# 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 Terrestrial Social-Ecological Systems Modelling |
| Job Reference | 79358 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$89,926 to AU$98,504 pa (pro-rata for part-time) + up to 15.4% superannuation |
| Location(s) | Darwin, NT |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All Candidates |
| Position reports to the | Senior Research Scientist |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Anna Richards via email at Anna.Richards@csiro.au or phone +61 8 8944 8437 |
| 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](mailto: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.**

A sustainable industry or community sits within a dynamic environment, society and economy which are faced with the need to rapidly adapt to accelerating climate change. Managing new and developing risks in this context of great uncertainty about change requires an understanding of future implications for social-ecological systems, including the flows of services and benefits nature will generate now and into the future. For example, effective actions for sustainability transitions in dynamic social-ecological systems require an understanding of the times and places that action needs to be taken (before local or regional change is irreversible or catastrophic) as well as identifying thresholds beyond which actions would be much more costly to take (often referred to as an ‘adaptation pathways’ approach in the context of climate change). Most scientific studies have considered such thresholds and ‘tipping points’ separately for biophysical and social-economic systems, and there is limited research into how, where and when such tipping points and their drivers might interact. Understanding these interactions requires a spatial mapping of the plausible future states of social-ecological systems and their values (e.g. capacity to provide ecosystem services and benefits), and an ability to model complex feedbacks and non-linear behaviour under different climate and land use scenarios.

The **Valuing Sustainability Future Science Platform (VS FSP)** is a substantial new 5-year investment in cutting edge research by CSIRO that will recruit several post-docs who will be embedded in diverse inter-disciplinary research teams. The VS FSP aims to co-produce future pathways, measures and indicators to underpin sustainable innovation and prosperity for current and future industries and communities. The VS FSP will bring together social, biophysical, economic and data science teams and work with diverse stakeholders to advance these outcomes, in part through developing measurement and assessment technologies that can support decision-making, attribute change to practice, and track progress.

Within the VS FSP, the **future states, thresholds, and flows of services and benefits from social-ecological systems** project aims to develop methods, tools and capability to identify, define, track and quantify the future states, transitions and tipping points of social-ecological systems, including explicit consequences for the flow of ecosystem services and benefits under future sustainability pathways and scenarios. The future states project is employing two CERC post-doctoral fellows: a marine and terrestrial social-ecological systems modeller based in CSIRO Oceans and Atmosphere and CSIRO Land and Water, respectively. The CERC post-doctoral fellows will work as part of a collaborative team with researchers at CSIRO (including marine and terrestrial social-ecological and agricultural systems modelers, transdisciplinary scientists, spatial scientists, environmental economists, data scientists and futures researchers) and several partner agencies. They will be expected to regularly communicate with managers and other stakeholders.

The CERC post-doctoral fellows will work on discipline-specific and cross-disciplinary activities to answer two questions applied separately to marine and terrestrial landscapes. The CERC post-doctoral fellows will also connect and cross-fertilise learnings from across terrestrial and marine systems to advance domain-level systems models and apply these to an integrated marine-terrestrial case study. The questions driving this research are:

* Can we develop robust and useable indicators or predictors of significant changes in flows of ecosystem services and benefits in dynamic social-ecological systems experiencing perturbations?
* Can we assess proximity to social-ecological state changes, thresholds and tipping points in a way that is useful for management and decision-making?

Specifically, the Terrestrial Social-Ecological Systems Modelling Postdoctoral Fellow will explore dynamic state and transition simulation modelling to describe current and project plausible future ecosystem states, that account for diverse and interacting social, ecological and economic drivers. The development of state and transition models will be informed by expert knowledge, high-frequency remote-sensing time series and on-ground monitoring datasets. The state and transition models will be integrated within a simulation environment that will enable the exploration of impacts of future climate and land use scenarios on the likely spatial location of future ecosystem states, indicators of tipping points (transitions between states) and consequences for the capacity of landscapes to provide ecosystem services, including local and regional benefits to biodiversity. Using learnings from marine social-ecological systems models, and a coupled marine-terrestrial ecosystem case study, the postdoctoral fellow will explore the potential to incorporate feedbacks from social-economic models into the simulation environment.

### Duties and Key Result Areas:

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

* + Carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes.
  + Recognise and utilise opportunities for innovation and the further development of social-ecological systems models
  + Work with project stakeholders and collaborators to design research questions, implement research activities and evaluate outcomes
  + Produce high quality scientific papers suitable for publication in peer reviewed journals, and internal and external reports. Prepare appropriate conference papers and present those at national and international conferences as agreed with their supervisor.
  + Translate outcomes of research activities to partners and end-users, for instance, through participation in management meetings, field visits and presentations.
  + Carry out research investigations requiring originality, creativity and innovation
  + Record, manage, and analyse data/information using relevant domain data science techniques.
  + Work collaboratively with colleagues within the team, the Business Unit and across CSIRO.
  + Proactively undertake development to grow effective researcher capabilities to support career goals.
* Adhere to the spirit and practice of CSIRO’s Code of Conduct, including ethical human research and privacy requirements, Health, Safety and Environment procedures and policy, Diversity initiatives and Making Safety Personal goals.
* 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 landscape ecology, ecological remote sensing, social-ecological or ecosystem modelling

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

1. Programming skills and demonstrated ability to work across a range of programming and data analysis languages (e.g. C#, Python, R) and software environments.
2. Experience in the development and/or application of quantitative models for understanding ecological or social-ecological systems
3. Experience in applying remote sensing techniques to ecological questions
4. 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.
5. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
6. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable:**

1. Theoretical background in systems ecology, including development of conceptual models to understand ecological states and transitions
2. The ability to apply data analytics techniques for handling large datasets and multi-model outputs
3. Experience undertaking ecological data collection in the field
4. Experience in stakeholder engagement, expert elicitation and/or knowledge co-production
5. Experience in undertaking cross-disciplinary research, knowledge generation or learning
6. The ability to remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
7. **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.**

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 (AU $87,068). 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.
* 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 Postdoc 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/)!

CSIRO is a values-based organisation.  In your application and at interview you will need to demonstrate behaviours aligned to our values of:

* 1. People First
  2. Further Together
  3. Making it Real
  4. Trusted

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