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2009 Staff List

Head of School
Peter Cowell, B.A., Ph.D.
Coastal Morphodynamics, GIS

Professors
Geoffrey Clarke, B.Sc., Ph.D.
Metamorphic petrology, thermobarometry and field geology in East Antarctica and New Caledonia

Philip Hirsch, B.A., M.Phil., Ph.D.
Resource management, environment and rural development (SE Asia)

R. Dietmar Müller, M.Sc, Kiel Ph.D. Calif
Analysis of tectonic plate motions, continental margin tectonics, and seafloor mapping

Associate Professors
Source and fate of contaminant in catchments and estuaries; sediment toxicity, environmental geochemistry

Construction geology, environmental geology, reinforcement of soil slopes by vegetation

Phil McManus, B.A., Grad. Dip., M.E.S., Ph.D.
Sustainability, Nature, Urban Geography

Bill Pritchard, B.A., Ph.D.
Economic Geography, Global Restructuring of Agriculture and Food Industries

Senior Lecturers
Eleanor Bruce, B.Sc, Ph.D.
Geographical Information Systems (GIS), Coastal Management

Social and political ecological aspects of natural resource management, community forestry

Stephen Gale, M.A., Ph.D.
Quaternary Environmental History, Sedimentary Geomorphology
Staff list

Patrice Rey, B.Sc., Ph.D.
Structural geology and tectonics
Jody Webster, B.Sc, Ph.D.
Atmospheric processes and climate change
Derek Wyman, B.Sc., Ph.D.
Economic Geology, Igneous Petrology, Geochemistry

Lecturers
Alina Hale, M. Physics, M. Phil., Ph.D.
Computational Volcanology Modelling
Kurt Iveson, B. Econ (Soc. Sci.), Ph.D.
Urban and Political Geography
Melissa Neave, B.A., Ph.D.
Fluvial and Arid Zone Geomorphology
Jeffrey Neilson B.A., B.Sc., Ph.D
Environmental Geography, Natural resource management and rural economic development in Southeast Asia
Edwina Tanner
Earth, Environment and Society

Associate Lecturers
Deanne Hickey, M.Sc.
Physical Geography, GIS
Elizabeth Moylan BAppSc (Hon), Grad Dip VET, PhD

Research Fellows
Elaine Baker, B.Sc, Ph.D.
Stephen Barry, B.Sc. (Hons), Ph.D.
Adriana Dutkiewicz, B.Sc, Ph.D.
Gabriele Morra, M.Sc., Ph.D.
Staff list

Daniel Penny, B.A (Hons.), Ph.D.
Leonardo Quevedo, B.Sc. (Hons), M.Sc., Ph.D.
Maria Seton, B.Sc., Ph.D.
Ana Vila-Concejo, M.Sc., Ph.D.
Joanne Whittaker, B.Sc (Hons)/BCom, MSc, Ph.D.

Emeritus Professor

John Connell, B.A., Ph.D, F.A.S.S.A.
  Third world development (South Pacific), cultural geography

Iain Mason, B.Sc Eng., M.A., Ph.D.
  Development of geophysical technology, drilling and drill hole analysis

Honorary Associates

David Branagan, B.Sc., Ph.D.
David Chapman, M.Eng.Sc., B.A., Ph.D.
Douglas Cato, Ph.D.
Deirdre Dragovich, M.A., Ph.D.
Victor Dent, B.Sc. M.Sc.
Robert Fisher, B.A., Ph D.
Gabor Foldvary, Ph.D.
Peter Hoare, M.Sc., Ph.D.
Ronald Horvath, M.A., Ph.D.
John Hudson, M.Sc.
Michael Hughes Ph.D.
Jock Keene, B.Ag.Ec., B.Sc., Ph.D.
Stephanie McCready, Ph.D.
Gordon Packham, B.Sc., Ph.D.
Roshanka Ranasinghe, Ph.D.
Staff list

Peter Roy, B.Sc., Ph.D.
Anne-Louise Semple, B.A., Ph.D.
Andrew Short, M.A., Ph.D.
Brian Stevens
Bruce Thom, B.A., MA, Ph.D.
Keeva Vozoff, B Phys, M.Sc., Ph.D.
Robin Warner, B.A., Ph.D.
Eric Waddell, B.A., M.Sc., Ph.D.
Thomas Zheng, Ph.D.

Administrative Staff
Suzy Andrew, B.A., B.Sc., M.A. School Administration Manager
Kate Griffiths, B.A. (Hons) Research Assistant, AMRC
Marlyn Horgan, B.A., MNIA Finance Manager
Nikki Montenegro, B.A. Administration Assistant
Troy Mutton B.App.Sci Geosciences Liaison Librarian
Lucie Reynolds B.Sc, B.A. Science Communicator
Sue Taylor Administration Assistant - Earthbyte
Grace Lei Zhang B. Acc. Finance Officer

Technical Staff
Tom Savage B.Eng. (Chem) Water, Sediment and Chemical Laboratories Manager
Graham Lloyd Field Support Officer
David Mitchell Senior Technical Officer
James Boyden B.Sc. Research Assistant
John Cannon B.Sc. M.Sc. Auscope Software Developer
James Clark Database Administrator for GPlates Project
Michael Qin B.Sc. M.Sc. Software Developer in C++
Elaine Baker

Elaine Baker is the Director of the UNEP Shelf Programme at the University of Sydney. The Programme headquarters are located at UNEP-GRID Arendal in Norway. UNEP Shelf aims to assist coastal states with submissions to secure sovereign rights to continental shelf beyond 200 nautical miles under article 76 of the United Nations Convention on the Law of the Sea (UNCLOS). Currently Elaine is working with colleagues from Geoscience Australia, South Western Pacific Coastal States and SOPAC to determine the areas of potential legal extended continental shelf in the region.

Elaine is also the co-ordinator of the Asian Neighbours Network “University of the Sea”. The “University of the Sea” is a partnership between the University of Sydney, the University of NSW, the University of Technology Sydney, the Australian National University, the University of Tokyo, the Korean Ocean Research and Development Institute, Tongji University China, the Partnership for Observation of the Global Oceans Canada, the National Institute of Oceanography Goa, the Indonesian Research Centre for Marine Technology and the Intergovernmental Oceanographic Commission of UNESCO.

The aim of the “University of the Sea” is to enable senior researchers from the region to work with young local scholars on marine issues of direct interest to the Asia – Pacific region. Students will address specific regional problems (including those unique to tropical and sub-tropical countries) through a program of targeted research.

Gavin Birch

Gavin moved from the petroleum industry to initiate Environmental Geology at Sydney University. He has five major, ongoing research projects: Assessing the ability of natural processes to effectively disperse contaminants on high-energy continental margins. Studying the role of stormwater in contamination of estuarine environments and the inability of conventional devices to effectively remediate stormwater. Research on the effects of sedimentary toxicants on benthic animals. The results of a decade of research into estuarine processes are being used to construct a contaminant model of complex estuarine systems and developing a new biological-effects based assessment scheme to categorise estuaries in New South Wales. Gavin’s specialities are in the toxicity of marine sediments and in the chemistry and remediation of stormwater.

Eleanor Bruce

Eleanor Bruce’s research interests are in environmental spatial analysis and modelling. More specifically this research has focused on examining processes of habitat loss in urban coastal environments, the use of GIS and remote sensing in vegetation change detection and landscape heritage management, marine zone planning and evaluating the impact of spatial data uncertainty in environmental decision-making. Current research projects include examining coastal wetland response to changes in inter-tidal sedimentation rates in Sydney Harbour and investigating links between spatio-temporal pattern and processes of landscape change to facilitate longer-term vegetation monitoring in Angkor, Cambodia. Eleanor is currently working on collaborative research projects with the Sydney Olympic Park Authority, Ku-ring-gai Council, Department of Environment and Climate Change, APSARA and UNESCO.

Geoff Clarke

Prof. Clarke has contributed to all aspects of the textural analysis of high-grade metamorphic rocks. Field-based ARC-funded research on high-P Cretaceous granulites (with Klepeis & Rushmer, USA, and Tulloch & Mortimer, IGNS, New Zealand) integrates tightly data from structural, petrologic and isotopic studies to study geological processes critical to the formation and modification of continental crust. Other ARC-funded research (with Powell, University of Melbourne) on the application of equilibrium thermodynamics has defined the P-T domains of common blueschist and eclogite facies assemblages, something that could not be done by direct experimentation, and established new approaches to the study of equilibrium during metamorphism. Geoff has also had ASAC-funded field programme examining lower crustal processes that formed high-grade rocks in MacRobertson and Kemp Lands, Australian Antarctic Territory.

Peter Cowell

Peter Cowell’s research interests are in the geomorphology of coasts and continental shelves; or more specifically, the nature of change in coastal landforms and the processes responsible for such change (known formally as the field of coastal morphodynamics). The research involves the combined use of field data and computer modelling to yield information that is otherwise unattainable, with the application of formal methods for managing uncertainty. This approach is applied to estimation of sediment transport and coastal change relevant to coastal management and coastal impacts of climate change, as well as to geological exploration. Research is being undertaken on four continents in collaboration with other coastal scientists from Australia, Europe and the Americas. This work has focused on clastic coasts (sand and mud deposits), and was expanded recently to include the morphodynamics of coral atolls.
John Connell
John Connell’s principal research interests are concerned with political, economic and social development in less developed countries, especially in the South Pacific region and in other small island states. Much of this research is currently oriented to issues of rural development, migration and inequality. A second research theme is on decolonisation and nationalism. More recently he has worked on the cultural geography of music and food. He is presently working on the impact of tourism and festivals on rural and regional development, and the global migration of skilled health workers. He has written books on migration and development issues, especially concerning Papua New Guinea and New Caledonia and urbanisation in the Third World.

Adriana Dutkiewicz
Adriana’s research is focused on petrology of sedimentary rocks, fluid geochemistry, fluid inclusions, formation of sedimentary opal, Precambrian oil and Earth’s early life and environments. Her currently funded projects include the study of ancient (older than about 1.6 billion years) petroleum systems. This project exploits recently discovered early Precambrian oil-bearing fluid inclusions and their geochemical compositions, including biomarkers, to constrain hydrocarbon-ore fluid interactions, the pressure-temperature conditions under which they co-exist, the diversity of the primordial biosphere and the nature of life’s earliest habitats. This research has included rocks from some of the oldest basins in Australia, Oklo natural fission reactors in Gabon, the Kapvaal Craton in South Africa and the Superior Craton in Canada. Adriana is also investigating geological and geochemical processes involved in the formation of Australia’s precious opal deposits in the Great Artesian Basin, including Queensland boulder opal and Lightning Ridge black opal. She is especially interested in the composition of fluids responsible for the formation of opal and the timing of opal formation in relation to the complex geological history of the Great Artesian Basin. All of her research in multi-disciplinary and usually involves the use of fancy instruments and the development of novel analytical techniques or approaches.

Deirdre Dragovich
Deirdre Dragovich’s current teaching and research relates mainly to rock weathering in different environments, including work on monumental stone, desert varnish and arid environments generally; patterns of dryland salinity; sediment transfer on hillslopes and to streams, especially in post-fire landscapes; and management of soil erosion including mine rehabilitation and pathway erosion in national parks.

Robert Fisher
Bob Fisher is an anthropologist. His PhD research was a study of human ecology, focusing on strategies for adapting to drought in the Thar Desert in Rajasthan. He specialises in social and political ecological aspects of natural resource management, particularly involving community forestry. Bob aims to combine theoretical and applied interests and has a strong interest in action research. His current research and consultancy focuses on conservation and livelihoods. Recently he has been working in Liberia, Ghana, Thailand, India and Mongolia. Bob is a Senior Lecturer and supervises research students working in the Mekong region. He is Senior Researcher with the Australian Mekong Resource Centre.

