

IRISH GEOSCIENCE NETWORK ORGANISATION REPORTS 2020

**Meeting held
12th February 2020 at 6:30pm
In
IGI, 63 Merrion Square, Dublin 2**

Report compiled by IGI



Members of the Irish Geoscience Network (IGN)

Trinity College Dublin (TCD)
University College Dublin (UCD)
University College Cork (UCC)
National University of Ireland, Galway (NUIG)
Geological Survey Ireland (GSI)
Geological Survey of Northern Ireland (GSNI)
Irish Association of Economic Geologists (IAEG)
Geotechnical Society of Ireland
Irish Geological Association (IGA)
Institute of Geologists of Ireland (IGI)
International Association of Hydrogeologists Irish Group (IAH)
National Museum of Ireland (NMI)
Royal Irish Academy (RIA)
Irish UNESCO Global Geoparks
Geoscience Ireland (GI)
Irish Mining and Quarrying Society (IMQS)
Irish Quaternary Association (IQUA)
Geological Society – Northern Ireland Branch (GeolSocNI)
Petroleum Infrastructure Programme (PIP)
Open University Geological Society Irish Branch (OUGS)
Ulster Museum
Dublin Institute of Advanced Studies (DIAS)
Exploration and Mining Division (EMD)
Petroleum Affairs Division (PAD)
RAW MatTERS and iFOSTER
Irish Brownfield Network (IBN)
Irish Centre for Research in Applied Geosciences (iCRAG)
Irish Geomorphology Group (IGGy)
European Association of Geoscientists and Engineers (EAGE)
Irish Association of Women in Geoscience
Speleological Union of Ireland
Soil Science Society of Ireland
Mining Heritage Trust of Ireland (now disbanded)

Contributors

Institute of Geologists of Ireland (IGI)
The Open University Geological Society – Ireland Branch (OUGS)
Irish Geological Association (IGA)
Irish Association for Economic Geology (IAEG)
University College Dublin (UCD)
Geological Survey Ireland (GSI)
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Geological Survey of Northern Ireland (GSNI)
University College Cork (UCC)
Geotechnical Society of Ireland

Apologies Received re Submissions

- Dr. Dave Chew, Head of Geology, Trinity College Dublin (was appointed to group on behalf of TCD Geology Department too late to contribute)



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The Institute of Geologists of Ireland (IGI) was established in 1999 with the mission of promoting and advancing the science of geology and its professional application in all disciplines, especially the geosciences and to facilitate the exchange of information and ideas in relation thereto. IGI Members are required to uphold, develop and maintain the highest professional standards in the practise of their profession.

Professional membership of the IGI is open to all practising geoscientists who meet the required standards of qualification and experience. For information on how to apply, please visit www.igi.ie.

Events

The following events took place since the last IGN meeting in March 2019.

13th and 14th March 2019

Report Writing and Presentation Skills Course

16th April 2019

Practical Mining – One-day Course presented by LTMS: Lisheen Technical and Mining Services

3rd July 2019

Annual General Meeting of the IGI

11th October 2019

To mark the 20th Anniversary of the IGI, we hosted a major conference in Athlone, Co. Westmeath. This event celebrated the founding of the IGI with a presentation to Founding Board members and examined the role of the geoscientist in the climate emergency and in community engagement. The event also served as the platform for the launch of the IGI Strategy 2019-2024. The 2019 Medal of Honour was awarded to Dr. John Ashton. The event was followed by a ‘speed networking’ session and evening dinner.

January 21st 2020

Medal of Honour Recipient Dr. John Ashton PGeo presented: “Historical to Recent Exploration at Boliden Tara Mines, Navan, Ireland: From Soil Geochemistry to Seismics”.

The IGI was represented at the following events

Mining Ireland – 8th October 2019 – attendance by board members.

Atlantic Ireland – 30th October 2019 – exhibition stand.

Geoscience 2019 – 5th November 2019 – participation of IGI President Mairéad Glennon in panel discussion on the role of geoscientists in the climate emergency; exhibition stand.

BT Young Scientist Exhibition – January 2020 – IGI members volunteered on the GSI stand throughout the event

The IGI sponsored the following events

IGeo 2020

The following courses and seminars are planned for the coming months:

March 9th 2020

“Aggregate standards – the role of the geologist” - This one day workshop, provided by industry experts, covering the role of the geologist in assessing aggregates with special emphasis on understanding aspects related to the presence of pyrite.

IGI working group activity 2019-2020

Strategy Working Group

The Strategy Working Group which met during 2019 undertook considerable work producing the IGI's new 6-year strategy which was completed on time for launch at the 20th anniversary conference. Available at: www.igi.ie/strategy .

Environmental Impact Assessment Regulations (EIAR) Working Group

The EIAR WG has been undertaking ongoing work in relation to updating geological considerations in 2013's Environmental Impact Statements Guidelines, based on recent legislative developments.

Contaminated Land Working Group

The Contaminated Land WG is due to reconvene in 2020 following a recent call to members for volunteers.

Minerals Information Working Group

In response to recent misinformation and growing opposition to mining and mineral exploration activity in Ireland, the IGI is convening a Working Group to produce factual information and undertake dissemination activities in Ireland. Over 20 participants have volunteered and plans are underway to convene the group in Q1 2020.

Petroleum Geologists' Working Group

Following scrutiny of the role of petroleum geoscientists at the IGI's 20th anniversary conference, and recent policy and economic developments in the petroleum sector, the IGI is scoping the convening of a Petroleum Geologists' WG to support career development of petroleum geologists in Ireland.

We thank our working group volunteers and our sponsoring bodies for their continuing support: the Irish Mining and Quarrying Society, the Irish Association for Economic Geology, Geotechnical Society of Ireland and the International Association of Hydrogeologists (Irish Group).

Mairéad Glennon
IGI President

OUGS Ireland Branch Annual Report for 2019

Our year began with our annual AGM in January 2019. This was held in the Canal Court Hotel in Newry. At this all our committee members were re-elected. Then after AGM business was completed, we had our lunch in the hotel where they serve an excellent carvery lunch. In the afternoon we had some short talks by some members, we looked at members' favourite rocks, then finished the afternoon with a short quiz.

Our next event took place in the Collins Barracks Museum in Dublin in March. In the morning we were able to take part in an Amber workshop, which was very interesting. After lunch in the museum café, we visited the Museum exhibitions which had the theme of 'Jurassic Skies'.

In May we visited Belshaw's quarry & Sculpture park in Co. Antrim in the morning. This was led by Veronica Browne and John Belshaw. Here we saw the basalt of Co. Antrim sitting upon the chalk. Also, we saw a number of sculptures and art work provided by the council. This field trip was well attended as some members of the Belfast Geologists came along also.

Later in the afternoon we had a building stones visit in Lisburn co Antrim, led by Mr Ian Forsythe of the Belfast Geologists Society, we saw many different shop fronts, many of whom were marble or granite.

In September, our next event was a long weekend for our 'Father Ted' field trip to Co. Clare. We visited a number of sites mentioned in the TV programme and we also visited the cliffs of Moher and the Alwee caves. We even had afternoon tea in the house where Father Ted lived in the story. Over the weekend we stayed in the Falls Hotel close by, which was reasonably priced and included breakfast and evening dinners. Members from other OUGS branches in the UK also attended the weekend. I believe they all enjoyed the trip. This trip was organised by Susan Pyne our Treasurer. Many thanks Susan.

Our last event of the year was in November 23rd when Ian Forsythe gave us another building stones trip. This time to Newry, Co. Down. In the morning we visited the shops and buildings in the main streets including the Town Hall, we saw some lovely granites, Mourne Granite and Newry Granite and lovely marble shop fronts. Also some Sandstone in the buildings. In the afternoon we visited the museum and has a tour around the magnificent Cathedral.

Phyllis Turkington

OUGS Ireland Branch Organiser



Irish Geological Association – Founded in 1959

1959 - 2019

The Irish Geological Association (IGA) is open to all who are interested in the geology of Ireland and beyond. Our members range from absolute beginners to professional geologists. We hold lectures and workshops each year and we organise excursions to geologically diverse locations all over Ireland. There is also an almost-annual excursion abroad too. Other events include Members' nights and our AGM. The IGA awards student prizes at the annual Irish Geological Research Meeting. We are involved with the BT Young Scientists' Exhibition, G. V. du Noyer Photographic Competition, Heritage Week and Science Week events.

2019/2020 has been our 60th Anniversary Year! We have been celebrating through our 15 events. Highlights... Excursions to the Burren with Dr. Markus Pracht (GSI), Achill Island/Annagh Head with Dr. David Chew (TCD), Dundrum Town Centre with Susan Pyne (OUGS/IGA), Peter Lewis Memorial Gold panning event with Judith Mather (GSI), and a number of lectures including 3 Diamond Jubilee commemorative lectures, Rocking around the Libraries Initiative, our 'Working with Silver' Workshop with Tina Keating and a Musical Concert Celebration of Geological (and other) music by Geologists.

Current yearly rates are €30 for a family, €20 for an individual and €5 per student.



