SVALGLAC-AUSTRIA activity report 2012

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The activities were mostly based on the national project (FWF, grant I 369 B17) and cooperation with partners in Norway and Sweden. Work content concerns field work, data analysis and simulations and is strongly focussed on energy and mass balance at Kongsvegen glacier as proposed. The key activities in those fields during 2012 were:

Field work (09 -23 April 2012):

- maintenance of 5 automatic weather stations at Kongsvegen (AWS)
- reduce Kongsvegen AWS network leaving 2 stations
- set up remaining AWS at Kronebreen, M. Lovenbreen and A. Broggerbreen
- clean up abandoned measurement sites to comply with SSF regulations
- return equipment not used any more
- assist NP snow and mass balance work Kongsvegen

The field conditions were more difficult compared to previous years, but the stations mostly withstanded and data were successfully recovered. Snow investigations were performed in limited extend. The current set up of Kongsfjorden AWSs is a common effort of IMGI and NP and is registered under RIS-ID 2203. The SvalGlac AWS metadata information was accordingly updated (http://imgi.uibk.ac.at/node/618).

Data analysis

- reanalysis of pre-SvalGlac AWS data (Kongsvegen AWS6 and Ny-Alesund 2000 to 2010)
- analyses of data gathered within SvalGlac focussed on:
  - analysis of AWS data to investigate the meteorological conditions and the energy and the mass balance along the glacier Kongsvegen
  - analysis of turbulence characteristics in the Kongsfjorden environment (cooperation with AWI, Bremerhaven)
  - investigation of snow characteristics (cooperation with SLF and LGGE)
  - contribution to RCM validation studies (cooperation with University Uppsala)
  - Contribution to development of a new surface mass balance model (cooperation with IMAU, Utrecht)

Modelling

Some of the above mentioned contributions are related to atmospheric modelling, in context of RCM validation mainly

- major efforts concern the application of energy and mass balance models to study the interaction of snow and ice with the atmosphere
- main output so far is based on modelling the mass and energy balance at a site close to the ELA of Kongsvegen glacier during the last decade. Current work focuses on

estimation of the inherent uncertainties, interpolation of the meteorological fields and evaluation of the spatial characteristics of snow structure.

Publications

F. Karner, F. Obleitner, Th. Krismer, J. Kohler, W. Greuell 2012: A decade of energy and mass balance investigations on the glacier Kongsvegen, Svalbard, in review at JGR-Atmospheres

B. Claremar, F. Obleitner, C. Reijmer, et al., "Applying a Mesoscale Atmospheric Model to Svalbard Glaciers," Advances in Meteorology, vol. 2012, Article ID 321649, 22 pages, 2012. doi:10.1155/2012/321649, http://www.hindawi.com/journals/amet/2012/321649/

G. Jocher, F. Karner, Ch. Ritter, F. Obleitner et al., "The Near-Surface Small-Scale Spatial and Temporal Variability of Sensible and Latent Heat Exchange in the Svalbard Region: A Case Study," ISRN Meteorology, vol. 2012, Article ID 357925, 14 pages, 2012. doi:10.5402/2012/357925, http://www.isrn.com/journals/meteorology/2012/357925/

Cntributions to other publications:

- Giesen, R. H. and Oerlemans, J.: Global application of a surface mass balance model using gridded climate data, The Cryosphere Discuss., 6, 1445-1490, doi:10.5194/tcd-6-1445-2012, 2012.
- Esau I. and I. Repina, 2012: Wind Climate in Kongsfjorden, Svalbard, and Attribution of Leading Wind Driving Mechanisms through Turbulence-Resolving Simulations, Advances in Meteorology, vol. 2012, Article ID 568454, 16 pages, 2012. doi:10.1155/2012/568454.

Participation in conferences

F. Bilgeri, F. Karner, W. Steinkogler, R. Fromm, F. Obleitner, and J. Kohler 2012: Snow micro-structure at Kongsvegen glacier, Svalbard. Geophysical Research Abstracts, Vol. 14, EGU2012-13832, 2012
http://meetingorganizer.copernicus.org/EGU2012/EGU2012-13832.pdf

G. Jocher, F. Karner, F. Obleitner, J. Reuder, Ch. Ritter, R. Neuber, K. Dethloff, and Th. Foken 2012: The near-surface small-scale spatial and temporal variability of momentum, sensible and latent heat exchange in Arctic regions: a case study. Geophysical Research Abstracts, Vol. 14, EGU2012-9516-1, 2012, http://meetingorganizer.copernicus.org/EGU2012/EGU2012-9516-1.pdf
F. Karner, F. Obleitner, F. Bilgeri, J. Kohler, G. Jocher, J. Reuder 2012: Surface energy and mass balance along the central flowline of Kongsvegen Glacier, Svalbard, http://www.igsoc.org/symposia/2012/finland/proceedings/proceedings.htm

V. Pohjola, B. Claremar, et al. 2011 Applying the WRF model at Svalbard glaciers: validation and improvements, IGS Nordic Branch meeting, Oslo. http://www.nve.no/en/Water/Hydrology/Glaciers/IGS-Nordic-Branch-Meeting-2011/Program/

Other activities

- Teaching at UNIS course "The Arctic Atmospheric Boundary Layer and Local Climate Processes", http://www.unis.no/10_STUDIES/1020_Courses/Arctic_Geophysics/agf_350.htm
- Contributions to SIOS developments (Atmosopheric and Glaciology flag ship)

Project developments and outlook:

Overall the national project develops as proposed but with some delay compared to the proposal. Notable deviations are that closure of field work required more effort than expected and that related PhD work is discontinued. To safely accomplish the proposed tasks the duration of national project was extended at neutral costs until December 2014.
Next field work is planned April 2012 and will mostly be devoted to further clean up at the measurements sites. The Austrian contribution will be limited and will mostly be taken over by NP based on continued scientific cooperation. Unfortunately, some equipment sent back to Austria is still missing causing some cumbersome negotiations with involved transport companies.

Support

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