

Weekly Report – June 7, 2024
 Cooperative Institute for Satellite Earth System Studies (CISESS)
 NOAA/NESDIS/STAR

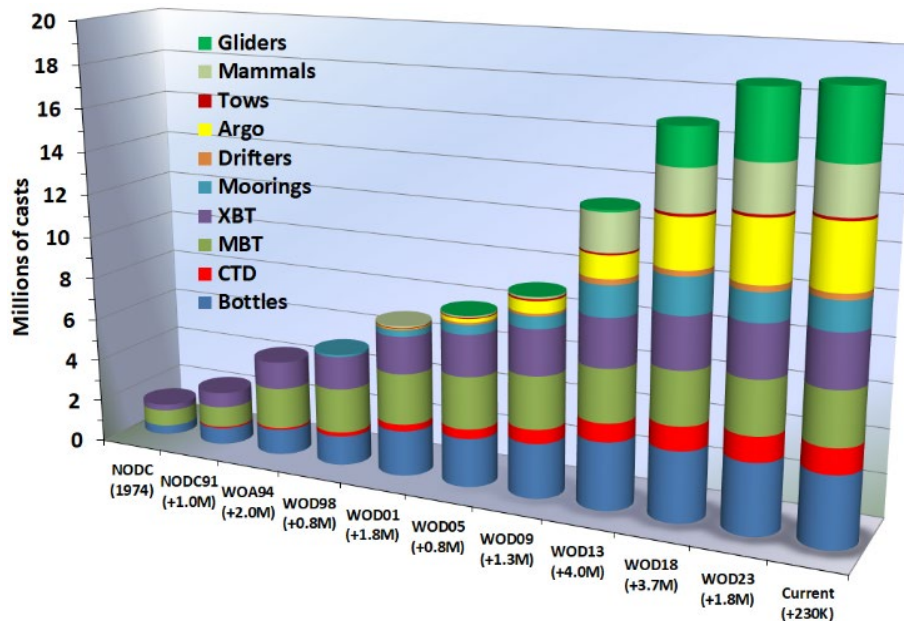
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TRAVEL AND MEETING REPORTS

CISESS Participation at the International Conference on Marine Data and Information Systems

CISESS Scientist Alexey Mishonov presented a talk at the International Conference on Marine Data and Information Systems (IMDIS) held this past May in Bergen, Norway. This recurring conference takes place every three years at different locations around Europe under the patronage of the International Oceanographic Data and Information Exchange, the United Nations Educational, Scientific and Cultural Organization’s Intergovernmental Oceanographic Commission, and local institutions. Mishonov presented the 2023 release of the World Ocean Database (WOD23) and the World Ocean Atlas (WOA23) to the international oceanographic data community in attendance. The updated WOD23 contains all in-situ ocean profiles assembled and processed by the Ocean Climate Laboratory team at NOAA’s National Centers for Environmental Information through December 2022. This includes all Argo measurements, with quality control as of 1 April 2023. Additionally, WOD23 contains updated quality-control flags based on the quality improvements made during the construction of the WOA23. WOD23 includes about two million new profiles when compared to the WOD18 and continues to be the world’s most extensive collection of ocean profile data, updated four times per year and available without restriction.



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Figure: Example from the World Ocean Database: growth of the seawater temperature data holding (current: 19 January 2024).

Mishonov also presented a poster describing the recently updated high-resolution Northern North Pacific regional climatology based on the WOA23. This region, which includes the Gulf of Alaska and the Bering Sea, is resource rich and significantly impacted by ocean climate variability. Its climatology of temperature and salinity fields has been enhanced with new data collected during recent years, as well as historic data recovered from earlier unaccounted observations added to the WOD23.

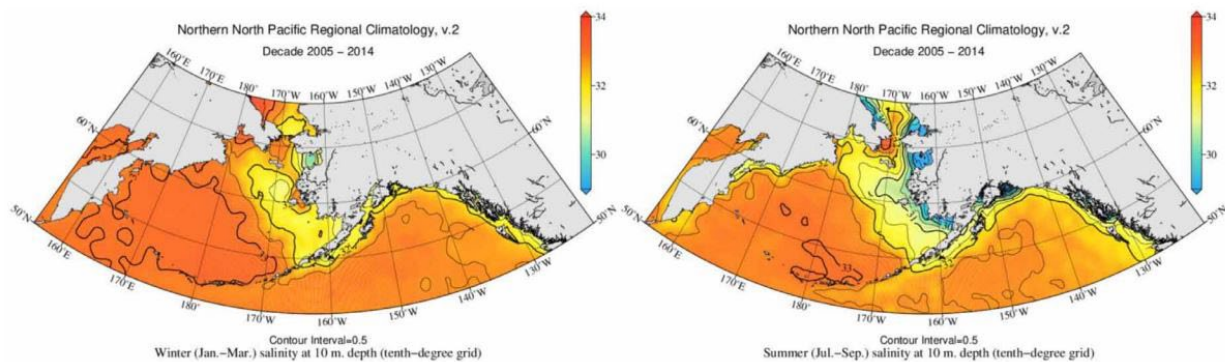


Figure: Winter (left) and summer (right) salinity fields from 2005 to 2014 on a 0.1° grid at the 10-m depth.

