

COST ES1404 WG meeting minutes

19 September 2017 9:00-12:00

Smolenice, Slovakia

Chair: Ali Nadir Arslan

WG 2 scientific focus and related tasks from MoU were presented by Leena Leppänen

- Every task has responsible person(s)
- Task 1: Satellite based sensors will be reviewed and some already existing material will be used. Review of ground based sensors will be included to report of questionnaire which first version is available. Estimation of uncertainties will be made only for ground based manual snow depth and SWE instruments.
- Task 2: Draft version of guidelines will be discussed on later meeting in Smolenice
- Task 3: Roberta Pirazzini will produce draft of white paper based on albedo workshop before end of October
- Task 4: Katalin Gillemot volunteered to participate to reporting which will be based on previous work and Snow Grain Size Workshops held in 2013-2014.
- Task 5: Group of interested people will have a meeting in December 2017 in Slovakia

WG 1 & 2 related deliverables and timetable items from MoU were presented by Leena Leppänen

- Only one deliverable is accomplished and most of others are on progress or undone
- Timetable items are done as scheduled, except training school will be organized in spring 2018.
- Leaders of all WG groups will discuss on undone deliverables and related actions in Smolenice, and contact to missing leaders by email.
- WG leaders should define responsible persons and groups attending to the actions, and share the information to WG members
- Deadlines for the actions will be decided in Smolenice meeting
- All documents and reports will be added to public webpage.

WG 3 related deliverables, tasks and meetings were presented by Jürgen Helmert

- Working group considers NWP, Hydrology and Climate models. Need for responsible person for each model group.
- Status of Deliverables:
 - o Review report on snow data assimilation techniques and the use of snow observations in NWP, hydrology and climate models.
 - Questionnaire, Evaluation and writing of a Review report

- Recommendations on how to get and use conventional snow observations from national networks for data assimilation and model validation.
 - Impact studies, zero snow depth – COST impact
- Recommendations about sustainable ways to create snow products for users by combining remote-sensing and conventional snow observations with modelling results.
 - Outcome of the workshop in Offenbach at
 - <https://agora.fmi.fi/pages/viewpage.action?pageId=21991738>
- Report on spatial and temporal representativeness errors of snow measurements for DA in NWP and hydrological models.
 - Questionnaire, booklet of snow?
- Peer-reviewed publications on advanced DA techniques for NWP and hydrological models.
 - WG3 meeting, Enquiry on WG3 members by mailing list
 - Two topical workshops for addressing the different focuses of the Action
 - Erzurum, March 1st, 2016, Offenbach, March 8/9, 2017
- Training school on snow measurements and DA.
 - SMRT training Q1 2018
- Each of the three working groups will produce a review paper by the end of the Action.
 - TBD
- COST ES1404 impact in organizations:
 - Connections to WMO, GCW Snow watch, EUMETNET, SRNWP
 - International NWP consortia
 - NWP center
- COST ES1404 freely available tools:
 - A web-based overview/data portal of snow observations, measurements and instruments with links to existing real-time snow databases
- Lessons learned until now:
 - Future of snow DA – on long term to use radiances
 - Snow-vegetation interaction is not well captured in many models
 - Snow monitoring is performed at different centers (ECMWF, SMHI, DWD)
 - Long way to adapt snow reporting practises and improve data exchange
- Merging information from the Arctic Terrestrial Modelling Workshop 14-15 September 2017, participants: Universities Canada, US, UK, MetServices, COST,...
 - Snow redistribution/feedbacks

- LS3MIP looks into some snow feedbacks.
 - Snow cover fraction - snow depth/mass relationships still being investigated. (e.g. ESM SnowMIP), hard to validate.
 - Machine learning can help – limitations to be considered.
 - Introducing blowing snow can reduce biases in snow depth. Blowing snow is also easily sublimated.
 - How to include into NWP/climate models?
 - Snow-vegetation interactions (snow on canopy), not represented in all models.
 - Snow refreshment value depends on resolution (temporal/spatial) at which models are run.
 - **Emerging modules/parameterizations and/or approaches (will depend on spatial and temporal scales – NWP, S2S, Decadal to climate scales; global to regional)**
 - Complex snow models such as CROCUS doesn't capture **snow density profile in tundra; depth hoar important during the initial winter months**. Some hydrology models probably has it.
 - Subgrid parameterization of snow is required. Multilayer snow models and elevation bands or clusters considering elevation, slope, aspect etc. important for different regions. Vegetation- snow interaction to be improved.
 - Hydrology – difficult to validate soil moisture/runoff, river discharge (streamflow) is available but adds another layer of modelling (and few models do it).
- Validation approaches
 - COST-ES1404 (snow in-situ and satellite), NSF (Arctic data centre), ABOVE, ESA, NCAR, AWI, NGEE Arctic, NSIDC sites useful sources.