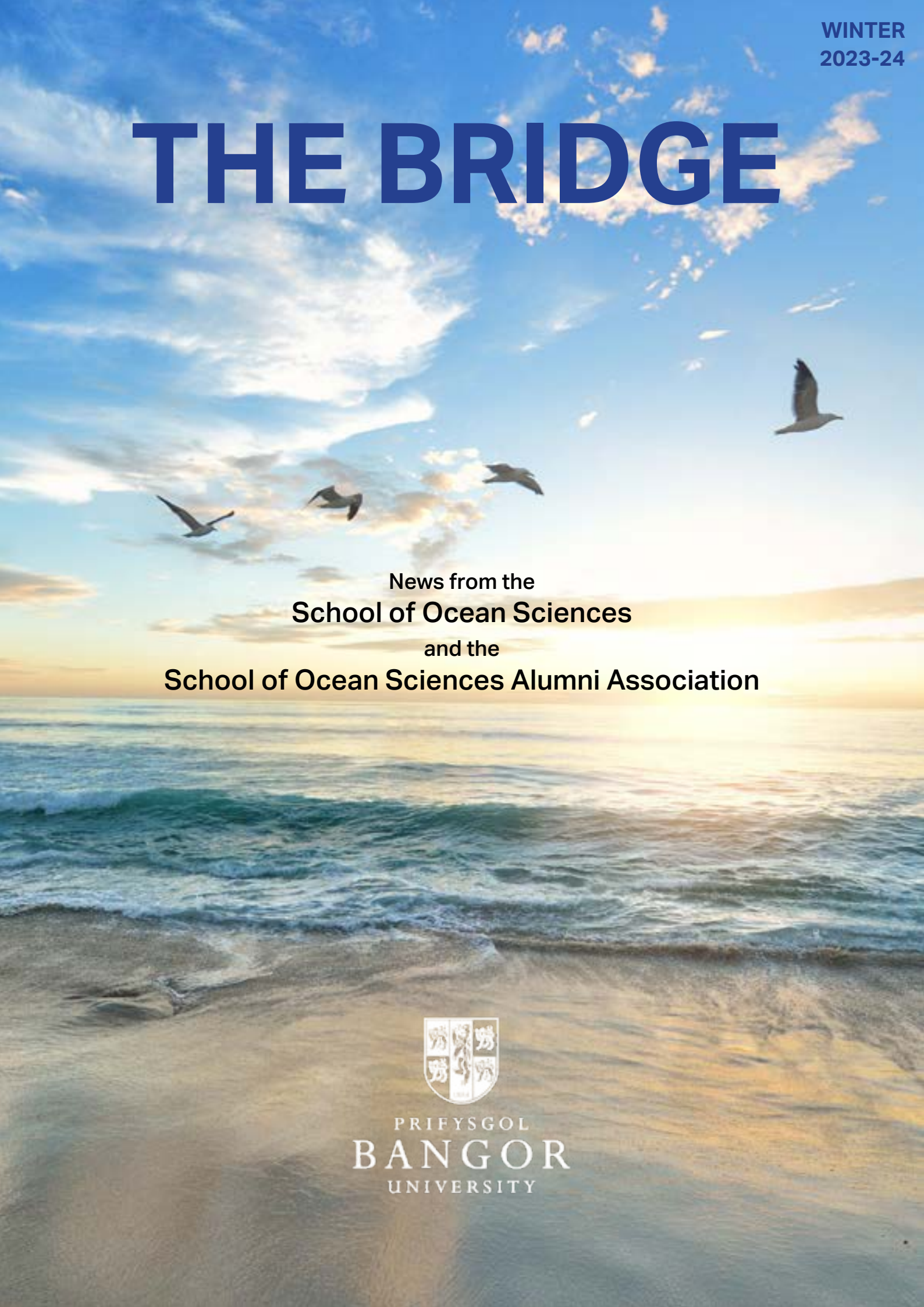
WINTER
2023-24

THE BRIDGE



News from the
School of Ocean Sciences
and the
School of Ocean Sciences Alumni Association

PRIFYSGOL
BANGOR
UNIVERSITY

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THE BRIDGE Winter 2023-24

Please send your news to:
l.haggett@bangor.ac.uk

THE BRIDGE

The newsletter of the School of Ocean Sciences and our alumni.

Aiming to keep all those interested informed of developments both in the School in Menai Bridge and globally through our vast network of alumni. By linking past, present and future potential students we hope to facilitate a network of marine scientists in support of pushing back the frontiers of our science and in providing a bridge between academic research and the offshore industry.

Edited by Tom Rippeth

Don't forget that you can catch up on previous editions of "The Bridge" online by visiting:
https://www.bangor.ac.uk/oceansciences/newsletter.php.en

2024 OPEN DAYS

Friday, 26 January 2024
- dedicated event for those wanting to start in September 2024

Saturday, 29 June 2024
Saturday, 17 August 2024

Welcome to the Winter 23/24 Edition of The Bridge

As you can see we've had a busy few months since the last edition and we have much to celebrate.

In September we welcomed one of our largest ever cohorts of new students to Ocean Sciences and in the New Year we look forward to welcoming 5 new members of academic staff to the school to support teaching and develop new areas of research. We also plan to launch new MSc courses in Marine Top Predator Ecology and Digital Ocean in the new year.

Following our strong performance in the most recent Research Excellent Framework last year, we are delighted to report that the major impact of our research on detecting COVID in wastewater has been recognised through two major awards.

The world leading nature of our research has also been recognised through the award of the Dillwyn medal to **Dr Iestyn Woolway**, hot on the heals of **Professor Yueng-Djern Lenn**'s American Geophysical Union Award at the end of last year.

Looking forward 2024 we not only celebrate the 140th Anniversary of Bangor University, but also the 30th Anniversary of the School of Ocean Sciences Alumni Association (SOSA). As you'll see we already have a number of events lined up for that celebration and look forward to welcoming many alumni back.

As always we are grateful to our alumni in supporting our current students through scholarships and are delighted to announce the first winner of the "Buchan Award" so generously financed by alumni in recognition of memory of **Sinclair Buchan**.

We hope you enjoy this edition of The Bridge.

With best wishes,

Professor John Turner (Head of School) & Professor Tom Rippeth (Editor)

MESSAGE FROM THE CHAIR OF SOSA

So, after more than 43 years working in the offshore sector, I have retired from commercial activities; a decision that has been difficult to come to as, with very few exceptions, I have thoroughly enjoyed my career.

Indeed, I have taken the liberty of writing an article for this newsletter detailing the highlights, and some of the lowlights, of the past 43 years. It goes without saying that I owe a deep debt of gratitude to the School of Ocean Sciences for providing me with the necessary background in marine geophysics, geotechnics and oceanography to facilitate such a rewarding career and, last not least, introducing me to my wife Christine, to whom I have been very happily married since 1980.

You will note above that I said 'commercial activities'. For many years, I have been lucky to have been involved in a number of associated pro bono roles of which Chairing the School of Ocean Sciences Alumni Association (SOSA) is one. And, I intend continuing doing my best to contribute positively to these roles in my 'retirement'. I may even have a bit more time to devote to these roles. But I also have a number of extraneous activities to indulge in including avidly watching and writing about rugby now I no longer play or coach, maintaining our very large garden, improving my photography, listening to more music and finally continuing to keep fit to stave off old age and to keep up with my wife (who is extremely fit), children (Christian & Stefan) and recently acquired grandchild, Benji. Benji was one in September, and we spent a month in California celebrating his milestone around that time. You have to be very fit to keep up with a one year old!

The offshore site investigation and geotechnical international conference that I mentioned in my previous Chairman's letter and that was held at Imperial College in London in September was a huge success; both technically and commercially. Organised under the auspices of the Society for Underwater Technology (SUT), 600 marine geoscientists attended the 3-day conference from all around the globe. We were treated to some 250 technical presentations and the conference was topped off by a dinner at the amazing and atmospheric Natural History Museum, adjacent to Imperial. This conference emphasised the demand for marine geoscientists and the contribution that such personnel are making to the 'Energy Transition' and our attempts to arrest adverse climate change.

As promised, the newly resurrected post-Pandemic SOSA committee comprising many new and young members, met in face-face and online form in June and September with our next meeting scheduled for early December. I am pleased to report that the 30th anniversary reunion scheduled for 24-26th May, bank holiday weekend, is largely planned and in place. So, make a note in your diaries and book your tickets soonest. We have a limit on numbers for the reunion dinner to be held at Reichel on the Saturday evening, so get in early to ensure your place. Consider getting together with your old cohort and enjoy a weekend back in North Wales with old friends where we are planning activities including rib rides on the Menai Strait, a guided walk to Llanddwyn Island, visits to Anglesey Sea Zoo and possible tours of the Prince Madog. Details will all be confirmed and advertised fully after our committee meeting in early December.

If you are interested in getting involved in any of the activities raised above, please contact me: mick@mickcook.com +44 7593 233633. I always look forward to hearing from you.

Best wishes,
Mick Cook

Chairman - School of Ocean Sciences Alumni Association (mick@mickcook.com)

CONGRATULATIONS

Major Awards for Bangor Wastewater Covid Monitoring Research

Natural Environment Research Council

Researchers whose work has had a significant, wide-reaching impact on the economy, society or environment were celebrated at NERC's 2023 Impact Awards

The ceremony took place underneath the skeleton of the blue whale, '*Hope*', in London's Natural History Museum's iconic Hintze Hall on 29th November.

We are delighted to announce that the Bangor University / Ocean Sciences led research programme which provided a new holistic approach for public and environmental surveillance during the recent COVID crisis was judged overall winner, selected from the 15 finalists.

The research was led by **Professor Davey Jones**, with **Professor Shelagh Malham**, and **Dr Kata Farkas** of Bangor University together with Professor William Gaze of University of Exeter. The work was supported by government, industry and several other UK Universities.

The Bangor University led research was used to monitor the prevalence of COVID-19, at one point covering 80% of the UK population through wastewater monitoring. The monitoring system played a crucial role in shaping national policy during the pandemic. It has since been adapted to measure many other diseases of public health concern in the UK and globally.

This award comes on top of The Queen's Anniversary Prize which was awarded to the Bangor team by His Majesty the King in October.

This major recognition of this important research resulted in Bangor University being one of only to twenty-two Higher and Further Education institutions across the United Kingdom to receive this award.

The ground breaking COVID detection work actually arose out of work on detecting norovirus in shell fish in the Menai Strait.

Learned Society of Wales Awards Dillwyn Medal 2023 to Dr Iestyn Woolway

We are delighted to report that Dr Iestyn Woolway, a NERC Independent Research Fellow and Reader at the School of Ocean Sciences has received this year's Dillwyn medal (STEMM) from the Learned Society of Wales.

The three Dillwyn Medals are awarded annually in recognition of outstanding early career research in three different academic fields: STEMM (science, technology, engineering, mathematics and medicine); social sciences, education and business; and the creative arts and humanities.

Dr Woolway is a climate scientist who researches the impact of climate change on lakes and their ecosystems. This work is invaluable for helping decision-makers who work to preserve vulnerable ecosystems.

Dr Woolway said, "*I'm truly delighted to have received this medal, and I want to express my heartfelt thanks to my wonderful family, supportive mentors, and collaborative partners from the past to the present, all of whom have been instrumental in my journey.*"

Iestyn is originally from Porthmadog and studied for a BSc in Ocean Sciences and an MSc in Physical Oceanography here at the School of Ocean Sciences before undertaking a PhD in Physical Limnology at University College London.

photos courtesy of The Learned Society of Wales

STUDENT AWARDS

Buchan Prize

Dafydd Thomas (BSc Ocean and Geophysics) - the inaugural Buchan prize for the best first year geosciences student.

We would like to thank everyone who's donations have allowed the introduction of this new award in honour of one of Ocean Sciences most popular lecturers, **Sinclair Buchan**.

Gavin Borthwick Prize

Ruth Flynn (BSc Marine Biology) - Best First Year Marine Biological Student

Darbyshire Prize

Noah Church (BSc Marine Biology) - Best 3rd year student
Arthur Wright (BSc Ocean and Geophysics) - Best BSc Student in Marine Physical Science

Ray Delahuntly Prize

Ellie Balahura - Best First Year Marine Biology/Oceanography Student

Darbyshire Prize - Post Grad

Rhian Tait (BSc Ocean and Geophysics, MSc Geological Oceanography) - for the highest scoring Post Graduate student in the Physical Sciences

Jeremy Jones Memorial Prize

Leanne Rosser (MSc Marine Biology) - for the highest scoring Post Graduate student in Biological Sciences

Employability Excellence

Francesca Fehlberg (BSc Marine Biology and Zoology, MSc Marine Environmental Protection)

Rhian, Leanne and Francesca after receiving their awards

Also nominated for prizes:

Noah Church (BSc Marine Biology) - John Robert Jones prize for the most meritorious 3rd year student

Emma Eddy (BSc Marine Biology and Oceanography) - British Sedimentological Research Group (BSRG) Prize - Best Dissertation in Sedimentary Research:

Bangor Inclusivity Scholarships

Inclusive Bangor Scholarships have been awarded to three exceptional Bangor graduates including Marine Biology student **Kodi Edwards**. These scholarships (which cover up to £9,500 of course fees) support students who are continuing their studies at Bangor. The aim of the scholarship is to highlight and celebrate the diversity and inclusivity of our student population, to ensure the student voice and experience is embedded in our Equality, Diversity and Inclusivity (EDI) and Athena Swan agendas and to support the career development of our students contributing to these important agendas.

