# 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 Collaborative Intelligence and Marine Ecosystem Modelling |
| Job Reference | 86321 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$89,926 to AU$98,504 pa + up to 15.4% superannuation |
| Location(s) | Hobart TAS; St Lucia (Brisbane) QLD; or Crawley (Perth) WA |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | * Australian/New Zealand Citizens, * Australian Permanent Residents and * Australian temporary residents currently residing in Australia (visa sponsorship may be provided to eligible onshore candidates) |
| Position reports to the | Team Leader |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Rowan Trebilco via email at [rowan.trebilc@csiro.au](mailto:rowan.trebilc@csiro.au)  or phone +61 3 6232 5138 |
| 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. |

**Acknowledgement of Country**

CSIRO acknowledges the Traditional Owners of the land, sea and waters, of the areas that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present. View our [vision towards reconciliation](https://www.csiro.au/en/about/Indigenous-engagement/Reconciliation-Action-Plan).

### Role Overview

**CSIRO Early Research Career (CERC) Fellowships** provide opportunities to scientists and engineers who have completed their doctorate and have less than three years relevant research 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 Fellows **are appointed for three years or part time equivalent.**

Ecosystem and social-ecological system models are essential for supporting sustainable management and adaptation strategies for marine systems and industries as the Blue Economy booms in Australia and worldwide. These models support tactical and strategic decision-making and will be central to future-proofing the seafood sector and for maintaining functionally-robust marine ecosystems. Demand for these tools is rapidly increasing but a critical bottleneck in capacity to meet this demand is that new models are very time-consuming and require a unique skillset to develop. This also means that that it is not currently possible to rapidly deploy new model implementations to proactively tackle emerging problems. The *Postdoctoral Fellow in Collaborative Intelligence and Marine Ecosystem Modelling* will pioneer the use of collaborative intelligence, where machine and human learning leverage upon one another, with the aim of eliminating this bottleneck.

The *Postdoctoral Fellow in Collaborative Intelligence and Marine Ecosystem Modelling* will be working at the forefront of both ecosystem modelling (and applied ecology/natural resource management more broadly) and human factors and artificial intelligence research. You will join a dynamic transdisciplinary team with world-leading expertise in both ecosystem modelling in support of sustainable management of marine systems; and in frontier-applications of AI design and technologies. The novel nature of the work will require the Fellow to show research independence and take ownership of the project, while also interacting with and drawing on the experience of the broader team.

There are 3 planned major components to this project that can be considered (and developed) as inter-related and interacting ‘modules’. These include: (i) a module for automated parameter collation; (ii) a module for semi-automated model tuning and fitting to observations; and (iii) a learning module, which analyses the operations from module ii and aims to identify additional general constraints for the model parameter space. The relative investment in these 'modules’ will be steered adaptively by the Fellow as the project develops, dependent upon their interest and informed by an initial scoping analysis of how humans and AI should work best together to develop complex models. It is planned that the Fellow will first develop the approach with relatively simple ecosystem models (e.g. the MICE and MIZER approaches), progressing toward more complex end-to-end models (e.g. the widely used Ecopath-with-Ecosim or Atlantis) as the project develops.

This project will be undertaken as a collaboration between the Coasts and Ocean (COR) Research Program and CSIRO’s Data61, with strong linkages with the Collaborative Intelligence (CINTEL) and Valuing Sustainability (VS) Future Science Platforms. The supervisory team also includes collaborators from the Institute of Marine and Antarctic Studies, the University of Melbourne and the international Fish-MIP (the Fisheries and Marine Ecosystem Model Intercomparison Project) further enhancing the collaborative links available to the incumbent Fellow.

### Duties and Key Result Areas

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

* + 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.
  + Utilise design thinking methodology to plan and prepare research proposals, and apply non-academic impact methodology to research projects.
  + 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 Zero Harm goals.
* Other duties as directed.

The CERC Fellow learning, development and training programis developed between the CERC Fellow and their CSIRO supervisor. The program will focus on enhancing the Fellow’s 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

## **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). The doctorate must be in a relevant discipline area, such as socio-ecological or ecosystem modelling, quantitative marine ecology, applied mathematics, or artificial intelligence and machine learning.

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

1. Demonstrated experience in computer programming (e.g. in R, C, Python or similar).
2. Demonstrated experience in innovative modelling of complex systems (e.g. socio-ecological systems) and /or in the development and application of artificial intelligence and machine learning tools.
3. 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.
4. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
5. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable**

1. Understanding of ecological processes and/or social and behavioural drivers of human behaviour (at individual, group or institutional scales) and human factors.
2. Theoretical background and/or prior experience relating to natural language processing and/or collaborative learning (between human and machine intelligence).
3. Experience in undertaking cross-disciplinary research, knowledge generation or learning.
4. 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.**

## **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.

To be appointed to this CERC Fellowship role within CSIRO, candidates will be expected to commence employment by 31 January 2023. Candidates are also required to have **submitted** their doctoral thesis 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 ($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 Clearance or equivalent. Please note that individuals 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 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.

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

## **About CSIRO**

We solve the greatest challenges through innovative science and technology. Visit [CSIRO Online](http://www.csiro.au/),

[CSIRO Oceans and Atmosphere](https://www.csiro.au/en/about/people/business-units/oceans-and-atmosphere), [CSIRO Data 61](https://data61.csiro.au/), [Valuing Sustainability FSP](https://research.csiro.au/vsfsp/) and [Collaborative Learning FSP](https://www.csiro.au/en/about/strategy/future-science-platforms) and for more information.

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

* People First
* Further Together
* Making it Real
* Trusted