Weekly Report – September 11, 2026

Cooperative Institute for Satellite Earth System Studies (CISESS)

NOAA/NESDIS/STAR

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MEDIA INTERACTIONS AND REQUESTS

A Meteorologist's Advice to Drivers in Severe Weather

This is an excerpt from an article written by Cazzy Medley and originally posted on the Earth System Science Interdisciplinary Center website.

ESSIC/CISESS scientist Will Miller was recently featured on the Sirius XM radio show, "On the Move with Dan Ronan". The show is on "Road Dog Trucking", a 24-hour channel devoted to the trucking industry. On the show, Miller spoke about weather data, forecasts, and their improvements over the past several decades due to increased computing power, finer grid resolution, better fundamental understanding of weather, and enhanced satellite data. He noted that thunderstorms in particular remain difficult to predict due to their chaotic, small-scale nature. Miller suggested that truckers look at weather sites like NOAA's Storm Prediction Center for daily thunderstorm severity outlooks covering the continental US.

(William Miller, CISESS, wmiller1@umd.edu, Funding: COSMIC2)

SOCIAL MEDIA AND BLOG POSTS

Edouard's Wet Wallop

This year's Atlantic hurricane season has not been the most active one thus far, but what tropical storms have popped up have packed a rainy punch. In his latest blog post, CISESS Scientist Christopher Smith, the GOES-R Satellite Liaison to the National Weather Service's (NWS) Weather Prediction Center (WPC) and Ocean and Tsunami Center, describes the latest disturbance, Tropical Storm Edouard, which developed at the start of September off the shores of Louisiana, dousing parts of Texas as it moved inland. The NWS WPC Storm Summary reported that over two feet of rain fell near Thicket, TX, with hurricane-force wind gusts recorded near Port Arthur, TX.

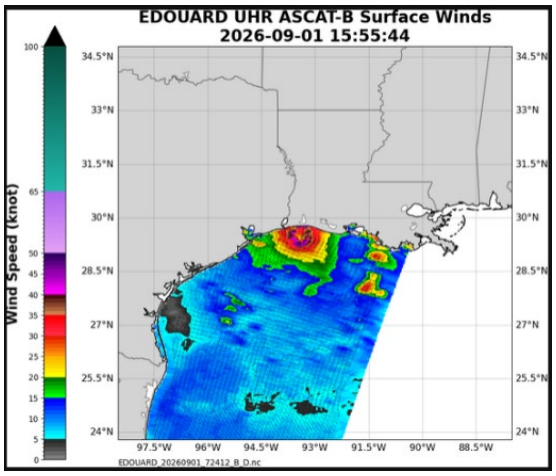

Figure: Ultra-high resolution Metop-B Advanced Scatterometer winds at 1555 UTC 01 September 2026. Credit: NESDIS/STAR

(Also published on the Satellite Liaison Blog, along with other blog posts of interest by other contributors.)

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

PUBLICATIONS

Stratospheric Dynamics Offer Clues to Predicting East Coast Cold Air Outbreaks
Citation: Barragan, Katherine and **Cristiana Stan**, 2026: Stratosphere–troposphere coupling during cold air outbreaks in the eastern United States. *Geophys. Res. Lett.*, **53**, e2026GL125002, https://doi.org/10.1029/2026GL125002.
Summary: Cold air outbreaks (CAOs) are extreme winter weather events where freezing polar air dips deeply southward toward the equator. This threatens human health and safety, among other things. Predicting these events on sub-seasonal to seasonal timescales is still a challenge because the mechanisms behind CAOs vary by event and are not yet well understood. However, there is some suggestion that stratospheric dynamics are somehow involved. This is explored by CISESS Scientists Katherine Barragan and Cristiana Stan in their article published in the journal *Geophysical Research Letters*, where they focus on U.S. East Coast CAOs and their relationship to stratospheric dynamics. They first use 2-meter surface air temperature (T2m) from the European Center for Medium-Range Weather Forecasts fifth reanalysis to identify CAOs during the boreal winters from 1979 to 2019, then calculate T2m anomalies defined as the difference between daily mean T2m and the 1979–2019 daily climatology. An Empirical Orthogonal Functions (EOF) analysis of the 10-hPa geopotential height (*Z*) is done to examine stratospheric variability. Finally, linear-lag regression is applied between T2m anomalies and principle components (PCs) from the EOF analysis to examine the relationship between stratospheric EOF patterns and T2m during CAOs. Their major finding is that about two weeks before the onset of a CAO, the polar vortex reshapes itself in such a way that planetary waves propagate downward, pushing the polar jet stream further south, thus setting off a CAO at the surface. This pattern suggests a potential way to better predict the onset of a CAO.

