



European Centre for
Environment & Human Health

UNIVERSITY OF
EXETER | MEDICAL
SCHOOL

Review 2011-12



EUROPEAN UNION
Investing in Your Future
European Regional
Development Fund 2007-13



European Union
European Social Fund
Investing in jobs and skills



convergence
for economic
transformation

The European Centre for Environment and Human Health is part of the University of Exeter Medical School. We are based at the Royal Cornwall Hospital site in Truro, Cornwall and part financed by the European Regional Development Fund Programme 2007 to 2013 and European Social Fund Convergence Programme for Cornwall and the Isles of Scilly.

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Phase 1 in brief

The Centre launched in May 2011 with support from the European Regional Development Fund (ERDF) and European Social Fund (ESF) Convergence programme for Cornwall and the Isles of Scilly. This is an overview of some of our activities since the launch, ranging from key research findings to events and recruitment.

Major research discoveries made

Researchers have published a range of high-impact findings - from a link between radon and skin cancer and the relationship between latitude and atopic disease, to the effect of the coast on emotional wellbeing.

International partnerships forged

The Centre has built strong partnerships with a number of leading research centres across Europe and the World, including universities and research institutes in the EU, Hong Kong, India and the USA.

Extending our influence

Centre members are increasingly represented on national and international advisory bodies such as the World Health Organisation and European Commission's Framework 7 programme.

Significant research grants secured

We have won several significant grants from funding bodies, including the Economic and Social Research Council, the Natural Environment Research Council and international health insurance company, BUPA.

PhD programme underway

As part of a programme of 18 PhDs, the Centre is helping to train the next generation of researchers.

University of Exeter

Following the disaggregation of the Peninsula College of Medicine & Dentistry, the European Centre became part of the University of Exeter Medical School in August 2012 - with a complement of 45 staff.

Engaging with business

The Centre has proactively sought business collaborations and is directly involving 12 local businesses in on-going PhD projects supported by the ESF.

Masters programme underway

An MSc in Environment and Health supported by the ESF welcomed its first cohort of students, from business and the public sector, in January 2012.

Collaborative conferences held

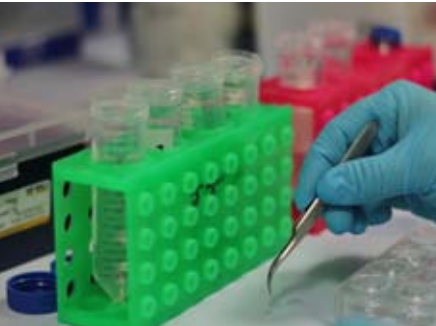
The Centre teamed up with local organisations such as Cornwall Council and the Eden Project to host conferences bringing together leaders in the field of environment and health.

Website launched

A newly developed website designed to showcase the Centre's research, www.ecehh.org, was launched in February 2012.

“The Centre has achieved a remarkable amount in the last year and a half, providing a solid foundation for it to prosper in the years ahead.”

Professor Michael Depledge, Chair of the Advisory Board



Director's statement

The European Centre for Environment and Human Health at the University of Exeter Medical School, secured a second phase of funding from the European Regional Development Fund beginning in 2013. This crucial achievement marked our progress from a fledgling research centre to a fully functioning academic hub, and recognised the huge efforts and achievements of everyone involved in our formation.



As we near the completion of the first phase of our funding, the timing of this review gives us an opportunity to reflect on our achievements to date and how we can prosper in the future.

We believe that the complexity of environment and human health issues — and the risks and opportunities they pose — must be addressed in a truly interdisciplinary fashion. To this end, we are establishing a research environment that incorporates both qualitative and quantitative research methods and uses science, the arts, the humanities and other disciplines to tackle problems. Collaborations with business, government and the third sector are at the heart of our work, exemplified by on-going projects with Cornwall Council, the NHS, the Eden Project, Sea Communications and Ginsters.

The Centre's uniqueness has allowed us to recruit some of the brightest talent in our field and we now have more than 45 researchers and supporting staff. With funding from the European Social Fund, we have also been joined by increasing numbers of PhD and Master's students.

“We have already produced crucial research that provides evidence for the importance of the natural environment to health and wellbeing.”

Professor Lora Fleming, Centre Director

There are always challenges in trying to do something new and cutting edge in a very short period of time. For example, many of the Centre's staff and students had no prior history of interacting with business. Yet after a steep learning curve, we now have many potential partnerships with Cornish businesses involving both on-going PhD research and new projects. Our staff are relatively young and represent a range of research disciplines and nationalities. This gives us a wonderful opportunity to create a 'Centre Culture', encouraging interaction across discipline and background.

One of the challenges has been to make the Centre central to emerging regional innovation in environment and health. To help achieve this, we are working with Plymouth University, University College Falmouth and other research bases at the University of Exeter, such as the Environment and Sustainability Institute. We believe that the South West region is the perfect 'test bed' for our studies. The recent formation of the Health and Wellbeing Innovation Centre and our relationship with Truro and Penwith College means we are an important part of the emerging Cornwall Health and Wellbeing Campus.

We have already published research demonstrating the importance of the natural environment to health and wellbeing. The UK Met Office is among organisations we are working with — partnerships that bring together relevant resources, research and training. Our links with Cornwall Council are improving health and wellbeing services for hard-to-reach groups. Through partnerships like this, we are also engaging photographers and artists to communicate our work beyond academic boundaries. Researchers from the Centre are simultaneously presenting their research at international conferences and to national and international policy makers.

There is still much to do, however. We must diversify our funding sources and secure continued backing for existing and future research and training programmes. We must expand our work nationally and internationally and ensure we are targeting the most relevant areas of our field. Above all, we must continue to carry out excellent research, so that our studies influence policies and focus on areas that increase our knowledge of environment and human health links.

When I reflect on our first 18 months, I see important achievements and significant potential for development. We have had a rewarding, non-stop adventure but we should also appreciate the privilege and responsibility of performing cutting edge research, with fascinating and talented people in a beautiful place like Cornwall.

A handwritten signature in blue ink, which appears to read 'Lora Fleming'.

Professor Lora Fleming
Centre Director



“The continued support of the European Regional Development Fund will allow the Centre to build on its track record of locally relevant research and business collaboration.”

Ms Emma Bland, Centre Manager

Our vision

In the current era of great social and economic upheaval and unprecedented global environmental change, understanding the links between the environment and human health and wellbeing has never been more important.

On the one hand, our actions are severely damaging ecosystems and potentially impairing human wellbeing through climate change, biodiversity loss and pollution. Conversely, society is starting to appreciate the beneficial effects of the natural environment on health. This is providing opportunities to tackle major worldwide problems ranging from poor mental health to obesity.

Only an interdisciplinary and inter-institutional approach can address these contradictory developments. It must involve scientists, academics, businesses, not for profit organisations and communities. Policy makers at local, national and international levels must be informed and involved, and funders and evaluators of research projects must show a greater regard for complex, integrated research programmes.

The University of Exeter Medical School established the European Centre for Environment and Human Health to fill this void. The Centre is based at the Medical School's campus in Truro, Cornwall, recognising the cultural and natural heritage of the area. Cornwall is renowned for its diverse landscape but also known for the environmental impact of its industrial past.

The support from ERDF until the end of 2014 is providing us with the financial security to build a critical mass of research staff, a track record of research success and an international reputation. The Centre's development over its first five years will focus on seven aims:

1. [Become an internationally and locally relevant research centre, recognised as a hub of expertise and knowledge in the environment and human health field;](#)
2. [Develop cutting edge, business-relevant research across several areas;](#)
3. [Diversify our funding base to ensure long-term sustainability;](#)
4. [Increase the number of international students and training activities at the Centre;](#)
5. [Conduct world class research across a number of disciplines;](#)
6. [Build partnerships globally with key stakeholders and complimentary research groups, to enable the Centre to compete successfully for research funds;](#)
7. [Communicate to policy makers our findings on the links between environment and human health.](#)

Areas of research

The Centre employs experts from diverse disciplines: epidemiology, communication, policy analysis, systematic reviews, horizon scanning, health economics, biostatistics, qualitative methods, chemistry and microbiology. Each researcher specialises in a range of quantitative and qualitative research methods and together, forms a team that is encouraged to break from traditional silos.

We have two major research areas: emerging threats to health and wellbeing posed by the environment, and the health and wellbeing benefits the natural environment can provide. Researchers work on projects that deliberately cross disciplinary boundaries. However, to provide cohesion to this report, a number of areas of interest have been identified. This somewhat artificial categorisation is a presentational tool within which we have grouped descriptions of our research activities.

Ageing well

As populations age worldwide, our views of older people, and how we deal with this ageing demographic, will need to evolve. Our research is considering how physical activity and the environment can impact on ageing and perceptions of growing old, and how age related conditions such as sight loss can affect older people's ability to stay fit and healthy.

Climate, health and wellbeing

Weather and climate can directly influence our health. We are investigating the impact climate and climate change may have on atopic illnesses. As patterns of disease change, drug treatments will alter too. We are considering the transport and fate of pharmaceuticals in the environment, and the ways in which they may vary in the future under pressures such as an ageing demographic.

Emerging pollution risk

Our research into the manmade pollution of the environment considers traditional contaminants such as pesticides, and newer substances such as pharmaceuticals. Along with environmental toxic exposures like radon and harmful algal bloom toxins, we are examining the way that pollution can impact on both the environment and health.

Microbial systems

Microbial systems underpin life on earth. Bacteria drive bio-geochemical cycles in the environment including the carbon and nitrogen cycle, facilitate plant growth through mineralisation of organic matter and cause a wide range of infectious diseases. Human and veterinary use of antibiotics and other pharmaceuticals affect these microbial systems and we are studying bacterial evolution in the lab to shed light on environmental mechanisms that can lead to antibacterial resistance.

Wellbeing and the environment

Evidence is emerging that all natural environments including coastal can improve physical and mental health. We are researching the therapeutic properties of these environments, assessing how they differ and how best to encourage access.

“To be part of a research Centre that actively encourages a broad range of academics to work together is extremely exciting; I’m approaching problems from angles I have never considered before.”

Dr Ben Wheeler, Research Fellow and Health Geographer



Ageing well

Population ageing is one of the most pressing global issues of our time. Within the UK, 2,800 people turn 60 every day. As this figure rises, the demographic change it creates presents both opportunities and challenges.

