



Nr 6/2011 – August 27



Geoviten-ekstern er Institutt for geovitenskap ved Universitetet i Bergen sitt eksterne nyhetsblad og utgis en gang pr. måned. Geoviten-ekstern kan også leses fra vår eksterne nettside: www.uib.no/geo
Gunn Mangerud, instituttleder

Geoviten-ekstern is the Department of Earth Science at the University of Bergen's external newsletter. It is issued once per month and can also be read from our webpages <http://www.uib.no/geo/en>
Gunn Mangerud, Head of department

The semester has started

The summer has come to an end and many of my colleagues are back from field work and scientific cruises. In Earth Science research the summer is often the most hectic time of the year. In particular for those that are dependant on weather conditions in the Arctic region, the field and cruise season is short and limited. A high number of researchers and students from our department have spent much of the summer in the field: In this issue you can e.g. read about one of our PhD students who did his field season in Jan Mayen.

Our geoscience course **Svalex**, being a collaboration between the Norwegian Universities UiO, UiB, NTNU, UiT, UiS and UNIS, is now ongoing in the Arctic. Svalex provides three main arenas for learning: The UNIS campus in Longyearbyen, Svalbard; the cruise liner M/S Expedition, conveying the participants across Isfjorden and surrounding fjords of Svalbard; and the seismic vessel M/S Håkon Mosby, which will carry out seismic acquisition. Svalex has been running since 2001 with more than 1300 participants in total. This field course is a unique opportunity for our students: It provides a multidisciplinary learning arena with excellent geological exposures, the best of equipment and the possibility to be on our research vessel and see in real life how things operate. The course is generously sponsored by Statoil. Since Svalex has a cost that would be impossible for the universities to carry, we are extremely grateful for being able to serve this opportunity to our students. We strongly believe that also the oil companies and the society benefits from Svalex: combining practical and theoretical science in a multidisciplinary setting, and having some of the most experienced and best professors and seniors from both academia and industry to lecture and guide the students during the course, will provide better students as "an output". We therefore hope all stakeholders see this as a win-win situation. Last year Svalex received the honours of winning the prestigious "Uglepris" at University of Bergen given to a university course which has shown high quality performance.

As you can read below, we received the highest numbers of new Bachelor students ever this semester. Our goal is to provide high quality education at all levels, in all our courses, whether they are in a lecture hall, a laboratory, at sea or in the field. Earth Science is still not regarded by the Ministry to require the same level of economic compensation as the Medical disciplines. Maybe a cost estimate of Svalex or our eminent field course to Utah (see Geoaktuelt juni 2011 or <http://geoaktuelt.no/undervisning/utah/>) will convince them?

Gunn Mangerud

From our research

PhD work on Jan Mayen



Foto: Eirik Gjerløw

PhD candidate Eirik Gjerløw was stationed on Jan Mayen Island this summer. Eirik will do his PhD work within our Centre of Excellence in Geobiology (CGB) and this was his first field season. Jan Mayen, Norway's active volcanic island, is a very beautiful place and has a dramatic geological history that extends into the recent past. Gjerløw will use the geological record of tephra layers to re-construct a volcanic history of the island, focusing particularly on the record of eruptions that can be found in the shallow coastal sediments around the island. Previous research has shown that the Jan Mayen tephra material differs from that formed on Iceland.

(1) Collecting marine sediment cores and looking for tephra grains, thereby re-constructing the volcanic history.

(2) Exploring the chronological variations in magma chemistry, and modeling of different eruption scenarios on the island and also to link the most characteristic unit on land to the tephra layers identified in the marine sediments.

(3) Reconstructing the Holocene eruptive history of Jan Mayen including identifying potential eruptive cycles, calculating volumes and effusion rates of individual eruptions and modeling of some of the largest eruptive events in order to estimate near and far field hazard and risk from future eruptions on the island.

Read more from CGB's own web page (see address below)

This edition's colleague

Jiří Konopásek joined our department at the beginning of this year, when he was appointed as an Associate Professor in Geochemistry and Petrology. Jiří comes from the Czech Republic where he received his PhD in petrology and tectonics in 1999 from the Charles University in Prague.



Shortly thereafter he got a postdoc position sponsored by the Marie Curie Fellowship scheme of the European Commission at the University of Mainz in Germany in the research group of Prof. Cees Passchier and Prof. Alfred Kröner. After his return to the Czech Republic, he started to work as a researcher at the Czech Geological Survey and at the same time taught principles of



metamorphic petrology and thermodynamics at the Faculty of Science of the Charles University in Prague.

Jiří's main research interests are connected with metamorphic reactions and processes connected with small-scale mass transfer. He is also working on thermodynamic modelling of metamorphic and geochemical processes, as well as on interpretation of natural microstructures that have developed during metamorphism. In the last several years, main emphasis of his work was on modelling and interpretation of high-temperature mineral assemblages and microstructures forming during granulite-facies metamorphism at the lower-crustal conditions and processes of intra- and intercrystalline diffusion in high-grade rocks. Currently, his focus has shifted more towards medium and low-temperature processes and geochronology.

