



environmental  
research  
institute

THE NORTH  
HIGHLAND  
COLLEGE

UHI  
Millennium  
Institute

Summer 2010

# erielelements

## Two exciting new MSc programmes at ERI

The ERI is delighted to be offering two new Master of Science (MSc) programmes starting this Autumn: **MSc Sustainable Energy Solutions and MSc Developing Low Carbon Communities**

On 23 March 2010, the Scottish Government stated that 60,000 jobs could be created in low carbon industries by 2020. These included 26,000 jobs in renewables, 26,000 in emerging low carbon technologies and 8,000 in environmental management. These programmes have been developed in response to the expected growth in jobs in the environmental sector.



© Fiona Chalmers, Cairngorm NPA

Log pile awaiting chipping for use in a community heating project

The programmes are designed for those who will be developing renewable energy and low carbon projects from a small scale through to major developments. They will be of interest to recent graduates with first degrees in engineering, earth and environmental sciences, environmental management, planning and rural studies; to mature students working in relevant professions or in local authorities or national agencies in the UK or elsewhere; and to community activists interested in developing local sustainable communities.

The courses can be taken on a full- or part-time basis. To provide flexibility the courses are on-line which enables students to study while remaining in



© AMEC Wind

Construction of a wind turbine

work. Students can register for a postgraduate certificate, diploma, an MSc or take individual modules for Continuing Professional Development.

Modules available to both programmes:

- Energy Climate and Carbon
- Transition to a Low Carbon Society
- Renewable Energy Technologies
- Research Methods and Techniques
- Future Energy Scenarios
- Sustainable Communities
- Developing a Community Energy Project
- Research Dissertation (MSc Only)

Developing Low Carbon Communities:

- Sustainable Development
- Participatory Approaches to Community Consultation

Sustainable Energy Solutions:

- Sustainable Rural Land Use and Energy
- Energy Modelling for Building
- Wind, Wave and Tidal

For more information and details of how to enrol, please contact **John McClatchey** or **Kenny Boyd** at ERI: [John.McClatchey@thurso.uhi.ac.uk](mailto:John.McClatchey@thurso.uhi.ac.uk), [Kenneth.Boyd@thurso.uhi.ac.uk](mailto:Kenneth.Boyd@thurso.uhi.ac.uk)

## Eminent researcher chooses ERI

Dr. Rachel Cave, a lecturer in Chemical Oceanography at the National University of Ireland, Galway (NUI Galway), is visiting ERI on sabbatical until November. Her current research projects include:

- a study of groundwater inputs to coastal waters, centred on the karst region of the Burren in Co. Clare, west of Ireland, where groundwater-influenced bays are important shellfish waters;
- ocean acidification, where she is involved in a baseline study of CO<sub>2</sub> parameters in Irish marine waters;
- trace metals cycling in coastal waters, with particular reference to macroalgae, where she is involved in the development of voltammetry systems for use in monitoring.

Rachel is currently supervising 5 PhD students, spread across the three projects, which are funded respectively by the Geological Survey of Ireland (GSI), the Irish Marine Institute, and the Science Foundation Ireland (SFI). Rachel is hosted at ERI by Dr. Francois Muller.

'My choice of the Environmental Research Institute at Thurso as the location for my sabbatical was threefold. Firstly the research being carried out at ERI complements much of the research being carried out at the Institute for Marine, Environment

and Energy at NUI Galway. In particular, the trace metal cycling, biogeochemistry and coastal ocean processes research of Dr Francois Muller, ERI, aligns very closely with my own research interests in marine and coastal processes. While I am at the ERI, I hope to explore funding opportunities that will

allow us to spin up collaborative research in these areas between our two institutions for the future. Secondly, the ERI is part of the UHI, and I am interested in looking at how distributed teaching and learning in marine and environmental sciences is carried out in practice, as this may provide a model for the future pooling of resources in Irish third level institutions, particularly those located along our western seaboard. Thirdly, and not least, I couldn't resist the prospect of being able to walk out of my house in the evenings in my wetsuit, straight into the Pentland Firth for some snorkelling or surfing, as the weather permits!'



Dr. Rachel Cave working in Kinvara Bay, Galway

## New marine renewables projects funded

The ERI is now a partner in two major renewable energy projects funded through the European Union. These are strategically important for the ERI and will contribute to the development of the marine renewable energy sector in Scotland.

The first of these projects is the **Off-shore Renewable Energy Conversion platforms - Coordination Action (ORECCA)**



funded through the Framework 7 (FP7) programme. The project is a partnership of 28 organisations who are highly respected in the field of offshore renewables spread across 12 countries in Europe and North America. The objective of the project is to create a framework of knowledge sharing leading to innovative, cost-efficient and environmentally-friendly offshore energy conversion platforms and to

develop a roadmap for research activities in this context.

The second project is **BLUETEC - Demonstration of the technological, economic and environmental sustainability of a full-scale tidal energy device in an offshore environment** is a €7.9M project funded through the Framework 7 (FP7) programme of the European Union. The project will demonstrate the technical feasibility and the cost effectiveness of a full scale floating tidal energy installation. It will also provide the EU with reliable data to help them create regulatory frameworks for the tidal energy industry. The ERI will be responsible for pre- and post-installation environmental investigation and monitoring of the device. The project is being led by Bluewater plc, Netherlands and also includes Ponte di Archimede from Italy.

