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The Global Precipitation Climatology Project (GPCP) Data Products—Transfer to Operations at NCDC

PRINCIPAL INVESTIGATOR: Robert F. Adler, Earth System Sciences Interdisciplinary Center ESSIC, University of Maryland—College Park (radler@umd.edu)
Co-Principal Investigator: George Huffman (SSAI/NASA Goddard)
Co-I: Mathew Sapiano (ESSIC/UMD)
Co-I: Ralph Ferraro (NOAA/NESDIS)
Co-I: Ping-Ping Xie (NOAA/NCEP/CPC)
Co-I: Long Chiu (George Mason University)
Co-I: Udo Schneider (Deutscher Wetterdienst [DWD])

1. Summary of Project

The objective of this work is to successfully transfer the routine production of Global Precipitation Climatology Project (GPCP) products to NCDC from the ad-hoc processing of the Co-Is listed above. The current monthly (1979-present), pentad (1979-present) and daily products (1997-present) have been developed by research groups over the last 15 years and are produced by a consortium of those groups, funded by various agencies. Transfer of the routine processing of the GPCP products to an operational entity will ensure continuation of these important data analysis sets.

This activity involves the development of a detailed strategy for transfer of scientific knowledge, satellite and other data source accesses, and processing code for successful implementation of an end-to-end processing system that would routinely produce the GPCP current (Version 2) products for archival and dissemination.

The current GPCP processing involves computation of individual intermediate products or data sets by a number of government and university entities and a merger of these products by another group. These codes are being organized, streamlined, updated and documented for product production from the level of the satellite-calibrated radiances to the final merged products. Testing and evaluation of output products from the new system is a key part of this project, as is an evaluation of the feasibility of reprocessing the 30-plus-year-record to make minor upgrades. Maintaining science quality of the output products will be a critical aspect and will require significant on-going effort.

2. Recent Progress

The existing algorithms that must be run to produce GPCP V2.2 are written in a mixture of Fortran and C code. These legacy codes are being streamlined and re-written where necessary to comply with NCDC coding standards. Each of the three products will be created separately by the Executive Control Package (ECP), a shell script that calls the various elements of the code. Data acquisition will be handled outside of the ECP since this will need to be done on a routine basis. Of the three code elements, the monthly product is the most challenging to implement because it has the most inputs and has the oldest legacy code. In addition, there are several processing streams used to produce the

30-year record. Figure 1 shows the three major processing periods. Each box refers to a different set of GPCP code, each of which has undergone the same process. First, the original code was ported to UMD and the locally produced output was tested against the original output produced at Goddard Space Flight Center. Next, the code was modified to meet NCDC coding standards and the output form this modified version was tested against the locally produced and original output. Finally, each code segment is then integrated into the ECP.