Many older adults contribute to society through formal and informal volunteering activities offering invaluable wisdom and experience. However, chronic disease and dependence on health care, social services and pharmaceutical treatment is also more likely as we age. The ability of policy makers and health practitioners to successfully promote lifestyles that encourage healthy ageing will rely on sound scientific reasoning.

Regular physical activity and participation in social and community events can help keep us healthy and maintain our economic and cultural engagement. In line with the World Health Organisation's definition of active ageing, the Centre's research focuses on "the process of optimising opportunities for health, participation and security in order to enhance quality of life as people age".

Currently, less than 10% of people over 55 in the UK meet the minimum level of physical activity recommended for good health. We are assessing the influence of physical activity on people's expectations and experiences of the ageing process and aiming to understand how the natural environment can influence the transition into retirement.

This area of research has attracted funding from the Economic and Social Research Council (ESRC) as well as other organisations, and is being produced in partnership with important regional and national academic institutions.

Exploring the impact of physical activity on ageing ¹

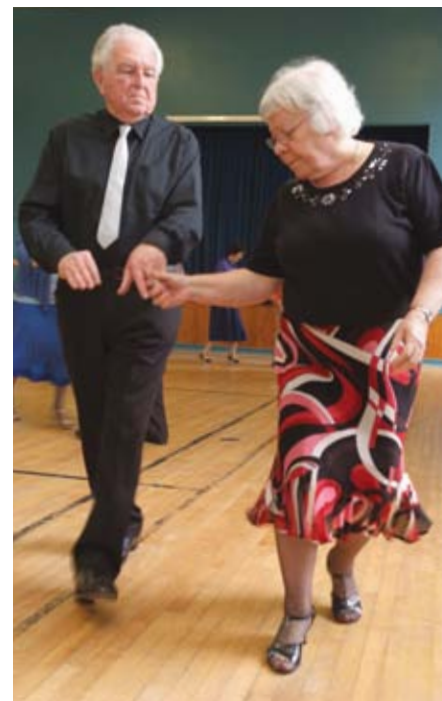
As part of a project funded by ESRC, Senior Lecturer Dr Cassandra Phoenix — a qualitative researcher with a background in social gerontology and sport and health sciences — is leading an investigation into people's experiences of being physically active in older age. The Moving Stories project is also examining how physically active older adults are perceived by other people.

Like much of the population, many older adults are inactive, which can adversely affect their health and wellbeing. By gathering first-hand accounts of how physically active older adults relate to physical activity, Dr Phoenix and Dr Noreen Orr are understanding how and why the study group deals with the barriers and challenges to being active.

The research team is collecting data in a range of ways, including life history interviews, photography, film, and focus group sessions. Photographing participants during activity, and using these images to draw out reflections of participant's experiences, is helping the team understand how people's activity connects physical experience with the environment. Researchers are also studying how physically active older adults are perceived by others. They can challenge stereotypes of ageing, but only if the listener

engages with their stories. The team have produced a video that is being shown to focus groups to prompt discussion about the role of physical activity in older age – for others, and, in relation to one's own life.

To compliment this work outreach events and exhibitions of the photos and film have been staged throughout Cornwall, providing an opportunity for policy makers, participants and civic individuals to view the images and footage, and debate the issue of physical activity and ageing.



¹ www.ecehh.org/publication/moving-stories



“We live in a youth-orientated culture where growing older is often seen only as a period of physical decline. Physically active older adults can challenge stereotypes of ageing - but only if their stories are engaged with by the listener.”

Dr Cassandra Phoenix, Senior Lecturer and Qualitative Research Specialist

Ageing well

Physical activity and sight loss ¹

Sight loss can compound a person's immobility as they age, limiting activity. Because sight loss is a significant risk factor for additional medical conditions, visually impaired older adults tend to have poorer health than those with good sight.

To enable older adults with sight loss to become more active and improve their health and wellbeing, Dr Phoenix and Dr Meridith Griffin are examining the experiences of physical activity among people who have suffered sight loss later in life. Participants are from Cornwall, London and Loughborough and include people who are active and non-active. The study considers a range of formal and informal physical activities beyond 'organised' sport.

This research will benefit visually impaired older adults by increasing our knowledge and understanding of their involvement in physical activity. It is supported by the Thomas Pocklington Trust and conducted in partnership with Loughborough University and the Cornwall Blind Association.

The impact of gardens on the wellbeing of those with dementia ²

There are an estimated 750,000 people with dementia in the UK, with nearly two-thirds of those living in care homes diagnosed with the disease. Cases of dementia are expected to increase by up to 40% in the next 15 years as populations age. Interest is growing in non-pharmaceutical methods of improving the wellbeing of those with dementia and their carers.

Gardens may offer a range of benefits for people with different degrees of dementia, from gardening itself to walking in gardens and sitting in soothing surroundings. Yet the ways in which gardens affect physical and mental health and wellbeing are complex.

Together with colleagues from the Evidence Synthesis Team at PenCLAHRC³, Senior Lecturer Dr Ruth Garside is leading a systematic review of the evidence for the wellbeing impacts of gardens for people with dementia, their families, carers and care home staff. The study will identify and synthesise the findings from qualitative and quantitative research and build a comprehensive picture of existing knowledge.



¹ www.ecehh.org/publication/physical-activity-and-sight-loss

² www.ecehh.org/publication/outdoor-space-and-dementia-systematic-review

³ National Institute for Health Research
Collaboration for Leadership in Applied Health
Research and Care for the South West Peninsula

Climate, health and wellbeing

Human health and wellbeing is closely linked with the climates in which we live. However, global temperature rise and its effects may alter the relationship between health and the environment over coming decades.

Some regions will become wetter and warmer; others will become hotter and drier and humans may face radically changing environmental conditions and be forced to adapt. Temperature changes are likely to increase extremes of cold and heat with subsequent impacts on human health. Less obvious impacts will include the increasing range of disease vectors (such as ticks and mosquitoes), a changing exposure to temperature-sensitive microorganisms such as harmful algal blooms, and a longer growing season for allergenic pollen-producing plants.

The Centre's research is improving our understanding of how variations in climate today can influence the prevalence of disease. It is being used to extrapolate future scenarios and assess how each of these potential outcomes may affect future policy. We are also considering how best to communicate these possible impacts. This work showcases the Centre's ongoing partnerships with the Met Office and other stakeholders, and is providing information relevant to policy makers in the South West region and nationally.

A link between atopic disease and latitude ¹

Research published in Australia and the US suggests that vitamin D deficiency could be contributing to the recent rise in allergic disease. Centre academics have been studying how latitude may affect the prevalence of food allergy and eczema in children. Sunlight stimulates the production of vitamin D in the skin, and regions further from the equator typically receive lower levels of sunshine.

The research is lead by Senior Research Fellow Dr Nicholas Osborne and is examining data from the Longitudinal Study of Australian Children. The team have shown that in eight to nine-year-olds, the odds of having a peanut allergy are six times higher in southern-most children compared to those in the north. The likelihood of having eczema is twice as great for those in the south.

A second study (a PhD project) with the UK Met Office's Hadley Centre and funded by the ESF, is using meteorological data from the last 100 years to investigate the relationship between sun and health in greater detail. The data is derived from ground-based measurements and satellite observations. It is hoped that the project will allow the precise measurement of sunshine exposure across the UK and the development of models to assess its effects on health.

Exploring pollen levels and health ²

Using the Met Office's network of pollen measurement sites, this research is examining the role that high pollen levels may have on hospital admissions. The research team is considering how peak pollen levels may exacerbate conditions such as cardiovascular disease, respiratory disease, mental illness and immune system disorders.

An important part of this analysis is to determine the distribution of pollen across the whole of the UK for the 30 years for which data is available. As well as identifying details on how symptoms can be worsened in those already suffering from asthma, the researchers hope to explore how individuals initially acquire asthma - providing avenues to reduce the prevalence of the disease and develop an early warning system.



Analysing climate adaptation ³

The Centre, together with the College of Social Sciences and International Studies in Exeter, is a partner in the European Commission's FP7 research programme led by Aarhus University in Denmark and involving 13 other organisations from across Europe. This initiative, the Bottom-up Climate Adaptation Strategies towards a Sustainable Europe (or BASE) project, is evaluating the environmental, social and economic impacts of different climate adaptation policies. It is also considering the costs and benefits, policy coherence and stakeholder perceptions of different methods of dealing with the forecast changes to global climate.

Dr Tim Taylor, Lecturer in Environmental and Public Health Economics at the Centre, is leading the assessment of health adaptation case studies, focussing particularly on mental health problems including the impacts and costs of climate change adaptation. With colleagues from the Euro-Mediterranean Centre for Climate Change in Italy and the Basque Centre for Climate Change in Spain, Dr Taylor is studying how best to integrate health into top-down modelling of climate change.

“Meteorology can impact the health of populations in a number of ways. Our research is hoping to identify the influence of climatic conditions on emergent diseases, and to examine how these will effect populations in the future.”

Dr Nicholas Osborne, Senior Research Fellow and Epidemiologist

Investigating the impact of changing pharmaceutical use ⁴

The presence of pharmaceuticals in the environment is now well established. As pharmaceuticals are neither completely removed by sewage treatment processes nor completely degraded in the environment, concerns have arisen about the impact of these compounds on organisms and their ability to enter the human food chain. Studies of human medications in the environment commonly focus on western 'heavy usage' treatments. Yet it is likely that changing climatic conditions, and rapidly ageing populations, will alter the global distribution of disease.

These factors will change the types of pharmaceuticals used with potentially unexpected impacts on environmental health. Researchers at the Centre will be recommending which medications should be placed under greater scientific scrutiny because of their predicted increase in use and potential environmental impacts.

Environmental analytical chemist, Lecturer Dr Clare Redshaw, is working to determine which classes of pharmaceuticals should

be targeted in future research. Her team, which is working closely with Professor Steve Rowland at Plymouth University, is also developing a model to predict the pharmaceutical contamination of aquatic environments, enabling limited monitoring and clean-up resources to be reserved for areas of high pollution.



