

Weekly Report

SCSB/CISESS
Cooperative Research Program Division (CoRP)
STAR/NESDIS
National Oceanic and Atmospheric Administration (NOAA)

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Publications

Upper Ocean Temperatures Hit Record High in 2020: CISESS Scientists Alexey Mishonov and Jim Reagan are coauthors on a new article published online on January 13th in *Advances in Atmospheric Science*. To calculate ocean temperature and salinity anomalies in the upper 2000 m layer, using all available observations from various measurement devices held in the World Ocean Database of NOAA/NCEI. Observations from 1958 to 2020 were used, along with data provided by the Institute of Atmospheric Physics of the Chinese Academy of Sciences. Mishonov and Reagan work on the [World Ocean Database](#) at NCEI. The most recent data indicates that the Ocean Heat Content (OHC) in the upper 2000 m layer of the world's oceans has increased with a mean rate of 5.7 ± 1.0 ZJ yr⁻¹ for the 1958–2020 period (see figure).

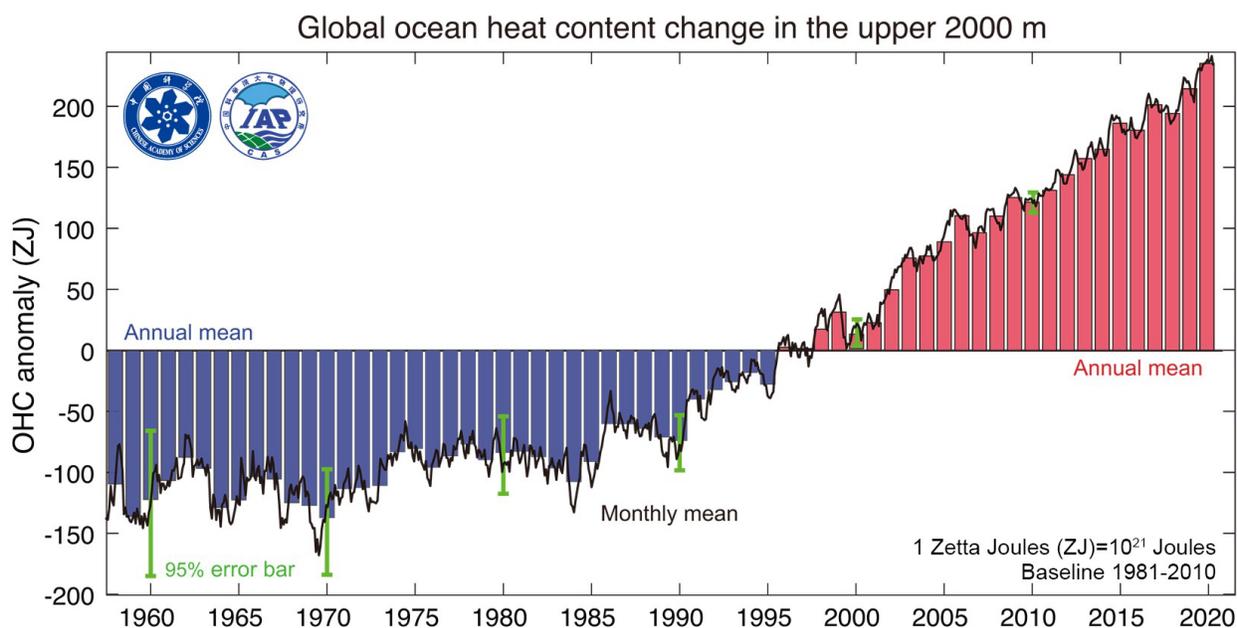


Figure: Global upper 2000 m OHC estimates from 1958 through 2020 from IAP. The histogram presents annual anomalies relative to a 1981–2010 baseline, with positive anomalies shown as red bars and negative anomalies as blue.

There is a more rapid increase in OHC that began in the ~1980s and has continued unabated since then. From 1986 to 2020, the trend in OHC is 9.1 ± 0.3 ZJ yr⁻¹, almost eight times larger than the trend from 1958 to 1985 (1.2 ± 0.6 ZJ yr⁻¹), while the estimates of uncertainty have decreased as instruments and sampling improved. The OHC value for 2020 is higher than the value for 2019, by 20 ± 8.3 ZJ using the IAP estimate, and by 1 ± 3.5 ZJ using the NCEI estimate. Both are the highest on record. This publication was coordinated with the [NCEI State of the Climate Report](#) for 2020, which was released on January 14 and cites this article.

