

Validation of the Climate-SAF Arctic surface albedo product against in situ observations

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The monitoring of the Arctic environment has increasingly important, as recent studies point to the Arctic as being particularly vulnerable to the effects of climate change [1]. One of the main factors controlling the energy budget of the Arctic region is its surface albedo, which refers to the fraction of Solar energy reflected by the surface. The surface albedo is a strong driver of near-surface temperatures and snow/ice evolution, and it is currently acknowledged as being poorly known or defined in climate models.

As in situ monitoring of the surface albedo in the remote Arctic regions is difficult and unpractical, satellite observations are the most effective means of creating datasets of surface albedo with good spatial and temporal coverage. We present the results of a validation study aimed at assessing the quality of a novel AVHRR-based Arctic surface albedo product (SAL) from the Climate-SAF project of EUMETSAT.

We studied some 2755 AVHRR overpasses covering the Arctic over the polar summer of 2007 and compared the retrieved albedo to in situ observations from the Greenland Climate Network and the Tara floating ice station. The results show that the SAL product achieves an accuracy that is comparable to previous AVHRR-based snow and ice albedo datasets such as the AVHRR Polar Pathfinder [2].

[1] Serreze, M., Barrett, A., Stroeve, J., Kindig, D., & Holland, M. The emergence of surface-based Arctic amplification. *The Cryosphere*, 11–19, 2009.

[2] Scambos, T., Haran, T., Fowler, C., Maslanik, J., Key, J., & Emery, W. AVHRR Polar Pathfinder twice-daily 1.25 km EASE-Grid composites. Technical Report. Boulder, CO, USA: National Snow and Ice Data Center, 2002.