EARTH SCIENCES

Newsletter

EARTH SCIENCES WITH PLYMOUTH UNIVERSITY

Volume 9 Winter 2015/2016

In this issue

- Welcome Introductions
- Grant successes
- News in brief
- Undergraduate prizes
- GeoCareers Fair 2015
- Graduation 2015
- Publication highlights

Welcome to the 9th issue of our annual newsletter. We hope you enjoy it. We report recent events, details of forthcoming research projects and information about the Earth Sciences. We've had a very a busy year of research progress and student success and we welcome the involvement and support of our global community of former students and friends. So if you would like to contribute in any way please let us know. To help us keep our database of email addresses up to date, please send an email to sally.greenwood@plymouth.ac.uk or Martin Stokes and we will add you to our list. Please keep in touch - we look forward to hearing from you all. Please follow us on Twitter @EarthSciPlymUni. We'll be tweeting about up-coming events, campus developments, fieldwork and research.

Front Cover photo taken by Sarah Boulton

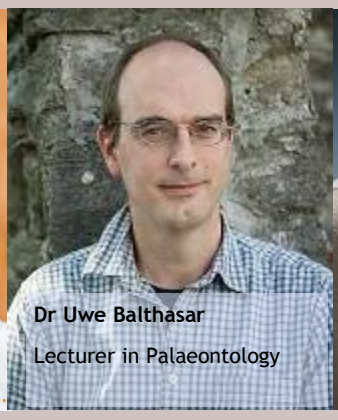
Earth Sciences Staff

Dr Colin Wilkins

Lecturer in Economic Geology

Dr Aude Gebelin

Lecturer in Tectonics

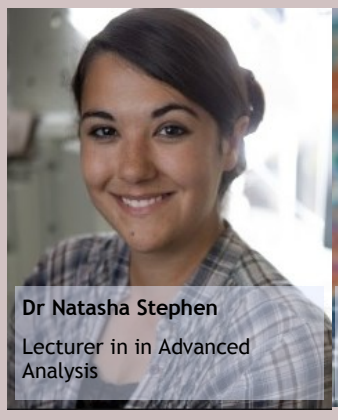


Dr Uwe Balthasar

Lecturer in Palaeontology

Dr Sarah Boulton

Lecturer in Remote Sensing in Geodynamics



Dr Natasha Stephen

Lecturer in in Advanced Analysis

Dr Paul Cole

Lecturer in Geohazards

Dr Mark Anderson

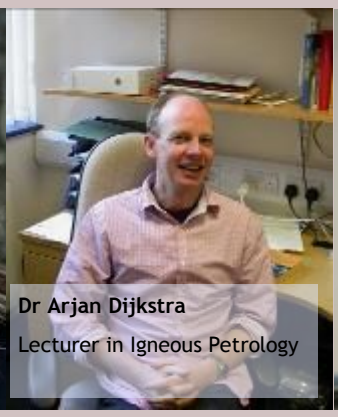
Senior Lecturer in Structural Geology, Head of School

Dr Silvia Danise

Research Fellow

Dr Marc Davies

Earth Sciences Technician



Dr Arjan Dijkstra

Lecturer in Igneous Petrology

Prof. Malcolm Hart

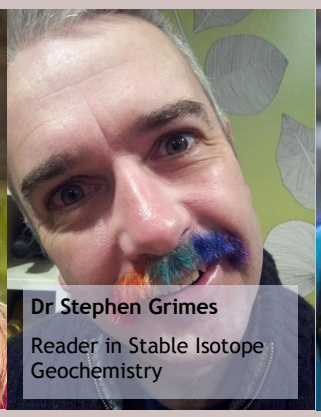
Emeritus Professor

Dr Jodie Fisher

Earth Sciences Technician

Dr Michelle Harris L

Lecturer in Earth Sciences



Dr Stephen Grimes

Reader in Stable Isotope Geochemistry

Rob Hall

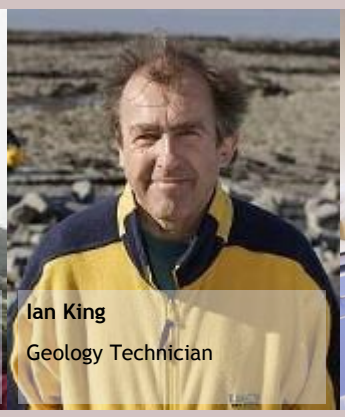
Earth Sciences Technician

Dr Meriel Fitzpatrick

Lecturer in Earth Sciences

Earth Sciences Staff

Dr Debbie Wall-Palmer
Leverhulme PDRA

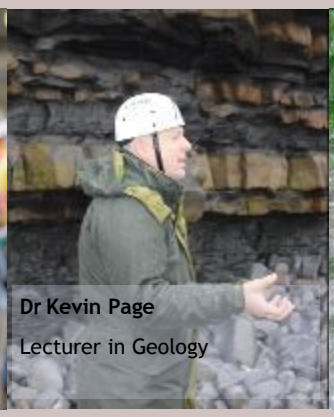


Ian King
Geology Technician

Prof. Gregory Price
Professor of Earth Sciences

Dr Andrew Merritt
Lecturer in Engineering

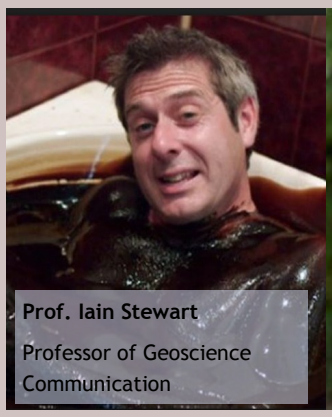
Prof. Tony Morris
Associate Head of School



