



Newsletter 12 July 2018

Welcome to the twelfth newsletter of the Sêr Cymru National Research Network for Low Carbon, Energy and Environment (NRN-LCEE).

In this latest NRN-LCEE newsletter you can read about some exciting workshops that were organised by NRN-LCEE Clusters with international scientists they invited to Wales. We also have a report on the Plants and Architecture Cluster and one of it's Fellows, Dr. Peter Wootton-Beard, gives an introduction to his research.

We have awarded all of our Returning Fellowships, Proposal Writing Fellowships and Research Development Funds and look forward to updating you with what has been achieved with this funding over the next months. You can read more about our latest Returning Fellows below.

Several NRN-LCEE funded events are being organised for the coming months including another public lecture, an event on single-use plastics and the NRN-LCEE Closing Event in November. You can find more information about some of these events in this newsletter.

A handwritten signature in black ink, appearing to read 'David Thomas'.

Prof. David Thomas (d.thomas@bangor.ac.uk)

Director of the Sêr Cymru National Research Network for Low Carbon, Energy and Environment

Introducing our Clusters: Plants and Architecture

The [Plants and Architecture](#) Cluster is a partnership between Aberystwyth, Bangor and Cardiff Universities, investigating the interactions between plants and buildings. The Cluster studies the benefits of plants in living spaces and cities and explores the potential for plants to improve human well-being, contribute to food security and help reduce carbon emissions for the built environment. Below, Sêr Cymru Fellow Dr. Peter Wootton-Beard (Aberystwyth University) shares from his experience.

Introducing our Fellows: Dr. Peter Wootton-Beard

Dr. Peter Wootton-Beard is a Sêr Cymru Fellow at Aberystwyth University and a member of the Plants and Architecture Cluster. His research focuses on the ways through which plants can contribute to green and sustainable cities in two main areas, 1) food production within the (peri-)urban environment and 2) optimisation of constructed green infrastructure, specifically green roofs, through plant selection. Put more simply, how to grow plants *on* buildings, and how to grow plants *in* buildings.

[Click here to read more about Peter's experience...](#)

News – NRN-LCEE research at the House of Commons for Anglesey Day

On 18 April, NRN-LCEE Director David Thomas represented the NRN-LCEE with a stand at Anglesey Day. The event was held at the House of Commons, London, to celebrate and promote the Isle of Anglesey and all that it has to offer. [Read more....](#)



Stuart Andrew MP, Prof. Colin Jago from Bangor University, Albert Owen MP and Prof. David Thomas at the NRN-LCEE stand on Anglesey Day

News – AquaWales hosts world-leading parasitologists at Cardiff workshop

A workshop organised by the AquaWales Cluster brought together world-leading experts in parasite ecology, aquaculture science, fish biology and invasive species, to address the hidden consequences of parasite control measures on aquatic life. [Read more...](#)

Upcoming Events:

Public Lecture:

[The Quest for the Holistic Grail of Sustainable Intensification](#)

Prof. Agustin del Prado
11 July. Pontio, Bangor

Workshop:

[The Secrets of Science Communication](#)

22 August
Royal Welsh College of Music and Drama, Cardiff

Public event:

[Single-Use Plastic – What about it?](#)

18 October
Principality Stadium, Cardiff

News – Quotient Cluster Modelling Workshop

The Quotient Cluster hosted a 2-day ocean modelling workshop at Marine Centre Wales, Menai Bridge. The workshop was based around an NRN-LCEE funded visit to Bangor by Professors Malcolm Spaulding and Stephan Grilli from the University of Rhode Island, USA. [Read more...](#)



News – Geo-Carb-Cymru hosts biofilm experts from the USA

Aberystwyth University welcomed visitors from Montana, USA, Tübingen, Germany, and Cardiff to a Subsurface Microbiology workshop organised by Geo-Carb-Cymru in collaboration with Aberystwyth's Interdisciplinary Centre for Environmental Microbiology (iCEM). [Read more...](#)

News – NRN-LCEE Director presents at Cross-Party Group on Sustainable Energy

Prof. David Thomas was invited to present at the event in the Senedd in June. David gave an overview of the successes to date from three of the NRN-LCEE Clusters addressing low carbon energy challenges: Geo-Carb-Cymru, Plants & Architecture and Quotient.

