

IRISH GEOSCIENCE NETWORK

ORGANISATION REPORTS 2021

Meeting held

3rd March 2021 on Zoom

Report compiled by IGI



Members of the Irish Geoscience Network (IGN)

Trinity College Dublin, Department of Geology (TCD)
University College Dublin, School of Earth Sciences (UCD)
University College Cork (UCC)
National University of Ireland, Galway: Earth and Ocean Sciences (NUIG)
Geological Survey Ireland (GSI)
Geological Society – Northern Ireland Branch (GeoSocNI)
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), Geosciences and Geographical Sciences Committee
Irish UNESCO Global Geoparks
Geoscience Ireland (GI)
Irish Mining and Quarrying Society (IMQS)
Irish Quaternary Association (IQUA)
Petroleum Infrastructure Programme (PIP)
Open University Geological Society Irish Branch (OUGS)
Ulster Museum
Dublin Institute of Advanced Studies (DIAS)
Department of Environment, Climate and Communications: Geoscience Regulation Office and
Geoscience Policy Office (formerly EMD and PAD)
RAW MatTERS and iFOSTER (no longer active)
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
Geothermal Association of Ireland (GAI)
Girls into Geoscience Ireland

Contributors to this report

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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 February 2020.

Aggregate standards – the role of the geologist - March 9th 2020

This one-day workshop, provided by industry experts, covered the role of the geologist in assessing aggregates with special emphasis on understanding aspects related to the presence of pyrite. This was the last in-person event held by the IGI. It was well attended with 39 attendees.

QGIS Workshop - 22nd May 2020

A one-day workshop on QGIS was held on 22nd May 2020. This was the IGI's first foray into the world of online hosting. The workshop was expertly delivered by the GSI's GIS Consultant Shane Carey. Given the nature of the course places were limited to 14, with all 14 places snapped up within minutes of the event being advertised. The IGI is very grateful to the event co-hosts GSI and indeed to Shane himself.

Geothermal Geology Lecture - 16th June 2020

The IGI invited Dr. David McNamara of the University of Liverpool to deliver an online talk on 'Geothermal Geology; Teaching a New Dog Old Tricks', on 16th June 2020. Over 40 members and non-members registered to attend and enjoyed a most interesting oversight of geothermal geology.

Social Licence to Operate Short Course - 16th July 2020

Dr. Mike Mlynarczyk PGeo responded to an appeal for ideas for online events that was issued in our weekly Members Bulletin. Mike very kindly offered to deliver a 3-hour short course on 'Stakeholder Engagement and earning Social License to operate Exploration and Mining Projects' on 16th July 2020. This short course was prepared as part of the EU-funded H2020 iTARG3T project (EIT RawMaterials # 18036): 'Innovative Targeting and Processing of W-Sn-Ta ores: Towards EU's Self-Supply'.

AGM 2020 - 16th September 2020

The first online AGM of the IGI was held on 16th September 2020. It was well attended and had 40 attendees. The video of the AGM is hosted on the IGI website.

Unconscious Bias Workshop - 16th December 2020

The IGI co-sponsored the EDIG Conference which took place on 15th & 16th December. The EDIG conference included a workshop which was run by Yasmin Sheikh from Diverse Matters (www.diversematters.org). This workshop utilized data from the recent EDIG survey looking at the experiences of geoscientists within our community, and addressed ethnic, gender, and disability challenges.

Practical Geo-communication Course - 25th January 2021

IGI recently licensed Geologize's course 'Practical Geo-communication' which is now free to avail of for all IGI members for one year. This is an online course which teaches geoscientists to bring the public to a greater understanding and appreciation of our planet through effective and powerful communication. As of now we have over 50 registrations

Lisheen Mine Closure Plan Lecture - 28th January 2021

A talk on the decommissioning and remediation of Lisheen Mine by Stephen Wheston (former site manager at Lisheen) was given via Zoom on the 28th January. It was well attended with 78 people logged in on the night. The talk was uploaded to IGI website.

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

A course on EIAR / SEA is currently being planned with CMG Training.

The IGI Working Groups have had a very busy year:

IGI Validation Committee: The Validation Committee interviewed and approved membership for 25 new professional members (PGeos) and 23 Members-in-Training (MITs). It is wonderful to see such growth in our membership.

Contaminated Land Working Group: This working group was set up to deal with matters arising in relation to Contaminated Land which would have an impact on our members in line with the overall IGI Strategy. They are also responsible for the maintenance and review of the IGI's Register of Professionally Qualified Geoscientists / Competent Persons (in respect of environmental risk assessment for regulated and unregulated waste disposal and contaminated land). This group typically meet twice a year.

Environmental Impact Assessment Reporting Working Group: A working group was set up in 2019, now comprising 6 people, following on from a call to the IGI membership for volunteers. It includes members from public service and industry, with a range of experience across the areas of the guidance. The existing IGI guidance needs updating, to reflect changes in the environmental impact assessment procedures and reporting, arising from an amendment to the EU EIAR Directive (EU Directive 2011/92/EU and its subsequent amending Directive 2014/52/EU) in so far as they apply to the soils, geology and water elements of the environment.

Minerals Information Working Group: The IGI convened a Minerals Information Working Group in early 2020. The group has the following objectives:

- a) To address the growing trend of misinformation about mining and exploration on the island of Ireland;
- b) To provide factual information on mining and exploration on the island of Ireland to all stakeholders, including the media, various interest groups and the general public.

The group consists of 21 expert mineral exploration, mining and environmental geologists across the island of Ireland. The Minerals Information Working Group have produced a series of informational materials available below which will be launched in the coming week.

Energy Geologists Working Group: The groups members include individuals who are involved in similar petroleum and energy transition groups in UK and Canada and the group will be fortunate to learn from the wider geoscience community. The group is currently formulating the Terms of Reference and is identifying initiatives for further work. It is envisioned it will meet quarterly.

Equality, Diversity and Inclusion Working Group: In the IGI's 2019-2024 strategy, we have made commitments to grow a diverse, gender-balanced membership inclusive of all disciplines. This year we are developing a number of initiatives which will aim to increase both participation and advancement of minorities in the geoscience profession, including people of colour, women, LGBTQ+ people and disabled people.

The IGI acknowledges the continued support of our sponsoring bodies, the Irish Mining & Quarrying Society (IMQS), Geophysical Association of Ireland (GAI), Geotechnical Society of Ireland (GSI), Irish Association for Economic Geology (IAEG) and the International Association of Hydrogeologists (Irish Group, IAH).

EurGeol. Mairead Glennon P.Geol
IGI President



IRISH ASSOCIATION FOR ECONOMIC GEOLOGY



Traditionally, 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.

Event	Date	Location	Title
Course	27 th February	GSI Corestore, Sandyford, Co.Dublin	Student logging course <i>Presented by Dave Stewart, John Colthurst and Pat O'Sullivan</i>
Lecture Series	7 th July	Virtual via GoogleMeet	Magmas and metasomatism: a tale of carbonatites, fenite and rare earth elements <i>Holly Elliott – University of Derby</i>
Lecture Series	21 st July	Virtual via GoogleMeet	The Black Angel Zinc Project, Greenland <i>Eoin McGrath – GSI</i>
Lecture Series	18 th August	Virtual via GoogleMeet	Reporting Standards in Ireland: An Introductory Comparison and General Prerequisites <i>Mark Burnett – AMC Consultants</i>
Lecture Series	12 th November	Virtual via GoogleMeet	How Sustainable is Mining? <i>Rob Bowell - SRK</i>
AGM + Lecture Series	10 th December	Virtual via GoogleMeet	AGM + COVID-19 and the minerals industry; impacts to date and future scenarios <i>Simon Jowitt – University of Nevada</i>

Like most, the IAEG have had to make changes to the way the association operates in order to adapt to restrictions and provide members with talks and events. Early in 2020 the decision was made to suspend all physical lectures and postpone the annual conference.

The 2021 programme is currently being finalised as we navigate what is realistic, however we will continue to host our successful virtual lecture series throughout the year with the first talk to be announced shortly.

Work continues to progress on 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.

As mentioned previously, the highly anticipated IAEG decennial conference, entitled ***Minerals 2020: Europe's Past, Present & Future***, was set to take place originally in May 2020 and then May 2021 after initial rescheduling, however the decision was made by the Minerals 2020 committee to defer the conference indefinitely until a realistic and appropriate date can be

ascertained. The conference planned to explore Europe's past mining tradition, document current activity and look to the future for the sector.

Updates regarding Minerals 2020 and upcoming events will be published on the IAEG website and social media channels in due course



UCD School of Earth Sciences

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17th February 2021

The UCD School of Earth Sciences had a successful 2020 on a variety of fronts, publishing papers in many of the top international journals (e.g. 3 papers in Nature/Nature Geoscience), leveraging funding for several research projects, managing changes in delivery of teaching arising from Covid and winning major awards, with Professor Frank McDermott elected to Membership of the Royal Irish Academy (MRIA), the highest academic honour in Ireland. 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 Covid crisis has, however, had a significant impact on staff and student activities over the year, with a great deal of work invested in counteracting potential negative effects.

Soon after the onset of Covid, teaching for earlier years (Year 1 and 2), in particular, was gradually transformed to entirely online lectures and practicals by the end of 2020. Since the turn of 2020 the delivery of all undergraduate teaching (Year 1 to 4) has been exclusively online, with the use of a range of online teaching and remote learning/access/software facilities. Despite Covid we have managed to undertake field classes and field mapping at 3rd and 4th year level, conforming to the full range of Covid restrictions. For example, 4th years have undertaken their mapping projects within 3 areas (Bray, Howth and Killiney) that are linked through an offshore mapping project of the East Dublin and Kish Basin area (incorporating well, seismic and sea bed data). On the research front, we have managed to keep our work continuing through remote access to a range of software facilities and through Covid compliant access to essential onsite facilities e.g. geochemical. The Higher Education Authority has also introduced a funding scheme for the extension of funding for periods of up to 4 months to all researchers (e.g. PhDs and Post-Doctoral) whose research has been negatively impacted by Covid.

The Irish Centre for Research in Applied Geoscience (iCrag) had an important year in which many research initiatives associated with the 6-year long iCrag1 phase of funding were drawing to a close by end of 2020. Most of these projects have, however, received 3-4 month extensions into 2021, with iCrag1 research now finishing by the end of April at the latest. iCrag hosted a variety of online meetings and conferences for our researchers, collaborators and industry partners. In September we held our 3 day SFI iCrag 6-year review, in which iCrag1 research and future plans were presented. Arising from our final reports and presentations, we received formal confirmation towards the end of 2020 that SFI will be supporting iCrag for a further 6 years. Our success in raising €28M funding from SFI for iCrag2 was announced in the national press in early February 2021. This funding will help deepen and broaden iCrag's research initiatives in three principal challenges (Earth System Change, Earth Resources and Earth Science in Society) dovetailing with a range of application areas including (i) climate and environmental geoscience, including the geomarine environment, (ii) water, energy and minerals resources, (iii) geotechnical engineering and hazards, and (iv) responsible decision making

and geoscience. Along with our ongoing separately funded initiatives in Environmental Geosciences (SFI/GSI supported) and Geotechnical Engineering/Hazards (SFI/GSI/Industry supported), which span iCrag1 and iCrag2, a major US-Ireland R&D Partnership project (SFI/NSF/Invest NI supported), entitled 'Multi-scale investigation of bio-based mineral precipitation in carbonate bearing granular soils and construction-related waste', was started in September 2020, in collaboration with Arizona State University, Georgia Tech, New Mexico State University, Queen's University Belfast and University California – Davis.

In 2018 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 2020 are: Dr Weimu Xu (formerly TCD), an expert in paleoclimatology, carbon cycling and climate change mitigation, and Dr Koen Torremans (formerly a Post-Doc at UCD), a structural geologist specializing in mineral deposits in sedimentary basins. Weimu and Koen joined our 2019 Ad Astra Fellow appointees, 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 Vincent Roche and Stratos Delogkos, post-doctoral researchers in our school, received Marie Skłodowska-Curie and Irish Research Council Fellowships for their research on induced seismicity and fault behaviour of earthquake time scales.

