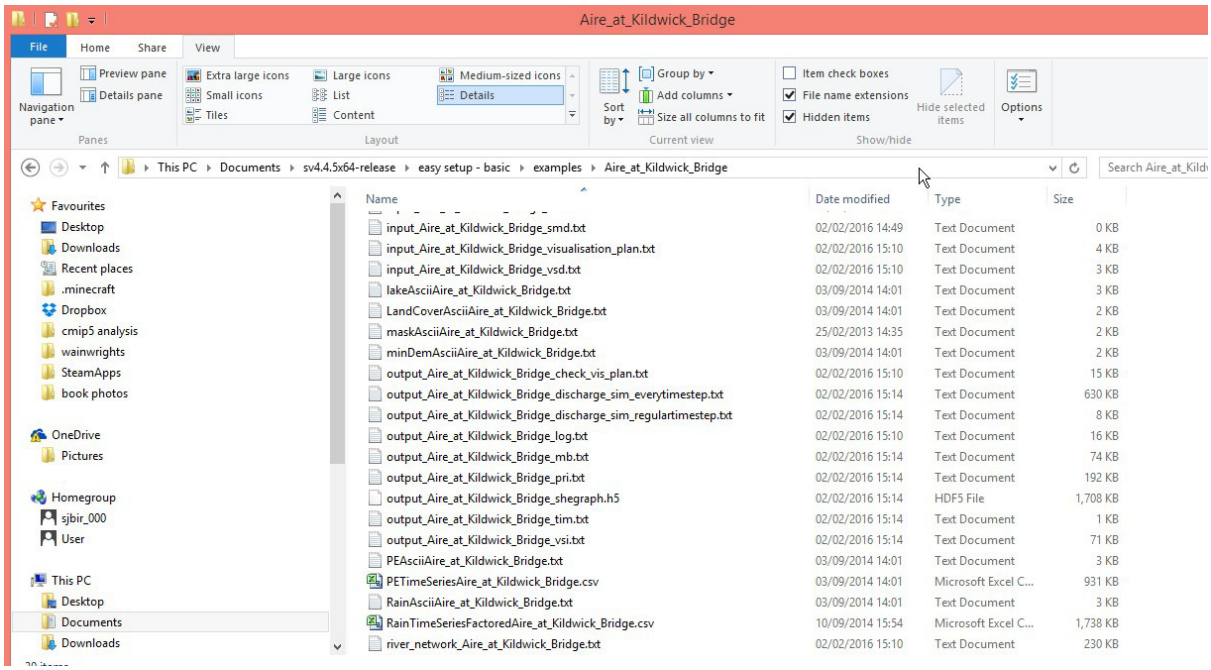
Shetran Outputs

See Video at https://youtu.be/rXkQf84l0j0

After a Shetran simulation is finished nine output files are produced. For the Aire at Kildwick Bridge these are shown below and are the file names starting with “output….”



1. **output_Aire_at_Kildwick_Bridge_check_vis_plan.txt**

This is not usually a very important file. The “input_Aire_at_Kildwick_Bridge_visualisation_plan.txt” file is used to say which data is put in “output_Aire_at_Kildwick_Bridge_shegraph.h5” . If there is an error in “input_Aire_at_Kildwick_Bridge_visualisation_plan.txt” it will tell you in this file. It is also useful as it list which variables that can be recorded in the H5 file.

2. **output_Aire_at_Kildwick_Bridge_discharge_sim_everytimestep.txt**

This has three columns. Date, time from simulation start(hours), discharge(m3/s) at the outlet. This file is output at every timestep. The standard Shetran timestep is one or two hours but this is reduced at the start of the simulation and during heavy rain before gradually increasing back up to the standard value.

