MSU/AMSU/SSU Atmospheric Layer Temperature CDR and applications

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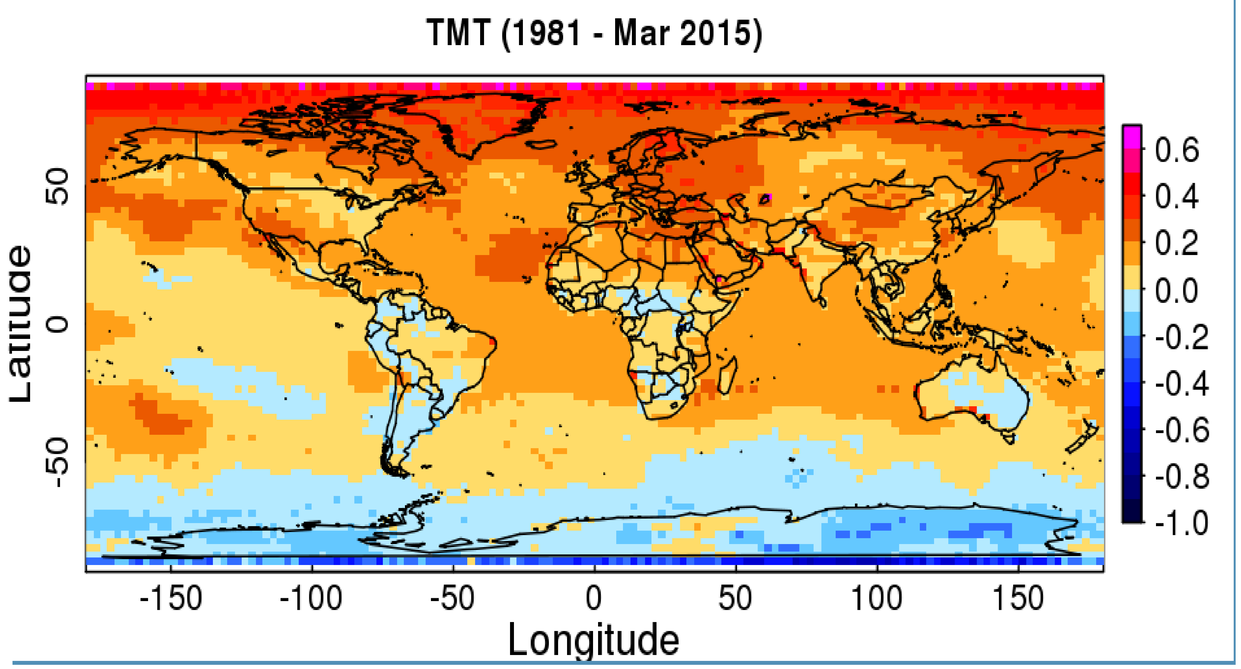
MSU/AMSU Mid-Tropospheric Temperature Trend during 1979-2015



CDR Description

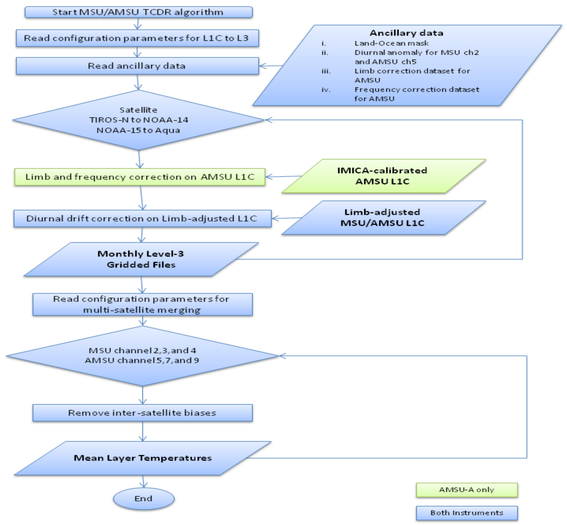
MLT CDR Specifications:

- Global Product
- 2.5x2.5 Degree Resolution (monthly Product)
- 2.5x2.5 Degree Resolution (pentad Product)
- 1979-present
- Updated each month

Inputs to the MLT CDR:

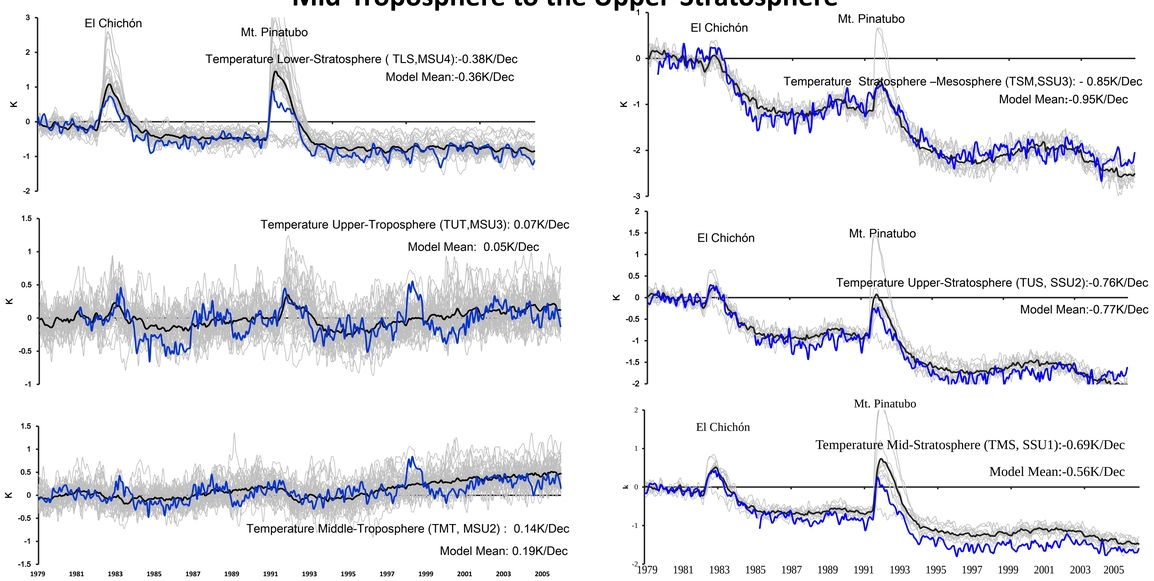
- NOAA MSU/AMSU Level-1C swath radiances derived from Integrated Microwave Inter-Calibration Approach (IMICA) which are obtained from NCDC CDR Program
- Recalibrated SSU Level-1C swath radiances obtained from STAR MSCAT Project
- Observational Geometric Conditions

Flow Chart for Generating MSU/AMSU MLT Products



Example of CDR Applications

Detecting Atmospheric Temperature Trends and Validating Climate Model Simulations from the Mid-Troposphere to the Upper-Stratosphere



Future Improvements and Anticipated Applications

Development & Improvement:

- Automating the production system for near real time data production
- Merging SSU with AMSU observations to extend the stratospheric MLT from 1979 to present
- Develop an inter-calibration algorithm for extending the products from heritage MSU/AMSU/SSU satellite observations seamlessly to JPSS ATMS observations

Potential Applications:

- Detecting long-term trend of atmospheric temperatures from the lower troposhere to the upper stratosphere
- Supporting climate change attribution and variability analysis
- Verifying and validating climate model simulations of the anthropogenic global warming
- Monitoring upper air temperature changes