Satellite

GOES WATER VAPOR IMAGERY

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Water vapor imagery has been available from Nimbus (1,2,3,) and METEOSAT (4).

Since the fall of 1981, GOES WEST satellite imagery of water vapor distribution in the upper troposphere was transmitted twice daily. See Figures 1 and 2. GOES EAST satellite imagery of water vapor distribution in the upper troposphere began five times daily of 31 March 1983. (Figure 3). METEOSAT images are shown in Figure 4.

These observations are made using the VAS remote vertical sounding system sensing radiation temperatures in the near infrared water vapor absorption wave-length band of 6.7 micrometers. Since these humidity observations are taken from the top of the atmosphere, they measure the vertically integrated moisture content of the air in the mid and upper troposphere (i.e., 600 to 300mbs).

These images are ideal for "seeing" upper level wind flow patterns as well as identifying areas where clouds are likely to form, or moisture boundaries where the potential for convection exists. Also monitored by this water vapor imagery is the ability to forecast mountain lee cirrus, better minimum temperature forecasts, and the interaction between the polar jet stream and circulatory systems in the tropics and subtropics.

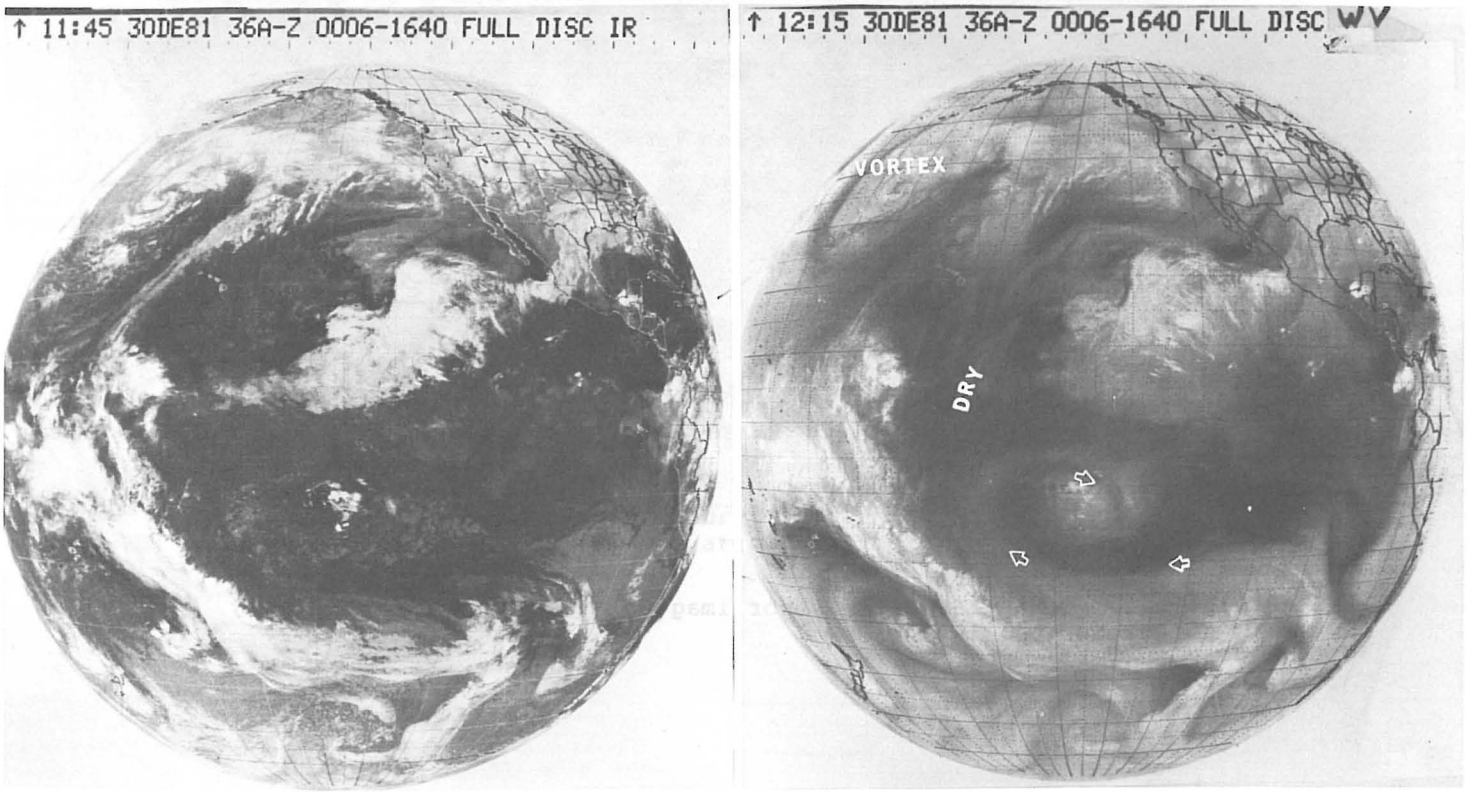

Figure 2. GOES WEST water vapor image (right) and Infrared photo (left) over the Pacific Ocean, 1215 GMT and 1145 GMT, respectively, December 30, 1981.