NRN-LCEE Research Development Fund (RDF) Events

A two-day NRN-LCEE funded workshop in Birmingham in May explored different scenarios for future upland management. Uplands provide important ecosystem services that benefit society as a whole and bring important cultural and social benefits to rural communities. Much of the UK is classified as 'upland' yet faces numerous pressures from changes in management, land use and climate. [Read more...](#)

Our Clusters:



[AquaWales](#)



[Cleaner Cows](#)



[Climate-smart Grass](#)



[Geo Carb Cymru](#)



[Multi-Land](#)



[Plants & Architecture](#)



[Quotient](#)



[Resilcoast](#)



Due to the success of previous workshops, the NRN-LCEE funded a third Proposal Writing Workshop for Marie Skłodowska Curie Individual Fellowship applicants. This workshop took place in Cardiff in May. [Read more...](#)

An overview of all RDF awards is available at: www.nrn-lcee.ac.uk/rdf-funded

Research Highlights – New NRN-LCEE Returning Fellows

We are pleased to announce that 4 additional NRN-LCEE Returning Fellows have started their projects over the last 3 months. These talented individuals have recently returned from a period of long-term absence from their work and will use their Fellowships to kick-start their research, travel to make new collaborations and attend international conferences. The Fellows are:

- Dr. Liz Bagshaw, Cardiff University, is developing new methods for measuring subglacial meltwater in Greenland to understand the impacts of extra meltwater from climate change.
- Dr. Kerrie Farrar, Aberystwyth University, is looking at beneficial microbes for sustainable climate resilient crop applications, particularly bacterial endophytes adapted to life within plants.
- Dr. Esther Jones, the University of South Wales, will be investigating the relationship between ecosystem services and biodiversity at important conservation sites in Morecambe Bay in order to inform coastal management plans.
- Dr. Sophie Ward, Bangor University, is modelling the impacts of tidal energy extraction on marine biogeochemistry around the Welsh coast.

[Read more about their projects on the NRN-LCEE website.](#)

Public Lecture Series

A busy period of public lectures brought 4 international speakers to Wales to present topics ranging from parasites to biomimicry to coastal planning.

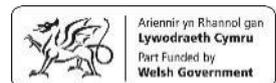
Prof Robert Poulin visited Cardiff University from the University of Otago, New Zealand to present 'Evolution of the body snatchers: the secret lives of parasites', sharing some examples of the amazing diversity and bizarre lives of parasites.

Our Thematic Research Areas:

1. [Sustainable intensification](#)
2. [Low carbon energy pathways](#)
3. [Developing the bio economy – social, economic and technological modelling](#)
4. [Impacts and mitigation of climate change and human activity](#)



LOW CARBON, ENERGY & ENVIRONMENT
RESEARCH NETWORK WALES
CARBON ISEI, YNNW A'R AMGYLCHEDD CYMRU



Dynged Cylidde Academig
Uwch Cymru
Higher Education Funding
Council for Wales

hefcw



[NRN-LCEE Research Videos](#)

Prof Malcolm Spaulding visited Bangor University from The University of Rhode Island, USA. Prof Spaulding presented on tools developed through his research to help assess and quantify the risks of storm surge faced by coastal communities.

Dr. Petra Gruber from the University of Akron, USA, gave a lecture on Biomimicry at Cardiff University. Dr Gruber's presentation took a closer look at examples of the use biomimetics in architecture – a strategic approach to translate information from biology to technology solutions.

Finally, Prof Robin Gerlach from The University of Montana, USA, visited Aberystwyth University to present his work on biofilms and rock-forming micro organisms. He showed some fascinating examples of how these organisms can aid challenges varying from healing cracks in concrete to non-invasively curing and preventing kidney stones.



Professor Robin Gerlach speaking at Aberystwyth University

Recordings of these lectures are available [on our website](#) and [YouTube channel](#).
[Our next public lecture will take place at Bangor University on 11 July.](#)

All NRN-LCEE lectures are free to attend and open to the public.
For an overview of confirmed future speakers in the series please visit:
www.nrn-lcee.ac.uk/future-lectures

News – Soapbox Science participation by NRN-LCEE Fellows

For the fifth year, Swansea University organised a Soapbox Science event. This is a global annual event to engage with members of the public who don't normally go to science events and to highlight women in STEMM. The topic of the talks ranged across the STEMM subjects, with giant soap bubbles, insect mating dances and antimicrobial resistance being some of the topics covered. Amongst the scientists were NRN-LCEE Geo-Carb-Cymru Fellow Dr Sara Rassner and Returning Fellow Dr. Emma Hayhurst. [Read more...](#)