Apart from these studies, he is also very active in field-oriented research and application of petrological studies in interpretation of crustal-scale tectonic processes. Due to his origin and background in the geology of the Czech Republic, Jiří has a long lasting interest in studies of the geology of the Bohemian Massif and tectonic evolution of the Variscan central and western Europe. Moreover, he works for the last ten years in Namibia on correlations and interpretation of the tectonic evolution of southern Africa and South America during Neoproterozoic period. His fieldwork is located in the Kaoko Belt of northwestern Namibia and the current research is focused on the development of the Neoproterozoic passive margin along the eastern flank of the Congo Craton and its later orogenic evolution due to collision with the Rio de la Plata Craton situated today in southern Brazil and Uruguay.

In the past Jiří led several scientific projects financed by the Czech Science Foundation and other funding bodies within the Czech Republic.

Jiří is an experienced lecturer and the beginning of his teaching career dates back to 1996 when he started with lecturing in petrography, petrology and optical microscopy courses. Since then he supervised several MSc. and PhD. theses, again mainly in the subjects of petrology, geochemistry and tectonics. Here at the department of Earth Science, he is also the member of the Centre for Geobiology. He teaches courses in geochemistry, mineralogy, petrography and optical microscopy. More complete information about the scientific career of Jiří Konopásek can be found at <http://petrol.natur.cuni.cz/~kony/>.



Link to our three Centres of Excellence:

<http://www.bjerknes.uib.no/>

<http://www.cipr.uib.no/>

<http://www.uib.no/geobio/en/>

Geo-letter from abroad

Report from a melting Arctic Chair in Amherst

Jostein Bakke



Lobster and hamburger is a "standard" lunch along the coast of New England. From left Karolina, Kristina, Bjørn Johan, Jostein and Oskar.

It is ironic to have seminars about Arctic glaciers surrounded by meadows and a burning sun from a blue sky with temperatures between 35 and 40°C outside the window. I chose Amherst and **University of Massachusetts (MASS)** as the resident University for my six months stay in US as a Fulbright Arctic Chair, and even if it still is too hot, my family and I are really pleased with the choice. The main reason for visiting UMASS is to cooperate and learn from the Distinguished Professor Raymond Bradley and his group. Bradley is a scientist that I have admired since I read his textbook "Paleoclimatology" in 1999 and later many of his highly ranked publications and it is a pleasure to have the opportunity to join his research team. It is a lot to learn when you're a visiting scientist, both scientifically and practically, and one practical thing that I really appreciate is how they have organized the climate group at the Department of Geoscience. We are all sitting in a big circular room with a huge table in the middle, only sheltered by light sound dampening walls, professors as well as students. This really encourages interaction and collaboration across generations and academic titles, and if you want to discuss something you simply bring your figure or presentation to the big plasma screen on the wall and sit down around the table for a chat with anyone interested. Every Wednesday at 11, one member of the group is bringing homemade cake, and we all gather for a social and scientific chat.

UMASS Amherst is the flagship campus of the University of Massachusetts system and is located in the scenic Pioneer Valley of Western Massachusetts, 140 kilometres from Boston and 280 kilometres from New York City. The campus provides a rich cultural environment in a rural setting but also close to major urban centres. In numbers the university has in total 27,000 students and 1200 instructional faculty members. Soft sciences are well represented at the campus with "The Fine Arts Center" bringing national-known theatre, music, and dance to campus year-round. We already benefited from this as our house is located two minutes off campus, and the whole family joined Jazz in July, both indoor and outdoor and we especially enjoyed the evening concert by the Campus pond where they played live jazz from five in the afternoon until dusk.

The summer is re-building season at the University and almost every building has a project. As part of the financial aid given by the Obama administration in order to boost the economy during the economic crisis – UMASS has received a substantial amount of funding for re-building. In late August the department will open a brand new wet-sediment lab and a new XRF lab including a Swedish ITRAX core scanner. This gives opportunities for knowledge exchange and we are planning a workshop on different aspects of the ITRAX machine in mid November (if someone needs an excuse for a visit). My duties as an Arctic



Chair, besides writing papers and building networks, are to promote US-Norwegian research cooperation in the Arctic and I will therefore give lectures at several other Universities and attend a number of conferences. This means a lot of exciting travelling within US and one of the big upcoming events is the Trans Atlantic Science Week in San Francisco arranged by the Norwegian Embassy in Washington, the Norwegian Ministry of Education and Research, the Ministry of Trade and Industry and the Research Council of Norway. The purpose of the conference is to stimulate collaboration between US and Norway in the fields of research, higher education, innovation, technology and knowledge-based business development.

After a summer with heat waves and hailstorms we all look forward to the fall, which is the favourite season of the locals, with scenic sceneries of the woodlands filled with warm colours and with comfortable temperatures. As the fall starts, the semester starts and the students will come back to UMSS, filling up the sleepy cafés with young Americans, having their first experiences without their protecting parents. We hang in, observing and learning, from a country rich in everything but money.

From our education

The semester has already started and new students as well as the "old" fill our corridors and rooms. It is encouraging that Earth Sciences attract so many young people and for us who work here it is very inspiring to be around young people engaged in their studies.