¹ www.ecehh.org/publication/prevalence-eczema-and-food-allergy-associated-latitude-australia

² www.ecehh.org/publication/pollen-and-its-impact-human-health-national-study

³ www.cmcc.it/research/research-projects/baseproject

⁴ www.ecehh.org/publication/climate-change-changing-disease-profiles-and-their-impact-upon-pharmaceutical-usage

Climate, health and wellbeing

Climate change and policy ¹

Climate change policy is now focusing increasingly on adaptation strategies and mitigation measures. However analyses of the related literature reveals that ecology is commonly not considered in adaptation policies. With co-author Professor Michael Depledge, Centre Research Fellow Dr Philip Staddon is reviewing climate change and human health, aiming to facilitate the incorporation of ecological knowledge into health policy and explain why ecology is central to human adaptation to climate change.

Dr Staddon and colleagues are also preparing a paper on how climate change will affect human health in Cornwall. This research aims to put a monetary value on the possible health impacts of climate change, allowing objective comparison of the various impacts. The Cornwall Health and Environment Committee will be using some of these findings to help highlight the importance of adaptation for the agenda of the local NHS trust.

Developing a complex carbon modelling tool ²

As part of efforts to achieve a low carbon future, honorary research fellow Dr Adam Pollard has been developing a carbon management model for use in the Cornish healthcare sector.

Based on data from a pilot study supported by the Royal Cornwall Hospital, the model uses a complex database of algorithms to conceptualise secondary healthcare. It will demonstrate the impacts of potential changes to health service provision and enable users to calculate demand for a service. It will also show the proximity of patients to that service and reveal the carbon and monetary costs of moving the service to a new, optimised location.

With backing from the Centre, a new Cornish company, Porthilly Holdings, has been formed. It is developing the model to help the NHS optimise its activities in terms of both energy use and carbon footprint.

Using information graphics to communicate the health impacts of climate change ³

In collaboration with Dr Sabine Pahl of Plymouth University, Associate Research fellow Dr Will Stahl-Timmins is exploring how the visual presentation of information might help non-expert audiences understand a number of complex, non-linear narratives, such as the possible health impacts of climate change.

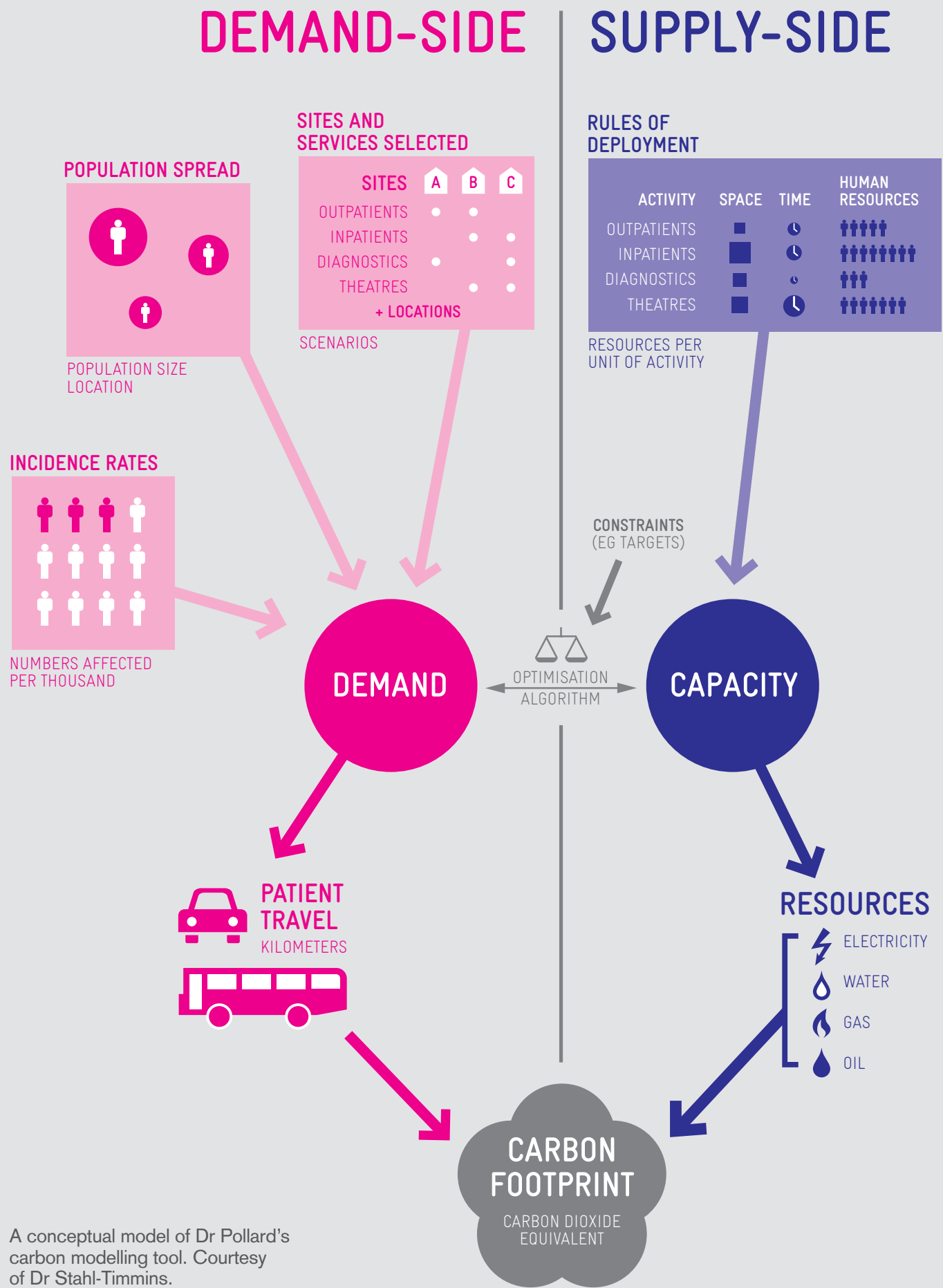
The *Seeing is Believing* project has completed two pilot studies, with initial analysis of the pilot data suggesting that the use of information graphics could reduce the time needed to interpret vital information.

Dr Stahl-Timmins also works closely with researchers of all disciplines at the Centre. One example of this, a conceptual diagram of the NHS carbon model developed by Dr Adam Pollard, is shown opposite. The graphic is designed to demonstrate the structure of the model to a wider audience.

¹ www.ecehh.org/publication/climate-change-adaptation

² www.ecehh.org/publication/carbon-management-modelling

³ www.ecehh.org/publication/seeing-believing



A conceptual model of Dr Pollard's carbon modelling tool. Courtesy of Dr Stahl-Timmins.

Emerging pollution risk

Through population, environmental and lab-based studies, we are examining the impact of pollution on both the environment and health, with particular relevance to Cornwall and the South West.

The Centre's research into the impacts of manmade pollution on the environment is considering traditional contaminants such as pesticides and more novel substances, including pharmaceuticals and personal care products. As global population rises and ages, the presence of an ever-changing cocktail of pharmaceuticals in the environment will require a dynamic research response.

In addition, a number of naturally occurring environmental toxins may threaten human health. Researchers are considering the processes by which agents (such as radon, harmful algal blooms and arsenic), often released through human activities, can increase the risk of disease. Our work in this area exemplifies the interdisciplinary nature of the Centre, with a number of studies being undertaken into pollution risk, ranging from cell biology to health geography.

Uncovering an association between radon and skin cancer ¹

Through detailed analysis of several datasets, the Centre's experts in epidemiology and cell biology have discovered a potential link between radon and a particular type of skin cancer. This work has huge regional relevance because of the South West's granite bedrock and high radon levels, and has generated significant media attention.

The team, led by Research Fellow Dr Benedict Wheeler, is examining data on radon concentrations and the reported rates of three types of skin cancer. Radon is already known to be the second leading cause of lung cancers and theoretical models suggest that radon may also be a risk factor for skin cancer. However, up until this point, epidemiologic evidence for the relationship has been weak. Our research indicates a possible association between radon and squamous cell carcinoma, but as with all population studies of this type, is unable to prove a cause-effect relationship.

To investigate further, the Centre is currently mid-way through a laboratory-based investigation into the direct cellular effects of radon. This study is an ESF-funded PhD project in collaboration with University of Exeter Medical School Senior Lecturer Dr Alison Curnow. It is analysing the direct effect that radon and UV exposures can have on the development of skin cancer. It is hoped that this research will provide an accurate understanding of the mechanisms of cancer growth in the skin, and determine whether radon can play a role in its enhancement.

