THEME 1: [EC] Environment and climate

Organizer: Ívar Örn Benediktsson

[EC 1] Glaciers and glacial processes

Conveners: Ívar Örn Benediktsson (iob2@hi.is) and Tómas Jóhannesson (tomas@vedur.is)

The Nordic region and adjacent Arctic regions include a significant part of the world's terrestrial ice masses, including the Greenland Ice Sheet and smaller ice caps and glaciers in Iceland, Scandinavia, Svalbard and other Arctic islands. A reduction in ice volume and area has been observed throughout these regions in recent years, with substantial effects on glacial river discharge and sea level, and exposure of large areas with glacial sediments and landforms that previously have been ice covered. These effects are expected to be magnified over the coming decades. Understanding the behavior of Arctic ice masses at present is, therefore, vital for reconstructing past environmental changes and predicting future climate and glacier change scenarios. This session will address recent and future changes in volume and areal extent of glaciers and ice caps and their potential societal impacts, and current and past glaciological and glacial geological processes. Presentations on observational programs, modeling studies, processes and reconstructions are solicited.

[EC 2] Glacial and climate history of Arctic, Antarctic and Alpine environments

Convener: Ólafur Ingólfsson (oi@hi.is).

Understanding natural paleoclimatic variations and glacial histories of the Arctic, Antarctica and Alpine environments on decadal-millennial scales is important for constraining amplitudes of natural environmental changes through time. This session will focus on the development of Arctic, Antarctic and Alpine environments through the Late Quaternary, with emphasis on the interaction between climate and glaciers through glaciations and interglaciations.

[EC 3] Permafrost and periglacial processes

Conveners: Ivar Berthling (ivar.berthling@svt.ntnu.no) and Bernd Etzelmüller (bernd.etzelmuller@geo.uio.no)

Permafrost is common in all Nordic mountain areas and a dominant characteristic of ground conditions in adjacent High-Arctic areas. The presence of cryotic ground conditions has important implications across the Earth and Planetary sciences including engineering. Permafrost aggradation or degradation takes place due to complex interactions between the surface-atmosphere energy exchange, (seasonally variable) ground surface and sub-surface thermal characteristics, and geothermal heat flow. The effect of climate change on permafrost distribution is likely to be pronounced, but there is strong heterogeneity in time and space of permafrost response due to these interactions. There is therefore a need for better models of transient ground thermal conditions, also for addressing and quantifying the positive feedback effects to climate change because of potentially increased greenhouse gas (GHG) release due to permafrost thaw. Permafrost and seasonal frost govern a.o. periglacial processes, such as periglacial slope processes, rock glacier development, interaction with glacial processes and mass wasting. These processes have faced increased attention, e.g. in relation to frozen and thawing slope stability, rock glacier distribution as an indicator of paleoclimate, and the role of ground thermal regime in landscape dynamics. The session will therefore invite for presentations addressing

mapping, monitoring and modeling permafrost, with studies related to periglacial processes and landforms.

[EC 4] Climate change impact in the Nordic during the 21st century
Conveners: Þorsteinn Þorsteinsson (thor@vedur.is) and Halldór Björnsson (halldor@vedur.is)
The impact of projected 21st century climate change on renewable energy sources like hydropower, wind power and biomass has been investigated in joint Nordic and Icelandic research projects (CES and LOKS) in the years 2007-2011. This session will focus on climate scenarios for the Nordic region for the period 2021-2050, and forecasting of associated changes in hydrological processes, glacial melt, wind strength, forest growth. Talks and posters focusing on recent changes in climate parameters, hydrology and biomass production are solicited along with presentations dealing with future scenarios and the associated impacts on energy production.

THEME 2: [UV] Understanding volcanoes
Organizer: Ármann Höskuldsson

[UV 1] Volcanoes in Iceland
Conveners: Ármann Höskuldsson (armh@hi.is) and Hannes Mattson (hannes.mattsson@erdw.ethz.ch)
The session will focus on volcanism in Iceland and descriptions of individual eruptions. We welcome all contributions in relations to eruption dynamics focused to describe how eruptions in Iceland did behave from beginning to end. Further, statistical analyses of eruptions at different volcanoes in Iceland are welcomed.