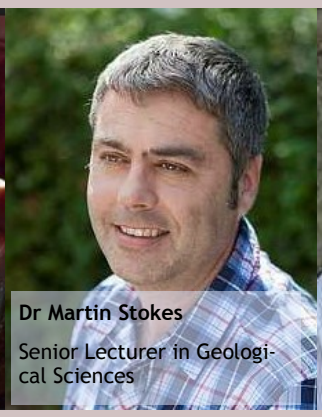
Dr Kevin Page
Lecturer in Geology

Dr Helen Hughes
Scientific Research Officer

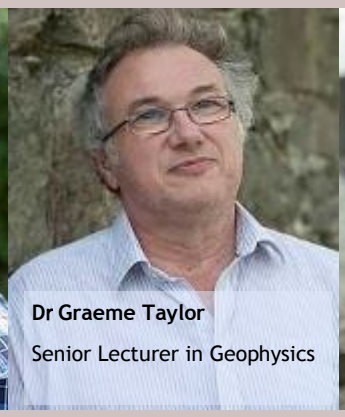
Dr Chris Smart
Reader in Palaeontology



Prof. Iain Stewart
Professor of Geoscience Communication

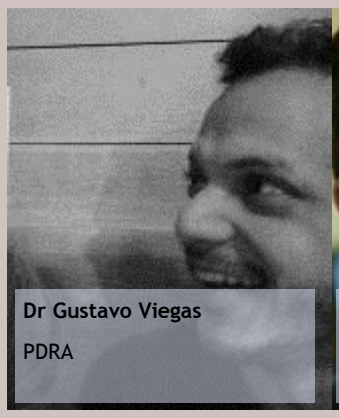


Dr Martin Stokes
Senior Lecturer in Geological Sciences

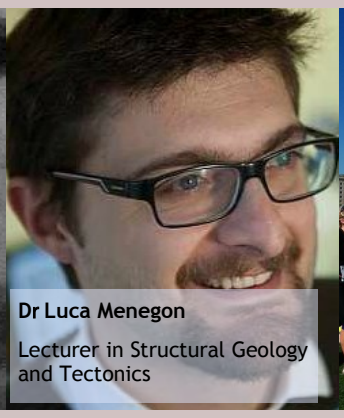


Dr Graeme Taylor
Senior Lecturer in Geophysics

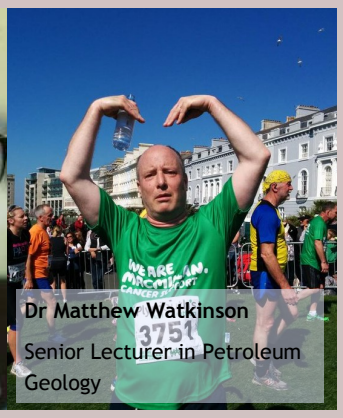
Dr Anita Di Chiara
Research Fellow



Dr Gustavo Viegas
PDRA



Dr Luca Menegon
Lecturer in Structural Geology and Tectonics



Dr Matthew Watkinson
Senior Lecturer in Petroleum Geology

Current PhD students
Saleh Alenezi
Giulia Alessandrini
Mohammed Chaanda
Alex Dawson
Israel Etobro
Hazel Gibson
Johanna Ickert
Emiko Kent
Lara Mani
Christian Marien
Amadu Tukur
Madeleine Vickers
Camille Dusseaux
Louise Koornneef
Grant Cole

Earth Sciences News

NERC Funding

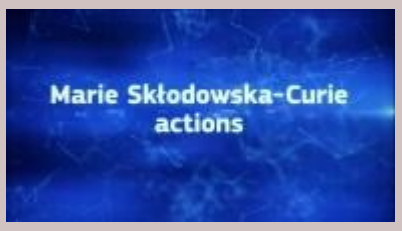
Michelle Harris was awarded £34243 by NERC for her project: Characterising hydrothermal alteration across the Atlantis Massif: IODP Expedition 357

Luca Menegon was successfully awarded £15,000 by NERC for his project:

Ion Microprobe Facility: Investigating the relationship between lower crust shear localization and water content.

Paul Cole was awarded £7040 to use the NERC Radiocarbon Facility in East Kilbride for his project: Eruption frequency at Soufriere St Vincent, West Indies.

Marie Sklodowska-Curie Fellowship



Anita di Chiara was awarded a Marie Sklodowska-Curie Fellowship to work with Professor Tony Morris and Dr Mark Anderson for her project: Palaeozoic Seafloor Spreading.

