



TEAGASC PHD WALSH FELLOWSHIP OPPORTUNITY

“Deriving high resolution, on-farm, rainfall estimates from terrestrial and satellite radar data: An application for use in real time nutrient management”

Ref 2017045

Background

As part of the European Union’s (EU) Water framework Directive (WFD) (Directive 2000/60/EC), member states are required to implement an integrated framework approach that seeks to protect and enhance their surface, ground and coastal waters. It also requires the management of water bodies to be geographically based, on river basins or catchments, rather than along political boundaries. A key supporting piece of legislation, the Nitrates Directive (91/676/EEC) is designed to prevent pollution of surface waters specifically from agricultural sources. Currently, these regulations stipulate a set of conditions to determine the appropriate time and places for the application of fertiliser. These include a 48-hour forecast period to assess suitable weather conditions, specifically with regard to rainfall.

Rainfall radar data could contribute significantly to agro-meteorological decision-making by providing real time information that is spatially detailed. The national meteorological service, Met Éireann, operates two radar systems, located at Dublin and Shannon airports. The UK Met Office also operates a radar system in Northern Ireland, Scotland, England and Wales, from which composite radar data for the whole of Ireland can be derived. These radar systems provide a ~1km resolution of rainfall reflectance every 5/15 minutes. In addition to the radar data, Met Éireann also maintains the national meteorological network.

The proposed research will establish a methodology for utilising rainfall radar, in combination with Met Éireann’s precipitation gauge network, to develop high spatio-temporal resolution, near real-time rainfall estimates for Ireland. An analysis of the rainfall radar will also be undertaken with available satellite data (eg. METEOSAT; Sentinel 1a/b). The results will provide a robust basis for developing real time, local rainfall estimates that coupled with the Teagasc Nutrient Management Planning decision support system (NMP Online) can inform timing of fertiliser applications.

Requirements

Applicants should have a good primary degree (First or Second Class Honours) or MA/MSc in an appropriate discipline (Geography, Environmental Science, Physics, Climate Science etc.). The successful candidate should be highly self-motivated. Ideally, potential candidates should be able to demonstrate experience in the use of remotely sensed data (e.g. satellite, radar, drone). Ability to work in a linux environment and coding experience is an advantage. A valid driving licence is necessary.

Award

The 4 year structured PhD Fellowship is a joint research project between the Department of Agrifood Business and Spatial Analysis, REDP, Teagasc (Ashtown), Maynooth University Department of Geography, Maynooth University, and the Department of Geography, University College Dublin. The student will be co-located between Teagasc Ashtown, Dublin and Maynooth University and will be registered at Maynooth University. The student will be working under the supervision of Rowan Fealy (MU) and Stuart Green (Teagasc) in association with Gerald Mills (UCD) and Reamonn Fealy (Teagasc). Periods of field work will be undertaken at various locations around the country.

The successful candidate will be expected to participate in Walsh Fellowship events organised by Teagasc.

The fellowship provides a stipend of €22,000 which comprises of fees of up to a maximum of €6,000 per annum. University fees are paid by the student from the stipend which is tenable for 4 years.

Further Information/Applications

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Gerald Mills, Department of Geography, University College Dublin, Dublin, Co. Dublin
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Application Procedure

Submit a Curriculum Vitae and a letter of interest, with the subject line WF 2017045, to:
Rowan Fealy email: rowan.fealy@nuim.ie,
Stuart Green: stuart.green@teagasc.ie
Gerald Mills email: gerald.mills@ucd.ie

Closing date

Friday, 30 June, 2017