



# PLYMOUTH UNIVERSITY SUSTAINABILITY RESEARCH REVIEW 2014

## **CHALLENGE ACCEPTED!**

Creating Solutions  
for Horizon 2020

**SUSTAINABILITY  
WITH  
PLYMOUTH  
UNIVERSITY**



Institute for Sustainability Solutions Research  
Research excellence for environmental, social and economic impact



# INTRODUCTION TO THE PLYMOUTH UNIVERSITY SUSTAINABILITY RESEARCH REVIEW 2014

Welcome to the Plymouth University Sustainability Research Review 2014 from the Institute for Sustainability Solutions Research (ISSR). This review highlights a small selection of the world changing research undertaken at the ISSR in 2013/14.

The review is framed around the "Tackling Societal Challenges" pillar of the funding stream Horizon 2020. Horizon 2020 is a new European funding stream with a budget of 70 billion euros. Each challenge shown in this review begins with an invited article from a partner organisation that works closely with us, outlining a summary of their sustainability activities. This is also accompanied by summaries from our researchers and sustainability news articles.

If you are interested in finding out more about the research then short presentations, from the third annual ISSR Sustainability research event, "Challenge Accepted! Creating Solutions for Horizon 2020" which took place on the 2 May 2014, are available. Please use the Augmented Reality in this publication to link to the presentations and further information on webpages. Alternatively, you can visit our website or contact us using the details below.

If this review inspires you to collaborate with us, or if you want to find out more, our team are here to help.

Please contact us at:

**Tel:** +44 (0) 1752 585816

**Email:** [issr@plymouth.ac.uk](mailto:issr@plymouth.ac.uk)

**www.plymouth.ac.uk/research/issr**



Find out more about our research expertise through web links and videos by using the Layar App.



INTERACTIVE PRINT



Download the free App.  
Find this symbol and scan the image.



Discover interactive content.

ISSR

Institute for Sustainability Solutions Research  
Research excellence for environmental, social and economic impact

## WELCOME TO THE INSTITUTE FOR SUSTAINABILITY SOLUTIONS RESEARCH (ISSR)

Plymouth University is a dynamic, ambitious world-class institution and our research is fundamental to the development of our University and integral to our success as a first class, first choice institution.

Plymouth University has been ranked among the global elite for impact of scientific research (QS World University Rankings), in the top 10 globally for University Sustainability (UI Green Metrics) and is the People and Planet's Green League's top overall performer since it began in 2007.

Sustainability research is a real strength at Plymouth University and the ISSR works to deliver on some of the big questions and issues that affect our planet and us.

The ISSR has over 300 researchers investigating sustainability from a variety of different perspectives including science, business, arts, humanities and health.

To find out more, please visit our website: [www.plymouth.ac.uk/research/issr](http://www.plymouth.ac.uk/research/issr)





SOLAR THERMAL on the Nancy Astor Building. Plymouth University use solar thermal to capture the sun's energy for hot water.

# CONTENTS

<b>Challenge:</b> Health, demographic change and wellbeing	5
<b>Challenge:</b> Climate action, resource efficiency and raw materials	9
<b>Challenge:</b> Europe in a changing world – inclusive, innovative and reflective societies	15
<b>Challenge:</b> Secure clean and efficient energy	23
<b>Challenge:</b> Smart, green and integrated transport	27
<b>Challenge:</b> Food Security, sustainable agriculture and forestry, marine and maritime and in-land water research and bio-economy	31





## CHALLENGE: HEALTH, DEMOGRAPHIC CHANGE AND WELLBEING



### INVITED ARTICLE

#### SUSTAINABLE HEALTHCARE: WHAT IS IT AND HOW CAN WE ACHIEVE IT?

*Rachel Stancliffe, Director, Centre for Sustainable Healthcare*

Top healthcare professionals have called climate change “the most serious health threat of the 21st Century”. We are legally committed to reducing carbon by 80% by 2050 as a country via the 2008 Climate Change Act and all countries must adopt such massive changes if our children are to have a chance of living healthy lives. But how are we going to do that?

In many cases the responsibility for carbon reduction in healthcare has been allied with energy efficiency and given to Estates Directors and Energy Managers within Trusts. But 5 years ago the NHS Sustainable Development Unit produced a carbon footprint of the NHS which showed that buildings and their direct energy use only amounts to about 19% of the whole. Another 16% is transport, and 65% is from procurement – including medicines (20%). Ways to reduce resource use, including carbon, must go to the heart of healthcare practice to transform systems and models of care.

It is clear that the doctors, nurses and others who practice healthcare need to begin to understand the resources used to treat patients and to manage these as part of their jobs. And patients too need to understand the resources and be involved in these decisions about prioritising.

The principles of sustainable healthcare are:

**Disease prevention**

**Patient education and empowerment**

**Lean service delivery**

**Low carbon treatments and technologies**

The provision of high-quality care to patients in the future depends absolutely on the transition to low-carbon models of care. Achieving this goal will require innovation, leadership, and a systems approach – the sustainable specialties programme lead by the Centre for Sustainable Healthcare provides a model for specialties to take a lead.

For more information please visit:

The Centre for Sustainable Healthcare:

**[www.sustainablehealthcare.org.uk](http://www.sustainablehealthcare.org.uk)**

The Climate and Health Council:

**[www.climateandhealth.org](http://www.climateandhealth.org)**

Healthy Planet:

**[www.healthyplanetuk.org](http://www.healthyplanetuk.org)**

The Sustainable Development Unit:

**[www.sduhealth.org.uk](http://www.sduhealth.org.uk)**

Fair Medical Trade group at the BMA:

**[www.bma.org.uk/fairmedtrade](http://www.bma.org.uk/fairmedtrade)**

### EMBEDDING HEALTHCARE SUSTAINABILITY INTO THE CURRICULUM THROUGH EVIDENCE-BASED INTERDISCIPLINARY LEARNING

*Professor Janet Richardson, Sustainability, Society and Health Research Group, Plymouth University*

Research undertaken in association with the NHS and funded by European Pathway to Zero Waste prioritised items used in healthcare that have significant impact on service delivery, but are vulnerable to supply disruption due to climate change, resources depletion or geopolitical issues. This research resulted in the production of scenarios to focus discussion on mitigating for and adapting to possible supply chain interruptions. Recognising that solutions require different disciplines we brought Design students into the Nursing skills sessions to see some of the problems that relate to healthcare practice, and identify where Design could provide some innovative solutions. We ran a healthcare sustainability scenario in Nursing skills sessions

observed by a number of Product Design students from 3D design, who were encouraged to respond holistically to the sustainability issues they were introduced to.

Insights enabled the generation of a range of ideas to innovate product and packaging concepts at local level and industry-wide. There are significant benefits in bringing together different professional groups to consider the very real challenges healthcare faces due to climate change and resource depletion. Feedback from sessions has been extremely positive and this approach is now embedded in the nursing and design curriculum.

#### Read More:

Grose J & Richardson J (2014) ‘Strategies to identify future shortages due to interruptions in the health care procurement supply chain and their impact on health services: a method from the English National Health Service’ *J Health Serv Res Policy* 19 (1), pp 19-26

Richardson J, Grose J, Doman M & Kelsey J (2014) ‘The use of evidence-informed sustainability scenarios in the nursing curriculum: development and evaluation of teaching methods’ *Nurse Educ Today* 34 (4), pp 490-493



## PERCEPTIONS OF TIME IN RELATION TO CLIMATE CHANGE

Dr Sabine Pahl, Psychology and Sustainability Research Group, Plymouth University

Climate change is long-term, delayed, with potentially rapid nonlinear changes. Individual and societal systems, on the other hand, are adapted to face to-face interactions, and to considering short-term outcomes, immediate and linear effects. From a human mind perspective, we argue that time is an important facet of the broader dimension of psychological distance that is deeply relevant to climate change. The challenges we are facing with climate change are complex and involve a system of interrelated societal actors and a long chain of causes, consequences, and possible human responses. However, the current dominant culture and our evolutionary history minimise the importance

of long term thinking. This does not imply that people are unable to comprehend climate change, it simply means communicators need to be smarter and engage people's strengths. If there is a genuine desire for an integrative negotiation of our climate change futures it is imperative to improve how we engage people and practitioners in envisioning the future. Some promising examples include better use of people-sized scenarios, perspective taking, future visualisation, and narrative approaches. If opportunities are taken to employ such approaches, we are optimistic that humankind can positively engage with and address the temporal challenges associated with climate change.

### Read more:

Pahl, S., Sheppard, S. R. J., Boomsma, C. & Groves, C. (2014). Perceptions of time in relation to climate change. Wiley Interdisciplinary Reviews (WIREs) Climate Change, 5, 375-388.

