

environews



The logo for the Environmental Sciences Association of Ireland (ESAI) features the letters 'e', 's', 'a', and 'i' in a stylized, lowercase font. A green wavy line arches over the letters, ending in a small circular shape. Below the letters, the full name 'Environmental Sciences Association of Ireland' is written in a smaller, sans-serif font.

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COVER
Conference
Poster Image

Photograph:
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Background photo, this page: The R.V. Celtic Explorer passes the Skelligs, Co. Kerry. Photograph: Michael O'Clery.

Editorial



John Wann
Honorary Editor

The conflict between ecclesiastical dogma and scientific findings has a long history. The publication *On the Revolution of the Celestial Spheres* by the Polish astronomer Nicholas Copernicus (1473-1543) was not published until after he died in order for him to avoid being persecuted by the Church. At the time anyone who opposed Church doctrine was branded a heretic, and that would destroy your reputation, put you in prison, or even sentence you to death. Galileo Galilei (1564-1642) was placed on trial and condemned by the Roman Catholic Inquisition in 1633 for his support of heliocentrism. Heliocentric books were banned and Galileo was ordered to refrain from holding, teaching or defending heliocentric ideas.

The period of Enlightenment or Age of Reason is an era from the 1650s to the 1780s which challenged the authority of institutions that were deeply rooted in society, such as the Catholic Church; there was much talk of ways to reform society with toleration, science and scepticism. Enlightenment philosophers included Francis Bacon (1562-1626), René Descartes (1596-1650), John Locke (1632-1704), Baruch Spinoza (1632-1677), Pierre Bayle (1647-1706), Voltaire (1694-1778), David Hume (1711-1776), Immanuel Kant (1724-1804) and Isaac Newton (1643-1727).

The French philosopher Pierre Bayle (1647-1706) for example was an enemy of sectarianism, who argued in favour of tolerance so that everyone could be free to follow the religion of their choice who said:

"If the Multiplicity of Religions prejudices the State, it proceeds from their not bearing with one another but on the contrary endeavouring

each to crush and destroy the other by methods of Persecution. In a word, all the Mischief arises not from Toleration, but from the want of it."

Another French philosopher Bernard le Bovier de Fontenelle (1657-1757) said *"You know all is very well without knowing how it is so; which is a great deal of ignorance, founded upon a very little knowledge"*.

Modern science writers such as Dr Ben Goldacre in his book *Bad Science* and through online postings (see www.badscience.net/) slams all who misuse science to mislead the public for their own commercial gain including drug companies, and self-styled nutritionists who falsify their results through flaky statistics. One might add the shameful minority of scientific researchers who have been exposed doing the same as a quick route to fame and fortune. Scaremongering tabloid journalists who spread misinformation and half truths by reason of lazy journalism or a poor grounding in science are also a target for Goldacre.

The scientific community throughout the Island of Ireland assemble for Environ 2015 in Sligo Institute of Technology April 8-10 to present their research results to the wider scientific community that aim to solve pressing human problems such as countering the impacts of climate change, slowing the loss of biodiversity, addressing future energy, food and water supply for ever burgeoning human populations, tackling pandemics, and lack of sewage infrastructure for the benefit of all humanity of all faiths and none.

We stand united with our French scientific colleagues and the wider French public in counteracting those who would wish to stifle rational scientific enquiry and free speech. It was Voltaire (1694-1778) who said *"I disapprove of what you say, but I will defend to the death your right to say it"*.

As I hand over my editorship to another competent colleague, I wish you all every success in your future research and no doubt I will meet up with at least some of you again.

John Wann, (Honorary Editor)

ESAI Chairperson Report



By ESAI Chairperson Tom Curran



Tom Curran

Welcome to the latest edition of *Environews*. Sadly, this marks the final Ezine under the direction of Honorary Editor, John Wann. On behalf of the ESAI, I would like to thank him sincerely for his input and wish him well for the future. I extend my good wishes to new Council member, Dr Dorothy Stewart (EPA) who follows in the footsteps of colleague Dr Shane Colgan (many thanks!) – an excellent contributor to ESAI activities over the past number of years.

As we begin a new year, we look ahead to a number of activities, the main one being our flagship Environ in IT Sligo, April 8-10, which takes place under the guidance of Dr Frances Lucy, Director of the Centre for Environmental Research Innovation and Sustainability (CERIS). This marks the 25th anniversary, so we look forward to welcoming many friends and colleagues in our ESAI network old and new. The event organisation is well under way and details can be found elsewhere in this newsletter.

