

Publications: Papers, books & book chapters

- Alabi, O.O., Edilbi, A.N.F., Brolly, C., Muirhead, D., Parnell, J, Stacey, R. & Bowden, S.A.** 2015. *Asphaltene detection using surface enhanced Raman scattering (SERS)*. *Chemical Communication*, 51, 7152-7155.
- Andrews, S.D. & Hartley, A.J.** 2015. *The response of lake margin sedimentary systems to climatically driven lake level fluctuations: Middle Devonian, Orcadian Basin, Scotland*. *Sedimentology*, doi: 10.1111/sed.12200
- Blamey, N., Parnell, J., McMahon, S., Mark, D., Tomkinson, T., Lee, M., Shivak, J., Izawa, M., Banerjee, N. & Flemming, R.** 2015. *Evidence for methane in Martian meteorites*. *Nature Communications*, 6, doi:10.1038/ncomms8399.
- Bond, C. E.** 2015. *Uncertainty in structural interpretation: Lessons to be learnt*. *Journal of Structural Geology*, 74, 185-200.
- Verdon, J. P., Stork, A. L., Bissell, R. C., **Bond, C. E.**, & Werner, M. J. 2015. *Simulation of seismic events induced by CO2 injection at In Salah, Algeria*. *Earth and Planetary Science Letters*, 426, 118-129.
- Melezhik, V.A., Fallick, A.E., **Brasier, A.T.** & Lepland, A. 2015. *Carbonate deposition in the Palaeoproterozoic Onega basin from Fennoscandia: a spotlight on the transition from the Lomagundi-Jatuli to Shunga events*. *Earth Science Reviews*, 147, 65-98, DOI: [10.1016/j.earscirev.2015.05.005](https://doi.org/10.1016/j.earscirev.2015.05.005)
- Gomez-Rivas, E.**, Griera, A. and Llorens, M.-G. 2015. *Fracturing of ductile anisotropic multilayers: influence of material strength*. *Solid Earth*, 6, 497–514.
- Hansen, L.A.S.**, Callow, R.H.T., Kane, I.A., Gamberi, F., Rovere, M., Cronin, B.T., & **Kneller, B.C.** 2015. *Genesis and character of thin-bedded turbidites associated with submarine channels*. *Marine and Petroleum Geology*, [doi:10.1016/j.marpetgeo.2015.06.007](https://doi.org/10.1016/j.marpetgeo.2015.06.007)
- Björn Nyberg & **John A. Howell**. 2015. *Is the present the key to the past? A global characterization of modern sedimentary basins*. *Geology*, doi:10.1130/G36669.1
- Björn Nyberg, Simon J. Buckley, **John A. Howell** & Rachel A. Nanson. 2015. *Geometric attribute and shape characterization of modern depositional elements: A quantitative GIS method for empirical analysis*. *Computers & Geosciences*, 82, 191–204.
- Jolley, D.W.**, Gilmour, I, Gilmour M., **Kemp D.B.** & Kelley S.P., 2015. *Long term resilience decline in plant ecosystems across the Danian Dan-C2 hyperthermal event, Boltysh crater, Ukraine*. *Journal of the Geological Society, London*. DOI: 10.1144/jgs2014-130/vol172/2015/p. 491-498.
- Owen, A.**, Nichols, G.J., **Hartley, A.J.**, Weissmann, G.S., & Scuderi, L.A. 2015. *Quantification of a distributive fluvial system; the Salt Wash Member of the Morrison Formation, SW USA*. *Journal of Sedimentary Research*, 85(5), 544-561.
- Parnell, J., Spinks, S., Andrews, S., Thayalon, W. & Bowden, S.** 2015. *High molybdenum availability for evolution in a Mesoproterozoic lacustrine environment*. *Nature Communications*, 6, doi:10.1038/ncomms7996.
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Publications (continued...)

Pellitero, R., Rea, B.R., Spagnolo, M., Bakke, J., Hughes, P., Ivy-Ochs, S., Lukas, S. & Ribolini, A. 2015. *A GIS tool for automatic calculation of glacier equilibrium-line altitudes*. Computers & Geosciences, 82, 55-62.

