

Snow observations in Finland in support of designing nature-based solutions (NBS) - from citizen observations to satellites

Achim Drebs¹, Antti Mäkelä¹, Heikki Tuomenvirta¹, Reijo Jantunen²

achim.drebs@fmi.fi, ¹ Finnish Meteorological Institute, P.O. BOX 503 FI-00101 Helsinki, Finland
reijo.jantunen@gmail.com, ² Pro Puruvesi ry., Laulajanraitti 74, FI-58200 Kerimäki, Finland



OPERANDUM

OPEn-air laboRAtories for Nature baseD solUtions to Manage hydro-meteo risks

OPERANDUM 2018 – 2022 delivers the tools and methods for the validation of Nature-Based Solutions in order to enhance resilience in European rural and natural territories by reducing hydro-meteorological risks.

Pro Puruvesi

Pro Puruvesi ry is a NGO aiming for monitoring and supporting research on the ecological status of the water quality in the Puruvesi Lake area in south-east Finland.



FMI team – climate researchers, remote sensing experts, and observational personnel



Photo: L. Musakka

Looking for snow water equivalent (SWE) measuring places, 20.1.2020, Training in Kerimäki, Finland

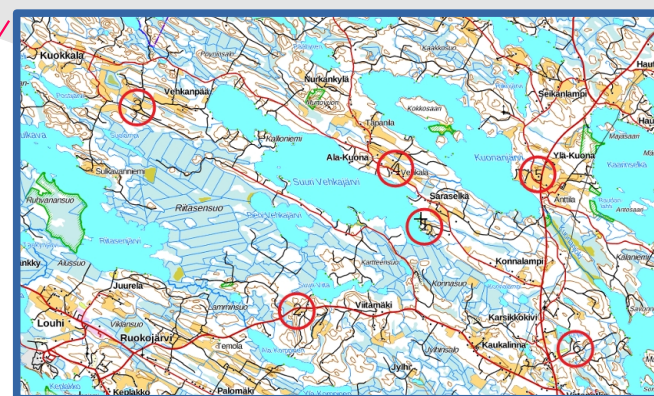


Photo: L. Musakka

Achim Drebs explains the principles of snow density measurement instruments.

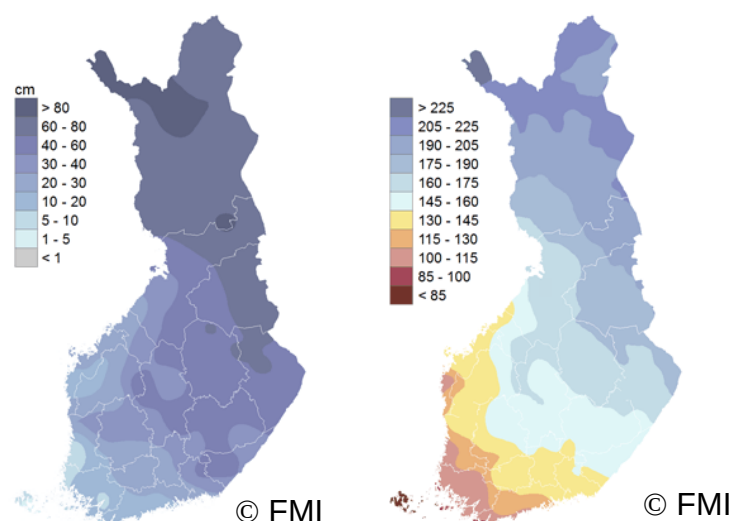


The OPERANDUM project site with marked snow density and snow pack measuring locations in south-east Finland



© <https://asiointi.maanmittauslaitos.fi/karttapaikka/>

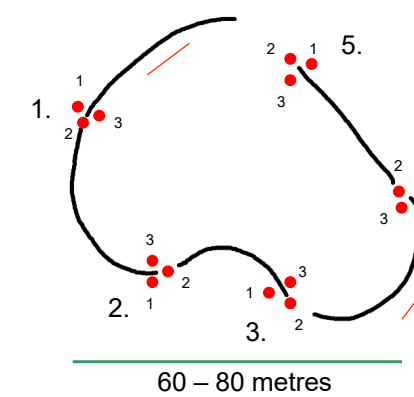
Baseline climate



© FMI

© FMI

Average snow conditions in Finland 1981-2010, left: snow depth on March, 31th.; right: number of days with snow cover

