

2021/2022



# Bangor University SDG Progress Report

---

# SUSTAINABLE DEVELOPMENT GOALS



# Introduction

---

## The Sustainable Development Goals

**"there can be no separating climate action from the larger planetary picture. Everything is interlinked – the global commons and global well-being.**

**That means we must act more broadly, more holistically, across many fronts, to secure the health of our planet on which all life depends.**

**Nature feeds us, clothes us, quenches our thirst, generates our oxygen, shapes our culture and our faiths and forges our very identity."**

António Guterres Secretary-General, United Nations

Sustainability is at the heart of Bangor University and is central to our University Strategy 2030:

*"A globally connected University, realising opportunities for success through transformative, innovative, impact-driven research and teaching, with a focus on sustainability: safeguarding the environment, revitalising society's health, and promoting economic, social, bilingual, and cultural vibrancy."*

As a University community, we must act in a manner which ensures that the needs of our students, staff and local community are met, without compromising the ability of those in the future to meet their own needs.

Bangor University's aims are to educate and inspire the next generation, conduct leading research, be a great employer, and to take an active role in the community. Sustainability at Bangor University is therefore wide-reaching, and it involves everything: from the health and well-being of its staff, to recycling in its student accommodation; from the content of the curriculum to its research activities.

## Sustainability Strategy 2030

# Table of Contents

---

## Sustainability reports are not just about looking back

This Report presents our third annual published SDG report to show a small sample of the many ways in which we are contributing through research, public engagement, learning and students, and operational elements, towards the 17 UN Sustainable Development Goals. This SDG Report is a continuous work in progress - a way for Bangor University to track its impact and improvements over time.

03	GOAL 1: NO POVERTY	21	GOAL 10: REDUCED INEQUALITIES
05	GOAL 2: ZERO HUNGER	23	GOAL 11: SUSTAINABLE CITIES AND COMMUNITIES
07	GOAL 3: GOOD HEALTH AND WELL-BEING	25	GOAL 12: RESPONSIBLE PRODUCTION AND CONSUMPTION
09	GOAL 4: QUALITY EDUCATION	27	GOAL 13: CLIMATE ACTION
11	GOAL 5: GENDER EQUALITY	29	GOAL 14: LIFE BELOW WATER
13	GOAL 6: CLEAN WATER AND SANITATION	31	GOAL 15: LIFE ON LAND
15	GOAL 7: AFFORDABLE AND CLEAN ENERGY	33	GOAL 16: PEACE, JUSTICE AND STRONG INSTITUTIONS
17	GOAL 8: DECENT WORK AND ECONOMIC GROWTH	35	GOAL 17: PARTNERSHIPS FOR THE GOALS
19	GOAL 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE		



## RESEARCH

### Momentum is building for a Universal Basic Income

Two Bangor academics discuss the pilot of the Welsh Universal Basic Income (UBI), and how UBI can play a role in reducing food poverty and ensuring nutritious sustainable diets for all. A UBI is a regular cash payment given without conditions and is not means-tested. Discussions assess how a UBI can guarantee the prosperity of future generations in Wales, and why this is socially and economically important for the UK and world.

### What adverse childhood experiences are costing European economies

Adverse childhood experiences include maltreatment, witnessing violence in the home or community, and living with family difficulties such as parental substance abuse. Exposure to such stressors is linked to poorer health and well-being across the life course, influencing children's neurological, biological, and social development.

All of these present major societal and economic costs. A meta-analysis of available studies, by public health researchers at Bangor University and Public Health Wales, provides stark evidence for policymakers across Europe to consider when setting priorities for post-COVID reconstruction.

## Goal: End Poverty in All Its Forms Everywhere

## PUBLIC ENGAGEMENT

### Sharing tax and welfare expertise to help the less well-off

A Tax specialist at Bangor University's Business School is bringing her expertise to bear on addressing social issues related to poverty in order to affect change.

As a result of fieldwork, a lengthy report has been submitted to the Citizens' Advice Bureau. Among other things, her report identifies the innovative ways that Citizens Advice Anglesey have adopted to provide effective services to citizens during a crisis, and how they managed staff wellbeing during challenging times.

The findings help identify aspects of good practice and weaknesses within policy and government financial support schemes during the COVID-19 pandemic and their impact on charity organisations. It is hoped that the report will feed into policy development to ultimately assist local people facing financial constraints and hardship.



*left-right Alwyn Rowlands MBE, Chair of the Trustee Board, Jackie Blackwell, CEO Ynys Môn CAB and Dr Closs-Davies.*

# LEARNING AND STUDENTS

## Fast Fashion Campaign

This Students' Union campaign centred around the environmental and financial impact of fast fashion. Students Union Clubs and Societies organised swap shops for members to swap clothes with local charity Ty Gobaith to encourage students to buy second-hand – especially at the annual summer ball, awards season, and sharing fancy dress costumes.



## 1-2-1 Budget Meetings for Students

All students are able to book a 1-2-1 session with the Money Support Unit to ask questions and get help in setting financial goals, creating a budget and tracking expenses.

## Student Housing Campaign

The housing campaign provides support to students looking for private housing. The project raises awareness of potential online scams regarding paying fees and encourages students to utilise [bangorstudentpad.co.uk](http://bangorstudentpad.co.uk) when looking for housing as landlords must agree to compulsory conditions. The service ensures students can make an informed decision on safe, suitable housing.

## Study

Module SXP-3210: Housing Policy introduces students to issues in housing policy, around quantity, quality and affordability. A theme of which is the UK housing crisis, generation rent, beds in sheds and homelessness.

# OPERATIONS

## Digital Hardship Fund

The University provides a Hardship Fund to support students to cover essential costs that could not be planned for. Hardship Funds are one of the ways in which we support our students along with our Bangor Bursaries, short-term loans and crisis grants. Last academic year, the Money Support Unit dealt with 1299 student enquiries relating to Digital Hardship and processed 1056 payments to students, totalling £483,603.99.

## Scholarships, Studentships, and Bursaries

Bangor is keen to offer extra help to students and offers a range of bursaries and scholarships to new and returning students. For new students, these include Merit Scholarships, for those from the UK the Bangor Bursary could provide extra financial help over the duration of a three-year course.

The University also offers several scholarships for students classified as refugees, internally displaced, or who have otherwise been affected by conflict.

## Access to 24/7 Learning Warm Spaces

Some social learning spaces across the Bangor University campus are available 24/7 so students can always access a warm place to go to.

## Campus Sport

Campus Sport is a free programme of sports available to all students at Bangor University. Gym memberships are included for all students living in University accommodation giving free access to the main sports centre at Ffriddoedd Village, or the fitness room at St Mary's Village.

The University also supports students with sporting ability by offering a number of Sports Scholarships worth up to £3,000 a year.





## PUBLIC ENGAGEMENT

### **Bangor wins best educational exhibit award at Royal Welsh Show**

Bangor University was named Best Exhibit of Educational and Instructional Value at the Royal Welsh Show in July, welcoming some 200,000 visitors back to the showground in Llanellwedd following the pandemic.

Algae smoothies, highlighting our research into sustainable food connected to the BioComposites Centre which is developing new products using algae, were very popular including with Jeremy Miles MS, the Education and Welsh Language Minister who visited the stand.



*Jeremy Miles MS, the Education and Welsh Language Minister taking an algae smoothie*

## **Goal: End Hunger, Achieve Food Security and Improved Nutrition and Promote Sustainable Agriculture**

### RESEARCH

#### **Alternative seed treatment project aiming for a more sustainable future**

A more sustainable and eco-conscious method of treating vegetable seeds is the focus of a multi-partner research project involving one of the UK's largest seed producers and Bangor University. Tozer Seeds has linked up with the University's Biocomposites Centre to develop alternative seed treatments which aim to control disease as well as improve suitable characteristics for germination and crop establishment. The 18-month project, funded via the UK Government's Farming Innovation Pathways programme, will see celery, parsnip, and coriander seeds treated with lasers and natural bioactive compounds.

#### **Prospects of Low Trophic Marine Aquaculture Contributing to Food Security in a Net Zero-Carbon World**

Researchers from Bangor took part in a global study on food security. Combining expertise from natural and social sciences and industry perspectives, an alternative vision for the future in the marine realm was proposed.

This vision includes moving towards aquaculture mainly of low trophic marine (LTM) species. Such a shift may enable a blue transformation that can support a sustainable blue economy. It includes a whole new perspective and proactive development of policy-making. This needs to be supported by transdisciplinary research co-produced with consumers and the wider public, as a blue transformation towards accelerating LTM aquaculture opportunities in a net zero-carbon world can only occur by considering the demands of society.

## LEARNING AND STUDENTS

### The Big Give Volunteering

The Big Give Student Volunteering Project aims to divert surplus/waste food from students away from the waste stream and back into surplus food for the community. It works with Bangor Cathedral Food Bank to achieve this through the following:

- Collecting surplus food across the year at various points on campus and delivering them to Bangor Food Bank
- Collecting surplus food at the end of the year at various points on campus and delivering them to Bangor Food Bank
- Recruiting volunteers to support by putting emergency food packages together

### Mindful Chef

The Mindful Chef Students' Union Project provides students with a box of free ingredients each week and a corresponding plant-based online cooking class. The programme ensures students have access to inclusive and healthy food sources; whilst further improving knowledge and confidence in the kitchen.

### Study Food Security

Food security has a long and proud history in Bangor, and our recent research has had major impacts in substantially and sustainably increasing food security for some of the poorest farmers in developing countries.