Geoscience Ireland (GI) is the business cluster supporting over 40 Irish companies winning business in overseas markets. In 2020, the GI Member Companies created 69 net new jobs (though SMEs created 199 net new jobs only for Larger companies to report significant losses) and in 2019 generated €1.23BN in turnover (€496M from overseas activities).

In 2020, GI welcomed Ground Investigation Ireland and Entrust Planning & Environmental and, in early 2021, Causeway Geotech as members.

Geological Survey Ireland launched **‘The Formation and Maintenance of a Successful Business Cluster May 2020’**¹ (May, 2020) manual which was developed on foot of a comprehensive examination of the Geoscience Ireland (GI) cluster; a further guide was published in early 2021².

Prior to the coronavirus lockdown, GI and its members participated at a number of international conferences and exhibitions including PDAC, Toronto; Mining INDABA, Cape Town and AME RoundUp, Vancouver.

GI maintained a virtual presence at key mining, water, civil infrastructure and environmental trade shows and conference over the past year.

In 2021, GI partnered with iCrag to operate a virtual Ireland booth at **AME RoundUp**, and also worked with the Irish Consul General to deliver a webinar promoting the strengths of Irish geoscience. GI will host its **‘Ireland – Open for Business’ forum at the virtual PDAC** show on Monday 8th March³ and will operate in collaboration with iCrag at the virtual booth over the course of the conference (details to follow).

GI continues to support the **Geo Driller Apprenticeship** in collaboration with IT Carlow, the IMQS and the private sector which commenced in January, 2020; a further 8 apprentices enrolled in September 2020. GI is the lead partner partner on the **COSME-funded ‘Geo Energy Europe’** project which kicked-off in September 2020; the two year project is focussed on assisting European SMEs accessing international geothermal markets.

Andrew Gaynor | Geoscience Ireland

¹ <https://www.geoscience.ie/minister-canney-launches-the-formation-and-maintenance-of-a-successful-business-cluster-may-2020-manual/>

² <https://www.geoscience.ie/new-guide-on-business-clusters/>

³ <https://www.pdac.ca/convention/programming/International-Stage>



Earth & Ocean Sciences at NUIG 2020

The discipline of Earth and Oceans Science at NUIG had a successful 2020 despite the pandemic: staff and research students published papers in international journals, PhD students successfully completed their projects, and the various research projects continued to grow and develop. iCrag wrapped up its first iteration and the NUIG projects were all successfully completed (or given COVID related extensions into 2021), and a number of short term projects funded by iCrag ran over the year covering everything from assessing public trust in geoscience to developing mapping packages for secondary school kids to delving deeper into the Irish carbonate story.

Undergraduate teaching moved online with labs and fieldwork being shelved. We'd been moving to flipped classrooms and blended learning, exploring more shared teaching and learning approaches in recent years and the move to online worked well. We managed to run virtual fieldtrips too, which, while no substitute to being on the rocks, did give students a sense of context for their work. In 2020, there were nearly 80 full time students in the denominated EOS degree programme, and the first year intake in September 2020 was up on previous years. This reflects our location in the west of Ireland, but also it reflects the success of the Girls Into Geoscience programme, and a number of the outreach events run through iCrag, which have increased awareness of geosciences in secondary schools (and among secondary school parents).

Research projects proceeded with modifications, but our EPA, Teagasc and SFI funded projects continue to grow, attracting new postgraduate researchers and research students, and strengthening ties with various government agencies and institutes. Dr Rachel Cave and Dr Eve Daly were added as Funded Investigator to iCrag bringing their skills and expertise in chemical oceanography, geophysics and remote sensing to the centre, and Dr Shane Tyrrell was made Deputy Director of iCrag.

Dr Tiernan Henry is the new head of EOS, taking over from Dr Martin White in the middle of the year. Dr John Murray was awarded the 2020 Gertrude Elles Award by the Paleontological Association for his History of Life film project. This innovative project encourages students to explore the evolution of life on Earth through the medium of film. A short film compilation explaining more about the project can be found on the History of Life YouTube channel: <https://www.youtube.com/watch?v=0Y0RmQFb628&feature=youtu.be>



iCIRAG IGN 2021 submission

The iCIRAG, SFI Centre for Research in Applied Geosciences drives research in areas that are critical to society and the economy, including the sustainable discovery of energy resources and raw materials required for decarbonisation, climate change mitigation and adaptation, securing and protecting groundwater and marine resources and protecting society from Earth's hazards such as flooding and landslides. iCIRAG's vision is to be a world-leader in applied geoscience research, discovery, and public understanding of Earth's critical resources and environment for a sustainable society. iCIRAG is developing innovative science and technology to better understand the Earth's past, present, and future, and to create solutions for a sustainable society.

The COVID-19 pandemic has led to significant challenges for all, but despite these limitations on business as usual, 2020 has been another active year for iCIRAG across a wide variety of activities. With 150 of researchers across 8 Irish research institutions, and hosted by University College Dublin, iCIRAG's focus for 2020 was to rapidly to pivot to online activity ensuring that our research continued and our planned impacts were kept on track.

An initial flurry of trade conferences in early 2020 took place pre-pandemic, including AME Roundup in Vancouver where iCIRAG, along with industry partner Geoscience Ireland, and the Irish Consulate in Vancouver was the first European country to exhibit at Roundup. Internationally, iCIRAG is working closely with Embassies and Consulates of Ireland in Canada to promote iCIRAG activities in this important trade market, and will continue to work towards building these relationships during 2021. Also pre-pandemic in March 2020, iCIRAG participated in the all-Ireland PDAC forum which highlights Ireland's mineral potential, geoscience research and service expertise. The Irish delegation, to PDAC 2020, consisting of members of iCIRAG, Geoscience Ireland and Enterprise Ireland, was led by Sean Canney, TD, former acting Minister of State for Natural Resources.

In mid-February iCIRAG led a session at the annual American Association for the Advancement of Science (AAAS) meeting in Seattle, Washington on "Climate change, climate justice: R&D addressing multiple societal goals" which dealt with natural resource issues in terms of the climate crisis. The session featured talks by Prof. Mary Robinson, former President of Ireland and UN High Commissioner for Human Rights, Prof. Mark Ferguson, Director Science Foundation Ireland, and Susan Dio, Chairman and President of BP America.

Shortly after the onset of the COVID-19 pandemic, iCIRAG researchers investigated the effects of the pandemic on the minerals sector workforce as published in the Society of Economic Geology's *Discovery publication*. Geographically, the greatest impact on employment was in Africa, and more often younger

respondents reported lost jobs whereas older workers reported reduced working hours. Those working in mineral exploration were most affected, but the impact across base, industrial, and precious metals was broadly similar for all participants.

Funding highlights in 2020 include:

- Prof. Maria McNamara of UCC was awarded €2.4 million by the European Research Council through a Consolidator Grant. Prof. McNamara's research aims to understand how key biomolecules such as melanin, keratin and collagen evolved in animals, and to understand how well these important biomolecules can be preserved in fossils.
- The US-Ireland Centre-to-Centre award in collaboration with the NSF-funded Centre for Bio-mediated and Bio-inspired Geotechnics (CBBG) and Queen's University Belfast Energy Efficient Materials Research Centre (EEM) which will use microbes and enzymes to enhance methods of bio-based mineral precipitation to cement granular soils, encapsulate problematic waste such as asbestos, and stabilise soil slopes in areas of high land-slide risk. The three-year project, with a total budget of €1.27M, will see eight researchers recruited across the republic of Ireland, Northern Ireland and the United States. A number of scientists and engineers from iCrag are Co-Principal Investigators in the project: Prof. Fank McDermott and Prof. John Walsh of the UCD School of Earth Sciences, and Dr Mike Long and Dr Shane Donohue from the UCD School of Civil Engineering.
- Dr Julian Menuge of UCD, is among a team of thirteen partners working on the €8.3 million GREENPEG project hosted by the University of Oslo and launched in 2020. GREENPEG is focussed on the development of new techniques to explore for battery and other green technology metals in pegmatite rocks.
- Furthermore, two iCrag researchers were awarded SFI Frontiers for the Future funding in 2020, supported by the GSI and EPA. Dr Shane Donohue of UCD was awarded €475k for the GEOTECS project which aims to develop a way of monitoring the impact of floods and extreme weather on the condition of man-made slopes. Dr Juan Diego Rodriguez Blanco of TCD, was awarded €467k to conduct the SEleCTOR project - SEparating Critical metals ThrOugh mineRal crystallization – which will develop novel, clean and cheap protocols to separate rare earths from water.

A key highlight in 2020 was the Equality Diversity and Inclusion in Geosciences (EDIG) conference held online in December. To help address prejudice, inequity, sexism, bias, exclusion, and discrimination in geoscience, researchers at iCrag, in collaboration with geoscientists from partner organisations, organised the EDIG conference to promote effective, long-term change and to help the geoscience community become more inclusive and equitable. Across two days, over 300 attendees heard from 17 speakers on a wide variety of issues including ableism, diversity, unconscious bias, historical inclusivity within STEM, and how to challenge inappropriate workplace behaviours. All sessions can be watched on the EDIG YouTube [channel](#).

With 2021 still uncertain as rolling lockdowns set to continue to be a feature of life, iCrag, in collaboration with the International Union of Geological Sciences, has launched the [UNESCO online Lecture Series](#) on Earth Materials for a Sustainable and Thriving Society. The programme of free online lectures, beginning January 26, 2021, is designed for a global audience and will provide diverse

perspectives on Earth materials and their role in society. Leading natural scientists, social scientists, and educators will look at how Earth materials are critical to a sustainable future and how the minerals sector, adhering to best practices, can contribute to society in a socially and environmentally positive way.

After a busy 2020, iCrag is looking forward to continuing our research in 2021 as we enter a new phase for our research programme and activities.

By Dr Fergus McAuliffe



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 of 134, 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

Due to the Covid-19 pandemic restrictions, it was not possible to hold the 40th IAH (Irish Group) Conference as originally planned in Tullamore in April 2020. The conference was rescheduled to two half-days on the 19th and 20th October 2020. The theme was “**Characterisation and Management of Groundwater in Limestones**”. The first session was an overview of Irish limestone aquifers and their natural capital. The theme of the second session was regional groundwater management. The second day started with a session of management and protection of water resources. Session four explored the characterisation and investigation of Irish limestones. In total, there were 285 attendees from 12 different countries. There were 238 attendees on the Monday and 187 attendees on the Tuesdays.

Annual Fieldtrip

Due to the Covid-19 restrictions, the format of the fieldtrip was changed from a weekend fieldtrip to a one day socially-distanced coastal walk. The fieldtrip took place on 12th September and was restricted to 15 households only, plus contributors. The contributors were: Robbie Meehan, Russell Rogers and Bruce Misstear.

Training Course

A course on **Statistics and Data Analysis through R** was held on 8th October via Zoom. The course trainers were: Dan Lapworth, British Geological Survey (BGS), Sonja Masterson, Shane Carey, GSI, Bentje Brauns (BGS), Matt Ascott (BGS) and Donald John MacAllister (BGS). It was attended by 52 people.

IAH Technical Discussion Meetings (TDMs)

In February and March, the TDMs were held at the Geological Survey of Ireland in Beggars Bush, Dublin. From November onwards, the TDMs were held online and will continue in this format until further notice.

15th January 2020 Joint IAH/Geotechnical Society of Ireland Lecture

- **Development and Conservation of Irish Bogs: Geotechnical and Hydrogeological Challenges:** Ray Flynn, Queens University Belfast.

11th February 2020: The David Burdon Memorial Lecture

- **The role of socio-hydrogeology in groundwater protection in developing countries,** Dr Viviana Re, University of Pisa.
-

3rd March 2020

- **Emerging organic contaminants in Irish groundwater: the occurrence of veterinary pharmaceuticals**, Damien Mooney, Trinity College Dublin.

