

# Strategic Plan 2022/25



# Contents

Environmental Research Institute	4
Our Strategic Priorities	5
Our Values	5
Our Strategic Aims	6
Research	6
Learning and Teaching	7
Partnerships	7
Our Themes	8
Energy	9
Pollution	10
Peatlands	11
Society	12
Our Organisational Context	13
UHI North Highland	14
Impact and the External Environment	15

# The Environmental Research Institute



The Environmental Research Institute (ERI) is based in Thurso, Scotland and is part of the University of the Highlands and Islands, North Highlands. Since 1999 our multidisciplinary team has sought to transcend scientific boundaries to undertake and promote high-calibre research, innovation, and education in the environmental sciences that 'makes a difference'. We aspire to excellence in all we do.

We seek to advance scientific understanding of contemporary environmental issues using our proximity to outstanding natural resources combined with state-of-the-art facilities. We advance our goals through development of networks with strong, strategic partnerships and

collaborations with academic, commercial and stakeholder organisations within regional, national and international contexts.

We aim to ensure that our work has tangible value to society, helping address new societal, economic and policy challenges related to use and management of the natural environment and its resources, and responding to changes in the environmental, organisational, financial and political landscapes. In doing so, we seek to contribute to the University mission of having a transformational impact on the region's economy, people and communities (strategic-plan-2021-25.pdfuhi.ac.uk).

## Our Vision:

A natural environment that is healthy, sustainable and valued by all

## Our Mission:

To provide dynamic leadership in research, innovation and education that advances understanding and informs management of our natural environment

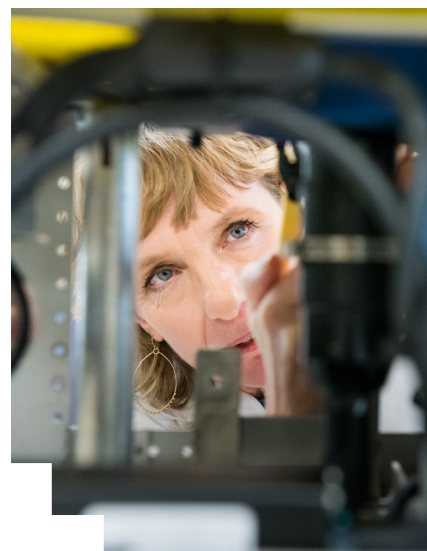


# Our Strategic Priorities

As part of UHI North Highland, our strategic priorities are:

- + **Research:** To develop a vibrant culture of research that is recognised for its regional impact & international excellence
- + **Learning and Teaching:** To provide students with outstanding and relevant learning opportunities
- + **Partnerships:** To develop our partnerships to maximise our impact on regional redevelopment

And our cross-cutting themes are 'Sustainability' and 'Net zero' and Enterprise. The UHI North Highland Strategic plan may be found here: [NHC-UHI-Strategic-Plan-2021-2025.pdf](#)



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## Our Values

We value research, learning and teaching and partnership activity that is:

- + **Aspirational** - characterised by excellence at all levels
- + **Relevant** - addressing contemporary environmental issues and ensure that policy, management and legislative decision making is informed by robust, high-quality science
- + **Recognised** – regionally, nationally, and internationally for quality and reliability
- + **Distinctive** – capitalising on the scientific strengths of the ERI and its partners and on the outstanding and often unique environmental assets of the region
- + **Innovative** – bring new knowledge and creative thinking into practice
- + **Inter- and multi-interdisciplinary** – an environment devoid of disciplinary boundaries and well adapted to addressing issues and solving problems
- + **Collaborative** – forming effective working relationships regionally, nationally and internationally with key partners from the academic, business, stakeholder and educational sectors



# Our Strategic Aims

- + To develop and sustain a vibrant and dynamic centre of excellence in the environmental sciences that is valued in the region and recognised internationally
  - + To advance the UHI and UHI North Highland missions of having a 'transformational impact on the prospects of our region, its economy, its people and its communities'.
  - + To make an effective contribution to the portfolio and strategic priorities of UHI North Highland in Research, Learning & Teaching and Partnerships.
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## Research:

To develop a vibrant culture of research that is recognised for its regional impact & international excellence.

