PICTURES OF THE MONTH

Texas Dust Moves Into Florida

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1. Introduction

In 1969 at the end of June and the early part of July the ATS-3 satellite showed Sahara dust moving westward across the Atlantic Ocean. The dust eventually reached Barbados on 4 July 1969 somewhat diffused, and was detected in Florida a few days later.

On 8 July 1971 the SMS/GOES-1 also recorded an African dust storm that moved into the Bahamas and eventually into Florida. It is safe to assume there have been many other cases of dust occurring in the Bahamas and the State of Florida that originated from the Sahara Desert (Brandli, 1977).

2. Discussion

In the last weeks of February 1977 dust was again reported in Florida; however, its origin was not the

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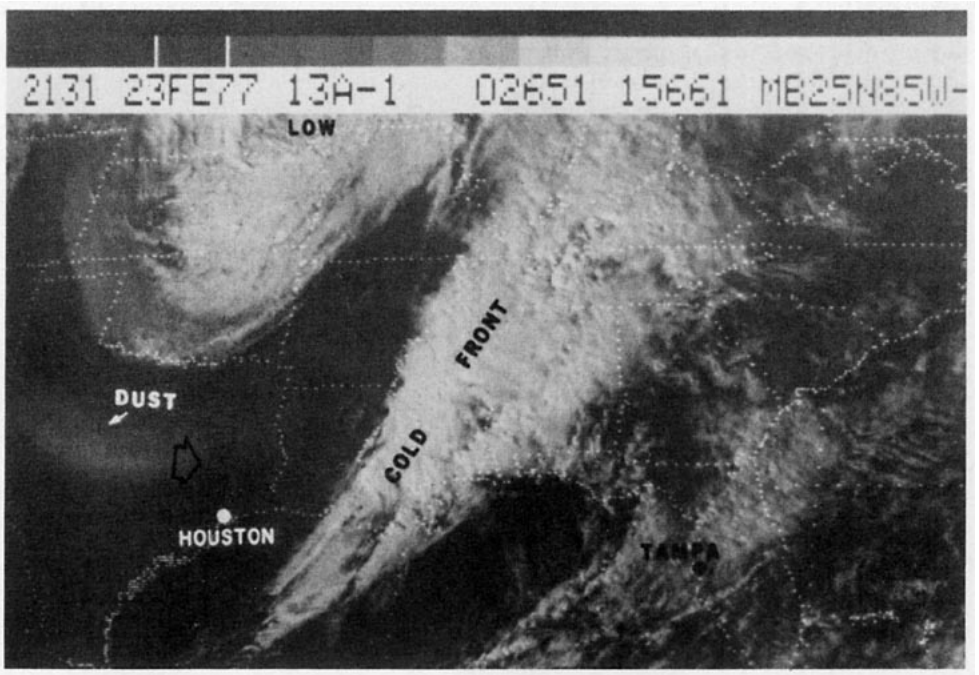

FIG. 1. SMS/GOES-1 1 n mi resolution visual imagery, 2130 GMT 23 February 1977. Texas dust is seen on photo created by greater than 50 n mi winds created by storm in plains states. Cold front is also labeled.