3rd November 2020: Digital resources available to hydrogeologists

- **An overview of the Groundwater Flood Map Viewer and the GSI Groundwater Level Data Viewer**, Ted McCormack, Geological Survey of Ireland.
- **Catchments.ie – science and stories about water from source to sea**, Paddy Morris, Environmental Protection Agency.
- **An overview of the EPA Hydrometric Bulletins**: Conor Quinlan, Environmental Protection Agency

1st December 2020: Hydrochemical Issues in Irish Groundwater

- **A Complete Method; Compositional Data Analysis (CoDA) of Groundwater Geochemistry at Lisheen Mine, Co. Tipperary**: Sean Wheeler, National University of Ireland, Galway and iCrag
- **Arsenic Contamination of Groundwater in Ireland; Occurrences and Sources**: Alex Russell, University College Dublin and iCrag.

Outreach

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 purchase of equipment and payment of sample analyses for an MSc on Drummin Raised Bog.

An IAH (Irish Group) **mentoring** programme was introduced to members in October 2020. The aim of the programme is to complement the IAH International mentoring programme by facilitating connections within the Irish hydrogeological community.

OUGS Ireland Branch Annual Report for 2020

After our AGM in January 2020, when all our current officers were re-elected, plans made at that meeting have had to be reviewed and unfortunately all the field trips planned for during the year had to be cancelled.

However, in great co-operation with Cork Geological Society we were able to view a number of lectures on Zoom. The first one was Volcanoes of the world with Dr. Stuart Monro. This was a really, great lecture. Others after that were very good too.

Hopefully 2021 will allow us at some stage to plan some more field trips and also have more lectures organised.

Best wishes to everyone for 2021.

Phyllis Turkington
BO. Ireland Branch



Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin

Ollscoil Átha Cliath | The University of Dublin

Department of Geology, IGN report

21st January, 2021

In common with all other members of the Irish Geoscience Network, the past year has been extremely challenging. But it has not been without positives – TCD Geology welcomed the arrival of our new Chair of Geology and Mineralogy, Prof. Jerry Dickens from Rice University, and commissioned the GSI-funded Earth Surface Research Laboratory. This facility will undertake geochemical analyses for the Tellus program along with acting as a research laboratory available to the Irish Geoscience institutions. In addition, staff and early career researchers were successful in publishing many journal articles in leading geoscience journals and securing research funding. Dr Juan-Diego Rodriguez-Blanco was successful in obtaining an SFI Frontiers for the Future award on *SEparating Critical metals ThrOugh mineRal crystallization* (SEleCTOR), which funds two new PhD students, Melanie Maddin and Luca Terribili. We also welcomed our new research students Lydia Whittaker, Fermin Alvarez Agoues and Vitor Azevedo to the department, along with our new postdoctoral fellows Drs Elliot Carter and Zoe Roseby. The last year also saw many of our iCRAG research fellows and PhD students either depart or approach completion as the research centre entered its final year. The extension of the research centre for a further six years was very welcome news and is a testament to all the hard work put in by the iCRAG staff and the academics in the Irish Geoscience institutions. The department also had many successful online initiatives in the past year, such as our departmental seminar series and the EIT Raw Materials University Days run by Drs Quentin Crowley and Sean McClenaghan.

Our new TR062 Geography and Geoscience degree is proving a popular CAO option, and the TR062 Geoscience students entered their third year last September. The implications of the COVID-19 pandemic on teaching has nonetheless been profound, with the vast majority of teaching having been online since late last March and most fieldwork replaced by online fieldtrips. Nevertheless, our final years of Geology and Earth Science students from the TR071 and TR077 degrees managed to undertake their field and research dissertations both safely and successfully. We are immensely grateful to the academic, technical and administrative staff in the Department who enabled teaching and research to continue in the last year in a safe environment.

Yours sincerely,

Prof. David Chew
HEAD OF GEOLOGY

National Museum of Ireland – Natural History

NMI is teaming up with Geological Survey Ireland on an exhibition *Down to Earth - Exploring Ireland's Geology* which was due to open in autumn 2020 but is now due in summer 2021. The exhibition has been timed to mark the 175th year anniversary of GSI and celebrate its work. It will bring Irish geoscience into the public realm, making connections that kindle curiosity, and will also be used to demonstrate how geology and geoscience relate to people and daily life. Co-Curators Dr Siobhán Power (GSI) and Nigel Monaghan (NMI) are completing the project initiated with Dr Matthew Parkes (NMI) who passed away in October 2020. The exhibition will be on view at the National Museum of Ireland, Collins Barracks, in the Riding School building, but including areas around the car park where an operational drill rig will be based, along with a research vessel and geological garden. It is expected that the exhibition will run up to end 2022.



IRISH GEOMORPHOLOGY GROUP

<https://irishgeomorphology.wixsite.com/home>

Twitter: @IGGyGroup

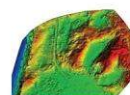
23 February 2021

Re: IGGy Activities 2020- 2021

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.

Highlights 2020-2021

May 2020. 7th annual Workshop of Irish Geomorphology Group [Postponed due to Covid-19]

Postgraduates:

The inaugural *East Coast Geomorphology* meeting was hosted by UCD Geography (21/11/2019) and was attended by representations from the EPA, DCU, NUIM, UCD and TCD. At that meeting it was decided to re-invigorate the IGGy postgraduate group. Kate de Smeth (undertaking a Ph.D in Fluvial, management, Geography, UCD) accepted the nomination to lead the group.

To date they have:

- Formed a separate IGGy listserve (iggypostgrad@gmail.com)
 - Held monthly online meetings
 - Joined the Network of Young Geomorphologists Group International Association of Geomorphologists page.
 - Formed formal links with the CIG Postgraduate Early career network (PECN) and the British Society for Geomorphology (BSG).
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Planned activities 2021-2022

1. *International Geomorphology Week 2021*. #IntGeomorphWeek2021

- Ireland will be represented in the [regional geomorphology webinars](#) by two early career researchers. Presentations will be delivered with other regional presenters from France, Italy and the UK.
- Our postgraduate representative will participate in the [Young Geomorphologist Groups](#) meeting.
- IGGy will host local events to mark the week

2. *Irish Geomorphology Workshop 2021*

This event will be hosted by TCD (Dr M. Bourke) and will run concurrently with the 52nd [Conference of Irish Geographers](#). Our Keynote speaker will be [Professor R. Cox](#). IGGy postgraduates will hold a postgrad meeting at CIG.

Outgoing President: Dr E. Farrell

Acting President (Ex Officio) Dr M. Bourke



Irish Quaternary Association Update 2020/21

Spring Meeting and AGM – COVID Impacts

Travel restrictions impacted all IQUA activities in 2020, and called for a rapid adjustment to the new working conditions. The Spring meeting, which had been scheduled to take place on 28 March was postponed, and later cancelled. The AGM, usually held immediately after the Spring meeting, was deferred until 30 June, by which stage the Committee and members had become accustomed to online meetings.

The AGM saw the election of a new committee. The outgoing President, Catherine Dalton, gave an impressive round-up of IQUA's achievements over the previous year, the highlight of which had been the successful hosting of the INQUA symposium. The main changes to the Committee included election of Gill Plunkett (President), Graeme Swindles (Secretary), Mark Coughlan (Treasurer) and Susann Stolze (Newsletter Editor). Mark Coughlan and Benjamin Thébaudeau kindly agreed to keep on their respective roles of Publications Officer and Webmaster. Catherine Dalton and Kieran Craven (former Treasurer) stayed on the Committee as Ordinary Members. Adrienne Foreman and Ryan Smazal were co-opted as Postgraduate Representatives later in the year.

Autumn fieldtrip

The second casualty of the COVID pandemic was the Autumn Fieldtrip, normally held in September and planned for Co. Sligo (led by Susann Stolze, Colorado University - Boulder). Several IQUA members had planned to hold informal regional field meetings, but tighter lockdowns made them unfeasible. In the end, only one trip in West Cork (organised by Robin Lewando) went ahead.

Autumn Symposium

Ongoing COVID restrictions prevented the Autumn Symposium being held in its usual venue, and instead a virtual conference took place (27 November). The Symposium ("Carbon Sequestration") was organised by Graeme Swindles (QUB) and Catherine Dalton (Mary Immaculate College, UL), assisted by Adrienne Foreman and Ryan Smazal. The programme comprised 12 speakers, including a keynote presentation by Prof. Bill Austen (University of St Andrews). The meeting was joined by 55 members.

Outlook for 2021

It is evident that IQUA will be unable to convene in person for events for the foreseeable future. The upcoming Spring meeting will be held virtually. Decisions relating to the Autumn fieldtrip and Symposium will be made during the summer. In the meantime, the Committee has been considering opportunities to promote Quaternary Research in Ireland, including supporting ECRs, and has launched Corporate Membership.



**An Roinn Comhshaoil,
Aeráide agus Cumarsáide**
Department of the Environment,
Climate and Communications

Reorganisation of Geoscience Functions in the Department of the Environment, Climate and Communications

An organizational review of the geoscience functions within the Circular Economy, Waste Policy and Natural Resources Section of the Department was undertaken during 2020. The review initially focused on the Exploration and Mining Division and subsequently broadened to include the Petroleum Affairs Division and the Geological Survey Ireland.

The recommendations from the review included separating the regulatory functions from the policy and promotional/outreach functions for both the minerals and petroleum sectors and consolidating each set of functions into new divisions.

As of 1 January 2021, the Exploration and Mining Division and the Petroleum Affairs Division no longer exist. The two new divisions are Geoscience Policy Division (GSPD) led by Eóin Deegan and Geoscience Regulation Office (GSRO) led by Clare Morgan. Both divisions are still within the Department of the Environment, Climate and Communications.

Geoscience Policy Division (GSPD@decc.gov.ie) is responsible for maintaining, developing and promoting policy and legislative frameworks for the mineral, petroleum and geothermal sectors.

Geoscience Regulation Office (GSRO@decc.gov.ie) will be responsible for the regulation, licensing and enforcement of mineral and petroleum exploration, production and decommissioning, geothermal applications and regulation (when policy is established).



**An Roinn Comhshaoil,
Aeráide agus Cumarsáide**
Department of the Environment,
Climate and Communications

Exploration and Mining Division (ceased end December, 2020)

Department of the Environment, Climate and Communications

Update on Activities in 2020

The Exploration and Mining Division (EMD), Department of the Environment, Climate and Communications was responsible for the regulation and permitting of exploration and extraction of scheduled minerals under Minerals Development Act 1940-1999 until end December, 2020.

Mineral Exploration in Ireland

At the end of 2020, there were 490 Prospecting Licences held by 46 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 2020, 180 exploration reports were publicly released through EMD's OPALS database.

Mining in Ireland

In 2020, 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, in the first half of 2020, Ireland ranked 19th in the world in relation to zinc mine output. Ireland currently places fifth in Europe, behind the Russian Federation, Sweden, Portugal and Spain in terms of European mine production for zinc.

Policy Statement

During 2020, EMD began drafting a Policy Statement for mineral exploration and mining. The draft policy statement will include a significant focus on how we can maintain and improve the sustainability of mineral exploration and mining, and on the role of minerals, (including minerals which are critical raw materials), in supporting technologies that will help achieve our decarbonisation targets.

There will be public consultation on this draft Policy Statement in 2021 and this will provide an opportunity for all stakeholders to inform the development of policy in this area.

AECOM report

The AECOM report is an independent assessment of the Galmoy Mine in Co. Kilkenny and Lisheen Mine in Co. Tipperary which ceased operation in 2012 and 2015 respectively. Both mines are now at an advanced stage of rehabilitation or have entered aftercare (monitoring period after mine rehabilitation).

The mines are the first in Ireland to be opened, operated and closed under modern mining, planning and environmental regulation. The Exploration and Mining Division in the Department saw the opportunity to critically assess the effects of mining on the locality throughout the entire mine life cycle. The report assesses the impact of the mines on communities from a social, environmental and economic aspect.

This report was published on 27 May 2020 and is available at <https://www.gov.ie/en/publication/29332-a-social-environmental-and-economic-assessment-of-galmoy-and-lisheen-mines/> .

Prospectors and Developers Association of Canada (PDAC) Trade Show

In March 2020, EMD attended the PDAC Trade Show in Toronto, Canada. As in previous years, EMD jointly exhibited with the Geological Survey of Northern Ireland and the Department for the Economy, in a combined Ireland exhibit.