Kodi Edwards from St Kitts and Nevis in the Caribbean, is studying for an MSc in Marine Biology, said: "*This scholarship will allow me to receive the necessary education to confidently partake in future research as a marine biologist and to be involved in EDI work. This is important to me as it allows me to participate in initiatives to increase the diversity and inclusion efforts of the School. As a young black female, I would like to see more people like me entering ocean sciences. I believe that by putting myself in this position, where I can showcase a person of colour actively pursuing this field of study, will encourage others to pursue it.*"

Honorary Degree for Caradog "Crag" Jones

At this year's graduation ceremony, our new graduates were joined by BSc Marine Biology and Oceanography alumnus and the first Welshman to reach the summit of Everest, Caradoc 'Crag' Jones. He was awarded an honorary degree for sporting achievements.

Speaking before the ceremony, he said: "I*t was a welcome surprise to be awarded an honorary degree and it's great to be back in Bangor. I spent many happy years here both studying and mountaineering, which was a big part of my life then as it is now.*"

As part of his speech, he reflected on what the future holds for our new graduates: "*As you set off to the world of work at this critical time, particularly for those in marine science, oceanography and marine biology, with the challenges that lie ahead, many of those challenges will be how to cope with cultural pressures due to the inevitable migrations when coping with climate change. The Welsh experience gives students from places like Bangor that unique opportunity to understand the cultural clashes that can occur and will equip you with the empathy and understanding needed to help the world cope with those kinds of changes.*"

Find out more about Crag's amazing journey: Bridge Autumn 2020.

Congratulations to everyone who graduated in 2023, and well done for all your hard work. Be sure to keep in touch!

Craig Kensler Studentship Fund

Each year the School is delighted to be able to offer 4 generous scholarship's to enable post graduate study thanks to the generosity of alumnus Craig Kensler. Here's what these scholarships have meant to completing students (2022-23) and to the new students it has enabled to study in 2023-24.

Simon Wills (MScRes)

Project title: "*How does parasite distribution and taxonomy vary in British Loliginids across internal anatomy and geographical area? With comprehensive methodology for cephalopod histopathology*" supervised by **Sarah Zylinski** and **Shelagh Malham**.

"*I would like to thank Craig Kensler greatly for the funding aid. I have been able to grow significantly in my independent work ethic and have picked up valuable new skills in an important field. With the complicated methodology, the year has tested my ability to refine a project to attain the optimal results. This has been an extremely beneficial year of research for me and, I hope, the histopathological research field.*"

Amy Ewing (MSc Applied Marine Geosciences)

Project title: "*A Stratigraphic Study of Llyn Idwal, Eryri: testing the evidence for limited Younger Dryas readvance*" supervised by **Dei Huws**.

"*Surveying on a protected lake so few people get permission to go onto, surrounded by mountains and features entrenched in mythology and scientific intrigue, was one of the best things I have ever done at university. I would like to thank Professor Craig Kensler for this award, which has been unparalleled in its benefits to my studies. Without it, I would not have had the time or ability to dedicate so much effort to my independent project, as well as achieve such high grades in my other modules. Thanks to this, I also had the chance to apply for many jobs in good time before finishing my degree, receiving multiple offers and finally accepting one with Gardline in July. Now, I am working as a Geophysicist, applying the technical skills I had the opportunity to hone at university, as well as working offshore assisting in the renewable energy and oil and gas sector."*

Francesca Sophia Fehlberg (MSc Marine Environmental Protection)

Project title: "*Effects of macroplastic pollution on crab diversity and community composition in the mangrove forests of Cebu, Philippines*" supervised by **Martin Skov**.

"I want to express my heartfelt appreciation for your generosity. Your scholarship has not only lightened my financial load but has also empowered me to pursue my passion for science with unwavering dedication. I am committed to making the most of this opportunity and to honour your trust in me by striving for excellence in all my endeavours. Once again, thank you for your incredible support. I look forward to sharing my progress with you and hope to continue contributing to the preservation and conservation of our ecosystems, thanks in large part to your generosity."

Ruth Wills (MScRes)

Project title: "*Population Biology of Dab (Limanda limanda) in the Irish Sea*" supervised by **Ian McCarthy** and **Luis Gimenez**.

"*I would like to give a big thank you to Craig Kensler for his generosity in this award. It has allowed me to experience independent research, the development of my own project, managing my time and fulfilling the aims and objectives myself. I have especially developed my skills in data analysis – choosing the appropriate tests and model selection. I have also massively increased in skill in R coding, not only able to do a greater range of things but understanding the logic and syntax behind it, which has allowed me to write code from scratch instead of copying and pasting as I used to do. Overall, I feel I have learnt a lot and gained a lot of experience from undertaking this research masters. Additionally, this award has enabled an increase in knowledge of our local dab population, which I aim to publish in a paper. Thanks again to Craig!*"

Introducing the 2023-24 Craig Kensler Scholars

Jude Chisholm

"I applied to Bangor university in 2020 to study marine biology, having both enjoyed studying my biology A level and always found sea life fascinating. During this degree, I completed a module which covered the basics of marine renewable energy and found it interesting. It led me to choose to base my dissertation on wave energy on Australia's west coast, a project in which I learnt a lot and enjoyed putting together. It was during this time that I found the MSc course 'Marine renewable energy' which I am studying currently. The Craig Kensler studentship has proven invaluable to me, as it has mean that I can spend more time studying where I otherwise would have had to work. This has been very important, as I have found the change from a biological degree to this one quite challenging."

Amelia Corvin-Czarnodolski

Amelia moved to Bangor for my MScRes investigating the potential impacts of offshore wind farms on seabird diets and foraging behaviour and is excited to be involved with the ECOWind-ACCELERATE Project.
Amelia says:

"I did my BSc in Biological Sciences but as a bird ringer and a scuba diver, I was looking for a way to combine my interests in marine biology and ornithology. After spending three months as a volunteer on Skokholm Island, I fell in love with all things seabird! Now, I'm combing new dietary analysis techniques with biologging data and oceanographic modelling to improve our understanding of the interactions between seabirds, their prey, and the seabed.
I am extremely grateful for the Professor Craig Kensler Studentship for enabling me to undertake this research and develop new skills."

Jennifer Hughes

"I am one of the grateful recipients of the Craig Kensler scholarship within Bangor university. Growing up in North Wales surrounded by the ocean I always knew I wanted to pursue a career that would help protect it. After travelling for many years to over 60 countries and working in diving schools I returned to North Wales to achieve my degree in marine biology and oceanography. During my undergrad I was led by great tutors who helped focus my interests. I will be studying the effect of wake dynamics produced by an offshore wind farm for my MScRes with the aim to work in the renewable sector.

Bangor University has already offered me great opportunities; from a cruise on the Prince Madog on the Irish sea investigating the link between marine physics and animal behaviour to helping with drone surveys off south stack looking at collision risks of a potential new site for a renewable source. I am thankful to the supportive staff at the university for guiding me on my academic career and look forward to the future ahead."

Becky Todd

"I studied Marine Biology at Bangor for 3 years before starting the MSc in Marine Biology this year. As a single mum and mature student, I am extremely grateful to be a recipient of the Professor Craig Kensler Studentship. This studentship will mean that I am able to focus more on my studies and my daughter while giving me the freedom and time to pursue extracurricular activities that will help me achieve my goal of working in marine research and data analysis."

SCHOOL OF OCEAN SCIENCES NEWS

Celebrating 60 Years of Physical Oceanography at Bangor

In 1963 the new department of Physical Oceanography at Bangor University (the then UCNW) come into existence with the appointment of **Jack Darbyshire** as Head of Department and the first Chair of Physical Oceanography.

Jack, originally from Blaenau Ffestiniog, had graduated from UCNW with a Physics degree during World War II, going on to join the Admiralty Research Establishment at Teddington.

At Teddington he joined *Group W*, a small group of mathematicians and physicists, whose objective was to study the propagation of ocean waves over very long distances, and to provide wave forecasts to aid amphibious landings. The advances they made in improving wave forecasts are often regarded as the beginning of modern oceanography here in the UK.

Over that 60-year period Physical Oceanography here at Bangor has gone from strength to strength with 5 Professors today! World leading oceanographic research within the school spans the globe, from the Arctic to the Antarctic, from centimeter scale turbulent mixing processes to global tides through the Earth's history, and to the characterization of marine energy resources and the impacts of extraction.

Today Physical Oceanography is part of the School of Ocean Sciences which is one of the largest in Europe and is unique in the UK in covering the full range ocean sciences under one roof. This has facilitated the development of a wide range of interdisciplinary research. Recent examples include the blue carbon grant (reported in this edition of the Bridge), the ongoing EcoWind project which is investigating seabed impacts of off-shore wind farms, and a new Nature paper on human impacts on coral reef fish (reported later).

Ocean Sciences' five Oceanography Professors:
Mattias Green, Tom Rippeth, Simon Niell, Yueng-Djern Lenn and Katrien van Landegham

Ocean Science at the National Eisteddfod

The 2023 National Eisteddfod took place in Boduan, near Pwllheli this year. Bangor University was the host University and Ocean Sciences were involved in various different events.

Dr Mollie Duggan-Edwards was a panel member for "*Celebrating Women in STEM*" panel hosted by **Mrs Marian Wyn Jones,** Chair of the University Council. The event celebrated Bangor University's women in STEM, with discussions were centred around the challenges of inspiring young girls into STEM careers, the imposter syndrome and gender imbalance in science and technology subjects.

We also displayed a new geological map showing the extent and retreat of the ice sheet which covered the UK during the last ice age. The map was a result of a major collaboration which involved **Dr Margo Saher** and **Prof Katrien van Landeghem**. Ocean Sciences Geoscientists **Dr Dei Huws** and **Dr Margo Saher** were on hand to explain the work in compiling the map.

Bangor Civic Day

14th October, on a bright autumn day, the University welcomed nearly 1,000 people to its first ever Community Day.

The Main University Building and Pontio were filled with children and adults of all ages who were warmly welcomed to enjoy the wide and rich range of opportunities, experiences and knowledge that the University has to offer.

The Community Day stemmed from the University's Civic Engagement Strategy and the desire to ensure that our communities understand the work that goes on behind the doors of the 'Coleg ar y Bryn' (College on the Hill), to feel that they can be a part of that and to have a sense of ownership of their local University.

Ocean Sciences ran a stall to inspire young minds to think about the ocean and the life it supports. This involved **Dr Martyn Kerr**, **Stef Krafft** (MScRes), **Miranda Hutchinson-Hartley** (Marine Biology and Oceanography), **Miranda Reid** (Ocean and Geophysics) and **Jennifer Hewitt** (MScRes).

Ocean Sciences at Westminster

UK Backs a Moratorium on Deep-Sea Mining

The deep sea holds large amounts of valuable metals, such as cobalt, copper and manganese. These elements are needed for some of the technologies facilitating humanity's green transition.

Consequently, mineral extraction from the deep sea is of interest to parts of the mining industry and to some political leaders. There is a general scientific consensus that the deep sea is understudied and that deep-sea ecosystems, providing key ecosystem services, may be vulnerable to such activities.

Dr. Martyn Roberts and **Dr. Craig Robertson** attended a reception on deep-sea mining at Portcullis House in Westminster, London. The event was hosted in September by Kerry McCarthy MP, Shadow Minister for Climate Change and Net Zero, together with conservation groups. It was attended by deep-sea scientists, conservationists, economists, and policy-makers, calling on the government to recognise the uncertainties around deep-sea mining and to back an international moratorium. Speakers included Dr. Diva Amon (University of California, Santa Barbara) and Prof. Alex Rogers (University of Oxford), who outlined the value of deep-sea ecosystems and the potential impacts of deep-sea mining. The ecological impacts of water column sediment plumes, seabed sedimentation, toxic discharges, light and noise pollution were discussed, together with the associated risks to biodiversity, fisheries, the global carbon budget (from disturbing deep-sea sediments acting as a carbon sink), and other biogeochemical cycles (from the removal of polymetallic nodules). The challenges of regulating deep-sea mining were highlighted, including the lack of governance structures and the difficulties in ensuring equity of benefit from the resource and determining environmental responsibility. The wider social, environmental and economic case for mining the deep-sea to support the green transition were scrutinised.

The United Kingdom's Exclusive Economic Zone (EEZ) does not include large areas of deep sea (>200 m water depth), and is lacking in the three broad settings where mineral deposits are generally found: abyssal plains (manganese nodules); seamounts (cobalt crusts); and hydrothermal vents (seafloor massive sulphides). However, most interest in deep-sea mining to date has focussed on international areas beyond national and economic jurisdiction, and exploration licenses have been granted in the Clarion-Clipperton Zone of the Pacific Ocean, for example, where the UK had until recently sponsored two licences.