## UNCERTAINTIES AND KNOWLEDGE GAPS IN SUSTAINABILITY

Dr Mona Nasser, Plymouth University Peninsula Schools of Medicine and Dentistry

Researchers, funders and research organisations make decisions everyday on what research questions are most worth addressing[1]. In recent years, there has been increased number of studies raising questions on the mismatch between published literature and the needs of the public and the society[2]. To address this gap, we work on conducting and evaluating different approaches to engage with stakeholders to set priorities for research as part of a bigger research community (Agenda and Priority Setting Methods Group – <http://capsmg.cochrane.org>). We worked with the primary dental practitioners [3] to identify uncertainties practitioners face in their daily practice. The question around reducing the use of plastic in dental practice was prioritised undergone a rapid evidence review[4]. The rapid review found a number of studies on dental materials and their wastage but no studies specifically describing the amount of plastic waste or providing solutions how to reduce plastics usage. As part of a wider search, a narrative review was identified on environmental regulations and their relations to dental practice. The review recommended environmental audit as a potential intervention[5]. We are currently evaluating the latter in an explorative study through the ISSR Small Collaborative Award (led by Prof. Janet Richardson).

### Read more:

[1] Nasser, M., et al., Evidence in agenda setting: new directions for the Cochrane Collaboration. J Clin Epidemiol, 2013. 66(5): p. 469-71.

[2] Chalmers, I., et al., How to increase value and reduce waste when research priorities are set. The Lancet, 2014. 383(9912): p. 156-165.

[3] Miguel, J.C., E.J. Kay, and J.C. Lowe, Shirley Glasstone Hughes Memorial Prize for Dental Research: an evaluation of the output 15 years after the Trust's inception. Br Dent J, 2007. 203(9): p. 535-41.

[4] Nasser, M., Evidence summary: can plastics used in dentistry act as an environmental pollutant? Can we avoid the use of plastics in dental practice? Br Dent J, 2012. 212(2): p. 89-91.

[5] Wilson, N.H., E.G. Bellinger, and I.A. Mjor, Dental practice and the environment. Int Dent J, 1998. 48(3): p. 161-6.



## 2013/14 NEWS ARTICLE

### MEASURE WELLBEING, GET WELLBEING: NEW DATA ON PLYMOUTH UNIVERSITY GRADUATE WELLBEING

The Careers and Employability Service at Plymouth University asked 2,600 Plymouth University Graduates the four Office for National Statistics (ONS) subjective wellbeing (SWB) questions at the end of the annual Destinations of Leavers from Higher Education (DLHE) survey, 6 months after they had completed their degree.

Notwithstanding demographic differences between the two samples, the key results show:

- 80% of recent Plymouth Graduates rated their life satisfaction as 7 or more out of 10 compared to 77% of UK adults surveyed by ONS.
- 81% of recent Plymouth Graduates rated the extent to which their activities feel worthwhile as 7 or more out of 10 which is the same as the ONS UK All-Adults statistic.
- 75% of recent Plymouth Graduates rated their happiness as 7 or more out of ten compared to 72% from the ONS statistic.
- 24% of recent Plymouth Graduates rated their anxiety as 6 or more out of 10, slightly higher than the ONS statistic of 21%.

The full report also splits the results by subject area and occupation. You can see the full report at: [www.tinyurl.com/measurewellbeing](http://www.tinyurl.com/measurewellbeing)





## CHALLENGE: CLIMATE ACTION, RESOURCE EFFICIENCY AND RAW MATERIALS

Image: Paul Wright  
[www.ecoart.pw](http://www.ecoart.pw)

### INVITED ARTICLE

#### TOWARDS A LOW-CARBON, SOCIALLY JUST AND HIGH WELLBEING ECONOMY: PUTTING THE PIECES TOGETHER

*Tony Greenham, Head of Finance and Business, New Economics Foundation*

*Chris Williams, Marine Socio-economics Coordinator, New Economics Foundation*

The New Economics Foundation (NEF) has been researching and advocating innovative solutions in economic policy for over 25 years. The question of what the economy is actually for is at the root of our thinking, and our answer integrates the social and environmental dimensions within the core of economics.

The economy is a system comprising both market and non-market interactions the purpose of which is to enable the efficient use of planetary resources to support high-levels of human wellbeing and social justice.

In other words, climate action cannot be separated from social and economic policy.

Reform of the economic system to achieve these goals has many interconnected strands. Examples of our work on systemic reform include:

- New measures of progress - Our Happy Planet Index attracts international attention for ranking the efficiency of economies in transforming natural resources into human wellbeing. NEF's Wellbeing team are pioneers in the integration of broader measures of social progress into economic policymaking at all levels from international to city level.
- Rebalancing time – Keynes predicted that by now our economic system would be so productive we would only have to work a 15 hour week. NEF's book "Time on our side: why we all need a shorter working week" explores the nature and value of time and discusses the idea that a shorter working week would lead to healthier, more fulfilling and sustainable lives and be better for the environment.
- Social return on investment – When social and environmental impacts are properly accounted for, investment decisions change. NEF's work on major infrastructure projects such as the third runway at Heathrow and HS2 showed they do not create enough economic, social and environmental value



- Financial reform – NEF has pioneered research into credit creation and its impact on financial stability, inequality and sustainability. Our textbook, "Where Does Money Come From? A Guide to the UK Monetary and Banking System", is recognised as an authoritative guide to the contemporary money system. Proposals such as full-reserve banking and complementary currencies once considered marginal are capturing much more attention since the financial crisis.
- Natural resources – The NEF environment programme demonstrates that managing natural resources in a sustainable way makes economic sense and delivers benefits to society as a whole, for example our research on sustainable fisheries 'Jobs Lost at Sea' estimated that letting fish populations grow to their maximum sustainable yield could deliver an additional amount of fish equivalent to feed 160 million EU citizens a year and additional revenue of £2,700 million per year which could support 100,000 jobs. "No Catch Investment" showed that the investment needed to restore EU fish stocks could be recovered in just five years, thereafter delivering positive returns of up to £14 for every £1 invested.

NEF works in partnership with academic institutions and civil society organisations both within the UK and internationally.

#### Read More:

[www.neweconomics.org](http://www.neweconomics.org)  
[www.sduhealth.org.uk](http://www.sduhealth.org.uk)

Fair Medical Trade group at the BMA:  
[www.bma.org.uk/fairmedtrade](http://www.bma.org.uk/fairmedtrade)



## THE VALUE OF DESIGN (WITH A LITTLE RE-PURPOSING)

Pete Davis and Mike Woods,  
3D Design and Design Knowledge,  
Plymouth University

The world has lots of good designers. But the demands of the 21st century require more than traditional designers can provide. We don't need Design to be about not doing, but to make the doing even better, more relevant, even more powerful.

On a good day, Design is the practice of intentional creation to enhance the world. It is a field of doing and making, creating great products and services that fit human needs, that delight and inform.

Design is exciting because it calls upon the arts and humanities, the social, physical, and biological sciences, engineering and business. When this mix is balanced with what we call Design Thinking (this comprises of strategies for finding and solving problems by bringing an understanding of people and society to technology and design) we have a focus on finding the correct problem before rushing to a solution. We believe that this balance is key to design skills and will be a key success factor for a new generation of creative leaders in technology, business, education and design.

But design (like a lot of things) faces an uncertain future. The traditional design fields create artefacts,

but new societal challenges, cultural values, and technological opportunities require new skills, so it seems reasonable to assume we must create enduring curricula for design education that merge science, technology, art and business with a sustainable and conscious view to creating new value and new values for the future.

In 2013, the Plymouth University's design team was highly commended in the Green Gown Awards for their work embedding the principles of Sustainability within their degree, for further info visit [www.tinyurl.com/greengownawardbrochure](http://www.tinyurl.com/greengownawardbrochure)



3D Design student project, 2013

## CARBON FARMING

Dr Paul Lunt, Environmental Science,  
Plymouth University

As humanity sleep walks closer towards the inevitable 450ppm atmospheric CO<sub>2</sub> concentration and the widely reported 2°C tipping point (Peters et al., 2013), solution based scientists review ever more unfeasible carbon capture technologies (McLaren, 2012; Milne & Field, 2012). Natural systems and photosynthetic fixation of CO<sub>2</sub> by plants remains the best option for reaching net negative carbon emissions on a global scale by the end of this century. Carbon capture by net primary productivity appears to be the most effective measure in terms of capacity, readiness and at a relatively low estimated cost of 59-111\$/tCO<sub>2</sub> equivalent (McGlashan et al., 2012). Wetland restoration and the sympathetic management of peatlands offer one of the most viable options for long term storage of carbon fixed by photosynthesis.