One of our major initiatives for this year is to reach out to colleges more than we have done in the past. As part of this, we are welcoming on board an ESAI Liaison in each college. These staff members will act as a contact point for ESAI activities and information flow. We are also offering free membership to all undergraduates in relevant courses in each college. The list of third level environmental education

programmes on our web site is being updated as part of this process. We hope that this approach will facilitate more engagement with students and in particular will raise awareness and stimulate interest in environmental research. We have been encouraged by the growing number of non-research based students (e.g. taught Masters) attending Environ over the past few years and we would anticipate that this trend may extend further to undergraduate students through this process.

Another recent development is that we are reviewing our aims and objectives at the core of the ESAI. It is healthy that we should question how we serve our members and can we do things better or differently. Perhaps, the focus needs to be moved more explicitly to a research agenda as many of our members are involved in this area. Furthermore, our membership is also quite diverse in terms of discipline, which is a great strength of the organisation. We are depending on the voluntary efforts of our members, so we must be cognisant of what is possible to achieve effectively. As always, we welcome your input.

Finally, another item that has been discussed at Council level is that we should change to a different form of newsletter – we hope to trial a new version in the coming months. In the meantime, best wishes for the year ahead and we look forward to meeting you at 'Environ 25' in Sligo.

Tom Curran is a lecturer in UCD School of Biosystems Engineering and has been on ESAI Council since 2008, served as vice-chair in 2013 and was conference convenor at the 2012 ENVIRON in University College Dublin.



The new Science building at IT Sligo.
Photograph: © Sligo IT

Environ 2015

Environ 25: Sustainability and Opportunities for Change

The 25th Irish Environmental Researchers Colloquium will take place from April 8th-10th 2015

By Frances Lucy,
Conference Convener, IT Sligo

The 25th Irish Environmental Researchers Colloquium (Environ 2015) will be held at the Institute of Technology, Sligo from April 8th-10th 2015. It will be co-hosted by IT Sligo (Department of Environmental Science, School of

Science) and the Environmental Sciences Association of Ireland (ESAI). We have a brand new Science building at IT Sligo for you to visit! This is where our strategic environmental research centre CERIS is based and moreover where our undergraduate science students begin their research development in state-of-the-art laboratories.

Are we sustainable? The 25th Anniversary colloquium theme addresses the need to review environmental change since the very first Environ was held in IT Sligo (then Sligo RTC). Although technologies and knowledge transfer systems have developed exponentially since 1990, major challenges to global sustainability have concurrently evolved. Is current Irish environmental research optimising

research to deliver management and policy recommendations towards sustainability? The colloquium will investigate current sustainability actions while addressing opportunities for positive changes in engagement.

ENVIRON is the longest running and largest forum for environmental researchers in Ireland with over 275 delegates attending the event annually. It provides a high-visibility platform for young researchers to present their findings to an audience drawn from academia, government bodies and industry.

Workshops

The conference will begin on **Wednesday, 8th April 2015** with two education and training workshops on offer to delegates:

Environ Workshop 1: Introduction to the use of R in Environmental Statistics

Environ Workshop 2: Communicating Research

There is a small fee of €10 for each workshop that needs to be paid when booking the event.

Environ 25 will open to the public on the evening of Wednesday April 8 with a question and answers style panel debate on the popular topic of **'Paying for our water: quality and quantity matter'**. The panel of five speakers will include politicians, academics, the media, and water industry representatives. The event will be free and open to members of the public, local stakeholders, professionals and students. This debate will facilitate the sharing of knowledge and expertise on this environmental issue of concern with local communities.

Thursday morning kicks off with a plenary session where three high profile speakers will deliver sustainability keynote presentations before the roll-out of more than 150 oral and poster presentations from mid-morning until Friday lunchtime.

Conference Registration

Registration is available online at www.environ2015.org. The call for oral and poster presentations begins on January 12th 2015 and closes on February 20th 2015.

The themes of the sessions of this year's colloquium have been chosen to accommodate the widest possible participation and span a broad spectrum of activities from the physical, life and social sciences. Submissions are invited from the following thematic areas:



Sculpture at IT Sligo.
Photograph: © Sligo IT

- Water quality and Resources;
- Wastewater management;
- Waste management;
- Climate change;
- Energy;
- Environmental Policy and Communication;
- Environmental Socioeconomics;
- Environment and Human Health;
- Air Quality and Urban development;
- Marine and Coastal;
- Biodiversity;
- Sustainability and Research Innovation;
- Nanotechnology and the Environment;
- Invasive species;
- Sustainable agriculture;
- Sustainability and Roads.



