Weekly Report – June 20, 2025

Cooperative Institute for Satellite Earth System Studies (CISESS)

NOAA/NESDIS/STAR

Submitted by: Maureen Cribb
Email: mcribb@umd.edu
Phone: 301-405-9344

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SOCIAL MEDIA AND BLOG POSTS

Flooding in Southern and Eastern U.S.

Mid-June saw an extremely moist air mass combined with a slow-moving rain-laden frontal system give rise to disastrous flash flooding in Texas and West Virginia, reports Christopher Smith, CISESS Satellite Liaison to the NWS Weather and Ocean Prediction Centers, in his latest blog post. For example, the 1973 record for the daily rainfall maximum in San Antonio, Texas of 3.26 inches was broken, with ~6 inches of rain recorded on June 12. Flash flooding ensued, resulting in thirteen deaths. The convectively active frontal system pushed east into West Virginia, spawning more thunderstorms and flash-flooding events.

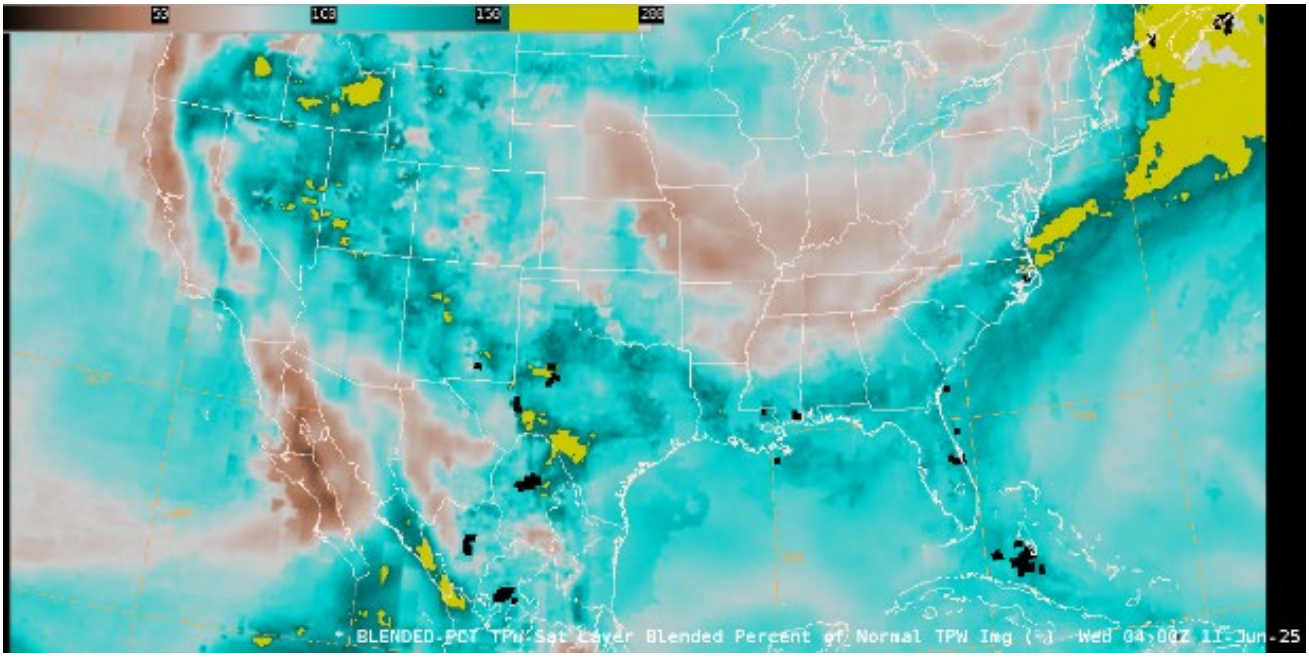

Figure. NESDIS/Office of Satellite and Product Operations Blended Total Precipitable Water Percent of Normal (bTPW) product at 0400 UTC 11 June 2025. Dark blue and yellow indicate bTPW values that are 150 to 200 percent of normal values.

(Christopher Smith, CISESS, csmith70@umd.edu; Funding: JPSS PGRR)

PUBLICATION(S)

The Importance of Information from Passive Microwave Imagers on Satellites
Citation: Rouzegari, Nazak, Mohammad Bolboli Zadeh, Claudia Jimenez Arellano, Vesta Afzali Gorooh, Phu Nguyen, Huan Meng, Ralph R. Ferraro, Satya Kalluri, **Soroosh Sorooshian**, and Kuolin Hsu, 2025: Passive microwave imagers, their applications, and benefits: a review. *Remote Sens.*, **17**, 1654, https://doi.org/10.3390/rs17091654.
Summary: Operating around the clock and with the capability of seeing through clouds, passive microwave imagers (PMWIs) are crucial for understanding and monitoring various aspects of Earth's environment from space, providing valuable data for weather forecasting and disaster preparedness, among others. In a review paper published in the journal *Remote Sensing*, Nazak Rouzegari, a PhD student working under the supervision of Prof. Soroosh Sorooshian, Director of the Center for Hydrometeorology and Remote Sensing (CHRS) at the University of California Irvine (UCI), a CISESS Consortium Member, and colleagues present a thorough analysis of the relevance, applications, and societal implications of PMWI data, highlighting their critical role in meteorological and hydrological applications. They pay particular attention to tropical cyclone intensity and structure, global precipitation (rain and snow) and extreme events, the cryosphere, flood prediction, the effectiveness of tropical storm and hurricane watches, fire severity and carbon emissions, weather forecasting, and drought mitigation, exploring the value of PMWIs for some of these applications. Looking forward, several recommendations are offered, including increasing the number of satellites to ensure more frequent global coverage, reducing data latency to improve real-time applications, and improving the resolution and swath sizes of PMWIs. Results from a survey prepared by the CHRS/UCI to collect feedback from PMWI data users and the public will be summarized in an upcoming report to CISESS. Of note, the survey reports that PMWI data are used the most for hurricane tracking and precipitation monitoring.