IMDIS conference proceedings are published and available at:
Simoncelli, S., Vernet, M., & Coatanoan, C. (2024). International Conference on Marine Data and Information Systems - Proceedings Volume. Miscellanea INGV, 80.
<https://doi.org/10.13127/MISC/80>

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

Zhang Gave an Invited Seminar (Virtual) at the UCAR Africa Initiative

CISESS Scientist Daile Zhang gave an invited virtual seminar at the [UCAR Africa Initiative](#) on 5 June 2024. The title of the presentation was “Lightning Climatology, Casualties, and Impacts in the U.S. and Africa.” The presentation summarized the lightning projects focused on Africa that Daile has been involved with over the past 10 years and what the next steps are with the new-generation satellite-based lightning imager.

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Figure: Lightning protection system installed at the Runyanya Primary School in Kaburasaho, Uganda. This is one activity that Zhang has been involved with over the years as an external participant of the UCAR Africa Initiative (photo taken in 2017).

(Daile Zhang, CISESS, dlzhang@umd.edu, Funding: GOES-R AWG, GOES-R PGRR, NOAA ROSES, CISESS Seed Grant.)

PUBLICATIONS

Consistency of VIIRS Thermal Emissive Bands on S-NPP, NOAA-20, and NOAA-21 Satellites

Citation: Zhang, Feng, Xi Shao, Changyong Cao, Yong Chen, Wenhui Wang, Tung-Chang Liu, and Xin Jing, 2024: Evaluation of VIIRS thermal emissive bands long-term calibration stability and inter-sensor consistency using radiative transfer modeling. *Remote Sens.*, 16, 1271, <https://doi.org/10.3390/rs16071271>.

Summary: The Visible Infrared Imaging Radiometer Suites (VIIRSs) onboard the NOAA-20, NOAA-21, and Suomi National Polar-orbiting Partnership (S-NPP) satellites have ushered in a new era of operational environmental remote sensing. VIIRS moderate-resolution thermal emissive bands (M TEBs) provide information about sea surface temperature and cloud properties, among others. Ensuring consistency of these bands from the three satellite platforms is vital for extending existing data products and creating long-term global science

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datasets. In a paper published in the journal *Remote Sensing*, CISESS Scientists Feng Zhang, Xi Shao, Wenhui Wang, Tung-Chang Liu, and Xin Jing, along with colleagues at NOAA/NESDIS/STAR, developed a radiative-transfer-model-based TEB quality evaluation method to (1) examine the long-term stability of the S-NPP VIIRS M TEBs covering the period from February 2012 to August 2020 and (2) assess the inter-sensor consistency of VIIRS M TEBs among the three satellites covering the period from 18 March to 30 November 2023. Their field of interest was the ocean surface between 60°S and 60°N under clear-sky conditions. They reported that robust long-term stability was observed in the S-NPP VIIRS TEBs, as well as excellent inter-sensor consistency among the different VIIRS instruments, important and encouraging results regarding the data quality of downstream VIIRS environmental data record products and the advancement of Earth science research and climate applications.

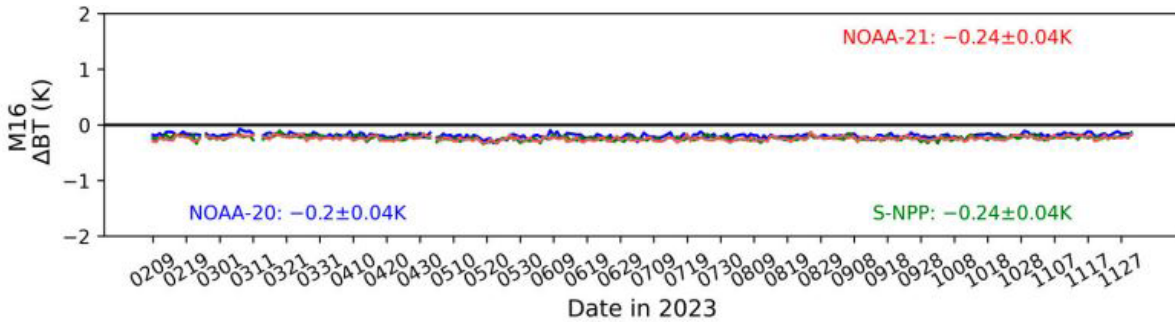


Figure: Example of daily trends of VIIRS-measured minus radiative-transfer-modelled brightness temperatures in M TEB 16 for the three satellite platforms.

(Feng Zhang, CISESS, zfsu@umd.edu, Funding: Taiwan CWB, Infrastructure; Xi Shao, CISESS, xshao@umd.edu, Funding: COSMIC2, DCAS, JSTAR; Wenhui Wang, CISESS, whwang1@umd.edu, Funding: JSTAR; Tung-Chang Liu, CISESS, tcliu@umd.edu, Funding: COSMIC2, JSTAR, METOP-SG; Xin Jing, CISESS, xinjing@umd.edu; Funding: COSMIC2)

(Maureen Cribb, CISESS, mcribb@umd.edu, Funding: Task I)