The event at Portcullis House was associated with an open letter from scientists (including several from Bangor University) to the Prime Minister calling for the UK government to support an international moratorium on deep-sea mining, which was published in the Financial Times. On 30th October, the UK government announced its support for a moratorium. In the announcement, the government stated that 'the UK will not sponsor or support the issuing of [exploitation licences for deep-sea mining projects] until sufficient scientific evidence is available to assess the potential impact of deep-sea mining activities on marine ecosystems and strong, enforceable environmental regulations, standards and guidelines have been developed and adopted by the ISA [International Seabed Authority]'.

Several researchers at the School of Ocean Sciences are working to fill key knowledge gaps relating to the deep-sea, and we will continue to provide the enhanced scientific understanding that is crucial to protecting our marine environments.

Major Antarctic Glacier Passed a Tipping Point in The Last 80 Years, Research Reveals

Pine Island Glacier in West Antarctica has gone through an irreversible retreat, passing a tipping point within the last 80 years.

These new findings are published in the influential journal *Nature Climate Change* by **Dr Brad Reed** with **Professor Mattias Green** and collaborators from Northumbria University.

While numerical model simulations have been used for some time to study the behaviour of glaciers and ice sheets, this is the first time they have been combined with real-world satellite observations to identify whether a climate 'tipping point' has been crossed in the past.

They have now been able to confirm that Pine Island Glacier underwent a rapid, unstable retreat at some point between the 1940s and 1970s, leading to an irreversible loss of ice over several decades.

Pine Island Glacier, together with its neighbour Thwaites Glacier, have been called the 'underbelly' of the West Antarctic ice sheet. Pine Ice Glacier is one of the fastest flowing outlets of ice in West Antarctica and has contributed more to global mean sea-level rise in recent decades than any other Antarctic glacier.

Between the 1940s and 1970s the glacier, which was 40km more advanced than its present-day position, detached from a seabed ridge. It underwent a rapid retreat until it temporarily stabilized on a shallow part of the seabed in the late 1980s.

The researchers believe that a period of warm ocean temperatures would have been sufficient to cause melting beneath the glacier, forcing it to retreat from its long-term position on the ridge.

While their study suggests that this accelerated phase of mass loss may now have come to a halt, their results indicate that by the early 1970s the glacier had retreated to a point where it could not recover its original mass and position during colder conditions. This confirms that the glacier's retreat during this period is irreversible, meaning it has passed a tipping point.

The researchers also applied their numerical model to predict the future behaviour of the glacier in a separate study and have found that it will again enter periods of rapid retreat unless global warming is kept within limits.

Dr Brad Reed (MSc and PhD in Physical Oceanography), now a Research Fellow in Ice-Ocean Modelling at Northumbria University, said: "*The implications for the future are clear. What has happened in the past can happen again.*

"Our ability to model past changes as the glacier passed a tipping point, provides us with an added confidence in our future predictions. But it is worrying that our model predicts further irreversible and fast periods of mass loss from this same region in the future unless we can halt global warming."

He added: "*Whilst the phase of retreat that we modelled may have finished, we cannot rule out similar irreversible mass loss from this part of the ice sheet in the near future and we should not risk the consequences associated with these types of retreat and mass loss.*"

Professor Mattias Green, who supervised the work, said: "*The investigation highlights the important interactions between the ocean and the glaciers in Antarctica. The trigger of the historical retreat was possibly an episode of warm ocean water entering the area of Pine Island Glacier, and even when conditions returned to the cold state, the retreat continued. This is quite concerning for the future state of Pine Island Glacier and its neighbours in a warming world.*"

Reference: Brad Reed, J. A. Mattias Green, Adrian Jenkins & G. Hilmar Gudmundsson (2023). Recent irreversible retreat phase of Pine Island Glacier. Nature Climate Change, https://www.nature.com/articles/s41558-023-01887-y

UNIVERSITY NEWS

Bangor University climbs in the league tables

The latest league tables published this Autumn show Bangor University climbing across the board. Bangor was one of the highest climbers in the Guardian's University league table, up 28 places on last year and placed in the top half of the 122 UK Universities.

Bangor University was named Welsh University of the Year in the inaugural Daily Mail University Guide 2024 whilst the University was up 19 points on its 2021 position in the Times/ Sunday Times University Guide.

Bangor took top spot in the 'Alternative' University league table. This new ranking table has found Bangor University is the best in the UK when looking at factors related to student life and experiences.

Subject areas linked to the School of Ocean Sciences also performed strongly in the annual National Student Survey, with courses in Marine Biology and Oceanography, Zoology and Conservation and Geography achieving a 100% student satisfaction rating.

We would like to thank every student who took the time to complete the NSS and tell us about their experience whilst studying at Bangor.

Alumni Event at the House of Lords

A full-capacity event was held for 180 alumni, honorary fellows, friends of the University and guests in the beautiful Cholmondeley Room and terrace of the House of Lords, London on Tuesday, 12 September 2023.

Guests were welcomed by Lord Dafydd Wigley and addressed by our Vice-Chancellor, Prof. Edmund Burke, and Bangor University's Chair of Council, Marian Wyn Jones. They were also treated to a performance by three students from the Department of Music and heard from Bangor alumnus Harry Riley (Master of Biology, 2019), now Head of Planning and Governance in Online Harms in the UK Government's Department for Science, Innovation and Technology.

Head of the School of Ocean Sciences, **Prof John Turner**, and **Prof Shelagh Malham**, Professor in Marine Biology, attended the event where they caught up with several SOS alumni. They were also joined by Alexander, Martin and Vincent Nuernberg, partners of the Prince Madog partnership.

Amongst Ocean Sciences alumni attending were **Simon Cragg**, now a Professor of Marine Zoology at Portsmouth University and **Caroline Gittens** who has recently taken on a new role with the Foreign and Commonwealth Office in the British Indian Ocean Territory Administration over environmental aspects of governance of the Chagos Archipelago.

Steve Backshall visit

Hundreds of Bangor University students attended a lecture by TV star, Steve Backshall.

The naturalist and explorer gave a talk on wildlife conservation at the university after performing in his sell-out theatre show, Ocean, at Venue Cymru in Llandudno.

The BAFTA-winning TV star and best-selling author, who has made programmes such as *Deadly 60* and *Expedition*, is an honorary lecturer at Bangor University, and was awarded an honorary degree by the university earlier this year.

Speaking to students at the event Steve said:
"*You've all made the best decision of your lives coming to Bangor University, and I want you all to make the most of it, treasure it, use it as best as you possibly can.*

On your doorstep you have natural wonders that almost nobody else in the nation has at university so please use them to their full extent."

Dr Christian Dunn, who talked to the BBC presenter on stage as part of his lecture at Bangor, said:
"*Many of our students grew up watching Steve on TV and it's him that inspired them to study the natural sciences - it's wonderful to see how much it means to them when they get to meet him.*

Chatting to him on the stage was a real privilege as he's so knowledgeable and experienced in the field - he's also a genuinely great guy with a brilliant sense of humour!"

The wide-ranging talk by Steve covered everything from politics to poaching, and deforestation to shark conservation.

Bangor University's Deputy Vice-Chancellor, **Professor Oliver Turnbull**, said: "
It's always fantastic to welcome Steve Backshall to Bangor – he is such a knowledgeable naturalist and experienced adventurer.

We're really fortunate Steve is one of our honorary lecturers, though it's no surprise he likes Bangor University so much when you consider how good we are at teaching and researching in ocean and environmental sciences."

Energy Island: Creating a Secure, Prosperous and Sustainable Energy Future

On the 5th October the University arranged an evening at M-SParc, in partnership with the Institute of Welsh Affairs (IWA) for discussion titled: *Energy Island: creating a secure, prosperous and sustainable energy future, centred on how to secure reliable and sustainable energy needed to power our communities, while striving towards a collective net zero future*.

The discussion covered energy initiatives underway and those planned for the future on Anglesey. These endeavors not only promise to revolutionise the area's energy landscape but also hold the potential to shape its economic prospects in the years ahead.

Professor Edmund Burke, Vice-Chancellor opened discussions by explaining that the University has an active and central role in supporting the region's economic prosperity, job creation, and low-carbon aspirations.

The Vice-Chancellor was followed by **Professor Simon Neill** of the School of Ocean Sciences who talked about his research on extraction of energy from the tides, and by Professor Simon Middleburgh of the Nuclear Futures Institute.

University Employability Fair

Comprising more than 100 exhibitors and over 50 guest speakers with Question & Answer time sessions across 5 rooms in Main Arts, Bangor's Employability Fair was great opportunity for networking; asking people about their jobs; whilst expanding networks and getting a better insight into the job market.

With a dozen or so other environmental organisations actively looking to hire people with exactly our student's skill sets, this was an unmissable event!

We were delighted to welcome back Ocean Sciences alumni in support of this event. They included visitors from the Crown Estate to talk about responsible use of the seabed. They included **Harriet Baldwin** (MSc Marine Environmental Protection) and now a Marine Evidence Advisor, **Jessica Campbell** (MSc Marine Environmental Protection), a Senior Strategic Consents Manager. **Chelsea Bradbury** (BSc Marine Biology and Zoology) a Senior Marine Data and Evidence Manager with surveying services company CGG.

"Once again we would like to thank our alumni for coming back to Bangor to help our current students navigate their future career direction"

Says **Professor Katrien Van Landegham**, School employability lead, adding:

"SOS students make up 9% of the Bangor student body, whilst 11% of all 1722 students attending this fair were from SOS – so we were represented well. Overall, some 20% of Bangor Uni students attended this fair."

Minister Visits The *Prince Madog* as it Undergoes Green Retrofit

A £5.5 million green retrofit using UK Government funding is underway on a research vessel based at Bangor University.

The *Prince Madog* is a multi-purpose research platform for conducting research into the science of the seas around the UK, including the Irish Sea and Celtic Sea, and has been operating for more than two decades.

In November Wales Office Minister Dr James Davies visited the ship which is used for researching the biology, chemistry, geology, and physics of our seas. The vessel is also used to train the next generation of scientists at Bangor's School of Ocean Sciences.

The vessel is currently undergoing a two-year retrofit to equip it with a hydrogen propulsion system with a diesel-fuelled main engine to enable zero emission operation at slow speeds or over short distances. In normal operation, it will reduce emissions by up to 60%.

The UK Government is funding the retrofit, with the Department for Transport providing £5.5 million from the £60 million Innovative Clean Maritime Technologies fund.

In the future, the operators of the *Prince Madog* anticipates the vessel will receive its hydrogen from Anglesey's proposed Holyhead Hydrogen Hub backed by £4.8m in UK Government funding.

Over the last two decades data collected from the *Prince Madog* has contributed to some major scientific findings including:

- Safeguarding sustainable fisheries by assessing the impact of trawling on the seabed.
- Revealing the past climate of coastal seas.
- Locating and identifying shipwrecks.
- Predicting weather and climate by developing new techniques and measurements used that are now used globally.
- Supporting the marine renewable energy industry by assessing potential sites for development and undertaking ecosystem and seabed assessments.
- Producing new techniques to measure ocean turbulence and the impact on the mixing of different waters in the ocean.
- Assessing the impact of the physical environment on the foraging energetics of seabirds and the consequences for breeding success

Dr James Davies said, "*It was fascinating to learn about the Prince Madog as well as meeting some of Bangor University's research staff and hear more about the work they undertake.*

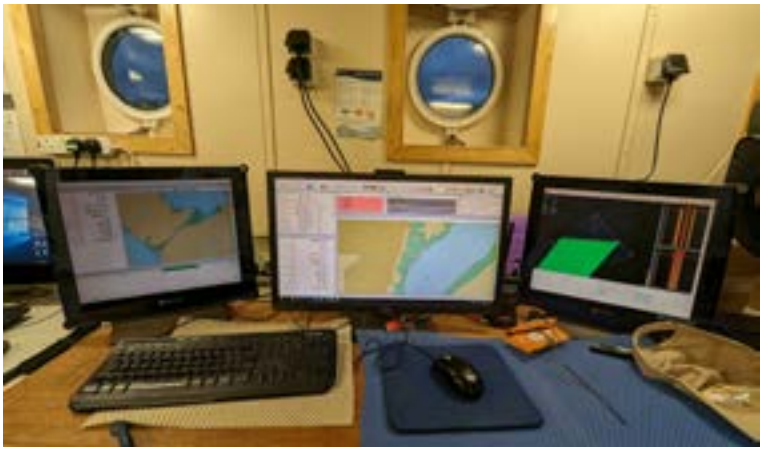
The ship has been a vital tool in countless studies over the last 20 years and has helped Bangor University become a world-leading destination for studying and researching the marine environment.

It is vital that we all reduce our carbon footprint and I'm delighted that the UK Government is funding the work necessary to equip this fantastic ship for the future."

Professor Paul Spencer, Pro-Vice-Chancellor for Research, said, "*The Prince Madog has been an asset to Wales, the UK, and internationally, both in education and research.*

The impact of research over decades by the School of Ocean Sciences is remarkable. It has changed science in a number of spheres, re-written textbooks and played an important role in supporting the continued sustainable development of the marine environment. "We look forward to many more years of ground-breaking research and impact from the decks of the Prince Madog."

Autumn teaching trips on the *Prince Madog*



WELCOME BACK

We are always delighted to welcome alumni back to the school. This semester several have returned to give seminars about their research:

Josephine Anselin (MSc, Physical Oceanography) - now working at British Antarctic Survey and a PhD student at Cambridge University. Her research interests are in ice-ocean interactions and her current research focus is on improving the representation of ocean-driven melting of Antarctic ice shelves in large-scale ocean models used for global sea level change projections.