Irish Geological Association – Founded in 1959

Forthcoming Events in 2020:

February	<ul style="list-style-type: none"> Lecture Prof. Pete Coxon (TCD) 19th Day Excursion to Navan Mine, Boliden (Wait list only at this stage) 25th
March	<ul style="list-style-type: none"> Lecture by Amy Dugdale 25th Day Excursion to GSI Roscommon Core Shed, Dr. Markus Pracht (GSI) 7th IGA AGM and Presidential Address 31st
April	<ul style="list-style-type: none"> International Excursion to (our President's homeland) Belgium: Lompret Quarry, Famenne-Ardenne Geopark, Massif de Stavelot - fully booked - Leaders: "L'Escargotite" organisation, Serge Delaby, Prof. Dr. Yves Quinif. 3rd to 7th Lecture Dr. Padraig Kennan in Galway 21st Lecture Dr. Siobhan Burke 22nd Lecture Dr. Padraig Kennan in Cork 29th
May	<ul style="list-style-type: none"> Weekend Workshop on Geomicrobiology at Miner's Centre, Glendalough with Maria Cullen & Howard Fox (OPW) in Association with National Parks and Wildlife Service 23rd and 24th Lecture Petra Coffey 27th Members' Night TBC Mature Conversations on Ireland's Geological Natural Resources - our needs, our sources plus our environmental and ethical records at home and abroad TBC
June	<ul style="list-style-type: none"> Weekend Excursion to Bere Island and Allihies, Co. Cork with Dr. Bettie Higgs 5th to 7th
July	<ul style="list-style-type: none"> Day Excursion to Co. Laois – possible collaboration with the Institute of Archaeologists Ireland TBC
August	<ul style="list-style-type: none"> Heritage Week events Day Excursion to Lough Bane, White Lough, Fore area, Co. Westmeath
September	<ul style="list-style-type: none"> Goldpanning Day Excursion in memory of Peter Lewis
October	<ul style="list-style-type: none"> Lecture TBC
November	<ul style="list-style-type: none"> Lecture TBC
December	<ul style="list-style-type: none"> Lecture TBC GV du Noyer Photographic Awards Members' Night



Irish Geological Association – Founded in 1959

Please tune in to our website and social media for more details:

Website: <http://geology.ie/>

Facebook: <https://m.facebook.com/IrishGeoAssoc/>

Instagram: <https://www.instagram.com/irishgeological/>

IGA Council 2019/20

President: Michèle Castiaux
Vice President: Maria Cullen
Treasurer: Dan O'Neill
Excursions Secretary: Howard Fox
Lecture Secretary: Dr. Patrick Roycroft
PR Officer: Laura Smith-Egan
Membership Secretary: Frank Clissmann
Health & Safety Officer: Chris Clayton
Cork Rep.: Dr. Bettie Higgs
Newsletter Secretary: Tom McGoldrick
Margaret Franklin
Ed McKenna
Website Manager: Niall Reenan
Auditor: Joan Hepworth

The Irish Geological Association wishes to thank all of our leaders, speakers, workshop teachers, participants, members and sustaining members for such excellent support during our 60th Anniversary and every year!



IRISH ASSOCIATION FOR ECONOMIC GEOLOGY

The IAEG annually organises a lecture series, conference and short courses aimed at industry professionals, academia and students. Its membership is made up from geoscientists working in Ireland and internationally

2019 Programme

Event	Date	Location	Title
<i>Lecture Series</i>	7th Feb	Liffey Valley, Dublin	I got my degree and then a funny thing happened! <i>Gerry Stanley</i>
<i>Course</i>	22nd-24th February	Clonbur, Co. Galway	Applied Geophysics Weekend Course
<i>Lecture Series</i>	28th March	Ashbourne, Co. Meath	Colombian Emeralds: A product of over-pressured basinal fluids, dissolved sabkha evaporites and K-T boundary tectonics <i>Colin Andrew, Gemrock</i>
<i>Annual Conference</i>	10th-12th May	Kilkenny	Mining: Our Future
<i>Lecture Series</i>	22 nd August	Liffey Valley, Dublin	The Dynamics of Permeability Enhancement, Fluid Flow and Ore Deposition in Overpressured, Fault-Controlled Hydrothermal Systems <i>Stephen F Cox, Research School of Earth Sciences, Australian National University, Canberra.</i>
<i>Course</i>	9 th October	Dublin	Characterisation for resource development <i>hosted in association with Grinding Solutions</i>
<i>Course</i>	8 th November	Athlone, Co. Westmeath	QA/QC Course <i>provided by Dave Stewart</i>
<i>Lecture Series</i>	14 th November	Ashbourne, Co. Meath	Diagenesis, Sulfur and Giant Zn Deposits <i>Sarah Gleeson, Society of Economic Geology</i>
AGM + Lecture Series	5 th December	Ashbourne, Co. Meath	AGM + The Abbeytown Project <i>Aiden Lavelle, Erris Resources</i>
Event	Date	Location	Title
<i>Course</i>	TBA	GSI Corestore, Dublin	Student Logging Course
<i>Annual Conference</i>	14 th -16 th May	Galway	Minerals 2020: Europe's Past, Present and Future

The 2020 programme is currently being finalised with further details to be confirmed. We will continue to host our lecture series throughout the year with the first talk to be announced shortly.

IAEG also continue to develop two planned publications. *The Mineral Exploration Handbook* (last updated 1979) and an update of *Lower Carboniferous Lithostratigraphy of the Irish Midlands* in partnership with Dr Mike Philcox and iCRAG – more widely known as the Blue Book.

The IAEG major decadal conference is entitled *Minerals 2020: Europe's Past, Present & Future*. Speakers will be announced shortly and registration of interest is now available at www.iaeg.ie for the conference and two conference field trips, entitled, 'Gold Northern Ireland' and 'Base Metals Midlands'. See poster below.



The Irish Association for Economic Geology (IAEG) was founded in 1973 with the primary goal of providing a forum for geoscientists working in economic geology in Ireland.

At the turn of each decade the Association organises an international conference. The 2020 conference will be

Minerals 2020 Europe's Past, Present and Future

Venue: Salthill Hotel, Galway, Ireland

Date: 14th - 16th May 2020

Website: www.iaeg.ie/minerals2020 Contact: chairperson@minerals2020.ie



**UCD School of
Domaneolaíochtaí
Earth Sciences**

**Scoil na
UCD**

UCD Science Education and
Taighde
Research Centre (West),
(Iarthar),
University College Dublin,
Baile Átha Cliath,
Belfield, Dublin 4, Ireland
Cliath 4, Eire

Ionad Léann agus
Eolaíochta UCD
An Coláiste Ollscoile,
Belfield, Baile Átha

Email: geology@ucd.ie
Web: www.ucd.ie/earthsciences/
Twitter: @UCD_Geosciences

4th February 2020

The UCD School of Earth Sciences had a successful 2019 on a variety of fronts, publishing papers in many of the top international journals, leveraging funding for several research projects and supplementing our teaching programmes with additional elective modules. There have been a number of other important developments with the arrival or appointment of new staff, and the start of new research projects.

The Irish Centre for Research in Applied Geoscience (iCrag) has had an important year in which many research initiatives are nearing their final phase, with a substantial number of published papers on many aspects of geosciences and our first tranche of completed PhDs. iCrag held a variety of events this year including SFI's 4 year SFI iCrag review, the iCrag2019 Industry event and a variety of Technical and Industry Advisory Committee meetings. iCrag1 extends until the end of 2020 and our proposal for a further 6 years funding for iCrag2 is under consideration; we are very hopeful for a successful outcome. Last year UCD launched its UCD Ad Astra Fellowship scheme, an initiative to bring some of the best early career academics from around the world to University College Dublin. Our school performed very successfully in this scheme, with 4 early career academics recruited in fields covering the broad range of disciplines in Earth Sciences. The two Ad Astra Fellows who started in 2019, with two more starting in 2020, are: Dr Claire Harnett (formerly of University of Leeds), an expert in the numerical modelling of rock deformation (particularly in relation to volcanic systems), and Dr Aline Melo (formerly of Colorado School of Mines), a geophysicist specialising in economic geology.

Our success in raising support for our research has included several research grants for our academic and research staff. For example, Drs Koen Torremans and Lola Yesares both received SFI Industry Fellowships to perform research on the Irish Zn-Pb Orefield with two of our industry partners (Teck and Boliden, respectively). Dr Gary O'Sullivan received an Irish Research Council Post-Doctoral Fellowship for a project on geochemistry of marine beds in sedimentary basins and Dr Eoghan Holohan is a PI on a major (€3M) EU-funded INTERREG project on Atlantic Geohazard Management. Dr Vincent Roche has recently been granted a Marie Skłodowska-Curie Post-Doctoral Fellowship to work on the analysis and modelling of fault growth from structural geology and induced seismicity. Dr Steve Hollis, Dr Anthea Lacchia and Aileen Doran received travel grants to support their research work. Earth Sciences was one of only 3 UCD schools to be supported by the University College Dublin – University of Edinburgh Strategic Partnership Fund, in our case to pursue research initiatives in the field of Geohazards, including those linked to earthquakes, landslides and volcanos, climate change and mitigation (e.g. storage).



Roinn Cumarsáide, Gnómhaithe
ar son na hAeráide & Comhshaoil
Department of Communications,
Climate Action & Environment



Geological Survey
Suirbhéireacht Gheolaíochta
Ireland | Éireann

Irish Geoscience Network: Geological Survey Ireland, 2019 News Items and 2020 Plans

The Geological Survey is Ireland's Geoscience Agency and is part of the Department of Communications, Climate Action and Environment. Geological Survey's role is providing reliable and independent geological data, information and advice to a wide variety of customers/stakeholders, and providing policy advice, planning tools and project partnership, particularly in relation to Irish geoscience input into other Government Departments, Agencies, Local Authorities and EU Programmes, as well as developing Irish geoscience research capacity and increasing jobs in the geoscience sector.