This year we received 96 new students starting on their 3 year Bachelor studies. In addition 46 students started their master program this semester. So far this year we've had 36 master exams and there are more to come by the end of this semester. As the average number of master students per year has been around 30 up until now we are now seeing the signs of the first big cohorts after the marked increase of students in Earth Science that started a few years ago. The really big challenge for the masters program will come next year when the cohort from 2009 enters the master's level. In addition the number of students applying from other universities is increasing. We are struggling to find lecture halls that can take them, to solve the logistics around field and lab courses etc. But most of all we worry about how to pursue the quality they deserve when e.g. field courses need a capacity of nearly 100 students. I can only repeat what I underlined in the introduction of this issue: Earth Science is still not regarded by the Ministry to require the same level of economic compensation as the Medical disciplines. Maybe a cost estimate of Svalax or our field course to Utah will convince them? They would not be possible to run without the support from Statoil.

Other news

We invite you to register to attend the forthcoming Royal Society Discussion Meeting: "Warm Climates of the Past - a lesson for the future?" London, UK, 10th-11th October 2011. Registration, and more details are available from: <http://royalsociety.org/events/warm-climates-of-the-past/> Confirmed speakers include: Jim Zachos, Paul Valdes, Maureen Raymo, Jim Hansen, Dorthe Dahl-Jensen.



GEO in media

[Bergens Tidende](#) (Jan Mangerud, Institutt for geovitenskap)

Tittel: - **Dette kan du bare spise**

Vil du ha dagens fangst i Bergen til middag? <http://www.bt.no/nyheter/lokalt/--Dette-kan-du-bare-spise-2506399.html>

Klimaklok teamet **Kikki Kleiven**, Siri Kalvik og Tobias Thorleivsson takker av etter 3 år med foredragsturne og gir stafettpinnen videre til: Generasjon Grønn, 6 nye klimaambassadører som skal ut på skoler og formidle om klima og miljø utfordringer.

<http://www.youtube.com/watch?v=v6TAqMbc2VI&feature=youtu.be>

og <http://www.facebook.com/generasjongronn>. Klimaklok teamet fortsetter som coacher og skal i lære opp de 6 nye Klimaambassadørene.

[Bergens Tidende](#) 29. juni 2011. Pris til breforskar. Fulbright Arctic Chair award til **Jostein Bakke**.

På Høyden. Førsteamanuensis **Jostein Bakke** ved Institutt for geovitenskap mottok nylig den prestisjefulle prisen Fulbright Arctic Chair Award. vært gjort før. http://nyheter.uib.no/?modus=vis_navn&id=49098

[NRK](#) (Jostein Bakke, Institutt for geovitenskap/Bjerknessenteret)

Tittel: **Brearmene kan forsvinna**

Forskarar trur no at kjende brearmar som Nigardsbreen, Bøyabreen og Briksdalsbreen vil kunne forsvinna heilt i løpet av 20 til 50 år.

[forskning.no](#) (Jan Mangerud og John Inge Svendsen, Institutt for geovitenskap)

Tittel: - **Tvang bort neandertalerne**

Det ble alt for mange moderne mennesker i forhold til neandertalerne. Det tvang frem utryddelsen av dem, tror forskere.

[forskning.no](#) (Eystein Jansen, Bjerknessenteret)

Tittel: **Sauer inn i klimaberegningene?**

Årringer i trær kan mange steder være mer påvirket av gnafsende planteetere enn av temperatur. Vi bør ta med dette beregningene av fortidens klima, ifølge en norsk-skotsk studie.

New in the department



Associate professor Jostein Bakke

Jostein Bakke has a PhD in Physical Geography from Department of Geography at University of Bergen and do research within Quaternary geology, physical geography, glacial history, palaeoclimatology, geomorphology, and lake sediments in Norway. Bakke came from a position as Associate Professor at

Department of Geography. He joined the Quaternary and Palaeoclimate research group in our department June 1st. Bakke will spend his first months at the Climate System Research Centre, University of Massachusetts as his received the prestigious Fulbright Arctic Chair Award.



Ruth Helene Kongsbak is temporarily employed as a student advisor until January 2012. The position will be advertised this fall. She comes from a position as student advisor at the Department of Community Medicine at NTNU in Trondheim.



Dina Vachtman is a post doc and from the University of Manchester as part of a project run by professor Rob Gawthorpe. Dina has her PhD on Formation and evolution of stream channels due to base level lowering (Ben-Gurion) 2009. At Geo she will be working on submarine slope geomorphology.



New candidates

Master's Degree presentations (since last issue)

Dato	Kandidat	Oppavetittel	Veileder	Ekstern sensor	Intern sensor
22.06.2011	Bjørge, Åse Oliv	Scenario based seismic risk assessment in Izmir, Western Turkey, based on simulated earthquake ground motions and vulnerability of building categories	Kuvvet Atakan	Hilmar Bungum (NORSAR)	Henk Keers
07.06.2011	Hovet, Anita Karina	Impact of iron and biofilm development on groundwater chemistry and mobility of heavy metals	Ingunn H. Thorseth	Helge Hellevang (Forsker), Institutt for geofag, UiO	Harald Furnes
28.06.2011	Jørgensen, Helge	Structural analysis and geochronology of the Tuscan basement and the lowermost tectonic units of the Eastern Elba thrust nappes	Joachim Jacobs	H. Fonneland-Jørgensen (Statoil,)	Harald Furnes
14.06.2011	Kitterød, Ingjerd Helene	COUPLED TECTONIC SURFACE PROCESS MODELLING OF LARGE SCALE TECTONIC GEOMORPHOLOGY OF RIFTED MARGINS	Ritske Huisman	Jan Inge Faleide	Patience Cowie