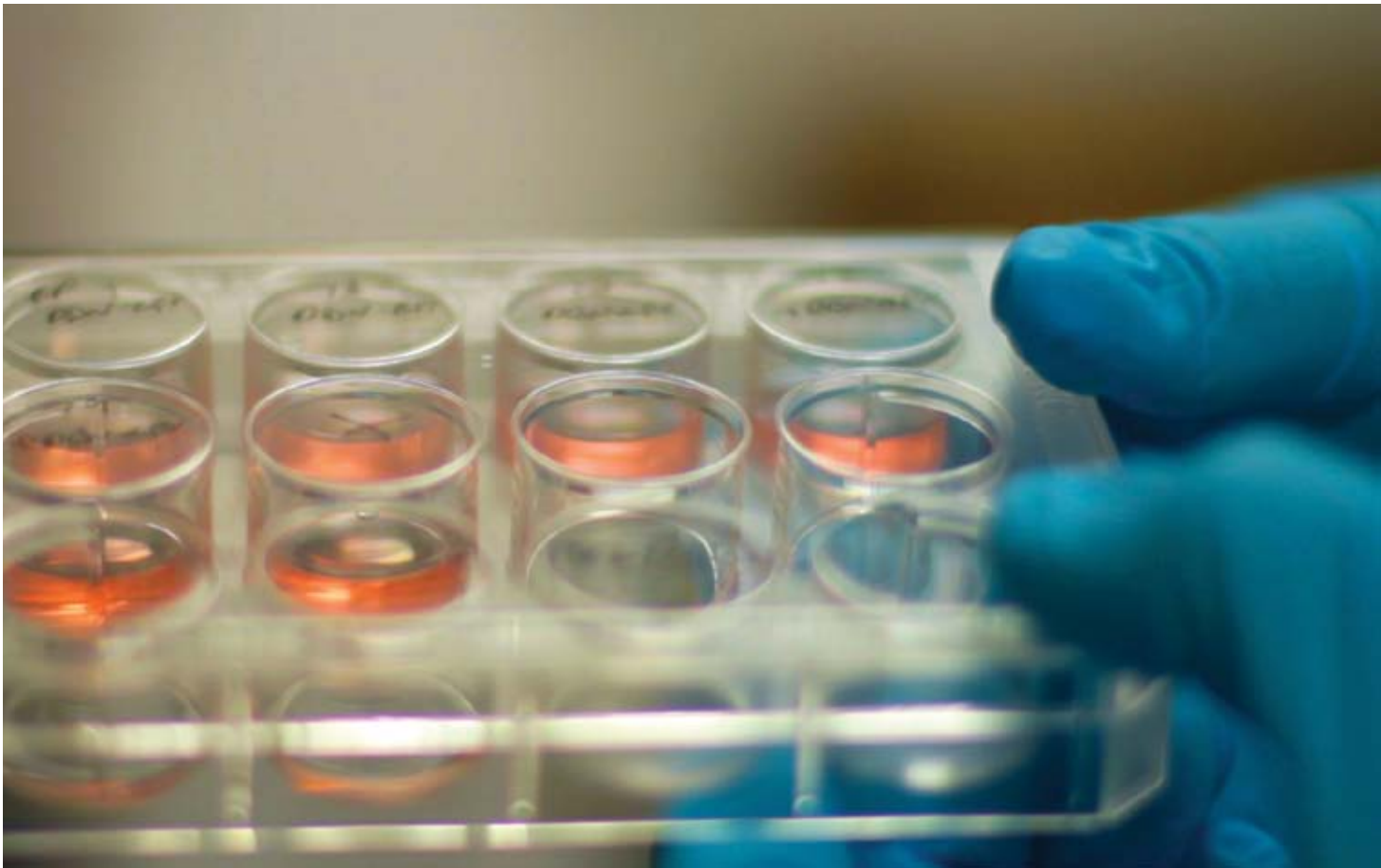
Modelling human skin ²

To address the limitations associated with lab studies of single cell types, or those using animals, Associate Research Fellow Dr James Allen is producing a 3D model of the human skin comprised of cells isolated from excess skin following surgery. These cells are then 'reassembled' in the lab to produce a tissue which is representative of the human skin.

Building a model of the skin will allow the team to investigate in more detail the effect of environmental toxicants such as arsenic, heavy metals and radon gas, through the use of intricate microscopic techniques. Ultimately it is hoped that this will increase our understanding of how disease is initiated by these agents and how it progresses within the skin.

¹ www.ecehh.org/publication/radon-and-skin-cancer-southwest-england-ecologic-study

² www.ecehh.org/publication/building-three-dimensional-model-skin



Emerging pollution risk

“We’re working with partners across the University of Exeter on studies that are really relevant to Cornwall, it’s the perfect place to explore the links between the environment and health.”

Dr Jessica Tyrrell, Associate Research Fellow and Genetic Epidemiologist

A genetic analysis of smoking and low birth weight ¹

Working with the Molecular Genetics Research Group within the University of Exeter Medical School, Associate Research Fellow Dr Jessica Tyrrell is using the genetic make-up of a group of pregnant women to investigate the relationship between smoking and birth weight.

Evidence is increasingly suggesting an association between smoking and low birth weight, which is a major risk factor in the future development of a range of diseases for new born babies. This study uses data from more than 26,000 individuals to analyse the association between a particular genotype and child birth weight, and has found a direct link between smoking and birth weight.

This research is the largest analysis of the smoking-birth weight relationship to date, combining data from several smaller studies. It has allowed the research team to draw robust conclusions about the effect of smoking on birth weight. They have confirmed a causal relationship, highlighting the importance of efforts to reduce smoking among pregnant women.

¹ www.ecehh.org/publication/smoking-and-low-birth-weight-genetic-analysis

² www.ecehh.org/publication/assessing-impact-waste-metals

Assessing the impact of waste metals ²

Anthropogenic contaminants released into the marine environment can seriously damage the health of marine species, species’ population size and wider biodiversity. As part of our research, academics at the Centre are working with Professor Tamara Galloway and the University of Exeter’s Aquatic Resources Centre to analyse the effects of waste metals — some of the most harmful anthropogenic toxins — on estuarine ecosystems.

The team is studying the Fal River in Cornwall which, due to historical mining activity, is in parts heavily contaminated with waste metals. As a result, local populations of the harbour ragworm have successfully adapted to levels of copper and zinc that would be lethal to their counterparts elsewhere. Associate Research Fellow Dr Jonathan McQuillan is using this example as a model for study, employing state of the art molecular biology and bioinformatics-based techniques to reveal the cellular mechanisms that underpin this adaptation.

Using next generation sequencing technology, the research team has prepared a library of gene sequence information for its model species. Genes which defend against toxic heavy metals have already been identified and a study of how these genes coordinate to protect the organism from the effects of copper is underway.



Microbial systems

Microbial systems underpin life on earth. Bacteria drive bio-geochemical cycles in the environment, including the carbon and nitrogen cycle, and facilitate plant growth through mineralisation of organic matter. Yet antibiotic resistant bacteria could pose an increasingly serious threat to human health.

Bacteria comprise complex synergistic communities within our bodies, outnumbering our own cells to form 'the human microbiome'. These populations have evolved over hundreds of millions of years and are fundamental to human health. Bacteria also include serious human pathogens that cause a variety of infectious diseases. These illnesses are becoming harder to treat because they have evolved antibiotic resistance.

The study of evolution in the laboratory is made possible by using bacteria as model organisms. Benefitting from their short life cycle and ability to acquire foreign DNA from other bacteria, Centre researchers are examining the rates of genetic change including mutation and the uptake of foreign DNA. We are also studying changes in behaviour of bacteria, including pathogenicity and resistance to antibiotics — areas that will have a serious impact on human health and the ability to fight disease.

This area of work is funded with support from the Natural Environment Research Council (NERC) and involves partnerships with industry and key organisations such as the UK Environment Agency. Research on microbial systems has cross-council appeal with funding opportunities available from the Medical Research Council, the Biotechnology and Biological Sciences Research Council (BBSRC) and the UK Government's Department for Environment, Food and Rural Affairs (Defra).

Identifying environmental reservoirs of novel antibiotic resistant genes ¹

Previous research by microbiology Senior Lecturer Dr William Gaze has demonstrated that the natural environment can act as a reservoir of previously unknown antibiotic-resistant genes. By cloning DNA into antibiotic susceptible *E. coli*, Dr Gaze has shown that novel genes from the environment can help bacteria develop resistance to some of our most important antibiotics.

In response to these findings, Dr Gaze is coordinating research that will reveal how humans are exposed to these resistant organisms. Working with the Environment Agency, his team has screened bathing water from beaches across England and Wales to assess the risk to swimmers, surfers and other beach users of exposure to resistant bacteria.

Preliminary results have confirmed that England's bathing waters can contain significant numbers of bacteria carrying clinically important antibiotic resistance genes. Further investigations will identify the sources of contamination, explore the ability of resistant organisms to survive and multiply in coastal environments, and propose measures to reduce exposure risks.

Assessing selection for antibiotic resistance in the natural environment ²

Established theories indicate that selection for resistant bacteria usually occurs in the human body when a patient is under antibiotic therapy. However, recent research suggests environmental pollutants (such as low concentrations of antibiotics and other compounds in the natural environment) could be behind selection for antibiotic resistance.

To further understand these mechanisms, Research Fellow Dr Lihong Zhang has engineered pairs of *E. coli* strains that are identical apart from the presence of a single resistance gene. This allows competition experiments to be carried out in the laboratory to examine whether carriage of the resistance gene allows one strain to outcompete the other, even at the extremely low concentrations of antibiotics in polluted environments.

The team hopes that the findings of this research will enable regulators to determine safe environmental limits of antibiotic residues.

¹ www.ecehh.org/publication/assessing-exposure-antibiotic-resistance

² www.ecehh.org/publication/environmental-pollutants-and-antibiotic-resistance

³ www.ecehh.org/publication/bacteria-and-viral-resistance

“Understanding how environmental pollution drives evolution of antibiotic resistance in bacteria is crucial to our ability to fight disease in the future, it’s an area of research that has global significance.”