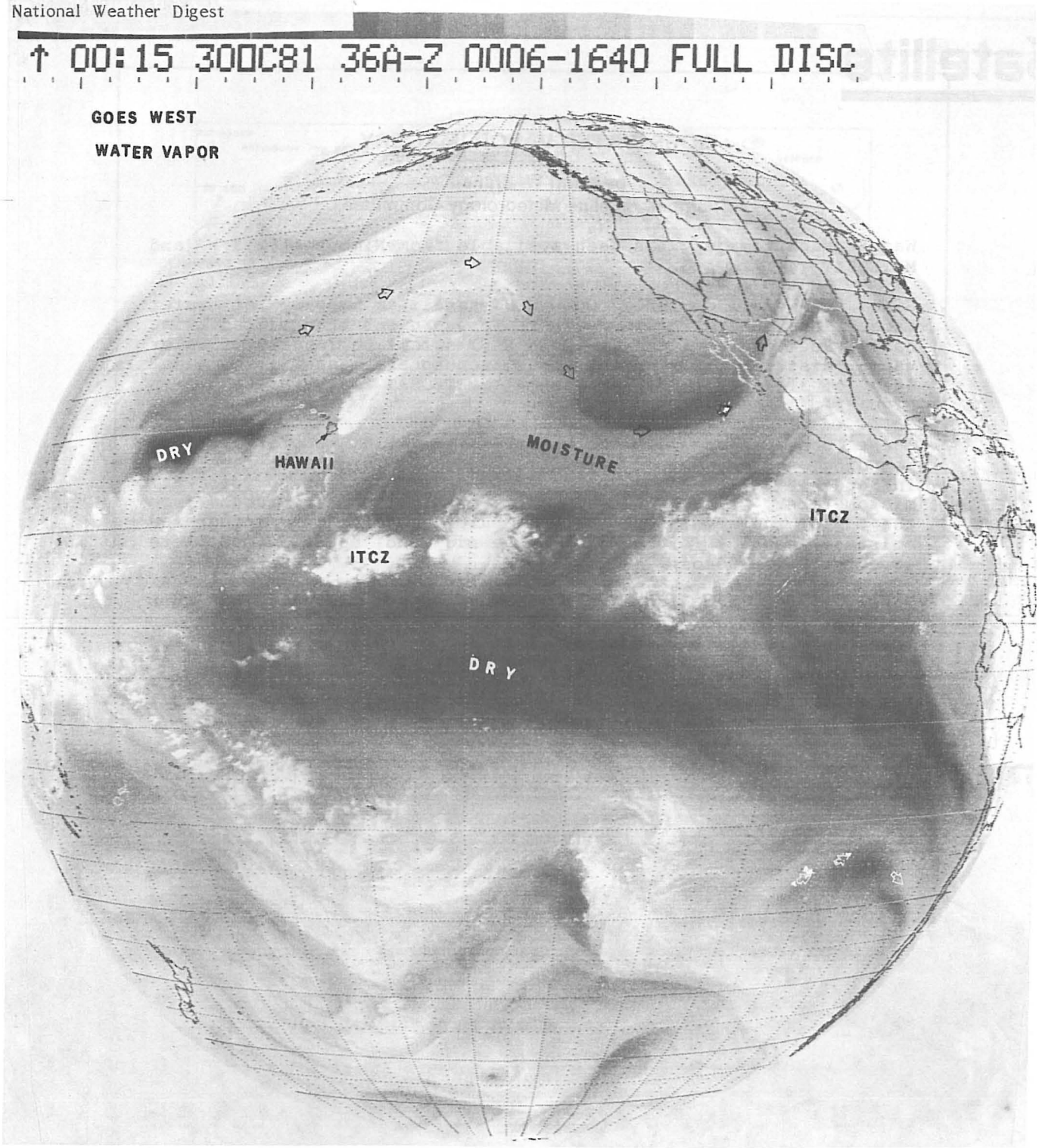

Figure 1. GOES WEST water vapor image of the Pacific Ocean, 0015 GMT, October 30, 1981.

