New Staff in Ocean and Earth Science 2013-2014

Please give them a warm welcome.

Amanda Bates

Amanda is a new Lecturer in Marine Biology. She studies how environmental variability influences the distribution of marine animals at scales ranging from the beach to the globe. Her PhD work (University of Victoria in Canada, 2006) focussed on population traits of hydrothermal vent gastropods along environmental gradients. Studying animals in the highly variable vent setting spawned her interest in understanding how species' biological traits, such as thermal tolerance, influence species-specific sensitivities to environmental variability. Based on this theme, she completed a series of research fellow positions in Canada (University of British Columbia), New Zealand (University of Otago), and Australia (Deakin University, University of Tasmania) working on diverse marine and freshwater systems from subterranean caves to Antarctica. Her interest in fine-scale physiological responses has paid off by allowing her to contribute to ecosystem comparisons of marine, freshwater and terrestrial communities. She is keen to progress her interests in global ecology to further our understanding of how biological traits can be used to predict the redistribution of species, and how the tropicalization of temperate systems relates to biodiversity patterns and community resilience. Her grab-bag of tools for understanding global processes includes rigorous, standardized experimental protocols in complementary laboratory and field settings, field surveys, meta-analytic approaches, and modern statistical approaches.

Nick Bates

Nick is a new part-time Professor in Ocean Biogeochemistry. He is based at the Bermuda Institute of Ocean Sciences (BIOS) in Bermuda where he will continue as Senior Scientist and Associate Director of Research in addition to his duties in the department of Ocean and Earth Science at NOCS. His research interests are focused on understanding the global ocean carbon cycle, marine biogeochemistry and ocean acidification. This also includes studies of the following: sustained ocean observations; ocean biogeochemical cycling of carbon, nitrogen and dissolved organic matter; physical and biological processes influencing ocean-atmosphere gas exchange of carbon dioxide (CO_2); coupling between ocean biogeochemical processes and climate variability; ocean carbon cycling in the Arctic Ocean and the surrounding polar shelf seas; and influence of ocean acidification on coral reefs and calcifying organisms. Nick received his BSc from Kings College London (1985) and MSc from Brock University in Canada (1990) in Geology. He gained his PhD on Oceanography at the University of Southampton in 1995.

Claudie Beaulieu

Claudie is a new Lecturer in Climate and Environmental Statistics. Her research focuses on the detection and attribution of abrupt changes and trends in the climate system and carbon cycle. She was previously an Associate Research Scholar in Atmospheric and Oceanic Sciences at Princeton University where she mainly studied mechanisms causing abrupt changes in the land carbon cycle and developed methodologies to detect shifts. During her time in Princeton, she also investigated long-term changes in ocean productivity and in climate variability. In 2009, she gained her PhD in Water Sciences from the University of Quebec, Quebec City, developing techniques to detect and correct artificial shifts in climate time series due to changes in the measurement procedures.

Steven Bohaty

Steven joined Ocean and Earth Science in January 2013 as a Southampton Marine and Maritime Institute (SMMI) Lecturer. His research is focused on the development of high-resolution palaeoceanographic records from marine drillcores through the combined application geochemical, micropaleontological, and sedimentological climate proxies. He received his Ph.D. in 2006 from the University of California, Santa Cruz, and then came to the University of Southampton as postdoctoral researcher in 2007. He has extensive seagoing and Antarctic field experience and has participated in several scientific drilling expeditions to the Southern Ocean and Antarctic margin (Cape Roberts Project, Integrated Ocean Drilling Program, and SHALDRIL). He has made important contributions to the understanding of high-latitude climate history and the early glacial history of Antarctica—especially during warmer, greenhouse conditions of the Paleogene (~24 to 65 million years ago). He is currently involved in several projects that utilise marine sediments to reconstruct past changes in temperature, ocean chemistry, ocean biology, global ice volume, and atmospheric carbon dioxide levels. The ultimate goal of this research is to quantify the role past changes in carbon cycling and atmospheric carbon dioxide levels had in effecting global climate change, as well as the capacity of ice sheets to influence past climate change through feedback mechanisms. In his new position as a SMMI Lecturer, he is currently developing new laboratory facilities at NOCS for environmental research involving stable isotope and organic geochemical techniques, and he is engaged in cross-disciplinary collaborations with researchers in Chemistry and Medicine.