Stephen Gale
Stephen Gale has research interests in Quaternary environmental history, human environmental impact during the late Holocene, long-term geomorphic evolution and sedimentary geomorphology. He has investigated the behaviour of hydrological systems, particularly in response to human activity. He has worked in glaciated, karstic and alpine terrains, and, more recently, in arid and lacustrine environments. He has undertaken research in Canada, the USA, the United Kingdom, Ireland, Spain, Greece, Libya, Malaysia and in many parts of Australia.

Alina Hale
Alina’s research focuses upon developing computational models of volcanic and subduction processes using the finite element method. She has a Ph.D. in Computational Volcanology, awarded January 2005, from the University of Reading, UK and two Master degrees in physics, a first class degree with honours (M.Phys.) and a research Master degree (M.Phil.), both from the University of Lancaster, UK. She received funding for a three-year discovery project research grant from the Australian Research Council to commence January 2007 with the title “Computationally Modelling a Volcano: Flow and Stability”.

Deanne Hickey
Deanne Hickey is a physical geographer, specialising in GIS. Her research utilises spatial methods to examine changes in the landscape, focusing on vegetative habitats. Deanne is involved in a four year project investigating processes of farm consolidation and fragmentation within Australia’s rural regions. This study, in its pilot year established a spatial approach to identify changes in rural farm holdings. Stage two of the project sees the expansion of this analysis to all NSW rural LGAs.
Philip Hirsch

Philip Hirsch is driven by an interest in the ways people, communities, societies and national and transboundary political systems organize themselves around natural resources; contested meanings and understandings of environment, development and relationships between them; and the Mekong River Basin as a site for understanding these. With this agenda in mind, he has research interests in natural resource management, rural change and the politics of environment in Southeast Asia, notably Thailand, Laos, Cambodia and Vietnam and the wider Mekong Region. He has been involved with collaborative field projects in each country and is the director of the Australian Mekong Resource Centre. Specific interests include water governance and river basin management, deforestation, environmental impact of development, rural social differentiation and agrarian change, the role of NGOs in development, resource tenure, changing relations between village and state, and community-based natural resource management. Recent research work includes projects supported by the Australian Research Council, Australian Agency for International Development, International Development Research Centre, Australian Water Research Facility, Asia Research Centre and Australian Centre for International Agricultural Research. He is a co-researcher in a Major Collaborative Research Initiative on Agrarian Transitions in SE Asia supported by Canada's Social Sciences and Humanities Research Council.

In particular, he has considered the ways in which planners should conceptualize, and respond to, different forms of diversity in the city. Kurt’s current research is focused on the governance of the outdoor media landscape (from graffiti to government notices, shop signage and outdoor advertising), and on the spatial politics of urban informatics systems (with a particular focus on their implications for privacy and urban citizenship).

Phil McManus

Phil McManus’ current research focuses on sustainable cities, urban forestry and representations of nature in the construction of a range of environmental issues. Within the area of sustainable cities he is researching the potential to develop Industrial Ecology, the use of metrics such as Ecological Footprints and migration issues such as the tree-change phenomenon in Australia. Phil’s research on nature includes thoroughbred breeding and the uses of nature. Phil’s work combines urban environmental history with policy and planning research that is future-oriented.

Gabriele Morra

Gabriele Morra is a post-doctoral fellow of the Swiss National Fund. His main interests are the analytical and numerical modelling of plate tectonics, in particular at the regional and global scale. He introduced the employment of the boundary element method and of the multi-pole approach for modelling geodynamics. All his work has focused on building models that embed the physics of systems self consistently, i.e. without imposing boundary conditions but modelling initial state. He has written about the dynamic causes of subducted plate morphology, about the fate of the lithosphere mantle, collision in India, dynamic interpretation of palaeo-tectonic data and fractal distributions in plate tectonics. He is currently visiting the school of Geosciences for two years. His main research focus is on plate reorganizations. He uses palaeo reconstructions and forward geodynamics simulations for detecting the mechanisms behind the sudden or slow changes in plate motions.

Tom Hubble

Tom Hubble’s research has been mainly in the field of marine and riverine site investigation including a major regional geomorphic and sediment mapping project on the Hawkesbury-Nepean River for Sydney Water. Current research projects include: the characterisation of the mass collapse mechanisms which are currently affecting the banks of the Hawkesbury-Nepean River in order to develop a remediation and prevention strategy; and, the evaluation the various stabilising mechanisms that trees and their root systems develop in soil slopes.

Kurt Iveson

Kurt is primarily interested in the question of how social justice can be achieved in cities. Within this broad interest, his previous research has focused on two main areas. First, he has examined the significance of the urban public realm for citizenship and democracy. This has included looking at contests over different uses of urban public space, including the politics of protest, graffiti writing, cruising, hanging out, and outdoor advertising. Second, he has explored how urban planning might work better to achieve social justice in cities.

Elizabeth Moylan

Elizabeth is a Research Associate in the School of Geosciences at the University of Sydney. She is currently working on the “Living with Heritage” Australian Research Council grant involving research at the world heritage site at Angkor in Cambodia. Her research interests include spatio-temporal mapping of landscape change and the spatial representation of cultural landscapes for Heritage and Conservation management.
Dietmar Müller

Dietmar Müller is an Australian Laureate Fellow with interests in marine geophysics, tectonic plate motions, geodynamics, continental margin tectonics, petroleum exploration, palaeoclimate and seafloor imaging. Dietmar’s research is focused on global and regional Earth system problems by linking onshore and offshore observations based on geophysical/geological data and kinematic/dynamic process modelling.

Dietmar founded the international Earthbyte project (www.earthbyte.org) which aims at building the infrastructure for a virtual geological observatory through the GPlates software consortium. He has spearheaded the concept of “Exploration Geodynamics” the use of geodynamic modelling as a resource exploration tool.

Melissa Neave

Melissa Neave’s main area of interest is in the field of biophysical interactions in fluvial systems with a focus on arid/semiarid hillslope processes. She has worked on the biogeomorphic influences of small mammals in a Chihuahuan desert ecosystem in the American southwest and is currently using rainfall simulation to model the effect of surface crust formation and soil salinity levels on runoff and sediment generation in western NSW, Australia. Mel was on maternity leave during 2009.

Jeff Neilson

Jeff Neilson is a geographer with research interests in the economic geography of rural development and natural resource management across South and Southeast Asia, notably in Indonesia and India. Specific interests include deforestation and landuse change, resource tenure, and smallholder engagement with global value chains for commodities such as coffee and cocoa. Recent research work includes projects supported by the Australian Research Council, the Australian Centre for International Agricultural Research, and the Australian Agency for International Development. He is involved in several cross-faculty collaborative initiatives at the University of Sydney, including the Institute for Sustainable Solutions and the Southeast Asia Studies Centre. Jeff’s research routinely feeds into policy development in Indonesia, where he collaborates with various Indonesian Government Agencies, private sector associations, NGOs and international donor organisations such as the International Finance Corporation and AusAID.

Dan Penny

Daniel Penny’s major research interests include long-term environmental change and variability in Indochina, particularly monsoon variability and plant biogeography. The interaction between people and the natural environment is a particular focus of interest.

Dan is currently investigating the demise of Angkor, Cambodia, using micro-paleontological techniques (pollen and spores from higher plants and ferns respectively, and algae, particularly diatoms). Angkor was capital to a sprawling medieval empire that encompassed much of the Indochinese peninsula between the 9th and sometime after the 15th C AD. His research will seek to explore the timing of and reasons for Angkor’s decline and eventual collapse.

Dan is co-Director of the Greater Angkor Project, a multidisciplinary international research group co-ordinated by University of Sydney Department of Archaeology.

Bill Pritchard

Bill Pritchard is an economic geographer. His research and teaching addresses the ways that economic, social and cultural processes intermesh with one another to create the specificities of place and space.

Within this broad agenda, he focuses on the geographies of global change in agriculture, food and rural places: the ways that the emerging global economy in food and agriculture is transforming places, industries and people’s lives. These questions have been pursued through a series of Australian-based and international studies into the global value chains of specific industries (wine grapes, dairy, beef, tomatoes, tea, coffee), complemented by in-depth examination of the policies, rules and institutions that have guided the globalisation project.

Bill uses his research experiences to inform his teaching. During the past five years, he has been Chief Investigator on four Australian Research Council Discovery Projects and one major project funded by the Australian Government’s Rural Industries Research & Development Corporation. Two of the ARC Discovery Projects have focused on the effects of globalisation on food systems in India and Indonesia. These studies have considered the fate of smallholders and plantation estates at a time of difficult global conditions within these industries. A particular aspect of these studies has been to investigate the role played by supermarkets in the restructuring of agricultural systems and farm-dependent rural communities. In 2010, he commenced a new ARC Discovery Project examining the changing food security scenario facing India, with particular reference to the interplay between climate change and world food markets.

Closer to home, Bill has been Chief Investigator on the
“Heartlands” Australian Research Council Discovery Project, which documented the regional economic restructuring of the Australian farm sector. His RIRDC-funded research has a similar focus, aiming to measure the incidence and effects of farm aggregation and fragmentation in Australian agriculture.

Leonardo Quevedo

Leonardo is a Research Fellow in the EarthByte Group, currently implementing numerical algorithms for geodynamic models of plate tectonics and mantle-lithosphere interaction as part of the “Planet-scale reorganizations of the plate-mantle system” project. He completed his PhD in theoretical physics at the Leibniz Universität Hannover, Germany in 2006. His main research interest is the use of high performance computational methods for rock creep flow, advection-diffusion of heat and seismic wave propagation. Particularly the application of distributed computing and GPU programming techniques to Boundary Integral and Multigrid Methods.

Patrice Rey

Patrice is a tectonicist interested in (1) the evolution of the continental lithosphere through tectonic processes, and (2) the evolution of tectonic processes through time. His research activities are therefore problem-driven and process-oriented. They are supported by research strategies involving quantitative multidisciplinary approaches, based on field work, numerical modelling and physical modelling. In the past Patrice has been working on the seismic structure of the continental crust and its relation to mountain building processes. He has produced work on the seismic reflectivity of ductile shear zones in the crust. In Europe he has worked on the evolution of the Variscan belt and its tectonic relationships with the Caledonides. In the last five years he has been investigating the tectonics processes that have shaped the surface of the early Earth in the Archaean era (4.03 to 2.5 Ga). Patrice Rey has acted as main Chief Investigator in three successive ARC-funded research projects. The most recent, titled “From synchrtron characterisation of single fluid inclusions to Archaean geodynamics: An integrated study of fluid-rock interaction in the primitive crust.”

Maria Seton

Maria Seton is currently focusing on an ARC-funded project related to subduction process modelling and is also a part of the Earthbyte group. Maria’s research interests are in the field of marine geophysics and geodynamics specifically looking at the kinematic controls on subduction and back-arc basin formation and linking these kinematic constraints to subduction modelling. Maria is also interested in examining the relationship between tectonics and palaeo-climate, palaeo-topography and bathymetry and ore-deposit formation.

Edwina Tanner

Edwina Tanner’s main area of research is in the field of marine science with a focus on climate change. Edwina is interested in geographic information systems for the management and visualisation of marine data. Edwina is currently working on a project funded by the Australian Partnership for Sustainable Repositories to develop a data model for the better management of research information.

Ana Vila Concejo

Ana Vila-Concejo is interested in the processes and morphology of coastal systems. Ana’s career started in Spain, where I did my undergraduate and MSc studying urban beaches; and Portugal, where I completed my PhD investigating the short and medium term evolution of tidal inlets in a barrier island system. At present, Ana is looking into the morphodynamics of flood-tide deltas in wave-dominated coasts within the framework of an ARC funded linkage project. Other areas of interest are coastal erosion and hazards including consequences of climate change.

