UCL Environment Domain: Climate Working Group

Co Chairs – Professor Nick Tyler and Professor Dan Osborn

Strategic Research Facilitator – Dr Becca Burns

Twitter @environ_domain #UCLEnvironment

Environment@ucl.ac.uk
UCL Environment Domain

The UCL Research Domains are large, cross-disciplinary research communities that span UCL and our partner organisations, fostering interaction and collaboration.

There are 8 research domains at UCL:
Neuroscience, Personalised Medicine, Populations and Lifelong Health, Cancer, Environment, eResearch, Collaborative Social Science and Food, Metabolism and Society.

“UCL Environment Research Domain aims to bring together the depth and breadth of environmental expertise at UCL and promote cross disciplinary action from a range of theoretical perspectives to make our subject specific expertise greater than the sum of its parts”
## Research Facilitation

Support researchers to identify potential funding sources for their research and to develop strong applications with the best possible chance of success.

Coordinating and developing large-scale strategic bids and, where appropriate, providing central management of responses to research funding calls.

- **Supporting** research bids and proposals via 1:1 bookable sessions, briefings, mock interviews and proposal feedback.
- **Communicating** funding opportunities via the monthly news bulletin, the website and twitter.
  - **Sharing** outcomes and research practices.
  - **Co-ordinating** responses to funding calls - including NERC standard grants.

## Community Building

Support academic and research staff overcome barriers to collaboration across disciplines in their research, innovation and educational activities.

Build ambitious, well-connected, interdisciplinary research communities, which connect researchers who might not have previously collaborated.

- **Events:** community building workshops, Environment Domain Launch Event and more to come.
- **Networks:** EDEN, Working Groups, Strategic Advisory Board.
- **Communications:** blogs, articles, news bulletin, twitter.
- **Collaborations** with: UCL Press, Research Domains, BEAMS team, UCL Public Policy, EDEN, external.
Get involved

- **Workshops:**
  - 31 October – Water Note venue change: now in Chadwick Building G07
  - 14 November – Health Note venue change: now in IoE 642
  - 21 November – Urban Malet Place Engineering Building 1.20

- **Working group theme leads and supports** – contact environment@ucl.ac.uk if you’re interested

- Submit notices for the news bulletin, website or twitter

- Launch Event: 31 January 2019

- Add the Environmental Theme to your Iris profile to join the list of researchers on Environment Domain Website

- EDEN
Find out more

- Environment@ucl.ac.uk
- Twitter @environ_domain
- Website: https://www.ucl.ac.uk/research/domains/environment
UCL Public Policy

www.ucl.ac.uk/public-policy

@UCLPublicPolicy
What is UCL Public Policy?

World of Research  <->  World of Policy

UCL Public Policy connects researchers with policy professionals, to inform policy with evidence.
Why UCL Public Policy?

Research Landscape
“30% of our impact case studies submitted to the REF 2014 were related to public policy.”

Academics
Promote the value and usefulness of your research
Strengthen the case for research funding
Shape further research needs and priorities
Showcase yourself, and your institution
Understand how to make your research more impactful
Transfer your knowledge to the wider community
Create societal impact for the greater good
Why UCL Public Policy?

**Government**

“There is an increased recognition by government of the importance of reliable evidence to enable the development of effective policy.”

*Professor Sir Mark Walport*
... how UCL Public Policy works...

- Academic-policy roundtables
- Training Policy 101
- Policy Fellowships
- Small Grants
- Policy Commissions
- UCL Public Policy Board
- UCL Policy Champions
- Policy Dialogues

Bespoke Model!
Keep Up to Date

Policy Postings
Building connections between research and policy

Tilting the Balance
Alexandre N. of the now defunct Cambridge Analytica, observed that to drive human actions a narrative 'doesn’t have to be true, it just...

Using the Corporate Toolkit to Fix Public Ills
Conventional thought dictates that the role of government is to regulate and the role of business is to generate profits.

Why Connect Research and Policy?
We asked academics and policy professionals to tell us why they think it is important to connect research and policy.