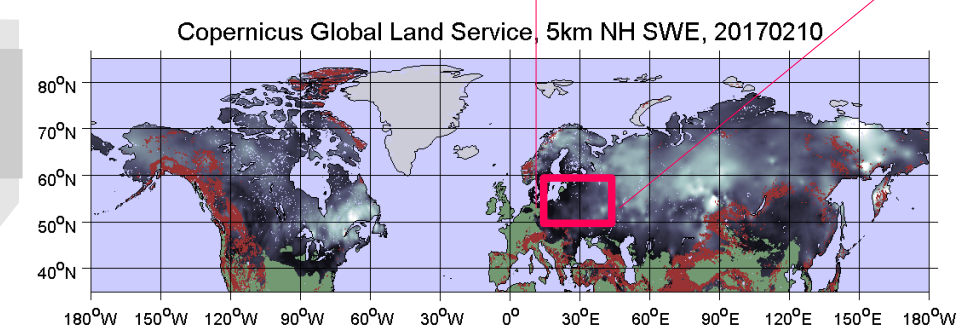
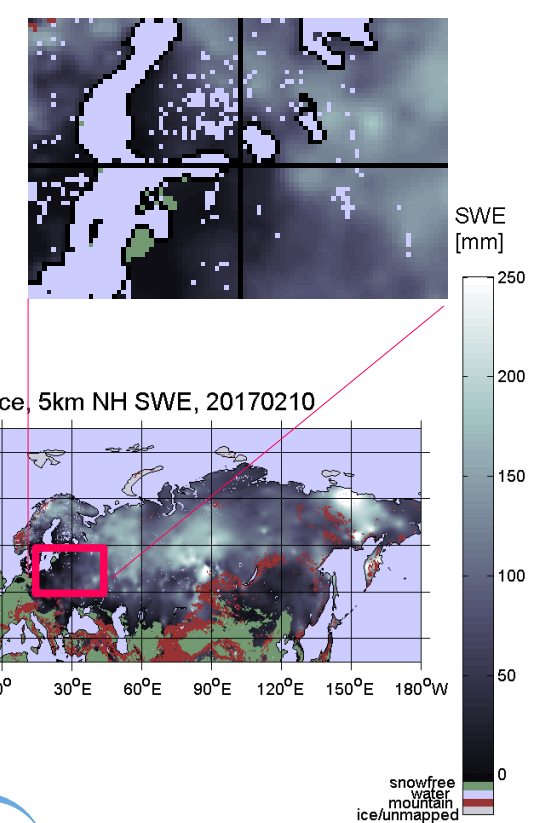


'How to measure' – sample picture from the training material by Achim Drebs



Snow water equivalent measurements from satellite

Motivation of use: Intense snowmelt and heavy precipitation events trigger extensive nutrient loads from intensively managed forest areas to Lake Puruvesi causing eutrophication. OPERANDUM co-develops nature-based solutions to maintain the excellent water quality of Lake Puruvesi.



European Union's satellite services
<https://land.copernicus.eu/global/products/swe>

In our area-of-interest (sub-catchment of Lake Puruvesi, 73 km²) there were no standard in-situ precipitation or snow measurements stations. On the other hand observations made by satellites provide only data over several square kilometres. Therefore, trained volunteers are essential for high spatial coverage of the in-situ measurements. During the OPERANDUM project volunteers are involved to measure the snow water equivalent for the snow pack. Six members of the Pro Puruvesi NGO participate in the snow measurement campaigns 2019 - 2022. Their observations help to refine the measurements gained by the national weather station network and the European Union's satellite observation and serve as an input into hydrological and climatological modelling.



www.operandum-project.eu



@OPERANDUM_EU



OPERANDUMproject



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 776848.
The publication reflects only the authors' views and the European Union is not liable for any use that may be made of the information contained therein.