

**Weekly Report – March 20, 2026**  
Cooperative Institute for Satellite Earth System Studies (CISESS)  
NOAA/NESDIS/STAR

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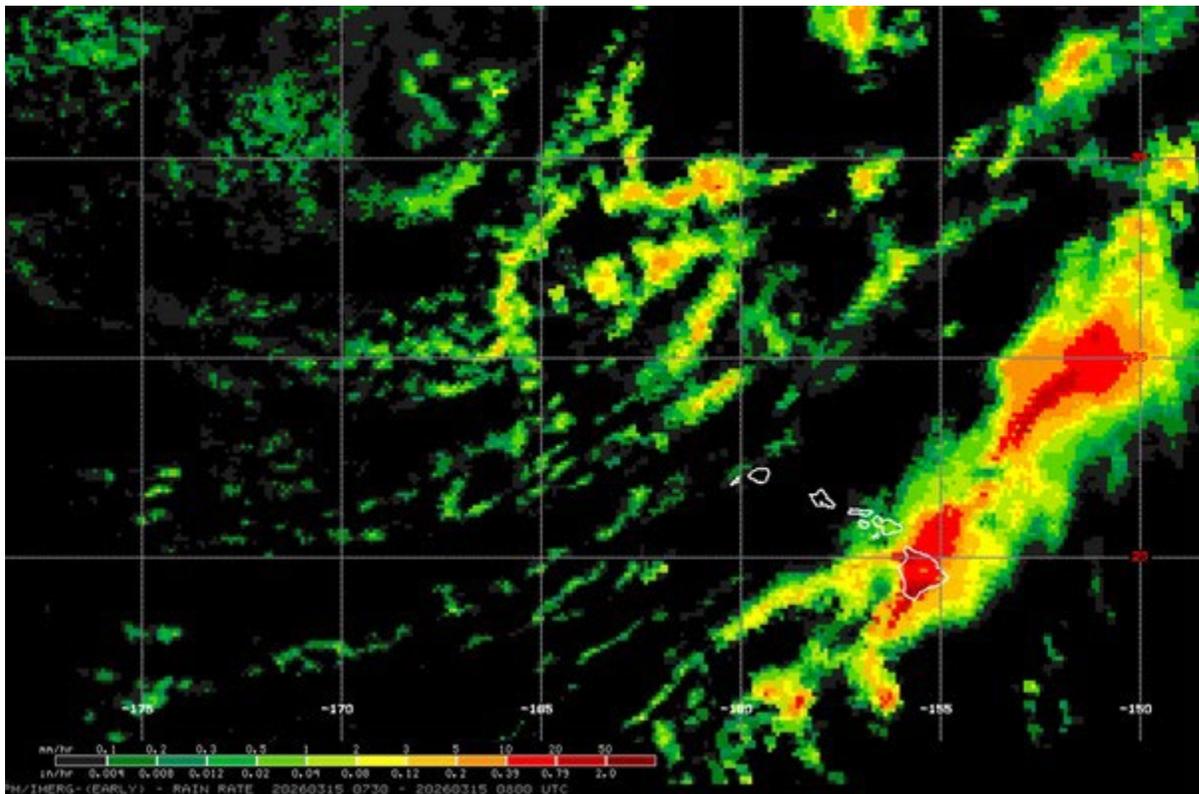
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**SOCIAL MEDIA AND BLOG POSTS**

**The Kona Low That Would Not Go**

Mid-March brought days of drenching torrential rain and hurricane-force winds to “The Paradise of the Pacific”, [describes CISESS Scientist Christopher Smith](#), the GOES-R Satellite Liaison to the National Weather Service’s Weather Prediction Center and Ocean Prediction Center. A stubborn Kona Low roiled away over Hawai’i, where top rainfall amounts reached almost 50 inches at the University of Hawai’i at Manoa Summit and a top gust of 135 mph was recorded in Hawai’i County. A second weaker Kona Low is expected to develop, affecting the islands in the coming days.



*Figure: Integrated Multi-satellite Retrievals for GPM (IMERG)-Early output at ~0800 UTC 15 March 2026. Deep red colors show rain rates of greater than 1 inch per hour.*

*(Christopher Smith, CISESS, csmith70@umd.edu; Funding: GOES-R PGRR)*

## **PUBLICATIONS**

### **LEO versus GEO**

**Citation:** Hsu, Chia-Hua, Daven K. Henze, Arthur P. Mizzi, Colin Harkins, Congmeng Lyu, Owen R. Cooper, Rebecca H. Schwantes, Jian He, Meng Li, Siyuan Wang, Chelsea E. Stockwell, Carsten Warneke, Andrew W. Rollins, Eleanor M. Waxman, Kristen Zuraski, Jeff Peischl, Shobha Kondragunta, **Fangjun Li**, Chuanyu Xu, R. Bradley Pierce, Gonzalo Gonzalez Abad, Caroline R. Nowlan, Xiong Liu, and Brian C. McDonald, 2026: Top-down estimates of U.S. NO<sub>x</sub> emissions using TEMPO and TROPOMI NO<sub>2</sub> remote sensing observations with WRF-Chem/Chem-DART. *J. Geophys. Res.: Atmos.*, **131**(2), e2025JD044223, <https://doi.org/10.1029/2025JD044223>.