Rosalind Coggon

Rosalind is a Royal Society Dorothy Hodgkin Research Fellow who transferred her fellowship from Imperial College London to Southampton in February 2013. She is an isotope geochemist, whose research focuses on the formation and hydrothermal alteration of the ocean crust. Her current research investigates natural CO_2 sequestration by the ocean crust, and the reconstruction of past seawater chemistry using hydrothermal calcium carbonate minerals. Roz gained her PhD at NOCS in 2006, studying the hydrothermal alteration of the ocean crust exposed on sub Antarctic Macquarie Island. She progressed to the University of Michigan, where she investigated the thermal history of the intrusive upper ocean crust with Prof. Jeff Alt. Roz returned to the UK in 2007 to work as a post-doc at Imperial College London, working with Dr Mark Rehkämper, using the thallium isotopic budget of altered ocean crust to evaluate hydrothermal fluid fluxes.

Phillip Fenberg

Phillip will start as lecturer in Marine Biology in October 2013. Phillip is a coastal marine ecologist, broadly trained in using integrative methods to bridge the gap between basic ecology, evolution and natural history research with marine conservation biology (notably size-selective/over harvesting and climate change). His research spans multiple levels of biological organization and time – from individuals and populations (life history, size/age structure, population genetics), species (range-wide patterns of abundance and causes of range limits), ecosystems (biogeographic structure and diversity), and across recent history (using natural history collections). Much of his work is focused on rocky intertidal species, particularly limpets and other gastropods. He also compliments his research with relevant marine policy and science outreach. Phillip's research has taken him to the eastern Pacific coastlines of California, Oregon, Baja Mexico and recently, down to Chile. He looks forward to expanding his research to the northeastern Atlantic. He received his PhD from the University of California, San Diego where he studied the ecological and evolutionary consequences of size-selective harvesting. After graduating from UCSD, he was a postdoc at the Natural History Museum in London where he assessed the utility of historical marine collections for climate change/ocean acidification research. Recently, he was at Oregon State University where he was the director for the Science of Marine Reserves Project (European version). Just prior to arriving at NOCS, Phillip was a curator at the University of Colorado Museum of Natural History.

Shari Gallop

Shari is a Research and Teaching Fellow in Coastal Processes at the University of Southampton. She has worked on a variety of projects in coastal morphodynamics and physical oceanography in several countries. Shari completed a BSc at the University of Waikato in New Zealand with a double major in Biological and Earth Science. She then did an MSc (Hons) degree in Ocean and Earth Science with a thesis focused on the automatic detection of rip channels in video imagery and their response to wave forcing. Subsequently, Shari undertook her PhD at the University of Western Australia, investigating how limestone reefs influence coastal sediment transport over a range of scales. This involved the design and deployment of a multi-scale programme of field measurements and working closely with numerical modellers.

Shari's key interests are: how coastal morphology responds at different time and space scales and interaction with fixed substrates; the effects of wind on waves,

current and coastal morphology; rip channel detection, variability and forcing; and the influence of hard landforms (such as rock platforms and reefs) on waves, currents and sediment transport. She has experience in the collection and analysis of field data, and numerical modelling.

Philip Goodwin

Phil Goodwin transferred his NERC fellowship to Southampton in June 2013 and moves onto a lectureship in October 2014. His research focuses on the carbon cycle and its links with climate, both in palaeo and future contexts. He investigates the causes of past changes in atmospheric carbon dioxide levels using theory, models and observations. He uses analytical tools to predict the future consequences of current carbon emissions in terms of warming, ocean acidification and sea level rise on long timescales. He previously held postdoctoral NERC and Herchel Smith Fellowships at Cambridge beginning in 2011 and, prior to that, he began a post-doc at UEA in 2008. During his post-doctoral research he developed a matrix-transformation method to reconstruct the past carbon cycle directly from observational multi-proxies, and assess uncertainties in the reconstructions. For his doctoral research at Liverpool, 2004 to 2008, he developed an analytical model that predicts atmospheric carbon dioxide levels based on global properties of the ocean-terrestrial-sediment system. He completed his undergraduate Masters degree in Physics from Imperial College in 2003.