The Irish delegation was again joined by the Minister of State for Natural Resources, Seán Canney, TD. Minister Canney visited a number of stands and met with Prospecting Licence holders, as well as providing addresses to the International Mines Ministers Summit and the 'Ireland-Open for Business' PDAC Forum. In addition, the Minister attended the European Union's Horizon program for research and innovation presentation and booth.



**An Roinn Comhshaoil,
Aeráide agus Cumarsáide**
Department of the Environment,
Climate and Communications

Petroleum Affairs Division (ceased end December, 2020)

Department of the Environment, Climate and Communications

Summary for Irish Geoscience Network annual meeting 2020

Exploration Update Offshore Ireland (to end 2020)

Clare Morgan

clare.morgan@decc.gov.ie

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

Exploration Update 2020:

The Concession Map offshore Ireland showing the location of licences and leases (Fig.1), illustrates the end of year (31 December 2020) status. Each Exploration Licence, as required, is accompanied with an appropriate technical work programme. In late 2020, a total of 30 petroleum Authorisations existed offshore when compared to 53 Authorisations at the beginning of the year 2020. The decrease in the acreage held offshore occurs in both the Atlantic Margin licences and in the Celtic Sea. There are currently some 37 companies involved, as operator or joint venture partners, in exploration and production offshore Ireland. The decrease in the number of oil and gas licences offshore and the number of companies involved in E&P Ireland in the past 12 months is largely a direct result of the policy changes that occurred during the year. Further detail on policy developments in 2020 is provided below.

No 2D or 3D seismic surveys were acquired offshore Ireland in 2020 and no wells were drilled offshore Ireland in 2020.

Production continued offshore during 2020 from the Corrib gas field in the Slyne Basin (supplying approximately 34% of Ireland's gas demand). Gas production ceased from the Kinsale field complex, on 5th July 2020 after more than 42 years of production. During 2019 and 2020, consent was granted for the first and second phases of the decommissioning of the Kinsale gas fields.

PAD's 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 was curtailed in the past 10 months, not because of pandemic restrictions but in order to align with current government policy. All of the GeoScience Graduate Placements in PAD completed their training in Q2 2020.

Update on Recent Policy Developments

The Programme for Government, published in June 2020, contains a commitment to end the issuing of new licences for the exploration and extraction of gas on the same basis as the decision taken in 2019 by the previous Government in relation to oil exploration and extraction.

The commitment was given effect immediately. The Department of the Environment, Climate and Communications is no longer accepting new applications for exploration licences for natural gas or oil, nor will there be any future licensing rounds.

In line with the implementation of the 2019 prohibition on new exploration for oil, applications and authorisations in place before the Government took office in June 2020 will not be affected by the ban. This means that all existing applications and authorisations for natural gas exploration in place before this time can seek to progress through the standard lifecycle stages towards production, subject to regulatory consents being given.

Research and data

PAD is the custodian of the National Data Repository and Archive for the petroleum sector. 2020 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 and iCRAG, aimed at deepening knowledge of the geology of Ireland's offshore basins, were progressed in 2020. For example, a reprocessing project of selected lines from the Department's/Eni 2D Regional Seismic Survey acquired in 2013 and 2014 was completed with significant uplift in seismic data quality. The project was so successful that a second phase of reprocessing on a new set of lines was initiated and mostly completed by yearend. The milestone Bio/Litho/Stratigraphic study was finalised in 2020 to provide a new, formal updated stratigraphic framework and nomenclature for all Irish offshore basins. Data and results from the offshore ObSERVE baseline aerial and acoustic data acquisition programme that were made publically available in 2019 continued to be accessed by a wide range of stakeholders in 2020. Plans for an ObSERVE 2 project were finalized and an RFT published in December 2020.

In summary, 2020 has been a challenging year for the petroleum sector offshore Ireland.

The Petroleum Affairs Division ceased to exist on 31 December 2020 due to an internal reorganization of the geoscience functions within the Department.



The following are the main activities of the society in 2019/2020. Further details of all of these activities can be found at www.imqs.ie.

Council Meetings

- 2020 - January 14th, February 18th (AGM), March 10th, April 28th, May 26th.

Representations in 2019/2020

Council members represented the IMQS at the following events/committees during 2019 & 2020

- European Federation of Explosives Engineers Conference & committee
- European Mining Convention – IMQS was a supporting partner
- Prospectors and Developers Conference (PDAC)
- Standing Committee on Public Engagement
- Geoscience Ireland
- Sinn Féin Motion 68 on mining (by correspondence)
- Quarry Skills Certification Scheme meetings (QSCS)
- Quarry Safety Partnership (QSP)
- Minerals Information Working Group (MIWG)
- Nore Vision Project
- Department of Environment Communications and Climate Change (DECC)

Planning & Innovation Seminar Oct 29th 2020

The Irish Mining & Quarrying Society hosted a Planning & Innovation Seminar on October 29th 2020.

The presenters were:

- Introduction and IMQS Updates; Nicola Nixon, President IMQS
- The Mine of the Future; Mike Lowther PGeo, LKAB
- Advances in Drone Technology; Sean Higgins, Sitech
- Recent Planning Issues; Liam Smyth, Irish Concrete Federation
- Quarry Health and Safety; Jim Holmes, ex - Health & Safety Authority

Annual Review 2020

The Annual Review 2020 as well as reviews from previous years can be viewed at www.imqs.ie.

Annual Dinner Dance 2020

The Annual Dinner Dance did not take place.

Institute of Quarrying – Northern Ireland, Stone Crushers Ball

The annual Institute of Quarrying (Northern Ireland) Stone Crushers Ball did not take place in 2020.

Annual Field Trip

The Annual Field Trip did not take place in 2020.

Mine Rescue 2020

The All Ireland Mine Rescue Competition was hosted by Irish Salt Mining and Exploration at Kilroot on Saturday 15th June 2019. The ISME team were the winners.

Flight training with the Helicopter Wing of the Irish Air Corps took place with Boliden Tara Mine Rescue in June 2019.

Due to the impact of the global pandemic, mutual training is on hold. Mine rescue response across the island of Ireland remains in place.

Rescue activities can be found in the 2020 review.

Geo-Driller Course

Geoscience Ireland, in collaboration with the Institute of Technology Carlow, is running a Geo Drilling Apprenticeship. The course continues virtually with 14 participants. Brendan Morris and Sean Finlay were involved in its set up.

Events in 2021

Depending upon restrictions -

1. The Annual dinner is planned for early November 2021.
2. The Annual Field trip is scheduled for Autumn 2021.

Nicola Nixon, President of IMQS.

16-02-2021



Irish Geoscience Network: Geological Survey Ireland, 2020 update and 2021 Plans

The Geological Survey is Ireland's Geoscience Agency and is part of the Department of the Environment, Climate and Communications (DECC). 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.

Under the new Department DECC, Geoscience Policy & Regulation has been reorganised (see reports elsewhere) and this will lead to Geological Survey Ireland taking on additional responsibility in the areas of Data Release and Research in particular.

2020 was an understandably challenging year for Geological Survey Ireland operations due to COVID-19 restrictions on fieldwork; however the bulk of our intended programme was completed. Geological Survey Ireland's flagship conference **Geoscience2020** was on the theme **Geoscience for Policy** and was delivered online over two half days. The conference was opened by Minister Eamon Ryan TD and topics covered included Geothermal Energy, Soil carbon, Tellus and Radon, INFOMAR and Offshore Renewable Energy, Groundwater and Drinking Water Policy and Raw Materials.

Other particular highlights in 2020 were the launch of Geothermal Assessment Report, opening of a new Core facility in Birr, Co Offaly, and commissioning of a new multi-purpose drilling rig and an additional inshore marine survey vessel.

- **Climate Action.** Since 2019 Geological Survey Ireland refocused its activities in the area of Climate Action, with progress in this area on a number of fronts;
 - **Geothermal Energy:** At the Geoscience conference in late 2020 DECC/Geological Survey Ireland published an *Assessment of Geothermal Resources for District Heating in Ireland* in conjunction with a Roadmap for a Policy and Regulatory Framework for Geothermal Energy in Ireland, to support the Government's commitments under the Climate Action Plan 2019 and the Programme for Government. In reflection of this renewed focus the Survey has established a Groundwater and Geothermal Unit, and is working on increased data acquisition, research, project and policy support in this area.
 - **Groundwater Climate Project** was established in 2020, building on the 3-year Groundwater/Turlough Flooding project. The new project is establishing borehole observation and monitoring networks across the country, examining the climate-groundwater trends in relation to flooding and drought and working with IT Carlow on a modelling research initiative.
 - **Coastal Change Initiatives:** In 2020 Geological Survey Ireland continued its participation in a 2-year project on Monitoring Coastal Change from Space with the European Space Agency and partners, with a virtual stakeholder conference delivered by Geological Survey Ireland on behalf of the project partners demonstrating project outputs. In addition, work continued on
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development of Coastal Vulnerability Index (CVI) mapping as a tool for coastal stakeholders. **CHERISH**, the Climate/Heritage InterReg funded project involving Geological Survey Ireland, continued operations in Ireland and Wales. Baseline and repeat UAV surveys were conducted at key sites to identify change. Coastal bathymetry was acquired in Co Kerry to compile seamless onshore off shore maps at cultural heritage sites, and repeat surveys on two shipwrecks were completed. The RV Keary spent 20 days in Welsh waters undertaking seabed mapping operations.

- **Tellus:** The COVID-19 pandemic had a significant impact on the Tellus, the national airborne geophysical and geochemical mapping surveys, during 2020, resulting in delays to operations until late in the year. Despite this, the Tellus team adapted well to the new working arrangements and we were able to develop and implement a new digital data capture system to support the geochemical survey operations. A new soil sampling campaign was started and was at approximately 60% completion when the latest lockdown measures were enforced. During the year a new airborne survey block was also started over south central Ireland which by the end of the year was 50% complete. It is hoped that when COVID-19 restrictions are eased we will be able to finish these surveys and then move on to new survey areas in 2021. New data was released throughout the year including airborne geophysical data for southeast Ireland, new EM inversion datasets and ICP soil geochemistry data for the north midlands. The Terrasoil research project in conjunction with Teagasc continued its analysis of soil samples while a new mineral prospectivity project was initiated during the year.
 - **INFOMAR**, the national marine mapping programme, completed the fifth year of its Phase II programme, which will see all Irish waters mapped by 2026. In 2020 total marine mapping achieved was 9707 sq.km (gross coverage from both Geological Survey Ireland and Marine Institute combined) despite a delayed season start due to COVID-19 restrictions. Nearshore and inner shelf mapping was undertaken by Geological Survey Ireland utilising four survey vessels and focussed on the Celtic Sea off west Cork. Offshore mapping was undertaken by the MI vessels in the Celtic Sea further south again, 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 (DHLGH). An external review was also commissioned and completed in 2020 to assess programme activity and outputs in the context of a developing Irish Offshore Renewable Energy (ORE) Sector and revised targets for offshore wind set out in the 2020 Programme for Government (PfG).
 - **Groundwater: 2019-2021: GW3D Phase II:** Mapping and evaluation of Groundwater resources in the **Leinster region in support of Irish Water and Drinking Water Directive & Plan:** 29 of 32 catchment assessments reports started/drafted. Aim to complete 32 in 2021. These will more comprehensively support the supply of clean drinking water (guidance for better resources) and WFD management (understanding the catchments). Fieldwork to verify desk studies planned for 2021. Geological Survey Ireland also continued participation in the CatchmentCARE InterReg North-South project, which included drilling of a number of monitoring boreholes in key vulnerable catchments.
 - **Geological Mapping (Quaternary & Bedrock Geological Mapping):** Bedrock geological mapping, in follow-up to Tellus surveying, was carried out in Wexford, with publication of a 1:50k map and data package due in 2021. Deep borehole drilling was aimed at further resolving the Carboniferous stratigraphy of the northwest midlands. A 1:50k bedrock map data package of the Cork 'geourban' area was published online. Quaternary mapping in Wexford focussed on coastal geology to contribute to erosion/protection work, with an expanded area to be targeted in 2021. A new 3D geological model viewer was added to our online suite. A
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Field Guide to South Mayo, authored by Dr John Graham, including a new 1:50k map, is at an advanced stage for publication in 2021.

