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COVER
1st Prize in ESAI Photography Competition, 'Warning waves'

Photograph: Nick Warinton

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Background photo, this page: Storm at Doulus Head, Co. Kerry. **Photograph:** *Michael O'Clery*

Windfarm. **Photograph:** *David Dodd*

Editorial

Attendees at Environ 2013, will be aware of the plethora of research presented on all aspects of the energy sector.

John Wann
(Editor, *Environews*)

For example, developments and issues in the Irish bioenergy and refining sector, activities of the Atlantic Ocean Energy Alliance, building retrofitting to curb energy demand, and potential ecological impacts of renewable energy systems. During the heavy snow that blanketed Northern Ireland back in March, my thoughts focused once again on energy demand and supply.

In this vein, a report commissioned by World Wide Fund for Nature Northern Ireland from GL Garrad Hassan, independent renewable energy consultants, entitled *'Positive Energy: how renewable electricity can transform the island of Ireland by 2030'* is of interest to the energy debate. The report is downloadable from http://assets.wwf.org.uk/downloads/positive_energy_summary_ni_nov_2012.pdf) where energy researchers can draw their own conclusions on the reports assumptions and conclusions based on their experience within the energy research sector.

The main conclusions of the report were by 2030, more than 70% of the projected electricity in the SEM could be provided by renewable energy, the renewable energy potential for Northern Ireland and the Republic of Ireland is between approximately 21 and 60 times the projected demand for electricity by 2030 from renewables, and increased interconnection has an important role to play in balancing supply and demand with output from baseload and intermittent generation.

Other conclusions reached by the report are that additional demand arising from the electrification of the heating and transport sectors is manageable, especially if part of that demand is deferred to outside of peak hours and finally that decarbonising Ireland's power sector could maintain security of supply and ensure electricity demands are met.

No doubt the exact mix of energy sources that should be promoted throughout the island of Ireland will be debated for some time to come as demonstrated by the serious debate on 'Ireland's Energy Future' at Environ 2013. It is however apparent that many technologies that are necessary to reach energy demand and reduction targets are well-developed. Increased political will is necessary from those who have been vested by the public through their portfolios to make the hard policy decisions that will create the investment climate to help create a revived healthy economy based on the export of environmental goods and services in the energy sector.

John Wann, editor

ESAI Chairperson Report

By ESAI Chairperson Dr Paul Bolger

Dr Paul Bolger

" If you want something done, ask a busy person."

"*Well done is better than well said.*"

Benjamin Franklin (1706 - 1790).

We are all familiar with the saying, "if you want something done, ask a busy person" but I only recently realised that it is attributable to Benjamin Franklin. Along with being one of the Founding Fathers of the United States Franklin was a renowned polymath, a leading scientist and invented the lightning rod, bifocals and the Franklin stove. Franklin was a man of action and a prodigious inventor; nowadays we would call him a serial entrepreneur. Another one of Franklin's well known quotes is, "well said is better than well done". At least it's good to know that being too busy is not just a 21st century phenomenon.

Franklin's quotes above illustrate that, ultimately, it is action that matters. The ESAI has been very fortunate over the past number of years in having a very hard-working, enthusiastic and dedicated Council who have, along with their busy day-jobs given large amounts of their time to growing and developing the range of activities that the Association offers. The success of the ESAI is very dependent on having an active ESAI Council. We are delighted to welcome new faces onto the ESAI Council; Dr Frances Lucy, Mark Nolan, Dr David Bourke, and Emer Cosgrove were elected to the ESAI Council at the ESAI AGM at ENVIRON 2013. New Council members always bring with them a host of fresh ideas and we are looking forward to working with the new Council members over the next two years. We are also very pleased to welcome Dr Tom Curran as the new ESAI Vice-Chairperson and Damian Howard as ESAI Treasurer.

Speaking of new faces it was great to see so many new researchers and research projects at the ENVIRON 2013 colloquium in NUI Galway. The Association is very pleased with the increased numbers of postgraduate researchers at the conference in the last number of years. Many thanks to Martina Prendergast, David Finn and the NUI Galway for hosting the event and for assembling a stimulating scientific programme. You can take a bow and a well earned rest - over to Trinity College Dublin for ENVIRON 2014 in February 2014!

While ENVIRON is the main event in the ESAI calendar the association is looking at a very busy year ahead where we are hosting a number of workshops and seminars in partnership with the Environmental Protection Agency, the Chartered Institute of Waste Management and NUI Galway. Further details of these events will be announced over the coming months on the ESAI listserver, LinkedIn and on our website (www.esaiweb.org). ESAI members can avail of discounted rates to these events. The Association has also agreed discounted rates for ESAI members for relevant Institute of Engineers of Ireland events.

As always thanks to Dr. John Wann, Dr. Shane Colgan and Sinead Macken for their work in producing Issue 25 of *Environews*.

Paul Bolger is manager of the Environmental Research Institute at University College Cork. He has been on the ESAI Council since 2007, served as treasurer from 2008-2009, vice-chair in 2010 and was conference convenor at the 2011 ENVIRON in University College Cork.

