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Improvements in Land Areas for IMERG Products

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Integrated Multi-satellitE Retrievals for GPM (IMERG) is a suite of global precipitation products being produced by the The U.S. Global Precipitation Measurement mission (GPM) science team. It is based on intercalibrated estimates from the international constellation of precipitation-relevant satellites and other data. IMERG is computed three times for each half-hour interval at latencies of 5 hours, 15 hours, and 3.5 months (labeled Early, Late, and Final). All three provide half-hourly 0.1° x 0.1° gridded data that are complete in the latitude belt 60°N-S and as-available (from microwave estimates) in the polar zones. All of the GPM algorithms have recently been upgraded to Version 04, which is the first to be based on data and intercalibrations provided by the GPM Core Observatory.

Over land in general, and oceans at higher latitudes, the Version 04 GPM products tend to have deficiencies, with high and low biases, respectively. Thus, in those regions IMERG is climatologically calibrated to the Global Precipitation Climatology Project (GPCP) monthly Satellite-Gauge product to adjust these biases. Over land, this adjustment mostly provides a first approximation to the monthly gauge adjustment that is carried out month-to-month in the Final Run, and climatologicallly in the Early and Late Runs. Some examples will be shown breaking out the contribution to IMERG Final Run uncertainty by each sensor. Half hours with "morphed" values tend to have uncertainties that are comparable to the uncertainties of half hours that directly use sensor estimates, although GMI-based estimates have much better accuracy. The performance by IMERG is frequently directly controlled by the performance of the individual sensors in a more broad-scale sense as well. Known algorithm problems in coastal regions and around complex terrain are passed into IMERG as well. Compared to Version 03 IMERG, regions with high precipitation rates have much better bias, and the inclusion of as-available (but not morphed) microwave estimates at high latitudes provides the first chance for researchers in those regions to examine use of merged data.