The Agroforestry and Food Security MSc provides students with a detailed understanding of the principles and processes of agroforestry as part of a sustainable food production system, including its social and environmental contexts.

Module DDL-4207: Global Food Security discusses the definitions and evolution of the concept of food security and the impact of future climate change.

## OPERATIONS

### Bwyd Da Bangor

November saw the opening event of Bwyd Da Bangor. Bangor University is a founding member of the North Wales Food Poverty Alliance which supports Bwyd Da Bangor.

Bwyd Da Bangor is an innovative multi-agency initiative that aims to address several key themes, whilst creating a go-to location in the centre of Bangor. Bwyd Da Bangor combines a membership-based food share programme, re-distributing surplus supermarket stock, with a high-quality training café. The café will be run by staff who are coming through the Penrhyn House drug and alcohol rehabilitation centre or those who are currently living in homeless accommodation in Bangor. Receiving training through Coleg Menai, these individuals will receive support and qualifications to gain access to long-term employment.

### Food Dudes Healthy Eating Programme

The University continues to provide licensing of the Food Dudes programme to Bord Bia3 in the Irish Republic. The programme developed by Bangor University is a primary school EU School Fruit and Vegetable Scheme.

Food Dudes is designed to positively change children's attitudes towards eating fresh fruit and vegetables, by combining three key elements: Repeated tasting, Rewards and Role modelling.



*Food Dudes Programme*



## 3 GOOD HEALTH AND WELL-BEING



### RESEARCH

#### **Bangor academics to play a vital role in developing the health and care research community in Wales**

Health and Care Research Wales has announced two Bangor staff in its next cohort of Senior Research Leaders and Specialty Leads from across academia and the NHS in Wales, to act as ambassadors for research into diseases, treatments and services that can change people's lives and drive improvements in patient care.

They will take up the role for the next 3 years and will play a vital role in developing the health and care research community in Wales, mentoring early career researchers and developing the next generation of research leaders.

#### **Testing sewage helped track COVID-19 and it could reveal more about UK's health**

Applying methods developed for COVID-19 to other diseases could revolutionise how we detect the causes of disease over the next decade. Following Bangor's Covid wastewater testing, researchers are also trying to reveal what other secrets wastewater may hold, and how these can be used to improve people's health and wellbeing and guide future healthcare policy.

## **Goal: Ensure Healthy Lives and Promote Well-being for All at All Ages**

### PUBLIC ENGAGEMENT

#### **Mindfulness Centre celebrates 20 years and aids in fighting the pandemic**

Bangor University broke new ground when it became the first university in the world to offer a Masters degree in Mindfulness after earlier being the first in the UK to offer research and training in the meditation-based programme.

Now Mindfulness is being used to help NHS staff deal with the stresses of working on the frontline and many of the teachers involved are University graduates. A guide for NHS staff by the Mindfulness Institute also includes mindfulness meditations of varying lengths, including some in Welsh.

#### **Mental Health and Wellbeing Resources for Students Through the Medium of Welsh Launched at the Senedd**

Myf.cymru, led by Bangor University in partnership with Grŵp Llandrillo Menai, Aberystwyth University and the University of Wales Trinity Saint David, launched in May.

Partners in the scheme recognised that there was a lack of dedicated online resources for students through the medium of Welsh. As a result, a Welsh-medium app was developed to support students in partnership with Helping Groups to Grow Developments Ltd, including a series of 5 podcasts entitled Sgwrs? and a network of Welsh-speaking therapists supporting students in further and higher education colleges across Wales.

Led by Bangor University, the resources provide a sound foundation for Welsh-speaking students, encouraging them to start a conversation about mental health and wellbeing in their mother tongue.

## LEARNING AND STUDENTS

### Supporting patient's health

Student nurses from Bangor University, on placement in Dolgellau Hospital, are acting as 'advocates' for a health charity and spreading the word among patients who may benefit from the support provided by health charities. This initiative also fits in with the public health component of their adult nursing degree and expands the student nurses' own understanding of the conditions they are promoting and how they affect patients.

### First Bangor University Physiotherapists

The first physiotherapy students to study at Bangor University have graduated and are about to begin working as Physiotherapists within the NHS. Physiotherapy was one of the services identified as requiring workforce investment in North Wales and, in 2019 the University was successful in securing the commission for training Physiotherapy students on the Post Graduate Diploma in Physiotherapy.

This is an important milestone for the NHS workforce in the region. In addition, this has also meant that prospective students from the region do not have to travel to other training providers to learn and in doing so, remain and continue to be integral in their community. Throughout their training, the students spend over 1000 hours in local healthcare settings on work experience.

### Welsh international athlete awarded

The University has awarded its annual award for sporting achievement, to Ffion Roberts. The Award is given to a student who has made the greatest contribution to raising the profile of Bangor University sport by their achievement at national or international level. Ffion is a 400m Welsh international athlete, having represented Wales individually and in a relay team.

## OPERATIONS

### Student Well-being Services

September 2021 saw the re-formation of a well-being team for students. The team offer counselling, mental health advice, sexual violence and harassment support and advice on matters relating to student equality and diversity.

The team also offer evidence-based single therapy sessions so that students can access support at the time they need it.

### Staff Cycle to Work Scheme

Cycle2work salary sacrifice scheme allows staff to choose a bike up to the value of £3000 to be utilised for commuting to and from work.



*Canolfan Brailsford Sports Hall during transformation work to create Ysbyty Enfys Rainbow Hospital*

### Ysbyty Enfys Hospital becomes Canolfan Brailsford once again

Canolfan Brailsford, Bangor University's Sports Centre, was handed back to the University in September 2021, having been used as an Ysbyty Enfys 'Rainbow' Hospital since April 2020.

Many organisations contributed to the change of use, including Bangor University, BCUHB, North Wales Fire and Rescue, North Wales Police, The Royal Irish Regiment, Coleg Menai and Evershed Sutherlands LLP. The building wasn't required as a hospital but was used to support the rapid rollout of the COVID-19 vaccination programme delivering over 90,000 vaccinations from the site.



## RESEARCH

### **An evidence-building framework for Education**

A [Bangor paper](#) discusses a framework to help educational researchers consider their research questions and methods in a more systematic way. By being critical about the types and quality of research we produce, we can build a more robust evidence base for an intervention or approach; considering its impact on pupil outcomes, how easy stakeholders find it to implement it in practice, and its cost-effectiveness.

Whilst the paper is written for researchers and teachers engaging in professional enquiry and research, we believe that this information should be shared with educators and policymakers to help them make better-informed decisions about intervention buy-in and promotion.



*Credit: Welsh Government*

**Goal: Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for All**

## PUBLIC ENGAGEMENT

### **Children's Language and Literacy Project to be expanded**

A [project](#) which has supported over 500 children to improve their language, reading skills and communication hopes to help up to 2,000 more across Wales, thanks to £290,000 from the Welsh Government.

The Remote Instruction of Language and Literacy (RILL) project, led by Bangor University, provides 7-11-year-olds with an intensive and interactive ten-week language and literacy programme in Welsh or English, either in or out of the classroom.

### **Launch of Welsh language digital resources for students**

Bangor University is part of an [innovative project](#) to create over 130 brand-new digital learning units to support undergraduate and A-level students all over Wales who are studying through the medium of Welsh.

The project has created specialist and unique resources to teach several popular subjects through the medium of Welsh, from Sports Sciences to [Social Sciences](#).

### **New fellowship programme leads the way in nurses' professional development**

The new '[Creating Caring Cultures](#)' [fellowships](#) are aimed at nurses and midwives passionate about clinical improvement and clinical education and who are aspiring clinical leaders and scholars. The Fellowship enables healthcare professionals to improve patient care and experience at Betsi Cadwaladr University Health Board.

## LEARNING AND STUDENTS

### Investment in students is next step to a North Wales medical school

The Health Minister has announced more medical students will spend all of their training in North Wales as part of moves towards establishing a medical school there.

The C21 North Wales programme, allows students to study for all of their medical degree in North Wales, with a greater focus on community medicine and a wide range of placements including a full year at a GP surgery. The programme will be expanded from 20 students to 25 and to 40 students in next year's intake.

### Bangor University's midwifery programme praised for retaining Unicef accreditation

Bangor has retained Unicef UK Baby Friendly Initiative (BFI) accreditation for their midwifery programme, the only midwifery programme in Wales to hold this accreditation.

The Baby Friendly Initiative supports education around infant feeding and relationship-building between mother and baby. The University has a highly-regarded midwifery programme, including opportunities to study aspects of the programme through the medium of Welsh, with over 100 students currently on the three-year course.

### A deep dive into new digital learning experiences

The University's academic schools were invited to apply for HEFCW-funded digital Teaching and Learning grants to support an innovative project that would improve the staff and student experience. Six grants were awarded and these enabled several enhancements to digital teaching, such as labour and birthing simulations and illustrating the occurrence of certain strata in a rock outcrop through Virtual Reality.

## OPERATIONS

### Graduations returned for three-year celebration following COVID-19 disruption

In July 2022, more than 5,000 students covering three academic years celebrated their achievements with their families and friends. During a three-week graduation festival, the University also bestowed 15 honorary degrees upon distinguished individuals who have made outstanding contributions to society.



*Academics and students at one of the 2022 Graduation Ceremonies*

### Excellence for Bangor University and its Welsh for Adults teaching provision

The Welsh for Adults provision at Bangor University - Learn Welsh North West (DCGO) - has been rated 'Excellent' by Estyn, the education and training inspector in Wales, receiving the highest award since the restructuring of Welsh for adults 6 years ago.

