# Position Details

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

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| The following information is for applicants | |
| Advertised Job Title | CSIRO Winanga-y Postdoctoral Fellowship in Modelling of Soil Carbon Dynamics |
| Job Reference | 95062 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$92,624 to AU$101,459 per annum plus up to 15.4% superannuation |
| Location(s) | Canberra, ACT |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All Candidates |
| Position reports to the | Team leader |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Enli Wang via email at [enli.wang@csiro.au](mailto:enli.wang@csiro.au) or phone +61 2 6246 5964 |
| 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).

**Child Safety**

CSIRO is committed to the safety and wellbeing of all children and young people involved in our activities and programs. View our [Child Safe Policy](https://www.csiro.au/en/about/policies/child-safe-policy).

### 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 full time equivalent.**

We are thrilled to be able to deliver on the commitment we made in our strategy to invest in frontier science with the new CSIRO Agriculture & Food Winanga-y Postdoctoral Fellowship scheme. The word Winanga-y (pronounced win-na-gnay) is a cultural asset gifted by the Gomeroi Nation in Myall Vale to CSIRO's Agriculture and Food Business Unit to name the Postdoctoral Fellowship Scheme. Winanga-y means to understand, know, remember, and think.

The specific focus of the CERC Fellowship role is to fill the knowledge gap in understanding and modelling of the formation, decomposition, and stabilization of soil organic carbon (SOC) in response to environmental and management drivers, develop robust modelling approaches to predict the trajectory of SOC change, and facilitate development of mitigation strategies and government policies.

Soil organic carbon (SOC) accounts for >80% of total carbon in terrestrial ecosystems. It plays a vital role in promoting sustainable agriculture and mitigating climate change. Government policies and initiatives are being developed to encourage changes in agricultural management practices to increase SOC, improve footprint and reduce GHG emissions. However, how much carbon can be sequestrated through what management changes across agricultural regions remains largely unknown, due to the incomplete understanding of the SOC stabilization processes and the difficulties in direct measurement. This creates a unique opportunity for research to fill the knowledge gap in understanding and modelling of SOC stabilization, improve our modelling platform and contribute to accelerated development of new management strategies and relevant government policies.

The research of the CERC Fellow will involve a critical review of the newest knowledge and data related to the key processes of the formation, decomposition, and stabilization of soil organic matter (SOM). Based on the review, the CERC Fellow will develop new functional approaches in APSIM NextGen Framework to address the key deficiencies in modelling SOC dynamics and stabilization through integration of the newest understanding of microbial functions and SOM stoichiometry together with data-driven inverse modelling. The improved APSIM NextGen model will be used to quantify SOC gaps at representative sites through scenario modelling and to develop surrogate models for rapid quantification of SOC potential across Australian regions. Within CSIRO, the CERC Fellow will collaborate with the team behind the world leading APSIM farming systems model, as well as with scientists from a wide range of disciplines.

### Duties and Key Result Areas

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

* Collate, format and manage data sets on dynamics of soil organic matter (SOM) and soil organic carbon (SOC) so they can be used in developing and testing new simulation approaches or parameterisation procedures in APSIM NextGen.
* Critique and propose improved ways of representing or parameterising the processes that affect the formation, decomposition, and stabilization of soil organic matter (SOM).
* Quantify the SOC trajectory and gap at representative sites in Australian grain regions through simulation of the dynamics of SOC in response to environmental drivers and management options.
* Recognise opportunities for innovation and generate new theoretical perspectives by pursuing new ideas/approaches and networking with research colleagues across a range of disciplines.
* Communicate results to scientific peers and stakeholders through publications, workshops, demonstrations, etc.
* Publish papers in suitable, high quality scientific journals, and present research at relevant industry and academic conferences.
* Contribute to the effective functioning of the research team and help deliver CSIRO’s organisational objectives and plans.
* Work collaboratively with colleagues within your team, the business unit, across CSIRO and other organisations.
* 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 mathematical modelling or data science with an agricultural and/or environmental application and soil-plant systems modelling.

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

1. A record of scientific innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.
2. Demonstrated ability to conceptualise, run and evaluate mathematical process-based models, and interpret their outputs.
3. Demonstrated theoretical and/or practical knowledge of processes affecting soil carbon and nutrient dynamics and their response to environmental drivers and management intervention.
4. Demonstrated knowledge and application of contemporary data management and analysis approaches (such as using R, python, javascript, etc.), and programming (e.g. C#).
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. **The ability to work effectively as part of a multi-disciplinary, regionally dispersed research team, plus the motivation and discipline to carry out autonomous research.**
8. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.

## **Desirable**

1. Experience with the farming systems model APSIM Classic and/or APSIM NextGen
2. Knowledge of soil microbiology and the function of soil microbes in carbon and nutrient cycling.
3. Ability to travel to field sites and interstate collaborators for short periods (e.g. 2-10 days).
4. Possession of (or ability to obtain) an Australian C class (motor car) licence.

## **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 as a CERC Fellow within CSIRO, candidates are 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 ($89,680). 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/) and [CSIRO Agriculture and Food](https://www.csiro.au/en/about/people/business-units/agriculture-and-food) 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