Jody Webster

Jody Webster’s research in sedimentology and stratigraphy focuses on carbonate sedimentology, climate change, and tectonics. Jody is particularly interested in coral reef and carbonate platform systems, both modern and ancient, and their associated sedimentary systems; as tools to address fundamental questions in palaeoclimate variability and tectonics, and in turn the influence of these factors on the geometry, composition and evolution of these sedimentary systems. His research is multidisciplinary nature, encompassing traditional elements of sedimentology and stratigraphy, combined with the novel use of marine geology and geophysics, GIS, palaeobiology, palaeoecology, and geochemistry (stable isotopes, trace elements, radiometric dating). Jody is also heavily involved in several large international research programs including the Integrated Ocean Drilling Program (IODP) which is focused on recovering sediment cores from the sea bed to understand past sea level and climate changes.

Joanne Whittaker

Jo Whittaker’s main areas of research are in marine geophysics, mid-ocean ridge processes, plate tectonics, palaeo-bathymetry, and seafloor imaging. Jo’s research is focused on global and regional. Presently, she is interested in
the plate tectonic development of the Indian Ocean, since the break-up of Gondwana to the present. She also researches mid-ocean ridge patterns and processes.

**Derek Wyman**

Derek Wyman’s research includes studies in Western Australia’s Yilgarn Craton and similar well-mineralised rocks in Canada. He also supervises Honours and Postgraduate students in studies of granitic rocks, gold deposits and other types of mineralization in eastern Australia. Derek maintains strong links with national and international research teams, as exemplified by his collaborative research with P. Hollings and R. Mitchell (Lakehead University, Canada) and the Ontario Geological Survey. This work focuses on the world’s oldest in situ diamond deposits (2.7 billion year old) that challenge conventional models of diamond formation. He is also undertaking studies of the regolith that have applications for mineral exploration and the mitigation of dryland salinity hazards.
2009 Units of Study

Undergraduate Units of Study

GEOS1001 Earth, Environment and Society
GEOS 1901 Earth, Environment and Society (Advanced)
Dr Mel Neave, A/Prof Bill Pritchard, Edwina Tanner
This is the gateway unit of study for Human Geography, Physical Geography and Geology. Its objective is to introduce the big questions relating to the origins and current state of the planet: climate change, environment, landscape formation, and the growth of the human population. The first module investigates the system of global environmental change, specifically addressing climate variability and human impacts on the natural environment. The second module presents Earth as an evolving and dynamic planet, investigating how changes take place, the rate at which they occur and how they have the potential to dramatically affect the way we live. Finally, the third module, focuses on human-induced challenges to Earth’s future. This part of the unit critically analyses the relationships between people and their environments, with central consideration to debates on population change and resource use.

GEOS1002 Introductory Geography
GEOS 1902 Introductory Geography (Advanced)
Dr Kurt Iveson, Deanne Hickey
This unit of study provides an introduction to the ways that human and physical landscapes are produced. It begins with an investigation of Earth’s surface features, exploring the distribution of landforms across Earth and interpreting their evolutionary histories. Several landscapes will be examined including those formed by rivers, wind, oceans and glaciers. But physical landscapes evolve under the influence of and affect human operations. Therefore, the unit of study will also consider the political, economic, cultural and urban geographies which shape contemporary global society. Each of these themes will be discussed with reference to key examples, in order to consider the ways in which the various processes (both physical and human) interact in the shaping of places. The unit of study will also include short field trips to localities surrounding the university to observe processes of spatial change and conflict.

GEOS1003 Introduction to Geology
GEOS 1903 Introduction to Geology (Advanced)
Dr Tom Hubble, Prof Clarke
The aim of this unit of study is to examine the chemical and physical processes involved in mineral formation, the interior of the Earth, surface features, sedimentary environments, volcanoes, and metamorphism. Lectures and laboratory sessions on mountain building processes and the formation of mineral deposits will lead to an understanding of the forces controlling the geology of our planet. Processes such as weathering, erosion and nature of sedimentary environments are related to the origin of the Australian landscape. In addition to laboratory classes there is a two-day excursion to the western Blue Mountains and Lithgow to examine geological objects in their setting.

GEOL1501 Engineering Geology
Dr Tom Hubble
The objective of this course is to introduce basic geology to civil engineering students. Students should develop an appreciation of geologic processes as they influence civil engineering works and acquire knowledge of the most important rocks and minerals and be able to identify them. Syllabus summary: Geological concepts relevant to civil engineering and the building environment. Introduction to minerals; igneous, sedimentary and metamorphic rocks, their occurrence, formation and significance. General introduction to physical geology and geomorphology, structural geology, plate tectonics, and hydrogeology. Associated laboratory work on minerals, rocks and mapping, will participate in alternatives to some aspects of the standard unit and will be required to pursue independent work to meet unit objectives. This unit may be taken as part of the BSc (Advanced).

GEOG2321 Fluvial and Groundwater Geomorphology
Dr Scott Rayburg
This unit of study provides an introduction to the fundamentals of fluvial geomorphology (the study of surface water as an agent of landscape change) and groundwater hydrology. The fluvial geomorphology section of the unit will describe the movement of water in stream channels and investigate the landscape change associated with that movement. Topics to be covered will include open channel flow hydraulics, sediment transport processes and stream channel morphology. Practical work will focus on the collection and analysis of field data. The quantity and quality of the groundwater resources are closely linked to geology and fluvial geomorphology. The groundwater section of this unit is based around four common groundwater issues: contamination, extraction, dryland salinity and groundwater-surface water interaction. In the practical component, common groundwater computer models such as FLOWTUBE and MODFLOW will be used to further explore these problems.

GEOS2111 Natural Hazards: a GIS Approach
GEOS2911 Natural Hazards a GIS Approach (Advanced)
A/Prof Patrice Rey, Dr Maria Seton
The geosciences provide an essential framework for understanding the environmental response to short-
long-term geologic, oceanic and atmospheric processes. This unit of study introduces students to a variety of natural phenomena that affect society with impact levels ranging from nuisance to disastrous. The discussion of each hazard focuses on: (1) the process mechanics, (2) hazards and risk, and (3) methods for mitigation. Geographic Information Systems (GIS) are used by scientists, planners, policy-makers and the insurance industry alike to address many issues relating to natural hazards. This unit of study will introduce students to the major concepts relating to GIS and provide practical experience in the application of GIS techniques to hazard mapping, risk assessment and mitigation.

GEOS2112 Economic Geography of Global Development
GEOS 2912 Economic Geography of Global Development (Advanced)
A/Prof Bill Pritchard, Dr Jeff Neilson

In this unit of study, students will be introduced to the sub-discipline of economic geography by way of debates on the spatial character of global development. We focus on questions relating to who are the winners and losers from contemporary patterns of global economic change. This includes the analysis of relevant conceptual approaches to these questions (including comparative advantage, global commodity chain theory, regionalism, economic governance etc), plus ‘hands-on’ examination of the key institutions (such as the WTO and ADB) driving these changes. In general, issues are tailored to themes being played out in Asia-Pacific countries. Students are expected to participate in a variety of practical class exercises throughout the semester, which will include presenting the fruits of independent research activities. This unit provides an especially relevant feeder-unit into GEOS3053/ GEOS3054, the Asia-Pacific Field School.

GEOS2113 Making the Australian Landscape
Dr Stephen Gale

The shifts in the nature of the Earth’s environment over time and the resultant changes in process regimes have had dramatic impacts on the way the Australian physical landscape has evolved. We consider here the effects of these changes on the broad pattern of the landscape, focusing particularly on slopes and soils. We follow this by investigating the environmental changes that have taken place since the end of the last glacial, the time when the continent’s climates and environments first took on a recognisably modern form. We deal specifically with the impact of human activity on the Australian biophysical environment, emphasising both pre-European impacts and those changes that have taken place since European contact.

GEOS2114 Volcanoes, Hot Rocks and Minerals
GEOS 2914 Volcanoes, Hot Rocks and Minerals (Advanced)
Dr Derek Wyman, A/Prof Patrice Rey, Prof Geoff Clarke

This unit of study relates the plate tectonics of subduction zones to a) volcanoes and their hazards; b) geological processes in the deep crust; and c) the formation of precious metal and gemstone ores around the Pacific Rim. A problem solving approach is used to develop the skills required to understand the history of individual volcanoes and predict their future activity and hazards. The unit includes a two to three day field trip to study an extinct volcano in NSW. Practical work includes independent study of igneous systems, rocks and minerals employing both microscope-based techniques and computer modeling. The unit provides relevant knowledge for GEOS3006/3906 - Mineral Deposits and Spatial Data Analysis.

GEOS2121 Environmental and Resource Management
GEOS2921 Environmental and Resource Management (Advanced)
A/Prof Phil McManus, Dr Jeff Neilson

This unit of study explores cultural constructions of nature and resources, the evolution of environmental thought and the debates about sustainable development. It integrates environmental, economic, cultural and social considerations, with particular regard to water, mining, forestry and fishing industries in Australia and other countries. The unit includes a fieldtrip to the Hunter Valley to look at geological and geographical issues pertaining to mines, wines and thoroughbred breeding industries in this region. The unit of study enables students to learn about the economics of resource extraction and the social, cultural and environmental considerations that must be taken into account when developing and implementing environmental and resource management policies.

GEOS2122 Urban Geography
GEOS2922 Urban Geography (Advanced)
Prof John Connell, Dr Kurt Iveson

Cities are full of different people doing all sorts of different things. Developing an understanding of these processes necessitates attention to the geographical principles that underlie varied social practices (work, leisure, sport, music etc) and social categories such as ethnicity, gender, sexuality and race. We will investigate how different people perceive space and construct space, primarily in Western contexts...
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and thereby seek to understand the cultural and political dimensions of everyday life in cities.

GEOS2124 Fossils and Tectonics
GEOS2924 Fossils and Tectonics (Advanced)
Prof Dietmar Müller, A/Prof Patrice Rey, Dr Jo Whittaker
The unit aims to convey how fossils, stratigraphic and structural data are used together to determine ages and environments and the deformation history of rock layers. It covers an introduction to historical geology and the evolution of the major fossils groups. Methods of stratigraphic age determination include litho-, bio-, chemo-, magnetostratigraphy, as well as radiometric geochronology and the stratigraphic characteristics of the main geological time intervals. Structural methods are focused on brittle deformation in the upper crust and sediments. Students will gain familiarity with the most important fossil groups and how to identify them, and with the most important types of faults and folds. The formation of fossil fuels such as coal, oil and gas will also be covered in an earth history and resource exploration context. The simultaneous use of fossils, stratigraphy and structure to unravel the geological history of a set of exposed rock layers is demonstrated during a field excursion to Yass.

GEOS3008 Field Geology and Geophysics
GEOS3908 Field Geology and Geophysics (Advanced)
A/Prof Patrice Rey, Prof Geoff Clarke
This unit is considered an essential component all Geology and Geophysics majors. All students will undertake a range of exercises, but concentrate on aspects that emphasise their chosen major: (1) field mapping and the analysis of geological objects in the field, in weakly to complexly deformed sedimentary and volcanic sequences; (2) field investigations of mineral deposits and their relationships to host rocks; and (3) the practical application of magnetic and electrical methods commonly employed in the search for mineral deposits. The field course complements other subject areas in Geology & Geophysics and will give students experience in the field identification of rocks and minerals, regional geology, stratigraphy, structure and rock relationships.

GEOS3009 Coastal Environments & Processes
GEOS3909 Coastal Environments and Processes (Advanced)
A/Prof. Gavin Birch, Dr Jody Webster
Australian coastal environments are dynamic systems responding to input sediments and processes as well as solid boundary conditions. The unit focuses on high-energy wave and wind dominated coastal systems that include the beach-surf zone, dunes, barriers, carbonate (coral reef) environments and their Holocene/Quaternary evolution. The regional impact of waves, tides, embayments, and other environmental parameters in controlling morphology and deposits are addressed. The practical program uses real data sets collected during recent research programs and during two field excursions which address issues specifically relevant to Australia’s coastline. The excursions include one 2 day weekend field trip and one 5 day field trip to the Great Barrier Reef in the mid semester break.

