



## TEAGASC PHD WALSH SCHOLARSHIP OPPORTUNITY

“Investigating hydromorphology in intensively farmed grassland catchments under a changing climate”

Walsh Scholarship Ref Number: 2022054

**Closing date for applications: Monday 31<sup>st</sup> January 2022**

### Call for Applicants

A fully funded, structured doctoral (PhD) scholarship is available to investigate dynamic hydromorphological states in two intensively managed grassland catchments. The PhD scholarship is a joint research project between Teagasc (Irish Agricultural and Food Development Authority) and University College Dublin. The student will be registered at University College Dublin (UCD) and will share their time between UCD and Teagasc Johnstown Castle in Wexford, under the primary supervision of Dr. Jonathan Turner (UCD) and Per-Erik Mellander (Teagasc). Additional supervision will be provided by Dr Fiachra O’Loughlin (UCD) and Dr Daniel Hawtree (Teagasc). The scholarship funding is €24,000 per annum and includes University fees of up to a maximum of €6,000 per annum and is tenable for 4 years.

### Introducing the project

The driver for this research is the central role that hydromorphology plays in the creation and turnover of physical habitat assemblages in fluvial environments. Hydromorphological assessment is a key metric under the EU Water Framework Directive (WFD) and the latest River Basin Management Plan (2018-21) identified hydromorphology as one of the principal pressures placing rivers at risk of failing the WFD in Ireland. Hydromorphology is also a common factor limiting water bodies from achieving high WFD status. To-date research on hydromorphology in Ireland has been limited and work is needed to investigate the impacts climate change may have on hydromorphological condition.

The research will focus on two catchments, the Timoleague in Co. Cork and Ballycanew in Co. Wexford, that form part of the Teagasc Agricultural Catchments Programme (ACP). The ACP has collected baseline physiographic catchment information and a wealth of data on river flows, nutrients and sediment flux since 2008. The catchments are ca. 10 km<sup>2</sup> in area and land-use is dominated by intensively managed grasslands, with a high proportion of farms in derogation. The catchments, however, have contrasting hydrological flow regimes giving rise to different types of hydromorphology and likely different responses to changes in climate and land-use.

The key research questions that will guide this study are:

- What role does hydromorphology play in supporting stream health in intensively farmed agricultural catchments?
- How is hydromorphology going to respond to climate and land-use changes in these settings?
- What targeted measures would best mitigate and/or restore climate and land-use impacts on hydromorphology?

These research questions will be addressed through four integrated tasks as follows:

1. Delineation and characterisation of baseline hydromorphology at nested geospatial scales, integrating extant hydromorphology datasets where appropriate.
2. Reconstruction of past patterns of hydromorphological change.
3. Investigation of temporal and spatial relationships between hydromorphology and existing catchment and channel-scale datasets.
4. Development of predictive models of hydromorphological response under different climate change scenarios. This task will include the application of the open-source landscape evolution model [CAESAR-Lisflood](#).

## **Guidelines for applicants**

The PhD candidate will undertake research, investigations, literature reviews and other work necessary to fulfil the requirements of the scholarship and workplan, and commit to the timely delivery of the various research deliverables, including interim reports and scientific publications.

Applicants should hold a master's degree (or equivalent) on or before the start date from a recognised institution, in Geography or a related discipline (e.g. Earth Science, Geology, Environmental Science, Environmental Engineering). Applicants with a first-class or higher second-class honours degree may also be considered, where they have demonstrable research experience.

Applicants must have an established proficiency in English. Where English is not the first language, applicants will need to submit a language proficiency assessment. Further details available [here](#).

Essential selection criteria include:

- A master's degree in Geography or related discipline (under exceptional circumstances, applicants with a first-class or higher second-class honours degree may be considered)
- Demonstrated GIS training and experience
- Fieldwork experience
- Full Driving License (non-EU license holders will need to convert to an Irish license)

Desirable selection criteria:

- Experience with field surveying equipment
- Experience with flying a drone
- Computer literacy in data management, data manipulation, and statistical analysis (programming experience would also be an advantage)
- Experience in geomorphological research
- Understanding of relevant EU directives, national legislation and policies

Further information on the structured PhD programme at UCD is available [here](#).

## **Application processes**

Applicants should submit a CV including qualifications, experience and three referees, and a cover letter detailing suitability for the post, by email simultaneously to Dr. Per-Erik Mellander ([PerErik.Mellander@teagasc.ie](mailto:PerErik.Mellander@teagasc.ie)) and Dr. Jonathan Turner ([jonathan.turner@ucd.ie](mailto:jonathan.turner@ucd.ie)). A short list will be created based on applications received and interviews will take place, either in person or via Zoom, by mid-February 2022. The start date for the PhD is 1 September 2022.

For further information please contact Dr Jonathan Turner ([jonathan.turner@ucd.ie](mailto:jonathan.turner@ucd.ie)) and Dr Per-Erik Mellander ([PerErik.Mellander@teagasc.ie](mailto:PerErik.Mellander@teagasc.ie)).