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Exercise 3: Hands on CWatM

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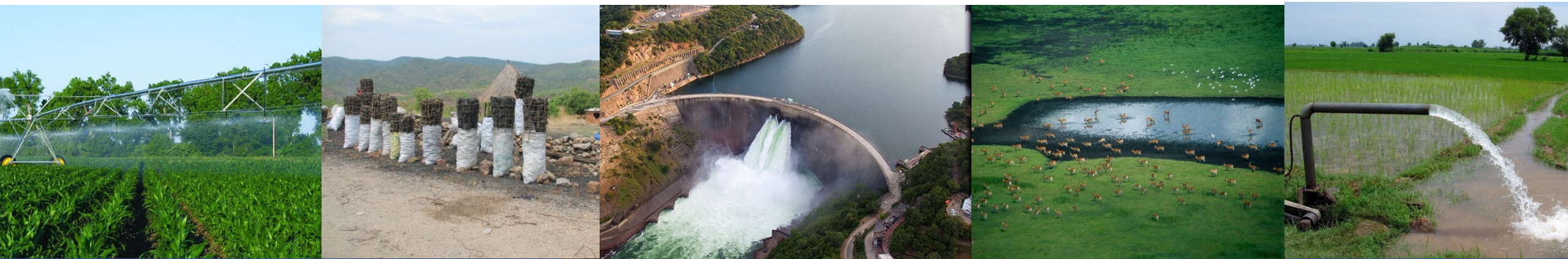
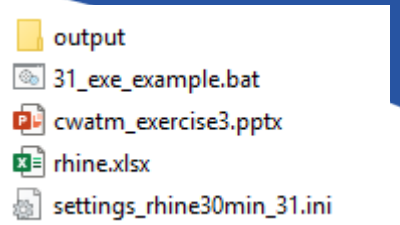


Hands on CWatM – Exercise 3

Compare simulated discharge with observed discharge

1. Run CWatM in folder cwatm_exercise3
2. Look at the output in cwatm_exercise3/output
3. Copy output to an Excel sheet
4. Change the settings file and run CWatM again
5. Copy the output again to Excel
6. Explain the difference

Hands on CWatM



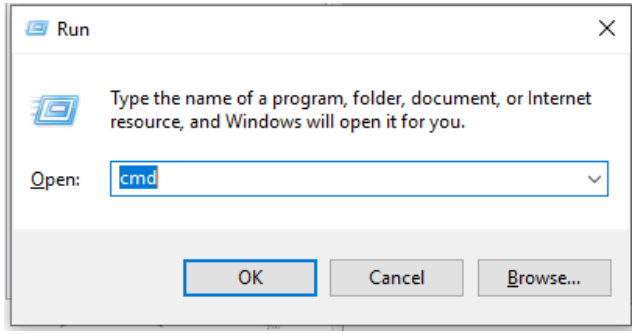
Folder structure CWATM_exercise3

1. Running CWatM

- Go to folder CWATM_exercise3
- Start: 31_exe_example.bat

  or open a DOS command prompt

  - press Windows+R
  - type cmd + return
  - change directory: e.g. cd c:/CWATM/CWATM_exercise3
    (or cd "c:/directory with white space/CWATM/CWATM_exercise3")
- Type ..\CWATM_model\CWatMexe\cwatm.exe settings_rhine30min_31.ini -l



