



UNIVERSITY OF
LIVERPOOL

SCHOOL OF
ENVIRONMENTAL
SCIENCES

POSTGRADUATE RESEARCH CONFERENCE
16-18 May 2016



UNIVERSITY OF LIVERPOOL SCHOOL OF ENVIRONMENTAL SCIENCES PGR CONFERENCE 2016

Dear Colleagues,

I am delighted to welcome you to the annual SoES PGR conference! We will have 85 presentations over two days followed by annual progress interviews. Dr Jane Rees, former editor of Nature, will deliver a keynote lecture on 'Publishing Impactful Research' on Monday at 4:00pm and there will be a panel discussion on 'Early Careers' on Tuesday at 4:30pm followed by PGR reception at 5:30pm. I hope that the conference will offer each of us something; the opportunity to present ongoing research and receive feedback from a distinguished audience or to learn more about new research in Environmental studies and sciences. This will certainly broaden our horizons and will hopefully further promote collaboration between various research areas of the school.

Enjoy the conference!

On behalf of the organising committee,
Hill Kulu

Keynote Session | Monday 16:00 – 17:00 | Rendall, Lecture Theatre 7



Dr Jane Rees

Organising Committee

Louise Hawkins	Peter Fawcett
Joshua Blamire	Hill Kulu
Hugh Smith	Pascal Salaun
Olivier Sykes	Andy Biggin
Suzanne Roebuck	Lindsay Davies
Claire Rimmer	

Panel Discussion: 'Early Careers'

Dr Holly Pelling	Postdoctoral Research Associate, University of Bangor/NOC
Dr Iris Verhagen	University Teacher, Earth, Oceans and Ecological Sciences
Dr Sebastian Dembski	Lecturer, Geography and Planning
Dr Emad Hemdan	Postdoctoral Researcher, University of Liverpool
Dr Catherine Wilkinson	Postdoctoral Research Associate, University of Durham

Each speaker has been invited to cover one or several of the following topics: applying for funding; producing good figures; how to write; participating in conferences; publishing; finding a job; having a family; moving abroad; using your PhD in an industry setting; leaving academia.

ABSTRACTS SCHEDULE

Monday 16th May 2016 Social Science Presentations

Location: Rendall Seminar Room 4

Session 1a: Chair - Hill Kulu

09.00-09.15	Peter Fawcett	Thomas Fischer	In Search of Health: the 'rhetoric and reality' of healthy town planning
09.15-09.30	Joshua Blamire	Peter North	"Just Simply Not Credible"? Discourses of Anti-Austerity Resistance in Liverpool
09.30-09.45	John Farrell	Olivier Sykes	Investigating the UK experiment with self-organised urban policy, through a game-theoretic lens
09.45-10.00	Fatemah Khosravi	Thomas Fischer	The potential for Strategic Environmental Assessment in Iran's Development Planning (Water Management) Introduction to research problem
10.00-10.15	Alex Alexiou	Alex Singleton	Developing a small-area classification of built environment characteristics: relationships with socio-economic classifications
10.15-10.30	Chrisna Permana	Dave Shaw	The Challenge of realizing the creative potential in the emerging world cities

10.30-11.00 Tea/Coffee Break

Session 2a: Chair – Yelena Mikhaylova-O'Connell

11.00-11.15	Ramiz Babayev	Thomas Fischer	TBC
11.15-11.30	Le Tang	Dave Shaw	Exploring the different types of urban community in Chinese Commodity Housing Estates'.
11.30-11.45	Hui Cheng	Dave Shaw	The application of polycentricity to the development of Chinese metropolitan areas
11.45-12.00	Mark Davies	Alex Lord	The Paradox of Decentralising Retail and Recentralising Policy: Investigating the Long Term Viability of the 'Town-Centre-First' Approach to Retail Development

12.00-13.00 Lunch

Session 3a: Chair – Xinkai Wang

13.00-13.15	Madeleine Gustavsson	Mark Riley	The Good Fisher: field, habitus, and capitals
13.15-13.30	Bertie Dockerill	John Sturzaker	A self-serving civic elite, retail places, and a quayside of squalor: Newcastle, 1835-1854
13.30-13.45	Leo Singer	Mark Green	Multilevel modelling of the association between patterns of multimorbidity and their socio-spatial and temporal contexts
13.45-14.00	Phillip Leigh	Dave Shaw	Assessing the Socio-ecological Impact of Small Publicly Accessible Urban Green Spaces (SPAUGS) in Liverpool
14.00-14.15	Sebastian Franke	Hill Kulu	Partnership Status, Health and Mortality: Protection or Selection?
14.15-14.30	Adeleh Haghgoo	Olivier Sykes	TBC

14.30-15.00 Tea/Coffee Break

Session 4a: Chair – Emily Dearden

15.00-15.15	Kaisa Lahtinen	Alex Singleton	Cities and consumer neighbourhoods
15.15-15.30	Maulud Tafida-Isa	Urmila Jha Thakur	Environmental Impact Assessment Follow-up: crude oil projects in Nigeria
15.30-15.45	Yajie Xu	Ian Mell	Living with Food - to explore the Interactions between Urban Agriculture (UA) and Urban Citizens in China

ABSTRACTS SCHEDULE

Monday 16th May 2016 Science Presentations

Location: Rendall Seminar Room 3

Session 1b: Chair – Louise Hawkins

09:00-09:15	Marcelo Paes Gomez	Matt Spencer	TBC
09:15-09:30	Caroline Harkin	Nick Kusznir	Investigation of Continental Rifted Margin Structure using Deep-Seismic Reflection Data and an Integrated Quantitative Analysis
09:30-09:45	Anastasiia Domina	Matthew Palmer	The life-cycle of high-frequency internal waves in a continental shelf seas: generation, propagation, dissipation
09:45-10:00	Celestine Nwojiji	Fabienne Marret-Davies	Ecological functioning of fossil plankton during the warm period of the Early Eocene in the Central Pacific Ocean.
10:00-10:15	Arthur Gourain	Pascal Salaun	Copper distribution and speciation in Open Ocean
10:15-10:30	Aurelio Melia	Dan Faulkner	Role of morphology in controlling wave overtopping volume through a sea defence breach

10.30-10.45 Tea/Coffee Break

Session 2b: Chair – Anastasiia Domina

10:45-11:00	Louise Hawkins	Andy Biggin	Implications of a weak geomagnetic field ~370 million years ago
11:00-11:15	Benjamin Philips	Andy Plater	Role of morphology in controlling wave overtopping volume through a sea defence breach
11:15-11:30	Guðjón Helgi Eggertsson	Yan Lavallee	Mechanical and permeability constraints for improved geothermal reservoir exploitation at Krafla, Iceland
11:30-11:45	Poonperm Vardhanabindu	Janet Hooke	Using Structure from Motion to Characterise the Behaviour of Soil Erosion
11:45-12:00	Valerie Le Guennec	Alessandro Taglibue	Investigation of the role of anthropogenic forcings in modulating biophysical interactions in the Black Sea using a 'state of the art' coupled hydrodynamic-ecosystem model
12:00-12:15	Michael Allen	Betty Mariani	Seismic cycle sealing on the Alpine Fault, New Zealand
12:15-12:30	Sumia Abdualhadi	Paul Nolan	Quantifying the Uranium Series Disequilibrium using gamma-ray spectrometry

12.15-13.00 Lunch

Session 3b: Chair – Jennifer Evans

13:00-13:15	Fiona Russell	John Boyle	Developing palaeolimnological records of organic content (DOC and POC) using the UK Uplands Waters Monitoring Network
13:15-13:30	Luke Wooldridge	Richard Worden	Biofilm origin of clay coated sand grains: Understanding the fundamental processes governing the origin and distribution of clay-coated sand grains in petroleum reservoirs through a modern day analogue
13:30-13:45	Minxuan Feng	Andreas Rietbrock	TBC
13:45-14:00	Anthony Wise	Christopher Hughes	Ocean to Coast: Impact of Deep Ocean on UK Coastal Sea Level
14:00-14:15	Joseph Gardner	John Wheeler	What kind of creep would do that? The link

ABSTRACTS SCHEDULE

			between metamorphism and deformation in mid-crustal rocks
14:15-14:30	Nealy Carr	Claire Mahaffey	Distribution, Source and Fate of Dissolved Organic Matter in Shelf Seas
14.30-14.45	Tea/Coffee Break		
<i>Session 4b: Chair – Joseph Gardner</i>			
14:45-15:00	Jennifer Evans	Judith Wolf	A Coupled Model of the Bay of Bengal: Impact on Storm Surge Forecast
15:00-15:15	Simon Martin	Janine Kavanagh	Investigating magma flow within intrusions: Insights from magnetic anisotropy
15:15-15:30	Charlotte Lyddon	Andy Plater	Tide-surge interaction in generating extreme water levels in a hypertidal estuary
15:30-15:45	Eugenio Ruiz	Jonathan Sharples	The effects of changes in agricultural land use and landscape structure on catchment flow and sediment generation
15:45-16:00	Simon Clark	James Cooper	Risk of river flood inundation under climate change: assessment of the relative effects of changes in plant growth and flood regime on conveyance

Monday 16th May 2016 Keynote Lecture Rendall Lecture Theatre 7

16.00-17.00	Dr Jane Rees, Research Communication Advisor, Research Policy Office Title: "Publishing Impactful Research"
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Tuesday 17th May 2016 Social Science Presentations

Location: Rendall Seminar Room 4

Session 5a: Chair – Madeleine Gustavsson

09.00-09.15	Philip Sapiro	Paul Williamson	The Geography of the Anglo-Jewish Population in the Twenty First Century: Characteristics, Spatial Distribution, Comparisons, and Trends
09.15-09.30	Rebecca Allan	Paul Williamson	Unravelling Urban-Rural Health Disparities in England: Context or Composition
09.30-09:45	Charlotte Beattie	Neil Macdonald	Parallel line or one-way flow?
09.45-10.00	Brian Williams	Mark Riley	"That We May Live": Pesticides, Race, and Agricultural Development in the US South
10:00-10:15	Philip Monaghan	Peter North	Cleaner Production Enterprise Zones: gold dust or fool's gold for sustainable cities policy?
10:15-10:30	Kush Thakur	Neil Macdonald	Quantifying the Economic Value of Data obtained from River Gauging Stations in Scotland: A Users' Perspective.
10.30-11.00	Tea/ Coffee Break		

Session 6a: Chair – Robert Jones

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11:00-11:15	Xinkai Wang	Ian Mell	Tomorrow's Eco-city in China: Improving Eco-City Development in a Culture of Collaborative Communication
11:15-11:30	Yelena Mikhaylova-O'Connell	Bethan Evans	Proximities of care: Exploring the spatial relations of voluntary and technological support for those living with dementia
11:30-11:45	Yangnan Guo	Ian Mell	Build multifunctional urban green space system for Chinese urban populations combining green infrastructure ideas
11:45-12:00	Alina Pelikh	Hill Kulu	Mobility of Young People During the Transition to Adulthood in Britain
12.00-13.00	Lunch		
<i>Session 7a: Chair – Rebecca Allan</i>			
13:00-13:15	Khalid Almatar	Dave Shaw	Towards an effective integrated planning framework for traffic management in Middle Eastern cities: The case of Dammam
13:15-13:30	Abdulaziz Almulhim	Mark Riley	Characteristics of Urban Residents Affecting Household Water Consumption/Conservation Patterns in Saudi Arabia: The Case of Dammam City
13:30-13:45	Emily Dearden	Christopher Lloyd	Exploring the connections between area deprivation and health using consistent small area Census datasets, 1971-2011'
13:45-14:00	Muhammad Hakim Danial	Hill Kulu	Population Change and Internal Migration in Kuala Lumpur Conurbation, Malaysia
14:00-14:15	Daniel Slade	Olivier Sykes	The Reform of Planning Practice, and the Practice of Planning Reform in the English Central State: How changing practices and strategies for 'getting policy done' shaped the Coalition Government's key planning reforms
14.15-15:00	Tea/ Coffee Break		
<i>Session 8a: Chair – Peter Fawcett</i>			
15:00-15:15	Robert Jones	Stephen Jay	Maritime Linked Spatial Strategies: New Territories for Regional Development
15:15-15:30	Michael King	Peter North	How are environmental outcomes achieved within complex strategic decisions? A case study of UK train procurement over time. Nobody wanted heavy trains, but is that what we have got?
15:30-15:45	Miu Yuk Cheung	Olivier Sykes	"Branding in Urban Design: Branding the City as an Attractive Place to Visit."
15:45-16:00	Soeren Metelmann	Andy Morse	Development of climate-driven models for mosquito-borne disease risk in the UK

Tuesday 17th May 2016 Science Presentations

Location: Rendall Seminar Room 3

Session 5b: Chair – Suraya Hilmi Hazim

09:00-09:15	John Bedford	John Wheeler	New insights on metamorphic reaction kinetics using time-resolved (4D) synchrotron X-ray microtomography
09:15-09:30	Charlotte Smith	Claire Mahaffey	Mixing and Community Structure Over Ocean Ridges
09:30-09:45	Thomas Redfern	Neil Macdonald	Describing and quantifying residential areas with a hydrologically relevant method

ABSTRACTS SCHEDULE

09:45-10:00	Callum Preece	Claire Mahaffey	Nitrogen & Carbon Cycling in Shelf Seas
10:00-10:15	Júlia Gómez-Romeu	Andreas Rietbrock	The evolution of fault geometry and lithosphere isostatic response to faulting during magma-poor rifted continental margins formation
10:15-10:30	Elliot Wood	Janine Kavanagh	Propagation dynamics of magma ascent, constraining the role of the damage zone
10.30-10.45	Tea/ Coffee Break		
<i>Session 6b: Chair – Elliot Wood</i>			
10:45-11:00	Rachael Lem	Fabienne Marret-Davies	Is the globe really warming: a palaeoclimatic evidence based approach
11:00-11:15	Surays Hilmi Hazim	Janine Kavanagh	Characterization of the mechanical properties of analogue materials for modelling crustal magma chamber growth
11:15-11:30	Alice Trevail	Sam Patrick	Causes and consequences of individual consistency in a changing climate
11:30-11:45	Christopher Feeney	Hugh Smith	Residence times of sediment in river floodplains
11:45-12:00	Joshua Griffiths	Richard Worden	Clay mineral distribution in modern estuarine sands: A predictive tool for the hydrocarbon industry
12:00-12:15	Kieran Newman	Andy Plater	Comparison and Combination of a High Resolution Coastal Ocean Model and X-band Radar-Derived Waterlines/Bathymetry
12:15-13:00	Lunch		
<i>Session 7b: Chair – Anthony Lamur</i>			
13.00-13.15	Oliver Lamb	Yan Lavallee	Relative velocity change at Volcán de Colima: Seismic and experimental observations
13.15-13.30	Jennifer Jardine	Claire Mahaffey	Using ocean gliders to understand the physical controls on phytoplankton distribution in shelf seas
13.30-13.45	James Utley	Richard Worden	Geochemical controls on iron-rich clay mineral genesis and transformation in the eogenetic zone.
13.45-14.00	Karen Halsall	Richard Bradshaw	Holocene Fire – vegetation: Methods and palaeoecological data from Northern Europe in exploration of natural and anthropogenic environmental drivers
14.00-14.15	Tsvetomila Mateeva	Nick Kusznir	Serpentinization : the most important metamorphic hydration process
14:15-14:30	Joseph Aslin	Betty Mariani	The deformation and metamorphism of micas in crustal shear zones: implications for the strength of the Earth's crust.
14.30-14:45	Tea/ Coffee Break		
<i>Session 8b: Chair – Tsvetomila Mateeva</i>			
14:45-15:00	Madeline Brasier	George Wolff	Investigations into the diversity, biogeography and trophic traits of Antarctic polychaete using DNA barcoding and compound specific stable isotope analysis
15:00-15:15	Anthony Lamur	Yan Lavallee	Fracture and healing in silicic magmas: a mechanism for cyclic eruptive behaviour
15:15-15:30	Verónica Escobar Ruiz	Hugh Smith	The effects of changes in agricultural land use and landscape structure on catchment flow and sediment generation
15:30-15:45	Auwalu Yola Lawan	Richard Worden	Controls and prediction of positive and negative effects of diagenesis on sandstones petroleum reservoir quality.