Emma Hayhurst explaining how antimicrobial resistance works to unsuspecting shoppers in Swansea's Oxford Street

Research Highlights – Publications

NRN-LCEE research has been published in the following selected recent publications:

Neill, S.P., Angeloudis, A., **Robins, P.E.**, Walkington, I., **Ward, S.**, **Masters, I.**, **Lewis, M.J.**, Piano, M., Avdis, A., Piggott, M., Aggidis, G., Evans, P., Adcock, T.A., Zidonis, A., Ahmadian, R., Falconer, R. (2018). Tidal range energy resource and optimization - past perspectives and future challenges. *Renewable Energy* 127: 763-778. DOI: <https://doi.org/10.1016/j.renene.2018.05.007>

Gordon, T.A.C., Harding, H.R., Clever, F.K., Davison, W., Montgomery, D.W. **Weatherhead, R.C.** et al. (2018). Fishes in a changing world: learning from the past to promote sustainability of fish populations. *Journal of Fish Biology* 92(3): 804-827. DOI: <http://doi.org/10.1111/jfb.13546>

Robinson, C., **Uren-Webster, T.**, **Cable, J.**, James, J., **Consuegra, S.** Simultaneous detection of invasive signal crayfish, endangered white-clawed crayfish and the crayfish plague pathogen using environmental DNA. *Biological Conservation* (in press). DOI: <http://doi.org/10.1101/291856>

Gonzales-Mejia, A., **Styles, D.**, **Wilson, P.**, **Gibbons, J.** (2018). Metrics and methods for characterizing dairy farm intensification using farm survey data. *PLOS One* (in press).

Ward, S.L., **Robins, P.E.**, **Lewis, M.J.**, Iglesias, G., Hashemi, M.R., Neill, S.P. (2018). Tidal stream resource characterisation in progressive versus standing wave systems. *Applied Energy* 220: 274-285. (in press).

McKinley, E., Aller-Rojas, O., Hattam, C., Germond-Duret, C., Vicuña San Martín, I., Hopkins, C.R., Aponte, H., Potts, T. (2018) Charting the course for a Blue Economy in Peru: A Research Agenda. *Environment, Development and Sustainability*. DOI: <https://doi.org/10.1007/s10668-018-0133-z>

McKinley, E., **Ballinger, R.C.**, **Beaumont, N.** (2018) Saltmarshes, ecosystem services, and an evolving policy landscape: A case study of Wales. *Marine Policy* 91: 1-10. DOI: <https://doi.org/10.1016/j.marpol.2018.01.021>

Ford, H., **Healey, J.R.**, **Markesteyn, L.**, **Smith, A.R.** (2018). How does grazing management influence the functional diversity of oak woodland ecosystems? A plant trait approach. *Agriculture, Ecosystems and Environment* 258: 154-161. DOI: <https://doi.org/10.1016/j.agee.2018.02.025>

Musolino, P., Mishuris, G. A nonlinear problem for the Laplace equation with a degenerating Robin condition. *Mathematical Methods in the Applied Sciences* (in press).

Foote, A.D. (2018). Sympatric speciation in the genomic era. *Trends in Ecology and Evolution* 33: 85-95. DOI: <https://doi.org/10.1016/j.tree.2017.11.003>

Robins, P.E., **Lewis, M.J.**, Freer, J., Cooper, D.M., Skinner, C.J., Coulthard, T.J. (2018). Improving estuary models by reducing uncertainties associated with river flows. *Estuarine, Coastal and Shelf Science* 207: 63-73. DOI: <https://doi.org/10.1016/j.ecss.2018.02.015>

Masum, S.A., **Thomas, H.R.** (2018). Modelling coupled microbial processes in the subsurface: Model development, verification, evaluation and application. *Advances in Water Resources* 116: 1-17. DOI: <https://doi.org/10.1016/j.advwatres.2018.03.015>

Schanz, T., **Tripathy, S.**, Sridharan, A. (2018). Volume change behaviour of swelling and non-swelling clays upon inundation with water and low dielectric constant fluid. *Applied Clay Science* 158: 219-225. DOI: <https://doi.org/10.1016/j.clay.2018.03.031>

Find all publications resulting from NRN-LCEE research at: <http://www.nrn-lcee.ac.uk/publications>

Cluster Highlights – Conference attendance

The NRN-LCEE encourages its Fellows and PhD students to present at conferences. Recently, two of our Fellows and two students received bursaries to present their work at international conferences in the UK. [Read more...](#)