Highlights from 2019 include:

- **Climate Action.** In 2019 GSI refocused its activities in the area of Climate Action, which was also the theme chosen for our 2019 Geoscience Conference in November. GSI is responsible for delivery of 3 projects under the Government Climate Action Plan; INFOMAR mapping to support offshore renewable energy development, An evaluation of natural resources in the Midlands in support of the Just Transition and development of a Geothermal Energy Roadmap to support decarbonisation of district heating. In addition GSI are a partner in the CHERISH InterREG (Ireland-Wales) project, examining coastal heritage and climate effects and in 2019 commenced a new 2 year project on Coastal change monitoring with the European Space Agency. In 2019 the **Groundwater/Turlough Flooding project**, submitted Groundwater Flood Maps, both historical extent and predictive to OPW in support of the EU Floods Directive. This was the culmination of a 3 year project also working with TCD & laterally IT Carlow. In 2020 work will be expanded to look at drought & groundwater supply issues.
- **Tellus,** The national airborne geophysical and geochemical mapping project continued its work in 2019. Airborne surveying was completed over blocks in Limerick & northern Tipperary and west Cork with industry co-funding and Southeast of Ireland for a total of 9,201 sq.km. At the Tellus Stakeholder seminar in October the Limerick/Tipp & Cork geophysical data was released, along with new geochemical data sets for topsoils, deeper topsoils, streams sediments and waters for samples collected in the west of Ireland primarily in counties Galway and Mayo along with peri-urban samples around the cities of Dublin and Galway. Progress was also made in relation to; the Terra Soil project with Teagasc who are analysing soil samples to investigate soil fertility to support farmers; Soil Reuse Facility project with EPA and The Earth Surface Research Laboratory with TCD. Airborne surveys in 2020 will focus on an area in south central Ireland, mainly Laois, Kilkenny, Tipperary and Waterford. The geochemistry programme is being restructured following external review to improve efficiency.
- **INFOMAR,** the national marine mapping programme, completed the fourth year of its Phase II programme, which will see all Irish waters mapped by 2026. In 2019 total marine mapping achieved was 11,724sq.km against a target of 8,000sq.km. Nearshore mapping was undertaken by GSI utilising four survey vessels and focussed on the Celtic Sea off Cork. Offshore mapping was undertaken by the MI vessels in the Celtic Sea mainly off Cork and Kerry, using both the Celtic Voyager and Celtic Explorer.

Shipwrecks continue to be investigated and recorded as part of INFOMAR mapping, working in conjunction with National Monuments Underwater Archaeology Unit (DoHPLG) and at year end a new joint publication on “Lustiana, the story of a wreck” was published.

- **Groundwater. GW3D mapping programme Phase I.** 1) Sand and gravel info/reports being reviewed to be published online and incorporated into existing maps (aquifer and vulnerability). 2) **Karst tracer** already online. 2019 - undertook significant karst feature mapping around Lough Carra (WFD issues plus strong community group). **Group Water Scheme (GWS): Phase I** ‘preliminary source protection zone project’ produced c. 5 ZOC reports by working with 9 hydrogeological consultancies. **GWS Phase II pilot** (source protection plans) concluding and discussions being held re national roll out. (collaborative projects with the National Federation of Group Water Schemes).
 - **2019-2021: GW3D Phase II:** groundwater resources in the **North Leinster region:** 7 of 32 catchment assessments reports started/drafted. Aim to complete 15 in 2020. These will more comprehensively support the supply of clean drinking water (guidance to likely better resources) and WFD management (understanding the catchments). **2020 GWSs:** complete the remaining ZOCs for GWSs (c.10). Continue with GWSs Phase II pilot and review in terms of being rolled out to all GWSs.
 - **Geological Mapping (Quaternary & Bedrock Geological Mapping):** Geological mapping, mainly in follow-up to Tellus surveying, was carried out across the northwest midlands, resulting in publication of a 1:50k bedrock map and data package for the North Midlands area, including Galway Geourban data, and upgraded Quaternary mapping for east Galway - Roscommon. A new viewer for the Geotechnical database was added to our online suite, making site investigation records more accessible.
 - **Corestore:** Scanning work is continuing at the National Geological Corestore (NGC) in Sandyford, where the entire holdings are currently being digitised via a high resolution RGB camera and a shortwave infrared hyperspectral camera.
 - **Geological Heritage:** County Audits: **Galway** (Phase 3) and Tipperary audit took place in 2019; **Donegal, Mayo, Galway and Tipperary** County Audits are all due to be published early this year. We supported geologists operating in the **UNESCO Global Geoparks** of Copper Coast (Waterford) and Burren/Cliffs of Moher (Clare) as well as the Joyce Country and Western Lakes (Galway-Mayo) aspiring geopark. In 2020 the County Audits of **Kerry (Phase 1), Leitrim and Galway City** are planned to start. Grants worth €10,000 each will be open for competitive application to 6 medium projects around the country to produce educational and promotional materials. GSI secured funding from the Rural Development and Regeneration Fund to develop the Joyce Country and Western Lakes geopark in Counties Galway and Mayo and this new phase commenced in January 2020.
 - **Minerals:** The Minerals programme is continuing its extensive collaborations with European partners across a wide range of raw materials projects including dimension stone, marine minerals, critical raw materials and minerals planning systems. A new Quarry Database is being developed linked to the Construction materials project and plans for improved Market Surveillance of the aggregates industry. Within the Irish
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mineral exploration space, the Minerals programme is continuing collaborating with multiple industry and academic partners to improve the data availability for exploration, including an improved National Borehole Database and commenced pilot Mineral Prospectivity Mapping in collaboration with the Tellus programme in the north-west midlands.

- **GSI Research Programme** represents and supports Irish geoscience research activities at a national level. The GSI funding programme includes GSI Postdoctoral Fellowships and small scale Short Call projects, but also co-funds with several other national and international funding agencies. In 2019 a new collaboration was established with SEAI with three new projects starting in 2020 under the geothermal energy theme. These projects will support the Geothermal Roadmap for District Heating to be delivered by GSI under the Climate Action Plan. GSI continues to grow its direct involvement in EU and other collaborative projects; current topics include; developing new data sharing platforms, groundwater resources, geothermal energy, remote sensing, marine and coastal research, environmental geoscience and mineral resources. GSI is also currently contributing to a number of national strategies including the revision of the national strategy for research and development science and technology, Innovation2020.
 - **Outreach/Communications:** We have seen continued increase in website visits, data downloads and social media followers. GSI sponsored another episode of the successful **RTE 10 Things to Know About...** this time on Metals. The programme was the second most popular in the series (after Vaccines episode), attracting 171,900 viewers and positive social media feedback. Among events supported/attended were BT Young Scientists, National Ploughing Championship, INQUA and the Geoscience2019 meeting in the Aviva Stadium. GSI also participated with EMD at PDAC in Toronto, the world's largest mining conference, including the "Ireland Day" event with Geoscience Ireland, EI and GSNI.
 - **Education:** Collaboration with JCT (Junior Cert Teachers) Geography to run a CPD day on March 2019 and a CBA (Classroom-based Assessment) workshop in January 2020 based on metals. We worked with iCRAG to develop a workshop for JCT STEAM on the sustainability in the future. The workshop will run 4 times across the country in early 2020. We are working with IQUA and GSNI on a quaternary lesson plan due for release in March 2020. 2020 will be the 175th anniversary of the establishment of a Geological Survey in Ireland. To mark this, we will have an exhibition with the National Museum of Ireland in Collins Barracks, due to open in July 2020, as one of the key events of the celebration year.
 - **National Committees:** GSI participate or support a wide range of national fora including several related to Water Framework Directive, Office of Emergency Planning (tsunami, ash and flooding) National Landscape Strategy, RIA Geographic and Geosciences Committee, Open Data Gov, Marine Coordination Group, National Standards Authority of Ireland (NSAI) and Dublin Institute of Advanced Studies board. In addition staff members participate in committees of very many of the Geoscience organisations, many of which also receive support of funding or corporate membership from GS and/or free access to theatre facilities for lectures.
 - **International:** GSI is active in a number of international Programmes and Networks. Principal among these is EuroGeoSurveys (EGS), the representative body
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of Geological Surveys, who have an office and secretariat in Brussels with several staff members engaged in Expert Groups and an active regional subgroup North Atlantic Geoscience group (NAG). Project participation includes EPOS (European Plate Observing System), EMODNET (European Marine Data and Observation Network), ERAMIN2 (Minerals Research), and numerous EU raw materials/minerals projects. GeoERA is EGS' network supporting research in the areas of GeoEnergy, Groundwater, Minerals and the Information Platform, EGS is also building the European Geoscience Data Infrastructure or EGDI which provides access to Pan-European and national geological datasets and services from the Geological Survey Organizations of Europe. GSI also represent Ireland with International Union of Geosciences (IUGS) and fund Irish research participation in the Integrated Ocean Drilling Programme (IODP).

- **Geoscience Ireland:** Further growth of this business cluster occurred in 2019, which is supported by GSI with Enterprise Ireland and Department of Foreign Affairs and Trade. (see separate report).
- **Staffing:** Geological Survey filled **three new permanent technical position** by external competition/panels in 2019; Dr Clare Glanville replaced Dr Sarah Gatley who retired as Senior Geologist and Head of the Irish Geological Heritage & Planning Programme at GSI. In addition two new permanent drillers were hired. At year end there was 104 staff, 48 of whom are permanent including 36 technical/professional.