With over 2000 learners in Conwy, Gwynedd and Anglesey annually, this provision is making an extremely important contribution to the aims of the 2050 Welsh language strategy: A Million Speakers, Welsh Government.

### Leap Into Literacy (LEAPS)

The LEAPS programme is designed for all children aged 6 – 11 years, who can benefit from a bespoke programme targeting oral and written language skills in small group and individual contexts. Children can follow the programme in either English or Welsh.





## PUBLIC ENGAGEMENT

### International Women's Day 2022

The University celebrated International Women's Day 2022 by welcoming the Chief Executive of Betsi Cadwaladr University Health Board (BCUHB) to speak to staff, students and the public.

Jo Whitehead shared a series of personal reflections on her career journey to date, a journey that has seen her return to North Wales after having worked in healthcare in both the UK and Australia for the last 30 years. She talked about her current role as the Chief Executive of BCUHB and the importance of encouraging diversity and celebrating differences when leading complex organisations.

M-SParc also held an event celebrating women pursuing a wide-range of career topics from psychology to computing and studying the ocean through to physics.



## Goal: Achieve Gender Equality and Empower All Women and Girls

## RESEARCH

### Firms with greater gender diversity in the workplace reduce CO2

The relationship between gender diversity in the workplace and a firm's carbon emissions was the basis for research carried out by Bangor University, the Bank for International Settlements (BIS) and the European Central Bank (ECB) which established whether females covering managerial positions improve a company's environmental performance. While the board of directors' decisions shape a firm's strategy towards environmental instances, in reality, it is managers who select the suitable strategy to meet a firm's objectives.

The results between the percentage of female managers and CO2 emissions are supported by a solid theoretical framework grounded on the pro-environmental traits of female personalities which influences their decisions regarding environmental issues in relation to implementing a board's strategy.

### Rapid Review - What innovations can address inequalities experienced by women and girls due to the Covid-19 pandemic across different areas

A rapid review by Bangor Academics investigated the evidence for the effectiveness of interventions to address gender inequalities across the domains of work, health, living standards, personal security, participation, and education.

Evidence presented to the Welsh Government noted further research is needed to evaluate the effectiveness of educational innovations, the effectiveness of the innovations in minority groups and the social value gained from interventions to address gender inequalities.

## LEARNING AND STUDENTS

### Erasmus + Empyre Project

Partners from the [Erasmus+ Empyre project](#) met in Bangor in March for a twelve-day student workshop on innovative youth work practice. Partners include universities and youth work agencies from four European countries, with Bangor students working closely with students from Finland, Poland and Austria. The workshop explored themes of equality, diversity and inclusivity.

### Student Data 2021/2022

Women continue to make up the majority of students studying at Bangor with [60% of all students identifying as female](#), higher than the UK sector of circa 57%. There are also small gender differences in outcomes, with a higher proportion of female students graduating with a first-class degree.

### Equality & Diversity Scholarships 2021/22

Three '[Equality & Diversity Scholarships](#)' have been awarded to exceptional Bangor University 2021 graduates. The Scholarships support students who are continuing their studies at Bangor to ensure the student voice and experience are embedded in the EDI and Athena SWAN agendas.

### On-Site Nursery

Tir na n-Og is a [non-profitmaking nursery founded by Bangor University](#). The Nursery is open to university students, staff and the public. We also provide staff with affordable childcare via a salary exchange arrangement.



## OPERATIONS

### Gender Pay Gap Reports

Our [Gender Pay Gap](#) continues to decrease, with our median gender pay gap standing now at 5.8%, down from 7.2%, and 10.8% in 2020 and 2019 respectively. While this is good progress, we recognise that there is more to be done and we are committed to addressing these issues and providing a unique, multicultural and inclusive experience for all. We achieved gender balance of our [Strategy Group membership](#) of 51% female, and our Executive Group remained at 33% female, up from 30% in 19/20. Our Heads of Schools are almost gender balanced with 44% female heads and 56% male; up from 7% in 18/19.

### Athena SWAN Charter

The University is extremely proud of awards celebrating our commitment to gender equality. We are fully committed to the [Athena SWAN Charter](#) and currently hold a Bronze award in recognition of our work and progress in this area. Across the academic domain, work is ongoing towards achieving additional school-level awards. Work is also progressing on our application for an institutional Silver award, and our aim is to submit this application before the end of 2023.

In recognition of this, the University already holds a Bronze Institutional Award and numerous Schools have all been awarded Athena Swan Bronze in recognition of their ongoing commitment to gender equality for staff and students.

### Menopause

A [Menopause Working Group](#) was formed in January 2022 with stakeholders across the University, focused on improving the support available for staff. A Staff Menopause Guidance document was created and plans are in place to host awareness-raising sessions for staff and Line Managers and also to pilot a Menopause Lounge series for staff.



## 6 CLEAN WATER AND SANITATION



### PUBLIC ENGAGEMENT

**Festival-goers asked: No matter how long the queue – use the loo**

Ecologists at Bangor University are highlighting one simple thing that festival-goers can do for the environment: use the loo.

People attending 'greenfield' festivals are being asked not to pee on the ground, as this can then seep into nearby rivers and streams. And it may not just be pee that's being released into the environment.

Research by Bangor University, using water samples downstream from the last Glastonbury Festival, found that some illicit drugs reached potentially environmentally damaging levels in the river flowing through the site, most likely due to people peeing in the area.



**Goal: Ensure Availability and Sustainable Management of Water and Sanitation for All**

### RESEARCH

**Bangor researchers collaborate with the local council to manage flood risk using visual analytics**

As the need to plan for flooding and manage flood alleviation schemes climbs higher on the public and private sector's agenda, researchers from Bangor University are working with the local council to develop an advanced visual analytics tool to model the impact of land use change on river hydrology and provide valuable insights.

Researchers have developed a new decision support toolkit, the 'Land Use Change SWAT+ Toolkit', to help improve the planning and management of flood alleviation schemes in Gwynedd Council, which has the potential to be rolled out further afield.



**Climate change will impact future water availability for hydropower and public water supply in Wales**

Wales could face public water supply challenges and lower hydropower generation potential in the future according to new research. The findings of the study conducted by Bangor University researchers, as part of the ERDF-funded Dŵr Uisce project, show water availability in Wales will become more seasonal under future climate change. Changes in water availability were most pronounced in the medium-term (2021–2054), and the rate of change slowed after 2060.

# LEARNING AND STUDENTS

## Beach Clean

In September Bangor students took part in a beach clean at Rhosneigr as part of the Great British Beach Clean/Tour of Climate Cymru.

## Drinking Water

All University catering outlets and kitchens have been mapped to show where water bottles can be refilled for free around campus.

## Study

Many of our undergraduate and postgraduate modules study the theme of water.

Catchment Processes provides an understanding of the factors influencing the quality and quantity of water resources. The hydrological cycle and water balance in catchments; rainfall/runoff relationships; channel & floodplain domains; hydrological processes; water quality; and legislation and the Water Framework Directive.

Water, air & soil pollution, discusses the major global environmental topics such as heavy metals, microplastics, pesticides, human pathogens, biodiversity loss from rivers, acid rain, salinity, and water scarcity.

Freshwater Ecosystems looks at the actual and potential human impacts on freshwaters and their Ecosystem Goods & Services. This includes understanding the available options for conservation and management of freshwater ecosystems.

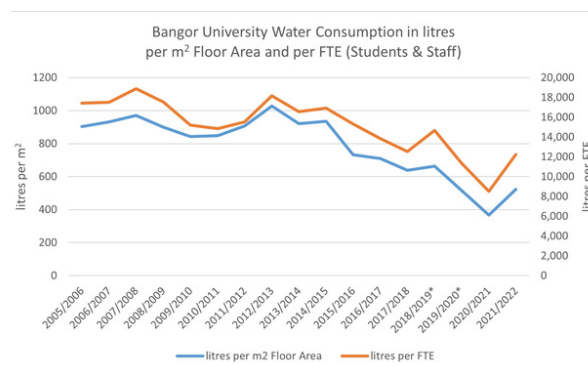


# OPERATIONS

## Water Management

During the 2021/22 academic year, Bangor University used more than 120,034 cubic meters of water.

The University sets itself targets to reduce water use as part of its Environmental Management System to not only conserve this globally scarce resource but to reduce treatment and pumping of water and wastewater as it is such an energy intensive process. Between 2005 and 2022, total water use was reduced by 42.0% per m2 floor area. Our annual target aims to reduce water consumption by 2% compared to the previous year.



## Bangor University's Water Consumption

### Reducing Water Consumption

Treborh Botanic Garden and Henfaes Research Centre/Bangor Forest Garden all make use of waterbutts to collect rainwater. Treborh has a total waterbutt capacity of around 3000 litres which is used to offset the use of clean water for watering plants.

Our Environment Centre Wales building was designed with a rainwater harvesting system. The water collected by the building is used to supply water for all the toilets in the building.

New installations or refurbishment programmes in the past have seen higher water efficiency low flow taps, low flush toilets, waterless urinals, use of automatic sensors, and Halls water efficient showerheads.

## 7 AFFORDABLE AND CLEAN ENERGY



### PUBLIC ENGAGEMENT

#### UK Government hosts roundtable discussion with Energy Leaders at Menai Science Park

Leaders from the Low Carbon Energy sector across the United Kingdom came together at Bangor University's M-SParc in May to discuss the nation's future energy mix and the opportunities for collaboration between industry and academia to deliver future projects and economic impact.

