CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD

Sustainable Places Research Institute

Sefydliad Ymchwil Mannau Cynaliadwy

OUR LEGACY

Acknowledgements

Editors

Matthew Quinn and Dr T.C. Hales

Contributors

Dr Abid Mehmood

Dr Angelina Sanderson Bellamy

Dr Brian MacGillivray

Dr Crispin Cooper

Dr Ella Furness

Dr Hannah Pitt

Professor Ken Peattie

Dr Leanne Cullen-Unsworth

Matthew Quinn

Professor Mike Bruford

Dr Poppy Nicol

Dr T.C. Hales

Dr Sara MacBride-Stewart

Emerita Professor Susan Baker

Emeritus Professor Terry Marsden

Dr Yi Gong

Contents

Foreword: Fostering the Environmental Imagination

The Sustainable Places Research Institute was an exciting investment in developing solutions to global problems of sustainability and the environment. By rejecting the specialised and siloed nature of academic research the Institute looked to challenge academics to consider work within a place-based context.

Thinking for this institute began in the late 1990s, when leading environmental scholars at Cardiff University began to collaborate via the development of research centres, networks and individuals, notably the ESRC research centre for Business Relationships, Accountability, Sustainability and Society (BRASS), directed by Prof. Ken Peattie. From these ever-broadening collaborative networks developed the idea for a research institute focused on place-based sustainability research that allowed researchers from across all colleges and schools within Cardiff University to work on interdisciplinary sustainability problems. In 2010, Cardiff University funded this network as a University Research Institute.

The Institute emerged at the international forefront of debates on sustainability, taking a distinctive place-based approach, and using that as a basis for further embedding (as this document testifies) interdisciplinary and transdisciplinary research. Working closely with partners from both academia and civil society, the Institute's scholars succeeded in pioneering new approaches and place-based concepts across a range of substantive environmental areas. If interdisciplinary working was something of a novelty in the early days, it became commonplace as the Institute matured. The Institute also created a significant sustainability science 'foot-print', with early-career colleagues going on to occupy more senior positions both in the UK and overseas.

The Institute's work and approaches will continue to create intellectual energy and a vibrant diaspora, both at Cardiff and beyond, over the next critical decades in resolving the questions of how to create more sustainable places and communities for current and future generations.

Emeritus Professor Terry Marsden

01 Introduction

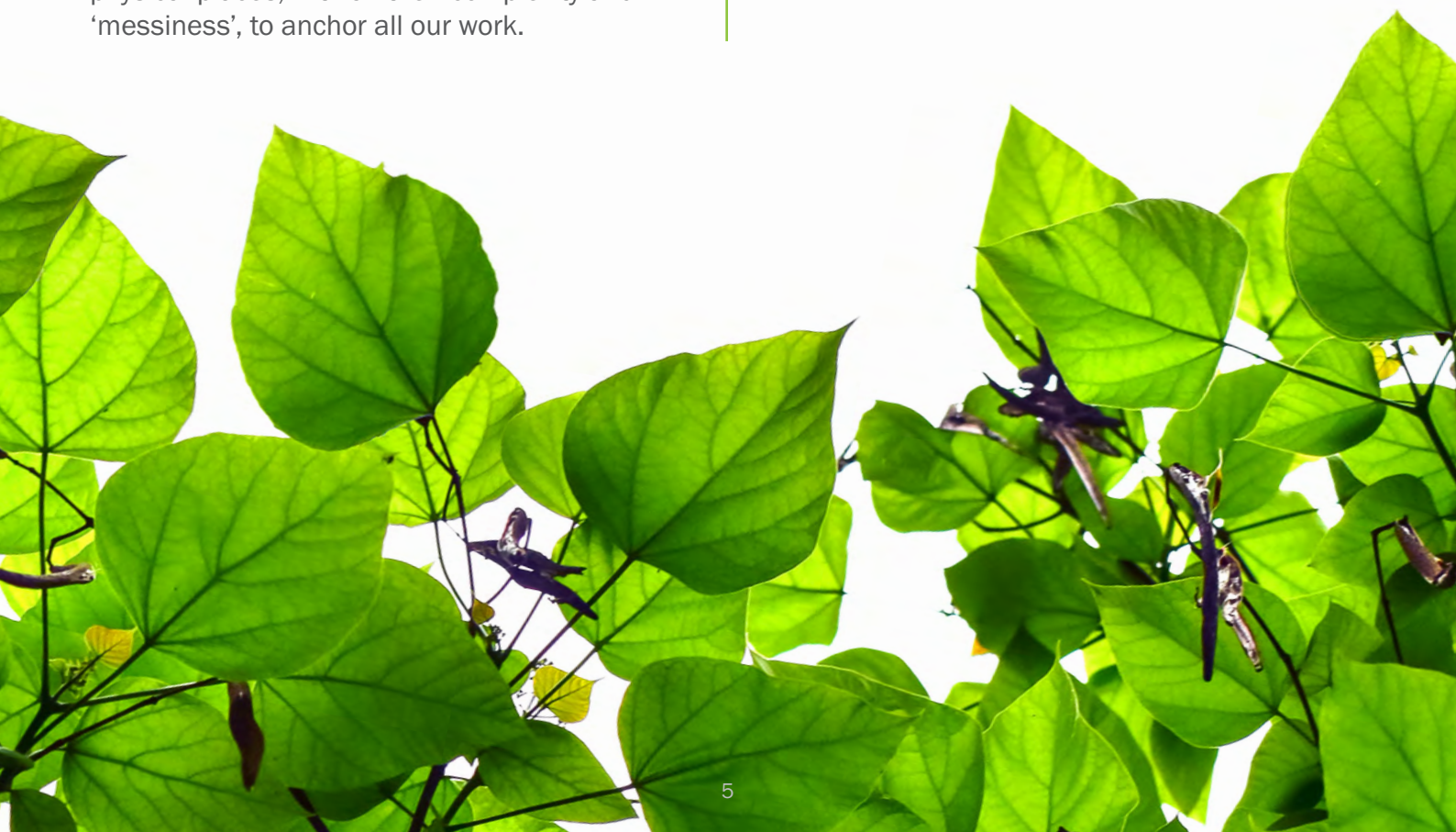
The Sustainable Places Research Institute was established at Cardiff University in 2010 out of a conviction that achieving sustainable development demanded new approaches to academic research.

Instead of prevailing technical or sectoral approaches to sustainability, and an emphasis on influencing individual behaviour and markets, the Institute approached sustainability as rooted in the day-to-day interaction of social, economic and environmental systems, and inseparable from issues of social and environmental justice and of governance.

To understand fully the complex interactions which continue to promote unsustainable practices, we chose the real-world lens of 'place' and brought together a wide range of academic disciplines – Geography, Biology and Ecology, Economics and Marketing, Political Science, Sociology, Psychology, Earth Science and Philosophy. This forced us to find ways to work together across very different disciplinary approaches and methods, using the reality of physical places, with all their complexity and 'messiness', to anchor all our work.

We adopted the ethic of working in partnership with communities and other interests rather than seeing them as objects of study. Our aim was to help academics, communities, non-governmental organisations, public authorities, and businesses work together and develop solutions which were meaningful for them, their localities and their values.

Over its lifetime, the Institute played a formative role in developing academic research which can connect theories with practical experience to generate new ways of addressing the challenges of sustainable development.
This focus has reframed research agendas, generated new tools and methods, and informed international and national practice.
Our work on sustainable place-making has also forged lasting partnerships and projects which continue beyond the lifetime of the Sustainable Places Research Institute. We leave behind a rich legacy of significant practical initiatives and policy impacts, leading academic publications, and, above all, a group of researchers who will continue to bring our learning to new pastures.



02 Reframing the Sustainability Research Agenda

With over a decade of interdisciplinary research, training and policy development, the Sustainable Places Research Institute has made a particular impact in understanding in the following areas:

- Food, Land and Security
- Society and Ecology
- Developing Interdisciplinary Research Skills
- Understanding Risk

This section highlights some of our contributions in these areas.

2.1 Food, Land and Security

Safe and equitable access to food resources remains one of the major challenges of the 21stcentury. By looking at the whole food system we enhanced understanding of what makes the system unsustainable and how we can increase food security by improving access to food for everyone.

The way we eat and how our food is produced must change to feed the growing global population without further exceeding the limited resources provided by our planet. The scale and complexity of this challenge means it can only be tackled by looking at the food system as a whole and its cumulative social and environmental impacts, by bringing together different perspectives and disciplines. By considering impacts and concerns at a place scale, we see how activity at the global scale creates local impacts and can reveal interconnections between different policy arenas and levels of governance.