ESAI upcoming events

May ESAI 8th Annual Photography Competition Launch. Open to all amateur photographers.

Sept (Date TBC). Workshop.
Water Workshop in conjunction with EPA, NUI Galway and Marine Institute, Galway.

Sept 10th Workshop.
Freswater Invasive Speices in conjunction with IT Sligo, Inland Fisheries Ireland, National Biodiversity Data Centre, IT Sligo.

October (Date TBC). Workshop.
Life Cycle Analysis Workshop in conjunction with Chartered Institute of Wastes Management, Enterprise Ireland, Dublin.

November ESAI Ezine *Environews* Winter Edition available online www.esaiweb.org

December 1st Registration and Abstract Submission Opens Online www.environ2014.org

Environ 2014 - 24th Irish Environmental Researchers Colloquium, Co-hosted by Trinity College Dublin, Dublin (Feb 26th-28th 2014).

Freshwater Invasive Species Workshop

ESAI would like to announce a one-day Freshwater Invasive Species workshop hosted at IT Sligo on Tuesday September 10th. This workshop is geared towards those who work and play in Irish river basins; particularly responsible agencies, third-level staff and postgraduates, NGOs, consultants and recreational bodies. This workshop will inform you how to (1) identify aquatic invasive species; (2) apply biosecurity protocols and (3) assess your potential role in aquatic invasive species management. The event will include presentations, a practical identification session and teamwork exercises.

The event is organised and supported by ESAI and IT Sligo (Frances Lucy), Inland Fisheries Ireland (Joe Caffrey) and the National Biodiversity Data Centre (Colette O'Flynn). There is no charge to delegates. For further information please contact Frances Lucy, Centre for Environmental Research Innovation and Sustainability (CERIS), Institute of Technology, Sligo at lucy.frances@itsligo.ie

Environmental Sciences Association of Ireland

2012 photography competition

The theme of the 2012 ESAI photography competition was "The Environment". The competition was opened to all amateur photographers on the 7th March 2012 at Environ 2012 in UCD, Dublin.

The winning photograph was taken by Mr. Nick Warrinton from Co. Wicklow and entitled "Warning Waves". The winning photographer received a framed copy of their photograph together with a €200 One4all voucher, kindly sponsored by the Environmental Research Institute at University College Cork.

(Left) **Warning Waves**
Winning photograph
by Nick Warrinton.

The two runners up in the competition, "Birds and the Ship Wreck" by Leo Murphy, Co. Meath, and "Energy from Waste" by Ultan Downes, Dublin, both received a €50 One4all voucher and a one year membership to the ESAI. Photographs were judged on picture quality, composition, and appropriateness of caption.

Birds and the Shipwreck
2nd Prize, by Leo Murphy.

Energy from Waste
3rd Prize, by Ultan Downes.

The winning photographs will be displayed in the Photo Competition Gallery section of the ESAI website at www.esaiweb.org/gallery/photo-competition

ESAI signs MOU with the Chartered Institute of Waste Management

By ESAI Chairperson Dr Paul Bolger

The ESAI signed a formal Memorandum of Understanding (MOU) with the Chartered Institute of Waste Management (CIWM) in February 2013. CIWM is the professional body which represents waste and resource professionals working in the sustainable waste and resource management sectors worldwide. Its objectives include education and competence to advance, for the public benefit, the art and science of waste management. Both CIWM and ESAI are committed to building and maintaining higher standards of professionalism within the environmental industry based on sound science engineering and technology, the provision of training, encouraging a better scientific understanding of environmental issues, and providing an expert platform for environmental issues in Ireland and abroad.

The ESAI-CIWM MOU will include commitments between the two organisations to run joint seminars/workshops, offer cross membership discounts for events/training courses and agree to promote each other's associations and activities.

(Left to Right) Kevin Ryan (ESAI Council), Dr Paul Bolger (ESAI Chairperson) and Enda Kiernan (CIWM Chairperson) at the signing of ESAI-CIWM MOU in February 2013. **Photograph:** *??*

The MOU with CIWM is part of the ESAI strategy to pursue links with other professional associations working in the environmental area in Ireland with a view to developing synergistic collaborations that will be of benefit to the organisations members. We look forward to a fruitful relationship with CIWM in the coming years and thank them for their past support of the ESAI.

Environ 2013, co-hosted by ESAI and the Ryan Institute, was held in the NUIG Research Facilities. Dr Martina Prendergast, host, with guest speaker Tony Juniper. **Photograph:** *Aengus McMahon*

Environ 2013

By Dr. Martina Prendergast
(Ryan Institute, NUI Galway)

Conference Partners:

The 23rd Irish Environmental Researchers' Colloquium, ENVIRON 2013, was held on January 30th to February 1st, 2013 in the Ryan Institute at NUI Galway.

The conference was last hosted in Galway ten years ago in 2003, and we were very pleased to co-host the event again this year in association with the Environmental Sciences Association of Ireland (ESAI). The event was very well attended again this year with almost 300 delegates registered over the three days.

