POSITION DESCRIPTION

WESTERN SYDNEY UNIVERSITY

Postdoctoral Research Fellow in Biogeochemical Modelling

POSITION DETAILS

Position Title	Postdoctoral Research Fellow in Biogeochemical Modelling
Classification	Academic Level A
Position Number	7016374
School/Office	Hawkesbury Institute for the Environment
Division	Provost

POSITION PURPOSE

The Postdoctoral Research Fellow will join a vibrant, nationally and internationally connected research team applying process-based climate-ecosystem modelling to understand response mechanisms of Australia's natural and managed ecosystems to climate change and management. The Fellow will work closely with senior researchers, postgraduate students and collaborators involved in two Australian Research Council-funded projects on the different but related topics: (1) responses of Australia's phosphorus-limited eucalyptus forests to rising atmospheric CO2; (2) drivers and interactions of snow gum woodland dieback in Australia's high country.

The Fellow will further develop and apply an existing dynamic vegetation model framework, LPJ-GUESS, already configured to simulate vegetation and soil processes of these ecosystems, harnessing measurement data and experimental process knowledge to improve the predictive skill of the model. They will support doctoral student work applying this model to evaluate mechanistic hypotheses regarding the structural and functional dynamics of the respective ecosystems, and their resilience to future climate change. They will collaborate with researchers and stakeholders on efforts to develop new applications of the resulting modelling capability to support strategic land management for production, biodiversity and climate outcomes.

KEY ACCOUNTABILITIES

1. Develop and evaluate modifications to an existing process-based ecosystem model based on empirical process knowledge and measurement data.
2. Design and conduct model experiments to attribute observed variations in woodland structure and function to underlying environmental drivers, ecological response mechanisms and management activities, or to project changes under future scenarios.
3. Collaborate with and mentor research team members including postgraduate students in the

application of modelling tools in the context of joint projects, grants and thesis work.
4. Contribute to the day-to-day delivery of research tasks and milestones as part of distributed project teams, including the timely delivery of manuscripts, reports and presentations for various audiences.
5. Develop and cultivate collegial and collaborative working relationships with team members, collaborators and stakeholders.
6. Where appropriate, lead or contribute to the development of grant applications to support own or collaborative research.
7. Occasional contributions to teaching in relation to the research projects, which may include the development and delivery of high-quality teaching such as lectures, demonstrations, workshops or supervision of undergraduate project work.
8. Ensure that project research data management conforms to the Australian Code for the Responsible Conduct of Research, University policies, and requirements of the ARC.

QUALIFICATIONS, EXPERIENCE AND SKILLS

1. A PhD degree in terrestrial ecology, biogeochemistry, environmental science or a related field.
2. Demonstrated experience in the development and application of process-based biophysical models to environmental change problems and questions. Previous experience working with the LPJ-GUESS ecosystem model is an advantage.
3. Demonstrated skills in the processing, analysis and management of scientific datasets, including field measurement data, complex spatio-temporal datasets such as satellite data, and model-generated data such as climate model ensembles.
4. Demonstrated ability to write and publish manuscripts as first author in top-quartile scientific journals, and a publication track record appropriate to the applicant's career stage.
5. Computer coding skills, particularly in C, C++, Python.
6. Previous experience undertaking work on high-performance computer clusters in a linux environment is an advantage.
7. Excellent organisational, communication and interpersonal skills, with the ability to be self-directed and to work effectively and harmoniously as part of a research team.

KEY RELATIONSHIPS

- **This position reports to**: Director of Research (7005874)
- **This position supervises**: nil
- **Key internal relationships**:
    - Institute Director
    - Institute Manager
    - Technical staff supporting HIE field and computing facilities
    - Academic Staff and HDR students of HIE
- **Key external relationships**:
    - Research collaborators at Australian National University, Lund University, Technical University of Munich, and the international LPJ-GUESS Developer Consortium
    - Partner Investigators of the Australian Research Council Linkage Project Understanding snow gum dieback for effective and integrated management

CHALLENGES

- Navigating competing priorities across multiple projects while maintaining research quality and meeting deadlines.
- Ensuring compliance with research ethics and integrity policy, standards and regulations.
- Communicating the value and purpose of numerical modelling as a component of research

methodology to diverse audiences.

UNIVERSITY EXPECTATIONS

The University expects that all employees are aware of, and comply with legislation and Western's policies and procedures relevant to the position, including but not limited to:

- → Code of Conduct
- → Work Health and Safety and Wellbeing Management System
- → Enterprise Agreement or Award
- → Anti-discrimination principles, Equal Employment Opportunity and staff and student equity.

Approved by: Lead People and Culture Partner (Provost)
Date: 25/05/2026