

Quick Start Guide and Installation for SWAT+

This document is a quick guide to install the SWAT+ model necessary for successfully completing the SWAT modeling lab exercise as a part of the undergraduate course Hydrology for Engineers.

What is SWAT+?

The Soil and Water Assessment Tool (SWAT) is a widely used hydrological model designed to simulate both the quantity and quality of surface and subsurface water, while accounting for changes in climate, land use, and management practices. Comprehensive technical documentation for the latest version, SWAT+ (Bieger et al., 2017), is available at: <https://swatplus.gitbook.io/io-docs>

Installation

Instructions for installing SWAT+ and the required ancillary software are available at:

<https://swatplus.gitbook.io/docs/installation>

Please follow the steps provided there carefully, making sure to select the procedures appropriate for your operating system (Windows, macOS, or Linux).

- **QGIS Installation.** SWAT+ requires a geographical information system (GIS) to handle geospatial datasets. The recommended option is QGIS, which is open source and available for all major operating systems.

NOTE for macOS and Linux users: Before installing QGIS, please install OpenMPI as described in Step 1 of the installation guide linked above. OpenMPI enables multiprocessor support and significantly speeds up geospatial computations.

On macOS, OpenMPI is typically installed via Homebrew. If the command `brew install openmpi` returns an error stating that `brew` is not found, it means that Homebrew is not installed. You can install Homebrew from the terminal using:

```
/bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh)"
```

- **SWAT+ Installation.** Download the SWAT+ installer provided in Step 2 of the installation guide. The installer includes all required ancillary software: SWAT+, QSWAT+, the SWAT+ Editor, and the SWAT+ Toolbox.

Before running the SWAT+ installation, it is recommended to consult the QSWAT+ manual ([link here](#)) for further guidance on the QGIS plugin setup.

NOTE for macOS and Linux users: There is no need to download the optional datasets mentioned in the installation guide (see Figure 1), unless you intend to run the bundled test case.

**For Linux and MacOS, the optional SSURGO/STATSGO soils and WGN databases should be downloaded from the [SWAT+ SQLite Datasets](#) section below as they are not included in the installers. See detailed installation instructions for Linux and MacOS [here](#).*

Figure 1: Optional datasets referenced in the installation guide. They are not required unless you want to run the test case.

References

Bieger, K., Arnold, J. G., Rathjens, H., White, M. J., Bosch, D. D., Allen, P. M., . . . Srinivasan, R. (2017, February). Introduction toSWAT+, a completely restructured version of the soil and water assessment tool. *J. Am. Water Resour. Assoc.*, *53*(1), 115–130. doi: 10.1111/1752-1688.12482