Monitoring and evaluation of near real-time water cycle fluctuations by microwave remote sensing

*Kazuyoshi Suzuki[1], Misako Kachi[2], Kazuyuki Saito[1], Hideki Kobayashi[1], Tetsuya Hiyama[3], Milija Zupanski[4]

1. Japan Agency for Marine-Earth Science and Technology, 2. JAXA, 3. ISEE, Nagoya University, 4. CIRA, Colorado State University

Changes in the water cycle associated with global warming have caused water-related problems in various parts of the world and have had a significant impact on local environments and ecosystems. It is essential to establish a water cycle monitoring system that integrates data from the atmosphere and land in order to facilitate a better understanding of the world's water issues and water resources. In this study, we will build a global water cycle monitoring system that integrates the atmospheric water cycle and the terrestrial water cycle. This monitoring system will allow a water cycle database to be published in near real-time. This database will be essential for the understanding of global water issues and water resources management. In this study, we focused on the amount of available global water storage, assessed by monitoring and evaluating the amount of precipitable air relative to the amount of terrestrial storage in light of global warming. We will build a water cycle reanalysis system that merges microwave remote sensing data and general meteorological data into a near-real-time coupled atmospheric and land surface database. We will obtain hydrometeorological observation data in Siberia, Alaska, and Mongolia, where water cycle fluctuations due to global warming are extreme, and compare and verify them with satellite data to evaluate the accuracy of the reanalysis database created. Based on this research, we hope to contribute to understanding the damage caused by global warming to the global water cycle, and perhaps help reverse this damage and route to resolving critical water resource problems.

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