

**Papers, books & book chapters***Published*

**Birkel, C., Tetzlaff, D. & Soulsby, C.** 2014. *Integrating parsimonious models of hydrological connectivity and soil biogeochemistry to simulate stream DOC dynamics*. Journal of Geophysical Research – Biogeosciences.

<http://dx.doi.org/10.1002/2013JG02551>

**Brasier, A.T.,** Morris, J.L. & Hilier, R.D. 2014. *Carbon isotopic evidence for organic matter oxidation in soils of the Old Red Sandstone (Silurian to Devonian, South Wales, UK)*. Journal of the Geological Society, vol 171, no. 5, pp. 621-634. <http://dx.doi.org/10.1144/jgs2013-136>

Salminen, P.E., **Brasier, A.T.,** Karhu, J.A. & Melezhik, V.A. 2014. *Travertine precipitation in the Paleoproterozoic Kuetsjärvi Sedimentary Formation, Pechenga Greenstone Belt, NE Fennoscandian Shield*. Precambrian Research v.265, p181-201.

**Dick, J.D., Tetzlaff, D., Birkel, C. & Soulsby, C.** 2014. *Modelling landscape controls on Dissolved Organic Carbon sources and fluxes to streams*. Biogeochemistry. <http://dx.doi.org/10.1007/s10533-014-0046-3>

**Alena Ebinghaus, Adrian Hartley, David Jolley, Malcolm Hole, John Millett.** 2014. *Lava-Sediment Interaction and Drainage-System Development in a Large Igneous Province: Columbia River Flood Basalt Province, Washington State, U.S.A.* Journal of Sedimentary Research, vol. 84, no 11, 1041-1063.

<http://dx.doi.org/10.2110/jsr.2014.85>

Marquer, L., Gaillard, M.-J., Sugita, S., Trondman, A.-K., Mazier, F., Nielsen, A.B., Fyfe, R.M., Odgaard, B.V., Alenius, T., Birks, H.J.B., Bjune, A.E., Christiansen, J., Dodson, J., **Edwards, K.J.,** Giesecke, T., Herzschuh, U., Kangur, M., Lorenz, S., Poska, A., Schult, M. & Seppä, H. 2014. *Holocene changes in vegetation composition in northern Europe: why pollen-based quantitative reconstructions matter*. Quaternary Science Reviews 90, 199-216.

Erlendsson, E., **Edwards, K.J.** & Gísladóttir, G. 2014. *Landscape change, land use and occupation patterns inferred from two palaeoenvironmental datasets from the Mosfell Valley, SW Iceland*. In: Zori, D. and Byock, J. (eds) Viking Archaeology in Iceland: Mosfell Archaeological Project. Turnhout: Brepols. Cursor Mundi 20, 181-192.

Ascough, P.L., Church, M.J., Cook, G.T., Einarsson, Á., McGovern, T.H., Dugmore, A.J. & **Edwards, K.J.** *Stable isotopic ( $\delta^{13}C$  and  $\delta^{15}N$ ) characterization of key faunal resources from Norse period settlements in North Iceland*. Journal of the North Atlantic, Special Volume 7, 25-42.

Bons, P.D., Fusswinkel, T., **Gomez-Rivas, E.,** Markl, G., Wagner, T. & Walter, B. 2014. *Fluid mixing from below in unconformity-related hydrothermal ore deposits*. Geology. <http://dx.doi.org/10.1130/G35708.1>

**Ledger, P.M., Edwards, K.J. & Schofield, J.E.** 2014. *A multiple profile approach to the palynological reconstruction of Norse landscapes in Greenland's Eastern Settlement*. Quaternary Research 82, 22–37.

**Ledger, P.M., Edwards, K.J. & Schofield, J.E.** 2014. *Vatnahverfi: a green and pleasant land? Palaeoecological reconstructions of environmental and land-use change*. Journal of the North Atlantic, Special Volume 6, 29-46.

