invent**W**ater

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UNIVERSITY *of*
STIRLING
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MSCA ITN Early-Stage Researcher (ESR11)
Adaptation strategies against progressing anoxia in lakes

Full time
Fixed term for a period of three years
Salary: circa £36,178 p.a subject to annual review based on exchange rates

The closing date for application is midnight on Thursday 22 April 2021
Interviews are expected to take place no later than 18 May 2021 via Microsoft Teams

It is anticipated that a successful candidate who does not already have valid Right to Work in the UK will apply for a Global Talent visa to take up the post

The post is also subject to successful enrolment on a PhD programme at the University of Stirling. The successful candidate will be provided with information on how to enrol on a PhD programme

Ref: ITN-MAR21/ITN-JONES

University of Stirling, UK

In partnership with Helmholtz Centre for Environmental Research, Germany; Swiss Federal Institute of Aquatic Science and Technology (EAWAG, Switzerland); & Anglian Water, UK.

Lead supervisor & Line Manager	• **Dr Ian Jones, University of Stirling** https://www.stir.ac.uk/people/1273691
Co-supervisors	• **Professor Eleanor Jennings, Dundalk Institute of Technology, Ireland** https://www.dkit.ie/users/eleanor-jennings • **Dr Peter Hunter, University of Stirling** https://www.stir.ac.uk/people/255710
In partnership with	• **Dr Don Pierson, University of Uppsala, Uppsala, Sweden**

Key Words	**Earth observation; Ecosystem Models, Forecasting; Lakes; Reservoirs; Water Quality; Algal Blooms**

The role

We are looking to recruit an outstanding and enthusiastic ITN Early Stage Researcher (ESR / PhD student) to work on the H2020 MSCA ITN project 'inventWater' funded by the European Commission. This is an exceptional opportunity to join an international cohort of 15 ESRs and a wider team of international scientists working on key topics in

the development of forecasting tools for adapting water quality management to a new climate.

The position involves carrying out research on the following topic: Adaptation strategies against progressing anoxia in lakes

The successful candidate will be responsible for research design and implementation including the dissemination of research outcomes through presentations and publications. They will also be required to submit a PhD thesis based on the research as part of the role.

The post will be salaried for period of three years with an expectation to submit a PhD thesis within four years of appointment. Please be aware that the fourth year of PhD registration   carries   no   salary.

Project description

Oxygen is a fundamental water quality parameter; depletions in oxygen will affect fish habitat and increase anoxia promoting internal release of nutrients and heavy metals from lake sediment. Increased air temperatures are forecast to cause longer periods of stratification in lakes that will directly lead to longer periods of deoxygenation. Other climate-induced changes such as alterations to the strength of stratification and to hypolimnetic temperatures will also affect oxygen dynamics, as will any changes to phytoplankton productivity in lakes. Oxygen concentration, and particularly deep-water oxygen concentration, is, therefore, at risk of significantly reducing because of climate change, with widespread negative consequences for standing water ecosystems. The impact of climate change on oxygen concentration needs to be understood for adaptation approaches to be applied effectively.

The objective of this PhD is to validate oxygen models against real data, use the models to understand the effect that different lake morphology has on oxygen dynamics, and conduct global modelling experiments to demonstrate the impact of future climate change and adaptation strategies on deep-water oxygen in lakes across the world.

Expected Results:

1. Model oxygen dynamics in Lake Erken with GOTM and compare with simpler oxygen models.

2. Use modelling based on Lake Erken, Sweden, and Milltown Lake, Ireland, to examine the influence hypsography has on oxygen depletion.

3. Carry out historic and future global modelling of deep-water oxygen concentration using the full suite of ISIMIP lake physics model outputs for each global grid square.