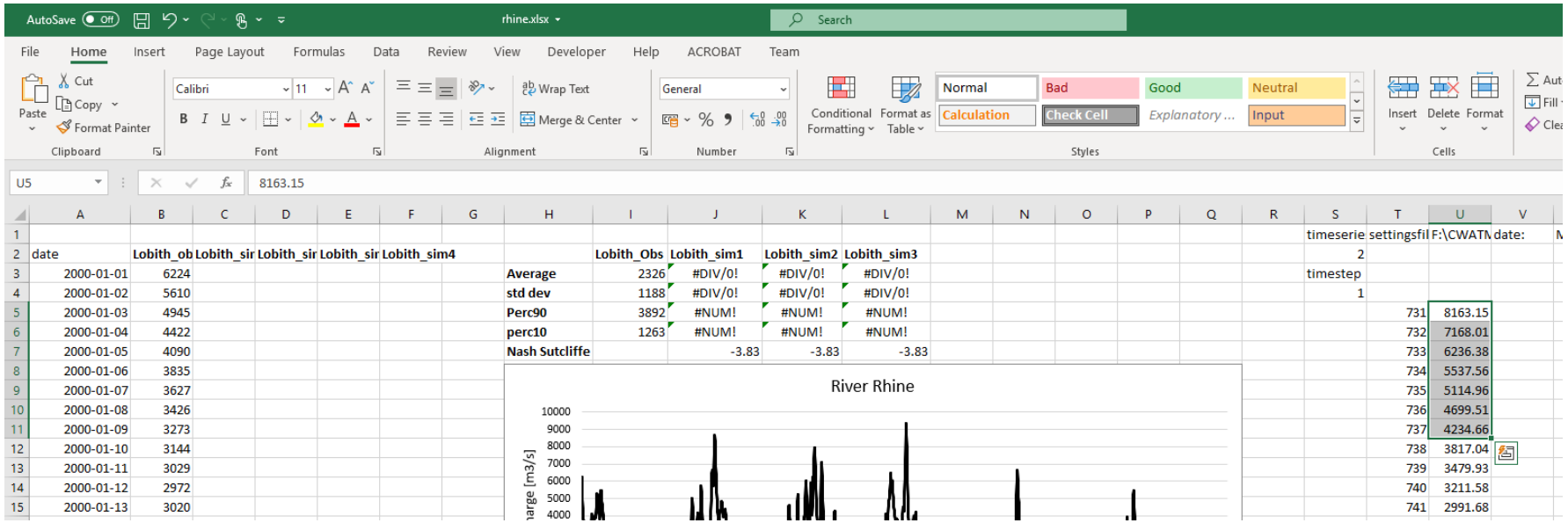

```
F:\CWATM.ECHO\CWATM_exercise3>cd F:\CWATM.ECHO\CWATM_exercise3

F:\CWATM.ECHO\CWATM_exercise3>..\CWATM_exercise1\CWatMexe\cwatmexe
CWATM - Community Water Model  1.04  Date:  version 1.04
International Institute of Applied Systems Analysis (IIASA)
Running under platform:  Windows
-----------------------------------------------------------
```

Hands on CWatM

2. Look at the output

- Go into directory ./CWATM_exercise3/output
- Load discharge_daily.tss into a text editor
- Open ./CWATM_exercise3/rhine.xlsx
- Copy content of discharge_daily.tss into rhine.xlsx with Text import Wizard



	A	B	H	I	J	K	L	S	T	U
1								timeserie	settingsfil	F:\CWATM
2	date	Lobith_ob		Lobith_Obs	Lobith_sim1	Lobith_sim2	Lobith_sim3	2		
3	2000-01-01	6224	Average	2326	#DIV/0!	#DIV/0!	#DIV/0!	timestep		
4	2000-01-02	5610	std dev	1188	#DIV/0!	#DIV/0!	#DIV/0!	1		
5	2000-01-03	4945	Perc90	3892	#NUM!	#NUM!	#NUM!		731	8163.15
6	2000-01-04	4422	perc10	1263	#NUM!	#NUM!	#NUM!		732	7168.01
7	2000-01-05	4090	Nash Sutcliffe		-3.83	-3.83	-3.83		733	6236.38
8	2000-01-06	3835							734	5537.56
9	2000-01-07	3627							735	5114.96
10	2000-01-08	3426							736	4699.51
11	2000-01-09	3273							737	4234.66
12	2000-01-10	3144							738	3817.04
13	2000-01-11	3029							739	3479.93
14	2000-01-12	2972							740	3211.58
15	2000-01-13	3020							741	2991.68