Uwe Balthasar was awarded a Research Bursary for an Undergraduate Project by the Palaeontological Association for a project on: Shell thickness distribution in Ordovician and Silurian rhynchonelliformean brachiopods.

The winner of the CRES geology photo competition was Sarah Boulton for her photo of Dartmoor at Dusk (winning photo below). Sarah was also appointed President of the South-West Regional Group of the Geology Society of London.

British Science Association Award

This autumn we have a visiting researcher, Dr Ernesto Brunetto, with us until then end of November. Ernesto is an earth scientist and holds a research position with CONICET (Argentinian government science organisation: www.cicyttp.org.ar). He is also affiliated with Santa Fe University (www.unl.edu.ar) where he undertakes some undergraduate teaching. Ernesto will be undertaking some collaborative research with Dr Martin Stokes, Dr Sarah Boulton and some of the geography staff on Quaternary fluvial landscape development in the La Plateau region, an intra cratonic area of exhumed Cretaceous basalt.

British Science Association Award

Congratulations to PhD student Hazel Gibson on being awarded the Charles Lyell Award by the British Science Association (BSA). This prestigious national award is in recognition of her work to proactively generate interest in geology and the sciences as part of her PhD research on the public perception of geology.

Amongst this year's recipients of the BSRG Gill Harwood Memorial Fund was Madeleine Vickers to support her research on "Early Cretaceous high latitude climate". Specifically the award will help towards fieldwork costs in Spitzbergen and in particular evaluate the palaeoenvironmental and palaeoclimatic character of the sediments and improve age constraints.

Madeleine has had further grant sucess as she has been selected as a grant recipient for the 2015 American Association of Petroleum Geologists Foundation Grants-in-Aid Program. Congratulations to Madeleine!

Michelle Harris joined the School of Geography, Earth and Environmental Sciences as a Lecturer in Earth Sciences in August 2015. Her research interest is hydrothermal circulation in the ocean crust, a topic she has been interested in since taking marine geology courses as an undergraduate during her year abroad at the University of California Santa Barbara. After completing her Masters in Geological Sciences from the University of Leeds she moved to the University of Southampton where she undertook her PhD and a post doc.

Hydrothermal Circulation within Oceanic Crust

Her PhD research focussed on constraining the role of hydrothermal circulation during the accretion of the ocean crust using samples from the only continuous borehole through the upper ocean crust (ODP Hole 1256D) and a tectonic window at Hess Deep in the eastern Pacific. This research had two approaches, the first used a combination of petrography and isotopes to trace the pathways of hydrothermal fluids and quantify the magnitude of the hydrothermal fluid flux. The second used the partitioning of trace elements between mineral pairs to determine the cooling rates of samples from the sheeted dykes and lower crustal gabbros.

Her post-doctoral research moved onto the ridge flanks to study the formation of calcium carbonate veins during low temperature hydrothermal circulation and their influence on the global carbon budget. Using novel laser ablation geochronology, she has been able to constrain the timing of carbonate formation from samples hosted in ocean crust up to 170 million years old.

Michelle has participated in multiple IODP and other research cruises. She is currently a member of the IODP Expedition 357 Atlantis Massif Serpentinisation and Life science party and recently returned from Bremen where she was part of the core logging team. Her research is expanding from samples recovered from modern ocean crust to ancient ocean crust emplaced on land, and she will be part of the science team for the upcoming ICDP drilling of the Oman ophiolite.

From the Granite City to the Ocean City

An introduction to PhD Candidate Grant Cole

At the beginning of 2016 Grant returned to Plymouth University to start his new chapter as a PhD student. He is originally from Plymouth and after three seasons as a semi-professional snooker player (2007-2010), he decided to undertake a BSc (Hons) in Physical Geography and Geology at Plymouth University (September, 2010).

After graduating top of his class from Plymouth University he moved to Aberdeen (Sept 2013) to undertake an MSc in Integrated Petroleum Geoscience at Aberdeen University, in which he secured a scholarship from Apache North Sea Ltd, operator of the famous Forties field, Central North Sea. As part of the MSc dissertation and scholarship fulfilment he undertook a three month project (May – September, 2014) with Apache North Sea ltd looking at near field (Beryl, Northern North Sea) exploration targets in the Palaeocene Maureen and Lista Formations. He identified drillable targets which were then incorporated into

Due to the collapse in oil price, 2014 was a tough time for new graduates as companies began to stop hiring new talent and reduce their expenditure by any means possible. However, Grant successfully secured a position as a Support Geoscientist, mainly as a Petrophysicist, at LR Senergy (January - December, 2015). This role involved providing theoretical, workflow and application support to clients that used LR Senergy's Interactive Petrophysics software. He spent a year at the company before then moving back to Plymouth to undertake his PhD.

