Welcome to the 10th 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 busy year of research and student successes 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 Sarah Bishop (sarah.bishop@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. As ever, we'll be tweeting about up-coming events, new projects, fieldwork and research.

In this issue

- Grant successes
- News in brief
- Girls into Geoscience
- Graduation 2016
- Publication highlights

New NERC Funding

Luca Menegon (principal investigator & Iain Stewart co-investigator) has been awarded a grant of £451,340 by the Natural Environment Research Council to develop greater understanding about the behaviour of the lower crust. Luca said:

“Earthquakes in the continental interiors are often devastating and, over the past century, have killed significantly more people than earthquakes occurring at plate boundaries. However those emanating in the lower crust are difficult to study directly, given that the deepest portions of the crust are very rarely exposed at the Earth’s surface and inaccessible for drilling projects, and as a result we have a very poor understanding of them. By combining geological and satellite observations with laboratory work and imaging, we hope to go some way to changing that.”

Front Cover The classic view of Etna from the 3rd century Greco-Roman amphitheatre in Taormina, looking south. The field trip visits the summit area (at centre), the rim of the Valle del Bove (just above the snowline on the left) and the Monte Nero area (the crater on the right just above the snowline).
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Dr Silvia Danise
Research Fellow

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Lecturer in Igneous Petrology

Dr Mark Anderson
Senior Lecturer in Structural Geology, Head of School

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Reader in Stable Isotope Geochemistry

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Earth Sciences Staff

Current PhD students

Giulia Degli Alessandrini
Grant Cole
Camille Dusseaux
Kilian Eichenseer
Israel Etobro
Johanna Ickert
Louise Koornneef
Lara Mani
Christian Marien
Francesca Prando
Wycliff Tupiti
Madeleine Vickers
Earth Sciences News

New NERC Funding

New funding to Arjan Dijkstra, Colin Wilkins, Christian Marien) from the NERC Isotope Geosciences Facilities Steering Committee of £29,500 (in kind) for a project entitled ‘From mantle to ore: Constraining the geological processes that build a major REE-deposit.

Visitor from Beijing Normal University

From October 2016 to January 2017 Earth Sciences hosted Miss Xiaohong Zhao as a visiting PhD student working with Dr Martin Stokes. Xiaohong is undertaking her PhD at Beijing Normal University and she is looking at evidence for Holocene Palaeoflood associated with the Yongding River, the major river system that flows through Beijing. Xiaohong has discovered field sedimentary and geomorphological evidence for large palaeofloods that occurred at 8.5ka, 3ka and <1ka. The flood deposits were dated using optically stimulated luminescence techniques on quartz grains. Xiaohong undertook some palaeoflooding field training up on Dartmoor and presented some aspects of her PhD at the November 2016 CRES conference. She also managed a tour of the UK with the Plymouth Chinese Society, visiting Birmingham, Leeds, Edinburgh and York over the New Year period. Martin Stokes is hoping to visit her in China later in 2017 to look at older palaeoflood records associated with Pleistocene river terrace sediments and landforms.

Public Engagement Prize

In February Iain Stewart, Professor of Geoscience Communication and Director of the Sustainable Earth Institute at Plymouth University, was presented with the Senior Public Engagement Prize by the Royal Society of Edinburgh (RSE). The award is in recognition of his exceptional, wide-ranging public engagement through the medium of broadcasting and his work with school pupils and teachers.

Raising Horizons

Dr Natasha Stephen, Lecturer in Advanced Analysis (Earth and Planetary Sciences), was among 14 women who took part in the Raising Horizons initiative. Coordinated by the TrowelBlazers group, in partnership with photographer Leonora Saunders, a multimedia exhibition endeavoured to reveal the real face of geosciences past and present, sharing its hidden heritage and promoting the power of networks for advancing women in science.

Contemporary women were photographed in the period clothing of a matched historical figure, featuring personal interviews which will act as the basis for a new oral history archive.

Congratulations to Madeleine Vick- ers who was awarded the Outstanding Student Poster and PICO Award at the EGU General Assembly for 2016. Her poster was entitled ‘Stratigraphy and palaeoclimate of Spitsbergen, Svalbard, during the Early Cretaceous’.

At the 2016 British Sedimentological Research conference it was good to see Plymouth graduates doing really well in research careers. Hannah Brookes (PGG 2013) is currently finishing off a PhD on Early Mesozoic submarine fan sediments from the Karoo at Leeds University, whilst Amanda Owen (PGG2010) is finishing off a post doc at Aberdeen University and is about to start her first lectureship at Glasgow University later this year. Amanda was also awarded the 2016 Roland Goldring Award for early career sedimentological research.
Volcano Watch!
By Colin Wilkins

Final year geoscience students from Plymouth have now travelled for the 10th year to analyse volcanic activity on Mt. Etna in Sicily – Europe’s largest and most active volcano

Mt. Etna from inception around 600,000 years ago to its present configuration as a large basaltic stratovolcano reaches an altitude of 3340m. Over the years the excursion has developed from a more regional overview of the geology of eastern Sicily to what is now a field-based introduction to volcanology. More recently we have included a ferry trip and overnight stay on the island of Vulcano, part of the Aeolian Island group of volcanoes just off the NE coast of Sicily in the Tyrrhenian Sea. Here we can examine lavas and pyroclastic deposits that are more typical of subduction-related volcanism (note that the Aeolian Island volcanoes are the product of NW-directed subduction of the Ionian Plate beneath Sicily and Calabria).