2020 (For field operations see activity map)

Association International
des Hydrogeologues



International Association
of Hydrogeologists

Irish Group

Founded in January 1976, the International Association of Hydrogeologists (IAH) (Irish Group) aims to develop and promote the science and engineering of groundwater in Ireland. It has a membership over 180, which includes individuals from professional backgrounds ranging from academic to state agencies to private consultancies. Regular activities include an annual two-day conference, an annual weekend fieldtrip, and a series of monthly lectures and technical meetings. Funding for the association is derived from membership fees and the annual conference. Further details are given below.

Annual Conference

The 39th IAH (Irish Group) Conference was held in the Tullamore Court Hotel on April 30th and May 1st. The theme was “**Groundwater: Drought, Floods and Climate Change**” and was chosen in response to the extremely dry conditions experienced in parts of the country in 2018. The aim of the theme was to explore: 1) the severe threats posed to groundwater systems and water resources by a rapidly changing climate; and 2) the potential solutions to climate change impacts provided by groundwater initiatives and groundwater professionals. The programme consisted of nineteen invited speakers from government, academic and industrial bodies from Ireland, the UK and the USA. Eleven posters showcasing current and recent groundwater research were also presented, and a workshop on QGIS for Hydrogeologists was presented on the second day. The number attending was 185.

Annual Fieldtrip

The fieldtrip was held in Clare and Galway with the theme ‘**Karst Hydrogeology of the Burren Uplands and Gort Lowlands**’ on the weekend of 19th and 20th October, with almost 40 hydrogeologists attending. The fieldtrip contributors were: Colin Bunce, David Drew, Laurence Gill, Bruce Misstear, John Paul Moore and Patrick Morrissey.

Training Course

A course on **Pumping Tests** was held on 21st November. The course trainers were: Bruce Misstear, Department of Engineering, TCD, Henning Moe, CDM Smith, David Ball, Hydrogeologist and Taly Hunter-Williams, Geological Survey of Ireland. It was attended by 65 people.

IAH Technical Discussion Meetings

15th January 2019: Annual Joint IAH/Geotechnical Society Lecture: Karst in hydrogeology and engineering

- Launch of the book **Karst of Ireland – Landscape Hydrogeology Methods (Drew, 2018)**. Published by the Geological Survey of Ireland. Koen Verbruggen, Donal Daly and David Drew.
- **What has karst research ever done for us?** Laurence Gill (Trinity College, Dublin).
- **Road Design in Karst Landscapes: the M17/M18** Deirdre O'Hara (Barry Transportation), Esther Madden (Arup) and Les Brown (Arup).

5th February 2019: The David Burdon Memorial Lecture

- **The Trials and Tribulations of Developing Groundwater Supplies in the Humanitarian Sector**, Geraint Burrows, [Groundwater Relief](#).

5th March 2019: Modelling Karst Environments

- **Field evidence in a pipe network model of Irish karst hydrology**, Philip Schuler, TCD.
- **Uncovering karst groundwater: 3D hydrogeological modelling of an Irish karst system**, Lea Duran, TCD.

1st October 2019: Blood Thirsty Ticks and Ravenous Green Aliens: Protection from tick borne diseases in the field & an introduction to riparian invasive plant species, John Sherry, TOBIN Consulting Engineers.

12th November 2019: The Hydrogeology of Irish Holy Wells, Bruce Misstear, Trinity College Dublin.

3rd December 2019: Field evidence in a pipe network model of Irish karst hydrology, Philip Schuler, Trinity College Dublin.

Outreach

Irish Groundwater Newsletter: one issue was published in 2019. This is a joint GSI and IAH (Irish Group) publication, which is available at this link: <https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/activities/Pages/Groundwater-Newsletter.aspx>.

The **IAH website** (<https://www.iah-ireland.org/>) contains relevant publications, conference proceedings and fieldtrip guides.

A **bursary** was awarded to a postgraduate student to part support attendance at a compositional data analyses course at the University of Girona.



National Museum of Ireland – Natural History

Planning work is getting into detailed phasing for major renovation work to the roof of the Natural History Museum, which will commence once all investigations, plans and preparation by the Office of Public Works are in place. This will require removal of all exhibits, including the suspended whale skeletons. Capital funding from the Department is in place to complete a major project to renovate the building, resolving many problems, including access. This work will be the focus of Natural History Division for the next few years with public closure required and the opportunity to conserve many exhibits and plan a new exhibition. The intention is to make it more informative and rewarding yet retaining the much loved ambience.

The more short-term priority is the delivery of a significant exhibition in the summer to celebrate the 175th anniversary of Geological Survey Ireland. This partnership project between the NMI and GSI has been in planning for a while, with a design team just appointed to assist the curators. A programme of events building on the exhibition will follow the opening of '*Exploring the Earth*' in the Riding School at Collins Barracks. This will run from the summer for a year. The intention is to demonstrate the dynamic and diverse activities of the GSI today, rather than focusing on its history, and to show its critical importance to society across the programmes. The exhibition will also showcase some of the hidden geological collections of the NMI, all with a view to demonstrating the need for a modern Earth Science Museum on the Collins Barracks site



Geoscience Ireland is the business cluster supporting 40 Irish companies winning business in overseas markets. In 2019, the GI Member Companies created 192 net new jobs and in 2018 generated €1.025BN in turnover (36% from overseas activities).

In 2019, GI welcomed CDM Smith, Aurum Exploration, TQS Integration and CDE Global as Members.

In collaboration with the IMQS, GI delivered the Mining Ireland conference which was attended by 100 delegates and opened by Minister Sean Canney TD; the conference followed the design of Ireland Day at PDAC, Toronto, and provided updates from mining and minex companies operating in Ireland as well as presentations from consultants and contractors.

GI and its Members participated at a number of international conferences and exhibitions over the last year:

Q3 2019; the Mining Show, Dubai; Enterprise Ireland Trade Mission to Kenya and Ethiopia; 'Supporting Partner' at the European Mining Convention, Dublin.

Q1 2020; PDAC, Toronto; Mining INDABA, Cape Town; AME RoundUp, Vancouver; at both AME and PDAC, GI operated a booth/ pavilion in collaboration with iCRAG.

Two major initiatives progressed by GI include the Geo Driller Apprenticeship in collaboration with IT Carlow and the private sector which commenced in January, 2020: 16 apprentices in total. GI is a cluster partner on the COSME-funded 'Geo Energy Europe' project which was closed-off in Q1 2020.

Andrew Gaynor | Geoscience Ireland



Irish Quaternary Association Update 2019/20

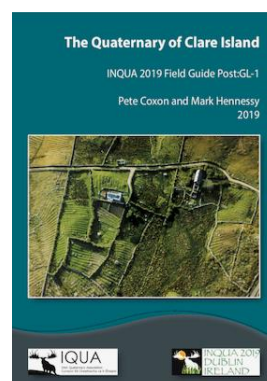
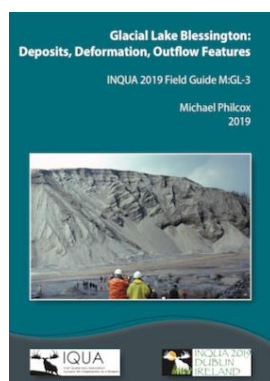
INQUA 2019

The Irish Quaternary Association delivered on its 5-year plan to host the 2019 International Quaternary Congress (INQUA) at the Convention Centre, Dublin. This was the largest ever INQUA congress (since formation in 1928) with 2,305 (56% male, 44% female) delegates from 75 countries. In the final count there were 139 sessions convened including 1,185 oral presentations and 1,476 posters who benefited from flawless timetabling and organisation. This level of success for the Congress could not have been achieved without expert guidance from Prof. Pete Coxon (Trinity College) and Prof. Keith Bennett (St. Andrews), our professional conference organisers Keynote Ltd and an enthusiastic and active Irish Quaternary community. The conference was additionally enabled through support from all our sponsors (including the GSI and the GSNI) and many years work by members of the Local Organising Committee, individuals who volunteered at the Congress and the staff of the Convention Centre Dublin.

There was an extremely good take-up for the conference fieldtrip programme which ran in tandem with the Congress meeting. 585 delegates (or 25% of the conference attendees) attended 22 pre-, mid- and post Congress fieldtrips to all corners of the island of Ireland and several locations in Britain with support from the QRA.



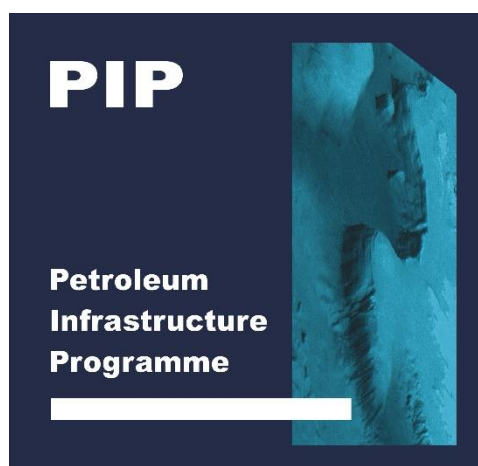
Members of INQUA Local
Organising Committee



Examples of INQUA fieldguides

IQUA 2020 Events

The core 2020 IQUA programme commences with the Spring Meeting and AGM at Queens University Belfast on March 28th. An IQUA fieldmeeting to Co. Sligo is being planned and will be lead by Dr. Susann Stolz in September/October 2020. This will be followed by the IQUA Symposium at the Geological Survey in November (date and symposium topic to be confirmed).



