



UCL Institute for Risk and Disaster Reduction  
Report 2013



Fukushima Nuclear Reactor, Japan

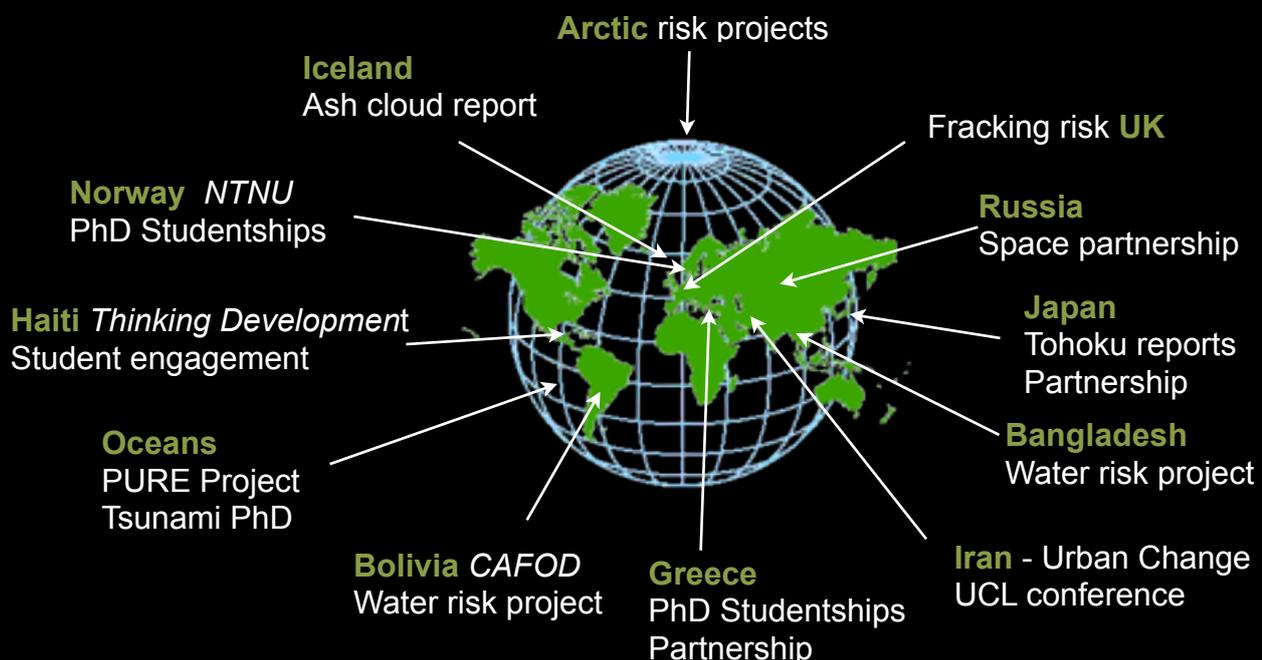
Prepared by Peter Sammonds and Rosanna Smith

## IRDR at a Glance

The Institute for Risk and Disaster Reduction (IRDR) was established in 2010 as a cross-UCL initiative, supported by the Provost's Strategic Development Fund for £296k. Below we highlight achievements and developments of the IRDR, which would not have happened without its existence.

- Established the UCL Chair for Risk and Disaster Reduction and appointed the world leading authority on resilience, David Alexander, to the position, so raising UCL to be a major international player in the field
- Established the Readership in Risk, Resilience and Global Health, jointly with the Institute for Global Health, in a unique initiative with the School of Life and Medical Sciences
- Established a Lectureship in Statistics and Risk Analysis, jointly with the Department of Statistical Science, the first position of this kind, internationally
- Established a Lectureship in Earthquake Hazard, appointing Joanna Faure Walker, who encompasses both disciplinary excellence and City experience in risk management
- Attracted £213k complementary funding from the MAPS Faculty and Departments
- Won £2,566k research funding from research councils, industry, charities and Europe
- UCL led the successful consortium bid for the NERC £2 million programme on Probability, Uncertainty and Risk in the Environment
- UCL co-leads the euro 4.75 million Cascading Crises European project
- Set up the first major university research project jointly funded by an NGO
- 17 new PhD studentships set up in the discipline, co-supervised across UCL
- 2 IRDR 3-year Research Fellowships set up
- Launched a new MRes in Risk and Disaster Reduction and an MSc in Risk, Disaster and Resilience
- 1600 participants in IRDR risk and disaster reduction events from UCL and beyond
- The IRDR has 220 staff and student members across UCL
- Achieved impact for UCL research and reports in government, the City and the global media and through knowledge exchange with partners, internationally
- Established a vibrant programme and a vision for the future for UCL

## IRDR - Global Reach



# Executive Summary

## Background and History

This report covers the three years of the UCL Institute for Risk and Disaster Reduction (IRDR), since its foundation in 2010, during the time it was in receipt of funding from the Provost Strategic Development Fund (PSDF).

Understanding global risks and reducing disasters presents a major challenge that requires coordinated and collaborative action. Responding to the UCL Grand Challenges, our vision for the IRDR was for an institute, hosted in the MAPS Faculty, but working across UCL, that would lead research, knowledge exchange (KE) with industry and humanitarian agencies and advanced teaching, in the area of risk and disaster reduction (RDR). The Institute would concentrate the internationally established, highly successful, but dispersed expertise at UCL. By providing a focus for UCL's activities, with its breadth of disciplinary emphasis, promotion of novel cross-disciplinary research and translation into practice, the Institute would assume leadership in risk and disaster reduction both in the UK and internationally.

Following a UCL Town Meeting, which brought together over 70 academics and researchers across 12 departments in 7 faculties involved

in world-class research and practice in the field, Professor Peter Sammonds led a proposal to the Provost to set up the IRDR, championed by 16 academics from Earth Sciences, Statistical Science, Mathematics, Space & Climate Physics, Civil Engineering, Mechanical Engineering, Population Health and Laws. £296k PSDF funding was secured, supported by £231k from the MAPS Faculty and Departments.



The IRDR was initially set up under the financial umbrella of Earth Sciences, hosted in their space and supported by their administrative staff. The aim of the IRDR was to become financially self-supporting through research and teaching income within five years, with an emphasis on new income generation from cross-disciplinary consortium bids, postgraduate teaching, and funding from industry and the humanitarian sector. It is located within its own space, because co-location of researchers demonstrably works, and is supported in its unique role by IRDR administrative staff and experts in KE, public engagement and research support.

## Leadership Team

### IRDR Executive

Peter Sammonds	Director, IRDR
Rosanna Smith	Deputy Director, IRDR
David Alexander	Professor of Risk and Disaster Reduction, IRDR
Christopher Kilburn	Director, Aon Benfield UCL Hazard Centre
Gerald Roberts	Professor of Earthquake Geology, Birkbeck College
Serge Guillas	Reader in Statistics, Statistical Science
Steven Bishop	Professor of Non-Linear Dynamics, Mathematics
Alan Smith	Director, Mullard Space Science Laboratory
Maria Lee	Professor of Law, Laws
Cassidy Johnson	Lecturer, Development Planning Unit, The Bartlett
Linda O'Halloran	Director, Thinking Development
Graham Hart	Dean, Faculty of Population Health Sciences
Helena Titheridge	Director, Centre for Urban Sustainability & Resilience, Civil Engineering



Peter Sammonds

# Executive Summary

## Key Achievements

**New Appointments:** The most significant result of the Provost's and Faculty funding into the IRDR has been the opportunity to recruit world class academics to transform UCL's impact in research, knowledge exchange and advanced teaching in risk and disaster reduction and complement departmental activities by making appointments adjacent to existing strengths and at the junction of departmental disciplines. The IRDR has demonstrated that it has become a target for both leading and early-career researchers seeking a thriving, multidisciplinary research environment.

