

Dr Russell Death



Dr Death is an Associate Professor at Massey University and will be visiting the University of Birmingham 14 July - 14 November 2014 hosted by **Dr Mark Ledger** (<http://www.birmingham.ac.uk/staff/profiles/gees/ledger-mark.aspx>) and **Professor David Hannah** (<http://www.birmingham.ac.uk/schools/gees/people/profile.aspx?Referenceld=9683>) from **Geography, Earth and Environmental Sciences** (<http://www.birmingham.ac.uk/schools/gees/index.aspx>).

Climate change is expected to increase the future occurrence of extreme hydrological events, such as severe droughts with potentially devastating effects on ecosystems, yet to date most ecological research effort has centered on the impacts of gradually shifting 'average' conditions, not extremes. Droughts are difficult to study in natural systems because they are, by definition, infrequent. Experiments have been advocated recently as useful tools to explore the *ecological* impact of climate extremes, and research at the University of Birmingham is at the leading edge of this new trend. We have recently published a body of work in high impact journals which characterises drought effects at higher levels of biological organisation

(i.e. food web patterns and processes; e.g. Ledger et al., 2011, 2012, 2013) and we are now beginning new NERC-funded research projects to explore underlying causative mechanisms (e.g. habitat loss, sedimentation, thermal stress etc.), including in our new ECOLAB facility on campus. UoB is also at the leading edge of *hydrological* research on drought and hydrohazards (as evidenced by the recent **IAS workshop** (<http://www.birmingham.ac.uk/research/activity/ias/workshops/2012/hydrohazards.aspx>) and UNESCO-International Hydrology Programme activities), and we are thus ideally situated to bring together hydrology and ecology at cutting edge of research to understand the environmental impacts of extreme events. Two immediate challenges arising from recent work are: 1) to better understand how shifts in food web structure and functioning caused by disturbances (floods, droughts) affect network stability in order to predict long-term responses of ecosystems to climate change, and 2) to upscale the work from patch-scale experiments and move towards prediction by developing modelling approaches which operate at spatial scales and timeframes relevant to managers and policy makers.

Collaboration with Dr Death a world leading ecohydrologist, will allow significant advances in these key areas. Russell is a senior figure in the field of disturbance ecology with high-level expertise in the artificial intelligence modelling approaches that would allow us to make the leap to a more predictive science.

Full details of the plans for the visit will be available soon but will include work on the submission of manuscripts to internationally peer-reviewed journals, a workshop on the use of artificial intelligence modelling techniques for communicating complex science to managers, a public seminar 'Water management issues in the colonies: what can the UK learn from 'down under' and a workshop on using Netica and WEKA (both freeware) for statistical modelling in geography and ecology.