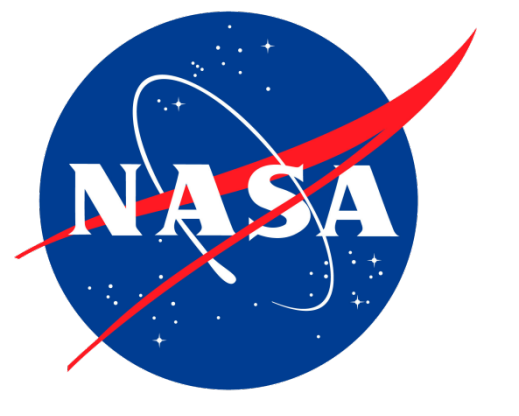




Aqua and Terra Direct Broadcast Processing at CIMSS/SSEC



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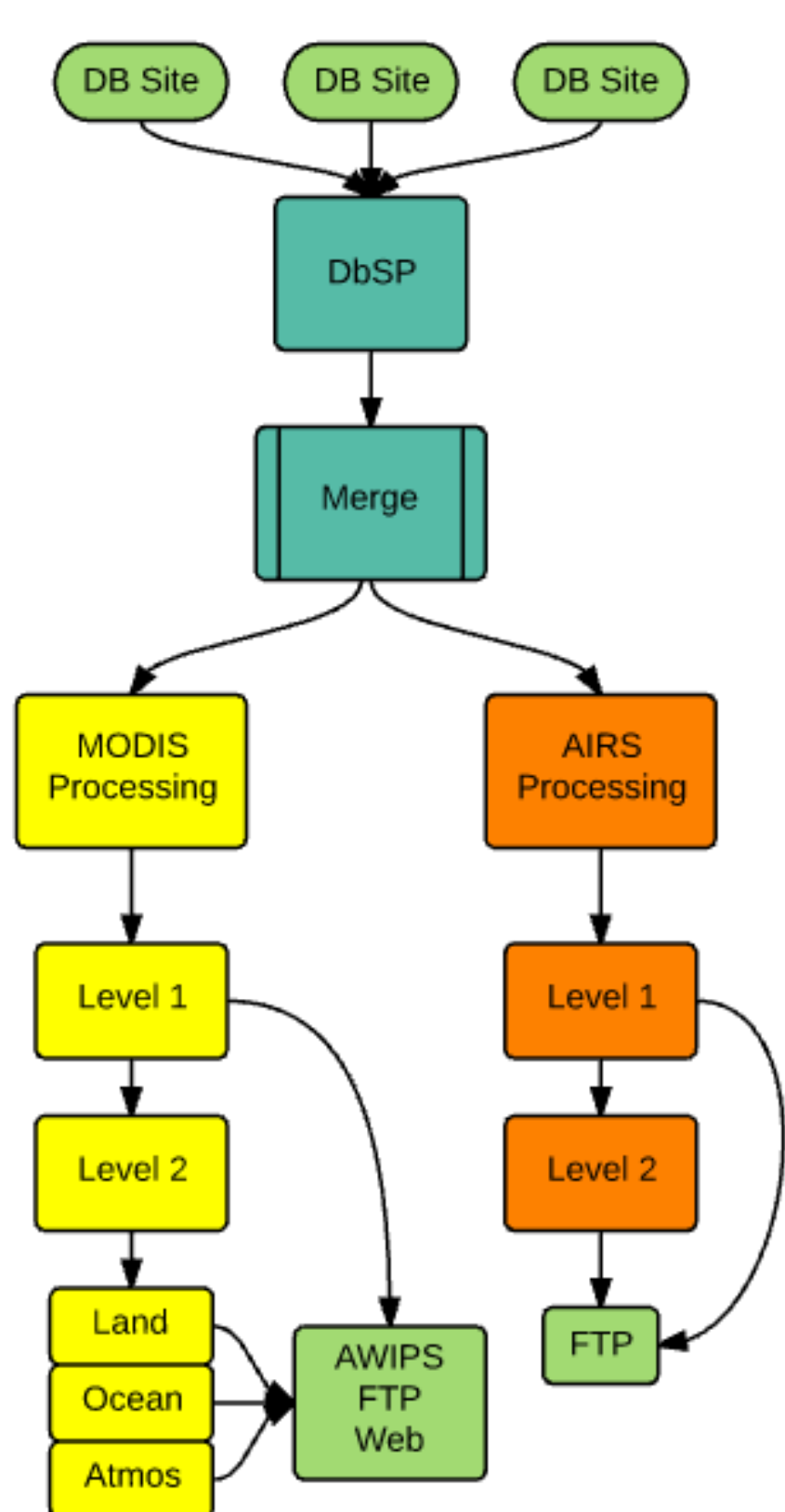
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ABSTRACT