**IRDR Forums:** A key IRDR innovation has been setting up regular cross-disciplinary Forums, which bring together key people across UCL, along with potential partners and collaborators. Each Forum has resulted in major success for RDR research, teaching or knowledge exchange, in which UCL would not be engaged if it were not for the IRDR.

**Public Engagement:** The IRDR has held highly successful public engagement events with strong UCL and public participation including, the IRDR Annual Conference, which has established itself as the leading London meeting for NGOs, government and re-

searchers, and evening public events such as *Dickens's London*, chaired by broadcaster and UCL Fellow, Mark Lawson, and *Gender and Disasters* for International Women's Day.

**Impact:** The IRDR is leading KE activities in water risk in Bolivia (with CAFOD), water risk in Bangladesh (part EPSRC supported), and the Tohoku region of Japan, post-disaster, (joining the Earthquake Engineering Field Investigation Team EEFIT), where the EEFIT report was cited 70 times in advice for ministers drawn up by the UK Cabinet Office. IRDR projects will form two REF case studies.

## Funding and Resources

Source	Amount	Duration
Provost's Fund	£ 296k	2010-2013
MAPS Faculty & Departments	£ 213k	2010-2014
Impact Studentships	£ 156k	2010-2016
<b>Total</b>	<b>£ 665k</b>	<b>2010-2016</b>
Industry	£1,034k	2010-2016
Humanitarian Sector	£ 139k	2012-2016
Research Centres	£ 122k	2010-2016
RCUK / EC	£1,251k	2010-2016
UK Government	£ 20k	2012-2013
<b>Total</b>	<b>£2,566k</b>	<b>2010-2016</b>

## IRDR Appointments

### New Academic Appointments created in the IRDR

David Alexander	Professor of Risk and Disaster Reduction, 2012
Joanna Faure Walker	Lecturer in Earthquake Hazard, 2012
Reader	Risk, Resilience & Global Health in 2013, jointly with the Institute of Global Health
Lecturer	Statistics and Risk Analysis in 2013, jointly with the Department of Statistical Science

### Other Core Appointments to the IRDR

Peter Sammonds	Director, IRDR (2010)
Rosanna Smith	Deputy Director, IRDR (0.8 FTE, 2012)
Yvette Twumasi-Ankrah	IRDR Administrator (0.5 FTE, 2013)
Christopher Kilburn	Director, Aon Benfield UCL Hazard Centre (0.2 FTE, 2011)
Stephen Edwards	Deputy Director, Aon Benfield UCL Hazard Centre (0.5 FTE, 2010)

## Key Questions

Natural, technological, socio-economic and intentional disasters are of great concern to humanity as their impact is increasing due to climate change, population growth and globalization. Most importantly, vulnerabilities are increasing as a result of poverty, marginalization, lack of rights, poor governance, urbanization, land-use change and stress upon ecosystems. Given the need to quantify and reduce the risk of disasters, some key research questions are:-

- How can we conceptualize and model the changing rate of natural, environmental and health catastrophes to reduce uncertainty?
- What will be the effects of environmental change?
- What scientific, technological and medical advances can reduce the impact of disasters?
- How should society organize itself in response to risk, in order to increase the resilience of vulnerable communities and manage disasters more effectively?
- How do we transfer scientific and technical knowledge to those who need it?
- How can we better understand vulnerability and exposure to disaster risk in complex human communities around the world?
- What are our legal or ethical responsibilities?

There is increasing evidence that disaster response planning and mitigation must take account of 'fat-tailed' distributions: in other words, high-magnitude events seem likely to be more common and devastating than was previously expected. Moreover, climate change may well worsen this situation with respect to meteorological and health hazards. Preparation for such contingencies is expensive, complex and challenging. Moreover, standard hazard assessments can be grossly misleading. Hence it may well be that vulnerability has been seriously underestimated in the world's principal hazard zones. These include a serious risk of major earthquake casualties and damage in mega-cities such as Tokyo and Tehran, exceptional cyclone hazards in Bangladesh and the Caribbean, flood hazards

in Thailand and South Asia, drought in the Horn of Africa and Sub-Saharan countries, and many other cases of extreme risk. Finally, the earthquake, tsunami and nuclear radiation release in Japan in March 2011 has refocused attention upon cascading and multiple hazards.

It may be argued that slow onset disease causes more deaths, but sudden onset natural catastrophes can bring economic disaster as well as mortality. In the case of the 2010 earthquake in Haiti, losses exceeded annual GDP. The disruption and damage may take a generation to overcome, especially if economic development and healthcare are both inadequate. After a disaster, recovery can be prolonged by inadequate understanding of what exactly is needed in order to rebuild complex social and productive systems. Moreover, in recent times the effectiveness of the international relief system has repeatedly been called into question. Hence, there is considerable potential for research and teaching to contribute to better management of disasters and disaster risk.

There is an urgent need to establish a multi-hazard, cross-disciplinary theoretical framework in which research into disasters can make progress, based on understanding them as complex non-linear systems, which are tractable with the tools of modern physics, mathematics, statistics and health and social research. This can be done, as was demonstrated by successful prediction of the location and magnitude of an earthquake in Sumatra in 2005, warning against a cyclone in Bangladesh in 2007 and social organization of preparedness in Sumatra in 2009, all of which saved thousands of lives. Our new understanding offers the opportunity to use laboratory and numerical experiments, satellite-based observation and social survey to make significant progress, providing this is pursued in a problem-based, interdisciplinary manner. Advances in statistical prediction, engineering, development planning, health maintenance and the social and political understanding of disasters, suggest that the goal of increased preparedness is eminently achievable.

# Objectives and Achievements of the IRDR

## Summary of Specific Objectives

- Coordinate multidisciplinary, cross-faculty RDR research at UCL and lead bids for major RDR programmes
- Publish high-impact RDR multidisciplinary reports to influence public policy
- Forge partnerships with industry and commerce, humanitarian agencies, international universities and institutes and UK professional and governmental bodies
- Create a website portal and organize keynote lectures, international workshops, seminar series, an e-newsletter and partner-focused special reports to raise the external profile of UCL RDR activities
- Launch 6 Institute fellowships in multidisciplinary research foci, building to 12

- Launch 6 research studentships, including new Impact Studentships, building to a full-fledged Doctoral Training Centre (DTC) with a target population of 30 students
- Coordinate RDR teaching, providing a portal to potential students for all programmes
- Launch a new multidisciplinary RDR Master's programme
- Develop bespoke courses for industry and commerce and humanitarian agencies
- Provide a central, physical base and resource centre for UCL RDR activities, acting as a Bloomsbury hub for IRDR members and partners and host for external visitors

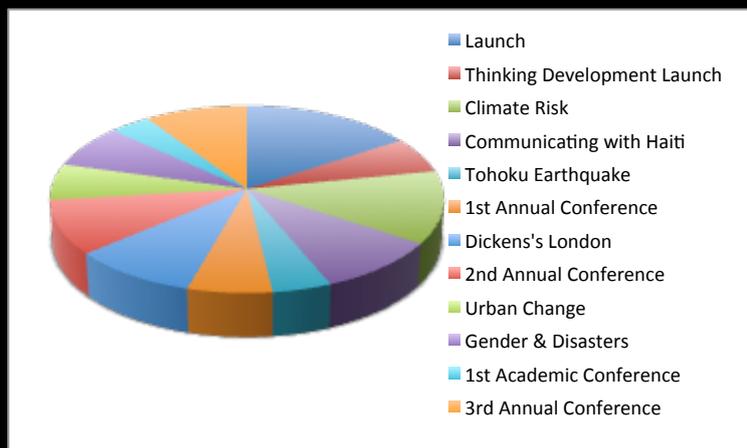
## Assessment of Achievements

The IRDR was launched in June 2010 to create a new cross-UCL Institute, which aims to lead research, knowledge exchange and advanced teaching in risk and disaster reduction. The IRDR Executive decided that these aims could best be met by investing in both fixed-term academic appointments and research fellowships, to provide UCL's RDR activities with critical mass. These appointments will give breadth to current underpinning activities, promote the development of novel cross-disciplinary research with practical impact and enable UCL to assume leadership in RDR, both in the UK and internationally. Following discussions with deans of the BEAMS School, institute directors and the Earth Sciences