His PhD research focuses on understanding how extensional and 'potential' salt tectonics (combined) controlled facies distribution in the Early Cretaceous strata of the Maestrat Basin, Spain. The first half of the PhD research will involve remote sensing and field based data from Aliaga (Aragon region), Spain, whilst the second half will focus on comparing the field based study to analogues from 3D seismic and well data sets. The outcome will be a series of models on how combined salt and extensional tectonics can be constrained and how they control facies distribution, and therefore petroleum reservoir heterogeneity, at the scale of oil fields for a range of marine and continental marine facies. These models can then be used by the oil and gas industry to help constrain their structural and reservoir models at the exploration or production phases.

Camille Dusséaux is a new PhD student in Structural Geology at the School of Geography, Earth and Environment. She joined the team in January 2016 and works on the topography reconstruction of the Variscan belt using stable isotopes.

She got her Bachelor's degree at the University of Lille (France) in 2013 where she focused on seismic interpretation, gravimetry and stratigraphic forward modelling of basins offshore Peru and Ecuador. She then followed a course about earthquake engineering and seismology in Iceland.

She moved to the University of Montpellier (France) for her Master's degree where she studied reservoirs and exploration Geology. Her field area was in the Limpopo Belt (South Africa) where, using a combination of structural and geophysical techniques, she tried to understand the relationship between melting and deformation of Archean migmatites.

Lezennes underground chalk quarries, North of France

Gneiss to meet you...

Starting her PhD project at the University of Plymouth under the supervision of Dr. Aude Gébelin, she moves forward in time by studying much more recent rocks in the Variscan Belt of Western Europe– only 300 million years-old! As seen on the map below, this belt is the result of Laurentia and Gondwana collision that led to the formation of the supercontinent Pangea. Look at the location of Plymouth 300 million years ago!

3.3 Ga gneiss in Mannamead, South Africa

Map of the Variscan belt 300 Ma years ago showing the location of Plymouth (after Blakey)

The main question that she is trying to answer is: Was there a Mount Everest around Plymouth 300 Ma ago?

The method that she is using is based on a technique that recovers the isotopic composition of ancient meteoric water that scales with elevation. Therefore, her task is to find ancient rainfall trapped in quartz veins and shear zones that she will study using stable isotope geochemistry in fluid inclusions and silicates.

Her plan is to go first to Brittany (March 2016) to study the South Armorican Shear Zone, and then to the French Massif Central and Spain to look at detachments zones that develop during the demise of the Variscan orogenic plateau.

Alberto Benvenuto!

Hi everybody!

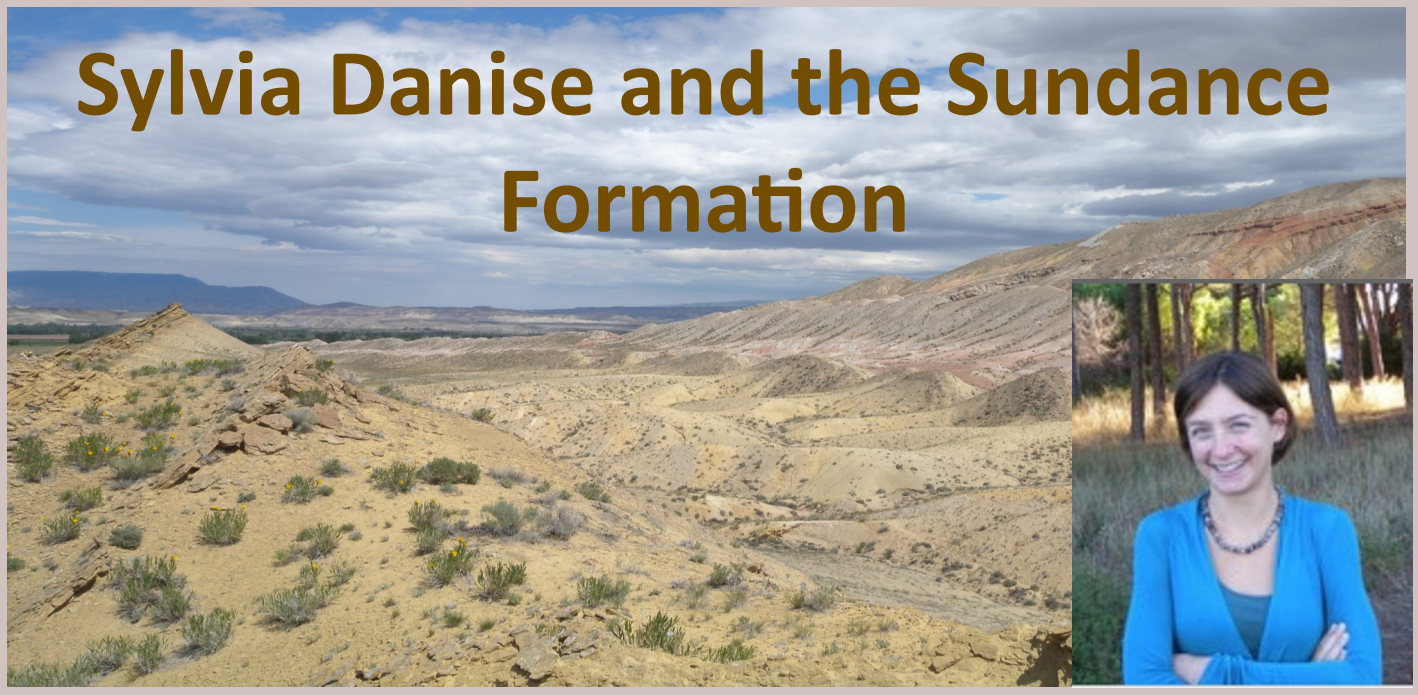
I'm Alberto, here at Plymouth University as Visiting PhD student for the next 6 months! I live and work in Padua (Italy), where my University is based, but I actually come from Cavaso del Tomba, a small lovely village at the foot of the Alps. My love for geology, mountain life and nature arose there.

