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README for the USGS Precipitation-Runoff Modeling System - Version: 6.0.0

File: .\prms_6.0.0\README.pdf

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Introduction

The Precipitation-Runoff Modeling System (PRMS) is packaged for personal computers using one of the Linux or Microsoft Windows operating systems. An executable file compiled for 64-bit operating systems is provided. The Linux executable was compiled using the gfortran and gcc compilers (9.4.0 version). The Windows executable was compiled using the Microsoft Visual Studio Community 2022 (64-bit), Version 17.7.5 and the Intel Fortran version 2023.2 and Intel C++ Classic version 19.2 compilers. Instructions for installation, execution, and testing of this version of PRMS are provided below.

Included with the release are several documents that use the Portable Document Format (PDF) file structure. The PDF files are readable and printable on various computer platforms using Acrobat Reader from Adobe. The Acrobat Reader is freely available from the following World Wide Web site: http://www.adobe.com/

IMPORTANT: Users should review the file .\Release_notes_prms_6.0.0.pdf for a description of, and references for, and changes that have been introduced into PRMS with each official release; these changes may substantially affect model results. See file .\PRMS_tables_6.0.0.pdf that provides replacements tables 2, 1-1, 1-2, 1-3, 1-4, and 1-5 in Markstrom and others, 2015 that documented the Precipitation Runoff Modeling System (PRMS) version 4.0.3. A new table is included that documents variables that can be input in Climate-By-HRU Files.

Distribution File

The following distribution files are for use on personal computers:

> prms_6.0.0.zip for Windows-based personal computers
> prms_6.0.0_linux.zip for Linux-based personal computers

The distribution file contains:

- PRMS_tables_6.0.0.pdf
- Release_Notes_PRMS_6.0.0.pdf
- executable (.\bin)
- source code (.\src)

- GUI (.\dist)
- PRMS documentation (.\doc)
- Seven example problems (.\projects)

Unzipping the distribution file creates numerous individual files contained in several subdirectories. It is recommended that no user files be kept in the prms_6.0.0 directory structure. If you do plan to put your own files in the directory structure, do so only by creating additional subdirectories of the ".\projects" subdirectory. The following directory structure will be created in the installation directory:

Figure 1. Directory structure for the PRMS release and project of version 6.0.0
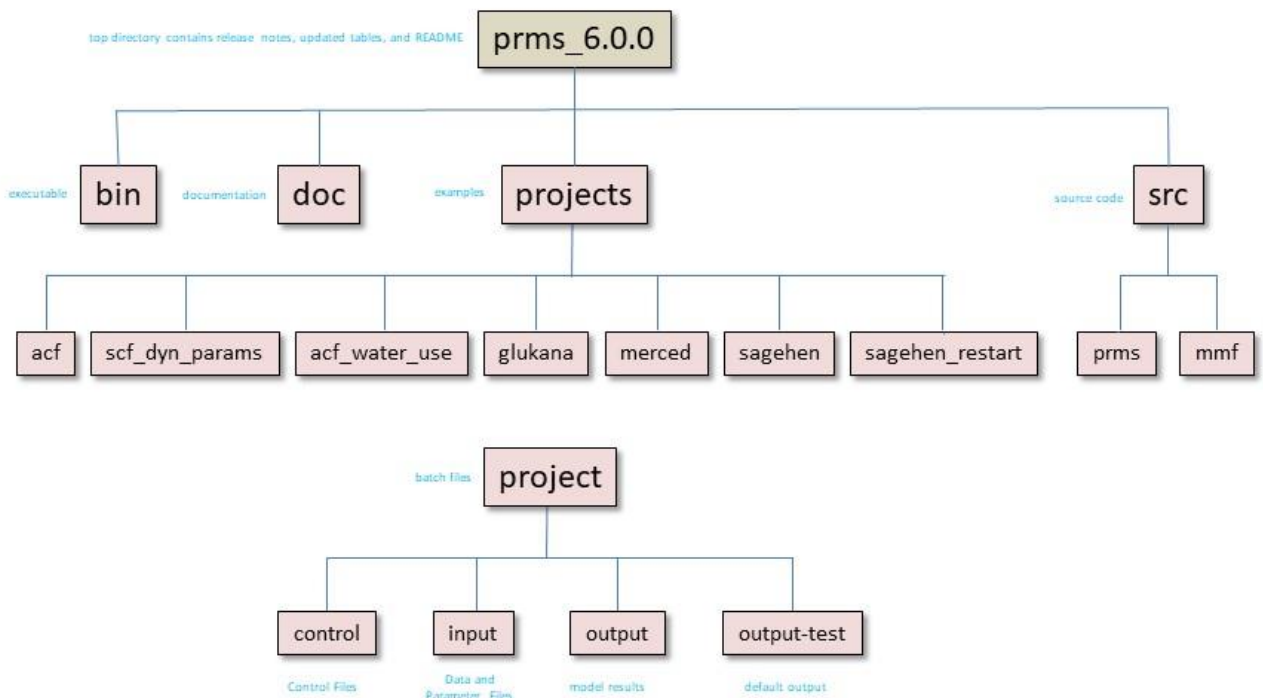
Installing