The Direct Broadcast (DB) group at CIMSS/SSEC has been processing MODIS, AIRS, and AMSU data from Aqua and Terra direct broadcast data for over 10 years. The current merged ingest system uses an overpass prediction method to merge collocated Level 0 PDS files ingested from multiple DB sites across the United States. The resulting PDS files have more extensive coverage and higher quality of data, as the majority of dropouts and bad packets are removed. The merged passes are processed into Level 1 and Level 2 products and distributed to operational sites including the National Weather Service (NWS) and NOAA CoastWatch. With the success of the MODIS, AIRS, and AMSU merged pass processing method, development is in progress to extend this merged method to other DB data including Suomi-NPP.

MERGE PROCESS

The PDS files are ingested from the SSEC Direct Broadcast Real-time Network (DbRTN) where the start and end packet times are collected and entered into a local database. Orbit overpass information is handled by Orbnav¹. For each satellite overpass, all overlapping files are merged together using the EdosLOUtil² package developed at CIMSS.



DB Site	Location
Oregon State University	Corvallis, OR
Chapman University	Orange, CA
City College of New York - CREST	New York, NY
GINA	Fairbanks, AK
Atlantic Oceanographic & Meteorology Lab	Miami, FL
Naval Research Laboratory	Monterey, CA
University of Puerto-Rico at Mayaguez*	Mayaguez, PR

