

Sustainable Places Projects: SUSPLACE

SUSPLACE is a Marie Skłodowska-Curie Actions Innovative Training Network funded by the European Commission, to train Early Stage Researchers (ESRs) in innovative, interdisciplinary approaches to study sustainable place-shaping practices.

The network provides training in scientific and professional skills to enable ESRs to pursue academic or high-professional careers at various institutions such as governments, NGOs, consultancies and businesses.

SUSPLACE brings together six universities and seven non-academic partners in seven European countries: The Netherlands, United Kingdom (Wales), Latvia, Lithuania, Belgium, Finland and Portugal. The SUSPLACE approach provides insight into how to utilize the full potential of places and communities for development and help to build capacities of people to engage in place-shaping processes and thus strengthen connectivity between policy-makers, academics, businesses and civil society.

The Sustainable Places Research Institute is hosting three ESRs in Cardiff in order to support the development of research and expertise in three specific areas:

- **Place Ambassadors:** exploring the role of private sector businesses in supporting sustainable place-shaping through their enrolment in formal 'place ambassador' schemes.
- **Connected Learning Spaces:** exploring the significance of 'place' within learning experiences for sustainability to increase connectivity and engagement between higher education institutions (universities) and local communities.
- **Sustainable City Regions:** promoting a better understanding of the relationship between the different sustainability pillars at a regional scale.

Research team



Professor Terry Marsden
Sustainable Places
Research Institute

MarsdenTK@Cardiff.ac.uk
+44 (0)29 2087 9271



Dr Abid Mehmood
Sustainable Places
Research Institute

mehmooda1@cardiff.ac.uk
+44 (0)29 2087 6232



Malin Bäckman
Sustainable Places
Research Institute

backmanm@cardiff.ac.uk
+44 (0)29 2086 88843



Catia Rebelo
Sustainable Places
Research Institute

cerqueirarebeloc@cardiff.ac.uk
+44 (0)29 2086 88844



Lorena Axinte
Sustainable Places
Research Institute

axintel@cardiff.ac.uk
+44 (0)29 2086 88842

Sustainable Places Projects: SUSPLACE – Connected Learning Spaces

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2. Sustainable City Regions: Promoting a better understanding of the relationship between the different sustainability pillars at a regional scale.

3. Connected Learning Spaces

Co-hosted by the KU Leuven (Belgium), the objective is to explore the significance of 'place' within learning experiences for sustainability to increase connectivity and engagement between higher education institutions (universities) and local communities.

The project aims to: Devise new ideas for place-based learning through community engagement and the creation of mutual learning spaces. The research programme will critically review the expanding literature on university-based sustainability initiatives and examine the role and existing potential of universities and university students in engaging with adaptive place-shaping practices in their contiguous localities and regions. This will also explore novel pedagogic practices and innovations in sustainable place-making such as co-production of community based knowledges and their dissemination.

Cardiff University, KU Leuven and Amsterdam Metropolitan Solutions will participate in this project.

Research team



Professor
Terry Marsden
Sustainable
Places Research
Institute

MarsdenTK@Cardiff.ac.uk
+44 (0)29 2087 9271



Dr Abid
Mehmood
Sustainable
Places Research
Institute

mehmooda1@cardiff.ac.uk
+44 (0)29 2087 6232



Malin
Bäckman
Sustainable
Places Research
Institute

backmanm@cardiff.ac.uk
+44 (0)29 2086 88843

Sustainable Places Projects: SUSPLACE – Sustainable City Regions

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3. Sustainable City Regions

Co-hosted by Wageningen University (Netherlands), the objective is to promote a better understanding of the relationship between the different sustainability pillars at a regional scale. The project is based in Wales, one of the first nations to have introduced the concept of sustainability in its constitution. The two recently established City-Region areas (Cardiff Capital Region and Swansea Bay City Region) will form the basis of research for assessing whether collaborative governance can balance between the economic drivers of city-region development and the broader social and environmental priorities of sustainable place-shaping.

The project aims to find: An evidence base for policy interventions focused on sustainable city-region building; Testing in a 'Living Lab' to explore the specific role of City-Region alliances and relationships in integrating together sector- (food, housing, transport, energy etc.) based approaches to sustainable place-shaping.

The programme of work will involve a critical understanding and conceptual development of the sustainable city-region literature, especially as it is associated with ideas and models of the regenerative city and socially innovative initiatives, and how they might be applied to the case study city regions.

Welsh Government and Royal Haskoning DHV (Netherlands) will participate in this project.

Research team



Professor Terry Marsden
Sustainable Places
Research Institute

MarsdenTK@Cardiff.ac.uk
+44 (0)29 2087 9271



Dr Abid Mehmood
Sustainable Places
Research Institute

mehmoda1@cardiff.ac.uk
+44 (0)29 2087 6232



Lorena Axinte
Sustainable Places
Research Institute

axintel@cardiff.ac.uk
+44 (0)29 2086 88842

Sustainable Places Projects: SUSPLACE – Place Ambassadors

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2. Sustainable City Regions: Promoting a better understanding of the relationship between the different sustainability pillars at a regional scale.

3. Place Ambassadors

Place ambassadors are owners of local businesses who share with visitors the distinctiveness of the local wildlife, history, cultural heritage and geology. Co-hosted by Latvia University (LU), the objective is to explore the role of private sector businesses in supporting sustainable place-shaping through their enrolment in formal 'place ambassador' schemes.

The project aims to provide: New insights into creating connectivity between the public, community and private sector in sustainable place-shaping, by capitalising on local knowledge and enthusiasm for promoting meaningful experiences of place.

The programme assess the role of Place Ambassador schemes in developing sustainable-place shaping projects and initiatives which have been developed in Wales and especially in the Brecon Beacons National Park. The work will subsequently identify 'road maps' and toolkits for a more sustainable- as well as community-based development.