Claire Mahaffey (BSc, Marine Biology and Oceanography). Claire is now Professor of Ocean Sciences at Liverpool University and is currently the Head of Discipline in Ocean Science and Ecology and Marine Biology. Her research interests focus on marine biogeochemistry and in particular the cycling of nutrients and carbon in the ocean and the connection between nutrients, plankton and food webs and the impact of climate change on ocean ecosystems.

Emma McKinley (MSc, Marine Environmental Protection). Emma has been a Research Fellow at Cardiff University since 2016. She is 'social marine scientist' with her research focusing on understanding the complex relationship between society and the sea. She researches the diverse types of perceptions, attitudes and values held by different communities and audiences, and considers how these insights can be used to support effective ocean governance. She is also Chair and Founder of the Marine Social Science Network.

Bob Marsh (MSc, Physical Oceanography). Bob is a Professor of Oceanography at Southampton University and has extensive experience of observing and modelling the oceans and climate. He is currently developing systems for monitoring and forecasting the extent of sargassum seaweed across the tropical Atlantic to inform communities recently challenged by the recent extensive beaching of sargassum on coastlines around the Caribbean and west Africa. He is also working with **Professor Yueng-Djern Lenn** and **Dr Martyn Roberts** in investigating links between the changing Arctic and mid-latitude weather extremes may be attributed to rapid warming and sea ice decline.

Cake Bake

The ongoing School of Ocean Sciences Cake Bake competition has produced some real works of art this winter

Thanks to everybody who as taken part so far, all the cakes have been excellent. We have one last bake in January before we move on to the next round. I hope everyone's New Year's resolution is to eat more cake.

EVENTS TO LOOK OUT FOR

(full details will follow on the University events page):

14th February: Public Lecture

by **Professor Yueng-Djern Lenn**'s talking about her ground-breaking work on the role of ocean heat in melting sea ice.

6pm Top College, Bangor University.

5th-13th March: Bangor Science Festival

5th March: Public Lecture

by Bangor University Honorary Fellow and Marine Biology and Oceanography graduate **Crag Jones**.

You can find out more about Crag's career from the Autumn 2020 edition of The Bridge

11th March: Public Lecture

by **Professor Mattias Green** in conjunction with Eryri Dark Skies and the Bangor Science Festival focusing on the Moon and Life on Earth.

6pm Top College, Bangor University.

17th April: Public Lecture

by **Professor Katrien van Landeghem** talking about her ground-breaking work in mapping the nature of the seabed, from identification the extent of past ice sheets to the impacts of new wind farms.

6pm Top College, Bangor University.

13th March: Ocean Sciences Careers Fair in Menai Bridge

Each year we are delighted to welcome back many alumni to meet the current student cohort and discuss with them the amazing range of career opportunities that an ocean sciences degree creates for them.

Once again, we would like to thank all those alumni who give up time to help inspire the next generation.
If you would like to help at the careers fair, please contact Katrien: k.v.landeghem@bangor.ac.uk

Weekend of 24th – 26th May: SOSA 30th Anniversary Reunion

Details elswhere in this edition

‘Virtual’ Oceanography meeting comes to Bangor

In mid-September over 50 oceanographers from across the globe gathered to discuss the latest advances in the understanding of the ocean at the School of Ocean Sciences.

The group first formed virtually in the early days of the first COVID-19 lockdown in April 2020, and have held regular virtual seminars via Zoom.

It was founded by **Professor Yueng-Djern Lenn** and **Professor Tom Rippeth** of the School of Ocean Sciences, along with colleagues in Liverpool University, Delft Technical University and the Warnemunde Institute for Sea Research. The aim was to provide an online forum for Europe-based oceanographers to share their latest research at a time when travel was not possible. The seminars soon became popular and began to draw in scientists from outside of the European time zones, from as far afield as Australia and the western seaboard of the US. The virtual meetings continued after lockdown, and the group decided to organise an in-person meeting.

Professor Rippeth commented, “*The in-person meeting provided an excellent opportunity for Bangor scientists to share their research with experts from Europe and the US. It was a very timely meeting given the recent announcement that the UK is to rejoin the EU Horizon funding scheme.*”

The meeting saw many Ocean Sciences alumni return to the school, including **Dr Charlotte Williams** *(MSc Physical Oceanography) who talked about her work monitoring climate change in the seas around the UK.*

Her talk was introduced by fellow Bangor Physical Oceanography graduate, **Sophie Ward**, *who now works in the School of Ocean Sciences on Blue Carbon issues.*

Bangor University hosts "Envision" Doctoral Training Partnership PhD workshop

This Autumn Bangor University hosted, in collaboration with the Envision Doctoral Training Program (DTP), an Ocean Sciences themed workshop for the Envision PhD students.

This provided opportunities for students across multiple disciplines to come together and learn from each other as well as to network with their peers, from those just beginning their PhDs to those nearing the end of their PhD journeys. This also gave the opportunity for the local Bangor students to run the event for their guests, travelling from the universities of Lancaster, Nottingham as well as the other Envision partners such as UK Centre of Ecology and Hydrology and the Rothamstead Research Institute. The students came from a diverse range of backgrounds, both physical and biological. Although sharing a common research framework as environmental scientists, the group comprised of river and marine biologists, ornithologists as well as physical oceanographers and soil scientists.

No trip to SOS would be complete without a tour of Marine Centre Wales and a visit to the Prince Madog. In typical fashion the weather prevented the boat from leaving its dock but that didn't stop us from taking plankton samples, trying out the handheld CTD and carrying out Secchi Disc readings. As well as demonstrating the methods of studying marine environments it was also key to the organising committee that wellbeing featured amongst the discussions as PhDs are not known to be easy. We were proud to present the wellbeing session in-house for all of those in SOS, with discussions set up by the organising PhD committee and **Dr Sophie Ward** who gave insights as to her own experiences as a PhD student and now research fellow.

Day two saw **Dr Craig Robertson** introducing the visitors to the wonderful world of worms, through a lab practical held in the Dennis Crisp Laboratories, followed by a trip to Aberffraw in the wake of a sunny afternoon with **David Roberts** to see some drone surveys in action. Coincidently after the demonstration of the drone we bumped into the first year Marine Biology class carrying out fieldwork of their own along the beach. Following this, we came to a close to the workshop's activities with **Dr Tim Jackson-Bué** giving a talk on the application of drones in research and perhaps how the students could apply using drones to their research in the future.

With the conference a success we thanked our guests for travelling to see the sights of SOS and that they took away with then valuable experience for the future. Many thanks to the teaching staff who have up their time to volunteer, Dr Sophie Ward, Dr Craig Roberston, David Roberts, Dr Tim Jackson-Bué and the main organiser of the event **Dr James Waggitt**. Also thanks to the PhD students who organised the event, **Nia Jones, Megan O'Hara, Lisa Goberdhan, Katie Sieradzan, Claire Carrington** and **Aaron Furnish** (author of this item.

Coral Reefs Need Simultaneous Land Sea Management to Survive in a Warming Ocean

Twenty years' worth of data, which included an unprecedented marine heatwave in Hawai'i, reveals how some coral reefs were able to persist.

In order to conserve biodiversity and safeguard the benefits natural ecosystems provide to humanity, most governments around the world have set themselves a '30 by 30' target to conserve at least 30% of the world's land and ocean by 2030 (a key goal of the Kunming-Montreal Global Biodiversity Framework).

Scientists reviewing 20 years' worth of data from coral reefs before, during and after a period of unprecedented high sea temperatures in Hawai'i, suggest that, to ensure the best outcomes for coral reefs, the areas of land and sea targeted for conservation need to be connected.

The findings by **Dr Gareth Willaims** and his team are published in Nature and indicate that the coral reef areas which were able to persist before and after the marine heatwave of 2015 had something in common: they had reduced levels of land-based human impacts like wastewater pollution, and more abundant communities of herbivorous fishes that feed on the fleshy algae that compete with reef-building corals for space on the reef floor.

Paper: Gove, J. M., Williams, G. J., et al. (2023). Coral reefs benefit from reduced land–sea impacts under ocean warming. Nature, 621(7979), p. 536-542.

Linking the Mechanics of Lake Heatwaves and Potentially Poisonous Blooms

One of the world's largest freshwater lakes is proving to be a useful model in predicting how heatwaves trigger potentially harmful blooms in freshwater lakes.

Eutrophication, the cycle whereby nutrients overstimulate the growth of potentially harmful plankton and cyanobacterial 'blooms' in freshwater lakes, has become a problem for over 60% of global inland waters. The problem is set to be exacerbated by climate change, and so our priority should be to further reduce external nutrient inputs to diminish the basis of cyanobacterial bloom outbreaks.

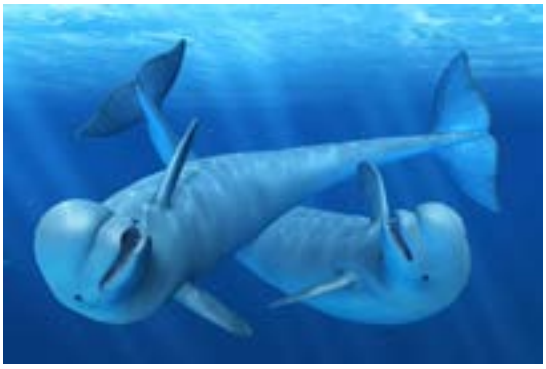
The study of one lake in China, an important source of water for over 20 million people and for industry, establishes the mechanisms between lake heatwaves and potentially poisonous cyanobacteria 'blooms'.

The research by **Dr Iestyn Woolway**, NERC Independent Research Fellow at School of Ocean Sciences and research colleagues in the Chinese Academy of Sciences, Nanjing, China and Aarhus University, Denmark, published in Science of the Total Environment studies the heatwave experienced in 2022 in Lake Taihu, one of China's largest freshwater lakes situated in the Yangtze delta, and the associated cyanobacteria blooms.

Paper: Na Li et al. (2023). The unprecedented 2022 extreme summer heatwaves increased harmful cyanobacteria blooms. Science of the total Environment, 896, 165312.

Working With Meta On Mixed Reality Ocean Worlds

Dr Llŷr ap Cenydd, lecturer in visualisation, has been working with tech giant Meta on new features which will soon be available as part of the virtual reality (VR) aquatic safari park, Ocean Rift.



Using a VR headset users can currently explore all kinds of aquatic habitats, from coral reefs to lagoons to the Arctic, freely swim around and teleport between points of interest, whilst learning all about marine creatures and prehistoric animals. Fully voiced narration also explains many of the challenges the ocean faces, including pollution and climate change.

The new 'mixed reality aquarium' for Ocean Rift developed by Llŷr will soon allow users to go one step further and experience mixed reality, which is similar to virtual reality but where you can still see the world around you via cameras and depth sensors

Beluga Whales
Credit: Picselica Ltd

Students Help in Two Major New Geosciences Studies

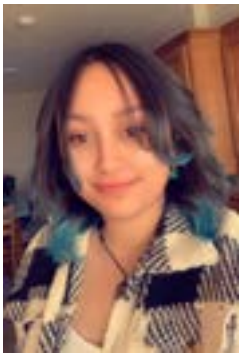
Tides are a key driver of a range of Earth system processes, and using computer models we now have the capacity to simulate tidal dynamics on local and global scales over the Earth's history. Such deep-time tidal predictions provide vital insights into past ocean circulation patterns, the evolution of life on Earth and the developments of the Earth-Moon system's orbital configuration. However, there a need to find new 'proxies' against which these tidal model simulations can be validated.

The first study focused on the feasibility of using new types of 'proxies'.

The locations of the black shale were compared with tidal mixing front locations predicted using the Simpson–Hunter parameter and finding excellent agreement and so indicating the huge potential of these new proxies in validating models and reconstructions of past climates

The work was carried out with input from a number of undergraduate students: **Laura Fitzgerald** (BSc Ocean and Geophysics), **Jennifer Hewitt** (BSc Geological Oceanography) and **Olivia Pampaloni** (MSci Physical Oceanography) together with **Dr Bin Guo** and **Professor Mattias Green**.

Paper: B Guo, L Fitzgerald, J Hewitt, O Pampaloni and JAM Green (2023). Testing geological proxies for deep-time tidal model simulations. The Depositional Record, https://doi.org/10.1002/dep2.256



In the second study **Dylan McGowan** (BSc Physical Geography and Oceanography) and **Amisha Salian** (MSci Marine Biology and Oceanography) published a paper in the internationally renowned journal *Sedimentology*, following a successful Bangor University internship project in the Hydrodynamics Laboratory.

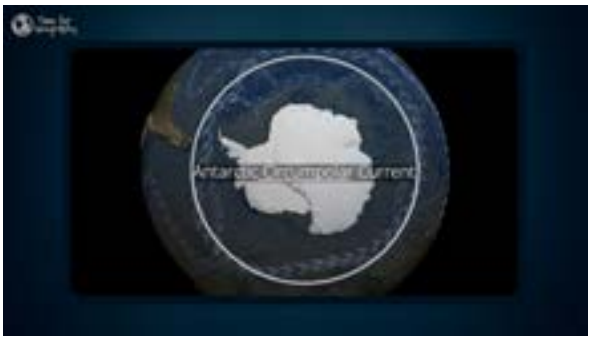
They developed a method for predicting the density and rheology of muddy ocean beds in the geological past from the type and size of groove marks and chevron marks. Grooves and chevrons are elongate erosional sedimentary structures formed by underwater landslides of high density. The work was supervised by **Dr Jaco H. Baas** with Prof. Jeff Peakall (Leeds) and Prof. Jim Best (Urbana-Champaign, Illinois).