HoD, a proposal was put forward to the MAPS Dean in May 2011, supported by the Vice Provost Research, to re-focus the priorities of the IRDR to making academic staff appointments. These proposed appointments received financial approval from the BEAMS School in two waves, from August 2011 to March 2013. This significant departure from the original plan slowed the initial growth of the IRDR, as we no longer rushed to appoint research fellows and students. However, we believe the IRDR has exceeded all the commitments made to the Provost for the period 2010-13 and are building a sustainable and resilience world-class institute.

## Attendance at IRDR Events

Participation at IRDR Events - 1600 total



## New IRDR Staff Appointments

The most significant result of the Provost's and Faculty funding into the IRDR has been the ability and opportunity to recruit world class academics and outstanding early career researchers to transform UCL's impact in research, knowledge exchange and advanced teaching in risk and disaster reduction. We are making appointments to two research foci in the broad theme of Risk and Disaster Reduction. Focus 1 emphasized natural hazards, linking natural sciences with statistics, engineering, social issues and the built environment. Focus 2 emphasizes population health and extreme events, with the linked issues of ethics, public policy and environmental change. The research foci share the common objectives of quantifying and reducing the risk of disasters and helping to increase socio-economic resilience. Our aim is to complement departmental activities by making appointments allied to existing strengths and capable of benefitting from bridges between different academic units and disciplines.

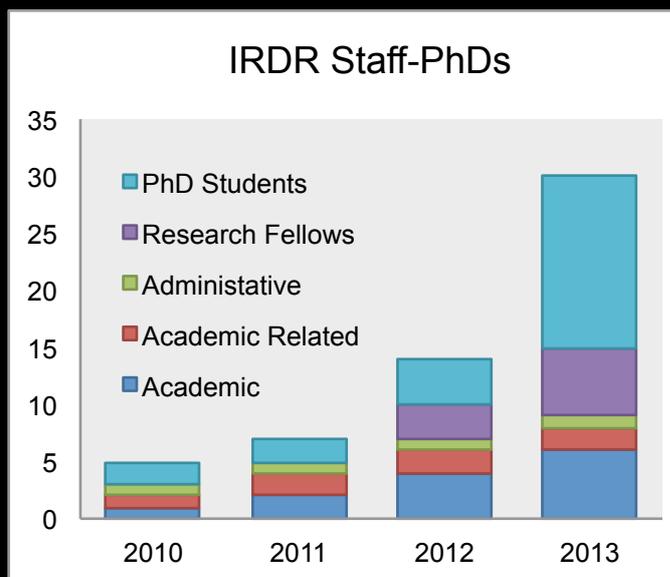
David Alexander was appointed to the newly created Chair in Risk and Disaster Reduction in October 2012. David was formerly at the Global Risk Forum, Davos, and is widely regarded as the world authority on risk, resilience and disaster reduction. His appointment genuinely enthused members of the appointment panel as justification for establishing an institute, and transforming the international view of UCL in this field.

The position of Reader in Risk, Resilience & Global Health is currently advertised to be appointed in 2013, jointly with the Institute of Global Health. Academic support came from two faculties (MAPS and Population Health) and supported financially by both BEAMS and SLMS schools. Creating such a joint position is a significant achievement and indicative of the strong desire in UCL for genuinely cross-disciplinary collaboration.

Joanna Faure Walker was appointed to the new Lectureship in Risk and Disaster Reduction in the field of earthquake hazard. As well as an excellent academic track record, with important publications to her credit, Joanna worked for two years at the City market leading firm, RMS (Risk Management Solutions),

giving her an insight into the insurance industry and global catastrophe modelling across multiple perils.

The new Lectureship in Statistics and Risk Analysis is to be appointed in 2013, jointly with the Department of Statistical Science. This represents a significant commitment by Statistical Science to risk and disaster reduction, following on from the success with the NERC PURE bid and the strong engagement in the IRDR of key statistics staff.



In addition to these new academic positions, further key appointments resulting from the creation of the IRDR are:

Professor Peter Sammonds (Earth Sciences), appointed Director, IRDR, 2010

Dr Rosanna Smith, appointed Deputy Director, IRDR (0.5 FTE in 2012 / 0.8 FTE from 2013), from a prestigious Marie Curie Fellowship held at the LMU, Munich, with a track record of public policy engagement at the Parliamentary Office of Science and Technology

Yvette Twumasi-Ankrah appointed IRDR Administrator in 2013, with a track record in events organization and administration

Dr Chris Kilburn (Earth Sciences) was appointed to the IRDR (0.2 FTE) as Director, Aon Benfield UCL Hazard Centre, in 2011

Dr Stephen Edwards was appointed to the IRDR (0.5 FTE) as Deputy Director, Aon Benfield UCL Hazard Centre, 2010.

## IRDR Research Projects

The IRDR has supported projects, fellowships and studentships from the Provost's funding as well as winning £2,566k funding from research councils, industry, the humanitarian sector, partner research centres and the Europe Commission (EC) for research and knowledge exchange projects in risk and disaster reduction. Some highlights are given below.