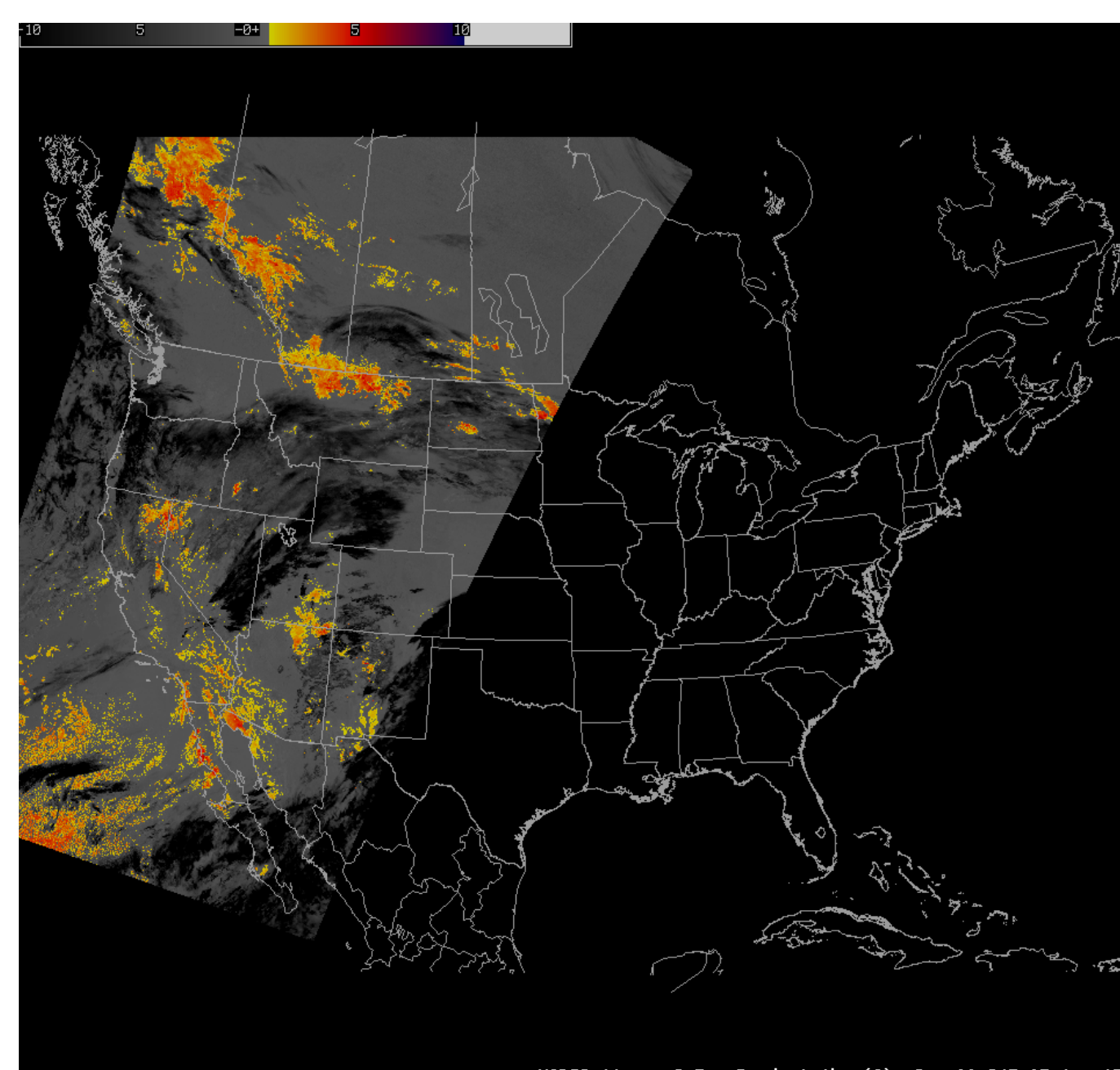
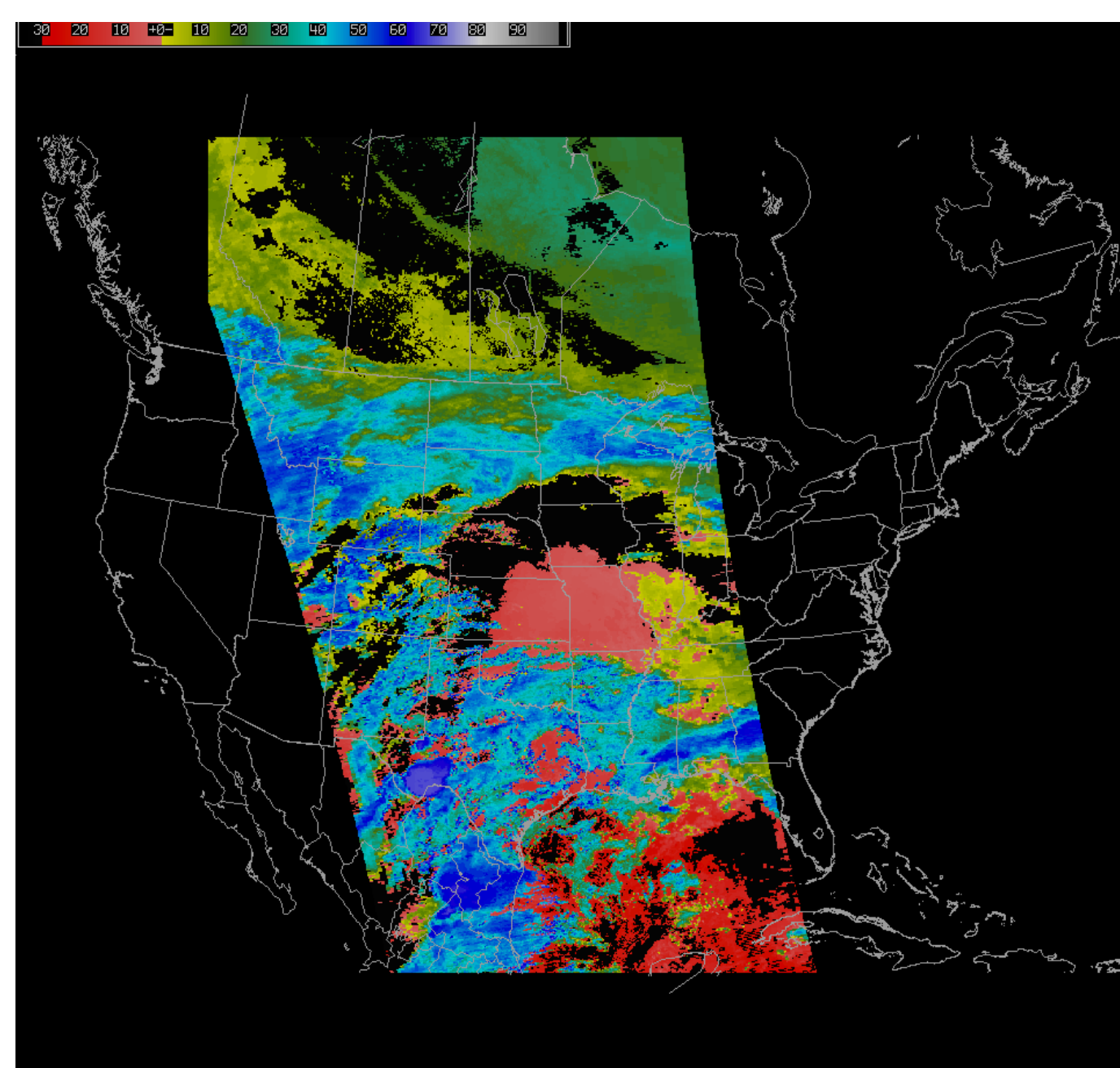
DB Site	Location
SSEC (2)	Madison, WI
NASA - Goddard	Greenbelt, MD
Purdue University	West Lafayette, IN
NWS - Honolulu	Honolulu, HI
USDA Forest Service Remote Sensing Applications Center	Salt Lake City, UT
University of South Florida	Tampa, FL
Environment Canada*	Edmonton, AB, Canada
Hampton University*	Hampton, VA

