

2019: The Warmest Year on Record?

Joel Susskind¹, Jae N. Lee^{1,2}, Gavin Schmidt³, John Blaisdell⁴, and Lena Iredell⁵

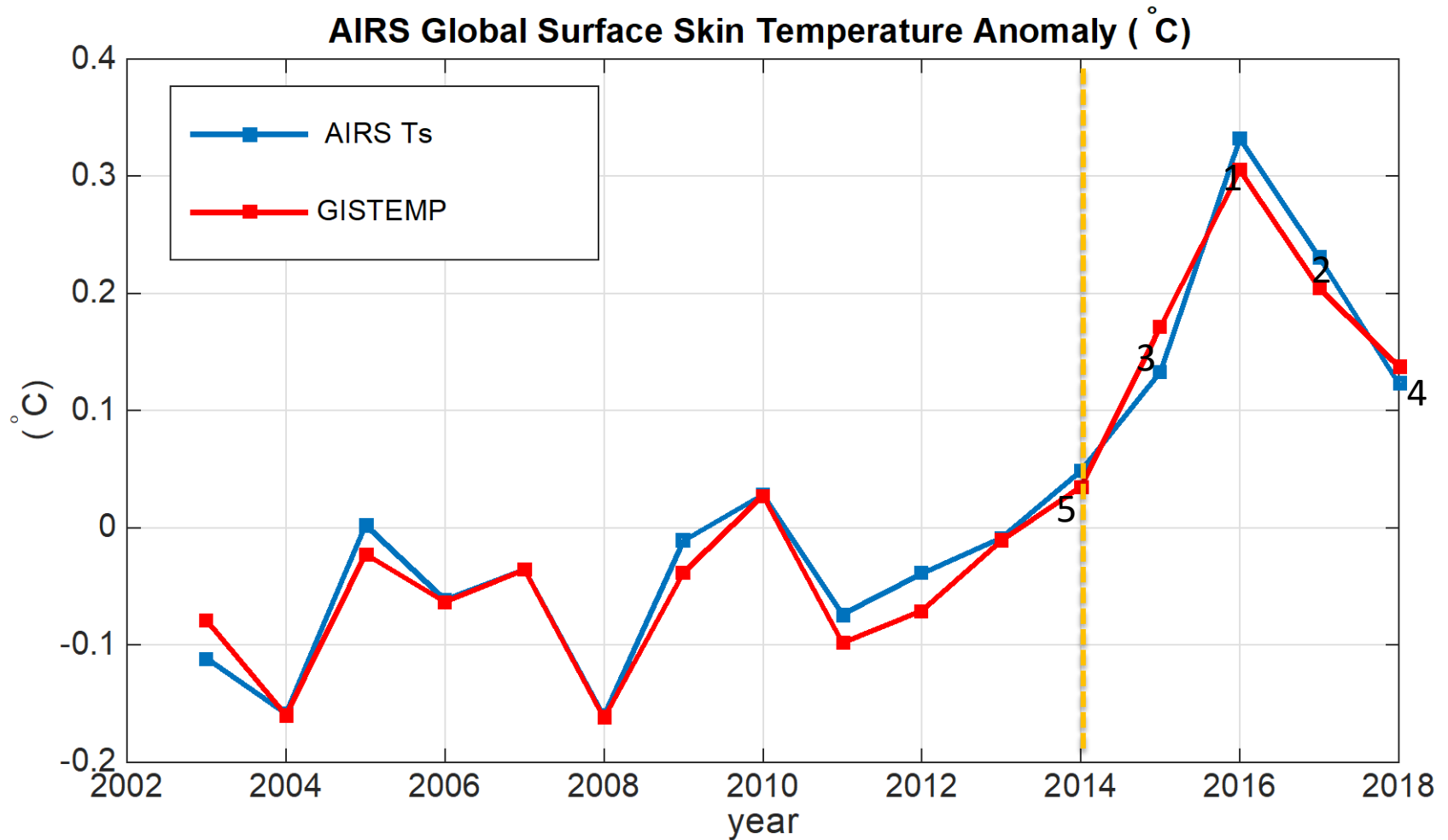
1. NASA Goddard Space Flight Center, Greenbelt, MD
2. Joint Center for Earth Systems Tech., University of Maryland, Baltimore County, MD
3. NASA Goddard Institute for Space Studies, NY
4. Science Applications International Corporation, MD
5. Adnet, MD