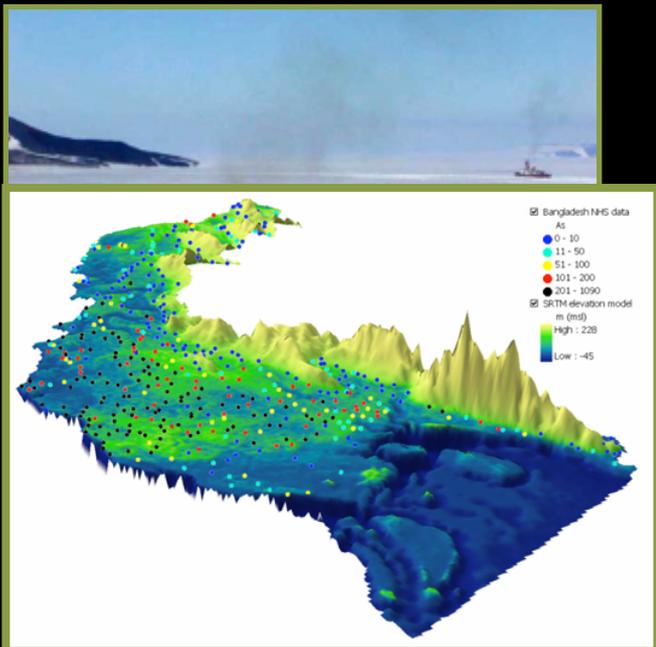
- **Water risk and its management in Bolivia's Altiplano** is a joint research project between CAFOD (the Catholic Agency for Overseas Development), the Aon Benfield UCL Hazard Centre (ABUHC) and the IRDR, launched in 2012 and exceptionally jointly funded by CAFOD for £96k. Dr Stephen Edwards (IRDR) is the Principal Investigator. Dr Megan French has been appointed for 3 years as IRDR Research Associate. She holds research degrees in environmental science and marine chemistry. An associated UCL-CAFOD Impact PhD studentship and NERC CASE studentship will both start in 2013.
- **Water risk in Bangladesh** IRDR Research Fellow Mohammad Shamsudduha (see below) has joined a research project "Groundwater resources in the Indo-Gangetic Basin (IGB): resilience to climate change and pumping" awarded to the British Geological Survey by UKaid. The objective is to assess groundwater resources in the IGB and to strengthen the evidence base linking groundwater, climate population and human abstraction of the basin. Currently, the UCL research team (including Dr Richard Taylor, Geography, and Dr William Burgess, Earth Sciences) is conducting extensive field research in Bangladesh and West Bengal.
- **Probability, Uncertainty and Risk in the Environment** is a UCL-led 4-year NERC consortium project (funded for £2 million) involving UK university and industrial partners. Richard Chandler (Statistical Science) is Principal Investigator. Dr Simon Day, a leading authority on tsunamis, and Joakim Beck, a statistician in natural hazards, were appointed as IRDR Research Associates. The project links to statistical modelling of tsunamis by IRDR Executive member Dr Serge Guillas and partnership with Tohoku University.
- **Earthquake Hazard in the Apennines, Italy** Newly appointed IRDR Lecturer Joanna Faure Walker has joined a major NERC multi-partner international project, led by IRDR Executive member Professor Gerald Roberts. She has already secured additional funding and is supervising two research students. David Alexander, IRDR Professor, joined the EEFIT Field Mission to evaluate recovery following the L'Aquila earthquake of 2009.
- **Cascading Crises** David Alexander is co-leading a new pan-European, multi-partner, EC project on cascading crises funded for euro 4.75 million.
- **Arctic Risks** programme aims to develop our understanding of sea ice mechanics and engineering problems in the context of environmental and societal risks in the Arctic. Ben Lishman was appointed IRDR Research Fellow (see below). We have signed a collaboration agreement with the NTNU, Norway, to support an IRDR Impact PhD Studentship and another with Total (France) for an Impact Studentship to work on arctic navigation. In April 2013 we hosted an international cross-disciplinary IRDR Arctic Risk Forum, addressing Arctic engineering risks and their implications, engaging with academics, engineers and professionals from the City. In May 2013 we hosted an International Rubble Ice Workshop for SAMCoT (see below).
- **Earthquake Hazard Assessment** using statistical physics approaches is a collaboration between IRDR Visiting Professor Filippos Vallianatos and IRDR Director Peter Sammonds, involving analysis of seismicity data, mathematical modelling and laboratory experiments. It is substantially funded by the Greek Scholarships Foundation, TEI Crete and the IRDR, supporting four IRDR PhD research students.
- **Aon Benfield UCL Hazard Centre**, directed by Dr Christopher Kilburn, are conducting extensive research and knowledge exchange projects with a City focus. An ABUHC Research Associate and an Impact Student will be appointed in 2013.

## IRDR Fellowships

The IRDR launched an open fellowship call, for excellent early-career researchers in any discipline in the field of risk and disaster reduction. The purpose was to produce excellent research with high impact, build capacity in the field and to signal our support and encouragement for early-career researchers from around the world to apply for prestigious fellowships to be held in the IRDR. We set up two 3-year fellowships for 2012 and will propose a third later in 2013.

**Dr Ben Lishman** was appointed in April 2012 to a 3-year IRDR Research Fellowship, in the area of Arctic engineering risks. Ben holds an MEng, an MPhil and a PhD from Cambridge University in engineering. He has worked at UCL and most recently has been a Research Associate at the Bristol Glaciological Centre.

The Arctic sea-ice cover has thinned in thickness and geographical extent over the last twenty years, and it is projected to do so for



the next twenty years. One effect is that the Arctic is more accessible, and heavy engineering – particularly for hydrocarbon production, mining and shipping – is increasing. This increase in economic activity has associated risks. The Arctic is a complex environment due to its remoteness, fragile ecosystems, the cold, the clash of local livelihoods with global capital, and the presence of sea ice. Sea ice both poses a hazard to offshore operations and shipping, and can act to transport and concentrate pollutants. Ben, working with

Danny Feltham (Centre for Polar Observation and Modelling), will simulate sea ice floe interactions, in the laboratory and environmental ice tank, and model sea ice dynamics using discrete element models in order to assess safe ice loads on offshore structures.

**Dr Mohammad Shamsudduha** was appointed in March 2012 to a 3-year IRDR Research Fellowship in the area of water risk. “Shams” holds a BSc and MSc in geology from Dhaka, MScs from Sydney and Auburn and a PhD in hydrogeology from UCL. Shams concurrently was funded by EPSRC for a KE fellowship on water risks in Bangladesh. His research will be included in the Earth Sciences REF Impact Case Study on water risks and has been featured in a *Nature Climate Change* paper he co-authored.

Every year many water-related hazards such as flood, tropical cycle, and drought affect people’s lives, properties and environments throughout the world. Globally, more than 50% of these naturally occurring disasters are hydrological. Amongst the hydroclimatological hazards, prolonged drought conditions resulting from insufficient rainfall and inadequate renewal of groundwater through rain-fed recharge can lead to serious social and economic disasters. In addition to water scarcity, poor water quality due to chemical and pathogenic contamination can lead to serious public health hazard.

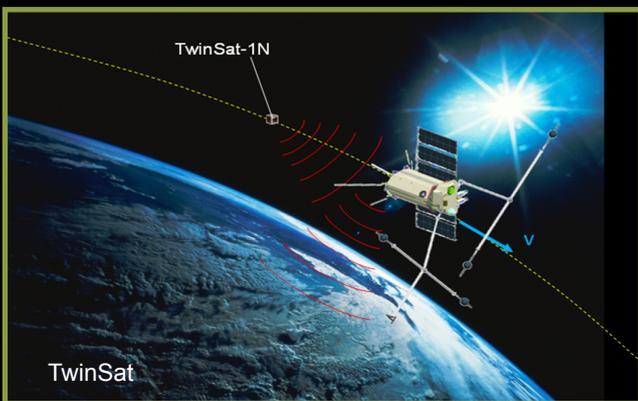
### *Groundwater arsenic distribution in south-eastern Bangladesh*

The IRDR identified groundwater, its associated risk to public health and food security, as a key research area. Globally, groundwater is the largest accessible store of freshwater that supplies both drinking and irrigation water supplies for many countries. Bangladesh has been recognised by the WHO as the world’s largest mass arsenic poisoning in history, affecting the health of more than 50 million people.

## International Partnerships



Building long-term international partnerships is important to the IRDR in order both to undertake world-class research and to achieve



real impact of that research amongst practitioners and policy-makers.

The IRDR is forging partnerships with government, research centres, multilateral agencies, NGOs, industry and commerce.

### **TwinSat: Russian-UK Earthquake Detection Satellite**



A Memorandum of Understanding was signed between the UCL Mullard Space Science Laboratory, the Schmidt Institute of Physics of the Earth, Russian Academy of Sciences and the IRDR to develop an instrumentation-based project for the detection of natural disaster precursors from space through the ob-

servations of their effects in the ionosphere and magnetosphere.

As a result, a proposal for a very low cost space mission involving a Russian micro satellite and a UK nano satellite has been developed to launch in 2017 and has won initial funding from the UK and Russia.

The project was a finalist for the Katerva Sustainability Awards in 2011.

*Nano satellite unit for detecting electron and ion fluxes.*

Bolivia - taken with permission

### **CAFOD - Bolivia**

Water risk and its management in Bolivia's Altiplano is a joint research project between CAFOD, ABUHC and the IRDR, launched in 2012, and involving partners working in Bolivia, including CENDA and CIPCA. (See above under IRDR Research Projects for further information.)