GEOS3014 GIS in Coastal Management
GEOS3914 GIS in Coastal Management (Advanced)
Dr Eleanor Bruce, A/Prof Peter Cowell
Coastal Management is about how scientific knowledge is used to support policy formulation and planning decisions in coastal environments. The course links coastal science to policy and practice in management of estuaries, beaches and the coastal ocean. The principles are exemplified through specific issues, such as coastal erosion, pollution, and impacts of climate-change. The issues are dealt with in terms of how things work in nature, and how the issues are handled through administrative mechanisms. These mechanisms involve planning strategies like Marine Protected Areas and setback limits on civil development in the coastal zone. At a practical level, the link between science and coastal management is given substance through development and use of ‘decision-support models’. These models involve geocomputing methods that entail application of simulation models, remotely sensed information, and Geographic Information Systems (GIS). The course therefore includes both principles and experience in use of these methods to address coastal-management issues. (It thus also involves extensive use of computers.) Although the focus is on the coast, the principles and methods have broader relevance to environmental management in particular, and to problem-solving in general. That is, the course has vocational relevance in showing how science can be exploited to the benefit of society and nature conservation.

GEOS3015 Environmental Geomorphology
GEOS3915 Environmental Geomorphology (Advanced)
Dr Stephen Gale
The first part of this unit deals with the effects of weathering on the physical and the built environment, and considers the relationship between soil and landforms. The second part
investigates the environmental changes that have taken place since the end of the last glacial episode, the time when the world’s climates and environments first took on a recognisably modern form. It deals specifically with changes to the Australian biophysical environment and will focus on human-environmental impacts, both under pre-European and post-contact conditions.

GEOS3018 Rivers: Science, Policy and Management
GEOS3918 Rivers: Science, Policy and Management (Advanced)
Dr Jeff Neilson, Dr Scott Rayburg
The unit of study is concerned with understanding the functioning of river catchments from both natural science and social science perspectives, at a variety of scales. The catchment as a morphodynamic process-response system is addressed with an emphasis on the relationships between processes and landform entities. Similarly, relationships within social, economic, and political systems are explored within the catchment context, with particular emphasis on the interactions between the social system and bio-physical system. Empirical context for the unit will primarily be drawn from the Murray-Darling, Mekong, and Hawkesbury-Nepean catchments. Fieldwork in the latter is integral to the unit of study.

GEOS3513 Regional Development and the Environment
GEOS3913 Regional Development and the Environment (Advanced)
A/Prof Bill Pritchard, Dr Tihomir Ancev
This unit of study acquaints students with debates and tools associated with regional development and the economic analysis of environmental issues. It provides a useful preparation for professional employment in the field of regional development, environmental policy and management, and is relevant for students interested in economic and social issues in regional Australia. Co-taught by a geographer and an economist, the unit addresses four key areas of relevance: (i) regional development theory and practice; (ii) the economics of efficiently utilising and managing the environment; (iii) debates on regional development in Australia (including consideration of the farm sector, Indigenous communities and environmental sustainability), and (iv) the use of GIS to analyse population census date.

GEOG3521 Sustainable Cities
GEOG3521 Sustainable Cities (Advanced)
A/Prof Phil McManus
Are cities sustainable? Why or why not? This unit of study develops themes introduced in Intermediate units in Geography relating to sustainability, focusing on the ways we manage urban regions. This involves discussion of topics including utopian visions for cities, urban history, ecological footprint analysis, bioregionalism, transport options, urban form and urban policy, with reference to sustainable futures. The unit of study looks at different Australian cities and includes practical work on a current sustainability issue in Sydney.

GEOS3522 Cities and Citizenship
GEOS3922 Cities and Citizenship (Advanced)
Dr Kurt Iveson
What does it mean to be a ‘citizen’, and what has this got to do with cities? This unit explores the urban dimension of contests over the meaning of citizenship. The first half will consider historical configurations of urban citizenship, from the Greek city-states of antiquity through to imperial, colonial and industrial cities. The second half will then focus on contemporary globalising cities. A series of case studies will consider the production of new configurations of urban citizenship across a range of cities in the world, looking at issues such as: asylum-seekers and the city; children and the city; homelessness in the city; ‘culture jamming’ and new forms of urban protest; trans-national social movements. The module will involve a substantial practical component, encouraging students to draw on their own experiences of city life to reflect on the meanings of citizenship.

GEOS3101 Earth’s Structure and Evolution
GEOS3801 Earth’s Structure and Evolution (Advanced)
A/Prof Patrice Rey, Prof Geoff Clarke
The Earth’s crust and upper mantle, or lithosphere, are a consequence of dynamic and thermal processes operating since the beginning of the Archaean. This unit focuses on information and techniques that enable an understanding of these processes. The main topics presented in this unit include: the formation and evolution of oceanic and continental lithosphere; structural deformation, magmatism and metamorphism at plate boundaries; and the mesoscopic and microscopic analysis of igneous and metamorphic rocks. Practical classes are designed to enable students to competently and independently identify the common crystalline rocks in hand-specimen; and to gather and interpret
the structural field data which enables the determination
of the structural style and deformational history presented
in particular tectonic settings. The concepts and content
presented in this unit are generally considered to be essential
knowledge for geologists and geophysicists and provide
a conceptual framework for their professional practice.
Students wishing to specialise in the field and become
professional geologists will normally need to expand upon
the knowledge gained from this unit and either complete an
honours project or progress to postgraduate coursework in
this field.

GEOS3102 Global Energy and Resources
GEOS3802 Global Energy and Resources (Advanced)
Dr Derek Wyman and A/Prof Gavin Birch
This unit examines the processes that form energy and
mineral resources, outlines the characteristics of major fossil
fuel and metal ore deposits and introduces the principles
that underpin exploration strategies used to discover and
develop geological resources. The unit will focus on a variety
of topics including; coal; petroleum formation and migration,
hydrocarbon traps and maturation; precious metal, base metal
and gemstone deposit types; and exploration strategies. An
integrated approach will relate tectonic processes through
time to the formation of fossil fuel and mineral provinces.
Practical exercises will introduce students to the techniques
used to identify economically viable geological resources
using a variety of exercises based on actual examples of
resource exploration drawn from both the petroleum and
minerals industry. An excursion to active and historic mining
sites in NSW will complement the practical studies.

GEOS3103 Environmental & Sedimentary Geology
GEOS3803 Environmental and Sedimentary Geology
(Advanced)
Dr Tom Hubble and Dr Adriana Dutkiewicz
Sediments and sedimentary rocks cover most of the Earth’s
surface, record much of the Earth’s geological history and
host important resources such as petroleum, coal, water
and mineral ores. The aim of this unit is to provide students
with the skills required to examine, describe and interpret
sediments and sedimentary rocks for a variety of different
purposes. Specific focuses of the unit will be on identifying
the recent or ancient environment in which sedimentary
materials were deposited; the techniques used to identify
anthropogenic pollution of modern sediments; and an
assessment of natural hazards commonly associated with
the formation of sediment bodies such as landslides and
deep marine slides. On completion of this unit students will be
familiar with the natural processes that form, modify, pollute
and lithify sediments and the recognition and management of
the environmental hazards associated with sediment bodies.
A variety of sedimentary settings will be examined including
fluvial, alluvial, lacustrine, marginal marine and deep marine
environments. The various controls on the sedimentary
record such as climate and sea-level change, as well as
diagenesis and geochemical cycles will also be discussed.
Practical exercises will require students to examine global
datasets, determine the properties of sedimentary rocks, as
well as collect and interpret their own field data. The course
is relevant to students interested in petroleum or mineral
exploration, environmental and engineering geology as well as
marine geosciences.

GEOS3104 Geophysical Methods
GEOS3804 Geophysical Methods (Advanced)
Prof Dietmar Muller and Dr Gabriele Morra
This unit introduces the common geophysical methods used
to investigate the interior of the Earth and focuses on the
techniques used for mineral and hydrocarbon exploration
and production. Applications of these methods to problems
in global geophysics will also be examined with an emphasis
on on their use in marine and terrestrial environments. On
completion of this unit students will have developed a
thorough understanding of the commonly used geophysical
methods and will be able to evaluate and critically assess
most forms of geophysical data as well as be able to actively
participate in geophysical explorations. The unit is aimed at
students with interests in land-based and marine resource
exploration, plate tectonics, internal earth structure, and
near-surface investigations of groundwater resources and
environmental pollution. Students wishing to specialise in
the field and become professional geophysicists will normally
need to expand upon the geophysics knowledge gained from
this unit and either complete an honours project or progress
to postgraduate coursework in this field.

GEOS3053 Asia-Pacific Field School-Assessment A
GEOS3953 Asia-Pacific Field School-A (Advanced)
Prof Phil Hirsch
The unit of study can be taken only in coincidence with
GEOS 3054 and with prior permission from the unit of study
coordinator. It constitutes a Field School run over a five-week
period in January-February, prior to the commencement of
the semester. In 2006 the Field School will be held in Thailand,
Laos and Viet Nam. In other years it may be held in the South
Pacific (Vanuatu and Fiji). It is run in close association with
local universities, whose staff and students participate in
some components of the course. It focuses on environmental and development issues in the context of rapid social change.

GEOS3054 Asia-Pacific Field School-Assessment B
GEOS3954 Asia-Pacific Field School-B (Advanced)
Prof Phil Hirsch
The unit of study can be taken only in coincidence with GEOS3053 and with prior permission from the unit of study coordinator. It constitutes a Field School run over a five-week period in January-February, prior to the commencement of the semester. In 2006 the Field School will be held in Thailand, Laos and Viet Nam. In other years it may be held in the South Pacific (Vanuatu and Fiji). It is run in close association with local universities, whose staff and students participate in some components of the course. It focuses on environmental and development issues in the context of rapid social change.

ENVI2111 Conservation Biology and Applied Ecology
ENVI2911 Conservation Biology (Advanced)
Dr Charlotte Taylor, Dr Clare McArthur
This topic examines the role of conservation biology and applied ecology in environmental science, examining pattern and process in natural systems and evaluating how these are being affected by pervasive anthropogenic impacts. Focusing on the conservation, assessment of impacts and the restoration of natural systems, we consider the range of ecological issues environmental scientists must address. We examine the extent of environmental problems; derive explanations of why and how they are occurring and address management options for resolving them. We will derive general principles for these by addressing case studies, chosen from Australian examples when possible. The aim of this unit is for you to understand the processes that go into solving environmental problems from an ecological perspective and how to identify management options.

ENVI3112 Environmental Assessment
Dr John Dee, Dr Scott Kable
This unit of study is composed of two components: environmental impact assessment and risk assessment. The former is generally concerned with issues related to environmental impact assessment and builds toward the process of producing an EIS/EIA. More specifically it seeks to establish a critical understanding of the theory and practice of environmental impact studies/statements (EIS) and environmental impact assessment processes (EIA) from both the positive (scientific) and normative (value) perspectives. Emphasis is placed on gaining skills in writing and producing an assessment report, which contains logically ordered and tightly structured argumentation that can stand rigorous scrutiny by political processes, the judiciary, the public and the media. The risk assessment component considers a more chemical approach to the assessment of risk and issues of safety with respect to chemicals, ecotoxicology and the environment.
ENVI3114 Energy and the Environment  
Dr Chris Dey  
This unit covers the following aspects of energy and the environment: energy use; electrical power generation including alternate methods such as wind turbines; the environmental impact of energy use and power generation including the enhanced greenhouse effect; transportation and pollution; energy management in buildings; solar thermal energy, photovoltaics, and nuclear energy; and, socio-economic and political issues related to energy use and power generation.