Dr William Gaze, Senior Lecturer and Microbiology Expert

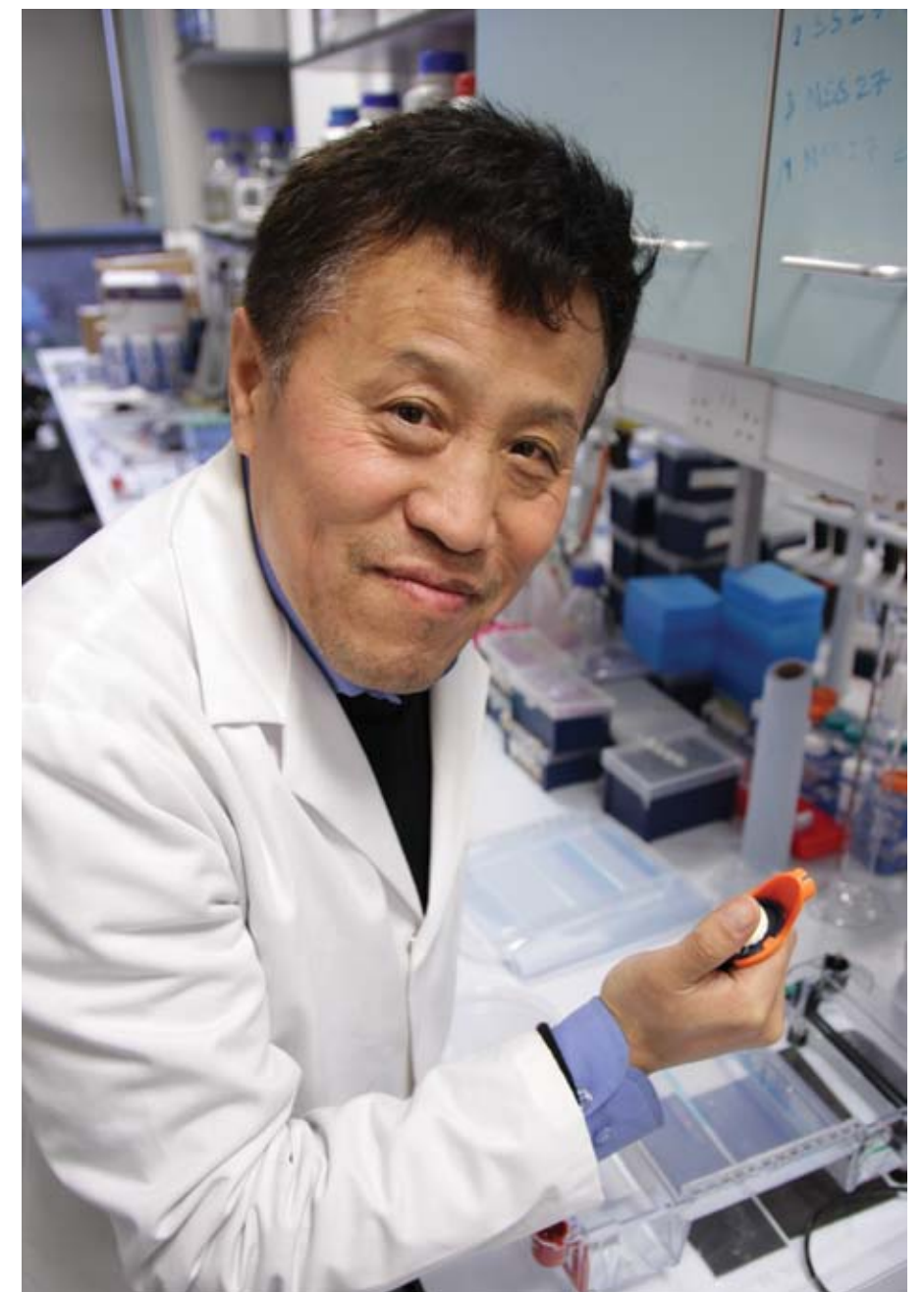
Bacteria and viral resistance ³

Bacteria are locked in a continual 'arms race' with viruses that replicate and destroy bacterium cells — a battle forcing bacteria to develop resistance and the virus to overcome this resistance. To stay ahead, bacteria do not rely on genetic mutations alone to generate immunity but acquire stretches of DNA from their environment as well.

This ability to shuffle genes between different strains of bacteria is the focus of work funded by a NERC New Investigator Grant awarded to Lecturer Dr Michiel Vos. Dr Vos and his team are analysing the way in which bacteria evolve to overcome their own viruses and hope to show how bacteria become successful human parasites.

The study is using the aquatic pathogen *Aeromonas*, a freshwater species of bacteria that is a serious pathogen problem in fish farms and can cause significant disease in humans. By cultivating bacteria and their viruses (or 'phages') in the laboratory, the team is testing whether the addition of DNA from resistant strains can hasten the development of viral resistance.

The findings should show how bacteria evolve and could be important in enabling the use of 'phage therapy' in combating disease.



Wellbeing and the natural environment

A growing body of evidence suggests that the recreational use of natural environments can have a range of benefits, among them better health and longevity. Investigating the gains to human health and wellbeing that natural settings can offer is a research priority for the Centre.

It has been suggested that the natural environment is an underused public health resource, particularly in terms of its potential to enhance people's physical and mental health. Research also indicates that aquatic or 'blue spaces' may provide even greater benefits.

Existing collaborative research at the Centre is assessing the nature of these benefits, how they arise and how best to harness them. These projects have input from several disciplines, including public health, planning, environmental psychology and geography.

As part of this work, we are developing programmes designed to improve health and wellbeing in the workplace. These initiatives can improve the health of a workforce, a community and an environment in addition to increasing productivity and efficiency. Several Cornish businesses and public sector organisations are delivering novel and nationally recognised workplace-based programmes. Our researchers are working with a number of these companies to develop rigorous evidence-based initiatives that will support training and the dissemination of best practice throughout Cornwall and the rest of the UK.

Coastal populations see improved health ¹

Researchers from the Centre are using data from the UK's 2001 Census to examine how health varies across the country. This multi-disciplinary analysis, lead by Research Fellow Dr Ben Wheeler, draws together data from more than 48 million people. It is involving specialists in epidemiology, psychology and visualisation. Allowing for variations in age, gender and social and economic

factors, the team has found that people are more likely to have good health the closer they live to the sea. This positive link is strongest in the UK's most economically deprived communities.

This study demonstrates that in general, there is a beneficial link between health and the coast. The research also backs existing evidence that access to 'good' environments can help reduce health inequalities.



¹ www.ecehh.org/publication/does-living-coast-improve-health-and-wellbeing

² www.ecehh.org/publication/psycho-physiological-responses-indoor-cycling-different-environments

³ www.ecehh.org/publication/inhabitat-project

⁴ www.ecehh.org/publication/what-are-health-and-wellbeing-impacts-participating-activities-enhance-environment

“Our research is already showing that the natural environment can offer physical and psychological benefits, we really want to understand how to make the most of these advantages and ensure that the message is appreciated by policy makers.”

Dr Mathew White, Lecturer and Environmental Psychologist

Blue space and exercise ²

An on-going study by the Centre and Plymouth University suggests that exercising in environments with blue space, as opposed to urban or even green space, can improve fitness and health.

Within highly controlled laboratory settings this research, led by risk and health Lecturer Dr Mathew White, is analysing how individuals respond to cycling on an exercise bike while viewing moving images of the coast, countryside or town. Over a period of four weeks, participants 'cycle through' each environment in turn as their mood, arousal levels, heart rate and blood pressure are measured.

Early findings suggest that exercise in each location has a similar effect on the participants' physiological measures, but that the impact on the individuals' psychology is significantly different. When cycling with views of a coastal or 'blue' scene, individuals were more positive, more willing to do the 'route' again and felt as though they had been exercising for significantly less time compared to other environments. The team is hoping that outside of the laboratory, 'blue' environments may prove most effective in encouraging people to exercise more often and for longer.

Developing a new data collection tool ³

Biodiversity researchers from the Centre are working with Cornish company Sea Communications to develop a pioneering digital tool that will capture information from members of the public about their local natural environment.

Initial funding for this project has come from the University of Exeter's Open Innovation Fund and is allowing both researchers and Sea Communications to improve their analyses of large amounts of data gathered directly from public participation. The new interactive tool will enable participants to report and map information that relates to their health, wellbeing, and, crucially, the type and quality of their surrounding environment. Led by Associate Research Fellows, Dr Sahran Higgins and Dr Rebecca Lovell, it is hoped that the results of this initial study will feed into the development of a much larger project and advance Sea Communication's skills and expertise in web mapping — a key growth area for its business.

Participating in environmental enhancement activities ⁴

Contact with nature is thought to improve health and wellbeing and when combined with activities that also foster environmental stewardship (such as beach cleans or improving wildlife areas) nature-based activities may initiate a reciprocal relationship between the community and its surroundings.

Led by Senior Lecturer Dr Ruth Garside, the Centre's systematic review team is examining research to assess the impact of participating in environmental enhancement activities, in terms of changes in wellbeing and general health status, social connectivity and self-esteem. Associate Research Fellow Dr Kerryn Husk is assessing quantitative and qualitative evidence and using input from a range of relevant organisations, such as the Woodland Trust and Mind, to refine the research focus.

Ultimately the authors are hoping to create a conceptual model that will describe the complex interactions taking place between involvement in environmental enhancement activities and health and well-being, as well as the impacts on different groups of individuals. This study is funded with support from the National Institute for Health Research's School for Public Health Research and is registered with the Cochrane Public Health Group.

Wellbeing and the natural environment



Working with the NHS ¹

Healthcare professionals in the United Kingdom have higher levels of absence and sickness, dissatisfaction, distress and burnout at work than staff in other sectors. In trying to redress this trend, workplace health initiatives have tended to adopt approaches that do not take into account the complex nature of health care systems. Subsequently, these programmes have limited sustainability and the success of an intervention in one setting is not replicated in another.

Academics at the Centre, in partnership with the National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care for the South West Peninsula (PenCLAHRC), and led by Research Fellows Dr Sarah Brand and Dr Julie Pepper with Senior Lecturer Dr Katrina Wyatt, are attempting to address these issues by developing a workplace health and wellbeing initiative within the NHS. The project is guided by the principles of complexity theory and is underpinned by a rigorous systematic review. Trends in the conditions required for workplace wellbeing are emerging.

In conjunction with these activities, in-depth qualitative data have been gathered from four Cornish businesses, including the Cornish Pasty company, Ginsters, and from interviews with NHS staff. These data, along with an ESF funded PhD, are revealing how workplace initiatives are perceived by employees, and how the conditions for creating a sustainable healthy workplace are achieved.

The Centre's Sustainable Workplace Advisor, Jane Abraham, is working closely with the hospital senior management team at Royal Cornwall Hospital Trust to apply this research to the development of an NHS healthy workplace programme.

Web-based horizon scanning ²

Horizon scanning is an integral part of the Centre's strategy, giving researchers and businesses vital insights into the direction that research should take. By its very nature, horizon scanning requires the continuous acquisition of new information to anticipate concerns, collect reliable data about them and inform critical decisions. Research led by Associate Research Fellow Dr Marco Palomino is using the existing infrastructure of proven search engines to automate the human-intensive process of seeking information and identifying new trends.

Working with the University of Exeter Business School and insurance industry giant Lloyd's of London, Dr Palomino's work is being used to frame decision making about novel risks in the insurance industry. The horizon scanning prototype software is also providing the UK Department of Health with an unbiased assessment of issues surrounding proton beam therapy.

Dr Palomino's model is now focused on forecasting new developments in eHealth and wellbeing, work which is vital in shaping future research of interest to the Centre, Cornwall Council and beyond.

Deepening our knowledge of relationships between nature, health and wellbeing ³

Dr Ben Wheeler and Dr Mathew White have secured funding through ESRC's Secondary Data Analysis Initiative to study how different types and qualities of natural environment can affect human health and wellbeing.

