Links to view Saharan dust plume:

https://weather.cod.edu/satrad/?parms=regional-gulf-truecolor-48-1-100-1&checked=map&colorbar=

https://fluid.nccs.nasa.gov/gram/du/29.7x-95.4/?region=nam

https://cds-cv.nccs.nasa.gov/GMAO-V/

Messages about the Saharan Air Layer 6-23-20

Q. What is the Saharan Air Layer?
A. The Saharan Air Layer is a mass of very dry, dusty air that forms over the Sahara Desert during the late spring, summer, and early fall, and moves over the tropical North Atlantic every three to five days. Saharan Air Layer outbreaks usually occupy a 2 to 2.5-mile-thick layer of the atmosphere with the base starting about 1 mile above the surface. The warmth, dryness, and strong winds associated with the Saharan Air Layer have been shown to suppress tropical cyclone formation and intensification.

Saharan Air Layer activity usually ramps up in mid-June, peaks from late June to mid-August, and begins to rapidly subside after mid-August. During the peak period, individual Saharan Air Layer outbreaks reach farther to the west (as far west as Florida, Central America and even Texas) and cover vast areas of the Atlantic (sometimes as large as the lower 48 United States).

Q. How does the SAL influence weather and climate?
A. The Saharan Air Layer has unique properties of warmth, dry air, and strong winds that can have significant moderating impacts on tropical cyclone formation and intensification. There are three characteristics of these Saharan dust outbreaks that can affect tropical cyclones, tropical disturbances, and the general climatology of the Atlantic tropical atmosphere:

Extremely Dry Air: First, The Saharan Air Layer's dry, dusty air has about 50% less moisture than the typical tropical atmosphere. This extremely dry air can weaken a tropical cyclone or tropical disturbance by promoting downdrafts around the storm.
African Easterly Jet: Second, Strong winds in the Saharan Air Layer (25-55 mph or 10-25 meters per second) can substantially increase the vertical wind shear in and around the storm environment. This "mid-level jet" of enhanced winds, typically found at a height of 6,500-14,500 feet (2000-4500 meters), can cause tilting of the tropical cyclone vortex with height and can disrupt the storm's internal heat engine.

Warm Temperatures: Third, The Saharan Air Layer's warmth acts to stabilize the atmosphere, which can suppress the formation of clouds. This stabilizing effect is produced when the Saharan Air Layer's warm, buoyant air rides above relatively cooler, denser air. The Saharan Air Layer's suspended mineral dust also absorbs sunlight, which helps maintain its warmth as it crosses the Atlantic Ocean.

Q. How does the SAL influence hurricane development?
A. The warmth, dryness, and strong winds associated with the Saharan Air Layer have been shown to suppress tropical cyclone formation and intensification.

Q. How/why does the SAL cause pretty sunsets?
A. The sun's white light is composed of all the colors of the rainbow. Our skies are normally blue because the gases that make up the atmosphere naturally scatter blue hues (shorter wavelengths) as opposed to the yellow-orange-red hues (longer wavelengths). Sunsets and sunrises take on more yellow and reddish hues because the low-angle sunlight passes through more of the atmosphere before it reaches your eyes. A heavy load of dust in the atmosphere can enhance this effect, leading to longer-lasting, duskier colors that cause vivid sunsets and sunrises.

Q. Is it common for dust from the Sahara to cross the Atlantic on a regular basis? How far west can it go into the U.S.?
A. SAL activity typically ramps up in mid-June and peaks from late June to mid-August, with new outbreaks occurring every three to five days. During this peak period, it is common for individual SAL outbreaks to reach farther to the west (as far west as Florida, Central America and even Texas) and cover extensive areas of the Atlantic (sometimes as large as the lower 48 United States).

Q. Is this week's Saharan dust pushing toward the U.S. a little unusual? If so, why?
A. Although SAL outbreaks often reach the U.S. coastline from late June to mid-August, this week's SAL is impressive for its size and the amount of dry, dusty air that it contains. It currently spans about 3,500 miles across the Atlantic from the west coast of Africa to Central America, contains less than half the moisture of the normal tropical atmosphere, and is carrying a significant amount of Saharan dust.

Q.Why is it important to track Saharan dust with satellites?
A.The Saharan Air Layer has unique properties of warmth, dry air, and strong winds that can act to suppress hurricane formation and intensification. Thanks to recent advancements in satellite technology, we can better monitor and understand the SAL, from its formation over Africa, to its interactions with tropical cyclones, to its impacts on weather along the U.S. Gulf coast and Florida. Forecasters and researchers at NOAA routinely use satellite data to detect these aspects of the SAL and some of this information is ingested into models to improve forecasts. Satellites are also used to plan NOAA aircraft research missions to sample the SAL and better understand how the SAL can suppress tropical cyclones.

Q. What satellite instruments do scientists use to track the dust and what information do the instruments give them?
A. Forecasters and scientists monitor and study the SAL using data from several satellites, including GOES-16, NOAA-20, and SUOMI-NPP. These satellites have a variety of visible, infrared, and water vapor channels that can be used in combination to track the SAL's warm temperatures, dry air, strong winds, and suspended dust. This information allows forecasters and scientists to continuously monitor the evolution of SAL outbreaks and their effects on the meteorology and climatology of the tropical North Atlantic.