### **Tohoku University, Japan**

A Joint Statement was signed with Tohoku University for international research collaboration at the one-year memorial of the 2011 Tohoku Earthquake and Tsunami Disaster.

This was followed by a joint workshop and seminar hosted by the British Embassy in Tokyo in September 2012. In November 2013, to commemorate 150 years of UK-Japan collaboration in science and the Choshu Five studying at UCL, an international workshop will be hosted at UCL.

### **Technological Educational Institute of Crete, Greece**

An Erasmus agreement for the exchange of staff and students was signed. TEI and the IRDR have 4 joint PhD students and two recently awarded earthquake research grants from the Greek research council, totalling over euro 550,000, held jointly with IRDR Visiting Professor, Filippos Vallianatos.

### **NTNU, Norway**

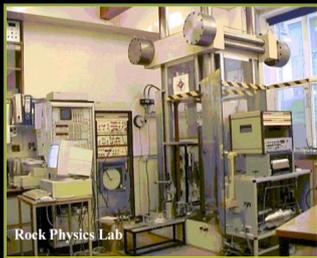
UCL will join the Norwegian-led multi-national Sustainable Arctic Marine & Coastal Technology (SAMCoT) programme and has received funding from SAMCoT for an Impact Studentship, jointly supervised by IRDR Visiting

# IRDR PhD Students

From the launch of the IRDR we have sought to build a vibrant PhD community. Starting with 2 students, the community will have grown to 17 in 2013, supported from diverse sources and supervised by trans-department panels. All our PhD students are based in the IRDR and engage with the full range of IRDR activities.

**Andria Sarri** Numerical modelling of tsunami comes at the expense of high computational resources. To overcome this, Andria's research uses a statistical emulator which approximates the mathematical model with high accuracy. *Funding: IRDR and Statistical Sciences. 2010-2014.*

**Alexis Cartwright-Taylor's** research is a laboratory-based investigation of electrical signals that accompany rock deformation. She is examining the relationships between microscopic fracture in the laboratory and crustal seismicity and electrical current patterns, aiming ultimately to improve assessing seismic risk.



Lab acoustic and electrical measurement during rock fracture

*Funding: TEI Crete Impact studentship. 2010-2014.*

**Giorgos Papadakis's** research analyses the spatial and temporal distributions of seismicity in the Hellenic subduction zone in the frame of non-extensive statistical physics.



The 1953 earthquake (M=7.2) in Kapsalio, West Attica (Greek State Scholarship Foundation). 2011-2015.

**Giorgos Michas's** research focuses on the geodynamic behaviour of the Earth's crust, taking a similar approach to the physics of fractures, applied to the Corinth rift, through experiments and theoretical modeling. *Funding: IKY (Greek State Scholarship Foundation). 2011-2015.*

**Amy Chadderton** is conducting laboratory simulations that combine both high temperature and deformation in permeability experiments in order to more accurately simulate real volcanic conduit conditions.

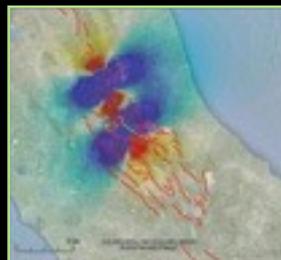
*Funding: IRDR & Earth Sciences. 2013-2016.*



Mount St Helens lava dome, 1st October 2004 photo USGS

**Stavros Helensov** is investigating the risk to Arctic offshore operations through analysing the structure, formation and strength of freeze bonds in sea ice. This is fundamental to understanding risks to man-made structures in the arctic. *Funding: NTNU SAMCoT Impact studentship. 2013-2016.*

**Luke Wedmore** is assessing seismic hazard in central Italy using rates of slip and earthquake recurrence through geophysical and geodetic measurements.



Coulomb stress modelling following the 1703 sequence of earthquakes in the Aegean, with Geospatial Research Lim-

**Luca** is investigating the spatio-temporal randomness of large earthquakes. This project uses proxies such as sub-marine deposits as a method to extend earthquake records at subduction zones. The eventual aim will be to suggest alternative distributions to those currently used that better reflect the behaviour of these extreme events. *Funding: Aon Benfield. 2013-2018.*

## IRDR PhD Studentships

**Social Media in disasters.** A project to enquire into and define the potential for using social media as a means of disaster response and risk reduction. The study will consider both actual and possible future uses of the new media. PI: D. Alexander; Col: J. Faure Walker.

*Funding: MAPS and IRDR. 2013-2016*

**Assessing landcover changes in urban areas and the implications for climate change adaptation.** A GIS-based study of Dhaka, Chittagong and Rajshahi cities in Bangladesh using remote sensing and numerical modelling to assess the impact of climate change and the need for adaptation. PI: D. Alexander.

*Funding: Commonwealth Scholarship Commission. 2013-2016*

**The link between earthquake recurrence and structural geology: the role of slip-rates, elapsed time and stress transfer.** PI: G. Roberts. Cols: J. Faure Walker, P. Sammonds

*Funding: NERC. 2013-2017*

**A European Perspective on Cascading Disasters.** An investigation of European vulnerability to cascading and complex disasters, with definition of a theoretical framework for assessing susceptibilities. Comparative approaches will be used in order to define spatial variations in vulnerability. PI: D. Alexander.

*Funding: European Commission funded project 'FORTESS'. 2013-2016.*

**Towards sustainable and risk free gas production from an unconventional source.** This project aims to find out more about the geo-

logical characterisation of shale gas reservoirs across various scales, and investigate the societal impacts of extraction such as the seismic risk. PI: J. Thurow. Cols: P. Meredith, J. Faure Walker, N. Skipper.

*Funding: UCL ISR. 2012-2016.*

**Living with mine waste: developing a decision-making tool for reducing water contamination risk.** PI: K. Hudson-Edwards; Cols: S. Edwards, G. Zamora Echnique and K. Crowley.

*Funding: NERC Open CASE PhD Studentship. 2013-2017.*

**Environmental impacts and risks to natural resources from mega-dams in the Amazon basin: a study of the proposed Cachuela Esperanza dam, northeast Bolivia.** PI: S. Edwards; Co-Is: M. Maslin, CAFOD and CIPCA.

*Funding: CAFOD Impact Studentship, 2013-2016*

**The threat of volcanic activity to major urban centres.** This interdisciplinary project will investigate the exposure of cities to volcanic eruptions and will develop response-and-preparation strategies. Using Naples as a case study, the results will be presented so that they can readily be incorporated into existing programmes for disaster reduction. PI: C. Kilburn. Cols: S. Edwards.

*Funding: Aon Benfield-UCL Impact PhD Studentship. 2013-2016.*

**Arctic Engineering Risks: Brush Ice.** An investigation with Total (France) of the risks of brush ice to Arctic gas transportation. PIs: P. Sammonds, K Riska (Total)

## IRDR Support

An important aim of the IRDR is to build the UCL risk and disaster reduction community.

**IRDR Student Support:** We have funded student members' travel and small projects and supported student-led conferences and workshops, such as the *Urban Change in Iran* meeting in 2012, providing £5,000 in travel bursaries and student prizes.

**Internships:** We have hosted several volunteers working on a variety of RDR projects and paid their expenses.

**Academic and Student Visitors:** We host excellent academic visitors.



Mt St Helens, Washington, USA

*Liz Gaunt (Earth Sciences) was funded to give an invited talk at the USGS Cascades Volcano Observatory, which undertakes volcano-hazard response worldwide.*

## Postgraduate Teaching

**Teaching is a core part of our mission.** We have established Risk and Disaster Reduction as a taught discipline by initiating two postgraduate programmes, a Master of Research In Risk and Disaster Reduction and its associated Postgraduate Certificate in 2012; an MSc in Risk, Disaster and Resilience will be launched in 2013.