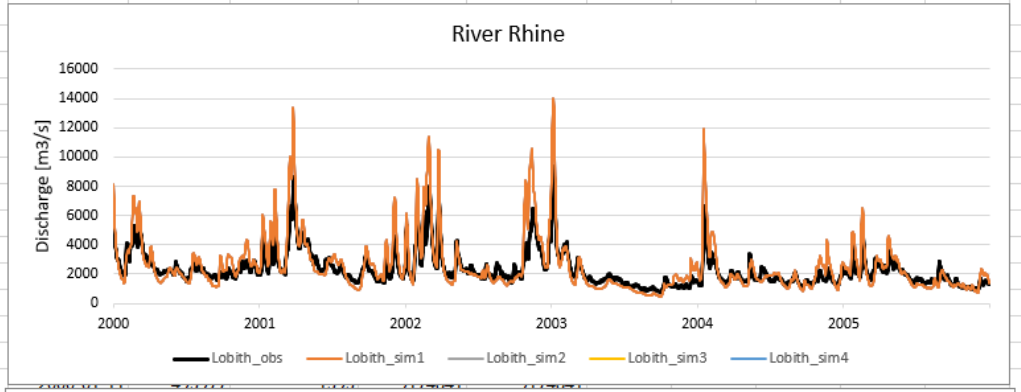
Hands on CWatM

2. Look at the output

- Copy column U to column C

date	Lobith_ob	Lobith_sir	Lobith_sir	Lobith_sir	Lobith_sim4
2000-01-01	6224	8163.15			
2000-01-02	5610	7168.01			
2000-01-03	4945	6236.38			
2000-01-04	4422	5537.56			
2000-01-05	4090	5114.96			
2000-01-06	3835	4699.51			
2000-01-07	3627	4234.66			
2000-01-08	3426	3817.04			
2000-01-09	3273	3479.93			
2000-01-10	3144	3211.58			
2000-01-11	3029	2991.68			
2000-01-12	2972	2811.45			
2000-01-13	3020	2660.64			
2000-01-14	2974	2524.9			
2000-01-15	2804	2392.16			
2000-01-16	2637	2257.55			
2000-01-17	2498	2124.97			
2000-01-18	2369	2003.86			
2000-01-19	2272	1898.77			
2000-01-20	2187	1800.23			

	Lobith_Obs	Lobith_sim1	Lobith_sim2	Lobith_sim3
Average	2326	2585	#DIV/0!	#DIV/0!
std dev	1188	1897	#DIV/0!	#DIV/0!
Perc90	3892	4765	#NUM!	#NUM!
perc10	1263	1107	#NUM!	#NUM!
Nash Sutcliffe		0.37	-3.83	-3.83



Hands on CWatM

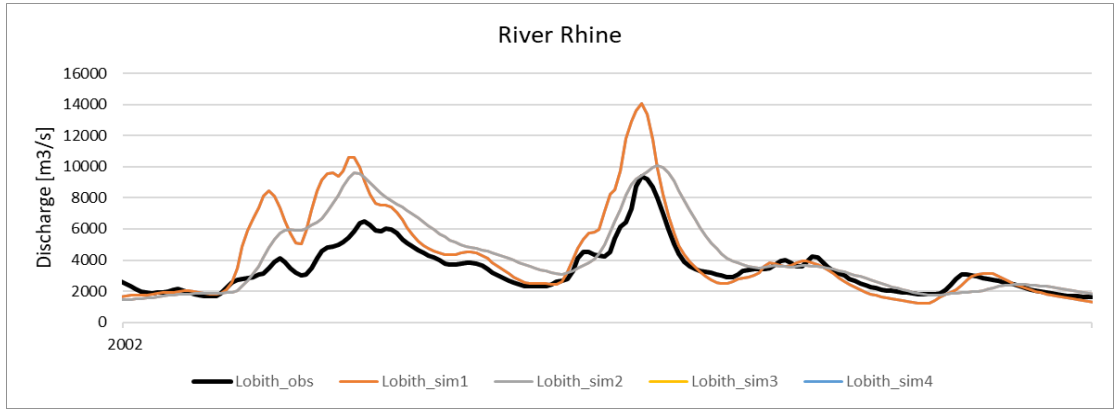
3. Change settings file and run againa settings file

- Change settingsfile

  instead manningsN = 1.86

  manningsN = 5.0 (routing roughness is increased)

