

Year 1 8th Bundle: Providing SSM/I Fundamental Climate Data Records to NOAA - OBOBWPAAMI11

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Background

The Special Sensor Microwave Imagers (SSM/I) are a series of 6 satellite radiometers that have been in operation since 1987. These satellite sensors measure the natural microwave emission coming from the Earth's surface. These emission measurements contain valuable information on many important climate variables including winds over the ocean, the moisture and rain in the atmosphere, sea ice, and snow cover. However, the extraction of this information from the raw satellite measurements is a complicated process requiring considerable care and diligence. The first step in the process is the generation of Fundamental Climate Data Records (FCDR) of the sensor measurements in term of antenna temperatures and brightness temperatures. Since the first SSM/I was launched in 1987, Remote Sensing Systems (RSS) has been providing SSM/I data to the research and climate communities. The most current RSS dataset is called Version 6 and is generally recognized as the most complete and accurate SSM/I FCDR available.

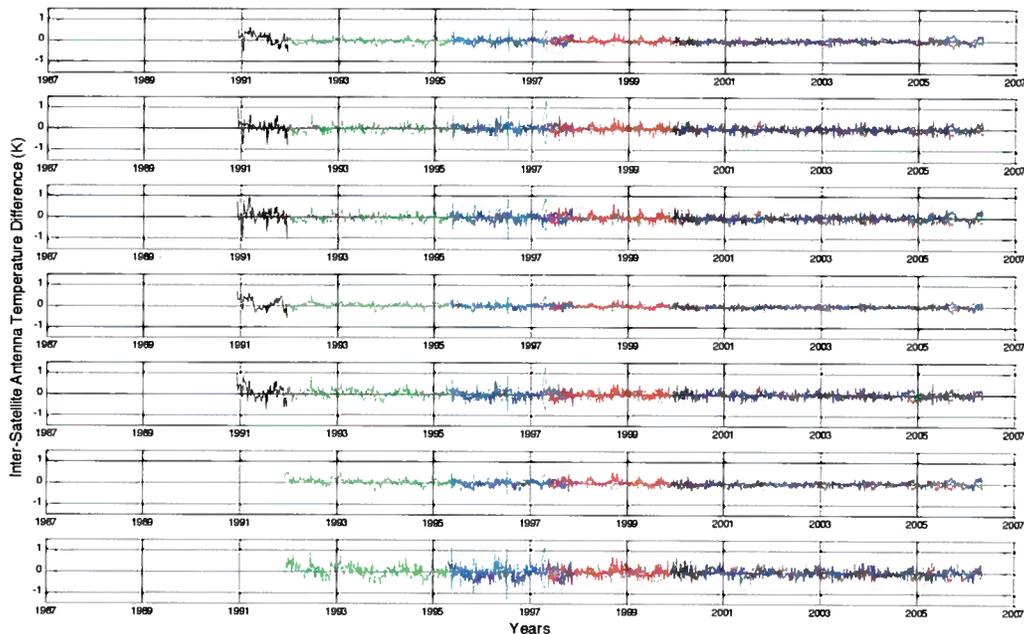


Figure 15 T_A differences for 11 overlap periods after applying all the corrections. Each overlap period is shown in a different color with the color-coding given by Table 1. The 7 frames show the 7 channels going from 19V at the top to 85H at the bottom in the order 19V, 19H, 22V, 37V, 37H, 85V and 85H."These results are for the evening portion of the orbit. (This is Figure 8 in the Technical Report: *The Version-6 Calibration of SSM/I*, October 2010 – see link below.)

Table 1. Color coding for figures displaying the 11 inter-satellite overlap periods.

black	red	green	blue	magenta	cyan	orange	black	red	green	blue
F08	F08	F10	F10	F10	F11	F11	F11	F13	F13	F14
F10	F11	F11	F13	F14	F13	F14	F15	F14	F15	F15

Accomplishments

This year RSS delivered to NCDC/NOAA the complete SSM/I Version-6 FCDR consisting of observations over 24 years from 6 satellites, thereby providing free access to this very important dataset. In addition, RSS provided 5 Technical Reports describing the SSM/I characteristics, geolocation procedures, quality control, data formats, and software for managing the SSM/I FCDR. One of these reports entitled, *The Version-6 Calibration of SSM/I*, provides the inter-satellite calibration method that was applied to the 6 SSM/Is. The figure on the next page shows the residual inter-satellite antenna temperature differences that remain after the on-orbit calibration has been applied. All 5 Technical Reports can be downloaded from ftp://eclipse.ncdc.noaa.gov/pub/ssmi/rss_v6_ssmi/doc/. Additional documentation can be found at www.ssmi.com. RSS has also been providing some support to NOAA for integrating the SSM/I FCDR into the NCDC computer environment and providing some help related to turning the SSM/I FCDR into an operational CDR.

Planned Work

The bulk of this investigation was the Year-1 work described above. In Years 2 and 3, we will provide User support for the SSM/I FCDR. This support includes: (1) the continue processing of the F15 SSM/I, (2) a complete reprocessing of all SSM/I data when Version 7 is finalized, (3) converting the RSS binary format into the netCDF4 format, and (4) supporting Users inquiries and feedback and attending meetings and conferences.

Publications

None

Technical Reports

To download the 5 Technical Reports, please visit the following website: ftp://eclipse.ncdc.noaa.gov/pub/ssmi/rss_v6_ssmi/doc/