NTMP3005 Coastal Management  
Prof Andy Short  
This unit examines the impacts of human activities on coastal and marine environments. It explores the complex relationships among the ecological and social values of these environments and outlines strategies and tools for their management. This is an intensive unit that will be held at the Moreton Bay Research Station.

Postgraduate Units of Study

GEOG5001 Geographic Information Science A  
Dr David Chapman  
This unit of study gives an overview of basic spatial data models, and enables students to understand the use of data from a variety of sources within a geographical information system (GIS). The analysis of spatial data, and its manipulation to address questions appropriate to planning or locational applications, will be addressed, as will the development of thematic maps from diverse data layers.

GEOG 5002 Geographic Information Science B  
Dr Eleanor Bruce  
This course will provide the conceptual background to more advanced GIS analysis applications and spatial reasoning methods in the context of contemporary environmental issues. The course is designed to provide an understanding of spatial analysis techniques available within a GIS environment, explore a diversity of both social and physical environmental applications and address emerging issues in GIS research. A range of topics will be introduced including field based capture of spatial information, spatial data structures, surface modelling, visibility analysis, hydrological modeling, network analysis, spatial data uncertainty and social GIS. Conceptual material presented in lectures and tutorial workshops will be placed in an applied context through a series of laboratory and field sessions designed to strengthen practical understanding and awareness of GIS methods.

GEOG 5003 Environmental Remote Sensing  
Dr Richard Murphy  
The unit of study explores how remote sensing has enabled the science of Earth Observation to become the most valuable and widely-used tool for characterising and quantifying Earths vegetation, geology and marine ecosystems. The study introduces the physical processes that influence how light interacts with materials of the Earth’s surface, which is the basis for Earth Observation. The course uses state-of-the-art, industry-standard software to introduce many different techniques in the analysis and interpretation of remotely sensed data. We will explore different kinds of remotely sensed data, starting from a simple colour photograph to multispectral and hyperspectral data gathered from satellites and aircraft. Earth Observation is becoming an essential skill for anyone interested in the natural environment - skills which are applicable across a wide range of science and environmental disciplines. Starting off simply, you will acquire the skills and knowledge to enable you to map and quantify vegetation and geology using image data acquired in different parts of the world. The objective of this course is to ‘demystify’ the use of satellite data and to provide the essential theoretical and practical skills to enable students to process data acquired by Earth Observation satellites and aircraft.

GEOG 5004 Environmental mapping and Monitoring  
A/Prof Peter Cowell  
The unit introduces methods associated with acquiring data in the field and examines issues associated with application of spatial data to environmental monitoring, terrain mapping and geocomputing. Students will learn both theoretically and practically how environmental data is collected using different remote sensing techniques, (pre)processing methods of integrating data in a GIS environment and the role of spatial data in understanding landscape processes and quantifying environmental change.
GEOS 5501 Human rights and the Environment
Dr Robert Fisher and Prof Philip Hirsch
The global community is faced with the collision between environmental degradation and human rights, from oil spill disasters to the disproportionate impact of anthropogenic climate change in the developing world. At the same time we are witnessing an ever increasing demand to meet human rights obligations. Both these phenomena necessitate a re-think of the way environmental conditions are perceived. This unit of study addresses the diverse and complex interaction between human rights and the environment, and examines whether human rights can be secured in degraded or polluted environments. Initially this course explores the role of human rights instruments in addressing environmental issues while also looking at the incorporation of human rights concerns within multi-lateral environmental agreements. The role of a rights based approach in addressing human rights and environmental issues is explored while the tensions inherent in development, conservation and human rights dialogues are considered. Through a series of themed lectures the course explores links between human rights and the environment in terms of development projects including large infrastructure programmes such as dams or resource use such as mining. The implications of a right to water are examined while the complicated issues associated with human rights and climate changes are investigated. The concept of an environmental refugee is studied with reference to vulnerable populations in the Asia-Pacific region. Consideration is also given to the urban environment; especially relevant to participatory or procedural human rights. Links between indigenous groups, the environment and human rights are explored. This course also probes connections between human rights dialogues and forestry; and potential implications of the REDD (Reduced Emissions from Deforestation and Degradation) scheme. The course deals with the human rights - environment nexus through a series of lectures and seminars.

ENVI 5501 Environmental Research Project
Dr Eleanor Bruce and Dr David Chapman
A valuable opportunity to apply some of the knowledge gained from earlier coursework, ENVI5501 consists of a research project as arranged between you (the student) and an appropriate supervisor. The project topic may contain a field or laboratory component, or may be entirely literature-based. The only requirement is that the topic be of environmental emphasis, meaning that potential topics range from ecotourism to pollution detection and monitoring, erosion to solar power, environmental law to conservation biology. The topic must also be able to be completed within the timeframe of 16 weeks (one semester) of investigation, including the literature survey, sample and data collection, analysis of data and results, and write up of the report. This unit is not conducted by way of a number of contact hours per week for a semester. Instead, the student will work on the project full-time (aside from other study commitments) in a continuous manner for the entire duration (1 semester).

ENVI5705 Ecological Principles for Environmental Scientists
Dr Charlotte Taylor
This unit of study introduces fundamental concepts of modern ecology for environmental scientists so as to provide non-biologically trained persons an understanding of the nomenclature of ecology and the physical parameters represented.

ENVI 5707 Energy – Sources, Uses and Alternatives
Dr Chris Dey
Environmental impacts of energy generation and use are addressed in this unit of study. Major topics include discussion of the various energy sources, global energy resources, the economics associated with energy production, the politics and culture that surrounds energy use, and the alternative sources of solar thermal and photovoltaic energy and atmospheric systems. This unit of study includes several field trips to energy utilities and associated energy sites.

ENVI5708 Introduction to Environmental Chemistry
A/Prof Gavin Birch
The aim of the course is to introduce students to the major physical and chemical processes that control the concentration and dispersion of chemical pollutants in natural and impacted coastal environments. The course will demonstrate how to use contaminant data effectively and how to judge the quality of chemical data. This knowledge will be used to design and to assess environmental projects, and to judge the magnitude of impact by human activity on marine environments and the risk posed by sedimentary contaminants to benthic animals. The course aims to provide present and future managers employed in environmental professions with the skills to use data with confidence and to make management decisions knowing the risks inherent in variable data quality.
ENVI5801 Social Science of the Environment
A/Prof Phil McManus
This unit provides both a conceptual and an empirical foundation for the analysis of relationships between society, the environment and natural resources. Contexts for application of social science concepts to the environment include climate change, water resources management, forest issues and urban environmental quality. Students will deal with both broad theoretical approaches to the societal analysis of relationships between people and the environment, and with specific themes including the sociological basis of collective action, property relations, resource tenure, participatory approaches to environmental and natural resource management, and systems of knowledge. The unit pays particular attention to the implications of competing interests for environmental and natural resource management and explores ways of dealing with diverse stakeholder interests. Empirical material is drawn from various countries, with special emphasis on Southeast Asia and Australia. The aim of the unit is to provide conceptual tools that will be used in other units of study within the program and for application in analysis of resource and environmental management issues faced in real world decision-making contexts. The unit will draw on the professional experience and agency roles of participants.

ENVI5803 Law and the Environment
Dr Gerry Bates
This unit of study provides an overview of Australian and international law as it pertains to the environment. It looks at a number of environmental issues at the various levels of analysis, policy making, implementation of policy and dispute resolution. It also provides a broad background to political and economic issues as they related to the legal issues.

ENVI5805 The Urban Environment and Planning
Dr John Dee
This unit of study will cover a broad range of topics including the scope of plan making, policy development, and land use control instruments together with principles of sustainable environments, heritage and indigenous development issues. It will endeavour to provide to students with a thorough understanding of how to assess development applications against a range of policy imperatives and conclude by giving students a thorough understanding of the role of the State in urban infrastructure provision (Roads, rail, water, sewers, electricity etc.), concepts such as new urbanism, urban consolidation and sustainable urban forms.

ENVI 5808 Applied Ecology for Environmental Scientists
Dr Clare McArthur
This unit of study complements ENVI5705, and covers in depth the concerns of modern ecology pertaining to both terrestrial and marine ecosystems. An understanding of the complex issues of invasive species, conservation of biodiversity and ecological management of the environment is provided.

ENVI5809 Environmental Simulation and Modelling
Dr David Chapman
The concept and use of computer modelling in natural resource management is introduced in this unit of study, which is aimed particularly at non-programmers. The unit involves a combination of lecture and applied modelling skills, with students learning practical techniques that can be applied to different environmental issues.

ENVI 5903 Sustainable Development
A/Prof Phil McManus and Dr Alison Gates
This unit of study demonstrates the history and contested understandings of the concept of sustainable development. It applies these concepts to explore important environmental science issues such as population, water management, sustainable cities, rural development, industrial ecology, and energy issues. The unit concludes by presenting a range of future scenarios and encouraging students to develop their own vision of sustainability at the global and other scales, and to communicate their means of achieving this sustainability vision.

ENVI 5904 Understanding Environmental Uncertainty
A/Prof Ross Coleman
No assessment of potential environmental impacts is possible without relevant information about the ecological consequences. This unit is for those without a quantitative ecology background, to explain the need to quantify and what are relevant measures. Describing and understanding uncertainty will be explained in the context of precautionary principles. Issues about measuring biodiversity and the spatial and temporal problems of ecological systems will be introduced.

ENVI 5905 Management of Parks
A/Prof Deidre Dragovich
This unit of study evaluates the reasons for the existence of parks, including National Parks, recreational spaces and reserves, and examines the applied aspects of their
management. Topics covered include conservation, ecotourism, plans of management and their implementation (with particular emphasis on the remediation of the impacts of visitor numbers and erosion), fire control practices and resource management. Students will visit various parks within the Sydney region (local parks and the Royal National Park) that highlight the different issues introduced in lectures and which illustrate the practical measures undertaken to manage the parks in a sustainable fashion.

MARS5006 Coral Reefs, Science and Management
Prof Maria Byrne
This unit provides an in-depth overview of the key biological and non-biological processes that make up coral reef ecosystems. There is a focus on the biogeographic, oceanographic and physiological processes underlying the integrity of global tropical reef systems. The Great Barrier Reef is used as a case study to explore emerging concepts on the influence of natural and anthropogenic processes on the integrity of global reef and lagoon systems. Learning activities will include a series of background lectures and research seminars and tutorials in the development of a major research project. A major aspect of this unit is an independent research project conducted under the supervision of the course instructors. The unit concludes with a series of oral presentations based on student research. Assessment tasks will consist of two essays and a research project report and presentation. The curriculum in this unit is based on current research and a course book will be provided. This is a field intensive course held at One Tree Island Research Station or Heron Island Research Station.
2009 Grants

Total research income for the School in 2009 was $3,126,507. This was approximately a 180% increase from 2008.