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15:45-16:00	David Williams	Kevin Horsborough	Modelling Meteotsunami on the European Shelf
16:00-16:15	Sion Regan	Hugh Smith	Modelling riverbank erosion at a catchment scale – balancing reach scale complexity against catchment scale applications
16:30–17:30 <i>Panel Discussion: Early Careers</i> , Rendall Lecture Theatre 7			

Location: Gordon Stephenson Studio

17:30-21:00
Reception

Monday 16th May Annual Progress Interviews (Social Science)

Location: Seminar Room 2, Gordon Stephenson Building

Interview panel 1a: Olivier Sykes, Urmila Jha Thakur, Sebastian Dembski

12:30-12:50 Lunch Break

12:50-13:10	Gouping Zhang	Nick Green
13:10-13:30	Linda Woods	Christopher Lloyd
13:30-13:50	Liam Bratley	Alex Singleton
13:50-14:10	Adedamola Aderiye	Thomas Fischer
14:10-14:30	Dean Riddlesden	Alex Singleton

14:30-14:40 Tea/Coffee Break

Interview panel 2a: Alex Singleton, Olivier Sykes, Mark Riley

14:40-15:00	Yogeswaran Sundara Murthi	Thomas Fischer
15:00-15:20	Philip Leigh	Dave Shaw
15:20-15:40	Sophia Kochalski	Leonie Robinson

Monday 16th May Annual Progress Interviews (Science)

Location: Seminar Room 1, Gordon Stephenson Building

Interview panel 1b: Andy Biggin, Pascal Salaun

10:40-10:50 Tea/Coffee Break

10:50-11:10	Adrian Hornby	Yan Lavallee
11:10-11:30	Thomas Prime	Andy Plater
11:30-11:50	Sion Regan	Hugh Smith

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11:50-12:10	Carl Spingys	Ric Willams
12:10-12:30		
12:30-12:50 Lunch Break		
Interview panel 2b: Andy Biggin, Pascal Salaun		
12:50 -13:10	Rachael Lem	Fabienne Marrett-Davies
13:10-13:30	Anthony Lamur	Yan Lavallee
13:30-13:50	Verónica Escobar Ruiz	Richard Worden
13:50-14:10	Auwalu Yola Lawan	Neil Macdonald
14:10-14:30	Amy Lennard	
14:30-14:40 Break		
Interview panel 3b: Hugh Smith, Pascal Salaun		
14:40-15:00	Joseph Aslin	Betty Mariani
15:00-15:20	Aurelio Melia	Dan Faulkner
15:20-15:40	David Williams	Kevin Horsborough
15:40-16:00	Tsvetomila Mateeva	Nick Kisznr

Tuesday 17th May Annual Progress Interviews (Social Science)

Location: Seminar Room 2 Gordon Stephenson Building

Interview panel 3a: Andy Davies, Mark Green, Hill Kulu

09:00-09:20	John Farrell	Olivier Sykes
09:20-09:40	Joshua Blamire	Peter North
09:40-10:00	Peter Fawcett	Thomas Fischer
10:00-10:20	Fatemah Khosravi	Thomas Fischer
10:20-10:40	Alex Alexiou	Alex Singleton

10:40-10:50 Tea/Coffee Break

Interview panel 4a: Alex Lord, Andy Davies, Hill Kulu

10:50-11:10	Chrisna Permana	Dave Shaw
11:10-11:30	Ramiz Babayev	Thomas Fischer
11:30-11:50	Le Tang	Dave Shaw
11:50-12:10	Hui Cheng	Dave Shaw
12:10-12:30	Mark Davies	Alex Lord

12:30-12:50 Lunch

Interview panel 5a: Mark Green, Urmila Jha Thakur, Daniel Arribas-Bel

12:50-13:10	Madeleine Gustavsson	Mark Riley
13:10-13:30	Bertie Dockerill	John Sturzaker
13:30-13:50	Sebastian Franke	Hill Kulu
13:50-14:10	Yajie Xu	Ian Mell
14:10-14:30		

ABSTRACTS SCHEDULE

14:30-14:40 Tea/Coffee Break

Interview panel 7b: Kathy Burrell, Olivier Sykes, Hill Kulu

14:40-15:00	Philip Monaghan	Peter North
15:00-15:20	Charlotte Beattie	Neil Macdonald
15:20-15:40	Adeleh Haghoo	Olivier Sykes

Tuesday 17th May Annual Progress Interviews (Science)

Location: Seminar Room 1, Gordon Stephenson Building

Interview panel 4b: Hugh Smith, Neil Macdonald

09:00-09:20	Marcelo Paes Gomez	Matt Spencer
09:20-09:40	Louise Hawkins	Andy Biggin
09:40-10:00	Benjamin Phillips	Andy Plater
10:00-10:20	Celestine Nwojiji	Fabienne Marrett-Davies
10:20-10:40	Anastasiia Domina	Matthew Palmer

10:40-10:50 Tea/Coffee Break

Interview panel 5b: Matt Spencer, Hugh Smith

10:50-11:10	Stephen Clesham	Peter Kokelaar
11:10-11:30	Caroline Harkin	Nick Kusznir
11:30-11:50	Arthur Gourain	Pascal Salaun
11:50-12:10	Guojon Helgi Eggertsson	Yan Lavallee
12:10-12:30	Michael Allen	Betty Mariani

12:30-12:50 Lunch

Interview panel 6b: Pascal Salaun, Iris Verhagen

12:50-13:10	Thomas Redfern	Neil Macdonald
13:10-13:30	Valerie Le Guennec	Alessandro Taglibue
13:30-13:50	Poonperm Vardhanabindu	Janet Hooke
13:50-14:10	Fiona Russell	John Boyle
14:10-14:30	Luke Wooldridge	Richard Worden

14:30-14:40 Tea/Coffee Break

Interview panel 7b: Pascal Salaun, Neil Macdonald

14:40-15:00	Minxuan Feng	Andreas Rietbrock
15:00-15:20	Anthony Wise	Jeff Poulton
15:20-15:40	Joseph Gardner	John Wheeler
15:40-16:00	Nealy Carr	Claire Mahaffey
16:00-16:20	Jennifer Evans	Kevin Horsborough

Wednesday 18th May Annual Progress Interviews (Social Science)

ABSTRACTS SCHEDULE

Location: Seminar Room 2, Gordon Stephenson Building		
Interview panel 7a: Olivier Sykes, Sam Hayes, Alex Nurse		
09:00-09:20	Philip Sapiro	Paul Williamson
09:20-09:40	Rebecca Allan	Paul Williamson
09:40-10:00	Maulud Tafida-Isa	Urmila Jha Thakur
10:00-10:20	Kaisa Lahtinen	Alex Singleton
10:20-10:40	Kush Thakar	Neil Macdonald
10:40-10:50 Tea/Coffee Break		
Interview panel 8a: Olivier Sykes, Hill Kulu, Alex Nurse		
10:50-11:10	Xinkai Wang	Ian Mell
11:10-11:30	Yelena Mikhaylova-O'Connell	Bethan Evans
11:30-11:50	Yangnan Guo	Ian Mell
11:50-12:10	Alina Pelikh	Hill Kulu
12:10-12:30		
12:30-12:50 Lunch		
Interview panel 9a: Kathy Burrell, Paul Williamson, Les Dolega		
12:50-13:10	Khalid Almatar	Dave Shaw
13:10-13:30	Abdulaziz Almulhim	Mark Riley
13:30-13:50	Emily Dearden	Christopher Lloyd
13:50-14:10	Muhammad Hakim Danial	Hill Kulu
14:10-14:30	Robert Jones	Stephen Jay
14:30-14:40 Tea/Coffee Break		
Interview panel 10a: Paul Williamson, Bethan Evans, Hill Kulu		
14:40-15:00	Michael King	Peter North
15:00-15:20	Daniel Slade	Olivier Sykes
15:20-15:40	Miu Yuk Cheung	Olivier Sykes
15:40-16:00	Leo Singer	Mark Green

Wednesday 18th May Annual Progress Interviews (Science)

Location: Seminar Room 1, Gordon Stephenson Building		
Interview panel 8b: Hugh Smith, Andy Biggin		
09:00-09:20	Suraya Hilmi Hazim	Janine Kavanagh
09:20-09:40	Charlotte Lyddon	Andy Plater
09:40-10:00	Eugenio Ruiz	Jonathan Sharples
10:00-10:20	Simon Clark	Hugh Smith
10:20-10:40	John Bedford	John Wheeler
10:40-10:50 Tea/Coffee Break		
Interview panel 9b: Andy Biggin, Leonie Robinson		
10:50-11:10	Charlotte Smith	Claire Mahaffey

ABSTRACTS SCHEDULE

11:10-11:30	Callum Preece	Claire Mahaffey
11:30-11:50	Júlia Gómez-Romeu	Andreas Rietbrock
11:50-12:10	Elliot Wood	Janine Kavanagh
12:10-12:30	Madeleine Brasier	George Wolff
12:30-12:50 Lunch		
Interview panel 10b: Pascal Salaun, John Boyle		
12:50-13:10	Simon Martin	Janine Kavanagh
13:10-13:30	Alice Trevail	Sam Patrick
13:30-13:50	Christopher Feeney	Hugh Smith
13:50-14:10	Joshua Griffiths	Richard Worden
14:10-14:30	Kieran Newman	Andy Plater
14:30-14:40 Tea/Coffee Break		
Interview panel 11b: Andy Biggin, Hugh Smith		
14:40-15:00	Oliver Lamb	Yan Lavallee
15:00-15:20	Jennifer Jardine	Claire Mahaffey
15:20-15:40	James Utley	Richard Worden
15:40-16:00	Karen Halsall	Richard Bradshaw
16:00-16:20	Kelly Barker	Richard Holme

Monday 16th May | Social Science

| Rendall Seminar Room 4

Peter Fawcett

In Search of Health: the 'rhetoric and reality' of healthy town planning

09.00-09.15

Few areas of debate have burgeoned in recent years as much as those concerned with the role town planning has in promoting health and wellbeing outcomes. In both academic and political circles there is a clear argument which reads that local planning authorities (LPAs) should incorporate health issues into their decision-making. Not only is town planning identified in many national strategies as being a potential solution to many key health challenges, but the National Planning Policy Framework (NPPF) 2012 positions health as a key facet of planning's obligation towards sustainable development. In contrast to the wealth of theoretical discussion of the benefits of 'healthy town planning', much less is known about how health and wellbeing are actually integrated into local level town planning. While a small body of work does provide a general landscape overview of this situation, it is limited by (a) its fractional coverage of LPA experiences (less than 20%) and (b) its outdated timeframe (mainly 2006-10). The aim of this research is thus to 'investigate how health and wellbeing are integrated into local level town planning in England'. Five case study LPAs have been chosen for analysis; these covering a spread of geography and area types, and local plan ('core strategy') adoption dates. Data will be gathered in two broad phases: Phase One will examine each LPA's local plans to test their health content; and Phase Two will involve interviewing LPAs members to elicit information about their perceptions of the health-town planning interface.

Joshua Blamire

"Just Simply Not Credible"? Discourses of Anti-Austerity Resistance in Liverpool

09.15-09.30

In the 'new politics of austerity' (Kitson, 2011; cf. Featherstone, 2015), multifarious forms of anti-austerity resistance have emerged in the Global North to oppose those neoliberal attacks to the welfare state and the final remnants of the social-democratic consensus; a process Jamie Peck (2012: 628) labels "austerity urbanism". The city of Liverpool is experiencing particularly accelerated forms of austerity urbanism, and here competing narratives take hold; at once, grassroots mobilisations repudiate austerity measures (cf. Parnell et al., 2014) and reimagine an alternative political pathway whilst, concomitantly, elite municipal politics advocate (at seemingly all costs) the steady management of, and collaboration with, private capital in order to 'successfully' and 'professionally' negotiate the crisis (cf. Peck, 2012). Crisis-management becomes, resultantly, inherently depoliticised (cf. Swyngedouw, 2011); as one senior Labour Party city councillor described: "those

protestors...they're just *simply* not credible".

This research, therefore, explores those interpretations 'from below' to consider how these forms of anti-austerity resistance narrate, embody, mobilise and restrict particular forms of (anti-)austerity discourse in opposition to those articulated 'from above'. Critically, this research offers a more sober interpretation of localised anti-austerity resistance in which we observe the oppositional 'scream against' (Holloway, 2010), but which might lack the political potentiality to generate a coherent and credible alternative, reconfigure the political imaginary and, ultimately, effect counter-hegemonic forms of societal change. This paper reflects upon the limitations of place-based politics and the seemingly impotence in penetrating the (post-) political discourse for austerity (cf. Žižek, 2012). The paper employs politically-engaged ethnographic research (Juris, 2007; cf. Russell, 2015) and semi-structured interviews with anti-austerity networks in Liverpool.

John Farrell

Investigating the UK experiment with self-organised urban policy, through a game-theoretic lens

The centralist model of urban policy that predominated British planning for decades has recently been called into question, with changes in the fabric of the planning system implemented to further involve public and private bodies in the management of public spaces who would not have been involved in bygone times. The nations of North-West Europe stand out as being particularly advanced, specifically in creating legal frameworks for self-determined associations of non-state actors to collectively plan, construct and implement urban policy.

This research will implement game theoretic assumptions, both experimentally and qualitatively, to assess the conditions that are required to both implement coalitions of actors in the urban arena, and to sustain them over periods of time, questions that have been left unanswered by previous theory such as growth coalitions and regime theory. This will be conducted at three scales: macro (local authorities and the Duty to Cooperate), meso (BID's) and micro scale (Neighbourhood Planning).

09.30-09.45

Research questions to be addressed include:

- What explains the nature of coalition formation in urban policy?
- Are particular starting conditions required e.g. first mover?
- What conditions and payoffs are required to keep the coalitions together?
- Can coalitions exist within the "grand coalition"?

Extensive primary data collection is to start in earnest within the next month, whilst research into how to conduct experimental games and the example planning mechanisms has already been undertaken. Primary data collection will be commenced through the use of experimental games based upon classic game theory, and semi-structured interviews at all three scales.

Fatameh Khosravi

The potential for Strategic Environmental Assessment in Iran's Development Planning (Water Management)

Introduction to research problem,

The needs for Strategic Environmental Assessment in Iran stems from the fact that established EIA system considers environmental impacts of individual projects and it is not able to address aspects at sector level and area wide level (UNDP, 2003). This weakness made some serious degradation in Iran environment in large scale. Drying of Urmia Lake can be a clear example of absence of Strategic Environmental Assessment studies.

09.45-10.00

Research question/Objectives,

The research attempts to achieve following aim: To investigate on how SEA can be integrated in to systematic planning framework for Water management in Iran.

Objectives of the research:

- 1) To review international SEA practice in different planning contexts
- 2) To make a list of good practice criteria of effective water management
- 3) To review SEA for water management plans
- 4) To review the status of environmental Assessment in Iran.
- 5) To review current Water management in Iran and Urmia Lake Basin.
- 6) To make recommendations in order to develop a SEA system which could be integrated with Iranian water

management?

Research question:

How SEA can be integrated in to systematic Spatial planning (Water management) framework in Iran?

Methods:

As the nature of this research is qualitative, methods that have been adopted for typical of qualitative research:

- Literature Review
- Interviews
- Case Study

Data and (where appropriate) :

Data has been collected about Iranian Environmental assessment context and Urmia Lake Basin by Literature review.

Alexandros Alexiou

Developing a small-area classification of built environment characteristics: relationships with socio-economic classifications

A geodemographic analysis is a type of quantitative analysis that has proven useful in identifying socio-spatial patterns through the process of organizing areas into categories that share similar socio-economic characteristics. While most of these spatial classification systems include a plethora of socio-economic attributes, there is arguably little to no input regarding attributes of the built environment or physical space, and their impacts to socio-economic profiles has not been evaluated in any systematic way. This research examines the generation of such neighbourhood characteristics, taking advantage of the increasing availability of spatial data from open data sources.

10.00-10.15

We use a set of variables collected on the built forms and relative locations that underpin neighbourhood differentiation and present a methodological approach for building a national classification of neighbourhoods. The dataset was compiled from open data sources, such as the OS Local Maps dataset, the Historic England Archive and CDRC. We adopt a Self-Organising Map (SOM) clustering methodology to create an Urban Morphology classification and test the extent to which this output systematically follows conventional socio-economic typologies. The results capture through the multidimensionality of the data both microscopic and macroscopic identifiers of urban morphology, suggesting an important dimension of residential decisions beyond socio-economic conditions. This classification can be used as input to more complex socio-economic models, increasing robustness. It can also provide a simplified structure of the physical properties of geographic space that can be used to explore correlations with other spatial phenomena, potentially in a variety of applications, from urban planning and renewal / upscale policies to health and wellbeing.

KEYWORDS: geodemographics, built environment, open data, SOM

Acknowledgements

This research is part of a PhD project funded by the ESRC with an Advanced Quantitative Methods (AQM) award at the North West Doctoral Training Centre.