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*Published (continued...)*

Bentivenga, M., Capolongo, D., **Palladino, G.** & Piccarreta, M. 2014. *Geomorphological map of the area between Craco and Pisticci (Basilicata, Italy)*. Journal of Maps.

<http://dx.doi.org/10.1080/17445647.2014.935501>

**Palladino, G.** 2014. *Determining the way-up of the Monte Facito Formation using new sedimentological data from the "La Cerchiara" succession, Southern Apennines*. Italian Journal of Geoscience.

**Spagnolo, M.**, King, E.C., **Ashmore, D.W.**, **Rea, B.R.**, Ely, J.C., Clark, C.D. 2014. *Looking through drumlins: testing the application of ground-penetrating radar*. Journal of Glaciology, 60, 224, 1126-1134.

<http://dx.doi.org/10.3189/2014JoG14J110>

Hillier, J.K., Smith, M.J., Armugam, R., Barr, I., Boston, C.M., Clark, C.D., Ely, J., Fankl, A., Greenwood, S.L., Gosselin, L., Hättestrand, C., Hogan, K., Hughes, A.L.C., Livingstone, S.J., Lovell, H., McHenry, M., Munoz, Y., Pellicer, X.M., **Pellitero, R.**, Robb, C., Roberson, S., Ruther, D., **Spagnolo, M.**, Standell, M., Stokes, C.R., Storrar, R., Tate, N.J., Wooldridge, K. 2014. *Manual mapping of drumlins in synthetic landscapes to assess operator effectiveness*. Journal of Maps. <http://dx.doi.org/10.1080/17445647.2014.957251>

**Wiltshire, P.E.J.**, Hawksworth, D.L., Webb, J.A. & **Edwards, K.J.** 2014. *Palynology and mycology provide separate classes of probative evidence from the same forensic samples: a rape case from southern England*. Forensic Science International 244, 186-195.

*In Press/Accepted*

Clark, C., **Healy, D.**, Johnson, T.E., Collins, A.S., Taylor, R.J. & Santosh, M. *Hot orogens and supercontinent amalgamation: a Gondwanan example using SHRIMP U-Pb geochronology, REE geochemistry, phase equilibria and numerical modelling*. Gondwana Research.

**Eoin McGregor**, S.B. Nielsen & **Randell Stephenson**. *Basin evolution in the Davis Strait area (West Greenland and conjugate East Baffin/Labrador passive margins) from thermostratigraphic and subsidence modelling of well data: implications for tectonic evolution and petroleum systems*. Bulletin of Canadian Petroleum Geology.

**De Siena L.**, C. Thomas, G. Waite, S. Moran & S. Klemme, *Attenuation and scattering tomography of the deep plumbing system of Mount St. Helens*. Journal of Geophysical Research: Solid Earth.

Valentina Gobarenko, Tamara Yegorova & **Randell Stephenson**. *Intraplate crustal underthrusting: local tomography model of the northeast Black Sea*. Geological Society of London Special Publication.

**Vargas Meleza, L.**, **Healy, D.**, **Alsop, G.I.**, & Timms, N.E. *Exploring the relative contribution of mineralogy and CPO to the seismic velocity anisotropy of evaporites*. Journal of Structural Geology.

<http://dx.doi.org/10.1016/j.jsg.2014.11.001>

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## Funding

The following NERC Oil & Gas CDT PhD projects, proposed by GPG staff, have been shortlisted and are being advertised. **Three out of eight awards will be funded**, starting in October 2015:

- Quantifying strain partitioning in multi-layers in fold-forelimbs: implications for reservoir quality and connectivity. **Clare Bond, John Howell.**
- Investigating rates and processes of travertine deposition and diagenesis. **Alex Brasier, Joyce Neilson.**
- The influence of recurrent fracture opening and sealing on dynamic permeability. **Enrique Gomez-Rivas, David Iacopini**, Paul Bons (Tübingen), Albert Griera (Barcelona).
- Mechanical stratigraphy in carbonate reservoirs: the influence of facies on stylolite and fracture network properties. **Enrique Gomez-Rivas, Dave Healy**, Paul Bons (Tübingen), Juan D. Martín-Martín (Barcelona).
- Seismic imaging without a source: Towards cost effective and low environmental impact hydrocarbon exploration. **Nicholas Rawlinson, David Cornwell.**
- Linking rifting history and magmatic cyclicity West of Britain (WoB). **Nick Schofield, Malcolm Hole, Dave Jolley**, Simon Holford (Adelaide).