4. Forecasts of anoxia on a subset of ISIMIP lakes and adaptation scenarios.

Secondments

This position involved significant collaboration with the following organisations and the successful candidate will be required to undertake secondment to these

organisations as part of the appointment. A willingness to travel and spend time outside the UK is therefore essential:

- Dr Don Pierson, **University of Uppsala**, Uppsala, Sweden; 4 months
- Professor Eleanor Jennings, **Dundalk Institute of Technology**, Ireland; 3 months

About the University of Stirling

The campus

The University of Stirling campus is exceptionally attractive, situated at the foot of the Ochil Hills and with a lake, Airthrey Loch, in the middle of campus. Stirling itself is a historic city, being the ancient capital of Scotland and lies close to Scotland's two major cities, Glasgow and Edinburgh.

Above left. The University of Stirling, Scotland, UK with its small campus lake, Airthrey Loch, and the historical Wallace Monument in the backdrop.

Faculty of Natural Sciences (FNS)

The Faculty of Natural Sciences was formed in August 2016 and encompasses the Divisions of Biological and Environmental Sciences, Computing Science and Mathematics, Psychology and the Institute of Aquaculture. The FNS is a distinctive academic arena where new fundamental understandings of the complex and challenging inter-relationships between human behaviours, technologies, biological, and environmental systems are created, explored and tested. Results of REF2014 confirmed that our research is regarded as world-leading and internationally excellent. Our research is supported through UK Research Councils, the European Union and a range of research charities and private enterprises. We work with businesses and public service organizations both at home and overseas to achieve direct and positive outcomes for society across a range of critical problems.

Biological and Environmental Sciences (BES)

The strength of Biological and Environmental Sciences lies in our unique focus on the interface between people and the environment, which positions us well to exploit growing funding opportunities and to develop strong student interest in environmental and ecological systems science and management. Our research interests are broad, ranging from conservation and evolutionary ecology to environmental processes including carbon and nutrient cycling, aquatic sciences and ecology, pollution, environment and human health, and impact monitoring. Our studies incorporate

science, policy and practice; they are used to inform national and international policy makers and practitioners in conservation and environmental regulation, planning and management. Our research and impacts are found in all continents of the world and positions us as a leading institution in Environmental Protection and Biological Conservation. Our location, the City of Stirling, is fast becoming a center for environmental and conservation activity in Scotland, with four times the national average number of jobs in the environment sector.

Person specification

Essential Criteria

Qualifications

- Primary degree in the natural sciences, mathematics, engineering, or physical geography, with a minimum of an upper second (2.1) degree (or equivalent)
- Any applicant whose first language is other than English must have either a certified English language proficiency of at least IELTS 6.5 or equivalent, or have undertaken their qualifying degree through English.

Knowledge, Skills & Experience

- Demonstrable numerical ability
- Experience in computer programming in one or more scientific programming languages (such as R, Python, Matlab, Fortran etc)
- Knowledge of environmental issues
- Willingness to take part in secondments detailed above and to take part in overseas training courses

Candidates must also meet the following eligibility criteria:

- Researchers are required to undertake trans-national mobility (i.e. move from one country to another) when taking up the appointment. Applicants **cannot** apply for an ESR position hosted in a country where they have resided, worked or studied for more than 12 months in total in the 3 years immediately prior to the start of recruitment.

- Applicants should be in the first four years (**full-time equivalent research experience**) of their research careers and not yet have been awarded a doctorate. This 4 year period is measured from the date of obtaining the degree which would formally entitle them to embark on a doctorate in the country of the host institution.

Desirable Criteria

Qualifications

- A first class degree (or equivalent) in natural sciences, mathematics, engineering, or physical geography
- An MSc in natural sciences, mathematics, engineering, or physical geography
- A distinction (or equivalent) at MSc in natural sciences, mathematics, engineering, or physical geography

Knowledge, Skills & Experience
- Experience in numerical modelling
- Experience in handling very large datasets
- Good statistical knowledge
- Knowledge of limnology
- Knowledge of ecology

Further Information

[Job advert and application portal on University of Stirling website](#)

Candidates should quote reference **ITN-MAR21/ITN-JONES** on their applications.

Informal enquiries and further information can be obtained by contacting Dr Ian Jones (ian.jones@stir.ac.uk).