The Petroleum Infrastructure Programme

The Petroleum Infrastructure Programme activities in the last year:

The programme provided €1.5m in research funding in 2019 across the geoscience departments in all Irish universities. The programme continues to be the largest industry cash and data contributor to iCRAG. The programme initiated a geoscience graduate placement programme in 2019.

Proposed upcoming activities

Given the recent government announcements concerning Irish oil exploration the programme has initiated a strategy review and will announce its proposed upcoming activities shortly. It will include continued funding of iCRAG projects.



**Roinn Cumarsáide, Gníomhaithe
ar son na hAeráide & Comhshaoil**
Department of Communications,
Climate Action & Environment



**Exploration
& Mining
Division** Minerals
Ireland

Exploration and Mining Division – 2019

The Exploration and Mining Division (EMD), Department of Communications, Climate Action and Environment is responsible for the regulation and permitting of exploration and extraction of scheduled minerals under Minerals Development Act 1940-1999.

Mineral Exploration in Ireland

At the end of 2019, there were 541 Prospecting Licences held by 47 mineral exploration companies. As in previous years, zinc and lead are the main commodities being explored for in Ireland, along with other commodities such as gold, silver, copper, lithium, antimony, barite, PGEs, molybdenum, tungsten, tin, REE, gem minerals, calcite, fluorite and gypsum.

EMD continued its policy of publicly releasing mineral exploration data that is six years old or associated with surrendered licences. This data is made available free of charge.

In 2019, 238 exploration reports were publically released through EMD's OPALS database.

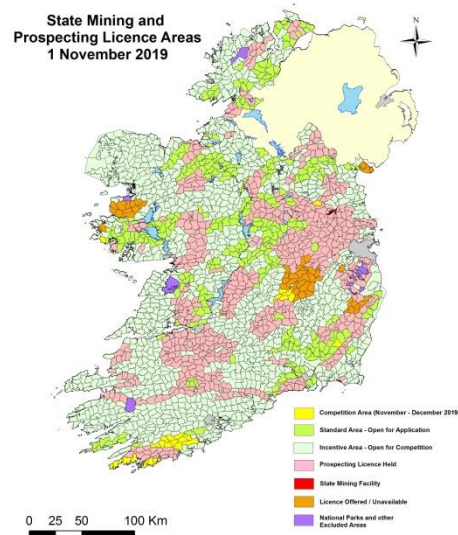
Exploration Data Depository (EDD)

As computer power and web accessible data has evolved

the desire for “Big Data” by organisations has greatly increased. EMD have for many years understood the mineral industry's

need for data by providing free digital open source exploration reports and raw data since 2000. EDD, our Exploration Data Depository, is the next step in the process. Currently the free open source data is available through our website www.mineralsireland.ie/OnlineServices as company reports, pdfs, xls or text files. We are evolving this so that the raw data will be available through a free online viewer from which individuals, companies or organisations can download their required data.

New data reporting templates for exploration activities have been developed. The purpose of the templates is to allow exploration companies to feed their information into us in a structured format. The structured format will result in more consistent data reporting across the different companies resulting in better quality data to the end user. It will in time be obligatory to submit data to EMD in this format. The next phase of the project is for us to build the loading page and web viewer.



Mining in Ireland

In 2018, there were 16 State Mining Leases / Licences for lead, zinc, gypsum, marble and fireclay. Two underground mines were in operation during the year, Boliden Tara Mines Ltd.'s Navan lead-zinc mine in Co. Meath and Gyproc's gypsum operations in Co. Monaghan.

According to data published by the International Lead and Zinc Study Group, Ireland had an estimated mine production of 123kt of zinc and 17kt of lead. Final figures will be produced in the coming weeks. For this period, Ireland ranked 3rd and 7th in Europe and 18th and 25th in the world for zinc and lead mine production respectively.

AECOM report

In 2012 and 2015 respectively Galmoy Mines and Lisheen Mines ceased operation, closed and have been rehabilitated. These mines were the first in Ireland to be opened, operated and closed under modern planning and environmental regulation. In fact Galmoy Mine was the first mine in Europe to close under an IPC licence and CRAMP, which was put in place in advance of the opening. EMD have commissioned the consultancy firm AECOM to produce a fair, independent and reasoned study of the social, environmental and economic impact the mines had on the local communities and environment. This report will be available in the first quarter 2020

The outcome of the study will be used to further advance the regulation and enforcement of the mining industry in Ireland by the Department and will be made publically available.

Environmental Impact Assessment (EIA) Directive – Mineral Exploration Drilling Update

The amending legislation in relation to EIA has been enacted which allows for the MCCAIE to screen mineral exploration drilling.

Three S.I.s will remain in place until the full transposition of the EIA by Department is completed. The full transposition will be by way of amendments to the 2017 Minerals Development Act.

Currently EMD assess relevant exclusion criteria to determine whether particular drilling proposals require screening for EIA. These criteria are based on drilling project area; distance to environmentally sensitive sites, such as SACs, SPAs, NHAs, pNHAs and National Parks; distance from domestic and public water supply wells; equipment capable of waste spillage or process run-off; and noise levels.

Licensees are now required to submit EIA Criteria Assessment Tables with relevant supporting documentation to EMD for all drilling applications. If a drilling application does not meet all of these criteria, then the drilling application will be referred to EIA screening on a case by case basis.

Prospectors and Developers Association of Canada (PDAC) Convention

In March 2020, EMD will attend the Prospectors and Developers Association of Canada (PDAC) Convention in Toronto, Canada. EMD has attended PDAC since 1989 providing information in relation to Ireland's diverse mineral potential, strong policy, and environmental awareness.



**Roinn Cumarsáide, Gníomhaithe
ar son na hAeráide & Comhshaoil**
Department of Communications,
Climate Action & Environment

Summary for Irish Geoscience Network annual meeting 2020

Exploration Update Offshore Ireland (to end 2019)

Clare Morgan

clare.morgan@dccae.gov.ie

Department of Communications, Climate Action and Environment, Petroleum Affairs Division, Head of Technical Section

Exploration Update 2019:

The designated offshore area for Ireland and our immediate neighbours, and location of licences and leases (Fig.1), illustrates the end of year 2019 status with strong industry interest particularly in the Porcupine Basin. Each Exploration Licence, as required, is accompanied with an appropriate technical work programme. In late 2019, in the Atlantic Margin, of the 28 licences awarded in 2016 (as a result of the last Licensing Round that closed in September 2015), 17 have converted (Azeire, CNOOC x5, Eni, Equinor x4, Europa x2, ExxonMobil x2, Total and Woodside), 5 applications are under consideration and 6 have surrendered. In recent months, Serica has surrendered their 3 licences along the Atlantic Margin and Providence Resources has surrendered FEL6/14 in the Goban Spur Basin. In open acreage, the Celtic Sea area continues to attract players. There are currently some 30 companies involved, as operator or joint venture partners, in exploration and production offshore Ireland.

A large number of seismic surveys were acquired in our offshore basins in recent years. From 2015 to 2017 ten significant seismic surveys were acquired, located in the Celtic Sea and Porcupine Basins (totalling 10,500km of 2D data; 20,500 sqkm of 3D data). In 2018 and 2019, seismic surveying as expected, given the life cycle of the licences issued as a result of the 2015 Licensing Round, was substantially reduced. Approximately 120km of new 2D seismic data were acquired as part of a site survey in the Goban Spur area in 2018. No 2D seismic surveys were acquired in 2019. No 3D seismic surveys were acquired in 2018 and 2019.

One well was drilled offshore Ireland in 2019. Exploration well 'Iolar' 53/4-1 was drilled in Frontier Exploration Licence 3/18 in the Porcupine Basin by CNOOC Petroleum Europe Limited and partners ExxonMobil Exploration & Production Ireland (Offshore South) Limited. The operator reported that the well was abandoned with dry hole status. The distribution of exploration wells in our offshore basins and neighbouring jurisdictions (Fig. 1) highlights the vastly under-explored frontier basins offshore Ireland. In 2019, the Department granted site survey approval for the Barryroe discovery in the Celtic Sea and data (analogue and environmental) were acquired in September.

Any applications for petroleum operations offshore are assessed in accordance with the Environmental Impact Assessment (EIA) Directive, the Habitats Directive and the Birds Directive. In 2019, changes were implemented in the statutory consent process for activities under licence – A new independent unit within the Department, the Environment Advisory Unit (EAU) was established to comply with provision of the EIA Directive and a new public consultation process was introduced on receipt of applications for all activities. The assessment of the financial

capacity for companies to deliver approved work programmes was a new measure taken in 2018/2019 and guidelines were published.

Production continued offshore during 2019 from the Corrib gas field in the Slyne Basin (supplying about 60% of Ireland's gas demand) and from the Kinsale field complex, the latter with declining gas production. On 30 November 2018, the Minister approved the sale of Shell's stake (45%) in the Corrib field to Nephin Energy. Nephin is a wholly owned indirect subsidiary of the Canada Pension Plan Investment Board (CPPIB). Vermilion and CPPIB formed a strategic partnership whereby Vermilion would assume operatorship of the Corrib natural gas project. During 2019, consent was granted for the first phase of the decommissioning of the Kinsale gas fields. The Department is in receipt of an application for the second phase of decommissioning.

