SATELLITE PHOTOS LOCATE CENTER OF HIGH

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1. INTRODUCTION

Satellite visual and infrared imagery, in addition to locating clouds and determining cloud types, can also be used to determine wind direction and speed (Fritz, 1965; Brandli, 1974; Dickinson, et al, 1974). Information concerning a multitude of other meteorological parameters can be deduced from this imagery. This paper discusses locating the gradient-level, high-pressure center using visual and infrared satellite photos.

2. DISCUSSION

Figure 1 is a Defense Meteorological Satellite Program (DMSP) visual photo, 12 December 1975, 1322 GMT. Closed, cellular stratocumulus clouds are seen off the southeast coast of the United States. These clouds form over the warm Gulf Stream as cold air moves out over the water (Weldon, 1975). North of 30°N latitude and west of 75°W longitude, the stratocumulus clouds are aligned parallel to the gradient-level flow. These stratocumulus lines curve in an anticyclonic man-

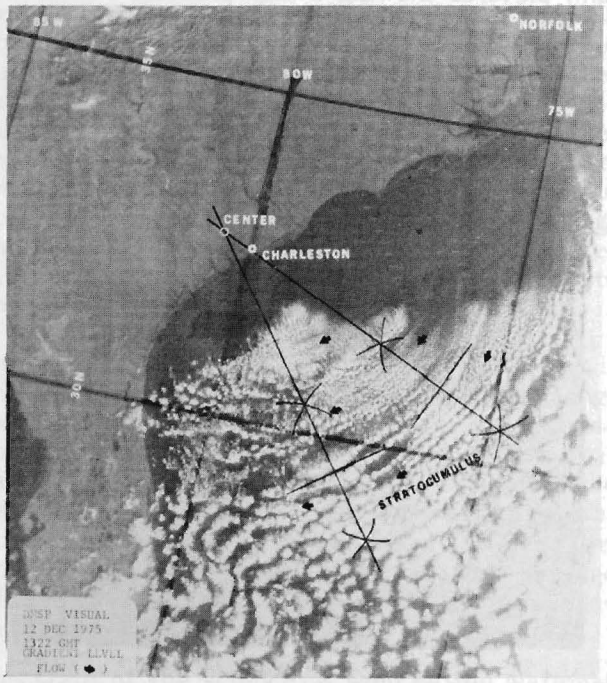

Figure 1. DMSP Visible Picture (0.62-km resolution), 1322 GMT, 12 December 1975.

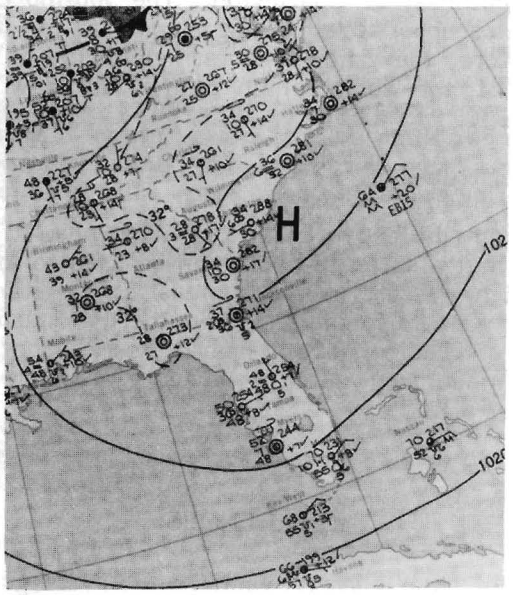

Figure 2. Surface Analysis, 1200 GMT, 12 December 1975.

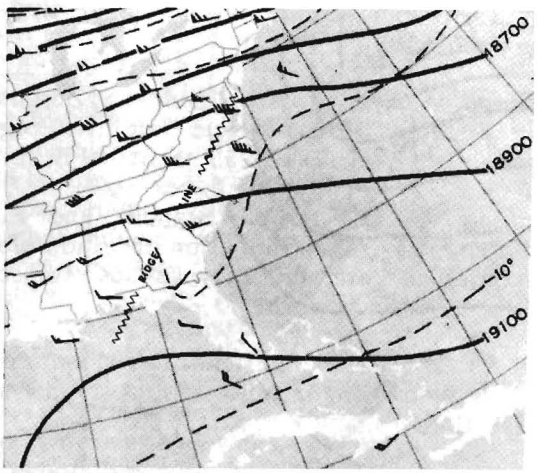

Figure 3. 500-mb Analysis, 1200 GMT, 12 December 1975.

ner and have average bases and tops of 800 meters and 1400 meters respectively (Brandli, 1976).