The theme of this year's conference was *'Environment: From Ecosystem Functioning to Human Health'*. Human health and well-being is achieved and maintained through our interactions with the world around us. Clean air, clean drinking water, safe food, good quality soils, and smart land use are essential elements in achieving good health. Delegates were challenged to relate their work to the conference theme, and dedicate a slide from their presentation to the overarching theme.

The conference kicked off on Wednesday morning with four workshops offered to delegates. The first workshop was *'Ecosystems and Health: from Local to Global Issues'* and was delivered by a team from NUI Galway and HSE West [Martin Cormican, Maire Connolly, Diarmuid O'Donovan, Akke Velinga, Maurice Mulcahy and Martina Prendergast]. Two GIS workshops were offered and delivered by Ronan Hennessy, NUI Galway: *'Free GIS in Environmental Science: Sourcing Free GIS Data and Using Free GIS Software'* and '*ArcGIS in Environmental Science: Skills and Thrills*'. A forth workshop was offered on '*Promoting Innovation in Research: Communication, Transfer & Application*' by John Gallagher and his team from TCD. I wish to extend a huge thank you to all the workshop organisers who volunteered and gave up their time for free.

The main conference activity kicked-off on Wednesday evening with a Q&A style panel debate on '*Securing Ireland's Energy Future*'. The event was very well attended with about 120 people present on the evening. Mr. Duncan Stewart, broadcaster and presenter of the RTÉ programme Eco Eye

moderated the debate which covered a very wide array of topics such as energy efficiency, renewable energy sources, CO^2 emissions, power, heat, transport, fuel imports/energy security, and the creation of energy-related jobs. Members of the panel included Eamon Ryan, leader of the Green Party and former Minister for Energy, Communications and Natural Resources, Brian Barrett, senior executive with Galway County Council, Emeritus Professor Phillip Walton, physicist and member of the Irish pro-nuclear lobby group BENE (Better Environment with Nuclear Energy), and Dr. Eimear Cotter, senior manager with EPA's Climate Change and Environmental Research Unit. The discussion was lively and got quite heated at times, especially when discussing the regulations governing the distance of wind turbines from residential homes.

Our keynote speaker was Mr. Tony Juniper, who is one of the top ten international environmental figures of the last 25 years. Tony is a British campaigner, writer, sustainability advisor and leading environmentalist recognised among other activities for his work as Executive Director of Friends of the Earth, England, Wales and Northern Ireland and Vice Chair of Friends of the Earth International from 2000-2008. His lecture on '*Nature for Health - Opportunities for People and the Environment*' examined how exposure to good quality green space and the natural environment can improve quality of life. He highlighted the potential economic benefits of working with nature instead of polluting the environment. He gave insights into how nature provides the 'natural services' that keep the economy going, and revealed that these and other services are each year worth about double global GDP. His new book called '*What has Nature ever done for us?*' was launched in January and he kindly signed copies after he delivered his keynote address. His lecture was stimulating and fascinating and was the highlight of the colloquium.

In total, we received over 150 abstract submissions and over the course of the Thursday and Friday there were 99 oral presentations and 50 posters on display. There were six oral and poster prizes on offer again this year, each worth €250, thanks to the kindness and support of our generous sponsors. The overall winner of the best oral was NUI Galway student Catherine Ludden for her presentation entitled '*Longitudinal Study of Environmental Contamination with Antimicrobial Resistant Organisms in a Newly Built Nursing Home*'. Her prize was sponsored by Lifetime Lab. The winner of the best poster sponsored by Cork City Council was Sarah O'Malley, also of NUI Galway, for her poster entitled '*Reconnecting children and nature? Mapping the evolution of environmental education in Ireland*'.

As well as the main conference activity, this year there were a number of invited speaker sessions. On Thursday afternoon, Prof. Gerard Jennings delivered a lecture remembering, Dr. Tom O'Connor (RIP), who passed away in November 2012. Tom made decades of important contributions to the fields of atmospheric physics, aerosol science, occupational hygiene, and the history of science. Later on Thursday afternoon a workshop on '*Accessing Research Funding*' took place with senior representatives from the Environmental Protection Agency (EPA), the Health Research Board (HRB), Science Foundation Ireland (SFI), Irish Research Council (IRC), Department of Agriculture, Food and Marine (DAFM), who gave 20 minute presentations on the best strategies to access funding for your research. This session was informative and was unique in having all the funding agencies present at the same event.

The conference dinner got underway on Thursday evening at 8pm in the Radisson Blu hotel. There was a large crowd of over 120 in attendance and we danced the night away to the sounds of our student-by day, DJ-by-night, John Staunton. The food was excellent and a good time was had by all.

This year, for the first time, the conference featured the ENVIRON Career Expo and CV workshop. Attendees met representatives from NGOs, environmental consultancies, research institutes, and semi-state bodies planning to recruit in 2013 to discuss job opportunities; internships; post-doctorate and Ph.D. programmes. Career guidance and CV consultation were provided at the event. The Career Expo was open to the general public, and attracted 80 members of the public. The hard work of Cara Augustenborg and Aoife Delaney made this event a huge success and it is planned to repeat this event at future ENVIRON conferences.