PAD's ongoing communications and outreach strategy to inform the general public, companies, contractors, governments and researchers about E&P offshore Ireland and to highlight the petroleum sector continued in the past 12 months, including PAD hosting booths at BTYS, IGRM and Seafest on a national level. The programme is supported by follow-up Dataroom appointments. Another initiative that PAD was directly involved with in 2019 included proposing, designing and implementing the launch of the GeoScience Graduate Placement Programme in order to build capacity in the sector.

In related news, the Irish State Sovereign Fund divested from fossil fuel projects in 2019. The Private Members Petroleum and other Minerals Development (Amendment) Climate Emergency Measures Bill 2018 continued to be debated during the year in the Dáil and hearings were held by the Joint Oireachtas Committee on Communications, Climate Action and the Environment. In July 2019 the Government decision not to provide a money message for the Bill, in effect halted its progress. The all Government Climate Action Plan of policies with actions across all sectors was published in June 2019.

Update on Recent Policy Developments

Following publication of the Climate Action Plan in June 2019, Government sought advice from the Climate Change Advisory Council on the future of oil and gas exploration offshore.

- The Council, noting that the Government's Climate Action Plan envisages a major shift away from oil combustion within heat and transport sectors towards renewables in the coming decade, advised that the exploration for, and recovery of new offshore oil reserves, is not compatible with a low carbon transition.*

Government accepted this advice with the Taoiseach announcing on 23 September 2019 that future exploration licenses would be awarded for natural gas only. On foot of this, three policy principles were approved by Government in October 2019:

- 1. All future licensing rounds in the currently Closed Area offshore (Atlantic Margin - 80%) will be for natural gas only and not oil.*
- 2. All new licence applications in the currently Open Areas (Celtic Sea and Irish Sea - 20% of total offshore area) will be for natural gas only and not oil, applicable from 23 September 2019.*
- 3. All applications and authorisations in place before the 23 September 2019 was made will not be affected by the decision and can continue towards exploration and production for both oil and/or gas as per their existing terms.*

These principles were further elaborated in a Policy Statement published on 17 December 2019 which clearly sets out the continued role for indigenous natural gas in underpinning Ireland's energy security as part of the transition to a low carbon economy. It includes:

- *The future development management framework for the exploration and production of natural gas, as a transition fuel, in Ireland's offshore; and,*
- *The energy security rationale for natural gas, including:*
 - *The need for back-up capacity for renewable power generation via lower CO2 emitting fossil fuels (natural gas);*
 - *The impact of the reduction of peat, coal and oil use on gas demand;*
 - *Our increasing reliance on imports given the decline of current indigenous supplies, also mirrored by a growing reliance at EU-level on imports (74% from outside the EU and growing).*

PAD is the custodian of the National Data Repository and Archive for the petroleum sector. 2019 saw continuation of the huge effort by PAD to digitally capture legacy technical data to facilitate ease of data access, to progress work programme time lines and to aid in disaster recovery.

Research projects, through PIP, iCRAG and NAPSA, aimed at deepening knowledge of the hydrocarbon potential of Ireland's offshore basins, were progressed in 2019. A number of very relevant studies are being scoped/on-going or completed. For example, a reprocessing project of the Department's/Eni 2D Regional Seismic Survey acquired in 2013 and 2014 has commenced and is progressing well. The milestone Bio/Litho/Stratigraphic study progressed substantially this year to provide a new, formal updated stratigraphic framework and nomenclature for all Irish offshore basins.. Results from the offshore ObSERVE baseline aerial and acoustic data acquisition programme were launched in the past year with data made publically available to a wide range of stakeholders. The ObSERVE project was the winner in the national Civil Service Excellence & Innovation Awards 2019 under the Research, Analytics & Insight category. The ObSERVE findings are being integrated into the regulatory process.

In summary, 2019 has been a challenging year for the petroleum sector offshore Ireland. However, PAD continues to embrace change, to enable research programmes, to progress the digital capture of data, to facilitate streamlined regulatory processes and to continue to collaborate with other regulatory bodies, with industry and with academia through a view to ensuring effective exploration in our offshore basins. The Irish Government has acknowledged and has stated publically the important role that natural gas will still have to play in Ireland's energy mix and low carbon transition over the coming years.

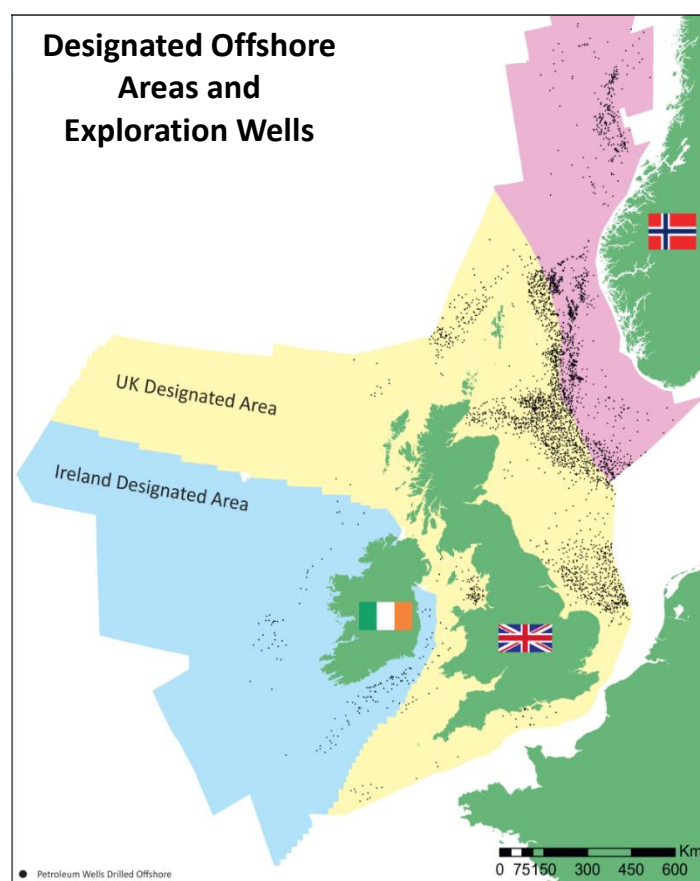
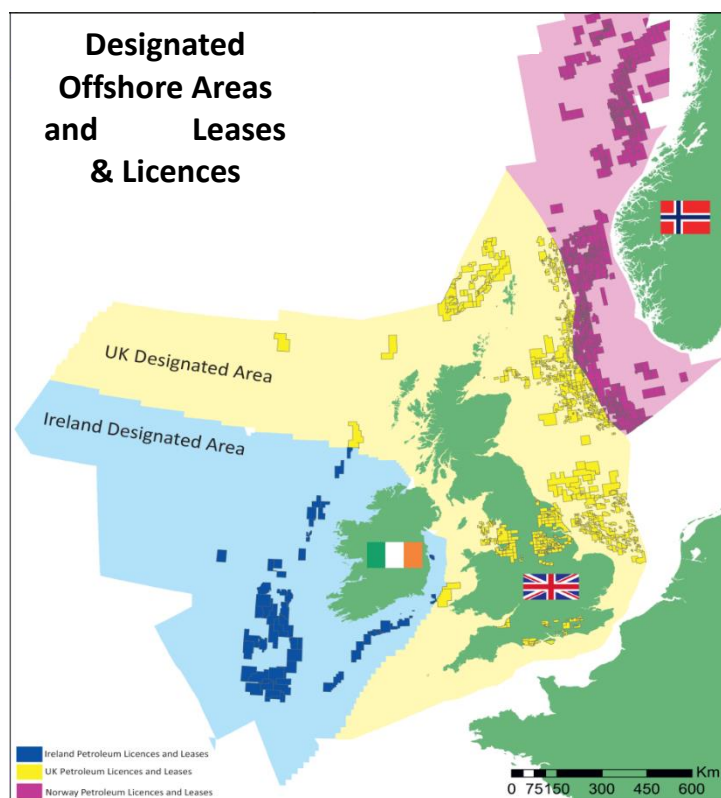


Fig. 1 Distribution of licences and exploration wells offshore Ireland, UK and Norway



iCRAG IGN 2020 submission

iCRAG, the SFI Centre for Research in Applied Geosciences, conducts multidisciplinary earth system science research that transcends industry and academia boundaries in the fields of earth system change, energy security, raw materials supply, groundwater protection, safeguarding the geomarine environment, and protection from the Earth's hazards. Funded by Science Foundation Ireland and co-funded by the European Regional Development Fund, Geological Survey Ireland and by industry partners, iCRAG's research findings deal with matters of urgent societal concern, such as climate change and the resources required to address the climate change issue. The Centre is hosted by UCD, with research partners in TCD, DIAS, NUIG, UCC, NUIM, DCU, and Teagasc. iCRAG's state policy partners include GSI, EMD, PAD, EPA and DCCAE.

Understanding the Earth system is an essential component in addressing the climate challenge. iCRAG's research findings on how and why the Earth system changes through time, the distribution and characteristics of Earth resources needed for clean energy technologies, and the interactions between people and the Earth system all support evidence-based policy options and decision making. Our research is helping to address climate-associated mitigation and adaptation actions across both European and global communities and will aid in Ireland's contribution to the UN Sustainable Development Goals. To coincide with the launch of the national Climate Action Plan, iCRAG published a response outlining where iCRAG research can play a leading role in the achievement of the plan's ambitious targets. Research developments in the last 12 months include breakthroughs in both sediment mapping and provenance research which have benefited significantly from the installation and technical enhancements to the LA-Q-ICP-MS and SEM facilities in the iCRAG Labs@TCD. Further developments of our mass-spectrometry facilities and collaborations on clumped isotope studies have provided a much-improved basis for sourcing, dating and vectoring of mineral deposits. Our geochemical facilities in TCD and UCD have supported the emergence of iCRAG as a leading presence in sandstone provenance research, a field which has implications both for reconstructing past climates and for the sourcing and quality of reservoir sands for natural gas. In addition to our existing work on cobalt, copper, lithium, lead, and copper deposits, our raw materials research has developed new, multi-disciplinary approaches to the characterisation of aggregate sources, including chemical and mineralogical fingerprinting of pyrite-bearing and mica-bearing quarry products, and the mechanical and petrographic characterisation of high PSV aggregates for road surfaces.

