x64.exe” into the command prompt window. Select the rundata file and when the simulation is finished the window will not disappear.


C:\Users\sjbir_000\Documents\sv4.4.5x64-release\standard version\program\sv...
SHETRAN Version 4.4.5 for PC - incorporating SHEGRAPH Version 2
Length of Simulation = 1464.00 hours.
Simulation Timestep = 96.32 hours % Completed = 6.58