The excursion has ten full field days and gives the participants the opportunity to explore the four phases of eruptive activity in the Etna region: the Basal Tholeiites (580-260 ka) including magnificent pillow lavas, the Timpe Phase fissure eruptions from 220 ka, the Valle del Bove Centres – the first group of large volcanic edifices from 90 ka, and the Stratovolcano Phase (from 40 ka to present) which produced at least 85% of the present volcano surface area through lava flows emitted from summit vents and parasitic cones spread over all the volcano’s flanks. At the same time students can develop their volcanological skills by mapping very young (some only 25 years old) lava flow features including aa, pahoehoe, slab-crusted flows, lava channels and tumuli to understand how lava flow fields develop on the flanks of active volcanoes – including exploring and mapping in previously active lava tubes that fed lava to a flow front.
Let’s not forget that volcanic eruptions and associated earthquakes pose a great threat to the local population in Sicily and further afield. We are able to study and assess these risks by visiting major active faults and rift zones on the volcano flanks, seeing for ourselves how lava flows have destroyed the tourist and skiing infrastructure at both Sapienza and Piano Provenzana in the period 2001-2003. The current dangers caused by active volcanism in the Mt Etna region are emphasised through recent annual visits to the Italian Geophysical and Volcanological Institute in Catania. Our hosts Drs Boris Behncke and Danieli Andronico provide an update on activity in the region through a visit to the volcano and earthquake monitoring control room that collates all real time data collected from a large network of surveillance equipment across Etna and the Aeolian Islands. The control room, staffed 24/7 by geoscientists, has a “red phone” to alert the Civil Defence Department when anything of significance happens that might endanger the population, e.g. when ash emissions require an interruption to aircraft flights.

Etna is certainly a restless volcano and each year there is a good chance that our group sees (from a distance!) some sort of volcanic activity ranging from vigorous fumarolic activity, ash emissions, or paroxysmal events that may last for a couple of days (lava fountaining and lava flows). Since we started running the trip we have seen the growth of a new pyroclastic cone (the New Southeast Crater) in Etna’s summit area. It did not exist before 2010 and has grown rapidly particularly between January 2011 and April 2012 with 25 episodes of lava fountaining, some of which we saw at night from the roof of our hotel and once during the day when we were exploring the NE-rift zone – exciting for sure, but we were a safe distance away. The finale of the trip is a chair lift ride from Sapienza and a walk to the summit area, usually through snow and ash – keeping an eye out for a prized perfectly shaped volcanic bomb.

If you would like to understand more about how volcanoes work – why not take an Earth Sciences course at Plymouth University and join the Sicily field trip. A number of our previous student participants became enthusiastic volcano watchers and have gone on to complete Masters and PhD level projects in volcanology.

Colin Wilkins has organised the Sicily field trip for 8 of the 10 years it has run and would like to thank Stuart Scott, Iain Stewart, Graeme Taylor and Paul Cole for their help throughout this period.
Schoolgirls from across the UK travelled to Plymouth University for 2 days of activities designed to inspire the next generation of Earth scientists. Girls into Geoscience has now been running for 3 years, giving A-level students an insight into the possibilities available to them in the Earth Sciences.

This year, 89 pupils from 26 schools took part in the event, which included a field trip to Dartmoor followed by a day of hands on workshops, seminars from inspiring female geoscientists, and the opportunity to tour the outstanding student and research facilities at the University. The event has attracted students nationally, with attendees from South West schools and from Essex, Hampshire, London, Wales and Yorkshire.

Dr Jodie Fisher, Technician in the School of Geography Earth and Environmental Sciences at Plymouth University, and part of the Girls into Geoscience Team, said:

“People often tend to think of geology as being a male dominated environment, but this doesn’t have to be the case. The idea behind Girls into Geoscience is to showcase the opportunities available to women in geosciences today, both at university and in industry, and to encourage young women to consider it as a career. It is a chance for them to meet women working in the field, to explore more about what doing an earth science degree entails, and to appreciate the full range of careers that a degree in geosciences can lead to.”

The event held in July is designed for Year 12 students just finishing their first year of A levels and starting to think about university options and applications. With an exciting programme, this year saw presentations from women in the geosciences industry, including Claire Jennings from Aquageo talking about Geophysics and seismic acquisition, and Kathryn Hadler, from Grinding Solutions and Imperial College, London, discussing Mineral Processing. Dr Michelle Harris, Lecturer in Earth Sciences at Plymouth University, talked on Hydrothermal circulation and ocean drilling. Talks were followed by workshops on geographic information systems, microfossils, reconstructing geological time and planetary geology, giving the girls the opportunity to get hands on with geological material, and a flavour of what it’s like to study geology at University.

