Weekly Report – February 16, 2024

Cooperative Institute for Satellite Earth System Studies (CISESS)

NOAA/NESDIS/STAR

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HIGHLIGHTS FOR NESDIS LEADERSHIP

Data and Information

NCEI releases the World Ocean Atlas Version 2 this week

CISESS Scientist Alexey Mishonov is one of the authors of the newly released World Ocean Atlas 2023. The World Ocean Atlas 2023 (WOA23) is a set of objectively climatological fields of *in situ* temperature, salinity, dissolved oxygen, Apparent Oxygen Utilization (AOU), percent oxygen saturation, phosphate, silicate, and nitrate at standard depth levels for annual, seasonal, and monthly compositing periods for the World Ocean. This is a five-year update to the previous version (WOA18). It is the world's largest collection of uniformly formatted, quality controlled, publicly available ocean profile data that are FAIR-compliant (Findable, Accessible, Interoperable and Reusable). https://www.ncei.noaa.gov/news/World-Ocean-Atlas-2023-v2 .

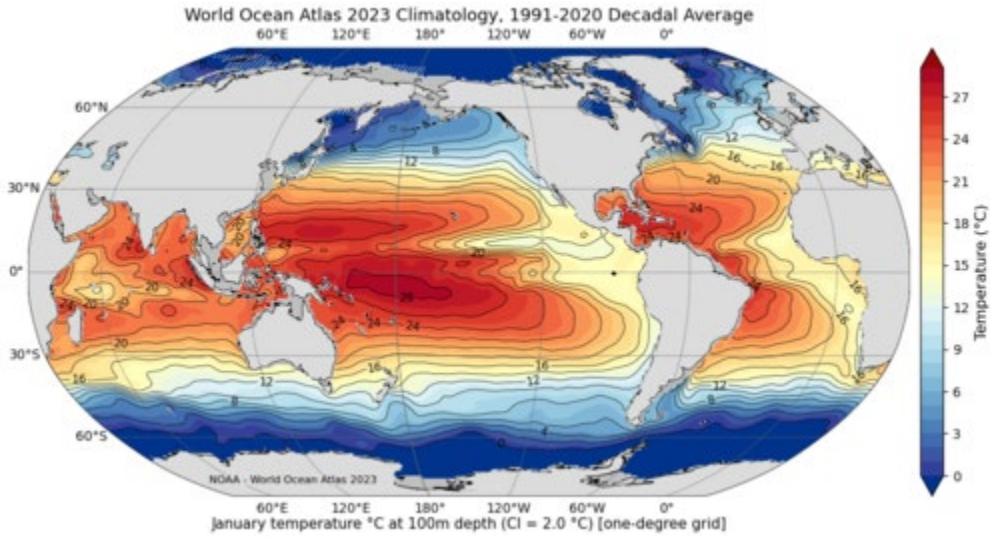

Figure: a sample graphic from the World Ocean Atlas 2023.

Reagan, James R.; Boyer, Tim P.; García, Hernán E.; Locarnini, Ricardo A.; Baranova, Olga K.; Bouchard, Courtney; Cross, Scott L.; **Mishonov, Alexey V**.; Paver, Christopher R.; Seidov, Dan; Wang, Zhankun; Dukhovskoy, Dmitry. (2024). World Ocean Atlas 2023. NOAA National Centers for Environmental Information. Dataset: NCEI Accession 0270533: https://www.ncei.noaa.gov/products/world-ocean-atlas .
(Alexey Mishonov, CISESS, alexey.mishonov@noaa.gov, Funding: NCEI)

PUBLICATIONS

An Updated Sea Surface Temperature Climatology Dataset
Citation Xungang Yin, Boyin Huang, James A. Carton, Ligang Chen, Garrett Graham, Chunying Liu, **Thomas Smith**, Huai-Min Zhang, 2024: The 1991−2020 sea surface temperature normals. Int. J. Climatology, **44**(2), 668–685, https://doi.org/10.1002/joc.8350.
Summary: This article documents changes in sea surface temperature (SST) climatology and was published by the NCEI-UMD-CISESS-STAR OISST group, which includes CISESS/SOCD Scientist Tom Smith. The article documents the warming climatology in recent decades, which is important for tracking and quantifying temperature changes and defining normal for a period.

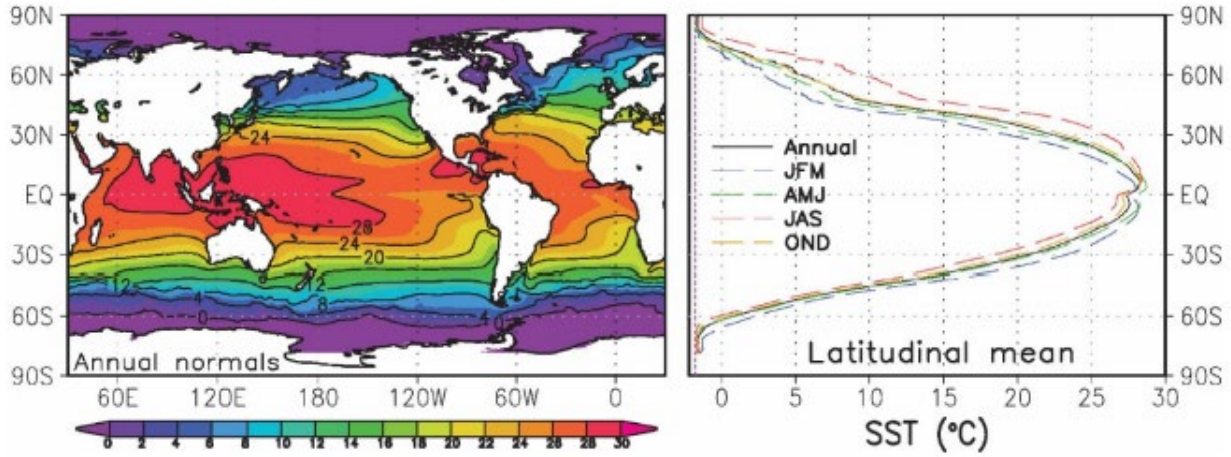

Figure: Annual normal SST (°C) pattern (left) and zonal means of annual and seasonal normal SSTs.
(Tom Smith, CISESS/SOCD, Funding: PDRA)
This item was submitted in the SOCD Weekly Report.