The human element of the geosciences was to the forefront of our research during 2019, centred around the need for a wider discussion on how we will resource present and future generations in a sustainable way. The ReSToRE international Summer School, led by iCRAG under the patronage of UNESCO, brought together over 40 participants from both developed and developing countries to address key issues at the nexus of social science and Earth sciences such as: how do we as individuals value the discovery, extraction, use, and disposal of Earth resources; what are the implications of the uneven geographical distribution of Earth resources on local, regional, and national communities.

Individual researcher highlights include the awarding of MSCA Individual Fellowships to Dr. Audrey Morley (NUIG) on informed constraints on the magnitude of future climate change and Dr. Weimu Xu (TCD) exploring carbon sequestration through basalt weathering. Dr Chris Mark of UCD was awarded an SFI Starting Investigator Research Grant on constraining rates and dates of geological processes by novel U-Pb analysis.

Looking to 2020, iCRAG will continue to build on its research efforts, industry collaborations and public engagement, and to play its role in delivering resources for a sustainable society and aiding the Irish economy.

Murray Hitzman, Director



IRISH GEOMORPHOLOGY GROUP

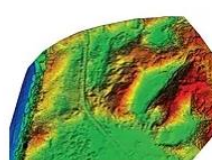
31 January 2020

Re: IGGY Activities 2018-2019 for 2020 IGN meeting 12 February 2020

From: Irish Geomorphology Group

To: Institute of Geologists of Ireland

*"Advancing scientific knowledge of the
geomorphological **processes** and **landforms** that
shape the **Irish landscape** in order to conserve our
natural heritage and protect our **communities**"*



The Irish Geomorphology Group was formed in 2013 and is composed of (1) scientific researchers and academics in Ireland, and (2) members working in environment related Industry and management agencies who focus on Irish landscape systems: oceans, coasts, rivers, catchments, peatlands, slopes and lakes. The group is particularly focussed on investigating the impact of climate change and human activities on the Irish landscape.

Read more at: <https://irishgeomorphology.wixsite.com/home>

Find us on Twitter: @IGGyGroup

Highlights 2018 – 2019

1. Special Issue of Irish Geography “The vulnerability of Irish landscape systems to climate change and human activity”

This special issue of 14 manuscripts has a strong international component with authorship from 32 authors located in 13 different research institutes in Ireland, the UK, Spain, Portugal, and South Africa. The special issue was completed for three reasons:

- highlight the breadth and depth of geomorphology research being conducted on the Irish landscape;
- build awareness within the scientific community of the quality and types of interdisciplinary geomorphology research in Ireland;
- to create a forum to capture and connect valuable field datasets that are critical to benchmark how Irish geomorphic systems are evolving today in order to understand how they might respond in the future with projected climate changes.

The research techniques and methods reported in this special issue included geomorphic processes (field observations and assessment), mapping (GIS; Earth Observation satellite imagery; ground penetrating radar; electrical resistivity tomography; biodiversity and habitats; UAVs; Structure-from-Motion photogrammetry), paleo-environmental reconstruction (sedimentology; dating; stratigraphy), and modelling (climate; landscape evolution; catchment dynamics; storminess).

Volume 51, No 2: Special Issue Part A is now available (Part B to be released early 2020):

<http://www.irishgeography.ie/index.php/irishgeography/issue/archive>

The opening manuscript (Farrell and Bourke, 2018) presents an overview of IGGY and presents a series of recommendations to promote the visibility of geomorphology research and teaching and identify opportunities where geomorphologists can contribute to national plans on broad landscape planning and building climate resilience.

Farrell, E. and Bourke, M. (2018) ‘The future geomorphic landscape in Ireland’. Irish Geography, 51(2), 141–154, DOI: 10.2014/igj.v51i2.1368

2. Sixth Annual Scientific Workshop

The annual scientific workshop was held in the School of Geography, Ulster University, Coleraine on 6 – 7 December 2018.

Day 1. Early Career Workshop

- Research Impact: an introduction
- Publishing and reviewing in international scientific journals
- Postdoctoral research proposals: insights from applicant and reviewer
- Researcher Development in the 21st Century
- Questions and networking

Day 2. Oral and poster presentations

- 12 oral talk; 7 posters



Keynote: AN EARLY WARNING AND DECISION SUPPORT SYSTEM FOR STORM IMPACTS IN COASTAL ZONES. Oscar Ferreira, University of Algarve, Portugal

- THE EFFECT OF IMPACT-GENERATED HETEROGENEITIES AND DISCONTINUITIES ON THE SUBSEQUENT WEATHERING OF IMPACTITES. Ankit Verma et al., Trinity College Dublin
- COLD CLIMATE BEACHROCK. Andrew Cooper, Ulster University
- SHOREFACE DYNAMICS IN IRELAND AND FRANCE. Klervi Hamon-Kerivel et al., Ulster University
- THE FUTURE OF COASTAL LANDSCAPES: PERCEPTIONS AND LANDSCAPE-BASED CONFLICTS IN IRELAND. Maria Pafi et al., Queen's University Belfast
- Launch of the Special Issue of Irish Geography: THE VULNERABILITY OF IRISH LANDSCAPE SYSTEMS TO CLIMATE CHANGE AND HUMAN ACTIVITY. Eugene Farrell, NUI Galway
- A COMPREHENSIVE ROADMAP TO 50 YEARS OF (SATELLITE) EARTH OBSERVATION RESOURCES FOR THE ISLAND OF IRELAND (1972 – 2023). Daithí Maguire, National University of Ireland Galway
- THE ROLE OF DISCONTINUITIES IN MEDIATING THE SPATIAL DISTRIBUTION OF COASTAL CLIFF EROSION. Niamh Cullen and Mary Bourke, Trinity College Dublin
- AN INVESTIGATION INTO THE ACCURACY OF DIGITAL ELEVATION MODELS FROM UNMANNED AERIAL VEHICLES WITHIN COASTAL ENVIRONMENTS. Eugene Farrell and Harriet Dundon, National University of Ireland Galway
- SLOWWATERS: A STRATEGIC LOOK AT NATURAL WATER RETENTION MEASURES. Mary Bourke et al., Trinity College Dublin
- LAND USE IN IRISH PEATLANDS. John Connolly Dublin City University
- THE ESTABLISHMENT OF REGIONAL CLIMATE ACTION OFFICES AND THE DEVELOPMENT OF LOCAL CLIMATE ADAPTATION PLANS. Maria O Connell, Climate Action Regional Office

Poster presentations

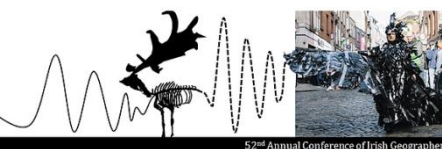
- Cristiana Giglio et al., Ulster University. The southern sectors of the British Irish Ice Sheet and the Newfoundland Ice Sheet: a comparative study of the retreat of marine-terminating ice sheets across the Northern Atlantic.
- Mary Bourke et al., Trinity College Dublin. High resolution DTM and roughness estimates for Irish coastal platforms derived from UAV platforms.
- Eugene Farrell & Niamh Connolly NUI Galway. Historic and contemporary dune inventories to assess dune vulnerability to climate change impacts.
- Ben McAteer. Queen's University Belfast. An exploration of the transformative potential of citizen science in marine environments: Power/knowledge and critical consciousness.
- Mary Bourke et al., Trinity College Dublin. Future Proofing for River Floods: The potential for establishing Natural Water Retention in Irish catchments.
- Mary Bourke et al., Trinity College Dublin. Forests for Floods: Natural Water Retention Mechanisms.
- Ciara Fleming et al., University College Dublin. Optically stimulated luminescence dating of lowland floodplain sediments in Ireland.

Please join us at the **Seventh Scientific Workshop** to be held in Trinity College Dublin concurrent with the 52nd Conference for Irish Geographers. **May 21 -23, 2020**

CIG 2020

May 21st – 23rd

Geographies of Responsibility: Rethinking
Boundaries and Borders in a Turbulent World
Trinity College Dublin



52nd Annual Conference of Irish Geographers



Speleological Union of Ireland (SUI)

Most IGN members might not be aware of the Speleological Union of Ireland – the representative body for cavers in Ireland, covering both sporting and scientific activities, including cave diving. Many members are also involved in the Irish Cave Rescue Organisation (ICRO). Conservation of caves and access to cave entrances are important issues, and a small grant from GSI has supported activities including a new Code of Practice for caves and cave entrances. Many members are karst geology specialists and undertake research like dye tracing of underground water. A body of knowledge exists that is not always transparent to mainstream geological research. A caving library is hosted by the National Museum of Ireland in Beggars Bush and Matthew Parkes, the SUI Librarian will assist with enquiries wherever possible. The SUI also supports foreign expedition caving through a grant scheme.