For more information on these projects, please contact Dr David Woolf, [David.Woolf@thurso.uhi.ac.uk](mailto:David.Woolf@thurso.uhi.ac.uk)

## ERI celebrates with inaugural lecture

The ERI celebrated its tenth birthday with an exciting event held at Caithness Horizons in Thurso. Staff, students, colleagues North Highland College UHI and other invited guests gathered to hear internationally renowned naturalist, writer and broadcaster Professor Des Thompson from Scottish Natural Heritage talk on 'Scotland's environment: unique, valuable and vulnerable'.

Professor Stuart Gibb, ERI Director, opened the evening saying: "The last 10 years have been a fantastic journey made possible by the support and contributions of many talented and committed people. ERI team looks forward to addressing the challenges of the coming decade. We are, and will continue to be, a centre of aspiration".

This event is the first of what is hoped will become a prestigious annual lecture series for the centre.

Giving a vote of thanks Rob Gibson, MSP commented: "The immediate importance of the ERI's work was never clearer. Some key parts of that work is focused on peatland monitoring and marine



currents and wave action in the Pentland Firth which is set to host marine energy are critical to sustainable futures for the this part of Scotland. I commend the ERI's development as an internationally recognized success story in the UHI's family of excellence."

## SuperGEN students go to Cornwall

During June, the ERI's three SuperGEN PhD students, Jacqueline Black, Matthew Easton, and Astrid Harendza attended a week long 'Mooring and Foundations' workshop hosted by the University of Exeter in Falmouth, Cornwall. The SuperGEN workshops are multi-disciplinary, involving over 30 PhD students from 10 different academic intuitions. The aims of the workshops are to broaden student's knowledge base, to encourage collaborative work, share experiences, and develop technical and transferable skills.

The week long programme looked at moorings and foundations, a key area in the advancement of the marine energy sector. Wave energy converters were a particular focus. We were interested to find out that one of the greatest expenses developing marine renewables is the cost of deployment and moorings. The event featured seminars from both experienced industrial and academic figures as well as an interactive workshop. The BBC did a segment on the week and filmed various participants so it was quite a high profile event.

Falmouth was a lovely location and we experienced the glorious Cornish weather during a boat trip to a

test wave buoy, although a few sea-legs were tested and found wanting. Some participants also gained first-hand experience of the powerful waves during an evening surfing session.



The workshop was a great success for all involved. It was fun and informative and a good way to develop some academic friendships and collaborations that will hopefully last the length of our careers.

**Jacquie Black, Matthew Easton, Astrid Harendza**  
ERI SuperGEN PhD Students

# FOCUS on ERI Commercial Services

The ERI's excellent research credentials, along with its superb laboratory and survey facilities allow the institute to offer niche consultancy and commercial services. Currently the ERI offers consultancy/ commercial services in **Analytical Services**, **Aquaculture/Veterinary Services** and **Renewable Energy**.

## ANALYTICAL SERVICES

The ERI offers a variety of Analytical Services utilising its range of state-of-the-art equipment and laboratory facilities (High Performance Liquid Chromatography (HPLC), Gas Chromatograph-Mass Spectrometer, (GC-MS), Spectrophotometers, Scanning Electron Microscope (SEM), Stereoscopic Microscopes), supported by an expert team of scientists and technicians. The staff are top chemists and biologists with years of experience and expertise in the areas of mass spectrometry (MS), chromatography, molecular spectroscopy and microscopy. We have widespread experience in successfully working with many different industries, delivering the highest quality services and developing long term client relations.

- **Organics Analysis**

HPLC, GC and MS are used in various configurations and combinations to permit the analysis of a wide range of organic compounds including fatty acids, pesticides, pharmaceuticals and plant products.

- **Metals Analysis**

Simultaneous determination of 78 elements in aqueous samples that can contain from 2% – 25% dissolved solids using Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES).

- **Microscopy Facilities**

The SEM, equipped with Energy Dispersive X-Ray Analysis (EDXA) not only allows the survey of surface anomalies but also elemental analysis on the specimen being viewed. The variable pressure SEM enables wet and non-conductive samples to be viewed in their original state. Web-based remote access to the SEM is also being developed. ERI's superb microscopy analysis also include a stereo microscope with digital camera that is ideal for dissections and optical microscopes.

- **Water Quality Analysis**

Determination of standard microbiological quality indicator parameters like *E.coli*, faecal coliforms (FC), total coliforms(TC), Enterococci and heterotrophic plate count (HPC) in marine and freshwater samples.

## AQUACULTURE / VETERINARY SERVICES

We currently analyse sediment samples for Emamectin as required for regulatory compliance by SEPA. We have provided this service to the aquaculture industry for over six years and our customers include the leading aquaculture companies.

Using our advanced chromatographic equipment and extensive expertise we are able to offer extensive range of other services, including the determination of other veterinary medicines, such as Teflabenzuron (the active ingredient of Calicide®), Phosphate and Chlorophyll.

For more information, please contact Priyanka Sharma, ERI Business Development Manager ([priyanka.sharma@thurso.uhi.ac.uk](mailto:priyanka.sharma@thurso.uhi.ac.uk), +44 (0)1874 889599) or visit our commercial services website: [www.erionline.co.uk](http://www.erionline.co.uk)

More information on Renewable Energy Services will follow in the next edition of ERIelements.



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