Goddard Multi-Satellite Team

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We plan to continue to support PMM with comprehensive science algorithm development, implementation, maintenance, and validation, including user support, for the current and next generations of quasi-global combined-satellite precipitation estimates at fine time/space scales, both in real and post-real time. This work continues the key product concept in PMM of combining all available precipitation estimates to provide a single “best” estimate, for which the current algorithm is IMERG. The Multi-Satellite Team in the GSFC Mesoscale Atmospheric Processes Laboratory has had comprehensive responsibility in PMM for multi-satellite products since their inception well over a decade ago and the group’s head currently leads the PMM Multi-Satellite Algorithm Team. These data sets fill critical needs in the broader scientific community by providing straightforward access to a long archive of state-of-the-art estimates at a variety of latencies.

Specifics include:

1. Project Coordination. We will work with PPS on data set production, which currently entails a code sprint to develop MERRA2/GEOS5-based morphing vectors for V06, moving to retrospective and initial processing of V06 for the TRMM and GPM eras, gracefully shutting down TMPA, and then developing V07. Throughout, we will lead the PMM Multi-Satellite Algorithm Team to coordinate and focus expertise that is spread across the PMM Science Team.
2. Multi-Satellite Product Advancement. Comprehensive development and support for IMERG will build on lessons learned and implement features that were not sufficiently mature for use in previous versions. For example, we will expand to fully global morphing and seek additional datasets that provide credible high-latitude data, including shifting to modern wind-loss corrections to precipitation gauge data. We plan to work with PMM researchers to develop better error estimators and alternative Quality Index parameters. We expect to develop a joint model-observation product, examine alternatives to the current IR scheme, and test the use of daily precipitation gauge analyses. In support of these studies, we will develop an IMERG testbed to facilitate partnering with other researchers and groups. At the same time, we will adjust IMERG as needed to accommodate shifts in input satellite precipitation algorithms and dataset availability.
3. User Interaction. We will continue our widely recognized support for individual users and documentation, as well as advising and working with GPM, GSFC, and NASA outreach teams; NASA Applied Sciences; and external organizations (IPWG, IGWCO, GEO, GEOGLOWS, etc.).
4. Scientific Studies. We plan to analyze the various IMERG Runs, both to enhance our understanding of the products’ performance and to estimate the behavior of precipitation around the globe, importantly including oceanic and high-latitude regions. This work, which is not exclusive of collaborations with or independent work by other scientists, includes precipitation’s long-term global behavior, typical diurnal cycles in different regions, and wet and dry extremes at various spatial and temporal scales. Comparisons to other satellite-based data sets (including GPCP, with which the group is also involved) and various reanalyses is one key activity, in conjunction with PMM GV and other researchers.