We investigated what makes the current system unsustainable, and why bold ideas for change have failed to be widely adopted. Working with farmers, food retailers, and rural and urban communities, our place-based research explored innovative new ways of addressing these challenges. By working with local activists and groups, the Institute has contributed to and led scientific debates and policy development on rural development, land-use and food systems. This has shaped political agendas in Wales, the European Union and internationally.

» Case Study

Transforming and Growing Relationships for Improved Nutrition and Sustainability

This collaborative research explored whether a regional-based UK food system can provide healthy and sustainable diets and impact on household food culture. This case study focussed on finding solutions to the key processes that lead to food insecurity and unsustainable food production – particularly the global processes driving increased agricultural production, such as specialization by farmers towards a small number of products, increased distance between consumers and producers of food in the supply chain, homogenization of the supply of food as the food system becomes more global, and concentration of power in a few key actors.

We worked to reconnect consumers and producers, thereby supporting a deeper understanding of how these relationships shape consumption and production practices. By focussing on two regions with different local farming practices, East Anglia (dominated by arable and horticulture) and South Wales (dominated by pastoral systems), our research uncovered the importance of forging place- and landscape-based connections between producers and consumers (and other producers) in developing more sustainable practices. Our place-based approach highlighted the importance of understanding how landscapes and their ecology, agricultural practices, and household food culture can together inform best practices to promote a food system that can feed future generations healthily and sustainably.

2.2 Society and Ecology

The global threats of climate change and biodiversity loss present major policy challenges. Our pioneering work has shown how society and ecology are strongly coupled – where changes in either will lead to complex consequential impacts.

Up to 83 percent of Earth's land surface has been altered by human activity, such as land use change, climate change, and the introduction of new species, so that it is significantly different from its pre-human state. Work within the Institute focussed on how social processes and ecological systems are so strongly linked and how they co-evolve. Recognition of intertwined socio-ecological systems allowed us to consider sustainable development not as a simple product but as a process that emerges through feedbacks and interactions operating across systems.

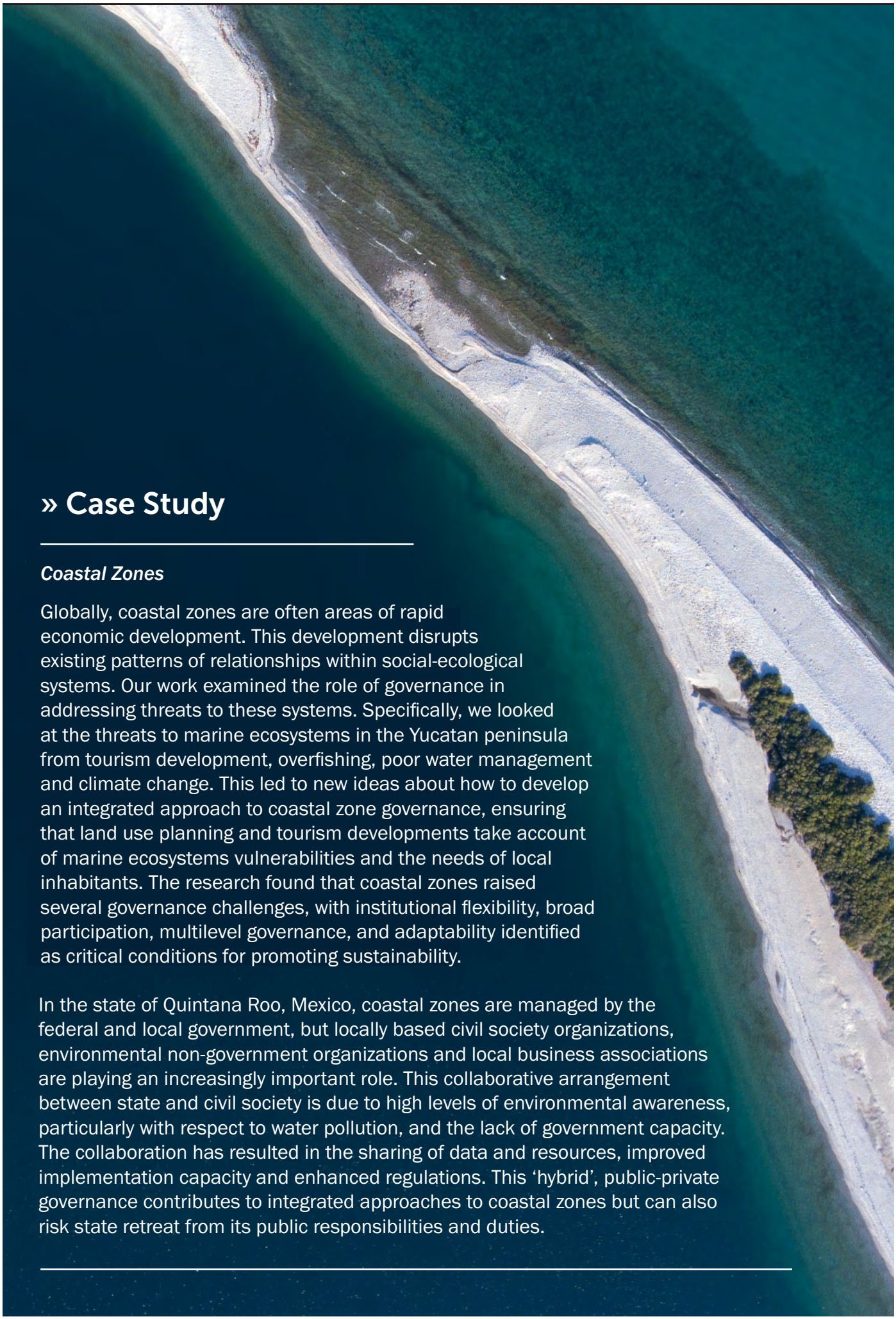
Recognising the strength of the relationship between society and nature informed a more nuanced set of questions about approaches to conservation management.

» Case Study

Ecological Restoration and Novel Ecosystems

Globally, ecological restoration has taken on a new significance in the face of climate change and biodiversity loss. Despite its growing importance, the social sciences have paid limited attention to the study of ecological restoration, policy, and practice, and the field had been largely dominated by the natural sciences. Taking an interdisciplinary approach, our research showed that social science engagement can contribute to a better understanding of how to govern restoration, and take account of uncertainty, complexity and adaptation in the system when using classical governance tools, such as regulations, financial incentives, and market schemes, such as certification, and accreditation. Our research has also looked at the institutional and regulatory barriers to restoration and how these can be overcome.

As the use of restoration grows, it is increasingly likely that it will give rise to social dispute and be brought into conflict with a variety of environmental, cultural, economic and community interests. Addressing this, we uncovered how power relations and vested interests influence ecological restoration outcomes and how these can be identified and addressed. This also helps to build new criteria for evaluating the social success of ecological restoration, which can operate alongside traditional ecological criteria.



» Case Study

Coastal Zones

Globally, coastal zones are often areas of rapid economic development. This development disrupts existing patterns of relationships within social-ecological systems. Our work examined the role of governance in addressing threats to these systems. Specifically, we looked at the threats to marine ecosystems in the Yucatan peninsula from tourism development, overfishing, poor water management and climate change. This led to new ideas about how to develop an integrated approach to coastal zone governance, ensuring that land use planning and tourism developments take account of marine ecosystems vulnerabilities and the needs of local inhabitants. The research found that coastal zones raised several governance challenges, with institutional flexibility, broad participation, multilevel governance, and adaptability identified as critical conditions for promoting sustainability.

In the state of Quintana Roo, Mexico, coastal zones are managed by the federal and local government, but locally based civil society organizations, environmental non-government organizations and local business associations are playing an increasingly important role. This collaborative arrangement between state and civil society is due to high levels of environmental awareness, particularly with respect to water pollution, and the lack of government capacity. The collaboration has resulted in the sharing of data and resources, improved implementation capacity and enhanced regulations. This ‘hybrid’, public-private governance contributes to integrated approaches to coastal zones but can also risk state retreat from its public responsibilities and duties.

