

Gaging (Monitoring) Station File (GAGE)

Lakes can be designated as having gaging stations located on them. For each such designated lake, the simulated time and corresponding calculated volume and stage of that lake (and if solute transport is being simulated, the concentration of each solute) after each time step (and each transport time increment) will be written to a separate output file to facilitate graphical postprocessing of the calculated data. The input file for specifying gaging station locations is read if the file type (Ftype) "GAGE" is included in the *MODFLOW* name file. (Changes from original documented version are highlighted.)

For each simulation, if *GAGE* package is used:

Record 1. Data: NUMGAGE

NUMGAGE Total number of gaging stations (including stream gaging stations, if any).

For each lake gaging station:

Record 2. Data: LAKE UNIT {OUTTYPE}

LAKE Negative value of the lake number of the lake where gage is located.

UNIT Unit number for output file. Specify negative value of unit number to invoke reading of optional parameter OUTTYPE for listing additional information for lakes.

OUTTYPE Code for type of expanded listing desired in output file:

- 0 Use standard default listing of time, stage, volume, and concentration.
- 1 Default values plus time-step fluxes for lake and total lake conductance.
- 2 Default values plus changes in stage, volume, and concentration for lake.
- 3 All of the above.

Notes:

You must specify a unique unit number for each gaging station and match those unit numbers to DATA file types and file names in the *MODFLOW* name file (see Harbaugh and McDonald, 1996, and Harbaugh and others, 2000).

The GAGE package can also be used in conjunction with the SFR1 package to specify the location of a gaging station on a stream. Therefore, to guarantee that the code can distinguish between input for lakes and that for stream locations, we require that lake numbers be specified as their negative value.

Data Set 2 must include exactly NUMGAGE lines (or records) of data. If NUMGAGE > 1, it is permissible to interleaf in Data Set 2 records for stream gaging stations (according to the format specified in the documentation for the SFR1 Package; see Prudic and others, 2004) with records for gages on lakes (according to the format described above). Data lines (records) within Data Set 2 can be listed in any arbitrary order.

Total lake conductance (printed if OUTTYPE = 1 or 3) is the sum of conductances of each seepage interface for each lake. If OUTTYPE = 2 or 3, the changes are listed both as incremental

change since the previous time increment and as cumulative change since the start of the simulation.

REFERENCES

- Harbaugh, A.W., and McDonald, M.G., 1996, User's documentation for MODFLOW-96, an update to the U.S. Geological Survey modular finite-difference ground-water flow model: U.S. Geological Survey Open-File Report 96-485, 56 p.
- Harbaugh, A.W., Banta, E.R., Hill, M.C., and McDonald, M.G., 2000, MODFLOW-2000, The U.S. Geological Survey modular ground-water model—User guide to modularization concepts and the ground-water flow process: U.S. Geological Survey Open-File Report 00-92, 121 p.
- Prudic, D.E., Konikow, L.F., and Banta, E.R., 2004, A new Streamflow-Routing (SFR1) Package to simulate stream-aquifer interaction with MODFLOW-2000: U.S. Geological Survey Open-File Report 2004-1042, 95 p.