[UV 2] Ancient volcanism in Scandinavia
Conveners: Kari Strand (Kari.Strand@oulu.fi) and Eirik Gjerlöw (eirik@hi.is)
This session provides the opportunity for contributions that fall within the broad spectrum of paleovolcanology, geochemistry and tectonic settings of ancient volcanic-sedimentary terrains in Scandinavia. We encourage abstract submissions on general documentation ancient volcanic products by their geochemical composition and physical characteristics. The processes in volcanic-sedimentary terrains are complex, and include volcanism, normal surface processes and tectonics, thus possible contributions related to facies architecture of ancient volcanic centres are most welcomed. Better understandings of ancient volcanic-sedimentary depositional environments have applications in mining exploration.

[UV 3] Volcanism in the North Atlantic
Conveners: Rolf B. Pedersen (rolf.pedersen@geo.uib.no) and Romain Meyer
A multidisciplinary examination of the North Atlantic volcanic role in plate tectonics and Earth's internal dynamics has the potential to cast new light on the interrelationships between these processes.
Continental breakup at the Paleocene-Eocene transition initiated the Northeast Atlantic. Early basin formation was not accompanied by significant volcanism, magmatic activity increased extensively around breakup time. We would like to address during this session observations from the volcanic events and magma evolution prior to and during continental separation (e.g. continental flood basalts, seaward dipping reflector sequences), and the post-breakup continuous activity

(including Mid-Ocean ridges and Quaternary volcanic activity on Svalbard, Jan Mayen and Iceland). It is necessary to understand those local volcanic activities in detail to also understand the origin and function of the North Atlantic geology. Welcome are not only geochemical, volcanological and experimental data but also models regarding magma injections during rifting/drifting, mantle plumes and mantle heterogeneities, lithosphere rheology and inherited weaknesses.

[UV 4] Magma plumbing system
Conveners: Paul Martin Holm (Paulmh@geo.ku.dk) and Christian Tegner (christian.tegner@geo.au.dk)
The magma plumbing of volcanic systems involve highly dynamic migration of melts in conduits and chambers, crystallization, mixing, reaction with country rocks and the hydrosphere, and eruption, and is linked to plate tectonics and structure of the crust. These processes control the compositional and textural diversity of igneous rocks, the style of volcanic eruptions, the nature of hydrothermal systems, and the deposition of metallic ore bodies. Establishing the nature and origin of volcanic plumbing systems requires integration of geophysical, geochemical and petrological observations, experiments and models for extinct and active systems. This session therefore seeks contributions from a wide range of studies shedding light on sub-volcanic processes, including volcanic roots (sills, dykes, plutons and their aureoles), extrusive rocks, and monitoring of active volcanoes.

THEME 3: [Gd] Geodynamics
Organizer: Steinunn S. Jakobsdóttir

[Gd 1] Earthquakes and seismicity
Conveners: Sigurlaug Hjaltadóttir (slauga@vedur.is) and Steinunn S. Jakobsdóttir (ssj@vedur.is)
Earthquake monitoring is performed in all of the Nordic countries. We here welcome all studies of recent large earthquakes worldwide, along with studies of seismicity in the Nordic countries or elsewhere. We also welcome presentations on development of new methods within earthquake research and monitoring.

[Gd 2] Active tectonics and volcano geodesy
Conveners: Þóra Árnadóttir (thora1@hi.is) and Rikke Pedersen (rikke@hi.is)
Measurements of surface deformation and small changes in the gravitational acceleration can be used to study active tectonic, magmatic, and hydrothermal processes at depth. Surface deformation can be measured with various techniques and range of models are used to gain inside into the processes.

[Gd 3] Glacial Isostasy, Sea level change and Mantel dynamics
Conveners: Ingi Bjarnason and Freysteinn Sigmundsson (fs@hi.is)
The session will focus on the long term crustal movement in Fennoscandia and crustal deformation in Iceland due to glacial isostasy. And their relation to active geological processes.

THEME 4: [GA] Geoscience and the society: hazards and anthropogenic impact

Organizer: Þorsteinn Sæmundsson

[GA 1] Geohazards in the Nordic and Arctic

Conveners: Þorsteinn Sæmundsson (steini@nnv.is) and Hermanns Reginald (Reginald.Hermanns@NGU.NO)

This theme aims at incorporating contributions related to the broad aspect of residing on a planet under the influence of both geo- and man-made hazards. In this context Geohazards should be understood in the broadest possible sense as any hazard affecting life on Earth.

The Nordic countries face a varied spectre of geohazards, spanning from geophysical types such as volcano eruptions and earthquakes at Iceland to quick clay landslides in Norway and Sweden. This session aims at presenting a wide range of geohazard studies in the Nordic countries, including case studies from various geographical, geological and topographical settings and more general evaluations of geohazards from a Nordic perspective. The session is open for all types of geohazards present in the region.