High-profile officials from a range of leading businesses and organisations attended the session, including Rolls-Royce, Bechtel, Westinghouse, Morlais, Shearwater Energy, BP Enigie, Cwmni Egino, the National Nuclear Laboratory, Bangor University, Grwp Llandrillo Menai, Ambition North Wales and Anglesey County Council.



*Seabed mapping for offshore energy*

### Goal: Ensure Access to Affordable, Reliable, Sustainable and Modern Energy

### RESEARCH

#### University shares Marine Renewable Expertise in Welsh Centre of Excellence

Bangor University has officially joined the Offshore Renewable Energy (ORE) Catapult's Marine Energy Engineering Centre of Excellence (MEECE) which supports innovative Welsh companies to develop new products, processes and services for the offshore renewable energy sector. It will initially be involved in two projects, supporting the development of a user-friendly, cloud-based constraints mapping tool to streamline the development and planning of offshore wind farms, and in further development of a public mobile app to learn and register sightings of cetaceans, both of which provide valuable information in assisting project developers during the consenting process of offshore renewable energy projects.

#### Wind turbines can breathe new life into our warming seas

Offshore wind capture is set to move further and further from shore, as demand for renewable energy grows and new floating turbine technology makes deep-water expansion possible. However, large areas of the UK continental shelf now open for development are "seasonally stratified".

According to research, one by-product of deep-sea wind farming is that the foundations of the floating turbines could help reverse the damaging effects of climate change on seas. It seems that offshore wind could help seasonally stratified seas become more productive, more biodiverse and support more fish. Careful turbine design and wind farm planning could provide an important tool in the battle to save these important ecosystems from the worst impacts of climate change.



## LEARNING AND STUDENTS

### Study

Our research specialties include Energy, Environment and Bio-sensing (EEBG); Marine; Solar; Environmental sensing; Biosensing; and Nuclear Futures Institute. Expertise from these areas are incorporated into our [teaching activities](#), giving students direct access to the latest Renewables research.

The [Renewable Energy module](#) examines alternative renewable resources for fossil fuels involving combustion technologies (e.g. biomass) and non-combustion technologies (e.g. wind, solar PV, solar thermal, heat pump technologies, hydro, wave and tidal) along with associated issues of energy storage and distribution.



Our [MSc in Marine Renewable Energy](#), equips students with the skills necessary to identify and quantify the potential of specific locations for marine renewable energy generation installations, with an emphasis on the resource (waves and tides), time series analysis, numerical modelling, and the challenges faced when placing arrays of devices in the marine environment.

[Sustainable Renewable Energy](#), identifies the principles behind sustainable energy, describing the principles behind Nuclear Power and the current trends towards this form of energy, explaining the business models and design behind renewable energy sources.

## OPERATIONS

### Bangor University's Campus Services Fleet goes electric

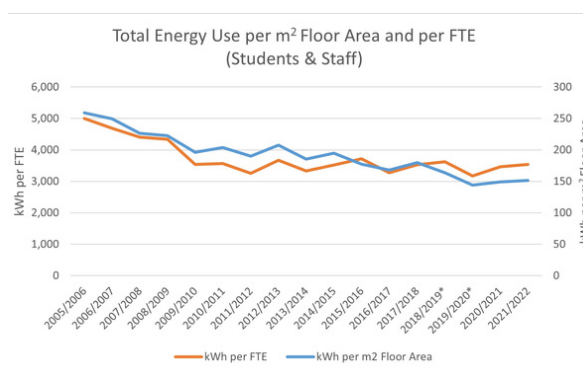
[Four vehicles](#) were funded by a successful bid for Circular Economy funding from the Welsh Government. A further six electric vehicles were purchased with funding from the Higher Education Funding Council for Wales.

Changing the fleet over to electric contributes to the University's ambitions to be a sustainable University.

### Energy Use at Bangor

During the [2021/22 academic year](#), Bangor University used around 34.7 million kWh of energy, the equivalent to the annual energy use of around 2,330 average UK homes. Most of this energy (57.7%) was in the form of natural gas for heating buildings and providing hot water. Electricity for lighting, computers and other equipment was the next most significant form of energy use at the University (40.7%). The other 1.6% of energy use was in the form of LPG and Heating Oil, to our properties that are not connected to mains gas. An additional 73.6 MWh was generated by rooftop solar panels.

Since 2005, the University has been working to reduce energy use and associated carbon emissions through our [Environmental Management System](#). Between 2005 and 2022, we have reduced our total energy use per m<sup>2</sup> floor area by 41.5%.



### Bangor University's Energy Consumption

## 8 DECENT WORK AND ECONOMIC GROWTH



### RESEARCH

#### Bank holidays: how a day off work affects the economy

Bangor lecturer in Economics: Central to the question, do bank holidays boost economics, is whether the benefit of increased consumer spending outweighs the loss of productivity by letting employees off work.

Sectors like tourism and hospitality would be expected to benefit more than industries such as construction or finance, for example. But there are other dividends to consider too. Bank holidays enable people to take a day off work to enjoy hobbies, take trips, or get together with family and friends.

#### Does inflation targeting increase income inequality?

Bangor researchers assessed the impact of employing a panel of 121 advanced and developing economies, including 27 IT adopters, during the period 1971–2015. Their results suggest that IT adoption has contributed to greater inequality of household income as measured by the Gini coefficient and to a reduced share of GDP going to labor compensation. The results are robust to alternative estimation methodologies and to variations in the sample with respect to countries and data frequency.

**Goal: Promote Sustained, Inclusive and Sustainable Economic Growth, Full and Productive Employment and Decent Work for All**

### PUBLIC ENGAGEMENT

**Nuclear Futures Institute and the National Nuclear Laboratory (NNL) enter into a strategic collaboration to further the advancement of nuclear science**

Bangor University, and NNL, the UK's national laboratory for nuclear fission, have signed a Memorandum of Understanding (MoU) that will see them work together to advance education and research in the field of nuclear energy, including skills and training for the nuclear industry. They will also work on joint research projects and share access to infrastructure, facilities and equipment that will advance nuclear technologies.

The partnership demonstrates NNL's commitment to driving up innovation, investment and employment of a skilled workforce in Wales – one that will be doing so much for the UK's contribution to net zero.



*From left, newly-appointed Vice-Chancellor for Bangor University, Professor Edmund Burke, current Vice-Chancellor Professor Iwan Davies, Dr Paul Howarth, CEO at the National Nuclear Laboratory Ltd, Dr Fiona Rayment OBE, Chief Science and Technology Officer*

## LEARNING AND STUDENTS

### North Wales Science Park helps launch the careers of Bangor University students

M-SParc by Bangor University has helped more than 70% of students interning with businesses at the site secure full-time employment within the centre and help kick-start their careers, with the average salary within M-SParc £5,000 higher than the Welsh average.

The positions at the park form part of the Santander Universities Employability scheme, which helps Bangor University students gain the qualifications and skills required to find full-time employment upon graduation while also providing a pipeline of skilled graduates to support growth of businesses in the region.

A work placement at Menai Science Park (M-SParc) has paid off for Bangor University alumni Callum, who is now in his second year of full-time employment with a business at the space.

M-SParc also added over 40 industrial placement roles to their Skills Academy and seven long-term, well-paid positions, in a major skills employment drive.

### Employability: Providing training and work experience for our students

Our undergraduate internship programme offered the opportunity for students to apply for 62 projects with successful applicants benefitting from an internship experience. With generous funding from Santander Universities, we invited applications from students and graduates to fund additional or complementary training courses and received more than 700 applications. £32,500 was awarded to 84 students and young alumni, enabling them to gain qualifications for driving, project management and diving to name a few, as well as provide financial support to gain graduate work experience.

## OPERATIONS

### Universities of Sanctuary

Bangor University is proud to be part of the Universities of Sanctuary national network of university staff, lecturers, academics and students. The University commits to creating a culture of welcome, safety, solidarity and empowerment for people seeking sanctuary within, and beyond, our campus. This has recently resulted in aiding Ukrainian refugees.

The University is also signed up to be part of the Cara network, the Council for At-Risk Academics, which provides help to academics in immediate danger, those forced into exile, and many who choose to work on in their home countries despite serious risks.

### Bangor Benefits

Benefits Bangor University has been set up for staff to add to their employment experience and help pay go a bit further.

The University Salary Scales are aligned to a HERA Job Evaluation scheme to determine a fair salary grade for duties and responsibilities across the organisation. We have signed up to the real living wage foundation and salaries are reviewed and pay awards considered annually through national pay bargaining negotiations with recognised Trade Unions.

Staff are able to access various benefits, enhanced annual leave, enhanced sick pay scheme, generous contributions to pension schemes and a range of avenues for Career Development, Promotion, Regrading and Recognition.



*A Real Living Wage Employer*



## 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



### PUBLIC ENGAGEMENT

#### **£4.2 million for Digital Signal Processing (DSP) to bring 5G broadband connections to parts of Anglesey**

The University is working with a consortium of companies to increase the capacity and enhance the sensing ability of fibre optic cables used to deliver faster and more reliable mobile broadband, and this will be trailed by more than 400 premises on Ynys Mon that do not have access to superfast broadband. The broadband delivery part of the project will last 18 months and allow customers to be connected as soon as the first site is live.

#### **New Welsh company to target some common Welsh cancers**

A new Welsh start-up company is to develop a novel cancer therapy, targeting a rare bone cancer and other cancers, more common in Wales, such as lung, colorectal, breast and prostate cancers. Represented by the company, Bangor University is the only non-Russell Group University in the project.