Paper: D McGowan, A Salian, J Baas, J Peakall and J Best (2023) On the origin of chevron marks and striated grooves, and their use in predicting mud bed rheology. Sedimentology, https://onlinelibrary.wiley.com/doi/10.1111/sed.13148

New Educational Film on Antarctica

The latest film in the Time for Geography series features the specialist knowledge of **Yueng-Djern Lenn**, Professor in Physical Oceanography here in the School of Ocean Sciences.

Co-developed by **Professor Yueng-Djern Lenn**, *Physical Geography of the Southern Ocean* explores the unique physical geography of the Southern Ocean, also known as the Antarctic Ocean, which has a fundamental role in our climate and ecosystems.



The film was created with *Time for Geography*, an education and outreach project that creates free educational videos on geography. The project brings together a collaborative team of teachers, academics, developers and filmmakers with a passion for geography.

Yueng-Djern said, "*It's been brilliant to share my knowledge about the mighty Southern Ocean and its unique properties which are essential for marine life. It's great that this video will help with teaching school pupils about how the Antarctic Ocean is crucial for fostering environmental awareness, understanding climate change and promoting biodiversity appreciation.*"

Bangor University has collaborated with other universities to produce *Time for Geography* educational videos on many occasions. A video about tsunamis with the University of Dundee won the Silver Publisher's Award by the Geography Association in 2020.

https://timeforgeography.co.uk/videos-container/physical-geography-southern-ocean

Wildlife Expert and TV Presenter Honours Fin-Tastic Welsh Shark Project

Project SIARC © National Lottery

Award winning naturalist and wildlife TV presenter Iolo Williams has honoured an inspirational project which aims to safeguard and increase people's understanding of rare sharks living off the Welsh coast.

Established in 2021, Project SIARC is a multi-partner collaboration led by ZSL (Zoological Society of London) and Natural Resources Wales (NRW), it aims to safeguard rare species of sharks, skates and rays (a group known as elasmobranchs) off the Welsh coast whilst cultivating a new appreciation for the underwater environment in Wales.

The project beat off stiff competition from 3,780 organisations to reach the public voting stage in this year's National Lottery Awards – the annual search for the inspirational people and organisations across the UK who have done extraordinary things with National Lottery funding. Project SIARC emerged victorious as the Wales winner following the vote.

Project SIARC covers a vast area and operates throughout Wales, but the research and work alongside local communities is focussed at two Special Areas of Conservation (SACs): 'Pen Llŷn a'r Sarnau' in North Wales and 'Carmarthen Bay and Estuaries' in South Wales. Research has included environmental DNA (eDNA) surveys, working with oceanographers at Bangor University to learn more about which shark, skate and ray species are present within the SACs.

IN MEMORIAM

Thomas (Tom) DONOVAN

Captain Tom Donovan, who was the first Master of the original R.V. *Prince Madog* died in August 2023, a week after reaching the age of 100.

He was Master for the first 2 decades of the vessel's service and for nearly 3 years prior to that stood by the building of the vessel. He joined at a time when the Menai Bridge laboratory was transitioning from a Marine Biology Station to separate Departments of Marine Biology and Physical Oceanography.

As he played such a major role in the saga of the vessel build it is worth recalling some of what happened in the 1960s. **Dennis Crisp**, then Director of the Marine Biology Station, had obtained a grant for a vessel to replace an earlier fishing boat. Next, **Jack Darbyshire** was appointed to lead on Physical Oceanography and proposed adopting the basic design of a recently built South African oceanographic vessel for a new build. T.R. Little, the consultant naval architects who had designed RRS *Discovery* for National Institute for Oceanography were appointed to work up drawings and tender specifications.

In expectation that the build would be measured in months. Captain Donovan was appointed to stand by the new build. Tenders for the South African design all came back well over budget so there had to be a re-think. Several stern trawlers laid up on Tyneside were considered for possible conversion. Provisional GA drawings were prepared, but after visits to inspect these vessels they were ruled out as unsuitable. One had a main engine intended for a railway locomotive and another had machinery from a submarine. It was at this stage in the story that **Denzil Taylor-Smith** was about to join the Menai Bridge staff, adding marine geophysics to the range of specialities to be catered for. Previously, Denzil happened to have had contacts with another firm of naval architects, Burness Corlett & Partners. They already had a hull design that seemed adaptable to scientific needs. In addition they had links with the small shipyard at Ramsey in the Isle of Man. It was as a result of these connections that ultimately the first *Prince Madog* came to be built at Ramsey. Captain Donovan was involved throughout, from advising on detailed specifications to standing by in the yard. In retrospect it is noteworthy that he insisted that the steel for the hull was primed in the steelworks before delivery to the Isle of Man. Under the name *Princess Madog* and after at least three changes of owner, the old vessel was still extant 55 years after being built. AIS Marine Traffic signals showed it was in Malta in mid December 2023.

The vessel was completed in 1968. Over the first few years in service the scientific high points were the geophysical cruises West of Ireland Sub-bottom profile lines using towed sparkers were run across Porcupine Bank. These cruises were perhaps the most challenging and the most consequential of all the work undertaken by the vessel during service with the University. Tom Donovan had a wry sense of humour, contrasting the living conditions on his lively little "penal colony" with those on the large Eastern European factory trawlers passed at the shelf edge. Later generations of ocean scientists need to remember that in the late 1960s the was no GPS for position fixing and no electronic logging of the ship's track. Navigation using Decca varied in accuracy and required manual conversion on charts to Lat & Long. In Cardigan Bay, where the geophysics group also worked, two Decca chains overlapped, so two sets were required for interchain fixing. It was also in this bay while trying to get sub-bottom measurements through the acoustic blanking of the superficial gassy sediment, that the ship was struck by lightning. This knocked out the radar and other electronics, meaning that traditional navigation skills were used to get home.

The late 1960s and early 1970s were also the period when cruises to study stratification in the western Irish Sea led on to the models of fronts and associated density driven flows for which the Menai Bridge oceanographers became noted for. It needs to be remembered that this was not long after thermoclines used to observed by scratches on smoked glass slides. It was the laying and recovery of instrument moorings for this work where the lifting capacity of the A frame gantry proved a particular asset. Prince Madog was possibly the first research vessel to be fitted with a hydraulic A frame. In these early years the Marine Biologists mainly used the ship for collecting material for lab based experimental work. Many former students will remember the fishing trips. The early 1970s also saw the start of long running studies of Liverpool Bay linked to the dispersal of sewage sludge and other sources of pollution. The Marine Chemists were also involved in this.

For Captain Donovan and his crew a key time in each year was the annual docking. For the first few years this was done at the old Port Dinorwic dry dock until insurance and moving so many laid up yachts made this no longer viable. Later the usual pattern was to go back to the slipway in Ramsey. Other operational considerations in the early years were that pleasure steamers still regularly called at Menai Bridge, so a heavy fore and aft mooring was laid off Ynys Faelog. This was an asset when the old pier and pontoon failed safety inspections and had to be rebuilt.

Looking back on the evolution of the Menai Bridge laboratories over the last 60 years the ability to offer sea going research and teaching facilities has been a major strength. With the old *Prince Madog*, Captain Tom Donovan left a legacy that later generations have built upon.

by **Ivor Rees**

ALUMNI NEWS

30th Anniversary Reunion in North Wales
Weekend of 24th – 26th May 2024

It is 30 years since **Sinclair Buchan** and **George Floodgate** founded the School of Ocean Sciences Alumni Association (SOSA).

As highlighted in my Chairman's letter and the previous edition of The Bridge, SOSA is in the advanced stages of planning a reunion of Alumni in North Wales over the late May bank holiday weekend in May 2024 to celebrate this event. Sadly, both Sinclair and George have passed away, but they will be forever in our memories.

Please get together with former colleagues, friends and family and join us at this reunion. We have a number of events planned:

Anglesey Sea Zoo

The weekend of events will kick-off with a 'Prosecco' evening at the Anglesey Sea Zoo in Brynsiencyn.

The Anglesey Sea Zoo lies on the shore of the Menai Strait in an area of Outstanding Natural Beauty with views across the Snowdonia Mountain range. The business first opened in 1984 and has always been the largest attraction on Anglesey and remains more than ever an important employer and contributor to the local economy and community. All the water for the exhibits is pumped directly from the sea and returns to the sea, so the animals experience natural food particles, seasonality and temperatures in the water supply.
Frankie Hobro is the Director and Owner of Anglesey Sea Zoo and an Alumnus of Bangor University. Frankie has always been a passionate advocate for conservation, particularly endangered species and marine conservation and has held many positions involving lecturing and teaching environmental, conservation, marine biology and ecology to various levels and ages, both in developing countries and elsewhere.

Today the Anglesey Sea Zoo is a unique product as the only exclusively British aquarium, housing only native species with an entirely natural sea water supply directly from the Menai Strait.

Friday 24th May meet 6:30pm for 7:00pm start

Evening Prosecco guided tour and buffet

Join Frankie for an exclusive behind-the-scenes guided tour of the Anglesey Sea Zoo marine conservation centre and its facilities while enjoying a glass or two of fizz!
Meet at the entrance and enjoy a glass of prosecco as you complete a behind-the-scenes guided tour through the aquarium and all its facilities, including the lobster hatchery of Wales and breeding and conservation programmes for both species of British seahorses and spiny lobsters. Learn all about the everyday running of the marine centre and all its inhabitants and Frankie's ongoing sustainability journey.

After the guided tour a hot and cold buffet will be served, and you will be free to wander around observing the facilities in more detail and to ask as many questions as you like.

The cost of this event will be £24.95 per person, includes Prosecco and buffet. Further alcoholic and non-alcoholic drinks will be available in the Rockpool Café during the buffet.

Saturday 25th and Sunday 26th at 2:00pm

Family friendly behind-the-scenes guided tour.

Join Frankie or a member of her team for an exclusive behind-the-scenes guided tour of the Anglesey Sea Zoo marine conservation centre and its facilities.
After the tour you will be free to ask as many questions as you like, then enjoy a complimentary game of crazy golf and either spend the rest of the day on site or return again whenever you like over the weekend with your ticket.

This family-friendly tour is suitable for all ages and is not limited to families. There is full disabled access across the site.
Adults £15.00, Children (under 12) £12.50. Tickets valid for the whole weekend so you can return as many times as you like.
Includes a complimentary game of crazy golf and admission to all daily talks, feeds and interactive sessions.

RV Prince Madog - Saturday 25th – TBC

Tours of the RV Prince Madog will occur on the morning of Saturday 25th May subject to the vessel's availability. Unfortunately, this activity is limited to adults and further details will be provided nearer to the date of the event.

RIBRIDE – Menai Adventure – Saturday 25th 1400 hours - St George's Pier

As for our previous reunion, we have arranged a RibRide tour of the Menai Strait for Saturday afternoon. The tour will be the Menai Adventure (see https://www.ribride.co.uk for details) and the cost will be £32 per person.

Menai Adventure lasts one hour and takes in many of the landmarks of the Menai Strait. Departing from St George's Pier in Menai Bridge, your skipper will be your fun guide as you travel beneath the impressive Menai suspension bridge, into the world famous Swellies. Rest assured you will be in safe hands, as your Skipper skilfully navigates through the channel. The Swellies is rich in history, and you'll be kept entertained with tales of shipwrecks, fish traps and lions!
After reaching Britannia Bridge and saluting Nelson, you'll turn around for a second spin through this amazing stretch of water before travelling up the Menai Strait to Beaumaris. Along the way you'll pass the spectacular houses of Menai Bridge, known locally as Millionaire's Row, many of which have their own fascinating and sometimes chequered history. The age restriction is 4+ years.

Afternoon refreshments – Saturday 25th 1530 hours – Marine Centre Wales, Menai Bridge

For those that wish to meet after the Rib Rides and/or prior to our evening meal, we will be offering teas/coffees and the Bangor University catering departments infamous chocolate brownies in Marine Centre Wales in Menai Bridge on Saturday afternoon. The cost will be ~£7.50 per person.

Reunion meal – Saturday 25th 1900-2300 hours – Reichel Hall, Bangor University

The Landmark Event for the 30th anniversary reunion will be a dinner to held at Reichel Hall at the University in Bangor. This event will include a welcome drink, three course dinner, wine, non-alcoholic alternative and after dinner coffee/tea. The cost will be £50 per person and an adjoining pay-for bar will be available for additional drinks, as required. Be aware that there is a capacity limit of 110 at Reichel, so tickets will be allocated on a first come, first served basis.

Guided walk to Llanddwyn Island, Newborough, Isle of Anglesey – Sunday 26th – meet 1100 hours at Newborough Beach main car park

For those that wish to get some fresh air after Saturday evening's meal, we have arranged a walk to Llanddwyn Island on the west coast of Anglesey on Sunday morning. The walk will be led by a local expert assisted by Dei Huws (Reader in the School of Ocean Sciences). The walk will take approximately two hours and will include information on the local flora/fauna/geology. There will be no charge for this event but be aware that there is a cost to park at Newborough Beach.

