3.2 Progress report

Message info

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Call	Researcher Networks 2009

Project plan

A detailed plan covering collaborative activities during the three years

The core aim of the proposed network is to promote Nordic scientific knowledge to the international forefront on integrated modelling and forecasting of the atmospheric environment, including weather, climate, air quality and their mutual feedbacks. MUSCATEN will be structured according to three main strands of activities:
1. Modelling the atmospheric BL and surface-related processes and parameterisations, with emphasis on NWP applications (leading: Finland, Prof. S. Zilitinkevich).
2. Modelling atmospheric chemical composition and air quality with emphasis on up- and downscaling, and scale interaction in ACT models (leading: Norway, Dr. Michael Gauss).
3. New generation of integrated numerical weather prediction atmospheric chemical transport (NWP-ACT) model systems with two-way feedbacks, including aerosol forcing of solar radiation and cloud formation, and integrating efforts from the activities of strands 1 and 2 (leading: Denmark, Prof. A. Baklanov).

Strand 1:
Special attention will be devoted to long-living stably-stratified BLs, the snow cover and water/land heterogeneities (e.g. lakes and archipelago) common in the Arctic and Nordic latitudes, but not well described so far in current NWP and ACT models. In the surface data assimilation, we will focus on optimal use and combination of different observational sources in order to prepare a balanced initial state for operational atmospheric models. Advanced mathematical methods both for the data assimilation and forecasting systems will be developed and applied within MUSCATEN. The basic framework for Strand 1 developments will be the HARMONIE system including the SURFEX package for handling processes related to atmosphere-surface interactions.

Strand 2:
The network activity in the field of atmospheric composition will concentrate on an integrated consideration of multi-scale chemical and physical processes driving the dispersion and transformation of atmospheric tracers. MUSCATEN will bring together the groups working at city-, meso- and regional scales and benefit from global studies. The questions of particular interest will be the up- and down-scaling of chemical composition studies, multi-scale parameterizations of governing processes and interactions with NWP modelling systems at each specific scale in ACT models. The impact and features of aerosol formation processes in industrial and remote regions, especially from biogenic precursors important in the boreal environment, will be considered in connection with the climate research groups.

Strand 3:
MUSCATEN will develop a new generation of integrated NWP-ACT modelling system framework with two-way feedbacks (i.e. temporal evolution in a given parameter arising from one model is carried to the other model, and the induced changes in the parameter there are brought back to the mother model). The two-way feedbacks will especially focus on the impact from aerosol forcing of solar radiation, cloud processes and further chemical transformation of pollutants. Other aspects to investigate are integrated modelling interfaces and the online/offline problematic to assess the online/offline advantages vs. disadvantages, interfaces conditions and requirements. Specific studies of meteorological and chemical processes interactions and interactions of the ACT and NWP modelling systems at different scales will be considered as well.

The MUSCATEN networking activities will be integrated through targeted workshops and training schools addressing all the core issues:
1. Workshop/training school on modelling of snow/ice-atmospheric interactions Finland, winter 2010.
2. Workshop/training school on modelling of lake-atmospheric interactions Sweden, Summer 2010.
3. Workshop/training school on integrated NWP-ACT modelling Denmark, spring 2011.
4. Workshop on volatile organic compounds (VOC): emissions, aerosol formation, modelling Estonia, 2011.
5. Workshop on chemical composition modelling in Northern Europe Sweden or Lithuania, 2011/12.
6. Workshop/Training school on surface-related modelling and data assimilation (SURFEX) France, spring 2012.

MUSCATEN aims to cover the basic research and researcher training towards the application of these models. We plan several mutual research visits relatively to the research strands, with priority given for students. Local university courses on NWP and ACT, such as the NUMLAB course of UH, MISU HIRLAM course, the DMI Enviro-HIRLAM course and the courses of dynamical meteorology and numerical modelling of RSHU are open for participants from MUSCATEN. Such participation will be supported, in order to enrol research-oriented last-year students into multi-scale integrated NWP-ACT modelling research already within their diploma projects.