Chrisna Permana

The Challenge of the creative potential in the emerging world cities

10.15-10.30

The current global economic restructuring has put the so-called 'creative economy' as one of the most promising sectors to promote economic growth and competitiveness in the city level replacing the trend of manufacturing industries. Whilst the first idea to use creative economy to re-boost economic growth came from the American and European countries in the late 20th century, its current trend is actually spreading to the emerging world cities. For instance, many city governments in the Southeast Asian cities adopt the concept of creative economy for local development – or can be called 'creative city'. Nevertheless, in addition to some positive impacts, there are many issues followed by the development of creative city. Many research found that creative city implementations in the emerging world cities are vulnerable to urban riots, violation, social exclusion, and stakeholder conflicts. In addition, there are also issues related to mismatch between localities

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and planning vision. This research aims to analyse planning approaches used to realise the creative potential in the emerging world cities. Using a methodology of case study in Southeast Asian cities, this research will then compare three cities representing rational planning approach, collaborative planning approach, and self-organisation planning approach, in the process of creative city development. The result is expected to come into potentials and challenges of using three different approaches or mixed amongst them, and planning recommendation about the most effective approach to manage creative potential in the emerging world cities.

11.00-11.15 **Ramiz Babayev**
TBC

Le Tang
'Exploring the different types of urban community in Chinese Commodity Housing Estates'.

There is the common and growing belief that an urban community no longer really exists in Chinese commodity housing estates since the Open-Door Policy from 1980s. However, contrary to this perspective there appears to be a growing realization that new types of urban community are forming in Chinese commodity housing estates through some form of civic phenomenon, especially as residents' increasingly show a desire for greater self or local autonomy. Thus, the research aim is to explore the existence of different types of urban community in Chinese commodity housing estates, with the following research objectives:

- 11.15-11.30
- (1) To understand distinctiveness of commodity housing estates in urban China;
 - (2) To explore how neo-liberal reform has challenged China's urban communities;
 - (3) To explore the nature of urban community and the civic actions;
 - (4) To evaluate the formation of the different types of urban community in the context of the civic action;

Methodologically, this project is premised on a qualitative research paradigm. A series of qualitative research approaches will be applied to gain the theoretical understanding of the project. Broad survey in two case cities is conducted to collect quantitative data on the typological research of civic actions. According to the former typological research, the semi-structured interview, the semi-structured questionnaires, and documentary analysis will be conducted in the embedded case commodity housing estates to explore the different types of urban community.

Hui Cheng

The application of polycentricity to the development of Chinese metropolitan areas

The term polycentricity originally emerged in the West, but with multiple meanings. More recently, the concept of polycentricity was increasingly invoked as a policy idea in seeking balanced development both within cities and more broadly regions. Fully functional edge cities have become a part of polycentric model used to try to create balanced development. Towards the end of 20th century, polycentricity and edge city, were introduced as new planning concepts into China. Subsequently a number of super/mega city-regions began to apply polycentric development spatial planning strategies designed to better facilitate more sustainable and balanced development. After more than ten years' development, there is, however, little research available on how successful this application has been, and it remains unknown whether Chinese edge cities at local level have been effectively planned and formed under the upper level polycentric strategy.

11.30-11.45

This research attempts to fill the gap by developing a conceptualization of the application of polycentricity and a methodology for investigating at both metropolitan and local scales in China. In particular the focus is to reveal and interpret the challenges and difficulties from the perspective of planning and development of Chinese edge cities. Methodologically, this research adopts an embedded case study approach. Data was mainly drawn from a documentary analysis of plans and interviews with key stakeholders.

This presentation is mainly to explore new and emerging polycentric patterns and features in Chinese mega city-regions at different scales, and discuss some of the findings on one of local level case studies.

Mark Davies

The Paradox of Decentralising Retail and Recentralising Policy: Investigating the Long Term Viability of the 'Town-Centre-First' Approach to Retail Development

11.45-12.00

Recent restructuring of the retail sector, as it adapts to meet the demands of today's digitally inclined consumer, has resulted in a renewed focus on the issue of 'decline' in Britain's town centres. In response, the Government has reiterated its support for the 'town-centre-first' approach to retail development, which seeks to limit the amount of development in off-centre locations through the use of a 'sequential test'. Given that this

policy was originally introduced in the mid-1990s, when the processes that were driving 'decline' were considerably different, this raises questions regarding whether such an approach remains viable today. This research seeks to make a contribution in this area through an examination and exploration of the contemporary usage of town-centre-first in planning. It will seek to understand how and why the 'town-centre-first' approach has become misaligned with the contemporary process of 'decline' and explore why it continues to remain a part of planning policy. It will also explore how the approach is actually used by Local Planning Authorities, investigating how local strategic responses are shaped by different 'knowledge sources' and 'normative practices' at the local level, before finally seeking to identify whether there is any evidence that different interpretations regarding the 'functional purpose' of town-centre-first impact on planning outcomes. Methodologically, it combines desk-based theoretical and historical analysis with primary research conducted into the contemporary practice of planning for retail development.

Madeleine Gustavsson

The Good Fisher: field, habitus, and capitals

13.00-13.15 Recent debates in fisheries social science have argued we need to understand social and cultural aspects of fisheries better. Inspired by the 'good farmer' literature and drawing on Bourdieu's thinking tools of habitus, field and capital the presentation will develop the conceptual idea of the 'good fisher'. First, the differences between the fishing and farming fields will be discussed, as well as looking at some of the implications this difference have on how we can draw on the 'good farmer' concept in developing the 'good fisher'. Second, the talk will look at how fishing activities can become visible, displayed and judged by others on a shared sea, which underpins the ways in which fishers can accumulate and demonstrate their symbolic capital and good fishing abilities. The findings draws on a qualitative analysis of life history interviews as well as participant observations taken place in a fishing community in North Wales. It will be concluded that the 'good fisher' is a useful conceptual framing in understanding the fisher individual in a broader social context.

Bertie Dockerill

A self-serving civic elite, retail palaces, and a quayside of squalor: Newcastle, 1835-1854.

13.15-13.30 This paper focuses upon Newcastle upon Tyne, the second case study with which the wider thesis is concerned. The paper questions the traditional interpretation of the redevelopment of Newcastle as one that led to the creation of a 'city of palaces'. Charting municipal progression from 1835 to 1854, it suggests that the glories of the redesigned Grey Street and central shopping area masked a worsening of conditions for the town's working-class population. Indeed, developers such as Richard Grainger noted that the concerns of such segments of the population were those of the elite. Increased spatial fragmentation led to sanitary conditions in areas such as Sandgate being ignored for many more years than in other comparable urban centres, such as Liverpool. This paper further suggests that the failure of the Liberal council to address sanitary concerns was a consequence of cronyism and a dominant political culture that placed personal aggrandisement above the needs of the general public. Faced with the town's worst ever cholera epidemic in 1853 and the destruction of swathes of the Quayside as a consequence of a manufactory explosion in Gateshead, the Corporation remained slow to react. Within the period addressed by this paper, it made only piecemeal inroads into the rehabilitation of notorious chares and alleyways which were homes not only to a largely transient population but also a largely unchecked trade in prostitution and vice. The paper concludes by reflecting on the locality-specific failings in the town's governance that allowed such conditions to continue unabated whilst, elsewhere in England, the construction of local authority social housing was imminent – advances that Newcastle would not enact until the early years of the twentieth century. In this way, therefore, the paper presages the need for both a more co-ordinated system of nationally-inspired regulation for issues relating to social housing and the regional variations that could emerge through a fractured system of local governance. Building upon the themes herein developed, next year's presentation will note how such deficiencies were addressed through a series of legislative instruments between 1890 and 1919.

Leo Singer

Multilevel modelling of the association between patterns of multimorbidity and their socio-spatial and temporal contexts

13.30-13.45 Multimorbidity refers to the co-occurrence of two or more chronic conditions in an individual. It has become a major and growing health issue in both rich and less affluent countries. While it takes the whole life time for multimorbidity to accumulate, the life course investigation into the development of multimorbidity is in its infancy. There is also a lack of social science perspectives on how social

and geographic contexts shape individual trajectories of multimorbidity. The existing causal models linking social determinants such as social class or education with disease may underestimate the role of social factors on individuals with multimorbidity.

Therefore my thesis aims to explore distribution and variation of multimorbidity in the population and over the life course, based on British longitudinal data sets. I will be using multivariate logistic regression and multilevel models. Life course trajectories will be developed by using longitudinal growth curve models.

Research questions:

1. **How does the distribution of multimorbidity in the population vary by individual characteristics?**
2. **How does the distribution of multimorbidity in the population vary by contextual characteristics?**
3. **Which characteristics shape the life course trajectories of multimorbid people?**
4. **Can the Generalized Health Impact model be extended over the life course?** *The hypothesis:* The effect of social determinants on individual morbidity is higher if the outcome is multimorbidity than if the outcome is each single disease on their own.

Phillip Leigh

Assessing the Socio-ecological Impact of Small Publicly Accessible Urban Green Spaces (SPAUGS) in Liverpool.

There is a growing body of evidence demonstrating the beneficial effects of urban green space on public health. A recent Faculty of Public Health report found lower all-cause mortality in areas with high concentrations of urban green space. Research in Copenhagen showed that 'pocket parks' promote socialisation and rest and restitution in their visitors. In Liverpool, the most deprived communities contain the least green space. Where space is at a premium, there is potential to develop Small Publicly Accessible Green Spaces (SPAUGS). These may not be publically owned but the public might be involved in their development and management.

13:45-14:00

The aim of this research is to evaluate the role of SPAUGS in improving public health within deprived communities in Liverpool. SPAUGS were identified in Liverpool's 10 most deprived wards. SPAUG typologies were developed and three wards identified for further detailed mapping. Detailed mapping informed decisions upon which SPAUGS to focus for field study. The SPAUGS selected for field study are located in a single Lower Super Output Area (LSOA) in the ward of Picton. It is in the top 1% most deprived LSOAs in the country. Some of the selected SPAUGS show evidence of community involvement in their development. Others are maintained by Liverpool City Council. A comparison of the socio-ecological impact of different SPAUG typologies will be made by employing observational studies, questionnaires and interviews. Results will inform future pragmatic land use for public health.

Sebastian Franke

Partnership Status, Health and Mortality: Protection or Selection?

Research on health and mortality by marital status shows lower mortality rates and better health for married persons in comparison to non-married individuals. Those differences, usually stronger for men than for women, persist even when controlling for sociodemographic and economic characteristics of individuals.

The rise in cohabiting couples, divorce rates and life expectancy; as well as a general change in household structures in Britain – invite a re-evaluation of these differences by focusing on health and mortality by different living arrangements.

14.00-14.15

This project analyses trends in mortality differences by partnership status in England and Wales, by applying hazard models to the 2001-census data from the ONS Longitudinal Study. The project investigates differences in overall and cause-specific mortality by partnership and examines the causes of those mortality differentials. It demonstrates that the increase in cohabitation leads to an under-estimation of mortality differences by marital status if cohabitation is ignored, as well as to an over-estimation of the mortality differences between married and cohabitants if age is grouped inappropriately. Using a competing-risk analysis of cause-specific mortality, it shows that mortality differences by partnership status exist for all causes, except cancer, especially at younger ages.

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	<p>Further, by looking at living arrangements rather than legal marital status alone, the project will show if health is a main reason for partnership status transition. This more in-depth analysis will be undertaken using the British Household Panel Study data. Multi-level equation survival models will be used to control for selection in and out of partnership statuses.</p>
14.15-14.30	<p>Adeleh Haghgoo TBC</p>
	<p>Kaisa Lahtinen Cities and consumer neighbourhoods</p>
15.00-15.15	<p>This research takes a data intensive approach to advance knowledge about neighbourhoods and their structures. The concept of neighbourhood can be very board and abstract, however it is still considered to be crucial in Social Science to further our understanding of urban structures and processes. However, in recent years the major expansion of available datasets relating to consumption has enabled urban researchers with an exceptional opportunity to identify, delineate and study neighbourhoods in new quantitative ways. This project is focused on creating neighbourhood boundaries with consumer data whilst at the same time evaluating the quality and appropriateness of the methods and data used. The three main objectives are: (i) to evaluate different regionalisation algorithms and look at ways to compare and quantify deviating results from a range of methods and/or runs when delineating neighbourhoods, (ii) to evaluate and discover the extent and type of bias that might be present in consumer data, and (iii) to delineate neighbourhoods using consumer data and to evaluate these extents against existing definitions of neighbourhoods. This project is utilising a range of geocomputation methods, in particular in the field of spatial analysis, focusing on methods defining area boundaries, such as regionalisation algorithms. This project is using novel data sources provided by the Consumer Data Research Centre (CRDC) focusing on data on consumption behaviour.</p>
	<p>Malaud Tafida-Isa Environmental Impact Assessment Follow-up: crude oil projects in Nigeria</p>
15.15-15.30	<p>Environmental Impact Assessment (EIA) was formally introduced in Nigeria through the promulgation of the Environmental Impact Assessment Decree No 86 of 1992. This decree made it mandatory for development projects in all the key economic sectors including oil projects. However, project specific follow-up has been neglected. This has not only undermined the role of EIA in aiding environmental management but has actually reduced EIA in many cases to a sheer exercise on paper.</p> <p>This work aims to study the current practices of EIA follow-up in oil projects in Nigeria and provide recommendations for its improvement. In order to achieve this aim, six objectives have been formulated. The work intends to make use of a combination of case studies situated in the Niger Delta area in Nigeria, interviews and literature reviews as its methods to draw data from its data sources.</p>
	<p>Yajie Xu Living with Food- to explore the Interactions between Urban Agriculture (UA) and Urban Citizens in China</p>
15.30-15.45	<p>In recent years, a significant proportion of Chinese citizens have shown preferences for participating in agricultural activities, as well as desires for farming experience. However, due to the limitations of cost, time, distance, location and government regulations, citizens have gained insufficient satisfaction of their will to take part in agricultural activities. Therefore, one of the major problems existing in the development of Urban agriculture (UA) in China is how to provide opportunities for citizens to meet their diversified demands of agricultural activities. This research will fill this gap, and make a contribution to both theory and practice by exploring the interaction between UA and urban citizens in China. Four key research questions have been identified. Firstly, to understand what UA is in China and to develop a better understanding of the current role that UA plays in citizens' daily life. Secondly to explore the challenges that UA projects face to encouraging citizens to participate? Thirdly to examine what mechanism can be used to improve the interactions between UA and urban citizens? And finally to identify the linkages between UA and human well-being? In terms of data collection, the research design for this project utilise a case study approach. Then, three commonly used methods have been selected (interviews, research observations, and surveys) for providing a mass of accurate primary data, and documental study was chosen to gather secondary data.</p>

09.00-09.15 **Marcelo Paes Gomez**
TBC

Caroline Harkin

Investigation of Continental Rifted Margin Structure using Deep-Seismic Reflection Data and an Integrated Quantitative Analysis

A continental rifted margin can be defined as the transition between oceanic and continental lithosphere resulting from the rifting of a continent and the subsequent evolution into sea-floor spreading. Thermal subsidence and sedimentation then alter the margins structure into what is seen today.

09.15-.0930 Three classical types of rifted margin exist: magma-poor, 'normal' magmatic and magma-rich. The main difference between the three is believed to be the volume of magmatism during formation. Magma-rich margins are formed with lots of igneous bodies that obscure the ocean-continent transition structure. Understanding the role of magmatism in the formation of these features and their effect on margin structure will help our general understanding of rifted margins.

One way to examine the structure of these margins is by using an integrated quantitative analysis (IQA) on deep-seismic reflection data. There are a series of methods that, when combined, make up the integrated quantitative analysis which consists of: gravity inversion, residual depth anomaly analysis, subsidence analysis and joint gravity and PSTM seismic inversion. Together these techniques investigate the structure of the margin, giving information on crustal basement thickness, Moho depth, lithosphere thinning factors and lateral density variations.

The south-east Indian margin, which has been thought of as a classic magma-poor margin, was analysed using the IQA method and found to be a composite margin with a complex tectonic history that involved a ridge jump and an influx of magmatism at ~120Ma resulting from the nearby Kerguelen plume and Rajmahal traps.

Anatasia Domina

The life-cycle of high-frequency internal waves in a continental shelf seas: generation, propagation, dissipation

Internal waves (IWs) have been recognised as one of the main drivers of climate controlling circulation, sustaining fisheries in shelf seas and CO₂-pump system. High frequency IWs are particularly important to internal mixing in the shelf seas. The origin, generation mechanism, propagation and spatial distribution of these waves are unfortunately still poorly understood since they are difficult to measure and simulate. In this study we aim to increase our understanding of high frequency IWs dynamics in shelf seas through a combination of observational (moorings, gliders, OMGs) and modelling methods (MITgcm), and test the hypothesis that Solitary waves are responsible for driving a large fraction of the vertical diffusivity at the shelf edge and adjacent shelf region.