Specific ERI aims:

- + To address key environmental issues impinging upon environment, economies, societies and cultures of the Highland and Islands region and comparable regions around the world.
- + To undertake environmental research that generates outputs of an internationally recognised standard.
- + Ensure that our key stakeholders are engaged and informed and that our research is accessible and valued.



# Learning and Teaching:

To provide students with outstanding and relevant learning opportunities.

Specific ERI aims:

- + To provide learners with a high-quality educational experience in distinctive curriculum areas that are informed by contemporary research practice, allowing them to achieve their full academic potential and enhance their career prospects.
  - + To provide relevant Learning Opportunities to locally based students, providing access to education and professional development in the sciences while also targeting a wider geographical audience through the provision of online programmes.
  - + To develop distinctive new curriculum capitalising on the internationally recognised research expertise of our staff and the quality of our resources (both laboratory and natural).
  - + To provide staff development opportunities for our staff engaged in teaching to enable them to secure professional accreditation for their practice.
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# Partnerships:

To develop our partnerships to maximise our impact on regional redevelopment.

Specific ERI aims:

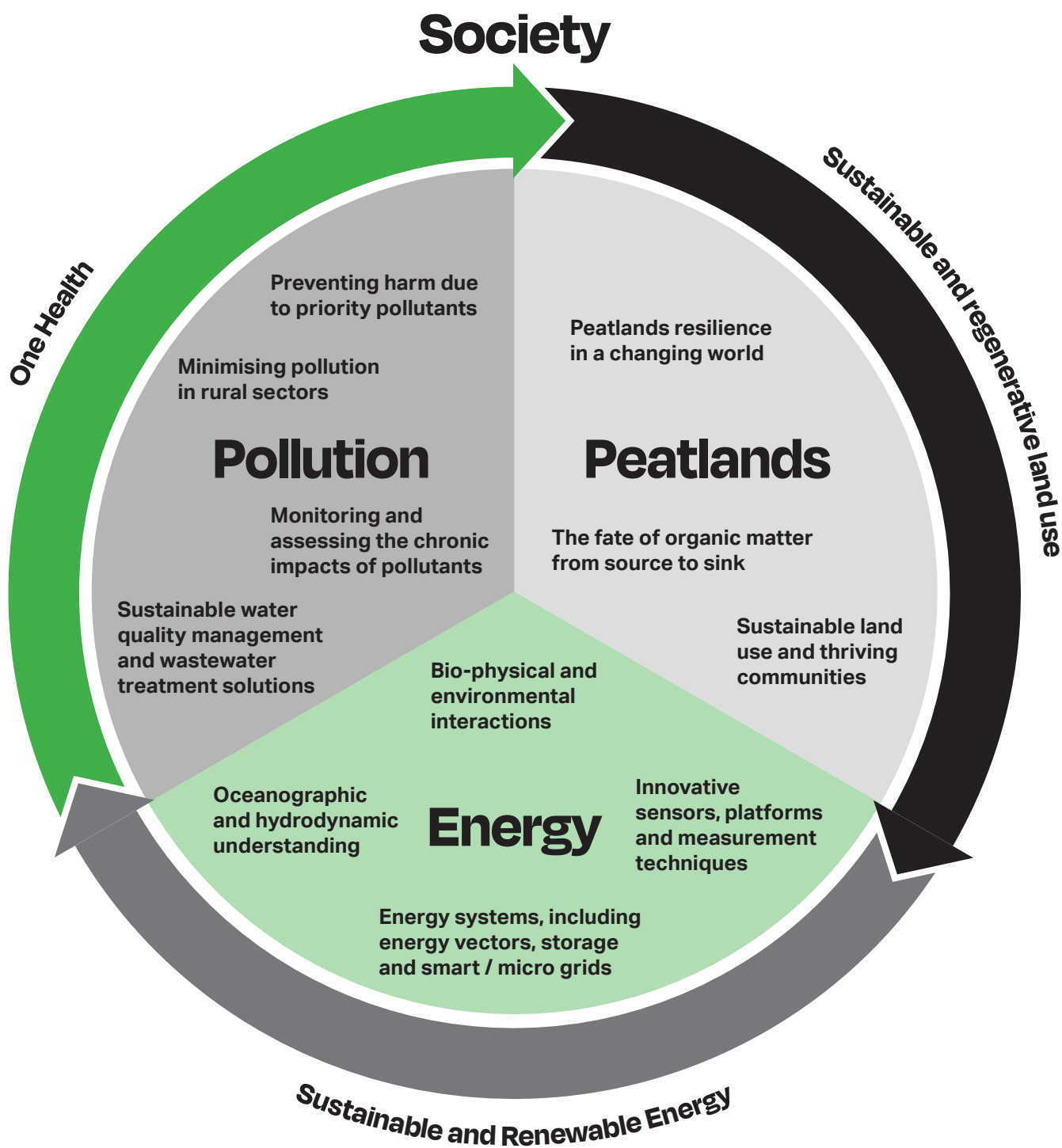
- + To develop a network of effective collaborations and partnerships within the regional, national, and international contexts that promotes the ability of the ERI to address contemporary and emerging environmental issues.
- + To engage in knowledge exchange activity that builds effective partnerships with businesses and stakeholders across the regions and makes a valued contribution to the local economy.
- + To develop and maintain a portfolio of commercial and consultancy services that are relevant and responsive to the needs of both private and public organisations in key economic sectors in the region.