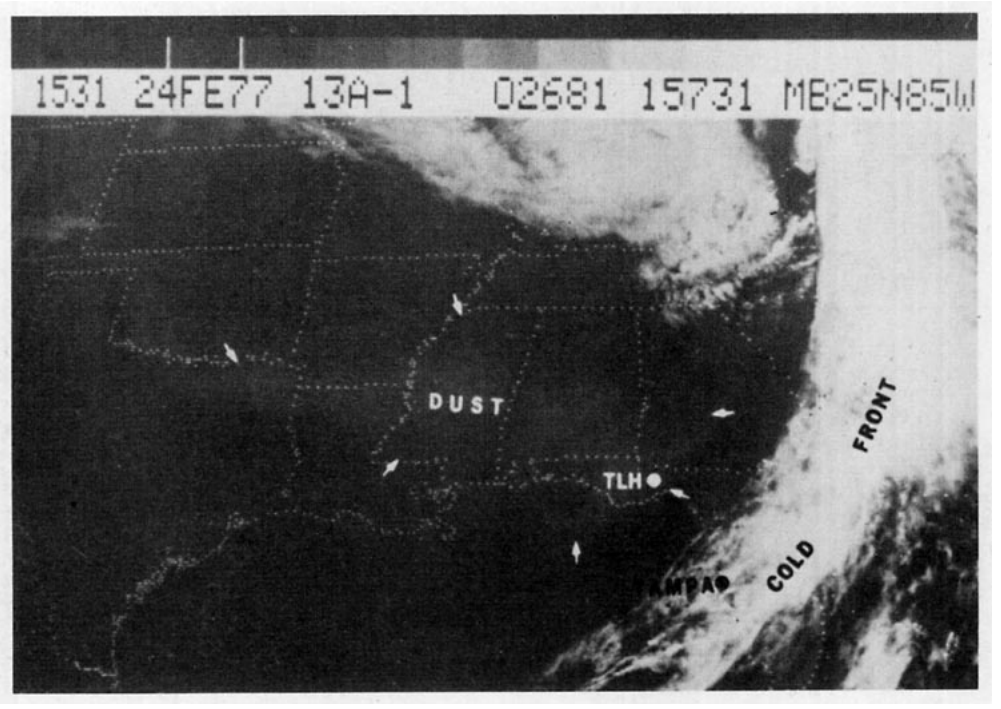

FIG. 2. SMS/GOES-1, 1 n mi resolution visual imagery, 1530 GMT 24 February 1977. Elongated dust from Texas to panhandle of Florida is clearly seen.

Sahara Desert but the midwest dust bowl of northwest Texas created by months of drought and eventual high winds that carried the dust aloft to the Florida Peninsula.

Fig. 1 is an SMS/GOES, visual, 1 n mi resolution display taken at 2130 GMT 23 February 1977. On this photo a low pressure area is seen at the top of the photo in the plains states. This low intensified and moved

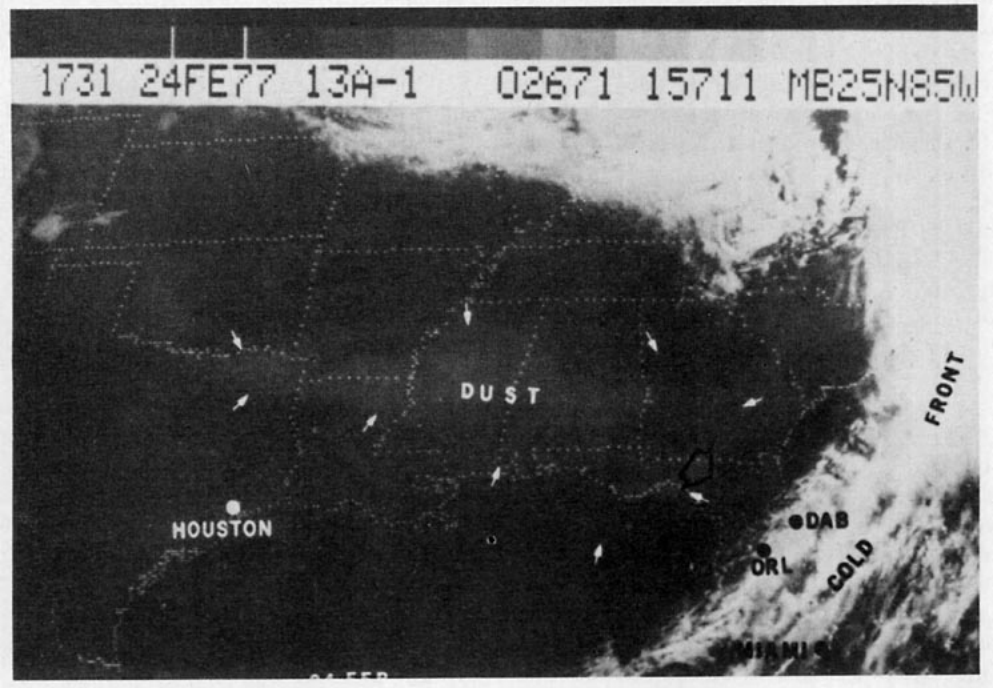

FIG. 3. SMS/GOES-1 1 n mi resolution visual imagery, 1730 GMT 24 February 1977. Elongated dust is clearly seen with extrapolation possible from sequence of Fig. 2 to Fig. 3.

TABLE 1. Pilot/surface observations for 24 and 25 February 1977.