» Case Study

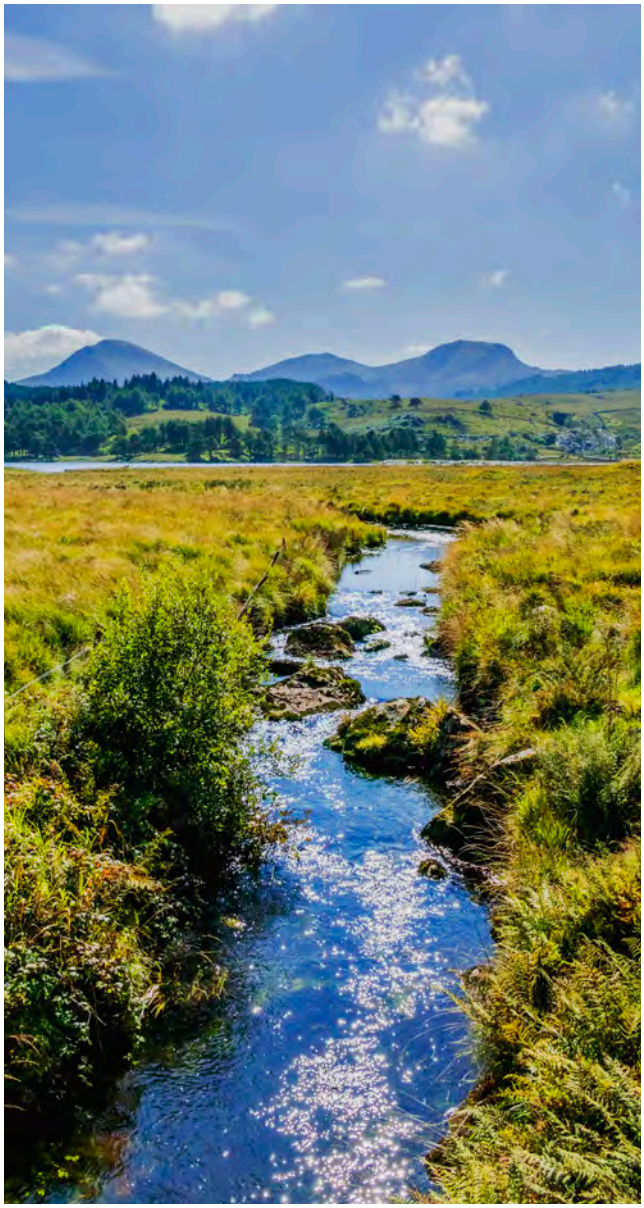
Engaging with Nature

A greater proportion of people are now living in urban areas, reducing their contact with nature to lower rates than in the past, and the character of this contact has changed to recreational ‘consumption’. Engagement with the natural world improves human physical and mental health, while also playing an important role in shaping social, cultural, and ecological values

Our human connection to special places, such as national parks or landscapes, is assumed to generate positive and protective relationships, yet individual understanding of the ecological and cultural value of places may be partial or superficial, resulting in harmful or damaging impacts of human activities. To understand the problem better, our research work in Wales, the UK, New Zealand and Malaysia has explored the ways in which various users of ecologically protected spaces engage with and understand natural landscapes. We investigated how people use these landscapes, how they think of themselves in relation to the landscape (recreational users, residents) and their understandings of the risks associated with the overuse of nature and natural landscapes.

The research found that encouraging people to be consumers of landscapes through sport and leisure activities can mean people underestimate their impacts on the natural environment or even intentionally damage it in the prioritization of individual well-being. There is a need to take account of how nature is thought about differently by different groups and in different places as it is often dependent on gender, ethnicity and social position.

» Case Study



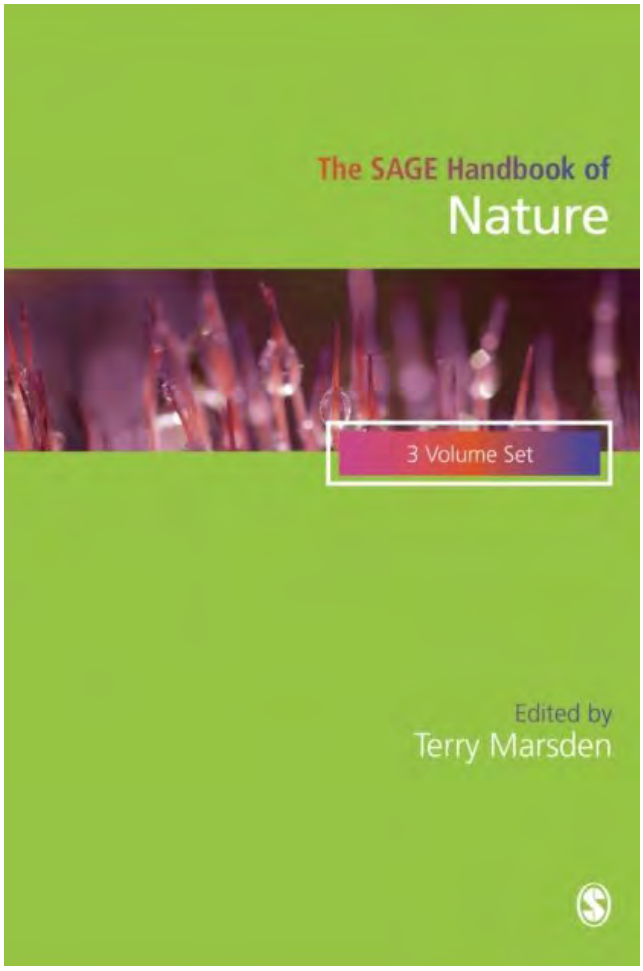
Welsh National Parks

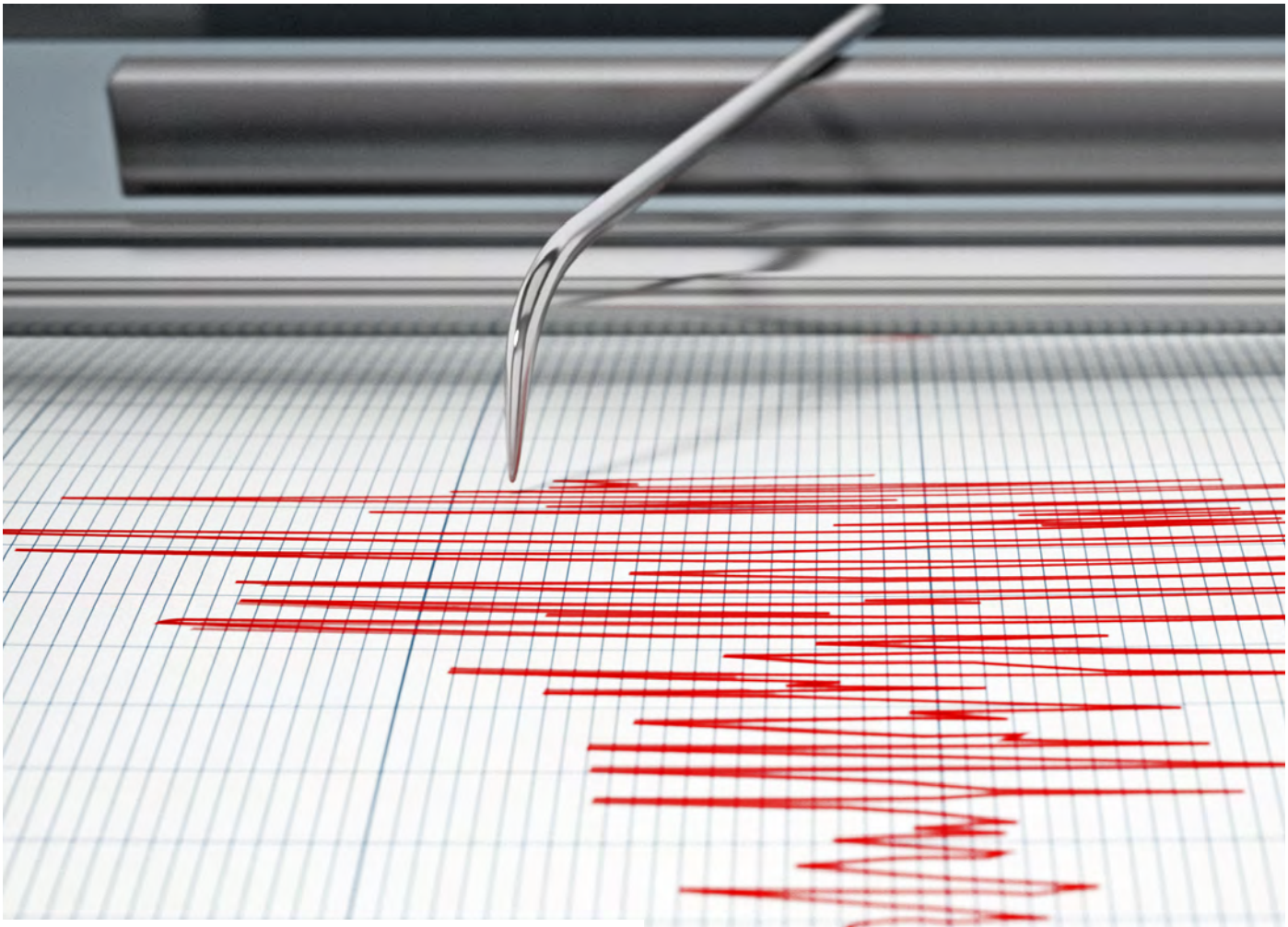
National Parks in Wales have two duties; conservation and societal well-being. Working with the Brecon Beacons National Park, one of three national parks in Wales, we explored how engagement with protected landscapes, which has traditionally excluded young people and marginalised communities, could be understood, and improved. Our research led to funding for new well-being and social engagement programmes for the Brecon Beacons National Park. These provided new opportunities for the use of the Park by diverse communities for health and well-being and for increased accessibility.