Peatlands cover just 3% of the world's surface but hold an estimated 500Gt of carbon, equivalent to over half the atmospheric carbon content (IUCN

2011). The International Union for the Conservation of Nature, UK Peatland Programme, has issued a call for one million hectares of damaged peat, just under half of the UK peatlands to be restored by 2020, following guidance in the new Peatland Code ([iucn-uk-peatlandprogramme.org](http://iucn-uk-peatlandprogramme.org)). Research at Plymouth University from blanket mire and valley on Dartmoor, suggests that between 7 and 16tCO<sub>2</sub>e ha<sup>-1</sup> y<sup>-1</sup> respectively can be captured from the atmosphere with appropriate hydrological management (Dartmoor Mires Project [dartmoor-npa.gov.uk](http://dartmoor-npa.gov.uk)).

### Read More:

Current Research Paper: being drafted

Previous research includes: Bain, C.G., Bonn, A., Stoneman, R., Chapman, S., Coupar, A., Evans, M., Gearey, B., Howat, M., Joosten, H., Keenleyside, C., Labadz, J., Lindsay, R., Littlewood, N., Lunt, P., Miller, C.J., Moxey, A., Orr, H., Reed, M., Smith, P., Swales, V., Thompson, D.B.A., Thompson, P.S., Van de Noort, R., Wilson, J.D. & Worrall, F. (2011) IUCN UK Commission of Inquiry on Peatlands. IUCN UK Peatland Programme, Edinburgh.

## TO WET OR NOT TO WET

Dr Tim Daley, ISSR Director,  
Plymouth University

Peatland re-wetting has become a multi-million pound, globally-endorsed (FAO, 2012) land management practice, in response, in part, to the potential for carbon sequestration and as an important tool for mitigating GHG emissions. A major assumption of that practice is that plant species, such as Sphagnum mosses that thrive through rewetting, enhance carbon accumulation through photosynthesis of atmospheric CO<sub>2</sub> (FAO, 2012). Recent evidence has revealed that, where methane-eating bacteria are present, a symbiotic relationship can develop with submerged mosses where the CO<sub>2</sub> used for Sphagnum photosynthesis is derived from that respired by the methanotrophic bacteria (Raghoebarsing et al., 2005). Where this occurs, the carbon in Sphagnum cellulose is ultimately sourced from biogenic methane released during decay of the lower sediments, rather than from the atmosphere.

Estimates of the modern carbon sequestration service provided by these peatlands are currently based on highly-precise modern measurements of gaseous fluxes between the peatland and the atmosphere, fluid fluxes of dissolved organic carbon and particulate organic carbon in peatland drainage and estimates of plant growth and decay rates (e.g. Kim et al 2012). There are some significant deficiencies in these current approaches. Most relevant here is that these measurements take no account of the microbial assemblage that existed in the past, or indeed the present, or link this biodiversity to environmental conditions on the peatland surface. Hence, none of these has tested for the influence of methane-eating bacteria in determining the efficacy of the peatland in its role in providing a carbon sequestration service.

For restoration practice, which delivers a variety of additional benefits, to be sustained, it must necessarily become self-financing and a legitimate investment for financial stakeholders. So far, restoration practice has delivered minimal measurable financial return on investment. Carbon markets provide a potential source for cost recovery and the generation of longer-term revenue. Whilst new initiatives are underway to better define and quantify the ecosystem services provided (e.g. the DEFRA peatland code), this will remain intangible until there is a robust method for measuring carbon drawdown over a land estate. There currently exists a danger that existing methods overestimate atmospheric carbon drawdown, or indeed, overestimate methane-based carbon loss. Were these early estimates to be prematurely incorporated in carbon market-based restoration financing, there could be a significant misrepresentation of service value. NERC-funded research underway currently at Plymouth aims to provide the solution to this key challenge! (Daley, PI: NE/K015451/1).

### Read More:

[FAO 2012] Food and Agriculture Organisation of the United Nations (2012) Peatlands – guidance for climate change mitigation through conservation, rehabilitation and sustainable use, in: Mitigation of climate change in Agriculture series 5, Department of Natural Resources and the Environment, Rome.

[Kim et al 2012] Kim, D.G et al. (2012) Effects of soil rewetting and thawing on soil gas fluxes: a review of current literature and suggestions for future research, Biogeosciences, 9, 2459–2483.

[Raghoebarsing, A. et al. 2005] Raghoebarsing, A. et al. (2005) Methanotrophic symbionts provide carbon for photosynthesis in peat bogs, Nature 436(7054), 1153-1156.



An agricultural digger on a mound of peat which has been extracted from the Somerset Levels in the UK.





## 2013/14 NEWS ARTICLE

### ENVIRONMENTAL SCIENTISTS CELEBRATE 40 YEARS OF PIONEERING STUDY AT PLYMOUTH UNIVERSITY

Students and lecturers spanning the past four decades gathered on the Hoe to celebrate the anniversary of a pioneering Environmental Science course at Plymouth University. The BSc Environmental Science degree was among the first of its kind in the country when it was started in 1973 to meet the environmental challenges of the day. There have been constant developments to keep it up to date and relevant, and it has spawned a host of successful graduates including world renowned academics and the directors of global environmental companies.

They – and many of their lecturers – were among the special guests at a celebratory event held in partnership with the ISSR. The degree retains its status as one of the top environmental science programmes in the UK.

For more info see [www.tinyurl.com/40EnviSci](http://www.tinyurl.com/40EnviSci)

Environmental Science Students carry out research fieldwork in Malaysia







## CHALLENGE: EUROPE IN A CHANGING WORLD – INCLUSIVE, INNOVATIVE AND REFLECTIVE SOCIETIES

### INVITED ARTICLE

#### SHAPING PLACES IN A WORLD WORTH WORKING FOR

Howard Jones, Founder and Chief Executive, Living Networks



##### A familiar text:

Full many a gem of purest ray serene,  
The dark unfathomed caves of ocean bear:  
Full many a flower is born to blush unseen,  
And waste its sweetness on the desert air.

(from: *Elegy written in a country churchyard*,  
Thomas Grey 1750)

Hold the idea of hidden treasure. The gems we miss in unequal societies, the full potential of humanity missed because of protected interest, un-balanced access to resources, ideas and each other. Consider the challenge of the next 100 years – when we really need to be the best we can be. There is a lot of capacity out there and we need it now.

Be slow to judge and quick to listen – ideas and solutions arise in the most unexpected places  
Innovation happens on the ground as well as the stars – often with people under most pressure

[Case Study – Growing for Life programme in prisons and with homeless people working on skills, recovery and jobs]

We have the intellect, the tools and the motive to reveal this treasure and address the challenges that face us all – we just need to adjust our minds. The nations that survive the next 100 years and the businesses that become most valued will have revised their motives to match these opportunities and these insights:

- Divert from the trivial consumption of the rich to the life-threatening needs of the poor
- Confront a burgeoning sense of aspiration and entitlement with an incentive to do and to have less
- Reveal and disarm a system devoted to satisfaction, which relies on perpetual dissatisfaction

The mass of ideas, actions, needs, resources, votes is out there to achieve this – it merely needs a market.

##### 3 simple ideas:

1. **Reverse Engineering**
2. **Comparative Advantage**
3. **Marketplace**

1. **Reverse Engineering** – of hard-wired provision, conventional wisdom, service delivery. It is not rocket science! Work locally and think globally – what do places and spaces need; what is the local market for skills, jobs and services – does

it work? How can those skills, products and services be developed locally; where is the commercial opportunity to support this? Doesn't have to be for-profit, but it must develop income, commitment and value. This works, it is scale-able, replicable and sustainable for the long term.

[Case study: *Shaping Places at Crystal Palace – a skills and enterprise programme with Job Centre Plus*]

2. **Comparative Advantage** – who said that all incentive, laws and policy have to encourage the wasteland of zero-sum competition? Who ever saw an example of completely free markets anyway? Why can't the 3 Kings of market-making (governance, incentive, taxation) be applied to the goals of comparative advantage – the social capitalism of the best working together and inspiring the many?

[Case study: *Shaping Places in Stoke on Trent – a Social recovery in a collaborative environment*]

3. **Marketplace** – the bit that makes the above seem less of a dream and more the inevitable conclusion. All the technological tools are in place to build this – we need to start building the stalls. Education, skills, jobs, learners – a marketplace; funders, projects, ideas, end-users – a marketplace; resources, products, services, users – a marketplace. Each with the same shape, dynamics and needs. Apply and integrate tracking, evaluation and input from users, enable comparison, comment, participation through traditional and emerging media – centred on app-driven platforms for the core product (job seekers, delivery agents, service providers, producers....). It is hard to see how we can do without.

[Case study: *(Work in progress) Social media as social capital – a test project with DWP South London*]

This isn't talk of revolution, or chucking stones from an ivory tower – this proposition is live, probable and working now. It is good business, builds resilience not resentment and may be the balance we need.

