

CE-QUAL-W2 Water Balance Utility

Program Updates

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The water balance utility was updated for use with CE-QUAL-W2 Version 4 in March 2017. This new console version of the water balance code provides the following updates:

1. This is not a windows dialog box driven code so it can easily be used in batch files.
2. There is now an input file for model parameters for the water balance utility and an output file for model errors.
3. There are several enhancements: one has more flexibility over file naming, the number of header lines to skip in input files, and the number of waterbodies to use in the analysis.

Input File: "WatBal.npt"

The new input file, "WatBal.npt" has the following format:

```
Water Balance input file for Console Application
"el_obs.npt"      , file for observations, time and water level time series in 2 columns
"tsr_8_seg36.opt" , tsr file for model predictions-assuming only one line skipped in file header
"qwb1.npt"        , Output file name
1                , NSKIPS - number of skips of data
1                , NAV - averaging interval, number of data points to average
1,1             , waterbody to perform water balance: JW1:STARTWB,JW2:ENDWB:1,2=WB1&2;1,1==WB1 ONLY
3               , number of lines to skip in the header for the water level data file
0               , past water balance PWB file: Yes==1, No==0
"qwb.npt"        , Previous Water Balance file name
```

The explanations of each line are shown in the example file above. If performing over multiple waterbodies, keep in mind that all waterbodies must have the same grid (i.e., ELBOT and vertical spacing must be the same). Currently all the flow correction is given to only 1 water balance file. A later option will be for multiple WB files so that one can distribute them across several waterbodies.

Output File: "WatBal_Errors.opt"

If there are errors, any errors will be shown in this text file. If no errors, then this file will not be written to the disk.

An example of the error file output is shown below:

```
Could not open simulated elevations file tsr_8_seg39.opt
```

Output File: “el_stats.opt”

This output file displays model error statistics of the water level and average flow rate in the qwb output file. Typical output from this program are shown below:

N	Mean Error	Absolute ME	RMS Error
238	0.00	0.00	0.00

Average water balance flow correction = .00 m³/s for period covering Julian day 1.04 to 239.94

Output File from water balance

The main output file from the water balance utility is a time series of flows necessary to match the water level.

A typical output file is shown below:

Computed flow to complete water balance

1	1
JDAY	QWB
1.040	0.00
2.000	24.34
3.000	2.33
4.000	2.34
5.000	3.72
6.000	2.33
7.000	4.67
8.000	2.34
9.000	3.71
10.000	3.29
11.000	4.66
12.000	2.34
13.000	3.69
14.000	2.34
15.000	3.32
16.000	3.31
17.000	3.49

How to Run the Water Balance Utility

The water balance utility is run by executing the exe file for 32 (**WBconsole32.exe**) or 64 bit (**WBconsole64.exe**) Windows operating system. One also needs the input file **WatBal.npt** in the directory of the executable.