output_Aire_at_Kildwick_Bridge_discharge_sim_everytimestep.txt - Notepad

File Edit Format View Help

01/01/1980_00:03:00	0.05000000	0.00000000
01/01/1980_00:06:05	0.10150000	0.00000000
01/01/1980_00:09:16	0.15454500	0.00000000
01/01/1980_00:12:33	0.20918135	0.00000000
01/01/1980_00:15:55	0.26545679	0.00000000
01/01/1980_00:19:24	0.32342049	0.00000000
01/01/1980_00:22:59	0.38312311	0.00000000
01/01/1980_00:26:40	0.44461680	0.00000000
01/01/1980_00:30:28	0.50795531	0.00000000
01/01/1980_00:34:23	0.57319397	0.00000000
01/01/1980_00:38:25	0.64038978	0.00000000
01/01/1980_00:42:34	0.70960148	0.00000000
01/01/1980_00:46:51	0.78088952	0.00000000
01/01/1980_00:51:15	0.85431621	0.00000000
01/01/1980_00:55:47	0.92994569	0.00000000
01/01/1980_01:00:28	1.00784407	0.00000000
01/01/1980_01:05:17	1.08807939	0.00000000
01/01/1980_01:10:14	1.17072177	0.00000000
01/01/1980_01:15:21	1.25584342	0.00000000
01/01/1980_01:20:36	1.34351872	0.00000000
01/01/1980_01:26:01	1.43382429	0.00000000
01/01/1980_01:31:36	1.52683901	0.00000000
01/01/1980_01:37:21	1.62264419	0.00000000
01/01/1980_01:43:16	1.72132351	0.00000000
01/01/1980_01:49:22	1.82296322	0.00000000
01/01/1980_01:55:39	1.92765211	0.00000000

3. output_Aire_at_Kildwick_Bridge_discharge_sim_regulartimestep.txt

Diacharge (m3/s) at the outlet is given. This is the mean value averaged over a specified timestep. The specified timestep should correspond with the timestep of the measured data so a direct comparison can be made. The timestep it is averaged over can be seen specified at the end of the xml file

```
<SimulatedDischargeTimestep>24.0</SimulatedDischargeTimestep> This should be the same as the measured discharge
```

This same value is shown in the standard Shetran input files at the end of the frd file:

:FR52 - OUTPUT DISCHARGE TIMESTEP(HOURS)
24.000

output_Aire_at_Kildwick_Bridge_disch

File Edit Format View Help

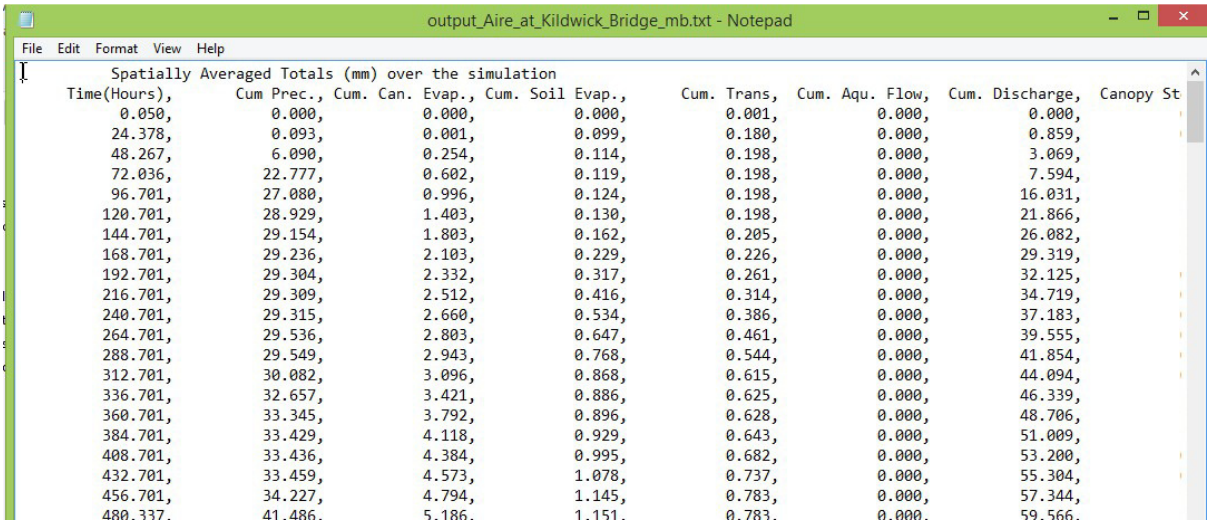
```
discharge at the outlet - regular timestep   24.00 hours
           2.71804842
           7.28089227
          14.92373682
          27.10640402
          19.37558779
          13.98054743
          10.70531148
           9.25038707
           8.54329639
           8.10988896
           7.80345656
           7.56509827
           7.36547523
           7.37134973
           7.77771220
```