[GA 2] Risk assessment and management of geohazards

Conveners: Anders Solheim (anders.solheim@ngi.no) and Harpa Grímsdóttir (harpa@vedur.is)

In recent years there has been an increased interest in the study of risk assessment and risk management in relation to geohazards. This interest is reflected both at international level, through UN organizations and the World Bank, and at regional and local levels. The world continues to see the development of extremely densely populated areas, depending on sophisticated infrastructure in order to secure necessary resources (e.g. food, water and energy). Such areas are, in many parts of the globe, exposed to threats from, i.a. earthquakes, tsunamis, rising sea level, floods and shortage of (ground) water. Smaller communities are exposed to more local threats, e.g. landslides in Norway.

The key questions are: How should societies, on a large or a small scale, handle the risk posed by geohazards? What should the role of geoscientists in the risk management process be? Contributions addressing issues such as risk, hazard, vulnerability, coping capacity etc. are welcome.

[GA 3] Offshore, near-shore and coastal geohazards

Conveners: Bjarni Richter ISOR (br@isor.is) and Sebastian L'Heureux Jean.LHeureux@ngu.no

As prospecting for hydrocarbons move into increasingly deeper waters of the world's continental margins, offshore geohazards become a topic of great importance. Main offshore geohazards include slope instability, underground blowouts, and effects of shallow gas and gas hydrates. In recent years, geohazards in near-shore and coastal settings, especially instability of slopes in coastal areas, have also received increasing attention. In this session we invite contributions from the offshore industry as well as from researchers and planners working on land-use plans in a coastal setting.

[GA 4] Engineering geology

Conveners: Börge J. Wigum (wigum@mannvit.is)

This session covers presentations in the field of Building materials, including research on aggregates, building stones and ornamental rocks. It also includes analysis and modeling of Geohazards, e.g Rock slope stability, and Rock mechanics covering e.g Underground civil works. Finally, presentations are also welcomed covering Soil mechanics and Environmental issues e.g. contaminated land management and hydrogeology.

THEME 5: [EP] Endogenic processes

Organizer: Kristján Jónasson

This theme focuses on the diverse processes occurring within the Earth and the terrestrial planets and on the resulting structures and materials. Sessions are planned on the tectonic evolution of the North Atlantic area and on the structure of the Earth's crust. Other sessions will focus on the structure and stability of minerals in different environments, and on the diverse aspects of igneous and metamorphic processes. Volcanoes and volcanic processes are the subject of a special theme.

[EP1] Tectonic evolution of the North Atlantic area

Conveners: Maryam Khodayar (mak@isor.is)
The session focuses on the opening of the North Atlantic in the broadest sense to illustrate an example of how oceanic crust is built, how basins form, the role of older continental weaknesses and whether they reactivate. Topics could span Precambrian to Quaternary, covering shield generation; orogenesis; continental break-up; major transgression, regression; and present-day plate tectonics. Contributions on structural geology and tectonic-sedimentary-volcanic evolution are particularly welcome to highlight the main steps and/or mechanisms involved.

[EP2] Structure and processes of the Earth's crust

Conveners: Ólafur Guðmundsson (ogud@ru.is)
The composition and structure of the hidden parts of the Earth's crust is the central theme of this session. What can we learn from geophysical and geological studies about the makeup of the oceanic crust, the continental crust, and the nature of the crust-mantle boundary?

[EP3] Structure and stability of minerals

Conveners: Kristján Jónasson (kristjan@ni.is)
Minerals are the basic ingredients of geology. This session focuses on the composition, structure and stability of minerals in the different environments of the world, whether they are generated at the Earth's surface, deep within the Earth, or in other exotic circumstances. Contributions on mineralogy in general are welcome.

[EP4] Igneous and metamorphic processes

Conveners: Olgeir Sigmarsson (olgeir@raunvis.hi.is)
Much of the bedrock we reside on is either formed or influenced by igneous and metamorphic processes. Shedding light on the genesis and history of different rock types and formations is the main topic of this session. Studies relating to the types of processes and the timing of events during the formation of different types of bedrock are welcome.