The aim of the programme is to identify and progress oncology innovations that will improve diagnosis and treatment of cancer. Its goal is to bring forward viable oncology projects much more quickly to significantly increase their likelihood of commercial success, ultimately benefitting patients.

### **Goal: Build Resilient Infrastructure, Promote Sustainable Industrialisation and Foster Innovation**

### RESEARCH

#### **First North Wales Growth Deal project launched ensuring region is at the cutting-edge of digital technology**

The North Wales Growth Deal launched its first project; with new cutting-edge equipment at Bangor University's Digital Signal Processing (DSP) Centre.

Technology at the DSP Centre manages the way digital signals are transmitted, providing a solution for the signals to be better processed and received and to be both more secure and more cost-effective. The £3 million Growth Deal funding will develop solutions to support the future's digital requirements, benefitting businesses and residents with better communication capabilities such as 5G & 6G.



*First Minister of Wales, Mark Drakeford AM viewing new technology at the DSP Centre*

*Credit:Iolo Penri*

#### **Nuclear energy research to address barriers to innovation**

The risk and cost of developing new nuclear energy technologies could be reduced, thanks to a new project bringing together UK and India scientists. The nuclear physics research aims to fill gaps in current knowledge, where low accuracy data leads to poor predictability currently dealt with by over-engineering or reducing performance and efficiency of the overall system.

## LEARNING AND STUDENTS

### Sustainable Hangers designed by Bangor Students to hit stores Worldwide

Innovative hangers may soon be lining the aisles of retail stores across the globe as a worldwide manufacturing company looks to expand on sustainable designs created alongside Bangor University undergraduates.

Global hanger maker Mainetti has worked alongside the university to develop new ideas for hangers for use with some of the world's largest fashion brands and retailers.

### Bangor's Book-publishers

Two Bangor University students have ventured into the world of publishing, having formed an independent publishing business and published their first book whilst studying a Publishing and Book Culture MA degree.

### Magnificent Seven for Bangor film-makers at the RTS Cymru Awards

Films produced at Bangor University won a record seven awards at the Royal Television Society Cymru/Wales awards, held at the Royal College of Music and Drama. This is the largest number of prizes won by one university in the history of these awards, held to celebrate all the activities of the television industry in Wales, and which have specific categories for student productions.

The successful film-makers were Kumara Gadda and Shafin Basheer from India, Matt Evans from Valley, and Dion Jones from Caernarfon.



## OPERATIONS

### Level Up

Bangor University's M-SParc provides an accelerator programme for innovative, high-growth science technology start-ups in North Wales. A five-month programme, founders of new start-ups can access expert mentoring, a community of like-minded founders, their own global advisory board with powerful networks and exclusive opportunities for growth. In 2021/22 Level Up, awarded £110,000 of support to 4 businesses in the region.

### Innovation Spaces

Bangor University believes that innovation is at its most creative and productive when it is a social activity. With that in mind, our purpose-built facilities, with five different labs, have been designed to encourage playful and productive interactions and conversations between people who might not normally meet. We also have some quieter spaces where members are able to refine their prototypes and test the promise of a great idea without public scrutiny.

### M-SParc On Tour



*Lucy setting up her Sheep Creations business at Colwyn Bay #On Tour*

The tour involves bringing M-SParc's ethos of innovation and inspiration to new communities, to stimulate businesses and encourage more people to take an interest in science and technology. In September 2021 On Tour went to Colwyn Bay to deliver a regional impact in the Creative, Science and Technology sectors, to stimulate businesses and encourage more people to take an interest in science and technology.



## PUBLIC ENGAGEMENT

### Gardens, Environment and Racial Identities

A series of public lectures organised by Bangor University and the Race Council Cymru, discussed Gardens and Diversity; Slavery Landscapes of Wales; The Unnatural Jew: Jews and Nature; and Environmental racism and urbanisation: The case of Indigenous Peoples in Latin America.

At the first lecture, it was announced the story of a man who became one of Britain's first black gardeners is being marked with a rose named in his honour. John Ystumllyn was abducted as a child in western Africa in the 18th Century to be raised and work in north Wales. The new rose was planted in Buckingham Palace's rose garden.

### What's Happening in Black British History? XIV

Public workshops were held at Bangor University in May, with the event focused on Welsh Black History, with a keynote from Professor Charlotte Williams, OBE, followed by sessions exploring the latest developments in Wales, histories from the Victorian Age through to the interwar years, and artistic and poetic responses.

**Goal: Reduce inequality within and among countries**

## RESEARCH

### Ways to make fieldwork more inclusive and accessible

Bangor University's involvement in the CULTIVATE project, funded by NERC, is about enabling educators to better plan and deliver fieldwork teaching that is inclusive and accessible for all students by taking a grassroots approach. They explored some key inclusion and accessibility issues through using storytelling to collect personal fieldwork experiences and exploring digital approaches used by colleagues for field teaching through hackathon and workshop events. In this way, CULTIVATE was very much about growing an inclusive teaching environment that was driven by the community for the community.

To aid educators the group published a booklet to summarise some points to help guide others when planning fieldtrips for their colleagues and students noting the visible and invisible barriers to fieldwork: 10 ways to make fieldwork more inclusive and accessible: a guide for educators.



Prepared by Dr Lynda Yorke, Dr Simon M. Hutchinson, and Dr Liz Hurrell, with input from the academic community.



*10 ways to make fieldwork more inclusive and accessible: a guide for educators*

## LEARNING AND STUDENTS

### Inclusive Bangor Scholarships Awarded 2021/22

Inclusive Bangor Scholarships have been awarded to three exceptional Bangor University 2021 graduates – Mae Bernard, Eddie Cox and Thea Moule. The scholarships (which cover up to £9,500 of course fees) support students who are continuing their studies at Bangor. The scholarships aim to highlight and celebrate the diversity and inclusivity of our student population, to ensure the student voice and experience are embedded in our EDI (Equality, Diversity and Inclusivity) and Athena Swan agendas and to support the career development of our students contributing to these important agendas.

### One World Gala

The University celebrated diversity and talent amongst its staff, students and the local community, with its annual One World Gala. The International Student Support team has organised the gala for more than a decade, but this year was extra special as the event returned following a hiatus due to COVID-19.



*One World Gala performance*

### Student Data 2021/2022

18% of all UK domiciled Bangor University students identified as Black, Asian, and Minority Ethnic in 2021/22. 21% of students were recorded as having a disability, this is much higher than the UK figure of 16%.

## OPERATIONS

### Two new appointments support Diversity and Inclusion

Professor Morag McDonald will take on additional responsibility, as Associate Pro-Vice-Chancellor for Diversity and Inclusion. The role will develop an approach that will ensure inclusivity is embedded across the University.

Dr Thandi Gilder will take up the role of Learning and Teaching Development Leader (Diversity and Inclusion) in The Centre for the Enhancement of Learning and Teaching. This new role, funded by the Welsh Government, will address inclusive practice in teaching and assessment across the University and support our Race Equality Action Plan.

### Bystander Training

Bangor University has developed its own, in-house 90-minute Bystander Intervention training session for students, and has also developed a Bystander Intervention awareness training session for staff. The training aims to introduce staff and students to the concepts of active bystander interventions and demonstrates safe and effective ways that students can intervene in lower-level problematic events and behaviours. In 2021–22 all first-year students were offered bystander training to support an inclusive community.

### Race Equality Charter (REC)

In 2022 Bangor University joined Advance HE's Race Equality Charter. Our journey towards becoming an anti-racist University – as part of the Race Equality Charter and in line with the Welsh Government's Anti-Racist Wales Action Plan. It will allow us to enhance our understanding of minoritised staff and students and their experiences of working and studying at Bangor. In turn, this will enable us to take more targeted and impactful steps toward addressing race inequality.



# 11 SUSTAINABLE CITIES AND COMMUNITIES



## RESEARCH

### Local Civil Society: Time, Place and Boundaries

A [recent book published by Bangor researchers](#) draws on place-based field investigations and new empirical analysis and investigates civil society at a local level. Analysing two Welsh villages, the authors examine the importance of identity, connection with place and the impact of social and spatial boundaries on the everyday production of civil society. Bringing into focus questions of biography and temporality, the book provides an innovative account of continuities and changes within local civil society during social and economic transformation.

### How People Foraging in Urban Greenspace Can Mobilize Social-Ecological Resilience

Informal foraging for food and other natural materials in urban greenspaces is an activity undertaken by many across the world. Through the capitals framework, [this paper](#) co-collaborated by a Bangor researcher, explores the role foraging could play in addressing issues of biodiversity conservation, culture, and education, good governance and social justice, multifunctional greenspace, and sustainable nature-based livelihoods in urban areas.

## Goal: Make Cities Inclusive, Safe, Resilient and Sustainable

## PUBLIC ENGAGEMENT

### College Park to be transformed into a vibrant and exciting place of education and enjoyment

Following consultation with stakeholders and members of the public, [work has begun on transforming College Park](#) to make the area a more accessible, safe and friendly space for the community of Bangor. Located at the foot of Bangor University's Main Arts Building, College Park is an important green space connecting the University and the City of Bangor.

The development will include new focus spaces as well as enhanced nature zones, including woodland trails and wildlife observation points. Creating a space that encourages use by the public for small-scale events, exercise, meeting friends or walking from one part of the city to another.



### Leading education institutions join forces to target local recovery and growth

Coleg Cambria and [Bangor University](#) will be working closely to develop new strategic pathways and support employers as they build back after a challenging period for all industries. Among the collaborative projects proposed by Cambria and Bangor is a 'Skills Factory' in Deeside, with initial funding support from the Higher Education Funding Council for Wales. The aim is to bridge the gap between higher and further education and engage with multiple arenas on research, innovation and business engagement.