» Case Study

Sage Handbook of Nature

The comprehensive three volume *Sage Handbook of Nature*, edited by Professor Terry Marsden, with contributions by researchers from the Institute and international colleagues, captures how our work has contributed to a new understanding of human relationships to nature and the environment. The Handbook combined understandings of nature, the environment and natural processes held by different sciences, and which were brought together in the Institute, and shows the intimate relationship to social, economic and governance processes. Areas covered in the three volumes include implications of sustainable development for future food, water, and energy systems, and for human and planetary health, combined with a consideration of social inequality, gender, rurality, urbanism, risk, resilience, and adaptation.





2.3 Understanding Risk

Globally, rare, large events, such as earthquakes, can have a devastating impact, particularly in developing nations. Our work on uncertainty and social innovation helps to inform more resilient approaches to risk.

Extreme events, such as earthquakes, tsunamis, and landslides place a devastating toll on human lives, critical infrastructure, and ecosystems, particularly in developing nations where major population centres are clustered in areas of high seismicity and exposed coastal regions. Mitigation of the risks of these extreme events involves both better understanding of their driving factors and their uncertainties as well as an understanding of the potential responses of communities and governments to these shocks. We have examined how people understand uncertainties of large, rare events, and considered how communities might become more resilient to these events.

» Case Study

Working with Uncertainty

Over recent years, computer-based models of hazard potential have provided advances in our ability to predict where and when hazardous events might occur. However, the knowledge that they produce is often highly uncertain and may be subject to systematic bias that needs to be considered when developing plans for improving the resilience of communities. Emergency warning systems and infrastructure that is designed to slow or stop a particular hazard provide a sense of security that can be misleading if this uncertainty is not accounted for or communicated to local communities. Although there are a range of formal and informal techniques for handling such uncertainties and biases, health and safety agencies often rely on standardized procedures for risk and hazard assessment that hinder their adoption. Our work demonstrated that the widespread belief that decision-makers desire precise, definitive analytical outputs, may increase risk and that new methods are required that can address the uncertainty through the combination of data and model outputs with qualitative or anecdotal information in consultation with communities.

» Case Study

Communities and Resilience

Through research, partnership, and consultancy we have substantially contributed to the work on place-based community resilience in various international settings. The work has emphasised cooperation and dialogue between public actors and civil society to develop practical tools, guidelines, and incentives.

In Lesotho, we worked with local tribes displaced from their ancestral lands by large-scale infrastructure projects who had been struggling for their rights and compensation for decades.

When the global COVID-19 pandemic prompted regulatory measures such as social and spatial distancing, we worked with stakeholders in Nepal, Jordan and South Africa to develop an understanding of how such measures proved challenging for people living in vulnerable situations and deprived conditions. Our research showed that housing design, household conditions and local neighbourhood dynamics played a key part in supporting the well-being of communities.

2.4 Developing Interdisciplinary Research Skills

The research training and experience offered by the Institute has helped to develop a new generation of sustainability researchers. These researchers are comfortable moving across the boundaries between disciplines and working collaboratively with colleagues from different research backgrounds. They are experienced in engaging with communities and respecting local forms of knowledge and experience. They have a desire to make a positive difference, going beyond theory and impacting on policy and action on the ground. They have also championed the importance of looking at sustainable development as a series of interconnected processes rather than separate events.

In addition to our Research Fellows, we have hosted 32 doctoral students, numerous international visitor placements, two Sêr Cymru Fellowships, a Newton Ungku-Omar Advanced Fellowship and five Marie Curie Fellowships. Our staff have gained promotions to academic appointments with Cardiff University as well across the UK and globally. We have also hosted a number of Distinguished Visiting Fellows, such as Matthew Quinn (Welsh Government), Dr. Karin Beland-Lindahl (Luleå University of Technology), Dr. Rachel Simon Kumar (University of Auckland), Dr. Paul Sinnadurai (Brecon Beacons National Park) who have supported the development, training, and global reach of the Sustainable Places Research Institute.

"As a researcher focusing on the intersection between sociologies of food, consumption, sustainability, and the environment, PLACE provided a platform from which to explore questions related to these themes in novel and interdisciplinary ways. With the support afforded by the team at PLACE, I developed the intellectual resources I needed to develop this research agenda, and to take it forwards in independent and collaborative ways. The research culture – not least its encouragement of collaboration across natural and social sciences – and intellectual home provided by PLACE has been instrumental in shaping my academic career to date."

Dr Jessica Paddock, Research Associate 2010-2014

"In 2014 I was fortunate enough to spend 4 months at Cardiff University's Danau Girang Field Centre as part of my PhD looking into the impact of oil palm plantations on the functioning of the Kinabatangan River in Borneo. The Kinabatangan was an incredible place to work as each day I was able to head out onto the river and explore its banks, trek through the rainforest, and dig lots of holes. In my time at the centre, I lived and worked alongside some of the most dedicated and passionate researchers I've ever met. It was a fantastic opportunity, not only to collect data for my own project, but also to engage with projects and subjects I would never have had the chance to experience otherwise."

Despite all the hard work, the tropical heat, the dirt, the insects, the mosquitos(!), having no electricity, no outside contact, and all the other inconveniences of living in a jungle – it was one of the best experiences of my life and I would happily to do it all over again."

Dr Alex Horton, PhD student 2014-2017

"I worked at the Institute from 2016-2018 as postdoctoral researcher, which provided a strong foundation for cementing my career, from an early career researcher toward developing independence and to specialise in a particular field.

It was a very supportive space, offering a chance to meet like-minded social scientists, with excellent mentors from a variety of backgrounds, and important networking opportunities. I have continued to maintain my connections to the Institute over the past 3 years through the writing of academic papers, and in order to brainstorm new and evolving research ideas. I found my time at the institute to be a creative and exploratory space to build my confidence and engage in a diversity of research projects across Sub-Saharan Africa and the Seychelles. This gave me experience needed to secure my current position as a Senior Conservation Scientist with the RSPB today."

Dr Natasha Constant, Research Associate, 2016-2018

03 Case Studies in Conducting Research

In this section we give examples of some of the large-scale projects where interdisciplinary and place-based working has allowed us to tackle complex sustainability problems.

3.1 Working across Academic Disciplines to Improve Forest Conservation

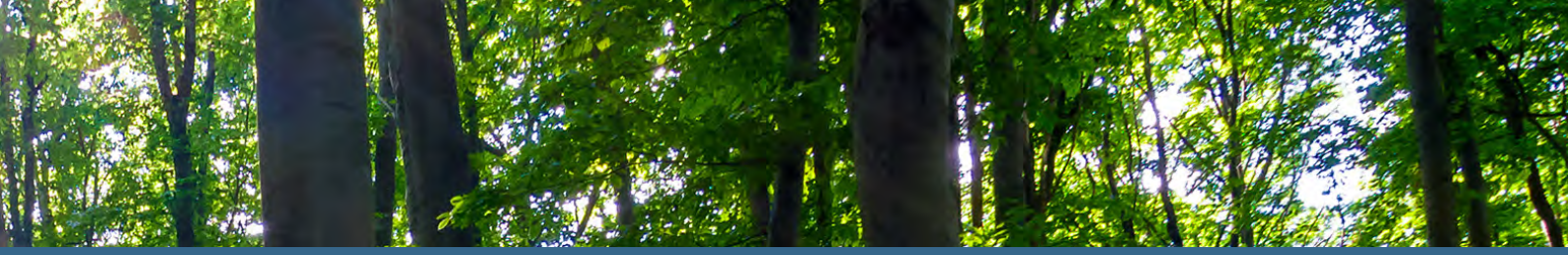
The development of interdisciplinary collaboration between social scientists, conservation biologists and environmental scientists has led to novel approaches to ecological restoration in a variety of ecological systems.

Lower Kinabatangan Wildlife Sanctuary

The tropical forest of the Lower Kinabatangan floodplain ecosystem is enormously biodiverse and supports significant populations of some of the most iconic and threatened animal species in Borneo. Since the 1970s, the Kinabatangan has experienced drastic changes due to selective logging for hardwood timber and the development of oil palm plantations. The remaining forest is fragmented and less able to support wildlife and the needs of the local communities.

