# Report from Bolin Centre Members on Achievements in 2015

This report summarizes responses by Members to a request in October 2015 to provide specific achievements in research, outreach and representation of science this year. No attempt has been made to seek out contributions but rather to summarize those submitted voluntarily. We believe that with practice each year before the Bolin Days this process will produce a report that captures a large portion of our accomplishments. In the contents publication titles have been used to list the papers. Elsewhere achievements are listed by researcher submitting the information. (use control click on Table of Content item to quickly move to it; use control z to return)

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[Robert Graham r.graham.1007@gmail.com Forskarfredag “Research Friday”(part of the European Researchers’ Night). 22](#_Toc435019239)

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[Rodrigo Caballero rodrigo@misu.su.se, Workshop on Storm Tracks 25](#_Toc435019261)

[Leonard Barrie Leonard.barrie@geo.su.se , Alasdair Skelton and Björn Gunnarson, Bolin Centre’s Summer School on Islay, Scotland, Isotopes in Climate and the Earth System, 23–29 August, 2015 26](#_Toc435019262)

[Örjan Gustafsson Orjan.Gustafsson@aces.su.se, American Geophysical Union (AGU) Fall/Nov. mtg. Convenor of session “Cryosphere-Carbon-Climate couplings in the East Siberian Arctic: past, present and future” (co-org by 4 sections) 26](#_Toc435019263)

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[Robert Graham <r.graham.1007@gmail.com> New position with the Alfered Wegener Institute, Potsdam, Germany, and Norwegian Polar Institute 26](#_Toc435019265)

[Meighan Boyd meighan.boyd@natgeo.su.se has a post-doctoral research associate position at Royal Holloway University of London on October 1st, 26](#_Toc435019266)

[Fabien Roquet roquet@misu.su.se appointed Docent in the Department of Meteorology SU 26](#_Toc435019267)

[Agatha de Boer <agatha.deboer@geo.su.se> elected to the Executive Committee of the International Association of the Physical Sciences of the Ocean (IAPSO) 26](#_Toc435019268)

[Malin Kylander malin.kylander@geo.su.se elected to the Executive Committee of the International Paleolimnology Association (IPA) 27](#_Toc435019269)

[Fredrik Charpentier Ljungqvist fredrik.c.l@historia.su.se Member of Scientific Steering Committee of Integrated History and Future of People on Earth (IHOPE) a project of Future Earth. 27](#_Toc435019270)

[Fredrik Charpentier Ljungqvist 27](#_Toc435019271)

[Caroline Leck is appointed, with the Vice-Chancellor of SU, to the Research Advisory Council to the Swedish Ministry of Higher Education and Research 27](#_Toc435019272)

[Gia Destouni was appointed Generalsekreterare för forskningsfinansiären Formas 28](#_Toc435019273)

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[Nina Kirchner nina.kirchner@natgeo.su.se, was appointed as Affiliate of the KTH (Royal Technical University) Centre of Naval Architecture 28](#_Toc435019276)

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## Reported Publications

Steffen, W., Richardson, K., Rockström, J., Cornell, S.E., Fetzer, I., Bennett, E.M., Biggs, R., Carpenter, S.R., de Vries, W., de Wit, C.A., Folke, C., Gerten, D., Heinke, J., Mace, G.M., Persson, L.M., Ramanathan, V., Reyers, B., Sörlin, S.,

### Planetary boundaries: Guiding human development on a changing planet

Science 347 (6223): 736, DOI:10.1126/science.1259855

The planetary boundaries framework defines a safe operating space for humanity based on the intrinsic biophysical processes that regulate the stability of the Earth System. Here we revise and update the planetary boundaries framework, with a focus on the underpinning biophysical science, based on targeted input from expert research communities and on more general scientific advances over the past five years. Several of the boundaries now have a two-tier approach, reflecting the importance of cross-scale interactions and the regional-level heterogeneity of the processes that underpin the boundaries. Two core boundaries – climate change and biosphere integrity – have been identified, each of which has the potential on its own to drive the Earth System into a new state should they be substantially and persistently transgressed.

Cynthia de Wit [Cynthia.deWit@aces.su.se](mailto:Cynthia.deWit@aces.su.se)

<http://www.sciencemag.org/content/347/6223/1259855.full.pdf?sid=9d89fa6e-2360-4aac-abd1-f72bd8dd6e11>

<http://www.sciencemag.org/content/suppl/2015/01/14/science.1259855.DC1/Steffen-SM.pdf>

Fabien Roquet [roquet@misu.su.se](mailto:roquet@misu.su.se)

In 2015, Fabien co-authored seven studies, including two as a first author.

Important contributions have been made on:

### Understanding of the seawater equation of state for determining the large-scale circulation

(Roquet et al. 2015a,b, Nycander et al. 2015). In particular, it was shown that the nonlinear nature of the equation of state is a fundamental aspect on the ocean circulation, yet a rather simple approximation of it could be devised which was validated with a numerical model. This approximation will be extremely useful in the future to gain understanding on the nonlinear effects of the equation of state as it is a much easier form to handle and analyse than the full empirical approximation of the seawater equation of state. Other work includes

### Study of the large-scale thermohaline circulation based on a simple thermohaline loop model,

two prominent studies on the relation between Southern elephant seal behaviour and their marine environment using instrumented seals, and a new study on

### The importance of geothermal heating during the Last Glacial Maximum period.

Nycander J., Hieronymus M., Roquet F., 2015. The nonlinear equation of state of sea water and the global water mass distribution. Geophysical Research Letters. doi: 10.1002/2015GL065525.

Roquet F., Madec G., Brodeau L., Nycander J., 2015. Defining a simplified yet “realistic” equation of state for seawater. Journal of Physical Oceanography. doi: 10.1175/JPO-D-15-0080.1.

Roquet F., Madec G., McDougall T. J. and Baker P., 2015. Accurate polynomial expressions for the density and specific volume of seawater using the TEOS-10 standard. Ocean modelling. doi: 10.1016/j.ocemod.2015.04.002

Pollmann F., Roquet F. and Madec G., 2015. Effects of the asymmetry between surface and interior flow on the dynamics of a thermohaline loop. Journal of Physical Oceanography. doi: 10.1175/JPO-D-15-0022.1.

Hindell M. A., McMahon C. R., Bester M. N., Boehme L., Costa D., Fedak M. A., Guinet C., Herraiz-Borreguero L., Harcourt R. G., Huckstadt L., Kovacs K. M., Lydersen C., McIntyre T., Muelbert M., Patterson T., Roquet F., Williams G. and Charrassin J.-B, 2015. Circumpolar habitat use in the southern elephant seal: implications for foraging success and population trajectories. Ecosphere. Accepted.

Labrousse S., Vacquié-Garcia J., Heerah K., Guinet C., Sallee J.-B., Authier M., Picard B., Roquet F., Bailleul F., Hindell M., Charrassin J.-B., 2015. Winter habitat use of southern elephant seals in the sea ice. Progress in Oceanography. Accepted.

Ballarotta M., Roquet F., Falahat S., Zhang Q., and Madec G., 2015. Impact of the oceanic geothermal heat flux on a glacial ocean state. Clim. Past Discuss., 11, 3597-3624.

Francesco S. R. Pausata, Leon Chafik, Rodrigo Caballero, and David S. Battisti,

Impacts of high-latitude volcanic eruptions on ENSO and AMOC,

Proceedings of the National Academy of Sciences of the USA

<http://www.pnas.org/content/early/2015/10/21/1509153112.full.pdf>

A study modelling the effects of high-latitude volcanic eruptions on climate finds that large summertime eruptions in the Northern Hemisphere could induce cooling and shift in atmospheric circulation patterns, generating an El Niño-like pattern during the first nine months after the event and changes in the Atlantic Meridional Overturning Circulation for several decades after the event.

Jessica E. Tierney, Francesco S.R. Pausata, and Peter deMenocal,

### Deglacial Indian monsoon failure and North Atlantic stadials linked by Indian Ocean surface cooling

Nature Geoscience: in press Nov 2015

The Indian monsoon, the largest monsoon system on Earth, responds to remote climatic forcings, including temperature changes in the North Atlantic. The monsoon was weak during two cool periods that punctuated the last deglaciation— Heinrich Stadial and the Younger Dryas. It has been suggested that sea surface cooling in the Indian Ocean was the critical link between these North Atlantic stadials and monsoon failure; however, based on existing proxy records it is unclear whether surface temperatures in the Indian Ocean and Arabian Sea dropped during these intervals. Here we compile new and existing temperature proxy data from the Arabian Sea, and find that surface temperatures cooled whereas subsurface temperatures warmed during both Heinrich Stadial and the Younger Dryas. Our analysis of model simulations shows that surface cooling weakens the monsoon winds and leads to de-stratification of the water column and substantial subsurface warming. We thus conclude that sea surface temperatures in the Indian Ocean are indeed the link between North Atlantic climate and the Indian monsoon strength.

Francesco Muschitiello, Francesco S.R. Pausata, Jenny Watson, Rienk Smittenberg, Abubakr Salih, Stephen Brooks, Nicki Whitehouse, Artemis Karlatou-Charalampopoulou, and Barbara Wohlfarth

Fennoscandian freshwater control on Greenland hydroclimate shifts at the onset of the Younger Dryas, Nature Communications, in press (coming out in about 10-14 days)

Sources and timing of freshwater forcing relative to major hydroclimate shifts recorded in Greenland ice cores at the onset of Younger Dryas (YD), ~12,800 years ago, remain speculative. Here we show that progressive Fennoscandian Ice Sheet (FIS) melting 13,100-12,880 years ago generated a hydroclimate dipole with drier-colder conditions in Northern Europe and wetter-warmer conditions in Greenland. FIS melting culminated 12,880 years ago synchronously with the start of Greenland Stadial 1 and a large-scale hydroclimate transition lasting ~180 years. Transient climate model simulations forced with FIS freshwater reproduce the initial hydroclimate dipole through sea-ice feedbacks in the Nordic Seas. The transition is attributed to the export of excess sea ice to the subpolar North Atlantic and a subsequent southward shift of the westerly winds. We suggest that North Atlantic hydroclimate sensitivity to FIS freshwater can explain pace and sign of shifts recorded in Greenland at the climate transition into the YD.