4. **output_Aire_at_Kildwick_Bridge_log.txt**

A log of files read. Only useful is something is not working

5. **output_Aire_at_Kildwick_Bridge_mb.txt**

A really important file. The first one I look at when the simulation is finished. For every day it gives the spatially averaged cumulative totals (mm) . The first thing to check is are the precipitation totals, evapotranspiration totals and discharge totals as expected? For the Aire at Kildwick Bridge the total precipitation after one year is 1436mm, evapotranspiration is 325+54+136mm and discharge 968mm –these are approximately correct so I am happy.


output_Aire_at_Kildwick_Bridge_mb.txt - Notepad

File Edit Format View Help

Spatially Averaged Totals (mm) over the simulation

Time(Hours),	Cum Prec.,	Cum. Can. Evap.,	Cum. Soil Evap.,	Cum. Trans,	Cum. Aqu. Flow,	Cum. Discharge,	Canopy St
0.050,	0.000,	0.000,	0.000,	0.001,	0.000,	0.000,	
24.378,	0.093,	0.001,	0.099,	0.180,	0.000,	0.859,	
48.267,	6.090,	0.254,	0.114,	0.198,	0.000,	3.069,	
72.036,	22.777,	0.602,	0.119,	0.198,	0.000,	7.594,	
96.701,	27.080,	0.996,	0.124,	0.198,	0.000,	16.031,	
120.701,	28.929,	1.403,	0.130,	0.198,	0.000,	21.866,	
144.701,	29.154,	1.803,	0.162,	0.205,	0.000,	26.082,	
168.701,	29.236,	2.103,	0.229,	0.226,	0.000,	29.319,	
192.701,	29.304,	2.332,	0.317,	0.261,	0.000,	32.125,	
216.701,	29.309,	2.512,	0.416,	0.314,	0.000,	34.719,	
240.701,	29.315,	2.660,	0.534,	0.386,	0.000,	37.183,	
264.701,	29.536,	2.803,	0.647,	0.461,	0.000,	39.555,	
288.701,	29.549,	2.943,	0.768,	0.544,	0.000,	41.854,	
312.701,	30.082,	3.096,	0.868,	0.615,	0.000,	44.094,	
336.701,	32.657,	3.421,	0.886,	0.625,	0.000,	46.339,	
360.701,	33.345,	3.792,	0.896,	0.628,	0.000,	48.706,	
384.701,	33.429,	4.118,	0.929,	0.643,	0.000,	51.009,	
408.701,	33.436,	4.384,	0.995,	0.682,	0.000,	53.200,	
432.701,	33.459,	4.573,	1.078,	0.737,	0.000,	55.304,	
456.701,	34.227,	4.794,	1.145,	0.783,	0.000,	57.344,	
480.337,	41.486,	5.186,	1.151,	0.783,	0.000,	59.566,	

6. **output_Aire_at_Kildwick_Bridge_pri.txt**

Another important file. If the simulation does not work the error messages will be displayed at the end of this file. Loads of other useful information is displayed at the start

7. **output_Aire_at_Kildwick_Bridge_shegraph.h5**

Another important file. This is an HDF5 file. To view it you need an HDF viewer such as HDFView (https://www.hdfgroup.org/products/java/release/download.html).This displays information about the catchment and output of variables from the simulation. A separate document is available for this output as it is quite complicated.

8. **output_Aire_at_Kildwick_Bridge_tim.txt**

Writes the time through the simulation and number of timesteps

9. **output_Aire_at_Kildwick_Bridge_vsi.txt**

At the end of the simulation phreatic surface levels and heads for each finite difference cell are written to this file. This can be used to set-up the initially conditions for another simulation of the same catchment. A separate document is available to explain this

10. **river_network_Aire_at_Kildwick_Bridge.txt**

This file is produced together with the Shetran input files by the shetran-prepare executable. It is NOT produced by the standard version of Shetran (sv4.4.5.exe). It is useful because it can be opened up in a GIS and it shows the location of the river channels in the model.