The work aims to assess how such schemes can be 'scaled out'. It will also contribute to the wider international literatures and research projects currently being undertaken in Canada, US, Brazil and the EU.

Research team



Professor Terry Marsden
Sustainable Places
Research Institute

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Dr Abid Mehmood
Sustainable Places
Research Institute

mehmoda1@cardiff.ac.uk
+44 (0)29 2087 6232



Catia Rebelo
Sustainable Places
Research Institute

cerqueirarebeloc@cardiff.ac.uk
+44 (0)29 2086 88844



Sustainable Places Projects: The Canal and River Trust (CRT)

The Canal and River Trust is responsible for 2000 miles of canal and navigable rivers, plus buildings and other historic features. This represents a considerable resource for recreation, transport, physical activity and more. In partnership with the Canal and River Trust the Sustainable Places Research Institute is investigating the public benefits of inland waterways in England and Wales.

Research Associate Dr Hannah Pitt is researching what socio-demographic factors might affect engagement with waterways, and seeking to identify how greater involvement can be facilitated. Her research is helping understand the social, economic and environmental benefits arising from waterways, and how else they might contribute positively to sustainable places and communities.

Following the signing of a strategic partnership in 2013, the first piece of collaborative work with CRT was to design an outcomes framework and supporting suite of indicators which reflected their strategic goals, allowing them to measure delivery of public benefits. This final framework is now being embedded into the organisation and its work. The institute is working with the Trust to share this as good practice in measuring and reporting an organisation's contribution to national wellbeing and sustainability.

The Institute is also undertaking research to help the Trust target activity and gather evidence around its ambitions for broadening the diversity of waterway users, to maximise the number and range of people benefiting from them. This aims to identify opportunities for furthering community use of and engagement with the Trust waterways in England and Wales. A particular focus of this phase of work is gaining fuller understanding of who is not using waterways at present, and why.

This is the focus a two year project seeking to understand opportunities for and barriers to public use and involvement. The purpose of the research is to support the Trust in its strategic objective of ensuring that the people benefiting from waterways reflect the demographic profile of the population. The research will focus on eight case study locations and beneficiaries across England and Wales, through in-depth qualitative work. The first two cases look back at projects which focused on engaging local people including groups typically under-represented in waterway usage. This stage will enhance understanding of the successes and challenges of this type of activity, and how it benefited participants.

The remaining cases focus on locations where there are concentrations of people who stand to benefit from greater access to waterways, for example places with high levels of economic and health deprivation. These will include dense urban areas with little open green space, and areas with concentrated black, asian and minority ethnic communities.

The research will begin by developing a baseline of current waterway use to identify which demographic groups do not seem to be represented. Then participatory approaches will be used to work closely with specific communities to understand current perceptions and use of waterways. Based on this understanding it is envisaged that the project will begin to test ways to address barriers to accessing canals and adjacent towpaths. This will generate insight into what the Trust can do in locations with similar demographic profiles to promote use of waterways in a way which meets people's needs and preferences.

The results of this research will inform the Canal and River Trust's future activity by suggesting ways of working, and identifying priorities for further work. It will enhance the evidence base of how waterways transform places and communities. Outputs of the project will include case studies in good practice and new approaches to reaching under-represented groups. In collaboration with the Trust, researchers will also prepare practical tools to support local teams through the process of understanding their communities and working to encourage diverse types of people to make use of waterways.



Research Lead

Dr Hannah Pitt

Research Associate, Sustainable Places Research Institute

Email: PittH2@cardiff.ac.uk Phone: +44(0) 29 2087 9632



Sustainable Places Projects: Resilience to Earthquake-induced landslide risk in China (REACH)

REACH is an interdisciplinary collaboration between social scientists, human geographers, geologists and engineers seeking to understand resilience and recovery of communities that suffer persistent landslide hazard caused by large earthquakes.

The NSFC-Newton Fund-NERC-ESRC-funded collaboration between the Sustainable Places Research Institute and the Chengdu Institute of Technology State Key Laboratory of Geohazard Prevention and Geoenvironment Protection will focus on recovery from the 2008 Wenchuan Earthquake, where post-earthquake landslide deaths and infrastructure loss has been significant.

After an earthquake, rainfall can cause significant landslide activity within the new debris created by the shaking. These landslides can persist for decades after the earthquake, affecting the ability of communities to recover from disaster. The limited availability of flat land in mountainous, earthquake prone landscapes means that often communities rebuild in areas that are prone to landslides, leading to a cycle of loss and rebuilding that limits recovery.

Our study seeks to understand the ability for communities to “bounce back” from these persistent and ongoing hazards. Termed “disaster resilience”, our project focuses on one of the most destructive earthquakes in history, the Wenchuan Earthquake.

Our Chinese focus is of particular importance, as rapid economic expansion and urbanization has increased Chinese susceptibility to major disasters, including the 2008 Wenchuan Earthquake.

Using and improving the large landslide databases created after the Wenchuan Earthquake the research team will create hazard maps to investigate the role of particular storms and aftershocks in creating landslides and use local census data to understand social vulnerability.

Combining these approaches the team hope to understand the physical and social mechanisms driving resilience in this area.

