

# SWAT+ modeling

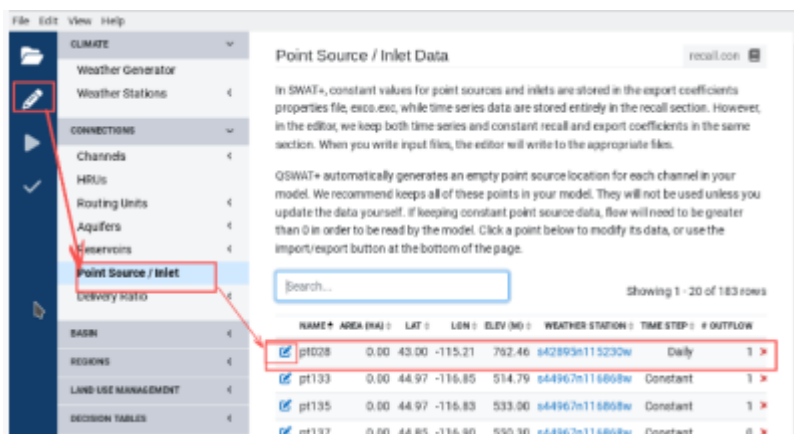
## How to add inflow hydrograph

### PointID selection for the inlet

The point ID for the inlet is defined when we prepare the SWAT+ model in QSWAT+. We can verify it in QGIS using the Identify Features tool.

### Implementation workflow using SWAT+ Editor

Edit SWAT+ Inputs → Point Source/Inlet → Edit Inlet Point → Set the time step to **“Daily”** and import the CSV file prepared for that specific inlet point.



To prepare the input file, we can export the empty recall file in .csv format, add the flow data (in volume, m<sup>3</sup>), and then import the updated file back into SWAT+.

Table: sample input file format for the inlet

| jday | mo | day_mo | yr   | ob_type | ob_name | flo        | sed | orgn | sedp | no3 | solp | chla | nh3 | no2 | cbod | dox | sand | silt | clay | sag | lag | gravel | tmp |
|------|----|--------|------|---------|---------|------------|-----|------|------|-----|------|------|-----|-----|------|-----|------|------|------|-----|-----|--------|-----|
| 1    | 1  | 1      | 2005 | pt_day  | pt028   | 16343154.4 | 0.0 | 0.0  | 0.0  | 0.0 | 0.0  | 0.0  | 0.0 | 0.0 | 0.0  | 0.0 | 0.0  | 0.0  | 0.0  | 0.0 | 0.0 | 0.0    | 0.0 |
| 2    | 1  | 2      | 2005 | pt_day  | pt028   | 16465483.4 | 0.0 | 0.0  | 0.0  | 0.0 | 0.0  | 0.0  | 0.0 | 0.0 | 0.0  | 0.0 | 0.0  | 0.0  | 0.0  | 0.0 | 0.0 | 0.0    | 0.0 |

### File that are generated or changed in the model

- file.cio: define *recall.con* in *connect* and *recall.rec* in *recall*
- recall.rec
- recall.con
- pt028.rec (example for inlet with point id 028)

### How to visualize or print output changes after defining an inflow

- Run the model before and after defining the inflow file, but save the outputs in different Textinout files. Make sure the model prints the channel output so that we can validate it at the

downstream channel section.

- Identify the channel downstream of the inlet.(using QGIS)
- Use the following awk command to extract the flow rate (m<sup>3</sup>/s) at the downstream channel.

```
awk '$7=="cha121" {printf "%.10f\n", $48}'
TxtInOut_withinflow/channel_sd_day.txt | head -n 10
```

## Structure of generated files

### recall.rec

The following shows the structure of the recall.rec file for the SWAT+ model

| recall.rec: written by SWAT+ editor v2.3.1 on 2026-05-28 15:44 for SWAT+ rev.60.5.7 |       |         |           |
|-------------------------------------------------------------------------------------|-------|---------|-----------|
| id                                                                                  | name  | rec_typ | file      |
| 1                                                                                   | pt028 | 1       | pt028.rec |