22.06.2011	Lutro, Torunn	Local site effects in İzmir, Turkey: Combining empirical and analytical approaches	Atakan	Hilmar Bungum (NORSAR)	Henk Keers
25.08.2011	Pedersen, Leif-Erik R.	Zircon provenance of Devonian deposits in Western Norway	Jan Kosler	Fernando Corfu (UiO)	Harald Furnes
24.06.2011	Sjursen, Eivind	The development of an incised valley-fill deltaic system, Gulf of Corinth, Greece	Wojtec Nemec	Dr. Carlo Messina (Senior Geolog, Statoil, Oslo)	Prof. Rob Gawthorpe (GEO)
28.06.2011	Suliman, Amel	Geochronology and tectonic setting of voluminous granitoids and related rocks and associated extensional structures in Dronning Maud Land (East Antarctica)	Joachim Jacobs	Asbjørn Thon (Statoil)	Brian Robins
14.06.2011	Torgersen, Espen	Magma chamber processes ; a study of the north-eastern part of the Sokndal lobe, Bjerkreim-Sokndal Layered Intrusion, SW Norway	Brian Robins	Dr. Jens Christian Andersen (Camborne School of Mines, University of Exeter, UK)	Harald Furnes
28.06.2011	Tvedt, Anette B.M.	Strain analyses and thermochronology in the Eastern Elba fold and thrust belt	Joachim Jacobs	Asbjørn Thon (Statoil)	Haakon Fossen
22.06.2011	Berge, Lise Våge	Kartlegging av område med potensiell skredfare i Os kommune, Hordaland	Atle Nesje	Dr. Anne Bjune, UniResearch	Henriette C. Linge
22.06.2011	Bolstad, Hege Chr.	Konsekvenser for havnivåstigning i Os kommune, Hordaland	Atle Nesje	Dr. Anne Bjune, UniResearch	Henriette C. Linge
17.06.2011	Halleraker, Caroline	Kjemisk analyse av forvitningsmateriale fra et autoktont blokkhav og torformer, samt geomorfologisk kartlegging av Tron, Nord-Østerdalen i Hedmark, Sør-Norge	Henriette C. Linge	Terje Solbakk Oljedirektoratet	Stein-Erik Lauritzen
17.06.2011	Hult, Linn Haugland	Rekonstruksjon av paleoisbevegelse over Tron (1666 m o.h.), Nord-Østerdalen, Hedmark, ved provenancestudie av flyttblokker	Henriette C. Linge	Michael Heim (Institutt for plante- og miljøvitenskap, UMB)	Håvard Juliussen (Institutt for geografi, UiB)
23.06.2011	Ljone, Torkjell	Detalj kartlegging av skredfare i Mobergslia, Os kommune, Hordaland	Atle Nesje	Aart Verhage, Norges vassdrags- og energidirektorat, NVE sitt distriktskontor i Førde	Rannveig Øvrevik Skoglund (Institutt for geografi, UiB)
15.06.2011	Sekkingstad, Juanita	Late Holocene Hydrographic variability in the Antarctic Circumpolar Current	Ulysses Ninnemann	Dorthe Klitgaard Kristensen	Jostein Bakke



23.06.2011	Smeland, Sondre	Skredfarekartlegging i Os kommune i henhold til ROS-analyse fase II	Atle Nesje	Aart Verhage, Norges vassdrags- og energidirektorat, NVE sitt distriktskontor i Førde	Rannveig Øvrevik Skoglund (Institutt for geografi, UiB)
14.06.2011	Bøyum, Eivind Sæterdal	Siste deglasiasjon av midt-norsk kontinentalsokkel	Hafliði Hafliðason	Forsker Dorthe Klitgaard-Kristensen, Norsk polar institutt	Ulysses Ninnemann
14.06.2011	Finsnes, Cecilie Damgård	Links between the Antarctic Circumpolar Current, intermediate ocean ventilation, and deglacial CO2 changes	Ulysses Ninnemann	Dorthe Klitgaard Kristensen	Hafliði Hafliðason
28.06.2011	Aspøy, Ingvild	Sedimentological Development of the Askeladden sequence of the Todalen Member (Paleocene) at Lunckefjellet, Svalbard	William Helland-Hansen	Scott Bullimore	Rob Gawthorpe
16.06.2011	Frafjord, Camilla	Estimation of geocell permeability based on small-scale sedimentary structures in the Brent Group on the Gullfaks and Oseberg fields	Jan Rivenæs	Jan Tveranger	Christian Hermanrud
23.06.2011	Hognestad, Leif Arne	Distal pinch-out characteristics of a basin-wide, one-lobe turbiditic system: the Marnoso Arenacea Fm. (Miocene), Northern Apennines, Italy	Wojtek Nemec,	Dr. Scott Bullimore (Senior Geologist, Statoil, Bergen)	Gunnar Sælen
29.06.2011	Hanevik, Eivind P.	Sedimentologi og sandkroppgeometri av Hollendardalenformasjonen, Nordenskiöld Land, Spitsbergen	William Helland-Hansen	Lars Magnus Falt	Gunnar Sælen
24.06.2011	Olsen, Stian Ihle	THE EFFECT OF GEOLOGICAL SETTING AND RESERVOIR PROPERTIES ON CSEM RESPONSE - A STUDY FROM THE NORTH SEA	Jonny Hesthammer	Behzad Alaeimajolan (Rocksource ASA)	Henk Keers
28.06.2011	Serigstad, Eirik	Paleoenvironment and its influence on the distribution of coal deposits in the Todalen Member, Firkanten Formation (lower Paleocene), Svalbard.	M Jensen (UNIS)	Arvid Nøttvedt	Wojtek Nemec
29.06.2011	Simonstad, Espen	Paleogeografi og avsetningsmiljø, Grumantbyenformasjonen (paleocen), Svalbard	William Helland-Hansen	Dirk Knaust	Gunnar Sælen
24.06.2011	Vold, Ingrid Eriksen	CSEM Response in Relationship to Depositional Environment and Reservoir Properties A Study from the Norwegian Sea.	Jonny Hesthammer	Behzad Alaeimajolan	Henk Keers
14.06.2011	Arslan, Asude	Modelling of OBS data west of Bear Island	Rolf Mjelde	Jan Inge Faleide, UiO	Atle Austegard