Tetzlaff, D., Buttle, J., Carey, S.K., **van Huijgevoort, M.H.J.,** Laudon, H., McNamara, J., Mitchell, C.P.J., Spence, C., Gabor, R.J., & **Soulsby, C.** 2015. *A preliminary assessment of water partitioning and ecohydrological coupling in northern headwaters using stable isotopes and conceptual runoff models*. Hydrological Processes. DOI: 10.1002/hyp.10412.

Peralta-Tapia, A., Sponseller, R.A., Agren, A., **Tetzlaff D., Soulsby, C.** & Laudon, H. 2015. *Scale-dependent groundwater inputs determine patterns of surface water chemistry in a boreal stream network during baseflow*. Journal of Geophysical Research – Biogeosciences. DOI: 10.1002/2014JG002878.

Funding

Josie Geris received £15k funding from the Royal Society to investigate whether novel cosmic ray soil moisture probes can be used to address the urgent need for upscaling water storage and flux dynamics in hydrological models.

Enrique Gomez-Rivas, Dave Healy (fracture systems and permeability) and **Randell Stephenson** (geophysics) are part of a consortium including the University of Glasgow, British Geological Survey and a number of companies active in Aberdeenshire, that has been awarded £49k for a pilot project entitled "The Hill of Banchory Geothermal Energy Project" by the Geothermal Energy Challenge Fund of the Scottish and EU governments.

Parnell J. & Feldmann, J. have secured £667k (£800k fEC) from NERC for a new project entitled 'Tellurium and Selenium cycling and supply' (TEASE), part of the Minerals programme.

Brice Rea reports that the SFC has agreed to fund SAGES+ for the next 5 years.

Chris Soulsby is an international co-investigator on the £150K project "Hydrogeomorphic controls on the nation's water quality" which has been funded by the USGS John Wesley Center for Analysis and Synthesis and NSF. The project will mainly be based in the US and is led by Dr Judd Harvey of the USGS. Aberdeen will provide data, modelling tools and expert input to this important new partnership.

Conferences, PresentationsEGU AGM in Vienna, April 2015

- 'Tracer-aided modelling to assess how the interplay of catchment storage and hydrological connectivity controls non-stationary stream water age' (**Christian Birkel, Chris Soulsby, and Doerthe Tetzlaff**).
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- ‘Understanding key drivers controlling daily stable isotope variations in precipitation of Costa Rica, Central America’ (Ricardo Sanchez-Murillo, Kristin Welsh, **Christian Birkel**, Germain Esquivel-Hernández, Jose Corrales-Salazar, Jan Boll, Erin Brooks, Olivier Rounsard, Irina Katchan, Rafael Arce-Mesén, **Chris Soulsby**, and Luis Araguás-Araguás).
- ‘Extrinsic controls on inter-basaltic plant ecosystems in the Columbia River Flood Basalt Province’ (**Ebinghaus, A., Jolley, D. & Hartley, A.**).
- ‘The lacustrine record of the Dan-C2 hyperthermal event in the Boltysh Impact Crater, Ukraine’ (**Ebinghaus, A. & Jolley, D.**).
- ‘Assessing the role of urban developments on storm runoff response through multi-scale catchment experiments’ (Mark Wilkinson, Gareth Owen, **Josie Geris, Chris Soulsby**, and Paul Quinn).
- ‘Thermal history and evolution of the Rio de Janeiro – Barbacena section of the southeastern Brazilian continental margin’ (**Julia Gezatt**).
- ‘Porosity variations in and around normal fault zones: Implications for fault seal and geomechanics’ (**Dave Healy, Joyce Neilson, Natalie Farrell, Tom Haines**, Nick Timms & Moyra Wilson).
- ‘Surface water types in the Western Canadian Arctic: geochemical evolution and aquatic carbon transport’, (Joshua F. Dean, Mike F. Billett, Kerry J. Dinsmore, **Jason S. Lessels**, Lorna Street, Ian Washbourne, Jens-Arne Subke, **Doerthe Tetzlaff**, Robert Baxter, and Philip A. Wookey).
- ‘A Europe-wide perspective on Younger Dryas glacier-climate’ (**Ramon Pellitero, Brice Rea, Matteo Spagnolo** et al.).
- ‘Quantifying and predicting interpretational uncertainty in cross-sections’ (**C Randle, C Bond**, A Monaghan, M Lark).
- ‘Evidence for and implications of a grounded ice sheet in the Central North Sea in the early Pleistocene’ (**Brice Rea, Matteo Spagnolo, Dave Cornwell, John Howell**, et al.).
- ‘New insights into West Greenland ice sheet/stream dynamics during the last glacial cycle’ (Dave Roberts, **Brice Rea** et al.).
- ‘VeWa: Investigating effects of Vegetation on Water flows and mixing in northern ecosystems using stable isotopes and conceptual models’ (**Doerthe Tetzlaff**, Jim Buttle, Sean K. Carey, **Marjolein H.J. van Huijgevoort**, Hjalmar Laudon, Jim McNamara, Carl P.J. Mitchell, Chris Spence, **Chris Soulsby**).
- ‘Tracer-based assessment of flow paths, storage and runoff generation in northern catchments’ (**Doerthe Tetzlaff**, Jim Buttle, Sean K. Carey, Kevin McGuire, Hjalmar Laudon, and **Chris Soulsby**).
- ‘Estimation of the spatial distribution of hydrological responsiveness based on solute series’ (Christian Lehr, Gunnar Lischeid, and **Doerthe Tetzlaff**).
- ‘The sedimentology of a palaeo ice stream bed: an in-depth analysis of the Wielkopolska (Poland) MSGL field’ (**Matteo Spagnolo, Brice Rea**, et al.).