These fill identified needs from practitioners to gain a sound underpinning in the subject and for trained researchers. Following a 'soft launch', two students are currently enrolled on the MRes programme. We expect advertising for 2013 will increase student numbers. For the MSc we are expecting less than 10 students in the first year, but anticipate these numbers will grow quickly to in excess of 20.

IRDR staff also teach extensively on the MSc Geophysical Hazards and the MSc Earthquake Engineering.

### MRes Risk & Disaster Reduction

Director: Prof David Alexander

The Master of Research is a research-intensive programme to meet the need for experts trained to analyze and provide solutions to complex issues relating to risk and disasters. The programme consists of four core taught modules, two of the four IRDR core courses listed for the MSc, and two in research methods, in addition to the substantial independent research project.

### MSc Risk, Disaster and Resilience

Director: Prof David Alexander

The MSc is a one-year full-time (or two-year part-time) taught master's programme in which students will explore the characterisation, quantification, management and reduction of risk and disasters, and their associated impacts from a diverse range of perspectives. The IRDR will teach the four core courses: *Natural and Anthropogenic Hazards and Vulnerability, Integrating Science into Risk and Disaster Reduction, Emergency and Crisis Planning, and Emergency and Crisis Management*. Additional modules from other departments in urban planning for disasters and climate change; anthropology of risk, power and uncertainty; societal resilience to disasters; geophysical hazards; seismic risk; security and terrorism risk reduction; and research skills will be available to students.

### Teaching Portal

To assist the coordination of teaching we have set up an *IRDR Teaching Portal* from where information on relevant programmes and modules across UCL can be accessed.



## Student Engagement

UCL students and graduates are regarded by the IRDR as great assets. The IRDR supports student societies and graduate-led disaster risk reduction and development projects aimed at increasing resilience.

**Thinking Development** is a collaborative, imaginative and sustainable design project connecting a community of nuns, teachers and schoolgirls in downtown Port-au-Prince, Haiti, with a group of UCL postgraduate designers, documenters and development planners, associated with and supported by the IRDR. The IRDR has supported Thinking Development since its launch in 2010 and hosted joint events and provided infrastructure.



## IRDR Forums

A key IRDR innovation has been setting up regular cross-disciplinary Forums, which bring together key people across UCL, along with potential partners and collaborators. Each Forum has resulted in major success for RDR research, teaching or knowledge exchange, in which UCL would not be engaged if it were not for the IRDR, and taken together have established UCL's leadership in risk and disaster reduction.

**IRDR Increasing Resilience to Natural Hazard Forum**, August 2010. Outcome – Following an application to the Natural Environment Research Council (NERC) and Social & Economic Research Council (ESRC), Peter Sammonds was appointed Strategic Advisor for the cross-research council £6 million increasing resilience programme, 2010-15.

**IRDR Teaching Forum**, February 2011. Outcome – Initiation of cross-UCL RDR teaching and M.Res. programme in Risk and Disaster Reduction and associate PG Certificate, with support from industry and NGO partners.

**IRDR Probability, Uncertainty and Risk Forum**, April 2011. Outcome – UCL led a successful £2 million consortium bid for the NERC programme. The UCL award (across 3 departments) is £683,000.



**IRDR Anthropology and Sociology Forum**, June 2012. Outcome – UCL joined a successful pan-European consortium bid to the European Commission (EC) Framework (FP7) for euro 4.75 million on Cascading Crises. The UCL award is euro 245,600.

**IRDR Student Forum**, October 2012. Outcome – UCL chapters of Geologists for Global Development and Engineers without Borders will join the Sustainable Resource Development in the Himalaya programme, Ladakh, 2014 which the IRDR is partnering, as a move towards cross-disciplinary student projects.

**IRDR Arctic Risk Forum**, April 2013. Outcome – UCL will join the Norwegian-led multi-national Sustainable Arctic Marine & Coastal Technology (SAMCoT) programme and has received funding from SAMCoT and from Total for two Impact Studentships.

UCL Institute for Risk & Disaster Reduction		
<b>Aon Benfield UCL Hazard Centre</b> <a href="http://www.abuhc.org/">www.abuhc.org/</a>	<b>EPICentre - Earthquake People Interaction Centre</b> <a href="http://www.epicentreonline.com">www.epicentreonline.com</a>	<b>Development Planning Unit</b> <a href="http://www.ucl.ac.uk/dpu">www.ucl.ac.uk/dpu</a>
<b>Tropical Storm Risk</b> <a href="http://www.tropicalstormrisk.com">www.tropicalstormrisk.com</a>	<b>Rock &amp; Ice Physics Laboratory</b> <a href="http://www.es.ucl.ac.uk/ripl">www.es.ucl.ac.uk/ripl</a>	<b>Centre for Ethics &amp; Law</b> <a href="http://www.ucl.ac.uk/silva/laws/law-ethics">www.ucl.ac.uk/silva/laws/law-ethics</a>
<b>Statistical Science</b> <a href="http://www.ucl.ac.uk/Stats/">www.ucl.ac.uk/Stats/</a>	<b>Mullard Space Science Laboratory</b> <a href="http://www.ucl.ac.uk/mssl/">www.ucl.ac.uk/mssl/</a>	<b>Extreme Citizen Science</b> <a href="http://www.ucl.ac.uk/excites/">www.ucl.ac.uk/excites/</a>
<b>Institute for Sustainable Resources</b> <a href="http://www.ucl.ac.uk/sustainable-resources/">www.ucl.ac.uk/sustainable-resources/</a>	<b>Centre of Advanced Spatial Analysis</b> <a href="http://www.bartlett.ucl.ac.uk/casa">www.bartlett.ucl.ac.uk/casa</a>	<b>EngD Centre for Urban Sustainability &amp; Resilience</b> <a href="http://engd-usar.cege.ucl.ac.uk">engd-usar.cege.ucl.ac.uk</a>
<b>Institute for Global Health</b> <a href="http://www.ucl.ac.uk/global-health">www.ucl.ac.uk/global-health</a>	<b>Environment Institute</b> <a href="http://www.ucl.ac.uk/environment-institute/">www.ucl.ac.uk/environment-institute/</a>	<b>School of Public Policy</b> <a href="http://www.ucl.ac.uk/spp/">www.ucl.ac.uk/spp/</a>

Associated UCL Centres

## Public Engagement

A key aim of the IRDR is to engage in public debate on issues in risk and disaster reduction, creating a space for academic discourse in the public-policy and political arenas, and raising the profile of UCL. To achieve this, we run highly successful events, open to the UCL community and the general public. Attendance varies from 150 to 250.

The 2012 Dickens Bicentennial provided an opportunity to examine the improvements in London's environment and public health and the resonances for global megacities of today. An Exhibition in the North Cloisters, drawing on the UCL Special Collections, featured Dickens's correspondence with Chadwick.

For International Women's Day in 2013, the



IRDR hosted a panel discussion on *Gender and Disasters*, which explored how the genders are differently impacted by natural disasters. The panel included Paula Albrito, Head of the European Office of the UNISDR, David

Alexander and Linda O'Halloran, Director of NGO Thinking Development. It was Chaired by Ellie Lee, Reader in Social Policy, University of Kent.

### Calendar of Public Events

#### 2010

IRDR Launch - May

Thinking Development: UCL Haiti Development Project Launch - August

Climate Risk & Implications for Food Security - November

#### 2011

Thinking Development: Communicating with Haiti - January

The Tohoku Earthquake - with a weblink to Japan - March

IRDR 1st Annual Conference - June

#### 2012

Dickens's London - March

IRDR 2nd Annual Conference - June

Urban Change in Iran - November

#### 2013

Gender and Disasters - to mark International Women's Day - March

## Leadership

**IRDR Annual Conference** provides the public space for thought-provoking lectures and discussions around the issues of risk, resilience and recovery, communication, disas-



ter risk reduction and critical infrastructure.