For more information on the case studies mentioned in this article please visit [www.tinyurl.com/iacceptwithISSR](http://www.tinyurl.com/iacceptwithISSR) for the video of Howard Jones presenting his work at the ISSR Sustainability research event 2014.



## MEDIA, ENVIRONMENT AND THE NETWORK SOCIETY

Professor Alison Anderson, Centre for Culture Community and Society, Plymouth University

Alison Anderson's forthcoming book, *Media, Environment and the Network Society* (Palgrave Macmillan, 2014) casts new light on the shifting role of the media in covering some of the most important global environmental challenges we face today.

In western societies many inhabit a 'supersaturated media landscape'. The sheer volume of information that publics can increasingly access means that we have to engage in continuous filtering processes. Online and offline media environments interact in complex and sometimes contradictory ways. The digital revolution has transformed not only how people in the developed world access and interact with information, but who has access and who produces content. New media actors have emerged and journalists routinely use social networking tools to source information. There are many factors that determine the rise and fall of particular environmental issues in the media. Some issues may resonate with the public more than others, some have greater visibility and visual appeal, and some are perceived to have greater immediacy, or are more politically opportune.

While there are undoubtedly more opportunities for publics to make their voices heard, there is little evidence to suggest that we have entered an age of minimal news media agenda-setting effects. Rather, we can identify a complex inter-media agenda-setting process whereby social media and traditional media dynamically interact. The strategies of news sources will be critical to addressing future challenges.

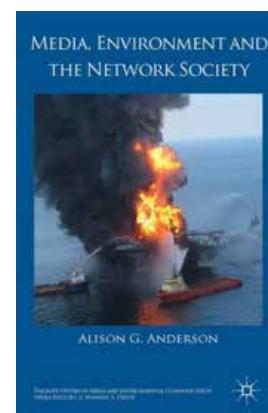
### Read More:

Anderson, A. (forthcoming 2014) *Media, Environment and the Network Society*. Palgrave Macmillan: Houndmills.

### Reviews

'*Media, Environment and the Network Society* is a much-needed rethinking by one of the field's leading scholars of many of our assumptions about media and environmental activism. Anderson's conceptually-smart analysis takes us well beyond activists' quest for access or visibility to the rapidly changing and complex terrain of global media politics – including digital media – in a networked world.' – Robert Cox, Professor Emeritus, University of North Carolina at Chapel Hill, USA

"A skilful guide through the rapidly-changing media landscape in which environment communication now takes place and through the new scholarship that has accompanied it. Anderson writes with the clarity of a good journalist and the rigour of a good academic." James Painter, Reuters Institute for the Study of Journalism, University of Oxford, UK.



## DEVELOPING A SUSTAINABLE UNIVERSITY – THE PLYMOUTH STORY

Professor Stephen Sterling, Head of Education for Sustainable Development, and chair of the Sustainability Executive Group

The talk centred on the Plymouth story of change and varied research over time which together helps us monitor and answer the question 'how far can we claim to be a sustainable university'?

After nine years on this agenda, we are now definitely seen as a sector leader both nationally and internationally, but there is still much we could do across all aspects of the university's work. A new impetus will be lent by the imminent launch of the new Sustainability Strategy, and our third Sustainability Report. Our highlights and achievements to date were presented. Looking to the future, work on a new

integrated sustainability action plan by Operations, CSF, and ISSR – which will be endorsed by the vice-chancellor's executive – was announced. This should help promote the engagement of the whole university community, rather than leave the agenda to those already engaged.

The role of the Centre for Sustainable Futures (CSF) in catalysing and facilitating change towards sustainability in curriculum, pedagogic research, and whole institutional approaches was briefly outlined, and some of our research work and interests were introduced.

For more information on the case studies mentioned in this article please visit:

[www.tinyurl.com/iacceptwithISSR](http://www.tinyurl.com/iacceptwithISSR) for the video of Stephen Sterling presenting his work at the ISSR Sustainability research event 2014.

## SUSTAINABILITY AND MARKETING

Dr Victoria Hurth, Service & Enterprise Research Centre, Plymouth University

There is much evidence to indicate that marketing has and continues to be a strong force for unsustainability in terms of reducing wellbeing through promoting consumption and materialism, exploiting resources for short-term profit, spurring high-levels of personal debt and inhibiting people's ability to fulfil their real primary needs.

Marketers have done much in the recent past to embrace aspects of sustainability from Green Marketing to entice environmentally minded customers, to changes in product design and packaging to reduce back-end impacts (Marketing Sustainably). More recently we have seen marketing begin to try and influence the sustainability behaviour of its customers and beyond (Marketing Sustainability).

Sustainable Marketing (a combination of Marketing Sustainably and Marketing Sustainability) therefore represents a marked shift not only in marketing practice but it also represents behaviour that is counter

to the long-standing definitions of marketing itself as a 'sense and respond' function where marketers discover and serve customer's existing preferences. It is currently unclear how Sustainable Marketing is being perceived by companies and how it might threaten conventional definitions of marketing. To investigate this, two pieces of research have been carried out. One considered how a range of companies involved in Business in the Community's Sustainable Marketing initiative 'Be the Change' perceive and practice Sustainable Marketing and marketing as a whole. The second is a Big Idea research piece commissioned by Friends of the Earth which considers how marketing might become a force for sustainability – or at least not a force for unsustainability.

### Read more:

Friends of the Earth 'Big Ideas' project:  
[www.tinyurl.com/FOEBigIdeas](http://www.tinyurl.com/FOEBigIdeas)

Business in The Community's 'Start' programme:  
[www.tinyurl.com/BITCStart](http://www.tinyurl.com/BITCStart)

## CAN APPS AND GAMES REVOLUTIONISE SUSTAINABILITY?

Dr Dan Livingstone, Interactive Systems Studio, Plymouth University

The power of games to change behaviour, secure public engagement and promote positive action is already proven. A well-publicised example, in the health and wellbeing sector, 'foldit' by Popovic and Baker, challenged online games communities to fold proteins competitively, providing a solution to a decade old problem in ten days; HIV retrovirus. This act of collective problem solving facilitated by appropriately designed game technology is well established. Lost Island, another online game, provided a beautifully crafted island for players to explore, with

the twist that their collective task was to categorise organisms provided by biologists from the real world.

The interactive Systems Studio team are actively engaged in developing games based solutions for real world problems, as a development partner we are well placed to create high impact solutions to engage stakeholders, motivate behaviour change and crowd source collective intelligence. We develop bespoke APPs for web, mobile and tablet and high end 3D interactive visualisations, training with embedded data collection and analytics. One example would be our ROV demo, which incorporates high end product modelling, undersea environment based on real location data to enable pre survey familiarisation, training and public engagement with SSR's with significantly reduced environmental impact.

For further info see: [www.iss.io](http://www.iss.io)





## INTRODUCING UBIQUITOUS TECHNOLOGY INTO LANDSCAPE MANAGEMENT, PROTECTION AND PLANNING

*Dr John Martin, Centre for Agricultural and Rural Sustainability (CARS), Plymouth University*