09.30-09.45 Our analysis of two separate sites, both situated 20km from the continental shelf break, shows that the energetics of low frequency IWs differs slightly between sites, however, high frequency kinetic energy distribution is significantly different between sites as well as kinetic energy distribution from high modes. A high-resolution (50m horizontal) MITgcm configuration, forced with three different density structures, is validated using the observed IW characteristics and employed to identify the generation and propagation of IWs in the Celtic Sea. The model has shown that energy is transferred from lower to higher frequencies mainly through energy peaks and gradual cascades of energy. The mixing hotspots on the Celtic Sea have been identified by using calculated Froude number maps. The majority of 3D model domain has Froude number $O[1]$, which leads to generation of Lee waves.

Celestine Nwojji

Ecological functioning of fossil plankton during the warm period of the Early Eocene in the Central Pacific Ocean.

09.45-10.00 Microfossils from Ocean Drilling Program Leg 199, Site 1215A Cores H6-H8 have been analyzed for faunal assemblages and trait changes across the Paleocene-Eocene Thermal Maximum (PETM). The cores were collected from the Central Pacific Ocean at 5396 meters below sea level during the Paleogene Equatorial transect cruise aimed to study the evolution of the Paleogene Equatorial Pacific climate. The lithologic composition of the cores is mainly dark yellowish brown nannofossil clay with chert fragments in some sections. Microfossil extraction followed the conventional procedure of soaking, sieving and chemical treatment. Picking and trait analysis were done using the MEIJ phase contrast microscope and INFINITY analyser software. Foraminiferal assemblages are

dominated by benthonic communities and few planktonic groups which showed high level of weathering. This implies that the sediment was deposited within the lysocline transition zone. Some important taxa identified include; *Nuttallides truempyi*, *Nonion havanese*, *Tappanina selmensis*, *Globoturborotalia brassriverensis*, *Bulimina* spp, *Subbotina patagonica*, *Cibicidoides* spp. and *Globorotalites micheliniana*. Eight foraminifera traits were analyzed, these include; test composition, shape, chamber forms, ornamentation, living habit, aperture, sizes, and feeding habits. The preliminary result shows no significant relationship between trait composition and environmental changes during the early Eocene warm event in the cores analyzed. The high abundance of *Buliminids* and *Nuttalides* species indicates low oxygen concentration in the ocean floor and oligotrophic condition during the event. This ocean anoxia could be responsible for the total absence of dinoflagellate cysts in all the cores studied. There are also significant abyssaminids species richness that suggests a 3000 to 5000m paleodepth for the analyzed cores

Arthur Gourain

Copper distribution and speciation in Open Ocean

Copper (Cu) is a trace metal present at nanomolar concentration in Open Ocean. Cu concentrations in surface, below 1nM, are mainly driven by external inputs (atmospheric deposition, riverine discharge...), and, internal processes as scavenging and biological uptake. Copper is a micro-nutrient essential for phytoplankton growth but it is also highly toxic to phytoplankton, dependent on its bioavailable concentration. Both bioavailability and toxicity are dependent on the chemical speciation of copper, i.e. on the various forms under which Cu is present. Moreover, speciation impacts on the overall distribution by, e.g. preventing or reducing scavenging through organic complexation.

10.00-10.15 Knowledge of Cu speciation is essential to understand its typical distribution and depth profiles in Open Ocean. For instance, it is known that its concentration increases linearly with depth, similarly to Thorium, but the processes involving this special distribution are not fully constrained. The similarity between Th and Cu distribution could suggest that they are both affected by the same process, i.e. reversible scavenging, where copper is scavenged in surface and released progressively during particles settling in depth. Presence of strong ligands at depth could thus explain the trigger of particulate copper dissolution.

Copper speciation is studied using different electrochemical technics including pseudo-polarography by Anodic Stripping Voltammetry (ASV) using a Gold Microwire electrode and titration by Competing Ligand-Exchange Adsorptive Cathodic Stripping Voltammetry (CLE-AdCSV) using a Mercury Drop electrode. This presentation will present preliminary results related to these techniques.

10:15-10:30 **Amelia Murelio**
TBC

Louise Hawkins

Implications of a weak geomagnetic field ~370 million years ago

10.45-11.00 Geological samples have provided a robust record for the behaviour of the geomagnetic field for the past ~320 million years (Myr). It has been suggested that there is a pattern to the variation in the field's behaviour on timescales of 10-100Myrs. Whole-mantle convection operates on these long timescales and controls heat flow from the outer core, where the field is generated. Numerical modelling supports the theory that changes in the total heat flow or to the spatial variation heat flow across the core-mantle boundary could change the strength of geomagnetic field and the frequency at which the magnetic poles switch places (a geomagnetic reversal). A transition in geomagnetic field from 170-120Myr shows a rapidly reversing, weak field becoming a strong, stable field with a lasting single polarity of 10's of millions of years, known as a superchron. This transition suggests a) that geomagnetic field strength and reversal frequency may be coupled and b) that this transition in field behaviour may be evident preceding other superchron, which occur every ~180Myr (for the last 600Myr). The nature of the geomagnetic field preceding the earlier Permo-Carboniferous Reversed Superchron (262-318Myr) has been poorly understood because of a lack of data. New evidence for the strength of the Late Devonian geomagnetic field comes from Microwave and Thermal palaeointensity experiments on samples from the Viluy Large Igneous Province, Siberia (~376-364Myr). These measurements suggest that the field was up to an order of magnitude weaker than the present day field, in agreement with the expected behaviour based on the field at 170Myr.

Benjamin Phillips

Role of morphology in controlling wave overtopping volume through a sea defence breach

Considering the probability of a given wave height (H_s) and water level (WL) occurring together provides a better understanding of flood risk to an area (Wadey et al., 2015). Therefore, different combinations of H_s and WL may have the same joint probability of occurrence, but cause different severities of flooding (Prime et al., 2016). Along with this uncertainty, the response of a beach during storm conditions is also likely to influence the volume of water overtopping a sea defence. This research aims to use a storm impact model (XBeach) to determine how the role of these beach changes (morphology) impacts on wave overtopping volume, to better inform flood modelling.

11.00-11.15 We selected four joint probability combinations of H_s /WL and used the following morphology scenarios: Morphology enabled, morphology disabled, and profiles extracted from before and after the storm with morphology disabled. Breaches occurring 60/30/15 minutes before high water (HW), at HW, and 15 minutes after HW were applied to Scenario 12 (the most severe wave overtopping).

Wave overtopping for the various H_s /WL combinations and morphology scenarios (no breach applied). Where the defence does not fail, it is clear that morphology results in greater wave overtopping under high H_s conditions. Where the water level is higher, and the waves smaller, wave overtopping is more severe where morphology is disabled. This has implications for flood modelling, if the applied model does not account for storm impact. In turn this may have implications for flood risk management, if the modelling approach underestimates wave overtopping volume.

Guðjón Helgi Eggertsson

Mechanical and permeability constraints for improved geothermal reservoir exploitation at Krafla, Iceland

The goal of this study, titled “Mechanical and permeability constraints for improved geothermal reservoir exploitation at Krafla, Iceland”, is to constrain the mechanics of the reservoir rocks in the Krafla geothermal system. The experimental work will describe the response of the lithologies at Krafla to different conditions of stress and temperature, and will constrain the permeability of the reservoir rocks (intact & broken) at natural conditions. This constraint will seek to bridge the knowledge gap on “hot rock permeability” for more efficient exploitation of the Krafla reservoir.

11.15-11.30 The study further aims to understand how fluid flow efficiency of the reservoir rock increases with thermal stimulation by water injection as well as during tectonic rifting events. The mechanical dataset obtained, by using conventional rock mechanical and permeability tests, supported by novel high-temperature triaxial apparatus, will further contribute to current collaborative efforts to constrain magma reservoir conditions targeted by the Krafla Magma Drilling Project which aims to increase our understanding and ability to detect magma residence as well as the efficient and safe utilisation of this high thermal anomaly for increased geothermal production.

During a field survey in fall 2015, and through information gathered from previous drilling exercises, five main rock types were identified and sampled to carry out this study. Room temperature tests have been carried out for all lithologies, that includes their porosity, permeability, uniaxial compressive strength and tensile strength.

Poonperm Vardhanabindu

Using Structure from Motion to Characterise the Behaviour of Soil Erosion

Being able to parameterise the surface roughness, so as to predict the hydraulics of overland flow, is crucial for understanding the probability of soil detachment. Surface roughness is dictated by the complex, micro-topography of the soil surface. Existing methods to characterize the surface roughness are unable to accurately measure the small-scale surface changes that occur due to soil erosion. Furthermore, these methods are expensive both in terms of cost and labour time. In this study, an image-based three-dimensional reconstruction method known as ‘Structure from Motion’ (SfM) is adopted to acquire a high quality elevation model (DEM) at an exceptionally low cost. The study was carried out using flume experiments to simulate overland flow by water and by acquiring images of changing surface conditions to reconstruct the micro-topographic changes. The experiments reveal that the ability of SfM is substantial. Over an area of 250 x 250 mm the method is able to produce a dense point cloud of bed elevations as small as 0.75 mm. This reveals that we can measure the

11.30-11.45

micro-topographic changes due to sediment detachment and subsequent rill formation at a resolution and error level that far exceeds the standards of existing methods. Thus SfM is an exciting method for examining flow-bed interactions in soil-erosion research.

Valerie Le Guennec

Investigation of the role of anthropogenic forcings in modulating biophysical interactions in the Black Sea using a 'state of the art' coupled hydrodynamic-ecosystem model

11.45-12.00

The simplest representation of trophic interactions locate autotrophic organisms (e.g. phytoplankton) at the basis of the trophic chain. They are then consumed by heterotrophic organisms (e.g. zooplankton) which are themselves eaten by bigger predators. Zooplankton organisms, situated at the mid-level of the trophic chain are getting more and more harvested in many regions of the world. Especially on the Black Sea, a good candidate is the copepod called *Calanus euxinus* which can form dense aggregations. The Black Sea is well known to be anoxic below a permanent pycnocline (around 180 m depth). This basin has been subjected over the last decades to diverse human pressures (riverine pollution, over_fishing and species introduction) leading to severe eutrophication issues and drastic changes of the ecosystem. Our project focuses on the impact that zooplankton extraction could have on the ecosystem of the Black Sea which is already under several pressures. The first objective is to understand the controlling processes affecting phytoplankton dynamics on seasonal and interannual time scales. We focus on chlorophylla, a good proxy of phytoplankton biomass extracted from satellite observations. The second objective is to assess how the biomass of copepods responds to changes in eutrophication and climatic forcings using a coupled hydrodynamic-ecosystem model (ERSEM coupled GOTM). The final goal of the project would be to investigate how the variability of copepods biomass due to both variability in physical forcing (including that due to climate change) and commercial extraction may impact lower trophic level interactions and the biomass of other key species. Keywords: Black Sea, Chlorophyll, Eutrophication, Climate change, Phytoplankton, Zooplankton, Modelling

Michael Allen

Seismic cycle sealing on the Alpine Fault, New Zealand

The Alpine Fault, a transpressional plate boundary between the Australia-Pacific plates, is known to rupture periodically (200-400yr) with large magnitude earthquakes ($M_w \sim 8$) and is currently locked at the end of its latest interseismic period. Processes such as fluid-rock interaction and mineral growth alter the physical properties of faults, influencing the timing and nature of seismicity. The aim of this study is to investigate the sealing behaviour of the fault via carbonate mineralisation, determining the temporal and spatial variation of deformation microstructures and geochemistry.

12.00-12.15

We present microstructural observations on fault rock lithologies recovered during the Deep Fault Drilling Project. Drilling revealed a typical shallow fault structure overprinted by a zone of alteration, a record of enhanced fluid-rock interaction on a currently low permeability fault. Carbonate mineralisation is concentrated within coseismic fractures/shears within the fault core. Through Electron Backscatter Diffraction (EBSD), Cathodoluminescence and Secondary Ion Mass Spectrometry multiple episodes of fracture generation and mineralisation have been recognised.

Earlier carbonate generations exhibit dull CL, high Fe concentrations and have accommodated extensive deformation (intense mechanical-twinning, cataclasis and dynamic recrystallization via hydrolytic weakening). Younger generations, attributed to the most recent seismicity, exhibit bright CL, greater Mn concentrations and little deformation. These results support the lack of stable creep between rupture events on the central Alpine Fault.

Sumia Abdualhadi

Quantifying the Uranium Series Disequilibrium using gamma-ray spectrometry

12.15-12.30

This study is aimed at the determination of the activity concentrations of radionuclides from U-series decay and hence quantifying possible disequilibrium in different environmental samples collected from different locations. Representative samples have been collected and analysed via high-resolution gamma-ray spectrometry using a hyper-pure germanium detector, BEGe-2825 model. This detector covers a wide range of gamma-ray energies (3 keV – 3 MeV). Gamma-ray transitions lines ranging from 46 keV up to 1.7 MeV associated with decay products from U-series decay have been analysed separately to obtain more statistically significant overall

results.

In the measurements of environmental samples using gamma spectrometry, the main concern is a reliable efficiency calibration. This is crucial especially for the analysis of low energy gamma emitters (<100 keV). ^{210}Pb (46 keV) and ^{234}Th (63 keV and 92 keV) are examples. Modelled efficiency calibrations using the LabSOCS software were applied within this work. A series of validation tests was performed and evaluated for different sample types, densities and volumes. Using this method, a significant improvement can be obtained in the reliability of the derived activity concentrations. Some of the measured samples were found to be in disequilibrium as a result of excess in ^{226}Ra activity concentrations. Notably, these samples were collected from an area in Namibia where leaching of radium has taken place. In the remaining samples the results showed secular equilibrium.

Fiona Russell

Developing palaeolimnological records of organic content (DOC and POC) using the UK Uplands Waters Monitoring Network

Monitoring programmes have shown increases in concentrations of dissolved organic matter (DOM) in the surface waters of northern and central Europe (Monteith et al. 2007), and negative impacts of the browning of lake waters have been reported for fish populations (Jonsson et al. 2012, Ranaker et al. 2012) and for ecosystem services such as water treatment (Tuvendal and Elmqvist 2011). The exact causes of recent browning remain uncertain. There is a need to better understand the pattern, drivers and trajectory of these increases in DOC and POC in both recent and longer-term (Holocene) contexts to improve the understanding of carbon cycling within lakes and their catchments.

13.00-13.15

The UK Upland Waters Monitoring Network (UK UWMN) sites have been monitored quarterly for organic carbon since 1988. Here four of those sites (Llyn Cwm Mynach, Scoat Tarn, Loch Grannoch and Loch Chon) are visited, with sampling focused on the sediment water interface and very recent sediment (approx. 200years). At Llyn Cwm Mynach a longer record (11.5K years) has been obtained to assess equivalent patterns through the Holocene.

Analysis of the gravity cores have focused on measuring and characterising the organic content for comparison with recorded surface water DOC measurements (UK UWMN). Data from pyrolysis measurements (TGA/DSC) shows that loss of mature humic substances (mass loss between 330-415°C) correlates well with observed trends in DOC trends in surface waters. Exploration of this data on the longer record show possible phases of elevated mass loss of mature humics paralleling fluxes in the supply of eroded catchment materials.

Luke Wooldridge

Biofilm origin of clay coated sand grains: Understanding the fundamental processes governing the origin and distribution of clay-coated sand grains in petroleum reservoirs through a modern day analogue

The ability to predict the occurrence of clay coated sand grains is essential in the exploitation of deeply buried anomalously high porosity hydrocarbon-bearing sandstones, resulting through the inhibition of the normally ubiquitous porosity-occluding quartz cement. However at present there is limited understanding of the origin of clay coats and no all-encompassing predictive model of clay coat abundance and distribution at a facies scale. To address this, we focused on the distribution and origin of clay-coatings in a modern sedimentary environment as a crucial step towards building a predictive capability.

13.15-13.30

This study adopted a high resolution analogue approach using the Ravenglass Estuary system, NW England, UK. The work involved analysis of the modern sedimentary system, including mapping surface sedimentary bedforms and bioturbation-intensity, grain size analysis and shallow cores. A range of scanning electron microscopy techniques were employed to characterise surface and core sediment samples in unison with Raman spectroscopy to study characteristics of clay coats on sand grains.

These exceptional data sets have produced unique and highly detailed maps that have started to reveal the pivotal role that biofilms (specifically diatom generated) play in the formation and distribution of detrital clay coated sand grains. Illustrating an original mechanism of clay coat formation. The results of which can be applied to aid the prediction of advantageous grain coating chlorite in sandstone reservoirs and thus facilitate prediction where the degradation of reservoir quality in ancient, deeply-buried petroleum reservoirs by quartz cement has been inhibited.