The huge scale of deforestation threatens not only the integrity of the ecosystems, but the lives and livelihoods of local communities, and demands a transdisciplinary research approach that considers not only restoration of the ecosystem, but also the communities, businesses and governmental bodies who are making decisions on the long-term sustainability of future activities in the region.

In 2007, the Danau Girang Field Centre was established in Borneo as a collaboration between Cardiff University and the Sabah Wildlife Department to focus on the conservation of endangered animals in a fragmented landscape. Through our work together, it has expanded into an interdisciplinary programme including research on land-use change and the effects on erosion, and on social-ecological systems in forest restoration and governance. This transformation was crucial to address underlying systemic issues that threatened biodiversity, wildlife and local livelihoods.

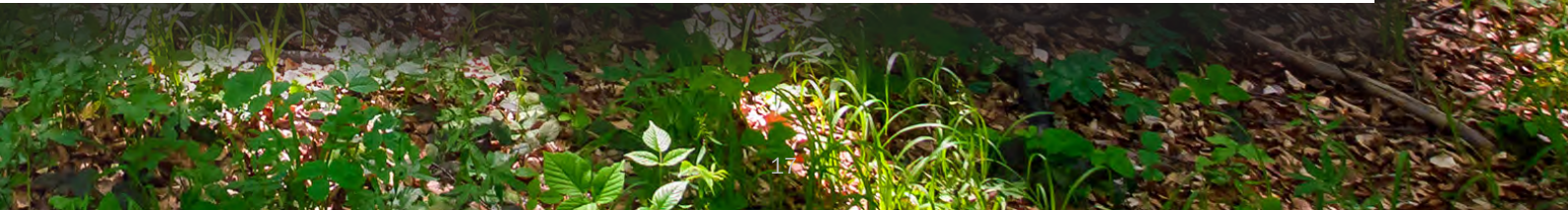


Our Research – Two Darwin Initiative grants focusing on Bornean orang-utans and elephants established a baseline for understanding how forest fragmentation was affecting long-term population viability for these species and subsequently many other key species. This work included developing state-of-the-art methods in molecular genetics, remote sensing, toxicology, and ecological modelling. A collaboration between the Danau Girang Field Centre in Borneo and the Sustainable Places Research Institute led to research in river dynamics, differing aspects of socio-ecological systems, including governance, how forest protection affects oil palm yields, and use of high-resolution habitat mapping and camera trapping networks to establish methods to understand biodiversity dynamics in real time.

By 2018, when the Danau Girang Field Centre held its 10th anniversary meeting, more than 100 scientific papers had been published describing research in this region, making the Sanctuary one of the best studied and well understood regions in South-East Asia. The results of this research are now being taken forward as the *Regrow Borneo* initiative in partnership with local non-governmental organizations, and with support from our researchers and regional institutions and businesses.

Working locally – Understanding and working with local and regional institutions and communities was an important aspect of our interdisciplinary place-based approach. These included the Sabah Wildlife and Forestry Departments, local and international non-governmental organizations, the private sector (palm oil companies, ecotourism companies, community-based ecotourism) and community groups. Richard Bloor, a PhD student from the Institute, carried out an in-depth analysis of these roles and interactions, identifying pressures, weaknesses, and potential solutions to building an inclusive approach to governance in the Kinabatangan. In 2012, our researchers brought together the palm oil and wildlife conservation sectors for the first time in 20 years. We continue to work with communities and governmental organisations to promote species conservation and forest restoration and protection, and in support of community livelihood.

Transforming thinking – Establishing an effective reforestation programme in the Kinabatangan floodplain would have been extremely challenging without an interdisciplinary appreciation of the systemic opportunities and constraints in the region. By combining a conservation approach with recognition of differing economic, community and institutional interests, we have not only created a more effective programme but also helped to secure support from key public and private actors in the area and internationally.



3.2 Understanding the Evolution of Risk after a Large Earthquake

Large earthquakes are complex events where recovering communities must manage increased rates of flooding and land sliding, while also managing changes to their communities and livelihoods. Our work showed that reliance on engineering as a method for recovery leads to increases in risk within communities.

The Wenchuan Earthquake

The 2008 Wenchuan Earthquake was one of the most fatal of the 21st century, with 87,587 deaths. The location of the earthquake in the steep mountains of Western China caused over 60,000 landslides that destroyed infrastructure and were responsible for up to one third of the fatalities.

By 2015, large financial and technical investments from provincial governments in China had largely rebuilt and expanded much of the infrastructure in the area. However, post-earthquake recovery had been hampered by catastrophic flooding and mudslides which affected the flat land adjacent to rivers where much of the new infrastructure was being built. These events were chronic, with significant mudslide events occurring during the monsoons of 2008, 2010, 2013 and 2019.

The engineering and land use responses to the original nature of the earthquake hazard has changed the pattern of risk, such that lowland flooding is now affecting more communities. Taking a place-based approach to these problems highlighted how particular elements of geography and development, from the shape of the landscape to the position of infrastructure to major transport systems, affect the potential risks of mudslides and floods after the earthquake. Without this coupled thinking, solutions can inadvertently lead to greater exposure to these hazards.

Our Research – The Wenchuan Earthquake is the second large earthquake to be examined in detail in the modern era, and our work came at a time when rapid advances in high resolution satellite imagery allowed us to see changes in the landscape, where buildings, dams and other structures were constructed, and the tracks of hazardous mudslides. These observations allowed new models of the magnitude of potentially hazardous debris flows to be developed. We gathered village-scale census data to understand how these villages recovered both in terms of economic recovery and changes to social structures. Our work demonstrated that the pattern of earthquake recovery is dictated by geography, proximity to a river and position in relation to major road networks. The research also highlighted how recovery is disrupted by debris flows and other hazards, slowing long term socio-economic development.

Working locally – We relied on traditional approaches to knowledge access and dissemination, connecting with local government through our partners, to get access to data. The dominance of the engineering approach to hazard management meant that other approaches, such as soft engineering or nature-based solutions, were not fully explored.

Transforming thinking – The project was developed within the Sustainable Places Research Institute by working between different disciplines, particularly the physical and social sciences. By taking a place-based approach, we had to think about the differing spatial and temporal scales to align the different effects and methodological approaches of landslides and social vulnerability.

3.3 Working Locally for Generating Action and Understanding of the Marine Environment

Seagrass plays a crucial role in the fight against climate change and biodiversity loss. Through a local and collaborative approach to research, we have supported its protection and restoration.

Seagrass Conservation and Program Lamun Wakatobi

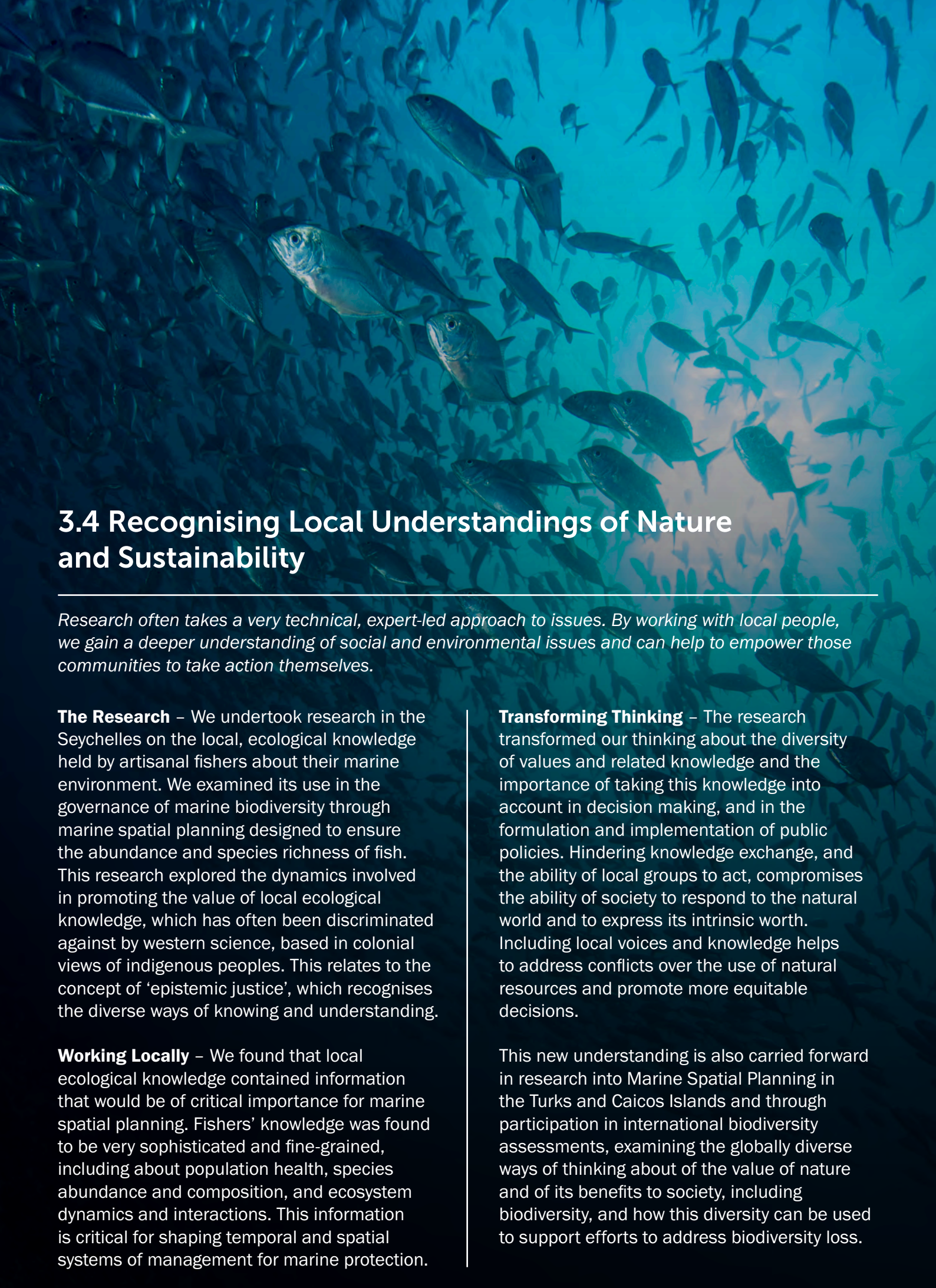
Seagrass meadows support marine life, biodiversity, and human populations globally. They remain marginalised within conservation planning and continue to decline globally at an alarming rate. Major threats to seagrass systems include declining water quality, physical disturbance, overexploitation and pressures of climate change.