Research Grants: Australian Research Council

ARC Discovery Grants

A. Dutkiewicz, S. George, L. Ridley
Biosphere hydrocarbon and ore fluid interactions in the early Precambrian, $139,677.00

G. Albrecht, P. McManus
Constructing nature: tradition and thoroughbreds, $79,630.00

G. Morra, R.D. Müller
Planet-scale reorganizations of the plate-mantle system, $112,228.00

A. Dutkiewicz, P. Rey
The Origin of Australian Opal Deposits: Unlocking the Secrets of an Australian Icon, $81,620.00

M. Gurnis, T. Torsvik, M. Seton
The Subduction Reference Framework: unravelling the causes of long-term sea-level change, $102,025.00

ARC Fellowships

R.D. Müller
The Virtual Geological Observatory: a 4D view into the Earth through deep-time data-mining, $299,905.00

ARC Linkage Grants

A. Vila Concejo
Port Stephens Flood Tide Delta: Shoreline Management Issues, $57,679.00

ARC Research Grants Shared

A. Hale, O.E. Melnik, H. Muhlhaus, R.S. Sparks, G. Wadge
Computationally modelling a volcano: Flow and stability, $107,192.00

Other Research Grants

P. Hirsch
Water Resource Management Research Capacity Development Programme, $146,765.00

W. Pritchard, J. Neilson
Enhancing farmer engagement with specialty coffee chains in Eastern Indonesia, $164,743.00

S.J. Gale
European impact on the natural environment of Kangaroo Island, $2,400.00

S.J. Gale
Bound for Botany Bay: archival and sedimentological records of Australia at the point of European contact, $4,800.00

I. Mason
Oxford University - ARCO Geophysics Research - Project Ongoing, $281,802.00

D. Cato
Beaked Whale Research Survey and Modelling, $40,000.00

R.D. Müller
World class research infrastructure to characterise the structure and evolution of the Australian continent in a global context from surface to core in space and time, $205,000.00

G. Birch, S. Lee
Hydrodynamic Modelling of Sydney Estuary, $20,000.00

M. Neave, W. Pritchard
The productive and environmental implications of farm consolidation and fragmentation, $80,000.00

D.J. Guest, J. Neilson
Improving cocoa production through farmer involvement in demonstration trials of potentially superior and pest/disease resistant genotypes and integrated management practices, $9,058.00
S.J. Gale
European impact on the natural environment of Kangaroo Island, $3,339.00

M. Neave
Investigating deflation basins, $83,700.00

G. Birch
Impact of contaminants on estuarine and fluvial sediments of Brisbane Water, $3,636.00

I. Mason
Co-operative Research Centre in Mining Technology and Equipment, $158,080.00

P. Hatherly
Funding for 75% of salary of Chair in Mining Geophysics to build research strength in the field, $4,269.00

R.D. Müller
Research and Modelling of tectonic plate movement in the Indian Ocean, $217,000.00

A. Vila Concejo
Port Stephens Flood Tide Delta: Shoreline Management Issues, $21,100.00

E. Baker
Feasibility study for the development of a facility for continental shelf delineation, $165,391.00

E. Baker
Ocean discovery network: Training through research in Asia, $6,231.00

R.D. Müller
StatoilHydro-Joint research with Caltex into Dynamic Earth Models of plates, faults and topography, $504,000.00

Consultancies/Other:

P.J. Cowell
Erasmus Mundus Coastal & Marine Engineering Management Program, $25,237.42
2009 Publications

Books

Connell, J H 2009, The Global Health Care Chain: From the Pacific to the World, Routledge, New York, USA


Book Chapter (commercial publication)


Connell, J H 2009, “I Never Wanted to Come Home”: Skilled Health Workers in the South Pacific, Migration and Transnationalism Pacific Perspectives, ANU E Press, Canberra Australia, 159-177

Connell, J H 2009, “We are not ready”: colonialism or autonomy in Tokelau, The Case for Non-Sovereignty Lessons from sub-national island jurisdictions, Routledge, Oxon, 157-169


Refereed Journal Articles


Birch, G F, McCreary, S 2009, Catchment condition as a major control on the quality of receiving basin sediments (Sydney Harbour, Australia), Science of the Total Environment, 407(8), 2820-2835


Coltice, N, Bertrand, H, Rey, P F, Jourdan, F, Phillips, B, Ricard, Y 2009, Global warming of the mantle beneath continents back to the Archaean, Gondwana Research, 15(3-4), 254-266

Connell, J H 2009, Birdwatching, twitching and tourism: towards an Australian perspective, Australian Geographer - Review Article, 40(2), 203-217


DiCaprio, L. J., Muller, R. D., Gurnis, M., Goncharov, A. 2009, Linking active margin dynamics to overriding plate deformation: Synthesizing geophysical images with geological data from the Norfolk Basin, G3: Geochemistry, Geophysics, Geosystems: an electronic journal of the earth sciences, 10(1), 1-14

Docker, B. B., Hubble, T. C. 2009, Modelling the distribution of enhanced soil shear strength beneath riparian trees of south-eastern Australia, Ecological Engineering, 35(5), 921-934


Gale, S. 2009, Dating the recent past, Quaternary Geochronology, 4, 374-377

Gale, S. 2009, Event Chronostratigraphy: A high-resolution tool for dating the recent past, Quaternary Geochronology, 4(5), 391-399

Herold, N. K., You, Y., Muller, R. D., Sdrolias, M. 2009, Climate model sensitivity to changes in Miocene paleotopography, Australian Journal of Earth Sciences, 56(8), 1049-1059


Rayburg, S, Thorns, M, Neave, M R 2009, A comparison of digital elevation models generated from different data sources, Geomorphology, 106(3-4), 261-270

Rey, P F, Teyssier, C, Whitney, D 2009, Extension rates, crustal melting, and core complex dynamics, Geology (Boulder), 37(5), 391-394

Rey, P F, Teyssier, C, Whitney, D 2009, The role of partial melting and extensional strain rates in the development of metamorphic core complexes, Tectonophysics, 477(3-4), 135-144

Sdrolias, M, Gaina, C, Muller, R D, Heine, C 2009, Mid-Cretaceous seafloor spreading pulse: Fact or fiction?, Geology (Boulder), 37(8), 687-690

Smith, H G, Dragovich, D J 2009, Interpreting sediment delivery processes using suspended sediment-discharge hysteresis patterns from nested upland catchments, south-eastern Australia, Hydrological Processes, 23(17), 2415-2426


Tong, J A, You, Y, Muller, R D, Sdrolias, M 2009, Climate model sensitivity to atmospheric CO2 concentrations for the middle Miocene, Global and Planetary Change, 67(3-4), 129-140


Whitney, D, Teyssier, C, Rey, P F 2009, The consequences of crustal melting in continental subduction, Lithosphere, 1(6), 323-327


Wyman, D A, Kerrich, R 2009, Plume and arc magmatism in the Abitibi subprovince: Implications for the origin of Archean continental lithospheric mantle, Precambrian Research, 168(1-2), 4-22

You, Y, Huber, M, Muller, R D, Poulsen, C, Ribbe, J 2009, Simulation of the Middle Miocene Climate Optimum, Geophysical Research Letters, 36(L04702), L04702-1-L04702-5

Journal Article (other)

Branagan, D 2009, Four Centuries of Geological Travel: The Search for Knowledge on Foot, Bicycle, Sledge and Camel, Annals of Science: a review of the history of science since the thirteenth century, 66(4), 572-575


Review/Abstract/Case Study/Commentary/Note

Hoare, P G 2009, Determining the Age of the Ancient Beach Succession at Morston, North Norfolk, U.K., by the Optically Stimulated Luminescence (OSL) Procedure, Quaternary Newsletter, 118, 36-38

Rey, P F 2009, Hot orogens, Tectonophysics, 477(3-4), 103-104

Conference Proceedings

Branagan, D 2009, The Inner Sydney Basin: Geology, Land Surface and Earthquakes, Potential geological sources of seismic hazard in the Sydney Basin, Geoscience Australia, Canberra, Australia, 7-12

Iveson, K J 2009, Too Public or Too Private? The politics of privacy in the real-time city, Engaging Data: First International Forum on the Application and Management of Personal Electronic Information, Massachusetts Institute of Technology, online, 1-6


Abstracts/Posters/Short Papers


External Reports


Encyclopaedia/Dictionary

2009 Honours Research

The Honours program is an additional one-year period of study taken following the completion of an undergraduate degree. The purpose of the program is to pursue in depth research on a specific topic – providing skills for those wanting an academic career, to advance potential employment opportunities, or simply to allow students to further explore the intricacies of a topic about which they are enthusiastic.

Honours theses completed in 2009

Carlos Blanco
Seasonal migration, remittances and development: Investigating the Australian Pacific Seasonal Worker Pilot Scheme and its development potential (John Connell)

Alex Collie
The effects of land holding ownership change on vegetation in rural New South Wales (Melissa Neave)

Daniel Cronin
The nature and origin of the Carrow coarse grained magnetite deposit, Eyre Peninsula, South Australia; mechanisms for its formation and controls on mineralisation (Derek Wyman)

Timothy Frewer
A geography of ‘civil society’ in Cambodia: NGO’s, governance and land in Mondulkiri (Phil Hirsch)

Daniel Harris
Multi-scale morphodynamic assessment of an embayed low energy estuarine beach, Shoal bay, Port Stephens, NSW (Peter Cowell)

Amy Haughton
Flood-tide delta terminal spit extension in drowned river valley estuaries (Peter Cowell)

Sharyn Hickey
Investigating the influence of geomorphic setting on fish habitat in two drowned river valleys located in the Sydney region using spatial techniques (Eleanor Bruce)

Kara Matthews
Cretaceous palaeogeography of Eastern Australia: Connecting the deep earth to surface processes (Dietmar Müller)

Jacqueline Murray
The role of cyclic climatic regimes and riparian vegetation: a qualitative and quantitative study into the cause of river bank slope instability and channel widening on the Macdonald river, New South Wales (Tom Hubble)
Amanda Murphy
Geology of the Clare Sandstone, Mullailey Sub-Basin, Gunnedah Basin, New South Wales  (Peter Hatherley)

David Oberthur
What triggers and barriers to practicing consumption ideals must be addressed by sustainable consumption solutions? (Kurt Iveson)

Thomas Parkinson
The effects of vegetation shading on residential energy use and comfort (Richard de Dear [Faculty of Architecture])

Kirstie Petrou
Wan NES Nomo: Place and access to primary care in rural Vanuatu (John Connell)

Christine Schultz
Dargues Reef, NSW: Investigation of gold-arsenic relationships (Derek Wyman)

Grace Shephard
Contribution of mantle convection to shifting South American coastlines during the Cenozoic (Dietmar Müller)

Katherine Silversides
Spectral and Geological Characteristics of West Angelas Iron Mine Rock Types: An Integrated Study (Dietmar Müller)

Alicia White
The influence of physical and anthropogenic factors on a channel’s geomorphic diversity (Melissa Neave)

Jessica Wickenden
Virtual Citizenship: The emergence of citizens on Facebook (Kurt Iveson)

Louise Willinck
The Mungaroo Formation, Carnarvon Basin: A Reservoir Quality Assessment (Geoff Clarke)
2009 Postgraduate Research

Candidates Awarded their degree in 2009

Rowena Butland (PhD) Perceptions of place in the management of heritage space (Bruce, E.)
Brett Davis (PhD) Primary sources of stormwater contaminants in a highly urbanised catchment of Sydney Harbour, Australia (Birch, G.)
Daniel Montoya (PhD) Water management in the Murrumbidgee: community-government relations (McManus, P.)
Josephine Gillespie (PhD) World heritage obligations and local communities: land law and justice at Angkor, Cambodia (Bruce, E.)
James Daniell (PhD) Sediment dynamics on a tide-dominated inner shelf, Torres Strait (Cowell, P.)
Nicolas Flament (PhD, cotutelle) Freeboard evolution, crustal evolution and the 2.7Ga late-Archean geological and biological crisis (Rey, P.)
Sunil Bajpai (MSc) Erosion of access tracks in Royal National Park: the Coast Walk, its Condition and Use (Dragovich, D.)