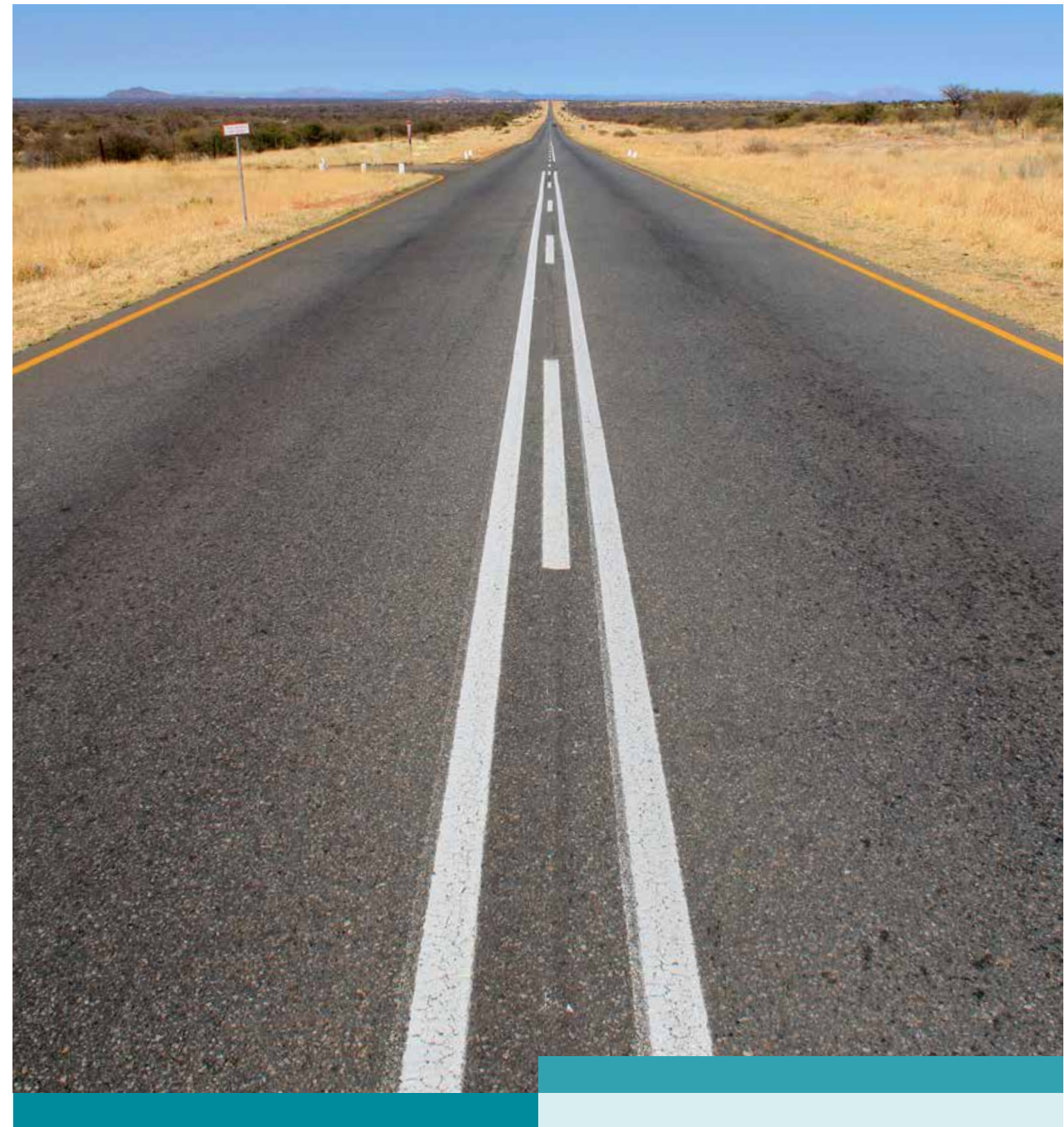
Landscapes play a major role within the environment with approximately 26% of England's land falling under a National Park or Area of Outstanding Natural Beauty (AONB) designation, both of which have a common aim to conserve and enhance the natural landscape. The European Landscape Convention (ELC) highlights the need to establish procedures for the participation of the general public and other stakeholders in the creation and implementation of landscape policies. The success of AONB management plans often depends on community engagement, as there are many benefits to public participation.

Public participation is often problematic as it is reliant on people attending pre-arranged community

meetings, where only stakeholders with an immediate interest participate. Many studies have focused on bridging the gap between landscape experts and communities by making use of visualisation techniques; however these practices are reliant on the use of IT-based tools in workshop scenarios.

A recent project has explored introducing ubiquitous technology into landscape management as a means of alleviating the issues of public participation. The project has resulted in the development of an app called 'Rate My View' and web site [www.ratemyview.co.uk](http://www.ratemyview.co.uk). The app (Apple and Android platforms) allows users to provide continuous landscape related feedback while exploring the landscape. It is free to download and allows users to automatically uploads pictures taken on smartphones/tablets to the Rate my View website. It uses GPS technology to pinpoint their location and detects the direction the person is facing. Users then rate their view by giving it between 0 and 5 stars; and submit words or short phrases that sum up their view.

Tell us what the landscape in means to you!  
Download our free new app from iTunes or Google Play



### 2013/14 NEWS ARTICLE

#### ROADBLOCK: ISSR LAUNCH STUDY INTO AFRICAN TRANSPORT-RELATED ENTERPRISE ISSUES

ISSR has successfully brought together the international skills of the University's Centre for Sustainable Transport, with those of the new Futures Entrepreneurship Centre and Integrated Transport Planning (ITP), the award winning sustainable transport consultancy, to successfully bid for funding to research into African transport-related enterprise issues. The focus of the research project will be the transport barriers that prevent women in Sub-Saharan Africa from realising their economic and entrepreneurial potential. The study will identify the gender, cultural, political, and financial barriers to the growth of the women's businesses created by rural transport planning and policy failures, and report on how locally-driven, women-led entrepreneurship could overcome them.

For more info see [www.tinyurl.com/africantransport](http://www.tinyurl.com/africantransport)



**PLYMOUTH UNIVERSITY/ISSR  
SUSTAINABILITY FINE ART PRIZE 2014**  
HIGHLY COMMENDED SHORTLISTED PIECES

---



**Mutagen**  
*Alice Cole*  
<http://alicecole.wix.com/visualartist>



**Neural Detours**  
*Jessica Holliland*  
<http://jessicaholliland.wordpress.com/>



**The End of an Ice Age**  
*David Partridge*  
<http://davepartridge.weebly.com/>



**Whitsand Bay Portrait**  
*Rosanna Thorn-Lees*  
<http://rosannathornlees.weebly.com/>



**What Killed the Whale**  
*Paul Wright*  
[www.ecoart.pw](http://www.ecoart.pw)



**Hive**  
*Kelly Soper*  
[www.kellysoper.wordpress.com](http://www.kellysoper.wordpress.com)





## CHALLENGE: SECURE CLEAN AND EFFICIENT ENERGY



### INVITED ARTICLE PEOPLE POWER IN ACTION



*Alistair Macpherson, CEO, Plymouth Energy Community*

Plymouth Energy Community (PEC) is a members' cooperative, run by local people for local people. Established in 2013 with support from Plymouth City Council, it aims to give residents in Plymouth the power to transform how they buy, use and generate energy. PEC works with partners to provide a range of money and energy saving services.

PEC established PEC Renewables to deliver local owned renewable energy projects. The first, a solar share offer, was launched in February 2014. Backed by a Council loan, over £600,000 of community shares were sold in less than eight weeks. Over 50% of these were local resident, which shows encouraging community support.

Using this investment, schools and community buildings receive free solar panels; providing low-cost energy and a valuable education resource. A target return of 6% was offered to investors (up to 9.4% with tax relief). PEC Renewables sells the surplus energy generated back to energy suppliers as part of the Government's Feed-In Tariff. Surplus funds will be used to deliver projects that tackle climate change and fuel poverty in Plymouth.

Thanks to the scheme, six primary schools are already generating their own power. With another eleven sites booked in for instalments in the next school holidays, Plymouth is firmly on the UK community energy map.

It really is all about people power. For more info see [www.plymouthenergycommunity.com](http://www.plymouthenergycommunity.com)



### THE ENERGY PERFORMANCE GAP

*Professor Pieter de Wilde, Environmental Buildings Group, Plymouth University*

There often is a significant gap between predictions of future building energy use at the design stage, and energy use measurements once a building is constructed and in operation. There are many reasons for this energy performance gap, such as actual occupant behaviour, weather conditions, workmanship/installation errors, systems' control settings and modelling issues. Recent developments in automated meter reading (AMR) and monitoring and targeting (M&T) make the performance gap visible to owners/operators. Bridging the gap becomes even more important if the industry intends to 'occupant/climate change proof' buildings.

This presentation gives a brief overview of recent work carried out in the context of a Royal Academy of Engineering Fellowship, that explored the role of uncertainty propagation in studying of the performance gap. While academic in nature, it shows the profound complexities involved in comparing predictions and

measurements. The work concludes that the energy performance gap can only be bridged through better definition and joint efforts across all actors involved in the design, construction and operation of buildings/building (sub) systems.

#### Read more:

**de Wilde, P.**, 2014. The gap between predicted and measured energy performance of buildings: a framework for investigation. *Automation in Construction*, 41, 40-49

**de Wilde, P.** and R. Jones, 2014. Closing the Energy Performance Gap. CIBSE ASHRAE *Technical Symposium*, Dublin, Ireland, April 3-4 2014 (USB)

**de Wilde, P.**, 2013. *Simulated and measured building performance: bridging the gap*. Final Report, Royal Academy of Engineering and Leverhulme Trust Project Number 10226/48

**de Wilde, P.**, Y. Sun and G. Augenbroe, 2013. Quantifying the performance gap – a probabilistic attempt. *EG-ICE 2013, Conference on Intelligent Computing in Engineering*, Vienna, Austria, July 1-3 2013 (USB)



## DEVELOPING BETTER DESIGN PROCESS, DELIVERING SUSTAINABLE ARCHITECTURE

*Simon Bradbury, Culture Theory Space research group, Plymouth University*

In the School of Architecture Design and Environment through the Culture Theory Space research group we explore issues connected with both architecture and the wider urban system. Our research areas include digital environments, sustainable cities, urban politics and critical cultural practices.

