# Position Details

## CSIRO Early Research Career (CERC) Postdoctoral Fellowship– CSOF4

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| The following information is for applicants |
| Advertised Job Title | CSIRO Postdoctoral Fellowship in Modelling Erosion Hazards  |
| Job Reference | 72249 |
| Tenure | Specified Term of 3 years Full-time  |
| Salary Range | AU$86,434 to AU$94,679 pa (pro-rata for part-time) + up to 15.4% superannuation |
| Location(s) | Black Mountain, ACT |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | * Australian/New Zealand Citizens and Australian Permanent Residents
* Australian temporary residents currently residing in Australia (visa sponsorship may be provided to eligible candidates)
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| Position reports to the | Team Leader, Landscape Evaluation |
| Client Focus – Internal | 10% |
| Client Focus – External | 90% |
| Number of Direct Reports | 0 |
| Enquire about this job | Scott Wilkinson via email at Scott.Wilkinson@csiro.au or phone +61 2 6246 5582 |
| How to apply | Apply online at <https://jobs.csiro.au/> Internal applicants please apply via **Jobs Central**If you experience difficulties when applying, please email careers.online@csiro.au or call 1300 984 220. |

### Role Overview

**CSIRO Early Research Career (CERC) Postdoctoral Fellowships** provide opportunities to scientists and engineers who have completed their doctorate and have less than three years relevant postdoctoral work experience. These fellowships aim to develop the next generation of future leaders of the innovation system through:

* A differentiated career development program to deliver capability excellence and breadth across all facets of the national innovation system.
* Research training via strategic research and development projects with a clear focus that will deliver real impact through science and engineering excellence;
* An innovative culture supporting the development and demonstration of original thinking and expertise leading to peer-recognition; and
* Opportunities to develop skills and experience in collaborative research teams to effectively work within national and global multi/transdisciplinary and multi-stakeholder environments.

CERC Postdoctoral Fellows **are appointed for three years or part time equivalent.**

CSIRO’s Land & Water business unit have an opportunity available for a Postdoctoral Fellow to join the Landscape Evaluation team within the Living Landscape program. The Postdoctoral Fellow will undertake computational research to develop, evaluate and implement landscape models of gully and stream bank erosion and hydrologic processes. The Postdoctoral Fellow will take the lead in developing process-based spatial models building on airborne LiDAR and other datasets using efficient modelling techniques and database structures. They will implement evaluation procedures involving statistical accuracy and spatial patterns, to adaptively develop models that deliver new understanding of erosion behaviour and water movement across diverse landscapes. The Postdoctoral Fellow will aim to deliver meaningful assessments which have value to natural resource managers in prioritising erosion and water resource management, including in northern Australia and catchments draining to the Great Barrier Reef. The research may also open new approaches to improving landscape function by minimising erosion rates and maximising water resource efficiency.

The Postdoctoral Fellow will have access to high-performance computing infrastructure and will have the opportunity to engage with the CSIRO Machine Learning and Artificial Intelligence Future Science Platform, such as on approaches to handle uncertainty and data integration. The Postdoctoral Fellow will be guided by an international team of hydrology, geomorphology and ecology scientists experienced in field and computational research involving terrain analysis, soil, vegetation, erosion, sediment transport and hydrology. The Postdoctoral Fellow will have opportunities to contribute to the research undertaken by the team regarding the sustainable development and use of soil and water resources, resilience to climate extremes, and ecosystem modelling. The team have, and will be able to introduce the Postdoctoral Fellow to, broad networks within academic institutions, and the natural resource management and agricultural industries.

Context: Soil erosion hazard assessment at fine spatial scales is increasing in importance due to the degradation of aquatic ecosystems and pressure to produce food and fibre within an increasingly variable climate. The Australian Natural Resource Management industry invests hundreds of millions of dollars each year to address land degradation and water quality problems but has little information to optimise its effectiveness.

The Postdoctoral Fellow will work with a project team to develop the overall research goals and approaches and to assess their practicality and related opportunities. They will take the lead in translating process-based spatial models to the landscape scale considering tractability and potential impact. The Postdoctoral Fellow will be responsible for evaluating outputs and leading the publication of research findings with the support of the team, as well as being actively involved in communication of the outputs with government agencies and other stakeholders.

### Duties and Key Result Areas:

Under the direction of senior research scientists and engineers, the CERC Postdoctoral Fellow will:

* Investigate and define methods to represent landscape morphology.
* Rapidly develop an understanding of the physical surface processes and mathematical constructs driving terrain-related phenomena.
* Undertake efficient analysis and management of large datasets.
* Develop spatial models including Python.
* Conduct model evaluation.
* Undertake remote field work surveying, collecting, recording, and documenting sample collection in inclement weather whilst being outdoors for prolonged periods of time.
* Apply rigorous attention to detail to enable accurate predictions.
* Publish cutting-edge journal articles.
* Carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes.
* Recognise and exploit opportunities for innovation and the generation of new theoretical perspectives, and progress opportunities for the further development or creation of new lines of research.
* Recognise where endeavours will make the greatest non-academic impact or difference and plan research methodology accordingly.
* Carry out research investigations requiring originality, creativity and innovation.
* Record, manage, and analyse data/information using relevant domain data science techniques.
* Proactively undertake development to grow effective researcher capabilities to support career goals.
* Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives and Making Safety Personal goals.
* Undertake other duties as directed.