ABSTRACTS SCHEDULE

13.30-13.45 **Minxuan Feng**
TBC

Anthony Wise
Ocean to Coast: Impact of Deep Ocean on UK Coastal Sea Level

By 2050 there will be 9 billion people on Earth. With populations growing fastest in coastal mega-cities, many will be vulnerable to flooding. Global mean sea level is predicted to rise by 56-200 cm by 2100 and understanding the coupling between open ocean and shelf seas is critical to understanding the impact of global mean sea level rise on the UK coastline.

13.45-14.00 The continental slope acts to insulate shelf seas from deep ocean changes and traps wind-driven changes on the shelf. Intuitively however, a sea level discontinuity between the ocean and shelf does not exist. We can describe the adjustment which takes place along the interface with waves that are trapped by the coast and which travel alongshore. How this theory integrates with our understanding of the deep ocean circulation, and how this will impact our ability to predict shelf sea responses to sea level changes driven by heat and wind are active questions.

Numerical models using resolutions fine enough to resolve the dynamics on the slope are a developing resource available to investigate these questions. Using NEMO, a state-of-the-art ocean modelling framework, a 3-dimensional model with idealised depth profile representing the ocean-slope-shelf geometry is used to run multi-year simulations investigating shelf sea responses. Initially the role of ocean forcing (temporal and spatial variation) and the decay of the on-shelf waves is investigated. Future work will include varying the level of realism, such as the shelf-slope geometry and variability alongshore.

Joe Gardner

What kind of creep would do that? The link between metamorphism and deformation in mid-crustal rocks

14.00-14.15 The way rocks have deformed is recorded in the microscopic structures they exhibit. In the mid crust rocks can deform without breaking. Instead, they flow in response to stress, i.e. they deform viscously. One of the most useful tools in distinguishing between the two main viscous deformation mechanisms is traditionally thought to be the presence or absence of a crystallographic preferred orientation (CPO). Dislocation creep, where slip without breaking occurs along weak planes in a mineral's structure, leads to the development of a CPO, because during deformation slip planes become aligned. Diffusion creep, where shape change is accommodated by diffusion of material, is thought to lead to grain rotations that wipe out any pre-existing CPO.

We use electron backscatter diffraction (EBSD) to collect crystallographic orientation data from feldspar in deformed rocks from the Italian Alps. At the P-T conditions of the middle crust feldspar should not deform by dislocation creep, as temperatures are too low for crystallographic slip systems to be active. However, EBSD reveals strong CPO domains in the feldspar matrix. We suggest these domains are inherited from original parent grains. Inheritance occurred during metamorphism by epitaxial nucleation (product grains 'borrowed' the parent crystal lattice to make nucleation easier). This orientation has subsequently been preserved during intense deformation accommodated by fluid-assisted diffusion creep. Our data suggest we cannot infer a dominant deformation mechanism simply from the presence/absence of a CPO.

Nealy Carr

Distribution, Source and Fate of Dissolved Organic Matter in Shelf Seas

Dissolved organic matter (DOM) is a complex array of molecules containing carbon (DOC), nitrogen (DON) and phosphorous (DOP), and represents the largest pool of organic matter in the marine environment. DOM in the sea originates from a variety of sources, including allochthonous inputs of terrestrial DOM from land via rivers, and autochthonous inputs through *in-situ* biotic processes that include phytoplankton exudation, grazing and cell lysis. Marine DOM is a substrate for bacterial growth and can act as a source of nutrients for autotrophs. However, a large component of DOM is biologically refractory. This pool is carbon-rich and nutrient-poor, and can transport and store its compositional elements over large areas and on long time scales. The role of DOM in the shelf seas is currently unclear, despite these regions being highly productive ecosystems, as well as acting as conduits between land and open ocean.

14.15-14.30 Using samples collected across the Northwest European Shelf Sea, we studied the distribution of DOM using a

combination of analytical tools, including DOM absorbance spectra and excitation emission matrices, in conjunction with parallel factor analysis (PARAFAC). By using observations of the optical properties of DOM as proxies for DOM source and lability, we found cross shelf gradients in DOM composition. There were strong relationships between DOM and salinity, DOC and humic-like DOM and, freshly produced marine DOM and primary production. Our findings illustrate the dynamic nature of DOM in shelf seas and highlight the potential for DOM to play a key role in transporting carbon in these regions.

Jennifer Evans

A Coupled Model of the Bay of Bengal: Impact on Storm Surge Forecast

Storm surges and extreme waves associated with tropical cyclones are a major cause of coastal flooding in the Bay of Bengal and can be devastating both in terms of loss of resources as well as loss of life. Previous work has focussed on 2-way interactions between the intense winds and the heat content of the ocean, whereas I am also including the impact of waves to explore unique characteristics of tropical cyclones in the Bay of Bengal.

14.45-15.00

Using WRF (Weather, Research and Forecast), an atmospheric model, very fine resolution simulations of tropical cyclones can be produced giving more accurate and detailed wind fields, particularly near the eye of the storm. These fine resolution wind fields are used as input to ocean model POLCOMS (Proudman Ocean Laboratory Coastal Ocean Model System) and wave model WAM (Wave Model). The models are coupled one-way with the atmospheric model forcing the ocean and waves models, allowing the impact of the increased resolution atmospheric forcing to be assessed. Storm surge and wave data from the ocean models using the finest resolution data has been compared against simulations using coarse resolution data from WRF both in terms location and magnitude of the waves and surge.

The fine resolution wind forcing may allow improved forecasting of these extreme events and give more detail on the associated hazards. However, this comes at a cost. Currently, this approach is too computationally costly to be operationally valid. This work may help focus operational improvements by assessing the importance of specific elements (e.g. fine resolution winds in specific areas of the cyclone) for an operational coupled forecast model, or fine resolution climate simulations.

SIMON MARTIN

Investigating magma flow within intrusions: Insights from magnetic anisotropy

Investigating the factors that influence magma flow dynamics within intrusions is important for understanding how magma migrates through the crust and erupts at the surface. Studying extinct volcanoes where erosion has exposed their plumbing systems provides insights into the final stages of magma movement.

15.00-15.15

Fieldwork was conducted in a disused quarry near Invertope, Isle of Skye, Scotland, to study how magma flow is preserved within intrusions. At this location two sills from the Little Minch Sill Complex (c.60 Ma) intrude into Jurassic sediments. The sills are 6 to 40 m thick, their contacts defined by contrasts in jointing frequency, crystal layering, occurrence of gabbro lenses and variations in mineral proportion, size and composition. Two dykes cross-cut the site striking approximately 170°.

Closely-spaced sampling was carried out on one of the sills to analyse variations in the magnetic fabrics across the thickness of the intrusion. Anisotropy of Magnetic Susceptibility (AMS) and Anisotropy of Anhyseretic Remanent Magnetisation (AARM) techniques were undertaken applied to 150 samples. The with results showing that AMS and AARM tensors have a long axis parallel to the sill margins, though the AARM data have up to 45° variation in the horizontal plane. Rock magnetic analyses suggest the magnetic behavior originates from a multi-domain, low Ti-titanomagnetite source. The analysis suggests magma flow was in a North-South orientation throughout magma solidification, this is aligned with the Cullin Hills which were contemporary magma chambers located to the South.

Charlotte Lyddon

Tide-surge interaction in generating extreme water levels in a hypertidal estuary

Coastal zones worldwide are subject to short term, local variations in sea-level, particularly communities and industries developed on estuaries. Astronomical high tides, meteorological storm surges and river flow present a combined flooding hazard. This can elevate water level at the coast above predicted levels, generating extreme water levels. These contributions also interact to alter the phase and amplitude of tides and surges, and thus cause significant mismatches between the predicted and observed water level. The combined effect of tide, surge, river flow and their interactions are the key to understanding and assessing flood risk in estuarine

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- 15.15-15.30 environments for design purposes.
- Delft3D-FLOW, a hydrodynamic model which solves the unsteady shallow-water equation, is used to assess spatial variability in extreme water levels for a range of historical events of different severity within the Severn Estuary, southwest England. Long-term tide gauge records from Ilfracombe and Mumbles and river level data from Sandhurst are analysed to generate a series of extreme water level events, representing the 90th, 95th and 99th percentile conditions, to force the model boundaries. A filtering method is applied to “de-tide” the residual total water elevation. The filtered surge component is recombined with tidal and river events in a sensitivity test, to see how the interactive processes influence the timing of extreme water level across the estuarine domain. The results can be used to understand the spatial variability in extreme water levels relative to a tide gauge location, which can then be applied to other management needs in hypertidal estuaries worldwide.
-
- Eugenio Ruiz**
The effects of changes in agricultural land use and landscape structure on catchment flow and sediment generation
- Rural environments in the UK have experienced significant changes over the last century, mainly influenced by human agricultural activities. From the period 1961 – 2005 there have been changes in the crop area, such as large increases in areas planted with wheat. However in the last decade this tendency had been stabilized. By 2013 the area cover by agriculture was about 71% of the total land. Recent flooding in the UK has focused attention on the role of agricultural land use and management on catchment flow generation. Furthermore, the requirements of Water Frame Directive necessitate a better understanding of runoff generation, soil erosion and sediment transport in agricultural environments to enable effective targeting of resources to reduce diffuse pollution from agriculture.
- 15.30-15.45
- The aim of the thesis is to quantify the effect of changes in agricultural land (extent and arrangement), agricultural land use practices and landscape structures on event-scale catchment flow and sediment generation. A second aim is to model land management scenarios that reduce flow and sediment output under both contemporary and future climate conditions. This includes investigation of both land use and structure scenarios to better understand how both agricultural activities and their position in the landscape affects catchment flow and sediment exports.
- A physically-based spatially-distributed model (SHETRAN) will be used to simulate hydrological, erosion and sediment transport processes in the study catchments. Flow and sediment generation will be simulated with calibration against flow and suspended sediment data available at the catchment scale for one stream in southern England.
-
- Simon Clark**
Risk of river flood inundation under climate change: assessment of the relative effects of changes in plant growth and flood regime on conveyance
- Climate change is expected to expose human populations to flood risks of increasing intensity and frequency (IPCC, 2014). A key yet neglected component of modelling river discharges are macrophytes (aquatic vegetation). Previous research implicates macrophytes as significant factors in exaggerating flood risk through momentum absorption, turbulence generation, and reducing channel capacity (Majoribanks *et al.*, 2014). However macrophyte-flow relationships are complex with uncertainty surrounding how they may influence flood risk estimation. This uncertainty has led to river management practices which overlook the many and varied relationships between plant and flow, as such they have unclear outcomes on flood risk and may stress river amenities (Greer, 2014). This project aims to develop a flood prediction model, drawing upon techniques from computational fluid dynamics and finite modelling. The overall aim is to simulate the impacts of macrophytes on flood risk through seasonal changes in biomass under climate change in the UK. The model is being built using TELEMAC 3D, an industry-standard model capable of calculating three-dimensional free surface flows. The project will focus initially upon the impacts of the macrophyte *Sparganium erectum* (branched bur-reed), known for its high hydraulic resistance and commonly found in UK rivers (Liffen *et al.*, 2011). Model outputs will consider alterations to river discharge and consequently flood risk with changes to bur-reed populations. Including macrophytes in 3D flood risk models will enhance the precision to which climate change will increase flood risk for human populations as rising temperatures alter vegetation growth and river discharge.
- 15.45-16.00
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Phillip Sapiro

The Geography of the Anglo-Jewish Population in the Twenty First Century: Characteristics, Spatial Distribution, Comparisons, and Trends

Key areas being examined are: variations in socio-economic and demographic characteristics across the country; changes in spatial distribution; determinants and patterns of internal migration; pulling these issues together to speculate about the future; and comparing the patterns for Jews with other similar-sized ethnic or religion-based groups.

Three elements have been completed, including a geodemographic classification of England and Wales, based on the demographic and socio-economic characteristics of Jewish residents. Seven distinct classes were identified – two covering inner urban Jews; two covering orthodox enclaves; and three encompassing suburban and coastal places of residence.

09.00-09.15

The second element is the retro-fitting of the 2011 classification to data from the 2001 census. This showed that 80% of the analysis areas (and Jewish population) fell into the same class in both censuses with a strong spatial factor to those analysis groups which changed category. The approach has allowed projections for the future size of the Anglo-Jewish population be prepared.

Thirdly, work on the determinants of internal migration has found that, after controlling for individual characteristics and region, a 5% 'cultural penalty' applies to Chinese, Arab, and Sikh propensity to move between 2010 and 2011. The absence of a penalty for Jews may relate to their longer-established presence in Britain.

Work continues on geographical aspects of internal migration of small groups considering such issues as counter-urbanisation, north-south drift, migration effectiveness, impact of distance on inter-community moves, and influences on destination choice. Investigations into inter-censal changes in spatial distribution of small groups, and analysis of dispersal or congregation are also ongoing.

Rebecca Allan

Unravelling Urban-Rural Health Disparities in England: Context or Composition

Background: Research presents significant health variations by residential context. Numerous studies report better health amongst rural populations in comparison to urban, whereas other research depicts the opposite. Upon investigation researchers are faced with a fundamental issue, that there is no universally accepted definition of what constitutes rural. As a result, academics suggest that any health variations reported could potentially be a data artefact.

Aims: To investigate health variations in England by residential contexts and the causes of such differences. Further, to examine the sensitivity of results according to differing rural-urban classifications.

Methods and Results: Using individual-level data from the 2001 UK census and applying logistic regression, utilising multiple rural-urban classifications, we demonstrate significant health variations by residential context. A clear gradient is apparent, with levels of limiting long-term illness increasing parallel to growing urbanisation. Unexpectedly however, London residents as a whole possess better than anticipated health, particularly those in outer London, with individuals holding health expectations similar to those in the most rural locations. Once we control for individual socio-demographic characteristics, variations between residential contexts significantly reduce; however, marked differences remain. The persistence indicates that although health variations are influenced by compositional factors, contextual issues play a significant role. Rural populations continue to have better health than that of urban, supporting the existence of a positive urban-rural health gradient, with the exception of the capital.

09.15-09.30

Further, it is evident that health variations across the continuum are significantly influenced by the classification utilised. Thus, the way in which locations are defined is extremely important, and any investigation must justify objectively the classification practiced.

ABSTRACTS SCHEDULE

Charlotte Beattie

Working Title: Parallel line or one-way flow?

09.30-09.45

In light of the case study analysis by (Hayes et al, 2014) and wider discussion of literature it is considered that there is a strong case to argue for the potential of SA and SEA to contribute to flood management in spatial planning. The research will aim to build on the research evidence from (Hayes et al, 2014) which identified wider research potential in the wider role of Sustainability Appraisal (SA), the over reliance on probabilistic information and need for a multiple perspective analysis of impact assessment tools. It will focus on the wider role of SA and Strategic Environmental Assessment (SEA) since the implementation of significant legislation changes in form of Flood Risk Regulations (2009) and Flood and Water Management Act 2010 and EU Floods Directive 2007/60/EC, specific requirements and focus on the assessment and management of flood risks, assessment, maps and flood risk management plans and remit of the SEA Directive 2001/42/EC. The research will explore the opportunity and linkages between directives and further analyze the wider role of SA of flood risk management in development plans and SEA in flood risk management plans. It will use a case study evaluation on the quality and scope of evidence base, strategic objectives and analytical assessments and procedures as impact assessment tools and their influence on policy outcomes and decision-making. It will challenge simplistic rational approaches around “policy integration” and “greater information creates better decisions”.

Brian Williams

“That We May Live”: Pesticides, Race, and Agricultural Development in the US South

09.45-10.00

In this paper, I engage with two paradoxes of mid-twentieth century pesticide-intensive agricultural development in the US South. First, pesticides played a significant role in a shift from a racialized sharecropping labor regime to capital-intensive agro-industry, yet this shift occurred in the context of widespread white resistance to the civil rights movement, and preserved profound levels of racial inequality. Secondly, pesticides were (and are) articulated as technologies deployed to foster plant life and human life, yet are definitionally intended to destroy life. This research asks how these paradoxes help us understand the development of industrial agriculture in a place like the Yazoo-Mississippi Delta, a majority-black agricultural region bordering the Mississippi River. Through discourse and content analysis of agro-industrial publications, US Department of Agriculture documents, US congressional records, and a pro-pesticide 1966 text by Mississippi Congressman Jamie Whitten, I derive two initial conclusions about these pesticide paradoxes. First, I contend that the politics of pesticides were enabled and even abetted by national developmental and geo-political discourses of productivity which served as a sort of anti-politics of agriculture—a chemical fix for so-called “social problems”. Second, I suggest that the so-called “unintended consequences” of pesticides as a technology targeting life made them particularly tractable to the articulation of the racial politics of agriculture in the US South with international geopolitics, and that their emergence can be put in the context of a *continuing* Green Revolution in the US South.

Philip Monaghan

Cleaner Production Enterprise Zones: gold dust or fool’s gold for sustainable cities policy?

10.00-10.15

An Enterprise Zone (EZ) based on cleaner production is an increasingly popular government policy to accelerate the sustainable cities agenda.