Location	Date/Time	Text
PILOT REPORTS		
OVR CBM (Colombus, Miss.)	24/1500 GMT	TOPS D 090
30W MOB (Mobile, Ala.)	24/1545 GMT	VSBY UNRSTD ABV 200
84W VPS (Eglin AFB, Fla.)	24/1620 GMT	HZ TOP 080
OVR TPA (Tampa, Fla.)	25/1150 GMT	TOPS DH LYR 25–30
OVR ORL (Orlando, Fla.)	25/1229 GMT	TOPS DH 035
OVR CEW (Crestview, Fla.)	25/1401 GMT	D LYR TOPS 100
SURFACE OBSERVATIONS		
Station	Date/Time	Observation
CEW (Crestview, Fla.)	24/1700 GMT	−X 1D
TLH (Tallahassee, Fla.)	24/1700 GMT	W6X 2D
GNV (Gainesville, Fla.)	24/1700 GMT	CLR 7
DAB (Daytona Beach, Fla.)	24/1700 GMT	13 SCT 100 OVC 7
TPA (Tampa, Fla.)	24/1700 GMT	27 SCT 40 OVC 8
MLB (Melbourne, Fla.)	24/1700 GMT	100 OVC 3R
CEW (Crestview, Fla.)	25/1200 GMT	CLR 3DF
TLH (Tallahassee, Fla.)	25/1200 GMT	CLR 4DF
GNV (Gainesville, Fla.)	25/1200 GMT	CLR 4DF
DAB (Daytona Beach, Fla.)	25/1200 GMT	−X 21/2D
TPA (Tampa, Fla.)	25/1200 GMT	CLR 3FD
MLB (Melbourne, Fla.)	25/1200 GMT	CLR 3DH

northeastward. The intensity of this low pressure area caused surface winds of over 50 kt in Oklahoma and Texas on 23 February. These strong winds, coupled with the dry conditions over that area, created a huge dust storm. On the GOES-1 sector (Fig. 1), the dust is seen in north central Texas. In fact, the orientation of the dust, as it appears on the imagery, indicates the cyclonic flow of the low that picked it up and moved it eastward. Indications were that the dust would move eastward, just how far would depend on the future movement of the low—a movement which could be determined from satellite pictures.

On Fig. 2, taken at 1530 GMT 24 February, an elongated dust pattern, from northeast Texas through the border of Arkansas, Louisiana, into central Mississippi, southwestern Alabama and into the western panhandle of Florida, is clearly seen and marked with arrows on this morning photo taken from the 19 300 n mi SMS/GOES-1 satellite. The leading edge of the dust in an arc shape is depicted extending from the Tallahassee area northeastward into central Georgia and southwestward into the Gulf of Mexico.

The 1730 GMT SMS/GOES sector taken 2 h later (Fig. 3) shows the dust has moved east and southeastward retaining the same leading edge of the "dust cloud." The geographical gridding of both of these pictures was excellent so that exact extrapolation was possible from this 2 h imagery. By carefully extrapolating the leading edge of the dust, it was determined that it was moving southeastward at about 20 kt; a dust forecast for Daytona Beach, Orlando and Tampa for around 2300 EST was more than probable and a further forecast for Brevard County and the Cape Canaveral area for around midnight was prognosticated.

The news media and other agencies were alerted by the authors and the Cocoa, Fla., newspaper *Today*, published on the morning of the 25th, told its readers dust from Texas would reach Brevard County and be on automobiles that morning. Sure enough, the populace of Brevard County awoke to find a yellowish sunrise and a few millimeters of dust on the cars. Pilot reports indicated tops of the dust anywhere from 10 000 to 20 000 ft (see Table 1). Because of a stagnant air mass over the Florida Peninsula, the dust continued to disperse but persisted for another 36 h.

3. Conclusion

Without the excellent SMS/GOES geographically gridded imagery (Brandli and Munson, 1976) which enabled accurate extrapolation, the forecast of such an unusual occurrence as Texas dust would not have been possible. This is one more example where extrapolation of a conservative meteorological phenomena like dust can be easily forecast many hours in advance if the imagery is available often enough and geographically gridded to take advantage of precise movements of such phenomena.

REFERENCES

Brandli, H. W., 1977: Satellite meteorology. Air Weather Service Tech. Rep. AWS-TR-76-264, 80–82.

——, and R. Munson, 1976: Frontal cloud movement from gridded satellite imagery. *Mon. Wea. Rev.*, **104**, 972–974.