**SawSim’s Inputs and outputs**

**In SawSim, DELTAT must be converted to seconds**

**Input:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Refers to:** | **Unit** | **Physical meaning** |
| **KR,KC,KV** | Hydraulic conductivity in x,y,z | m/s | is a measure of a material's capacity to transmit water |
| **SY** | Specific yield | - | is the volume of water released from storage by an unconfined aquifer per unit surface area of aquifer per unit decline of the water table. |
| **SS** | Specific storage | 1/m | is the volume of water that an [aquifer](https://en.wikipedia.org/wiki/Aquifer) releases from storage, per volume of the aquifer, per unit decline in hydraulic head |
| **BED\_THK** | Confining bed thickness | M | Is the thickness of the confining unit between the unconfined and confined aquifers |
| **BED\_K** | Hydraulic conductivity of the confining bed | m/s | The vertical hydraulic conductivity of the confining unit |
| **UNCONF\_THK** | Unconfined aquifer thickness | m | The maximum thickness that an unconfined aquifer reaches below the vadose zone |
| **CONF\_AQ\_THK** | Confined aquifer thickness | m | The thickness of confined aquifer |
| **NLAY** | Number of groundwater layers | - | SawSim has 2 layers, the first upper layer is for the unconfined aquifer, and the second layer is for the confined aquifer |
| **NCOL** | Number of columns | - | In the X-direction (-🡪), along with the row |
| **NROW** | Number of rows | - | In the Y direction ( ), along with the column |
| **TERRAIN** | Surface elevation | m | The elevation of the surface (asl) |
| **DELTAC** | Width of cell | m | Width of the cell along the column (in the y direction) |
| **DELTAR** | Width of cell | m | Width of the cell along the row (in the x direction) |
| **BC\_type** | Type of boundary condition | - | 0 not at boundary, 1 constant head boundary, 2 Noflow boundary |
| **BC\_value** | The value of the boundary condition | m | The groundwater head at the boundary |
| **Source\_type** | External source type | - | 0 cell has no external source, 1 cell has a pumping well, 2 cell has a river |
| **H\_initial** | Initial head | m | The initial groundwater head for numerical iterations (it can be model span out or input data) |
| **Recharge\_rate** | Recharge rate from upper soil layers | m/s | It can be called from Noah MP shallow (RECH) or MMF scheme (DEEPECH) \* grid area (need to be converted to m/s) |
| **Pumping\_rate** | Pumping rate | m3/s | As input, it will be as m3/timestep , must to converted to m3/s |
| **K\_RIVERBED** | Riverbed hydraulic conductivity | m/s | The riverbed is the layer below the river that the water moves through it between the aquifer and the river |
| **RIVERBED\_THK** | Riverbed thickness | m | The thickness of the riverbed |
| **W\_RIVER** | The riverbed width | m | The river width |
| **L\_RIVER** | The river bed length | m | The river length |
| **H\_RIVER** | The river water stage | m | The river water level |
| **RIVBED\_BOT** | The riverbed bottom elevation | m | The elevation of the riverbed bottom |

**Output**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables** | **Refer to:** | **Unit** | **Physical meaning** |
| **HNEW** | NEW head | m | The groundwater piezometric head at each time step |
| **GW\_HEAD** | All groundwater head | m | The groundwater piezometric head at all time steps |
| **WTD** | Water Table head | m | The groundwater head in the unconfined aquifer; should be returned to the recharge scheme to update soil moisture |
| **recharge\_flux** | Recharge flux | m | Recharge as m/timestep |
| **pumping\_flux** | Pumping flux | m | Pumping as m/timestep |
| **River\_flux** | River-GW flux | m | River as m/timestep |
| **lat\_xri\_flux** | Lateral flux in x dir | m | As m/timestep |
| **lat\_yci\_flux** | Lateral flux in y dir | m | As m/timestep |
| **Vertical\_flux** | Vertical flux | m | Between the 2 groundwater layers as m/timestep |
| **dStorage** | Change in storage | m | The changes in storage at each grid cell |
| **Net\_flux** | Net flux | m | The net flux at each grid at each timestep in m |