Also, the French artist, Francois Gunning, was our ENVIRON artist-in-residence. He exhibited 20 of his pieces in the foyer and break-out rooms. Francois links art and science and paints pictures and builds sculptures using recycled materials and plastic debris found on the sea shore and along the coast on beaches. He uses his art to educate the public about the value of material that we perceive as waste. He was present during Thursday and Friday to discuss the meaning of his pieces with delegates.

The conference closed on Friday at 2pm with the announcement of next year's hosts. ENVIRON 2014 will be held in Trinity College Dublin on 26th-28th February, 2014. Good luck to Laurence Gill, Brian Broderick and John Gallagher with the plans for the next ENVIRON.

Author: Dr. Martina Prendergast

ENVIRON 2013 Conference Convenor.

BEST ORAL PRESENTATION
WINNER: Catherine Ludden

What lies beyond: doors, floors and the risk of infection?

By Catherine Ludden[1], Martin Cormican[1,2], Bernie Austin[3], Dearbháile Morris[1]

[1] Antimicrobial Resistance and Microbial Ecology (ARME) Group, School of Medicine, National University of Ireland Galway.

[2] Department of Medical Microbiology, Galway University Hospitals, Galway, Ireland

[3] St. Brendans Home, Galway, Ireland.

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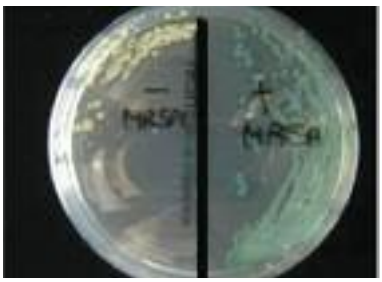
Best Oral Presentation, Catherine Ludden, NUIG and Ryan Institute, and Duncan Stewart, Broadcaster.
Photograph: *Ryan Institute*

Antibiotic resistant bacteria (ARB) are a serious public health concern. Infection with ARB results in increases in health care costs and lengths of hospital stay. Nursing homes may represent potential reservoirs for ARB. In Ireland, as in much of Europe the numbers of people resident in nursing homes is increasing all the time. Shared space in such facilities creates conditions in which direct and indirect spread of bacteria (including ARB) is facilitated. Our study looked at how long it took for the environment of a newly built nursing home to become contaminated with ARB.

A number of sites in an occupied nursing home (n=18) and a newly built nursing home intended to replace the old nursing home (n=21) were selected for monitoring prior to and post habitation by residents over an 11 week period. Environmental screening was performed to detect 3 different types of ARB: meticillin-resistant Staphylococcus aureus (MRSA), extended spectrum β-lactamase-producing Enterobacteriaceae (ESBL-PE) and vancomycin-resistant enterococci (VRE).

MRSA was detected at two sites before the residents inhabited the facility and was detectable in all areas once residents moved in (63/147 positive MRSA swabs). MRSA was most commonly found on floors, bed frames, bed side lockers, arm chairs, toilet seats, tables and door handles. ESBL-producing *E. coli* O25b:ST131 was detected on one occasion and VRE was not detected.

Our data suggests that contamination of the physical environment is likely to play a significant part in the persistence and transmission of MRSA in the nursing home setting. The presence of MRSA in the environment prior to habitation by residents is a cause for concern. This research has implications for cleaning procedures and infection control measures to help prevent the spread of antibiotic resistant bacteria in the nursing home setting.



chromIDTM MRSA agar
Photograph: *Catherine Ludden*

Cefoxitin resistance
Photograph: *Catherine Ludden*

BEST POSTER PRESENTATION
WINNER: Sarah O'Malley

Reconnecting children and nature?

Mapping the evolution of environmental education in Ireland

Sarah O'Malley NUIG and Duncan Stewart
Photograph: *Ryan Institute*

Sarah O'Malley PhD candidate (IRCHSS)

School of Political Science and Sociology, Room 331, Áras Moyola, NUI, Galway

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Thanks to our prize sponsor

This research study critically examines the status of environmental education in Ireland to establish whether, and to what extent, this type of education (re)connects children to the natural world. In the past children learned about the biophysical environment through participation in agricultural work and cultivation, exploration, adventure and enjoyment. In line with modernisation, such informal ways of learning have been formalised to include media outlets and various structured, organised, supervised educational programmes.

This environmental education sector in Ireland plays a dual role in supporting and promoting both informal and formal approaches. However, conventional environmental education programmes tend to promote the management and monitoring of natural resources as a way of solving environmental problems. Consequently, the opportunity for informal regular, unstructured, experiential learning outdoors with no specific educational outcome is increasingly marginalised.

Sarah O'Malley and students on a scavenger hunt.
Photograph: *Burren Beo Trust*

The research project empirically investigates the evolution of environmental education policy and practice in Ireland. It examines the sector's formalisation process and underlying notions of the biophysical environment, education, and sustainable development. The study recommends that environmental education adopts a more self-critical approach and recognise that children have the capacity to surpass such structural constraints to educate the home, school, and community environments. Therefore, the sector must rediscover and attach renewed value to children considering their boundless creative ingenuity and the role that plays in solving global environmental problems.