**Doerthe Tetzlaff** received funding from the IGB Leibniz Institute (Institute for Freshwater Ecology) in Germany to support a PhD studentship. £20K. 2015-2016.

## Conferences, Presentations

**Alex Brasier** gave a talk at SUERC, on 4<sup>th</sup> November 2014: Analysis of stable carbon isotopes in the field: Cavity ringdown spectrometry at hot-springs.

**Bas Buddendorf**, a new PhD student in the hydrology group, supervised by **Chris Soulsby** and **Josie Geris**, presented a poster at the inaugural meeting of the Scottish Government's Hydronation Scholars Scheme which funds his PhD project. Bas also undertook the initial field work of his PhD project in late October with project partners at Marine Scotland Science and the James Hutton Institute.

**Rob Butler** presented "Geoheritage and the UK's most significant geological sites" as October's London Lecture of the Geological Society, on the 15th October, as part of Earth Science Week. The lecture is available online at:

<http://www.geolsoc.org.uk/~link.aspx? id=9256314DC7D247EFAE2B215E938D0CED& z=z>

**Randell Stephenson** co-convened a symposium entitled "Circum-Arctic Lithosphere-Basin Evolution" at the annual Geological Society of America conference at Vancouver (Canada) in October. **Goodluck Anudu** also attended. UoA presentations were:

- The crustal structure of Ellesmere Island from receiver function modelling by Christian Schiffer (Aarhus University, Denmark), **Randell Stephenson**, and Gordon Oakey (Geological Survey of Canada Atlantic, Halifax)
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- Combined crustal-geological cross-section of Ellesmere Island by **Randell Stephenson**, Karsten Piepjohn (BGR Hannover, Germany), Christian Schiffer (Aarhus University, Denmark) and Gordon Oakey (Geological Survey of Canada Atlantic, Halifax)
- A lithospheric map of the Arctic by Victoria Pease (Stockholm University, Sweden), Sergey Drachev (ExxonMobil International Ltd, Leatherhead), **Randell Stephenson**, and Xiaojing Zhang (Stockholm University, Sweden).
- Crustal affinity and relative timing of major tectonic events on the northeastern Canadian polar margin by **Goodluck K. Anudu**, **Randell Stephenson**, **David I. M. Macdonald** and Gordon N. Oakey (Geological Survey of Canada Atlantic, Halifax)

**Hannah Watkins, Clare Bond, Rob Butler & Dave Healy.** Application of fracture modelling in a fold-and-thrust belt; an analogue for folded tight reservoirs. Presented at the International Discrete Fracture Network Engineering conference, Vancouver, 20th-22nd October.

**Hannah Watkins, Clare Bond, Rob Butler & Dave Healy.** Characterising fracture patterns in a fold-and-thrust belt; an analogue for a fractured tight sandstone reservoir. Poster presented at GSA Vancouver 19th-22nd October.

#### **Esteem**

**Rob Butler** chaired the Geological Society's selection panel for the 100 Great Geosites project.

**Rob Butler** chaired the Geological Society's Geoconservation Committee, and attended committee meetings for the Society: External Relations Committee, Library Users Group.

**Rob Butler** chaired the Awards Committee of the NERC CDT in Oil and Gas.

**Kevin Edwards** has been awarded the degree of Doctor of Science by the University of St Andrews for a thesis entitled 'Studies in Quaternary, Geographical and Archaeological Science'.