By constructing perpendicular bisectors of the more pronounced curved cloud lines, one should be able to locate the center of curvature of these stratocumulus cloud's pressure center. The gradient-level, high-pressure center will be close

to the surface high-pressure center, provided vertical stacking is present. Such bi-sectors have been drawn on Figure 1. The center of the gradient-level high is located approximately 30 miles west-northwest of Charleston, SC on Figure 1.

Figure 2 is the surface-weather chart and Figure 3 is the 500-mb weather chart for the southeast United States for 12 December 1975, 1200 GMT, nearly coincident with the DMSP photo. The analysis indicates a surface high-pressure center just southeast of Charleston. The 500-mb chart indicates upper-level ridging sloping to the west. Therefore, the gradient-level high should be just west of the surface-high center as shown on Figure 1.

3. CONCLUSION

Although the above case is an ideal one, it does show that a satellite photo can be used to locate the high-pressure center, at least at the gradient level. Other Northern and Southern Hemisphere obvious gradient-level, high-pressure locations, determined from satellite imagery are shown on Figures 4 and 5.

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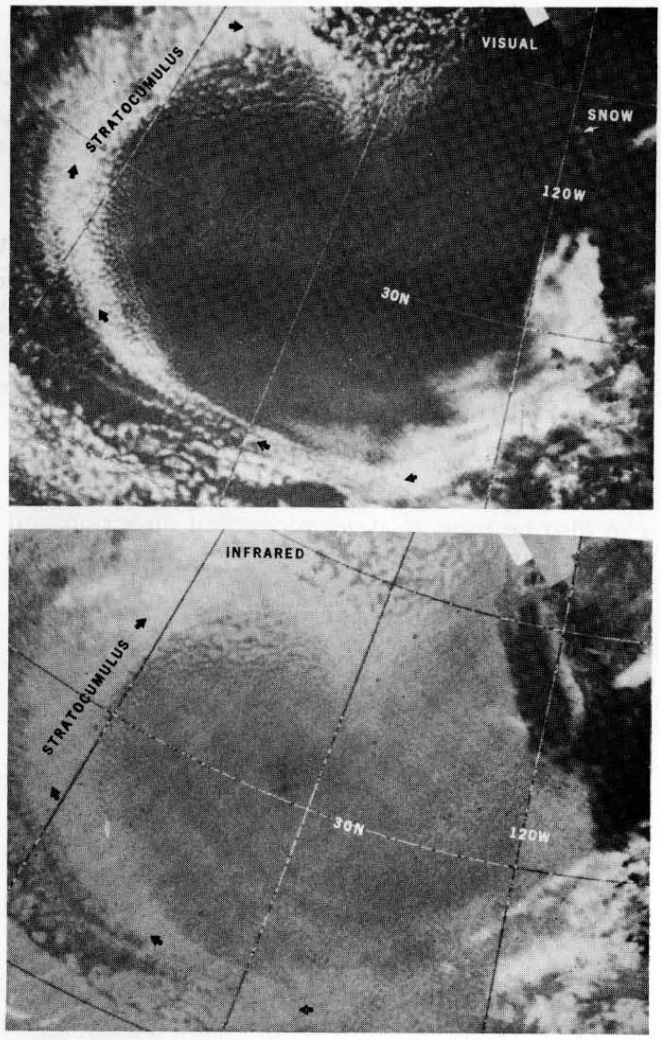

Figure 4. DMSP Visible (top) and Infrared (bottom) pictures showing a high-pressure center off the west coast of the U.S. on 19 April 1977.

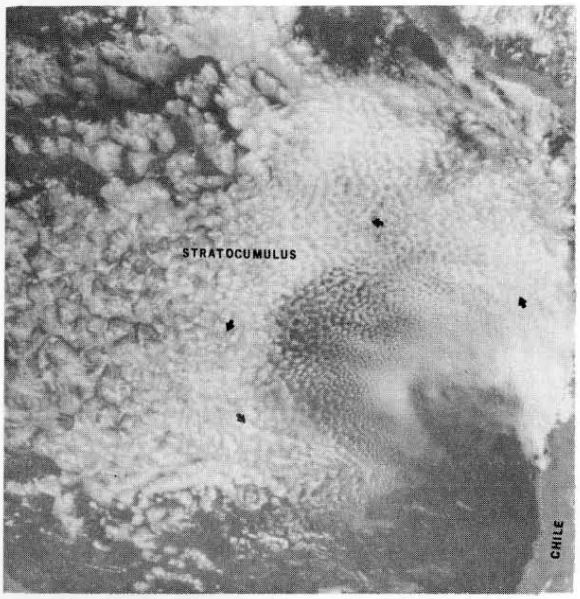

Figure 5. GOES-1 Visible Image off the coast of South America showing a high-pressure area on 9 March 1977.