Global Precipitation Measurement (GPM) mission

Precipitation Processing System (PPS)

GPM Mission Gridded Text Products

Provide Surface Precipitation Retrievals

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Topics

• Standard GPM mission products available
• Obtaining GPM mission products
• Background of the gridded text products
• Content of the gridded text products
• Available tools for the gridded text products
• Plans for future gridded text products
Obtaining All GPM Mission products

- **Must be a registered PPS user**
  - Register at URL: [http://registration.pps.eosdis.nasa.gov](http://registration.pps.eosdis.nasa.gov)
  - Must provide information
    - Valid, reachable email
    - Affiliation
    - GPM product interest
  - Will receive an email to the registered address and must then validate

- **Registered email address is username AND password for both the query and search interface**
  - STORM: [http://storm.pps.eosdis.nasa.gov](http://storm.pps.eosdis.nasa.gov)
  - ftp location: arthurhou.pps.eosdis.nasa.gov

- **All data included gridded text products are online and available in either of the ways**

- **Ftp access is really a special anonymous ftp implementation.**
  - For Linux and MAC it is possible to make a .netrc entry
  - Such an entry will facilitate access via scripts without requiring manual entry of username and password.
## GPM Production Swath Products

<table>
<thead>
<tr>
<th>Toolkit ID</th>
<th>Granule</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1AGMI</td>
<td>Gorbit</td>
<td>GMI unpacked packet data</td>
</tr>
<tr>
<td>1BGMI</td>
<td>Gorbit</td>
<td>GMI Brightness Temperatures</td>
</tr>
<tr>
<td>1CGMI</td>
<td>Gorbit</td>
<td>GPM Common Calibrated Brightness Temperature</td>
</tr>
<tr>
<td>GMIBASE</td>
<td>Gorbit</td>
<td>GMI Antenna Temperatures</td>
</tr>
<tr>
<td>1BKa</td>
<td>Gorbit</td>
<td>Ka Power</td>
</tr>
<tr>
<td>1BKu</td>
<td>Gorbit</td>
<td>Ku Power</td>
</tr>
<tr>
<td>2AGPROFGMI</td>
<td>Gorbit</td>
<td>Radiometer Precipitation/profiling</td>
</tr>
<tr>
<td>2BCMB</td>
<td>Gorbit</td>
<td>L-2 Combined DPR and GMI</td>
</tr>
<tr>
<td>2ADPR</td>
<td>Gorbit</td>
<td>DPR precipitation</td>
</tr>
<tr>
<td>2AKa</td>
<td>Gorbit</td>
<td>Ka precipitation</td>
</tr>
<tr>
<td>2AKu</td>
<td>Gorbit</td>
<td>Ku precipitation</td>
</tr>
</tbody>
</table>

Gorbit- Southernmost part of orbit to southernmost
## GPM Mission Gridded Products

<table>
<thead>
<tr>
<th>Toolkit ID</th>
<th>Granule</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3AGMIGPROF</td>
<td>Daily &amp; Monthly</td>
<td>GMI GPROF precip .25 deg x .25 deg</td>
</tr>
<tr>
<td>3APartnerGPROF</td>
<td>Daily &amp; Monthly</td>
<td>Partner Constellation GPROF precip .25 deg x .25 deg</td>
</tr>
<tr>
<td>3AKu</td>
<td>Daily &amp; Monthly</td>
<td>Ka Power</td>
</tr>
<tr>
<td>3AKa</td>
<td>Daily &amp; Monthly</td>
<td>Ku Power</td>
</tr>
<tr>
<td>3ADPR</td>
<td>Daily &amp; Monthly</td>
<td>Radiometer Precipitation/profiling</td>
</tr>
<tr>
<td>3ACombined</td>
<td>Daily &amp; Monthly</td>
<td>L-2 Combined DPR and GMI</td>
</tr>
<tr>
<td>3IMERG-Half Hour</td>
<td>Half-hour</td>
<td>.1 deg x .1 deg merged radiometer/IR Precip</td>
</tr>
<tr>
<td>3IMERG-Month</td>
<td>Monthly</td>
<td>.1 deg x .1 deg merged radiometer/IR Precip</td>
</tr>
</tbody>
</table>
### GPM NRT Products