# Our Themes

ERI activity is focused on the following issue-driven, interdisciplinary themes:

- + **Energy:** Renewable energy and the environment
- + **Pollution:** Understanding environmental contamination and developing sustainable solutions
- + **Peatlands:** Linking carbon, water, biodiversity and climate
- + **Society:** Connecting environment, economy and society





# Energy

## Renewable energy and the environment

The promise of renewable energy is huge, from reaching emissions targets to contributing to blue growth. Along with this promise comes the pressing need to understand how energy harnessed from wind, waves and tides will impact the environment. Sustainable use of these resources will play a key role in achieving the Scottish Government's ambitious renewable energy and carbon emission targets. Our philosophy of "research where the resource is" means ERI is ideally situated, yet our research has international reach and impact. We actively seek and develop effective collaborations and partnerships, within regional, national and international settings.

Our team integrates in-situ measurement, environmental survey, experimental, modelling and remote-sensing approaches. These provide new insights relevant to renewable energy, but

also ecosystem functioning and anthropogenic impacts more generally within the fields of marine biology, behavioural ecology and oceanography.

We promote understanding of closely coupled social and economic issues, with a focus on rural and island communities. We are proud to contribute to the prospects of northern Scotland, supporting sustainable industries that can have a transformational impact on the prospects of our region, its economy, its people and its communities. We continue to incorporate new environmental understanding into integrated sustainability assessments and models at community, local and regional scales. We also explore the interdependencies of adjacent sectors such as nuclear energy, oil and gas, and aquaculture, including leading Energy Knowledge Exchange and Innovation activities across UHI..

## Our priorities are:

**Renewable energy and the environment** – investigating renewable energy ecological and bio-physical interactions to inform pre- and post-consent monitoring, cumulative impact and strategic environmental assessment. This is underpinned by increased understanding of marine vertebrate ecology using techniques such as telemetry/bio-logging, remote sensing and observation to investigate ecosystem effects, understanding of mechanisms, predator-prey interactions and environmental drivers of behaviour and biodiversity.

**Oceanographic and hydrodynamic understanding** – in-situ, remote-sensing and modelling approaches across scales (temporally and spatially) to inform renewable energy resource measurement, knowledge of metocean conditions, flow-structure interactions (e.g., wakes) and ecological drivers. This includes wave-current interactions, and advanced understanding of turbulent flow, with implications for renewable energy device design, placement and operation.

**Innovative sensors, platforms and measurement techniques** – development and application of novel cross-cutting approaches and technologies to gain new environmental insights including drones, hydroacoustics, sensor fusion, computer vision, machine learning and techniques for exploiting large datasets. Innovative engineering solutions underpin our environmental science priorities and assist forthcoming science requirements by enabling cutting-edge environmental research.

**Energy systems**, including energy vectors, storage and smart or micro grids – supporting optimal use of intermittent renewables into grid and off-grid applications, including remote / island communities and developing countries, for a socially and economically sustainable energy transition, and aspects of social licence and community engagement.

# Pollution

## Understanding environmental contamination and developing sustainable solutions

A myriad and ever-increasing range of anthropogenic contaminants are now present in our environment. We seek to assess the fate, behaviour, and impacts of pollutants (from source-to-sink), and work on a wide range of priorities including emerging contaminants, marine plastics, pharmaceuticals, and heavy metals.

