# Position Details

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

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| The following information is for applicants |
| Advertised Job Title  | CERC Postdoctoral Fellowship in Model Data Fusion |
| Job Reference | 98537 |
| Tenure and Work Schedule | Specified Term of up to 3 years Full-time |
| Salary Range | AU$99K – AU$109K per annum (pro-rata for part-time) plus 15.4% superannuation |
| Location(s) and Office Arrangements | Forest Hill, QLD.Flexible work options available.  |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | * Australian/New Zealand Citizens
* Australian Permanent Residents
* Australian Temporary Residents, currently residing in Australia with a valid working visa to cover the length of the specified term without the requirement of visa sponsorship from CSIRO
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| Position reports to the | Team Leader, Software Solutions |
| Client Focus – Internal | 20% |
| Client Focus – External | 80% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Neil Huth via email at Neil.Huth@csiro.au |
| Support and Workplace Adjustments | We offer a range of reasonable supports and workplace adjustments. Please let us know via email careers.online@csiro.au if we can help you to equitably participate in our recruitment process or the role itself. |
| 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. |

**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).

**About CSIRO**

As Australia's national science agency, CSIRO is solving the greatest challenges through innovative science and technology. Many of our iconic innovations were once considered impossible until someone, just like you, joined us and took on the challenge.

As one of the world’s largest multidisciplinary mission-driven research organisations, we are focused on the issues that matter the most: for our quality of life, for the economy and for our environment. We believe diverse teams are more effective and deliver more innovative outcomes. When we all focus on the big things that really matter, and work in partnership with our communities and [Indigenous Australia](https://www.csiro.au/research/indigenous-science), Australian science and technology can solve seemingly impossible problems and create new value for all Australians. Visit [CSIRO.au](https://www.csiro.au/) for more information.

### 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 full-time equivalent.**

The CERC Postdoctoral Fellow will work within the Software Solutions Team of the Digital Innovations Research Group within the Agriculture & Food business unit. This Group includes leading experts in software engineering and mathematical modelling of soil, plant, livestock, and atmosphere processes. The CERC Postdoctoral Fellow will support the development and delivery of predictions of wood products, carbon and water use for the Australian forest plantation sector involving the world leading farming systems model, APSIM (see [www.apsim.info](http://www.apsim.info)). This software package is used nationally and internationally by thousands of researchers to develop productive and responsible forestry, cropping and integrated crop-livestock systems in the face of globally significant issues such as wood and fibre security, carbon sequestration, water use and greenhouse gas emissions in relation to climate change and environmental sustainability. In collaboration with industry partners, the position will also integrate APSIM modelling with other software commonly used in the industry for wood-flow and profitability forecasting, e.g. YTGen (<https://interpine.nz/ytgen-forest-yield-table-generator/>), particularly in response to updated climate change forecasts. The position will also develop model-data fusion methods that enable forecast updates for new observations of plantation condition (e.g. stocking, tree height and leaf area) that are becoming available through remote sensing.

In this role, the CERC Fellow will work with scientists and software engineers across multiple CSIRO sites, and with staff of industry collaborators and in other Australian and overseas institutions to further develop our integrated plantation forestry modelling capability. The CERC Fellow will identify opportunities to improve modelling systems to support CSIRO science and achieve impact at farm, regional, national, and international scales. They will maintain and manage model and software features and facilitate/co-facilitate training sessions for staff and external users. They will also provide leadership in maintaining and developing CSIRO’s capability in forest plantation modelling and support innovative research using novel modelling approaches to generate industry impact.

The Software Solutions Team applies Agile development approaches (e.g., customer focus, user stories, continuous integration, refactoring, embracing simplicity, valuing face-to-face collaboration) using Github (e.g. https://github.com/APSIMInitiative/ApsimX). Our software is developed on, and tested for, Windows, Linux and MacOs, predominantly using Microsoft Tools (e.g. Visual Studio, .NET).

The Team is passionate about what they do and that motivates them to try new things and play a part in diverse research projects across CSIRO. They are easy-going, have a very decent work-life balance with the benefits of flexible hours and actively coordinate a time to work together face to face. They enjoy collaborative software development and use software sprints in Australia and overseas to achieve goals. We pride ourselves on the close-knit community we have created within our team and broader modelling community.