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BEST BIODIVERSITY PRESENTATION
WINNER: Inga Reich

The Kerry Slug:
How should we manage a protected species in commercial conifer plantations?

Inga Reich NUIG and Aoife Delaney BEC.
Photograph: *Ryan Institute*

Inga Reich[1], Kim O'Meara[1], Eugene Cush[1],Fiachra Tierney[1], Rory Mc Donnell[2], & Mike Gormally[1]

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The distribution of the Kerry Slug *Geomalacus maculosus* (Photo 1), a species protected under EU and Irish law, was believed to be limited to northern Iberia and to south-west Ireland, where it was known to inhabit predominantly deciduous woodland and open moor or blanket bog. However, in July 2010, the slug was found for the first time outside its previously known range in a commercial conifer plantation in Co. Galway[1].

As the Kerry Slug is a protected species, it is important that commercial forestry operations do not threaten its existence. The effect of clear felling on the species is unknown, so when an area populated by *G. maculosus* had to be felled, tree stumps, which measured about 3 meters in height (Photo 2), were left standing in the clearfell to accommodate the slug population. To investigate whether this was a suitable mitigation measure, 15 slug refuge traps were placed on these tree stumps and 15 further traps were put up in a neighbouring forested area. The traps were checked on a weekly basis for the duration of one year and specimens of *G. maculosus* found beneath them were removed and counted. No significant difference between the slug numbers in forest and clearfell could be found, indicating that the clearfelling in this manner at this site does not appear to significantly affect Kerry Slug populations at least in the first year. However, further studies are required to determine how weather conditions and age of tree stumps affect Kerry Slug populations in the long term[2].

Photo 1, above. Black (more frequent in open country) and brown (more frequent in forests) forms of *G. maculosus*. **Photograph:** *Inga Reich*

Photo 2, above right. Searching for *G. maculosus* at the 3m high stump in the clearfell.
Photograph: *Kim O'Meara*

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[1] Kearney, J (2010). Kerry Slug recorded at Lettercraffroe, Co Galway. *Irish Naturalists' Journal* 31(1): 68-69.

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Project sponsors

National Parks & Wildlife Service

NUI Galway
OÉ Gaillimh

Thanks to our prize sponsor

becconsultants

BEST SOIL PRESENTATION
WINNER: Andrea Richter

Integrating soil characteristics, land management and soil microbial communities

By Andrea Richter[1,2], Evelyn Doyle[1], Nicholas Clipson[1], Rachel Creamer[2] and Daire ÓhUallacháin[2]

[1] University College Dublin

[2] Teagasc Environment Research Centre, Johnstown Castle, Wexford

Corresponding author: Andrea Richter andrea.richter@teagasc.ie

Soil ecosystems are highly complex and contain a huge abundance and diversity of species. Microbial populations in the soil are of fundamental importance to ecosystem functioning, through determining nutrient cycling, organic matter decomposition and energy flows. A better understanding of this complex environment and the associated soil processes is vital if we are to address two of the most important global challenges i.e. increase food production for a constantly growing world population and protecting our natural resources.

Our Teagasc-funded study seeks to uncover whether soil types in Ireland have different and distinctive microbial fingerprints. Furthermore, we aim to determine how microbial community structure and diversity is influenced by physicochemical properties and differing land use. For this purpose, soil horizon samples are being collected from 250 soil pits throughout Ireland. The genetic, phenotypic and functional properties of the microbial communities within these samples are being analysed and compared. These results will be related to the comprehensive physicochemical, soil type and land use data set provided by the Irish Soil Information System (ISIS).

Preliminary results indicate that top-soil respiration rates are influenced by soil types, physicochemical properties, microbial biomass and land-use. This would suggest that individual sample sites have distinct microbial fingerprints.

Soil profine pits. **Photograph:** *© ISIS Team*

Thanks to our prize sponsor

Soil Science Society of Ireland

BEST FORESTRY ORAL PRESENTATION

WINNER: Paul Egan

Habitat suitability modelling of Rhododendron for management and conservation

By Paul Egan, Trinity Centre for Biodiversity Research, Trinity College Dublin

Best Forestry Oral Paul Egan TCD and Duncan Stewart
Photograph: *Ryan Institue*

Thanks to our prize sponsor

Department of Agriculture, Food and the Marine
An Roinn Talmhaíochta, Bia agus Mara

Rhododendron ponticum (ssp. *baeticum*) is a problematic invasive species throughout most parts of Ireland. The plant is a particular threat to native biodiversity in areas of high conservation value especially native oak woodlands, where it interrupts forest regeneration and has led to displacement of species such as holly (*Ilex aquifolium*). On-going research at the Trinity Centre for Biodiversity Research (TCD) has focused on development of high resolution habitat suitability models for *R. ponticum* at the European scale. These models which account for both current and future climate scenarios, help predict areas most at risk from invasion, and, from a management perspective, which pre-established populations can best be prioritised for conservation action. The study is largely based on experience of invasion in Ireland and Britain and is of particular relevance to other European countries, within which there is observed potential for expansion. Having included the species native and threatened Iberian range within our models (where ironically it is designated on the national Red Lists of Portugal and Spain), we have also revealed a significant threat of extinction to the species here under climate change. Within this context, how might we best manage invasive populations, and can the aim of total eradication be advocated in this light? Our current work will explore and propose several prospects in this regard.