Sounder Science Team Meeting, College Park, MD
September 26, 2019

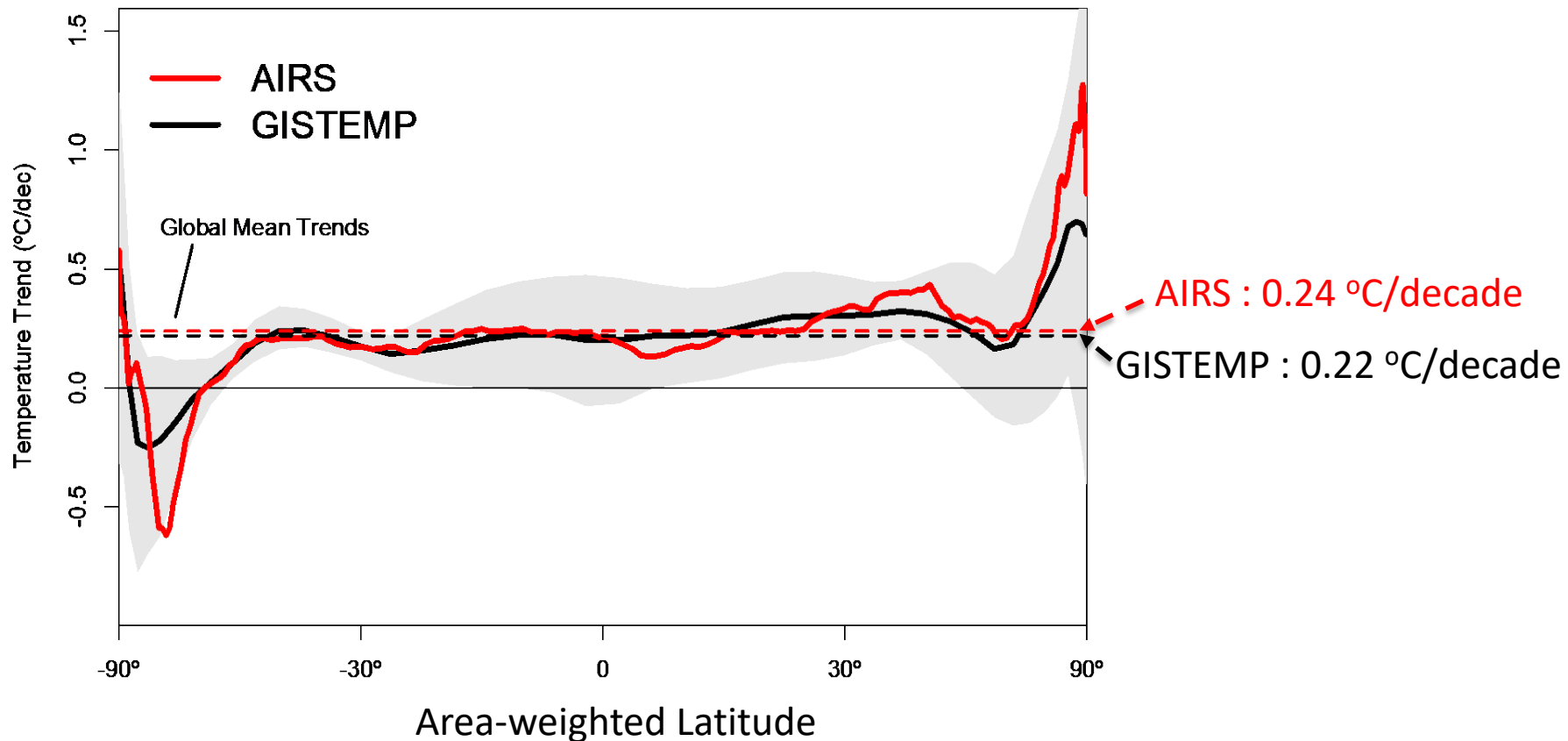
Overview

- Some material from the last Science Team presentation: “Recent Global Warming as Confirmed by AIRS” which covers surface temperatures from 2003 through 2018
- New results for January 2019 through August 2019