Booking is essential for all events but feel free to attend as many or as few events as you wish to.

Further details and a link to a booking form can be found on the School of Ocean Sciences website:
https://www.bangor.ac.uk/events/school-of-ocean-sciences-association-reunion
and alumni will be regularly alerted to the reunion by the University Development and Alumni Relations Department.

Special discounted accommodation rates have been agreed with the university Management Centre and Halls of Residence. Details will be provided on the booking form and any accommodation should be booked directly with the accommodation offices.

Mick Cook, *Chairman - School of Ocean Sciences Alumni Association*
mick@mickcook.com

45 Years and (Time to Stop) Counting

Life is full of opportunities and decisions. And, in retrospect, my decision to stop working as a Town Planner in Kensington & Chelsea, London and embark on a new life in Marine Science in 1978 was possibly the best decision I have made in my 70 years on planet earth. It is just over 45 years since I first went to Menai Bridge.

After obtaining a BSc in Geography from Queen Mary College, London University, I got a job as a Development Control Officer with the Royal Borough; a job I thoroughly enjoyed for 18 months or so before realising that Planning Law in the UK was not something I relished and working in Local Government was not for me.

Whilst at my parent's home over Christmas, 1977, I picked up a prospectus for Swansea University. My middle brother, Gary, was in the process of applying for university. I came across a picture of an oceanographic survey vessel, and this piqued my interest. Coming from Nuneaton in the heart of England, as far from the sea as you can get, I have surprisingly always had an interest in the sea. So, I began to investigate an MSc in oceanography and, despite my poor A-level grades in Maths and Physics (I was hopeless in my teens), I was, eventually, offered places at Southampton, Swansea, and Bangor Universities.

The Head of School at Bangor at that time was **Prof. John Simpson**. Not unsurprisingly, for those who know John, he had some concerns about my mathematical abilities but, somehow, I managed to convince him I was up to what was required. After John offered me a place, he needed a decision, and soon – like the next day. So, what to do? In those days, information was not readily available, as it is today. We had no internet, no mobile phones, no social media. In the end, I did what every geographer should do – I looked at a map. And, after an evening of consideration, I decided that living on an island (Anglesey), next to a range of mountains (Snowdonia) would be a challenge and fun. My journey into marine science had begun. I announced my impending departure to my colleagues at the Royal Borough who all assumed, rather amusingly, that I was aiming to be the next Jaques Cousteau – younger readers should Google Cousteau!

So, in late September 1978, I packed up all my belongings into a single cardboard box (you think I am joking?), got into my ancient Morris 1100 and made the trip along the A5 through Snowdonia to a small cottage in Brynsiencyn, Ynys Mon, to commence my MSc. Never one to accept the status quo, I realised within days of arriving in Menai Bridge that my skills and interests were more suited to a combination of marine geophysics, geotechnics and oceanography rather than pure oceanography. Hence, I arranged to meet with John Simpson who, to my surprise and delight, was amenable to me undertaking a hybrid MSc covering all three subjects.

Life on Anglesey was delightful and the community that, in those days, was labelled the 'Marine Science Laboratories', was warm, exciting and collegiate. Having worked for two years prior to doing my MSc helped enormously as I had matured as a person and effectively treated the course as 'a job'. But it was not all 'work'. Indeed, visits to the Liverpool Arms, the Auckland and other hostelries were frequent, and the highlight of the week was the 'Labs Jug Band' who performed in the Auckland on a Wednesday evening. Academically, I benefited from the wise counsel of a wide range of lecturers including **John Simpson, Denzil Taylor-Smith, Sinclair Buchan, Jack Darbyshire. Colin Jago, Tony Jones**, and three of the younger members of the team including **Angie Davis, Dave Bowers** and **Jim Bennell.** And I was part of a great cohort of MSc students including **Mark Broughton, Richard Lailey, Kay Deadman, Steve McGiveron, Alan Ridehalgh, Jose Pelegri**.

Christine and Mick three months after our marriage – Christmas 1980 – with my youngest brother Graham and my Grandad in my auntie's pub.

Perhaps most importantly, Menai Bridge is where I met my wife of 43 years, **Christine Tigar** (Marine Biology). Chris was working as a research assistant for Peter Spencer having graduated from Bangor a couple of years previously. The coffee room in 'The Labs' was a great place to meet colleagues/friends and was responsible for us meeting. Christine tells me that I stood out as I was the only student who wore a suit jacket with my jeans!

Other memories of my time in North Wales include sleeping downstairs in front of the open fire in Winter in my cottage in Brynsiencyn because it was too cold to venture upstairs; swimming the Menai Strait at slack tide with colleagues Richard and Jose only to find Steve had not shown up on the opposite shore with our clothes - we had to swim back to Menai Bridge arriving just as the tide began to flow and almost ended up at Puffin Island; playing summer evening tennis and post-match barbecues on Ynys Faelog; five-a-side football at the university sports hall and introducing **Dave Boon** and **Toby Sherwin** to the delights of tackling; working as an AB on the *Prince Madog* for a week and being reprimanded for talking to **Captain Donovan** whilst 'manning the wheel'; and sorties into Snowdonia for walking and assisting **Sinclair** with his Easter meteorological field course for undergrads. Visits to Snowdonia were always punctuated with breakfast at the legendary 'Pete's Eats' in Llanberis.

And so, I graduated from my MSc and obtained a job as a marine geophysicist with Fairfield Aquatronics, a subsidiary of the American seismic company, Fairfield Industries. My first job was aboard the MV Sperus offshore northern Spain where in my first 12 hours night shift I learned more than I care to remember about the realities of commercial survey; the hardest 12 hours of my working life!

The Aqua Star – one of my early survey vessels – a bit different to modern-day survey vessels

My next project was off the East Coast of the USA working on the MV *Aqua Star* out of Wood's Hole in a very cold late Winter. Luckily, my next project was in Singapore and the South China Sea; a little warmer! Readers need reminding that travel in the early 1980s was a lot less common than it is today. I thought I was very lucky to get so much travel early in my career.

My job involved data acquisition Quality Control (QC), processing and interpretation of the geophysical and geotechnical data we were obtaining to investigate the seabed and the top 1000 metres or so of geology in preparation for the drilling of oil and gas exploration wells and other applications such as the installation of submarine pipelines and cables; indeed, any structures that were to be placed on the seabed.

Eighteen months or so after starting my job, I learned a huge lesson that stood me in good stead for the remainder of my career. I was the marine geophysicist on a drilling well site survey close to Natuna Island in the South China Sea for Mobil (now part of ExxonMobil). A few months after completing the survey that I worked on, the Glomar V drillship began drilling an exploration well over the site we had investigated. My report stated that we foresaw no hazards at the proposed well site. Unfortunately, whilst drilling at approximately 700m below seabed, the well encountered high pressure shallow gas and the well 'blew out'. Luckily, the drillship was pulled off the well site and the drilling personnel evacuated before the expanding gas cloud in the water column resulted in the drillship sinking. You can imagine that when the news broke, I was mortified; the only consolation being that no-one was injured or indeed killed in the blow out. A subsequent enquiry exonerated both me and my company from fault, but I had learned a great lesson in that the work we were doing could result in such catastrophic loss of plant, equipment, damage to the environment or ultimately kill people. We subsequently undertook a survey of the seabed only to find that the Glomar V had disappeared into a crater in the seabed without trace.

Anyway, my career prospects were proven not to have been in tatters when a year or so later, my manager left, and I was appointed to the lofty post of Seismic Interpretation Manager; responsible for all geophysical aspects of the company's activities. For the first time in my career, I had responsibility for the management of a team of personnel, operations, client relations and financial management/budgeting. I remember staring into the mirror whilst cleaning my teeth on the first morning of my new post and thinking, 'I am not sure I am up to this'. It was a very steep but incredibly useful learning curve.

In mid-1984, I was approached by a small and embryonic consultancy company, Hydrosearch, that we did a lot of work with asking if I was interested in joining them. By this time, I felt I had gone as far as I could with Fairfield and moved. My wife Christine has subsequently confided to me that she thought I was mad leaving a good and well-paid job with company car to join what was not far from being a 'start-up'.

I think I joined Hydrosearch as the third employee. The owners and directors at the time were all self-employed. Hydrosearch provided project management and QC of offshore site investigation surveys mainly in the UK North Sea. The owners/directors were all very bright and experienced personnel and I learned a lot in a very short space of time and, being a small company, did a wide range of things. Within a few years of joining, I was made a director and became part owner of the business. And we began to expand the business significantly; recognising that dependence on a narrow range of services for a small number of clients in one region of the world was not a healthy position for a business such as ours. Controlled diversification was the key to growth, stability and sustainability.

So, over the next 20 years, we widened the range of consultancy services we offered to include seismic exploration (both land and marine acquisition, processing and interpretation), Health & Safety, offshore survey/positioning, geology, environmental etc. We also expanded our client base hugely and the industry sectors in which we worked to include oil and gas, submarine cables, offshore wind etc. And perhaps most importantly, we expanded internationally. At that time, I 'went east' and my colleague Steve Middleton (with whom I share a birthday) 'went west' to market our business. This meant numerous visits to SE Asia for me culminating in opening an office in Perth, Australia in the mid 1990's to handle our Asia-Pacific business. Indeed, our global

The Petromar V sinking after a shallow gas blowout

success was recognised when in the late 90's we were awarded the Queen's Award for International Trade and by this time we were arguably the largest consultancy company of our kind in the world. Presciently, and by sheer coincidence, we received the award from the Queen's Sheriff in Surrey on the 15th November – the date of Steve and my birthdays!

At the turn of the century, we recognised that to develop our business further and to provide headroom for our middle management and other employees, we should seek external support and investment. Up until that point we had self-funded the growth of our business. And, on September 23rd 2003, (my wife's birthday, by coincidence) we sold the business to the FTSE 250 listed RPS Group – one of a small number of sizeable pure environmental consultancies. Hydrosearch formed the core of the newly created RPS Energy Division, and I was appointed Managing Director – Operations of the new division. With RPS support, we expanded the business rapidly over the next five years in part through organic growth but also as a result of acquiring some 20 new relevant businesses around the globe. This was a very exciting time for us all and for me personally. During that period, I learned a lot about subjects I knew nothing about including nuclear safety and I also learned a lot about the transactional process of purchasing businesses and perhaps most importantly the necessity of integration when growing a business. We now worked in 100+ countries each year and had offices in a variety of jurisdictions including Europe, USA, Canada, Russia, Australia, Singapore etc.

In 2008, I concluded that after 25 years working for Hydrosearch and RPS, it was time for me to do something different and I semi-retired. After leaving RPS at the age of 53, and not really knowing what I would do next, I was lucky enough to receive a number of calls from friends and industry contacts enquiring about what I was planning to do. This led to a number of offers and I set up my own consultancy MCL with the aim of helping others to 'make more of what they have'. This resulted in commissions from several companies, mainly within the marine science sector, to undertake reviews of their businesses and to provide recommendations to assist them improve what they do. Such reviews often led to offers to join company boards as a non-executive director and also to utilise my knowledge of company acquisitions from my RPS days to manage the sale and purchase of a number of businesses. So, for the past 15+ years, I have had a lot of involvement with financiers and lawyers in undertaking such transactions – a world away from my geoscience background. And interestingly, I have found the commercial side of business just as fascinating as the technical side.

Being semi-retired and working part-time for my own company has allowed me time to get involved in a lot of pro bono activities. For well over 30 years, I have had an association with the Society for Underwater Technology (SUT), firstly as a member and Chair of the Offshore Site Investigation and Geotechnics (OSIG) committee and latterly as a Council Member and Treasurer of this learned society. Recently I set up the Marine Environmental Science Special Interest Group (SIG) and set up and chaired the Unexploded Ordnance (UXO) SIG on behalf of the SUT. I have also been privileged to serve as chair of the Bangor University School of Ocean Sciences Alumni (SOSA) Association for the past 12 years or so. And I have provided input to and acted as editor for a number of industry guidance notes for use in the offshore site investigation (SI) industry; the most recent of which applies to offshore renewables.

So, why am I telling you all this? And profuse apologies for the length of this article. Well, after some 45 years involvement in marine science in industry, I have retired from commercial activities and I am very keen to relate that 'if I can do it, anyone can do it'. I have never been the brightest, but I have always had a keen interest in marine science and have been lucky enough to have a lot of energy, enthusiasm, integrity, innovation ('never accept the status quo'), drive and a competitive nature. Studying for an MSc in Menai Bridge set me on the path to a very fulfilling life and career and introduced me to my wife, Christine, my soul mate, and best friend. My career has allowed me to travel to and work in many countries around the world and to work with exceptionally talented people from a wide range of cultures. Thank you, Menai Bridge, and all those associated with the School of Ocean Sciences. I owe you an enormous debt of gratitude. But special thanks to my wife and family who have provided me with great support and, to my knowledge, never complained about all the travelling I have done and my time away from home.

Mick Cook – Chair SOSA

ALUMNI PROFILES

INTERTEK ENERGY & WATER

Whilst studying at Bangor University, the words 'Bangor Mafia' were said multiple times over to describe the large proportion of Bangor graduates working in the marine industry.