Jasechko, S., Lechler, A., Pausata, F. S. R., Fawcett, P. J., Gleeson, T., Cendón, D. I., Galewsky, J., LeGrande, A. N., Risi, C., Sharp, Z. D., Welker, J. M., Werner, M., and Yoshimura, K.:

### Late-glacial to late-Holocene shifts in global precipitation δ18O,

2015, Clim. Past, 11, 1375-1393.

Pausata, F. S. R., Grini, A., Caballero, R., Hannachi, A., and Seland, Ø.

### High-latitude volcanic eruptions in the Norwegian Earth System Model: the effect of different initial conditions and of the ensemble size,

2015, Tellus B, 67, 26728.

Pausata, F. S. R.:

### How Do High-Latitude Volcanic Eruptions Affect Climate?

AGU EOS, 2015, 96.

Pausata, F. S. R., Gaetani, M., Messori, G., Kloster, S., and Dentener, F. J.:

### **The role of aerosol in altering North Atlantic atmospheric circulation in winter and its impact on air-quality**,

Atmos. Chem. Phys., 2015, 1725-1743.

Anders Moberg [anders.moberg@natgeo.su.se](mailto:anders.moberg@natgeo.su.se)

Brugnara Y, Auchmann R, Brönnimann, Allan RJ, Auer I, Barriendos M, Bergström H, Bhend J, Brázdil R, Compo GP, Cornes RC, Dominguez-Castro F, van Engelen AFV, Filipiak J, Holopainen J, Jourdain S, Kunz M, Luterbacher J, Maugeri M, Mercalli L, Moberg A, Mock CJ, Pichard G, Řezníčková L, van der Schrier G, Slonosky V, Ustrnul Z, Valente MA, Wypych A, Yin X. 2015:

### A collection of sub-daily pressure and temperature observations for the early instrumental period with a focus on the “year without a summer” 1816.

Climate of the Past 11: 1027-1047, doi:10.5194/cp-11-1027-2015

Moberg A, Sundberg R, Grudd H, Hind A. 2015:

Statistical framework for evaluation of climate model simulations by use of climate proxy data from the last millennium – Part 3: Practical considerations, relaxed assumptions, and using tree-ring data to address the amplitude of solar forcing.

Climate of the Past 11: 425-448, doi:10.5194/cp-11-425-2015

Anders Moberg [anders.moberg@natgeo.su.se](mailto:anders.moberg@natgeo.su.se)

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Shakhova, N., I. Semiletov, V.Sergienko, L. Lobkovsky, Y. A. Salyuk, A. Salomatin, D. Chernykh, D. Kosmach, G. Panteleev, D. Nicolsky, V. Samarkin, S. Joye, A. Charkin, O. Dudarev, A. Meluzov and Ö. Gustafsson (2015)

The East Siberian Arctic Shelf: towards further assessment of permafrost-related methane fluxes and role of sea ice.

Trans. R. Soc. A, 373, 20140451. http://dx.doi.org/10.1098/rsta.2014.0451

Winiger, P. , A. Andersson, K. E. Yttri, P. Tunved, and Ö. Gustafsson (2015)

Isotope-Based Source Apportionment of EC Aerosol Particles during Winter High-Pollution Events at the Zeppelin Observatory, Svalbard.

Environ. Sci. Technol., 49, 11959−11966. DOI: 10.1021/acs.est.5b02644.

This is the first top-down source determination of greenhouse soot aerosols in the Arctic with the 13C / 14C isotope diagnostics. ACSE / BolinC PhD in cooperation between the two SU teams and Norwegian colleagues.

Robert M. Graham, Agatha M. De Boer, Erik van Sebille, Karen E. Kohfeld, Christian Schlosser

### Inferring source regions and supply mechanisms of iron in the Southern Ocean from satellite chlorophyll data

Journal: Deep Sea Research Part I

<http://www.sciencedirect.com/science/article/pii/S096706371500103X>

Primary productivity is limited by the availability of iron over large areas of the global ocean. Changes in the supply of iron to these regions could have major impacts on primary productivity and the carbon cycle. However, source regions and supply mechanisms of iron to the global oceans remain poorly constrained. Shelf sediments are considered one of the largest sources of dissolved iron to the global ocean, and a large shelf sediment iron flux is prescribed in many biogeochemical models over all areas of bathymetry shallower than 1000 m. Here, we infer the likely location of shelf sediment iron sources in the Southern Ocean, by identifying where satellite chlorophyll concentrations are enhanced over shallow bathymetry (<1000 m). ……….These analyses support the hypothesis that bioavailable iron from continental shelves is entrained into western boundary currents, and advected into the Sub-Antarctic Zone along the Dynamical Subtropical Front. Our results indicate that upwelling at fronts in the open ocean is unlikely to deliver iron to the ocean surface from deep sources. Finally, we hypothesise how a reduction in sea level may have altered the distribution of shelf sediment iron sources in the Southern Ocean and increased export production over the Sub-Antarctic Zone during glacial intervals.

Hendrickx, K., L. Megner, J. Gumbel, D. E. Siskind, Y. J. Orsolini, H. Nesse Tyssøy, and M. Hervig (2015),

Observation of 27 day solar cycles in the production and mesospheric descent of EPP-produced NO

J. Geophys. Res. Space Physics, 120, doi:10.1002/2015JA021441. <http://onlinelibrary.wiley.com/doi/10.1002/2015JA021441/full>

Nitric oxide (NO) is produced by energetic particle precipitation (EPP) in the mesosphere-lower thermosphere (MLT) region, and during the polar winter, NO can descend to stratospheric altitudes where it destroys ozone. In this paper, we study the general scenario, as opposed to a case study, of NO production in the thermosphere due to energetic particles in the auroral region.

G. Messori and R. Caballero,

On Double Rossby Wave Breaking in the North Atlantic

JGR Atmosphere Accepted manuscript online: 21 October 2015

Discuss the dynamical features associated with double Rossby wave breaking (DWB, concurrent cyclonic and anticyclonic breakings) over the North Atlantic, with a focus on the North Atlantic Oscillation (NAO), the mid-latitude jet stream and surface wind extremes over continental Europe. Objective automated algorithms for detecting wave breaking and determining the location, intensity and direction of the jet are adopted. The analysis is performed on the European Centre for Medium-Range Weather Forecasts ERA-Interim reanalysis and the Max Planck Institute Earth System Model (MPI-ESM). We find that DWB events can project onto both phases of the NAO, albeit showing no strong preference for either. Wave breaking pairs occurring in the northern North Atlantic project onto the positive NAO, while the opposite holds for pairs occurring further south. DWB also affects the direction and intensity of the jet stream. Events in the eastern half of the basin (EWB) intensify and zonalise the jet, while events further to the west (WWB) weaken the westerly flow over Europe. An analysis of destructive wind storms over Europe in the last three decades suggests that these are typically associated with a very intense, zonal jet – similar to the case of EWB. Indeed, EWB corresponds to an enhanced likelihood of destructive windstorms over the continent, although there is not a one-to-one correspondence. The MPI-ESM model does not capture this statistical relationship. On the contrary, WWB corresponds to a decreased likelihood of destructive weather.

Link: <http://onlinelibrary.wiley.com/doi/10.1002/2015JD023854/abstract>

Fredrik Charpentier Ljungqvist [fredrik.c.l@historia.su.se](mailto:fredrik.c.l@historia.su.se)

Xu, C., Chen, B.J.W., Abades, S., Luís, R., Teng, S., Ljungqvist, F.C., Huang, Z. Y.X., and Liu, M. 2015

Macroecological factors explain large-scale spatial population patterns of ancient agriculturalists.

Global Ecology and Biogeography, 24: 1030–1039.

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### Tree-Ring Amplification of the Early Nineteenth-Century Summer Cooling in Central Europe.

Journal of Climate, 28: 5272–5288.

Anna C. Fitch, 2015:

### Climate Impacts of Large-Scale Wind Farms as Parameterized in a Global Climate Model.

J. Climate, 28, 6160–6180.

doi: http://dx.doi.org/10.1175/JCLI-D-14-00245.1

Anna Fitch [anna.fitch@smhi.se](mailto:anna.fitch@smhi.se)

Wind turbines in large wind farms cause only slight changes in temperature, cloud and rainfall in the region of the wind farms. Globally, the change is negligible. Therefore, there should not be any fear that the operation of wind farms increases climate change.This conclusion was reached by researcher Anna Fitch in a study of wind farm impacts on regional and global climate. With a climate model, Fitch has studied how the climate is affected if wind farms covering 16, 65 or 130 percent of the expected global electricity demand in 2050 were built.

Mentioned in a news article from SMHI:

<http://www.smhi.se/en/research/research-news/wind-farms-have-negligible-impact-on-climate-1.90405>

and by the WMO:

<https://www.wmo.int/media/content/wind-farms-have-negligible-impact-climate>

Steve Lyon [steve.lyon@natgeo.su.se](mailto:steve.lyon@natgeo.su.se) :

Sjöberg, Y., P. Marklund, R. Pettersson, S. W. Lyon (2015)

Geophysical mapping of palsa peatland permafrost, The Cryosphere, 9, 465-478.

Jantze, E.J., H. Laudon, H.E., Dahlke, S.W. Lyon (2015),

Spatial variability of dissolved organic and inorganic carbon in sub-arctic headwater streams. Arctic, Antarctic, and Alpine Research, 47(3), 529-546.