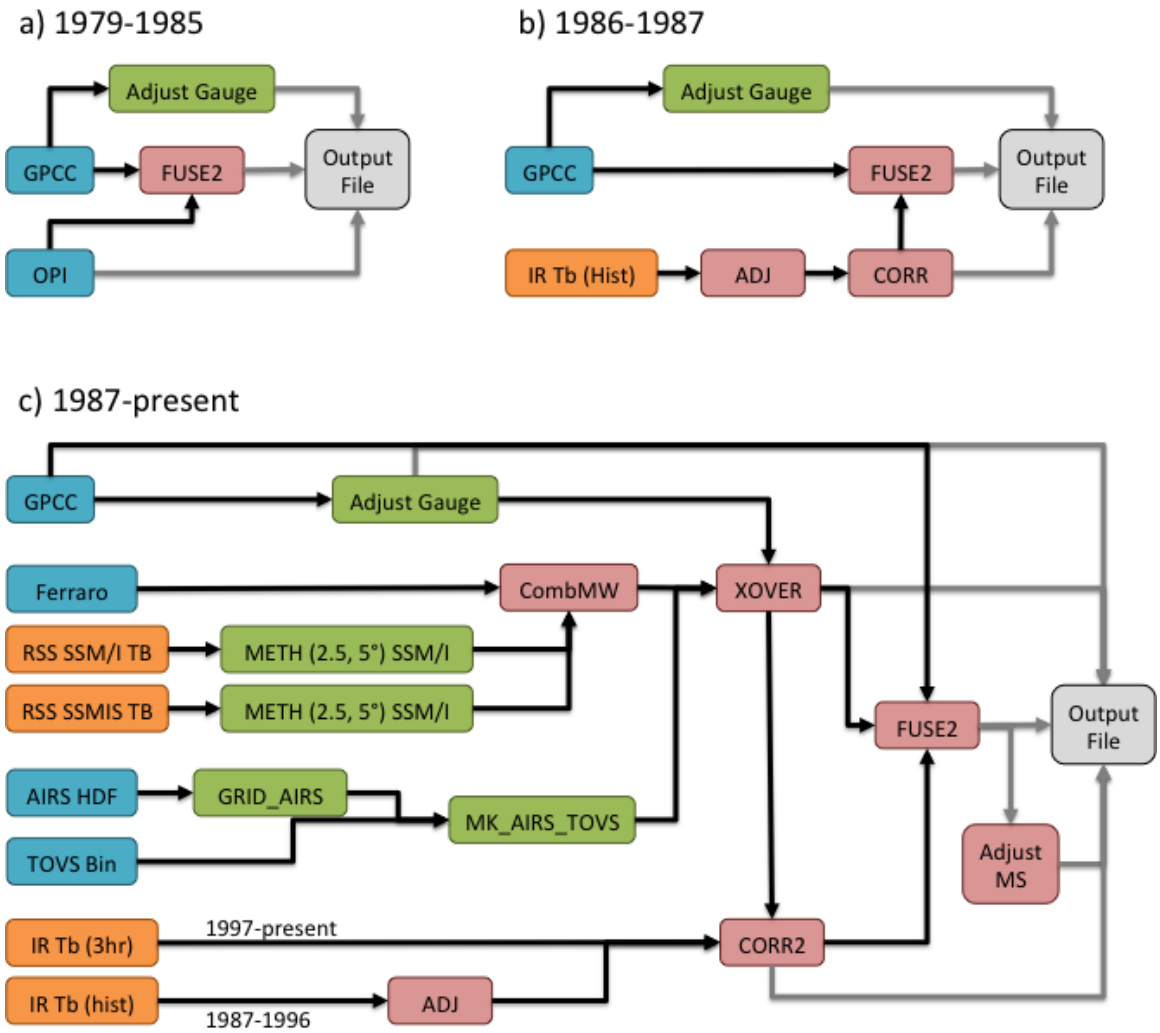

Figure 1. Structure of GPCP V2.2 code for each of the three major processing periods.

The monthly code package has now completed the design and assembly phases and has been streamlined to run in test mode at UMD. The code for the pentad and daily products is still in the design phase. Figure 2 shows the output from the monthly ECP run at UMD. Some additional testing of the Monthly product is required, but we are close to being able to run the code to produce the full period of GPCP data.

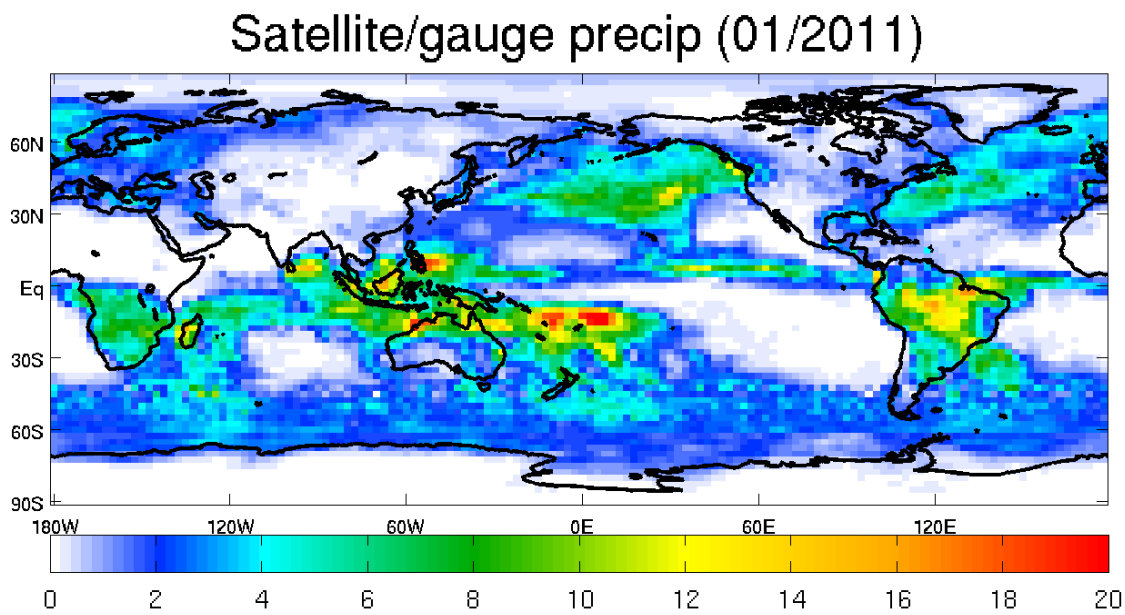

Figure 2. Monthly precipitation for January 2011 produced using the monthly CDR code.

2.2 Version 2.2 availability

Issues still remain with the routine production of GPCP V2.2 at Goddard. The data are currently available up to June 2011 due to issues in obtaining the IR data required. These issues are being addressed and it is hoped that the delivery will soon return to routine processing times, about two months after observation.

2.3 Availability of RSS V6 SSMIS at NCDC

It is our understanding that the RSS V6 SSMIS will be available from NCDC and we have planned to use this source for the GPCP CDR. The RSS Tb data are an important input for GPCP as these data are used by the METH algorithm to produce estimates over the ocean. At present, these data are not available through the NCDC CDR website and the inputs for the GPCP CDR are still being produced by Long Chiu at George Mason University (GMU) based on RSS V6 data obtained through the existing GPCP agreement with RSS. There are two issues: 1) when will the RSS SSMIS data be available form NCDC? 2) The GPCP CDR is being built to require these data for future operational processing: will the data be available from RSS in a timely manner? This latter question has broad implications for the possibility of producing an Interim Climate Data Record.

2.4 Plans for coming 6 months

In the coming 6 months we plan finish testing the monthly CDR code and use this to produce the full GPCP record at NCDC. Once the RSS SSMIS data are available, these also will be integrated into the system, but the rainfall fields from (GMU) will be used in the meantime. We also expect to begin implementation of the Pentad product, which appears to be relatively straightforward since it is produced by bias adjusting the CMAP pentad data produced at NOAA CPC to the monthly GPCP product. Finally, we are working on the NetCDF output file formats and will liaise with the relevant NCDC contacts to ensure that the standard developed is acceptable.