THEME 6: [ER] Earth resources

Organizer: Björn S. Harðarson

[ER 1] Geothermal research and exploitation

Conveners: Anette K. Mortensen (akm@isor.is) and Bjorn S. Hardarson (bsh@isor.is)

The thermal state of the Earth controls a wide range of geological processes. As such, terrestrial heat flow studies are of prime importance for understanding the past, present and future of our planet and for planning the use of its natural resources. The growing demand for new and clean energy sources has, in addition, renewed the interest from society in geothermal energy. Geothermal energy is cost effective, reliable, sustainable, and environmentally friendly. Recent technological advances have dramatically expanded the range and size of viable thermal resources, especially for applications such as home heating, thereby opening a potential for widespread exploitation. The goal of this session is to give an overview on the recent progress made in the field, as well as on the future of geothermal energy as a potential solution to the energy crisis facing the globe.

[ER 2] CO2 sequestration

Conveners: Sigurdur R. Gislason (sigrg@raunvis.hi.is)

Amid the warnings of weather perturbations and globally rising temperatures, scientists are searching for ways to reduce the growing threat of climate change. Although the magnitude and timing of any impacts from climate change remain uncertain, there is increasing pressure to reduce greenhouse gas emissions now. The development of carbon capture and sequestration technologies may play an important role in addressing this issue. The reduction of anthropogenic CO_2 emissions may be considered one of the main challenges of this century. By capturing large volumes of industrial CO_2 emission and injecting it into suitable deep geological formations, the carbon released is returned back where it was extracted instead of freeing it to the atmosphere. This session addresses the feasibility of CO_2 storage in the subsurface, which depends on reservoir performance, cap rock sealing properties, monitoring techniques and consequences for the environment.

[ER 3] Hydrology and hydrogeology

Conveners: Daði Þorbjörnsson (dadi.thorbjornsson@isor.is) and Þrainn Fridriksson (thf@isor.is)

It has been estimated that about 98% of all available freshwater in the world is groundwater. Groundwater is an important resource both for household supply, agriculture and industrial needs. Understanding of groundwater resources and aquifer properties is also essential for sustainable exploitation, to avoid pollution and protect groundwater dependent ecosystems. Groundwater has in recent years increasingly been used in the Nordic countries as a heat source for heat pumps. Hydrogeologists are therefore studying thermal properties of aquifers just as the hydrological properties. Sustainable exploitation and protection of groundwater resources requires hydrgeological mapping and exploration, monitoring, pollution control, groundwater models and flow behaviour in porous and fractured media, GIS

applications, precise data, studies on groundwater quality and urban hydrogeology.

[ER 4] Ore deposits and fossil fuel
Conveners: Hjalti Franzson (hf@isor.is)
This session comprises presentations on ore and industrial mineral deposits and may concern individual deposits or prospects and describe their geological and tectonic features, metal content, isotopic signatures, genesis, exploration potential etc., or it may embrace whole belts and provinces simple or complex in terms of their ore types and geological evolution. We also welcome papers on the metallogeny with overviews of ore-forming processes and the geological evolution in space and time.

[ER 5] Petroleum provinces of the NE Atlantic region
Conveners: Thorarinn S. Arnarson (thorarinn.sveinn.arnarson@os.is) and Bjarni Richter (br@isor.is)
With the acceptance of peak oil and highly fluctuating prices and markets, the petroleum industries are facing increasing challenges to secure the resource demands at sustainable costs. It is accepted that oil and gas will continue to be our major energy source for many years. Our dependency on oil is unsustainable because the resources are limited and it cannot be regarded as being environmentally friendly. This session will address topics associated with Petroleum geosciences applied to present and future exploration and production by the Nordic countries. Which sources are available, how large are these resources, how can they be developed, and to which cost in terms of investment and influence on the environment. The Arctic region represents one of few remaining underexplored provinces with high hydrocarbon potential and the political and economic interest in the region also comprises its petroleum resources.

[ER:6] Environmental Impact and Challenges
Conveners: Magnus Olafsson (mo@isor.is) and Halldór Ármannsson (h@isor.is)
Exploitation of mineral and energy resources may lead to significant environmental impacts by disturbing terrestrial and marine ecosystems. Scientifically based assessments of the actual impact of past and current mining and energy operations relative to those of larger-scale geochemical processes are of vital importance in understanding their environmental impact and in predicting those of future activities. Public acceptance of mineral and energy industry and operations necessitates optimal utilization of resources and secure, sustainable management of waste. Other anthropogenic activities cause additional waste handling and pollution of soil, water and sediments. The environmental impact of geothermal exploitation has been debated in recent years, as have the effects of heat pumps on groundwater- and soil temperatures. This session deals with the wide spectrum of topics related to the exploitation of mineral and energy resources and the management of waste and pollution in geo-systems in general.