**Summary:** The amount of nitrogen oxides [NO<sub>x</sub>, defined as the sum of nitric oxide and nitrogen dioxide (NO<sub>2</sub>)] in the atmosphere gives an idea of the level of air quality, important to know given that NO<sub>x</sub> affects human health and has certain detrimental effects on the environment. Ground-based in-situ measurements are one way of monitoring NO<sub>x</sub> levels, but these are point measurements, and monitoring stations making these measurements are sparsely distributed around the world. Remote sensing from space is a way to get around this problem. Over the past decades, a number of NO<sub>x</sub>-monitoring instruments have been deployed on low Earth orbit (LEO) satellites, such as the Tropospheric Monitoring Instrument (TROPOMI). However, even though there is global coverage, retrievals are typically made only once a day. Enter recently developed geostationary (GEO) satellite instruments like Tropospheric Emissions: Monitoring of Pollution (TEMPO) measuring NO<sub>x</sub> hourly at a higher spatial resolution. In their paper published in the *Journal of Geophysical Research: Atmospheres*, CISESS Scientist Fangjun Li and colleagues explore the benefit of using TEMPO (GEO) NO<sub>2</sub> data for NO<sub>x</sub> emission estimates compared to TROPOMI (LEO). The model they used to estimate NO<sub>x</sub> emissions is the Weather Research and Forecasting Model with the chemistry/Data Assimilation Research Testbed (WRF-Chem/DART), and the selected period of study is August 2023. The authors present promising results, first showing that top-down NO<sub>x</sub> emissions derived from midday TEMPO and TROPOMI data were similar over urban regions, reducing bottom-up NO<sub>x</sub> emissions obtained from 2021 Greenhouse gas And Air Pollutants Emissions System (GRA<sup>2</sup>PES) by 5–20%, and agreed better with the updated 2023 GRA<sup>2</sup>PES emissions. The general conclusion is that TEMPO midday data can better track and infer NO<sub>x</sub> sources than TROPOMI's once-daily measurements. They do note that there are inherent data biases requiring a further look into but that overall, high-resolution hourly monitoring from TEMPO will greatly advance the tracking and understanding of air pollution, leading to more effective emissions mitigation strategies.

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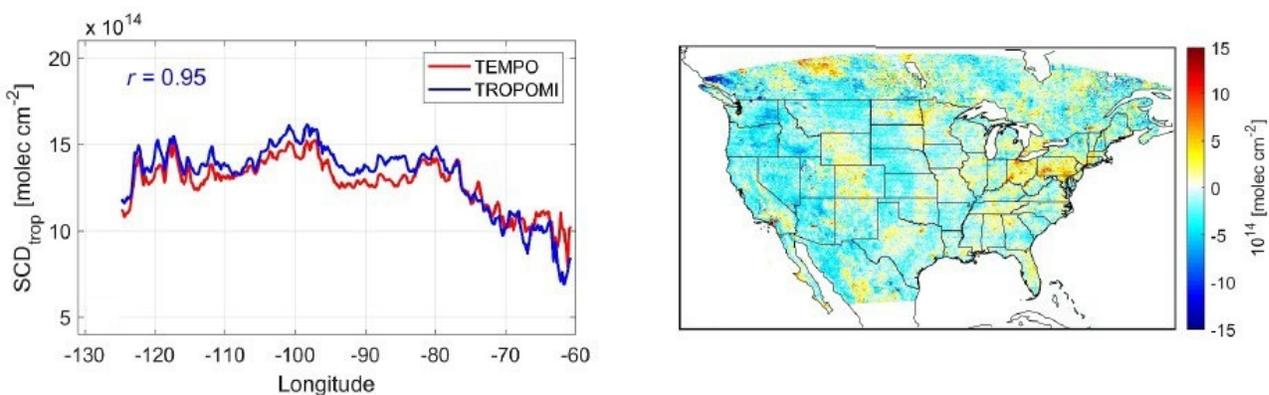


Figure: (left panel) Meridionally aggregated NO<sub>2</sub> tropospheric slant column density (SCD) and (right panel) TEMPO minus TROPOMI tropospheric NO<sub>2</sub> SCD.

(Fangjun Li, CISESS, [fangjun.li@sdstate.edu](mailto:fangjun.li@sdstate.edu); Funding: OCS)

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