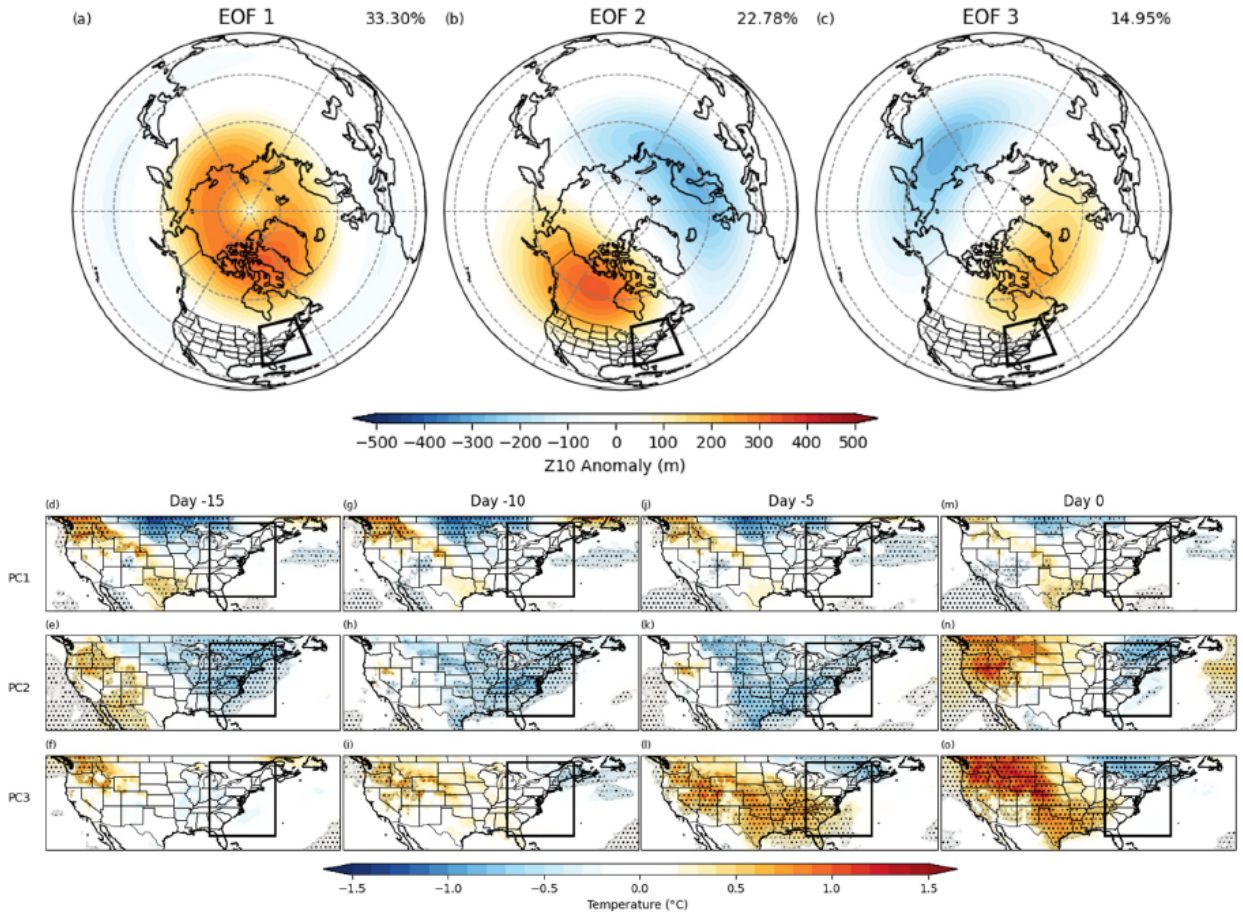

Figure: (a–c) EOF leading modes for 10-hPa Z daily anomalies during winter from 1979 to 2019 (percentages indicate the explained variance) and (d–o) linear-lag regression patterns between principal components and T2m anomalies at various lag days. Black boxes denote the study region (25°N, 51°N, 130°W, 49°W) where CAOs were identified. Stippled areas indicate regions of statistical significance at the 95% level. Of the three linear-lag regressions, PC2 shows the strongest relationship within the region of interest, suggesting that the distortion of the polar vortex captured in EOF2 may contribute to a negative temperature anomaly that occurs prior to the onset of East Coast CAOs, thus acting as a precursor. The persistence of this signal for several days prior to onset suggests a consistent stratospheric signal that potentially influences the troposphere.

(Katherine Barragan, CISESS, kbarrag@gmu.edu, Funding: OSTI; Cristiana Stan, CISESS, cstan@gmu.edu, Funding: OSTI)

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