Weekly Report – January 26, 2024

Cooperative Institute for Satellite Earth System Studies (CISESS)

NOAA/NESDIS/STAR

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TRAVEL AND MEETING REPORTS

Global Ocean Acidification Observing Network North American Hub Meeting

CISESS Scientist Liqing Jiang spoke at the Global Ocean Acidification Observing Network (GOA-ON) North American Hub Meeting, held on January 17 – 18 at the University of Delaware. His talk was on data exchange platforms for ocean acidification research. He went over requirements for NOAA platforms, including:

- Ocean Carbon and Acidification Data System (OCADS) [see figure below];
- Ocean Acidification Program (OAP) Science Data Information System;
- Rich Metadata Management System (RMMS); and
- Coastal Ocean Data Analysis Project–North America (CODAP-NA).



(Liqing Jiang, CISESS, <u>liqing.jiang@noaa.gov</u>; Funding: NCEI & OCADS)

UMD Global FEWture Alliance Symposium

CISESS scientist Daile Zhang presented a poster at the Global FEWture Alliance Symposium at the University of Maryland on January 18, 2024. The Global FEWture Alliance is one of the UMD Grand Challenges Program Institutional Grants and seeks to alleviate Food, Energy and Water (FEW) insecurity and bolster community resilience in a changing climate. The title of Zhang's poster was "Lightning Climatology, Casualties and Impacts in the U.S. and Africa." The poster describes how to better implement the satellite data applications in Africa based on what has already been done in the U.S.



Figure: Participants at the UMD Global FEWture Alliance Symposium, from: <u>https://qlobalfewture.umd.edu/events/inauqural-global-fewture-alliance-annual-symposium</u> (Daile Zhang, CISESS, <u>dlzhanq@umd.edu</u>, Funding: GOES-R AWG, GOES-R PGRR, NOAA ROSES and CISESS Seed Grant.)

PUBLICATIONS

Unified Forecast System Coupled Land-Atmospheric Variables Show Improvement

Citation: Seo, Eunkyo; Paul A. Dirmeyer, Michael Barlage, Heiln Wei, and Michael Ek, 2024: Evaluation of land-atmosphere coupling processes and climatological bias in the UFS global coupled model. *J. Hydrometeor.*, 25(1), 161–175, https://doi.org/10.1175/JHM-D-23-0097.1. *Summary*: The latest version of the NOAA Unified Forecast System (UFS) has a new land surface model, Noah-MP (Multi-Parameter), a global vegetation dataset, and many other GFS improvements. CISESS Consortium Scientists Paul Dirmeyer and Eunkyo See (GMU) tested UFS's ability to simulate observed surface conditions in 35-day predictions based on the accuracy of model land surface processes. They developed a blueprint for the validation of coupled landatmosphere behavior in forecast models for forecasts of any length of time. In UFS, they found improvements in the near-surface meteorological variables, especially surface soil moisture and surface fluxes of radiation and moisture. Temperature biases were found to be connected to the model's ability to simulate the different balances of coupled processes between waterlimited and energy-limited conditions, as defined in the schematic below.

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Figure: Schematic of the land-atmosphere coupling process chain that is triggered by soil moisture (SM) and net radiation (ΔR_{net}) corresponding to the water- and energy-limited regime, respectively, where ΔT is the change in temperature and ΔQ is the change in moisture. Although the regime is specified by the SM critical point, it determines sensible heat flux (SH) and latent heat flux (LH) partitioning. (PBL is the planetary boundary layer).

(Paul Diremeyer, CISESS & GMU, <u>pdirmeye@qmu.edu</u>, Funding: WPO)