Candidates continuing research in 2009

Elizabeth Abbey (PhD) A history of reef response, climate change, and sea level fluctuations since the last deglaciation: Evidence from the Great Barrier Reef (Webster, J.)
Kellie Adlam (PhD) Risk-based forecasts of changes in estuary morphology: using geological evidence in the calibration of an estuarine evolution model (Cowell, P.)
Farshad Amirislani (PhD) Modelling of indicators for management of degraded arid environments (Dragovich, D.)
Carmen Apostolatos (PhD) Spatial and temporal change in heavy metal concentrations in the Port Jackson estuary using the Sydney Rock Oyster (Saccostrea glomerata) (Birch, G.)
Tim Austin (PhD) Morphodynamics of the Port Stephens flood tide delta (Short, A./Cowell, P.)
Robin Branson (PhD) Assessment procedures for sustainable reuse of industrial waste (McManus, P.)
Andrew Bray (PhD) Integrated geophysical and geological analysis for resource planning and development (Hatherly, P.)
Paula Brown (PhD) Fisheries co-management in Vietnam (Hirsch, P.)
Virginia Brunton (PhD) The environmental history and future of sustainable agriculture in the Sydney Basin (McManus, P.)
Phalla Chem (PhD) Integrated catchment management in the context of irrigation development: the role of hydrological analysis in managing conflict, maximising benefit-sharing and promoting social equity (Neave, M.)
Marc Daley (PhD) Shoreface equilibrium and consequences for climate change impact predictions (Cowell, P.)
Kevin Davies (PhD) Tropical Forest Change Detection using Remote Sensing (Bruce, E.)
Matthew DePaoli (PhD) High-pressure granulite to eclogite facies metamorphism: mechanisms of formation and tectonomorphic implications, Fiordland, New Zealand (Clarke, G.)
Olivia Dun (PhD) Migration and environmental change in Vietnam (Connell, J.)
Gareth Edwards (PhD) Construction, experience and management of water scarcity in NSW and implications for social equity and environmental sustainability (McManus, P.)
Salette Figueiredo (PhD) Risk-based forecasts of sea level rise impacts on the Brazilian Coast (Short, A./Cowell, P.)
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<th>Name</th>
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<td>Renee Fulton (PhD)</td>
<td>Green resources in coastal peri-urban environments (Dragovich, D.)</td>
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<td>Ana Gibbons (PhD)</td>
<td>Tectonic evolution of the Indian Ocean (Müller, D.)</td>
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<td>Jasmine Glover (PhD)</td>
<td>South Indian supply chains in the globalisation of the ornamental cut flower industry (Pritchard, W.)</td>
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<td>Raewyn Graham (PhD)</td>
<td>Horse festivals: place, production and performance of thoroughbred horses in Scone, New South Wales and Georgetown, Kentucky (McManus, P.)</td>
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<td>Kate Griffiths (MSc)</td>
<td>Aid cultures in Cambodia (Hirsch, P.)</td>
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<td>Michelle Haron (PhD)</td>
<td>Sensitivity of landscapes to the development of dryland salinity (Dragovich, D.)</td>
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<td>Nick Herold (PhD)</td>
<td>Trends and quantification of processes contributing to two major Cenozoic warming events (Müller, D.)</td>
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<td>Relationship between wetland hydrology and fine scale vegetation distribution (Bruce, E.)</td>
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<td>Phil Holmes (PhD)</td>
<td>Economic and environmental viability of pastoralism in Australian arid rangelands (Dragovich, D.)</td>
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<td>Patric Horne (MSc)</td>
<td>Magmatism and mineralization in a complex subduction zone setting- New Britain, Papua New Guinea (Wyman, D.)</td>
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<td>Tariqul Islam (MSc)</td>
<td>Modelling hydrocarbon caps (Rey, P.)</td>
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<td>Angela (Wenping) Jiang (PhD)</td>
<td>Numerical Modelling of Flood-tide Delta Morphodynamics at Port Stephens, New South Wales. (Cowell, P.)</td>
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<td>Serey Rotha Ken (PhD)</td>
<td>The role of social capital in community based natural resource management in Cambodia (Hirsch, P.)</td>
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<td>Oulavanh Keovilignavong (PhD)</td>
<td>Private sector intervention and poverty-environment nexus in Laos (Hirsch, P.)</td>
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<td>Daravy Khiev (MSc)</td>
<td>Institutional arrangements for water governance in the context of catchments in Cambodia (Hirsch, P.)</td>
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<td>Sean Somatra Kim (PhD)</td>
<td>Property arrangement and management of the commons: the case of irrigation water in Cambodia (Hirsch, P.)</td>
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<td>Michael Kinsela (PhD)</td>
<td>Morphokinematic response of the shoreface profile to changing sea level and implications for the deposition and preservation of systems tracts. (Cowell, P/Vila-Concejo, A)</td>
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<td>Gina Koczberski (PhD)</td>
<td>Smallholder agriculture in New Britain, Papua New Guinea (Connell, J.)</td>
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<td>Serena Lee (PhD)</td>
<td>Modelling contaminant transport in the Port Jackson estuary (Birch, G.)</td>
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<td>Kayla Maloney (PhD)</td>
<td>Mesozoic Evolution of the Andean margin in Southernmost South America (Clarke, G.)</td>
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<td>Paolo Mazzi (PhD)</td>
<td>The greening of government (McManus, P.)</td>
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<td>Fiona McKenzie (PhD)</td>
<td>Fostering decision and innovation: towards agriculture that maintains or improves the natural resource base (McManus, P.)</td>
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<td>Rhiannon McKeon (PhD)</td>
<td>100Ma Global Scale, Plate Tectonic Reorganisations (Müller, D.)</td>
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<td>Chun Yeong Ng (PhD)</td>
<td>Geoparks and geotourism: management approaches to geological heritage in China (McManus, P.)</td>
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<td>Tuong Huy Nguyen (PhD)</td>
<td>Poverty and livelihoods in coastal fisheries communities around Nha Phu lagoon, Vietnam (Hirsch, P.)</td>
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<td>Marco Olmos (PhD)</td>
<td>Heavy metal contamination in NSW estuaries (Birch, G.)</td>
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Surin Onprom (PhD)  Critical investigation of the collaborative management approach to protected areas governance in Thailand (Hirsch, P.)

Rafiuddin Palinrungi (PhD)  The Dynamic of Cocoa Industry Upgrading in Indonesia (Pritchard, W.)

Robert Renew (PhD)  Urban bushland regeneration and its relationship to urban development (Mcmanus, P.)

Soimart Rungmanee (PhD)  GMS Transnationalization and Agrarian Change in Northeast Thailand and Laos (Hirsch, P.)

Mattij Smits (PhD)  Energy transitions in the Mekong region: a multi-scale case study on the power sector in the Lao PDR and Thailand (Hirsch, P.)

Worawan Sukraroek (PhD)  Embedding Integrated Water Resources Management (IWRM) in the Lower Mekong Basin: rhetoric or realistic at local level (Hirsch, P.)

Edwina Tanner (MSc)  The effect of global warming on upwelling and adaptation of artesian fisheries (Hubble, T.)

Kate Thornborough (PhD)  Effects of climate change on reef growth and development of the southern Great Barrier Reef (Webster, J.)

Judy Tong (PhD)  Modelling of the energy balance in the ocean for addressing climate change (Müller, D.)

Laurence Troy (PhD)  Urban Political Ecology of Urban Redevelopment Areas in Perth and Sydney (Iveson, K.)

Ann Turner (PhD)  The evolution of institutional arrangements in railway administration, NSW and Queensland (Pritchard, W.)

Nathan Wales (PhD)  Investigating the relationship between spatio-temporal patterns of vegetation change and forest management practices within the Angkor World Heritage Site (Bruce, E.)

Wei Wang (PhD)  The anatexis of high grade metapelites in Altai Orogen, Xinjiang, China (Clarke, G.)

Dong Xing (PhD)  Making Green Roof Policy in China: A comparative study between Beijing and Chicago (McManus, P.)
Our intent was to seek financial support for student programs in areas that produce value for industry. To this end we launched the Geosciences Industrial Project Placement Scholarship (“GIPPS”) which was based on a successful program run by the Engineering Faculty. However the timing was poor, with target companies reporting cutbacks in staff and budgets due to the Global Financial Crisis.

The Foundation continued its usual business of organising scholarships for students during the year. To this end the Foundation held a very successful function at the Nicholson Museum on 19 May 2009 at which we made our annual presentation of scholarships to graduate and undergraduate students from the School, followed by a cocktail party for the students and their guests. This is always a well attended and much anticipated event and the Foundation would like to congratulate the winners and thank the sponsors of our scholarship awards.

The Foundation continues to support the Teacher Earth Science Education Program (TESEP); which is an initiative of Australian Science Teachers Association. We have undertaken to provide financial support over three years. The Foundation also provided, through the School, a venue and other support for the February and August 2009 TESEP school teachers workshops.

We expect this to be an ongoing opportunity to assist in explaining the relevance of the geosciences to society and to engage with high school students and their teachers.

The ERF has decided to undertake a renewal process to ensure that it is doing the best possible job for the academic staff and our students. This in part reflects significant changes in focus for the School of Geosciences in recent years. As a consequence the Foundation has started a process of consultation over its future role within the School. We expect to be in a position to start implementing any resultant recommendations during 2010.

Prof. Dietmar Müller is the University liaison officer for the Foundation and was joined by Dr. Chris Stewart as Director. Chris has subsequently resigned and has been replaced by Dr. Tom Hubble. I would like to welcome Tom and to thank Chris and Dietmar for their work during the year and in particular to thank Chris for his efforts in starting the process of formal consultation over the role of the Foundation within the School.
The University of Sydney Institute of Marine Sciences (USIMS)

Edwina Tanner and Dr Inke Falkner

USIMS has taken a leading role in the development of the Sydney Institute of Marine Science (SIMS) EIF (Education Investment Fund) grant. It has also developed promotional materials, developed and delivered work experience programs, and has established links with the Sydney Institute of Marine science. USIMS has raised its profile through the upgrading of its website and the distribution of a quarterly newsletter.

Goals met during 2009 include:

Sydney Institute of Marine Science (SIMS)

- The USIMS Director is a member of the small committee overseeing the expenditure of the $19.5M EIF grant for infrastructure development, to ensure full engagement of USIMS.
- Leading of the development of a joint marine science masters by coursework program through SIMS.

Outreach

- Development of information brochure for future undergraduate students ‘Studying marine science at Sydney University’
- USIMS represented at Sydney Uni live with information materials and presentation
- Hosting of marine science taster day at Sydney Institute of Marine Science in collaboration with the School and Industry Coordinator of the Sydney Local Community Partnership
- Developing work experience program and hosting work experience students from NSW high schools

Interdepartmental liaison

- Hosting of USIMS showcase including talks about the latest marine research being conducted at the Schools of Geosciences and Biological Sciences, the Department of Anatomy and Histology, the Centre for Research on Ecological Impacts of Coastal Cities and the Australian Centre for Field Robotics, DSTO and CSIRO
- Hosting of marine science seminars with local and overseas speakers

Development and Technology

- Upgrading of website in order to comply with university standards and update information on website www.usyd.edu.au/usims
- Development of marine science honours thesis data management project

International activities

- Organisation of International Ocean Drilling Program meeting 2010
- University of Cape Town delegation visit
- Chinese Fisheries delegation visit

Donations received

One-off student prize (for best marine science honours thesis) worth $1,000 from the Marine Aquarium Society of Sydney to be awarded in 2010.
The Australian Mekong Resource Centre (AMRC) is located in the School of Geosciences and is a Centre of the University of Sydney. The Centre is devoted to research, education and community engagement. AMRC has achieved a reputation as the leading centre of expertise on development in the Mekong Region, particularly with regard to the implications of development for people, the environment and the links between them.

AMRC is committed to research that supports action, policy and advocacy for equitable and sustainable approaches to development in the Mekong Region. It works on principles of engaged research that also supports the building of independent and critical research capacity within the region. The Centre is a focal point for information, data, local studies and policy-oriented research relating to the Mekong.

AMRC undertook four key programs during 2009:

- Cambodia water project, running over five years 2006-2011, is supported by a $3 million grant from AusAID, administered through the Cambodia Development Resource Institute. The grant supports School of Geosciences and Agricultural Economics staff (Hirsch, Bruce, Neave, Santos) to work with Cambodian researchers and also includes five research student scholarships. The project seeks to develop capacity in water resources management research in the context of irrigation development and catchment management in Cambodia. Partners include AMRC, Cambodia Development Resource Institute and Royal University of Phnom Penh.