Laura Grange

Laura is a new Teaching Fellow in Marine Biology. She is a benthic marine ecologist and has studied benthic ecosystems on both sides of the Antarctic Peninsula, in both shallow and deep-water habitats, with her main focus on epibenthic megafauna. She received her PhD in the reproductive success of Antarctic marine invertebrates from the NOCS in 2005. Recently, Laura has gained over four years postdoctoral experience working at the University of Hawaii at Manoa. Here, she studied megafaunal abundance and diversity patterns in subpolar fjords along the West Antarctic Peninsula and the benthic ecosystem response to a strong latitudinal sea-ice gradient to explore ecosystem consequences of sea ice loss from climate change. Before this, she worked as a marine environmental consultant for the Centre of Marine and Coastal Studies Ltd based in Liverpool. Most recently, she was appointed as an Assistant Professor in the Department of Biology at the University of Hawaii at Manoa, where she was tasked with co-instructing, developing and designing the core-course curriculum for the first graduate program in Marine Biology offered in Hawaii. Her primary research interests focus on using benthic systems as models to investigate marine ecological and biological theory against a

backdrop of changing environmental conditions, and evaluating benthic ecosystem responses to climate change.

Mathis Hain

Mathis is a new NERC Independent Research Fellow in the Paleo group. His research has varied widely in the Earth Sciences, starting as a geologist (Dipl. In Geology; University of Potsdam) and then shifting via the nutrient cycle of the modern ocean towards numerical modeling of the carbon cycle of the late Pleistocene ice ages (MA and PhD; Princeton University). Mathis' main expertise lies in the development of geochemical models for the seawater acid/base chemistry incorporating representations of the global cycles of carbon, alkalinity and nutrients as well as the various related isotope systems. The core goal of his work is to extract from paleoceanographic records additional information on the respective roles of biology and ocean circulation in the regulation of atmospheric CO_2 and the ocean's nutrient cycles. The NERC IRF fellowship will allow Mathis to expand his research topics to include the warm climates of the early Cenozoic, and to study the coupling of global climate, ocean circulation and marine biogeochemistry through the punctuated Cenozoic transition from greenhouse conditions to the ice age cycles.

Rachael James

Rachael joined as a Reader in Marine Geochemistry in October 2013. She was previously Principal Geochemist at the National Oceanography Centre, arriving at the NOC in 2008 having worked at the Open University as Lecturer and then Senior Lecturer in Oceanography since 2000. Rachael gained her PhD from the University of Cambridge in 1995, and was a NERC-BRIDGE Postdoctoral Research Fellow at the University of Bristol (1996-1999) and a post doc at the Natural History Museum (London) (1999-2000) prior to moving to the OU. Her research focuses on the development and application of chemical and isotopic techniques to improve our understanding of earth and planetary processes- both now and in the past. Examples include the use of stable and radiogenic isotopes to explore the links between weathering, ocean chemistry and climate change, and assessing the utility of Cr isotopes as a tracer of ocean oxygenation. She is also working on methodologies to monitor and assess the impact of potential leakage from sub-seafloor CO_2 storage sites, as well as the effects of Arctic warming on the stability of sub-seafloor methane hydrate. She has been involved in a wide range of shipboard sampling programmes, including ocean drilling and submersible studies of hydrothermal systems.

Phyllis Lam

Phyllis joined as a Lecturer in Microbial Biogeochemistry in May 2013. She was previously a research scientist at the Max Planck Institute for Marine Microbiology in Bremen, Germany. She obtained her B.Sc. in Oceanography and Marine Biology here at the University of Southampton, and subsequently a Ph.D. in Oceanography at the University of Hawaii at Manoa, USA. Her research interests lie in the functional roles of microorganisms within the biological communities as well as in biogeochemical cycling. She applies a variety of genomics-based techniques to study the genetic potentials of microorganisms in performing biogeochemical processes, and gene expression and proteomics analyses to verify their activities. The combination of these molecular analyses with parallel biogeochemical rate measurements has been proved a powerful tool to, for instance, unravel the complex nitrogen cycle in oceanic oxygen minimum zones, where previously considered aerobic and anaerobic processes were found to in fact co-occur. Her research sites have ranged from deep-sea hydrothermal vents and cold seeps, to suboxic water columns, ocean twilight zones and the surface ocean. She would like to further investigate how microbial communities and their biogeochemical functions may respond to ongoing and future global environmental changes, as well as what feedback functions, such as the production of greenhouse gases, these microorganisms may give in return.