Our research seeks to not only quantify the presence of pollution, but to understand its risks to and impacts on biodiversity, working at the molecular, individual and population level. Our work sits firmly within the wider global "One Health" agenda, which recognises that the health and wellbeing of humans, biota, and the environment are all closely interconnected and interdependent. As such, holistic transdisciplinary solutions are needed.

We continuously work to promote globally sustainable solutions to complex pollution related problems, engaging with a diverse range of stakeholders and collaborators to apply fundamental and world leading research to real world challenges. Our research aims to inform and affect environmental protection policy at the international scale.

ERI leads the UHI's WaterHub knowledge exchange team which addresses contemporary challenges in drinking water provision, wastewater treatment and resource management in rural and sparsely populated regions of Scotland, and in similar regions elsewhere in Europe and around the world.

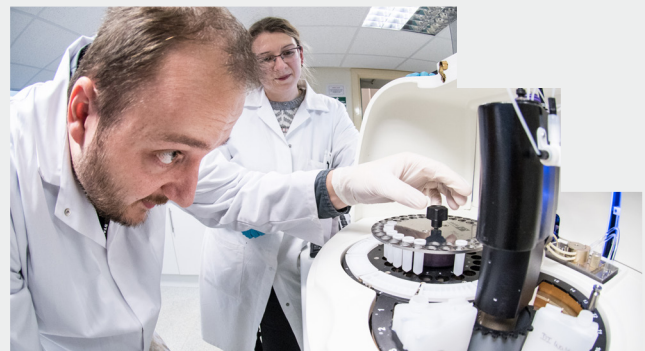


## Our priorities are:

**Sustainable water quality management and wastewater treatment solutions** - Novel and 'circular' wastewater treatment solutions, the repurposing of waste for use in water treatment, developing engineered adsorption technology, low-cost and sustainable approaches (including constructed wetlands), resource (i.e., nutrient) recapture, recovery, and reuse.

**Monitoring and assessing the chronic impacts of pollutants** - Novel 'biomonitoring' techniques (i.e., to assess emerging risks, such as from antimicrobial resistance); eDNA metabarcoding to quantify community level impacts of pollutants; remote sensing and citizen science approaches to support large-scale monitoring assessment.

Development of new ecotoxicity tools involving model organisms and developing testing systems at the micro-, meso- and macrocosm scale; facilitating assessment at various trophic levels and toxicity endpoints.



### Minimising pollution in rural sectors

- Working closely with sectors such as agriculture, forestry, conservation, and game management to minimise the impacts of pollution on the environment through activities such as deforestation or afforestation, windfarm construction, hunting and the use of agrochemicals.

### Preventing harm due to priority pollutants

- Developing cross-sector partnerships to seek to prevent priority pollutants entering the environment through changes in practice (i.e., in pharmaceutical prescribing), and through promoting greater recovery, recycling and re-purposing (i.e., of waste plastics).

# Peatlands

## Linking carbon, water, biodiversity and climate

Peatlands may cover about 3% of the global land area but contain 25% of the global soil carbon stock: that is twice the amount found in the world's forests. In Scotland, peatland soils cover around 20% of the land area holding an estimated 1600 million tonnes of carbon and the Scottish Government's climate change plan 2018-2032 update aims to restore at least 250,000 hectares of degraded peatland by 2030.

Healthy peatlands act not only as important carbon sinks, but contain rich habitat and biodiversity, including a wide range of threatened and endemic species; improve water quality and reduce flooding risk; and provide grazing land and recreational spaces.

The ERI benefits from unrivalled access to The Flow Country peatlands of Caithness and

Sutherland: covering 4000 km<sup>2</sup>, they represent largest expanse of blanket bog in Europe and a site of global significance. The Flow Country is also a changing landscape where large-scale restoration and infrastructure development are rolled out at pace, and where climate extremes like wildfires and droughts have become more frequent.

Our research seeks to provide underpinning evidence that can drive changes in policy and practice to ensure a resilient future for the Flow Country peatlands and rivers, and a just transition for its people. The ERI also facilitates access to the Flow Country for researchers from across the UK and abroad and coordinates the Flow Country Research Hub, a network of >60 organisations and stakeholders with an interest in the Flow Country peatlands.