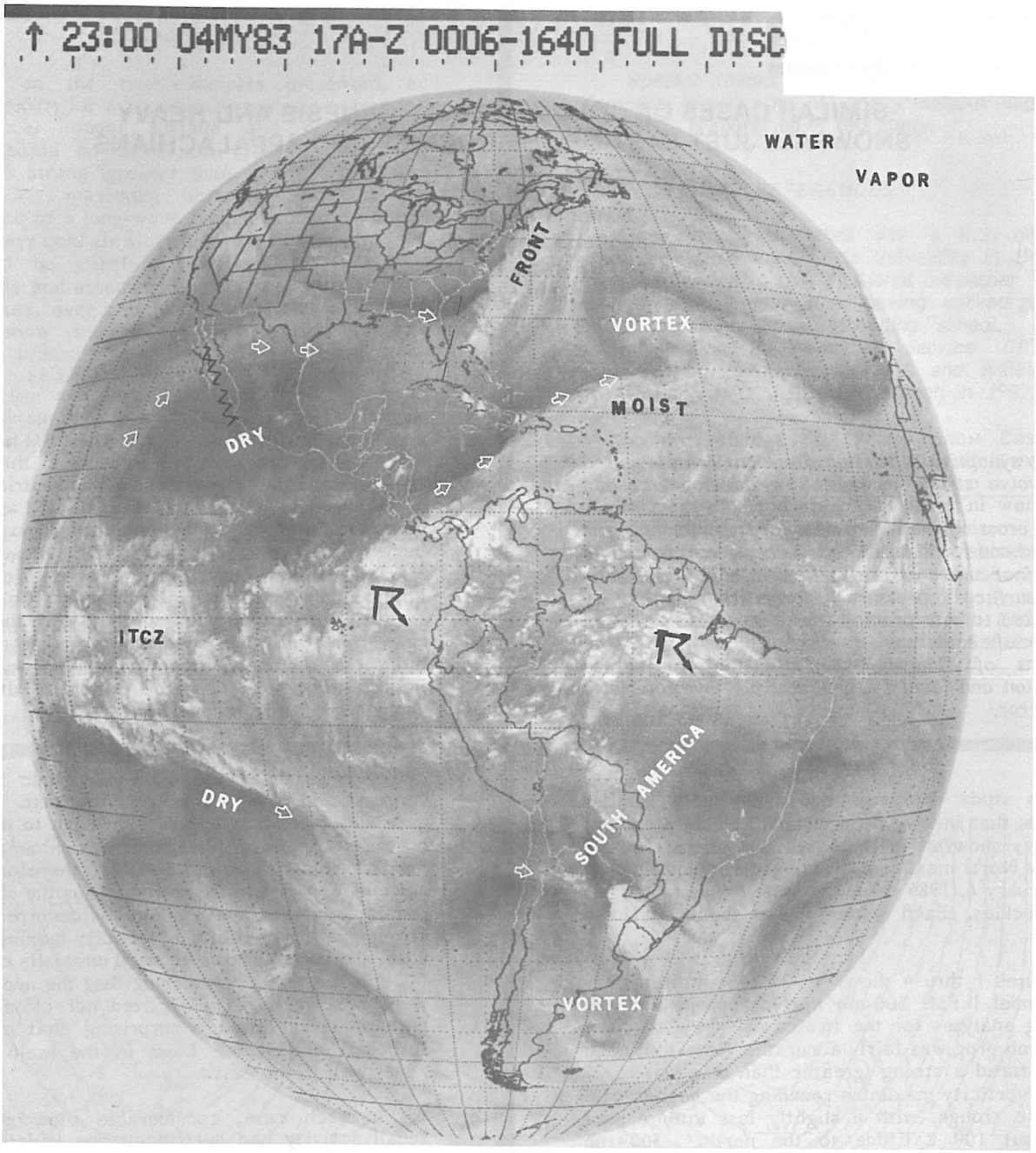

Figure 3. GOES EAST water vapor image of the Eastern Hemisphere, 2300 GMT, May 4, 1983. The arrows indicate water vapor flow in the 600-300 mb level.

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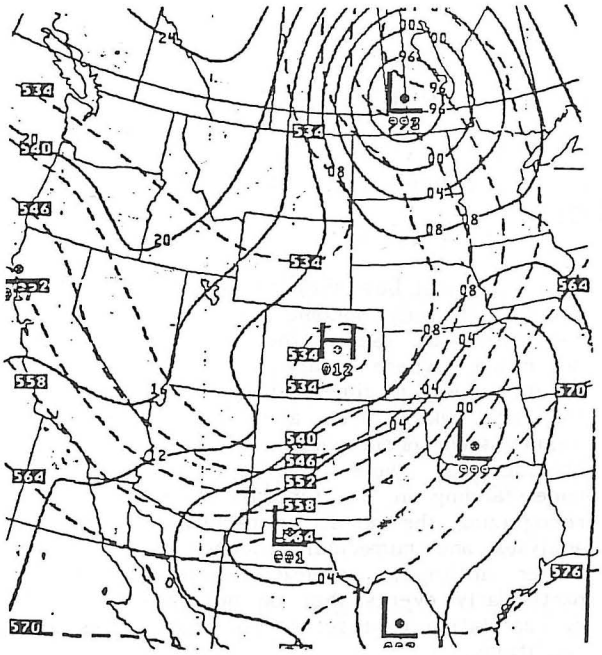

Figure 7. 24-hr LFM sfc pressure/1000-500 mb thickness forecast, VT 1200 GMT 16 Oct. 1984.