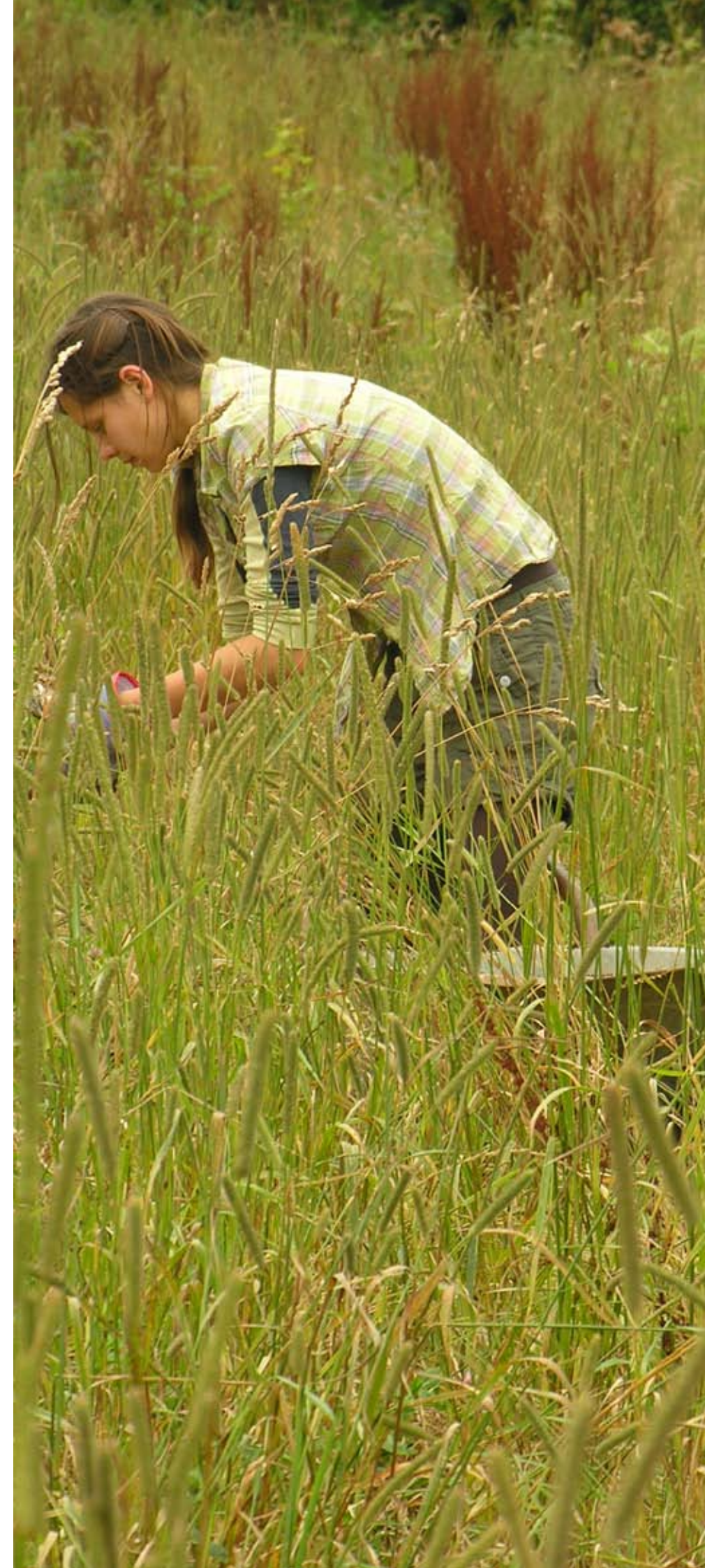
Much of the related research to date has considered 'green space' in general, with no differentiation between types or qualities of environment. The researchers will be using some of the UK's existing datasets to assess how environment type and quality can affect human health and wellbeing.

The project will use large secondary datasets allowing the team to address complex research questions. Researchers will also investigate local trends using ecological data from the Environmental Records Centre for Cornwall and the Isles of Scilly. The project will involve several Centre researchers and has an advisory board including representatives from Cornwall Wildlife Trust, Natural England and Forest Research.

¹ www.ecehh.org/publication/healthy-workplace-project

² www.ecehh.org/publication/web-based-horizon-scanning-concepts-and-practice

³ www.ecehh.org/publication/beyond-greenspace



Collaboration, engagement and impact

Research in the UK and internationally is increasingly being driven by the need to collaborate with industry, the community and policy makers to ensure growth, impact, and innovation. Through our programme of regional research, the Centre is working closely with Cornish businesses and developing findings that will have international application and influence.

A strong knowledge-based economy is crucial to the economic and social wellbeing of the UK. This is even more relevant in the current economic climate and is exemplified in regions such as Cornwall. The realised and potential impacts that scientific findings have are central to the future of research globally. They are scrutinised by research councils, international research funds and high level publications.

The Centre is engaging with local, national and global organisations through accessible events, seminars and outreach programmes. These initiatives are leading to meaningful and sustainable research collaborations and partnerships. The Centre operates on a range of levels – from networking events, one to one meetings and international fora, to highly focused UK Research Council and EU projects.

As well as these essential business links, we want to engage the people of Cornwall and the South West in debate that will energise and promote the field of environment and human health. Over the last year, our programme of business and community-focused events has brought together academics and representatives from a range of organisations to discuss burgeoning issues and the contribution of research to their study.



Formulating research based spin-out companies

Research into sustainable and healthy workplaces has led Centre staff member Ms Jane Abraham to develop plans to establish a healthy workplace spin-out company. The company, FLOURISH, will provide research-based input to Cornwall's Healthy and Sustainable Workplace Programme.

As a result of the Centre's support, Research Fellow Dr Adam Pollard has started a new Cornish company, Porthilly Holdings, which is developing software to help the NHS increase its energy efficiency and reduce its carbon footprint.



Assessing a new housing project

Working directly with Cornish social enterprise Ocean Housing, environmental psychologist Dr Mathew White is assessing the health and wellbeing of residents as they move into a pioneering new eco-development.

To understand the impact of the new development, Ocean Housing needs accurate analysis of the development's effects on elderly residents. The team hopes the collaborative project will give researchers and developers a greater insight into the potential benefits of this type of housing initiative, particularly for those with disabilities and health-related immobility.



'In Residence' programme

The Centre has initiated an 'In Residence' programme to help stimulate collaborative research questions and pilot projects. The aim of the scheme is to establish and improve relationships between individuals and within businesses by better understanding the needs, constraints and targets of all parties involved.

By enabling researchers and businesses to work closely together, joint research, training and business initiatives will be developed that are collaborative and mutually beneficial. The project is simultaneously supporting the flow of information and expertise between business and academia.

“Being able to work with the European Centre, and to be part of research that will add value to our programme is going to be vital to our survival and growth – it’s really important to us.”

Emma Fowle, Exhale

Collaboration, engagement and impact



Bringing people together

Supported by the ESF and coordinated by the Centre, the biannual Peninsula Environment and Human Health Forum is creating an expanding network of researchers, businesses and third sector organisations in the South West. With a focus on research and policy development, the forum represents a key facet of the Centre's interaction with enterprise and its success is reflected in its rising membership, with more than 80 delegates attending each event.

More information on the Forum can be found at www.ecehh.org/forum



Collaborative conferences

In October 2011, we partnered Cornwall Council in hosting a two-day conference — Enterprise, Wellbeing and Environment. The event comprised interactive seminars on business theory, science communication, health and wellbeing, and policy, and involved speakers from the US and University of Exeter Business School. It attracted 150 participants from businesses across the South West. In November 2012 the Centre and the Eden Project ran a second two-day conference on sustainable change and the use of complexity theory within communities and the workplace, showcasing success stories from Cornish businesses and communities.



Enterprise-focused events

The Centre has organised a concerted programme of events to stimulate discussion and initiate partnerships between academics and business. Events have included a Business of Climate Change seminar at which media and communications companies discussed how best to convey climate science to lay audiences. A second example, Enabling Access to the Environment, explored the use of the environment by disadvantaged or disabled people.

A special interest group initiated by the Centre has evolved to focus on children's health and outdoor play. The group is led by an industry chair and is made up of children's play equipment manufacturers, product and landscape designers, clinicians, schools and academics. It already sees itself as a bid-ready stakeholder group, focused on informing research and policy and the development of business products and services.



Supporting Nuffield Foundation student placements

In August 2012, the Centre hosted two students from Cornish secondary schools on a Nuffield Foundation Science Bursary. The scheme is designed to give first year A level students a hands-on experience of academic research. It was held in Cornwall for the first time in 2012.

The students' enthusiasm, maturity and the quality of their final reports impressed everyone at the Centre underlining the importance of this kind of outreach.



Providing photographic inspiration

As part of our efforts to encourage the exploration of science through art, the Centre worked with Truro and Penwith College to set its FdA Action Photography students an artistic brief leading to a week-long exhibition. The task was based around the Centre's environment and human health themes. It challenged students to interpret an element of the themes and use photography to explore its human and abstract form - with great results.



Getting the message out

Since the Centre's launch in May 2011, we have attempted to raise awareness and understanding of our activities and their importance. In conjunction with academic journals and conferences, we have distributed material to a broad group of audiences using our website, a quarterly newsletter and local and national media.

"I cannot over emphasise just how important the academic collaboration with the European Centre has been to the success of our work - it has informed strategy, programme writing and perceived value. The partnership makes our work unique and explicitly exposes those much neglected qualitative as well as quantitative indicators and results."

Mod Le Froy, Director at Global Boarders

"The research carried out by the European Centre is fundamental to what I do because time and again, clients want proof that investing money in improved environments will have a real impact on their service users and stakeholders. If I can have access to research data and academics working at the cutting edge of the field, I go out armed to make an effective and convincing argument to people who are going to invest in the kinds of services I provide."

Mike Westley, Director at Westley Design

Training the next generation of researchers

The Centre has 18 collaborative PhD studentships in the field of environment and human health. Students will develop high level research skills and meet the needs of business partners in Cornwall and the Isles of Scilly.

Many of these studentships are funded by the European Social Fund under its Convergence regeneration programme for Cornwall and the Isles of Scilly. Each of these projects involves interdisciplinary collaboration between two academic institutions and a Cornwall-based business. The inclusion of a business partner is crucial to the goals of the initiative with study design and objectives feeding into the long-term development of each company's skill base.

Exploring perceptions of shellfish consumption ¹

To better understand shellfish purchasing decisions, and to improve communication between the industry and the public, Cornish company Aquatic Water Services is collaborating with the Centre on an ESF-funded PhD project.

The shellfish industry is an important part of both the Cornish and UK economy. Shellfish landings were worth £11m in 2011 and several shellfish farms are located in the county. Research has identified the numerous factors influencing the foods people choose to eat. This interdisciplinary project is exploring these factors in the context of shellfish — an area where data are currently lacking.