## Our priorities are:

### **Peatlands resilience in a changing world -**

Using a combination of field-based monitoring, controlled experiments, remote-sensing and modelling to assess how peatland biodiversity and processes respond to the compounding effects of land use and climate change, including droughts and wildfires.

Working across disciplines and scales to build evidence on the nexus of environmental and societal changes associated with peatland management.

### **The fate of organic matter from source to sink -**

Using a range of field and lab-based techniques to characterise organic matter and to measure carbon exchange between the terrestrial pool, freshwater ecosystems and the atmosphere.

Applying analytical chemistry to assess how land use change on peat-dominated catchments (restoration, wind farm construction) alters water quality and biodiversity in freshwater systems.



### **Sustainable land use and thriving communities -**

Contributing to the development of innovative solutions where peatland management can support climate change mitigation, economic growth, circular economy and just transition for rural highland communities.

Providing expertise to assess the economic and societal impacts linked with peatland degradation, restoration, and conservation, from the local scale to the international context.

# Society

## Connecting environment, economy and society



The ERI's fourth theme seeks to articulate our work on environmental sciences to address economical and societal needs across the three 'pillars' of sustainability, carbon economics and the circular economy. Issues affecting rural, remote, coastal and island regions and their communities are of particular interest and the theme is a key mechanism through which the ERI supports the core UHI mission of having 'a transformational impact on the prospects of our region, its economy, its people and its communities'.

The theme provides a conduit through which the ERI can respond to support 'Green Recovery' efforts post-Covid and post-Brexit, and the Scottish Government aim of creating *'a more successful country with opportunities for all of Scotland to flourish through increased wellbeing, and sustainable and inclusive economic growth through good quality, green jobs and ensures a fair and just transition to net-zero, leaving no-one behind'*.

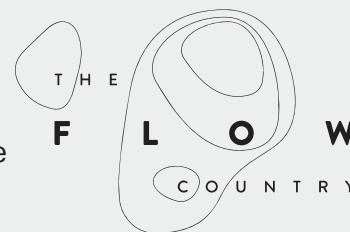
## Our priorities are:

**'OneHealth'** - recognises that the health of humans, the environment, and animals are closely interdependent and interconnected. This includes close partnership with key public sector agencies through the OneHealth Breakthrough Partnership in reducing the environmental impacts of healthcare.



**Plastics and Society** - analysis of plastic use, disposal and damage caused to the environment and to ecosystems with emphasis on solutions that contribute to the circular economy.

**Sustainable and regenerative land use** - understanding the economic and societal impacts linked with land use and land-use change, especially peatland degradation, restoration and conservation both in Scottish (e.g., Highland estates, traditional land use and its cultural importance and international contexts). The ERI is a partner in the Flow Country Partnership taking forward the possible listing of the Flow Country as a World Heritage Site.



**Sustainability and Renewable Energy** - assessment of sustainability issues surrounding both mature and developing renewable energy technologies with foci on marine energy, off- & onshore wind, off-grid and community energy systems.

# Our Organisational Context

The ERI is part of UHI North Highland, one of the academic partners in the University of the Highlands and Islands.

## The University of the Highlands and Islands (UHI)

The University of the Highlands and Islands is a new, progressive and innovative university. We are a regionally focused partnership of independent colleges and research institutions covering the largest geographical area of any campus-based university or college in the UK. We have the largest student body in Scotland, with over 35,000 studying with us each year, and we contribute £560 million annually to the region, indirectly supporting 6,200 jobs. As a multiplier effect, the university puts back £4 for every £1 spent into the economies of the Highlands and Islands, Moray and Perthshire.

**UHI** Our university's aspirations extend beyond the place-based education we have in our regions and communities and embrace a 'daring to be different' ethos. This ethos will harness our energy and set new ambitions in our areas of strength, namely: tertiary education, research impact, enterprise and engagement.

The Daring to be Different strategic plan signals a shift in thinking, one for which our partnership is well prepared, and sets an ambition of becoming more engaged with our communities and more enterprising in our activity.

**Professor Todd Walker, Principal and Vice-Chancellor. University of the Highlands and Islands**

The UHI strategic and planning framework identifies areas of improvements around a common set of shared values. The framework takes account of the current state and compares it to a desired state. It implies that the university partnership will be going through an organisational change aligned with an agreed overarching strategy and vision. It captures our intent to see students grow and succeed whatever the stage of their learner journey.