Native populations of *R. ponticum* in Portugal.
Photograph: *Erin Jo Tiedeken*

BEST WASTE & RESOURCE MANGAGEMENT PRESENTATION

WINNER: Ross Donnelly Swift

Waste and resource management presentation

The Chartered Institution of Wastes Management

Ross Donnelly-Swift, UCD, was awarded the prize for Best Waste and Resource Management presentation at Environ 2013, based on the oral presentation on his research he delivered entitled "Remote sensing of slurry spread on grasslands with exposed soil". The prize was sponsored by the Chartered Institution of Wastes Management and was presented by Honorary Secretary of the CIWM Irish Centre, Dr Anne Morrissey, DCU.

Ross Swift UCD and Anne Morrissey CIWM.
Photograph: *Ryan Institute*

Innovation where technology meets the sea

By John Breslin,
General Manager, SmartBay

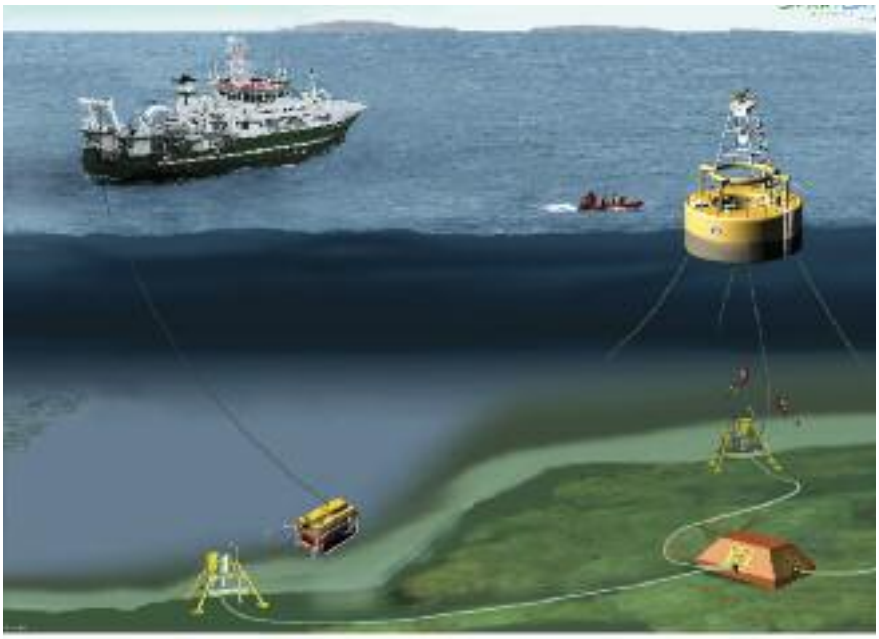
Maintenance Inspection of SmartBay Mobilis Buoy
© SmartBay Ireland. **Photograph:** *SmartBay*

SmartBay Ireland is a not-for-profit company funded under the Higher Education Authority Programme for Research in Third-Level Institutions Cycle V to facilitate the development of innovative approaches for the collection and dissemination of marine data and the testing and demonstration of novel sensors and equipment. The SmartBay infrastructure consists of a suite of commercially available technology platforms including a network of buoys, sensor hardware and data communication systems.

The SmartBay technical team can provide innovative Marine Support and ICT solutions to support users of the infrastructure. Within Galway Bay, ocean energy developers can utilise SmartBay infrastructure and marine support services to validate prototype devices and collect data during deployments.

SmartBay Ireland is keen to collaborate with researchers, innovators and entrepreneurs, to develop R&D projects and proposals. Partners can use both SmartBay's physical and cyber environment to collect data and to develop, test and demonstrate new solutions for marine and related sectors.

The SmartBay National Infrastructure Access Programme (NIAP) fund will be made available through Dublin City University (DCU) over a two year period to enable researcher's to access the SmartBay Ireland National Test and Demonstration Facility in Galway Bay. Research proposals will be invited for funding under a number of themes. This fund will provide small awards (typically €2-25K) to research teams through a national competitive process, which will be open to all higher education institutions on the island of Ireland. NIAP funding is operated on an 'Open Calls' basis.



Future Schematic Ocean Energy Test Site Spiddal.
Photograph: *© Maine Institute.*

Now you're Talking rubbish

By Brenda McEvoy, rx3

Minister Hogan with Carlow IT Student, Cathal Sheridan & Brendan Lynch and Christine Fitzgerald, Abbott Ireland. **Photograph:** *??*

Students turn trash to cash

The Minister for the Environment, Community & Local Government, Mr. Phil Hogan, T.D., announced the winners of the rx3 "Trash to Cash" competition on Thursday 28th February 2013. The competition called for third level students to turn recyclable waste into new products under the theme of "recreate" or "play". Carlow Institute of Technology came out on top at this year's awards, with four of its students winning the top three prizes. First Prize went to Cathal Sheridan for his Hi-Cu Passive amplifier for iPhones made from wood pallets provided by Abbott Ireland. The clever natural amp offers a convenient and energy saving way of sharing music.

