

Long term daily discharge simulation for Asian major basins using gridded precipitation dataset APHRODITE

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Gridded precipitation datasets, such as a gauge-based daily dataset "the Asian Precipitation Highly Resolved Observational Data Integration Towards Evaluation of Water Resources (APHRODITE's Water Resources)", were applied to the Integrated Flood Analysis System (IFAS) to simulate long-term historical daily discharge over major river basins in Asia. IFAS is a computer-aided hydrological discharge nowcast/forecast system applicable to any locality even without ground observations using available hydro-meteorological and land surface information. In order to make a system applicable to basins of various scales, the "scalable hydrographical river basin dataset" were produced based on a simple scaling algorithm (Masutani et al., 2006) and integrated to IFAS. This new dataset includes various types of information such as elevation, flow direction, river slope, and basin boundary with different resolutions from 90 m to 20 km. In this study, the following preliminary analyses were made. First, parameter optimization and its validation were performed using APHRODITE precipitation and other hydro-climatology datasets. Second, comparisons were also made between simulated discharges based on APHRODITE and satellite-based gridded precipitation datasets such as GSMaP and TMPA. These preliminary results confirmed the importance of using long-term gauge-based precipitation datasets and the utilization of distributed hydrological models applicable to basins of any scale. Furthermore, APHRODITE's data coverage enables us to estimate daily discharge and its extreme values in even poorly gauged basins.

Keywords: gridded precipitation dataset, distributed hydrological model, flood, extreme