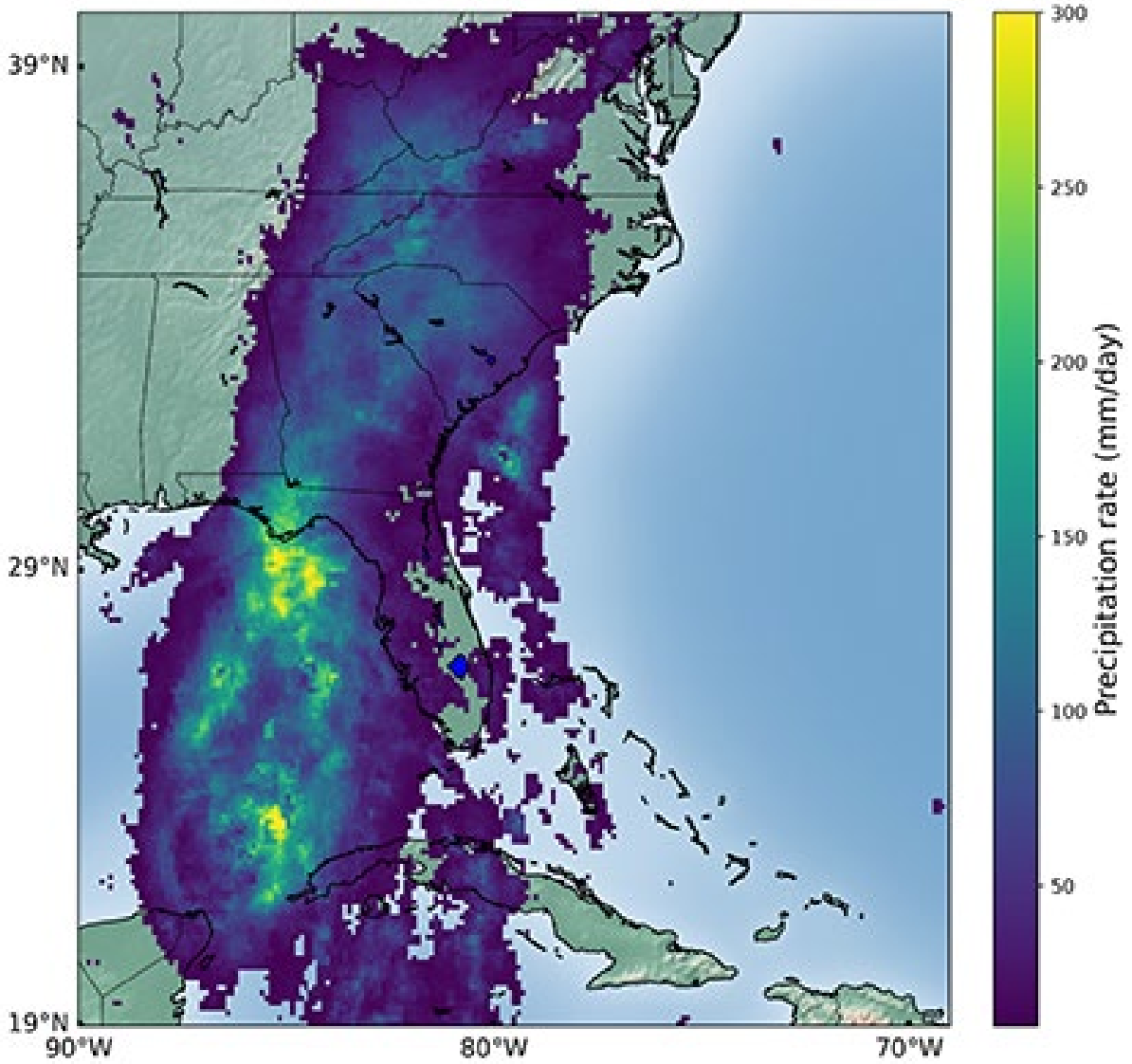

Figure. NASA Integrated Multi-satellitE Retrievals for GPM precipitation rate, demonstrating how precipitation rates from multiple microwave sensors on different satellites can be combined, creating a more in-depth picture of impactful weather events. Illustrated here are precipitation rates from Hurricane Helene on 26 September 2024. The upper limit of 300 mm/day (yellow areas) is equivalent to a foot of rain per day.

(Soroosh Sorooshian, CISESS, soroosh@uci.edu; Funding: JPSS PGRR)

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