

Recent activities of the ArCS II Research Infrastructure: Earth Observation Satellite Data

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Japan Aerospace Exploration Agency (JAXA) participates in the Arctic Challenge for Sustainability II (ArCS II) Project as the Research Infrastructure: Earth Observation Satellite Data. Taking advantage of satellite observations as spatial and temporal wide coverage of the Arctic region, we play a role in providing observation data on the atmosphere, ocean, land, ecosystem and cryosphere from JAXA's Earth observation satellites in an easy-to-use format for researchers, in cooperation with the Arctic Data archive System (ADS) in National Institute of Polar Research (NIPR). In collaboration with ADS, we have been organizing satellite data requests, processing and providing data, and support for data analysis through the ArCS II project.

The GCOM-C/SGLI and GCOM-W/AMSR2 products are routinely processed and provide, and the quality of the products were continuously improved through version upgrades by evaluating product accuracy and improving algorithms. For example, all GCOM-C/SGLI standard products were major version upgraded twice in FY2020 and FY2021. Through these upgrades, these products were improved quality. GCOM-W/AMSR2 all standard products and several research products are continuously provided. The sea surface temperature product was major version upgraded in FY2020 and minor version upgraded in FY2022. The total precipitable water and cloud liquid water products were minor version upgraded in FY2021.

In addition, new research products are released to expand the use of new satellite observation data. Since the start of the ArCS II project, we have released new research products that contribute to the understanding of changes in the cryosphere or polar region environment, such as the AMSR2 high-resolution sea ice concentration (Fig. 1), AMSR2 sea ice motion vector, AMSR2 snow depth, AMSR2 soil moisture content and SGLI snow and ice surface albedo products (Fig. 2). These products are now preparing for easy browsing on the web in cooperation with ADS. In this context, we also developed the format conversion tool to convert satellite data into user-friendly formats such as netCDF and GeoTIFF.

We also provided analysis support in response to requests received from the ArCS II researchers. In FY2021, we conducted interferometric SAR (InSAR) processing using ALOS-2 data for permafrost areas and provided them.

From this fiscal year, we have been conducting interview surveys for each Research Programs promoted by the ArCS II project in order to further expand the use of satellite data that may support their research activities. Based on the understanding of the status of data use, we are investigating the problems that researchers have in using satellite data and identifying and analyzing the factors that hinder the expansion of data use.

In the second half of the ArCS II project, we will continue to provide the satellite observation data, evaluate the product accuracy, improve algorithms, and release new research products. In addition, in order to solve the issues identified based on the interview surveys, we will develop manuals and tutorials for satellite observation data handling as user-friendly formats. Through these activities, we aim to further expand the use of earth observation satellite data in Arctic research.

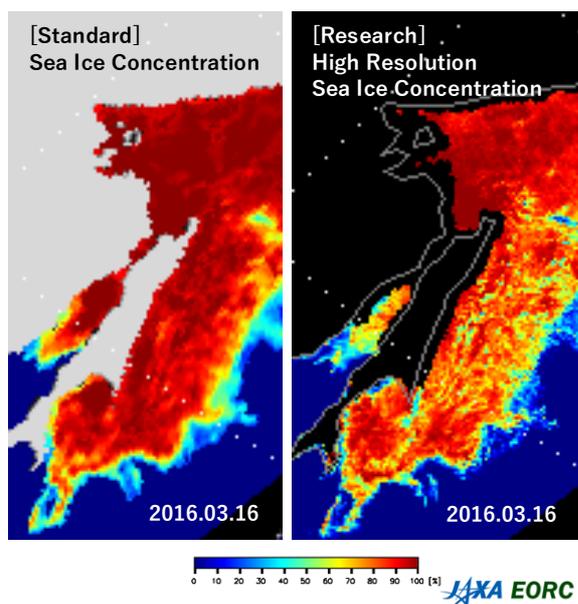


Fig. 1 Comparison between AMSR2 sea ice concentration as a standard product (left) and high-resolution sea ice concentration as a research product (right).

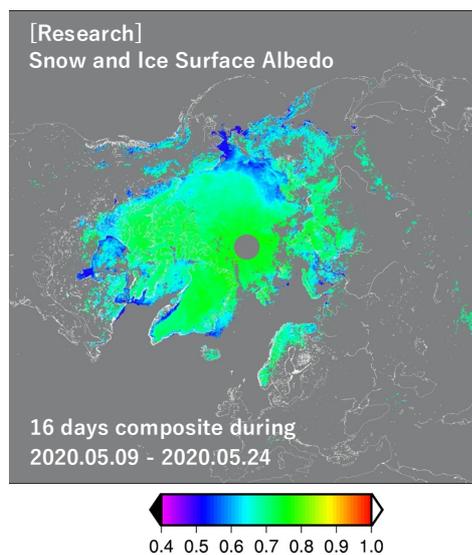


Fig. 2 Snow and ice surface albedo distribution in the northern hemisphere derived from SGLI.