Kirsteen MacKenzie

Kirsteen is a new Teaching Fellow in Marine Biology. She works on the marine ecology of pelagic fish, using stable isotopes to understand their movements, population dynamics and life histories. She gained her PhD from NOCSS in 2011, investigating the marine life of declining wild Atlantic salmon from the UK by analysing the stable isotopic composition of carbon and nitrogen naturally incorporated into their scales. Prior to this, she worked for the JNCC on marine habitat mapping, and has spent some time in the Bahamas researching shark ecology. She has just completed a Defra-funded post-doctoral research fellowship here at the University of Southampton, NOCSS, working with Clive Trueman on expanding her PhD research to further reveal the hidden lives of salmon at sea, and studying other pelagic animals including herring and jellyfish. Her current research interests centre on studying the impacts of regional climatic variation on migratory marine animals and linking stable isotopes in animal tissues to population trends, location and diet.

Marc Rius

Marc Rius will start as a Lecturer in October 2013. His research uses a multidisciplinary approach, mainly merging ecological and genetic techniques, to understand the underlying mechanisms that determine species ranges. He is particularly interested in biological invasions as they not only represent tremendous conservation challenges, but also serve as an ideal system to address fundamental questions in ecology, evolution and biogeography. He combines experimental work, both in the field and laboratory, with analyses of field samples collected along coastlines around the world. Right before joining NOCSS he will lead a collaborative research project on the coast of Chile. He has been a Marie Curie Postdoctoral Fellow (2011-2013) at the Department of Evolution and Ecology, University of California, Davis, USA, and a Centre for Invasion Biology Postdoctoral Fellow (2009-2010) at the University of Cape Town, South Africa. He obtained his PhD (2008) at the University of Barcelona, Spain, and MSc at Rhodes University, South Africa. He has completed research visits at the University of Bologna, Italy, and the University of Queensland, Australia.

Jessica Whiteside

Jessica is a new Lecturer in Geobiology and Organic Geochemistry, starting in July 2013. She earned her Ph.D at the Lamont-Doherty Earth Observatory of Columbia University for studies on carbon cycling and climatically forced biotic perturbations associated with the end-Triassic mass extinction, across a hierarchy of temporal and spatial scales.

Jessica is interested in the mechanisms of mass extinction, especially the role of ocean acidification and deoxygenation in deep time, and the evolution of continental ecosystems as recorded in cyclical lake sequences. Her studies focus on ecosystem response and resilience to climate change (particularly CO_2 forcing) in greenhouse worlds, as well as the rates and spatial signatures of past climate transitions, especially those between icehouse and greenhouse climatic states. Some of the key tools in these efforts are the relative abundances and isotopic compositions of taxon-specific organic molecules (biomarkers) preserved in marine and terrestrial archives, which she uses to unravel the biotic and physical geochemical signatures (microbial paleoecology, surface water temperature, water column stratification, salinity, redox potential, carbon and nutrient cycling) associated with climatic change.

Jessica is currently applying these approaches to four extreme climate events in the geological record that resulted in varying degrees of extinction: the end-Triassic mass extinction, Cretaceous Oceanic Anoxic Events, the end-Cretaceous mass extinction, and Paleogene hyperthermals. This research takes Jessica to fieldwork in Germany, Italy, Portugal, Spain, Tunisia, Morocco, China, US, Canada, and the seafloor of

the North Atlantic Ocean. In addition to generating a wealth of information about how the Earth-Life system responded to super-greenhouse climate modes in the past, these studies are of current scientific and societal interest as they serve as partial analogues to present and future climate scenarios and their sequelae.

Chuang Xuan

Chuang is a new Lecturer in Paleomagnetism. His primary research interest is to use paleomagnetic information preserved in sediments, rocks, and other geological and archaeological materials, to reconstruct the Earth's past magnetic field variation at various temporal and spatial scales, with the objective of understanding the dynamics as well as causes and consequences of geomagnetic change. His main research interest also includes the application and improvement of paleomagnetic data as reliable stratigraphy and geochronology tools. He is interested in studying magnetic properties of sediments and rocks and their (paleo)environmental implications. He also uses advanced statistical and mathematical methods to solve paleomagnetic and paleoclimate questions, and develop related software using MATLAB. Chuang received his Bachelor's degree in Geology (2002), and Master's degree in Applied Mathematics (2005), at the China University of Geosciences (Wuhan). In 2010, he obtained his PhD in paleomagnetism at the University of Florida. He then worked as an institutional postdoctoral fellow at the Oregon State University from 2010 to 2013. Chuang joined University of Southampton as a Lecturer in April 2013.