



IGI NEWSLETTER

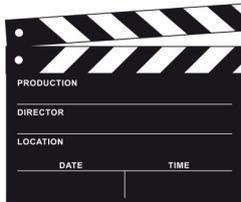


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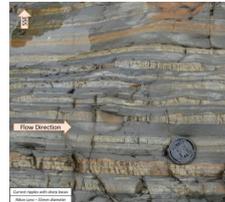
Top stories in this newsletter



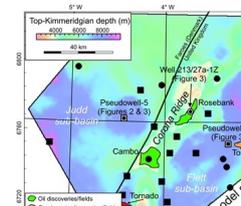
Directors' Cut



IGI News



North Devon Field
Geology



Technical Note

Read to the end of this newsletter for an 'interesting fact'...

Directors' Cut

Welcome to our first Newsletter, which we plan to issue quarterly, and which we hope you will find informative. As this is our first Newsletter, please let us know if you would like us to do anything different with future issues.

A view to the future

We at IGI have a long-term ambition to consolidate our position in the oil and gas exploration sector, whilst also diversifying our project work & consultancy into other areas including decommissioning, and other application domains requiring geochemistry expertise. We see geochemical database construction, management and hosting as a growth area for IGI, having the appropriate software tools and personnel/experience, as well as a strong existing position in this area. We further aspire to develop our scientific data management, visualisation and data analysis software into an even wider range of application domains in future.

An opportunity

To help us achieve these objectives IGI are looking for an experienced geochemist or petroleum systems analyst to work alongside Paul Farrimond and Dan Cornford, ensuring the long-term sustainability of the company. A little more information on this role can be found on our website: <https://www.igilt.com/news/could-you-help-steer-igis-future/>

IGI News

Geochemical training courses

IGI organizes specialist petroleum geochemistry and basin & petroleum systems modelling courses on a multiclient basis (twice each year, at IGI's offices in Devon) and for single clients (usually in their offices). We are currently preparing new geochemistry training modules to allow an even greater range of training courses to be offered, including:

- Introduction to Petroleum Geochemistry for Explorationists (2 days)
- Advanced Petroleum Geochemistry (2 days)
- Field-based Petroleum Geochemistry & Data Interpretation (5 days; Dorset, UK)

Please contact us if you would like us to discuss with you what our training courses can offer.

Our next multiclient training courses will be held at IGI's offices in Devon:

- Basin & Petroleum Systems Modelling (5 days): 20 – 24 April 2020
- Petroleum Geochemistry (5 days): 27 April – 1 May 2020

Please enquire and book now as places are limited.

Further details can be found on our website: <https://www.igilt.com/training-courses/multi-client/>

Geochemical software

Our long term investment into p:IGI+ and our geochemistry data management system, Metis, is really starting to pay off. The tools are now being used extensively within IGI and across many of our clients. For those thinking of upgrading, please be aware that p:IGI+ is not just a simple update of p:IGI-3, it is a complete rethink; we have kept the best bits, whilst providing a more modern user experience and a lot of enhanced functionality. We are excited to have released version 1.21 in late December 2019, which added several new features, including Star plots and the project analysis overview. The details can be found on our website: <https://www.igilt.com/news/pigi-metis-transform-version-1-21-x-release/>

If you are thinking of upgrading from p:IGI-3 to p:IGI+, it might be worth having a chat with us about training options – the transition will be a lot smoother with training!

At the moment we are working to improve the map in p:IGI+, improve performance across all our applications, and allow for access control in Metis. We'll be providing a new set of releases in April 2020.

We are also excited to begin our involvement with the Open Subsurface Data Universe (<https://www.opengroup.org/osdu/forum-homepage>), an industry initiative that should make it easier to share data across systems.

Geochemical databases

IGI's commercial geochemical databases for the Norwegian Continental Shelf (North Sea, Norwegian Sea & Barents Sea) are currently being converted from p:IGI-3 format to the new format for our p:IGI+ and Metis software. The extremely comprehensive data model built for Metis & p:IGI+ allows more data to be captured and stored with relevant metadata. We have taken the opportunity to revisit the original source files and capture additional detail for vitrinite reflectance and some other types of data. We are also currently updating the databases with released data to the end of 2018; data released in 2019 will be included later in the year.

IGI On the Road

3 – 5 February 2020: AAPG Rift Basin Evolution & Exploration (Bahrain)

Tiago Cunha will be presenting a talk entitled “*Thermo-tectono-stratigraphic modelling of rift margins and implications for the petroleum systems: insights from mature and young basins*”. Before and after the conference Tiago will be in Bahrain and Abu Dhabi for visits to interested companies – please contact us.

30 – 31 March 2020: DECOM 2020 – 2nd International Conference on the Decommissioning of Offshore & Subsea Structures (Aberdeen)

Laura Milne will be attending this conference in Aberdeen and will be happy to meet any existing or potential clients at the event.

Did you miss this?

IGI staff gave presentations at the following conferences recently:

11 – 12 December 2019: Prospec (London)

“*Geochemical evidence for Jurassic-sourced petroleum in the Devil's Hole Horst, UK Central North Sea*” (a talk by Marianne Nuzzo).

29 – 30 October 2019: Atlantic Ireland (Dublin)

“*Source rocks development in offshore Ireland in the context of the new standard lithostratigraphic framework*” (a talk by Mischa Gehlen).

30 September – 2 October 2019: PESGB Africa Conference (London)

“*De-risking hydrocarbon charge in the Namibe Basin (southern Angola) using 2-D and 3-D petroleum systems modelling techniques*” (a talk by Tiago Cunha).