UCL Public Policy News, events and opportunities: Oct 2018

In this edition:
What would your top climate policy be? Enter our competition | Write
Got an Idea? Get in Touch

**UCL Public Policy**

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public-policy@ucl.ac.uk
[www.ucl.ac.uk/public-policy](http://www.ucl.ac.uk/public-policy)
EDEN (Environment Domain Early-Career Network)

Our aims:
- Promote multidisciplinary research
- Provide a platform for peer support, career advice, mentoring, training, funding information, etc.
- Identify and highlight key needs of early-career researchers
- Bring key themes that UCL environment researchers are working on to the fore
- Promote work-life balance, equality, diversity and inclusion

Upcoming events:
- Writing Retreat 7-9 November 2018
- Career talk: *Do’s and Don'ts of The Early Academic Career* (at AGM in early February 2019)
- EDEN Writing Group (ongoing)
- Spring term seminar series?

How to join us:
- Mailing list subscription link on EDEN webpage: http://www.ucl.ac.uk/research/domains/environment/eden
- Email: vpro.eden@ucl.ac.uk
- Twitter: @UCL_EDEN
Research Presentations
CUSSH
Complex Urban Systems for Sustainability and Health

- ventilation and indoor air pollution
- household crowding
- housing affordability
- energy efficiency and climate change
- community connection and quality of neighbourhoods
- land ownership, value and development patterns
- fuel poverty and indoor temperature

Jo Hale | Centre for Behaviour Change and CUSSH Consortium | jo.hale@ucl.ac.uk | @DrJoHale

Locations:
- London
- Rennes
- Kisumu
- Nairobi
- Beijing
- Ningbo
CUSSH as a catalyst for change

• We facilitate cities in system dynamics and behaviour change
• Cities design and agree on interventions and how to implement them
• Our scientific team provide evidence to guide the intervention:
  1. Systematic review – what works?
  2. Tracking city progress through key indicators
  3. Modelling of future scenarios
CBC Enviro-Hub
We are planning to launch a new hub for researchers interested in understanding and changing behaviours that affect the environment.

CBC Hubs are ‘member-led’ and have been successful in:
• Facilitating engagement with partners outside academia
• Supporting access to academic expertise
• Facilitating cross-disciplinary research, events, and exchanges

If you would like to get our invitation, please email jo.hale@ucl.ac.uk
## DEPARTMENT OF STATISTICAL SCIENCE
### CLIMATE-RELATED RESEARCH
#### October 2018

**Academic staff members (email @ucl.ac.uk)**

<table>
<thead>
<tr>
<th>Academic staff</th>
<th>Email</th>
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<tbody>
<tr>
<td>Richard Chandler</td>
<td>r.chandler</td>
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<td>Serge Guillas</td>
<td>s.guillas</td>
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<td>Paul Northrop</td>
<td>p.northrop</td>
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### Research themes

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**Climate data products**

Assessment of uncertainties in past climate due to data gaps, inhomogeneities etc.


**Models and uncertainty**

Interpretation of outputs from imperfect climate/weather forecasting models etc.; design of climate model experiments; communication of uncertainty

- **Example**: ensemble weather forecasts (UKMO, ECMWF, NCEP) of temperatures at two locations showing shared discrepancy (Clair Barnes, with UCL Geography)
- Also Turing-funded project, 2018-20 (Serge Guillas)
If animations were permitted ...

- Visualisation of uncertainties in global temperature projections 2016-2035, based on 32 GCMs from CMIP5 ensemble and accounting for shared discrepancies etc. (Marianna Demetriou)
Downscaling / weather generation

Generation of synthetic weather sequences (particularly precipitation) consistent with future climate projections, for assessment of future climate impacts

- Example: evaluation of synthetic daily temperature sequences for Thames catchment, using Rglimclim software package (http://www.ucl.ac.uk/~ucakarc/work/glimclim.html)

Risk and extreme events

Estimation of risk and uncertainty from high-impact, low-frequency events for which data are sparse and models may be unreliable

Microfossils to reconstruct past climates

Bridget Wade, Earth Sciences

Images from Fox and Wade (2013)
What are the forcing and feedback mechanisms in the Earth climate system?