Second prize was awarded to Shane McGuinness & Ian Hannon for their idea of the Eco Sound iPhone Amp made from cardboard. Third Prize was awarded to Denis Tiryaki for Drop, a sustainable pendant lamp made from 100% woven recycled polypropylene salt bulk bags provided by Glanbia. The winning and shortlisted projects can all be viewed at www.rx3.ie.

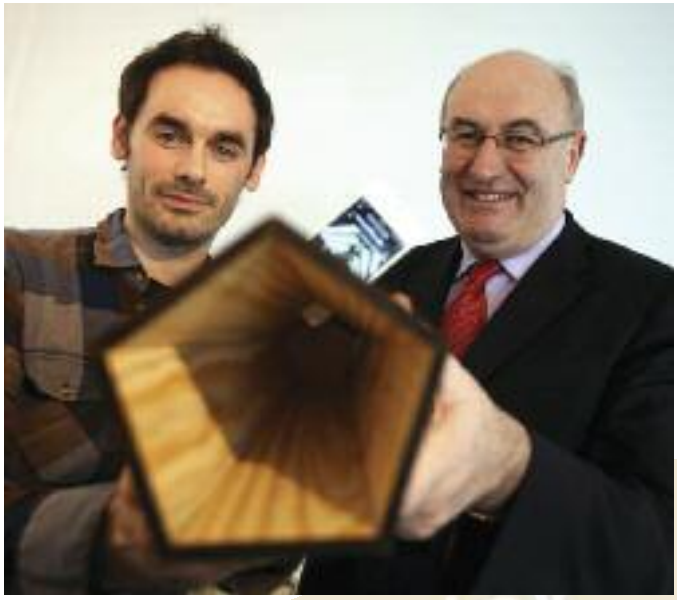
In this year's competition there were a total of 33 entries received by rx3: rethink, recycle, remake. This was shortlisted down to 10 entries who were invited to pitch and exhibit in the final of "Trash to Cash" at the Science Gallery. The winner will now go on to work with members from the Institute of Designers in Ireland to develop their product further.

"From an early stage in the programme, rx3 considered it crucial that upcoming and existing Irish product designers, engineers and scientists look at waste as a resource and use it in their products which is evident today among all of these innovative Recreate products created by the students," said Minister for the Environment, Community & Local Government, Mr. Phil Hogan, T.D. The Minister added that "In Ireland as across the whole of the European Union, the way we deal with waste is changing. This is both a necessity and an opportunity. It will be key to securing growth and jobs for Ireland and will bring economic opportunities, improve productivity, drive down costs and boost competitiveness".

In the competition this year rx3 teamed up with Business in the Community Ireland (BITC) and the Science Gallery to host the third Trash to Cash competition. Third level students across Ireland were challenged with creating a product from waste materials identified by BITC members Abbott Ireland, Bord Na Móna, Glanbia and Vodafone Ireland under the theme of 'Recreate'.

In 2010 approximately 82% of non-hazardous waste collected in Ireland or 1,375,868 tonnes of recyclable materials (including paper, cardboard, plastics, aluminum cans, steel food tins, organic waste, textiles and glass) was exported abroad for processing. These items could be turned in to new products here in Ireland, creating employment and generating revenue in Ireland.

"The Trash to Cash competition was a great opportunity to engage students in sustainability and identify creative uses for some of our waste materials," said Katharine Jensen,



Cathal Sheridan, Winner of Trash to Cash, from Carlow IT with Minister Phil Hogan. **Photograph: *??***

Corporate Social Responsibility Manager of Abbott and judge. "Safeguarding the environment is a key priority for Abbott and this competition aligns with our commitment to minimise impact on the global environment."

The Trash to Cash Judging Panel consisted of representatives from rx3, the Science Gallery, Business in the Community Ireland, BITC members including Glanbia, Abbott Ireland, Bord na Mona and Vodafone; Philip Lee Solicitors, Institute of Designers in Ireland and the Department of the Environment, Community & Local Government.

The Winners and Commended Students are as follows:

- 1st prize winner –Cathal Sheridan, Carlow IT: Hi-Cu Amp
- 2nd prize winner – Shane McGuinness & Ian Hannon, Carlow IT: Eco-Sound
- 3rd prize winner – Denis Tiryaki, Carlow IT & HfG Schwäbisch Gmünd: Drop
- Stuart Scanlon and Greg O'Gorman, NUI Maynooth: Bottle Rocket Kit
- Vincent Derrien, DIT: Cloud Leaf
- Sean Darling, DIT: Ecofight Boxing Bag
- Aoife Grogan, Lucia Berlanga Vega, Eric Flannery and Kima Omara, UCD: Whis-Cycle Kit
- Donagh Kelly, Darragh Collopy and Michael Lillis, NUI Maynooth: Wellen
- Alan Grincell, Carlow IT: Chameleon
- Kate Sheppard, Carlow IT: Recreate Chemistry