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Malin Kylander [malin.kylander@geo.su.se](mailto:malin.kylander@geo.su.se)

Karl Ljunga, Sofia Holmgrena, Malin Kylander, Jesper Sjoltea, Nathalie Van der Puttena, Masa Kageyamac, Charles T. Porterd, 1, Svante Björcka,

### **The Last Termination in the central South Atlantic Quaternary Science Reviews**,

Volume 123, 1 September 2015, Pages 193–214

Lake sediments and peat deposits from two basins on Nightingale Island (37°S), in the Tristan da Cunha archipelago, South Atlantic, have been analyzed. The studies were focused on the time period 16.2–10.0 cal ka BP, determined by 36 14C dates from the two sequences. A wide variety of proxies were used, including pollen and diatom analyzes, biogenic silica content, C and N analyzes, stable isotopes (13C and 15N), elemental concentrations and magnetic susceptibility measurements, to detect environmental changes that can be related to shifts of the circulation belts of the Southern Ocean. In addition, climate model simulations were carried out. We find that the sediments are underlain by a >2 cal ka BP long hiatus, possibly representing a dried-out lake bed. The climate simulations corroborate that the area might have been exposed to arid conditions as a consequence of the Heinrich 1 event in the north and a southward displacement of the ITCZ. The development on the island after 16.2 cal ka BP is determined by the position of the Subtropical Front (STF) and the Southern Hemisphere Westerlies (SHW). The period 16.2–14.75 cal ka BP was characterized by varying influence from SHW and with STF situated south of Tristan da Cunha, ending with a humidity peak and cooler conditions. The stable conditions 14.7–14.1 cal ka BP with cool and fairly arid conditions imply that STF and SHW were both north of the islands during the first part of the Antarctic Cold Reversal. The most unstable period, 14.1–12.7 cal ka BP, indicates incessant latitudinal shifts of the zonal circulation, perhaps related to climate variability in the Northern Hemisphere and bipolar seesaw mechanisms as the strength of the Atlantic Meridional Overturning Circulation (AMOC) varied. At 12.7 cal ka BP the Holocene warming began with a gradually drier and warmer climate as a result of a dampened AMOC during the Younger Dryas cooling in the north with ITCZ, STF and SHW being displaced southwards. Peak warming seems to have occurred in the earliest part of the Holocene, but this period was also characterized by humidity shifts, possibly an effect of retraction and expansion phases of SHW during AMOC variations in the north.

Link: <http://www.sciencedirect.com/science/article/pii/S0277379115300421>

Malin Kylander malin.kylander@geo.su.se

Karin F. Helmensa, J. Sakari Salonenb, Anna Plikka, Stefan Engelsc, Minna Välirantad, Malin Kylandere, Jo Brendryenf, Hans Rensseng,

Major cooling intersecting peak Eemian Interglacial warmth in northern Europe, Quaternary Science Reviews Volume 122, 15 August 2015, Pages 293–299

The degree of climate instability on the continent during the warmer-than-present Eemian Interglacial (around ca. 123 kyr ago) remains unsolved. Recently published high-resolution proxy data from the North Atlantic Ocean suggest that the Eemian was punctuated by abrupt events with reductions in North Atlantic Deep Water formation accompanied by sea-surface temperature cooling. Here we present multi-proxy data at an unprecedented resolution that reveals a major cooling event intersecting peak Eemian warmth on the North European continent. Two independent temperature reconstructions based on terrestrial plants and chironomids indicate a summer cooling of the order of 2–4 °C. The cooling event started abruptly, had a step-wise recovery, and lasted 500–1000 yr. Our results demonstrate that the common view of relatively stable interglacial climate conditions on the continent should be revised, and that perturbations in the North Atlantic oceanic circulation under warmer-than-present interglacial conditions may also lead to abrupt and dramatic changes on the adjacent continent.

<http://www.sciencedirect.com/science/article/pii/S0277379115002231>

Richard Gyllencreutz <Richard.Gyllencreutz@geo.su.se> Stokes, C. R., Tarasov, L., Blomdin, R., Cronin, T. M., Fisher, T. G., Gyllencreutz, R., Hättestrand, C., Heyman, J., Hindmarsh, R. C. A., Hughes, A. L. C., Jakobsson, M., Kirchner, N., Livingstone, S. J., Margold, M., Murton, J. B., Noormets, R., Peltier, W. R., Peteet, D. M., Piper, D. J. W., Preusser, F., Renssen, H., Roberts, D. H., Roche, D. M., Saint-Ange, F., Stroeven, A. P., and Teller, J. T., 2015,

On the reconstruction of palaeo-ice sheets: Recent advances and future challenges: Quaternary Science Reviews, v. 125, p. 15-49.

Reconstructing the growth and decay of palaeo-ice sheets is critical to understanding mechanisms of global climate change and associated sea-level fluctuations in the past, present and future. The significance of palaeo-ice sheets is further underlined by the broad range of disciplines concerned with reconstructing their behaviour, many of which have undergone a rapid expansion since the 1980s. In particular, there has been a major increase in the size and qualitative diversity of empirical data used to reconstruct and date ice sheets, and major improvements in our ability to simulate their dynamics in numerical ice sheet models. These developments have made it increasingly necessary to forge interdisciplinary links between sub-disciplines and to link numerical modelling with observations and dating of proxy records. The aim of this paper is to evaluate recent developments in the methods used to reconstruct ice sheets and outline some key challenges that remain, with an emphasis on how future work might integrate terrestrial and marine evidence together with numerical modelling. Our focus is on pan-ice sheet reconstructions of the last deglaciation, but regional case studies are used to illustrate methodological achievements, challenges and opportunities. Whilst various disciplines have made important progress in our understanding of ice-sheet dynamics, it is clear that data-model integration remains under-used, and that uncertainties remain poorly quantified in both empirically-based and numerical ice-sheet reconstructions. The representation of past climate will continue to be the largest source of uncertainty for numerical modelling. As such, palaeo-observations are critical to constrain and validate modelling. State-of-the-art numerical models will continue to improve both in model resolution and in the breadth of inclusion of relevant processes, thereby enabling more accurate and more direct comparison with the increasing range of palaeo-observations. Thus, the capability is developing to use all relevant palaeo-records to more strongly constrain deglacial (and to a lesser extent pre-LGM) ice sheet evolution. In working towards that goal, the accurate representation of uncertainties is required for both constraint data and model outputs. Close cooperation between modelling and data-gathering communities is essential to ensure this capability is realised and continues to progress.

Richard Gyllencreutz <Richard.Gyllencreutz@geo.su.se>

Hughes, A.L.C., Gyllencreutz, R., Lohne, Ø.S., Mangerud, J., Svendsen, J.I. (2015)

The last Eurasian Ice Sheets - a chronological database and time-slice reconstruction, DATED-1. Boreas. doi:10.1111/bor.12142 in press

We present a new time-slice reconstruction of the Eurasian ice sheets (British–Irish, Svalbard–Barents–Kara Seas and Scandinavian) documenting the spatial evolution of these interconnected ice sheets every 1000 years from 25 to 10 ka, and at four selected time periods back to 40 ka. The time-slice maps of ice-sheet extent are based on a new Geographical Information System (GIS) database, where we have collected published numerical dates constraining the timing of ice-sheet advance and retreat, and additionally geomorphological and geological evidence contained within the existing literature. We integrate all uncertainty estimates into three ice-margin lines for each time-slice; a most-credible line, derived from our assessment of all available evidence, with bounding maximum and minimum limits allowed by existing data. This approach was motivated by the demands of glaciological, isostatic and climate modelling and to clearly display limitations in knowledge. The timing of advance and retreat were both remarkably spatially variable across the ice-sheet area. According to our compilation the westernmost limit along the British–Irish and Norwegian continental shelf was reached up to 7000 years earlier (at c. 27–26 ka) than the eastern limit on the Russian Plain (at c. 20–19 ka). The Eurasian ice sheet complex as a whole attained its maximum extent (5.5 Mkm2) and volume (~24 m Sea Level Equivalent) at c. 21 ka. Our continental-scale approach highlights instances of conflicting evidence and gaps in the ice-sheet chronology where uncertainties remain large and should be a focus for future research. Largest uncertainties coincide with locations presently below sea level and where contradicting evidence exists. This first version of the database and time-slices (DATED-1) has a census date of 1 January 2013 and both are available to download via the Bjerknes Climate Data Centre and PANGAEA (www.bcdc.no; http://doi.pangaea.de/10.1594/PANGAEA.848117).

Open access link: <http://onlinelibrary.wiley.com/doi/10.1111/bor.12142/abstract>

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Löwemark, L., Chao, W. -S., Gyllencreutz, R., Hanebuth, T. J. J., Chiu, P. Y., Yang, T. -N., Su, C. -C., Chuang, C. -K., León Dominguez, D. C., Jakobsson, M., In press.

Variations in glacial and interglacial marine conditions over the last two glacial cycles off northern Greenland, Quaternary Science Reviews, Available online 31 October 2015, ISSN 0277-3791, http://dx.doi.org/10.1016/j.quascirev.2015.10.035.

Five sediment cores from the Lomonosov Ridge and the Morris Jesup Rise north of Greenland show the history of sea-ice coverage and primary productivity over the last two glacial cycles. Variations in Manganese content, benthic and planktonic foraminifera, bioturbation, and trace fossil diversity are interpreted to reflect differences in sea-ice cover and sediment depositional conditions between the identified interglacials. Marine Isotope Stage (MIS) 1 and MIS 2 are represented by thin (<<5 cm) sediment units while the preceding interglacial MIS 5 and glacial MIS 6 are characterized by thick (10–20 cm) deposits. Foraminiferal abundances and bioturbation suggest that MIS 1 was generally characterized by severe sea-ice conditions north of Greenland while MIS 5 appears to have been considerably warmer with more open water, higher primary productivity, and higher sedimentation rates. Strengthened flow of Atlantic water along the northern continental shelf of Greenland rather than development of local polynyas is here suggested as a likely cause for the relatively warmer marine conditions during MIS 5 compared to MIS 1. The cores also suggest distinct differences between the glacial intervals MIS 2 and MIS 6. While MIS 6 is distinguished by a relatively thick sediment unit poor in foraminifera and with low Mn values, MIS 2 is practically missing. We speculate that this could be the effect from a paleocrystic sea-ice cover north of Greenland during MIS 2 that prevented sediment delivery from sea ice and icebergs. In contrast, the thick sequence deposited during MIS 6 indicates a longer glacial period with dynamic intervals characterized by huge drifting icebergs delivering ice rafted debris (IRD). A drastic shift from thinner sedimentary cycles where interglacial sediment parameters indicate more severe sea-ice conditions gave way to larger amplitude cycles with more open water indicators was observed around the boundary between MIS 7/8. This shift is in agreement with a sedimentary regime shift previously identified in the Eurasian Basin and may be an indicator for the growth of larger ice sheets on the Eurasian landmass during the penultimate glacial period.