- Quantify atmospheric CO$_2$
- Measure changes in temperature
- Document variations in global ice volume
- Orbital forcing
- Biotic response
• Focus on 38 to 8 million years ago
• NERC funded
• Looking in particular for collaborators examining the modern ocean
Colin Provost
Associate Professor of Public Policy
School of Public Policy/Department of Political Science
c.provost@ucl.ac.uk

One Focus of my Research:
Environmental Regulation, Particularly Air Quality
Previous Research Projects

• Recent Projects Have Involved:
  • Government Assistance with Voluntary Programmes, such as E.U. Eco Management and Audit Scheme (*Review of Policy Research*, w/ Andy Whitford)
  • Environmental Federalism in the Trump and Obama Administrations (*Publius: the Journal of Federalism*, w/ Paul Nolette)
  • Bureaucratic Reputation and Water Regulation (*Regulation and Governance*, w/ Tereza Capelos)
  • Environmental Inequity/Justice in Rulemaking (*Journal of Public Policy*, w/ Brian Gerber)
Current Focus/Current Projects

• Focusing on Climate Adaptation Policies in Local Governments in U.S. and Comparatively (U.S., U.K., Australia)
• How Do Bureaucracies Function in Local Governments Committed to Fighting Climate Change?
• How Do Local Climate Adaption Policies Vary Across National Governments?
• How is Climate Change Affecting Environmental Justice and Public Health?
• How is Austerity Affecting U.K. Local Government Capability to Cope with Climate Change and with Environmental Inequities?
BLOOMSBURY ENVIRONMENTAL ISOPOTE FACILITY (BEIF LAB)

UCL, Department of Earth Sciences and Department of Geography

www.ucl.ac.uk/beif

Email: beif@ucl.ac.uk

Phone: 0207 679 4592

Location:
Christopher Ingold Building, LG11 (20 Gordon Street, London  WC1H 0AJ)
Analytical Techniques

Preparation Unit - GasBench
- Acid digestion of inorganic samples to give CO₂ gas.
- Measures:
  - $\delta^{18}O$
  - $\delta^{13}C$
  - $\delta^D$

Preparation Unit - Thermal Combustion Elemental Analyzer (TC/EA)
- Pyrolysis of organic matter to give CO and H₂ gases.
- Measures:
  - $\delta^{18}O$
  - $\delta^D$

Preparation Unit - Flash EA
- Combustion of organic matter to CO₂, N₂ and SO₂ gases.
- Measures:
  - $\delta^{15}N$
  - $\delta^{13}C$
  - $\delta^{34}S$
Climate working group workshop - 24 Oct. 2018

Research

Environmental Archaeology
The Journal of Human Palaeoecology

The Seasonal Mobility of Prehistoric Gazelle Herds in the Azraq Basin, Jordan: Modelling Alternative Strategies Using Stable Isotopes
Elizabeth Henton, Isabelle Rubens, Carol Palmer, Louise Martin, Andrew Garrard, Matthew Thirwall & Anne-Lise Jourdan

Lake isotope records of the 8200-year cooling event in western Ireland: Comparison with model simulations

An investigation into the conversion of specific carbon atoms in oleic acid and methyl oleate to particulate matter in a diesel engine and tube reactor
Aaron Eveleigh, Nicos Ladommatos, Paul Hellier, Anne-Lise Jourdan

Key words:
Paleoclimate
Paleodiet
Bones, enamel, hair
Foraminifera, ostracods
Lake sediments
Insects, algae
Carbonates
Organics
Water
Yasna Palmeiro Silva
PhD Student at Institute for Global Health
yasna.palmeiro.18@ucl.ac.uk

Past Research
- Nursing
- Child and Pregnancy
- Environment – Health

Present Research
- Environment – Health
- Climate change – Health

Future Research
- Environment – Health
- Sustainability – Health
- Planetary Health
- Sustainable Development
To develop health indicators related to climate change, at national, regional, and local levels, in Chile

To measure the local burden of disease attributable to climate change in Chile, from 1990 to 2018