Dr Sarah Boulton, Lecturer in Neotectonics and part of the Girls into Geoscience Team, added:

“Fieldwork is an essential part of any undergraduate earth science degrees and many careers, but can be daunting for students who have never had the opportunity to go on a field trip. This taster day aims to show that fieldwork is fun and accessible for all and with the added opportunity to stay in halls, the girls are able to get a real taster experience, not just of geology, but of university life.”
The Oman Drilling Project is a multi-phase project designed to recover drill core from the lower crust and mantle rocks from the Semail ophiolite in order to answer long-standing scientific questions about the formation of the ocean crust and the processes (ancient and modern) that modify these rocks.

This is an ambitious international project that features several researchers from Earth Sciences (Michelle Harris, Tony Morris and Louise Koornneef). The project includes two seasons of drilling operations (winter 2016/17 and winter 2017/18), with the cores transported to the D/V Chikyu for core characterization and analysis during the subsequent summers.

We are currently in phase 1 of the operations which includes drilling three boreholes at different levels within the lower crust, and Michelle was part of the first onsite team over Christmas and New Year that initiated the drilling operations. The first borehole was Hole GT2 located in Wadi Gidyeah near the town of Ibra, that targeted the foliated gabbros and the transition to the underlying layered gabbros.

After some initial delays, drilling began on Christmas Day and since then operations have been relatively smooth and coring has typically progressed at 23 – 33m per day! The diamond coring has resulted in near perfect core recovery, unlike the rotary coring used at sea, and this has revealed some spectacular features in the cores, with something to satisfy every discipline from magmatic foliations to intense hydrothermal alteration to highly deformed shear zones. Each core advance is 3m, and the record currently stands at 2.45 m for a single intact piece of core, with several examples just under 2m, as modelled by Michelle in the photo! Hole GT2 was successfully drilled to the target depth of 400m and operations are currently underway at Hole GT1 that is targeting a deeper section of layered gabbros that hosts a hydrothermal fault zone. Michelle, Tony and Louise will be onsite at various times throughout February and into March, follow their progress and the projects on Twitter @OmanDrillProj and via the project website http://oman.icdp-online.org
Many of our Earth Science students who graduated in September 2016 have gone on to do some great things. These include graduate geotechnical engineers, GIS and data technicians, consultant geologists, land surveyors, engineering geologists and mud loggers to name but a few. Companies who are employing our graduates are varied but include some well known international companies including Tarmac, UK Hydrographic Office, Kier Construction, GENECO, CGL, Wolf Minerals, Cyient, Geotechnical Engineering Limited and Schlumberger as well as a whole range of small to medium enterprise companies. Many graduates have gone on to MScs all over the UK primarily in engineering geology, geo-environmental, hydrocarbon exploration and mining. Some students are taking a well-deserved break, travelling the world and earning some money before taking up MSc and graduate employment positions. We caught up with some of our recent graduates to find out what they had been up to.

Josh Hyde (BSc Physical Geography and Geology) currently works as a Geotechnical Engineer for the Kier Group.

“I work within a design consultant team of the Highways department who maintain road assets, with a primary focus on earthworks, retaining structures and bridge foundations. Some of my key roles and responsibilities include planning and undertaking site inspections and ground investigations, asset condition data collection and analysis, as well as preparation of technical designs, calculations, drawings, reports, tender documents, specifications, risk assessments and other CDM documentation. Current projects that I am working on include motorway upgrades and improvements along the M5 and M50, and will also be involved with projects related to HS2 construction. I have started to work towards chartered geologist status, and am also considering completing a part time MSc whilst still working for Kier.”

Barney Gliksten (BSc Applied Geology) is currently undertaking the MSc Mining Geology at Camborne School of Mines (University of Exeter)

"I chose the Mining Geology MSc at The Camborne School of Mines to broaden my knowledge into the mining industry and ultimately seek employment into the minerals and mining industry. The University of Plymouth gave me a decent understanding of the basics of mining geology. The course at CSM is fantastic with great fieldwork opportunities and I will be heading to Australia to undertake some fieldwork at the end of March. The mining facilities at CSM are world class with access to the test mine to undertake both geological and geotechnical mapping along with fantastic labs for petrology focussing on economic minerals. The course gives a great understanding into all aspects of the industry including mine engineering, mineral processing, economics, resource estimation and analytical techniques also including some exploration techniques. In the summer I hope to undertake my placement/dissertation in USA working on a large copper-gold project."

Carrie Potter – (BSc Geology with Ocean Science) since graduating has gone on to work as a Hydrographic Data Technician for the United Kingdom Hydrographic Office

“Since June, I have been working full-time at the Hydrographic Office creating electronic navigational charts for mariners across the world. I applied as part of an internship with the company, but after six months I gained a permanent contract to work there. The course at Plymouth was the only one that had combined Geology and Ocean Science modules, which was the main route I wanted to go down. The course also opened up a lot of options for me after graduation, with multiple career paths and options for postgraduate study, which was good for me as I didn’t know for certain what I planned to do after university”


Danise, Silvia, Bertolasso, Luca; Dominici, Stefano, 2016. Bathymodioline mussel dominated Miocene whale fall from Italy, Bollettino Della Societa Paleontologica Italiana, 55, 47-53.


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