Soil Science Society of Ireland

Activity Summary 2019 *Upcoming Activities 2020*



The Soil Science Society of Ireland organise scientific and public awareness events concerning all aspects of Soil Science. These typically involve scientific conferences/symposia, field days and public awareness events.

For example, recent activities have included:

- Soils for Society Conference, UCD, 5 Dec 2018. In conjunction with the UCD School of Agriculture and Food Science and the UCD Earth Institute, this one-day conference, marking World Soil Day, was aimed at professionals, scientists, students, policy makers and citizens concerned with soils and their use and protection. It featured presentations from a range of soil scientists and others, including Dr. Jessica Davies, Lancaster University on “The business case for soils” and Dr. John Ryan, recent recipient of the Justus von Liebig Award from the International Union of Soil Scientists for his work at the International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria.
- SOILFEST 2019. 5 Dec 2019, Mart Gallery, Rathmines, Dublin. The inaugural SOILFEST, this was a really successful public awareness event to mark World Soil Day, 5 Dec. The line-up included soil scientists and artists talking about soils from different viewpoints and using different media and materials. Giulia Canevari and Cathy Reddy exhibited their art and talked about their connections to soil and Dr. Fanuel Laekemariam, Wolaita Sodo University, Ethiopia, talked about Soil Erosion and effects of Soil Conservation practices in Ethiopia. The event was well attended by a diverse crowd and there was plenty of time and space for lively discussion. It was a real success and everyone came away enthused for soils! We hope to make this an annual event on World Soil Day to help raise public awareness of the importance of soils and soil science.
- SSSI website launch. Launched at SOILFEST 2019, a new and improved SSSI website is now active as a focal point online for all of our activities and communications:
<http://www.ucd.ie/sssi/>

Upcoming activities we hope to organise include:

- Scientific field meeting, 2020, TBC.
 - Public awareness event to mark World Soil Day, 5 Dec 2020, TBC.
 - 3rd Global Soil Biodiversity Conference, Dublin, 2021.
 - World Congress of Soil Science, Glasgow 2022. In support of our colleagues in the British Society of Soil Science, we hope to organise a pre-congress tour in Ireland.
-



Soil Science Society of Ireland presents

SOIL FEST 2019

To celebrate World Soil Day 2019, the Soil Science Society of Ireland will be hosting Ireland's inaugural soil festival. It will explore soil in our societies, culture and exhibit art and science it has inspired.

05.12.2019 | 3 - 8 PM
MART Gallery, Rathmines, Dublin



Register at <https://www.eventbrite.ie/e/soil-fest-2019-tickets-81966226189>




STOP SOIL EROSION SAVE OUR FUTURE

World Soil Day

5 DECEMBER 2019


World Soil Day
Field Meetings
Membership

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Soil Science Society of Ireland
Cumann Eolaíocht Ithreach na hÉireann

Home
Events

The Soil Science Society of Ireland is an all-Ireland body for professionals working in the discipline of soil science. The society actively promotes research, knowledge transfer and sustainable management of Irish soils through scientific meetings, fieldtrips and discussion forums.




World Soil Day Events
Ireland presents

SOIL FEST 2019


5th of December is World Soil Day each year

Field Meetings



SSSI holds a field meeting in the spring.

Membership



Join the Soil Science Society of Ireland


UCD School of Agriculture and Food Science
UCD Earth Institute

Soil Science Society of Ireland

SOILS FOR SOCIETY

A CONFERENCE TO MARK WORLD SOIL DAY

What Functions Do Soils Have?
Why Are Soils Important for Society?
How Do We Manage Soils Sustainably?
How Can Society Protect Soils?


A one-day conference on the use, management and protection of soils. Aimed towards professionals, scientists, students, policy makers and citizens concerned with soils and their use and protection.

Wednesday 5th December 2018
09:00 – 16:00
Clinton Auditorium,
University College Dublin,
Belfield
ADMISSION FREE

BOOK ONLINE NOW

Register your place by
30th November 2018

For more information visit
www.ucd.ie/agfood





Mining Heritage Trust of Ireland

It is with some sadness that we report the end of the Mining Heritage Trust of Ireland. Following a slow decline in membership and participation in field meetings, and critically a lack of new younger people coming in and taking on roles, the MHTI was wound up in August 2019. With the assistance of UCC geology graduate Eleanor Honan, the records, library and archive of MHTI was catalogued and transferred to the Natural History Museum. A legacy website was created by Ewelina Rondelez for MHTI and although much more material remains to be added on individual mine sites, most of the range of MHTI publications are freely available on www.mhti.org.



Department for the
Economy
www.economy-ni.gov.uk

GSNI Geological
Survey of
Northern
Ireland
www.bgs.ac.uk/gsni

Geological Survey of Northern Ireland (GSNI) have provided a link to their
Annual Report

https://www.bgs.ac.uk/gsni/GSNI_AR_2018-2019.pdf

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<http://bees.ucc.ie>February 7th 2020

2019 has been a busy year for the Discipline of Geology in the School of Biological, Earth and Environmental Sciences at UCC. Professor Andy Wheeler has been made the Head of School and Dr. Pat Meere has stepped into the role of Head of Geology. We also welcome a new lecturer to Geology, Dr. Kate Kiseeva who joined us last summer from Oxford. She is an experimental petrologist with a strong background in geology and geochemistry. Her current research interests revolve around two topics. The first is how a number of economically and geologically important chemical elements partition themselves between the silicates of the outer parts of the Earth and sulphides, minerals and liquids rich in sulphur. Her second research interest is in the oxidation state of the mantle, the deep carbon cycle and the generation of kimberlite melts.

Numbers in undergraduate geoscience programmes at UCC are holding up despite the national/international drop in such numbers. There are currently over 60 full time students registered in the BSc Geology and BSc Earth Science programmes. There is an on-going drive to promote student internationalisation in the School with a number of 3rd Year undergraduates currently mobilised to the University of Montana and the University of West Virginia. There has been a concerted effort in recent months to raise geoscience student recruitment through a number of outreach activities including dedicated geoscience information sessions, social media video posts and the development of a dedicated CPD geoscience course for Geography teachers. The relatively new MSc in Applied Environmental Geoscience is also growing in popularity with 20 students registered in the 2019/2020 year. This programme is very much tied into local and national industry practitioners, the Geological Survey of Ireland and the Environmental Protection Agency all of whom provide direct contributions to curriculum design and delivery.

Geology staff have received a number of awards over the last year. Dr Kate Kiseeva awarded the Max Hey medal by the Mineralogical Society, this medal recognises existing and on-going research of excellence carried out by young workers, within the fields of mineralogy, crystallography, petrology or geochemistry. Dr. Maria McNamara won the Start-up Lab of the Year at the Irish Laboratory Awards 2019. Dr. McNamara also has an important paper published *Nature Ecology & Evolution*. Geology staff have also been very successful in securing research funding, e.g. Dr Pat Meere has secured €3.6 million INTEREG award to help set up a new ecomuseum in western Iveragh with a strong emphasis on geo-heritage. Staff also continue to actively contribute to the SFI funded Irish Centre for Research in Applied Geoscience (iCRAG).



**Geotechnical
Society
of Ireland**

Recent events

12th November 2019 (6:00pm) Joint Geotechnical Society/Engineers Ireland West Region lecture: “A risk management framework for embankments over soft ground, M17/ N17 Galway, Ireland”.

Speaker: Graham Barton, Jacobs.

Venue: Alice Perry Engineering Building, NUI Galway.

26th November 2019 (2:00pm) Geotechnical Society Autumn seminar: “The lines of evidence approach to challenges faced in engineering geological practice” – 2018 Glossop lecture; new land drilling apprenticeship at Carlow IT; Mincon spiral flush drilling system.

Speakers: Dr Kevin Privett; Brian Byrne; Jukka Ahonen.

Venue: Clyde Road, 2pm to 5pm, Tuesday.

15th January 2020 (6:30pm) Joint Geotechnical Society/IAH Evening lecture: “Development and Conservation of Irish Bogs: Geotechnical and Hydrogeological challenges”

Venue: Geological Survey Ireland, Beggars Bush, Haddington Road, Dublin 4

Speaker: Dr Raymond Flynn, Queen’s University Belfast.

Venue: Engineers Ireland, Clyde Road, Dublin 4.

28th January 2020 (6.30pm): Joint IStructE/Geotechnical Society evening lecture: “Updating CIRIA C580”.

Venue: TU Dublin Bolton Street, Dublin 1.

Speaker: Stuart Hardy, Arup.

4th February 2020 (7:00pm) Joint Geotechnical Society/Engineers Ireland Cork Region lecture: “Geotechnical impacts for Offshore Wind Energy”.

Speaker: Paul Doherty, GDG.

Venue: Rochestown Park Hotel, Cork.

Future Events

22nd April 2020 (2:00pm) 3rd Hanrahan Lecture (biennial Honorary Lecture): “How Eurocode 7 has Advanced Geotechnical Design in Ireland and Europe” (Honorary Lecturer: Dr Trevor Orr, Trinity College Dublin) and “Rapid load pile testing and the development of testing standards for non-static pile testing for use within the Eurocode framework” (Dr Michael Brown, University of Dundee). Venue: Engineers Ireland, Clyde Road, Dublin 4.

Potential joint seminar/conference with IGI, Spring 2020: Seminar/conference on 10 years of deleterious material research and practice. Focus on Defective aggregates with pyrite induced expansion being a key component. In collaboration with IGI and UCC. UCC. Spring 2021. TBC.