The last five years are the warmest

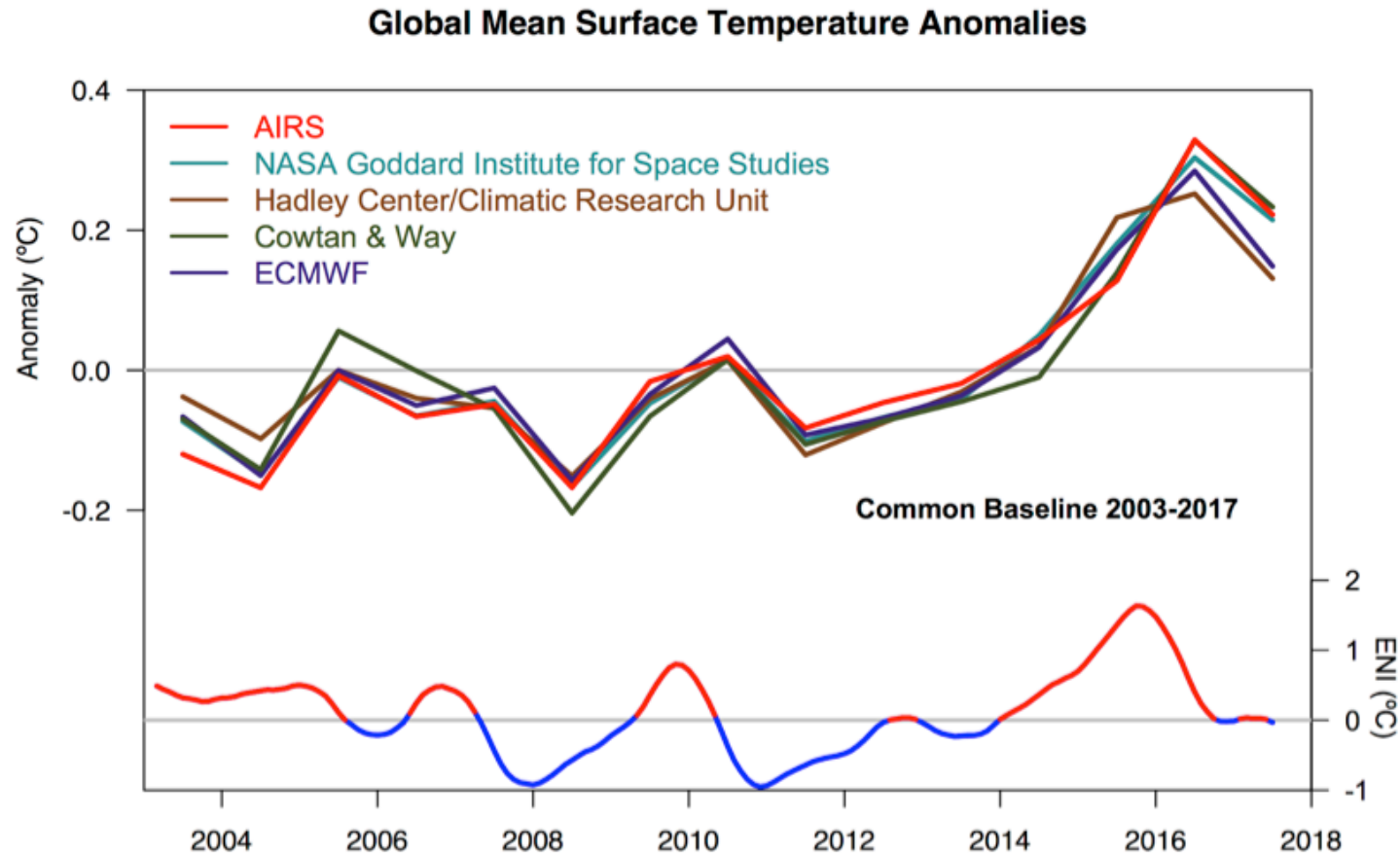


Zonal Mean Surface Temperature Trends (2003-2017)



GISTEMP underestimates large polar T_s trends of opposite sign in the Northern and Southern Hemisphere.