Research team



Dr TC Hales
School of Earth and
Ocean Sciences/
Sustainable Places
Research Institute

Email: halest@cardiff.ac.uk
Phone: +44 (0)29 2087 4329



Dr Yi Gong
Sustainable Places
Research Institute

Email: gongy2@cardiff.ac.uk
Phone: +44(0) 29 2087 0955



Dr Brian MacGillivray
Sustainable Places
Research Institute

Email: macgillivraybh@cardiff.ac.uk
Phone: +44(0) 29 2087 6132



Dr Rob Parker
School of Earth and
Ocean Sciences/
Sustainable Places
Research Institute

Email: parkerr5@cardiff.ac.uk
Phone: +44 (0)29 2087 4051



**Professor Yacine
Rezgui**
School of
Engineering

Email: rezguiy@cardiff.ac.uk
Phone: +44 (0)29 2087 5719



Dr HaiJiang Li
School of
Engineering

Email: lih@cardiff.ac.uk
Phone: +44 (0)29 2087 5133



Dr Jing Ran
Sustainable Places
Research Institute

Email: ranj@cardiff.ac.uk
Phone: +44 (0)29 2251 0063



Dr Wanqing Zhao
School of
Engineering

Email: zhaow9@cardiff.ac.uk
Phone: +44 (0)29 2087 0016



Sustainable Places Projects: Systems thinking and place-based methods for Healthier Malaysian cities (SCHEMA)

Cities are now the dominant human habitat, with more influence than ever on economies, environments and health. Despite progress, intractable urban health problems persist, often the unintended consequences of decisions in other sectors. These problems carry substantial costs and are unevenly distributed.

Unravelling urban complexity requires systems approaches grounded in a social-ecological understanding of health. In illuminating the linkages between human health and physical and social environments, such work can lead to healthier, greener, more equitable cities.

The SCHEMA project will inform urban decision-making, helping to improve local health and meet environment goals, while at the same time developing local research capacity. In particular, the project will explore how health links with green infrastructure and urban food in the Malaysian context. It will create new knowledge, facilitate the implementation of place-based systems approaches, and so lead to better planning decisions and health outcomes in future.

Funded by the Newton-Ungku Omar Fund, the SCHEMA project is led by the Sustainable Places Research Institute and the International Institute for Global Health at United Nations University. Joining partners with expertise in systems and place-based methods, urban planning and public health, to examine urban health in Malaysia.

The Newton-Ungku Omar Fund

On 5 December 2013 the UK Chancellor announced the creation of an Emerging Powers Research and Innovation Fund of £375 million over 5 years to support science and innovation partnerships with emerging powers. The Fund forms part of the UK's Official Development Assistance (ODA) commitment and its primary focus is to develop partner countries research.

Under the Newton-Ungku Omar Fund in Malaysia, the British Council, as one of several UK delivery partners working with the Higher Education International Unit, is aiming to run programmes in the 'People' strand of Newton, in partnership with the Malaysian Industry-Government Group for High Technology (MIGHT) as part of the Science to Action (S2A) initiative undertaken by the Government of Malaysia.

Institutional Links is a global initiative with initial focus on establishing collaborations on specific areas that are linked to Malaysian priorities and development needs, and to bring in relevant private and third sector partners, including small- and medium enterprises (SMEs), non-governmental organisations (NGOs), technology transfer offices and other not-for-profit organisations.

United Nations University - International Institute for Global Health (UNU-IIGH)

The United Nations University (UNU) is an international community of scholars, engaged in research, postgraduate teaching and capacity development and dissemination of knowledge in furthering the purposes and principles of the Charter of the United Nations.

The mission of UNU is to contribute, through research and capacity building, to efforts to resolve the pressing global problems that are the concern of the United Nations and its Member States.

The UNU-IIGH undertakes research, teaching and capacity development and dissemination of knowledge related to key issues of human health. The aim is to contribute to the development and strengthening of health services policy frameworks and management actions, particularly for people in developing countries, and to support implementation of promotive and preventive approaches to human health. For more information please visit <http://iigh.unu.edu>.

Research team



Professor Terry Marsden
Sustainable Places
Research
Institute

Email: marsdentk@cardiff.ac.uk
Phone: +44(0) 29 2087 9271



Professor David Fone
School of Medicine

Email: FoneD@cf.ac.uk
Phone: +44(0) 29 2068 7241



Dr Yi Gong
Sustainable Places
Research Institute,
School of Medicine

Email: gongy2@cardiff.ac.uk
Phone: +44(0) 29 2087 0955



Professor Anthony Capon
United Nations
University, Institute
of Global Health

Email: tony.capon@unu.edu
Phone: +60 3 9171 5394



Dr Jose Siri
United Nations
University, Institute
of Global Health

Email: siri@unu.edu
Phone: +60 3 9171 5394



Dr David Tan
United Nations
University, Institute
of Global Health

Email: tand6@cardiff.ac.uk
Phone: +44(0)29 2087 9271



Sustainable Places Projects: Place based approaches to environmental education

The place-based approaches to environmental education project explores the impact of efforts to nurture environmental learning within experiential contexts. It is led by Sustainable Places Research Associate, Dr Ria Dunkley.

Environmental education encourages learning about environmental systems. In particular, it is concerned with encouraging more sustainable interactions between the human and natural world. Related fields include Education for Sustainable Development and the more progressive field of eco-pedagogy.

This research project explores the burgeoning field of place-based approaches to environmental education, in urban and rural contexts including within botanical gardens, eco-attractions, national parks, city parks, nature reserves and wetlands and arboretums.