The purpose of this presentation is to critique EZ theory and the credibility of policy transfer to sustainable production in cities.

I have undertaken a literature review on EZ theory; produced a survey of cleaner production EZs to highlight its application in England; and developed a conceptual framework for a triple bottom line form of EZ.

Based on these findings I argue that for the credible transfer of EZ theory to the sustainable cities agenda, policy should align to my conceptual framework for an Ecological Empowerment and Enterprise Zone (EEEZ).

Key words: Sustainable cities; Industrial strategy; Deregulatory incentives

Kush Thakar

Quantifying the Economic Value of Data obtained from River Gauging Stations in Scotland: A Users' perspective.

10.15-10.30

River gauging stations are used to monitor water levels at approximately 392 sites across Scotland. Data on river levels and flow is observed and analysed by a diverse range of industrial, academic, public sector, civil society and recreational groups; but, most importantly, Category 1 Emergency Responders and local populations are reliant on the data produced by the gauging stations to provide flood warnings. Data from gauging stations also informs the management of water resources to help meet EU Water Framework Directive objectives, the design of new infrastructure on floodplains, and is increasingly used by scientists and policy practitioners to understand the impacts of climate change. Hydrometric data is thus a public good accruing benefits well above its market value, but to date no quantified assessment of its economic benefits has been made. The aim of this project is to estimate the value of the data collected from river gauging stations in Scotland using non-market valuation techniques, specifically Choice Experiments (CE). This presentation will outline some of the key design and estimation issues encountered in the study.

Xinkai Wang

Tomorrow's Eco-city in China: Improving Eco-City Development in a Culture of Collaborative Communication

11.00-11.15

The delivery of Chinese Eco-city has met certain challenges in the plan-making and the subsequent implementation of the planning documents. Meanwhile, communicative and collaborative planning has been advocated as a method that can assist in decision-making and the facilitating urban development in China. But in the development of 'Eco-city', the communicative and collaborative planning has met certain barriers to its implementation, thus played a limited role in the planning system. This research examines whether the communicative turn has occurred in the delivery of Eco-city, as a trend of sustainable development in China, how communicative and collaborative planning could help to improve the development of Chinese Eco-cities, and if so through what methods. To provide an update of the difficulties of communication and collaboration in planning work, the programme of Sino-Singapore Tianjin Eco-city and Shanghai Dongtan Eco-city are reviewed and compared since Tianjin Eco-city was approved as one of pilot areas of developing Eco-cities by the central government, and Dongtan Eco-city was suspended and failed to achieve its original vision. Also, along with the emerging technologies, local authorities are facing new challenges and opportunities on adopting communicative and collaborative planning. The study concludes that an extensive implementation of communicative and collaborative planning through both traditional and emerging technologies is required to reconcile the diverse interests of stakeholders and address the multi-disciplinary issues in the sustainable development of Chinese Eco-city.

Yelena Mikhaylova-O'Connell

Proximities of care: Exploring the spatial relations of voluntary and technological support for those living with dementia

11.15-11.30

The focus of the study is voluntarily and technologically delivered dementia care in the context of profound social care budget cuts which are being gradually implemented by the current UK government. The project aims to explore and define specific geographies of dementia care present in Liverpool through the study of local conditions and their interaction with broader social care policy trends. For this purpose the study is carried out in partnership with a CASE organisation providing voluntary befriending support to people living with dementia and their carers.

The geographical emphasis of the study is on micro- and meso- levels and on the interactions present within and between them. In this context the ways in which care relationships are constructed, shaped and reshaped and the impact of assistive technologies on independent living are examined. Themes emerging from empirical work carried out to date indicate unease around the changing role of volunteer befrienders in dementia care delivery, concerns among care staff about possible job losses due to technology expansion, and the importance of design in the adoption of wearable technology.

Findings will contribute to the development of care practice around the use of voluntary and technological means to support independent living at a localised place-based level.

Yangnan Guo

Build multifunctional urban green space system for Chinese urban populations combining green infrastructure ideas

11.30-11.45

An urban green space system (UGSS) plan is required to be prepared for each Chinese city, setting out plans for networks of UGS that bring ecological and environmental, social and economic, as well as, landscape and cultural benefits. UGSS planning relies on quantitative indexes, which can lead to efficient implementation, but has been criticized to have not addressed the quality of UGS to the same extent. Correspondingly, a number of challenges for UGSS planning have been identified: UGS shortage in medium-to-small-sized cities, unbalanced spatial distribution, lack of public consultation and the inappropriate occupation of UGS. In face of these issues, some well-developed cities (Beijing, Shanghai and Guangzhou) have started using innovative green infrastructure (GI) approaches (greenways and vertical greening). Therefore, current research is going to investigate how the China's UGSS have been developed with multifunctionality and public use as key planning/design principles and to establish whether there is a perceived public needs from various types of UGS (parks, street greenery and residential green spaces). Meanwhile, efforts will be made to identify and evaluate potential/methods of combining innovative GI approaches into local UGSS planning to better fulfil public needs of UGS. A case study approach will be used, focusing on medium-to-small-sized cities¹. The data collection methods will include: documentary analysis, interviews with local planners and planning professionals, questionnaires with public and observational studies. Comparisons will be made among qualitative data collected through different methods, while SPSS will be used to analysis the quantitative data.

Alina Pelikh

Mobility of Young People During the Transition to Adulthood in Britain

11.45-12.00

This paper examines the life course trajectories of young people in England and Wales, who began their transition to adulthood in the era of neoliberalism, with a special focus on moving trajectories. British pattern of the transition to adulthood is usually characterized by early transitions from school to work and heterogeneous household and family formation. The goal of the research is to look at the dynamics of cohort and gender changes in mobility among young people, controlling for both personal background characteristics (such as parental socio-economic status, region of birth) and interaction with other life domains, such as employment, education and partnership histories. For the analysis I use data from 18 waves of the British Household Panel Survey (BHPS), an annual survey consisting of a nationally representative sample of households recruited in 1991. I analyse housing and moving trajectories by applying the technique of multistate event history analysis, which is based on the set of competing risks models for repeated events (sequence of long- or short-distance moves). Preliminary results show that the youngest cohort postpones leaving parental home, but once they leave the parental nest, they show higher residential mobility than the two older cohorts. As for the gender gap in mobility, our results confirm an overall trend of females leaving parental home earlier than males and moving more often 2nd time, but by the higher order of moves these differences disappear.

Khalid Almatar

Towards an effective integrated planning framework for traffic management in Middle Eastern cities: The case of Dammam.

13.00-13.15

The issue of traffic congestion in urban cities, particularly in developing countries, has become an increasing problem, which requires urgent attention. Many have argued that what is required is a better understanding of the causes that are contributing to the increased traffic congestion one of which is the inadequate integration between a country's traffic management and physical planning systems and agencies (Eagles, 1984). It is argued that a more integrated approach will assist in making cities become thriving places for innovation and sustainable development. Therefore, the main purpose of this dissertation is to create an integrated framework that will help to make spatial planning and the management of traffic work together in easing congestion in second tier Middle Eastern cities (Sigler, 2013, p620). Recent trends will serve as the benchmark for developing the conceptual framework for the future development of sustainable urban set ups that integrates traffic management and the physical planning sectors to address traffic congestion in urban cities.

A study of integration of these two sectors could therefore facilitate a more effective allocation and use of transport infrastructure land in cities. The research will additionally reveal the fact that poor allocation of land leads to unsustainability in land utilization, which would infringe deliberate determination regarding optimum utilization of infrastructural land, thus traffic congestion (Oxford Business Group 2008, p. 109). Furthermore much research on congestion focuses on core cities, but it is equally become apparent that the problem is

equally acute with middle or second tier cities. A final focus for the research is to explore these issues with particular reference to MENA countries with a focus on Saudi Arabia, which are currently experiencing significant levels of development and establishing projections that are aimed at improving the future infrastructure of these developing second tier cities.

Abdulaziz Almulhim

Characteristics of Urban Residents Affecting Household Water Consumption/Conservation Patterns in Saudi Arabia: The Case of Dammam City

13.15-13.30 The city of Dammam has an arid desert climate with little rain in addition to absence of freshwater rivers or lakes, and people do not care about water and waste water by misuse. In trying to address this water crisis, previous researches on residential water consumption have mainly focused on pinpointing those physical characteristics of buildings, such as design and construction characteristics. What has been missing within this research is a fuller understanding of the water behaviours of Dammam residents. This research will fill this research gap, by considering human factors such as socioeconomic, psychological and behavioural factors on household water consumption/conservation in Dammam. In addition to these structural challenges, anecdotal evidence suggests that there is a relatively poor understanding, amongst residents regarding proper water consumption and conservation which can help them shift their behavioral pattern. The aim of the current study aimed at examining factors that affect residents' patterns of water consumption and conservation alongside revealing the attitudes to water conservation behaviour in the region. The study has the following objectives: I. Examine the existing water consumption/conservation patterns in Dammam households; II. Explore the socio-economic, demographic and socio-psychological factors shaping these patterns; III. Consider how water policy might encourage more efficient water usage. The study will use both qualitative and quantitative Method in data gathering, collation, and analysis. A questionnaire will be distributed among the Dammam residents which will aim to address all of the research questions and core objectives of the study was formulated. In depth, semi-structured interviews will be conducted with residents and policy makers to obtain data about the role of the government authorities in curbing water shortages and in creating managing water policies.

Emily Dearden

'Exploring the connections between area deprivation and health using consistent small area Census datasets, 1971-2011'

13.30-13.45 Across the UK people are, on the whole, living for longer and spending greater periods of their lives in 'good' health than ever before. Despite continued improvements, stark health inequalities remain persistent and continue to widen in both social and spatial terms, with individuals in the UK experiencing ongoing disparities in their health, well-being and length of life (ONS, 2014). This investigation takes a consistent geographical and temporal approach by utilising a new population surface resource, providing the first geographically fine-grained analysis of persistent area deprivation and ill-health in the UK. A consistent small area Census dataset (for 1971, 1981, 1991, 2001 and 2011) allows for the analysis of deprivation and health status in small areas over time, removing issues of variable boundaries. The population counts are produced for 100m by 100m grid cells, created from the standard small area Census data and include counts for the whole range of Census outputs – age, sex, employment status, education, housing tenure (for all years) and other variables including health (from 1991 onwards). This investigation presents the first direct time-series analysis of the relationship between persistent area-deprivation and health outcomes in the UK and specifically aims to explore the structure of health in the UK, assessing how this changes over space and time and how it is influenced by deprivation. Consequently, findings enhance considerably knowledge of area deprivation change and its relationship with health status.

Hakim Danial

Population Change and Internal Migration in Kuala Lumpur Conurbation, Malaysia

13.45-14.00 The population growth in Malaysia is evident since colonial period of World War II. Large number of migrants from other countries contributes significantly to the growth of population compared to natural increase. Natural increase has taken place in late 1950s from the rapid growth of birth of post war baby boomers. However, the growth starts to slow down starting 1960s till recent years due to the continuous decline of fertility rate (Hirschman, 1980). Kuala Lumpur, the capital city in Malaysia had experienced a decline in population growth since 1980. This phenomenon also happened to other big cities in 2 States, *Georgetown* and *Johor Bahru* where people has shifted and migrated out to the periphery districts or towns since early 1970s (Abdullah, 2007). Previous studies on the population growth more or less are focussing on large scale context. The main aim for

this research is to study on the population change and internal migration by small areas (which is called as *Mukim*) focussing on Kuala Lumpur Conurbation, Malaysia. This research will analyse 4 main components: population change, internal migration, determinants of population change and internal migration, and population projection. The methods are as follow: 1) review past literature especially in Malaysia, 2) collect statistic data (population census, migration, fertility and mortality, socioeconomics, education, employment, etc.) from Department of Statistics Malaysia, 3) Re-organize and merge the data into statistical software for mapping, and 4) Analyse based on main components of this research.

Daniel Slade

The Reform of Planning Practice, and the Practice of Planning Reform in the English Central State: How changing practices and strategies for 'getting policy done' shaped the Coalition Government's key planning reforms

The English planning system has been in an almost constant state of pro-market reform since at least the 1980s. Academic accounts of these reforms have so far developed nuanced understandings of the (inter)national discourses driving these changes, as well as how they play out in, and are shaped by, the realities of day-to-day policy practices at the local and urban levels.

14.00-14.15

What they lack, however, is a rigorous understanding of how the changing policymaking practices and strategies of agents operating at the national level, within the English central state (i.e. central government and Parliament), have systematically influenced the shape and substance of such planning reforms. Or, indeed, what the key forces shaping these national-level practices are. This gap in our understanding is significant; in the English system national-level agents and institutions play a vital role in determining how the system as a whole operates.

This thesis provides a first step towards filling this gap. It explores how the different practices, strategies, and ideas agents deployed in order to 'get policy done' at this level shaped the outcomes of the Coalition Government's three key planning reforms (the Localism Act 2011, National Planning Policy Framework, and Guidance Review), as well as the long-term process of pro-market reform these episodes relate to.

The research draws on a range of methods and data sources, including (but not limited to); semi-structured interviews with politicians, civil servants, and expert groups, field notes from the author's time working in government, and the detailed analysis of parliamentary records.

Robert Jones

Maritime Linked Spatial Strategies: New Territories for Regional Development

Recent planning theory has highlighted the emergence of new trends in spatial planning, particularly at strategic high level conceptual scales, which are offering a more flexible, dynamic approach to how the formation, evolution and implementation of plans, whilst offering new mechanisms for cooperation between invested parties. This new "soft space" approach to planning is being characterised by their tendency to transcend conventional statutory planning structures, lying outside the traditional political-administrative boundaries. Primarily, existing soft space plans have focussed on terrestrial contexts however there has been an increasing focus and emergence of regional strategies, both by public authorities and private enterprise, with distinct marine and maritime components, many with soft space attributes, predominantly aimed at capitalising on growth opportunities being driven by current changes in global maritime trade and shipping routes.

These "Maritime Linked Spatial Strategies" (MLSS), often have a primary focus on the development of logistical infrastructure aimed at developing and strengthening business supply chains, including the expansion of port infrastructure as well as the transport networks of the hinterlands they supply. However, though often having similar goals and focuses; the scales, scope, institutional arrangements and organisation vary between cases, and in many cases fail to achieve stated goals

15:00-15.15

The research aims looks to add to current knowledge by investigating a sample of MLSS case studies, investigating the strategies being employed, the actors involved and the outcomes of such strategies, as well as the governance arrangements and decision making mechanisms being employed to understand which approaches to MLSS are most successful in attaining their goals and maximising their effectiveness. This will

ABSTRACTS SCHEDULE

expand current soft space planning theory to include how maritime dimensions affect decision making as well as add to existing knowledge of the opportunities and potential being created by global maritime trends and changes.

Michael King

How are environmental outcomes achieved within complex strategic decisions? A case study of UK train procurement over time. Nobody wanted heavy trains, but is that what we have got?

Introduction to research problem: The motivation for this work began with a chart showing UK trains getting heavier from 1960 to the present day. Heavy trains mean more fuel consumption, more emissions and higher maintenance costs. The specification and procurement of new rolling stock (trains) is a highly complex strategic decision: typically costing several hundred million Euros, with multiple stakeholders, long time-frames, and producing an asset with a 30-40 year lifespan. During the procurements for these new trains it seems unlikely that anyone said "Make sure they are heavy." So how could this have happened?

15.15-15:30

Research Objectives: This research will seek to verify this apparent increase in weight. The strategic decision process and context will be investigated to understand how this outcome could have happened; ideally providing insights to improve future decisions.

Research Methods: Theory building will draw upon the literature in Strategic Decision Making, Social Issues in Management and insights from Foucault regarding power and influence.

A quantitative approach will be used to verify the increase in weight. This will be followed by two streams of qualitative work: an archival analysis of publicly available tender documents for the procurement of rolling stock; and interviews with industry experts later in the research process.

Preliminary Results: Quantitative analysis provides support for the apparent increase in relative weight of UK trains over time. Social and political characteristics appear more important than simple changes in the vehicle formats over time. This will be explored further in subsequent stages.

Miu Cheung

The title of my study is "Branding in Urban Design: Branding the City as an Attractive Place to Visit."

