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Exercise 5: Higher resolution

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Higher resolution – 5 arcmin

0. What you need – downloading data from FTP
1. The world at 30 arcsec
2. Example for River Rhine, Central Europe
3. Example for Lake Tana, Blue Nile, Ethiopia

Higher resolution - 5 arcmin

0. What you need

- You downloaded already the climate data (precipitation, temperature, radiation etc.) from ftp climate_2011_2012.zip or even wfdei.tar

- You need a global dataset on 5 arcmin because this is too big for dropbox please download:

  cwatm_input5min.zip from

  ftp://rcwatm:Water1090@ftp.iiasa.ac.at/

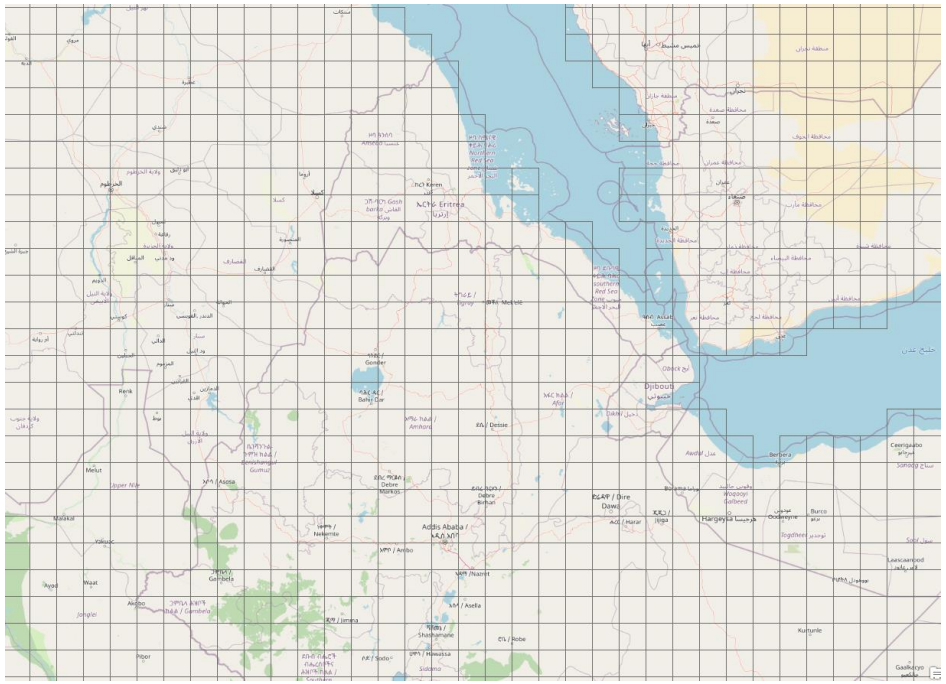
  please copy to the folder CWATM_data and unzip (extract here) in