<http://www.sciencedirect.com/science/article/pii/S0277379115301566>

M. Bilde et al., many many authors

Saturation vapor pressures and transition enthalpies of low-volatility organic molecules of atmospheric relevance: from dicarboxylic acids to complex mixtures, Chemical Reviews, 2015, 115, 4115-4156

This is a comprehensive review and overview of the thermodynamic properties of low-volatility atmospheric organic acids.

<http://pubs.acs.org/doi/pdf/10.1021/cr5005502>

Ilona Riipinen [ilona.riipinen@aces.su.se](mailto:ilona.riipinen@aces.su.se)

Ernest Chi Fru, Emma Arvestål, Nolwenn Callac, Abderrazak El Albani, Stephanos Kilias, Ariadne Argyraki, Martin Jakobsson,

### Arsenic stress after the Proterozoic glaciations,

Nature Scientific Reports (in press)

Link: XXXXXXX

Protection against arsenic damage in organisms positioned deep in the tree of life points to early evolutionary sensitization. Here, marine sedimentary records reveal a Proterozoic arsenic concentration patterned to glacial-interglacial ages. The low glacial and high interglacial sedimentary arsenic concentrations, suggest deteriorating habitable marine conditions may have coincided with atmospheric oxygen decline after ~2.1 billion years ago. A similar intensification of near continental margin sedimentary arsenic levels after the Cryogenian glaciations is also associated with amplified continental weathering. However, interpreted atmospheric oxygen increase at this time, suggests that the marine biosphere had widely adapted to the reorganization of global marine elemental cycles by glaciations. Such a glacially induced biogeochemical bridge would have produced physiologically robust communities that enabled increased oxygenation of the ocean-atmosphere system and the radiation of the complex Ediacaran-Cambrian life.

Ernest Chi Fru, Christoffer Hemmingsson, Mikaela Holm, Beverly Chiu, Enrique Pacheco Iñiguez,

### Arsenic-induced phosphate limitation under experimental Early Proterozoic oceanic conditions

Relevance of this paper is related to the impact of phosphorus in the draw down of CO2 through primary productivity in the Precambrian oceans, 2015, Earth and Planetary Science Letters (in press)

Link: XXXXXXX

Comparison of phosphorus concentrations associated with modern hydrothermal Fe(III)(oxyhydr)oxides and ancient Fe(III) oxide-rich iron formations, is used to estimate bioavailable Precambrian marine phosphorus (P) concentrations. This led to the proposition of a low dissolved P budget of ~10-25% of present-day levels, before ~1.9 billion years ago. Estimates incorporating ancient marine Si levels ≥0.67 mM instead suggested global dissolved P levels greater than today. Here we unite current experimental models that have considered NaCl solutions containing elevated dissolved Fe(II), Si, Ca2+ and Mg2+ ions in the incorporation of P in Precambrian marine Fe(III)(oxyhydr)oxides, in addition to arsenic as a hydrothermal proxy. We show that the coprecipitation of dissolved P and Fe(III)(oxyhydr)oxides from arsenic-rich marine waters produces an average P distribution coefficient of ~0.072 (±0.01) μM–1. This is comparable to the ~0.07 μM–1 predicted for Fe(III)(oxyhydr)oxides in modern arsenic-rich, submarine hydrothermal settings, from which the lower Early Proterozoic dissolved marine P concentrations were predicted. As/P molar ratios below modern seawater ratios removed the negative feedback effect high Si impose on P scavenging by Fe(III)(oxyhydr)oxides. The binding of As(III) to Fe(III)(oxyhydr)oxides exhibits a lower competitive influence on P fixation. As(V) that likely became prominent in the surficially oxidized Early Proterozoic oceans induced dissolved P limitation because of preferential P sequestration at the expense of dissolved As(V) enrichment. The control of As on P scavenging by the precipitating Fe(III)(oxyhydr)oxides is strong regardless of common seawater cations (Mg2+ and Ca2+). The data suggest that the application of Si and Fe(III)(oxyhydr)oxides as an ancient seawater P proxy should consider chemical variability between depositional basins, taking into account the rather strong role hydrothermal arsenic has on the distribution of P in Fe(III)(oxyhydr)oxides. We propose that the generalized lower dissolved P budgets estimated from Early Proterozoic iron formations are consistent with oceans thought to be at least 3-4 times more hydrothermally active than at present.

Hilton, R. G., Galy, V., Gaillardet, J., Dellinger, M., Bryant, C., O'Regan, M., Grocke, D. R., Coxall, H., Bouchez, J., and Calmels, D.,

Erosion of organic carbon in the Arctic as a geological carbon dioxide sink, Nature, Nature 524, 84–87 (06 August 2015) doi:10.1038/nature14653

<http://www.nature.com/nature/journal/v524/n7563/full/nature14653.html>

Helen Coxall and Matt O’Regan contributed to this fantastic Canadian led study on Arctic carbon cycling.

Soils of the northern high latitudes store carbon over millennial timescales (thousands of years) and contain approximately double the carbon stock of the atmosphere1, 2, 3. Warming and associated permafrost thaw can expose soil organic carbon and result in mineralization and carbon dioxide (CO2) release4, 5, 6. However, some of this soil organic carbon may be eroded and transferred to rivers7, 8, 9. If it escapes degradation during river transport and is buried in marine sediments, then it can contribute to a longer-term (more than ten thousand years), geological CO2 sink8, 9, 10. Despite this recognition, the erosional flux and fate of particulate organic carbon (POC) in large rivers at high latitudes remains poorly constrained. Here, we quantify the source of POC in the Mackenzie River, the main sediment supplier to the Arctic Ocean11, 12, and assess its flux and fate. We combine measurements of radiocarbon, stable carbon isotopes and element ratios to correct for rock-derived POC10, 13, 14. Our samples reveal that the eroded biospheric POC has resided in the basin for millennia, with a mean radiocarbon age of 5,800 ± 800 years, much older than the POC in large tropical rivers13, 14. From the measured biospheric POC content and variability in annual sediment yield15, we calculate a biospheric POC flux of teragrams of carbon per year from the Mackenzie River, which is three times the CO2 drawdown by silicate weathering in this basin16. Offshore, we find evidence for efficient terrestrial organic carbon burial over the Holocene period, suggesting that erosion of organic carbon-rich, high-latitude soils may result in an important geological CO2 sink.

Reghellin, D., H. K. Coxall, G. R. Dickens, and J. Backman,

Carbon and oxygen isotopes of bulk carbonate in sediment deposited beneath the eastern equatorial Pacific over the last 8 million years. (2015), Paleoceanography, 30, doi:10.1002/ 2015PA002825.

Reghellin, Coxall and Backman are RA6 members.

To improve the understanding and utility of bulk carbonate stable carbon and oxygen isotope measurements, we examine sediment from cores in the Eastern Equatorial Pacific (EEP) that span the last 8 Ma. We measured δ13C and δ18O in 791 samples from IODP Site U1338 and DSDP Site 573, both located close to the Pacific Equator. In 100 samples, we measured δ13C and δ18O on isolated <63 µm and <38 µm fractions, which concentrates calcareous nannofossil carbonate and progressively excludes foraminiferal carbonate. Bulk carbonate δ13C and δ18O records are similar to published records from other sites drilled near the Equator and seem to reflect mixed layer conditions, albeit with some important caveats involving the precipitation of calcite by coccolithophores. The comparatively lower δ13C and δ18O of the <63 µm and <38 µm fractions in sediments younger than 4.4 Ma is attributed to an increase in deep-dwelling planktic foraminifera material in bulk carbonate, shifting the bulk isotopic signals towards higher values. Bulk carbonate δ13C is similar over 2500 km along the Pacific Equator, suggesting co-varying concentrations and δ13C of DIC within surface waters since 8 Ma. Greater bulk sediment δ13C and δ18O, higher sedimentation rates, and low content of coarse material suggest intensified wind-driven upwelling and enhanced primary productivity along the Pacific Equator between 8.0 and 4.4 Ma, although a full understanding of bulk carbonate records will require extensive future work.

Steinthorsdottir, M., Porter, A., Holohan, A., Kunzmann, L., Collinson, M., and McElwain, J.C.,.

Fossil plant stomata indicate decreasing atmospheric CO2 prior to the Eocene-Oligocene boundary. 2015, Climate of the Past, 4985-5019.

In this article we present a new and sought-after CO2 reconstruction of high resolution, spanning the mid to latest late Eocene, as well as the earliest Oligocene and late Oligocene. A fundamental shift in global climate occurred at the Eocene-Oliogocene boundary, but the role of CO2 is not well understood. Most datasets derive from marine isotopes, which are subject to potentially obscuring taphonomic filters. Terrestrial datasets have been marred by a prevalent gap across the Eocene-Oliogocene boundary, that we plug here for he first time. Our manuscript reports that ~40% decrease in pCO2 preceded the large characteristic shift in marine oxygen isotope records. The results endorse the theory that pCO2 drawdown was the main forcer of the Eocene-Oligocene climate change, and a ‘tipping point’ was reached in the latest Eocene, triggering the plunge of the Earth System into icehouse conditions. Under open access review and discussion

## Books and Book Chapters

Chen D, Walther A, Moberg A, Jones P, Jacobeit J, Lister D. 2015:

### European Trend Atlas of Extreme Temperature and Precipitation Records.

Springer, Dordrecht, Netherlands: 178 pp, 2258 illus. in colour. doi:10.1007/978-94-017-9312-4.

The BACC II Author Team (31 lead authors and 116 contributing authors including Moberg A). 2015:

### Second Assessment of Climate Change for the Baltic Sea Basin.

Springer Open, 501 pp. (Chapter 4: Recent Change – Atmosphere, by: Rutgersson et al., p. 69-98). doi:10.1007/978-3-319-16006-1.

