WRF-CMake and GIS4WRF: Useful Additions to a Modeller's Toolbox?

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WRF-CMake and GIS4WRF are two recent developments aimed at helping model-developers and end-users with several of their tasks in the Advanced Research WRF (Weather Research and Forecasting) model, here simply "WRF": from contributing to source-code and building executables, to pre- and post-processing input or output data, or running actual simulations on local or remote systems.

WRF-CMake adds CMake support to the latest version of WRF with the intention of streamlining and simplifying its configuration and build-process. In our view, the use of CMake provides model developers, code maintainers, and end-users with several advantages such as robust incremental rebuilds, flexible library dependency discovery, native toolchains for Windows, macOS, and Linux with minimal external dependencies, thus increasing portability, and automatic generation of project files for several IDEs for different platforms.

GIS4WRF is a free cross-platform and open-source QGIS plug-in written in Python aimed at supporting researchers and practitioners with pre- and post-processing data in WRF. The choice of developing GIS4WRF as a QGIS plug-in allows for easy installation, automatic update notifications, use of built-in QGIS functionality, and access to the QGIS plug-in ecosystem. Users can perform data manipulation and conversion tasks, visually and intuitively define model domains, configure model parameters, run simulations, and post-process model output data within a single graphical user interface directly in QGIS.

We present an overview of both tools focusing on their workflow, structure and usability. We show how WRF-CMake and GIS4WRF can be used together, or independently of each other, to help WRF users with several tasks and applications.