<b>Mission</b>	To have a transformational impact on the prospects of our region, its economy, its people and its communities			
<b>Vision</b>	To become connected, streamlined and sustainable			
<b>Brand story</b>	Where learning means <u>more</u>			
<b>Core values</b>	Collaboration	Openness	Respect	Excellence
<b>Stakeholders</b>	Staff   Students   Alumni   Business   Government   Community   Industry			
<b>Strategic Pillars</b>	<b>Tertiary education</b>	<b>Research Impact</b>	<b>Enterprise</b>	<b>Engagement</b>
	We will deliver a high-quality connected curriculum built on personalising the learner journey with more content, to more people, through more channels	We will enhance our research impact, ensuring it is internationally ranked, industry linked and world leading	We will embrace an entrepreneurial spirit based on strong economic and commercial growth, resulting in a socially responsible and well managed enterprise	We will be a connected organisation that pursues engagement with the people and the communities in which we work, always striving for mutual benefit
<b>Cross-cutting themes</b>	Equality and Inclusion   Gaelic Language   Climate Change			
<b>Operational planning themes</b>	Academic Plan Student Recruitment Plan	Research Plan Knowledge Exchange Plan	Sustainability Plan Digital Enhancement Plan	Alumni and Advancement Plan Engagement Plan
<b>Enabling plans</b>	International Plan • People and Culture Plan • Island Plan • Gaelic Language Plan • Highlands and Islands Students' Association Student Partnership Agreement			

# UHI North Highland

We are an academic partner of the University of the Highlands and Islands, a new, progressive and innovative University located in the Highlands and Islands of Scotland that dares to be different. As a tertiary institution we respond to local, regional and national educational needs from entry level training all the way through to PhD opportunities.

## Our Purpose

We believe in providing education and research opportunities that matter in a changing world

A key player within UHI, we bring a multiplicity of strengths to the partnership through our innovative learning, teaching and training methods, our unique curriculum offerings and our first-class research activity, all through a curriculum with a strong science, technology, engineering and mathematics (STEM) focus underpinning every theme from environmental studies to golf to health and social care.

Within the North Highland area itself we are a large employer and support over 2500 full time, part time and online students annually. We also play our part in the University of the Highlands and Islands partnership in contributing millions annually to the region - as a multiplier effect in the areas we serve we put back £4 for every £1 spent.

In today's unprecedented times at UHI North Highland we are committed to working with all our partners and stakeholders and communities to ensure we can respond rapidly and effectively to changes precipitated by COVID-19, Brexit, funding reforms, climate change, etc. We all agree we need to pull together and work closer to ensure we continue to provide a first-class education and training experience for all our students. This new strategic plan encompasses our thinking and planning intent as we drive forward to become a connected, streamlined and sustainable university.

**Debbie Murray, Principal, UHI North Highland**

# UHI | NORTH HIGHLAND

Where learning means more

## Strategic Goals

Learning & Teaching

Research

Partnerships

## Enablers

People

Processes & Technology

Estates

Finance

## Cross-cutting themes

Net-Zero

Enterprise

# Impact and the external environment

Our work is framed by the most significant challenges of our time including recovery from the COVID-19 pandemic; global climate emergency; biodiversity crisis, chemical pollution and the energy crisis. These issues, individually and collectively, present significant challenges, but also opportunities. For example: the Organisation for Economic Co-operation and Development (OECD) note that 'cleaner air quality, healthier water, effective waste management, and enhanced biodiversity protection not only reduce the vulnerability of communities to pandemics and improve resilience, but have the potential to boost economic activity, generate income, create jobs, and reduce inequalities'.