## Science Review/Assessment Contributions

Arvid Bring and Johanna Mård and a group of other non-SU researchers co-chaired the work of the

### **Arctic Freshwater Synthesis (AFS) Assessment**

see info at <http://www.climate-cryosphere.org/activities/targeted/afs> ),

AFS is a science integration project initiated by the WCRP Climate and Cryosphere project and co-sponsored by the International Arctic Science Committee (IASC) and the Arctic Council’s Arctic Monitoring and Assessment Programme (AMAP). The overall goal of the AFS has been to synthesize our current scientific understanding of Arctic freshwater sources, fluxes, storage and effects, with the project structured around 5 major components: atmosphere, ocean, terrestrial hydrology, terrestrial ecology, and resources.

The project is intended to result in a special issue of JGR Biogeosciences, with papers currently in review, or in some cases, already accepted or published. The introduction and summary papers are available at:

http://onlinelibrary.wiley.com/doi/10.1002/2015JG003127/full

http://onlinelibrary.wiley.com/doi/10.1002/2015JG003128/full

Arvid Bring <arvid.bring@natgeo.su.se>

The AFS authors will also continue to work with AMAP, IASC and CliC to produce a layman's report intended for a broader audience.

M. Bilde et al., many many authors

Saturation vapor pressures and transition enthalpies of low-volatility organic molecules of atmospheric relevance: from dicarboxylic acids to complex mixtures, Chemical Reviews, 2015, 115, 4115-4156

This is a comprehensive review and overview of the thermodynamic properties of low-volatility atmospheric organic acids.

http://pubs.acs.org/doi/pdf/10.1021/cr5005502

Ilona Riipinen [ilona.riipinen@aces.su.se](mailto:ilona.riipinen@aces.su.se)

Steffen, W., Richardson, K., Rockström, J., Cornell, S.E., Fetzer, I., Bennett, E.M., Biggs, R., Carpenter, S.R., de Vries, W., de Wit, C.A., Folke, C., Gerten, D., Heinke, J., Mace, G.M., Persson, L.M., Ramanathan, V., Reyers, B., Sörlin, S.,

### Planetary boundaries: Guiding human development on a changing planet

Science 347 (6223): 736, DOI:10.1126/science.1259855

The planetary boundaries framework defines a safe operating space for humanity based on the intrinsic biophysical processes that regulate the stability of the Earth System. Here we revise and update the planetary boundaries framework, with a focus on the underpinning biophysical science, based on targeted input from expert research communities and on more general scientific advances over the past five years. Several of the boundaries now have a two-tier approach, reflecting the importance of cross-scale interactions and the regional-level heterogeneity of the processes that underpin the boundaries. Two core boundaries – climate change and biosphere integrity – have been identified, each of which has the potential on its own to drive the Earth System into a new state should they be substantially and persistently transgressed.

Cynthia de Wit [Cynthia.deWit@aces.su.se](mailto:Cynthia.deWit@aces.su.se)

<http://www.sciencemag.org/content/347/6223/1259855.full.pdf?sid=9d89fa6e-2360-4aac-abd1-f72bd8dd6e11>

<http://www.sciencemag.org/content/suppl/2015/01/14/science.1259855.DC1/Steffen-SM.pdf>

## Successful Grants Applications

### Britta Sannel [britta.sannel@natgeo.su.se](mailto:britta.sannel@natgeo.su.se) Title: Thawing permafrost in subarctic peat plateaus - impacts of climate change

Under future warmer conditions ice in perennially frozen peatlands can melt, causing ground collapse and formation of thermokarst lakes. These landscape changes are of importance since they can have a significant effect on hydrology, greenhouse gas exchange and leaching of organic carbon from these carbon-rich environments. In this project a wide range of methods will be used to study and link closely connected aspects of permafrost and the carbon-climate feedback in a subarctic peat plateau complex in Tavvavuoma, northern Sweden. To develop a baseline quantification of the current landscape conditions, mapping of thermo-erosion features, current surface hydrology and permafrost distribution within the peat plateau complex will be performed using satellite images and airborne laser scanning. To identify key physical processes and critical thresholds driving the evolution of landscape changes analyses of ground temperature and meteorological data, and modeling of permafrost and hydrology will be conducted. Finally, analyses of soil organic carbon quantity and quality, and greenhouse gas fluxes from thermokarst lakes will be carried out to facilitate quantification of potential future carbon pool losses. The results of this project will increase our knowledge of landscape dynamics in subarctic peat plateau complexes and help us understand how permafrost peatlands will respond to future climate change, and what impact this could have on water cycling and the carbon balance.

Funding agent: The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (grant #214 - 2014-562)

Sum and duration: 3410000 SEK, 2015-01-01 - 2018-12-31

### Örjan Gustafsson <Orjan.Gustafsson@aces.su.se Source apportionment of Black Carbon (BC) aerosols in Bangladesh

VR Development Grant

### Steve Lyon [steve.lyon@natgeo.su.se](mailto:steve.lyon@natgeo.su.se) Two Grants on water resources SIDA and SSSEES

1. Linking Public-Private Partnership to Secure Sustainable Water Resources Management in the Kilombero-River Basin, Swedish International Development Agency - SIDA, S.W. Lyon (PI), J. Nobert (UDSM), (7.9M SEK) 2015-2020.
2. Ensuring disaster risk reduction via sustainable wetland development in Zambia, S.W Lyon (PI), and R. Lindborg, SSEESS, (90k SEK) 2015.

### Malin Kylander [malin.kylander@geo.su.se](mailto:malin.kylander@geo.su.se) Reconstructing Past Mineral Dust Deposition and Effective Humidity Variations in Southern Africa

This project reconstructs past changes in mineral dust deposition (rates and sources) and effective humidity (precipitation minus evaporation) during the late Pleistocene and the Holocene in southern Africa. Although southern Africa is one of four major dust source regions worldwide, not a single continuous, terrestrial paleorecord of dust deposition exists. We fill this knowledge gap through the novel use of peat as an archive of dust deposition paired with bog surface wetness proxies which, like dust deposition, are largely controlled by effective humidity. In linking these two types of records at sites across the seasonally controlled rain zones we can better understand climate dynamics in one of the most climate change vulnerable regions on Earth.

Funding agent: Swedish Secretariat for Environmental Earth System Sciences

Sum and duration: 78 kSEK, 1 year

Link: sseess.org

### Francesco Pausata [francesco.pausata@misu.su.se](mailto:francesco.pausata@misu.su.se) Impacts of regional nuclear wars on climate

The aim of the project is to better understand the impact on Earth’s climate of a regional nuclear conflict, investigating the role played by the assumptions made in previous works. We want to further examine the processes by which the black carbon reaches the stratosphere and which processes are involved. We aim to address the following questions:

· How is the climate affected by the temporal extent of the release of black carbon in the aftermath of a nuclear conflict? Higher concentrations of black carbon imply stronger heating and a faster self-lofting into the stratosphere, which might reduce the amount of rainout. We therefore want to investigate to what extent the amount of black carbon reaching the stratosphere is affected by whether all black carbon is released at once or during several days or weeks.

· How does the season of the emission influence the residence height of black carbon? The wet deposition of black carbon may be important for the final black carbon residence height and amount left in the stratosphere/mesosphere, especially when the emission takes place over an extended period of time. It is therefore interesting to investigate the impact of the season in which the nuclear detonation occurs. Furthermore, the season will also have a large impact on the atmospheric circulation, particularly in a monsoon region such as India and Pakistan, which in turn may affect the lofting of soot particles.

· How does the assumed release height impact the amount of black carbon that reaches the stratosphere?

· How are the results affected if a fraction of the emitted particles consists of organic carbon? Organic carbon has a lower absorptivity of solar radiation than black carbon. This might imply less heating and a weaker convection if the emitted particles are composed of both organic and black carbon.

· How does the particle size affect their residence time in the atmosphere?

To achieve these objectives we will use a coupled atmospheric-ocean-chemistry Norwegian Earth System Model (NorESM1-M, Kirkevåg2013). NorESM is a state-of-the-art global climate model with advanced chemistry-aerosol-cloud-radiation interaction schemes. We will perform short model simulations (1 year), as that allows for extensive sensitivity experiment

Funding agent: Svenska läkare mot kärnvapen Sum and duration: 4 months of post-doc salary Accepted at the end of 2014

### Alasdair Skelton, alasdair.skelton@geo.su.se Climate in the Gymnasium (i.e. High School)

Grant awarded: 437,000 SEK

The idea of the project application is to increase understanding of climate related processes in upper-secondary students by providing research-based field work within the framework of school work. Through these projects the minds of high school students strengthened on climate change. Moreover, links between universities and secondary school to be strengthened. The field work will be led by researchers from the Bert Bolin Centre for Climate Research. The aim is that the project will be a högskoleför-preparatory projects within secondary schools. The scientific questions that the students will work with are as yet unanswered and therefore requires the collection of data in the field through observations and measurements with subsequent analyzes.

### Ilona Riipinen, [ilona.riipinen@aces.su.se](mailto:ilona.riipinen@aces.su.se) Novel approaches for quantifying land-use change impacts on air quality and climate

We will develop novel approaches for describing the impacts of ammonia, amines and biogenic organic compounds on atmospheric aerosol loadings and effects in air quality and climate models, resulting in improved assessment of the consequences of different land-use policies. In particular, we will focus on the effect of these compounds on atmospheric ultrafine (<100 nm) aerosol numbers, as well as their interactions with common inorganic compounds from industrial activities (e.g. sulfuric acid, H2SO4). To achieve this, we will use a combine well-defined laboratory experiments conducted as part of the CLOUD experiment in CERN with regional and global scale atmospheric modeling. The participation in CLOUD ensures extremely high-quality laboratory data to develop the fundamental understanding of molecular processes governing ultrafine praticle concentrations. The large-scale models, on the other hand, are the only tools to generalize this understanding and utilize it for improved support for e.g. policymakers. Funding agent: FORMAS, Sum and duration: about 3 MSEK for 3 years

### Helen Coxall helen.coxall@geo.su.se; co-proponent. PI = Prof. P. Pearson, Cardiff. Tanzanian Onshore Paleogene Integrated Coring (TOPIC)

TOPIC consortium involving participants from numerous universities in the UK, USA, Sweden, Norway, Ireland, Netherlands, Australia, Germany, India, Belgium and Canada, and industrial partners in Tanzania.