1 – 6 September 2019: 29th International Meeting on Organic Geochemistry (Gothenburg)

“*Recognizing the causes of complex (mixed) molecular maturity signals in oils*” (a talk by Paul Farrimond).

“*An open petroleum geochemical database for the UK continental shelf*” (a poster by numerous IGI staff, presented by Mischa Gehlen).

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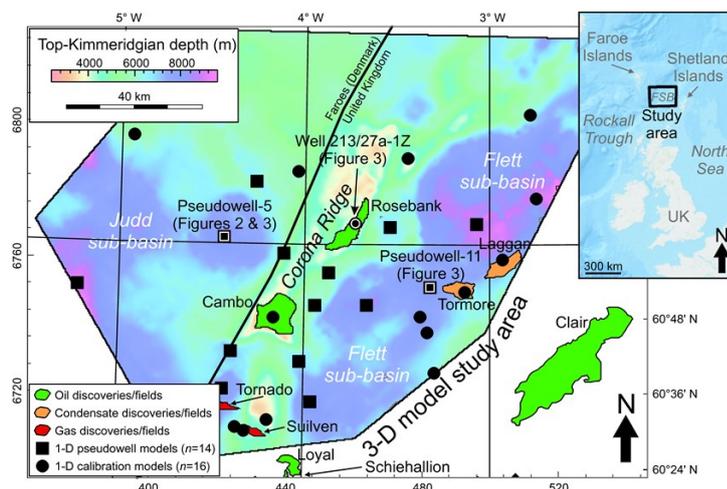
The importance of igneous intrusions and basement composition on the timing of petroleum generation

by David Gardiner (published on IGI's website in October 2019)

The Faroe-Shetland Basin (FSB) is a prolific deep-water hydrocarbon province with world-class oil, gas and condensate discoveries within reservoirs ranging in age from Neoproterozoic fractured basement to Devonian, Carboniferous, Triassic, Jurassic, Cretaceous and Paleogene clastics, including the Clair Field with an estimated 10×10^9 barrels of in-place oil.

Several geological features of the FSB make this a relatively unique province within the UK Continental Shelf (UKCS), including:

1. Prolific Paleogene flood basalts and igneous intrusions which are thought to be thickest in the basin (up to 1,500 m cumulative thickness) (Mark et al., 2018)



- Sampling shows basement rock in the FSB (e.g. Cambo-1, 204/10-1) to be composed of Neoproterozoic orthogneisses which are significantly older, and consequently colder, than the North Sea basement, where average upper crustal radiogenic heat production (RHP) averages 2.8 – 3.2 $\mu\text{W}/\text{m}^3$. Our calculations suggest the RHP may be 50 – 60% lower than in other petroleum basins on the UKCS (e.g. Central Graben), averaging just 1.6 $\mu\text{W}/\text{m}^3$ on the Corona Ridge.
- Wide-angle seismic, gravity and magnetic evidence suggests that continental rifting may be of a much greater magnitude in the centre of the Flett Sub-Basin, with a cumulative stretching (β) factor of 3.0. This implies the present-day crystalline crust may be as thin as 7km.

Recent work by IGI in collaboration with Siccar Point Energy, Chemostrat, APT & The University of Aberdeen has created an updated geological and petroleum systems model which includes igneous intrusions and basement composition, in order to investigate their effects on the timing and magnitude of petroleum generation from Kimmeridgian source rocks. The results suggest the geological characteristics of the basin may, once properly included in our 3-D model, bring the predicted timing of oil generation closer to the present day by up to 40 m.y.

The study was published in *Geology* in October 2019, with an open access pre-publication edition available online here: <https://pubs.geoscienceworld.org/gsa/geology/article/573069/modeling-petroleum-expulsion-in-sedimentary-basins>

North Devon field geology, a word from Andrew Green on an IGI field trip location...

Location: Westward Ho!, Devon, UK, Sea Field House (SS:423-291) to Mermaids Pool (SS:418-290)

Access: Cliffs and wave-cut platform are accessed via stairs south of the saltwater swimming pool (SS:428-293)

Ripples in the Crackington Formation

Westward Ho!, famed for its vast expanses of sandy surf beaches, natural pebble ridge and rocky wave-cut platform, is a great natural field laboratory to explore and investigate different sedimentary structures. In particular, various types of depositional lamination which occur within the Crackington Formation (Fm).

The Crackington Fm is one of three formations (the others being the Bideford Fm and Bude Fm) deposited in the synorogenic Culm Basin and estimated to be 1200m thick. Namurian in age (326.4-315Ma), the section at Westward Ho! is situated at the top of the formation representing the transition from dynamic deepwater turbidites to the overlying Bideford Formation's prograding delta system.

The Crackington Fm section at Westward Ho! (see image) records rapid influx of fine turbiditic sand (sharp bases of lamination packages) into an otherwise mud dominated environment. Displayed in the exposed outcrop are examples of planar parallel (P), lenticular (L) and wavy (W) lamination with micro cross-lamination in the tops of many of the silt lenses formed by current ripples. Differences between the lamination types are caused primarily by variations in flow velocity (transition between planar parallel to wavy lamination indicates flow velocity reduction), grain size and sediment type.



Current ripples produce an asymmetrical structural form, resulting from a unidirectional flow travelling 0.2-0.4m/sec. Using present-day orientations currents in the Culm Basin at the time of Crackington Fm deposition were flowing east to west. Appreciation of the current ripples in 3D is achieved through the inspection of individual bedding planes seen in the vertical cliff faces. Current ripples are seen to have an undulating crest pattern.



And finally...did you know...?

The Troll A platform is the tallest man-made construction ever moved on the Earth's surface, towering at 472m, over 50% taller than the Eiffel Tower and 20m taller than Kuala Lumpur's Petronas Towers.