AAPG ACE in Denver, June 2015

- ‘Emplacement of Sand Injections During Contractual Tectonics’ (**Palladino, G.**).
 - ‘Systematic Identification of Modern Analogs for Reservoir Modelling’ (**Howell, J. & Nyberg, B.**).
 - ‘Predictive fluvial facies models and sedimentary basin fills’ (**Owen, A., Hartley, A.J.**, Weissmann, G.S., and Nichols, G.J.).
 - ‘Fold-Thrust Belt Field Analogues and Models to Predict Reservoir Damage in Carbonate Systems’ (**Bond C.E., Butler R.W.H, Clelland S., Sierralata L., Watkins H.**).
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- ‘Contrasting Perceptions of UK Experts and Publics in the Exploitation of Unconventional Gas’ (Roberts J., **Bond C.E.**, Shipton Z.K., Joao E.).
- ‘From Field Fractures to Reservoir Prediction: Utilizing Drones, Virtual Outcrop and Digital Data Analysis to Input Into Discrete Fracture Network (DFN) Models’ (**Bond C.E.**, Shackleton J.R., **Wild T.**).

AAPG (Fractured reservoirs: geological, geophysical and engineering tools to crack them) in Catania, April 2015

- ‘The importance of structural style in forecasting reservoir-scale fracture damage: insights from outcrops’ (**Rob Butler**).
- ‘Appraisal of fracture sampling methods and a new workflow to characterise heterogeneous fracture networks at outcrop’ (**Watkins, H., Bond, C.E., Healy, D. & Butler, R.W.H.**).
- ‘Characterising fracture variations in a fold and thrust belt; implications for DFN modelling and fractured reservoir quality’ (**Watkins, H., Bond, C. E., Butler, R. W. H. & Healy, D.**).

Steven Andrews gave two presentations at the IAS conference Krakow 22nd – 25th of June: ‘A 2.3 Million Year Lacustrine Record of Orbital Forcing from the Devonian of Northern Scotland’ (**Steven D. Andrews, David G. Cornwell, Nigel H. Trewin, Adrian J. Hartley**, Stuart G. Archer) and ‘Devonian lacustrine shore zone architecture imaged with ground penetrating radar’ (**Andrews, S.D.**, Moreau, J., Archer, S.).

