A 57-Year Daily Gridded Precipitation Dataset for Asia Based on a Dense Network of Rain Gauges –APHRODITE project–

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An updated version of long-term daily gridded precipitation dataset for 1951-2007 over Asia is described. The previous version (APHRO_V0902; Yatagai et al., 2009, SOLA) has already been created by collecting rain gauge observation data across Asia, through the activities of the Asian Precipitation – Highly Resolved Observational Data Integration Towards the Evaluation of Water Resources (APHRODITE) project. The current version (APHRO_V0912) is extended for additional 10 years from APHRO_V0902 and will be provided on our Website (http://www.chikyu.ac.jp/precip/).

APHRO_V0912 is the only product with long-term (57-yr), high-resolution (0.25° and 0.5°), and continental-scale based on a dense network of daily rain-gauge data for Asia. The number of valid raingauges used for analysis was between 5000 and 12,000, representing 2.3 to 4.5 times the data available through the Global Telecommunication System network, which were used for most daily grid precipitation products. APHRO_V0912 well reproduces precipitation characteristics in mountainous areas, especially in the Himalayas and the Middle East.

Extensive quality controls (QC) are performed before carrying out interpolation. Many kind of errors are found in not only station metainfomation, but precipitation data themselves, e.g., unit-of-measurement error. We will feed the information on errroneous data detected by the QC scheme back to data centers and/or the organizations who kindly provided the rain-gauge data.

We also develop a new interpolation method based on an Angular-Distance-Weighting (ADW) method. This new method considers local topographical features between rain-gauge and intepolation point, e.g., high crest, and reduces the oversmoothing problem in ADW method.

The product has already contributed to studies such as the evaluation of Asian water resources, diagnosis of climate change, statistical downscaling, and verification of numerical model simulation and satellite-based high-resolution precipitation estimates.