



PhD Opportunity

"ET4I: EvapoTranspiration maps for Ireland"



Ref Walsh Scholarship Number: 2023201

Position Summary

A fully-funded 4 year PhD position is available in "ET4I: EvapoTranspiration maps for Ireland", with Teagasc, Met Éireann and the School of Mathematics and Statistics, UCD, Dublin, Ireland.

Stipend: €18,500 per annum, plus a contribution of up to €6,000 per annum for fees.

Please send applications as pdf files to both gary.lanigan@teagasc.ie and conor.sweeney@ucd.ie with your CV, a letter of motivation, academic transcript/degree certificate, and two academic referees.

This is a Met Éireann-Teagasc co-funded Walsh Ph.D. Scholarship which aims to produce gridded Actual Evapotranspiration (ET) and Potential Evapotranspiration (ET_0) gridded datasets for Ireland.

Potential evapotranspiration is a measure of the atmosphere's ability to remove water from the surface through both evaporation and transpiration assuming no control on water supply. Actual Evapotranspiration is the quantity of water that is actually removed from a surface due to the processes of evaporation and transpiration. Met Éireann currently produces 1 km gridded products of rainfall and temperature based on climatological observations. These would be greatly complemented if the potential (ET_0) and actual evapotranspiration (ET) could be estimated on this grid to provide the input into hydrological models as well as agricultural decision support systems on a daily time scale.

This project will use state-of-the-art methods and data, including satellite data, data from the Irish Soil Moisture Observation Network (ISMON, 2022), and the National Agricultural Soil Carbon Observatory (NASCO, 2020) flux tower data, coupled with forecasts from high resolution numerical weather prediction (HARMONIE's surface model SURFEX) and Machine Learning techniques.

This project will produce novel research including national ET & ET_0 maps, and associated academic papers. National ET maps will enable more accurate modelling of soil moisture, nutrient availability as well as leaching of nutrients from the soil. National ET maps will also enable weather-based nutrient advice to be given to farmers and also allow for more accurate N_2O emission modelling. Importantly, national ET maps will help inform national policy e.g. the Nitrates Directive and Nitrates Action Plan.

Principal Duties and Responsibilities

The candidate will be required to:

- Work on their PhD project on campus in person, full time, 5 days per week.
- Give tutorials to undergraduate students, and help with other teaching activities.
- Take part in training and development events
- Take part in public engagement and outreach events

Selection Criteria

Selection criteria outline the qualifications, skills, knowledge and/or experience that the successful candidate would need to demonstrate for successful discharge of the responsibilities of the post. Applications will be assessed on the basis of how well candidates satisfy these criteria.

Mandatory

- MSc or Primary degree (First or Upper Second Class Honours) in Atmospheric Science, Mathematics, Physics, Engineering, Earth Science, or related quantitative discipline.
- Strong mathematical skills.
- Excellent coding skills in Python (R or Matlab are also acceptable).
- Experience of analysing large, multi-dimensional datasets and their visualisation.
- Excellent English communication skills.
- Excellent interpersonal skills.
- Good report writing experience.
- Attention to detail and strong organisational skills.
- Ability to manage a complex workload and work to tight deadlines.
- Willingness to work closely with a wider cohort of stakeholders and collaborators.
- Awareness of equality, diversity and inclusion agenda.

Desirable

- Experience with atmospheric and/or hydrology measurements.
- Experience of coding with Machine Learning techniques.
- Linux and bash scripting skills.
- Analysis of satellite data, GRIB, and NetCDF data.

Equality, Diversity and Inclusion:

UCD is committed to creating an inclusive environment where diversity is celebrated, and everyone is afforded equality of opportunity. Diversity is highlighted in the university's strategic plan as one of the core values of UCD, and its EDI commitment is further demonstrated through the strategic objective relating to the attraction, retention, and development of an excellent and diverse cohort of students, faculty and staff. We welcome applications from everyone, including those who identify with any of the protected characteristics that are set out in our Equality, Diversity and Inclusion policy. The university adheres to a range of equality, diversity and inclusion policies. We encourage applicants to consult UCD's equality, diversity and inclusion policies here <https://www.ucd.ie/equality/>.

UCD's Equality, Diversity and Inclusion Strategy 2018-2020-2025 sets out the University's objectives aligned to UCD's ten equality grounds. [Link](#)