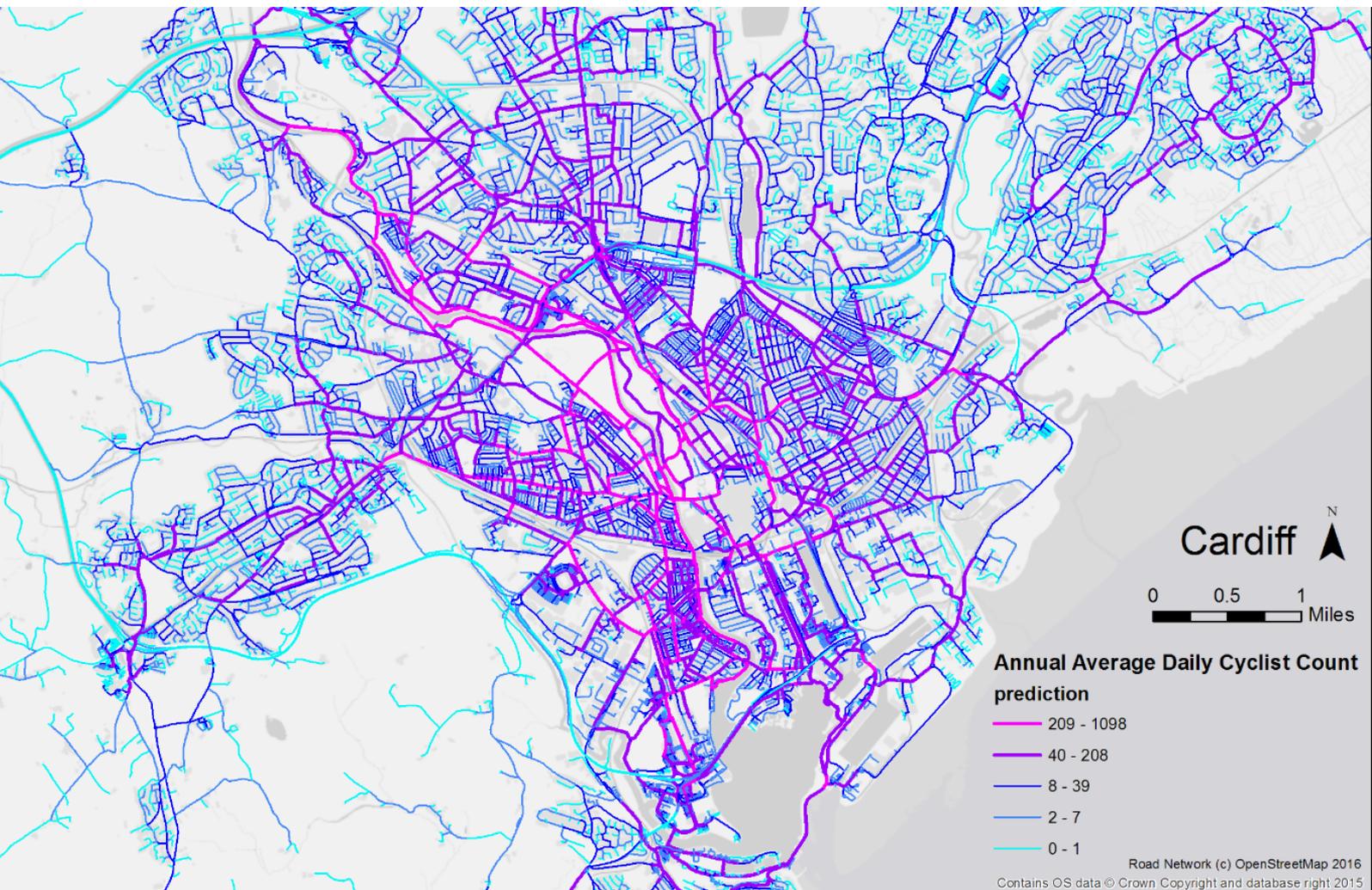
The project seeks to explore novel place-based pedagogic approaches notably, the utilisation of citizen science and experiential learning. Ultimately, it seeks to uncover the meaning of environmental learning experiences within the lives of participants to provide understanding of the value of environmental education.

Recent Studies

- **Exploring the motivations and experiences of environmental citizen scientists:** A comparative study of two citizen science projects (Funders: PLACE 2014-Present).
- **Citizen science in informal environmental education** (Student internships: CUROP 2015; PLANET EUROPE 2015).
- **Spot-a-bee:** A citizen science project to identify plants most visited by bees in Cardiff (Funders: Santander, in collaboration with Professor Les Baillie, Cardiff School of Pharmacy).
- **BBNP: Proximity to Nature:** The role of Brecon Beacons National Park in young people's Everyday Encounters with Nature and the Environment at BBNP (in collaboration with Dr Thomas Smith, Cardiff School of Geography and Planning).
- **Using innovative technological methods to understand the role of Apps and mobile technologies in people's interactions within the outdoors,** in collaboration with Dr Thomas A Smith, Cardiff School of Geography and Planning (2015-Present)
- **Building evaluative capacity amongst outdoor learning practitioners:** enhancing user experience understanding through place-based research methodologies, January 2016 -December 2016 (ESRC Impact Acceleration Account, co-applicant).
- **Informal learning in Botanical Gardens** (Department of Education – 2010-2011; European Social Fund 2010-2011; Sustainable Places 2014-2016).
- **The Campus as a Living Laboratory** – exploring place-based learning approaches to Education for Sustainability (2016-2019 – European Commission: SUSPLACE - Marie Curie Actions Training Network; 2013-2015 – Funders CUROP, Warwick-Monash Alliance 2013-2014, HEA 2014).
- **Sustainability, Place and Memory (Environmental Humanities Network),** 2015 (GW4 2015).
- **Sensing, sense-making and sustainable place making:** an arts & social science collaborative network, 2013 (Funders: AHRC).

Project information

Sustainable Places Research Institute
Email: sustainableplaces@cardiff.ac.uk
Phone: +44(0) 29 2087 9271



Sustainable Places Projects: spatial Design Network Analysis (sDNA)

sDNA is a suite of software tools produced by the Sustainable Places Research Institute, which are used to characterise urban environments, plan sustainable cities and predict the use of walking, cycling and public transport.

Developed by our Research Associate Dr Crispin Cooper, sDNA has hundreds of users worldwide in government, commercial, academic and third sectors.

Transport networks influence everything from environmental sustainability (pollution and carbon emissions) and social sustainability (health, wellbeing, community cohesion) to economic sustainability (town centre vitality, commercial success).

sDNA fills a gap between GIS and Transport models of cities. Transport demand models are the mainstay of modern simulation, but expensive to commission, and hard to apply to problems generally considered to fall outside the realm of transport planning, as well as the active travel behaviours, walking and cycling. Mainstream spatial analysis, on the other hand, only captures spatial proximity when considering factors that influence people's everyday lives.