P.N. Pearson (UK), W. Hudson, (Tanzania), M. Berke (USA), N. Boniface (Tanzania), F. Boscolo Galazzo (Italy), G. Bowen (USA), P. Bown (USA), H.K. Coxall (Sweden), T. Dunkley Jones (UK), H. Dypvik (Norway), S. Feakins (USA), G. Foster (UK), B.T. Huber (USA), M. Huber (USA), C. Kaaya (Tanzania), M. Kagya (Tanzania), A. Karega (Tanzania), C. Koeberl (Austria), M. Leng (UK), K. MacLeod (USA), I. Marobhe (Tanzania), S. Manya (Tanzania), C.J. Nicholas (Ireland), R.D. Pancost (UK), R.J. Parkes (UK), J. Pross (Germany), W. Renema (Netherlands), A.P. Roberts (Australia), U. Roehl (Germany), P. Saraswati (India), P. Stassen (Belgium), E. Thomas (USA), B.S. Wade (UK), T. Westerhold (Germany), U. Wortmann (Canada)

Abstract:

This is a full drilling proposal to recover 1000-1200 m cores of hemipelagic mudstone spanning the Eocene from the Kilwa Group of coastal Tanzania. Previous work on outcrops and shallow cores at this site has revealed remarkably well-preserved records of tropical climate and biodiversity and has produced a very high-quality but highly discontinuous record of Eocene climate. The proposal seeks to drill new cores to provide a continuous section spanning the entire Eocene to address important questions about climate and biodiversity, most notably questions of the Earth’s climate sensitivity to atmospheric greenhouse gas forcing during the most recent ‘hothouse’ when atmospheric CO2 concentrations were several times present levels. The core would also produce new records of marine and terrestrial biotic responses to extreme temperatures during this time period and enable development of a tropical Eocene ‘reference section’ through application of cyclostratigraphic, magnetostratigraphic, and biostratigraphic tools. Secondary objectives of the proposal include research into the deep biosphere, and in particular the nature of the microbial ecosystems living at depth in relatively impermeable uplifted marine sedimentary sections, and meteorite impact history during the Eocene.

Funding agent: International Continental Drilling Program (ICDP)

Sum and duration: US$1.0, Funding reserved, conditional on consortium securing own contribution.

Link: movie link: https://vimeo.com/107911777 (promo film funded by RA6 in 2014!)

Outreach / Media events

### Stefan Wastegård <stefan.wastegard@geo.su.se paleoclimate research grant from the Swedish Research Council for a 4 year project that aims to get a better understanding of rapid climate changes in the past and to compare climate signals preserved in different high-resolution climate archives in the North Atlantic region.

Time-synchronous tephra markers will be used to line up palaeoclimate records and we will contribute with precisely linked palaeoclimate records which allow testing hypotheses regarding synchronous or non-synchronous responses to climate forcing. The Vedde Ash (c. 12.1 ka BP) was recently identified in a varve sequence from eastern Sweden and we will use this extremely useful marker and other tephra isochrons to align our climate archives, including the Greenland ice cores and annually resolved European lake records. The project will be carried out in collaboration with scientists from Södertörn University College, GFZ Potsdam, Germany and two UK universities, Royal Holloway, University of London and Swansea University.

http://www.natgeo.su.se/english/new-grant-to-stefan-wasteg%C3%A5rd-from-the-swedish-research-council-1.254656

## Expeditions

### Örjan Gustafsson <Orjan.Gustafsson@aces.su.se> Participating and leading efforts at strategically-located atmospheric observatories in India and China regions

These are located both in megacity source regions of S Asia (Delhi and Dhaka) and E Asia (Beijing, Shanghai, Guangzho, Chegdu) and in seasonally downwind receptor locations; such as the Maldives Climate Observatory – Hanimaadhoo (MCOH; Gustafsson serves as Director of MCOH International Science Team), Korea Climate Observatory – Gosan (KCOG), and several observatories in the Tibetan-Himalaya plateau operated by colleageus of the Chinese Academy of Sciences.

### Fabien Roquet <roquet@misu.su.se> deployment campaigns Baltic Sea and Kerguelen Islands (Southern Indian Ocean) attaching oceanographic tags to seals.

In November 2015, four oceanographic tags will be deployed on grey seals in the Southern Baltic as part of a pilot project aiming at observing at-sea behavior of Baltic grey seals and getting fine-scale oceanographic data (temperature and salinity as a function of depth) along their way. This data should help us assess what kind of fish population Baltic grey seals target, and also provide us with new information on the oceanographic distribution of seawater properties in the strategic area at the entrance of the Baltic Sea. The project is led by Fabien Roquet (MISU) and Olle Karlsson (NRM), and funded by the BEAM project (Baltic Ecosystem Adaptive Management).

In December 2015, I will participate in this campaign. A dozen oceanographic tags will be attached to Southern elephant seals. These tags will then allow us to follow the animals at sea and to obtain temperature and salinity data measured during their foraging dives. This campaign is part of an on-going observing program (MEOP: Marine Mammals Exploring the Oceans Pole to pole, see meop.net) to which I am an important contributor.

### Malin Kylander <malin.kylander@geo.su.se > Reconstructing Past Mineral Dust Deposition and Effective Humidity Variations in Southern Africa

Short description: Fieldwork was carried out in Lesotho and in South Africa to collect organic sequences in the start up phase of this project.

Participants: Malin Kylander, Jenny Sjöström, Caroline Bringensparr, Dr Jemma Finch, Professor Trevor Hill and Professor Stefan Grab

When: May 2015

Where: Lesotho and South Africa

Outcome: Several sites were vetted in Lesotho. Two sequences were collected and are currently being analyzed by Masters student Caroline Bringensparr. Preliminary dating of these previously unstudied spring fed deposits shows over 2000 years of peat accumulation is preserved in the records. Another visited site from the South African midlands is also under study by Masters student Gabriel Norén. This sequence is over 12,000 years old and together with Dr. Elin Norstöm we are complimenting previously made pollen analyses with inorganic geochemistry and biomarker analysis. Since the fieldwork we have written two larger proposals that are awaiting decision.

Link: <http://people.geo.su.se/malin/research.htm>

### Martin Jakobsson [martin.jakobsson@geo.su.se](mailto:martin.jakobsson@geo.su.se) Petermann Expedition 2015, Multidisciplinary expedition to investigate the long and near term dynamics of the Peterman Glacier system

Participants: Martin Jakbosson (IGV), 58 scientists from 6 countries including the British Antarctic Survey

Co Chiefs: Alan Mix, Oregon State University and Martin Jakobosson IGV, with Ice Breaker Oden

When: July 30 -Sept 3 20105, Petermann Fjord/Glacier NW Greenland

Outcome: Extensive geological and geophysical data sets documenting the dynamics of the Petermann Glacier during on long and show times scales, i.e.: multibeam bathymetry data, 60 sediment cores, and seismic data that reveal glacial dynamics through the distribution of submarine glacial land forms. In addition CTD data at oceanographic stations, drilling through the ice shelf and sampling sub glacial ice-shelf environments –BAAS.

### Matt O’Regan, matt.oregan@geo.su.se Transitions in the Arctic Seasonal Ice Zone (TRANSSIZ)

Short description: Polar Stern research cruise

Cruise proposal co-proponent and PI for the Geology program: Matt O’Regan (IGV)

When: May–June, 2015

Where: Yermak Plateau and West Spitsbergen Margin, Arctic Ocean

Purpose: The TRANSSIZ cruise was developed as a joint proposal between the executive committee members on the Arctic in Rapid Transition (www.iarc.uaf.edu/ART) and colleagues from the Alfred Wegner Research Institute (AWI) in Germany. The overall aim of the expedition was to conduct ecological and biogeochemical studies on winter-spring transitions in the European Arctic Ocean. These studies will complement summer datasets and advance biogeochemical process studies and modeling, calibrate remote sensing algorithms and improve paleo proxies for interpreting past sea ice and ocean circulation changes. The geology program on TRANSSIZ was developed to calibrate and test different sedimentary proxies for sea ice and ocean circulation; establish how they are preserved in the sedimentary records; and use the results to improve Arctic paleoceanographic and paleoenvironmental reconstructions during the last one to two glacial cycles. Specific research aims were to: A) Improve paleo-reconstructions by calibrating, comparing and validating established and emerging proxies for sea ice and water mass properties, B) Decipher the history and properties of Atlantic Water inflow during the last 2 glacial cycles (200 kyr), specifically during periods of potentially reduced sea ice extent in the central Arctic Ocean, C) Reconstruct changes in vertical stratification across the last 2 glacial cycles and its relation to changes in sea ice extent, and D) Investigate the response of planktic and benthic ecosystems to changes in AW inflow and sea ice during interglacial and interstadial periods in the late Quaternary.

Outcome: A successful, international and interdisciplinary expedition resulting in recovery of numerous sediment cores, water column and sea ice observational data and samples and geophysical data. The cruise involved significant graduate student involvement. Analyses of the geologic samples has begun, with Masters and PhD students involved in this work at Uppsala/Stockholm University, The University of Taiwan, Newcastle University, Cardiff University, Bremen University, and AWI.

## Outreach / Media events

### Sara Broomé sara.broome@misu.su.se Forskarfredag “Research Friday”(part of the European Researchers’ Night).

Demonstrated using experiments with water tanks to explain parts of the atmosphere and ocean (the whole group) and participation on stage in “Meet three scientists” to explain what a scientist does and why we love doing it

Where: Medborgarhuset (Medborgarplatsen) Stockholm

When: Sept 25 2015

Participants: Sara Broomé, Malin Ödalen, Filippa Fransner, Maartje Kuilman, Cecilia Wesslén

Audience: Young students ages 15-18

Link: http://forskarfredag.se/

### Robert Graham [r.graham.1007@gmail.com](mailto:r.graham.1007@gmail.com) Forskarfredag “Research Friday”(part of the European Researchers’ Night).