## LEARNING AND STUDENTS

### High Sheriff Awards

Volunteers who have demonstrated outstanding dedication to volunteering whilst at university received High Sheriff Awards. This year, four individual awards were given along with two group awards. Grug Evans is a volunteer for our elderly projects and a volunteer at Hafan Café; a place for the community to meet up with friends, and chat with our volunteers. Amber Khan was also rewarded for her role as project leader for Wellbeing Buddies which pairs carefully selected volunteers with service users.

Sbectrwm is a student-led project providing a weekly play session for autistic children and their siblings. Sblat was another group commended for their hard work. Sblat is an activity group for local children living in the surrounding areas of Bangor.

### Reclaim the Night

Students took to their local streets on the 27th of October to march against drink spiking. This aimed to challenge behaviours and to create a safer social space for students when on nights out.

### 100 Years of Music

Bangor University celebrated 100 Years of Music by hosting a series of music to highlight the diversity of sounds over a century. The celebrations included concerts, performances and masterclasses and paid tribute to the great tradition of music-making at the University, with events taking place throughout the city of Bangor.

Young practitioners from National Theatre Wales, the Royal Shakespeare Company, the West End, Sherman Theatre, Coleg y Drindod and the Orchestra National de Bretagne presented masterclasses for Bangor students and local schools.

## OPERATIONS

### Civic Engagement

Bangor University has a long history of working with our community to raise aspirations and improve quality of life. Through partnerships and collaborations, we seek to contribute to the economic, environmental, cultural and social well-being of our area.

The Community Board was introduced in 2022 and replaces the former Liaison Group. The Board is an important way of connecting the University with our communities, discussing areas for collaboration, working together on issues of common interest, and developing our civic engagement. The Board provides a platform to discuss the University's strategic aims and how it can work with a range of partners to improve the well-being of communities across North Wales.

### Bangor University Collections

Bangor University has had museum collections since at least 1887. The museum collections reflected the subjects being taught at the University, including botany, chemistry, geology, Welsh history and zoology. Today, we have collections of art, ceramics, musical instruments, zoology, geology, timber and damaged wood, all held within different buildings of the University.

The University also has a significant collection of archives, manuscripts, and a diverse range of rare books and printed material, all held in the University's Archives and Special Collections Department.



*Nautilus Shell from our collection*



## 12 RESPONSIBLE CONSUMPTION AND PRODUCTION



### PUBLIC ENGAGEMENT

#### Mapping the litter problem

Citizen scientists have been urged to photograph the rubbish they find and [post it on social media](#) to help researchers understand the country's littering problem.

Any data collected will be used as part of a wider project investigating why people litter and what can be done about it. Lucozade bottles have been chosen because an earlier study, with the organisation [Trash Free Trails](#), found these products to be the most littered item on mountain biking trails across the UK.

#### Bangor University capping off work on eco-conscious paper whisky bottle

Consumers could soon be pouring [whisky out of a paper bottle](#), with a sustainable packaging project nearing completion. The Biocomposites Centre has partnered with the global green packaging consortium Pulpex to design a paper bottle for use by a number of global consumer packaged goods companies, including Diageo.

Made from sustainably sourced, FSC-certified wood pulp, the bottles have been designed to balance functionality and quality with recyclability, and the intention is to create a resilient container which will allow for a long-term shelf-life and simple mass production.

### Goal: Ensure Sustainable Consumption And Production Patterns

### RESEARCH

#### Catastrophic consequences for our oceans when climate change and plastic pollution crises combine

Zoological Society London and Bangor University have revealed fundamental links between the global climate crisis and plastic pollution, including extreme weather worsening the distribution of microplastics into pristine and remote areas.

In a [paper published](#), an interdisciplinary team of scientists have for the first time, collated evidence that the global issues of marine plastic pollution and climate change exacerbate one another, creating a dangerous cycle, and are urging governments and policymakers to tackle the two issues in unison.

#### Prevention is better than cure: converting organic waste to biogas is good for the climate, but waste prevention is better

According to a [new study](#) by Bangor University, the University of Limerick and Feedback Global, biogas use should be carefully constrained to prioritise more effective climate solutions such as waste prevention, solar electricity generation and afforestation in order to meet the challenging "net zero" greenhouse gas (GHG) emission target set for 2050.



## LEARNING AND STUDENTS

### Period Poverty

Bangor University provides students with free access to period products. We want to inspire students to adopt more planet-friendly period practices through our Campaign. This includes encouraging students to give reusables a go or order from our 100% plastic-free range of single-use products, available through our home delivery supplier Hey Girls. We want to educate students on how to use reusable products and correctly dispose of single-use products.



*Period Poverty and Dignity Campaign*

### Study

The Waste Management & Utilisation module explores the implications of our present behaviour around waste generation and materials utilisation, looks at the options and issues surrounding different strategies for dealing with waste, and considers the changes needed to manage and utilise waste and materials in a sustainable manner.

Sustainable Manufacturing Management provides students with an appreciation of the concerns that manufacturing on an industrial scale faces with regard to environmental impact, waste, and efficiency which all factor into whether a process is sustainable.

Distance learning module on Sustainable use of non-timber forest products identifies priorities for intervention & sustainable yields.

## OPERATIONS

### Waste Awareness Week

Waste Awareness Week, the University's annual waste campaign, increases awareness about waste reduction, reuse, and recycling, engaging students and staff in resource efficiency events and activities. This year's campaign culminated in a Students' Union litter pick.

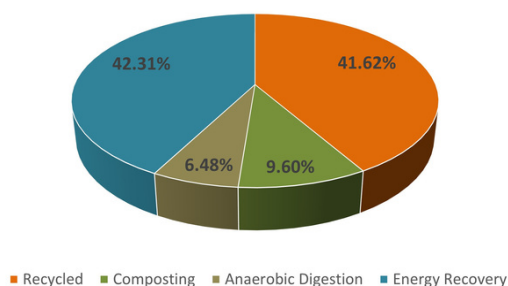


*Waste Awareness Week 2021*

### Waste Data

In 2021/22 Bangor University diverted 100% of its waste from landfill. Out of the waste diverted, 57.69% was recycled and 42.31% was recovered. 787.8T of waste was generated in total, a 274.8T (53.6%) increase from the previous year. We aim to reuse/recycle 70% of our waste by July 2025, as laid out in Wales' overarching waste strategy - Towards Zero Waste.

2021/22 Total Waste to each Waste Stream



*Bangor University's Waste Data*



## PUBLIC ENGAGEMENT

### COP 26: green shoots or storm clouds?

A [free public lecture](#) organised jointly by Bangor University and the Menai Branch of the United Nations Association was delivered by a Bangor Professor Emeritus.

The lecture discussed what is it about us, our economic and social priorities and our relationships with energy, that makes it all so fraught in trying to resolve global warming and other great crises confronting humanity.



### Places of Climate Change 2021 Seminars

A series of [public lectures](#) discussed various questions such as: Are the voluntary initiatives adequate to encourage the banks to keep their commitments towards the climate change and greener economy issues? How do local Inuit communities reflect upon Arctic warming changes to their horizons? Given uncertainties in policy, future extreme events and societal behaviour – how can we mitigate future climate change-driven risk? Should we? And how can this be done in a fair and sustainable way?

## Goal: Take Urgent Action to Combat Climate Change and Its Impacts

## RESEARCH

### Lakes in hot water, climate change creating a cauldron of issues

Three researchers [from Bangor and Canada](#) reviewed and synthesized available studies on global freshwater lakes. The research found that the effects of climate change on lakes are often cumulative and can affect any of the more than 100 million world's lakes.

Warmer water temperatures lead to changes in stratification regimes, declines in dissolved oxygen, a higher risk of cyanobacterial algal blooms, as well as a loss of habitat for native cold-water fish. It can affect not only water quality and quantity, but also cultural and recreational activities, and local economies.

### Innovation, compromise and opportunity on the path to net zero

We all need to eat, but producing our food accounts for a quarter of global greenhouse gas emissions. Reducing these emissions is vital to combatting climate change but we also need a resilient and profitable agricultural sector to ensure everyone has enough food. A [new paper published](#) looks at how we can navigate these issues in the challenging context of farmed peatlands. It looks to open up a discussion on responsible peatland management strategies, whilst considering current economic and social realities.

### Controversial policy to reconcile mining and biodiversity demonstrates success

Ambatovy mine, a major contributor to Madagascar's economy has positioned itself as a leader in sustainable mining, Bangor-led [research](#) suggests it is on track to deliver 'No Net Loss' of the unique forest habitat destroyed by the mine.

## LEARNING AND STUDENTS

### School holds zero-carbon “sprint challenge”

The School of Computer Science and Electronic Engineering hosted a zero-carbon “sprint challenge” to celebrate ‘This is Engineering Day’ 2021. The ‘This is Engineering’ campaign challenges the misconceptions and outdated views of what engineering is, and what engineers do, by presenting a positive image of modern engineering.

The Zero Carbon Sprint is an Innovation Design-Sprint challenge, where participants discuss and compose new potential solutions to mitigate the effects of climate change. The groups presented their work, along with a short video pitch. After discussion, the organisers decided that the best presentation should go to the Carbon App group.

### Communicating about trees wins competition

A Bangor University PhD student has won a competition led by #SmallNationsBigIdeas which invited researchers across four Welsh Universities to communicate by video the value of their research in tackling global climate change.

