INSTITUTT FOR GEOVITENSKAP
Department of Earth Science

GEOVITEN
-ekstern

Nr 4/2011 – 29. april

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

Årets søkertall – mest glede + en liten bekymring.

Det matematisk-naturvitenskapelige fakultet kan i år skilte med en økning i primær søkere (søkere som har oss som sitt førstevalg) til våre studieplasser på 10 % fra i fjor. Hvis en ser tilbake til 2008 har mengden primær søkere økt med 40 %. Også ved institutt for geovitenskap har økningen fortsatt, instituttets primærsøkermasse har økt med 10 % fra i fjor. Dette er en gledelig nyhet for alle som har arbeidet med realfagssatsing og lover godt for fremtiden.

Samtidig ligger det en liten spire til bekymring gjemt. Økningen fra i fjor gjelder kun for studieretningen i geologi. På studieretningen i geofysikk er det ingen økning. Søker tallet fra i fjor har heldigvis holdt seg på nøyaktig samme nivå, og i hadde vi en viss økning fra året før. Likevel er det grunn til å rope (hviske?) et varsko: det er de "tunge" realfagene som ser ut til å ha minst økning, samtidig som samfunnet også her sårt trenger flere kloke hoder.

Det er derfor ingen grunn til å "hvile på våre laurbær" – her må videre profilerings og realfagssatsing til. Derfor var det ekstra inspirerende å høre rektor Lin Holvik fra Bergens nye videregående "realsfagsskole", Nordahl Grieg, fortelle på gårsdagens Christiekonferanse at søkertallene til realfag fra vg 1 til vg 2 ved den nye videregående skolen var på utrolige 60 %. Dette er en spennende pilot der en videregående skole, Det matematisk-naturvitenskapelige fakultet (UiB) og VilVite senteret "spleiser" på en stilling for nettopp å koble de ulike utdanningsnivåene tettere, gjøre bruk av universitetets ressurser i undervisningen og gjennom samarbeid stimulerer unge mennesker til nysgjerrighet gjennom tett kontakt med forskningsmiljø. Dette er det mye å lære av – for alle parter!

Vi regner derfor med at denne videregående skolen sammen med mange andre skoler i Norge er full av framtidige geofysikk og geologi studenter!

Gunn Mangerud

From our research

Fig.1. **HEAT MACHINE** The Atlantic meridional overturning circulation, known as the Gulf Stream, consists of basically two currents. One is a subtropical gyre of warm surface water, a giant horizontal swirl that circulates clockwise. But part of this water heads northeast and forms two branches, one heading toward Scandinavia and crossing the Greenland-Scotland Ridge (GSR), and the other toward northern Canada. As these waters cool, they sink in the regions marked with stars, and flow south at great depths down the western edge of the Atlantic Basin.

© Nature 2005 & Chemical & Engineering News
December 2, 2005 CLIMATE CHANGE | Oceanic Heat Conveyor Slows

THOR (Thermohaline Overturning-at Risk?)

Learn more about THOR:

Main obejctives: Contribute to a better understanding of the strength and variability of the ocean's Thermohaline Circulation (THC), and the effect it has on climate, with special emphasis on the North Atlantic/European region

PROJECT PERIOD: 2009-2012

PERSONS INVOLVED FROM GEO: Helga F. Kleiven (Norwegian PI, and leader Core Team 1), Ulysses Ninnemann

FUNDING: EU - FW7

WEBPAGE: http://www.eu-thor.eu/Home.532.0.html

From our education

Student exchange

The Department of Earth Science aims to provide research based education of high quality. We emphasize student exchange as an important part of the education, and encourage our students to take one or two semesters at a foreign institution during their bachelor or master degree. In addition to the general bilateral UiB administrated agreements in countries like USA, Canada, Australia and New Zealand, the department has 19 exchange agreements within the field of Earth Science, throughout Europe. Since 2010 we have focused on establishing and securing research-based exchange agreements through the Erasmus Lifelong Learning Programme. This included visits to four strategic partners which resulted in four new agreements with universities in Copenhagen, Utrecht, Grenoble and Southampton. We have been promoting these four as the main exchange agreements for our students. As a result we have had a big increase in the number of students wanting to spend a semester abroad in Europe. In 2009, eight students spent a semester at a foreign institution, all of them outside of

Europe. The number increased to 11 in 2010, 20 in 2011, and in spring 2012 as many as 26 students will be going abroad. We are especially happy to see that the higher number for spring 2012 is a result of an increase in students applying for exchange in Europe (12 out of 26). The department aims to continue the good work in this area and hope to further increase the number of students on international exchange programmes, both on bachelor and master's level.