This rings very true at our company Intertek Energy & Water, where Bangor Uni alumni can be found in each team, in addition to working with fellow Bangor graduates as clients, partners, subcontractors and associates.

Intertek Energy & Water is part of the Intertek Group, a FTSE 100 listed company quoted on the London Stock Exchange. Our legal entity is Metoc Ltd. (Bangor alumni **Kevin Deeming** as a founder), but we trade as Intertek Energy & Water Consultancy Services.

We have been working in the marine sector for over 30 years. Intertek Energy and Water has established a record of excellence in delivering a diverse range of offshore energy projects along with associated permitting and consenting, interconnectors and carbon management.

Intertek Energy & Water's global offshore project experience encompasses numerous industries and includes the planning, permitting and construction oversight of offshore renewables projects, as well as power transmission and telecommunication cables. Our many services include site selection and characterisation, feasibility studies, survey and installation oversight, Environmental Impact Assessments (EIAs) and scoping studies, metocean assessments and risk management for a variety of offshore developments.

In addition, Intertek Energy & Water experts provide assurance solutions to complex technical, environmental and regulatory challenges throughout the project lifecycle for multiple sectors, including oil and gas, power transmission and renewables, water utilities, and ports & harbours.

Our Modelling Team help operators, regulators and governmental organisations understand the environmental impacts on aquatic systems - rivers, lakes, reservoirs, estuaries and coastal waters - that result from human activities. Intertek Energy & Water offer a range of services including integrated environmental modelling, compliance assessments, surveys, and monitoring services that deliver measurable benefits to regulatory, environmental, and engineering constraint challenges.

Please feel free to connect with us for further information about Intertek Energy & Water, our projects, our team members, and our opportunities. We would love to hear from you! https://www.intertek.com/energy-water

Examples of our expertise at Intertek Energy & Water are listed below:

- Wave and tidal resource assessments
- Dynamics & Water Quality
- Scour Assessment
- Site, Route & Landfall Feasibility
- Metocean Assessment
- Permitting & Consenting
- Site Investigation Permits
- Cable Risk & Burial Assessment
- Survey Design & Management
- Survey Field Client Representation & Installation Supervision
- Modelling of Tides, Waves, Sediment
- Energy Optimisation
- Physical Process Assessment
- Constraint Studies
- Environmental Impact Assessment
- GIS Based Data Analysis & Asset Management
- Regulator & Stakeholder Consultation
- Subsea Route Engineering
- Geophysical & Geotechnical Assessments
- Survey Procurement & Contract Development

Stéphane Theurich (MSc Marine Geotechnics, BSc Marine Biology and Oceanography)

I was awarded my bachelor's degree in Marine Biology and Oceanography in 2003.

During my undergraduate time I was able to do a number of trips on the Prince Madog, including spending hours sifting seawater samples for a number of PhD students projects! I was also able to spend time using the flume for my third year project on axial convergence in estuaries building on a theory put forth by oceanographer **Prof John Simpson**. Following that, I swapped disciplines and did the Marine Geotechnics MSc as it was named at the time, this is where I learned about marine geophysical and geotechnical data acquisition and interpretation. I did an Erasmus exchange to Belgium where I completed the research for my thesis on the 3D morphology of buried coral mounds in the Porcupine Basin with Renard Centre of Marine Geology at Ghent University.

Following this I secured a role as an offshore marine geophysicist with Gardline. For 10 years I worked onboard a number of survey vessels, acquiring, processing and interpreting geophysical data and shallow geotechnical core samples for oil and gas and renewable projects in the North Sea, Caribbean, west Africa, western Australia and Malaysia.

In that time I met my wife Laura, who also worked offshore at the time, and we have been lucky to be able to travel to many destinations on holiday where I continued my enjoyment and interest in marine biology by scuba diving. I have been very fortunate to have visited a number of extraordinary diving locations from the pristine reefs and manta rays of Raja Ampat and Komodo in Indonesia. Diving with whale sharks, mola mola and marine iguanas in the Galapagos. Experiencing the darkness of cenotes in Mexico to name but a few of these amazing dive locations.

After my early career offshore I joined Intertek Energy and Water Consultancy Services in 2016 where I have been supporting a number of renewable energy and submarine power cable projects worldwide. From putting together survey specifications and managing these surveys to undertaking pre and post survey engineering studies. In my time at Intertek I have become a both a Chartered Scientist and Marine Scientist with the Science Council through the Institute of Marine Engineering, Science and Technology (IMarEST). I work together with a number of Bangor Alumni who all fondly remember our time studying in Menai whether recently in the case of our graduates or even longer ago than myself.

Paul Taylor (MSc Physical Oceanography)

I graduated from Bangor in 1996 (Physical Oceanography MSc) and managed to get a job with TT Surveys (one of **Dr. Mitchelson-Jacob**'s contacts – thanks Gay!), working offshore, undertaking shallow hazard seismic surveys.

I worked for almost two years in the South China Sea, the Caspian Sea and the North Sea. Although it was certainly interesting, I did not want a long-term career working offshore, and in 1998 I got the job I had been looking for – as an environmental consultant for BMT Marine Information Systems Ltd. This job involved the application of numerical models – something I had particularly enjoyed during my MSc course at Bangor – for example for oil spill modelling. One project I managed which I was very proud of was the Search and Rescue Information System we developed for the UK Coastguard Agency. I left BMT and joined Metoc plc (the company founded by **Kevin Deeming**) in 2003, which was acquired by Intertek in 2010, and I've worked there (more or less) ever since.

I am now a Chartered Member of CIWEM (and a Chartered Scientist and Environmentalist) and I am the team leader of the Modelling Team at Intertek. We undertake hydrodynamic, sediment transport and water quality modelling, predominantly for the UK and Ireland Water industry, and also for the marine renewables sector. I work with a great team of scientists, many of whom are ex-Bangor graduates, including **Kevin McGovern**, who I studied Oceanography with back in 1996.

I've been with my wife, Gabby, since our undergraduate days at the University of Newcastle-upon-Tyne, and now live with her and our four children in Havant, on the south coast of England.

We 'emigrated' to Australia in 2009, where I worked in Canberra for the federal government assessing the risk and impact of natural hazards, including climate change and storm surge. I met **John Hunter**, another ex-Bangor oceanographer, whilst over there. We had a great time, and I made some really good friends and colleagues. However, we missed the inclement weather (and modelling sewage discharges), so returned to the UK (and to Intertek) after only 15 months.

Harry Stewart Haspell (MSc Applied Marine Geoscience, BSc Geological Oceanography)

I studied at Bangor University starting in 2017, doing both my BSc in Geological Oceanography and my MSc in Applied Marine Geoscience which I completed in 2021.

I got to live on Anglesey while I studied in the idyllic Rhosneigr which was nice during COVID lockdown!
After graduating, I started working with Intertek Energy and Water and have been enjoying my time with them ever since. I am a Junior Consultant and I do a multitude of tasks and work on many different projects, ranging from water quality modelling with the Modelling team, oil and gas permits with the Environmental team, and various cable routing and navigation assessments with the Cables team. We have a strong Bangor University presence in the company with a diverse set of skills from the different degrees and lecturers we each had.

My other responsibilities are helping on various proposals and will eventually evolve into managing projects around the UK and the rest of the world. I am also one of the fire warden's and first aiders in the Liphook office of Intertek Energy and Water and help the tender tracking team in finding tomorrow's work for the company.

Furthermore, I am working to become a chartered marine scientist with IMarEST.

I met Alice at Bangor, my girlfriend of 6 years (after we met on our first day!) who was not only my course mate but now also my colleague.

Alice Gymer (MSc Applied Marine Geoscience, BSc Geological Oceanography)

I am a MSc Applied Marine Geoscience and BSc Geological Oceanography graduate, now supporting the Site Characterisation & Engineering team at Intertek Energy & Water as a Marine Geoscience Consultant!

I feel like I've hit the jackpot finding a job that was the perfect follow-on from finishing my Master's in 2021. I had the interview for Intertek the day after submitting my MSc research project dissertation and I have worked in Hampshire ever since.

After my gap year, I wanted to study something that combined my love for geology with my interest in the marine environment – studying Geological Oceanography at Bangor was therefore an ideal opportunity and location. Because of this, I have always loved and appreciated the holistic nature of offshore work. This interest has carried on in my current job at Intertek Energy & Water, where we work on a variety of offshore projects (including submarine cables, wind farms, and energy platforms) which require a multi-disciplinary approach. I primarily enjoy undertaking constraints analyses and landfall assessments for subsea cables, which require an integration of geological, geospatial, environmental, socio-economic, metocean and practical parameters.

Being a consultant at Intertek has taught me even more beyond the technical knowledge and skills Bangor provided; I am now a project manager on various workstreams, have a better understanding of the financial & contractual aspects of projects, coordinate client representatives on-board survey vessels, get involved in HSE and also corporate initiatives (e.g. Zero Waste to Landfill). I have additionally had the opportunity to work on other marine projects with Intertek, such as navigational risk assessments, water quality modelling, benthic invertebrates, and environmental reports.

My link to Bangor will never fade, as Harry and I still love coming to visit Anglesey and will do for many years to come. Intertek are also a partner on the ECOWind-ACCELERATE project, and the company always has a steady stream of Bangor Uni alumni, both old and new. I can thank the School of Ocean Sciences, particularly **Katrien, Dei** and **Martin**, for everything they taught us and leading me to a career that I love.

Dan Williams (BSc Ocean and Geophysics, MSc Marine Renewable Energy)

I started my academic journey at Bangor University in 2017, where I earned my BSc in Ocean and Geophysics.

Although my initial focus was on geophysics, I soon found myself captivated by the dynamic world of ocean physics. This fascination led me to pursue a Master's degree in Marine Renewable Energy, which I completed in 2020.

Shortly after graduation, I joined the great team at Intertek, where I've been a part of the organization since 2020. In my role, I primarily focus on modelling hydrodynamics, data and geospatial analysis, and research in various locations, primarily in the UK, Ireland, but other regions around the world too. This position has given me the opportunity to travel and connect with professionals in the marine renewable energy sector.

My responsibilities at Intertek have expanded beyond modelling, as I've become more involved in project management and client engagement. I now play a role in overseeing initiatives related to water quality in the sea and rivers and marine energy, applying my academic knowledge to real-world applications.

My journey since Bangor University has been deeply influenced by my exposure to the dynamic nature of the marine environment, in both nature and industry. This initial experience laid the foundation for my career. As I move forward in the field of ocean science and renewable energy, I won't forget where that spark came from.

More Alumni News

Professor Sandy Shumway (Marine Biology, 1977, and Bangor University Honorary Fellow)

has recently published a paper entitled "*A Critical Assessment of Microplastics in Molluscan Shellfish with Recommendations for Experimental Protocols, Animal Husbandry, Publication, and Future Research*".

The article is available to view here: https://doi.org/10.1080/23308249.2023.2216301

Congratulations to Professor Peter A. Cook (PhD, 1970)

on being made an Honoured Life Member of the National Shellfisheries Association for his contributions to shellfish biology, in particular the global development of abalone aquaculture.

Photo credit: Rumeena Nizam.

Wiktoria Rajewicz (Marine Biology MSc, 2019)

"I am currently finishing my PhD in Biology in the Institute of Biology at the University of Graz, with a focus on Animal Behaviour and using stress behaviours as sensors for environmental monitoring.

I've been busy building biohybrid robots and performing laboratory and field experiments with Daphnia. I live in Austria and study closely the ecology and protection programs of various Austrian lakes. Please check out my recent publications if you'd like to know more about the developed "Daphnia Organ" for autonomous environmental monitoring!"

https://www.researchgate.net/profile/Wiktoria-Rajewicz-3

Professor David Gray (Marine Biology, 1993)

Professor David Gray B.Sc (Hons) Marine Biology (1993) has accepted the role of Provost and Vice-President (Academic) at the University of Niagara Falls, Canada.

Previously he has held the position of Dean of the Faculty of Agriculture and Principal of the Agricultural Campus at Dalhousie University, Nova Scotia for 10 years.

Here's a photo of David's favourite bridge, found in the centre of the Fujian Agriculture and Forestry University Campus in Fuzhou, China.

Emily Cunningham (Marine Biology MSc, 2012)

Bangor Alumna Emily Cunningham wins UK Women of the Future Award

Bangor Alumna **Emily Cunningham** (Master of Marine Biology, 2012) has won a prestigious UK Women of the Future Award. These national awards celebrate trailblazing women across a number of sectors and Emily was shortlisted for her work in ocean conservation.

Announcing her win at the annual Women of the Future Awards Ceremony in London on 15th November, the judges commented: "*Emily's love and commitment to the ocean was hugely inspiring and grounded in expertise. Her potential for global influence is clear from growing Motion for the Ocean, the publication of her upcoming book, and global advocacy.*"

Emily has worked at the frontline of ocean conservation since completing her studies at Bangor, working both in the UK and overseas. She has led the development of two pioneering coastal conservation projects - securing over £5m in funding, served on the Board of the UK's leading marine conservation organisation, and was named a Global 30 under 30 Environmental Leader in 2020. She has spent the past 18 months working on board an expedition ship in Antarctica and the Americas and is currently writing her first book.

