

Institute for Climate, Energy and Disaster Solutions (ICEDS)

Working with ANU Scientists to Find New Solutions to Preventing Flood Damage

Internships Available for Winter/Semester 2, 2023

Climate, energy and disasters are crucial and growing issues for Australia. The [Institute for Climate, Energy and Disaster Solutions](#) (ICEDS) initiates and supports the innovative cross-disciplinary research across ANU with the aim of ensuring broad societal impact as well as leading outreach, policy engagement, facilitation and coordination roles.



A helicopter came to rescue the residents atop the hotel in Lismore. (Nine)

Current approaches to flood resilience are not keeping up with climate change. They cannot be relied upon. We need to think and act differently from in the past. We must find new solutions.

Australian floods of biblical proportions as we are seeing in NSW and QLD are not just 1 in 100 or 1 in 1000 year events. We can expect them much more often.

Australia is suffering greater impacts of climate change than any other advanced economy, and will face cascading, compounding and aggregate impacts on cities, settlements, infrastructure, supply-chains and services from floods (IPPC Report).

Traditional solutions for flood prevention will not work on their own.

This is why the ANU Institute for Climate, Energy and Disaster Solutions (ICEDS) is embarking upon a new initiative to partner with regional communities to develop a framework and process to evaluate options for minimizing the impacts of floods on communities.

Nature based solutions and their ability to address flood risk is a solution that is receiving increasing attention globally. The project also includes a review of these global developments, and assessment of they can be applied in Australian conditions.

We invite interns to join our team in our quest for finding new solutions to prevent flood damage.

| Internship details | |
|-------------------------------------|---|
| Internship Availability | Winter and Semester 2, 2023 Preferred timeframes are indicated for some projects below |
| Internship Discipline/s | There are a number of projects. Each requires different disciplines, including <ul style="list-style-type: none"> • Environmental science • Mathematical modelling • Hydrology • Environmental economics |
| Internship Level | 2 nd and 3 rd year Undergraduate; Postgraduate Coursework |
| Available to International Students | Yes |
| Preferred Project Skills: | There are a number of projects. Each requires different skills, including <ul style="list-style-type: none"> • Excellent written communication • Experience in mathematical modelling • Understanding of climate change and flood mitigation • Creativity and initiative when problem solving |
| Clearances Required | No |
| Host Supervisor | Dr Roslyn Prinsley Head of Disaster Solutions, ICEDS E: Roslyn.Prinsley@anu.edu.au |
| Location | Coombs Building, ANU |

Project Opportunities/Benefits for the Intern

- Work with a multidisciplinary team of ANU researchers to identify innovative approaches to reducing the risk of floods to regional communities.
- Gain research experience in environmental science, hydrodynamic modelling, or engagement with local government stakeholders.
- Improve your ability to review and analyse complex environmental science concepts and practices.
- Put into practice your mapping skills or your mathematical/hydrodynamic modelling skills.



Lismore McDonald's before and during the floods. Composite: Jason O'Brien/Google Maps/AAP (<https://www.theguardian.com/australia-news/2022/feb/28/lismore-flooding-before-and-after-pictures-show-the-full-scale-of-disaster>).

Opportunities exist for high-achieving undergraduates or Masters students from ANU to undertake an internship at the Institute for Climate, Energy and Disaster Solutions under the guidance of the ANU National Floods Initiative Team.

We are seeking an intern for each of the following projects:

Projects

Are you keen to put your literature review and problem-solving skills into practice to explore concepts and design/assessment methods for nature-based solutions to flooding?

1. Summarise benefits and co-benefits from specific nature-based solutions to flood mitigation (e.g. wetland restoration, river restoration or riparian revegetation). *Literature review. (Winter/ Semester 2)*
2. Identify best practice, design and implementation considerations in relation to specific nature-based solutions to flood mitigation (e.g. wetland restoration, river restoration, reforestation, riparian revegetation). *Literature review. (Winter/ Semester 2)*
3. Compile and analyse Social Impact Assessment approaches/methods relevant to nature-based solutions to floods. *Literature review. (Winter/ Semester 2)*
4. Document and quantify social co-benefits and risks of specific nature-based solutions to floods. *Literature review. (Winter/ Semester 2)*
5. Explore the resilience of different vegetation types to fire/ drought/ floods, including under future climate scenarios. *Literature review. (Winter/ Semester 2)*

Can you apply your data analysis, modelling or mapping skills to help address contemporary flood risk management issues?

6. Collection of historical river flow data to analyse flood events experienced in specified catchments within Australia. *Data collation and analysis. (Winter/ Semester 2)*
7. Literature review, spatial analysis and interpretation of land use changes and their implications on the extent of flood-affected areas within specific catchments in Australia. *Spatial data analysis and literature review. (Winter/ Semester 2)*
8. Use hydrological modelling to explore potential for large scale flood mitigation. *Data analysis, modelling (Semester 2)*

9. Explore biophysical land suitability for nature-based solutions within specific catchments, based on available spatial data (e.g. land use, current/ historic vegetation, topography, soil and geology types). *Spatial data analysis. (Semester 2)*

Are you interested in collecting social and institutional data on nature-based solutions for flood resilience within local communities in Australia?

10. Engage with local councils to explore institutional barriers and enablers for nature-based solutions to floods. *Social data collection and assessment (includes data collection on site) (Winter intensive)*
11. Engage with local community groups to document perceptions on nature-based solutions to floods
Social data collection and assessment (includes data collection on site) (Winter intensive)
12. Engage with local community groups to document initiatives and ideas in relation to nature-based solutions.
Social data collection and assessment (includes data collection on site) (Winter intensive)
13. Analyse state framework and processes relating to flood risk management within Queensland, NSW and Victoria and the extent to which these integrate nature-based solutions. *Literature Review (Winter/ Semester 2)*

Criteria:

The internships would be best suited for interns who have an interest in using their skills in review, data analysis and/or mathematical modelling to contribute to the team's research with local communities in regional Australia to increase resilience to flood risk. The interns would need to have strong written communication ability, strong analytical skills, the ability to undertake independent research, creativity and initiative.