<table>
<thead>
<tr>
<th>Toolkit ID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1CGMI</td>
<td>GPM Common Calibrated Brightness Temperature (5min)</td>
</tr>
<tr>
<td>2AGPROFGMI</td>
<td>Radiometer Precipitation/profiling (5min)</td>
</tr>
<tr>
<td>2AKu</td>
<td>Ku 3-D profile of precipitation (30min)</td>
</tr>
<tr>
<td>2AKa</td>
<td>Ka 3-D profile of precipitation (30min)</td>
</tr>
<tr>
<td>2ADPR</td>
<td>Dual-Frequency 3-D profile of precipitation (30min)</td>
</tr>
<tr>
<td>2BCMB</td>
<td>Level-2 DPR and GMI Combined (30min)</td>
</tr>
<tr>
<td>3IMERGH</td>
<td>I-MERG 30-minute (.1 x .1 grid) (early and Late)</td>
</tr>
</tbody>
</table>

- 1C for each contributing radiometer (size depending upon instrument)
- GPROF for each contributing radiometer (size depending upon instrument)
Background of Gridded Text Product

• First provided during the Tropical Rainfall Measuring Mission (TRMM) (3G series of products) to provide just surface precipitation retrievals in an easy to use format

• Was determined that space delimited fields of ASCII text terminated by a newline character was the easiest to use

• In TRMM the 3G products had an internal compression scheme that made lines have different number of fields on a line.
  – NOT done in GPM gridded text product
  – In GPM gridded text product every line always has same number of fields

• In TRMM text products so become among the most popular products for users

• Basic objectives
  – Keep format simple
  – Provide just basic information about the surface precipitation
  – Maintain hourly information (helps with diurnal studies)
  – Package as a daily file to minimize number of download necessary
  – Use information from the swath products directly
Content of GPM Gridded Text Products

• Details of product including calculations used in poster 2015-1387
• Five lines of metadata describing the product
• Hourly grids at .25 deg x .25 deg
• Each data line contains
  – Row number of global grid, column number of global grid
  – Hour (starting at 0), Minute (starting at 0)
  – Four surface precipitation retrievals in grid box
    • GMI GPROF
    • KU
    • DPR matched (Ku/Ka) swath (dual-frequency retrieval)
    • Combined matched (GMI/Ku/Ka) swath
  – Each retrieval type (of the four used) has:
    • Total pixels
    • Number of precipitating pixels
    • Mean precipitation rate
    • Convective fraction
    • Liquid fraction
    • Retrieval quality
Available tools for the Gridded Text Products

• **Tool High-resolution Observation Review (THOR)**
  – Data viewing and analysis tool
  – Allows looking through the gridded text product and finding the value of variables
  – See image (next slide)
  – Download URL: pps.gsfc.nasa.gov

• **Combining tool**
  – C programs
  – Allows combining all the daily gridded text products into a single file
  – Can retain the hourly grids or collapse all hours into a single hour grid (thereby providing a total aggregation)
  – If interested email: erich.f.stocker@nasa.gov
  – Within 6 months will be available in python
Example of THOR with Gridded Text Product
Plans for Future Gridded Text Products

• Current plans call for two additional type of gridded text products to be produced in time for the first major GPM reprocessing in September 2015

• GPROF retrievals from partner constellation microwave conical scanning radiometers
  – SSMIS (F16-F19)
  – AMSR2
  – This expected to be available by the beginning of August

• GPROF retrievals from partner constellation cross track radiometers
  – MHS (NOAA18, NOAA19, MetopA, MetopB)
  – Saphir
  – ATMS
  – Not expected to be ready until September