The project is being supervised by academics from diverse backgrounds and the broad range of skills on offer is enabling student Mr Nick Boase to approach the project in a truly holistic fashion.

Blue space benefits for children ²

In order to deliver sound scientific foundations to their programmes of work, the Centre and Cornish social enterprise, Exhale, have created an ESF-funded PhD exploring the benefits to children of interacting with the aquatic environment.

The project is also working with a second Cornish company, Global Borders, to give both firms and student Ms Rebecca Jenkin what is thought to be an unprecedented insight into the positive impacts of 'blue space' on youngsters' psychological health.

The research is giving both organisations a long-term opportunity to engage with academic research and better understand the way the coastal environment can affect children's health and wellbeing.

Understanding the links between housing and health ³

Better insulation and more effective ways of sealing buildings have improved energy efficiency but have also changed the way that homes are ventilated. This may adversely affect domestic living conditions.

To understand how this might happen, Cornish company Coastline Housing is working with ESF-funded PhD student Mr Richard Sharpe to study how building design and occupant behaviour can increase exposure to mould and spores. The research

is also assessing the impact this can have on allergic and respiratory diseases in residents.

The first part of the pilot work is underway, with the collaboration ultimately hoping to feed its findings into Coastline Housing's public health policies and messages.

Storytelling, children and the natural environment ⁴

As part of an ESF-funded PhD, student Mr Philip Waters is working with the Eden Project to analyse for the first time the use of stories to introduce key concepts, such as social responsibility and environmental sustainability, into children's experiences of nature.

Children's ability to access the outdoor environment increasingly has to compete with attractions such as computer games, TV, social networking, mobile phones and concerns about health and safety. This research should reveal how stories influence youngsters' physical activity. The aim is to enhance children's environmental awareness and desire to spend time outdoors.

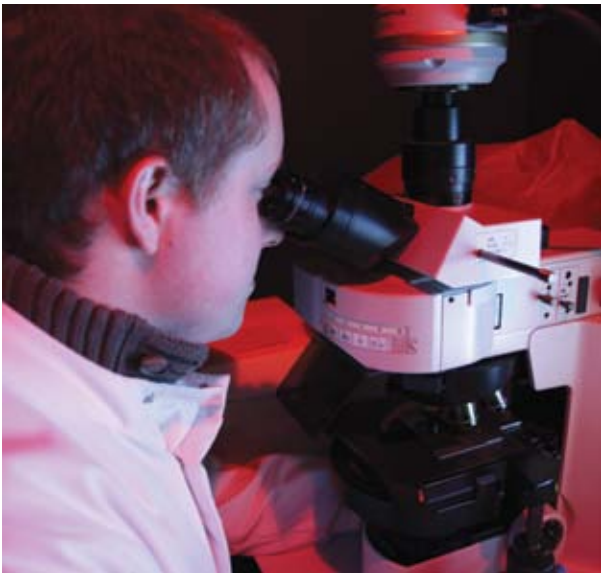
The research supports the Eden Project's policies of social inclusion, community engagement and child education, and will provide expert analysis to inform its teaching programme.

¹ www.ecehh.org/publication/sea-saucepan

² www.ecehh.org/publication/blue-gym-kids

³ www.ecehh.org/publication/health-and-housing

⁴ www.ecehh.org/publication/narrative-journey



“This has been such a refreshing and positive experience for us. The professionalism, level of knowledge and fresh approach that working with a PhD student has brought has captured everyone’s enthusiasm. High-quality research is critical to any future decisions we make, so its importance can’t be underestimated.”

Mark England, Head of Technical Services, Coastline Housing

Training the next generation of researchers

A full list of our PhD projects.

“We’re always looking at new ways to encourage children to love the outdoors, so we’re really interested in a detailed analysis of ‘narrative journeys’. We see it as highly relevant to our charitable aims, our business development and how we engage youngsters both at Eden and in the wider world.”

Jane Knight, Landscape Architect, Eden Project

Student Name	PhD Project	Academic Supervisors	Business Partner (s)	Start Date
Sarah Bell	Perceptions and use of greenspace areas: Implications for landscape design, health and wellbeing	Dr Cassandra Phoenix ¹ Dr Melvyn Hillsdon ²	Westley Design Cornwall Sports Partnership	01/12/2011
Richard Sharpe	Health and housing: Are the new measures employed to better heat housing leading to more atopic diseases via exposure to dampness, moulds and fungal spores?	Dr Nicholas Osborne ¹ Dr Christopher Thornton ³	Coastline Housing Ltd	01/11/2011
Cherry Buckwell	How can environmental and societal conditions for sustainable changes in health and wellbeing behaviours be created?	Dr Katrina Wyatt ⁴ Prof Lora Fleming ¹	Ginsters of Cornwall	01/11/2011
Shukru Esmene	Low carbon vehicles: Energy, emissions and impacts on behaviour	Dr Tim Taylor ¹ Prof Clive Sabel ⁵ Dr Bridget Woodman ⁵	EcoDrive	01/10/2011
Rebecca Jenkin	Blue Gym for kids - promoting child health and wellbeing using Cornwall's coastal environment: A complex interventions approach	Dr Mathew White ¹ Dr Sabine Pahl ⁶	Global Boarders Exhale CIC	01/10/2011
David McNeil	Valuing ecosystem services in the Isles of Scilly: Achieveing benefits for local enterprise	Dr Tim Taylor ¹ Prof Richard Owen ⁷	The Duchy of Cornwall The Council of the Isles of Scilly	01/10/2011
John Rowe	Positioning the environment as a health and wellbeing resource: Innovation for market creation	Dr Tim Taylor ¹ Prof Richard Owen ⁷	Global Boarders	01/10/2011
Mark Cherrie	Understanding the relationship between solar irradiance, vitamin D and its effect on health in populations	Dr Nicholas Osborne ¹ Prof Trevor Bailey ⁸	Met Office	01/10/2011
Philip Waters	Narrative journey, a pedagogical tool connecting children and nature: Social, health and environmental benefits	Dr Ian Frampton ¹ Sue Waite ⁹	Eden Project Big Fish Ventures	01/10/2011

Student Name	PhD Project	Academic Supervisors	Business Partner (s)	Start Date
Kloe Wood Lyndorff	Enhancing the entrepreneurial capacity of Cornish SMEs: Innovating lifestyle services around the Blue Gym concept	Dr Tim Taylor ¹ Prof Gareth Shaw ⁷	WALKIT Cornwall	01/10/2011
Nick Boase	From sea to saucepan: Investigating stakeholder perceptions to inform communication within the UK shellfish industry	Dr Mathew White ¹ Dr Clare Redshaw ¹ Dr William Gaze ¹	Aquatic Water Services	06/06/2012
Aaron Robertson	An in vitro investigation into the effects of radon and ultraviolet radiation on human skin cells	Dr Alison Curnow ⁴	JR Board Radon Remediation Air Tech Environmental Systems	01/09/2010
Josey Field	Coast, countryside and The National Trust: Examining the role of outdoor physical activity in young adults' sense of belonging.	Dr Cassandra Phoenix ¹	National Trust	01/10/2011
Andrea Harvey	The value of a healthy marine environment	Prof Lora Fleming ¹ Prof Michael Depledge ¹ Dr Melanie Austin ¹⁰ Dr Caroline Hattam ¹⁰		01/10/2011
Julie Hollenbeck	Effective knowledge mobilisation in a socially deprived coastal community: The case of marine environmental awareness	Dr Cassandra Phoenix ¹ Prof Lora Fleming ¹ Dr Katrina Wyatt ⁴		01/10/2011
Joanna Ross	Narrating transitions into retirement: Exploring the role of physical activity in the natural environment	Dr Cassandra Phoenix ¹ Prof Michael Depledge ¹		01/10/2010
Under recruitment	Are bacterial pathogens in the coastal zone a threat to human health?	Dr William Gaze ¹		01/2012
Under recruitment	Disability and the Blue Gym in Cornwall: Assessing market potential based on quality of life enhancement for those with restricted ability and their carers	Dr Tim Taylor ¹		01/2012

¹ European Centre for Environment & Human Health

² Sports & Health Sciences, University of Exeter

³ Biosciences, University of Exeter

⁴ Peninsula College of Medicine & Dentistry

⁵ Geography, University of Exeter

⁶ School of Psychology, Plymouth University

⁷ University of Exeter Business School

⁸ College of Engineering, Mathematics & Physical Sciences, University of Exeter

⁹ School of Education, Plymouth University

¹⁰ Plymouth Marine Laboratory

MSc in environment and human health

The MSc in environment and human health was launched in January 2012 in response to demand from both business and the third sector. With funding support from the ESF this full-time and part-time course has been developed with reference to the requirements of the Chartered Institute of Environmental Health and the UK Faculty of Public Health.

