



Hydro-NEXRAD radar database: A community resource for rainfall studies

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Hydro-NEXRAD is a software system with web-based user interface for obtaining historical customized NEXRAD-based radar-rainfall maps (products) from some 40 WSR-88D radars covering mainly the central and eastern U.S. These products have increased spatial and temporal resolution in comparison to the operational products available from the US National Weather Service. Rainfall researchers and hydrologists can request customized products by selecting various algorithmic modules and parameter values. The produced rainfall maps can be projected on a grid of choice. The output is formatted for ingest by geographic information systems and mapping software. The authors present the system architecture, the database extent and the possibilities of including additional algorithms in the future versions. They illustrate the utility of the software with several applications where side-by-side comparisons of various products allow studies of uncertainty propagation and sensitivity analysis. One of the comparisons presented involves the NWS products obtained with the Precipitation Processing System. Since one of the features of Hydro-NEXRAD is repeatability of the results, the system promotes systematic studies of new algorithms, comparisons with rain gauge data and error modeling, and uncertainty propagation in hydrologic applications. The system can be considered as prototype of large-scale data dissemination system broadly customized for a specific application. The system could be evolved into a world-wide database of radar data serving the needs of global remote sensing research community.