* Future DB sites

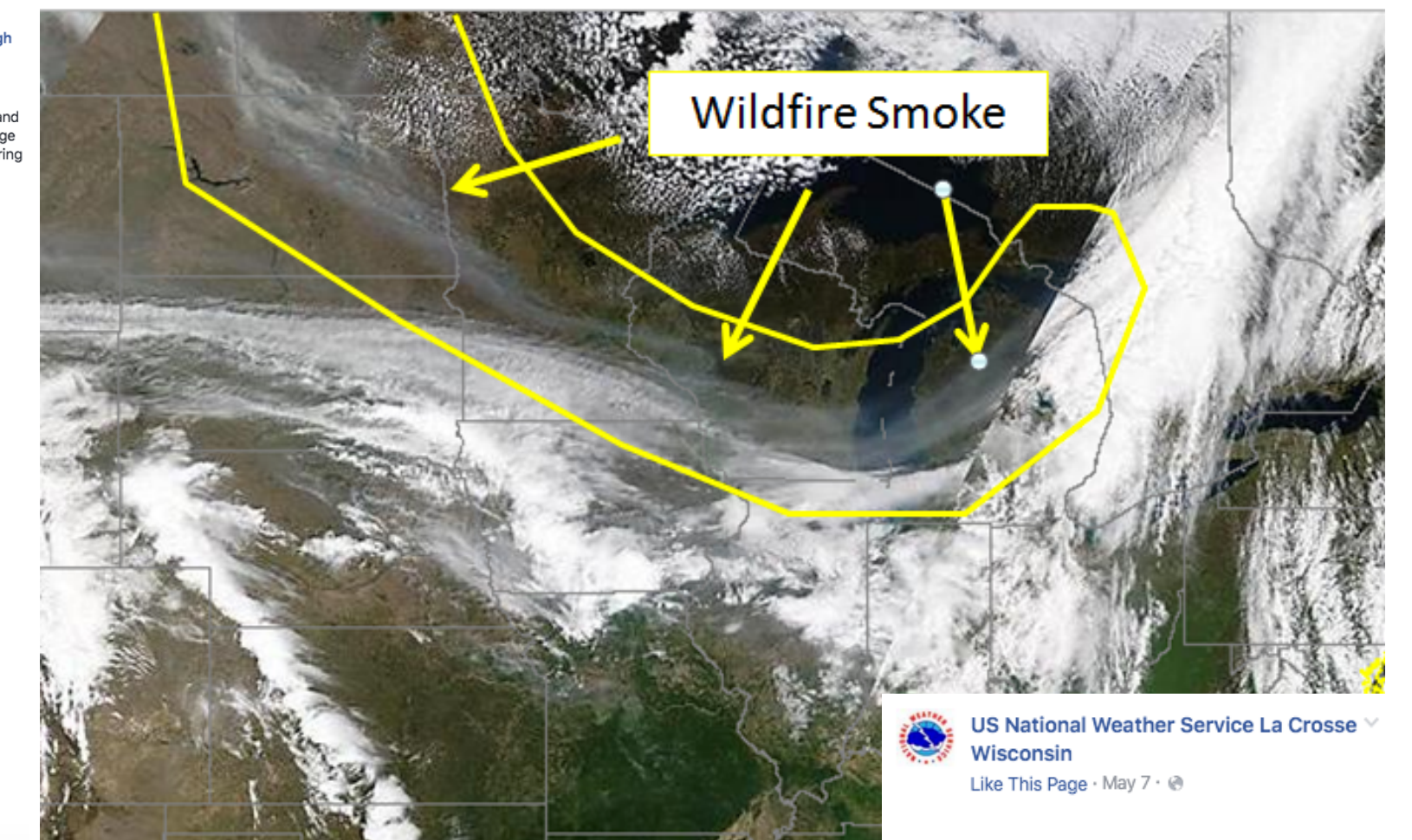
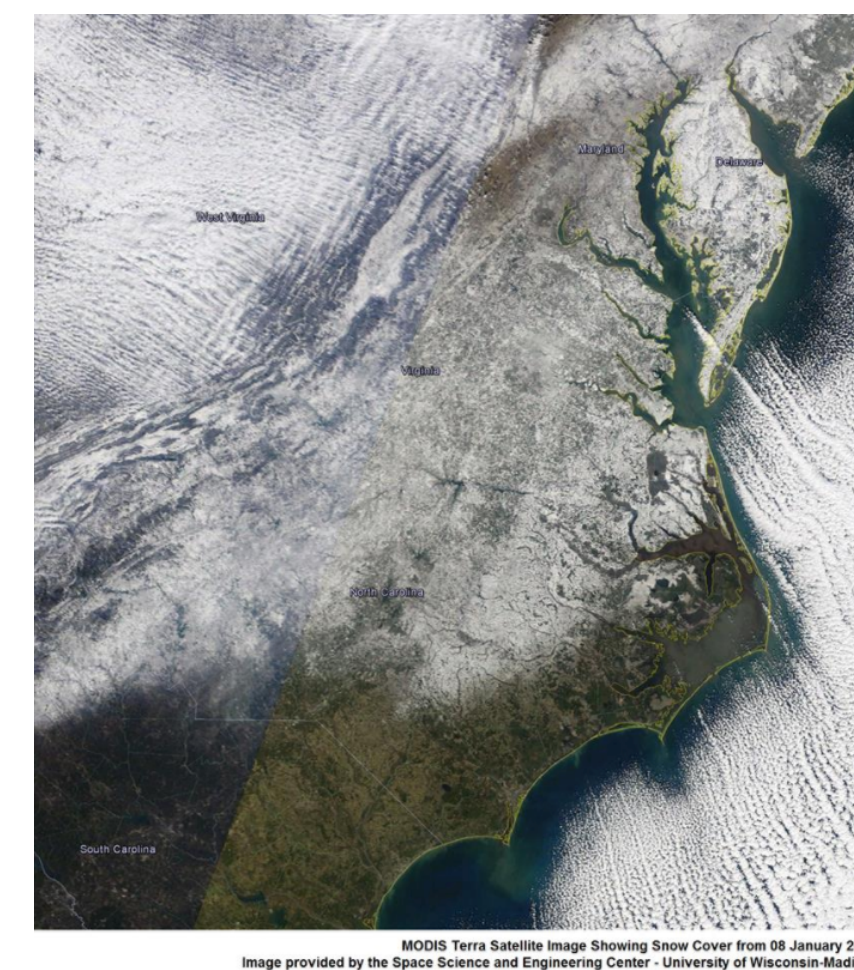
Data Processing and Distribution

Level 1 and Level 2 products are created and distributed using the Grid Engine batch-queuing system. The processing creates Level 1 and Level 2 products for MODIS, AIRS, and AMSU using the merged Level 0 PDS files. Level 1 products are created using SeaDAS (MODIS) and IMAPP (AIRS). Level 2 products for MODIS include IMAPP MODIS Level 2 Clouds, Aerosols, Snow/Ice, and Atmospheric Profile Products using the MODIS Collect 6 algorithms; SeaDAS Ocean Color and SST Products; Projected Imagery for AWIPS and Google Earth; Direct Readout Fire Detection, NDVI/EVI, LST, and Corrected Reflectance.

Operational products for the NWS are distributed to AWIPS via the Local Data Manager (LDM) (shown below). GeoTIFF files used by NOAA CoastWatch are distributed to the SSEC FTP site for pick up along with other data file and imagery for use by the general public.