In my PhD project, I deal with ductile and brittle deformation processes of the middle-upper crust, from the micro- to the regional scale, pretending to be a structural geologist. In particular, my studies focus on the structural evolution of Periadriatic plutons, those set of igneous bodies that characterize the inner part of the Alpine orogen, such as the Adamello, Bergell and Rieserferner plutons. In these igneous bodies, awesome ductile and brittle faults are preserved in their incipient stages of evolution and are perfectly exposed on recently de-glaciated outcrops.

By means of petrography and SEM-based microstructural analyses (Cathodoluminescence and Electron BackScattered Diffraction), I'm trying to understand the deformation and metamorphic processes that control the nucleation and first stages of evolution of these ductile structures. In addition, kinematic and mesostructural interpretation carried on the field, help me to understand the complex tectonic framework and stress field acting during the emplacement, cooling end exhumation of the plutonic body.

Here in Plymouth, I'm going to develop with Dr. Luca Menegon most of the EBSD microstructural analyses.

Sylvia Danise and the Sundance Formation



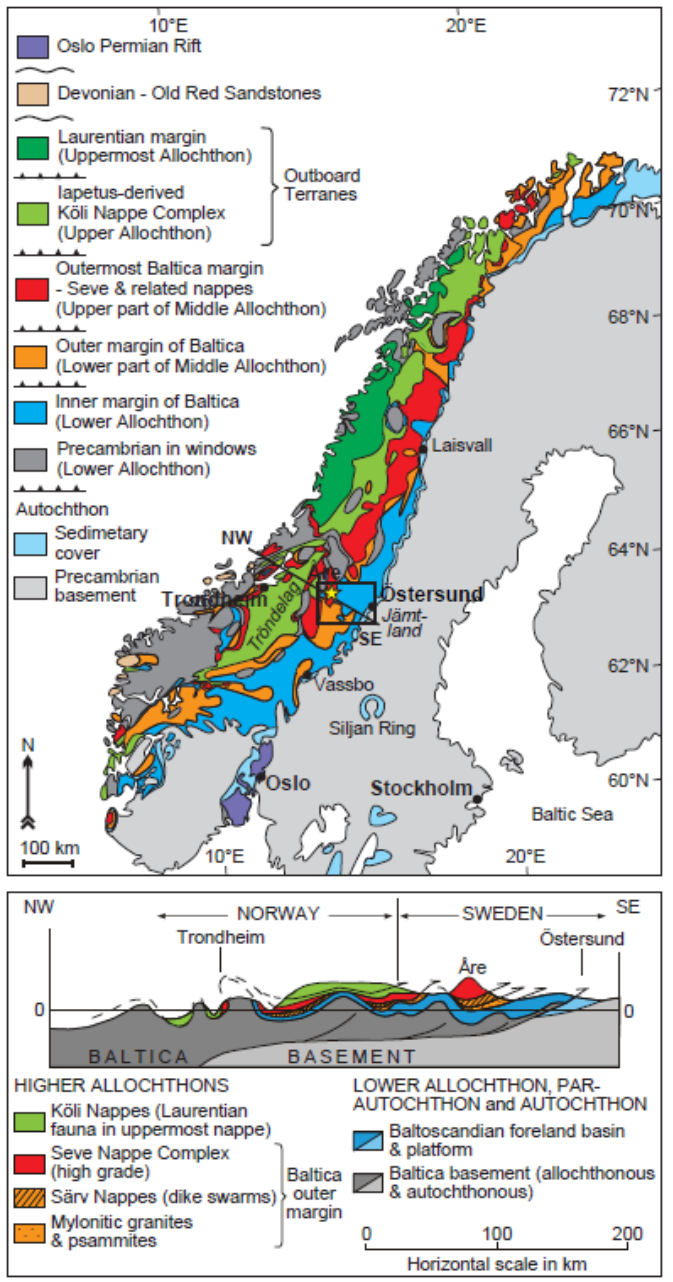
Silva Danise is spending two years as Postdoctoral Researcher at the University of Georgia, USA, to work on the project MAREST (MARine Ecosystem Stability and Turnover). The project has been awarded to Plymouth University in 2014 as a Marie Curie International Outgoing Fellowships for Career Development Grant.