- **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, being operated under contract by SGS.
 - **Geological Heritage:** Donegal and Mayo County Geological Site audits were published in 2020 and audits of Leitrim and Galway City were completed for publication early in 2021. We continue to support the geologists in the UNESCO Global Geoparks. Six Geoheritage grants were awarded to diverse community-led projects around the country. The €1.19 million Joyce Country & Western Lakes project started in January 2020 with the employment of four staff, and is working towards application to UNESCO for Global Geopark status in late 2021.
 - **Minerals:** The Minerals programme is continuing its extensive collaborations with European partners across a wide range of raw materials projects including those under GeoERA described below. A new Quarry Database is being developed linked to the construction materials project and plans for improved market surveillance of the aggregates industry in collaboration with the National Building Control Office. Within the Irish mineral exploration space, the Minerals programme is continuing to collaborate 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.
 - **Information Management:** Geological Survey Ireland is currently building new IT infrastructure working closely with staff in the Department of the Environment, Climate and Communications and the Department of Agriculture, Food and the Marine. The goals are to improve data management, standardise data and provide “Open” access to all Geological Survey Ireland data via a single portal, as front end of the National Geoscience Data Centre (NGDC). It is expected that the new data portal will be launched towards the end of 2021.
 - **Geological Survey Ireland Research Programme** represents and supports Irish geoscience research activities at a national level. In 2020, Geological Survey Ireland funded 17 new Short Call projects across a range of topics. A further five projects in the area of geothermal energy were funded (two co-funded with the EU Geothermica network and three co-funded with SEAI) and two projects co-funded with SFI in the areas of geotechnical assessments for infrastructure and new methods for separating critical minerals. Geological Survey Ireland also hosted the IGRM in 2020 to mark its 175th anniversary. The event was very successful with over 250 attendees in Athlone. In May, Geological Survey Ireland co-hosted a Great Debate at the 2020 European Geosciences Union *Managing our mineral resources for a sustainable future: The role of Earth Scientists*. 2020 also saw the launch of the Earth Surface Research Laboratory based at TCD, with geochemistry facilities open to researchers across the Island of Ireland. Information on all research projects funded by Geological Survey Ireland is available on www.gsi.ie
 - **Outreach/Communications:** Public and stakeholder events were changed, curtailed or postponed in 2020 due to the COVID-19 pandemic. This was somewhat disappointing as 2020 was our 175th anniversary year. Geological Survey Ireland hosted IGRM2020 in Athlone on 28-19 Feb and 1 March, 2020 as a start to our anniversary celebrations. As mentioned above, Geoscience2020 successfully moved to an online platform on 18/19 November with the theme
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of Geoscience for Policy. The online format allowed for more international speakers and delegates and increased attendance. The Geological Survey Ireland sponsored episode on RTÉ's 10 Things to Know About... was on Flooding and Drought in 2020. The programme was very successful, attracting over 186,000 viewers and positive social media feedback, the repeat of the 2019 Metals programme in May also generated big viewer numbers. The Survey participated with EMD at PDAC in Toronto, the world's largest mining conference, including the "Ireland Day" event with Geoscience Ireland, EI and GSNI and hosted a stand at BTYTE with DIAS, National Museum and PAD in January, as well as sponsoring a special award. Other national events such as the National Ploughing Championships were cancelled. There has been continued increase in website visits, data downloads and social media followers.

175th Anniversary: Down to Earth exhibition, co-curated by Siobhán Power, Geological Survey Ireland, and the late Matthew Parkes, National Museum of Ireland, will open to the public when restrictions lift. The Island, a 3-part TV series on the geology of Ireland, part funded by Geological Survey Ireland, will be broadcast on RTÉ and BBCNI in late 2021, if restrictions allow for filming. We hope to publish an Atlas of our data and maps in 2021 and we are planning for another online annual conference, Geoscience2021 in November.

Education: Collaboration with JCT (Junior Cycle Teachers) Geography to run a metals and mining CBA (Classroom-based Assessment) workshop in January 2020. We worked with iCrag to develop a workshop for JCT STEAM on the sustainability in the future. We were able to deliver 2 of 4 workshops before restrictions started. We will be delivering similar resources with both JCT Geography and JCT STEAM in 2021. New content for the Education section of the website will be made public in 2021. The new content will be tailored to suit the National Curriculum.

- **National Committees:** Geological Survey Ireland participates in or supports a wide range of national fora including several related to Water Policy (DHGLH), Office of Emergency Planning (tsunami, ash and flooding) hosted by Dept of Defence, National Landscape Strategy, RIA Geographic and Geosciences Committee, Irish UNESCO Global Geoparks, Open Data Gov, Marine Co-ordination Group, National Standards Authority of Ireland (NSAI) and Dublin Institute of Advanced Studies board. In 2020 DHGLH commenced a new interdepartmental Committee on National Coastal Change strategy, with Geological Survey Ireland participating in both the Steering Group and Technical sub-Committee. In addition, staff members participate in committees of very many of the Geoscience organisations and research bodies such as iCrag, many of which also receive support of funding or corporate membership from Geological Survey Ireland and/or free access to theatre facilities for lectures.
 - **International:** Geological Survey Ireland is active in a number of international Programmes and Networks. Principal among these is EuroGeoSurveys (EGS), the representative body of Geological Surveys, who have an office and secretariat in Brussels, with several Survey staff members engaged in expert groups and projects. 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's 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 will provide access to Pan-European and national geological datasets and services from the Geological Survey Organizations of Europe. Geological Survey Ireland also participates in the Integrated Ocean Drilling Programme (IODP) supporting both the European Management (ECORD) and technical (ESSAC) committees, and North Atlantic Geoscience group (NAG).
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- **Geoscience Ireland:** Further growth of this business cluster occurred in 2020, which is supported by Geological Survey Ireland with Enterprise Ireland and Department of Foreign Affairs and Trade. (see separate report).
- **Staffing:** Long term staff member **Mary Carter retired** during the year while Geological Survey Ireland filled four new permanent technical position by external competition/panels in 2020; Driller **Jason Rehill** joined Geological Survey Ireland Central Technical Services Unit. New Senior Geologists appointed were Dr Ted McCormack in the Groundwater Climate Programme, Mairead Glennon, promoted from Geologist, in the Tellus Programme and Eoin MacCraith with the Marine and Coastal Unit. At year end there was 100 staff, 48 of whom are permanent, including 36 technical/professional staff positions.
- **Buildings/Equipment/Facilities:** This year Geological Survey Ireland commissioned the **Birr Core Store** which has capacity to rack up to 60,000m of drill core. It has taken in approximately 45 pallets of core from exploration companies to date. We have also taken ownership of a new truck-mounted **Commachio MC-T7 drill rig** which will be utilised in continuous flight auger drilling, water well drilling and rotary core drilling. The new rig has completed a field project with auger drilling this year to much success and also a 150mm diameter water well borehole to a depth of 123m. We have two drillers currently attending Carlow IT undertaking the Geo-Driller apprenticeship programme and they are scheduled to complete this in 2021 and 2022. We have cored nearly 1500m for geological mapping projects, drilled 60 boreholes for quaternary mapping and drilled three boreholes on groundwater projects. Geological Survey Ireland's current offices at Beggars Bush are to be renovated and become Departmental headquarters for DECC. The current plan would see Geological Survey Ireland staff move offices, temporarily, to Booterstown and Labs/Storage/Equipment and Library to a facility in City West, Dublin, scheduled for Q3 2021.

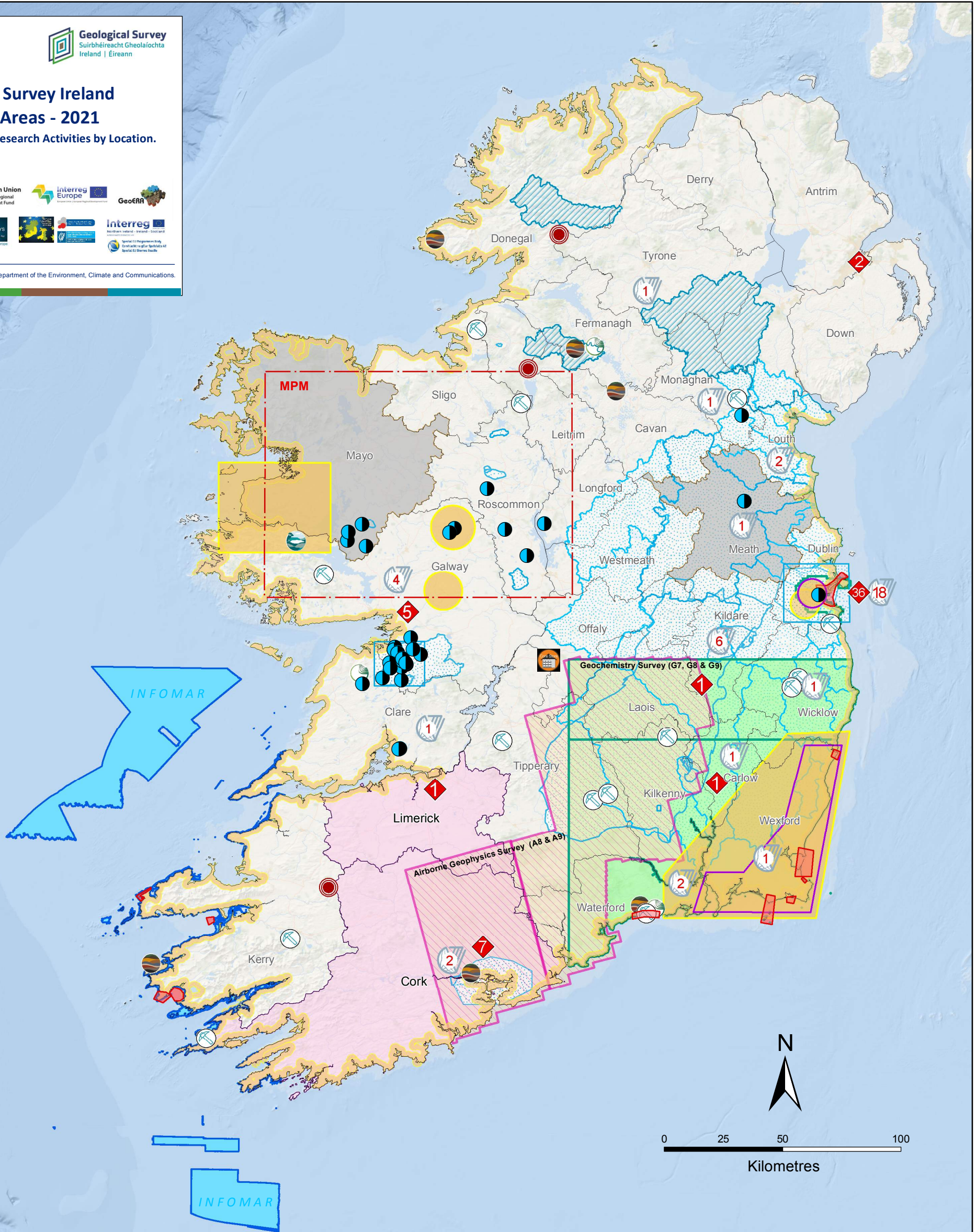
2021 (For field operations see draft activity map)

Geological Survey Ireland Activity Areas - 2021

Survey, Support and Research Activities by Location.



Geological Survey Ireland is a division of the Department of the Environment, Climate and Communications.



Key to Activity Classifications

Groundwater & Geothermal	GW Mapping (GeoERA/Geothermal/GDA Study Area Catchments)	CatchmentCARE (INTERREG)	Groundwater Monitoring Sites
Geological Mapping	Bedrock Mapping	Quaternary Mapping & Geotechnical Data Entry	Landslide project with NPWS
Geoheritage	Geoheritage County Audits (Limerick, Cork)	UNESCO Global Geoparks	Joyce Country & Western Lakes Aspiring Geopark
Minerals	Minerals Quarry Database (Meath & Mayo)	MPM	Historic Mine Sites (Mintell4EU)
Research Projects	53	Number of Geological Survey Ireland funded research projects	
Geoscience Ireland	41	Number of Member Companies (County Indexed)	
Tellus	Airborne Geophysical Survey (A8 and A9)	Geochemistry Survey (G7, G8 & G9)	Geological Survey Ireland Corestore - Birr, Co. Offaly
Marine & Coastal Unit	INFOMAR Survey Area	CHERISH Project (INTERREG)	



Speleological Union of Ireland (SUI)

The SUI is a recent member of the IGN, we were delighted to have been invited last year to meet with other Geoscience bodies. We are the representative body for cavers, the sport of caving and the science of Speleology in Ireland and Northern Ireland.