Our research programme began by developing the sDNA software based on refining and updating a long tradition of spatial network analysis. The first version was used in a number of studies, including one which found links between town layout and community cohesion in the South Wales valleys.

More recent upgrades have been funded by an ESRC Impact Accelerator award, as well as Hong Kong and Tongji Universities. In partnership with sustainable transport charity Sustrans and engineering consultants Arup and WSP Parsons Brinckerhoff, we have also used sDNA to predict pedestrian and cyclist behaviour. The software has also been used to assist in ecological footprinting, and we are currently studying how spatial networks influence land use change.

sDNA has a global user base who are currently being surveyed to discover the full range of uses. Perhaps most surprising is the discovery that archaeologist Hector Orengo used sDNA to analyse the transport networks of Roman Britain! Outside of academia, sDNA also continues to be used in numerous urban design projects worldwide.

Find out more about the sDNA project on the project website.
www.cardiff.ac.uk/sdna

Research team



Dr Crispin Cooper
Sustainable Places
Research Institute

Email: cooperch@cardiff.ac.uk
Phone: +44(0) 29 2087 6072

Hong Kong University

Dr Alain Chiaradia
alainjfc@hku.hk

Professor Chris Webster
cwebster@hku.hk

Dr Chinmoy Sarkar
csarkar@hku.hk



Sustainable Places Projects: Seagrass

The Seagrass Ecosystem Research Group (SERG), is a joint inter-disciplinary marine research collaboration between marine biologists in the school of Biosciences at Swansea University, and interdisciplinary marine scientists at the Sustainable Places Research Institute. Although the core SERG team are based at Cardiff and Swansea Universities, their collaborative research team is internationally extensive, including scientists at the Zoological Society of London (ZSL) Philippines, Hasanuddin University in Indonesia together with collaborative research with Flora and Fauna International in Cambodia and Myanmar.

Our Research Fellow Dr Leanne Cullen-Unsworth, along with PhD student Richard Lilley and Research Assistant Benjamin Jones conduct basic and applied research into the structure, function and resilience of seagrass meadows, within a linked social ecological system, they also focus on their food provisioning service.

The group undertake research in the UK, but also have ongoing work in Indonesia, Myanmar, Sri Lanka, the Turks and Caicos Islands, Cambodia, the Philippines, and Greece.

Seagrass Meadows

Seagrass meadows are soft sediment intertidal to subtidal benthic habitats that are comprised of a group of plants adapted to life in the sea. Seagrasses comprise one of the world's most widespread habitats in shallow coastal waters; they are found on all of the world's continents except Antarctica.

Seagrass habitats can be patchy, but is more commonly comprised of continuous vegetation which can be thousands of square kilometres in size. It is these large swaths that are referred to as seagrass 'beds' or 'meadows'.

Seagrass meadows occur in sheltered intertidal and shallow subtidal areas on sand or mud substratum. Three seagrass species are considered endangered and ten species are at elevated risk of extinction; however, the majority of species are considered common. It is the common abundance of these species, rather than their rarity, that makes them important.

Seagrasses provide habitat, meaning they have a major functional role in supporting various stages in the life cycles of other organisms. For this reason, and with their extensive root-rhizome system and well-developed canopy, seagrasses, like reef building organisms, are termed 'foundation species'.

The research group have recently received funding for an international project, investigating drivers of seagrass decline across multiple scales throughout South East Asia.

The project will help to demonstrate the value of seagrass meadows and their role in supporting food production. It will also support communities across South East Asia to demonstrate the value of their seagrass resources and assist them to identify the current issues in order to bring about conservation action. Information gathered will be used to help communities and managers to take action to stem seagrass loss and empower calls for policy changes to support seagrass conservation.

Engagement

To combat the problems associated with science and public engagement, scientists from the Seagrass Ecosystem Research Group have also set up their own charitable organisation "Project Seagrass" which is working to improve our understanding of seagrass systems in the UK and further afield and raise awareness of their ecosystem service value by taking science to the public.

To find out more about their work, visit the [Project Seagrass](#) website.

Research team



Dr Leanne Cullen-Unsworth
Sustainable Places Research Institute

cullen-unsworthlc@cardiff.ac.uk
+44(0) 29 2087 9366



Benjamin Jones
Sustainable Places Research Institute

jonesb67@cardiff.ac.uk



Dr Richard Unsworth
Swansea University

r.k.f.unsworth@swansea.ac.uk
+44(0) 1792 606 745



Richard Lilley
Sustainable Places Research Institute

lilleyrj@cardiff.ac.uk



Sustainable Places Research Themes: Cities and sustainable places

The Cities and Sustainable Places Programme provides an independent hub to help address specific urban issues and concerns related to sustainable place-making. It offers cross cutting research opportunities to connect with work on future cities and place-based resilience.

Our researchers engage with approaches to regenerative urbanism, which include urban metabolism, climate change, air quality, food security and energy.

They consider how urban cultures transform in terms of reinvigorating links between urban settlements and adjoining ecosystems, especially through the human-environment relationship with sustainability objectives.

These objectives are based on comprehensive, integrated and socio-ecological understanding of local resources.

The work also looks at specific processes relating to a range and types of places including national parks, nature reserves, city-regions, urban and rural communities, food producing regions, and urban regeneration initiatives, to achieve the UN's **Sustainable Development Goals** (SDGs) with a particular emphasis on the following two integrating areas:

Social innovation for sustainable urban living

With a focus on improving the quality of life, liveability and resilience, the approach is based on satisfaction of basic needs of people, improvement of social relations and socio-political empowerment of citizens. Social innovation research cuts across much of the research at the Institute, especially in relation to social and ecological transitions. It has a key role to play in the processes of development in the quest to create more sustainable lifestyles and systems of consumption and production.

The work further looks at diverse issues around: Sustainable mobility, environmental hazards, urban food systems, low-carbon futures, energy vulnerabilities, ethnicity, and entrepreneurship.