Introduction to structural Geology and Tectonics

The course Introduction to structural Geology and Tectonics (Geov 104) is taken by our undergraduate students in the 4th semester. This year we are having 65 students. The course provides basic concepts for the understanding of rock and lithosphere deformation. Structural geology tries to relate present day geometries, such as folds and faults, to deformation histories. Deformation histories in turn help to reconstruct the nature of the forces the deformation is related to.

The course consists of three different parts, which complement each other and are strongly interlinked. A series of lectures provide concepts of stress, strain, rheology and strength of the lithosphere, and provides the means to describe structures from the grains scale, over the outcrop scale to the mountain and tectonic scale. In a series of practicals, students learn how to interpret geological maps and how to plot and use structural data to solve easy geological problems. Towards the end of the semester, geological field trips in and around Bergen provide hands-on experience on a broad range of geological structures. The picture shows students studying impressive folds along Fjellveien on a rainy day in mid April.

This edition's colleague

Ingunn H. Thorseth is Professor in Geomicrobiology. She joined the department as Associate professor in 2004. Thorseth received her PhD at UiB in 1995 with an interdisciplinary study of low-temperature alteration of glassy basalt; the first to link geochemistry and microbiology in this research field. In her subsequent post-doc and later research projects she continued to focus on the importance of geobio-interactions during low-temperature geochemical processes in a range of environments from surface terrestrial to deep seafloor and subseafloor. Currently she is leading the theme Water-Rock-Microbe Interactions and Deep Biosphere at our Centre for Geobiology.

The most important result from her early research is the various biosignature evidence for endolithic microbial life in glassy oceanic basalt - and thus of the existence of a putative deep biosphere in the ocean crust. This observation has led to new important questions concerning: the genetic and functional microbial diversity within the oceanic basement; the magnitude of endolithic microbial biomass; available energy and carbon sources and degree of linkage to the surface world; microbial influence on the alteration of the ocean crust and the geochemical exchange between the oceanic lithosphere and seawater; as well as whether these processes were also active during the early history of Earth. The research activity on these questions has been carried out in close collaboration with geologists and microbiologists at UiB and other research institutions abroad, and includes investigations of both recent seafloor basalts from mid-ocean spreading ridges and subseafloor basalts from older ocean crust material, as well as laboratory experiments. She has participated in several marine research cruises including ODP Leg 187 to the South-East Indian Ridge, Alvin dives at the Juan de Fuca Ridge, and UiB-lead cruises to the Arctic Mid-Ocean Ridges.

Another branch of her research has been focused on weathering processes in connection to deterioration and preservation of rock art. Important subjects within geomicrobiology connected to this research include weathering effects and biomineralisation of lichens.

During the last few years Thorseth has been involved in the discovery and exploration of deep-sea hydrothermal vents and mineral deposits on the Arctic Mid-Ocean Ridges. A specific focus has been on the very large siliceous iron-deposits formed by low-temperature hydrothermal venting, and the associated iron-oxidising bacteria and biofilm formation. This has included identification of morphological and chemical biosignatures, which could be used for possible detection of similar processes in ancient rocks (jasper, BIF, stromatolites) and on other planets. In addition, she has been engaged in similar studies of iron-deposits formed in relation to groundwater seepage. Lately, marine barite deposits and the barium cycle have been subjected to similar geomicrobiology investigation. Other new research topics the last years are serpentinization of ultramafic rocks and abiotic generation of hydrogen and organic compounds, as well as early diagenetic and biogeochemical processes in marine sediments. Recently she has also been involved in a research project on mine tailing placements in Norwegian fjords.

Thorseth teaches in the fields of aquatic geochemistry, geomicrobiology and electron microscopy.