The past year has been a challenging one for many organisations and the SUI is no exception, one of the greatest blows to our organisation was the unexpected passing of Matthew Parkes, who among many roles was the Librarian for the SUI and a major force for the pursuit of scientific development within the organisation. The SUI Library remains at Beggars Bush, please contact our librarian Des McNally for access.

This year the SUI has been involved in a major Dye Tracing survey at the boundary of the Shannon and Erne Catchments on Cuilcagh mountain near the Cavan border. We would not have been able to carry out this project without the fantastic work of Dr Les Brown and Dr John Kelly, generous funding via CatchmentCare.eu and the EU INTERREG fund, and the assistance of the Geological Survey of Ireland. The results of this work have been the subject of a Film produced and presented at the Northern Ireland Science Festival and change the understanding of the catchment boundaries of these two major river systems.

We continue to work on developing our own scientific funding stream and are very happy to engage with other bodies interested in speleological studies, either via direct assistance, guidance or funding of research.

National Museums Northern Ireland (Ulster Museum)

The geological work of National Museums NI continues with just a single full-time curator (there are also two partially retired zoology curators), but progress has been made towards appointing a new Senior Curator of Natural Sciences. Subject area has not been specified, so the successful candidate may be a geologist!

Many of the museum's usual activities and events have, necessarily, been curtailed but Covid restrictions have provided an opportunity to work on other projects.

Considerable media excitement surrounded formal publication of the evidence for dinosaurs in Ireland, based on two small bones from the Lower Jurassic of Co. Antrim. This is just one of five papers published (currently online) or in press that draws on NMNI specimens and/or expertise. Together they will form part of a thematic issue of *Proceedings of the Geologists' Association* that is focussed on the Jurassic System in Ireland.

Simms, M.J., Smyth, R.S.H., Martill, D.M., Collins, P.C. and Byrne, R. First dinosaur remains from Ireland.

Simms, M.J. Echinoderms from the Triassic and Jurassic of Ireland.

Simms, M.J. and Edmunds, M. Ammonites from the Lias Group (Lower Jurassic, Sinemurian and Pliensbachian) of White Park Bay, Co. Antrim, Northern Ireland.

Jeram, A.J., Simms, M.J., Hesselbo, S.P. and Raine, R. Carbon isotopes, ammonites and earthquakes: Key Triassic-Jurassic boundary events in the coastal sections of south-east County Antrim, Northern Ireland, UK.

Raine, R., Copestake, P., Simms, M.J. and Boomer, I. Uppermost Triassic to Lower Jurassic sediments of the island of Ireland and its surrounding basins.

As a close friend, and sometime caving companion, of Matthew Parkes, my counterpart at the National Museum of Ireland, I wrote an obituary for him in the caving magazine to which we both subscribed for many years.

Simms, M.J. 2020. An unforgettable caver [obituary for Matthew Parkes]. *Descent: The magazine of underground exploration*, **277** (Dec 2020/Jan 2021), 13.

Although face-to-face events have been suspended for the past year, the museum continues to receive enquiries from the public pertaining to aspects of geology. There has also been a demand for online presentations from audiences across Ireland and beyond. In many ways this is a welcome development that has enabled the museum to engage with audiences far beyond its previous geographic range, and it is to be hoped that we may be able to include this element of presentations in the future.

Michael J. Simms

Senior Curator of Natural Sciences

National Museums Northern Ireland

Summary Report for 2019/2020FY

GSNI Science Strategy

The world has changed since GSNI was established in 1947 and last year GSNI began the process of developing an inclusive and holistic Science Strategy to enable the organisation to augment, adapt and re-focus the current work programme to benefit the citizens of Northern Ireland.

External process

A stakeholder survey was carried out online between 15th January and 10th February 2020 through Survey Monkey and attracted 597 responses. The survey was promoted through GSNI social media channels and directly by email to GSNI stakeholders and users of our enquiry service. Questions focussed on the following topics: Environmental Change and Hazard Resilience, Sustainable Resource Management and Decarbonisation, geological mapping and modelling, strategic partnerships, data, communications and education.

Stakeholder and public events

We ran two events for our stakeholders and the general public respectively at Crumlin Road Gaol in Belfast on Thursday 20th February 2020 as part of Northern Ireland Science Festival. The new Director of the British Geological Survey Dr Karen Hanghøj attended and presented at the stakeholder event which attracted 120 delegates. As part of this stakeholder event we summarised feedback from the online survey and hosted 10 thematic round-tables.

Next steps

GSNI is examining and summarise the stakeholder feedback from the themed round-table event; consolidating key strategy themes and carrying out the process of identifying outcomes, actions and measurable targets. This year we will bring our draft strategy to the GSNI Science Advisory Committee and consult our stakeholders and the public.

GSNI Science Advisory Committee

Under the terms of the Service Level Agreement (SLA) that the GSNI works to for the Northern Ireland Department of Economy, a new GSNI science advisory committee (SAC) was formed and held its first meeting on 19th September 2019. The main purpose of which is to advise GSNI on the development and delivery of its public role and science strategy; following a call to over twenty organisations from across government, academia, industry and the third sector for nominations to the SAC; 20 scientists and technical professionals were appointed to join GSNI's new SAC.

Groundwater Stakeholder Resources Group

The Groundwater Stakeholder Resources Group established by GSNI in 2018 aims to identify gaps that exist in the sustainable use and management of groundwater resources in Northern Ireland and to make proposals to the relevant government departments for progress towards more sustainable use of groundwater resources. These gaps include knowledge, educational, policy, regulatory, skills and awareness gaps. These outcomes will inform future work programmes for GSNI and its collaborators. The group meets twice a year preceded by some form of visit to a practical groundwater site. In October

2019, the group visited the shallow geothermal groundwater system that now cools the Biological Sciences building at Queen's University.

Cross-departmental consultations

Over the past year, GSNI has responded to the DAERA Science Strategy Framework, the DAERA Environment Strategy for Northern Ireland, and more recently have worked on the response to the Belfast City Council Draft Belfast Resilience Strategy and the DAERA Green Growth Strategy.

One of the most significant pieces of work has been GSNI's contribution to the Northern Ireland Department for Economy's Call for Evidence for its Energy Strategy. GSNI's submission in February 2020 was one of 166 submissions from across NI's civic society. This marks the beginning of a process that will shape and inform an Energy Strategy for Northern Ireland that will enable new and challenging decarbonisation targets as the UK has committed to a 100% reduction in greenhouse gas emissions by 2050. As a consequence of this submission, GSNI scientists were invited to join DfE's Heat Working Group on the Energy Strategy; GSNI also moved within DfE to join its Energy Group.

Catchment Care

Work continued on the €12M EU-funded Catchment Care project in collaboration with BGS, the Geological Survey of Ireland (GSI) and Agri-Food and Biosciences Institute with bore well drilling and catchment monitoring in selected cross-border catchments.

GSNI is working collaboratively with GSI on the groundwater monitoring borehole installation in Northern Ireland and in the adjacent counties in the Republic of Ireland. So far, a scoping study has focused on where the boreholes should be located to optimise their value for gathering long-term groundwater data. Contracts were drawn up for drilling, surface geophysics, groundwater sampling and monitoring, pumping tests and spring flow gauging.

Northern Ireland Coastal Forum Working Group

Ministers from both DAERA and DfI NI government departments established the Coastal Forum in 2015 to bring together relevant government departments, local councils and other interested parties to discuss coastal management issues and to consider if a strategic approach to tackling such issues could be adopted.

Two working groups were established, the Coastal Planning Working Group and the Coastal Forum Working Group, both of whom would feed into the overarching Coastal Forum. Given GSNI's knowledge of both the bedrock and superficial geology of the coastline and the processes that act upon them, we attended meetings of both working groups.

One of the main outputs of those two working groups was the Position Paper to Inform Councils' consideration of Coastal Change when preparing Local Development Plans. This Paper recognises the difficulties that Councils face with respect to coastal management, many of which have arisen because of the absence of systematic collection of data to measure how the Northern Ireland coast is changing with time. Because of this work, GSNI is now part of the Coastal Forum Working Group, which is the mechanism through which coastal management issues are being considered and progressed collaboratively by central and local government and the National Trust.

Platform for Atlantic Geohazard Risk Management (AGEO)

The Platform for Atlantic Geohazards Risk Management (AGEO) is funded under the Interreg VB Atlantic Area programme and is for a total of €2.5 million between 2019 and 2022. AGEO is being led by the University of Lisbon and GSNI are one of 12 partners involved in the project that will see the launch of seven Citizens' Observatories across France, Portugal, Spain, Ireland and UK. The aim is to encourage

local communities to actively participate in geohazard monitoring, and to enhance local capacity in risk management.

Emergency Response Plan: Incorporating mine rescue capability

GSNI continued to work closely with the emergency services, Department of Justice and other stakeholders on the Northern Ireland Abandoned Mine Emergency Response Plan. The plan puts in place the multi-agency process and procedures in the event of an incident at any of Northern Ireland's 2,400 abandoned mine workings. Throughout the year GSNI have continued to coordinate regular meetings with all key stakeholders as well as updating risk assessment information packs.

On 1st January 2020, the Department officially joined the Mine Rescue Scheme. This has greatly enhanced the capacity of the Emergency Response Plan as it puts in place cover to carry out underground rescues in the event of a person trapped within a disused mine. This service will be carried out by MRS Training & Rescue, a global operating specialist rescue service with over 100 years of experience of working and carrying rescues in dangerous underground environments. As well as GSNI responders, MRS will also provide a 24/7 call out service if such an incident occurs.

GSNI Core Store

The GSNI core archive constitutes a valuable resource for Northern Ireland. Research is encouraged to add value to the archive. In 2019/2020 much of this initial research came to fruition. Some of the research on the GSNI core archive forms part of a larger collaborative study of the Triassic-Jurassic boundary and the GSNI holds cores across this important stratigraphical boundary that have been sampled extensively by researchers. At least 180 biostratigraphy samples, 320 geochemical samples and 54 palynology samples have been analysed and over 320 fossil samples collected. In 2019/2020 two peer-reviewed papers were published that used GSNI core archive data and five papers were in review or in press. The archive has contributed material for one undergraduate project, six post-graduate and two post-doctoral research projects.

CCEA Geography Subject Advisory Group

Studying geography at post-primary school is one of the few ways that young people find the gateway to geoscience and offers valuable encouragement for many students who then go on to study geology at a higher level. The value of geography as key conduit for geoscience is emphasised even further as the NI Skills Barometer compiled by the University of Ulster has identified an under-supply of skills in the physical and environmental sciences sector in both the short and long term. Given the skills gaps identified, GSNI was delighted to be invited onto the Geography Subject Advisory Group by the Council for Curriculum Examination and Assessment (CCEA), to help shape and inform the future development of the geography curriculum for our post-primary schools.

Cross-Departmental Working Groups

The 2019/2020 financial year saw an important new development in the work of GSNI with the invitation to take part in a number of significant cross departmental working groups. This shows recognition for the value and importance of the work done by GSNI and the substantial contribution that GSNI can make to a range of issues including energy, infrastructure and the environment.

Many of these cross-departmental working groups have been established to address the potential impacts and effects of climate change and show a real positive deviation towards multidisciplinary approaches to solve complex issues. Some of the working groups that GSNI are now represented on include the DAERA-led Climate Change Adaptation Sub-Group, the DAERA-led Climate Adaptation Sub-Group, the DAERA-led Future Generations Working Group, the DfE led Heat Policy Working Group and the previously mentioned joint DAERA and DfI led Northern Ireland Coastal Forum.