Cheng, Lijing, John Abraham, Kevin E. Trenberth, John Fasullo, Tim Boyer, Ricardo Locarnini, Bin Zhang, Fujiang Yu, Liying Wan, Xingrong Chen, Xiangzhou Song, Yulong Liu, Michael E. Mann, Franco Reseghetti, Simona Simoncelli, Viktor Gouretski, Gengxin Chen, **Alexey Mishonov**, **James Reagan** and Jiang Zhu, 2021: Upper ocean temperatures hit record high in 2020. *Adv. Atmos. Sci.*, in press, <https://doi.org/10.1007/s00376-021-0447-x>.

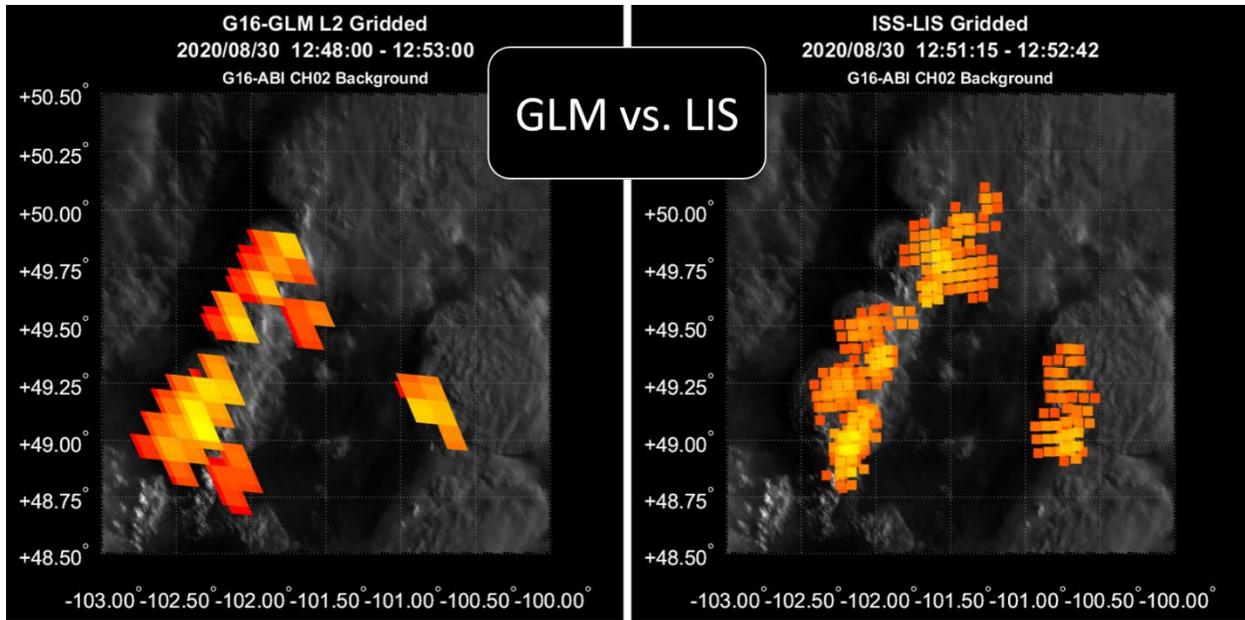
(Alexey Mishonov, alexey.mishonov@noaa.gov, NCEI)

Workshops, Conferences, and Meetings

Ferraro Collecting AMS Summary Slides for STAR Website: Ralph Ferraro has asked STAR, Cooperative Institute and Contracting Scientists to prepare one-slide summaries of their AMS presentations, as he does every year. This is particularly important this year because AMS is limiting access to their website archives to attendees only for the next three months because of the meeting's virtual format. (<https://annual.ametsoc.org/index.cfm/2021/>). Summary slides are due by February 15th.



GLM Poster at the Virtual AMS Conference: Daile Zhang, a CISS postdoc associate, presented her poster of “An Initial Intercomparison of GLM and ISS-LIS Lightning Observations” at the 10th Conference on the Meteorological Application of Lightning Data at the 2021 AMS Annual Meeting (Jan. 9-15, 2021). Daile’s work combines the GLM and ISS-LIS observations to develop the GLM-LIS cloud-top optical products empirical relationships. The results will help identify and characterize storms that cause reduced GLM detection efficiencies and may also help to reduce GLM parallax location errors.



POC: Daile Zhang, dlzhang@umd.edu, Funding: GOES-R PGRR; GOES-R AWG; NOAA ROSES