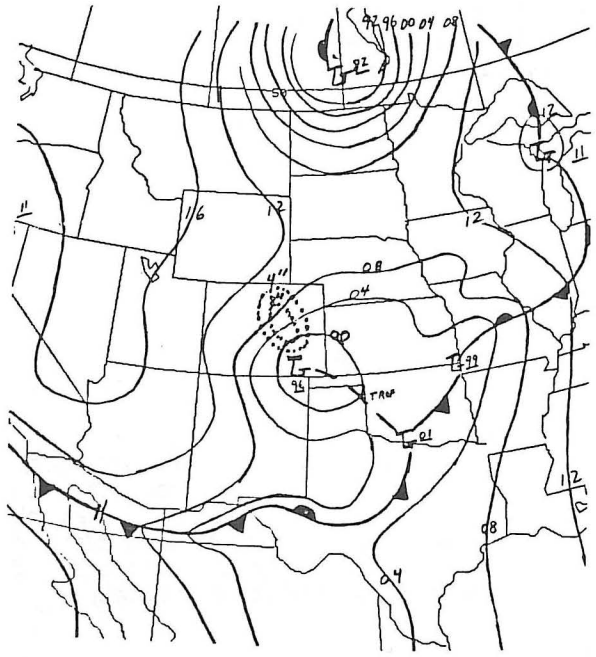

Figure 8. NMC sfc analysis, 1200 GMT 16 Oct. 1984, with total snowfall for previous 12 hr shaded.

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METEOSAT

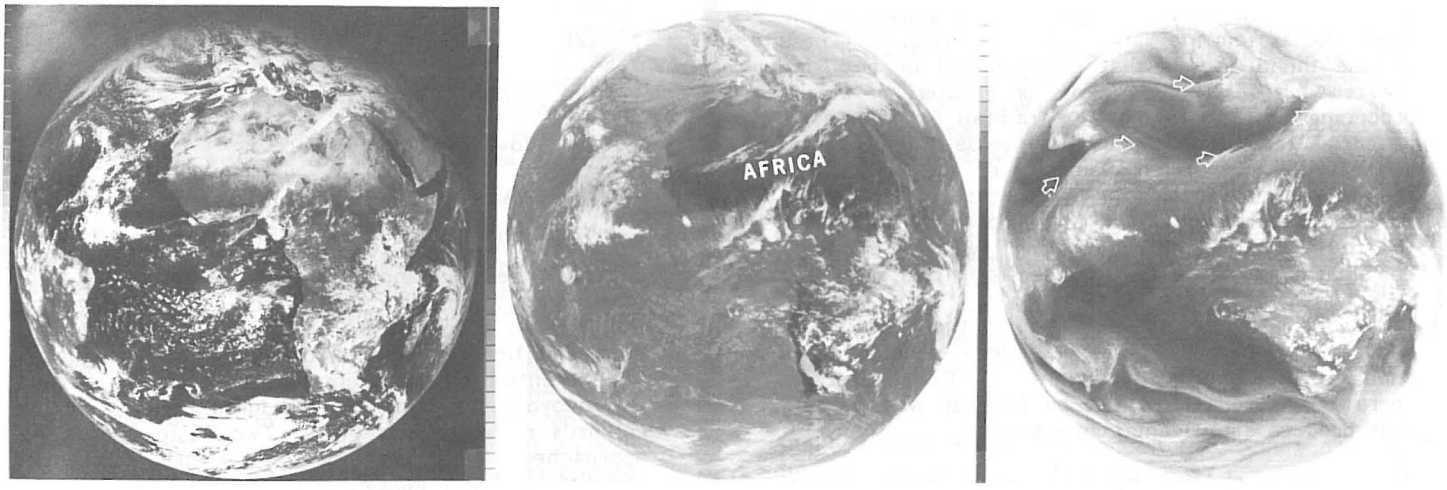

Figure 4. METEOSAT images, comparing visual, infrared and water vapor channels. (date unknown).

REFERENCES

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Steranka, J., L.J. Allison, and V.V. Salomonson, 1973: Application of Nimbus-4 THIR 6.7m observations to regional and global moisture and wind field analyses. J. Appl. Meteor., 12 pp. 386-395

Rogers, E.B., V.V Salomonson, and H.L. Kyle, 1976: Upper tropospheric dynamics as reflected in Nimbus-4 THIR 6.7m data. J. Geophys. Res., 81, pp.

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