### Duties and Key Result Areas

* Develop model-data fusion approaches to link APSIM modelling approaches and outputs to on-ground data, including measurement-based and remotely-sensed data.
* Assist in improving and maintaining the *Eucalyptus* and *Pinus* plantation forestry models in APSIM, and provide technical support to model users as required.
* Assist in the curation and integration of our existing agroforestry models.
* Assist in the development of new capability within the APSIM *Eucalyptus* and *Pinus* models (which will be defined by the project team and may include a frequency distribution of tree sizes, wood density inputs, foliar nitrogen, and self-thinning), and in redesigning and refactoring of existing code for improved performance and maintainability.
* Communicate openly, effectively and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO’s reputation.
* Work collaboratively as part of a multi-disciplinary, regionally dispersed research team to carry out tasks in support of CSIRO’s scientific objectives.
* Adhere to the spirit and practice of CSIRO’s Values, Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives and Making Safety Personal goals.
* Other duties as directed.

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 Values, Code of Conduct, Health, Safety and Environment procedures and policy and diversity initiatives.
* 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 Mathematics, Data Science, Computer Science, or similar.

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

1. Experience with model-data fusion techniques and/or large datasets and data cubes
2. 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.
3. A sound history of publication in peer reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
4. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable**

1. Experience or knowledge of plantation forestry systems, agroforestry and/or environmental science.
2. Experience using high-performance or cloud computing.
3. Demonstrated experience in programming in C#, Python or equivalent and version control (e.g., GitHub).
4. Experience in software process management, including user requirements, implementation, testing and refactoring for improved performance and maintainability.
5. The ability to quickly learn and apply software libraries (e.g. from Microsoft NuGet, Python Libraries).

**Not sure if you meet all the criteria?**

While it is CSIRO policy that the successful candidate must meet all the essential criteria, there are many ways to demonstrate this. Don’t let the list discourage you. If you are unsure about applying, please reach out to the contact on page 1 of this document so we can discuss the role further.

## **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 (AU$96,811). 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.

**Setting You Up For Success**

We understand that not everyone works in the same way and sometimes people may require reasonable support and adjustments to perform at their best. Whether related to the recruitment process and or the role itself, this may include options such as providing different methods of communication, flexible hours or physical adjustments to work methods. If you feel comfortable, we encourage you to share any support and adjustments you may need to carry out the inherent requirements of the role. Please let us know via the contact details on Page 1 if we can help you to equitably participate in our recruitment process or the role itself

**Life at CSIRO and Flexible Working Arrangements**

We [work flexibly at CSIRO](https://www.csiro.au/en/careers/life-at-csiro/Flexible-work), offering a range of options for how, when and where you work.  We can discuss flexible work arrangements with you during the recruitment process. CSIRO also offers a range of leave entitlements, [benefits](https://www.csiro.au/en/careers/life-at-csiro/Benefits) and [career development](https://www.csiro.au/en/careers/life-at-csiro/Career-development) opportunities. To learn more, visit [Careers at CSIRO](https://www.csiro.au/en/careers).

We celebrate the uniqueness of our workforce and are committed to creating [diverse and inclusive teams](https://www.csiro.au/en/careers/life-at-csiro/Diversity-inclusion-belonging) where everyone feels they belong. CSIRO is an equal employment opportunity organisation dedicated to recruiting people based on merit, and reflecting the diversity of the community we serve. We recognise true diversity encompasses all ages, nationalities, abilities, cultures, genders, sexualities, faiths, levels of education, diversity of thought and many more aspects of identity. By empowering diverse teams, our community is reflected in the solutions we create.

**CSIRO Values**

CSIRO is a values-based organisation committed to values-based leadership.

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| **Value** | **Descriptor** | **Behaviour** |
| **People First** | Our priority is the safety and wellbeing of our people. We believe in, and respect, the power of diverse perspectives. We seek out and learn from our differences.  | * Respectful
* Caring
* Inclusive
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| **Further Together** | We achieve more together than we ever could alone. We listen and collaborate, in teams, across disciplines, across boundaries. We embrace ambiguity and use discussion and persistence to generate unique solutions to complex problems. | * Accountable
* Authentic
* Courageous
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| **Making it Real** | We do science with real impact. We thrive when taking on the big challenges facing the world. We take educated risks and defy convention. We celebrate successes and failures and leverage them to learn as we strive to be the force for positive change. | * Partnering
* Cooperative
* Humble
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| **Trusted** | We’re driven by purpose but remain objective. We fight misinformation with facts. We earn trust everywhere through everything we do. We trust each other and we hold each other accountable. Together our actions drive Australia’s trust in CSIRO. | * Curious
* Adaptive
* Entrepreneurial
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**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).

Special Requirements

Appointment to this role is subject to provision of a pre-employment background check and may be subject to other security/medical/character clearance requirements.