Building on the success of our Launch Event, we are now organizing our third Annual Conference, which have included

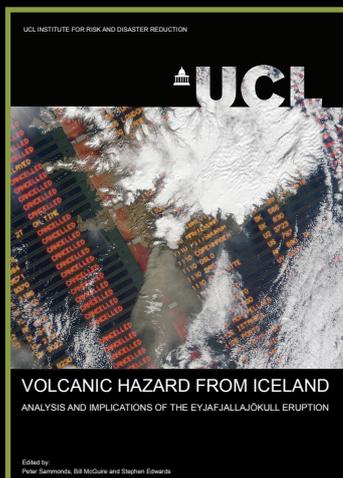
high profile speakers, such as the Chief Scientist for the Department for International Development and the former Permanent Secretary of the Home Office. Using a range of formats to promote discussion, such as panel discussions, 'in conversation' interviews and poster presentations for early-career researchers, taking advantage of our central London location and keeping registration costs low, we will build participation (presently around 150) so the Annual Conference becomes the pre-eminent forum in the field.

**Academic Conference on Risk and Disaster Risk Reduction and Resilience** is launched this year (extending Annual Conference) to provide leadership for university research and teaching in the UK and Europe and foster communication and collaboration.

## Knowledge Exchange

Knowledge exchange is a core part of the mission of the IRDR which we seek to fulfill by publishing high-impact reports, engaging with the media and building long-term partnerships. IRDR Arctic Risk and Water Risk projects have important KE - see below.

### Eyjafjallajökull eruption



Our report *Volcanic Hazard from Iceland*, analyzing the 2010 Eyjafjallajökull eruption and its social consequences was widely commended and was the only contemporaneous report that analyzed the implications for future travel disruption both qualitatively and quantitatively.

### Tohoku Earthquake and Tsunami

The IRDR Director joined the *Earthquake Engineering Field Investigation Team (EEFIT)* mission to Tohoku and contributed to the EEFIT report. This report has been drawn on extensively by the UK Cabinet Office in advice to ministers.

The IRDR organized a follow-up *International Disaster Workshop* in Japan in October 2012 at the British Embassy in Tokyo with the new *International Research Institute of Disaster Science, Tohoku University*. A report was published by the IRDR on fieldwork undertaken,



including to the Fukushima nuclear reactor.

Two IRDR Research Students investigated post-tsunami recovery in March 2013, supported by the UK Embassy. Both Joanna Faure Walker and David Alexander joined the return *EEFIT Mission* in June 2013.

[www.ucl.ac.uk/rdr/publications](http://www.ucl.ac.uk/rdr/publications)

### Aon Benfield

Sponsorship of the Aon Benfield UCL Hazard Centre (ABUHC) was negotiated by the IRDR Director from 2010 to 2014 to support hazard research and knowledge exchange oriented towards the City re-insurance industry. This sponsorship is the most important vehicle for knowledge exchange between universities and the City. The ABUHC has undertaken a broad

## Media Engagement

The IRDR maintains a high-profile media strategy, providing both immediate comment during disasters and features for documentaries.

Appearances have included:

- L'Aquila trial, 2012 (BBC News)
- Tsunami risks in Japan, 2012 (Monocle 24 Radio)
- Earthquake-resistant buildings, for RIBA, 2011 (NBS Learning Channel)
- Comment on Icelandic volcanism, 2011 (Sky News)
- Extensive comment on the 2011 Tohoku earthquake & tsunami (CNN, BBC World TV, Sky News, BBC Radio 5 Live, LBC, BBC Newsnight)



## Participation, Management and Accountability

The IRDR aims to cultivate an inclusive, stimulating and sustainable environment to support outstanding research, teaching and knowledge exchange in risk and disaster reduction. Research, teaching and knowledge exchange in the IRDR aspires to be cross-disciplinary, international and have strong societal impact.

To achieve these aims, the IRDR Director and Deputy Director draw up planning programmes, which are presented to biannual meetings of the IRDR Executive Board, which is drawn from across UCL, who advise on the strategic direction of the IRDR. An IRDR Research Committee, also drawn from across UCL, chaired by the Professor of Risk and Disaster Reduction, has a strategic role in promoting cross-disciplinary research and a management role in quality assurance of research proposals, oversight of IRDR-funded awards and studentships, and research ethics and safety.

The Director reports annually to the Deans' Oversight Committee and an Advisory Board, chaired by the Vice Provost Research, and an AGM of members of the IRDR.

Day-to-day management of the IRDR is undertaken by the Director and Deputy Director, supported by the IRDR Administrator, in con-

sultation with a Management Team consisting of IRDR academic staff, who report biannually to a General Staff Meeting and consult biannually with a Staff-Student Committee.

The IRDR is constituted as an informal Academic Unit within MAPS (level 60), which means it has departmental status on matters such as HR and space. The IRDR budget has its own cost code, CQ, for which the director is responsible, but is under the financial umbrella of Earth Sciences. The IRDR has evolved to assume increasing responsibility for its own affairs. However some systems in the central administration are challenged by how to cope with a cross-disciplinary institute.

The IRDR is unique in encouraging an open membership from staff and students across UCL, reflecting the broad interest in risk and disaster reduction. Membership numbers over 240. The IRDR mailing list numbers over 1000, both from inside and outside UCL.

### **Advisory Board**

Prof David Price, Vice Provost (Chair)

Tony Gilland, Institute of Ideas

Prof Dougal Goodman, Director, Foundation for Science & Technology

Prof Yvonne Rydin, UCL Environment Institute

Prof Julian Hunt, FRS, UCL

Geoff Donoghue, CAFOD

## A Physical and Intellectual Hub

The IRDR now provides both a physical and intellectual hub for UCL's activities in risk and disaster reduction, occupying its own space in the South Wing on the Main UCL Campus.

Space at UCL is principally organized around departments, but where groups have co-located new synergies have developed, which have led to new ideas, research grants and publications. The IRDR will reap the benefits of a risk and disaster reduction hub, particularly as this community comprises relatively small and dispersed groups, by providing a physical fo-



cus for research, with flexible membership, a Doctoral Training Centre, central teaching and learning space and for hosting leading intellectuals. However, the current rapid expansion of the IRDR means that further space in the South Wing is now an acute matter.

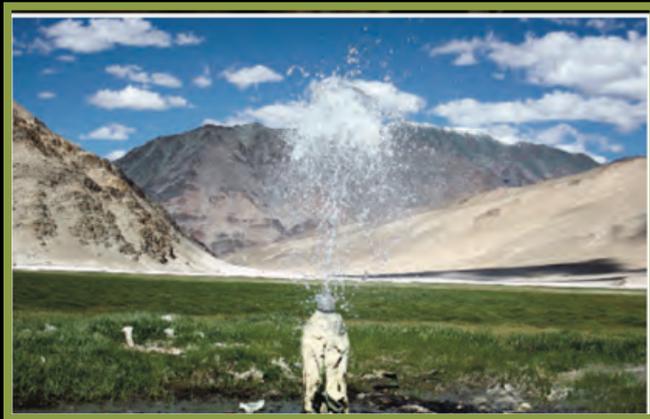
The IRDR website, with its teaching portal and links to associated research centres across UCL, provides an information hub for UCL's risk and disaster reduction activities, and the quarterly IRDR e-newsletter keeps members in touch with events.

