

PICTURE OF THE MONTH

A Jet Stream Cirrus Shield

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Jet-associated cirrus is very frequently seen in satellite cloud pictures but seldom as spectacularly as in this instance. These photographs (visible and infrared, Figs.

1 and 2) were recorded by the Very High Resolution Radiometer (VHRR) aboard the NOAA-2 satellite as it passed southward over the eastern portions of Canada

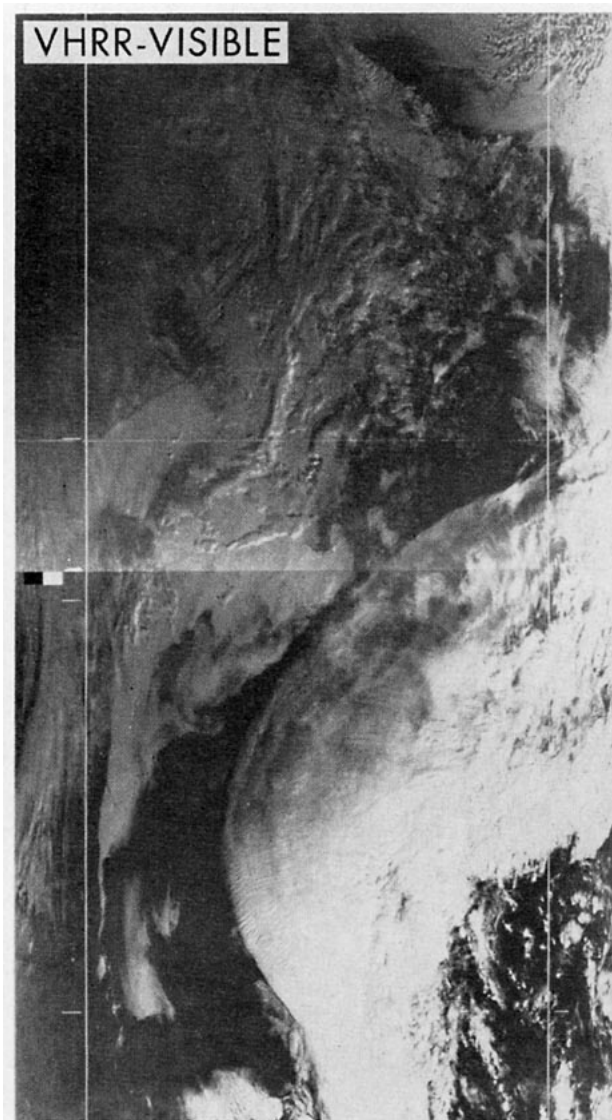


FIG. 1. View of eastern North America as seen through the visible channel ($0.6\text{--}0.7\ \mu\text{m}$) of the Very High Resolution Radiometer aboard the NOAA-2 satellite. Picture time is approximately 1445 GMT (0945 EST) 8 December 1973.

FIG. 2. Same as Fig. 1, except infrared view ($10.5\text{--}12.5\ \mu\text{m}$). The coastline of the eastern United States and the 300-mb rawin data for 1200 GMT have been added.

and the United States on the morning of 8 December 1973 at approximately 1445 GMT. The pictured area extends from northern Labrador to central Florida (the coastline of the eastern United States is delineated in the infrared view).

Rawin data at 300 mb for 1200 GMT 8 December have also been added to the infrared picture. When comparing these wind data with the cirrus clouds, the reader should keep in mind the approximate 3-hr time difference, the downwind displacements of the rawinsondes, and the fact that some of the cirrus almost certainly extended above 300 mb. Nevertheless, gross features are plainly apparent. The cirrus shield is embedded in a strong southerly and southwesterly anticyclonic flow, with the edge of the shield very nearly parallel to the flow. The clear area just west of the shield and over the Mississippi Valley is shown to be a region of a sharp upper trough and very large cyclonic shear.

In the visible view of the cloud shield, many small transverse waves may be seen very clearly. These are most noticeable near the western edge of the shield over

the southern states, but they also are apparent over a wide area to the north and east. Also in the visible view and at the western edge of the mid-portion of the shield is a distinct shadow cast by the cirrus. Calculations based on sun angle and the width of the shadow show that the altitude of the cirrus at that place was probably at the tropopause, near the 200-mb level.

At the surface at picture time, a developing low-pressure system of moderate intensity was located some 200 mi south-southwest of Cape Hatteras. The cyclone subsequently moved northward, causing widespread rain along the Atlantic seaboard and a narrow band of heavy snow in the central Appalachian highlands. However, the cyclone never attained more than moderate intensity; minimum pressure was near 1000 mb.

Far to the north, the coast of Labrador is clearly seen in both pictures. Also apparent are low-level convective clouds in the arctic air over the Labrador Sea. The northwest portion of the visible view is quite dark because of low solar illumination.