We initially focused on four study sites within the Wakatobi National Park in Indonesia, encompassing the four main islands in the Wakatobi chain – Wanci, Kaledupa, Tomia and Biningko. These are coral islands with no ground above 300 metres. Invertebrate and fin fisheries are essential activities, sustaining the livelihoods of more than 90 percent of the Wakatobi population. Later, our research progressed to sites in Cambodia, Philippines, and an additional site in Indonesia.

Our Research – Our case study examined the potential of seagrass meadows to provide food security in Wakatobi and to develop an evidence-base to guide marine protected area management. Through a programme of cooperative research, outreach, and engagement, together with data gathering on the sea fisheries, we were able to determine the links between seagrass meadows, fisheries productivity and food provision.

Working locally – We collaborated with several local services, researchers and community members. The research engaged local community members and fisheries non-governmental organizations from all four islands. We also worked with national parks rangers, Wakatobi government fisheries officers, the Banda Sea fisheries department, WWF-TNC Indonesia staff, Hasanuddin University and a Kaledupan environmental education official. Our knowledge exchange workshops, focus groups and research training to support citizen science strengthened our research and supported the delivery of our outcomes.

Transforming Thinking – By working with local communities, the research has added to the ecological evidence for the importance of seagrass to food fisheries, as well as socio-economic evidence of the economic value and food security potential of seagrass meadows in these coral islands. We were able to identify previously undocumented threats to seagrass meadows alongside seagrass habitat decline, as well as fostering a community-level desire to stem the degradation and loss of seagrass meadows through community education and outreach programmes. The research programme has also led to the development of the Indo-Pacific Seagrass Network and opened up avenues for dialogue with governmental institutions on the protection of seagrass meadows.



3.4 Recognising Local Understandings of Nature and Sustainability

Research often takes a very technical, expert-led approach to issues. By working with local people, we gain a deeper understanding of social and environmental issues and can help to empower those communities to take action themselves.

The Research – We undertook research in the Seychelles on the local, ecological knowledge held by artisanal fishers about their marine environment. We examined its use in the governance of marine biodiversity through marine spatial planning designed to ensure the abundance and species richness of fish. This research explored the dynamics involved in promoting the value of local ecological knowledge, which has often been discriminated against by western science, based in colonial views of indigenous peoples. This relates to the concept of 'epistemic justice', which recognises the diverse ways of knowing and understanding.

Working Locally – We found that local ecological knowledge contained information that would be of critical importance for marine spatial planning. Fishers' knowledge was found to be very sophisticated and fine-grained, including about population health, species abundance and composition, and ecosystem dynamics and interactions. This information is critical for shaping temporal and spatial systems of management for marine protection.

Transforming Thinking – The research transformed our thinking about the diversity of values and related knowledge and the importance of taking this knowledge into account in decision making, and in the formulation and implementation of public policies. Hindering knowledge exchange, and the ability of local groups to act, compromises the ability of society to respond to the natural world and to express its intrinsic worth. Including local voices and knowledge helps to address conflicts over the use of natural resources and promote more equitable decisions.

This new understanding is also carried forward in research into Marine Spatial Planning in the Turks and Caicos Islands and through participation in international biodiversity assessments, examining the globally diverse ways of thinking about of the value of nature and of its benefits to society, including biodiversity, and how this diversity can be used to support efforts to address biodiversity loss.

3.5 How Place-Based Working Challenges Conceptions of Socio-Economic Activity

Here we examined the contributions of Fairtrade communities to sustainable practice. Our research showed that working at a place-based scale demonstrated how simple socio-economic models may miss the real value of sustainable practices.

Fairtrade communities

Fairtrade is one of the best-known examples of sustainable production and consumption. It is viewed as a means by which global markets can be harnessed to deliver more equitable development for poorer communities. The discipline of economics views Fairtrade as the abstract willingness of consumers to discriminate in favour of products that include an ethical premium and to consider the general impact this has on supply chains.

Our research – We engaged with specific communities within which the consumption or production of Fairtrade goods takes place to understand the personal and social dynamics of Fairtrade. The consumption research with Fairtrade Towns and our work in producer countries shared the experience of producers of Fairtrade wine in Chile, Argentina and South Africa, and its local impact.

Working locally – Our ground-breaking study of Fairtrade Towns worked with communities and activists and revealed how local activists acted as "citizen marketers" influencing everything from local place branding efforts to local consumption habits, even the local school curriculum. The towns wove the Fairtrade status together with ideas about local identity, for example farming communities connecting support for farmers in poorer nations with the travails of local farmers. Research in producer communities confirmed many of the socio-economic benefits from accreditation accrue to producers and their communities, but also raised issues about the impact of the distribution of these benefits.

Transforming thinking – Our research showed that Fairtrade towns are not about simply promoting a premium for goods but act as a doorway through which communities at the opposite end of otherwise abstract global supply chains could meet, support, and better understand each other. At the same time, research in producer communities showed that action in pursuit of global trade justice could create local injustices. This indicated a need for more locally inclusive Fairtrade governance processes to improve how Fairtrade is experienced and lived by these communities.

04 Place-Based Tools and Methods

Along with theoretical development, the Sustainable Places Research Institute has worked to develop tools and methods that allow our approach to be applied across different contexts.

4.1 Modelling

Place-based modelling empowers local communities to identify actions to improve their lives.

Simulating the local built environment to improve people's lives

Modelling can often be excluding of local challenge or opaque in its assumptions, but the Institute's modelling work is designed to be accessible and inform how communities can increase their sustainability. Our Spatial Design Network Analysis (sDNA) software was developed to model sustainable transport planning, including information useful to health and economic assessments and efforts to address climate change. An important aspect of this research was to consider different impacts and how they can be modelled to address issues of inequality in access and well-being, reflecting the diversity of transport users.

The model included cycling and walking, often omitted in traditional transport models, with a ground-breaking strategic pedestrian model that has now been used and refined through real time data over several years.

The software is open access and has around 3,000 active users worldwide. It has been applied to major transport infrastructure and urban design projects, including design of walking and cycling networks in numerous local authorities, by commercial collaborators such as Arup and Wedderburn Transport Planning, and sustainable transport charity Sustrans. Recent collaboration with the Institute for Transport Studies, Leeds University, has combined our respective research expertise to create new open-source active transport models for better user engagement.

4.2 Evaluation Methods for Local Needs and Opportunities

Place-based working uncovers the full social impacts of actions for local communities.

Canals and Rivers Trust

Bluespaces are areas of coastal and water environment that are vital to the health of both body and mind. In partnership with the UK's largest manager of inland waterways, the Canal and Rivers Trust, researchers from the Institute have helped to understand the well-being benefits of the Trust's works. Our research is now embedded as an outcomes measurement framework and accompanying toolkit across the Trust's operations and planning. By having better evidence of who engages with waterways, the Trust was able to identify groups and communities not currently making use of their spaces.

Researchers worked with them to design qualitative research to explore the factors that affect engagement with waterways.