Place branding is topic with growing interest to urban designer, policy maker and academic. Cities compete globally in order to attract tourism, investment and talent, as well as to achieve many other objectives, it seems that the concepts of brand strategy are gradually more adopted from the commercial world and applied in pursuit of urban development, regeneration and quality of life. Existing researches in terms of business perspective shows that a good brand will deliver the strong message of products clearly, confirm credibility, connect target prospects emotionally, as well as motivate the buyer and concretely user loyalty. In the past, much of the published research into city branding originates in the disciplines of marketing and urban studies, showing two fields have tended to follow parallel rather than interdisciplinary paths. Since the 1960s, an interdisciplinary field of environmental perception started to gradually develop in the process of urban design. This research aims to present a wider recognition that places of all categories can all benefit from executing coherent strategies on proper management on city resources, reputation and image. In this research, there are three main research questions: How branding develop internationally in urban design (*when and how it happens, why it is important to develop since then*), what is the consumers' experience before and after visiting (*how design reflect the brand*) and how to use branding in urban design to create greater benefit to major stakeholder? (*Local people, tourist & local authorities*) To achieve this, case study method including semi-structured interview with urban designers in Liverpool, face-to-face questionnaire to visitors/tourists in the Liverpool City Centre and online secondary data collection will be used.

15.30-15.45

Soeren Metelmann

Development of climate-driven models for mosquito-borne disease risk in the UK

Mosquito-borne diseases are a major health issue for the human population. Up to 300 million people in tropical and subtropical regions come down with dengue each year, 200 million people are infected with malaria, and recently an outbreak of Zika in South America was all over the media. The occurrence of these diseases is strongly dependent on temperature, rainfall and other climate conditions. In this regard, climate change is a health risk for the UK as its effects will include impacts on future distributions of mosquitoes and potentially infectious diseases. The aim of this PhD project is to develop mosquito-borne disease models for

15.45-16:00

Europe and especially the UK. Current and future climate gridded data will be used to mathematically describe the risk of mosquito-borne diseases for a range of mosquitoes and pathogens, including those not currently present in the UK. The diseases of interest include dengue, chikungunya, malaria, and the West Nile virus. Preliminary results suggest that at least southern England is suitable for invasive mosquito species and with increasing temperatures, more and more regions will be. Final results will hopefully contribute to our understanding of species distributions, transmission risks and health impacts in the UK and be therefore also important for decision makers.

Tuesday 17th May | Science

| Rendall Seminar Room 3

John Bedford

New insights on metamorphic reaction kinetics using time-resolved (4D) synchrotron X-ray microtomography

09.00-09.15

Metamorphic reactions control the physical properties of the Earth's crust in a range of tectonic settings, from mountain belts to subduction zones. Despite this the processes by which one mineral assemblage transforms into another are largely unknown as direct observation is near impossible. Our understanding of reaction kinetics is mostly inferred from preserved mineral textures brought to the surface by uplift and erosion. Experimental investigations of metamorphism have also been limited, typically to concealed vessels thus restricting direct microstructural monitoring. Recent advances in synchrotron-based X-ray microtomography allow for new experiments that utilise X-ray transparent setups in order to image these processes on the micron-scale in 4D. We conducted in-situ constant temperature experiments at the Advanced Photon Source (USA) to image a complete metamorphic reaction, the dehydration of gypsum to form bassanite and H₂O. New bassanite grains initially grow in relative isolation from each other before the grain size increases to a point where they begin to interact. Porosity that forms because of a large solid volume reduction is observed to wrap around new grains forming a moat like structure. The transport of Ca²⁺ and SO₄²⁻ ions to the growing bassanite grains must therefore occur via diffusion across the fluid-filled moats. Quantification of the grain growth velocities also suggests that there is a strong diffusional control on the reaction.

Charlotte Smith

Mixing and Community Structure Over Ocean Ridges

09.15-09.30

It has recently been hypothesised that vertical mixing of water over ocean ridges may be the missing mechanism for supply of nutrients to the surface waters of the subtropical ocean. I assess whether there is a change in the phytoplankton community structure in the surface waters (top 200 m) over the Mid-Atlantic Ridge, concurrent with nutrient supply into nutrient depleted waters. Samples were collected on a transect down the Atlantic Ocean (September to November 2015) and analysed for size-fractionated chlorophyll, particulate organic carbon and picoplankton community structure. A comparison was made between over-ridge and open ocean stations. Over the ridge the water was characterised as being cooler, less saline, and denser waters were found closer to the surface below the mixed layer. The shape of the chlorophyll profile differs between ridge and open ocean stations. Comparisons of the phytoplankton community structure found that over the ridge there were higher concentrations of large phytoplankton (>20 µm, p=0.001), and above the depth of maximum chlorophyll there were higher concentrations of *Synechococcus* and picoeukaryotes and lower concentrations of nanoplankton (p<0.001, p=0.022, p=0.018). At the depth of maximum chlorophyll higher concentrations of nanoplankton were found (p=0.008). Differences found in the local phytoplankton community in the surface waters over the ridge may indicate nutrient supply driven by mixing over the Mid-Atlantic Ridge.

Thomas Redfern

Describing and quantifying residential areas with a hydrologically relevant method.

09.30-09.45

We currently lack a widely applicable method for describing and quantifying the design of urban areas in a hydrologically relevant manner which hampers our ability to quantify the likely impacts of new and changing urban development on hydrological systems.

A method to compare and contrast the hydrologically relevant design features of residential areas has been developed and applied to study areas of north Swindon. The methodology uses a combination of Ordnance Survey Master Map data, Light Detection and Ranging (LiDAR) data, Aerial Photography and detailed site visits to determine surface types, condition, connectivity and drainage efficiency.

The results illustrate that increasing densities of drainage connection points increases the proportion of urban land cover with local connections to the drainage system. In addition differences in the land cover of private areas (domestic surfaces) and public open spaces is shown to be a significant differentiator between residential areas. The implications of this research for hydrological modelling and storm water management is discussed.

Calum Preece

Nitrogen & Carbon Cycling in Shelf Seas

09.45-10.00 Shelf seas are dynamic, highly productive and economically important regions of our oceans. They are thought to be responsible for 15% of global primary productivity and thus play an important role in the global carbon cycle. Productivity in shelf seas is sustained by the physical supply of nutrients. However, there remains some uncertainty regarding the source of these nutrients. Nutrients are likely to be supplied via a combination of cross shelf physical transport from the nutrient-rich deep open ocean, local regeneration of organic matter and local nitrification. Using the spatial distribution and time-series of nutrients, the $\delta^{15}\text{N}$, and $\delta^{18}\text{O}$ isotope composition of nitrate we will unravel the relative magnitude and importance of physical transport processes and local regeneration in sustaining an on-shelf nitrate pool. Here, we present cross-shelf and shelf edge gradients in nutrients, $\delta^{15}\text{N}$ and $\delta^{18}\text{O}$ across the Celtic Sea covering a seasonal cycle from 2014 to 2015. During spring the bottom water $\delta^{15}\text{N-NO}_3$ and $\delta^{18}\text{O-NO}_3$ increased with nitrate consumption due to phytoplankton growth as nitrate was depleted. Throughout summer and autumn there was a decoupling in the $\delta^{15}\text{N}$ and $\delta^{18}\text{O}$ of nitrate indicating that bottom water nitrate is at least partially supplied by local regeneration by remineralisation of particles. Knowledge of the nutrient sources is important as a new supply of nutrients from the deep ocean will be accompanied by a new source of dissolved inorganic carbon.

Júlia Gómez-Romeu

The evolution of fault geometry and lithosphere isostatic response to faulting during magma-poor rifted continental margins formation

A rifted continental margin is the transition between continental and oceanic crust. The formation of it requires the progressive stretching and thinning of continental lithosphere, which starts to occur at the continental rifting and eventually leads to continental breakup and sea-floor spreading initiation. The geometry of extensional faulting in the upper lithosphere and the isostatic response of the lithosphere to faulting during rifted continental margin formation are controversial. Especially in the latest stage of its formation which corresponds to the hyper-extended domain consisting of extremely thin continental crust. Within this domain allochthon blocks, i.e. triangular pieces of continental crust bounded by faults and mantle, can be identified and the development of these structures are the main aim of our research.

10.00-10.15 In order to better understand the formation mechanism of allochthon blocks, we investigate fault geometry and lithosphere response to extensional faulting for the whole evolution of a rifted continental margin, i.e. from continental rifting to rifted continental margin and eventually sea-floor spreading initiation (slow spreading ocean ridges).

Our initial results show a steep planar extensional fault at depth for both continental rifting and slow spreading ocean ridges. However, different amounts of fault extension and lithosphere flexural strength to extensional faulting are needed in each tectonic environment. Currently, a simple model of fault geometry and lithosphere isostatic response is available and has been used to reproduce the main stages for the evolution of a continental rifted margin. This model has to be improved and tested by application to three case studies.

Elliot Wood

Propagation dynamics of magma ascent, constraining the role of the damage zone

10.15-10.30 Understanding the processes which control magmatic ascent through the earth's crust could play a crucial role in future hazard assessment, which is becoming increasingly more important as human population within volcanic regions continues to rise at an unprecedented rate.

To begin to qualitatively assess the importance of rock damage zones this study has taken an approach to remove the complexity of fractures which involve magma but instead looks at an excellent example of a fault running through a uniformed lithology of granodiorite in Chile. This fault provides a unique insight into the distribution of the damage zone as we are able to study it along its length from tip to core using image analysis

of small healed fracture planes within quartz crystals, which are termed fluid inclusion planes (FIPs). Using image processing software combined with ImageJ the density (total microfracture length / area) of these FIPs can be determined across the damage zone at varying distances along and away from the fault. The techniques which have now been developed on these fault rocks are to be transferred to looking at rocks which are heavily influenced by magmatic intrusions in the Colorado Plateau, Utah.

Preliminary results of the microfracture density of FIPs show that a decrease in density towards the tip and an increase in microfractures towards the core of the fault, this is in contrast to traditional models which suggest the highest regions of microfractures would be found towards the tip regions of a fault.

Rachael Lem

Is the globe *really* warming: a palaeoclimatic evidence based approach

At present we live in the Anthropocene, a geological time period coined by man, typified by the influence that man has played in altering earth system processes. Today the climate is 'warmer' and weather events are more 'extreme'; is this fact, or is our knowledge of comparable warm periods (interglacials) simply just limited?

Little is known of the centennial to millennial scale variability of interglacials, other than the Anthropocene. Greenland ice cores now show that the Earth was 5 °C warmer during the last interglacial (Eemian) and evidence the need for more detailed studies of this time period in order to understand the potential impact of natural climate variability on a greenhouse future.

10.45-11.00

Western equatorial Africa provides a unique insight past climatic variability. Changes in the strength of the West African Monsoon (WAM) reflect the complex interaction between low latitude solar insolation and high latitude ocean circulation. Marine sediment sequences offer high-resolution, uninterrupted records of palaeoclimatic change and the opportunity to further explore the drivers behind WAM variability.

Here we present a continuous marine sediment record from the Ogooué Fan, Gabon, covering the last 140,000 thousands years. Geochemical and total organic carbon records evidence pronounced terrigenous outwash from the Ogooué River, and a concomitant strengthening of the WAM, during the Eemian that is not present during the Anthropocene. Further, isotopic $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ sequences yielded foraminifera conversely evidence a weakening of the WAM during the Anthropocene and document an increase in oceanic productivity and regional upwelling.

Suraya Hilmi Hazim

Characterization of the mechanical properties of analogue materials for modelling crustal magma chamber growth

Plutons are large bodies of unerupted magma, typically covering hundreds of square kilometres in aerial extent with an estimated volume of >104 km³. Recent studies suggest that these large bodies of magma grow over time as the result of multiple episodes of emplacement in a brittle-ductile crust. Analogue experiments can be used to help constrain the conditions for magma chamber development and their relationship with plutonic bodies using appropriate and well constrained analogue materials.

11.00-11.15

Gelatine is viscoelastic, which means that it has the ability to express both viscous and elastic behaviour depending on the extent and timescale of deformation. This range of material behaviour makes gelatine a highly relevant material to be used in the study of formation of large magma intrusions.

A series of experiments has been carried out in cylindrical containers with volumes up to 4-litres of pig-skin gelatine with concentrations ranging between 2.0 wt% and 4.0 wt%. The Young's modulus of the gelatine over time is measured by placing a load of known dimensions and mass onto the free surface of the gelatine and measuring the deflection caused by it. Each of the experiments was carried out over the course of one week to study how the properties of the gelatine change with time. A small portion of the sample was tested in the rheometer to characterize the rheology of the gelatine. The results from these experiments will help to outline the ideal setup of analogue materials used in experiments studying the growth of crustal magma chambers.

Alice Trevail

Causes and consequences of individual consistency in a changing climate

11.15-11.30

Consistent individual differences in behaviour have been comprehensively reported across a wide range of taxa,

and have implications for ecological processes, population dynamics and evolution potential. However, variation in the magnitude of individual specialisation between species and populations is poorly understood, as are the underlying mechanisms of such variation. Here, I will present my preliminary PhD research into the importance of environmental predictability, indicative of resource availability, in shaping foraging consistency in a European seabird. By comparing the behaviour of individuals, deduced from GPS tracking, with proximal oceanographic conditions, I will investigate environmental drivers of behaviour among individuals. This study explores whether resource availability may vary the optimal foraging strategy, providing a mechanism through which different levels of consistency may emerge. This work will increase our understanding of the origins of individual behaviour with potential consequences in a changing environment

Christopher John Feeney

Residence times of sediment in river floodplains

11.30-11.45 The longevity of sediment in storage (residence time) has attracted increasing attention in catchment management. Fine sediment (clasts <2mm wide) in particular is an important vector for contaminants such as heavy metals and pesticides, and is a key building block of landforms including floodplains, which buffer flood pulses and provide stable ground for riparian vegetation and ecosystem development. Coarse sediment (clasts >2mm wide) inputs provide gravels for bar development and channel bed fish spawning grounds. However, relatively little is known about sediment storage dynamics and residence times. This study will answer: to what extent do sediment residence times in floodplains of UK river catchments vary in response to environmental changes? This project will use the CAESAR-Lisflood landform evolution model to simulate floodplain changes along 12 1-2km-long valley floor reaches from a past year, based on the existing streamflow record, to present day, and compare this with channel change maps generated from the historical OS map record. This hindcasting will calibrate the model ready for long-term simulations of different synthetic environmental change scenarios. Scenarios will be based on changing frequency of overbank flood events, and vegetation cover and maturity. Each simulation will produce a digital elevation model of the resulting floodplain ages. Residence time distributions shall be calculated from these using mathematical formulae that relate reservoir size with particle ages and magnitude of reworking processes. These distributions will be compared across sites and scenarios to identify the relative magnitudes of key residence time drivers.

Joshua Griffiths

Clay mineral distribution in modern estuarine sands: A predictive tool for the hydrocarbon industry

11.45-12.00 One of the major causes for porosity- and permeability-loss in sandstone reservoirs is the growth of authigenic quartz cements at depths >2.5 km (>80-90°C). Chlorite, an iron-magnesium rich clay, can form well-developed grain coats which preserve anomalously high porosity in deeply buried sandstone reservoirs through the inhibition of authigenic quartz cements. Illite and kaolinite clay minerals are typically reported as being detrimental for sandstone reservoir quality through their ability to block pore throats and diminish permeability. The dominant control on the type and occurrence of clay minerals in the subsurface is the initial (depositional) mineralogy owing to their isochemical behaviour during burial diagenesis. To overcome the limited spatial resolution of core based investigations in sandstone reservoirs, a modern estuarine analogue study of clay mineral distribution has been constructed to aid reservoir quality prediction. This research focuses on the origin, abundance and distribution of clay minerals within the Ravenglass estuary, UK. Hinterland geology and climate controls the sediment mineralogy (type and abundance) transported into the Ravenglass estuary. Chlorite is relatively enriched toward the channel axis. Illite is relatively most abundant toward the estuarine margin. Kaolinite shows a ubiquitous distribution. Clay mineral grain size combined with local estuarine drainage patterns and bathymetry control clay mineral distribution patterns in the Ravenglass estuary. This remarkably high resolution dataset reveals the controls on clay mineral distribution within a marginal marine system, allowing for the prediction of sandstone reservoir quality on a stratigraphic reservoir-scale basis.

Kieran Newman

Comparison and Combination of a High Resolution Coastal Ocean Model and X-band Radar-Derived Waterlines/Bathymetry

12.00-12.15 Bathymetric surveys of areas close to the coast using techniques such as aircraft-based LIDAR can give very accurate profiles, but are expensive and provide only "snapshot" surveys. Bell et al. (2015) have presented a method for using X-band marine radar to obtain intertidal bathymetry with good spatial and temporal resolution, however, this currently relies on a fixed tide-gauge measurement for sea level, applied across the domain. Tidal asymmetry, waves, and surge effects could give a spatial variation in the sea surface, which may

affect the results.

I will aim to use the Coastal Ocean Model POLCOMS, to model a nested high-resolution domain in the Dee Estuary. Bathymetry derived from the radar method will be used to run the model at high resolution, to produce a pixel based elevation record. The long-term aim is to iterate the process between the radar processing and the model to gain accurate bathymetric information at high spatial and temporal resolutions.