Governance for sustainable place making

This research focuses on policies and practices which try to build a sense of place among individuals and groups, such as the use of innovative participatory techniques in planning, politics, policy, and practices

The work further looks at:

- Governance systems and their interaction with other ecological and social systems and the resulting issues related to the role of public organisations and agencies, civil society and stakeholder participation, co-production, capacity building and value transformation in promoting transitions towards sustainable places;
- Governance for a sustainable global environment, including biodiversity and climate change, particularly in relation to the understanding, and communication of risk at urban, regional and national levels.

Funded Research

Funded research activities include;

Research Projects

- Transforming City Food Systems: carbon reductions and health and wellbeing gains in London (With Greater London Authority)
- Information models for the “sharing economy”

- Place Ambassadors: building place identity through participation in national parks
- Connected Learning Spaces: looking at links between HE institutions and local communities
- Sustainable City Regions: considering the case of collaborative governance in Wales

PhD studentships

- ESRC Type-2 studentship on Low-carbon planning, innovation and management in Brecon Beacons National Park
- ESRC Type-2 studentship on Making sense of financial consumption for ethnic minorities in Wales

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Sustainable Places
Research Institute

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Sustainable Places
Research Institute

mehmooda1@cardiff.ac.uk
+44 (0)29 2087 6232



Lorena Axinte
Sustainable Places
Research Institute

axintel@cardiff.ac.uk
+44 (0)29 2086 88842



Catia Rebelo
Sustainable Places
Research Institute

cerqueirarebeloc@cardiff.ac.uk
+44 (0)29 2086 88844



Malin Bäckman
Sustainable Places
Research Institute

backmanm@cardiff.ac.uk
+44 (0)29 2086 88843



Sustainable Places Research Themes: Co-evolving interactive systems

Our researchers explore the relationship between ecological systems and social processes across different temporal and spatial scales, examining the ways in which place-based sustainable futures can be created in the context of global environmental change.

The 'places' we study emerge through interactions between four interrelated systems and processes:

- physical (landscape)
- ecological and ecosystems
- technical and built
- social and governance

Integrative research that takes account of the evolving relationship between all four systems is lacking. Our programme is developing theoretical models and analytical frameworks to better understand the co-evolving relationships between all four systems and processes.

Specifically, it examines the relationship between natural and physical change, their likely ecosystem consequences, and how societal responses both shape, and are shaped by, governance arrangements and the technical and built infrastructure.

Going from theory to practical engagement, our work explores specific places, including urban, extra-urban and human modified rural and forested landscapes and including coastal regions.

Ecological restoration

Ecological restoration has taken on new policy significance in the face of climate change and biodiversity loss. This new area of research is investigating what ecological restoration can do to promote both social and ecological improvements and influence governance arrangements. Using case studies drawn from soil restoration practices on the Aran Islands and Iceland, community led forest restoration initiative in Borneo, Malaysia and from the EU Life funded Vindel River in Northern Sweden, research will be used to build new criteria for evaluating the success of ecological restoration.

Projects contributing to this work

Kinabatangan: Building upon our earlier work in the Lower Kinabatangan floodplain, Sabah and with the support of Cardiff University's Danau Girang Field Centre, our research focuses on restoration initiatives focusing on societal participation, governance enforcement and capability and economic impacts, alongside environmental physical science, ecology and biodiversity. From a natural sciences perspective, this research examines fragmented forest ecosystems, their viability and interactions with dramatically altered rural landscapes – especially that produced by oil palm monoculture. Our research provides new opportunities to carry out parallel analysis on soil stability, erosion, sediment transfer processes and related far-field marine (reef) impacts. From a social science perspective, we are evidencing the socio-economic multiplier effect of community forest restoration initiatives and their social impacts.

Brecon Beacons National Park: A collaboration between the Institute and the Brecon Beacons National Park, this place-based research focuses on spatio-temporal changes in biodiversity within the Fforest Fawr Geopark. Enhancing the Park's Management Plan and increasing resilience to future stressors, this research is analysing the landscape and its biodiversity and the impact of tourism throughout the Park.

Venda, South Africa: Our research in the Vhembe Biosphere Reserve explores the role of local and indigenous knowledge for understanding environmental and social change in sacred forests, as well as identifying the threats and provisioning ecosystem and cultural services of indigenous tree species. We adopt an interdisciplinary perspective to explore the utility of integrating indigenous knowledge, ethnobotany, participatory mapping and species distribution models to inform forest conservation and restoration efforts on communal land.

Ecological Restoration and Building Sustainable Communities: Our research in this research domain is currently represented by a PhD project funded by ESRC and the Scottish Forestry Trust, focusing on how community led restoration in Scotland may improve understanding of ecosystems and develop human relationships with nature.

Biodiversity and the Sustainable Management of Natural Resources: Working together with RSPB and Bridgend Council, we are exploring how Area Statements proposed under recent Welsh legislation, can be an effective means of ensuring that Wales meets its biodiversity objectives. The research will provide recommendations on what needs to be incorporated into the development of Area Statements to ensure biodiversity is considered fully and appropriately at local and national scales.

Land2Coast: Is it possible to incorporate sea and land borne impacts in coastal zone management? Policies addressing land use, coastal zone food security and marine conservation are fragmented and institutionally uncoordinated, unable to address the linkages and interplay between these dynamics. Our research addresses this gap by conducting an assessment of private and public governance operating across land and marine sectors to identify integrated pathways for management actions that address impacts on land based-economic development, fisheries management, livelihoods and conservation.

Seagrass as Coupled Socio-ecological Systems: Seagrass meadows provide an excellent model system for studying clear social-ecological interactions. Seagrass is a widespread yet underappreciated habitat globally that is suffering increasingly from degradation. Our work focusing on monitoring, education and restoration of these vital habitats aims to protect the myriad of ecosystem services they provide including their significant role in food security and carbon sequestration. Our work takes place in multiple locations with active study sites in Europe, SE Asia and South America.

