

## Hydrohazards: extremes, environment and people

**Date(s)** Wednesday 17th October 2012 (09:00-16:30)

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Water-related hazards (hydrohazards) are the results of complex interactions in the ocean-atmosphere-land process cascade. Extreme hydrological phenomena (floods and droughts) are anticipated to increase with global warming. Floods and droughts have significant impacts on the environment affecting biogeochemical processes, water quality extremes and pollutant levels as well as altering habitat conditions with impacts on ecosystem structure and function. These hydrological extremes have profound consequences also for people. Floods cause more deaths and infrastructure damage than any other sudden-onset hazard. Droughts have a gradual onset but typically cover larger geographical domains and persist over longer time periods, hence yield widespread impacts on socio-economic life. Floods and droughts result in some of the largest disaster-related economic losses in low to high income countries, with costs of flooding increasing by 160% in OECD countries since 1980. Increased hydrohazard impacts and costs are attributable to factors such as: increased event frequency and magnitude, unplanned urbanization, degradation of ecosystem services, vulnerable livelihoods, and inaccurate public perception of risk.



Despite the serious consequences of hydrohazards for society and the environment, major research gaps remain including: (1) understanding links between climate-land-hydrology-human processes that generate (potentially exacerbate) floods and droughts; (2) reducing uncertainty of projections of future flood and drought space-time distributions in the context of global change; (3) integrated assessment of hydrohazards impacts on biophysical and socio-economic systems and processes; (4) how best to use knowledge to improve decision making, planning and policy on mitigation and adaptation strategies to enhance resilience and reduce impacts of hydrohazards now and into the future; and (5) moving beyond pure 'social' and 'technical' interpretations of hydrohazards to understand the political ecologies implicated in conditioning human vulnerability. To address these grand challenges in understanding, predicting and managing hydrohazards trans-disciplinary approaches to research are necessary. The workshop has potential to build on existing areas of strength across the University and integrates across traditional disciplinary boundaries with the goal of generating world-leading and innovative research activities with impact. It is timely to focus on hydrohazards as "Water-related disasters" and "Water Scarcity" have been identified as core themes for UNESCO's International Hydrology Programme's 8th phase (2014-2019). Furthermore, NERC has planned (TAP3) directed research programmes on "UK drought" and "Flooding from intense rainfall". EPSRC has identified "water engineering" as one of only 12 research areas within the engineering theme for growth (the other 100 being either reduced, maintained or under review). A "Floods" Action has been launched very recently at the Joint Research Centre (JRC) of the European Commission. The hydrohazards theme connects up with the University's strategic investment initiative on "Resilience and Urban Living".

A 'Hydrohazards' session is proposed for the [American Geophysical Union's \(AGU\) 45th annual Fall Meeting \(http://fallmeeting.agu.org/2012/session-search/single/hydrohazards-processes-diagnosis-and-projection/\)](http://fallmeeting.agu.org/2012/session-search/single/hydrohazards-processes-diagnosis-and-projection/). The conference will be attended by more than 20,000 Earth and space scientists, educators, students, and other leaders in San Francisco, California, 3rd-7th December, as they gather to present groundbreaking research and connect with colleagues.

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