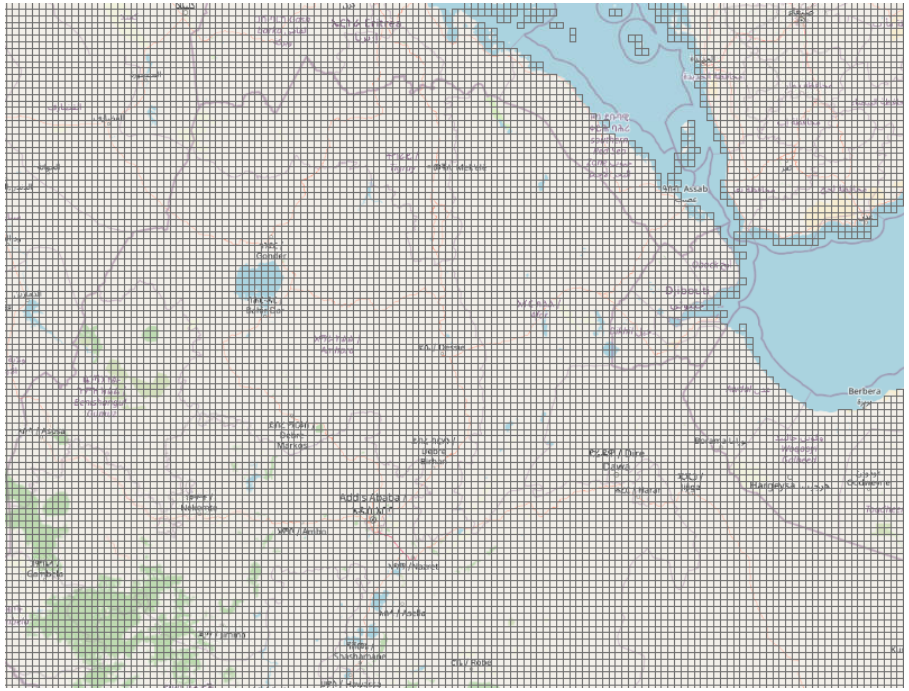
  CWATM_data/cwatm_input5min

Higher resolution - 5 arcmin

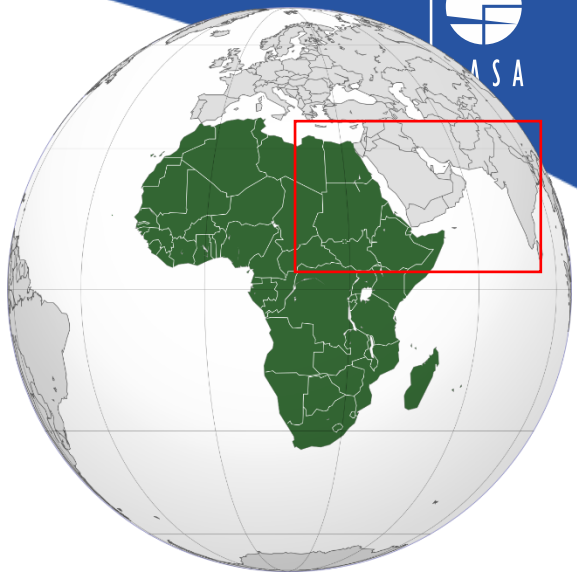
2. The world in 5 arcmin raster

- CWatM is a distributed model which can be used at different resolutions e.g. 30 arcmin, 5 arcmin, 1km
- This is a part of the World (Ethiopia) split into 5 arcmin cells (around 10 km x 10 km)