Emily is a co-founder of the international #Motion4theOcean movement, through which 19 councils have now passed an Ocean Recovery Declaration and are taking local action for ocean recovery. Of these 19, two councils are inland and one (so far) is in Wales. Anyone can get involved and ask their local Council to pass a Motion for the Ocean, everything you need is here.

The winners of the UK Women of the Future Award will be announced at an Awards Ceremony in London on 15th November.

You can find Emily on social media (please connect!):
LinkedIn: Emily G Cunningham
Instagram: @marinebiologylife
X/Twitter: @EG_Cunningham
Facebook: Marine Biology Life

Pegah Amjadian (Marine Renewable Energy MSc, 2023)

Congratulations to Pegah Amjadian on receiving a fully-funded place on to study a PhD in the College of Engineering and Architecture, University College Dublin, in the field of Offshore renewable energy.

NEW GRANTS

Professor Jan Hiddink is leading a new NERC funded research project examining the impacts of bottom trawling on seabed carbon storage.

The work builds on his recent work published in Nature (see June 2023 edition of the Bridge) and is in collaboration with fellow SOS scientists **Ben Lincoln, Martin Austin, Martin Skov, Hilary Kennedy** and **Tom Rippeth** together with external collaborators from St Andrews, Leeds, Imperial College London, Herriot Watt University, Plymouth Marine Laboratory and CEFAS.

Professor Yueng-Djern Lenn is leading a new NERC funded research project which will investigate the drivers and impacts of North Atlantic heat and freshwater fluxes in unsettling modern-day climate.

Collaborators in this new grant include Exeter University and the National Oceanography Centre in the UK and Texas A&M University in the USA. The new grant is part of the "*Climate consequences of Rapid Ocean change*" programme.

Martin Austin is part of a major new NERC funded collaboration which aims to investigate coastal gravel barrier response to sea-level rise, storms, and changes in wave conditions linked to climate variability.

The response is currently poorly understood and differences in fundamental physical processes mean that knowledge gained from their more widely studied sandy counterparts cannot be directly translated. This project will develop reliable, consistent and appropriate approaches for working with, and making space for, these natural features to enable more sustainable and adaptive national-scale management practices.

The is led by SOS alumni **Jenny Brown** (BSc Physical Oceanography and Maths; PhD Physical Oceanography) from the National Oceanography Centre with co-investigators including **Connor McCarron** (MSc Applied Marine Geosciences; PhD Geological Oceanography, now HR Wallingford) as well as Plymouth, UCL, Aberdeen, Liverpool and Southampton Universities.

We have also been successful in winning a number of DEFRA Fisheries Industry Science Partnerships.

These include a joint proposal with Natural Resource Wales and Welsh Fishermen's Association on understanding bycatch rates in Welsh net fisheries with **Leo Clarke, Jan Hiddink** and **James Waggitt**. A proposal to examine the Impact of Climate Change on Whelk growth **Charlotte Colvin, Natalie Hold, Pete Robins, Ian McCarthey** and **Shelagh Malham**. A joint proposal with Seafish to fill the gap in crustacean evidence for English and Welsh FMPs with **Natalie Hold** and **Jan Hiddink**. A joint proposal with NRW, Welsh Fishermen's Association and Welsh Government to examine the Impact of Pot Fishing on Seabed Ecosystems with **Leo Clarke** and **Jan Hiddink**.

Further research funds have come from European Maritime and Fisheries Fund to the Seas of Change project with **Julie Webb, Ben Winterbourn, Jamie Thorpe, Karen Tuson, Lewis LeVay** and **Shelagh Malham**. From the UKAEA: Small Business Research Initiative to encourage innovation in the development of Lithium in an economic, sustainable, and scalable fusion energy fuel cycle. Led by Professor Simon Middleburgh of the Bangor University Nuclear Futures Institute and including **Tom Galley, Nick Jones** and **Shelagh Malham**. £400K in research funds as also come from the Shared Prosperity Fund (Gwynedd) to support the Shellfish and Aquaculture Hub.

RESEARCH AND IMPACT HIGHLIGHTS

Anticipating obsolescence- the next step to enhancing the sustainability of aquaculture

Would a 'three sisters' aquaculture model lead to greater profit and sustainability?

With growing concerns about the environmental toll of single species fish farms, a European Union funded research project has been looking at the feasibility of introducing a more sustainable and potentially more profitable method of fish farming, using three complementary species.

Much as native American people planted squash, maize and climbing beans together to benefit each other, (often called the 'three sisters'), farming finned-fish, shellfish and seaweeds together could benefit each other and reduce any environmental effects of fish farming. Small scale integrated multi-trophic aquaculture (IMTA), as the system is called, has traditionally been used at a small domestic scale in Asia, providing the farmer with more than one product to sell or use.

The feasibility study conducted by Bangor University has identified the locations around the Atlantic coast which would be most suitable for IMTA, based on farming salmon, blue mussels and Oarweed, a type of kelp seaweed commonly found in temperate Atlantic coasts. The research considered the natural distribution of the three species, whether suitable locations clashed with busy shipping lanes or marine protected areas and whether there was close access to sizeable ports in order to reach markets.

The western coast of Lewis in the Outer Hebrides, Scotland; Lough Swilly in County Donegal, Ireland, and the western coast of Brittany, northwest France were found to be the best locations to further develop IMTA based aquaculture.

As **Conchúr Hughes** of Bangor University's School of Ocean Sciences explained,

"One of the problems with the type of single species aquaculture practiced in Europe is that excess food and faeces can lead to deterioration of local ecology, while density can mean that aquaculture companies need to use antibiotics and other additives to maintain a healthy fish-stock.

"*Mussels are filter feeders, they can be responsible for removing up to 54% of salmon waste materials from the water column, using it as energy to grow, while the oarweed removes soluble nutrients from the water column. Oarweed can then be farmed to use in a variety of products, from food supplements for human consumption or for fish farms, as a fertilizer or as an ingredient in pharmaceuticals*"

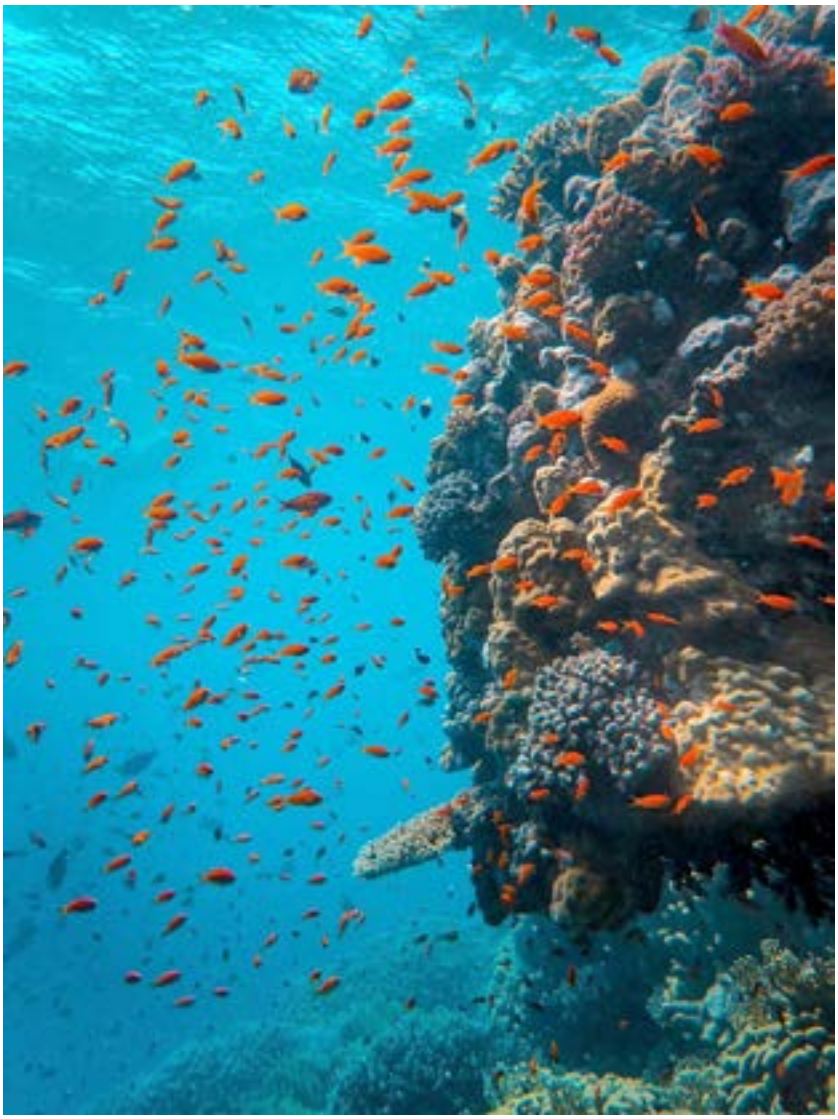
"*Each of these species complements the other and mitigates against problems.*"

https://www.bangor.ac.uk/news/2023-09-27-anticipating-obsolescence-the-next-step-to-enhancing-the-sustainability-of

Paper: Conchúr Hughes and Jonathan W. King (2023). Habitat suitability modelling for an integrated multi-trophic aquaculture (IMTA) system along Europe's Atlantic coast. Ecological Modelling, 484, 110459.

Theories About the Natural World May Need to Change to Reflect Human Impact

New research, reported in Nature Ecology & Evolution, (25 September 2023) has for the first time validated at scale, one of the theories that has underpinned ecology for over half a century. In doing so, the findings raise further questions about whether models should be revised to capture human impacts on natural systems.



Scientists working in the 50's and 60's developed theories to predict the ecological distribution of species. These theories could be applied across a broad range of environments and variables such as food supply or temperature and when tested on a small scale they were found to be accurate. Amongst the earliest examples of these theories is the coral reef zonation theory which explains how different types of fish or corals for example are found on coral reefs at different depths.

Modern computing capabilities have now made it possible to test these theories at a larger scale, to see whether they 'hold water'.

To validate the depth zonation model on coral reefs, scientists at Bangor University and the US Government National Oceanic and Atmospheric Administration (NOAA), led by Dr Laura Richardson, of Bangor University, collected data from 5525 surveys at 35 Pacific Ocean islands. Their work has revealed that the model is correct and can predict the distribution of different fish species according to depth, but only on uninhabited islands where there is no and has never been any local human interference.

At islands and reefs with human habitation the pattern was not as marked or predictable.

The findings therefore suggest that our old 'models' of the natural world may no longer be valid in the face of mounting local human impacts.

As lead author, **Dr Laura Richardson** of Bangor University's School of Ocean Sciences, suggests,

"*Science is cumulative, building on past work. Now that we have greater computing capabilities, we should be testing these widely accepted but spatially under-validated theories at scale. Moreover the intervening years have seen human impacts on the environment increase to such an extent that these models may no longer predict the ecological distribution patterns we see today.*

"This leads to more questions, both about the usefulness of models which represented a world less impacted by human activity, and about how to quantify or model our impact on the natural environment."

"The results show that now is the time to consider whether and how to include human impacts into our understanding of the natural world today."

https://www.bangor.ac.uk/news/2023-09-25-theories-about-the-natural-world-may-need-to-change-to-reflect-human-impact

Paper: Laura E Richardson et al. (2023). Local human impacts disrupt depth-dependent zonation of tropical reef fish communities Nature Ecology and Evolution, 7, 1844–1855.

High Latitude Lakes Warming at a Rapid Pace

Building on previous work revealing rates at which global lake surface temperatures are rising, **Dr Iestyn Woolway** and collaborators in China, have extended our understanding of lakes in high latitudes (>60° N), by including a larger number of lakes and studying their temperatures.

The study, published in Nature Water used both satellite data and numerical modelling to analyse lake surface water temperatures of 92,245 lakes.

Though lakes are getting warmer at a rate of 0.24 degrees Celsius per decade from 1981 to 2020, this is still slower than the change in surface air temperature (0.29 degrees Celsius per decade) during the same period. The main reason is that higher air temperature increases evaporation, which, in turn, cools the lake surface.

The study also found that lakes at high latitudes, are warming fastest. This is because lakes in these regions are more sensitive to changes in the climate.

Dr Iestyn Woolway, NERC Independent Research Fellow and Reader at Bangor University says:

"*Lakes are important ecosystems. They provide a variety of benefits, including drinking water, recreation, and habitat for fish and other aquatic life. Lake warming is a serious threat to these fragile ecosystems, as it can lead to changes in water quality, increased algal blooms, and fish kills. Lakes also influence wider global geophysical processes such as weather patterns, hydrological cycles, and the distribution of freshwater resources.*"

The new study highlights the need to reduce greenhouse gas emissions in order to mitigate the impacts of lake warming. It also provides valuable data that can be used to study the effects of lake warming and develop adaptation strategies.

Paper: Tong, Y., Feng, L., Wang, X. and Woolway, I (2023). Global lakes are warming slower than surface air temperature due to accelerated evaporation. Nature Water, https://doi.org/10.1038/s44221-023-00148-8

Mochras or Shell Island is just one of the places we're lucky enough to visit for fieldwork.
A peninsula with an exposed sandy beach and dune system protecting sheltered saltmarsh and mud flats, it provides us with a range of habitats in spectacularly beautiful surroundings.

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