To make the executable version of PRMS accessible from any directory, the directory containing the executable (./bin/prms on Linux-based computers or .\bin\prms.exe on Windows-based computers) should be included in the PATH environment variable. Also, if a prior release of PRMS is installed on your system, the directory containing the executable for the prior release should be removed from the PATH environment variable.

As an alternative, the executable file in the ".\bin" subdirectory can be copied into a directory already included in the PATH environment variable. Note, the example problems provided with the release (described below) have example Linux shell scripts or Windows batch files that require the executable be in the ".\bin" subdirectory.

Executing the Software

A 64-bit (prms for Linux and prms.exe for Windows) executable is provided in the ".\bin" subdirectory. After the ".\bin" subdirectory is included in your PATH, PRMS is initiated in a Command-Prompt window using the command:

      prms [Fname]

The optional Fname argument is the name of the PRMS Control File. If no argument is used, then PRMS will look for a Control File named "control" in the user's current directory.

The arrays in PRMS are dynamically allocated, so models are not limited by the size of input data. However, it is best to have at least 4 MB of random-access memory (RAM) for model execution and more RAM for large models. If there is less available RAM than the model requires, which depends on the size of the application, the program will use virtual memory; however, this can slow execution significantly. If there is insufficient memory to run the model, then PRMS will not initiate the beginning of the simulation; however, if on a Windows-based computer, the Command-Prompt window may continue to indicate that PRMS is executing. For this circumstance, the program must be terminated manually using the Windows Task Manager application.

Testing

Example problems with PRMS data sets are provided in the ".\projects" subdirectory to verify that PRMS is correctly installed and running on the user's system. The example problems also may be looked at as examples of how to use the program.

See the Readme.txt file in that subdirectory for a description of the seven example problems.

Compiling

The executable file provided in the distribution was created using compilers as described above. Although executable versions of the program are provided, the source code also is provided in the ".\src" subdirectory so that PRMS can be recompiled if necessary. However, the USGS cannot provide assistance to those compiling PRMS. In general, the requirements are a Fortran compiler, a compatible C compiler, and the knowledge of using the compilers. Makefiles are included in the ".\src" subdirectories as an example for compiling PRMS.

References

Markstrom, S.L., Regan, R.S., Hay, L.E., Viger, R.J., Webb, R.M.T., Payn, R.A., and LaFontaine, J.H., 2015, PRMS-IV, the precipitation-runoff modeling system, version 4: U.S. Geological Survey Techniques and Methods, book 6, chap. B7, 158 p. https://dx.doi.org/10.3133/tm6B7.

Regan, R.S., Markstrom, S.L., LaFontaine, J.H., and Norton, P.A., 2025, The precipitation-runoff modeling system, software release version 6.0.0, with release notes from version 4.0.1 March 11, 2015 to version 6.0.0 December 20, 2024: U.S. Geological Survey Software Release, https://doi.org/10.5066/P97032NH.