30.06.2011	Hegdal, Marius	Spatial Analysis of Sub-facies Associations in the Middle Jurassic Brent Delta Complex, Northern North Sea	William Helland-Hansen	Eirik Larsen, Rocksource, Postboks 994 Sentrum N-5808 Bergen	Wojtek Nemec
22.06.2011	Tangedal, Øyvind	3D Architecture and Hydrocarbon Potential of a Pre-uplift Billefjorden Basin	Walter H. Wheeler	Atle Rotevatn (CIPR)	Haakon Fossen
05.08.2011	Torland, Jonas Aas	Fluvial architecture of the Triassic Snadd formation, Barents Sea	John Howell	Dr.Scott Bullimore (Senior Geologist, Statoil, Bergen)	Rob Gawthorpe

PhD dissertations (since last issue)

For further details see below

Dato/date	Kandidat/Candidate	Oppgavetittel/title	Veileder/Supervisor	Bedømmelseskomité/Committee
10.06.11	Karoline Bælum	Geophysical and geological investigations of subsurface reservoirs - case studies of Spitsbergen, Norway	Alvar Braathen	Harald Walderhaug GEO Isabelle Lecomte. Arvid Nøttvedt
15.06.11	Ali Shahraini	Characterization of fractured reservoirs by joint inversion of seismic and production data	Morten Jakobsen	Atle Austgård GEO Martin Landrø, NTNU Karl Stephen, Herriot-Watt, Edinburgh
21.06.11	Louise W. Bjerrum	Deterministic seismic hazard assessments through hybrid ground motion simulation	Kuvvet Atakan	Morten Jakobsen GEO Kim Bak Olsen, San Diego Eser Çakti, Istanbul
23.8.11	Aamir Ali	Correlations between the effective permeability and seismic anisotropy of fractured reservoirs	Morten Jakobsen	Tor Arne Johansen, GEO Boris Gurevich, Curtin University, Martin Landrø, NTNU