Link to our three Centres of Excellence:

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

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

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

Andre nyheter/Other news

Aurora Borealis

Read the report and executive summary on "*The road to new knowledge about the Arctic Ocean - climate, environment and resources*".

GEO in media

En vulkansk askesky. GEO365.no (Jan Mangerud, professor emeritus, Institutt for geovitenskap). Et gigantisk vulkanutbrudd på Island for mer enn 12.000 år siden har satt interessante spor etter seg. De er til stor hjelp for å sammenligne klimaet og den geologiske utviklingen på Grønland, i Atlanterhavet og i Europa. http://www.geo365.no/forskning/askesky/

Jakter på isgass. Dagens Næringsliv 28.1.11 s. 20 (Haflidi Haflidason) Gassnasjonen Russland trapper opp letingen og forskning på gasshydrater etter å ha avdekket inntil tre ganger så mye "isgass" som ordinær gasshydratfelt like stort som "Ormen Lange" funnet, men kommersiell utnytting er komplisert.

Da Sotra kom fram frå isen. Prof Jan Mangerud i Magasin http://redir.opoint.com/?key=Ka03dpWHvl7XPkOZW8PA .

Verdens største havstrøm. Ulysses Ninemann har ledet forskningsprosjektet om hvordan klimaendringer påvirker verdens største havstrøm som går rundt Antarktis. (papir). Klima og havet, Aftenposten, 12.04.2011

Fann landets eldste reinslort. Breer og issmelting: I den 4000 år gamle Juvfonna er det gjort funn av landets eldste reinslort. (...)Professor Atle Nesje opplyser at lorten er datert til rundt år 600. (papir). Gudbrandsdølen Dagningen, 07.04.2011

Isbreer og kraftverk
NRK Dagsrevyen: innslag om Jostein Bakke/Bjerknessenteret sin forskning på Folgefonna. Les mer...NRK1, 25.04.2011, Breer og issmelting

New in the department

Patience Cowie

Professor Patience Cowie started in our department April 2nd this year. She comes from a position at the University of Edinburgh and will work in the Geodynamics Research Group but also in close collaboration with the other research groups. Professor Cowie began her work with the evolution of faults, and developed her work into fault scaling and the fractal nature of fault topography and deformation models. In more recent years she has moved into field surface processes although retaining her strong links to faulting. She has made significant contributions in these fields and has published many well cited

papers on these topics. She is now the principal editor at GSA's Geology for surface processes.

Stijn De Schepper

April 1st Stijn started his 3 year post doc project at Geo. He holds a BSc and MSc degree in Geology (Palaeontology) from Ghent University, where he studied between 1996 and 2000, and later received his PhD from the Quaternary Palaeoenvironments Group at Cambridge University UK, where he stayed from

October 2002 to July 2006, funded by the Gates Cambridge Trust. He successfully defended his thesis in 2006 and continued as a Post-doctoral researcher at the University of Bremen, in Germany from October 2006 to 2011 before moving to Bergen.

Scientific production

PUBLIKASJONER

Emmel B., Kumar R., Ueda K., Jacobs J., Daszinnies M.C., Thomas R.J. & Matola R., 2011. Thermochronological history of an orogen-passive margin system: An example from northern Mozambique. Tectonics, 30, TC2002. Doi:10.1029/2010TC002714

POPULÆRVITENSKAP

Mangerud J., 2011. Der havet stiger mest. Klima 2-2011, 16-17.

Mangerud J., 2011. Et tynt sandlag - og en vulkansk askesky. GEO, 14, 28-33.

Nesje A. 2011. Sedimenter løser isgåte. Klima 2-2011, 12-13.
Ridyard D. & **Hesthammer J.**, 2011. Value creation using electromagnetic imaging. World Oil, March, 51-54.

MUNTLIGE OG POSTER PRESENTASJONER PÅ KONFERANSER

Nesje A. Havet stig - er det grunn til bekymring? Maskinistforening sin pensjonistgruppe, Bergen, 06.04.2011.

ANDRE FOREDRAG

Minakov A. Breakup of Laurasia: how to break a continent. Department seminar, UiB, 29.03.2011.

Raeesi M. Rupture Process of March 11, 2011 (Mw=9.1) Honshu (Japan) Earthquake.Geodynamics Seminar, UiB, 28.03.2011.