NRL Blended Technique

The NRL blended satellite technique is based upon area-dependent statistical relationships derived from a precise, near realtime ensemble of colocated passive microwave (PMW) and infrared (IR) pixels from any or all low Earth-orbiting (LEO) and geostationary satellites, respectively, as their individual orbits and sensor scan patterns continuously intersect in space and observation time.

Imagery website:
NRL Marine Meteorology Division (Monterey, California, USA) hosts a website that depicts current imagery:
http://www.nrlmry.navy.mil/sat-bin/rain.cgi

Realtime digital data ftp location:
Near realtime digital datasets are maintained on an anonymous ftp site, in a simple-to-read binary rectangular map projection. Sample Fortran code and a README are also available:
ftp://ftp.nrlmry.navy.mil/pub/receive/turk/global_rain
An archive of data (with occasional missing periods) is available going back to April 2001. Contact us for more information.

Spectral Intervals & applicable satellites:

The technique is developed to work at a very basic level and then can work with additional capabilities depending upon which satellite datasets, channels, and ancillary data are available.
It can work with just PMW data from LEO satellites, in which case the products are simple weighted accumulations over a time interval. If geostationary data are also available (one or more satellites), then the blended product can be produced.
Currently, the blended technique requires (at minimum) the basic 11-um longwave IR window channel. It will work with increasing capabilities are additional spectral channels are availabe, and as more LEO datasets are available.

Spatial Scale:

0.1-degree finest scale
Temporal scale instantaneous, but 3-hourly accumulations are the shortest time-interval accumulation
Ancillary data The following are utilized by the blended technique, but are not required, in which case the technique will bypass any orographic detection and correction.

Temporal Scale:

Computed at instantaneous, but minimum time scale for products is 3-hourly, maximum time scale is any multiple of 3-hour (6, 12, 24, 48, etc).

Ancillary Data (e.g., soundings):

1. Numerical Weather Prediction (NWP) global (or mesoscale) model data: 850 hPa winds, precipitable water and relative humidity.
2. Fine-scale (under 5-minute resolution) topography database.

If addiitional IR data are maintained, a time-rate-of-change correction is also used to identify possible convection.
If lightning flash data are available, they are also used to identify possible convection.

Depending upon how many instantaneous-scale rainfall files are maintained, the accumulations can extend as far back in time as desired, up to one week. For 1-week to 1-month time scale products, these are summations of 3-hourly accumulations. For 1-month to N-months time scale products, these are summations of 24-hour accumulations.

Additional Comments:
The technique works in two parts: a background process which constantly analyzes incoming data file and maintains an updated database of lookup tables that can adjust the IR temperatures, and a foreground process, which computes the instantaneous-scale products using the appropriate lookup table database.
Accumulations are produced via a cron task that starts up once per hour and performs the accumulations as specified above.

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