At the University of Georgia Silvia is part of the UGA Stratigraphy Lab, lead by Prof Steven Holland. Research in the Stratigraphy Lab focuses on the integration of sequence stratigraphy and palaeobiology to understand the long-term response of marine biotas to past sea level and environmental changes. Project MAREST, in particular, focuses on the Middle-Upper Jurassic marine succession of the Western Interior Seaway, a narrow and elongated seaway that was colonised multiple times by marine fauna because of cyclic sea level changes over 12 million years.

In summer 2015 Silvia spent twelve weeks in the field between Wyoming and South Dakota. Fieldwork has been very successful. She collected abundance data on fossil macro-invertebrates, integrating them in a sedimentologic and sequence stratigraphic framework. She is now planning the second fieldwork for summer 2016 that will extend the study area to Montana. In 2017 Silvia will move back to Plymouth University where, in collaboration with Prof Gregory Price, she will integrate the collected palaeoecological data with geochemical analysis to reconstruct the environmental gradients across the Seaway.

Caledonides: The Palaeozoic Himalayas

By Luca Menegon



Tectonostratigraphic map of the Scandinavian Caledonides. The star marks the location of the COSC-1 borehole. From Henning et al. 2015.

The COSC project is funded by the International Continental Scientific Drilling Program (ICDP) and focusses on mountain building processes in a major mid-Palaeozoic orogeny in western Scandinavia and its comparison with modern analogues like the Himalaya. The first part of the project (COSC-1) started in 2014, and a 2.5 km deep fully cored drillhole was successfully completed in October 2014. COSC-1 sampled a thick section of a mid-to-lower crustal continental unit originally located at the continent-ocean transition and subsequently involved in continental collision during mountain building processes in the Palaeozoic.

The second part of the project (COSC-2) aims to drill through the basal Caledonian decollement (the basal decollement is the major fault of a mountain belt) and into the basement of the Fennoscandian Shield in Sweden. One of the main aims of COSC-2 will be to investigate the mechanical behaviour of frontal thrusts of the Caledonian system, which are structurally equivalent to the faults that ruptured during the 2015 Ghorka earthquake in the Himalaya. Thus, this ambitious continental drilling project aims to provide fundamental insights to the earthquake distribution and related hazard, as well as to a major geodynamic process like continental collision.

Dr Mark Anderson and Dr Luca Menegon from Plymouth University are members of the COSC Science Team and among the proponents of the COSC-2 project, which is currently under review. Mark and Luca have attended the COSC-2 workshop in Uppsala (Sweden) in October 2015, when the project was designed in collaboration with scientists form Sweden, Germany, USA, Norway, Switzerland, and the UK. Mark and Luca hope to bring to Plymouth some unique pieces of deep and inaccessible portions of a mountain belt soon!

“...only 35 % of Geology undergraduate places being filled by females...”

This July 4th will mark the 3rd Annual Girls into Geoscience event. This exciting one day workshop introduces female A-level students to the Earth Sciences and demonstrates the world of careers open to Earth science graduates today. This workshop was developed as, unfortunately, female participation in the Earth Sciences is still well below that of the guys, with only ~ 35 % of Geology undergraduate places being filled by females.

Yet, the Earth Sciences represent a diverse and exciting range of professional jobs that as we know anyone can do! Therefore, we hope that this event will educate students that have not had the opportunity to do geology at school, or still are not quite sure what careers are available in the future – generally, we hope to inspire the next generation of female geologists!

Girls into Geoscience

This year we will see exciting talks from the marine geoscience sector (Claire Jennings from Aquageo) and the mining industry (Dr Kathryn Hadler, formerly of Grinding Solutions) as well as from our very own Dr Michelle Harris, on hydrothermal circulation and ocean drilling. In the afternoon follows a choice of workshops themed to relevant A-Level topics and giving an insight into undergraduate practical classes.

This year we are also running a one day field trip to investigate the wonderful geology of the Dartmoor Granite, and see rocks in their natural habitat!

For more information about Athena Swan at Plymouth University:
https://www.plymouth.ac.uk/your-university/about-us/university-structure/service-areas/equality-diversity-and-inclusion/athena-swan

Research Publication Highlights for 2015

Arculus, R.J., Ishizuka, O., Bogus, K., and the Expedition 351 Scientists (inc. Morris, A.), 2015. Proceedings of the International Ocean Discovery Program, Expedition 351: Izu-Bonin-Mariana Arc Origins: College Station, TX (International Ocean Discovery Program). doi: 10.14379/ iodp.proc.351.2015.

Arculus, R. J., Ishizuka, O., Bogus, K., Gurnis, M. C., Hickey-Vargas, R., Aljahdali, M. H., Bandini-Maeder, A. N., Barth, A. P., Brandl, P. A., Drab, L., do Monte Guerra, R., Hamada, M., Jiang, F., Kanayama, K., Kender, S., Kusano, Y., Li, H., Loudin, L. C., Maffione, M., Marsaglia, K. M., McCarthy, A., Meffre, S., Morris, A. et al. 2015. A record of spontaneous subduction initiation in the Izu-Bonin-Mariana arc. Nature Geoscience, 8, 728-733.