Higher resolution - 5 arcmin



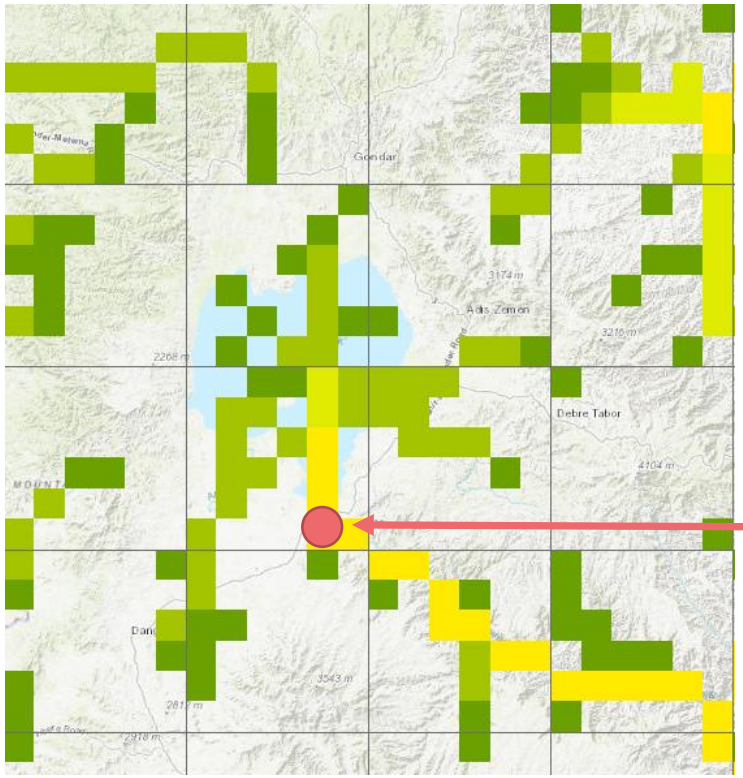
3. Flow accumulation map

- upstream catchment area of each cell in km^2
- See upstream_area_5min_km2.tif

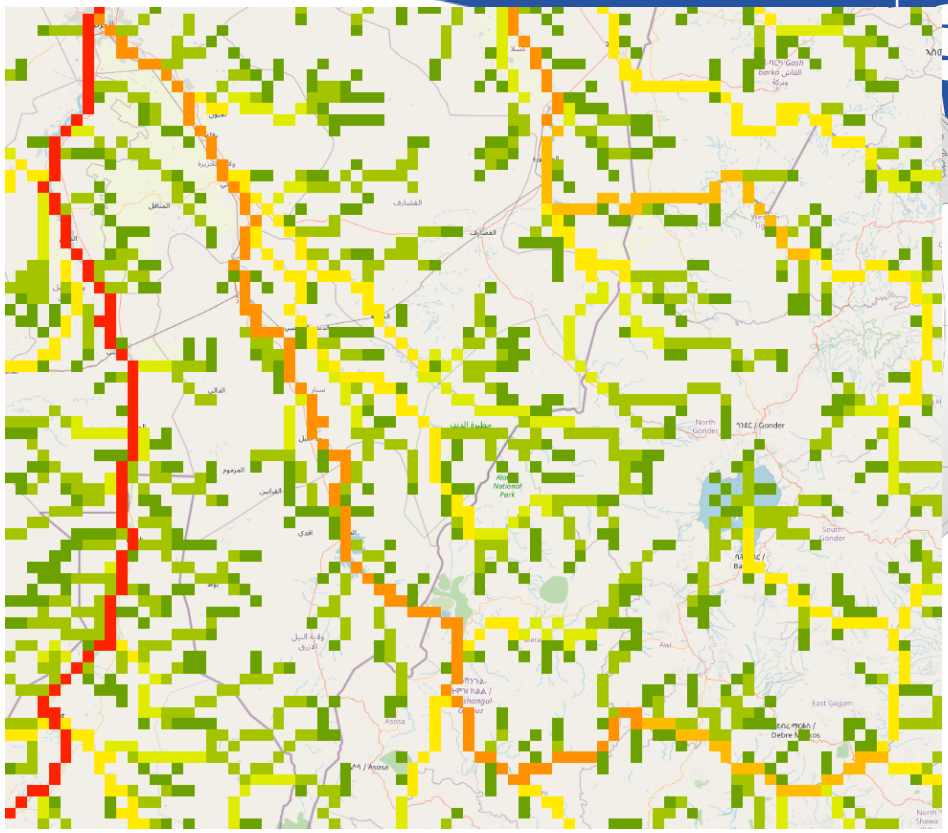
Higher resolution - 5 arcmin

4. Upstream area of lake Tana

- Lake Tana, 5 arcmin resolution



Lake Tana, Ethiopia



Flow accumulation Lake Tana till conjunction Blue Nile with White Nile

Real location of outlet of lake Tana and 5 arcmin network outlet

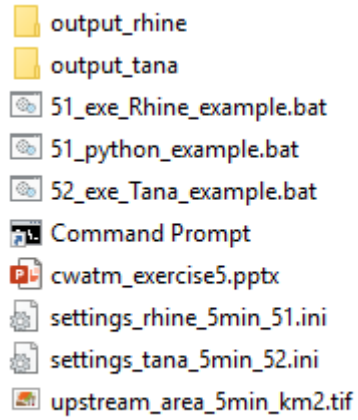
Exercise: Higher resolution - 5 arcmin

1. Run 5 arcmin for the Rhina basin

Folder: CWATM_exercise5

Based on the Rhine basin:

Run:
..\CWATM_model\CWatMexe\cwatm.exe settings_rhine_5min_51.ini -l
Or: 51_exe_rhine_example.bat



Folder structure CWATM_exercise5

Important!
We are in folder CWATM_exercise5
Please cd CWATM_exercise5
but we using the model stored in CWATM_model

Exercise: Select a basin

2. Select another outlet of a basin

Based on the Rhine basin:

Change a few line in the setting: settings_rhine_5min_51.ini
And save it with the name: settings_tana_5min_52.ini

PathOut = ./output_tana — Change output destination

MaskMap = 37.39 11.6
Gauges = 37.39 11.6

This will change the basin from Rhine to Lake Tana

You can use the '#' to out comment a line and to keep in mind the original version!