[**The CERC Postdoctoral Fellow learning and development program**](http://www.csiro.au/en/Careers/Student-and-graduate-programs/Postdoctoral-fellowships)is developed between the CERC Postdoctoral Fellow and their CSIRO supervisor. The program will focus on enhancing the Fellows’ capabilities to the level expected of an independent researcher and will include on-the-job and course-based development encompassing:

* Discipline-specific techniques and protocols
* Professional growth
* Project management
* Communication and influencing skills
* Working and collaborating with others

## **Required Competencies:**

* **Teamwork and Collaboration:** Cooperates with others to achieve organisational objectives and may share team resources in order to do this. Collaborates with other teams as well as industry colleagues.
* **Influence and Communication:** Uses knowledge of other party's priorities and adapts presentations or discussions to appeal to the interests and level of the audience. Anticipates and prepares for others reactions.
* **Resource Management/Leadership:** Allocates activities, directs tasks and manages resources to meet objectives. Provides coaching and on the job training, recognises and supports staff achievements and fosters open communication in the team.
* **Judgement and Problem Solving:** Investigates underlying issues of complex and ill-defined problems and develops appropriate response by adapting/creating and testing alternative solutions.
* **Independence:** Recognise and makes immediate changes to improve performance (faster, better, lower cost, more efficiently, better quality, improved client satisfaction).
* **Adaptability:**Copes with ambiguity or situations that lack clarity. Adapts readily to changing circumstances and new responsibilities (which may include activities outside own preferences) in the interests of achieving team objectives. Recognises the need for and undertakes personal development as a result of changes.

## **Selection Criteria**

#### Essential

*Under CSIRO policy only those who meet all essential criteria can be appointed.*

1. A doctorate (or will shortly satisfy the requirements of a PhD) in a relevant discipline area, such as earth sciences, engineering, environmental sciences, information and computing sciences.

Please note: To be eligible for this role you must have **no more than 3 years** (or part time equivalent) of postdoctoral research experience.

1. High level written and oral communication skills with the ability to represent the research team effectively internally and externally, including the presentation of research outcomes at national and international conferences.
2. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
3. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.
4. Ability to remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
5. **The ability to work effectively as part of a multi-disciplinary, potentially regionally dispersed research team, plus the motivation and discipline to carry out autonomous research.**
6. Demonstrated experience in spatial modelling and programming capabilities using Python.
7. Demonstrated research experience in spatial analysis of terrain and/or demonstrated research experience in gully and stream bank erosion processes.

## **Desirable:**

1. Experience using high-performance computing clusters and managing data analysis workflows.
2. Research experience in geomorphology, surface hydrology, and machine learning.
3. Research experience analysing LiDAR point clouds and vegetation remote sensing imagery.
4. Research experience informing catchment water quality management in Australia.
5. Proficiency in experimental design and robust statistical analysis.

To be appointed as a CERC Postdoctoral Fellow within CSIRO, candidates are required to have **submitted** their PhD at the time of commencement, as a minimum requirement, if PhD conferment has not been obtained. If a candidate has submitted, but their PhD has not yet been formally attained, the starting salary will be CSOF4-1 $83,687. Upon CSIRO receiving written confirmation that the PhD has been awarded (within a six month period from commencement date), the salary will be increased to the negotiated level and the difference will be back-paid to the Officer’s start date.

Special Requirements

Appointment to this role may be subject to conditions including provision of a national police check as well as other security/medical/character clearance requirements.

The successful candidate will be asked to obtain and provide evidence of a National Police Check or equivalent. Please note that people with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.

The successful candidate may be required to undertake a pre-employment medical examination prior to commencement.

A current Australian driver’s licence or the ability to obtain one.

If the successful candidate is not an Australian Citizen or Permanent Resident, they may be required to undergo additional security clearances, which may include medical examinations and an international standardised test of English language proficiency (i.e. IELTS test).- https://ielts.com.au/

**Our value proposition**

We want CERC Postdoctoral Fellows to join our world class science, engineering and digital teams to solve big, complex problems that make a real difference to the future of Australia and the world.

You'll get to work with some of the most talented minds in their fields, not just in Australia, but in the world. At CSIRO, we spark off each other, learn from each other, trust each other and collaborate closely to achieve more than we could individually.

CSIRO Early Research Career (CERC) Postdoctoral Fellow Experience Employee Value Proposition (EVP). Find out more [here](https://www.csiro.au/en/careers/postdoctoral-fellowships)!

## **About CSIRO:**

We solve the greatest challenges through innovative science and technology. To find out more visit us [online](http://www.csiro.au/)!

Find out more about CSIRO [Land and Water](https://www.csiro.au/en/Research/LWF)