The research has provided the most detailed picture to date of how different people perceive blue spaces, and what deters access. This insight has shaped the Trust's priorities for community engagement and is informing their work to engage diverse audiences. Working in long-term partnership has resulted in a programme of research shaped by diverse needs. The Trust is now recognised as leading the way in strategic planning for well-being benefits across different communities.

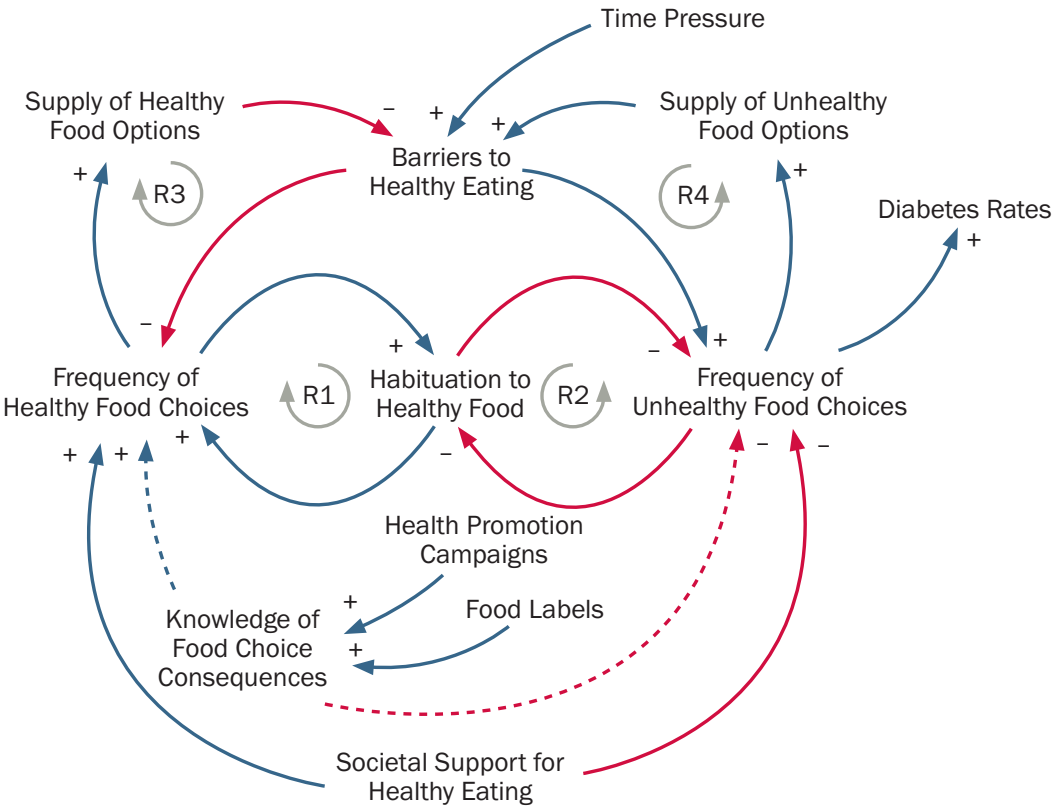
4.3 Systems Thinking

Place-based systems tools enable sharing of perspectives across different groups or disciplines

Collaborative mapping tools

Major health issues often originate in decisions made in non-health sectors, such as land use, housing, agriculture or transportation. Identifying linkages between health and physical, social, and ecological environments can lead to better understanding of the drivers of health outcomes and help to shape healthier, greener, more equitable cities.

We held a series of workshops with partners in Malaysia working across disciplines and sectors, focusing on green infrastructure and food systems in relation to urban health. We enabled participants to generate ideas on the wider drivers of poor health and the measures which could help to address them through systems mapping. In addition to developing participants' skills in systems and place-based methods, these workshops have nurtured transdisciplinary networks between policy makers, practitioners, academics, community leaders and civil society representatives around urban health and sustainability challenges. Participants have generated a diversity of new initiatives focused on issues such as river restoration, walkability, food systems and indigenous knowledge.



4.4 Tools for Local Co-Production

Communities become our partners in research, empowering them to act and capturing a richer range of knowledge and experience.

SUSPLACE toolkits

Co-production, the involvement of citizens in the design, development and delivery of research, public policies, programmes, and services, is an important approach in place-based research. Co-production is rarely achieved in practice due to the failure to use appropriate tools to enable different voices to be heard and to help shape the research agenda. The SUSPLACE EU programme developed a range of toolkits and policy lessons, including a practitioner guide to place-based co-production and a guide to arts-based methods. The aim of these products is to allow others to avoid familiar pitfalls or misunderstandings and to be stimulated to use new methods of engagement.

People's Assembly

Researchers from the Institute's Food, Land and Security research programme partnered with Cardiff's local food partnership, Food Cardiff, to facilitate a people's assembly on the future of food in the Cardiff city region. We used co-production methods to support conversations around the food futures of a city-region. Through this use of an assembly, we created a space for public dialogue on the future of food in Cardiff.

4.5 Place-Based Citizen Science

Creating local benefit rather than extracting research information for use elsewhere.

Place-Based Citizen Science for Global Watershed Management

Place-base citizen science can create direct benefits and agency for local communities. Our researchers, in collaboration with the University of Malaya, supported the development of a place-based citizen science programme for watershed conservation in urban and rural Malaysia.

Engagement of communities in citizen science is better when local values, relationships to the environment and local environmental problems are used as the starting point for the development of tools. Our researchers and the community both benefited from place-based discussions about how the local environment is understood, leading to outputs that were meaningful both to science, and society. The work was directly used to shape regional watershed management policies and local responses to pollution and contributed to discussion in the British Ecological Society.

05 Our Initiatives

The Sustainable Places Research Institute will leave a legacy in the ongoing impact of programmes promoted by its work.

5.1 Regrow Borneo

The expansion of palm oil plantations in the Lower Kinabatangan, Sabah, Malaysia has led to a loss of three quarters of rainforest cover since the early 1970s.

The Sustainable Places Research Institute was crucial in the development of Regrow Borneo, a forest restoration and research project established through an interdisciplinary collaboration between the Institute, the Danau Girang Field Centre and KOPEL Bhd in Borneo. It launched as an independent charity in late 2021 (www.regrowborneo.org).

Regrow Borneo's mission is ethical, transparent, and research-led reforestation and carbon mitigation. At a time when actions on the climate crisis are more urgent than ever, the initiative goes beyond carbon sequestration, incorporating actions aimed at improving lives and livelihoods for local communities, and increasing biodiversity and ecosystem resilience in the Lower Kinabatangan.

The charity partners with local communities who grow seedlings from seed harvested in the forest, paying them a living wage for their work, and providing a sustainable alternative source of income to working in oil palm agriculture.

The Institute's focus on place-based working was essential to the development of Regrow Borneo by combining the practicalities of forest restoration with research, particularly creating a social and natural science evidence-base for the effectiveness of our approach. As a result, the Regrow Borneo team includes specialists in ecology, soil erosion, biodiversity, ecological restoration, community values and forest governance, allowing us to understand how restoration affects the health of the forest and the people who live within and near this environment.

5.2 Deep Place

Deep Place is a holistic approach to sustainable place-making, focused on how to achieve more economically, socially, environmentally, and culturally sustainable places and communities. Developed by Professor Dave Adamson and Institute Honorary Fellow Mark Lang, the Deep Place method is based on the premise that a properly functioning economy should add to, rather than undermine, the social, environmental, and cultural sustainability of places and communities. It treats people as assets and each place as a unique set of opportunities.

5.3 SUSPLACE

SUSPLACE brought together six universities and seven non-academic partners in seven European countries, namely the Netherlands, Wales, Latvia, Lithuania, Belgium, Finland and Portugal. The aim of the SUSPLACE network was to train early-stage researchers in innovative, interdisciplinary approaches to study sustainable place-shaping practices, funded by the European Commission and led by Wageningen University, NL. The network provided training in scientific and professional skills to enable researchers at early stages in their career to pursue academic or high-professional careers at various institutions, such as governments, non-governmental organizations, consultancies and businesses.

The SUSPLACE approach provides insight into how to utilise the full potential of places and communities for sustainable development and help to build capacities of people to engage in place-shaping processes and thus strengthen connectivity between policymakers, academics, businesses, and civil society.

5.4 Project Seagrass

Project Seagrass promotes societal change to enable the recognition, recovery, and resilience of seagrass ecosystems globally. This environmental charity, established in 2013 and housed within the Institute until 2021, is devoted to the conservation of seagrass ecosystems through education, influence, research, and action.

