MERGING FLAT/FOREST AND MOUNTAINOUS SNOW PRODUCTS FOR EXTENDED EUROPEAN AREA

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Abstract

In the frame of EUMETSAT Hydrology and Water Management Satellite Application Facilities (H-SAF) project, two different approaches have been developed for snow products. One is focused on flat/forested areas and has been developed by Finnish Meteorological Institute (FMI) (originally for EUMETSAT Land-SAF), and the other one by Turkish State Meteorological Service (TSMS) for mountainous areas. Snow cover over mountainous areas and over flat/forest areas show completely different physical properties, thus usage of two separate algorithms makes it possible to get better results. On the other hand, the Project Plan of H-SAF states that the users should be offered unified snow products covering the H-SAF domain.

In this study we introduce a method for merging the two snow recognition products, and also discuss the first results from validation. The products have different projections and nearest neighbor approach was selected for data co-location. The main idea of the merging algorithm is to minimize projection errors and try to reflect the strengths of the two algorithms in the final merged product. A mask based on digital elevation model (DEM) was used to separate the mountainous pixels from flat/forested areas. The merging algorithm finds the exact location of the non-mountainous pixels using this mask. These values are then replaced the values from the product for flat and forested areas.

The method was first tested for the daily products of November 2008. The merged products were visually compared against METEOSAT RGB images. The merged products were found noticeably better than the stand-alone products according to visual comparison. While comparing the products separately to the RGB composites, it came apparent that flat/forest product underestimates the snow on mountainous regions, and the product for mountainous regions misclassified pixels on non-mountainous areas. With the merging, most of these errors are removed.

First validation results against in-situ observations are also presented.