Where: Stockholms Universitetet

When: 7 - 8 October, 2015

Participants: Gymnasium level students

Link: Finding Ocean Currents using satellites in space

### Robert Graham [r.graham.1007@gmail.com](mailto:r.graham.1007@gmail.com) Primary school presentation/lesson - Observing the weather in extreme environments

Where: Cornton Primary School, Stirling, Scotland.

When: 6 October, 2015

Participants: Class of 6 to 8 year olds

### Robert Graham [r.graham.1007@gmail.com](mailto:r.graham.1007@gmail.com) Bolin Days for Schools

Where: Stockholm University

When: May 2015

Participants: Primary school children

### Meighan Boyd [meighan.boyd@natgeo.su.se](mailto:meighan.boyd@natgeo.su.se) Bolin Days for Schools

It really was fun and educational, I had a fantastic time!

Where: Naturvetenskapens Hus

When: May 2015

Participants: All the coolest Bolin people!

Audience: School kids between 9-13 I think

### Malin Ödalen malin.odalen@misu.su.se, Bolin Days for Schools, 2015

“It was a great experience to get to talk about our planet and see how interested these kids were in hearing about it. They wanted to learn everything!!

### Malin Kylander [malin.kylander@geo.su.se](mailto:malin.kylander@geo.su.se) Bolin Days for Schools and beyond

What: Beyond Bolin Dagar I also had the blog for kids: "Goop and Time Travel in southern Africa"

Audience: elementary school kids

Link: http://bolin.su.se/index.php/bolin-blogs

### Fabien Roquet <roquet@misu.su.se> Marine Mammals Exploring the Oceans Pole to Pole: MEOP

* Following the successful launch in June 2015 of the MEOP ([www.meop.net](http://www.meop.net) ) website describing the project and distributing the associated seal-derived hydrographic database MEOP-CTD, a large number of media have reported on our work. Amongst the journals that wrote an article on the MEOP project, are the Guardian and BBC news in the UK, the French journal Le Monde, Libe, and Le Figaro, The Washington Post in the USA.
* In Sweden, I was interviewed in the radio program Vetenskapsradion on Sverigesradio, and we got a short notice on the Svenska Dagbladet.

### Richard Gyllencreutz [Richard.Gyllencreutz@geo.su.se](mailto:Richard.Gyllencreutz@geo.su.se) Lectures and fieldwork on marine geology and piston coring at the Askö Laboratory for grade 9 and 12 pupils in collaboration with teachers with a Licentiate degree in geology/marine geology. Topic: The Baltic sea history and present state.

* Lecture on earthquakes (focus on Nepal) for grade 9-12 pupils during ForskarFredag at Debaser Medis (part of EU commission’s Researchers’ Night)
* Lecture on glaciers and ice ages for 4th grade pupils in Vinstaskolan, Stockholm
* Participated in “Levande frågelådan”, a science panel answering questions from 5th grade pupils in Aula Magna.

### Ilona Riipinen, [ilona.riipinen@aces.su.se](mailto:ilona.riipinen@aces.su.se), Deep tricks, a collaborative performance combining dance, performance and atmospheric science

* Where: Kiasma, the Finnish Museum for Contemporary Art, Helsinki, Finland
* When: October 16th 2015
* Participants: Rea-Liina Brunou (coreographer, dancer, performance artist) and Ilona Riipinen
* Audience: General audience Link: <http://teatterinyt.fi/Puheet>

### Ilona Riipinen, [ilona.riipinen@aces.su.se](mailto:ilona.riipinen@aces.su.se),How health is the key to climate action, a 15-min talk by Ilona Riipinen at the TEDxSSE event

* Where: Stockholm School of Economics, Stockholm, Sweden
* When: April 23rd, 2015
* Participants: Ilona Riipinen
* Audience: TEDx audience (a couple of hundred bought tickets) + online video audience (> 1300 views by October 2015)
* Link: <https://www.youtube.com/watch?v=2YN9OH5fOr0>

### Ilona Riipinen, [ilona.riipinen@aces.su.se](mailto:ilona.riipinen@aces.su.se), A 15-min performance at the Think, Helsinki, think! -event

* Where: The main hall of University of Helsinki, Helsinki, Finland
* When: September 4th, 2015
* Participants: Ilona Riipinen
* Audience: (a couple of hundred bought tickets)
* Link: <https://www.thinkhelsinkithink.com/>

### Nina Kirchner [nina.kirchner@natgeo.su.se](mailto:nina.kirchner@natgeo.su.se), Interview with Sveriges Radio on the dynamics of the Larsen B ice shelf,

Where: P1, Studio, Stockholm When: 20 maj kl 11.01 Link: <http://sverigesradio.se/sida/artikel.aspx?programid=1637&artikel=6169429>

## Awards / Honours

### Henning Rodhe receives the 2015 Volvo Environment Prize

One of the most respected international awards in Environment and Sustainability Science this year goes to one of three original founders of the Bolin Centre: <http://www.environment-prize.com>

### Robert Graham [r.graham.1007@gmail.com](mailto:r.graham.1007@gmail.com) receives Högskoleföreningens pris for his PhD thesis för framstående vetenskaplig prestation 2014.

<http://www.su.se/medarbetare/personal/n%C3%A4tverk-f%C3%B6reningar/h%C3%B6gskolef%C3%B6reningen/h%C3%B6gskolef%C3%B6reningen-bel%C3%B6nar-de-mest-framst%C3%A5ende-avhandlingarna-1.238062>

### Per Holmlund awarded a research prize from Åforsk

For his in in depth research and knowledge of the ice sheets melting

His next planned expeditions are to Spitsbergen and West Antarctica.

[www.science.su.se/om-oss/nyheter/per-holmlund-f%C3%A5r-%C3%A5rets-kunskapspris-1.225585](http://www.science.su.se/om-oss/nyheter/per-holmlund-f%C3%A5r-%C3%A5rets-kunskapspris-1.225585)

### Ilona Riipinen, [ilona.riipinen@aces.su.se](mailto:ilona.riipinen@aces.su.se) International Union for Geodesy and Geophysics (IUGG) Early Career Scientist award

* For outstanding research and international cooperation in Earth and space sciences
* Link: <http://www.iugg2015prague.com/iugg-awards.htm>

## Invited Presentations

### Örjan Gustafsson [Orjan.Gustafsson@aces.su.se](mailto:Orjan.Gustafsson@aces.su.se) four invited presentations

* Gordon Research Conference in Polar Marine Science (Castelvecchio Pascoli, Italy) Apr 2015, Invited Platform
* The 2015 Hallim Lecture on “Fine Air Particles”, KAST (Korean Academy of Science and Technology) (Seoul, Sept. 2015)
* OECD Ministerial Meeting Invited by Korean Minister for Science, and Technology to give platform presentation on “Climate and Environment” (Daejon, Oct.. 2015)
* Univ California San Diego (UCSD, Dept Chem), UCSD-Scripps Inst of Oceanography, Peking University, Chinese Academy of Sciences Institute for Cryospheric Research, Seoul National University, Korea University, Asian Institute of Technology (Bangkok)

### Ilona Riipinen, ilona.riipinen@aces.su.se four invited presentations

* Keynote presentation at the Goldschmidt conference in Prague, August 2015: Interactions of atmospheric organic aerosol constituents with inorganic molecules and water
* Keynote presentation at the IUGG conference in Prague, June 2015: Atmospheric organic aerosol particles: Interplay of natural sources and anthropogenic influences
* Invited presentation at the American Chemical Society fall meeting in Boston, August 2015: Atmospheric fate and effects of organic aerosol constituents: Interplay of natural sources and anthropogenic influences
* Invited speech at the 10th anniversary of Nordforsk: Ten years of Nordic added value – a perspective of an atmospheric scientist

## Organization of Scientific Meeting/Conference

### Johan Nilsson [nilsson@misu.su.se](mailto:nilsson@misu.su.se), Rodrigo Caballero and David Battisti organize Bolin Centre workshop at Stockholm university ''The Atlantic Meridional Overturning Circulation (AMOC) in a Global Perspective’’ September 8-10, 2015

Many invited high-profile international experts speakers

* David Battisti: "Why is the Northern Hemisphere deep sinking in the North Atlantic:

a review of proposed mechanisms."

* Tapio Schneider: "The atmospheric hydrologic cycle: Observations and mechanisms."
* David Ferreira: "Ocean freshwater transports: the observational basis.”
* David Marshall: “A decade of monitoring the AMOC: an overview of the RAPID programme and some new results on attributing observed AMOC variability.”
* Jerry McManus: "Paleo-perspective on the AMOC." Sybren Drijfhout: "Does the AMOC possess a stable off-state in the coupled ocean-atmosphere system?"
* Paola Cessi: "Size matters: another reason why the Atlantic is saltier than the Pacific."
* Agatha de Boer: "Atlantic dominance of the Meridional Overturning Circulation."
* Joe Lacasce: "The three dimensional thermally-driven circulation, in idealized and realistic geometry." Arnaud Czaja: "Air-sea interactions and the thermohaline circulation."
* Tapio Schneider: "Controls on the zonal asymmetry of net precipitation and ocean freshwater forcing."
* David Marshall: "A simple model of eddy saturation of the ACC and implications for the AMOC.” Jerry McManus: "The role of AMOC in abrupt climate change.”
* Fabien Roquet: "Analyzing the AMOC with a 1-dimensional thermohaline loop: on the oscillatory route to overturning collapse."
* Aitor Campino: "The Mediterranean outflow and time-variability of the AMOC."
* Jonas Nycander: “The nonlinear equation of state of sea water and the global water mass distribution.”

