

# RGS-IBG Monica Cole Research Grant

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Geographical  
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**Year:** 2008

**Principal Investigator:** Kate Armstrong, University of Edinburgh

**Project Title:** Testing Wallace's Line as a Biogeographical Barrier for the Pantropical Tree *Manilkara* (Sapotaceae)

**Abstract:**

*Manilkara* is a genus in the Sapotaceae consisting of c. 81 species distributed throughout the tropics (30 South and Central American, 37 African and 14 SE Asian and Polynesian). Its distribution in Asia stretches from India to Samoa. Indonesia lies at the centre of this distribution at the crossroads between an Asiatic flora to the west and an Australasian flora to the east. This overlap and mixing of floras combined with the geological history of the region means that the Indonesian archipelago is an interesting study area. The Indonesian species of *Manilkara* are central to understanding the group's speciation and biogeographical history in the region. The primary objectives of this fieldwork were 1.) To investigate the effect of Wallace's Line as a biogeographical barrier for the tree genus *Manilkara* and its implications for biodiversity and geography in SE Asia and; 2.) to examine diversification patterns of *Manilkara* in SE Asia in relation to the historical biogeography of the group in Africa and South/Central America. Eighty two specimens were made as part of this research. Field-based observations and collections of *Manilkara fasciculata* have been very informative. Although only few populations of *Manilkara* were found, the information gained from the specimens collected has been insightful and will contribute valuable data towards a taxonomic revision, phylogenetic reconstruction and analysis as well as conservation assessments of *Manilkara* species in Southeast Asia. The additional Sapotaceae specimens collected will also be of great value for continuing collaborative research on the family between RBGE and Indonesian researchers at the Herbarium Bogoriense and there has already been discussion of beginning molecular analysis on them.

**Year:** 2007

**Principal Investigator:** Natasha Barlow, Durham University

**Project Title:** Isostasy, Eustasy and Tectonics in Southern Alaska

**Abstract:**

The main goal of this research was to unravel the complex history of relative sea level (RSL) fluctuation in Southern Alaska during the last 1000 years, particularly researching the special variations of crustal response to glacier loading. This project arose as a consequence of observations of anomalous RSL fluctuation understood to be a result of the earthquake deformation cycle. This observation was tentatively correlated as being a result of the isostatic loading and unloading of local glaciers during a period of cooling known as the Little Ice Age. Research focused on relative sea level (RSL) reconstruction using biostratigraphy and geophysical modelling. Field sites visited were Hope, Bird Point, Ocean View, Girdwood and Knik Arm. Due to the financial restrictions of requiring a helicopter or boat to access Chickaloon Bay, it was not feasible as a study site.

**Year:** 2004

**Principal Investigator:** Dominique Chaput, University of Oxford

**Project Title:** Dynamics of Microbiological Weathering Communities in a High Arctic Ecosystem

**Abstract:**

This project addressed some of the knowledge gaps surrounding the dynamics of biological weathering communities in cold environments. It investigated the responses of such

communities to changes in physical parameters, focusing on shifts in community composition (and thus in weathering type and severity) that may accompany climate warming. The project helped to improve our predictive capacities with regards to ecosystem responses to climate warming.

**Year:** 2001

**Principal Investigator:** Helen Bray, University of Oxford

**Project Title:** Late Quaternary Palaeoenvironmental Reconstruction of the Arabian Peninsula

**Abstract:**

This research established a precise chronology and explanation for Late Quaternary dune mobility and humid phase deposits of the Arabian Peninsula. Most explanations for changing dune systems cite altering wind conditions as a major factor, placing less emphasis on parameters such as sediment supply and age, in determining dune field structure. This research investigated uncertainties regarding the factors of importance in the formation of dune systems. The main technique used was optically stimulated luminescence dating (OSL). Optical dates, combined with sedimentological analyses, allowed interpretation of the external and internal forcing factors of Quaternary climate change.

**Year:** 1998

**Principal Investigator:** Anne-Marie Nuttall, University of Bristol

**Project Title:** Assessing the Impact of Superimposed Ice Formation on the Glacier Mass Balance of Northwest Svalbard

**Abstract:**

On many glaciers in the Arctic, superimposed ice (SI) forms at the base of the snow-pack during winter and spring by refreezing of meltwaters. It is believed to form a significant proportion of the mass balance budget for Svalbard glaciers. Traditional methods of measuring mass balance do not take into account the contribution of SI to the accumulation. This project sought to further our understanding of SI formation and its significance for mass balance measurements on Spitsbergen through the combination of a field campaign, a laboratory study and numerical modelling. The project quantified the variation in SI formation across a group of glaciers experiencing similar meteorological conditions but encompassing different altitude ranges, monitored the contribution of SI to mass balance.

**Year:** 1995

**Principal Investigator:** Sarah Selby, University of Edinburgh

**Project Title:** Groundwater Salinity and its Relationship with Plant Composition and Distribution on a Wetland/Savannah Transition in the Rio Bravo Conservation Area, North West Belize

**Abstract:**

This project attempted to ascertain the importance of soil and water salinity in contributing to plant composition and distribution in wetland and savannah areas within the Rio Bravo Conservation Management Area in North West Belize. The aims of the research were to 1. Measure the salinity of groundwater in a wide range of locations in the study area to establish the distribution of salinity; 2. Carry out a detailed survey of salinity variation in one or more location, to establish the spatial scale of change; and 3. Outline likely plant-soil-salinity inter-relationships. The results will lead to a proposal for long term monitoring in the



area which will contribute conservation management plans. Whilst in Belize Sarah also carried out an assessment of the effects of Mennonite agriculture on wetland ecology in northern Belize.

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