ENSO effect on global surface temperature

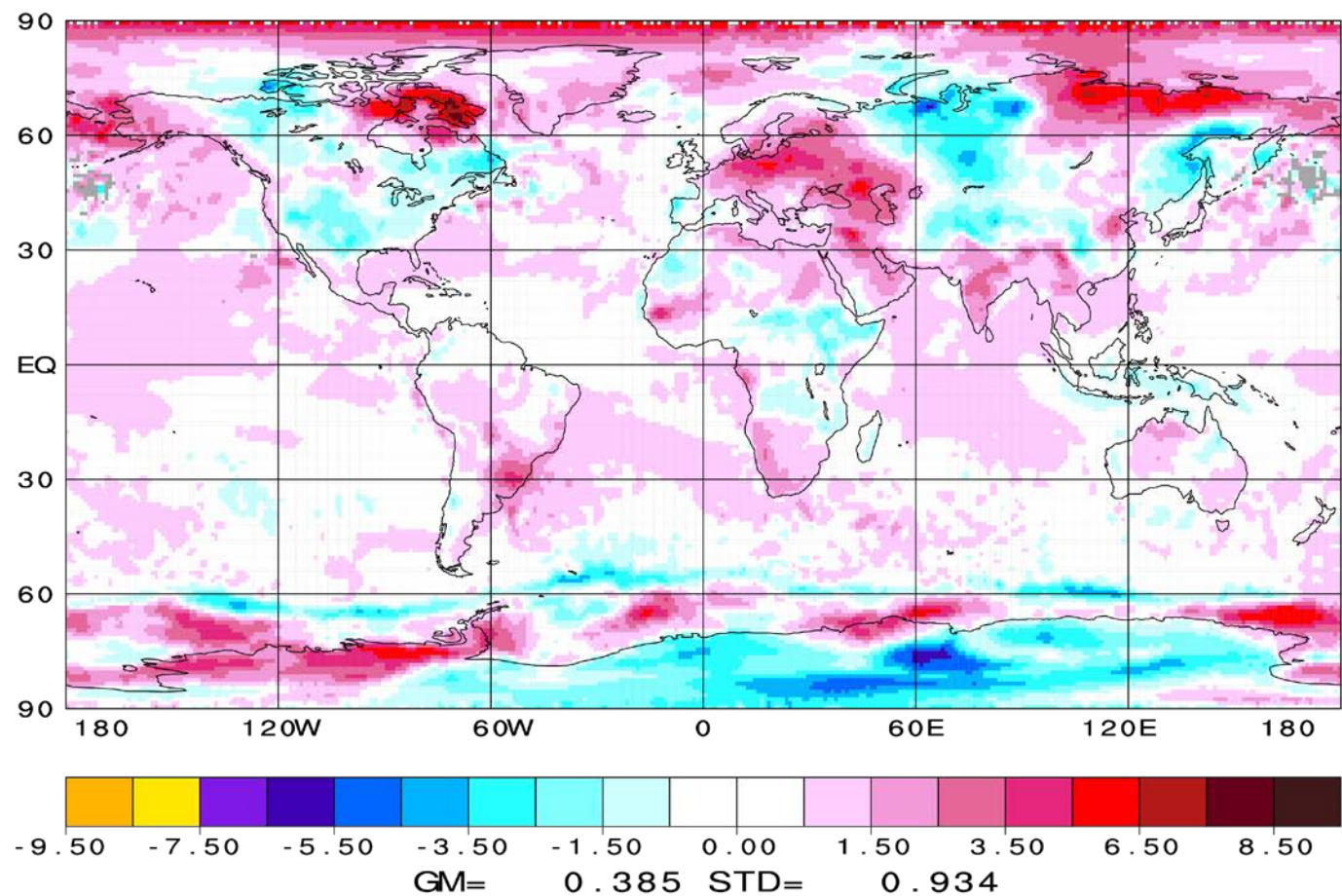


El Niño (La Niña) events contribute to local maxima (minima) but do not affect trends
High 2016 and 2017 temperatures were influenced by El Niño