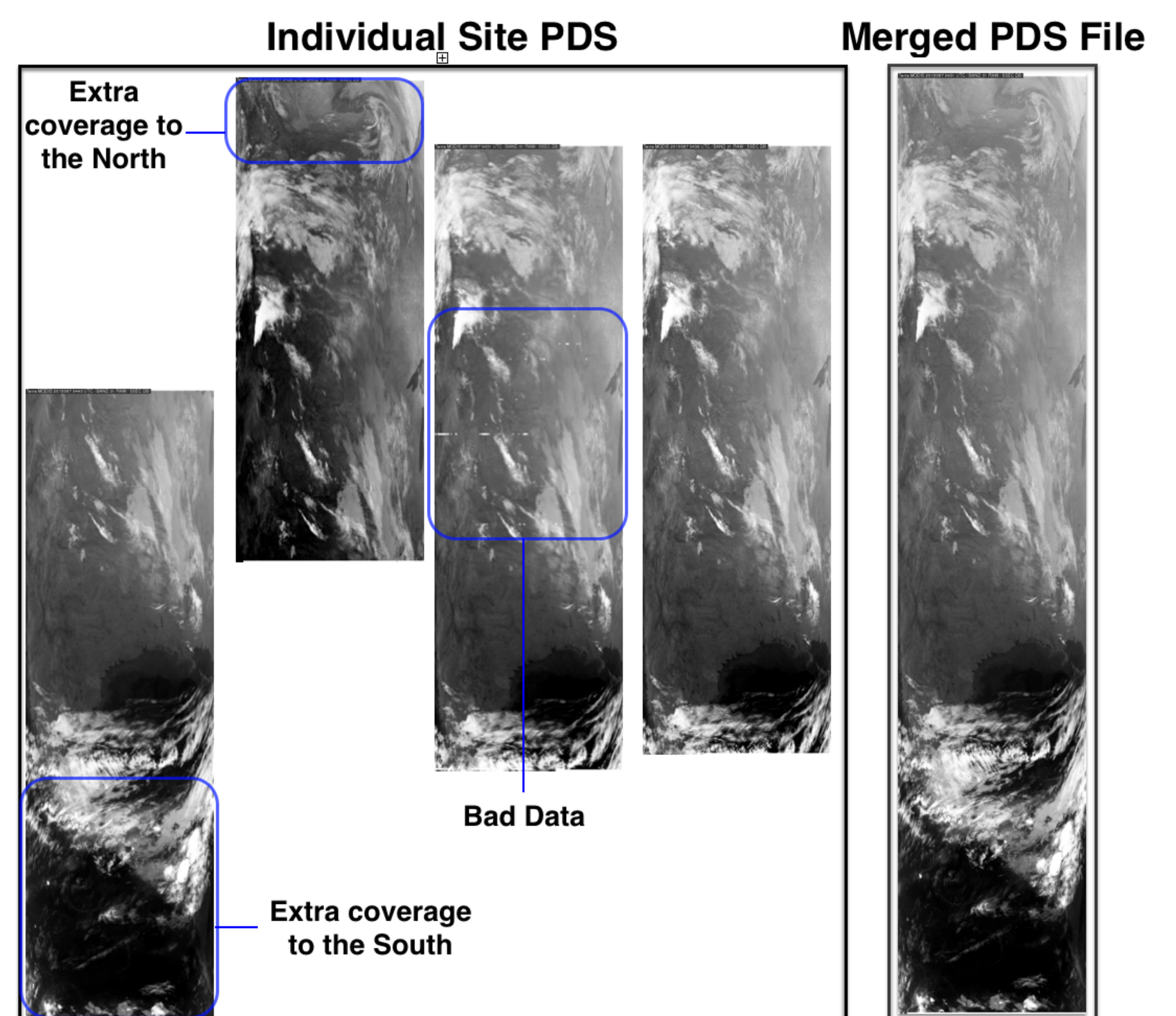


MODIS Today Images are used throughout Social Media to inform and educate the public.