**Kevin Edwards** has been invited to join the editorial board of the journal Biodiversity and Conservation.

**Natalie Farrell** has won the prestigious Student Author of the Year Award (2014) for her first published paper '*Anisotropy of permeability in faulted porous sandstone*', in the Elsevier *Journal of Structural Geology* (co-authors Dave Healy and Colin Taylor). The citation from Journal editor Bill Dunne reads "This well written and illustrated paper addresses the subject of anisotropic permeability in faulted rocks using as case study porous sandstones deformed in the Clashach Fault, Moray, Scotland. The topic is highly relevant for understanding fluid flow patterns in fault rocks and was approached through a well-balanced integration of field and microstructural studies and laboratorial measurements of permeability in cm-scale core plug samples. As a result, Farrell et al. have generated one of the most detailed datasets on anisotropic permeability in high-porosity natural rocks available in the scientific literature. ... The international structural geology community has demonstrated strong interest in the study, and the paper has become the most downloaded article in the JSG website."

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**Marjolein van Huijgevoort** was invited to give a talk at the annual Krycklan symposium at SLU Umea, Sweden in September 2014. Marjolein combined that with a research visit of the Krycklan research site. The Krycklan site is one of the long-term experimental sites which are part of the **Doerthe Tetzlaff's** ERC funded VeWa project.

**Luca de Siena** gave an invited talk on the 5th of December at the School of Geography and Geosciences, University of St. Andrews.

**Doerthe Tetzlaff** was invited to give a research seminar at the Department of Geography, Durham University in October 2014. In addition, discussion about next year's NERC SPAG call also took place.

### **Outreach, training, media**

**Clare Bond** spoke at a ClimateXChange policy day in Edinburgh attended by local authorities, SEPA, SNH, Environmental Consultants, IGas and others presenting her and co-authors work on [potential greenhouse gas emissions from the Scottish shale gas resource](#), on November 12th.

**Clare Bond** and Zoe Shipton (Strathclyde University) presented a 'What the Frack' public lecture at Tinderbox (café) in Glasgow's Merchant City on November 13th.

**Rob Butler** gave live interviews about the launch of the 100 Great Geosites project on BBC News, BBC Radio Scotland (MacAulay & Co and on the lunchtime news), BBC Radio Cornwall, BBC Radio Norfolk, on the BBC local radio network, and for Aberdeen's Evening Express.

**Alex Brasier** was invited to SNH in Cupar to join discussions with SNH, English Nature and Natural Resources Wales on 'Updating the GCR [Geological Conservation Review] of Tufa'. This concerns identifying and designating new SSSIs. 28th October 2014.

**Andrew Hurst** reports that Fabric of the Land (FoL) was held this year held at Union Square and was a big hit. It was sponsored by Dana Petroleum, University of Aberdeen, Aberdeen City Council and Aberdeen Inspired. There were 216 entries and 74 selections. More than 1000 people registered as visitors. Prof Steve Logan was a member of the selection panel. Nigel Trewin installed a wonderful geological exhibition. It looks unlikely that FoL will, in the short term, return to exhibit on the King's campus, and in 2015 will again exhibit in Union Square. The city centre site is an opportunity for GPG/Geosciences to raise its profile in the local community.

**Ben Kneller** led core workshops for BP, as part of the PRACSS JIP (and in association with an internship on Schiehallion for **Larissa Hansen**), and for Ithaca, as a training opportunity for three new PhD students, including **Qun Liu** and **Dugmar Mendez** who arrived in the Department since the last newsletter.

**Alabi Oluwarotimi, Thomas Wild** and **Ponfa Roy Bitrus** attended a NERC funded advanced training course in 'Multidisciplinary fieldwork training in a professional geoscience environment'. The training was in three parts: Assessment and Planning, Collecting field data, Data assessment and model generation over the course of October and November 2014, with a focus on Geochemical mapping (Alabi) and Quaternary landforms (Thom and Roy).

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**Field**

**Alex Brasier** conducted field work around Mono Lake, California, examining lacustrine carbonates and their depositional processes, 7<sup>th</sup> – 19<sup>th</sup> October.