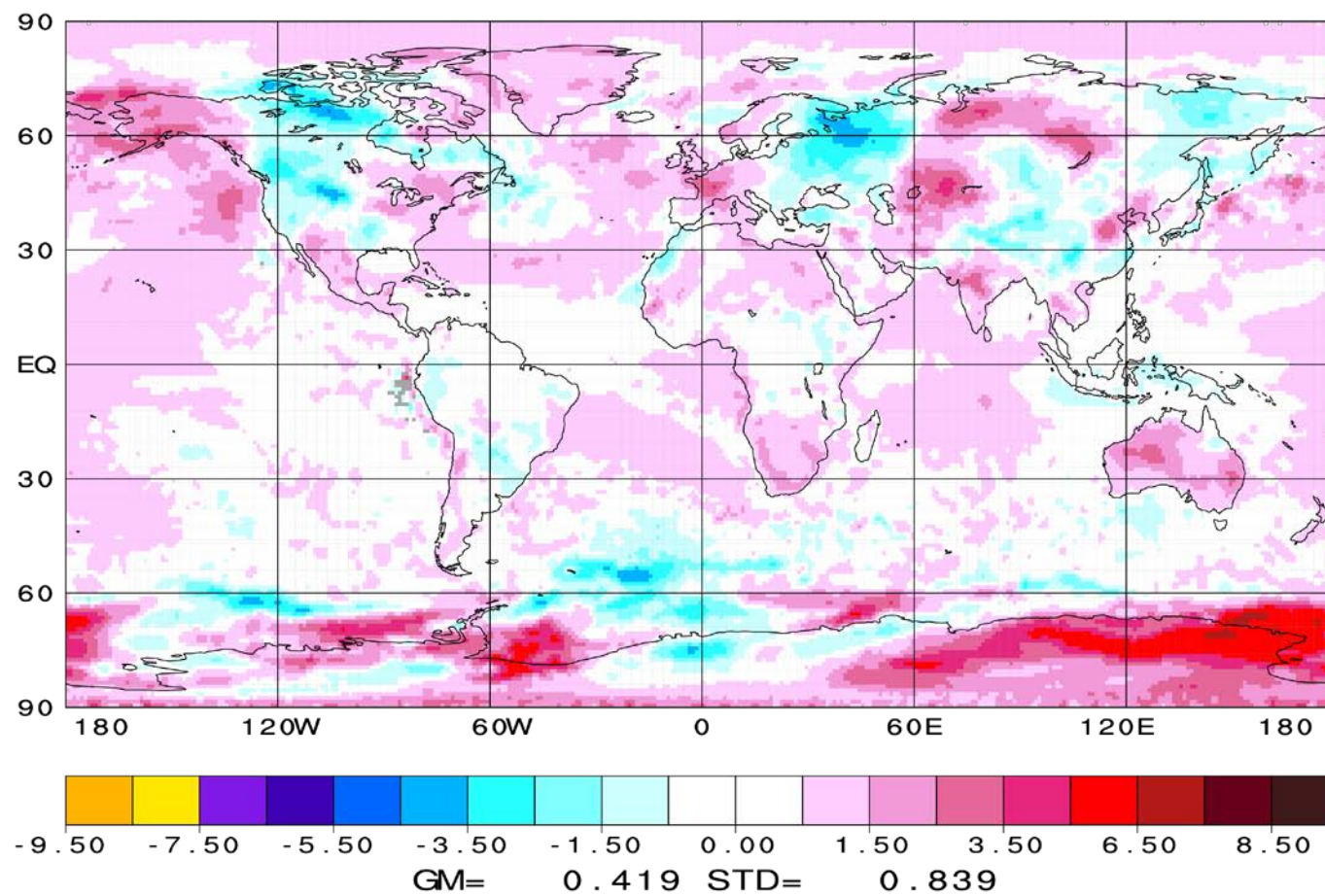
New Results for 2019

- NOAA claims that June 2019 and July 2019 were the warmest June and July on record; AIRS confirms this
- AIRS shows that August 2019 is the second warmest August on record, slightly behind August 2016
- The next four charts show AIRS T_s anomalies for June 2019, July 2019, August 2019, and the first eight months of 2019: January 2019 through August 2019