Clare Bond gave a presentation at the 77th EAGE Conference and Exhibition 2015, entitled ‘Geomechanical Simulation of Microseismic Events Induced by CO₂ Injection at In Salah, Algeria’ (JP Verdon, AL Stork, RC Bissell, **CE Bond**, MJ Werner).

At the 25th World Water Congress in Edinburgh in May, PhD student **Bas Buddendorf** gave the following talk: ‘Identifying potential impacts of hydropower regulation on salmonid habitats in Scottish rivers using connectivity metrics’.

Alena Ebinghaus presented a poster at the 2nd Jóannes Rasmussen Conference, Faroe Islands, 5 - 6th May 2015, entitled ‘Volcanic controls on inter-lava plant ecosystems within the Columbia River Flood Basalt Province, Washington State, USA’, (Ebinghaus, Jolley, Hartley).

Julia Gezatt presented a poster at the XV Simpósio Nacional de Estudos Tectônicos/IX International Symposium on Tectonics (18-21/May, Vitória, Brazil), entitled ‘Thermal history and evolution of the Rio de Janeiro – Três Rios section of the southeastern Brazilian continental margin’.

Enrique Gomez-Rivas gave a talk at the AFES Carbonate Formation Evaluation Seminar on 22nd April. The talk was on ‘Stylolite networks as a primary control on diagenetic/hydrothermal alterations’.

Esteem

Christian Birkel gave an invited talk at EGU entitled ‘Using tracer data to develop parsimonious process-based rainfall-runoff models’ (with co-authors **Doerthe Tetzlaff** and **Chris Soulsby**).

Esteem (continued...)

Rob Butler gave an Invited talk to the annual meeting of the Geological Society's History of Geology Group – on the UK's outcrop heritage. June 2015.

Josie Geris gave an invited talk at EGU entitled 'Multi-scale hydrogeological controls on water storage, mixing and release in upland catchments' (with co-authors **Doerthe Tetzlaff, Christian Birkel, and Chris Soulsby**).

Josie Geris was invited to give a talk on 'Modelling Hydropower Impacts in Data Scarce Mountain River Ecosystems' at the Scottish Hydrological Group 'Hydropower updates' meeting in Perth, in April 2015.

Josie Geris convened two sessions at the European Geosciences Union (EGU) General Assembly 2015 on "Linking river ecology, hydrology, and geomorphology for integrated river management" and "New developments in understanding ecohydrological systems and their interfaces". Josie also organised an EGU Hydrology Subdivision meeting on 'Ecohydrology, Limnology, and Estuaries' (HS10) at the EGU Assembly in April 2015. At this meeting, she took over as the new Chair of the HS10 subdivision (2015-2019).

John Howell gave a keynote talk at the Paralic Reservoirs conference at the Geological Society of London.

Brice Rea gave an invited seminar 'Evidence for and implications of a grounded ice sheet in the Central North Sea in the early Pleistocene' and spent a day with the Quaternary Palaeoenvironments Group, Scott Polar Research Institute and personnel from the British Antarctic Survey, at the University of Cambridge.

Brice Rea was an invited attendee at the CRAM (Cryosphere Research At Manchester) meeting in the Lake District, which focused on formulating plans for new proposals in Greenland.

Brice Rea and **Matteo Spagnolo** gave an invited talk at Dana Petroleum entitled 'Glaciers and glaciation, landforms and landsystems – relevance for shallow gas accumulations in the North Sea and beyond'.

Nick Schofield has been awarded the Clough Memorial Award from the Edinburgh Geological Society. The award is given to a geologist of British nationality under 35 years of age, whose research on some aspect of the geology of Scotland and the north of England has outstanding merit. The award is in recognition of his innovative work on the interaction of volcanic and sedimentary basins in prospective areas.

Matteo Spagnolo convened and chaired the Cold Region Geomorphology session at EGU.

Doerthe Tetzlaff convened a session at the European Geosciences Union (EGU) General Assembly 2015 on "Nordic light" on runoff generation processes and use of tracers in northern ecosystems.