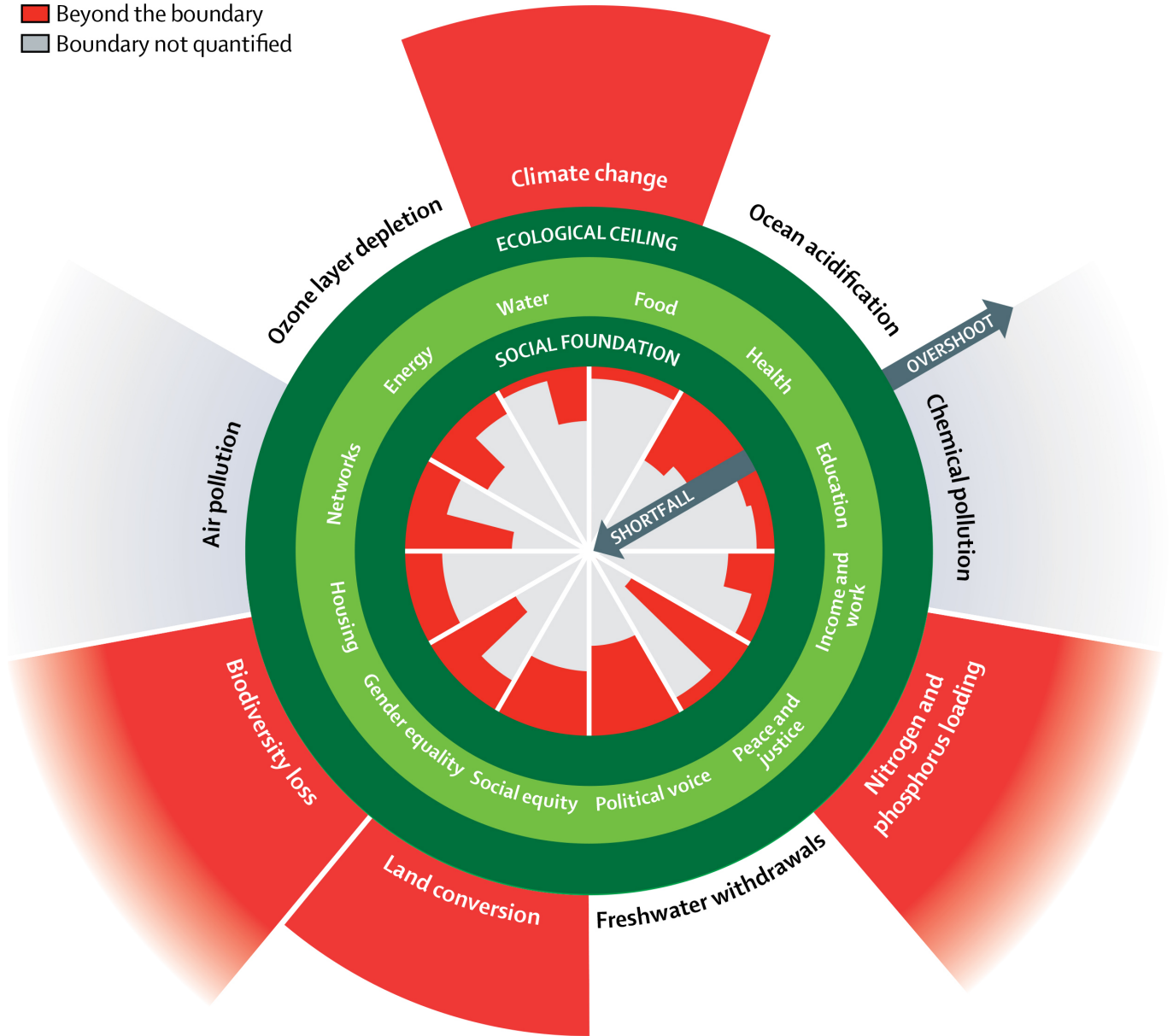
Green, just and resilient recovery has been highlighted by Governments across the world, including the Scottish Government who noted that "The natural economy is a vital asset in mitigating greenhouse gas emissions, responding to climate change, ending biodiversity loss and creating

the new, green employment opportunities of the future...". We have committed to a 'green recovery' from COVID-19, one which captures the opportunities of our just transition to net zero. That means creating green jobs, developing sustainable skills and nurturing wellbeing. This approach recognises climate change as a human rights issue and the transition to net zero as an opportunity to tackle inequalities. It is an approach that is fundamentally important to the future prosperity of our people and planet.

Scotland's National Performance Framework (2018) sets an overall purpose and vision for Scotland and is intended to inform discussion, collaboration and planning of policy and services across Scotland, encompassing the public sector, businesses, civil society and communities. It is Scotland's framework to localise the United Nations Sustainable Development Goals (SDGs). It is in this context that the ERI seeks to maximise its impact.



■ Beyond the boundary  
■ Boundary not quantified



**Image:** Kate Raworth and Christian Guthrie/The Lancet Planetary Health







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