



# Community modelling of water in the landscape

The Bureau of Meteorology invites hydrological and climate modellers to use and develop the Australian Water Resources Assessment Community Modelling System (AWRA-CMS).

The AWRA-CMS is a freely available version of the Australian Water Resources Assessment Landscape model (AWRA-L) which simulates the water balance in the Australian landscape.

## What can the AWRA-CMS be used for?

You can use the CMS to test, refine and run your own landscape water model application for your own region, and contribute any core model improvements back to the user community.

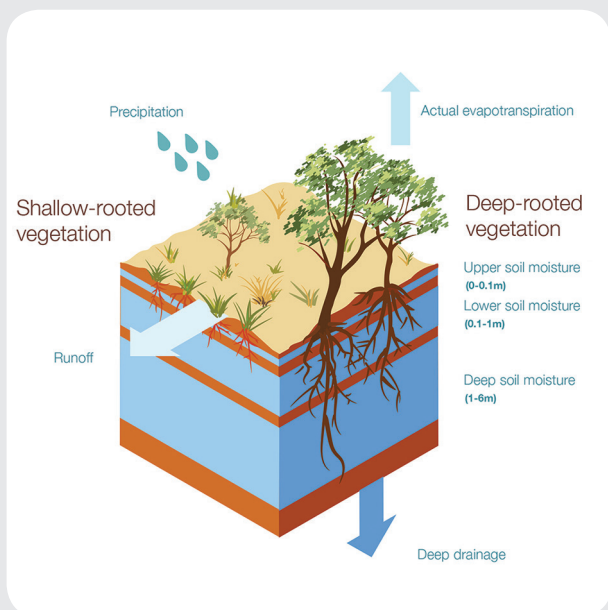
Broadly speaking, the AWRA-CMS caters for two types of users:

- **Applying users:** People who are interested in applying the current model to a region of interest using localised and/or scenario data where available.
- **Contributing users:** People who would like to extend or improve the capabilities of the model with new research and additions or changes to model code.

While the AWRA-L model is set-up for Australia, you can adapt the Australian model to your own catchment or region of interest to refine the model locally. For example, you might improve the model with local soil and land-use data, or calibrate it to local observation data. Perhaps you'd like to test and evaluate an improved process description in the core model?

## The Australian Water Resources Assessment Landscape model

AWRA-L simulates the flow of water through the land—through the vegetation and soil—and then out again as evapotranspiration, runoff to surface water, or deep drainage to groundwater. It represents the soil column using three layers and has two different hydrological response units (shallow and deep-rooted vegetation).



## Technical Specifications

**AWRA-CMS Components:** The package includes the following components:

- The AWRA-L model code
- Simulation, Calibration, Visualisation, Benchmarking and Utilities modules
- Training workbooks
- User guide

**Languages:** AWRA-CMS is a modelling system developed in the Python programming language, with the core model algorithms implemented in C and generic functionality provided by robust, open-source libraries (e.g. NetCDF, HDF5, MPI).

**Operating system:** The AWRA-CMS system has been developed and tested for use on the Linux OS. A conda package list (see <https://conda.io/>) is provided for easy setup of a virtual environment to run the modelling system.

**Interface:** The Jupyter notebook interactive environment (see <http://jupyter.org>) can be used to run all components of the modelling system. Example notebooks are provided as a guide to get you started.

## Getting started with the AWRA-CMS

You can get started with the AWRA-CMS today, by downloading the AWRA-CMS code at:

[https://github.com/awracms/awra\\_cms](https://github.com/awracms/awra_cms)

It is provided together with annotated Jupyter notebooks with guidance on using the code.

After registering as a user at [awracms@bom.gov.au](mailto:awracms@bom.gov.au) and agreeing to the licence conditions you will receive the model code, notebooks, user guide and a test set of Australia-wide data to run the model. The licence agreement simply requires that you inform the Bureau of Meteorology on how you intend to use AWRA-CMS and that you contribute back to the AWRA-CMS any potential improvements you make.

Did you know the Bureau of Meteorology runs free 1–2 day training courses in using the AWRA-CMS? Register your interest at [awracms@bom.gov.au](mailto:awracms@bom.gov.au)

## What is the Bureau's role?

As part of its Water program, the Bureau has built a comprehensive and reliable picture of Australia's water resources to support policy and planning. It provides nationally consistent landscape water balance estimates using the AWRA-CMS as part of its water information role and responsibilities under the *Water Act 2007*.

The Bureau of Meteorology released the model as a community modelling system in December 2016 to further the development of this model by the Australian modelling community. The model was developed through the Water Information Research and Development Alliance between the Bureau and CSIRO.

FIND OUT MORE

To access the AWRA-CMS or to apply the model in your region please contact [awracms@bom.gov.au](mailto:awracms@bom.gov.au)

Subscribe to our newsletters and product notices to receive regular updates at [www.bom.is/enviro-news](http://www.bom.is/enviro-news)



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