Currently we have ongoing research projects looking at Sustainable Digital Neighbourhoods, Sustainable re-industrialisation, Radical Inclusivity in Urban Environments, Daylight and Sunlight master planning and energy in buildings (design process and cultural values).

We work alongside industry, community groups and local governments across Europe to help develop ideas (research through design) for urban and building projects particularly in post-industrial cities. This has led to a changes in policy and national media coverage. We are interested in developing long term partnerships with cities who have challenging development issues and are keen to explore radical alternatives.

In addition to research we also offer consultancy and strategy advice through Plymouth Design Lab if support is needed on particular urban or building projects. We are committed to developing cross-sector partnerships that seek to understand and design more resilient, inclusive and sustainable cities and welcome all approaches.

For further information see:

[www.tinyurl.com/ISSRsustainablearchitecture](http://www.tinyurl.com/ISSRsustainablearchitecture)

## ISSR BLOG: BELIZE TO BABBACOMBE – FROM ONE EXTREME TO ANOTHER

*Professor Chris Balch, Centre for Research in Environment and Society, Plymouth University*

Over the summer I led a group of 30 third year geography students on a fieldtrip to Belize – the only English speaking country in Central America with a population of around 350,000 in an area the size of Wales. Despite enjoying a stunning natural environment (forests and coral barrier reef) and rich cultural heritage (Mayan, Creole, Mestizo and Garifuna) Belize faces significant challenges arising from climate change. With a low lying coast and periodic hurricanes the population and economy of Belize City is vulnerable to flooding with some of the poorer areas lying below sea level. Following Hurricane Hattie in 1961, which killed 100's and damaged or destroyed 80% of the city's buildings, the British colonial and fledging self-government took the decision to build a new capital some 50 miles inland. After diplomatic wrangling and a series of bureaucratic delays the government eventually transferred its operations to the newly planned 'garden city' of Belmopan in 1970.

Today, despite clear risks to life and livelihoods, 70,000 people live in Belize City while the population of Belmopan has only reached 15,000 largely as the result of an influx of refugees and migrants wanting to escape from civil war and unrest in Central America. It seems protection from natural hazards is not enough to dissuade people living at risk of coastal flooding – event which are going to become more common as a result of global warming. However plans are afoot to direct continuing urban growth to less vulnerable locations.

This brings me to Babbacombe which I visited last weekend to be confronted by the sight of the remains of a house tottering precariously above a major cliff fall caused by last autumn's intense rainfall event. It seems that living on the coast holds inherent risks. That maybe fine if it means abandoning farmland to the sea but it's a different matter when it comes to prime real estate in cities like London or Shanghai which will require heavy investment to raise their flood defences.

It is clear that how we plan and manage human settlement on the coast is going to become an increasingly pressing issue globally and one where Plymouth University is uniquely placed to assist, particularly given our recent success in becoming the UK's newest fully accredited Planning School offering specialist modules in marine and coastal planning and regeneration.

Every month someone in the ISSR management team writes an informal sustainability think piece/blog. To view other blogs please visit [www.issrplymuni.blogspot.co.uk](http://www.issrplymuni.blogspot.co.uk).

Image: Matthew Clarke,  
Plymouth Master of Architecture Student



## 2013/14 NEWS ARTICLE

### NEW PLYMOUTH UNIVERSITY PARTNERSHIP BETWEEN THE SCHOOL OF ARCHITECTURE, DESIGN AND ENVIRONMENT AND LIGHTUP ANALYTICS

LightUp Analytics are helping to deliver a new module on emerging architectural research at Plymouth University. The module, is based on the premise of students engaging in an specific inquiry related to staff research agendas and is intended to support both student learning and the research community within the architecture programme. The Postgraduate students are using the LUA software to assess various projects against daylight and sunlight design criteria and how they would design them differently. The outcomes from their work will be featured on the LUA website and form part of a research paper. Gary Jackson and Julian Brooks from LUA are providing guidance and advice to the students and Simon Bradbury (who is a member of the ISSR Management Team) is the supervising Lecturer in Architecture.

For further info see [www.lightup-analytics.com/nupp](http://www.lightup-analytics.com/nupp)





**CHALLENGE:  
SMART, GREEN  
AND INTEGRATED  
TRANSPORT**

**INVITED ARTICLE**

**SMART, GREEN AND INTEGRATED TRANSPORT**

*Christopher Irwin, Member, European Commission's Transport Advisory Group and Chair of European Railway Agency*

Taking the funding allocated for the Horizon 2020 programme over the years 2014-2020 as a starting point, this presentation attempts to peel back the European Union's related Research & Innovation programme to outline the various elements forming its focus on Societal Challenges. It then identifies some of the policy complexities inherent in drawing on the 2.5€ billion research funding available around the 'Smart, green and integrated transport' challenge.

This area of research and innovation activity needs to accommodate EU policy objectives, and public transport is at the heart of delivering massive modal shift. This has been thought necessary to overcoming congestion, reducing dependence on oil imports and securing a 60% reduction in carbon emissions by 2050 without limiting either growth or individuals' wish to travel.

The author argues that these necessitate a massive paradigm shift: a successful transport system depends on meeting the needs of both passengers and freight forwarders, not least to engender political will necessary to sustain the massive new public investments required. This demands a better understanding of users' needs and aspirations. It is an opportunity that calls for an inspired and energetic response from the research community.

For more information please visit [www.tinyurl.com/iacceptwithISSR](http://www.tinyurl.com/iacceptwithISSR) for the video of Christopher Irwin presenting his work at the ISSR Sustainability research event 2014.



**100 MILLION ECO JOURNEYS  
AND COUNTING**

*Dr Andrew Seedhouse, Centre for Sustainable Transport, Plymouth University and South West Smart Application Limited*

The presentation updates ISSR stakeholders on the research and development work undertaken by the Director of Transport and his team on sustainable transport, aligned with the ISSR. It is a short, concise overview of key work themes, actions and outputs over the last 12 months.

It outlines the continued growth of South West Smart Applications Ltd (SWSAL) the not-for-profit company, hosted by the University in providing a managed service for smartcard technology for all 16 local councils and all local bus companies in SW England. It goes on to outline the £2.5m National Managed Service Pilot for the Department for Transport being delivered through SWSAL in Norfolk, the first phase of which is now live and operational.

The presentation then outlines the international research work developed and led by Andrew over the last year for DFID in rural Nigeria, in partnership with Plymouth Business School, commercial Transport Planning Company ITP Ltd and Pan-Atlantic University in Lagos. Also outlined is the work the University is undertaking to support the LEPs and Councils on improving rail services to the SW Peninsula; the ongoing Knowledge Transfer Partnership (LTP) research on mobile app development for sustainable transport;

and the leadership being shown through the ISSR on helping young people back to work – in partnership with job Centre Plus.

For more information please visit [www.tinyurl.com/iacceptwithISSR](http://www.tinyurl.com/iacceptwithISSR) for the video of Andrew Seedhouse presenting his work at the ISSR Sustainability research event 2014.