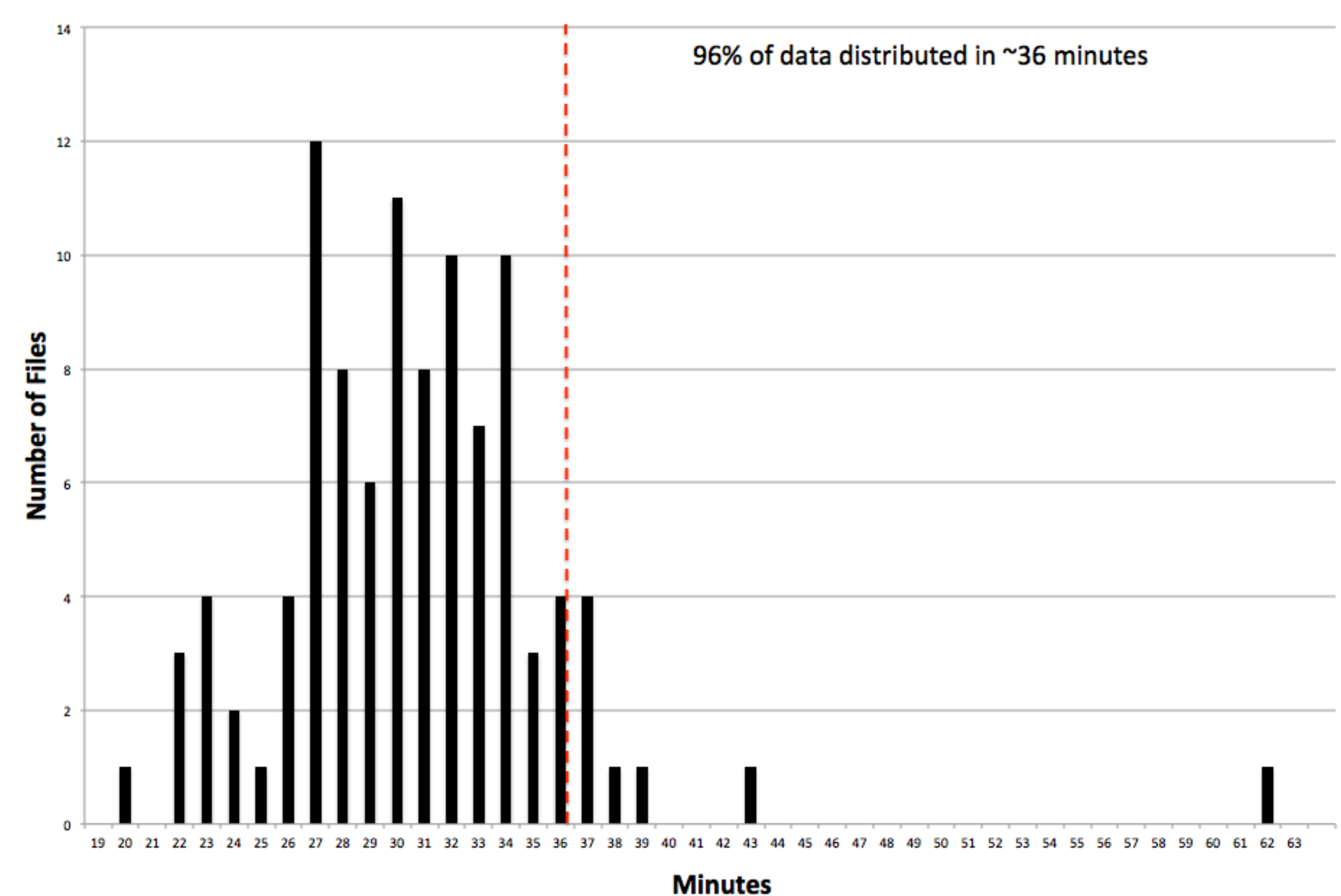
QUALITY CONTROL

The merging process compares each packet of data across all input files. Bad packets are skipped in favor of good quality data from other input files.



Data Latency

Time Between Pass End and AWIPS Distribution
2017-05-01 to 2017-05-07



Future Work

Processing of Level 1 and Level 2 products from S-NPP, Metop-A/B, and NOAA-18/19 data acquired from a single antenna is currently in production at CIMSS. Level 1 and Level 2 products are created using the suite of Community Satellite Processing Package (CSPP) software. Level 2 products include Clouds, Aerosols, Snow/Ice, Atmospheric Profile Products, SST, and Precipitation.

Future plans include reworking the merge processing system to improve latency by modifying the current merge calculation method, as well as expand processing by including Level 0 data from additional sensors, starting with the VIIRS, CrIS, and ATMS instruments on S-NPP. Data from additional polar-orbiting satellites will follow.

¹ <http://sips.ssec.wisc.edu/orbnav>

² <https://gitlab.ssec.wisc.edu/sips/EdosLOUtil>