Balthasar, U. & Cusack, M., 2015, Aragonite-calcite seas—Quantifying the gray area. Geology, v. 43(2): 99-102.

Boon, D.P., Chambers, J.E., Hobbs, P.R.N., Kirkham, M., Merritt, A.J., Dashwood, C., Pennington, C., Wilby, P.R., (2015) A combined geomorphological and geophysical approach to characterising relict landslide hazard on the Jurassic Escarpments of Great Britain, Geomorphology, http://dx.doi.org/10.1016/j.geomorph.2015.07.005

Cassidy, M., Cole P.D, Hicks K., Varley N., et al (2015) Rapid and slow: varying magma ascent rates as a mechanism for Vulcanian explosions. Earth and Planetary Science Letters 420. 73-84

Cassidy, M., Watt, S.F.L., Talling, P. J., Palmer, M.R., Edmonds, M., Jutzeler, M., Wall-Palmer, D., Manga, M., Coussens, M., Gernon, T., Taylor, R.N., Michalik, A., Inglis, E., Breitkreuz, C., Le Friant, A., Ishizuka, O., Boudon, G., McCanta, M.C., Adachi, T., Hornbach, M.J., Colas, S.L., Endo, D., Fujinawa, A., Kataoka, K.S., Maeno, F., Tamura, Y. and Wang, F. 2015. Rapid onset of mafic magmatism facilitated by volcanic edifice collapse. Geophysical Research Letters, 42, doi:10.1002/2015GL064519.

Christopher T., Blundy, J., Cashman, K., Cole, P., Edmonds, M., Smith, P.J., Sparks, R.S.J., Stinton, A.,2015 Crustal-scale degassing due to magma system destabilization and magma-gas decoupling at Soufrie`re Hills Volcano, Montserrat. Geophys. Geochem. Geosyst., 16, 2797 -2811.

Cole, P. D., Stinton, A.J., Odbert, H. M., Bonadonna,C., and Stewart, R.C., 2015. An inclined Vulcanian explosion and associated products. Journal of the Geological Society, 172, 287-293.

Consolaro, C. Rasmussen, T. L. Panieri, G. Mienert, J.Bünz, S. and Sztybor, K. 2015. Carbon isotope ($\delta^{13}C$) excursions suggest times of major methane release during the last 14 kyr in Fram Strait, the deep-water gateway to the Arctic, Climate of the Past, 11, 669-685.

Expedition 351 Scientists (inc. A. Morris), 2015. Izu-Bonin-Mariana arc origins: continental crust formation at an intra-oceanic arc: foundation, inception, and early evolution. International Ocean Discovery Program Preliminary Report, 351. doi: 10.14379/ iodp.pr.351.2015.

Foster, W.J., Danise, S., Sedlacek, A., Price, G.D., Hips, K., Twitchett R.J., 2015. Environmental controls on the post-Permian recovery of benthic, tropical marine ecosystems in western Palaeotethys (Aggtelek Karst, Hungary). Palaeogeography, Palaeoclimatology, Palaeoecology 440, 374-394.

Gasser, D., Jeřábek, P., Faber, C., Stünitz, H., Menegon, L., Corfu, F., ... & Whitehouse, M. J. (2015). Behaviour of geochronometers and timing of metamorphic reactions during deformation at lower crustal conditions: Phase equilibrium modelling and U-Pb dating of zircon, monazite, rutile and titanite from the Kalak Nappe Complex, northern Norway. Journal of Metamorphic Geology.

Gébelin, A., Teyssier, C., Heizler, M., Mulch, A. (2015). Meteoric water circulation in a rolling-hinge detachment system (northern Snake Range core complex, Nevada), Geological Society of America Bulletin, 127, 149-161, doi: 10.1130/B31063.1.

Hart, M. B., Clarke, M. R., De Jonghe, A., Price, G. D., Page, K. N. and Smart, C. W., 2015. Statoliths from the Jurassic succession of south-west England, United Kingdom. Swiss Journal of Palaeontology, 134, 199-205, DOI: 10.1007/s13358-015-0080-3.

Hall-Spencer, J. M., Pettit, L. R., Newcomb, L. A., Carrington, E., Smart, C. W., Hart, M. B. and Milazzo, M. 2015. It will take more than seaweed to deal with ocean acidification. European Journal of Phycology, 50, 198.

Hornbach, M.J., Manga, M., Genecov, M., Valdez, R., Miller, P., Saffer, D., Adelstein, E. and Expedition 340 scientists. 2015. Permeability and pressure measurements in Lesser Antilles submarine slides: Evidence for pressure-driven slow-slip failure. Journal of Geophysical Research, doi: 10.1002/2015JB012061

Jerrett, R.M., Price, G.D., Grimes, S.T. and Dawson A.T. 2015. A paleoclimatic and paleoatmospheric record from peatlands accumulating during the Cretaceous-Paleogene boundary event, Western Interior Basin, Canada. GSA Bulletin, doi:10.1130/B31166.1

Maffione, M., Thieulot, C., van Hinsbergen, D. J. J., Morris, A., Oliver Plümper, O. and Spakman, W., 2015. Dynamics of intra-oceanic subduction initiation, part 1: Oceanic detachment fault inversion and the formation of forearc ophiolites. Geochemistry, Geophysics, Geosystems, 16, doi: 10.1002/2015GC005746.