THEME 7: [SÞ] A tribute to Sigurður Þórarinsson

Organizer: Guðrún Larsen

[SÞ 1] Volcanic eruptions in historical records

Conveners: Bergrún A. Óladóttir (bergrun@hi.is) and Jan Mangerud (Jan.Mangerud@geo.uib.no)

Descriptions of volcanic activity in contemporary accounts and other historical records is a tool that Professor Thorarinsson utilized extensively in his studies on the eruption history in Iceland since the time of settlement in the late 9th Century and the impact these events had on the community and the environment in and outside of Iceland. In this regard, his work set the tone for multidisciplinary approach to research straddling the boundaries of volcanology, paleoclimateology, geography, history and archaeology. This session we invite contributions that exploit this useful linkage from multi- and uni-dimensional perspectives, whether aimed at improving the knowledge of the volcanism or applying volcanic records to enhance the understanding of other proxy archives.

[SÞ 2] Eruption types and styles in Iceland and long distance plume transport

Conveners: Ármann Höskuldsson (armh@hi.is) and Fred Prata (fred.prata@nilo.is)

As emphatically illustrated in the works of Professor Thorarinsson and his predecessors, an outstanding feature of Icelandic volcanism is its diversity, both in terms of eruption styles and environmental setting, with nearly all eruption types known on Earth are represented in the volcanic succession. On numerous occasions these eruption have produced far-reaching ash plumes and their effects have been felt well beyond Iceland. In this session we welcome contributions on all aspects concerning the nature of Icelandic eruptions and the atmospheric transport of erupted material.

[SÞ 3] Tephrochronology - on land, in ice, lakes and sea

Conveners: Esther R. Gudmundsdóttir (estherrg@raunvis.hi.is) and Stefan Wastegård (stefan.wastegard@geo.su.se)

Professor Thorarinsson – the father of tephrochronology – pioneered tephra studies in Iceland and its application as a chronological tool in Holocene soil profiles. As a utility, tephrochronology has expanded both in terms of its development and application. Currently it is one of the principal chronological tools used for dating and correlation of Holocene and late glacial proxy archives obtained from soils, peat, lake and marine sediments and ice cores. In this session we invite contributions dealing with all aspects of tephrochronology.

[SÞ 4] Volcanic pollution: its environmental and atmospheric effects

Conveners: Sigfús Johnsen (sigfus@nbi.ku.dk) and Evgenia Ilyinskaya (evgenia@vedur.is)

Volcanic pollution from Icelandic eruptions has impacted the atmosphere and the environment with significant socio-economic consequences on local to hemispheric scales. These impacts have been produced by explosive basaltic to rhyolitic eruptions as well as by large flood lava eruptions, as has been extensively recorded in ice core, paleoclimate proxy and historical accounts. We invite contributons dealing with all aspects of volcano-climate/environment interactions.

THEME 8: [Is] Interdisciplinary sessions

Organizer: Ívar Örn Benediktsson

[Is 1] Planetary geoscience (including e.g. Impact craters, Mars etc.)

Conveners: Henning Dypvik (henning.dypvik@geo.uio.no) and Elin Kalleson (elin.kalleson@geo.uio.no)

Planetary geosciences have gained increased interest also in the Nordic geosciences communities the last decades, not at least due to the activity of ESA. Multidisciplinary analyses of planetary objects, impact craters and meteorites give important results also for better understanding of the geological and biological development of the Earth, now partly included in the topics of Astrobiology. During this session we would like to address studies on Moon and Mars, as well as impact crater and related studies on Earth, along with topics of astrobiology. We welcome geoscientific papers, as wells as experimental studies, numerical modeling and contributions of biological character.

[Is 2] Developments in data aquisition, modeling and visualization

Conveners:

[Is 3] Earth history - stratigraphy and palaeontology

Conveners: Friðgeir Grímsson (fridgeir.grimsson@univie.ac.at)

This session is open to all contributions dealing with biostratigraphic, chronostratigraphic, lithostratigraphic, and magnetostratigraphic successions and the environmental changes associated with them. We also welcome presentations of research extracting chemical and/or biological information from stratigraphic units. Treatments of fossil floras and faunas, and detailed reports on particular fossil taxa/species, and their biogeographic histories, are also appreciated.

[Is 4] General contributions to geoscience

Conveners:

[WS] Workshops and short courses

Open for proposals