IT Sligo. Photograph: © Sligo IT

To ensure a high standard of submission, all abstracts will be peer-reviewed by an academic committee comprising experts in all the topics addressed within the session themes. Presenters who have submitted posters will be offered the opportunity to summarise their findings in a one-minute oral presentation at the end of an oral session. Prizes for the best overall oral and poster presentations and in a number of selected topics will be on offer again this year, thanks to the generosity of our sponsors.

The registration fees for ENVIRON 2015 are as follows:

Full delegate **€190**

Students/Reduced/Seniors **€100**

Student Group Discount Rate (groups of ten) **€75**

The conference gala dinner will take place at the Clarion Hotel, Sligo and tickets cost €25.00 for a three course meal. We strongly encourage all delegates to come to this event which will include plenty of entertainment. The Clarion Hotel is also the conference hotel and special rates have been negotiated with the hotel and with other hotels, B and B's and hostels in Sligo. Please organise your accommodation directly and quote 'ENVIRON2015' for the discounted room rate.

We look forward to welcoming you all to IT Sligo.

Frances Lucy
Conference Convener, IT Sligo

Student Competition for Prizes at Environ 2015

Environ 2015

Be sure to register and win some of the generous prizes for the best student presentations

By Sinead Macken, ESAI Administrator

For many years, the ESAI has run a competition for the best student presentations at the Environ Colloquium. At this year's colloquium, all student oral and poster presentations will be included in the competition and judged. All winners will be invited to write a short piece on their research for publication in the ESAI Ezine.

There are €1,500 of prizes so far this year including:

- ESAI Best Oral Presentation (€500), sponsored by the School of Natural Sciences - Trinity College, Environmental Protection Agency, the Family of Maximilian Von Sternburg and Environmental Sciences Association of Ireland.

- ESAI Best Poster Presentation (€250), sponsored by the School of Natural Sciences - Trinity College, Environmental Protection Agency and the Family of Maximilian Von Sternburg.

- Best Waste and Resource Management Presentation (€250 and 2015 CIWM Student membership), sponsored by Chartered Institution of Wastes Management (CIWM).

- Best Soils Presentation (€250), sponsored by Soils Sciences Society of Ireland.

- Best Water Related Presentation (€250), sponsored by the Chartered Institute of Water and Environmental Management (CIWEM).

- Best Biodiversity Presentation (€250), sponsored by Institutes of Technology Ireland (IOTI)

So don't forget to register to be in with a chance of winning a prize!



Best Poster Winner co-author Siobhan Atkinson accepts her prize from sponsor John Parnell, School of Natural Sciences TCD. **Photograph:** Grace Healy



Tracey Lydon's winning YouTube clip

Communicating Environmental Science



ESAI Youtube Competition Winner Announced

By Mark Nolan ESAI

During 2014, the Environmental Sciences Association of Ireland hosted their inaugural 'Communicating Environmental Science' YouTube Competition.

Entrants were sought who had a flair for communication and who could explain the value of their environmental science research to a wide audience. Entrants were asked to submit a short video in which they described their research and explained how it had the potential to contribute to society. All entrants to the competition had their videos posted on the ESAI YouTube channel where they could be viewed by the public.

The competition closed at the end of May and the ESAI council chose Tracey Lydon from Trinity College Dublin as the 2014 winner. To view Tracey's excellent winning video on her research into micro-hydro energy recovery, scan the code below or visit the ESAI YouTube channel (www.youtube.com/esaiweb/).

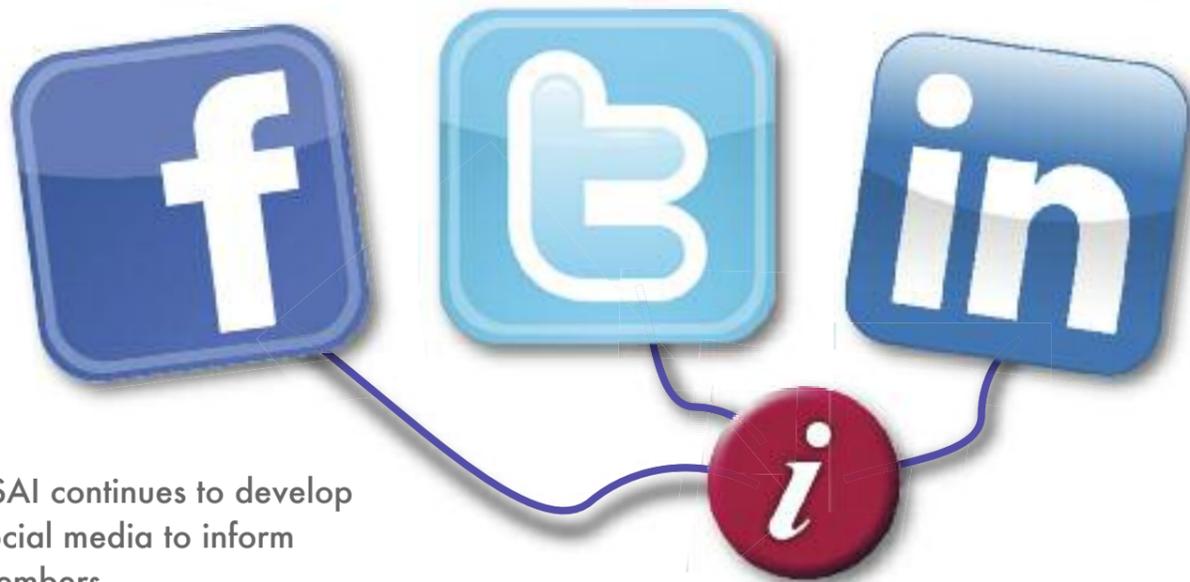
This was the first year of the competition and the ESAI hopes to build on its success next year. For details of the 2015 ESAI YouTube competition look out for updates on the ESAI website and social media channels.