Scientific production

Publications

- Krylova, E.M., Gebruk, A.V., Portnova, D.A., Todt, C. & **Hafliðason H.** 2011. New species of the genus *Isorropodon* (Bivalvia: Vesicomidae: Pliocardiinae) from cold methane seeps at Nyegga (Norwegian Sea, Vøring Plateau, Storrega slide). *Journal of the Marine Biological Association of the United Kingdom*. DOI:10.1017/S002531541100004X
- Slimak, L., **Svendsen, J.I.**, **Mangerud, J.**, Plisson, H., **Heggen, H.O.**, Brugère, A. & Pavlov, P.Yu. 2011. Late Mousterian persistence near the Arctic Circle. *Science* 332, 841-845. DOI: 10.1126/science.1203866
- Agersborg, R., **Johansen, T.A.**, Mavko, G. & Vanorio, T. 2011. Modeling of elasticity effects of sandstone compaction using coated inclusions. *Geophysics* 76, E69-E79. DOI: 10.1190/1.3565050
- Chand, S., Rise, L., Knies, J., **Hafliðason, H.**, **Hjelstuen, B.O.** & Bøe, R. 2011. Stratigraphic development of the south Vøring margin (Mid-Norway) since early Cenozoic time and its influence on subsurface fluid flow. *Marine and Petroleum Geology* 28, 1350-1363. DOI: 10.1016/j.marpetgeo.2011.01.005
- Reiche, S., **Hjelstuen, B.O.** & **Hafliðason, H.** 2011. High-resolution seismic stratigraphy, sedimentary processes and the origin of seabed cracks and pockmarks at Nyegga, mid-Norwegian margin. *Marine Geology* 384, 28-39. DOI: 10.1016/j.margeo.2011.03.006
- Maaløe, S.** 2011. Olivine Phenocryst Growth in Hawaiian Tholeiites: Evidence for Supercooling. *Journal of Petrology*. DOI: 10.1093/petrology/egr015
- Christoffersen, A., **Husebye, E.S.** 2011. Seismic tomographic mapping of the Earth's interior – Back to basics revisiting the ACH inversion. *Earth-Science Reviews* 106, 293-306. DOI: 10.1016/j.earscirev.2011.02.007
- Matveeva, T.**, **Husebye, E.S.** 2011. Reliable *L_g* Arrival-Time Picks and Potention for Enhanced Epicenter Location. *Bulletin of the Seismological Society of America* 101, 1341-1353. DOI: 10.1785/0120100197
- Sandstå, N.R., **Robins, B.**, Furnes H., & de Wit, M. H. 2011. The origin of large varioles in flow-banded pillow lava from the Hooggenoeg Complex, Barberton Greenstone Belt, South Africa. *Contributions to Mineralogy and Petrology*, 162, 365-377. DOI: 10.1007/s00410-010-0601-4
- Thiede, J., **Eldholm O.** & Myhre, A.M. 2011. Scientific deep-sea drilling in high northern latitudes. From: Spencer, A.M., Embry, A.F., Gautier, D.L., Stoupakova, A.V. & Sørensen, K. (eds.) *Arctic Petroleum Geology*. Geological Society, London, Memoirs. 35, 703-714. DOI: 10.1144/M35.46
- McLoughlin, N.** 2011. Archean traces of life. From: Gargaud, M. (Editor-in-chief), Amils, R., Cernicharo Quintanilla, J., Cleaves, H.J., Irvine, W.M., Pinti, D. & Viso, M. (editors). *Encyclopedia of Astrobiology*. Springer Reference. 74-84
- McLoughlin, N.** 2011. Biogenicity. From: Gargaud, M. (Editor-in-chief), Amils, R., Cernicharo Quintanilla, J., Cleaves, H.J., Irvine, W.M., Pinti, D. & Viso, M. (editors). *Encyclopedia of Astrobiology*. Springer Reference. 171-172
- McLoughlin, N.** 2011. Endogenicity. From: Gargaud, M. (Editor-in-chief), Amils, R., Cernicharo Quintanilla, J., Cleaves, H.J., Irvine, W.M., Pinti, D. & Viso, M. (editors). *Encyclopedia of Astrobiology*. Springer Reference. 489-490
- McLoughlin, N.** 2011. Stromatolites. From: Gargaud, M. (Editor-in-chief), Amils, R., Cernicharo Quintanilla, J., Cleaves, H.J., Irvine, W.M., Pinti, D. & Viso, M. (editors). *Encyclopedia of Astrobiology*. Springer Reference. 1603-1613
- McLoughlin, N.** 2011. Syngenicity. From: Gargaud, M. (Editor-in-chief), Amils, R., Cernicharo Quintanilla, J., Cleaves, H.J., Irvine, W.M., Pinti, D. & Viso, M. (editors). *Encyclopedia of Astrobiology*. Springer Reference. 1645-1646
- Slama, J.**, Walderhaug, O., Fonneland, H., **Kosler, J.** & **Pedersen, R.B.** 2011. Provenance of Neoproterozoic to Upper Cretaceous sedimentary rocks, eastern Greenland: Implications for recognizing the sources of sediments in the Norwegian Sea. *Sedimentary Geology* 238, 254-267. DOI: 10.1016/j.sedgeo.2011.04.018



Mangerud, J., Gyllencreutz, R., **Lohne, Ø.S.**, & **Svendsen, J.I.** 2011. Glacial history of Norway. From: Ehlers, J., Gibbard, P. L. and Hughes, P. D. (eds.): *Developments in Quaternary Science* 15, 279-298

Reports

Wacey, D., **McLoughlin, N.**, Stoakes, C.A., Kilburn, M.R., Green, O.R. & Brasier, M.D. The 3426-3350 Ma Strelley pool formation in the east Strelley greenstone belt – a field and petrographic guide. Record 2010/10. Geological Survey of Western Australia

Presentations

Janocko, M., **Nemec, W.**, Cartigny, M. & Hansen, E.W.M. 2011. In-phase flow in submarine sinuous channels – a prerequisite for point bar formation. Conference on Internal Architecture, Bedforms and Geometry of Turbidite Channels, Geological Society of London, Great Britain, 20.-21.6.2011

Slama, J. Detrital zircon U-Pb provenance and some experimental issues. Source to Sink meeting, Statoil, Norway. 24.5.2011

Slama, J. Probe into sedimentary provenance studies. Geo-Bio seminar, UiB, Bergen, Norway 18.5.2011

Husebye, E.S., **Matveeva, T.** & Fedorenko, Yu. Focal depth through polarization analysis of the Pn coda. A. Dziewonski Symposium, Harvard University, USA, 4.6.2011

Husebye, E.S., **Matveeva, T.** & Fedorenko, Yu. Focal depth through polarization analysis of the Pn coda. CIBTO Sci & Tech. Conference, Wien, Austria, 8.10.6.2011

Mangerud, J., **Svendsen, J.I.**, **Heggen, H.P.**, Slimak, L., Plisson, H., Brugère, & A., Pavlov, P.Y., 2011: Breaking news on Ice Age Humans in Northern Russia. APEX Fifth International Conference and Workshop. Longyearbyen, Svalbard. 1.-4.6.2011, p. 96.

Kirchner, N., Gyllencreutz, R., & **Mangerud, J.** 2011: Novaya Zemlya - a nucleus for glaciation in the Barents-Kara Sea during MIS 3-2? APEX Fifth International Conference and Workshop. Longyearbyen, Svalbard. 1.-4.6.2011, p. 83.