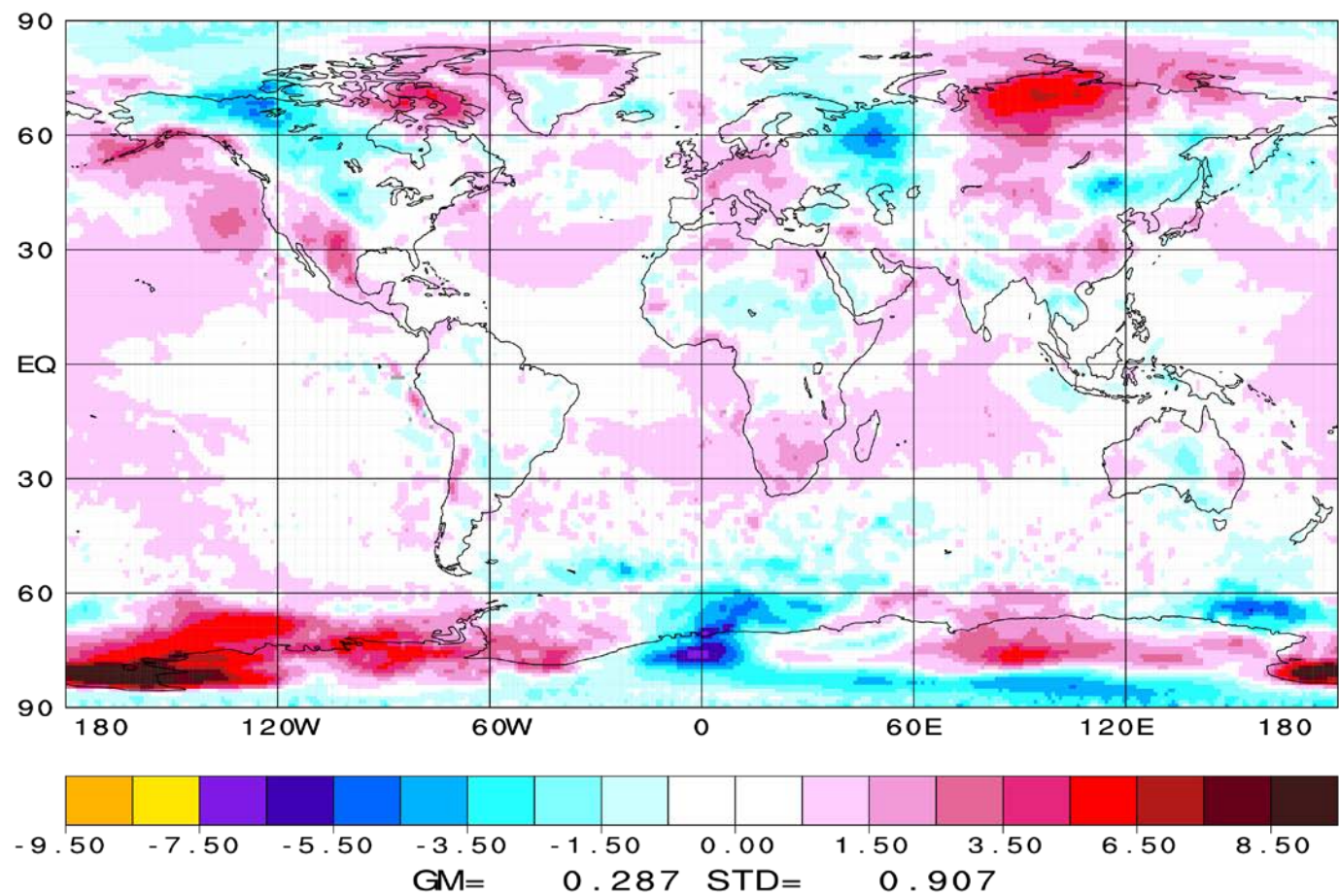
June 2019
AIRS Only Surface Skin Temperature Anomaly (K)
Baseline Climatology 2003 - 2017