Use this QR code to access the YouTube clip

Communicating With ESAI Members in 2015

Trans  forming, Educa  ting and Grow  ing



ESAI continues to develop social media to inform members

John Gallagher (ESAI Council Member)

With the dawn of social media and professional networks, the ESAI have strived in the past few years to develop a portfolio beyond the annual networking opportunities for members, such as the annual ENVIRON conference and the association's e-mail listserver and website updates. As a progressive organisation, our 'A Network for Environmental Professionals' motto means it is hugely important for us to connect and inform our members through a channel of communication that works best for them, whether they are a student, an academic or from industry.

Our current networks consist of a LinkedIn account with 2,500 connections, a Facebook page with 930 friends and a twitter page with 584 followers. In all cases, these connections extend well beyond the ESAI membership base. This allows our association to promote our activities, engage with other organisations, and increase our contacts within the wider environmental science community.

As we are growing, we are always interested in your views as ESAI members; what form of communication do you prefer, and how can we provide you with the information that matters through a medium that you are actively connected with?

If you have views, then please let us know through your preferred channel of communication.

Find us online at:
Website: www.esaiweb.org/

-  LinkedIn: www.linkedin.com/in/esaiweb
-  Facebook: www.facebook.com/ESAIweb
-  Twitter: https://twitter.com/ESAI_Environ

Examining the scope for rethinking sanitation



Are we wasting waste? Taking a fresh look at how we dispose of sewage and effluent

Féidhlim Harty
Director of F.H. Wetland Systems Ltd.
Environmental Consultancy

Despite the advances in sewage treatment in Ireland over the past decade, the welcome inclusion of reed beds and constructed wetlands in EPA and Department of Environment guidance; and the greater public attention on septic tanks and treatment system maintenance, there's still work to do.

We really need to reconsider how we view this subject. The continued failure to do so has blinded us to the fact that instead of trying to deal with sewage problems, sludge disposal, eutrophication and groundwater pollution, we could instead be exploring a whole science of resource management and nutrient cycling. If we continue to take perfectly good humic material, nutrient-rich urine, clean water, household chemicals of widely varying toxicity and blend them up before pouring them into our drinking water supplies, surely we're asking the wrong questions. Certainly the treatment methods we use to get this mix clean again have become more elaborate and effective, but fundamentally we're still falling well short of what our science can contribute to this subject.

Not entirely surprisingly, Scandinavia has been at the forefront of this emerging science. Research in Sweden into source separation of urine and faecal solids has led to new technologies on the market there; used in tandem with the familiar flush toilet infrastructure, they remove the high nutrient and high biomass element as early as possible. This leaves only grey water and relatively clean flush water to deal with before disposal.

Taking the source separation theme further, EcoSanRes in Sweden and the Global Dry Toilet Association of Finland both examine the role that compost toilets can play in conserving water, preventing pollution and avoiding the waste of potential fertiliser sources. This is a waste we currently take so much for granted that we don't even question it.

In Denmark, the Zero Discharge Willow Facility has been adopted by the EPA and local councils there as the ecological technology of choice. The same mix of urine, faecal matter, water and household chemicals occurs, but the solution isn't to try and clean it before putting it back in the groundwater. Instead it is used as a fertiliser to fuel the growth of a vigorous biomass willow crop and thus avoid any discharge at all. If the willows are chipped for use instead of heating oil, this can reduce the overall carbon footprint of a household by the same degree as a standard mechanical treatment system will increase it.