Ecosystem Services: This research examines place-based ecosystem services and the challenges involved in their valuation, including cultural services. It also examines the problems associated with the governance of river catchments for multiple users, and the consequential impacts of environmental change on ecosystem service delivery within freshwater ecosystems. Our work includes assessing ecosystem services tools to understand which of these toolkits are best suited to both full and appropriate delivery of ecosystem resilience and achievement of biodiversity priorities. This includes their use in natural resource management area statements in a Welsh context.

Research team



Professor Susan Baker
Sustainable Places
Research Institute

bakerscm@cardiff.ac.uk
+44 (0)29 2087 70434



Dr Angelina Sanderson
Bellamy
Sustainable Places
Research Institute

BellamyA1@cardiff.ac.uk
+44 (0)29 20 875 045



Professor Mike Bruford
Sustainable Places
Research Institute

brufordmw@cardiff.ac.uk
+44 (0)29 2087 4312



Dr Natasha Constant
Sustainable Places
Research Institute

constantn@cardiff.ac.uk
+44 (0)29 2068 8845



Dr Leanne Cullen-Unsworth
Sustainable Places
Research Institute

cullen-unsworthl@cardiff.ac.uk
+44 (0)29 2087 9366



Dr Edward Hind-Orzan
Sustainable Places
Research Institute

hind-ozane@cardiff.ac.uk
+44 (0)29 2081 0065



Dr Benoit Goossens
Sustainable Places
Research Institute

goossensbr@cardiff.ac.uk
+60 (0)12 836 4005



Sustainable Places Research Themes: Food, land and security

Redefining the 'new food equation' the food, land and security programme is developing new thinking about place-based food interactions that takes a holistic perspective of food systems in order to move towards greater sustainability: from ecosystems to production practices to movement and consumption of food. Our research involves studying the environmental and social components together in order to identify pathways to greater food security and food sovereignty.

The greatest challenge that we face is how do we achieve transformations in the food system to promote a holistic and sustainable approach to food production based on local, place-based food interactions?

Other questions that we address include:

- What are the pressures and challenges that face food interactions in different places and times?
- How are places reconstituting food interactions? How do practices, networks and policies work together in co-producing (un)sustainable places? What are the linkages that create lock-in to unsustainable food interaction pathways? Where are the leverage points at which interventions can instil change via a ripple effect?
- How do we assess adaptive process in sustainable place-making? Is 'place' a new metric for measuring the dynamism of sustainability in different places and across time?

Projects and places in this programme

- Costa Rica: drivers of land use change and how to balance livelihoods with ecological integrity. Other projects in Costa Rica look at improving the environmental impact of Rainforest Alliance certification in banana production and how to improve harvesting of melons so as to reduce food waste throughout the supply chain.
- Turks and Caicos Islands: seagrass conservation and food security. This work interrogates the link between ecosystem services provided by seagrass meadows and food security. It also explores the gendered experience of food (in)security across a Caribbean archipelago.
- Building a strategic network to identify how to incorporate land use policy in coastal zone management in a developing country context. Countries included in the network span Latin America, East Africa and Southeast Asia.
- Agroecology Project: a collaboration with researchers at Exeter and Essex Universities looking at the expansion of the “Nexus” to include social, economic and political dimensions. This is in addition to the focus on environment, water and energy in food production systems, as well as identifying the limits and opportunities for growth of agroecological businesses in the UK, the EU, Brazil, India and Costa Rica.
- Aran Islands (Ireland): research has also been undertaken in the Aran Islands, examining soil ethics, food growing and place belonging. In addition, avenues for policy transfer and lesson learning around the conditions necessary for the promotion of sustainable islands are being explored with European colleagues.
- The Sustainable Management of Natural Resource (SMNR) framework: commissioned by the RSPB, this project is establishing a framework and principles to ensure the effective delivery of biodiversity commitments and the sustainable management of natural resources under the Well-Being of Future Generations (Wales) Act.
- Transmango: Food security drivers in the UK and Europe.
- UK Food Research Collaboration with City University: engaging civil society, as well as an ESRC seminar series ‘The Future of Our Food’
- Trust and integrity of food in the face of ‘appropriateness’ of food as a core pillar of food and bio-security – This bridges into the health programme.
- Developing links with food-land and nexus policy development with the Welsh, UK and EU governance frameworks.

Research team



Professor Terry Marsden
Sustainable Places Research Institute

MarsdenTK@Cardiff.ac.uk
+44(0) 29 2087 9271



Dr Angelina Sanderson-Bellamy
Sustainable Places Research Institute

bellamya1@cardiff.ac.uk
+44(0) 29 2087 5045



Sustainable Places Research Themes: Health, infrastructure and well-being

The Health, infrastructure and well-being research programme adds significant value to current work by drawing together the inter-disciplinary methodological strengths in the Institute to better measure and characterise “place” in relation to human health.

This will be applicable to a variety of research questions in environmental, social and economic sustainability and will provide substantial added-value to important questions in understanding health inequalities and the development of complex interventions needed to address these.

The key research questions to be addressed in this programme are;

- How can we define and measure a place in a way meaningful to communities and planners to characterise those features of importance to health and well-being?
- How can we use new methods of network analysis to better characterise the environments in which we live?
- What is the relationship between these aspects of place and important health outcomes?
- How is health linked with community resilience and vulnerability associated with natural hazards and climate-related disaster?