Theresa Bodner submitted a short video explaining her research into how well unplanted trees that grow outside woodlands are establishing, and how we might include these trees in overall plans to expand woodland.

### COP26 March

Bangor students joined hundreds of people who marched together in November 2021 as part of Global Action Day for COP26, with the aim of encouraging leaders to act now to preserve our communities and the planet we live on.

## OPERATIONS

### Bangor’s research is changing the world

In the Government’s most recent Research Excellence Framework (REF2021) research in Earth Systems and Environmental Sciences ranked 1st in the UK for the impact of its research. With one of the largest groups of environmental scientists in the UK, our research is ranked sixth in the UK and 1st in Wales for research power.

Our scientists are tackling climate change and addressing some of the planet’s greatest environmental issues on land and sea, such as the overuse of single-use plastics, and protecting the variety of species and ecosystems through biodiversity conservation research.

### Carbon Management

For the 2021/22 academic year, the University’s carbon emissions were calculated to be 7,096.38 tonnes CO<sub>2</sub>e. This is a reduction of 25.24% in absolute terms, compared to 2018/19.

April 2022 saw the publication and commitment to our Carbon Management Plans for Scope 1, 2 and 3. The document noted strategic principles and plans for the delivery of a net-zero carbon footprint at Bangor University. The University is committed to achieving net zero and playing its part in ensuring a sustainable and safe environment for the well-being of future generations.







## PUBLIC ENGAGEMENT

### Demystifying Climate Change

To many, climate change and the complex scientific research surrounding it is often confusing and mystifying - this is where the BlueFish project set out to help. Bluefish assessed and disseminated knowledge on the risks and opportunities for commercial fish and shellfish under climate change scenarios.

As opportunities to tour the BlueFish exhibition in 2020 and 2021 were greatly impacted by the restrictions on gatherings due to COVID-19, the Marine Institute now presents the full collection of artworks through the insightful and engaging animation - Demystify. Demystify follows an ordinary character in a coastal setting who is initially confused and frustrated by the changing unseasonal weather conditions. Throughout the animation, viewers can engage with the artwork in its intended structure and flow through the eyes of an everyday perspective.

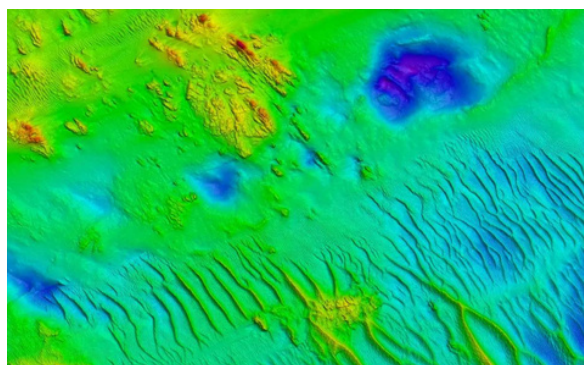


## Goal: Conserve and Sustainably Use the Oceans, Seas and Marine Resources For Sustainable Development

## RESEARCH

### Bangor University contributing to a global research programme, the Convex Blue Carbon Seascape Survey

Researchers are among world-class ocean and blue carbon scientists contributing to a new multi-million-dollar partnership. The ambitious 5-year programme is the largest attempt yet to build a greater understanding of the properties and capabilities of the ocean and its continental shelves in the earth's carbon cycle. It represents an urgent effort to slow climate change.



*Multibeam seabed images off North Wales  
Credit: SEACAMS2 / Bangor University*

### Worldwide Trawling Study advances knowledge on Trawling's Global Impact

A worldwide study of the impacts of bottom trawling has found that seabeds are in good health where trawl fisheries are sustainably managed.

The first study of its kind builds on recent international collaboration. It brings together data from 24 large marine regions around the world to establish a relationship between the distribution and intensity of trawling activities and the health of seafloor communities.

## LEARNING AND STUDENTS

### Celebrating Prince Madog research ship's 20-year impact on science and education

A research ship which has played a part in providing us with an understanding of marine sciences, celebrated 20 years of service to science and education this year.

Based at Bangor University, the research vessel, the Prince Madog is a purpose-built, flexible multi-purpose research platform for conducting science along the British coastline and in the Irish or Celtic Sea. It is used for research and to educate and train future marine scientists at Bangor University.

The Prince Madog is the UK's only fully seagoing research vessel focussing on the coastal seas on the vital 'coastal' seas. These shallower seas up to the continental shelf, are the most influenced by human activity - and are also the most important to us, as a resource for fishing and renewable energy.



*The Prince Madog Research Vessel*

### School of Ocean Sciences

Our School of Ocean Sciences is one of the largest university Marine Science departments in Europe, located on the shores of the Menai Strait, with a long-established tradition of excellence in research and teaching in marine science. Undergraduate and postgraduate degrees are available in Marine Biology, Ocean Sciences and Physics.

## OPERATIONS

### Food and Drink

Wherever possible our Catering Services work to incorporate environmental and social considerations into the products and services we provide. Some of our Policy commitments include:

- Procuring food from suppliers who are proactively operating in a sustainable way
- Maintaining the availability of seasonal and local produce within our menus
- Maintaining the availability of fish from the MCS "Fish to Eat" list, never serving any fish for the 'fish to avoid' list
- Maintaining a wide availability of Fairtrade products across the University
- Working to reduce single use materials including plastics in Catering on Campus
- Reducing the use of disposable cups in favour of crockery and glass

### Pollution Prevention

The University provides guidance on making sure hazardous chemicals are disposed of safely in order to protect people, prevent pollution of the environment, to comply with all relevant legislation and minimise its environmental impacts. Additionally an oil spillage procedure to prevent leakage into the main drains or pollution to watercourses is in place.

All University sites on mains sewer and drainage lines connect to the Dŵr Cymru/Welsh Water treatment works for processing.



*Marine biology fieldtrip - digging, sifting and sampling at Aberffraw beach, Anglesey*





## PUBLIC ENGAGEMENT

### Bringing voices from Madagascar's rainforest into the heart of the international climate change debate

Tropical forests store carbon so conserving them is a key Nature Based Solution to climate change. However, for forest conservation to be effective, and crucially to avoid contributing to poverty in poorer countries, it needs to better include the people living in those forests. Unfortunately, their voices are seldom heard in international policy discussions.

The film, 'Voices from the Forest', featuring a Bangor academic, explores how global efforts to conserve forests are experienced by local people. It aims to bring the voices and views of those affected by forest conservation, into the heart of international policy debate.

### Rewilding: restoring environments, threatening place?

Rewilding is increasingly being promoted as a means to address the interconnected crisis of climate change and biodiversity loss. This public lecture reflects on the balance between meeting environmental objectives and attending to socio-cultural priorities.

**Goal: Protect, Restore and Promote Sustainable Use of Terrestrial Ecosystems, Sustainably Manage Forests, Combat Desertification, Halt and Reverse Land Degradation, and Halt Biodiversity Loss**

## RESEARCH

### Protected areas don't always boost biodiversity

Protected areas such as national parks have a "mixed impact" on wildlife, according to the largest-ever global study of their effects. The findings show that managing parks to protect species and their habitats is crucial - and without management, parks are more likely to be ineffective. The research team included Wetlands International, numerous universities and relied on the efforts of thousands of volunteers worldwide to collect the data on waterbird population numbers.



*Black-tailed godwit (Limosa limosa)*

*Credit: Robert Blanken*

### Global warming and an intense hurricane combine to drive tree species up tropical mountains towards extinction

Two effects of global climate change are combining to threaten a global biodiversity hotspot according to new evidence published. Global warming is increasing the intensity of the strongest Atlantic hurricanes. At the same time, it is slowly shifting the range of plant and animal species into previously colder zones: towards the north and south poles and up the slopes of mountains to higher altitudes.

## LEARNING AND STUDENTS

### Student shares nature-watching tips with the BBC's Autumnwatch

A [Bangor University student](#) has contributed to Autumnwatch's programme blog.

Amber a second-year Master of Zoology student, who regularly blogs for Earthwatch, an international non-profit organisation that connects citizens with scientists to improve the health and sustainability of the planet. Earthwatch enables students like Amber to write blogs for Naturehood, a lottery-funded community project to take positive action for the wildlife on our doorstep. Amber's blog, 'Nocturnal wildlife to spot', explores the phenomenon that is nocturnal wildlife, to help the reader know what to spot in the autumn.



*Healing Gardens Raised Beds*

### Healing Gardens

The [Bangor University Healing Gardens](#) are a student-led garden in the heart of Upper Bangor. The gardens started in 2010 to transform University land into a productive, beautiful, and biodiverse organic garden. The garden has continued to grow and progress to now feature raised beds, Welsh heritage fruit trees and a sensory spiral and bog garden. The project more recently focused on improving accessibility and making the garden brighter and more welcoming. The garden provides a space for students to moderate and reduce stress whilst connecting with others and improving the local environment.

## OPERATIONS

### Bangor's hidden 'green' gem: Valuing the health and well-being benefits of Treborth Botanic Garden

[University researchers are working with Treborth Botanic Garden](#) to explore the benefits it brings to staff, students and the wider community. [Treborth Botanic Garden](#) covers an area of 18 hectares on the shores of the Menai Strait and has been owned by Bangor University since 1960. The garden comprises 15ha of native woodland, 2ha of species-rich unimproved grassland, 1ha of managed orchard and many mature trees and shrubs.

The Social Value Hub at the Centre of Health Economics and Medicines Evaluation (CHEME), and Wales Centre of Behavioural Change (WCBC) at the School of Human and Behavioural Sciences, are investigating the well-being benefits and social value that Treborth Botanic Garden generates for those that visit and volunteer at the garden, including staff, students and members of the local community.

