

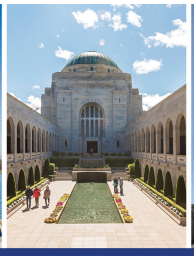


1–6 December 2019

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Supporting evidence-based decision making: the role of modelling and simulation

Workshops

Workshops will be held on Wednesday 4 December. Please contact the workshop organiser for more information.

Implementation and development of coupled fire-atmosphere modelling

UNSW Canberra at the Australian Defence Force Academy
Room SR06

This workshop provides an opportunity for those interested in modelling the fire-atmosphere system across a range of scales; from fine-scale combustion dynamics to large pyroconvective events. A number of targeted presentations will highlight advances, new insights, technical issues and emerging research directions associated with each of the respective modelling frameworks. These presentations are intended to promote technical discussion of important modelling issues, with a particular focus on synergies and linkages across the modelling platforms that might lead to fruitful collaboration and progress in modelling the fire-atmosphere system at relevant scales.

Specific modelling platforms likely to be represented include:

- WRF-Fire
- ACCESS-Fire
- FDS/WFDS
- Phoenix RapidFire
- CSIRO Spark

Workshop length: 9:00 am to 2:00 pm

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Agenda

9:00-9:20: Arrivals
9:20-9:30: Introduction and house-keeping
9:30-10:00: Sofiane Meradji – 3D physics-based model FIRESTAR3D for the prediction of wildfire behaviour.
10:00-10:30: Khalid Moinuddin – Fire Dynamic Simulator (FDS) for wildfire propagation modelling.
10:30-11:00: Morning tea
11:00-11:30: Rachel Badlan – Using WRF-Fire to investigate violent pyroconvection
11:30-12:00: James Hilton – Models for local wildfire atmospheric interactions in Spark: rapid approximations to fluid dynamics.
12:00-12:30: Duncan Sutherland – Simulations of junction fires in nonzero wind.
12:30-13:00: Lunch
13:00-14:00: Discussion – issues and future directions of coupled modelling.
14:00: Close

Contact

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Human-environment interactions in the Murray–Darling Basin — from forecasting to foresighting

Forestry Lecture Theatre, Australian National University

The recent drought has yet again placed water resources in the Murray Darling Basin in the public spotlight. While decisions related water management policy in the basin will naturally remain contested and political, it is critical that policy is developed upon the solid foundations of open, transparent and peer reviewed science. This workshop will discuss the science and modelling technology requirements to help inform policy decisions related to water management, including identifying research and investment priorities to understand the historical, near-term and long-term

movement of water throughout the basin. The topic will be approached from a biophysical perspective but also from social, economic, ecological, engineering and policy perspectives.

Cost: Free

Key Contact: Seth Westra (**seth.westra@adelaide.edu.au**)

Registration: via EventBrite: **http://ozewex6.eventbrite.com.au**

System-of-systems modeling framework

Stringybark room, ground floor, Synergy building (Building 801), CSIRO Black Mountain

A tiered, system-of-systems modeling framework is required to represent and characterize the interconnections among the many components of socio-environmental systems. However, managing uncertainty and dealing with scale are two major interrelated barriers that must be simultaneously surmounted, because scaling affects uncertainty. Particular questions to discuss:

1. What are the main issues we deal with in systems-of-system type of situations (temporal, spatial, structural scales and boundaries, complexity, uncertainty, coupling, etc.)?
2. What are the relevant case studies where we can assess current modeling practices in the context of systems-of-systems?
3. How to develop a conceptual system-of-systems modeling framework applicable to various cases?
4. How to quantitatively evaluate implementation of the framework and synthesize conclusions?

