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ARCTIC SNOW COVER CHANGES AND THEIR CONSEQUENCES: DEVELOPING A ROAD MAP FOR RESEARCH AND LONG–TERM MONITORING

Terry V Callaghan *(Royal Swedish Academy of Sciences, Sweden)*
Margareta Johansson *(Lund University, Sweden)*
on behalf of the IASC Snow Meeting Participants, Copenhagen, 16-17 October 2014.

terry_callaghan@btinternet.com

Rationale
Snow is a critically important and rapidly changing fundamental characteristic of the Arctic, but it has too often been over-looked in major environmental assessments. Snow cover, stratigraphy and physical as well as biological characteristics are constantly changing throughout the winter period and there is increasing evidence that episodic rain-on-snow and mid-winter thaws are increasing in frequency. These snow dynamics provide challenges for the methodology of measuring snow characteristics both on the ground and remotely. Also, they make prediction, particularly of extreme events, very difficult even though they are critically important because of the numerous impacts of a changing snow cover.

In order to focus snow measuring, prediction and impacts communities on evaluating the current status of snow studies and the need to build a roadmap to integrate the various activities, an IASC "cross-cutting activity" was motivated at the IASC Terrestrial Working Group meeting in Krakow in 2013. A workshop was planned to develop a road map to improve measurement and prediction of changing snow characteristics to be presented at the ICARP III meeting, Toyama Japan, April 2015.

A workshop was financially supported by IASC, INTERACT and AMAP while many organisations were represented including CliC, GEO Cold Regions, GCW and the EEA. Over 30 participants attended a two-day workshop at the European Environment Agency in in Copenhagen on 16 and 17th October 2014.

Proceedings
Short presentations were made that covered a wide range of snow-related issues.

Presentations on snow monitoring covered methodological details and challenges, and examples of trends in snow cover at various scales including in various Arctic countries, throughout the entire Arctic, in the European Alps and at the Third Pole. Presentations on snow models included descriptions of modules in Earth-system modelling and specific models of warming and rain-on-snow events in winter. Impact studies were particularly well-represented and included perspectives on ecology, reindeer herding, pollution, biogeochemical and biogeophysical cycling, urban planning, as well as snow and ice disaster prevention.

In addition to presentations, breakout groups were convened to collate material on the state of the art and needs for development of activities on observations, predictions, and impacts of a changing Arctic snow cover. A particular gap became evident in the expertise available - snow on sea ice perspectives.

Meeting products
An overview of the output of the meeting is to be published in a peer-reviewed wide circulation journal. APECS members are the champions of the writing but all participants will be included as authors. The contents of the paper currently developing will be presented at ICARP III. Workshop participants will also submit specific abstracts. In addition, detailed reports and materials will be given to all the organisations participating in the workshop and, finally, INTERACT and other organisations will seek to *implement* key priorities for monitoring and research agreed at ICARP III.

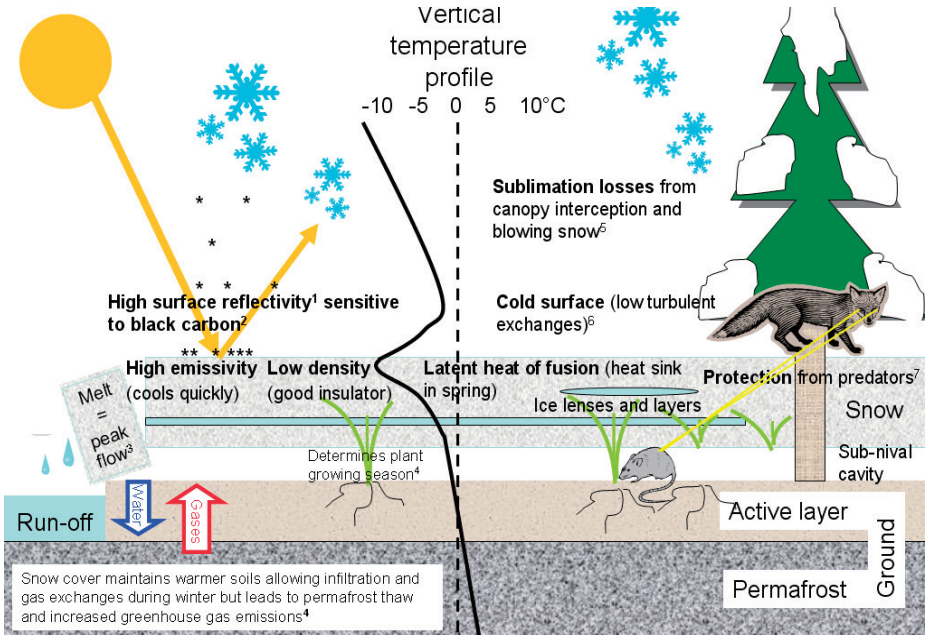

Figure. Some of the more important biogeophysical interactions involving snow cover. From Callaghan et al., 2011