Methner, K., Mulch, A., Teyssier, C., Wells, M., Gottardi, R., Gébelin, A., Chamberlain, P. (2015). Eocene and Miocene extension, meteoric fluid infiltration and core complex 1 formation in the Great Basin (Raft River Mountains, Utah), Tectonics, 34, 1-14, doi: 10.1002/2014TC003766.

Menegon, L., Fusseis, F., Stünitz, H., & Xiao, X. (2015). Creep cavitation bands control porosity and fluid flow in lower crustal shear zones. Geology, 43(3), 227-230.

Merritt., A.J., Chambers, J.E., Murphy, W., Wilkinson, P.B., West, L.J. & Uhlemann, S., (2015), Measurement and modelling of soil moisture – electrical resistivity relationship for the calibration of time-lapse electrical resistivity tomograms (ERT), J. App. Geophysics. http:// dx.doi:10.1016/j.jappgeo.2015.11.005

Morris, A., Robertson, A.H.F., Anderson, M.W. and Hodgson, E., 2015. Did the Kyrenia Range of northern Cyprus rotate with the Troodos microplate during the tectonic evolution of the eastern Mediterranean? International Journal of Earth Sciences, doi: 10.1007/s00531-015-1208-9.

Pettit, L. R., Smart, C. W., Hart, M. B., Milazzo, M. and Hall-Spencer, J. M., 2015. Seaweed fails to prevent ocean acidification impact on foraminifera along a shallow-water CO2 gradient. Ecology and Evolution, doi: 10.1002/ece3.1475.

Price G.D., Hart, M.B. Wilby, P.R., Page, K.P., 2015. Isotopic analysis of Jurassic (Callovian) mollusks from the Christian Malford Lagerstätte (UK): Implications for ocean water temperature estimates based on Belemnoids. Palaios, 30, 645-654.

Robertson, A, H. F., Boulton, S. J, Taslı, K., İnan, N., Yildirim, N., Parlak, O., 2015. Late Cretaceous-Miocene sedimentary development of the Arabian continental margin in SE Turkey (Adıyaman region): Implications for regional palaeogeography and the closure history of Southern Neotethys. Journal of Asian Earth Sciences.doi:10.1016/ j.jseaes.2015.01.025

Trela, J., Ferré, E. C., Launeau, P., Bartz, D. M. and Morris, A., 2015. Magmatic accretion and thermal convection at the sheeted dike-gabbro boundary in superfast crust, ODP Hole 1256D. Tectonophysics, doi: 10.1016/j.tecto.2015.08.023

Tukur, A., Samaila, N.K., Grimes, S.T. Kariya, I.I. and Chaanda M.S. 2015. Two member subdivision of the Bima Sandstone, Upper Benue Trough, Nigeria: Based on sedimentological data. Journal of African Earth Sciences 104, 140–158.

Uhlemann, S., Wilkinson, P.B., Chambers, J.C., Maurer, H., Merritt, A.J., Gunn, D.A., Meldrum, P.I., (2015) Interpolation of landslide movements to improve the accuracy of 4D geoelectrical monitoring, Journal of Applied Geophysics, Volume 121, Pages 93-105, ISSN 0926-9851, http://dx.doi.org/10.1016/j.jappgeo.2015.07.003

Uhlemann, S., Smith, A., Chambers, J., Dixon, N., Dijkstra, T., Haslam, E., Meldrum, P., Merritt, A., Gunn, D., Mackay, J. (2015). Assessment of ground-based monitoring techniques applied to landslide investigations. Geomorphology, http://dx.doi:10.1016/ j.geomorph.2015.10.027

Wall-Palmer, D., Smart, C.W., and Hart, M.B., 2015. Data report: the Late Quaternary fossil record of holoplanktonic gastropods at IODP Sites U1395 and U1394. In: Le Friant, A., Ishizuka, O., Stroncik, N.A., and the Expedition 340 Scientists, Proceedings of the Integrated Ocean Drilling Program, doi:10.2204/iodp.proc.340.203.2015.

Wall-Palmer, D., Smart, C.W. and Hart, M.B. 2015.The fossil record of holoplanktic gastropods at IODP Sites U1395 and U1394. Proceedings of the Integrated Ocean Drilling Program, 340: doi:10.2204/ iodp.proc.340.203.2015.

Watt, S.F.L., Jutzeler, M., Talling, P.J., Carey, S.N., Sparks, R.S.J., Tucker, M., Stinton, A.J., Fisher, J.K., Wall-Palmer, D., Hühnerbach, V. and Moreton, S.G. 2015. New insights into landslide processes around volcanic islands from Remotely Operated Vehicle (ROV) observations offshore Montserrat. Geochemistry, Geophysics, Geosystems. doi: 10.1002/2015GC005781

http://www.plymouth.ac.uk/research/cres