**Jason Lessels**, PDRA on the NERC funded HYRDA project which is Aberdeen led by **Doerthe Tetzlaff**, just completed his last field season at Trail Valley in the Mackenzie River Basin, Canada. In conjunction with Prof. Phil Wookey, Heriot Watt and Dr. Kerry Dinsmore, Centre for Ecology and Hydrology (Edinburgh) they collected soil, and water samples from the Arctic catchment. The data include a unique stable water isotope data set of arctic headwaters to develop a tracer-aided hydrological model which will be used to increase the understanding of the flowpaths and stores and consequent source and fate of carbon in Arctic systems.

**Ramon Lopez** travelled to SE Turkey from early September to early October to continue his fieldwork in the deepwater deposits of a Miocene marine basin. This field season included a tour for personnel from oil companies sponsoring the PRACCS project.

The entire deepwater group (**Ben Kneller plus 10 PhD students**) enjoyed a wet long weekend team-building on the rocks in the Lake District.

**Randell Stephenson** participated in seismic (controlled-source WARR) fieldwork in August and September in Romania. A WARR profile some 650 km long running from the Apuseni Mountain in Romania to the Ukrainian Shield in Ukraine was acquired. Randell would like it to be placed on record that this was “hard work”.

**Claire Tunaley**, PhD student in the hydrology group has just completed a unique intensive field campaign to sample stable isotopes in precipitation and stream water at 6 hourly intervals over a month long period. Her work is using stable isotopes to examine the scaling of flood generation processes in the Cairngorms.

**Other**

Congratulations for **Dr Jonathan Dick**, who successfully defended his PhD thesis in November, and also started a post-doc position in the hydrology group working on the hydrology and biogeochemistry of northern catchments (funded through the Leverhulme funded project PLATO, PI **Doerthe Tetzlaff**).

**John Howell, Dave Healy, Nick Schofield & Rob Butler** represented the university at a NERC Knowledge Exchange workshop with the oil and gas industry on Extreme Environments in London (17th October 2014).

**Ben Kneller** visited Zhejiang University, Hangzhou, China, to discuss collaborative research and training opportunities. He also concluded the articulation agreement to bring Zhejiang undergrads to Aberdeen from half-way through level 2 until graduation (first one arrives early 2015). The agreement was signed in Hangzhou by Seth Kunin, the VP for Internationalisation. Ben also taught a 3-day short course on deep marine classics to Zhejiang PhD students.

**Ben Kneller** is currently in Brazil as part of a BG-funded collaboration with Universidade do Vale do Rio Sinos in Rio Grande do Sul state, co-supervising 2 PhDs.

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**Luca de Siena** attended a round table discussion of the JSPS London Presentation, to discuss fellowship programmes between the Dept. and Japanese Universities.

The **Earth Science research theme** had a successful research away day on 28th October. The aim was to jointly discuss how our unit could best prepare itself for any next REF submission, by developing research synergies, increasing research income and improving research output quality. A particular focus was the development of research profiles amongst our many recently appointed early career faculty. It was also emphasised again how important it is for all academic staff, postdocs and PhDs of our research unit to support our Earth Science seminar series by regular visits.

The **Hydrology group** hosted a visit by Hjalmar Laudon, Professor of Landscape Biogeochemistry at the Swedish University of Agricultural Sciences in Umea. Hjalmar is one of the world's leading biogeochemists and is involved in collaborative EU and NERC-funded studies with the hydrology group on climate change in northern environments involving sites in Scotland and Sweden.

### **Seminars**

Seminars take place on **Thursday afternoons 3.30-4.30pm in Meston 118** and each week there will be a post-seminar reception/gathering with the speaker in the Map Room on the first floor of the Meston Building with drinks/nibbles. These talks are jointly hosted by the Departments of Geology & Petroleum Geography and Geography & Environment. All welcome. Please encourage new colleagues and PhD students to come along. <http://www.abdn.ac.uk/geosciences/seminars/index.php>

*NB: from the next issue, we'll only be listing Published papers, and not those Accepted/In Press.*

**Next copy deadline: January 20<sup>th</sup>, 2015**

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