# 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 Satellite Observations, Machine Learning and Coastal Forecasting |
| Job Reference | 86722 |
| 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) | Canberra, ACT |
| 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)
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| Position reports to the | Team Leader |
| Client Focus – Internal | 50% |
| Client Focus – External | 50% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact **Nagur Cherukuru** via email at nagur.cherukuru@csiro.au or phone +61 2 62465735 |
| 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. |

**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.**

Water quality degradation in coastal aquatic ecosystems is a global problem. Reduced water quality impacts coastal ecosystems and related marine industries. Both climate driven changes and human activity are known to impact coastal water quality and ecosystem. Degradation of water quality changes the structure, composition, and extent of aquatic habitats. Degrading marine environment eventually leads to disruption of marine ecosystem functioning, resulting in socio-economic loss to human populations that depend on aquatic resources. It is thus important to monitor and manage coastal aquatic ecosystems towards sustainable development. Successful monitoring and management depend on the availability of advanced knowledge of water quality changes and its impact on coastal ecosystems (such as scenario modelling projections and forecasts). Such knowledge will support better decision-making for coastal aquatic ecosystem preservation and restoration.

To overcome monitoring and management challenges, this project aims to develop models that can provide scenarios and forecasts of coastal water quality changes. The CERC Fellow, in this project has the unique opportunity to lead research and development of coastal water quality forecasting models using satellite earth observation data and machine learning methods. Using satellite data and machine learning methods, the fellow will work on: (1) developing new models to estimate land-to-ocean outflows, (2) model the changes in coastal water quality due to river outflows, coastal processes, and ocean currents and (3) implementation of novel data-driven coastal water quality forecasting models. They will work closely with CSIRO experts in satellite oceanography, terrestrial remote sensing, ecosystem modelling, cloud computing and machine learning. Outputs and outcomes of CERC fellow’s research will be of great interest to coastal ecosystem managers, environmental scientists and blue economy related industries.

We welcome candidates with research interests and skills in the application of machine learning methods on satellite earth observation data and/or expertise in satellite earth observation data processing and analysis (such as ocean colour, land use/land cover, rainfall, winds, and ocean currents). The CERC Fellow will work as part of a diverse research team, with the opportunity to develop innovative solutions and demonstrate it to national and international end-users.

### Duties and Key Result Areas

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

* + Develop new earth observation-based models to connect land, climate, and ocean parameters with coastal water quality.
	+ Implement novel data-driven coastal water quality forecasting modelling approaches using satellite observations and machine learning methods.
	+ Demonstrate research outputs in tropical and temperate settings to national and international partners and end-users.
	+ Lead high-impact collaborative publications communicating research advances made in the project.
	+ 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 satellite remote sensing (ocean, climate, or land) applications, computer science (machine learning), coastal ecosystem modelling or earth system modelling.

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

1. Demonstrated knowledge and practical experience in satellite data processing (such as ocean colour, land cover, wind, ocean currents data) and analysis.
2. Strong computer programming skills (e.g. Python) related to satellite data processing.
3. Knowledge of machine learning methods for application in spatial-temporal modelling.
4. A good biogeophysical understanding of connections between land, climate, and oceans.
5. 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.
6. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
7. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable**

1. Experience working with cloud computing infrastructure (open data cube or GEE).
2. Experience in ecosystem modelling and/or earth system modelling.
3. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
4. **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/), [Oceans and Atmosphere](https://www.csiro.au/en/about/people/business-units/Oceans-and-Atmosphere), [Data61](https://www.csiro.au/en/about/people/business-units/Data61), [Land and Water](https://www.csiro.au/en/Research/LWF) and [Space and Astronomy](https://www.csiro.au/en/about/people/business-units/Space-and-Astronomy) 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