

COST Action ES1404

Report of the Management Committee and Working Group Meeting for WG3

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Grenoble, March, 18-20, 2015

The working group “Snow data assimilation and validation methods for NWP and hydrological models” (WG3) was represented by 5 talks in the second plenary session of the Management Committee meeting on March, 18.

- Jürgen Helmert: “Objectives and Tasks of the WG3”
- Aynur Sensoy: “Developing an Operational Hydrologic Forecasting System using EPS and Satellite Data in Mountainous Euphrates”
- Ekaterina Kurzeneva: “Snow data assimilation in HARMONIE”
- Samantha Pullen: “Ongoing efforts to improve Synop snow-reporting practices”
- Laurent Mesbah: “Snow measurements as indicators for climate change with the case of Bosnia and Herzegovina”

The working group meeting with 20 participants on March, 19, started with presentations of the working group members:

- Jürgen Helmert and Aynur Sensoy: “Welcome and Overview of the WG3 Session - Presentations, Tasks and Work Plan, Short-Term Scientific Missions, Training School”
- Ekaterina Kurzeneva: “Present panorama of the FMI activities in WG3”
- Samantha Pullen: “Snow data assimilation at the Met Office - current work and future plans”
- Martin Lange: “Snow data assimilation at DWD”
- Maria Derkova: “Snow and NWP activities at SHMU”

- David Gustafsson: “Snow data assimilation in meteorological and hydrological models in Sweden”
- Dagrun V. Schuler: “Assimilation activities in NWP models at MET Norway, as well as snow modelling for the snow avalanche warning”
- Sigurdur Thorsteinsson: “Icelandic glacier/snow update in HARMONIE Cy38h1.2 and plans”
- David Pulido-Velazquez: “Overview of snow observations and data assimilation employed in different hydrological approaches within water resources management problems”
- Vera Potopová: “Modelling the effect of snow cover on variability of soil moisture and temperatures”
- Rui Salgado: “Next WG3 Meeting: Evora, Portugal: 8-9 May”
- Cenk Donmez: “Estimating snow dynamics using a process-based modelling approach in a Mediterranean Environment”
- Nadejda Petkova: “Participation of National Institute of Meteorology and Hydrology - BAS in COST ES1404”.

After the presentations, a discussion of the tasks followed and decisions for the working plan for the year 2015 have been taken. The major focus of the working group in 2015 should be on the questions:

- ★ *How many and which kind of snow observations are assimilated in numerical weather prediction and hydrological models?*
- ★ *What are the data assimilation methods used in meteorology and hydrology for snow observations?*

The corresponding tasks and decisions are:

- Overview of the various snow observations used in NWP, hydrology and climate studies for different purposes including validation and data assimilation (e.g. different snow observations are used in different environmental applications).
 - Decision: Preparing a questionnaire for snow observations in meteorology and hydrology communities (categories of data types, parameters, frequency, scales, format, demands).
- For data assimilation, different methods are used in NWP and hydrology. The overview will allow to assess the current situation and to understand future perspectives.

- Decision: Preparing a questionnaire for data assimilation in meteorology and hydrology, Short description of methodology, example of application will provided.
- Links between different communities of users of snow observations will be established.
 - Decision: Two-way feedback between working groups, preparing a guide for end users.
- A critical review of snow models utilizing physical snow parameters as input and used as parameterization schemes or for downstream applications (CROCUS, Snowpack, SNTHERM) will be included.
 - Decision: Preparing a questionnaire, using existing model intercomparison experience (e.g. SNOWMIP2), investigating interoperability of snow models with data assimilation, consider model sophistication.

For the second stage of the project, after 2015 the focus will be on the question:

★ *How could the assimilation of snow observations improved?*

The corresponding tasks are therefore considered later. Some first ideas have been developed.

- Finding a new method for combining satellite observations with conventional in-situ snow measurements and modelling results: Microwave satellite observations are combined with conventional in-situ observations in some products (Hydro-SAF), while optical satellite observations together with conventional in-situ observations are assimilated into NWP models.
 - Decision: Will be considered in a later stage of the project.
- Sustainable principles to combine all types of information should be found. This will allow advanced assimilation of new and forthcoming satellite observations of different snow properties (snow-melt, snow extent and SWE).
 - Decision: Will be considered in a later stage of the project.
- Need for new methods to update non-observed simulated physical snow variables (such as snow wetness, density profiles and mechanical properties) based on the observed ones (such as snow depth and extent).
 - Decision: Will be considered in a later stage of the project.
- Looking for strategies towards a more extended usage of conventional snow observations to include observations from high-resolution national networks into NWP, hydrological and climate models, as the use of data from national networks is currently very limited.

- Decision: Considering a Web-Portal solution for data exchange (e.g. similar to OPERA for radar data); taking into account zero snow height information; Inform national and international institutions about COST action needs.
- The impact of more extended usage of conventional snow observations will be assessed and recommendations how to increase their availability will be given.
 - Decision: Will be considered in a later stage of the project.
- Acquiring more information about observational errors relevant for DA by establishing links between the modelling and measurement communities via WG1 and WG2. These links will also provide the users' feedback to the measurement community by reporting about the quality of data and potential problems.
 - Decision: Exchange of information about representativity of data, making realistic estimation of observation errors, managing deficiencies of observations.