Séminaire vendredi le 1 décembre 2017 11:00 / Seminar Friday Dec 1st 2017 11:00h

Sujet/Subject: Terrestrial snow observing system simulation experiment

Langue/language : Français/French avec diapositives en anglais (English slides)

Conférencier/Lecturer: Camille Garnaud (RPN-E)

Résumé/Abstract:
Due to its geographical location, Canada is particularly affected by snow processes and their impact on the atmosphere and the hydrosphere. Yet, snow mass observations that are on-going, global, frequent and at adequate spatial resolution for assimilation within operational prediction systems at Environment and Climate Change Canada (ECCC) are presently not available. Thus, ECCC partnered up with the Canadian Space Agency (CSA) and other collaborators to initiate a radar-focused snow mission concept study to define space-borne technological solutions to this observational gap. In this context, an Observing System Simulation Experiment (OSSE) is performed to determine the impact of sensor configuration (i.e., resolution, revisit frequency) and SWE algorithm performance (i.e., accuracy) on snow analyses from the Canadian Land Data Assimilation System (CaLDAS).

Results indicate that snow analyses are strongly sensitive to the revisit frequency with an increased quality of outputs for a reduced revisit time, particularly during the spring melt season. CaLDAS is also very sensitive to the synthetic observed snow mass retrieval accuracy, especially with respect to correlation and RMSE, both spatial and temporal. The synthetic observations resolution impact is negligible and ambiguous as there seems to be improvements when going from 2000-m resolution to 1000-m in some cases, but not when going from 1000-m to 500-m, although all the tested resolutions are finer than the current CaLDAS resolution (i.e., 2.5 km). In the context of this study, conclusions support that efforts should be put towards the optimisation of revisit frequency as well as SWE algorithm performance in order to obtain the most benefit from satellite derived snow retrievals.