Mangerud, J., **Svendsen, J.I.** & **Lohne, Ø.S.** 2011 Younger Dryas glaciation of Scandinavia - the type area for the Younger Dryas. XVIII. INQUA Congress. Bern, Switzerland. 21.-27.7.2011.

Gyllencreutz, R., **Mangerud, J.**, **Svendsen, J.I.** & **Lohne, Ø.S.** 2011: The DATED chronology and Eurasian Ice Sheet reconstructions. XVIII. INQUA Congress. Bern, Switzerland. 21.-27.7.2011

Kirchner, N., Gyllencreutz, R., & **Mangerud, J.** 2011: Novaya Zemlya - a nucleus for glaciation in the Barents-Kara Sea during MIS 3-2? XVIII. INQUA Congress. Bern, Switzerland. 21.-27.7.2011.

Lane, C., Blockley, S., Smith, V., Tomlinson, E., Matthews, I. & **Mangerud, J.** 2011: Is the Icelandic Vedde Ash one of a kind? XVIII. INQUA Congress. Bern, Switzerland. 21.-27.7.2011.

NEW PhD's

Simulering av jordskjelv for seismisk risikovurdering



Foto: Jan Kåre Wilhelmsen

Louise Wedderkopp Bjerrum disputerte tirsdag 21. juni for ph.d.-graden ved Universitetet i Bergen med avhandlingen:

“Deterministic seismic hazard assessments through hybrid ground motion simulation:
Case studies for Wenchuan, China and İzmir, Turkey”

Jordskjelv er den type naturkatastrofe som årlig dreper flest mennesker. Risikoestimering for utsatte områder er derfor viktig for å minimere både menneskelige og økonomiske omkostninger i fremtidige katastrofer. Mens det er vanskelig å forutsi presis når et jordskjelv vil skje, er det ved hjelp av datasimulering mulig å kvantifisere effekten av et forventet jordskjelv i form av estimerte jordbevegelser. Dette er især viktig for områder, hvor det ikke har vært jordskjelv på lenge, og hvor det derfor ikke finnes noen tidligere registreringer av jordbevegelser.

Bjerrum har gjort simuleringer av jordskjelv for to områder: for Wenchuan, Kina, hvor det var et jordskjelv med styrke 7.9 i mai 2008; og for İzmir, tredje største by i Tyrkia, hvor det ikke har vært noen større jordskjelv de siste 230 år. Studiet for Wenchuan er et “retrospekt studie”, der de simulerte jordbevegelser kontrolleres mot målte jordbevegelser fra skjelvet i 2008. Under en felttur til det jordskjelvrammede området, var det mulig å undersøke bygningsskader og sammenlikne disse med de simulerte jordbevegelsene.

Izmir, med nesten 4 millioner innbyggere, ligger tett på flere aktive forkastninger, som kan forårsake jordskjelv med styrke opp mot 7. Arbeidet viser at İzmir forkastningen, som skjærer tvers gjennom byen, utgjør den største trusselen. Grunnet usikkerhet i de parameterne som brukes i simuleringen av jordbevegelsene, er gyldigheten til de simulerte jordbevegelsene undersøkt ved å gjøre simuleringene flere ganger, mens inputparameterne blir variert. Resultatet viser stor variasjon, og det er derfor viktig å ta flere mulige scenarier i betraktning når risikoen for et område vurderes. Siden grunnen under İzmir består av løse sedimenter, er det forventet at jordbevegelsene vil øke når de seismiske bølgene reiser mot overflaten. Dette er undersøkt ved en feltstudie i byen, der det ble funnet at den nordligste del av byen er særlig utsatt.

Personalia:

Louise Wedderkopp Bjerrum er født i 1981 og oppvokst i Danmark. Hun tok en bachelorgrad i fysikk-geofysikk ved Københavns Universitet i 2005, og en mastergrad i geodynamikk på Institutt for Geovitenskap ved Universitetet i Bergen i 2007. Siden august 2007 har hun vært ansatt som stipendiat ved Institutt for Geovitenskap.

Olje og gass i reservoarer med sprekker



Aamir Ali disputerte 23. august 2011 for ph.d.-graden ved Universitetet i Bergen med avhandlingen: "Correlations between the effective permeability and seismic anisotropy of fractured reservoirs"

En stor og økende andel av verdens oljereserver finnes i reservoarer med sprekker. Det er derfor viktig å kunne karakterisere slike oppsprukne reservoarer. Dette kan imidlertid være vanskelig, fordi sprekkenes ofte har en foretrukket orientering som medfører at både strømningssegenskaper og seismiske responser (reflektivitet) varierer med retning. Ali har i sitt ph.d.-prosjekt utviklet metoder for å estimere sprekkenes orientering (samt andre sprekkeparametre relatert til strømning) fra seismiske data. Ali har vist at man i prinsippet kan estimere strømningssegenskaper til et oppsprukket reservoar fra seismiske data, dersom man benytter en matematisk (bergartsfysisk) modell for sammenhengen mellom strømningssegenskaper, sprekkegeometri, seismisk bølgefart, anisotropi (retningsavhengighet) og demping.

