Geophysical Research Abstracts
Vol. 20, EGU2018-11295, 2018
EGU General Assembly 2018

A new comprehensive daily snow depth dataset of the North Hemisphere during 1980-2016 merged from remote sensing, reanalysis, and in situ data based on "Multiple" Collocation

Lin Xiao (1,3) and Tao Che (1,2)

(1) Key Laboratory of Remote Sensing of Gansu Province, Heihe Remote Sensing Experimental Research Station, Northwest Institute of Eco-Environment and Resources, Chinese Academy of Sciences, Lanzhou 730000, China; (xiaolin@lzb.ac.cn), (2) Center for Excellence in Tibetan Plateau Earth Sciences, Chinese Academy of Sciences, Beijing 100101, China;, (3) University of Chinese Academy of Sciences, Beijing 100049, China;

Triple Collocation (TC) can estimate error of datasets without knowing the truth, which is quite useful in data evaluation and validation. Standard TC technique is available for three datasets only, while the "Multiple" Collocation makes it possible to expand the number of datasets into arbitrary ones. Thus, this method was applied to multiple sources of daily snow depth data over the North Hemisphere, including remote sensing products (CHE, AMSR-E, AMSR2, GlobSnow), reanalysis data (ERA-Interim, MERRA-2), and in situ data (snow survey and station data of the former Soviet Union areas from Russian meteorological stations, ground station data of China, observation data of the North Hemisphere land areas from Global Historical Climatology Network). Note that the three in situ data was combined and kriging interpolated as one data source. The error of each product was separated into structural error and non-structural error, on purpose of decreasing the influence of correlation among datasets. As a result, products with similar generation process, i.e. the four remote sensing products, the two reanalysis data, were grouped first, and their non-structural error were calculated within the group, respectively. Then, the structural error among remote sensing products, reanalysis products and in situ data was calculated. The total error of individual product is the combination of structural and non-structural error. Based on the error assessment, products were compared and analyzed. Taking the error assessment result as products' merging weight, the daily snow depth dataset, which comprehensively combines the advantage of individual product, was merged and established over the North Hemisphere during 1980-2016.