Enhancing the Impact of *Aeolus* Rayleigh Winds on NOAA Global Forecasts
Citation: **Liu, Hui**; Garrett, Kevin; **Ide, Kayo**; and **Hoffman, Ross N**.; 2024: On the use of consistent bias corrections to enhance the impact of Aeolus Level-2B Rayleigh winds on NOAA global forecast skill. *Quart. J. Roy. Meteor. Soc.*, **150**(758), 355–372, https://doi.org/10.1002/qj.4600.
Summary: A newly published article in the *Quarterly Journal of the Royal Meteorological Society* by CISESS scientists Hui Lui, Kayo Ide, and Ross Hoffman looked at satellite wind measurements using Rayleigh backscatter, often called Rayleigh winds. They examined whether using NOAA Finite-Volume Cubed Sphere Global Forecast System (FV3GFS) forecast backgrounds instead of the operationally used European Centre for Medium-Range Weather Forecasts (ECMWF) backgrounds in bias correction procedures carried out on Rayleigh winds provided by the European Space Agency Earth Explorer satellite *Aeolus* would have a positive impact on global

forecasts. They reported that there were notably enhanced positive impacts of the FV3GFS-corrected Rayleigh winds on forecasts compared with those of the ECMWF operational Rayleigh winds in the Southern Hemisphere at the days 1–10 range. Results suggest that it would be beneficial for other numerical weather prediction centers to perform Rayleigh wind corrections using their own model backgrounds, noting that this would depend on the quality of those backgrounds.

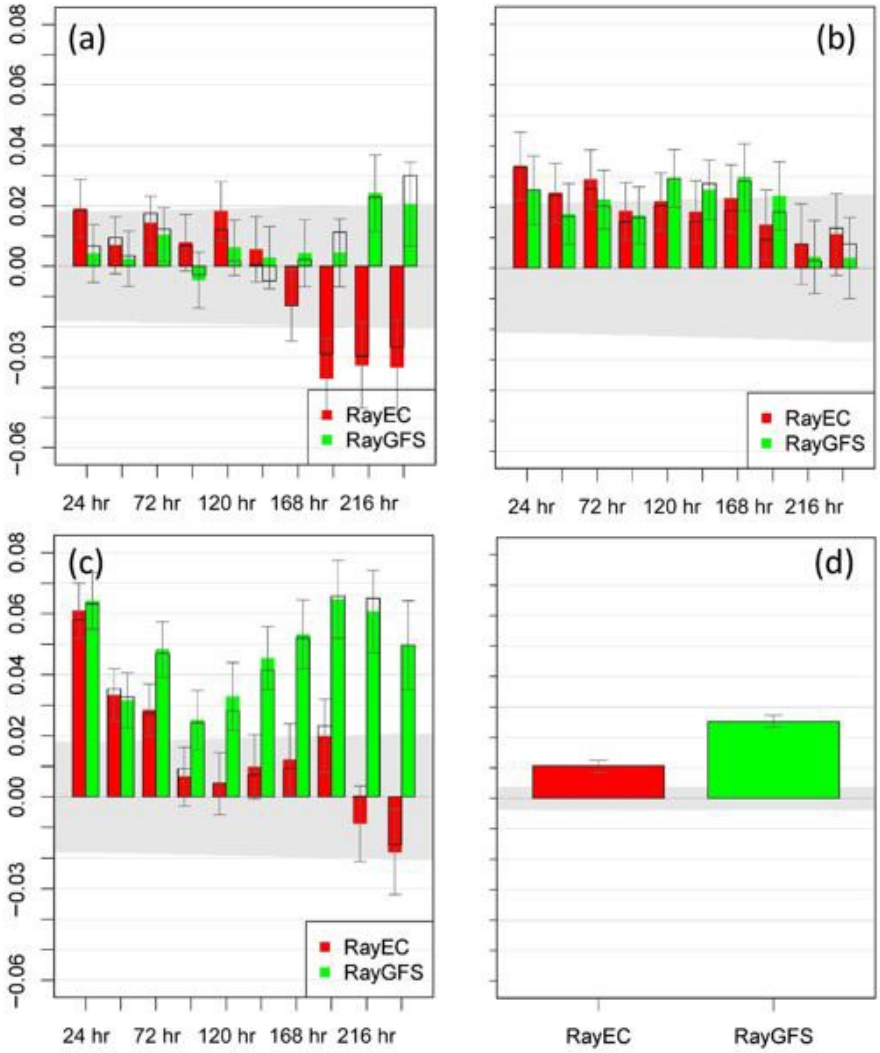

Figure: Difference summary assessment metrics (SAMs) for RayEC and RayGFS versus control experiments. The SAMs are shown for 1–10 days forecast lead times in the (a) Northern Hemisphere extratropics, (b) Tropics, (c) Southern Hemisphere extratropics, and (d) for overall performance. Values above 0.0 represent an improvement of the forecast versus the control. RayEC: ECMWF operational Rayleigh winds (red); RayGFS: Rayleigh winds produced using the FV3GFS background in the corrections (green).
(Hui Liu, CISESS, hliu6@umd.edu; Funding: STAR, DARTM & OPPA)