### Rodrigo Caballero [rodrigo@misu.su.se](mailto:rodrigo@misu.su.se), Workshop on Storm Tracks

in 24-28 August 2015 Grindelwald, Switzerland, Bolin Centre co-organized with WCRP/SPARC will result in a review paper in Nature Geoscience

Storm tracks and jets, together with their modes of variability, affect the regional distribution of precipitation, temperature, and wind in the mid-latitudes of both hemispheres. One of the most pressing questions regarding the impacts of climate change concerns how storm tracks will change. While comprehensive climate models predict a poleward shift of the zonal-mean mid-latitude westerlies in response to global warming, observational evidence is mixed, and such a shift does not necessarily occur regionally, particularly in the Northern Hemisphere. The purpose of the workshop was to review recent advances on the dynamics of storm tracks, jets and their modes of variability and to address key questions related to the regional response to climate change. The workshop focused on areas of research in which recent progress has been notable, along with emerging themes: characterization of storm track response to climate change, model hierarchies of the storm tracks, model biases, low-frequency variability, coupling to the cryosphere, ocean, stratosphere and tropics, coupling with moisture and clouds and connection to extreme events.

Invited speakers:

Edmund Chang, Clara Deser, Ed Gerber, Kevin Grise, Brian Hoskins, Yohai Kaspi, Sukyoung Lee, Jian Lu, Olivia Martius, Alan Plumb, Tapio Schneider, Len Shaffrey, Ted Shepherd, Dave Thompson, Tim Woollings <http://www.sparc-climate.org/meetings/Sparc-grindelwaldworkshop-aug2015>

### Leonard Barrie [Leonard.barrie@geo.su.se](mailto:Leonard.barrie@geo.su.se) , Alasdair Skelton and Björn Gunnarson, Bolin Centre’s Summer School on Islay, Scotland, Isotopes in Climate and the Earth System, 23–29 August, 2015

Isotopes are the basis of many powerful tools for understanding climate and the Earth system. They offer insight into climate variability at tectonic, orbital, millennial and historical timescales and help us to unravel complex processes. At the School PhD students learned about isotopes in biogeochemical cycles of climatically active substances such as water, carbon compounds and aerosols. Other topics were the use of isotopes in reconstructing the state of the past climate and in studying Earth system processes. An important part were lectures describing how isotopes are measured in various media. It was five days total: four days with morning and late afternoon lectures allowing time for afternoon field trips and one day field excursion. The sites of interest included raised shorelines, glaciated landscapes, peatlands, machair, Neoproterozoic glacial deposits and stromatolite-bearing cap carbonates ( which have been cited as evidence for near global Snowball Earth glaciations).

Participants: International lecturers and 30 PhD students: 15 from Sweden and 15 from range of European countries.

<http://www.bolin.su.se/index.php/summer-schools/summer-school-2015>

### Örjan Gustafsson [Orjan.Gustafsson@aces.su.se](mailto:Orjan.Gustafsson@aces.su.se), American Geophysical Union (AGU) Fall/Nov. mtg. Convenor of session “Cryosphere-Carbon-Climate couplings in the East Siberian Arctic: past, present and future” (co-org by 4 sections)

## Nominations/Transitions/Appointments

### Robert Graham <r.graham.1007@gmail.com> New position with the Alfered Wegener Institute, Potsdam, Germany, and Norwegian Polar Institute

Postdoctoral Scientist, Climate Modelling, Part of the Norwegian Young Sea Ice project.

### Meighan Boyd [meighan.boyd@natgeo.su.se](mailto:meighan.boyd@natgeo.su.se) has a post-doctoral research associate position at Royal Holloway University of London on October 1st,

I'll be spending the next 3 years working on making a stacked record of terrestrial climate and environmental change from over 20 speleothems (stalagmites and flowstones) from the rock of Gibraltar caves. Hope everything is going well in Stockholm! I'll be back and doing my "spikning" on the 16th of November,2015! The Bolin Centre has been a huge help in my research!

### Fabien Roquet [roquet@misu.su.se](mailto:roquet@misu.su.se) appointed Docent in the Department of Meteorology SU

October 2015 was appointed

### Agatha de Boer <agatha.deboer@geo.su.se> elected to the Executive Committee of the International Association of the Physical Sciences of the Ocean (IAPSO)

It is a 4 year appointment.

### Malin Kylander [malin.kylander@geo.su.se](mailto:malin.kylander@geo.su.se) elected to the Executive Committee of the International Paleolimnology Association (IPA)

The next meeting of the IPA, the International Paleolimnology Symposium will be held in Stockholm in 2018 and she is co-chair of this meeting along with colleagues in Umeå (Prof Richard Bindler) and Lund (Prof Dan Hammarlund).

Link: <http://paleolim.org>

### Fredrik Charpentier Ljungqvist [fredrik.c.l@historia.su.se](mailto:fredrik.c.l@historia.su.se) Member of Scientific Steering Committee of Integrated History and Future of People on Earth (IHOPE) a project of Future Earth.

<http://www.futureearth.org/projects/ihope-integrated-history-and-future-people-earth>

Fredrik Charpentier Ljungqvist [fredrik.c.l@historia.su.se](mailto:fredrik.c.l@historia.su.se) Core team member of the Past Global Changes (PAGES) Euro/Med2k working group of Future Earth.

<http://www.futureearth.org/projects/pages-past-global-changes>

### Caroline Leck is appointed, with the Vice-Chancellor of SU, to the Research Advisory Council to the Swedish Ministry of Higher Education and Research

Caroline, a Bolin Centre Member, states that: *“I hope to be a good ambassador for climate research, in general and in the Arctic, and for future needs of research funding in dialogue with the research community. It is also important that we push for better career opportunities for young researchers.”*

<http://www.regeringen.se/pressmeddelanden/2015/04/regeringen-utser-forskningsberedning/>

This will be a forum for Helene Hellmark Knutsson, Minister of Higher Education and Research, to discuss the research policy priorities with which the government will move forward. If Sweden is to be a leading research nation, it is crucial for our future development. Swedish research and innovation policies should strengthen Swedish business and meet our national and global societal challenges. The minister states that: “*I look forward to share the experience and knowledge as a research preparation will contribute to the work of the next research bill.”* The Research Advisory Council's main task in 2015 and 2016 will be to discuss the design of the proposals and priorities referred to be the government's research bill autumn in 2016.

The committee consists of

Chair- Helene Hellmark Knutsson, Minister of Higher Education and Research

Members:

* Mikael Alexandersson, Dean of Halmstad University and Professor of Education and Professor of Education at the University of Gothenburg
* Bertil Andersson, president of Nanyang Technological University and Professor of Biochemistry at the University of Stockholm
* Mats Benner, Professor of Research Policy at Lund University
* Kristina Edström, professor of inorganic chemistry at Uppsala University
* Moa Ekbom, PhD at the Department of Linguistics and Philology at Uppsala University
* Bjorn Halleröd, professor of sociology at the University of Gothenburg
* Sigbritt Karlsson, Vice-Chancellor of the University of Skövde and professor of polymer technology at KTH
* Caroline Leck, Professor of Meteorology at Stockholm University
* Kerstin Lindblad-Toh, professor of comparative genetics at Uppsala University
* Björn O Nilsson, President of the Royal Swedish Academy of Engineering Sciences and biochemist from KTH
* Staffan Normark, Permanent Secretary at the Royal Academy. Sciences, Professor of Molecular Microbiology at Umeå University and Washington University, Professor of Clinical Bacteriology, Karolinska Institute
* Ingalill Rahm Hallberg, Professor of Health Sciences at the University of Lund
* Sylvia Schwaag serger, PhD in economic history at the London School of Economics
* Henry Smith, Professor of Animal Ecology at Lund University
* Christian Stråhlman, a doctoral student at the MAX IV Laboratory
* Astrid Soderbergh Widding, Rector of Stockholm University and Professor of Film Studies
* Sverker Sörlin , professor in the Department of Historical Studies at KT

### Gia Destouni was appointed Generalsekreterare för forskningsfinansiären Formas

<http://iahs.info/About-IAHS/Officers.do>

Gia Destouni has been elected as a Fellow of the American Geophysical Union (AGU)

<https://eos.org/agu-news/2015-class-of-agu-fellows-announced>

<http://www.su.se/om-oss/press-media-nyheter/nyheter/georgia-destouni-vald-till-internationella-poster-1.243713>

### Ilona Riipinen, [ilona.riipinen@aces.su.se](mailto:ilona.riipinen@aces.su.se) is an active leader in eight science bodies:

1. Organisation: SITES Title: Board member Link: http://www.fieldsites.se/en/
2. International Aerosol Modelling Algorithms conference Title: Conference chair,

https://sites.google.com/site/iama2015conference/home

1. American Association for Aerosol Research Title: Director, Link: https://www.aaar.org/
2. Nordic Society for Aerosol Research, Title: Board member www.nosa-aerosol.org/
3. Vetenskapsrådet, Title: Proposal evaluation panel member, NT-8
4. European Commission, Title: Expert evaluator, Marie Sklodowska Curie actions
5. Kungliga Vetenskapsakademin, AMBIO, Title: Associate editor
6. European Geosciences Union, Atmospheric Chemistry and Physics, Editor

### Nina Kirchner [nina.kirchner@natgeo.su.se](mailto:nina.kirchner@natgeo.su.se), was appointed as Affiliate of the KTH (Royal Technical University) Centre of Naval Architecture

Role: Strengthen cross-disciplinary national collaboration focusing on underwater technology, and aiming at application of new technology such as autonomous underwater vehicles in ice covered oceans, in order to enhance knowledge about the marine cryosphere

Why: In the wake of the Wallenberg grant where I was co-applicant (funded in 2014), when we commission building of an AUV. KTH develops small AUVs, this is where collaboration started.

### Matt O’Regan, matt.oregan@geo.su.se Recruited to serve on the International Ocean Discovery Program (IODP) Science Evaluation Panel (SEP)

Role: Evaluate incoming new deep sea drilling proposals, including many concerned with palaeoclimate. Why: Wealth of experience of deep sea drilling

## Interesting Miscellaneous Activities

### Lindsey Higgins [lindsey.higgins@natgeo.su.se](mailto:lindsey.higgins@natgeo.su.se) attending the United Nations Framework Convention on Climate Change (UNFCCC) in Paris as an observer for the American Association of Geographers

In December 2015, Lindsey will be attending the United Nations Framework Convention on Climate Change (UNFCCC) in Paris as an observer for the American Association of Geographers. Her task is to observe and report back on the second week of talks. She is planning on giving a presentation on the experience after the winter holidays for anyone interested.