## THE TRANSPORT DEBATE: WE'RE MOVING IN THE RIGHT DIRECTION BUT COULD BE DOING SO MUCH BETTER

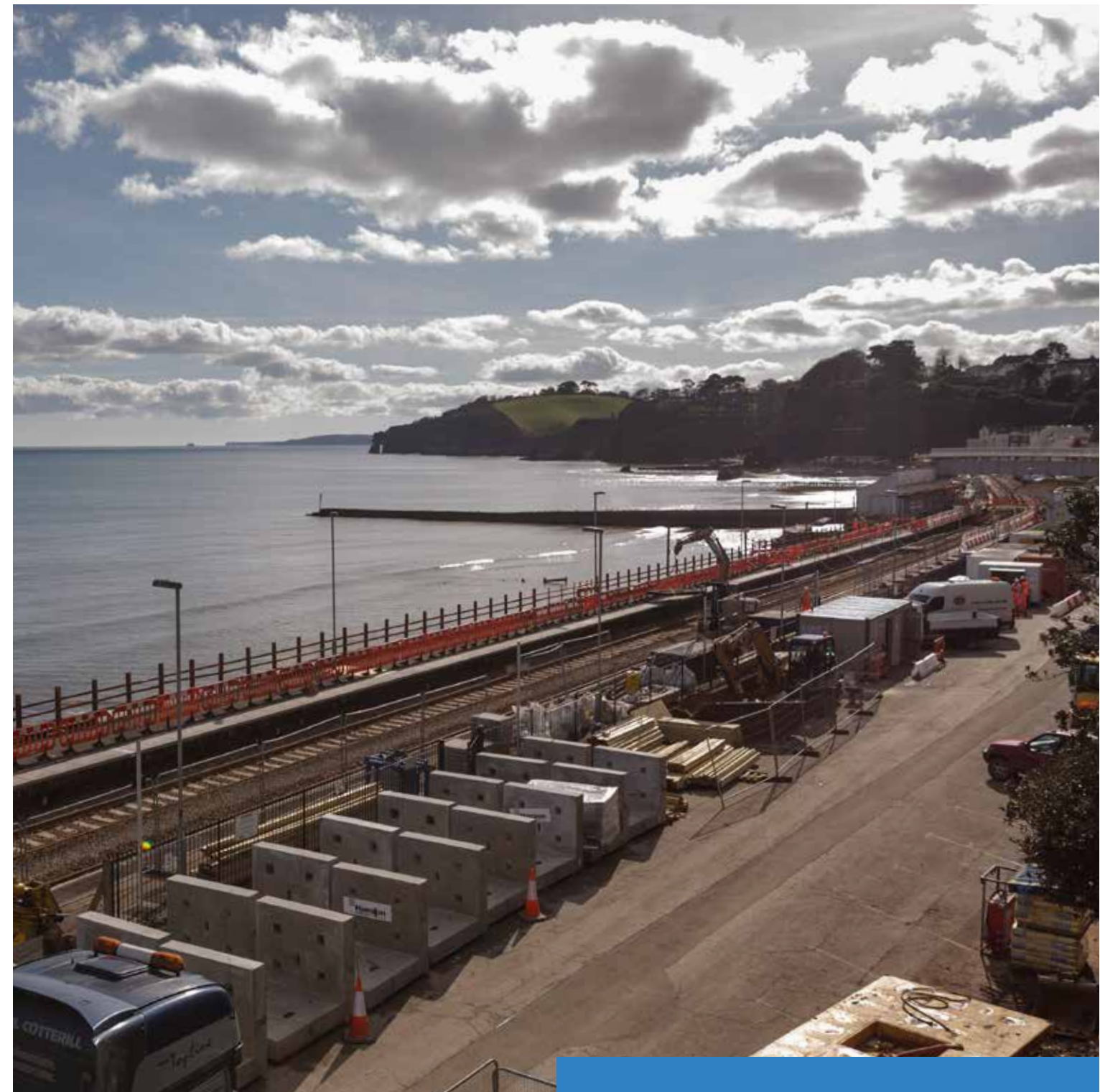
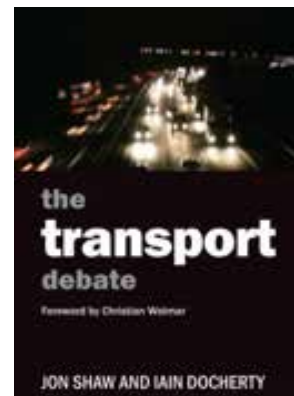
*Professor Jon Shaw, Centre for Sustainable  
Transport, Plymouth University*

On recently being asked to write a book about transport policy from a UK perspective, I set myself the task of challenging the status quo. Of course I wanted to critique what have become established norms in British transport policy, but I also challenged myself to write about them in a novel way. I worked on the project with a longstanding colleague who shared these views, Professor Iain Docherty, of Glasgow University. After quite some time, and any number of abortive trial runs about how best to do things differently, we decided to focus our chapters around a series of journeys - the sorts of transport experiences with which you, and we, are most familiar - rather than on specific modes or issues (environment, economy, society etc.). This approach allows us both to explore the links between transport issues and policies as they apply to everyday activities we all understand well, and to relate emerging themes to broader economic, social and environmental imperatives.

Drawing up on 'traditional' transport literature as well as that emerging from the 'new mobilities paradigm' and a good deal of our own experience, we follow journeys made by our very own 'Motorway Man', Paul Smith, and his family. The Smiths' experiences - during the commute, the school run, the business trip, the family visit and the summer holiday - reveal the many shortcomings, occasional successes, and various opportunities for improvement evident in UK transport policy.

### Read more:

Shaw, J and Docherty, I (2014) *The transport debate*. The Policy Press, Bristol. 240pp.



## 2013/14 NEWS ARTICLE

### MAJOR INVESTMENT NEEDED IN NEW RAIL LINK TO DEVON AND CORNWALL, SAYS PLYMOUTH UNIVERSITY EXPERT

Jon Shaw, Plymouth University's Director of the Centre for Sustainable Transport has said that if the six-week closure of the rail line at Dawlish costs the region £500million as predicted, there was a sound economic argument in committing to a major capital investment elsewhere.

Professor Shaw, co-author of a recent book *The Transport Debate*, said creating a new link from Exeter to Plymouth was the best long-term solution to the region's rail problems.

This could be through a route around the northern and western edges of Dartmoor - with much of a track-bed in place from Exeter to Okehampton, and Tavistock and Plymouth - or a diversionary route between Exeter and Newton Abbot, also along an old track-bed, being a possibility.

More information can be found at [www.tinyurl.com/newraillink](http://www.tinyurl.com/newraillink)



# CHALLENGE: FOOD SECURITY, SUSTAINABLE AGRICULTURE AND FORESTRY, MARINE AND MARITIME AND IN-LAND WATER RESEARCH AND BIO-ECONOMY



## INVITED ARTICLE

### THE STORY OF APPLIED CATCHMENT MANAGEMENT, A PRACTITIONERS VIEWPOINT

*Dr Dylan Bright, Head of Sustainability, South West Water*

Upstream thinking (UST) has its origins in 2003 when South West Water had problems with a eutrophic reservoir developing an algal bloom annually. The company needed to stop nutrients getting into the lake but the land was farmed intensively by private individuals within legal limits. To achieve the change required, the company worked with the Westcountry Rivers Trust, a charity which had a history of working successfully with farmers.

The charity delivered advice and funding to the farmers which addressed the loss of nutrients. The advice was designed to be cost beneficial, i.e. the nutrients were potentially of value to the farmer and therefore, if they could be preserved on the farm they could be used to fertilise crops, saving money. Monitoring showed a decrease in the nutrient entering into the rivers leading into the lake. This benefitted the farmer, South West Water and the local ecology.

SWW realised that this could be beneficial in many other situations and so in 2009 several pilot projects for catchment restoration were included in the five year business plan. The projects can be divided into two functional groups:

- 1) Projects that work on a catchment scale with lowland farmers giving advice and funding infrastructure, to improve water quality in the wider environment.
- 2) Projects that work on upland areas, such as moorland, to restore drained land and increasing water storage.

As well as the private, direct benefits to SWW there are many wider benefits. Farmers and landowners effectively receive income to 'farm water' on the moors and to farm more efficiently in lowland areas making their businesses more profitable and less risky. Consultants estimate that an individual lowland farmer will be £20 000 a year better-off as a result of engagement with the Upstream Thinking project. There are also significant benefits for biodiversity not just in the rivers but across the landscape arising from the de-intensification of agriculture and the restoration of wild habitat in those areas.



Benefits accrue for many other goods and services which society needs from the land. When this is compared with the traditional solution prior to UST - i.e. better filtration systems or more water storage - it is very evident that the catchment approach, as well as being cost-effective has a much broader range of essential societal benefits.

Alongside these developments Defra have launched the Catchment Based Approach (CaBA). The CaBA will seek to consolidate rural spatial planning. Currently there are many separate, sectorial plans for initiatives to look after a single species, single habitat, rural access, water storage, food production etc. each created without reference to one another and each prioritising private land for a different single purpose, often without involving the owner. The CaBA will work with owners and interested parties to derive a master plan to supply ecosystem goods and services in the optimum area, based on land suitability, ensuring multiple objectives are delivered by one action in one area through one investment.

Farmers in the future will produce many other goods and services for society, in addition to food, based on incentives linked to integrated spatial planning. They will be funded by those who benefit directly and indirectly from the range of services they provide through a mediator who ensures balanced delivery of the integrated plan. South West Water as an organisation and the South West as a region is a long way ahead but there are other good examples nationally and internationally most of whom we are in touch with or actively working with. This is the essence of sustainability, no one set of goods or services is delivered at the expense of another, allowing ecosystems to function within their natural limits with time to replenish and continue to supply all that society needs.

For further information see:  
[www.southwestwater.co.uk](http://www.southwestwater.co.uk)



## UNDERSTANDING AND VALUING RIVERS

*Professor David Gilvear, Catchment and River Science (CARIS), Plymouth University*

Rivers are dynamic, connected and complex networks. These system attributes maintain a resilient ecosystem and one that can bring multiple benefits to humankind. In order to reduce hazard or maximise a resource, humankind has regulated, fragmented and reduced the complexity of rivers, with deliberate or inadvertent loss of certain ecosystem services. 21st century river management is about rehabilitating rivers to enhance ecological functioning, ecosystem services and bring about rivers that are highly valued by the population at large.