- ChATSEA is a CAD$2.5 million five year collaborative initiative (2005-2010) funded by the Social Science and Humanities Research Council of Canada, involving over 16 universities studying rural change in Southeast Asia. The funding to AMRC for research activity on agrarian transitions in SE Asia includes postgraduate student support. To date, five School of Geosciences postgraduate students have been supported through ChATSEA.

- Mekong Learning Initiative, coordinated by AMRC and funded by Oxfam, is a collaboration between eight universities in the Mekong Region for teaching and learning in the social sciences of natural resource management. To date this project has attracted approximately $300,000 in funding support.

- A study of land titling in Laos is being carried out in collaboration with the Faculty of Agriculture, Food and Natural Resources with funding from AusAID’s Australian Development Research Awards scheme.

The Director of AMRC is Professor Philip Hirsch. AMRC also employs a senior researcher: Dr Robert Fisher, and two research assistants: Kate Griffiths and Natalia Scurrah. In addition, several postgraduate students are associated with AMRC. In 2009, these students were Paula Brown, Kate Griffiths, Nathan Wales, Jo Gillespie, Nguyen Tuong Huy, Oulavanh Keovilignavong, Phalla Chem, Rotha Ken Serey, Surin Onprom, Kim Sean Somatra, Olivia Dun, Wora Sukraroeok Daravy Khiev and Sopheak Chann.

Further information on AMRC can be found at: www.usyd.edu.au/mekong
CRC Mining Geophysical Imaging Group

The aim of the Cooperative Research Centre for Mining is to significantly enhance mining industry performance in terms of economics, safety and environmental impact. This is to be achieved by working on:

- Reducing short-range geological uncertainty
- Advanced monitoring and control of machines,
- Characterising and controlling the overall mine production system, and
- Introducing radically new mining methods.

The Geophysical Imaging Group at the University of Sydney undertakes research for the CRC’s Geological Sensing Work Area. Work is focussed on development of seismic, wireline logging, borehole radar and interactive visualisation and interpretation tools.

Field work has been undertaken in mines in Australia, South Africa and Canada. There is close collaboration with mining industry professional and research scientists in those countries. The Australian Coal Association Research Program also supports our activities with grants for research on geotechnical analysis from wireline logs and seismic inversion.

In 2009, the group included the following staff and associates from the School of Geosciences.

- Prof Iain Mason
- Mr Andrew Bray
- Mr Phil Manning
- Mr Steve Owens
- Mr Tim Sindle
EarthByte
Professor Dietmar Müller

The EarthByte Group went through a phase of rapid growth in 2009, mainly due to an Australian Laureate Fellowship being awarded to Dietmar Müller, for building a Virtual Geological Observatory, dubbed VIRGO. The virtual observatory is envisioned as a knowledge-rich, 4-dimensional eScience environment that is compatible with international geodata standards.

Professor Müller receives the Australian Laureate Fellowship from Sen. Kim Carr, Minister for Innovation

Modern Earth Sciences has moved into an era dominated by information: data from satellites; data from airborne geophysical surveys; data from marine and continental geophysical surveys that probes deep into the Earth — data telling us how the Earth evolved and how the Earth moved through deep time to the present to attain its present configuration. This is a vast electronic resource, and VIRGO will help mining it for useful information: methods that can deal with multidimensional, global-scale, deep-time data; methods that will help to re-invigorate resource exploration and advance our understanding of the complex history of crustal dynamics. Improved knowledge about the geological features and processes underneath Australia will be generated by building a 4D dynamic Earth model.

VIRGO will be firmly connected to international efforts for the construction of virtual observatories that enable skilled and unskilled observers to explore our world in entirely new ways. Through electronic interfaces with VIRGO, it will be possible to analyse observations from many different areas of the Earth Sciences — energy, minerals, natural and environmental hazards — in deep space-time.

VIRGO will allow users to categorize, cluster, and extract features from large data sets using “visual knowledge discovery”: large-scale data analysis coupled with rich interactive visualisation, enabling users to quickly digest data and build understanding in ways hitherto impossible. VIRGO will provide specific “knowledge-exploration” pathways for policy and decision makers, educators and students, while at the same time delivering useful geoscience knowledge to users across the spectrum of expertise.

VIRGO is a large collaborative project. Geoscience Australia has committed in-kind support for the construction of a 4D Australia model and VIRGO is firmly embedded in the AuScope Data Grid and Simulation and Modelling effort.
2009 represented the first year that the school has the services of full-time Science Communicator. Almost 10,000 school students from years 3-12 have been exposed to the School of Geosciences educational programs over the last 12 months. These students have been reached through various programs such as the Science in the City Project which runs in August every year. Hands-on workshops have definitely been the favourite feature, with activities ranging from an ‘Amazing Race’ style ‘Race around the Campus’ to building and erupting clay volcanoes.

The School of Geosciences is also especially proud to have been involved in the University’s Compass Social Inclusion Program which aims to introduce school aged children from lower socio-economic backgrounds to university life.

Teacher training has also featured in the outreach calendar with the school continuing its relationship with PESA and its wonderful professional development division, TESEP.
Scholarships and Prizes

EARTH RESOURCES FOUNDATION SCHOLARSHIPS AND COMPANY AWARDS

ERF Second Year Scholarship in Geology
Iris Bleach
Megan Holdt
William Dunlop
Isabelle Whitehead

ERF Third Year Scholarship in Geology or Geophysics
Floyd Howard

Coffey Geosciences Scholarship
Rebecca Hamilton

Suunto Prize sponsored by Prospectors Earth Sciences Pty Ltd
Daniel Cronin

Ken Richards Memorial Prize
Katherine Silversides

URS Scholarship
Jacqueline Murray

Fugro Ground and Airborne Geophysics Prize
Kara Matthews

SCHOOL OF GEOSCIENCES AND UNIVERSITY AWARDS

Slade Prize for Practical Geography
Isabelle Whitehead

Prof. James MacDonald Holmes Prize for Geography
Isabelle Whitehead

Jack Mahoney Memorial Prize in Geology
Megan Holdt

Professor Griffith Taylor Prize for Geography
Felicity O’Neill

C E Marshall Scholarship for Geology
Iris Bleach

Slade Prize for Intermediate Geology Practical
Aedon Talsma

W H Maze Prize in Intermediate Geography
Anna Helfensdorfer

Olga Marion Brown Prize for fieldwork report in Geology
Bridget Ashton

G S Caird Scholarship for Geography
Carlos Blanco

Edgeworth David Prize
Floyd Howard

Leo A Cotton Prize
Grace Shephard

Deas-Thomson Scholarship in Mineralogy
Grace Shephard

Rev A S McCook Memorial Scholarship for Geography
David Oberthur

Sheila Mitchell Swain Memorial Prize for Geology Fieldwork
Jacqueline Murray

Edgar Ford Memorial Scholarship for Geography
Jessica Wickenden

Quodling Testimonial Prize for Crystallography and Petrology in Geology
Sabin Zahirovic

POSTGRADUATE AWARDS

Deas-Thomson Scholarship in Geology
Rhiannon McKeon

LA Richardson Memorial Prize
Rhiannon McKeon

George Harris Scholarship
Nicholas Herold
2009 Seminars

Southeast Asian Seminar Series

Report by Kate Griffiths

The Australian Mekong Resource Centre (AMRC) Southeast Asian seminar series is run in conjunction with the Chair of Southeast Asian Studies in the Faculty of Arts. It is held in the Madsen Conference Room, with speakers from the AMRC and the wider community and is designed to bring together those with interests in Mekong Region environment and development issues.

8 April
Writing the Mekong
Professor Milton Osborne, Australian National University

22 April
Contextualising community: Ethnic identity in Makassar, 17th - 21st centuries
Professor Heather Sutherland, Free University, Amsterdam

27 May
Oil palm, agricultural policy and the agrarian transition in Indonesia
Dr John McCarthy, Australian National University

7 August
Aspects of the prehistory of Viet Nam
Professor Ben Kiernan, Yale University

28 August
Contested waterscapes in the Mekong region: Hydropower, livelihoods and governance
Dr Tira Foran, Chiang Mai University

25 September
Ecological nationalism in China: The Nu (Salween) river controversy
Ms Hongyan Ga, University of Sydney

19 October
Fighting for the role of the nation state in knowledge mobilisation and educational research: An autoethnography of a mobile transnational Vietnamese scholar
Ms Phan Le Ha, Monash University

30 October
Livelihoods and landscapes in Doi Mae Salong: ‘Doing it differently’ in a Thai protected area
Dr Bob Fisher, University of Sydney

Thank God It’s Fursday (TGIF) Seminar Series

Report by Anna Gibbons

Researchers from a wide variety of disciplines spoke at TGIF (Thank God it’s Fursday) in 2009, including those from such organisations as Caltech, Monash University, the University of Cádiz, Geoscience Australia and several other Universities from within NSW. Such a variety of speakers was largely possible due to the contacts kindly provided by staff from within the school. However, a tendency toward more geological presentations was still apparent, as in previous years. This will lead to a review of the TGIF format for 2010 in the hope that more of the breadth of the School of Geosciences’ research can be showcased.

The list of 2009 presentations follows:

5th March
How far can a plateau lower crust flow? How do plates break? What is the fate of continental slabs? Answers from Computational Tectonics
A/Prof Patrice Rey, The University of Sydney

12th March
Effect of ocean gateway changes under greenhouse warmth
Dr Willem Sijp, University of NSW

19th March
Deep crustal structure of Australia/Antarctica conjugate margins: recent advances and emerging problems
Alexey Goncharov, Geoscience Australia

26th March
Dr Ana Vila Concejo & Tim Austin, The University of Sydney

9th April
Submarine Landslides and Tsunamis - Preliminary results from a voyage aboard R.V Southern Surveyor
Michael Kinsela, The University of Sydney

30th April
Global warming, upwelling, goats, and marauders: Marine records of past and present climatic and cultural upheaval in southern Morocco
Dr Helen McGregor, University of Wollongong
7th May
Life on Mars: How geologically similar or different are Earth and Mars?
Dr Graziella Caprarelli, University of Technology, Sydney

14th May
Generating petrological-geophysical-geochemical consistent models of the upper mantle and transition zone: so far, so good... so what?
Dr Juan Carlos Afonso, Macquarie University

28th May
Mekong Film - City of Ghosts
Prof Phil Hirsch, The University of Sydney

4th June
Branded cities: Outdoor advertising, urban governance, and the outdoor media landscape
Dr Kurt Iverson, The University of Sydney

30th July
Coastal risk in Cádiz, Southwest Spain
A/Prof Javier Benavente and Prof Laura del Rio
University of Cádiz

6th August
Talking Science
Dr Chris Stewart, The University of Sydney

20th August
Visiting the Chinese Altai Mountains/ Geology as a cover for espionage
Prof Geoff Clarke, The University of Sydney

27th August
The southern Brazilian coastal environment and climate change
Salette Figueiredo, The University of Sydney

9th September
Thomas Griffith Taylor: a geographic perspective
Emeritus Professor Bruce Thom, The University of Sydney

17th September
South East Australian continental-shelf abrasion surface
A/Prof Peter Cowell, The University of Sydney

24th September
Dynamic controls on plate motions and deformations around convergent margins
Dr Fabio A. Capitanio, Monash University

8th October
The Integrated Marine Observing System (IMOS) program at UNSW and SIMS
Moninya Roughan, University of NSW

15th October
The Integrated Ocean Drilling Program (IODP) expedition to the Great Barrier Reef: unlocking the climate secrets and fate of our national icon
Dr Jody Webster, The University of Sydney

22nd October
Nature and Museums: Networks connecting Scotland, London and Sydney in the early 19th Century
A/Prof Phil McManus, The University of Sydney

29th October
Large-scale topographic changes of continents and mantle dynamics
Prof Mike Gurnis, Caltech