A waterline derived from a 180m resolution POLCOMS (Brown et al., 2014) run, overlaid on a radar plot from the same time, shows well-defined features of the radar plot can be seen to correlate with the model at this low tide; however, there is a larger discrepancy at high and mid tides, showing the need for higher resolutions. Detailed application of the tidal asymmetry is the next step in improvement of the waterline method for intertidal bathymetry. This method could then be applied to data from radars currently in operation, allowing tracking of morphological changes.

Oliver Lamb

Relative velocity change at Volcán de Colima: Seismic and experimental observations

Volcán de Colima, Mexico, entered a new phase of eruptive activity in late 1998 with the extrusion of a new lava dome and flow. Continuous data recorded by the local seismic network between October 1 1998 and January 1 1999 was used to investigate the influence of ascending magma on seismic wave propagation.

13.00-13.15

We adopted a multi-station detection algorithm to build a catalogue of 17,893 earthquakes during this period, from which 1,313 repeating events were identified using waveform correlation. Coda wave interferometry was employed to assess relative seismic velocity change between hundreds of pairs of repeating earthquakes at each station in the seismic network. Linear inversion of these measurements allowed us to retrieve the time history of seismic velocity change within the observation period. We observe a substantial decrease in relative seismic velocities prior to the eruption onset on 20 November 1998. We infer that the reduction in seismic velocity resulted from the accumulation of damage and changes in the local stress regime caused by dyking during magma ascent.

Our interpretation is supported by acoustic emissions measured during Brazilian tensile tests on andesite from Volcán de Colima, which demonstrate that crack dilation by tensile stress decreases seismic velocity properties. In nature, following onset of eruption of the eruption, pressure release is seen to correspond with a swift recovery of the seismic wave velocity across the edifice. This study highlights how a multi-disciplinary approach to understanding geophysical signals can help future interpretations of pre-eruptive activity at dome-forming volcanoes.

Jennifer Jardine

Using ocean gliders to understand the physical controls on phytoplankton distribution in shelf seas

13.15-13.30

Despite covering only 7% of the Earth's surface, shelf seas account for 30% of the oceanic primary production and thus are a vital sink for atmospheric CO₂ and a significant part of the air-sea CO₂ flux. Phytoplankton photosynthesis plays a key role in carbon sequestration, thus a thorough understanding of what controls phytoplankton distribution is essential for improving the predictive capabilities of global climate change models. Autonomous underwater vehicles, called gliders, were deployed to carry out repeat transects between the shelf break and the central Celtic Sea, resulting in a near-continuous time series from November 2014 to August 2015. In addition, state-of-the-art Ocean Microstructure Gliders (OMG) were deployed during the same region, measuring the finescale turbulence within the pycnocline (the area defined by steep density gradients) and how this compares to the local biogeochemistry.

Preliminary analysis of temperature and fluorescence (a proxy for phytoplankton chlorophyll) show an increase in thermal stratification (i.e. the stability of the water column due to heating), with increased mixing at the shelf break. Initial plots show that phytoplankton distribution is extremely patchy, and could possibly be due to the local bathymetry forming "mixing hotspots", with fluorescence at depth indicative of mixing. Isolated changes in the stability of the water column could be due to local meteorological conditions, including wind mixing, which enhances vertical mixing, or changes in precipitation / evaporation that suppresses mixing. Although still in the early stages, the initial analyses provide exciting insights into how physical processes impact phytoplankton variability within shelf sea environment.

James Utley

Geochemical controls on iron-rich clay mineral genesis and transformation in the eogenetic zone.

As the world's easily accessed oil and gas reservoirs near exhaustion, energy companies must seek out and exploit ever deeper reservoirs, many deeper than 4km. Oil and gas reside in the pore spaces of these reservoirs; however at these depths the pore spaces can be blocked by the growth of new minerals. These new minerals can either slow down the rate at which oil and gas can be extracted, or fill up the pores sufficiently that no oil and gas can be held in the reservoir at all.

The presence of some iron rich clay minerals can prevent this detrimental new mineral growth, preserving good reservoir conditions for oil/gas extraction.

13.30-13.45

Therefore the questions to answer are; Where in present day environments ("the eogenetic zone") are these iron rich clay minerals found, what conditions led to their formation, and how can this understanding be used to predict where they will be found in deeply buried oil and gas reservoirs?

Preliminary work has shown that a reportedly rare iron-rich clay mineral, berthierine, is present in the modern sediments of Mauritius. After burial berthierine can form one of the clay minerals that keep reservoir pores open?

However berthierine is easily confused with another iron-poor clay mineral kaolinite. It is therefore necessary to repeat the work of earlier soils scientists, but with more detailed laboratory analysis, in order to understand where and why berthierine occurs in certain modern environments.

Karen Halsall

Holocene Fire – vegetation: Methods and palaeoecological data from Northern Europe in exploration of natural and anthropogenic environmental drivers

The relationship between fire, vegetation, climate and people is complex and still poorly understood. Projected changes in fire regimes across Northern Europe and globally are expected to trigger biotic reorganisations and have broad consequences for land-surface feedbacks and the global carbon cycle. A deeper understanding of the long term effects of fire and why charcoal fragment quantities (proxy for fire events) vary throughout the Holocene can be achieved by analysing fire regimes both temporally and spatially.

Uncertainty in the taphonomic processes of fossil charcoal fragments has commonly complicated interpretation of their role in ecosystems; calibration between fire prone sites at the regional, national and global level has not yet been fully achieved. This study uses an improved digital analysis method for the use of charcoal fragments in paleo-environmental reconstructions. Using a U.K. ombrotrophic bog as a case study, a charcoal fragment record dating back 7000 years is here presented combined with novel non pollen palynomorph records indicating local environmental conditions. Pollen data has been statistically treated using the Landscape Reconstruction Algorithm (Sugita, 2007) to improve regional representation of key flora.

13.45-14.00

Further Holocene datasets from sites across Northern Europe, have been constructed using this method, for comparison with trends developed from compiled datasets for Northern Europe.

Tsvetomila Mateeva

Serpentinization : the most important metamorphic hydration process

The serpentinite is created by the alteration of mantle rock with water. This process is called serpentinization and is the most important metamorphic hydration process. The serpentinization is linked to lithological and biological changes and is important for many domains - geology, chemistry, microbiology, seismology, biology, astrobiology.

14.00-14.15

Studies of hydrothermal vents in modern ocean settings suggest that methane produced by serpentinization can support methanotrophic bio-systems. Are such bio-system locally restricted to hydrothermal vents or are they more pervasive, being linked with the geology of serpentinized mantle in the subsurface? Answering this question has implications for our understanding of the global importance of hidden sub-surface bio-systems, the fate of methane and the carbon cycle. The results from this study (biological evolution in the serpentinite) may be important while searching traces of life on other silica planets such as Mars.

Results from the examined Alpine Tethyan ocean-continental transitions locations show evidence for the preservation of marine organic matter in the serpentinized mantle and overlying sediments, although there is no unequivocal indication that the organic matter is generated from methanotrophic bio-systems.

Joe Aslin

The deformation and metamorphism of micas in crustal shear zones: implications for the strength of the Earth's crust.

14.15-14.30

The Earth's crust is a dynamic system that interacts with the atmosphere, hydrosphere, cryosphere and biosphere, as well as the deep Earth, to form the Earth system. Global scale stresses and processes originating from the deep Earth influence the conditions and behaviour of the crust, giving rise to mountain ranges, volcanoes and oceanic basins. In order to understand the mechanisms which facilitate this deformation, it is necessary to study the places where tectonic stresses are focussed into narrow regions of intense strain, known as shear zones. Within these lineaments strain is further localised into the weakest mineral phases, such as mica, which as a result have a significant influence on the strength of these features and the deformation of the crust.

This project aims to characterise how mica deforms and reacts under the conditions of crustal shear zones and the implications of this for the rheology of the crust as a whole. The focus of the first part of this study is the Cossato-Mergozzo-Brissago (C-M-B) Line in Northern Italy, a perfect example of a mid-crustal mica-rich mylonitic shear zone. Microstructural analysis has been conducted using optical and electron microscopy techniques, including electron backscatter diffraction (EBSD), to observe and quantify the extent and nature of deformation within micas and other associated phases. Highly recrystallised biotite mica has formed an interconnected network in these rocks, facilitating further localisation of strain into the weak phase.

Madeleine Brasier

Investigations into the diversity, biogeography and trophic traits of Antarctic polychaete using DNA barcoding and compound specific stable isotope analysis

14.45-15.00

DNA barcoding has revealed that many taxa once believed to have widespread or circumantarctic distributions are actually made up of several morphologically identical but genetically distinct 'cryptic species' with restricted species ranges. Using mitochondrial DNA this study uncovered evidence for potential cryptic species in 50% of the 16 Antarctic polychaete morphospecies investigated. High levels of cryptic diversity within Antarctica has been linked to its glacial history, which could have promoted genetic divergence and speciation by reproductive isolation of different populations during glacial periods. However contrary to many previous studies most cryptic polychaete clades appear coexist across the same Antarctic regions. This circumantarctic trait in Antarctic polychaetes could be associated with and maintained by both the reproductive biology and current oceanographic features which together aid larval dispersal throughout Antarctic waters. Despite the increased research effort to document and understand the potential impacts of climate change on marine biodiversity to date there has been little research into the importance of cryptic species at a functional level. Preliminary data suggests that by using compound specific stable isotope signatures we are able to quantitatively determine the trophic level of Antarctic polychaetes. By determining the trophic level of different cryptic species should provide insight into the functional variability within and between species and highlight the relative importance of cryptic species in ecosystem function.

Anthony Lamur

Fracture and healing in silicic magmas: a mechanism for cyclic eruptive behaviour

15.00-15.15

What controls the cyclic eruptive behaviour at continuously active silicic volcanoes? This cyclic pattern is characterised by sharp bursts of explosive activity, followed by short periods of quiescence (tens of minutes to several hours) during which effusive dome build up/lava flow development can be observed. It has long been shown that gases escape is the driving mechanism for volcanic eruption, and permeability is the physical property controlling the degassing efficiency. The low viscosity of silicic magmas often prevent efficient degassing and tend to allow for stress build up through gas accumulation. We hereby present the results of two series of experiments aiming at quantifying the permeability evolution of low permeability magmas through the development and sustainability of fractures in these systems. We show that stress at silicic volcanoes is released through fracturing, leading to a short and dramatic increase of permeability, allowing for a sudden burst in degassing efficiency. We then show that the fractures created can heal back in timescales ranging from several

minutes to few hours, hence decreasing the permeability and leading to a stress build up within the system. We conclude that cyclic opening and closing fractures in silicic system is a dominant mechanism we have to account for to explain such cyclicity at silicic volcanoes.

Verónica Escobar Ruiz

The effects of changes in agricultural land use and landscape structure on catchment flow and sediment generation

Rural environments in the UK have experienced significant changes over the last century, mainly influenced by human agricultural activities. From the period 1961 – 2005 there have been changes in the crop area, such as large increases in areas planted with wheat. However in the last decade this tendency had been stabilized. By 2013 the area cover by agriculture was about 71% of the total land. Recent flooding in the UK has focused attention on the role of agricultural land use and management on catchment flow generation. Furthermore, the requirements of Water Frame Directive necessitate a better understanding of runoff generation, soil erosion and sediment transport in agricultural environments to enable effective targeting of resources to reduce diffuse pollution from agriculture.

15.15-15.30

The aim of the thesis is to quantify the effect of changes in agricultural land (extent and arrangement), agricultural land use practices and landscape structures on event-scale catchment flow and sediment generation. A second aim is to model land management scenarios that reduce flow and sediment output under both contemporary and future climate conditions. This includes investigation of both land use and structure scenarios to better understand how both agricultural activities and their position in the landscape affects catchment flow and sediment exports.

A physically-based spatially-distributed model (SHETRAN) will be used to simulate hydrological, erosion and sediment transport processes in the study catchments. Flow and sediment generation will be simulated with calibration against flow and suspended sediment data available at the catchment scale for one stream in southern England.

Auwalu Yola Lawan

Controls and prediction of positive and negative effects of diagenesis on sandstones petroleum reservoir quality.

Sandstone petroleum reservoirs of the Middle Jurassic Brent Group from the Thistle Field (UK sector of the North Sea), and the Lower Jurassic Cook Formation from the Knarr Field in the nearby Norwegian sector of the North Sea, are characterised by the occurrence of contrasting iron-rich minerals that grew during burial and heating (i.e. during diagenesis). The Thistle Field contains pore-filling and grain-replacing siderite (iron-rich carbonate) as the main Fe-mineral whiles the Knarr field contains grain-coating chlorite (iron-rich-clay) as the main Fe-mineral. The Thistle and Knarr Fields thus present themselves as an excellent natural laboratory.

This research is investigating why these two Fe-rich shallow marginal marine sandstones reservoir successions have such contrasting styles of diagenetic mineral growth that resulted in the different Fe-diagenetic minerals. The research uses the available well core, core analysis data and wireline data from the two fields to document the diagenetic evolution of the fields.

15.30-15.45

Detailed core description and sampling of the Mid Jurassic Brent core and Lower Jurassic Cook Formation core was carried out and a significant progress was made on the Brent core looking at the diagenetic controls on reservoir quality starting with an ultra-detailed core description, identifying geochemical signatures in the core, moving on to detailed petrography, and integrating porosity and permeability data with wireline data and petrographic data.

Results from the research so far identified:

1. Siderite presence in the Mid Jurassic Brent core is not ubiquitous across all the Formations of the Brent Group.
 2. There is a contrasting style of diagenesis within the Brent Group Formation of the Thistle core controls by initial sediments composition and depositional environments.
 3. There are geochemical signatures anomalies from the representatives' sedimentary facies of the Brent Thistle core identifying compositional mineralogy.
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ABSTRACTS SCHEDULE

	4. There is a significant variation in the reservoir quality parameters; porosity and permeability across the identified facies of the Lower Jurassic Cook Formation from the Knarr field.
15.45-16.00	Aurelio Melia TBC
16.00-16.15	David Williams Modelling Meteotsunami on the European Shelf Meteotsunami are tsunami-like waves of atmospheric origin which can severely affect harbours, with wave heights up to 6 m. Whilst not common for the UK, they are produced by moving thunderstorms with extremely high pressure gradients and $\sim 20 \text{ ms}^{-1}$ wind speeds, which normally generate $\sim 1 \text{ cm}$ waves due to dynamical forcing alone. However, idealised numerical models show that when pressure fluctuations move over the sea surface close to the meteotsunami wave speed, 'Proudman resonance' occurs and the wave may amplify 5 - 10 times (to $\sim 10 \text{ cm}$). It may grow by another order of magnitude by shoaling and resonance with the harbour geometry (to $\sim 1 \text{ m}$). The ocean dynamics software Telemac utilises multiscale, unstructured meshes, allowing our models to operate at the high resolutions required for harbour waves with reasonable computational efficiency. Often studies do not consider atmospheric dynamics, and therefore models produce fairly inaccurate representations of real meteotsunami. This project will determine whether realistic atmospheric forcing from the Weather Research and Forecasting Model (WRF) produces results closer to meteotsunami observations. Understanding the mechanisms that drive wave amplification, with more realistic ocean and atmospheric physics than previously modelled, is also of interest. The 2011 UK meteotsunami is used as a case study. Preliminary results from our highly idealised models support findings that sinusoidal pressure disturbances result in more enhanced Proudman resonance in comparison to linear disturbances.
16.15-16.30	Sion Regan Modelling riverbank erosion at a catchment scale – balancing reach scale complexity against catchment scale applications. Riverbank erosion is a complex process occurring naturally in many stream and river networks. However, it is not evenly distributed across river catchments. Erosion is the results of interaction between driving forces, such as hydraulic action, gravity and trampling, and the resisting characteristics of the riverbank. Important factors that need to be considered are the bank material, riparian vegetation cover, channel curvature, human modifications, channel stream power and stock access. Riverbank erosion can be a source of fine sediment pollution, it can undermine infrastructure and result in the loss of valuable agricultural land. Correctly identifying vulnerable areas is important to help river management and restoration. The main objective of this research is to develop a model that can predict areas that are vulnerable to riverbank erosion on a catchment scale, using remotely sensed data. A conceptual model will be created using a combination of previous modelling approaches and empirical research. A pixel-based approach will be taken, with each pixel along the river edge given a vulnerability ranking, based on the bank material, the riparian vegetation coverage, slope, channel curvature and the presence of human structures. The Cranfield Soils database will provide a proxy for bank material; the slope and channel curvature will be calculated from a digital terrain model sourced from the 5m Digital Elevation Model available from Edina; riparian vegetation and human structures will be produced from the Environment Agency LiDAR (Light Detection and Ranging) data. The model will be evaluated using a combination of expert judgement, aerial photography and historical mapping.

