Recent Developments and Plans in the U.S. GPM Project

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As the Global Precipitation Measurement (GPM) Core Observatory (GPM-CO) satellite begins its fifth year of operation, the NASA-JAXA GPM project is working to compute the Tropical Rainfall Measuring Mission (TRMM) data sets for the last time, now using algorithms that are consistent with the GPM era algorithms. [In subsequent GPM reprocessings the TRMM data will be treated as an extension of the GPM record.] The combined, consistently processed TRMM-GPM record will set a new standard for long, fine-scale precipitation datasets. This work includes developing the U.S. GPM team's Integrated Multi-satellitE Retrievals for GPM (IMERG) merged precipitation product to use the radar-radiometer combined products from both the TRMM and GPM Core Observatories as calibrators in their respective eras. [The Japanese equivalent to IMERG is the Global Satellite Mapping of Precipitation, or GSMaP, dataset.] The result will be a uniformly processed precipitation record from 2000 (or even 1998) to the present at 0.1˚ half-hourly resolution, with full coverage in the latitude band 60˚N-S and partial coverage at higher latitudes.

The use of GPM data will be illustrated, with examples drawn from the eventful Atlantic hurricane season of 2017. These range from scientific studies using GPM-CO sensor data, to the use of IMERG in Puerto Rico following Hurricane Maria, when ground-based radar systems on the island were destroyed. IMERG also contributes to a better understanding of rainfall accumulation, inland flooding, and landslide susceptibility during the passage of hurricanes and other prolific rainfall events.

Future plans will be reviewed, including research into the challenging problem of accurate snowfall retrievals, extension of multi-satellite precipitation estimates to fully global coverage, and the use of numerical model-based precipitation estimates to complement observational retrievals. Finally, one key issue for the future is ensuring the on-going constellation of passive microwave satellites.

Keywords: GPM, IMERG, satellite precipitation, global rain and snowfall