Doerthe Tetzlaff was invited to give one of the two keynotes at this year's 6th Water Research Horizon Conference in Berlin, Germany, in June 2015. The Water Research Horizon Conference offers an open platform to catalyze the interdisciplinary 'water community' to intensify the dialogue between scientists, practitioners, policymakers, stakeholders and decision-makers. Doerthe gave the opening keynote entitled "Hydroecological interfaces between landscapes and riverscapes" within the 'hydrosphere and biosphere' theme.

Field work & visits

Clare Bond, Enrique Gomez-Rivas and **Dave Healy** visited the Spireslack open cast coal pit in Ayrshire, as guests of the Scottish Mines Restoration Trust and the BGS. Further trips are planned over the summer.

Clare Bond also conducted field work at Wick with **Mark Mlella** and **Yuki Totake**.

Hannah Braun, who is doing her MSc at the University of Freiburg, Germany, in collaboration with the hydrology group in Aberdeen, started her fieldwork campaign. Her work is part of the ERC funded “VeWa” project. Hannah is investigating the influence of vegetation on the partitioning of precipitation in northern ecosystems.

Bas Buddendorf, PhD student in the hydrology group, supervised by **Chris Soulsby** and **Josie Geris**, started a major programme of fieldwork in May as part of his Scottish Government-funded Hydronation studentship. This involves ecohydraulic modelling of salmon habitat in parts of the Tay catchment that are used for hydropower generation.

Jonathan Dick, postdoc in **Doerthe Tetzlaff**'s Leverhulme funded “PLATO” project, visited Boise State University in May and June. Boise State is a collaborative partner in the project. Jon had a hands-on instruction to geophysical field methods by partner Prof John Bradford. Jon will apply similar methodologies and measurements to the Scottish field site near Ballater now.

Alena Ebinghaus and **Amanda Owen** have completed a two month field campaign in the Bighorn Basin, Wyoming.

Luca Fabris PhD student in the hydrology group, supervised by **Chris Soulsby** and **Doerthe Tetzlaff**, and funded by Marine Scotland Science started his fieldwork in upper Deeside. This is providing ecohydraulic models for 7 sites that have been electrofished for salmon since 1966. Luca will be assessing the effects of hydroclimatic variability – in terms of river flows and stream temperatures – on salmon growth and productivity.

Enrique Gomez-Rivas carried out a 2-week field campaign at the Benicassim outcrop analogue (Maestrat Basin, E Spain) in early May, to analyse hydrothermal dolomitisation fronts.

John Howell conducted field work in Utah and Arizona.

Brice Rea and **Matteo Spagnolo** enjoyed a successful field campaign in Cumbria collecting ground penetrating radar (GPR) data across a drumlin field and testing multiple systems.

Bernhard Scheliga, PhD student in the hydrology group, supervised by **Doerthe Tetzlaff** and **Chris Soulsby**, and partly funded through the Leibniz Institute, Germany, started his field programme just few months after the start of his PhD in January 2015. Bernhard has installed 7 groundwater wells in the group's flagship Bruntland Burn catchment in Glen Girnock.

Outreach, training & media

Rob Butler was interviewed by CNN India for a documentary on Himalayan tectonics and the Nepalese earthquakes – to be broadcast early July 2015.

Luca De Siena became the second most read researcher of the University on the media following statistics from theconversation.com website with his news articles on Deception Island (co-authored by **David Macdonald**), tremors along the Kyushu trench, and new earthquake-forecasting opportunity from fracking experiments. <https://theconversation.com/metrics/institutions/university-of-aberdeen?token=e41e5437bd986b04d9cb8ad1281f38e6f495b075>

Other

Steven Andrews has left us (again) to re-join CASP starting on the 29th of September. Before that he will be carrying out fieldwork in East Greenland for 6 weeks.

Sarah Bachtouli is visiting in July-August from the Tunis Centre of Water Research and Technologies (CERTe) on an Tunisian Government PhD exchange scheme – working on geophysical imaging and groundwater modelling of the effect of artificial recharge on seawater intrusion in the Korba coastal aquifer (Tunisia), with **Jean-Christophe Comte** (PhD co-supervisor).