www.exeter.ac.uk/medicine/mscenvironmenthealth

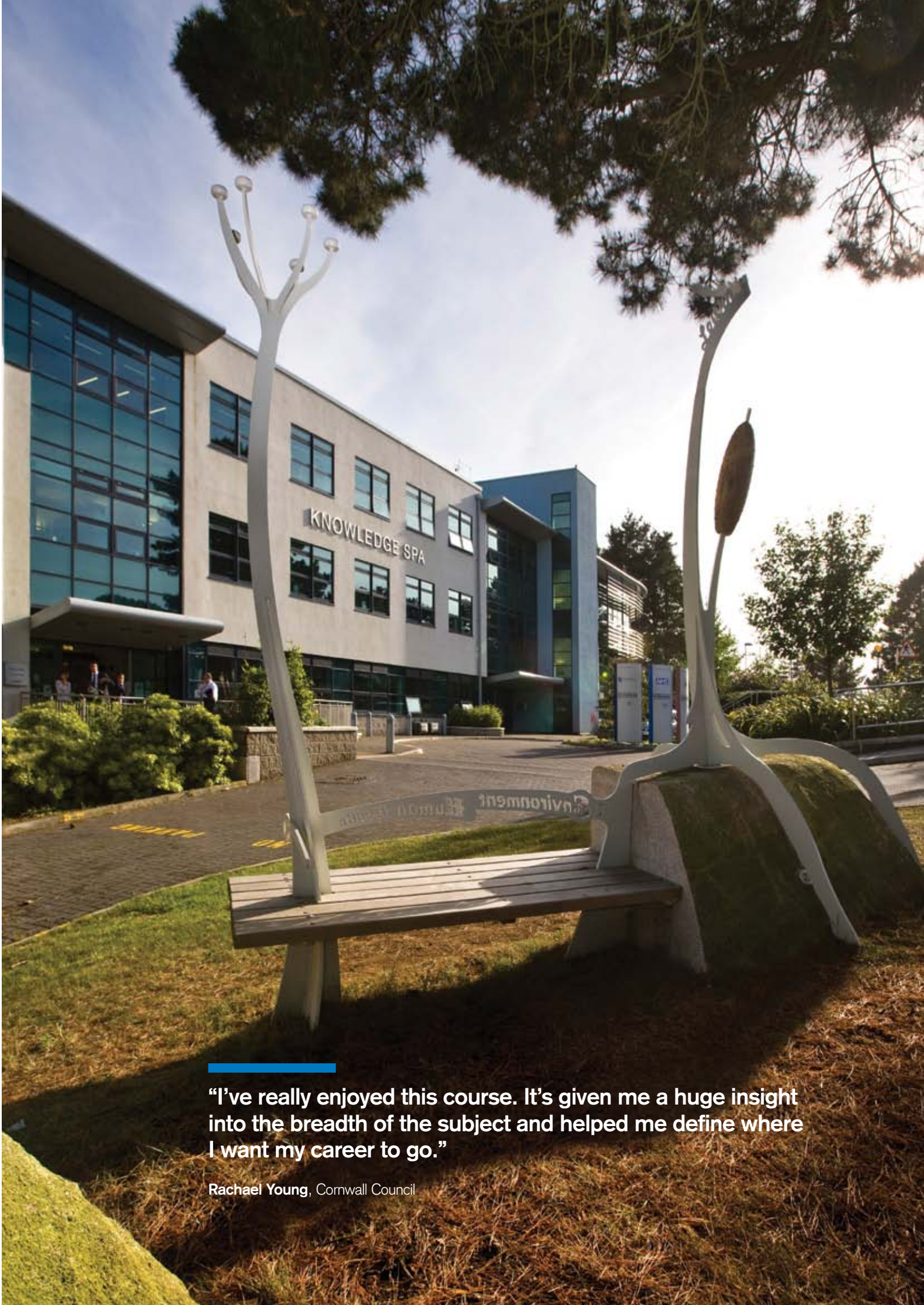
The programme offers students the opportunity to advance their knowledge, skills and understanding of current issues in environment and human health sciences. It will equip them with the skills necessary to critically analyse and synthesise information. The course is designed to provide a detailed understanding of ecological public health and the relationship between health and the environment, as well as the social determinants of health and healthcare systems.

The launch of the course attracted considerable interest within Cornwall, with 15 of the 16 students in the first cohort coming from the county. Several of these students

are from organisations already involved in business engagement activities, underlining the success of the Centre's relationship with local enterprise.

Visitors from the Met Office, Age UK and the World Health Organisation, and specialists in epidemiology and geographical information systems from the Centre itself have been among the experts contributing to the programme. Course coordinator, Dr Ian Frampton, has been keen to give the students as much of an insight into the practical application of their curriculum as possible and has organised several field trips and exercises based on real-world scenarios.

In one such example, organisers and course leaders from University College Falmouth's MA in broadcast journalism challenged students to run mock press conferences on contentious local environmental and health issues. The conferences were then edited for real time television broadcast by University College Falmouth's students, giving an insight into the pressures faced by the media and potential pitfalls of poor communication.



“I’ve really enjoyed this course. It’s given me a huge insight into the breadth of the subject and helped me define where I want my career to go.”

Rachael Young, Cornwall Council

External advice and support

The European Centre is extremely fortunate to have an international board of experts providing advice and support. The Advisory Board help to direct our research and engagement activities and advise on new opportunities and collaborations.

The Board is chaired by Professor Michael Depledge and is comprised of members from the private and public sector and experts in local, national and international environment and human health. The Board meets biannually to review the Centre's activities and achievement of its targets. It also provides guidance and advice on future development and strategic direction.

Prof Michael Depledge (Chair)
European Centre for Environment and Human Health, University of Exeter Medical School

Prof Lora Fleming
European Centre for Environment and Human Health, University of Exeter Medical School

Mr Kevin Lavery
Cornwall Council

Mr Mark Duddridge
Ginsters Food

Prof Kevin Gaston
Environment and Sustainability Institute, University of Exeter

Prof Steve Rowland
University of Plymouth

Prof Steve Thornton
University of Exeter Medical School

Prof Anthony Kessell
Health Protection Agency

Prof George Morris
Independent expert in environmental public health

Mr John Rea
Defra

Mr Wayne Elliott
World Meteorological Organisation

Mr Richard Robinson
Paul Hamlyn Foundation

Prof Angela Shore
University of Exeter Medical School

Dr Stephen Holgate
University of Southampton

Dr Julia Slingo
Met Office

Dr Tony Kendle
Eden Foundation

Dr Jacqui McGlade
European Environment Agency

Dr David Gee
Independent expert in environmental risk

Ms Suzanne Bond
Cornwall Development Company

Mr Chris Pomfrett
Cornwall and Isles of Scilly Local Enterprise Partnership

Prof Peter Part
European Environment Agency

Laura Burke
Environmental Protection Agency, Ireland



Our research team

We have an ever expanding team of research and support staff.
For full profiles and contact details visit www.ecehh.org/people



Prof Lora Fleming
Centre Director



Prof Michael Depledge
Chair of Advisory Board



Prof Clive Sabel
Associate Professor



Dr Ruth Garside
Senior Lecturer



Dr William Gaze
Senior Lecturer



Dr Ian Alcock
Associate Research Fellow



Dr James Allen
Associate Research Fellow



Nick Bearman
Associate Research Fellow



Dr Meridith Griffin
Associate Research Fellow



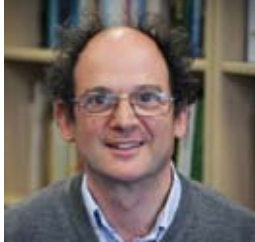
Dr Sahran Higgins
Associate Research Fellow



Dr Cassandra Phoenix
Senior Lecturer



Dr Nicholas Osborne
Senior Research Fellow



Dr Gyorgy Fejer
Lecturer



Dr Ian Frampton
Lecturer



Dr Clare Redshaw
Lecturer



Dr Kerry Husk
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Gyula Kothencz
Associate Research Fellow



Dr Rebecca Lovell
Associate Research Fellow



Dr Jonathan McQuillan
Associate Research Fellow



Dr Rebecca Moran
Associate Research Fellow



Dr Tim Taylor
Lecturer



Dr Michiel Vos
Lecturer



Dr Mathew White
Lecturer



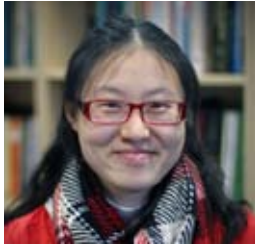
Dr Katherine Ashbullby
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Dr Sarah Brand
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Dr Noreen Orr
Associate Research Fellow



Dr Ivy Shiue
Associate Research Fellow



Pawel Sierocinski
Associate Research Fellow



Dr Will Stahl-Timmins
Associate Research Fellow



Dr Jessica Tyrrell
Associate Research Fellow



Dr Marco Palomino
Research Fellow



Dr Adam Pollard
Research Fellow



Dr Philip Staddon
Research Fellow



Dr Mark Taylor
Research Fellow



Dr Ben Wheeler
Research Fellow



Dr Lihong Zhang
Associate Research Fellow



Jane Abraham
Healthy Workplace Advisor



Emma Bland
Centre Manager



Catherine Hale
Knowledge Exchange Officer



Thandie Hara
Knowledge Exchange Officer

Credits

The European Centre for Environment and Human Health is part of the University of Exeter Medical School and is part financed by the European Regional Development Fund Programme 2007 to 2013 and European Social Fund Convergence Programme for Cornwall and the Isles of Scilly.

The Sunday Times University of the Year 2012-13, the University of Exeter is a Russell Group university and in the top one percent of institutions globally. It combines world-class research with very high levels of student satisfaction. Exeter has over 18,000 students and is ranked 7th in The Sunday Times University Guide, 10th in the UK in The Times Good University Guide 2012 and 10th in the Guardian University Guide. In the 2008 Research Assessment Exercise (RAE) 90% of the University's research was rated as being at internationally recognised levels and 16 of its 31 subjects are ranked in the top 10, with 27 subjects ranked in the top 20.

For more information visit www.exeter.ac.uk

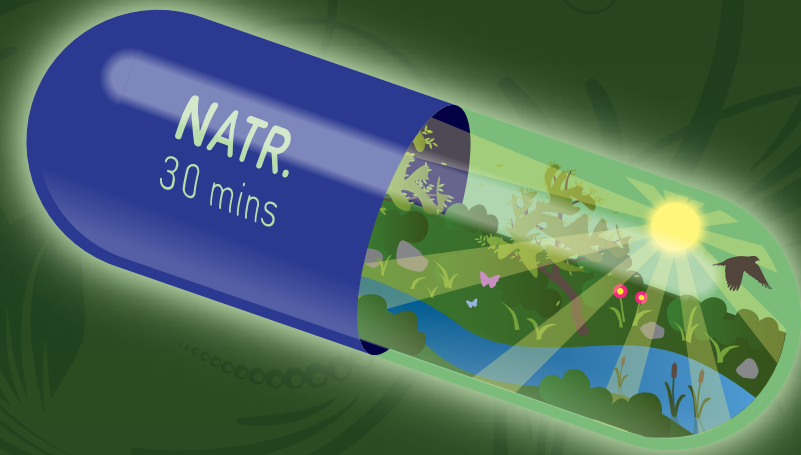
The Department for Communities and Local Government is the managing authority for the European Regional Development Fund Programme, which is one of the funds established by the European Commission to help local areas stimulate their economic development by investing in projects which will support local businesses and create jobs.

For more information visit www.communities.gov.uk/erdf

European Social Fund Division, part of the Department of Work and Pensions, is the managing authority for the European Social Fund (ESF) Convergence, which is one of the funds established by the European Commission to help local areas stimulate their economic development. ESF Convergence invests in the economic regeneration of Cornwall & Isles of Scilly, investing in people, their jobs and skills.

For more information visit www.dwp.gov.uk/esf and www.cornwallworks.org.uk

Design: www.jordanblyth.com



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