Terminology used in the file is explained as follows

| Term      | Meaning                            |
|-----------|------------------------------------|
| pt028     | Name of recall object              |
| rec_type  | recall type, 1 for daily data      |
| pt028.rec | file containing actual time series |

### recall.con

The following shows the structure of the recall object connection file for the SWAT+ model

| recall.con: written by SWAT+ editor v2.3.1 on 2026-05-28 15:44 for SWAT+ rev.60.5.7 |                |        |                                                                                                                                                                                                                                                                            |          |            |           |     |                |     |      |      |         |         |        |         |         |
|-------------------------------------------------------------------------------------|----------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-----------|-----|----------------|-----|------|------|---------|---------|--------|---------|---------|
| id                                                                                  | name           | gis_id | area                                                                                                                                                                                                                                                                       | lat      | lon        | elev      | rec | wst            | cst | ovfl | rule | out_tot | obj_typ | obj_id | hyd_typ | frac    |
| 1                                                                                   | pt028          | 28     | 0.00001                                                                                                                                                                                                                                                                    | 43.00159 | -115.20618 | 762.45911 | 1   | s42895n115230w | 0   | 0    | 0    | 1       | sdv     | 104    | tot     | 1.00000 |
| Term                                                                                | value          |        | short_description                                                                                                                                                                                                                                                          |          |            |           |     |                |     |      |      |         |         |        |         |         |
| wst                                                                                 | s42895n115230w |        | Pointer to the weather station file                                                                                                                                                                                                                                        |          |            |           |     |                |     |      |      |         |         |        |         |         |
| cst                                                                                 | 0              |        | No constituent station assigned.                                                                                                                                                                                                                                           |          |            |           |     |                |     |      |      |         |         |        |         |         |
| ovfl                                                                                | 0              |        | No overflow routing defined.                                                                                                                                                                                                                                               |          |            |           |     |                |     |      |      |         |         |        |         |         |
| rule                                                                                | 0              |        | No management or routing rule applied.                                                                                                                                                                                                                                     |          |            |           |     |                |     |      |      |         |         |        |         |         |
| out_tot                                                                             | 1              |        | One downstream routing connection exists.                                                                                                                                                                                                                                  |          |            |           |     |                |     |      |      |         |         |        |         |         |
| obj_typ                                                                             | sdv            |        | <b>I searched for the sdv in the documentation and couldn't find a clear definition.</b> One pdf refer it as SWAT DEG CHANNEL but it doesn't provide detailed information. This term is used in the route_unit.con, reservoir.con, recall.con, aquifer.con and chandeg.con |          |            |           |     |                |     |      |      |         |         |        |         |         |
| obj_id                                                                              | 104            |        | Identifier of the SDC object receiving the flow.                                                                                                                                                                                                                           |          |            |           |     |                |     |      |      |         |         |        |         |         |
| hyd_typ                                                                             | tot            |        | Routes total flow and associated constituents without splitting by component.                                                                                                                                                                                              |          |            |           |     |                |     |      |      |         |         |        |         |         |
| frac                                                                                | 1.00000        |        | 100% of flow are routed to the downstream SDC object.                                                                                                                                                                                                                      |          |            |           |     |                |     |      |      |         |         |        |         |         |

inlet → SDC → route unit

# Files

Files in namespace [root]

| Name                                                          | Size     | Date                |
|---------------------------------------------------------------|----------|---------------------|
| howtos                                                        | —        | —                   |
| wiki                                                          | —        | —                   |
| 0                                                             | —        | —                   |
| q_as                                                          | —        | —                   |
| projects                                                      | —        | —                   |
| software                                                      | —        | —                   |
| lectures                                                      | —        | —                   |
| recall-files.zip                                              | 80.3 KB  | 2026-06-04 01:59 pm |
| elements_of_style_for_writing_scientific_journal_articles.pdf | 1.4 MB   | 2019-12-19 11:07 am |
| writing_a_scientific_paper_-_from_clutter_to_clarity.pdf      | 214.9 KB | 2019-12-19 11:07 am |
| screenshot_20260529_111000.png                                | 116.3 KB | 2026-05-29 11:12 am |
| define-inlet-data.png                                         | 116.3 KB | 2026-05-29 11:17 am |

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SWAT+, Modeling

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