INQUA Congress

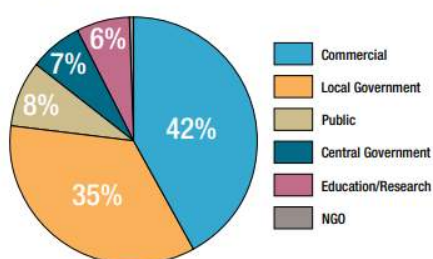
The International Union for Quaternary Research (INQUA) congress, held every four years, took place in Dublin, July 2019. GSNI were part of the local organising committee since 2014, and involved with promoting and organising the congress as well as securing sponsorship. Combined with staff from the BGS, GSNI involved with running and participating in over 27 scientific sessions during the congress across a huge range of topics. GSNI attended a meeting at the GSI on the International Quaternary Map for Europe where and we are now a UK representative. GSNI sponsored an expo stand at INQUA, which allowed the All Ireland Quaternary Map to be included in every delegate conference pack. GSNI also had a 1000 piece jigsaw of the All Ireland Quaternary map on the stand. This attracted many puzzle aficionados and a Twitter competition was run to win a copy and help to promote the GSNI brand. The display copy was also donated to the Irish Quaternary Association.

Enquiry service

GSNI responded to 626 enquiries. The sector represented and enquiry type have been collated from the enquiries database and are shown in the charts below.

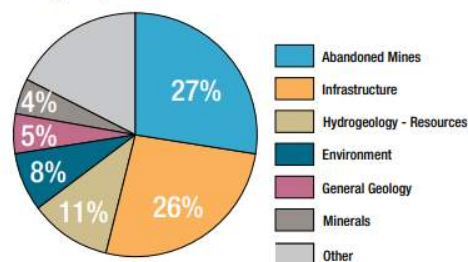
2019-2020
626
ENQUIRIES

Sector



Category

Enquiry category	%
Abandoned Mines	27
Infrastructure	26
Hydrogeology	11
Environment	8
General Geology	5
Minerals	4
Other	19



Categories of enquiry
responses in 2019-2020.

Soil Science Society of Ireland



Activity Summary 2020 *Upcoming Activities 2021*

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.

Due to COVID-19 restrictions, normal SSSI activities were limited somewhat, but we did organise an online event to mark World Soil Day, 5 December 2020, with the theme of: Keep Soil Alive, Protect Soil Biodiversity. This included short video clips highlighting aspects of soil biodiversity and its protection, hosted on the SSSI YouTube channel.

Upcoming activities we hope to organise include:

- Scientific field meeting, September/October 2021. Likely focus: peat bogs and climate change.
- Public awareness event to mark World Soil Day, 5 Dec 2020.
- International Soil and Tillage Research (ISTRO) Conference 2022



5 DECEMBER 2020
World Soil Day
Keep soil alive,
protect soil biodiversity



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.





The Geothermal Association of Ireland

Ground Source Heat Pumps and Deep Geothermal Energy

Geothermal Association of Ireland. 2020-2021

Report to Irish Geoscience Network February 2021

Membership & AGM

- Membership has remained steady at the association throughout 2020 with a 15% increase in student membership. Causeway Geothermal joined the GAI as a new corporate member in 2021.
- The AGM was held online on the 17th of December 2020. The main activities of the association were presented and the final consultation version of the GAI Strategy for Geothermal energy development to 2030 was discussed.

Website & Social Media

- Twitter remains the main social media platform for the association
- The new GAI website is in final development phases and should be online by mid-2021

Publications

- GAI Scientific Newsletter 26 was published in December 2020 for paid members
- The current status of the utilisation of geothermal energy in Ireland is presented in the 'Geothermal Energy Utilisation - Ireland Country Update' published in the Proceedings World Geothermal Congress 2020

Projects

GAI is actively involved in participating and facilitating the dissemination activities of a number of EU funded projects – these include:



GEO-URBAN



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News & Activities

- GAI has published a Strategy document outlining the vision for the development of the geothermal sector to 2030 (*All Island Strategy For Geothermal Energy Development To 2030*). The contribution of both ground source heat pumps and deep geothermal are highlighted in the context of the targets set out in the Climate Action Plan for the retrofit of buildings and decarbonisation of the heat sector. **The consultation is open until mid March – please contact the secretariat (info@geothermalassociation.ie) for a copy.**
- A revised version of the 'Guidance Document Completion, Installation & Testing Of Closed & Open Loop Heat Exchangers' (Rev B – April 2020) has been published. The document represents a revision on the installation of closed loop borehole heat exchangers in line with the prEN17522 expected for final publication in Q3 of 2021. This document is available as a technical reference manual for our paid members.



The Geothermal Association of Ireland

Ground Source Heat Pumps and Deep Geothermal Energy

- GAI has been actively participating in the development of Standard Recommendation document published by the NSAI in 2021 (*Standard Recommendation S.R. 50-4:2021, Building services — Code of practice — Part 4: Heat pump systems for dwellings*) which set out the best practice guidance in the design, installation and commissioning of ground source heat pump systems using closed loop and open loop collectors. The new document act as the main reference for all designers and installers of heat pump systems in Ireland. Whilst geothermal is one of the technologies represented, the document covers **all** heat pumps and has had contributions from many stakeholders active in the sector.
- In December 2020, GAI participated to the *Building Back Better – a Future for Geothermal Energy in Northern Ireland* conference and presented the opportunity for shallow geothermal systems in the building retrofit scenarios being considered as part of the Energy Strategy under development by Department for the Economy.
- GAI has joined Renewable Energy Ireland (www.renewableenergyireland.ie). The REI was established in January 2019 as an open partnership of sustainable energy associations working collectively to support the energy transition in Ireland. The REI members shared vision is that by 2050 Ireland will be energy independent through using indigenous, clean, carbon-free renewable energy supported by, and supporting, communities across our country. GAI has been actively promoting geothermal in the development of the REI's Heat Roadmap document that is due for publication in Q2 of 2021.



Acadamh Ríoga na hÉireann Royal Irish Academy

Geosciences and Geographical Sciences Committee

Report to Irish Geoscience Network meeting 5 March 2021

Committee members:

Koen Verbruggen, Geological Survey of Ireland (Chair)
Nuala Johnson, Queen's University Belfast (Vice-chair)
Peter Mooney, Maynooth University (Secretary)
Chris Bean, Dublin Institute for Advanced Studies
Avril Behan, Technological University Dublin
Mary Bourke, Trinity College Dublin
Marie Cowan, Geological Survey of Northern Ireland
Peter Coxon, Trinity College Dublin
Catherine Dalton, University of Limerick
Federico Ferretti, University College Dublin
Alun Jones, University College Dublin
Gerry Kearns, Maynooth University
Deirdre Lewis, SLR Consulting
Marie Mahon, NUI Galway
Jennifer McKinley, Queen's University Belfast
George Sevastopulo, Trinity College Dublin
Graeme Swindles, Queen's University Belfast
John Walsh, University College Dublin
Andy Wheeler, University College Cork

Teresa Gallagher, Royal Irish Academy (Programme Manager) t.gallagher@ria.ie

The Geoscience and Geographical Sciences Committee is an all-island multidisciplinary committee formed in September 2014. The purpose of the multidisciplinary committee is to advise the Academy on the development of policy, address issues of concern through a programme of works and act as the national adhering organisation for the following international unions: International Union of Geodesy and Geophysics (IUGG); International Union for Quaternary Research (INQUA); and International Union of Geological Science (IUGS). Its membership represents academia, industry and national organisations.

The Committee met three times in 2020. At the start of 2020 two activities in the geosciences were planned.

- Oireachtas Science Pairing Scheme – this activity supported by the GSI would see Members of the Oireachtas paired with scientists and researchers working on issues of relevance in their constituency or committee work. The topics under consideration cover some of the key issues facing Ireland today, including housing, rural sustainability and energy.

- Gender, Power and Knowledge – a half day conference to explore the problems and issues associated with the retention and progression of women in the geosciences, both in industry and academia

The first of these was initially put on hold due to the general election, and subsequently remained on hold due to the pandemic. It has been agreed that it will be relaunched once it is safe for it to run as planned with in-person meetings and field visits.

The second has been largely postponed due to COVID19. However, planning is ongoing, and three panel themes have been identified:

- Gender and Knowledge: Making the Graduate Experience in Geography and the Geosciences
- Panel on the Athena SWAN process in Ireland
- Achieving gender equity in the Geosciences and Geographical Sciences

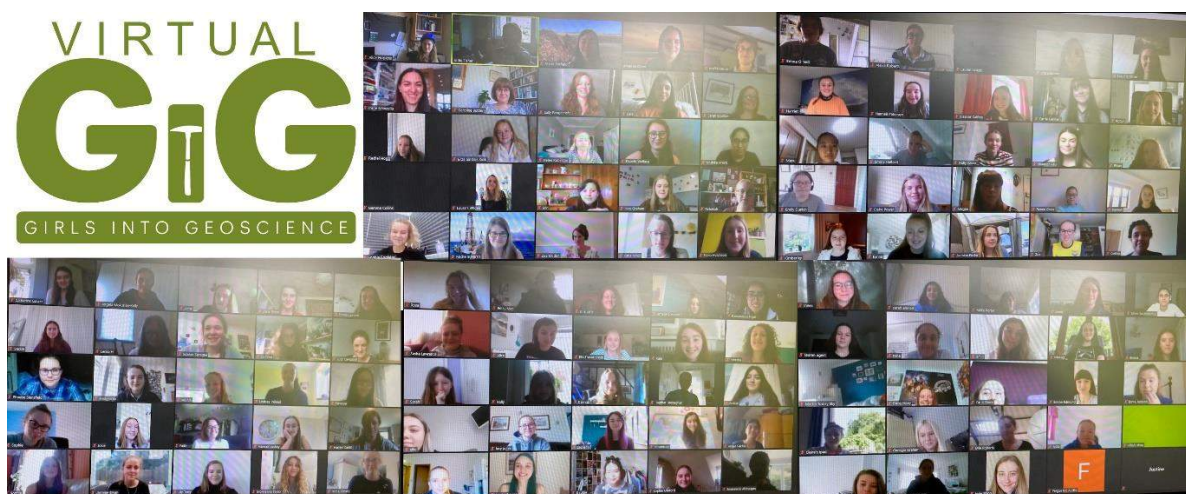
It is hoped the event will be able to run in late 2021.



Girls into Geoscience – Ireland 2020

Girls into Geoscience – Ireland (GiGie) is an exciting initiative to introduce female-identifying school and university students to the Earth Sciences and demonstrate the world of careers open to geoscience graduates. The Irish chapter of Girls into Geoscience (GiG) was started in 2018 and is run by a rotating organising committee of inspirational women and allies in the geosciences, overseen by the Irish Centre for Research in Applied Geosciences (iCrag) Education and Public Engagement team.

The global pandemic presented a huge challenge for holding an in-person GiGie event in 2020. The decision was made to postpone the in-person event for 2020, and to host an online event instead. GiGie came together with GiG England, GiG Scotland and GiG Wales to create an online event filled with workshops, panel discussions, talks and two virtual field trips. The event was attended by 266 participants, some joining from as far afield as Dubai and India. Following the success of the online event in 2020, the four GiG chapters will be combining again for another virtual event in 2021.



Pictured: Attendees of Virtual Girls into Geoscience 2020

Though creating challenges, the global pandemic has also presented opportunities for GiGie. GiGie has taken the opportunity to create a brand new webpage (<https://www.girlsintogeoscienceireland.com/>). The new site is much more user friendly, more aesthetically appealing and contains new contact features. In addition to this, the website hosts the GiGie blog. Each month, an inspiring role model (female-identifying or an ally) writes a post for the blog about something important or interesting to them and their geoscience journey. We are actively recruiting new role models to write posts for us. If you are interested, please get in touch.

Moving forward, GiGie is working on the development of a new format for the programme to allow it to reach larger audiences and to conduct deeper engagement. This will include the addition of a new stream aimed at working directly with Transition Year students over a series of visits and working with guidance councillors. The new format has a current planned roll out of September 2021.