Approximately 35,000 people visit Treborth Botanic Garden each year, where they have free access to 45 acres of woodland and landscaped garden, plus seven tropical and temperate glasshouses which house over 3,500 species. There are many volunteering opportunities available to help improve the gardens and facilities. The garden also organises events, lectures, workshops, field outings, plant sales and open days.



*The Rockery at Treborth Botanic Garden*



## PUBLIC ENGAGEMENT

### **Banks' Voluntary Commitment towards Environmental Sustainability: Pivotal Move or Greenwash?**

This [public lecture](#) asked: Are the voluntary initiatives adequate to encourage the banks to keep their commitments towards the climate change and greener economy issues?

Based on a recent study it is noted that universal mandatory regulatory measures e.g., added capital requirements, are needed to be introduced so that irrespective of their location as well as the corporate objectives, banks have to comply with unique environmental regulations.

### **Honourable mention at the international conference in data visualisation**

At this year's international data visualisation conference a paper on "[Explanatory Journeys: Visualising to Understand and Explain Administrative Justice Paths of Redress](#)" presented a tool, Artemus. The tool allows users to explore and visualise administrative justice paths of redress. The journal paper was also awarded with an [honourable mention at the conference](#).

**Goal: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels**

## RESEARCH

### **Electoral Administration - Victoria Parliament, Australia**

Two Bangor Professors were invited to [write a submission](#) to the Victoria Parliament (Australia) Electoral Matters Committee's Inquiry into the Impact of Social Media on Elections and Electoral Administration. The submission informed the Inquiry's Final Report's findings and recommendations.



### **Bangor professor influences UN Human Rights Council adoption of 'Right to privacy in the digital age'**

The United Nations (UN) Human Rights Council has accepted the necessity of recognising emotion recognition technologies as an [emergent priority in the global right to privacy in the digital age](#).

In principle, this is an update of the UN's understanding of human rights to better account for modern digital life, and questions of privacy raised therein. With most States having adopted constitutions and other laws which formally protect basic human rights, this Resolution will be international in reach and influence, informing international treaties and law, and regional and national law.

## LEARNING AND STUDENTS

### Bangor University in the Supreme Court

Bangor University has been selected as one of only 12 U.K. Law Schools to stage a Moot Court Competition final at the Supreme Court, before a Supreme Court Justice (Judge).

A moot court competition simulates a court hearing where students fulfil the role of a barrister or solicitor, and advance their research, problem-solving, and advocacy skills.

Mooting requires students to prepare written submissions and present a reasoned oral argument. The scenarios usually concern a contentious, or unsettled area of law, an area of recent change, or topical legal development.

### Professional Policing

Bangor University and North Wales Police are working together to offer Police Constable Degree Apprenticeships and the Degree Holder Entry Programme for North Wales which will be available to newly recruited Constables.

It has allowed new recruits to combine academic learning with work-placed learning. The dual pathway scheme provides formal recognition for the skills demonstrated by today's police professionals and the demands placed on them by an increasingly complex working environment.

### Study

All students have the opportunity to take part in the CYMUNED (Community) programme which involves careers talks, workshops, work placement opportunities (including barristers mini-pupillages), mooting (mock trials), and volunteering with a Law Clinic in providing free supervised legal advice to the public.

## OPERATIONS

### Annual Report and Financial Statements

Bangor University annually publishes its Financial and Annual Reports publicly for transparency.

### Students' Union

Undeb Bangor is the voice of the students and the home of student life at Bangor and is led by elected student representatives working to enrich and enhance the student experience. A team of dedicated elected Sabbatical Officers work to ensure student voices are heard as representatives on University Committees, and that the kind of activities that are needed are being developed. They run the Sports Clubs, Societies, Volunteering Projects, UMCB (Welsh Union), Undeb Bangor Course Reps and Networks and Student Forum.



*Undeb Bangor - Students' Union*

### University Policies

Our Anti-Bribery Policy sets out the steps the University will take in order to ensure compliance with the provisions of the Bribery Act 2010, so as to avoid any criminal or civil liability attaching to the University and/or individual members of staff, and to maintain the professional image and reputation of the University.

The University has adopted the Code of Practice on Freedom of Speech with a view to ensuring that freedom of speech within the law is secured for members, students and staff of Bangor University and for visiting speakers.





## RESEARCH

### **Wider-reaching solutions are urgently needed to reach a realistic 'net zero'**

The [research report](#), with input from environmental scientists, ecosystem modellers, human geographers, humanities scholars, and other experts including Bangor, Rothamsted Research and the UK Centre for Ecology and Hydrology, stresses the potential negative impact of existing pathways to net zero climate targets, which include losses in the benefits of biodiversity, human wellbeing and cultural knowledge of the landscape.

Highlighting 'multiple contradictions' in the pathways to net zero climate targets they call for wider-reaching solutions to create a more sustainable future.

### **When One Health Meets the United Nations Ocean Decade**

This paper from [Bangor University](#) and Brazilian researchers proposes a model for interdisciplinary work under such global agendas, particularly the interface between One Health and the UN Ocean Decade and identify three priority research areas closely linked to each other: human-nature connection, conservation-human behaviour, and implementation strategies (bringing stakeholders together).

**Goal: Strengthen the means of implementation and revitalise the global partnership for sustainable development**

## PUBLIC ENGAGEMENT

### **Bangor University is part of a newly launched Blue Carbon Forum for the UK**

A new [UK Blue Carbon Forum](#) aims to support and develop the UK's role in protecting its precious "blue carbon" habitats, vital to mitigate the effects of climate change. The UK boasts an array of "blue carbon" habitats known to draw in and store carbon.

Members of the landmark forum include environmental and social scientists, representatives from government agencies, habitat specialists, environmental NGOs, landowners, legal representatives, and marine users to discuss and reach a consensus on how best to conserve and restore blue carbon habitats.

### **New chairholder aims to make nature conservation more effective and equitable**

A [Professor in Conservation Science at the School of Natural Sciences](#) has been appointed to a prestigious Chair at Utrecht University in The Netherlands. Professor Jones is to be the holder of the Prince Bernhard Chair for International Nature Conservation, for a period of five years.

### **Expert to work with Welsh Government on Sustainable farming**

The Fellowship, enables Dr Wynne-Jones, a human geographer, specialising in farming and rural change, to [support the Welsh Government team](#) tasked with the design of bespoke Welsh policy, following the UK's EU departure. This change in policy will also meet Wales' commitments to address the Climate Emergency and enable the agricultural sector to achieve Net Zero emissions.

## LEARNING AND STUDENTS

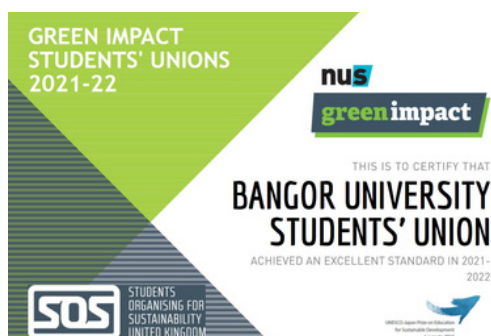
### Multi-million-pound initiative advances sustainable management

Bangor University is part of a major new consortium of industry, government, NGOs and universities which have joined forces for a major new initiative aimed at sustainability managing the UK's coasts and seas.

The Centre for Doctoral Training in Sustainable Management of UK Marine Resources aims to deliver the next generation of researchers, solution providers and practitioners. The Centre will train almost 50 interdisciplinary PhD students over the next seven years focussing on subjects ranging from marine and social sciences to law, health, education and economics. Together they will cover existing and emerging topics of local, national and global importance, from enabling biodiversity gains and delivering Net Zero, to enhancing coastal protection and supporting coastal communities.

### Green Impact

Undeb Bangor was awarded the Green Impact Excellence Award in the Green Impact Students' Unions 2021-22, the highest level you can achieve. This is the eleventh consecutive year Undeb Bangor has picked up this award due to the efforts of its staff, officers, and students in addressing key sustainability and environmental issues, as well as working to embed positive sustainability changes at Bangor University.



NUS Green Impact Award

## OPERATIONS

### Bangor research ranked highly in the UK

Bangor University's research is in the Top 30 in the UK for its impact on society. Our research has been ranked highly in the Government's most recent Research Excellence Framework (REF2021), with 85% judged to be world-leading (4\*) or internationally excellent (3\*).

Overall, Bangor University is ranked 2nd in Wales and 42nd in the UK in the REF which measures research quality across all UK universities. Bangor University's research delivers social, cultural, and environmental benefits, from advances in healthcare to combatting global environmental change and finding the energy solutions of the future.

Bangor's Sport and Exercise Sciences is ranked in the Top 5 overall in the UK and our research in Allied Health Professions, Dentistry, Nursing and Pharmacy is ranked 15th overall in the UK.

### Sustainability Strategy

Our latest Sustainability Strategy was approved by the Council in May 2022 and is aligned closely with the University's overarching Strategic Plan - Strategy 2030: A Sustainable World for Future Generations.

A number of KPIs detailed enhance education and activity towards the UN SDGs for staff and students so sustainability becomes embedded at the University. We continue to map our entire curriculum onto the SDGs.

### Student Volunteering

Student Volunteering Bangor (SVB) has been providing community projects in and around the Bangor area since 1952. Since then SVB has grown to over 50 regular volunteering projects, collaborating with numerous local, national and global non-governmental organisations on a wide range of projects.