Ali har i tillegg bidratt til utvikling av moderne metoder for karakterisering av oppsprukne reservoarer og relaterte systemer som forkastninger og sammensatte porøse medier basert på kvantitativ (statistisk) integrasjon av seismiske data og produksjonsdata (observasjoner av trykk og strømningsrater i brønner). Ali har i løpet av sitt ph.d.-studium hatt et lengre utenlandsopphold, samt omfattende kontakt med norsk oljeindustri.

Personalia:

Aamir Ali ble født 1982 i Rawalakot, Azad Kashmir, Pakistan. Han tok bachelorgraden sin ved AJK University. Etter oppnådd mastergrad i geofysikk ved Quaid-Azam University (QAU) i Islamabad, Pakistan, jobbet han som foreleser i geofysikk ved Department of Earth Sciences, QAU, Islamabad, Pakistan. I 2008 ble han tildelt stipend fra Higher Education Commission (HEC) i Pakistan til å gjennomføre doktorgradstudier i petroleum geofysikk ved Universitetet i Bergen.

Forbedret karakterisering av reservoarer med sprekker



Foto: Jalaleh Jamali

Ali Shahraini disputertet 15. juni 2011 for ph.d.-graden ved Universitetet i Bergen med avhandlingen:

"Characterization of fractured reservoirs by joint inversion of seismic and production data"

Betydelige olje- og gassreserver er lagret i reservoarer med sprekker. En bedre karakterisering av oppsprukne reservoarer kan føre til bedre reservoarstyring og mer effektiv hydrokarbonutvinning. Et reservoar er heterogent eller anisotropt når egenskapene varierer med posisjon eller retning. På grunn av den store graden av heterogenitet og anisotropi i oppsprukne reservoarer trengs det en tverrfaglig tilnærming, der man får til en forbedret reservoarkarakterisering ved å foreta en integrert analyse av flere typer data. Dynamiske produksjonsdata, slik som olje- og gassvolumer produsert fra brønnen og vannkutt, mengden av vann som produseres i forhold til den totale produserte væsken, er en slik type informasjon. 4D-seismiske data er 3D-seismiske data samlet inn fra det samme området ved forskjellige tidspunkt.

I avhandlingen har Shahraini utviklet en integrert arbeidsflyt der en oppnår en forbedret karakterisering av oppsprukne reservoarer ved å bruke produksjonsdata og/eller seismiske data. Arbeidsflyten starter med bruken av en bergartsfysisk modell som relaterer et sett av sprekkeparametre til effektive hydrauliske og de mekaniske egenskapene til et oppsprukket reservoar. Etterpå beregnes de effektive hydrauliske og mekaniske egenskapene og de blir brukt i strømning og seismiske modelleringsverktøy for å beregne seismiske data og produksjonsdata.

Fordelingen av sprekkeparametre oppdateres her inntil forskjellen mellom beregnede og observerte 4D-seismiske- og produksjonsdata blir tilstrekkelig liten. Forskjellige metoder for seismisk historietilpassning, inkludert den såkalte Ensemble Kalman Filter metoden, har også blitt utviklet og tilpasset reservoarer med sprekker. Resultatene viser klart at man kan få til en bedre karakterisering av reservoarer med sprekker om man benyttet 4D-seismiske data i tillegg til produksjonsdata.

Geophysical investigations of Svalbard reservoirs



PhD candidate Karoline Bælum has investigated subsurface reservoirs in certain areas of Spitsbergen, producing new knowledge about structures that one day can become important reservoirs for CO₂ storage. Bælum defended her PhD thesis on June 10. It took place at UNIS.

Karoline Bælum defended her PhD thesis "Geophysical and geological investigations of subsurface reservoirs - case studies of Spitsbergen, Norway" on June 10, 2011 at UNIS.

Bælum's thesis gives, through different geophysical methods, an insight into different geological areas in Svalbard that either has, or could have reservoir properties.

The methods used by Bælum are seismic, ground penetrating radar (GPR), geoelectrical measurements and LIDAR scans. These are combined with geological data from, among other things, drill holes and field observations, in order to produce new knowledge about the structures of the Svalbard bedrock.

Bælum has investigated the Billefjorden fault zone (BFZ); Tellbreen, a smaller glacier north of Adventdalen; a paleokarst area in Billefjorden and an area close to Longyearbreen where there are plans to store CO₂.

New knowledge of reservoir properties

The results of her investigations are somewhat contrary to the current, prevailing theories concerning the hydrology properties of cold, Arctic glaciers. Tellbreen has a drainage system which functions as a reservoir, storing and releasing water all year round.

Bælum's seismic investigations of the BFZ have resulted in new knowledge about its progress and geometry, especially in the areas south of Tempelfjorden, where the fault zone is located underground.

The seismic studies of the bedrock in Adventdalen has, together with the drill holes, have resulted in a specific mapping of the bedrock layers which are suitable for CO₂ storage, and test injections have already been undertaken. Her investigations of paleokarst structures in 2D and 3D with GPR have resulted in new knowledge about these structures that can be important reservoirs and transport channels for hydrocarbons and groundwater, among other things.

About the candidate: Karoline Bælum (born 1980 in Aarhus, Denmark) has a Master's degree in geology/geophysics from Aarhus University and UNIS (2006). In 2007 she enrolled as a PhD student at the University Centre in Svalbard (UNIS) and the University in Bergen.