Exercise: Select a basin

2. Select another outlet of a basin

Run:

..\CWATM_model\CWatMexe\cwatm.exe settings_tana_5min_52.ini -l
Or: 52_exe_tana_example.bat

Or:
python ../CWATM_model/CWatM/run_cwatm.py settings_tana_5min_52.ini -l

in case you did not manage, we prepared a settings file with the changes
..\CWATM_model\CWatMexe\cwatm.exe settings_tana_5min_52.ini –l

Exercise: Select a basin

2. Select another outlet of a basin

Tana basin

```
F:\CWATM.ECHO\CWATM_exercise5>..\CWATM_model\CWatMexe\cwatm.exe settings_tana_5min_52.ini -l
CWATM - Community Water Model  1.04  Date:  version 1.04
International Institute of Applied Systems Analysis (IIASA)
Running under platform:  Windows
-----------------------------------------------------------
Create catchment from point and river network
Number of cells in catchment:    175 =   14648 km2
Resolution of meteo forcing is 6.0 times higher than base maps.

CWATM Simulation Information and Setting
The simulation output as specified in the settings file: ./output_tana can be found in settings_tana_5min_52.ini

Step         Date   Discharge
 1      01/01/2011      161.90
2       02/01/2011      157.57
3       03/01/2011      154.74
4       04/01/2011      151.69
5       05/01/2011      147.86
6       06/01/2011      144.41
7       07/01/2011      140.73
8       08/01/2011      137.27
9       09/01/2011      134.28
10      10/01/2011      131.89
15:48:02.653215
15:48:06.407704
```

Basin area fits better than with 30arcmin

Station name	Drainage area (km²)
Abbay at Bahir Dar	15321

Exercise: Select a basin

3. Create a basin mask map

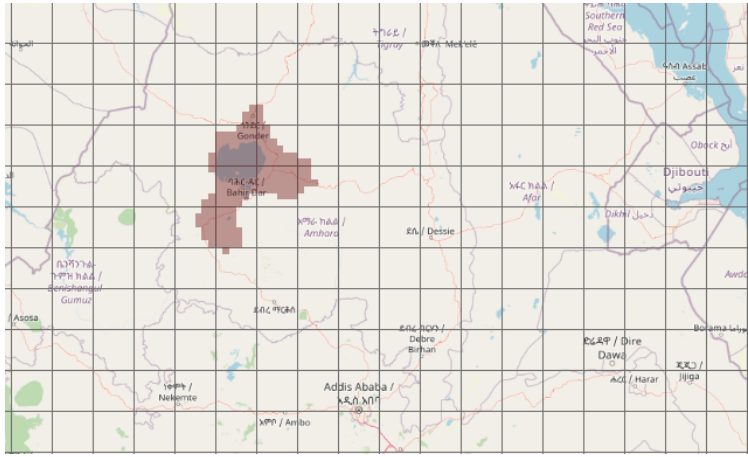
Add:
OUT_MAP_TotalEnd = catchment
At the end of the settingsfile settings_tana_5min_52.ini

Run:
python ../CWATM_model/CWatM/run_cwatm.py settings_tana_5min_52.ini -l
-> you will find catchment_totalend.nc in ../CWATM_exercise5/output_tana
move this file to ../CWATM_exercise5

Change:
MaskMap = ./catchment_totalend.nc
And delete OUT_MAP_TotalEnd = catchment

Run:
python ../CWATM_model/CWatM/run_cwatm.py settings_tana_5min_52.ini -l

With a GIS tool you can (but you do not have to) change catchment_totalend.nc
To eg tana.tif



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