Research aimed at understanding how river rehabilitation can create multiple benefits and over what timescale and how the benefits can be mapped on to river networks. Such work it is hoped will aid understanding of how natural rivers deliver ecosystem services, how ecosystem services can be lost via regulation, fragmentation and reduced complexity and how river rehabilitation can create rivers that are more highly valued by society.

Read more: Gilvear DJ, Spray CJ & Casas-Mulet R (2013) 'River rehabilitation for the delivery of multiple ecosystem services at the river network scale' *Environmental Management* 126, pp 30-43

## THE LOCAL, NATIONAL AND INTERNATIONAL AGRITECH STRATEGIES

*Professor Mick Fuller, Centre for Agricultural and Rural Sustainability, Plymouth University*

Ever since the world woke up to the fact that the world's agricultural production will not meet the demands by its consumers as we get deeper into this century, there has been growing realisation that mankind needs a 2<sup>nd</sup> Green Revolution. The first Green Revolution fuelled by the combined technological revolutions of genetic improvement and agronomic developments, doubled the world's agricultural production capacity, but it now needs to double again. How this can be stimulated and sustained is a huge question facing agriculturalists and politicians alike. All economies of the world have now realised the importance of this "ask" and monies are being made available to fuel the research

## VALMER; APPLYING ECOSYSTEMS SERVICES ASSESSMENT TO DELIVER SUSTAINABLE MARINE MANAGEMENT

*Ness Smith, Centre for Marine and Coastal Policy Research, Plymouth University*

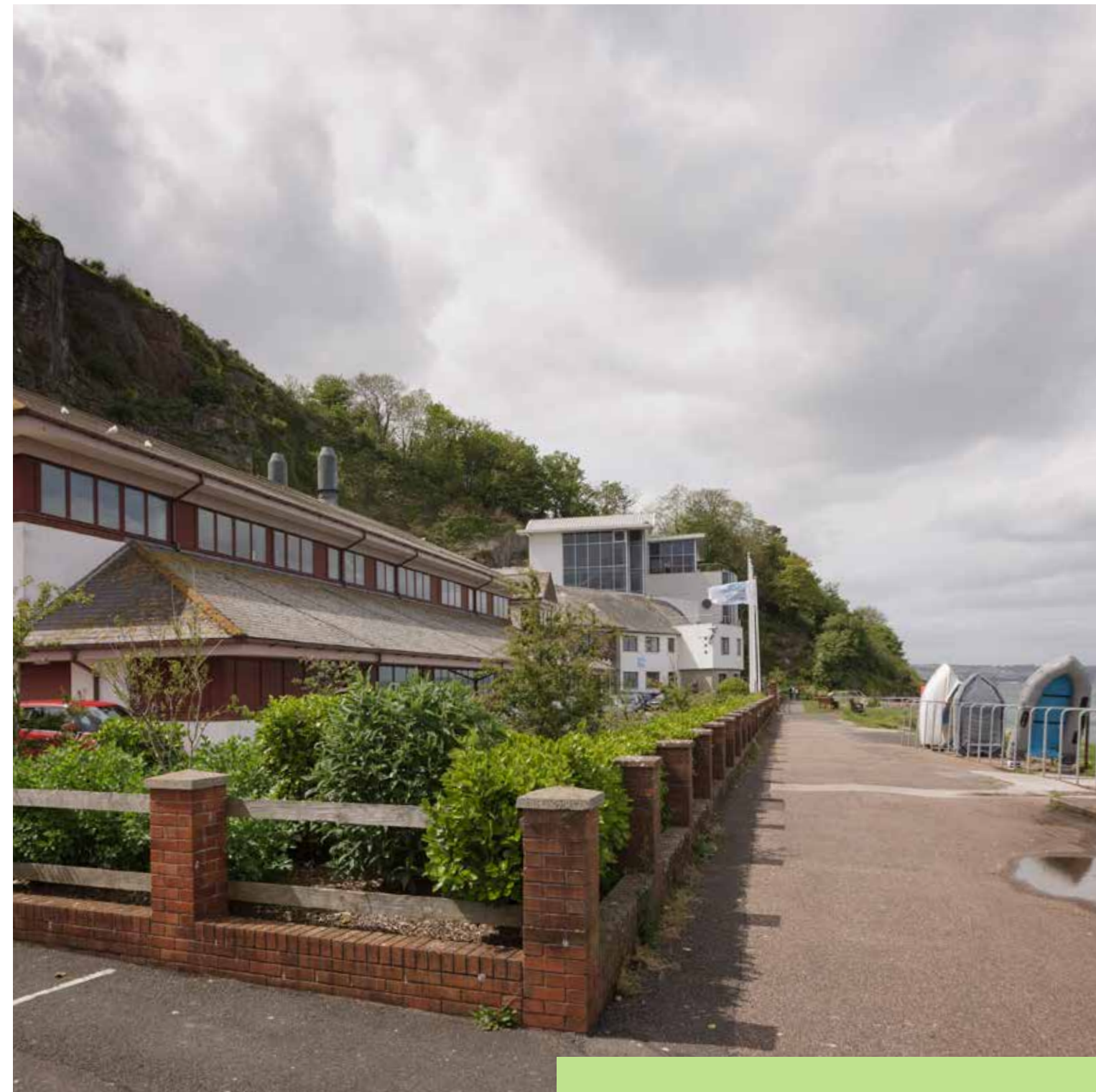
VALMER sits under the Marine ecosystem services and economics theme in the Marine and Coastal Policy Research group, and is an eleven partner, €4.7 million project co-funded by the INTERREG IV A 'Channel' programme. The project runs from 1 September 2012, to 31 March 2015.

Applying an ecosystem services approach (those aspects of ecosystems utilised to produce human wellbeing) has the potential to improve marine management and planning, but to date there have been limited documented cases. VALMER will therefore explore methodologies to place economic, social and environmental values on marine and coastal ecosystem services, and seek to improve current understanding of the links between ecosystem services, their valuation, and effective marine management and governance. It will do so by applying future management scenarios to ecosystem service assessments at six case study sites located in South West England and Brittany.

Further information can be found at: [www.valmer.eu](http://www.valmer.eu) and [www.tinyurl.com/MarCoPolResearch](http://www.tinyurl.com/MarCoPolResearch)

machines to respond to these needs. Agri-food research is back on the agenda and the first phase of this is being labelled as AgriTech and is deliberately encouraging "big" solutions to the "big problem". There is however a danger associated with trying to "engineer" ourselves out of this problem and that is associated sustainability of the solutions. High Tech options are principally the preserve of industrial farming and require heavy financial aid and whilst this is part of the answer we need to ensure that "every farmer matters" and has the where-with-all to benefit from AgriTech solutions. The strategy for the Centre for Agricultural and Rural Sustainability (CARS) is to work in partnership with researchers throughout the SW peninsula through PPRE (Peninsula Partnership for the Rural Environment) in concert with the local AgriFood strategies in the LEP's and nationally and with the Levy Board (AHDB) in a pan-European Sustainable Agriculture delivery project.

For further information see [www.tinyurl.com/carsResearch](http://www.tinyurl.com/carsResearch)



## 2013/14 NEWS ARTICLE

### ASTRAZENECA DONATES BRIXHAM ENVIRONMENTAL LABORATORY TO PLYMOUTH UNIVERSITY

AstraZeneca, a global innovation-driven biopharmaceutical company specialising in the discovery, development, manufacturing and marketing of prescription medicines has announced that it plans to donate its Environmental Laboratory in Brixham, South Devon, to Plymouth University. The donation of the facility and its equipment will ensure that the laboratory continues to serve scientific and research purposes, benefitting the region and beyond.

Plymouth University plans to use the site to create a global research and education facility. The University, which is known for its marine and environmental science expertise, also plans to offer commercial innovation opportunities through the facility via the region's Growth Acceleration and Investment Network (GAIN).

For more information visit [www.tinyurl.com/astrazenecalab](http://www.tinyurl.com/astrazenecalab)



The University is committed to providing information in accessible formats.  
If you require information from this guide in an alternative format, please contact:

**Tel:** +44 (0)1752 585 816

**Fax:** +44 (0)1752 585 714

**Email:** [paul.hardman@plymouth.ac.uk](mailto:paul.hardman@plymouth.ac.uk)

[www.plymouth.ac.uk/research/issr](http://www.plymouth.ac.uk/research/issr)

**Cover image:** Kirsty Andrews, ISSR Marketing and Communications Administrator.

For further photos, please see [www.kirstyandrews.com](http://www.kirstyandrews.com)

**SUSTAINABILITY**  
**WITH**  
**PLYMOUTH**  
**UNIVERSITY**