All of these technologies have been used in Ireland already. I've had clients in my business over the years who have spent considerable time, energy and resources getting planning and building these less conventional systems in their effort to reduce their environmental impact. It hasn't been easy or cheap because the technology is new to many site assessors, engineers, planners, environment officers, builders merchants and builders.

However, talk of septic tanks is in the air these years. There is an opportunity for environmental scientists to start asking different questions and seriously rethink this subject; deleting "sewage treatment" from our engineering manuals and substituting it with "integrated nutrient resource management".

Research topics are many and varied, for example:

- What is the monetary fertiliser value of Ireland's potential urine and faecal compost resource?
- What chemicals are we currently adding to our grey water that make sewage sludge reuse an agricultural contamination problem? How can we substitute these for safer alternatives?



Alternative treatment types
 Composite photograph: Feidhlim Harty

- How effectively do constructed wetlands and reed beds remove hormone-mimicking compounds, micro-plastics and other problematic contaminants from sewage before discharge?

- How does this compare with mechanical treatment systems or percolation areas in this regard?

- What are the effects of antibiotics and oral contraceptives on the safe reuse of urine in agriculture and indeed on existing discharges to groundwater and surface waters?

- What are the most effective, lowest energy-input methods of safely returning faecal compost to agriculture?

These are just some of the many questions that we need to be asking if we want to create a sustainable approach to our water use. There are also social and psychological obstacles to be thoroughly explored and examined, but perhaps that's for the social sciences to undertake.

Much has already been done here in Ireland. Constructed wetlands and reed beds are already an accepted eco-friendly, zero-energy option for secondary and tertiary

effluent treatment. Aquatron faecal separators and Dubbletten urine diverting toilets and many different dry toilet systems have been granted planning and are in use here. Several councils have initiated trials for zero discharge willow facilities or have granted them outright.

We can embrace these opportunities, broaden the scope of our research, learn from both the successes and the failures and really bring our strengths as environmental scientists and engineers into this most important of unmentionable topics.

Feidhlim Harty is the director of FH Wetland Systems Ltd environmental consultancy and the author of Septic Tank Options and Alternatives - Your Guide to Conventional, Natural and Eco-Friendly Methods and Technologies, available at www.wetlandsystems.ie

ESAI Postgraduate Researcher of the Year 2015 Competition

Dr. Martina Prendergast, NUI Galway

In its second year the ESAI Postgraduate Researcher of the Year 2015 competition for ESAI members will be launched at Environ 2015, 8th-10th April in IT Sligo.

Applications will be accepted from students doing either a PhD or a Masters degree by research in an environmental topic.

Applications forms will be downloadable from the ESAI website, at www.esaiweb.org/news/?item=22#news-22

Each application will be evaluated under three criteria:

- Scientific excellence and originality;
- Impact (economic/environmental/societal);
- Dissemination (conferences, outreach, media).

Candidates will be asked to outline research objectives, background to research, why the research is necessary and novel, environmental relevance, methods, results, accomplishments, awards, publications/patents, the potential impact of the research (economic/environmental/societal), and outline the dissemination activities related to



Richard Manton Winner
 ESAI Young Researcher of the Year 2014.
 Photograph: M. Prendergast

the project. Entries are open until July 31, 2015 and the prize for the winner is €500.

ESAI Website: www.esaiweb.org



Paper makers first meeting at the University of Glasgow. On back from left: Ian Nolan, Luca, Valentina Marconi, David Kelleghan, Jennifer Freer, Ros Burgin, Jethro Brice, Sally Evans. On Front from left: Lydia Bach, Fiona Harrington, Charli Clark, Deborah Hewson, Natasha Hill.
Photograph: Gordon Gale

Using Science to inspire art

Tom Curran, UCD/ESAI

David Kelleghan, an EPA-funded PhD student at the UCD School of Biosystems Engineering has been selected to participate in an international project called the Paper Makers project (the-paper-makers.blogspot.com) which uses science to inspire art. This collaboration aims to increase the public understanding of ecological issues, by communicating scientific content through the medium of art. It will build on the work of seven early career researchers and artists as they interpret one scientific paper, which discusses climate change and more broadly changes in biodiversity.

The idea is that seven artist/scientist pairs will create seven pieces of artwork engaging with this issue in their own ways and learning different ways of communication from one another and exploring meaning. At the same time the project would significantly benefit from the people engaging with the project and exploring what climate change means to them. The project aims to communicate the process of interpreting the paper and creating the works of art through its Facebook page www.facebook.com/thepapermakers?fref=ts, which would benefit from as many likes as possible!

The project is funded by the British Ecological Society and supported by the Natural Environment Research Council.