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19 February 2021
Our Ref: IBN/0221/IGN

Karen-Lee Ibbotson, (Executive Secretary)
The Institute of Geologists of Ireland
63 Merrion Square
Dublin
D02 TW21

Dear Karen,

Re: Irish Geoscience Network meeting - Annual Summary

We are pleased to provide a summary of the IBN's activities since the previous Irish Geoscience Network meeting. Like most organisations 2020 has not been without its challenges, however, the IBN has shown great resilience and increased its activity over the year culminating with our first ever Webinar.

The year started with a change in leadership as Ann Marie Casey, stood down and was replaced by David Kerr as Chair. We are indebted to Ann Marie for the effort she put into the IBN as Chairperson in recent years and in particular driving the IBN's asbestos in soil guidance document. In addition to Chairperson the IBN Executive Committee had a shuffle in personnel including some new positions:

- Vice Chairperson - Christopher Newton
- Treasurer – Dr. Siobhan Cox
- Membership Coordinator -Anne Marie Casey
- Event Coordinator - Owen Williams
- Liaison Officer – Dr. Rory Doherty -
- Policy Coordinator - Olivia Holmes
- Secretary - Dr. Olivia Hall
- Technical Advisor - Claire Clifford
- Academic Advisor – Dr. Chaosheng Zhang

With renewed impetus we sought in 2020 to continue the progress we made in 2019, promoting good practice in the assessment of brownfield land. We published in final draft the 'Management of Asbestos in Soils' guidance document, following very useful feedback on earlier drafts from Northern Irish Environment Agency, Dr. Simon Cole (SoBRA and AECOM), Dr. Paul Nathanail (Land Quality Management) and Geological Survey Ireland. This is due to be finalised during spring 2021, based on comments from the Irish Environmental Protection Agency.

In early 2021 we also released a position statement entitled 'Demonstrating Competency in Contaminated Land'. This presents a framework under which practitioners can work towards and



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present their competency in their individual specialist area. It is hoped that by publishing this Position Statement, practitioners and industry will adopt an approach that will encourage the continual improvement and advancement of a complex discipline.

During the past twelve months we have started to established various subgroups:

- Professional Competency Good Practice;
- Waste & Resources; and
- Emerging Contaminants.

The 'Demonstrating Competency in Contaminated Land' document was the outcome of one of these new subgroups. 2021 has the potential to bring further exciting developments as we hope to establish further sub-groups. We recently launched an Early-Careers Sub-Group with the aim of bringing together a network of young professionals involved in, or seeking to be involved in, brownfield redevelopment, and to provide networking opportunities, advice, complementary training options for professional development and to encourage professional qualifications with relevant bodies.

Our year finished on a high with a webinar entitled "Waste soils on development sites on the island of Ireland" held jointly by the Institution of Environmental Sciences (IES) and the Ireland Brownfield Network (IBN). The event presented speakers from the Irish Department of Communications, Climate Action and Environment, The Irish Environmental Protection Agency and the Northern Irish Environment Agency. The event was over-subscribed, very well attended on the day and well received. Encouraged by this we propose to jointly host further webinars on related matters.

In summary, 2021 has proved to be a very busy and successful year for the IBN. We continue to receive new members with a passion for brownfield matters and this will help us continue to maintain this success through the coming year and beyond.

Yours Sincerely

David Kerr
Chairperson

Christopher Newton
Vice Chairperson

Ireland Brownfield Network
Tel. +44 7403 893 560
Email. info@irelandbrownfieldnetwork.com

On behalf of the IBN Executive Committee



Irish Geological Association - Founded in 1959

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.

2020/2021 has been an unusual year to say the least, a lot of our events have had to be cancelled because of COVID-19 but we managed to move a lot of events online and we are hoping to keep on sharing our events online after we return back to normal.

2020-2021 Events

January 2020	<ul style="list-style-type: none"> Geology Week in Portlaoise Library with Michele Castiaux (outreach events)
February 2020	<ul style="list-style-type: none"> Lecture by Prof. Pete Coxon (TCD) Day Excursion to Navan Mine, Boliden (Wait list only at this stage)
March 2020	<ul style="list-style-type: none"> Lecture by Amy Dugdale POSTPONED 4 day trip to Belgium CANCELLED
June 2020	<ul style="list-style-type: none"> Lecture by Amy Dugdale (NUI Maynooth) on Zoom
July 2020	<ul style="list-style-type: none"> AGM Virtual Show and Tell
August 2020	<ul style="list-style-type: none"> Virtual Show and Tell
September 2020	<ul style="list-style-type: none"> Field trip to Kiltorcan, Co. Kilkenny with Maria Cullen (IGA) and Dan O'Neill (quarry owner) IGA Memorial Gold Panning Field Trip with Frank Clissmann (IGA) Lecture by Dr. William Foster (UCD) on Zoom
October 2020	<ul style="list-style-type: none"> Lecture by Dr. Juan Diego Rodriguez Blanco (TCD) on Zoom
November 2020	<ul style="list-style-type: none"> Lecture by Dr. Michael J. Stock (TCD) on Zoom 3x lectures by Dr. Ian Sanders (TCD) on Zoom (3 out of 4)
December 2020	<ul style="list-style-type: none"> Lecture by Dr. Ian Sanders (TCD) on Zoom (4th of 4) Lecture by Dr. Kate Kiseeva (UCC) on Zoom

	<ul style="list-style-type: none"> • Virtual Members' Night • GV Du Noyer Awards
January 2021	<ul style="list-style-type: none"> • CGA/IGA/GGA lecture by Dr. Chris Standish (Univ. of Southampton)
February 2021	<ul style="list-style-type: none"> • Lecture by Dr. Robin Edwards (TCD)

Forthcoming 2021 Events

March 2021	<ul style="list-style-type: none"> • Isabel O'Brien (Open University graduate and IGA stalwart) on geohazards associated with the Campei Flegrei volcanic field in Italy, 10th • AGM, 31st
April 2021	<ul style="list-style-type: none"> • Jennifer Scully (NASA) on Planetary Geology, 14th
May 2021	<ul style="list-style-type: none"> • Bill Sheppard on Geology and Medieval Irish History, 12th
June 2021	<ul style="list-style-type: none"> • Ed Jarvis (UCC) on Mary Anning, 23rd • Members' Night • Show and Tell (TBC)

Field trips and other events to be included in the programme as COVID-19 restrictions ease up.

Possible field trips are:

- Weekend Workshop on Geomicrobiology at Miner's Centre, Glendalough with leaders Maria Cullen & Howard Fox (OPW) in Association with National Parks and Wildlife Service
- Weekend Excursion to Bere Island and Allihies, Co. Cork
- Day Excursion to Lough Bane, White Lough, Fore area, Co. Westmeath
- Goldpanning Day Excursion in memory of Peter Lewis

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/>

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

IGA Council 2020-2021

President: Michèle Castiaux Incoming Vice President: Laura Smith Outgoing Vice President: Maria Cullen Treasurer: Dan O'Neill Excursions Secretary: Howard Fox Lecture Secretary: Dr. Patrick Roycroft Sustaining Membership Secretary: Frank Clissmann	Health & Safety Officer and Minutes Secretary: Daniel O'Connell Cork Rep.: Dr. Bettie Higgs Newsletter Editor: Tom McGoldrick Margaret Franklin Ed McKenna Website Manager: Niall Reenan Auditor: Michael Shorten
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The Irish Geological Association wishes to thank all of our leaders, speakers, workshop teachers, participants, members and sustaining members for such excellent support!



Report from the Irish UNESCO Global Geoparks Committee – 2020

The Irish UNESCO Global Geoparks Committee (IUGGC) operates on an all-Ireland basis to allow for networking and exchange of knowledge from all those involved and interested in UNESCO Global Geoparks across the island. Membership of the IUGGC consists of representatives from both Ireland and Northern Ireland.

Members:

Kirstin Lemon (Chair) – Geological Survey of Northern Ireland
 Siobhán Power (Vice-Chair) – Geological Survey Ireland
 Gráinne O'Connor – Marble Arch Caves UNESCO Global Geopark
 Martina O'Neill – Marble Arch Caves UNESCO Global Geopark
 Carol Gleeson – Burren & Cliffs of Moher UNESCO Global Geopark
 Eamon Doyle – Burren & Cliffs of Moher UNESCO Global Geopark
 Robbie Galvin – Copper Coast UNESCO Global Geopark
 Mike Sweeney – Copper Coast UNESCO Global Geopark
 John Galloway – Copper Coast UNESCO Global Geopark

Active applications:

- No current active applications
- An application has been submitted to UNESCO from the Mourne Gullion Strangford Aspiring UNESCO Global Geopark. As this is entirely in NI, the application has to be submitted through the UK National Committee for UNESCO via the UK Committee for UNESCO Global Geoparks.

Interested territories:

- Antrim Geopark
- Joyce Country & Western Lakes Geopark Project

Committee Activities

Meetings

- The Irish UNESCO Global Geoparks Committee organises an annual Irish Geoparks Forum to allow for networking and engagement amongst all those interested in UNESCO Global Geoparks on the island of Ireland. In 2020, this event took place virtually and over 70 people attended. The theme of the forum was 'Geoparks and Resilience' and the keynote speaker was Dr Kristin Rangnes the Co-ordinator of the European Geoparks Network and Director of GeoNorvegica UGGp, Norway.

Mentoring

- Geological Survey Ireland is lead partner on a €1.19 million Project Ireland 2040 project to prepare Joyce Country and Western Lakes geopark (Mayo/Galway) for UNESCO Global Geopark status. Other partners in Údarás na Gaeltachta, Mayo and Galway County Councils, Fáilte Ireland, and Coillte.

- GSNI are working closely with Antrim Geopark and have established a small working group to move the project forward. This is being led by the Causeway Coast and Glens Heritage Trust with assistance from Causeway Coast and Glens Council.

Updates from individual UNESCO Global Geoparks

Burren and Cliffs of Moher UNESCO Global Geopark

- Many Geopark Staff were redeployed to work on the Clare County Council Covid-19 Community Helpdesk; a service that provides supports to those impacted by the Covid-19 lockdown using local community volunteers, the Red Cross and other agencies, as well as a befriending service for those struggling with isolation.
- Many tourism businesses in the Geopark are struggling, as elsewhere, however the Geopark has been contributing to the tourism department of Clare County Council and the Burren Ecotourism Network who have initiated a number of promotional marketing events to maximise the potential of 'Staycations'.
- Progress continues on the Atlantic Geoparks project along with the two other Irish UNESCO Global Geoparks. This project ends in November and has developed transnational digital marketing and promotional tools to promote a new European Atlantic Geotourism Route uniting Geoparks across Ireland, UK, Spain, Portugal and France.
- Fortunately, while other events have been cancelled or restricted, research has continued in the Geopark with a number of palaeontology papers being prepared and submitted.

Copper Coast UNESCO Global Geopark

- The Copper Coast Visitor Centre has reopened in an altered format to accommodate Covid-19 regulations and has been well received. There have been lots of visits from locals and Irish nationals.
- Work is progressing on a visitor app as part of the Atlantic Geo tourism Interreg project.
- Socially-distanced private tours have been organised for small groups and families. A new series of interpretation signs is currently being installed around the coast to encourage visitors to explore less visited places

Marble Arch Caves UNESCO Global Geopark, Northern Ireland/Ireland

- The cross-border nature of the Geopark has presented challenges particularly in relation to cross jurisdictional differences in timing and nature of measures introduced during 'lockdowns' in the UK and Ireland which the Geopark team has worked innovatively and creatively to overcome. Specific areas worthy of note are:
- Site management and maintenance standards were and continue to be held to the highest possible level in extremely challenging circumstances.
- The Geopark has elevated its resource input to on-going mentoring and support to Geopark Ambassadors to enable them to develop create approached to activity delivery and facilitate engagement activities within their respective Geopark Communities where possible.
- The Geopark has worked in partnership with key stakeholders to create and deliver a diverse engaging activity programme across throughout 2020.
- MACUGGp has engaged in active sharing of knowledge, information and expertise on educational activities with a number of other UGGps throughout the Pandemic.
- Funding has been secured across a number of different funding streams for a diverse array of initiatives in the last number of months, providing a strong focus on rejuvenating the local business sector and strengthening local communities' including the Geopark Business Programme, Heritage Champions Programme and Community Hubs initiative.