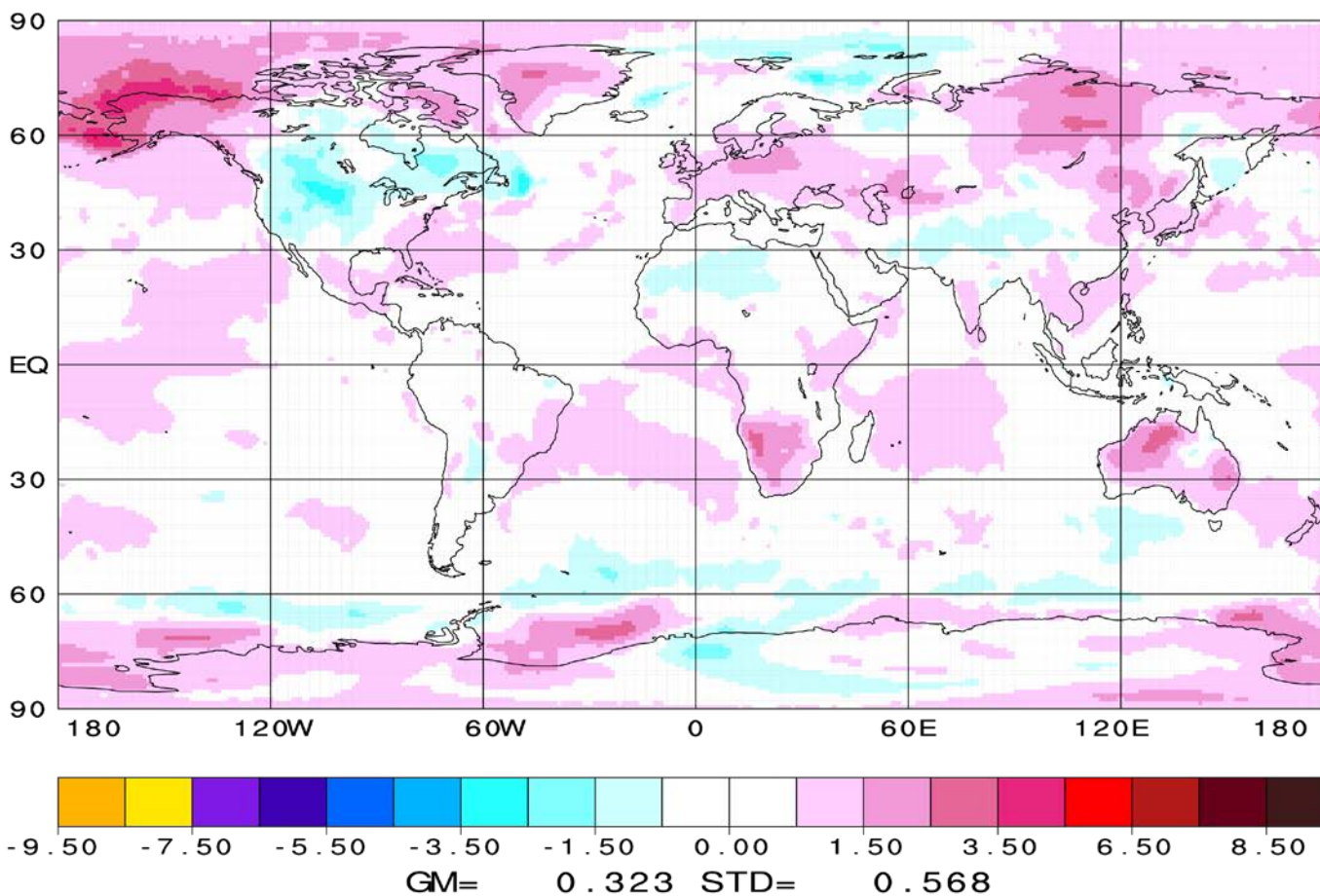
July 2019
AIRS Only Surface Skin Temperature Anomaly (K)
Baseline Climatology 2003 - 2017