Workshop length: 1/2 day (8:00 am to 12:00 pm)

Workshop organisers: Alexey Voinov, Sondoss Elsawah and Tony Jakeman (with John Little and Hsiao-Hsuan Wang remotely)

Workshop contact: Alexey Voinov (**aavoinov@gmail.com**)

Open Modeling Foundation: Standards for Model Documentation

Stringybark room, ground floor, Synergy building (Building 801), CSIRO Black Mountain

Documentation is a very important, and impactful part of any model. However documentation makes sense only if it can be understood by a much broader audience than just the model developers. It has to provide adequate information to know what the model is capable of simulating, on what processes it is based, what assumptions are made, what the limitations are, and for which applications it was initially developed. Numerous attempts to provide some standards for model documentation have been made, however a universal and accepted standard is yet to emerge. This workshop is to discuss:

a. What should such a standard for model documentation include?
b. What are the minimal requirements?
c. How will modeling scientists who meet this standard be recognised?
d. How can model developers be incentivised to meet these documentation standards?
e. How should these standards be reviewed, adopted, and disseminated?
f. What other standards relevant to modeling science need to be developed?
g. What can be a formal process for such standards to be proposed, reviewed, and adopted?

Workshop length: 1/2 day (1:00 pm to 5:00 pm)

Workshop organisers: Alexey Voinov, Min Chen, Susan Cuddy and Tony Jakeman (with Michael Barton and Albert Kettner remotely)

Workshop contact: Alexey Voinov (**aavoinov@gmail.com**)

AWRA Community Modelling System and Landscape Water Balance Training

Torrens Room National Convention Centre, Canberra

In this two-part workshop, we will introduce you to the data and models behind the Australian Landscape Water Balance products at **www.bom.gov.au/water/landscape**. The training will consist of two parts:

- Part 1: Understand the Australian Landscape Water Balance website, underlying model and data (9am-12pm)
- Part 2: Understand and use the AWRA Community modelling system, AWRA-CMS (1pm-5pm)

The AWRA modelling system (AWRAMS) was developed through the Water Information Research and Development Alliance (WIRADA) initiative between the Bureau and CSIRO, towards supporting the Bureau of Meteorology's requirements in water reporting. It comprises the national AWRA-L model which simulates the terrestrial water balance across the Australian landscape and the AWRA-R model which simulates the riverine water balance for key river systems across Australia. This training is focused on the AWRA-L model and the data available online from the national, daily, 0.05 degree application of the model. It simulates the flow of water through the landscape: from the rainfall entering the grid cell through the vegetation and soil moisture stores and then out of the grid cell through evapotranspiration, runoff or deep drainage to the groundwater.

The Bureau of Meteorology is committed to continuing development of the AWRA MS and therefore invites open participation in the AWRA Community Modelling System (AWRA-CMS **https://github.com/awracms/awra_cms**). The AWRA-CMS allows the public, researchers and organisations to now access, run and alter the AWRA-L model and suggest changes to the Bureau. This also means that AWRA-L can be used for different applications, such as regional applications using locally relevant climate, soil or vegetation properties and a local calibration.

Attendees are invited to attend Part 1 only or both Parts 1 and 2. Part 1 has no prerequisite requirements

and is intended for those interested in using the outputs of the AWRA-L model. Part 2 is intended for those interested to run and perhaps alter the model themselves. For those attending Part 2 we ask that attendees have previous programming experience (preferably Python) and are accustomed to working with hydrological models without graphical user interfaces (GUIs).

Workshop organisers: The Bureau of Meteorology

Registration: Please email **awracms@bom.gov.au**

Cost: $220 full day (Part 1 and Part 2), $150 half day (Part 1 only)

Workshop length: Full day (Part 1 and Part 2) or half day (Part 1 only in the morning)

Download workshop flyer

Download workshop agenda

Water quality modelling – challenges, opportunities and future plans

Forestry Rm 108, Australian National University (ANU)

This informal workshop is open to all MODSIM participants interested in water quality modelling. The purpose of the workshop is to have an open discussion to:

- Connect members of the water quality modelling community in Australia and New Zealand
- Discuss key research needs in the area of water quality modelling
- Discuss future plans for addressing water quality modelling topics at meetings and conferences like MODSIM

Workshop length: 2 hours, 3:00 pm to 5:00 pm

Workshop contact: Anna Lintern (**anna.lintern@monash.edu**)