For further information:
Contact Ciara Murphy 087 6177859 / 01 7098092

Carbon dioxide capture from flue gas streams

By Emma Daniels and Dr. Teresa Curtin,
emma.daniels@ul.ie

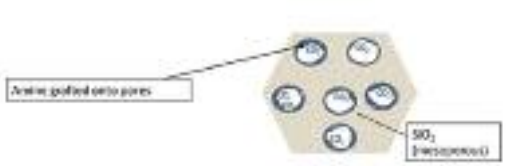
A typical industrial flue gas stream.
Photograph: *Emma Daniels*

Human activities in the form of burning fossil fuels are believed to be a contributing factor to the increase in atmospheric concentration of carbon dioxide (CO^2). Currently the CO^2 content of the atmosphere is rising by 2 ppm per year.

CO^2 released from fossil–fuel fired energy generation plants is believed to be one of the main contributors to these emissions. Human dependence on fossil fuels for energy, most likely will not be met by alternative sources of energy for the foreseeable future.

The most viable option, in the short term, for reducing carbon emissions is capture and storing of CO^2 from flue gases of large stationary sources, such as power stations. Amine-based, wet scrubbing systems are currently used for this purpose. This process however is extremely energy intensive.

The aim of this research is to synthesize a high capacity solid capable of absorbing CO^2 from gaseous streams using the advantages of mesoporous solids with pore sizes between 2 and 50 nm. A number of mesoporous solids have been synthesized via the grafting process, to produce solids with reasonable CO^2 adsorption abilities. Various amines such as APTES were fixed into the pores of mesoporous solids. This amine will react with the CO^2, thus capturing it. Current studies are focused on further improving mesoporous solids by the introduction of aluminium sites.



Mesoporous silica modified with amine, capable of capturing CO^2.

Snippets

CELT Agroforestry Courses 2013

- **Saturday 13th July** Creating a Forest Garden - An introduction to site assessment and planting design – how to get the most from a design that both fits your needs and what works for the ecosystem.

- **Saturday 20th July** Drinks from the Forest Garden - All kinds of drinks (both alcoholic and non-alcoholic) can be made from a range of plants typically grown in forest gardens.

- **Saturday 27th July** Forest Garden Produce - Introduction to a range of herbal products that can be made from the trees, shrubs and ground flora of a forest garden.

- **Saturday 10th August** Forest Garden Plants & Their Uses, Including Propagation Techniques- Propagation, growing and harvesting the trees, shrubs, vegetables and herbs of a typical forest garden in Ireland

- **Saturday 17th August** Heritage Day in the Forest Garden - We will spend a day in the garden meeting the plants and trees and exploring their folklore and traditional uses in medicine, food and craft work. We will discover how ancient plant knowledge can be successfully applied today.

The above courses will be held in the beautiful working garden of our Herblore Tutor, Kes Clarke in Caher Rice, Caher, Co Clare. Costs: €40 (waged), €25 (unwaged) per day. All places must be booked in advance through the CELT Office.

Heritage Day, Saturday 17th August East Clare Community Co-op, Main Street, Scariff, Co Clare. Hosted by the East Clare Community Co-op for Heritage Week we will be running demos and hands-on workshops in Traditional Skills and Natural Crafts. A selection of hand-crafted items from our tutors will also be on sale.

Weekend in the Hills, 28th & 29th September Slieve Aughty Centre, 15 minutes south of Loughrea, Co Galway. Workshops on silversmithing, knife making, wooden bowl & spoon carving, spinning and weaving including natural dyeing, natural building, basketry, herblore, coppersmithing, wet felting, needle felting, musical instrument making from recycled materials, blacksmithing, rustic furniture making, woodcarving, sugan chair making, longbow making, dry-stone & lime mortar walling and adventure bushcraft for 8-14yr olds. Further descriptions of these courses, and photographs, are on our website www.celtnet.org

Prices are €130 for the weekend, including weekend membership of CELT. All courses must be booked in advance through the CELT office (contact details below). Accommodation, including camping, must be booked separately through the Slieve Aughty Centre. Phone 0909745246, email Jenny@riding-centre.com or visit www.slieveaughtycentre.com. Camping is €5 per tent per night, B&B €35pp per night, and an eco-cottage is also €35pp per night based on 6 sharing.

CELT (Centre for Environmental Living & Training)
Registered Charity Number CHY14519
Gleann Glas, Tuamgraney, Co Clare
061-640765 info@celtnet.org www.celtnet.org
Office Hours: Tues & Thurs 9.15am-1.15pm, Weds 3-5pm.

Information and Communications Technology for Environmental Regulation: Developing a Research Agenda Workshop

Thursday 20 June - Friday 21 June 2013
National University of Ireland Galway
www.conference.ie/Conferences/index.asp?Conference=205

The aim of this workshop is to build a network of researchers dealing with the issues raised by the use of information and communications technology in order to prepare joint projects, funding applications and work towards an international conference dealing with this topic. Enquiries to: ronan.m.kennedy@nuigalway.ie or to Rónán Kennedy at +353-91-495626

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