Project Seagrass has a dedicated interdisciplinary team who believe that we can respond to global challenges only by bringing together a diverse range of identities, experiences, and perspectives. Project Seagrass was created to turn cutting-edge research into effective conservation action and education schemes, by collaborating with local communities and other stakeholders.

As well as its education, awareness and conservation work internationally, Project Seagrass has gained global recognition for its seagrass spotter app, widely used as a tool for citizen science.

For more information visit: **projectseagrass.org**

06 Shaping Public Policy

Researchers at the Sustainable Places Research Institute have contributed to public policy development at an international and national level.

International

The **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services** (IPBES) is an independent intergovernmental body that strengthens the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development. Our researchers contributed to their 2019 Regional Assessment, Europe and Asia, which explored opportunities to promote food security, economic development and equality while avoiding land and aquatic degradation and conserving cultural landscapes, as well as their Global Assessment report in 2020, which addressed global environmental changes and the policy and social dimensions of using restoration as an adaptation and mitigation tool. Our expertise is contributing to the IPBES Values Assessment, due for completion in 2022. This will present global findings on how diverse communities value nature differently and provide evidence to help decision-makers recognise different types of values of nature and to integrate plural valuation approaches into diverse decision-making contexts.

The **International Union for Conservation of Nature (**IUCN) is a global union of governments, non-governmental organisations, other stakeholders and scientists who work together to provide the most up-to-date advice on biodiversity conservation, following best global practice.

Our researchers have played an important role in the Species Survival Commission of the IUCN, through leading the Conservation Genetics Specialist Group (CGSG) and membership of taxon specialist groups. Specifically, through the CGSG we published landmark papers in 2020 and 2021 (including two highly cited articles in *Science*) on the inclusion of genetic targets and indicators for the post-2020 Convention on Biological Diversity (CBD) Framework and have gained traction within the CBD Framework with the inclusion of 2030 Milestones and 2050 Targets for wild species.

European Union

Ecological restoration: We have been part of the EKLIPSE Expert Working Group on the Effectiveness of Ecological Restoration, and through this we informed the review of the EU Biodiversity Strategy. We helped to highlight the ecological and social complexities of biodiversity restoration, detailing the barriers and how these can be overcome.

Social innovation: Our research contributed to the 2017 review commissioned by European Commission DG Research and Innovation to examine the place of social innovation in the research and development projects funded by the EU. We investigated the relevance of social innovation and its research in collective action, policy making and socio-political transformation in Europe and globally.

Genetic diversity: We have played a key role in the G-Bike COST Action project (Genomic Biodiversity Knowledge for Resilient Ecosystems) focusing on current activities and best practice for monitoring of genetic diversity, both across Europe and globally. We have developed a set of guidelines and key tools for the implementation of national genetic monitoring programs, an area that has been severely lacking to date in national responses to biodiversity loss.

Wales

Changing Sustainable land and resource management in Wales

Researchers from our Institute contributed to the National Assembly for Wales' Environment and Sustainability Committee enquiry during 2014. This influenced the subsequent Wellbeing of Future Generations (Wales) Act 2015 and Environment (Wales) Act 2016, not least in developing the concept of sustainable management of natural resources. This concept is now the central and statutory role of **Natural Resource Wales**.

Re-Designing Designated Landscape Policy

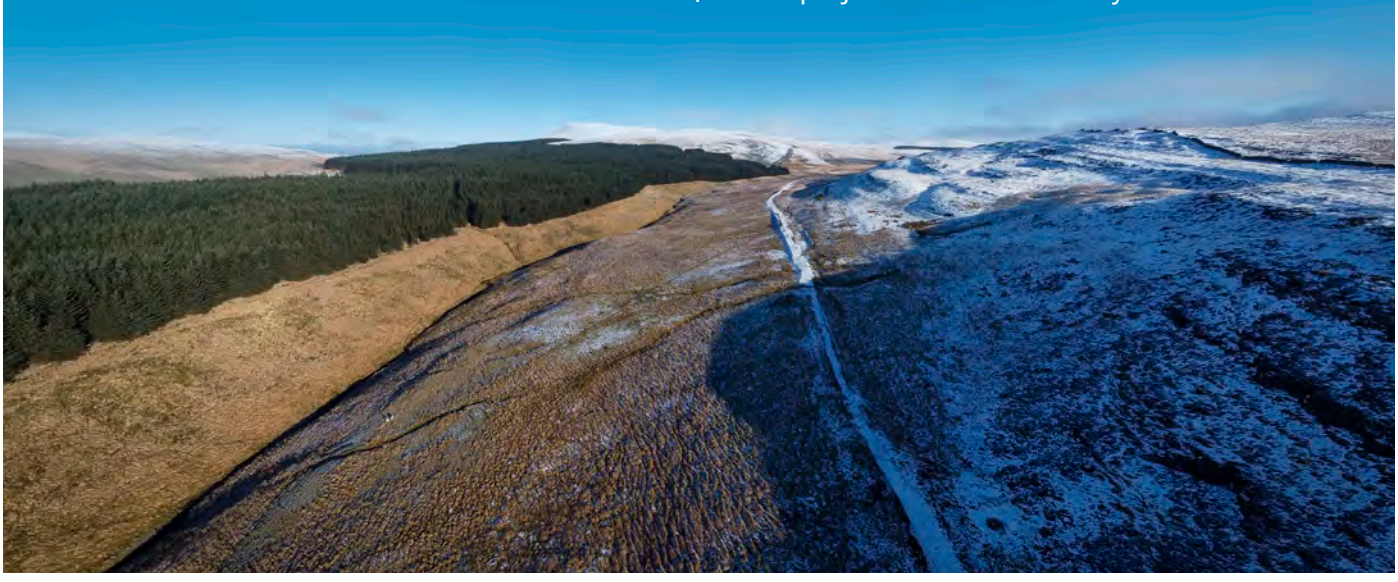
Professor Terry Marsden chaired the Welsh Government's Review of the structures and governance of National Parks and Areas of Outstanding Natural Beauty (Designated Landscapes of Wales) in 2014. This led to policy proposals for changes to the legal basis of protected areas in Wales to align them with the duty of sustainable management of natural resources as set out in the Environment (Wales) Act 2016.

Boosting wildlife and improving biodiversity in Wales

We worked with The Royal Society for the Protection of Birds (RSPB Cymru) to produce a report investigating how biodiversity could be reflected in Natural Resources Wales' work on the statutory area statements on local natural resources, as required by the Environment (Wales) Act 2016 to inform other public bodies' priorities. This research informed Natural Resource Wales' implementation of the area statements and how they could fully consider the role that biodiversity plays in supporting local ecosystem resilience.

Biodiversity and Ecosystem Evidence Research Needs program

We have led the academic input into Welsh Government's evidence research needs program, which is a funding scheme that allows for small projects across the HEI sector, enabling crucial evidence to be gathered for both Welsh Government and Natural Resources Wales' implementation of the Environment (Wales) Act 2016. This activity comprises support for project evaluation and funding decisions and involves Welsh Government, NRW, the Welsh NGO sector and Welsh HEI Academics working in partnership to shape the research program, with approximately 10 projects awarded each year.



07 Our Legacy

The Sustainable Places Research Institute represented a meeting place for sustainability science and delivered innovative solutions for a more sustainable future. It demonstrated there are different approaches to research which can better reflect the complex demands of achieving sustainable development.

This report has been written at a critical time for global action on sustainability. The next few years are crucial to addressing the challenges of biodiversity loss and climate change in a way that is socially just and inclusive. The world needs academic researchers with the breadth and vision to support this work. The Institute has demonstrated the importance of viewing these challenges as deeply embedded in our current economic and social systems and shown how we can work across civil society to address the interconnected nature of the challenges, through the lens of place.

As a centre for excellence, our major contribution has been that of bringing together researchers from across academic boundaries and from across the globe. From students and early career researchers, to established world-leading academics, our Institute has been home to genuinely interdisciplinary and ethically-led place-based research. We wish them well in their future work.

If academia is to avoid failing the test of relevance for future generations, it must reflect on the limitations of its disciplinary siloes and engage more broadly and radically across society. In this way it may begin truly to embrace its wider social and environmental potential.

08 Appendices

Appendix 1: Publications 2010-2021

Researchers from the Sustainable Places Research Institute have been involved in the publication of the following books, book chapters and journal articles between 2010 and 2021.

Publications – Sustainable Places Research Institute – Cardiff University

Appendix 2: Notable Funded Projects

www.cardiff.ac.uk/sustainable-places/research/our-legacy/appendix-2

Appendix 3: Institute Staff

www.cardiff.ac.uk/sustainable-places/people


CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD
Sustainable Places Research Institute
Sefydliad Ymchwil Mannau Cynaliadwy
cardiff.ac.uk/sustainableplaces
@sustainablecu
sustainableplaces