

This directory contains the global anomaly time series of the reference mean layer atmospheric temperatures developed by the NOAA/STAR team (Zou et al. 2021).

RTMT (Reference Temperature Mid-Troposphere): RTMT uses AMSU-A channel 5 (53.596 GHz) observations onboard the Aqua and MetOp-A satellites and ATMS channel 6 (also 53.596 GHz) observations onboard the SNPP and NOAA-20 satellites. The Aqua, MetOp-A, SNPP and NOAA-20 satellites are all on stable sun-synchronous orbits. The time period of the dataset is from August 2002 to present with a spatial resolution of 2.5° latitudes by 2.5° longitudes. The RTMT measurement accuracy for long-term trends is about 0.01K per decade. The time period of monthly climatology used to calculate the RTMT anomalies is from January 2008 to December 2017. Both RTMT anomalies and the reference monthly climatology are provided in this directory.

RTUT (Reference Temperature Upper-Troposphere): RTUT uses AMSU-A channel 7 (54.94 GHz) observations onboard the Aqua satellite and ATMS channel 8 (also 54.94 GHz) observations onboard the SNPP and NOAA-20 satellites. The Aqua, SNPP, and NOAA-20 satellites are all on stable sun-synchronous orbits. The time period of the dataset is from August 2002 to present with a spatial resolution of 2.5° latitudes by 2.5° longitudes. The time period of monthly climatology used to calculate the RTUT anomalies is from January 2012 to December 2019. Both RTUT anomalies and the reference monthly climatology are provided in this directory.

RTLS (Reference Temperature Lower-Stratosphere): RTLS uses AMSU-A channel 9 (57.290 GHz) observations onboard the Aqua and MetOp-A satellites and ATMS channel 10 (also 57.290 GHz) observations onboard the SNPP and NOAA-20 satellites. The Aqua, MetOp-A, S-NPP and NOAA-20 satellites are all on stable sun-synchronous orbits. The time period of the dataset is from September 2002 to present with a spatial resolution of 2.5° latitudes by 2.5° longitudes. The time period of monthly climatology used to calculate the RTLS anomalies is from January 2012 to current month. Both RTLS anomalies and the reference monthly climatology are provided in this directory.