This programme will provide health and well-being analysis of these areas listed below in relation to place:

- General physical health
- Non-communicable diseases
- Respiratory conditions and diseases (e.g. asthma)
- Mental health (e.g. psychological distress) and well-being
- Common infections
- Alcohol-related harm (e.g. excessive consumption, morbidity, violence)
- Common diseases in childhood (e.g. asthma, respiratory conditions, infections, injuries)

Research team



Dr Yi Gong
Sustainable Places Research Institute

gongy2@cardiff.ac.uk
+44(0) 29 2087 0955



Professor David Fone
Cardiff University School of Medicine

FoneD@cf.ac.uk
+44(0) 29 2068 7241



Dr Crispin Cooper
Sustainable Places Research
Institute

CooperCH@cardiff.ac.uk
+44(0) 29 2087 6072



Sustainable Places Research Themes: Risk, place, identity and sustainability

Risk is increasingly central to a variety of academic disciplines and spheres of public and industrial life – it is perhaps the principal lens through which scientists, industrialists, policy-makers, and the public characterise and debate sustainability issues ranging from climate change to biodiversity loss.

This research programme provides two functions:

- It provides an integrative set of concepts, methods, and analytical approaches to tie together the work going on across the institute;
- It conducts primary research on public and expert understandings of sustainability issues and how they inform governance.

Site based research is central to the institutes' approach, alongside this it is equally important to not lose touch with the fundamental global sustainability challenges facing us.

The grand narratives of modernity and technological progress, and how they tie in with unsustainable practices and identity-making, are fundamental issues of the 'risk society' that are not going away. The risk literature has long grappled with the tensions of balancing detailed site-based research with macro level analyses of social and environmental problems, and so offers useful insights on scaling up knowledge about particular places to connect with the issues of global sustainability.

Another major issue is the challenge of visioning scenarios of future sustainability. There is an opportunity to engage in some methodological innovation to develop methods that better engage with fundamental issues of identity, uncertainty, ambiguity, and risk narratives.

These speak to basic issues of problem-framing and public engagement, which are major strengths of existing risk research at Cardiff University. We are building on the successes of our earlier methodological work on methods of risk and decision analysis in governing sustainability issues, but re-oriented around the concept of place and the grand challenges of sustainability.

Our research explores what the concept of place means in characterising environmental and public health problems, how our current methods take account of this (particularly formal models), and how we might do better.

Another area of work adopts a risk lens to focus upon an uncertain and changing world, looking at how the problems of unsustainability 'in place' need to be informed by alternative visions of the relationship between technology, culture and future identities within the organisation of our risk society.

Research team



Professor Nick Pidgeon
School of Psychology

pidgeonN@cardiff.ac.uk
+44(0) 29 2087 4567



Dr Brian MacGillivray
Sustainable Places Research Institute

macgillivraybh@cardiff.ac.uk
+44(0) 29 2087 6132



Sustainable Places Research Themes: Sustainable rural-urban communities

Many fundamental aspects of sustainable place-making, including the development of more sustainable systems of transport, food production and distribution, energy and waste management and housing provision, depend on where and how people live. Understanding differences in community context (particularly urban versus rural) and governance processes are therefore crucial in exploring sustainable work and living.

Our work in this area looks at sustainability from small communities through to cities and city-regions. This will take forward our research at the city-region and community scales, exploring the role of communities and spatial scale in sustainable place-making. More specifically, we are looking into four key areas: community led transitions and adaptations, Fairtrade Towns, sustainable mobility and community and environment.

Community led transitions and adaptations

Key transition and adaptation questions explore how we encourage social innovation in production and consumption. This work links to the new University Energy Systems Research Institute and Water Research Institute in relation to sustainable production and consumption systems within communities.

Our earlier work is being continued, looking at Cardiff as a city-region and other national and international examples of city-region sustainability initiatives, linking into complementary research and capacity within the School of Geography and Planning.

Fairtrade Towns

Fairtrade Towns represent a rapidly growing initiative that seeks to improve the social and environmental sustainability within producer communities, usually in poorer countries, through changes to marketing and consumption practices.

Our research investigates the operation of the Fairtrade Towns movement as an innovative place-based marketing network, to derive lessons that may help in future efforts to market sustainability orientated goods and services in specific local markets.

Sustainable mobility

Transport systems are central to sustainable place-making. Our work relating to transport integrates existing Cardiff research strengths in the field of sustainable mobility and electric vehicles by working with the School of Engineering, the School of Psychology, the Business School and the School of Geography and Planning. This work encompassed the potential of electric and alternative vehicle systems to tackling challenges such as sustaining the viability of remote rural communities and reducing carbon emissions within eco-cities.

This work connects to the Energy Systems Research Institute, exploring relationships between energy and transport within communities and with the Health, Infrastructure and Wellbeing Programme in considering the relationship between mobility, wellbeing and particular transport modes (such as cycling).

Community and environment

Our work examines the socio-cultural, political, economic and environmental factors which structure and shape the relationships between communities and their local environments. Part of this work focusses on community food system relationships forming a bridge to the Food, Land and Security Programme and other complementary work within Cardiff School of Geography and Planning.

This research builds upon our existing work with an emphasis on integrative research methods for sustainability science, international and multi-stakeholder research engagement and collaborative research relationships with a range of external stakeholders. It includes research work on citizen science and participatory approaches to environmental education, exploring how to develop relationships between communities and their environment that promote a greater understanding of sustainability and sustainable lifestyles.

Key projects within this research theme are based on strategic partnerships with other organisations. This includes work with the Canal & River Trust to understand and develop community use of and engagement with waterway spaces, and work with the Brecon Beacons National Park focussing on sustainable education and community development. Other UK partnerships involve Welsh Government and the Community Land Advisory Service. Ongoing international collaboration with academic partners in mainland Europe, North and South America creates further opportunities for cross-disciplinary knowledge exchange amongst a wide range of national & international stakeholder networks.

Research team



Professor Ken Peattie
Sustainable Places
Research Institute

peattie@cardiff.ac.uk
+44(0) 29 2087 7293



Dr Hannah Pitt
Sustainable Places
Research Institute

pitt2@cardiff.ac.uk
+44(0) 29 2087 9632