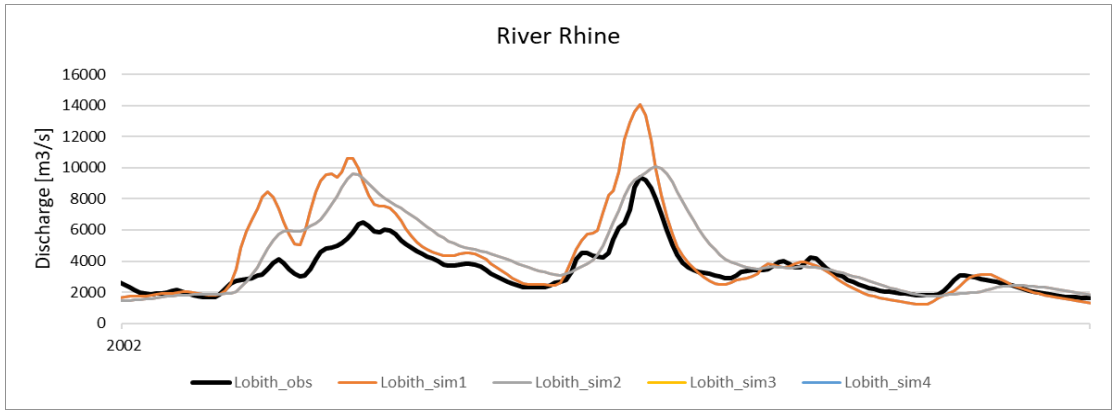
- Run Start: 31_exe_example.bat again
- Goto step 1 to 2 and look at the difference



Black line is observed:
Orange line is 1st run
Gray line is 2nd run

What is the difference to first run?
Why?

Hands on CWatM



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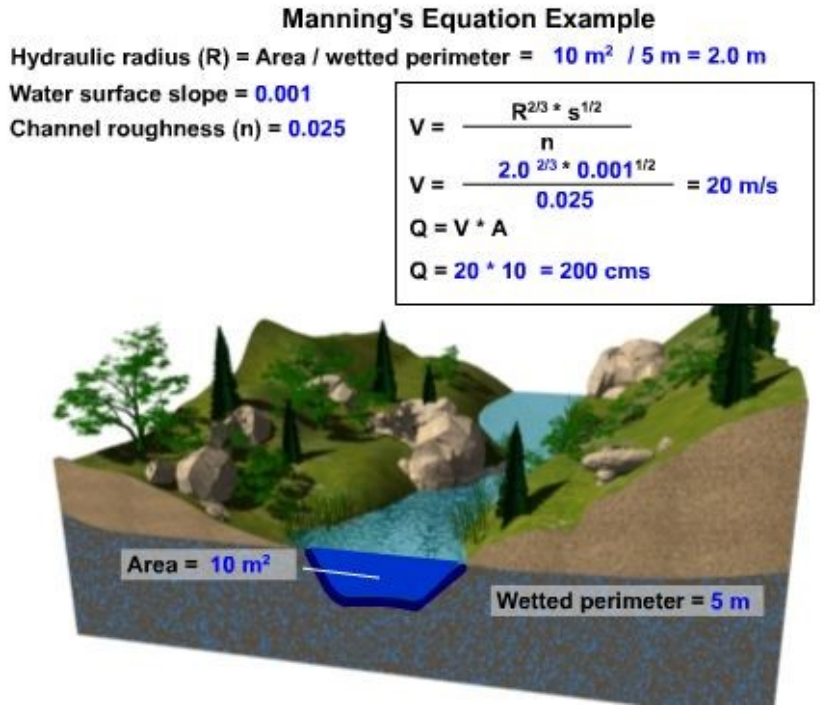

Smaller n ➡ higher velocity ➡ faster ➡ higher peak Q

Problems

Most problems come from different file systems, folder structures

We try to set up everything with relative path.

1. Please make sure that your folders have a similar structure like in slide 3 in cwatm_exercise1.ppt
2. The settings file has a part:

```
[FILE_PATHS]
PathRoot = ../cwatm_data
PathOut = ./output
PathMaps = $(PathRoot)/cwatm_input30min
PathMeteo = $(PathRoot)/climate/rhine
```

../ jumps back to the previous folder

./ uses the folder output in the same folder as the settings file or the directory you are in

3. If this is not working you can use also absolute path (also with white space)

PathRoot = C/root directory/second.root/cwatm/cwatm_data

4. If you execute cwatm you can also use absolute path

instead

../CWATM_model/CWatMexe/cwatm.exe settings_rhine30min.ini –l

"C/root directory/second.root/cwatm/CWATM_model/CWatMexe/cwatm.exe" settings_rhine30min.ini –l (mind the " if there are white spaces)

5. Some other errors we address in:

https://cwatm.iiasa.ac.at/tutorial.html#test-the-python-model-version