Alex Brasier and **Joyce Neilson** had a successful trip to UFRGS (Porto Alegre) and USP (Sao Paulo) in Brazil aimed at furthering geoscience links, and a second trip to USP (**Alex Brasier** and **Ben Kneller**) is planned for October.

Rob Butler attended various Geological Society of London and NERC CDT committees in May.

We welcome **Magda Chmielewska** as a new Postdoctoral Research Assistant, working with **John Howell** on virtual outcrops.

John Howell has four new PhD students: **James Mullins**, **Luca Agostini**, **Eva Zimmer** (all working on the Safari project), and **Mustafizur Rahman** working on coastal plain systems.

Ben Kneller heard on the grapevine that The University of Aberdeen is in the process of signing a formal collaboration agreement with Curtin University in Perth (Western Australia). There are 4 principal strands, one of which is 'Energy'. More details to follow from Professor Richard Wells. Details of staff and research at Curtin can be found here:

- <http://geology.curtin.edu.au/>
- <http://geophysics.curtin.edu.au/>

John Parnell visited the James Hutton Institute to discuss geochemical modeling, hosted a TEASE project meeting at Aberdeen and made a research visit to the National University of Ireland, Galway.

Prof. Hans Renssen (Amsterdam University) visited **Brice Rea**, **Ramon Pellitero** and **Matteo Spagnolo** in April to discuss palaeoclimate reconstruction across Europe during the Younger Dryas.

Other (continued...)

Brice Rea attended a meeting with Professor Paul Hagan, director of Research and Innovation at the Scottish Funding Council, as part of the SAGES Executing Committee.

Chris Soulsby and **Doerthe Tetzlaff** welcomed colleagues from CEAZA in La Serena, northern Chile, including joint post-doc **Dr Tripti Muguli**. This visit was part of a Newton Fund, British Council funded project (*ConSIST Collaboratory - CHile Scotland Isotope Collaboratory*). The goal of this project is to apply stable isotopic tracers and numerical modelling to quantify the contributions of snow and glacial melt to streamflow and groundwater in Northern-Central Chile. The Chile-Scotland Isotope Collaboratory is funded by the Comisión Nacional de Investigación Científica y Tecnológica (CONICYT), British Council, and the Newton-Picarte Fund. The project does not stop with science, and has a considerable outreach and education component.

Doerthe Tetzlaff, as the Editor-in-Chief of Hydrological Processes, the flag-ship journal of experimental hydrology, organised the journal's Editorial meeting, which is held every 3 years, in Aberdeen. Scientists from the University of Bristol, Exeter, and Lancaster, Trent University (in Canada), CSIRO Australia, Duke University, University of Massachusetts, University of Minnesota (all US) visited Aberdeen. In conjunction with that meeting, the international visitors were holding a workshop on hydrological research. They also visited the main experimental site at the Bruntland Burn, near Ballater, discussing future international collaborations.

Doerthe Tetzlaff, **Chris Soulsby**, **Marjolein van Huijgevoort** and **Jonathan Dick**, all visited Boise State University, Idaho, US, at the beginning of June where the 2nd annual workshop for the ERC funded project VeWa was held. Over 5 days, the international project team discussed the progress of the project to date, agreed on future common sampling strategies and visited two long-term experimental field sites: Reynolds Creek and Dry Creek.

Doerthe Tetzlaff and **Chris Soulsby** hosted Professor John Wainwright, University of Durham, in a visit to the hydrology group. Prof. Wainwright gave a talk within the Earth Science seminar series. The team also used his visit to discuss future collaborative grant proposals.

Dr. **Hailong Wang**, who received his PhD from Flinders University of South Australia, started his work as a postdoc in Doerthe Tetzlaff's Leverhulme funded "PLATO" project in June. Hailong is an expert in understanding the interactions between vegetation, water and atmosphere, through the measurements and modelling of vegetation water use and its response to environmental variables.

Hannah Watkins successfully defended her PhD thesis, and is staying on as a Postdoctoral Research Fellow in the new Fold-Thrust Research Group (joint PIs **Clare Bond** and **Rob Butler**), working on the carbonate fold-thrust systems of the French Sub-alps and Papua New Guinea.

Next copy deadline: September 10th, 2015

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