GPM Application Group

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Background for Discussion

- GMI has No oxygen sounding channels and limits some advanced applications that rely on temperature

- GPM has WV sounding infor and offers some new science studies (e.g. HF Dual polarization may separate sfc snow and falling snow)

- A few channels (e.g 10 -22 GHz) will be affected by RFI , which will degrade the quality of surface products

- Current NASA program focusing on precipitation (solid precip.) over land
  - Lack of surface products in general, such as, soil moisture.
  - Lack of synergy/collocation with other satellites, such as, SMAP, JPSS.
  - Rely on data assimilation for other parameters?
  - For these applications that are not support by the primary mission objective by NASA need identify the funding and who will do the work.

Requirements for Proxy Data and Software

- Proxy Data efforts
  - User community requests the GPM Proxy data to test the readiness of systems
  - Challenged by TRMM TMI frequency range, scan swath width, … etc.
  - Importance for testing the GPM applications.
- Format conversion tools
  - Radiance should be in BUFR for data assimilation > Potential to leverage BUFR toolkit developed at NDE
  - NetCDF4 outputs to NWS/AWIPS
  - HDF5 to level 2 products

Synergistic Use of GPM and Other Sensor data

- Surface Products
  - Combine with SMAP for better soil moisture retrieval
  - Combine with JPSS sensors for ocean surface wind speed, surface temperature under heavy precip condition.
- Atmospheric Products
  - Combine with NPP/JPSS and POES, Metop for TPW over land
  - Explore the capability to retrieve LWP and IWP over land
  - Combined with GOES-R GLM for identifying precipitation type, and electrification

Major NOAA GPM Applications

- Level -1 Data Applications
  - Data Assimilation: preparing CRTM readiness for GPM, convert data format to BUFR, ..etc.
  - Enhanced GPM Imagery with polarization correction for tropical and midlatitude storms (positioning, intensity monitoring and eye-wall replacement).
  - Multi-sensor co-registered radiance.
- Level-2 Products Applications
  - Multi-sensor blended products, such as, eTRAP, blended TPW, RR, ...etc.
  - Active and passive to improve freezing level estimation
  - Tailoring capability for specific NOAA users in sense of formats, regions, ...etc.
- Level-3
  - QPE
  - Merged or unified NOAA precip product

Overarching User Requirements

- GPM real-time monitoring
  - (O-B) bias (e.g. water vapor sounding channels)
  - Trend GMI noise (NeDT), calibration targets, and house-keeping information
- Independent assessments of GPM level 1c cross-calibration
  - Polar over-passing technique
  - Double difference technique (DDT)
  - GSICS MWRG and GPM Xcal combined capability
  - Non-linearity calibration science