In addition to the IRDR Public Events, KE Events and Forums, the IRDR maintains a stimulating intellectual environment with two seminar series: for internal and for guest speakers

## Future Plans

### Recruitment

Broadening the academic reach of the IRDR is central to our future plans. We are currently recruiting a Reader as a joint appointment with the Institute of Global Health and a Lecturer as a joint appointment with the Department of Statistical Science. These appointments are central to our plans to develop new areas of cross-disciplinary research. The IRDR will facilitate this with cross-disciplinary meetings and forums to build the research, teaching and knowledge-exchange base. Looking into the future, we anticipate that new appointments will again be joint appointments. In the 2013-14 academic year we will make a fresh proposal with other strategic partners for the IRDR from across UCL, particularly looking towards bridging to the social sciences, ethics and laws, and economics and public policy.



### Research Direction

Two major projects, the NERC Probability, Uncertainty and Risk programme and the EC FORTRESS Cascading Crises projects, to which the IRDR is heavily committed launched in 2012 and 2013 respectively. As well as being important projects in their own right, they are also indicative of the direction of travel of cross-disciplinary research for the IRDR. PURE is looking for common methodologies across environmental risks. FORTRESS is looking at a major cause of uncertainty – namely how crises cascade or why they do not. These are issues where fundamental research can make much progress and where the impact of these researches can reach a broad range of user communities.

### Doctoral Research Centre

With PhD students numbers building rapidly, we will establish an IRDR Doctoral Research Centre, which is cross-disciplinary, international in perspective, making real societal impact, and aiming to transform knowledge into wisdom. Cross-disciplinary supervisory panels, an educational programme in risk and disaster reduction, participation in IRDR events, language training and a 2-day annual retreat will foster a new type of graduate who can benefit from collective multi-disciplinary knowledge and work internationally.

### Teaching

The IRDR will launch its MSc in Risk, Disaster and Resilience in 2013. The years following the launch will see the development of the programme, engaging the new appointments.

### Public Engagement

We will continue to develop a lively programme of public events. We have reach capacity for the number of events we can put on with existing staff, but we intend to drawn on newly appointed faculty staff whose remit includes public engagement.

### Knowledge Exchange

The Aon Benfield Sponsorship agreement will come to and end in 2014. We envisage a new partnership emerging with Aon and all its activities, worldwide. The IRDR has also been acting to diversify the range of City firms we engage with, and in discussion with UCL Business Partnerships is setting up UCL Risk Analytics as a new vehicle for engagement with the City, which will act as a manager and broker of UCL research.

### Global Citizenship

With the UCL chapters of *Geology for Global Development* and *Engineers without Borders UK*, the IRDR is promoting joint projects to increase resilience in the Himalaya as part of a broader collaboration with Jammu University and the Geological Society conference on Sustainable Resource Development in the Himalaya, 2014. We see this as a model for growth of student global citizenship.

**10th October 2013 (Provisional)**  
**Disasters and Ethics Forum (UCL)**

Cross-disciplinary research forum.  
Convenor: *Prof. Peter Sammonds*  
[p.sammonds@ucl.ac.uk](mailto:p.sammonds@ucl.ac.uk)

**19th November 2012**

**UCL Lunch Hour Lecture**

Earthquakes and Natural Disasters in Japan  
Lecturer: *Peter Sammonds*  
Darwin Lecture Theater, 1.15-1.55

**21st-22nd November 2013**

**International Disaster Workshop (UoL)**

An invitation-only 2-day workshop jointly hosted by the IRDR and the International Research Institute of Disaster Science, Tohoku University. Further information: *Dr Rosanna Smith*  
[rosanna.smith@ucl.ac.uk](mailto:rosanna.smith@ucl.ac.uk)

**5th March 2014 (Provisional)**

**Disaster and Health Forum (UCL)**

Cross-disciplinary research forum.  
Convenor: *Prof David Alexander*  
[david.alexander@ucl.ac.uk](mailto:david.alexander@ucl.ac.uk)

**12th June 2014 (Provisional)**

**IRDR Second Academic Conference on Risk, Disaster Risk Reduction and Resilience (UCL)**

An invitation only academic meeting on Teaching and Research in Higher Education.  
Convenor: *Prof David Alexander*  
[david.alexander@ucl.ac.uk](mailto:david.alexander@ucl.ac.uk)

**13th June 2014 (Provisional)**

**IRDR Fourth Annual Conference (UCL)**

The Annual Conference - a one-day event of thought-provoking lectures and discussions, open to the UCL community and the general public.

Convenor: *Dr Rosanna Smith*  
[rosanna.smith@ucl.ac.uk](mailto:rosanna.smith@ucl.ac.uk)

**19th-20th June 2014 (Provisional)**

**IRDR Student Summer School**

Convenor: *Prof David Alexander*  
[david.alexander@ucl.ac.uk](mailto:david.alexander@ucl.ac.uk)

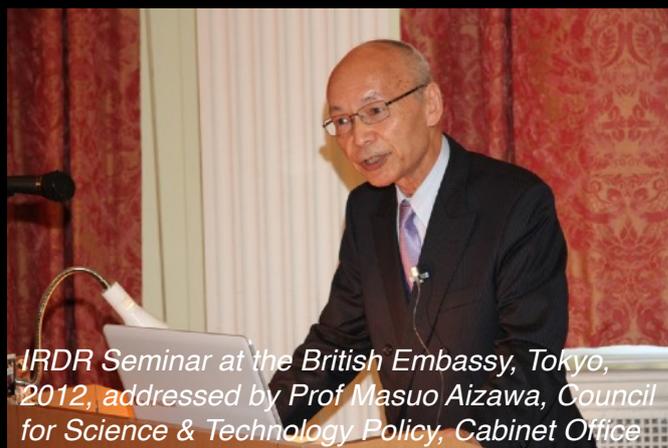
**Monthly**

**IRDR Invited Seminar Series**

Convenor: *Dr Megan French*  
[m.french@ucl.ac.uk](mailto:m.french@ucl.ac.uk)

**IRDR Internal Seminar Series**

Convenor: *Dr Mohammad Shamsudduha*  
[m.shamsudduha@ucl.ac.uk](mailto:m.shamsudduha@ucl.ac.uk)



IRDR Seminar at the British Embassy, Tokyo, 2012, addressed by Prof Masuo Aizawa, Council for Science & Technology Policy, Cabinet Office

## If you wish to organise an IRDR event

The IRDR supports the following events:

**IRDR Forums** which aim to bring together 16-20 people from the UCL community, informally, with potential partners and funders, to foster cross-disciplinary collaboration. The format is three lead presentations, then brief talks by researchers and open discussion, followed by a drinks reception.

**Evening Discussion Meetings** which are open to the UCL community, general public and media, are organized around a topical theme which promises a lively debate.

**IRDR Annual Conference** sessions on a research theme. The format may be presentations, panel discussion, keynote lecture or “*in conversation*” interview.

**IRDR Sponsorship** of launch events, conferences or workshops at UCL, where we can provide logistical support and pump-priming funding.

For further information, please contact the IRDR Deputy Director.

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Follow@UCLIRDR



Children's planning workshop for a new school in Port-au-Prince, Haiti

**BECOME A MEMBER OF THE IRDR.** Reducing global risks and disasters presents a colossal challenge that requires coordinated and collaborative action. UCL is uniquely well placed to respond to this challenge with at least 70 academics across 12 departments and 7 faculties involved in world-class research, teaching and practice in the field. The IRDR aims to bring together this wealth of knowledge and expertise, and through research, teaching and knowledge exchange aims to overcome the barriers to understanding risk and reducing the impact of disasters. To find out more - or to register your own activity - please visit [ucl.ac.uk/rdr/join](http://ucl.ac.uk/rdr/join)