An active and interactive web page, providing resources and helping to organising the activities, will be created for exchange and dissemination of information within the network as well as to promote the Nordic networking activities.

Progress report
According to application, official start of MUSCATEN was 01.01.2010. Thus, only planning and preparing activities were carried out in October - December 2009. The most important of these was the NordForsk network kick-off meeting in October in Oslo, where project leader Rein Rõõm and manager Marko Kaasik made an overview presentation on MUSCATEN network aims, participants and planned activities. MUSCATEN-NETICE workshop on Modelling of snow-ice-atmosphere interactions (Kuopio, Finland 24-26.3.2010) was planned and announced. Planning of 2nd Workshop on Parameterization of Lakes in Numerical Weather Prediction and Climate Modelling (Norrköping, Sweden, September 15-17 2010) was started. The MUSCATEN website was designed: http://muscaten.ut.ee/. New participants, Odessa State Environmental University, Ukraine, and Horfour company, Iceland (thus, completing the Nordic-Baltic domain in the network) joined with MUSCATEN.

Financial report

Budget report

	Budget	Actual	Deviation
Expenses			
Travel expenses	110 000	3 219	106 781
Living expenses	150 000	4 895	145 105
Honoraria	0	0	0
Administration (max 10 % of the grant)	30 000	6 151	23 849
Material	10 000	0	10 000
Other	0	0	0
Section totals	300 000	14 265	285 735
Period totals	300 000	14 265	285 735

Year	Paid	Used
2009	300 000	14 265

Comments or deviations
Administration costs constitute of bank fees (1360 NOK, mostly due to transfer from NordForsk to UT) and web page design costs (4791 NOK). Travel and living expenses are spent to participate at NorForsk kick-off meeting in Oslo (R.Rõõm, M. Kaasik).

Accountant	Lilia Lanemann University of Tartu Ülikooli 18, 50090 Tartu, Estonia lilia.lanemann@ut.ee Phone +372 7376527
Auditor	Laile Kaasik AS PricewaterhouseCoopers Pärnu mnt 15, 10141 Tallinn, Estonia tallinn@ee.pwc.com Phone +372 6141800
I hereby confirm that the information given is based on accounts, and that the project has been audited in connection with the institution's regular audit.	Yes

Participants

	Research students		Other participants		Country total		
	M	F	M	F	Male	Female	Total
Denmark	5	2	5	0	10	2	12
Finland	4	6	7	3	11	9	20
Iceland	0	0	0	0	0	0	0
Norway	1	1	6	1	7	2	9
Sweden	2	2	6	3	8	5	13
Estonia	3	5	6	0	9	5	14
Latvia	2	2	3	0	5	2	7
Lithuania	1	1	2	2	3	3	6
Russian Federation	4	4	5	2	9	6	15
France	1	1	5	0	6	1	7
Total	23	24	45	11	68	35	103

	Research students		Other participants		Country total		
	M	F	M	F	Male	Female	Total
Denmark	5	2	5	0	10	2	12
Finland	4	6	7	3	11	9	20
Iceland	0	0	1	0	1	0	1
Norway	1	1	6	1	7	2	9
Sweden	2	2	6	3	8	5	13
Estonia	3	5	6	0	9	5	14
Latvia	2	2	3	0	5	2	7
Lithuania	1	1	2	2	3	3	6
Russian Federation	4	4	5	2	9	6	15
Afghanistan	0	0	0	0	0	0	0
Ukraine	0	0	1	0	1	0	1
France	1	1	5	0	6	1	7
Total	23	24	47	11	70	35	105

Comments or deviations

All institutions listed in the network proposal are present. New participants, Odessa State Environmental University, Ukraine, and Horfour company, Iceland (thus, completing the Nordic-Baltic domain in the network) joined with MUSCATEN in last months of 2009.
Sorry! Afghanistan has no relation with MUSCATEN network. It was added to the list just by accident. Unfortunately, there is no option for deleting a country in the list.