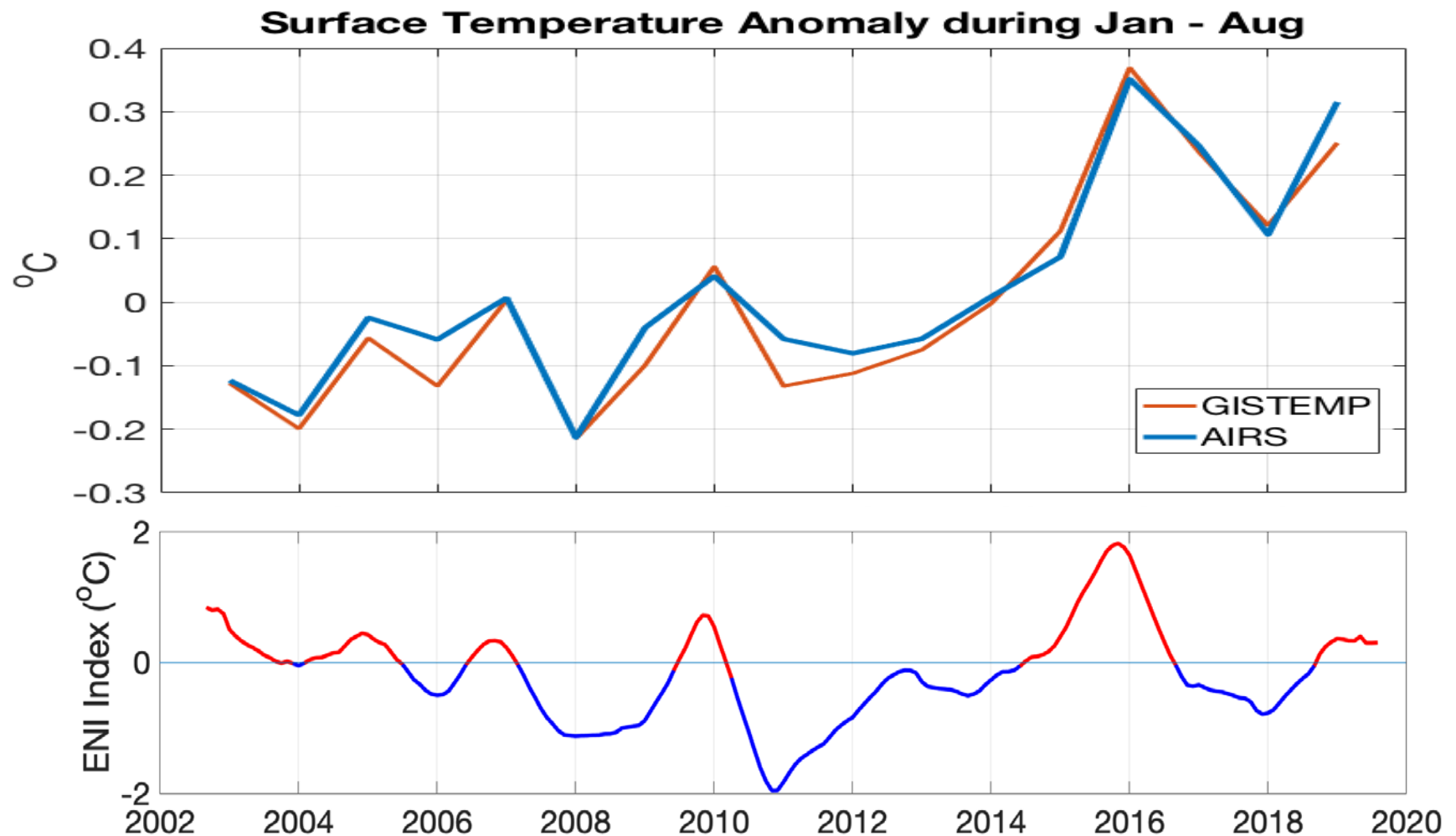
August 2019
AIRS Only Surface Skin Temperature Anomaly (K)
Baseline Climatology 2003 - 2017



January through August 2019
AIRS Only Surface Skin Temperature Anomaly (K)
Baseline Climatology 2003 - 2017



Most 2019 warming occurred poleward of 60°N. This area is undersampled by GISTEMP. The contiguous US has been cooler than average in 2019.



AIRS shows that, statistically, the first 8 months of 2019 are the second warmest on record, and only slightly cooler than 2016, which was enhanced by El Niño.

Stay tuned!!