P2.42 NEAR-REAL-TIME AMSR-E PROCESSING AT NOAA

Ivan Tcherednitchenko*, Computer Sciences Corporation, Suitland, Maryland
Paul Haggerty, Science and Technology Corporation, Suitland, Maryland
Gene Legg, National Oceanic and Atmospheric Administration, Suitland, Maryland
Ray Luczak, Computer Sciences Corporation, Suitland, Maryland

1. INTRODUCTION

The NOAA/NESDIS Near-Real-Time Processing System was implemented under the Computer Sciences Corporation (CSC) Central Satellite Data Processing (CSDP) contract. This system provides near-real-time environmental products to NOAA customers based on the MODIS (Moderate Resolution Imaging Spectro-radiometer) data available from two NASA EOS satellites – TERRA and AQUA.

In August 2003, the system was expanded to process data from another instrument aboard the AQUA satellite – the Advanced Microwave Scanning Radiometer for the Earth Observing System (EOS), abbreviated AMSR-E. AMSR-E is a passive microwave radiometer, modified from the Advanced Earth Observing Satellite-II (ADEOS-II) AMSR, designed and provided by NASDA (currently JAXA), Japan. It observes land, oceanic, cryospheric, and atmospheric parameters and monitors various water processes that exert a strong influence on climate and weather.

The first step in processing AMSR-E data is to convert the raw Rate Buffered Data (RBD) files that NOAA receives from NASA's EDOS (EOS Data Operations System) to Level 1A and 1B data. (See Figure 1) The Level 1B data, the radiance temperature images, is used to create the higher level products, such as precipitation, sea surface temperature, ice concentration, snow water equivalent, surface wetness, wind speed, atmospheric cloud water, and water vapor.

The software for converting RBD data into Level 1 data was provided by NASDA and NASA; whereas the wrapper scripts and the database containing metadata and processing control information were developed at NOAA.

This poster session will display a processing system structure, dataflow, and sample products.

2. LEVEL 1A AND 1B PROCESSING

The processing algorithm uses AQUA's Ground Based Attitude Determination (GBAD) RBD files for geo-referencing AMSR-E data. Every AMSR-E RBD file has a corresponding GBAD RBD file containing ephemeris and attitude information derived from data packets in the AQUA spacecraft telemetry downlink.

The data packets in AMSR-E and GBAD files are not sorted in the time order. They contain both the "play back" (recorded by the onboard storage device) and direct broadcast data. Upon arrival in the input directory of the processing system, RBD files are sorted by the NASDA program to retain only the playback data. This sorted (Level 0) data is further used by the NASDA program to generate Level 1 data files. The file name and times of the first and last scans of sorted data are written to the "sorted" table of the database.

The Level 1A and 1B output files (in HDF format), or scenes, are defined as half-orbits, beginning and ending at the poles. According to the file naming convention, a file name should contain the instrument identification, the date of the start of the scene, the orbit direction (ascending or descending), and the path number. The path number defines the sub-satellite track on the Earth and is used by customers to locate their areas of interest.

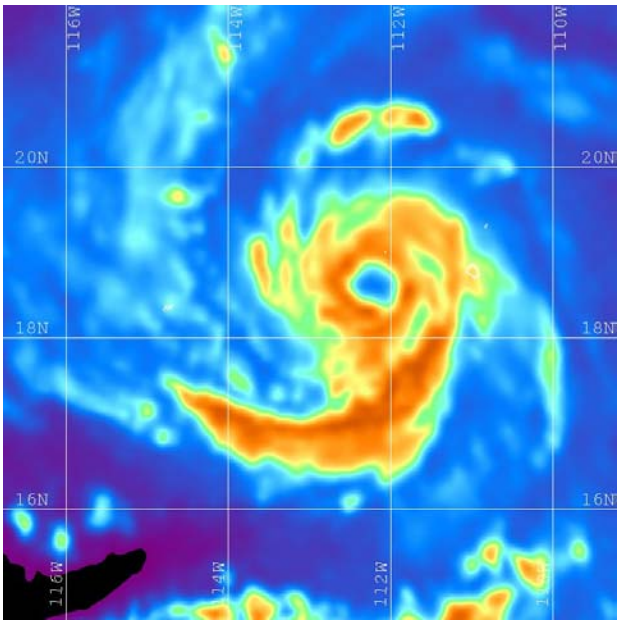

Figure 1. *A sample of the Level 1B data. (Image created in NRL, Monterey, CA using NOAA/MODIS/NRT Level 1B files).*

The information about the satellite positioning on orbit is extracted from AMSR-E Orbital Event files provided by NASA. All parameters needed to identify an AMSR-E scene are stored in the "scenes" table in the database.

Using the "scenes" and "sorted" database tables, we match a particular scene and the corresponding Level 0 file(s) that comprise this scene. A record containing the scene and data file information is written into the "processed" table of the database. The other information needed to process the AMSR-E data is the Earth

*Corresponding author address:
Ivan Tcherednitchenko, CSC, NOAA/NESDIS/IPD FB-4, RM 0303, 4401 Suitland Road, Suitland, MD 20746; e-mail: ivan.tchered@noaa.gov.

Orientation Parameters (EOPs) provided by the International Earth Rotation Service (IERS). This information is available once a month and contains EOPs in five-day intervals. Therefore, we use interpolation to calculate EOPs for the current date. The last step before Level 1 processing is creation of a configuration file containing all information necessary for processing, such as input and output file names, start and end times of the scene, and other scene and orbit-related data.

Processed Level 1A and 1B files are stored on the file server and/or transferred to the customer site.

3. CONCLUSIONS

A new subsystem for AMSR-E Level 1 processing was added to the NOAA/NESDIS AMSR-E Near-Real-Time Processing System. This subsystem will be expanded to accommodate the Level 2 processing when the software for product generation becomes available.

A copy of this poster session is located at http://www.osdpd.noaa.gov/MODIS/AMS/