To project the local burden of disease attributable to climate change according to the IPCC-RCP scenarios, in Chile
Sustainable & Healthy Food Systems (SHEFS) project

funded by the Wellcome Trust’s Our Planet, Our Health Programme

“The overarching objective of the SHEFS programme is to provide policy makers with novel, interdisciplinary evidence to define future food systems policies that deliver nutritious and healthy foods in an environmentally sustainable and socially equitable manner.”

http://blogs.lshtm.ac.uk/shefs/
Impacts of agricultural land cover and land use change on biodiversity across scales in southern Africa and implications for food systems and human health
Background
Computer engineering
Bioinformatics

Research
Energy demand
ESTIMO model (Prof Mark Barrett)

Projects
RESTLESS [http://www.restless.org.uk/] (Dr Paul Dodds)

UKCREDS – Heat Challenge (Prof Robert Lowe)
Interests

• Climate

• Energy-water-land

• Pollution

• Public policy
Tiziano Gallo Cassarino
t.cassarino@ucl.ac.uk

Research associate @ EnergySpaceTime group
https://www.ucl.ac.uk/bartlett/energy/research/themes/energy-space-time

BSEER – Energy Institute
Central House, 14 Upper Woburn Place
Pollinator communities

Data used
- Species occurrence records
- (pollinators and priority species)
- Bioclimatic variables – now and various futures.
- Landcover data (percentage cover 2x2km grid cells.)

etc. =
1 Research questions

What is the relative contribution of:

- background regional climate
- local urban climate
- building energy retrofit
- inhabitant behaviour

on

space heating energy use
summer thermal comfort
indoor air quality
health

...at the national or citywide level?
2 Housing stock modelling overview

Research questions

Housing stock modelling

London Great Britain

Sample approach

Archetype approach

BREDEM GIS EnergyPlus

GIS

Housing surveys

Building fabric

Inferred inputs and assumptions

External climate

Inhabitant behaviour

Metamodelling

Multiple Linear Regression

Artificial Neural Networks

Support Vector Networks

Testing

LUCID data

EFUS data

Outputs

- **Shutters** significantly reduce temperature exposure. **Energy retrofit** leads to a very small increase in overheating.
- Combined shutters/retrofit significantly reduce overheating and save energy.
3 Future collaboration

Research interests
- climate responsive architecture and urban design
- indoor environmental quality and associated health risks
- the impact of urban heat islands and climate change on energy use, comfort and health
- the adaptation of the built environment to a warming climate
- energy efficient retrofit technologies
- fuel poverty

Contact details
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The Bartlett School of Environment, Energy and Resources
UCL Institute for Environmental Design and Engineering
Central House | 14 Upper Woburn Place | London | WC1H 0NN

Selected projects
- Health Protection Research Unit (HPRU) in Environmental Change and Health, Theme 2: Sustainable Cities (NIHR)
- 'Seasonal Health, Ageing and Resilience in Urban Populations and Environments' (SHARPER) (NERC and Arup Global Research Challenge)
- 'Airport Capacity Consequences Leveraging Aviation Integrated Modelling' (ACCLAIM) (EPSRC)
- 'Air Pollution and WEather-related Health Impacts: Methodological Study based On spatio-temporally disaggregated Multi-pollutant models for present day and futurE' (AWESOME) (NERC);
- 'Building Supply Chain for Mass Refurbishment of Houses' (Energy Technologies Institute);
- 'The development of a Local Urban Climate model and its application to the Intelligent Design of cities' (LUCID) (EPSRC)
Martina Fisk (Departments: Geography, Science and Technology Studies)

Contact: martina.fisk.15@ucl.ac.uk, @MartinaFisk

Research interests:
- the role of science in the geopolitics of environmental problems
- Co-production of environmental science and state territory
- the politics of environmental measurements for policy making

PhD project: The Geopolitics of Carbon Accounting

Research Aims:
- Understand the internal workings and compare the differences of the national GHG inventories of UK and Germany
- Understand the decision process on methodological changes in national GHG inventories (social, political, historical factors)
- Develop a history of carbon accounting and the proliferation of its different forms
- Discuss the role of carbon accounting in the creation of ‘atmospheric territory’

Looking for:
- a current GHG measuring problem that directly feeds into the national CO2 emissions count
- Contacts to people working on GHG emissions measuring for national inventories