Toronto
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Imaging the Earth at multiple view angles from MISR

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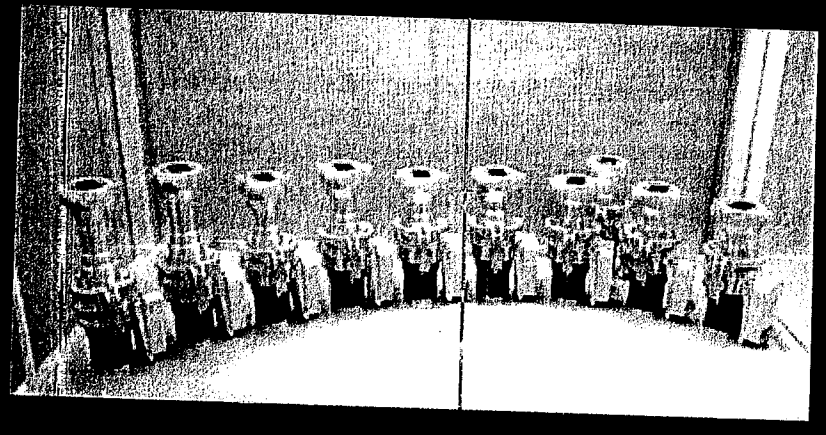
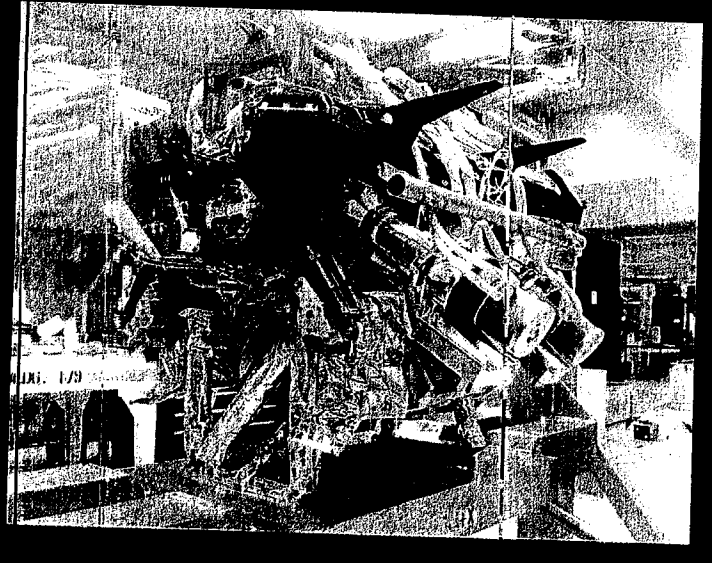
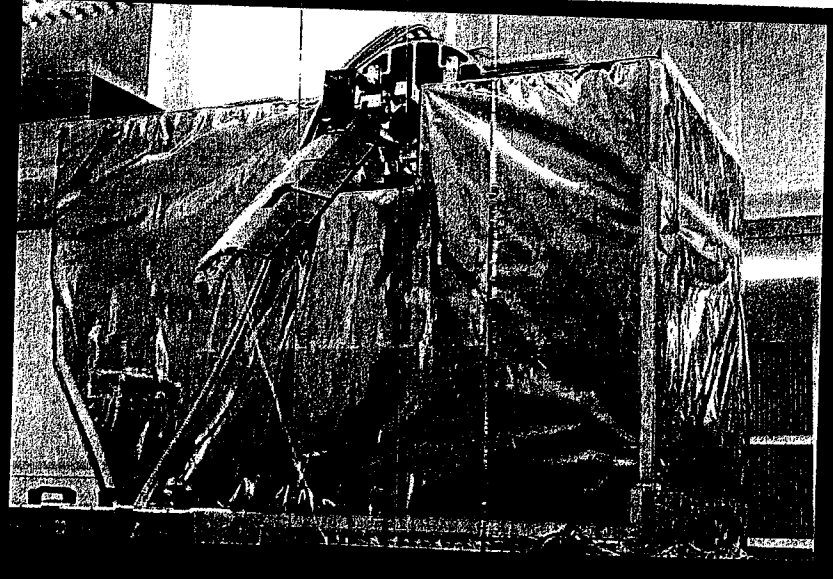
MISR characteristics







9 CCD pushbroom cameras

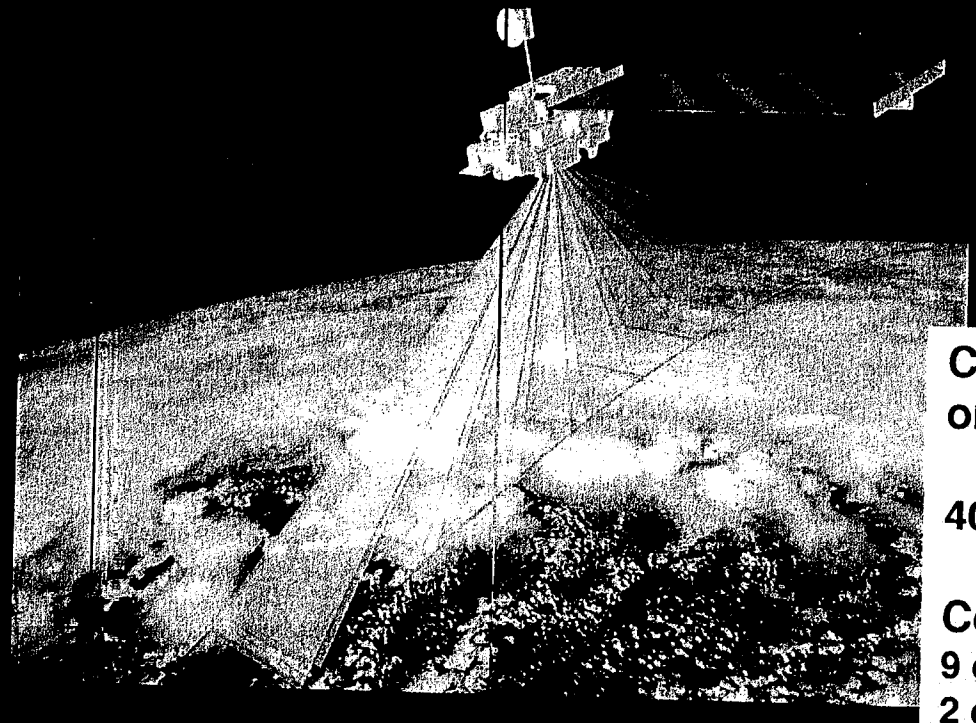
9 view angles at Earth surface:
70.5º, 60.0º, 45.6º, 26.1º forward
nadir
70.5º, 60.0º, 45.6º, 26.1º backward

4 spectral bands at each angle:
446, 558, 672, 866 nm

14-bit digitization

On-board calibration system

Observational attributes



Continuous pole-to-pole coverage on orbit dayside

400-km swath

Contiguous zonal coverage:
9 days at equator
2 days at poles

275 m - 1.1 km sampling

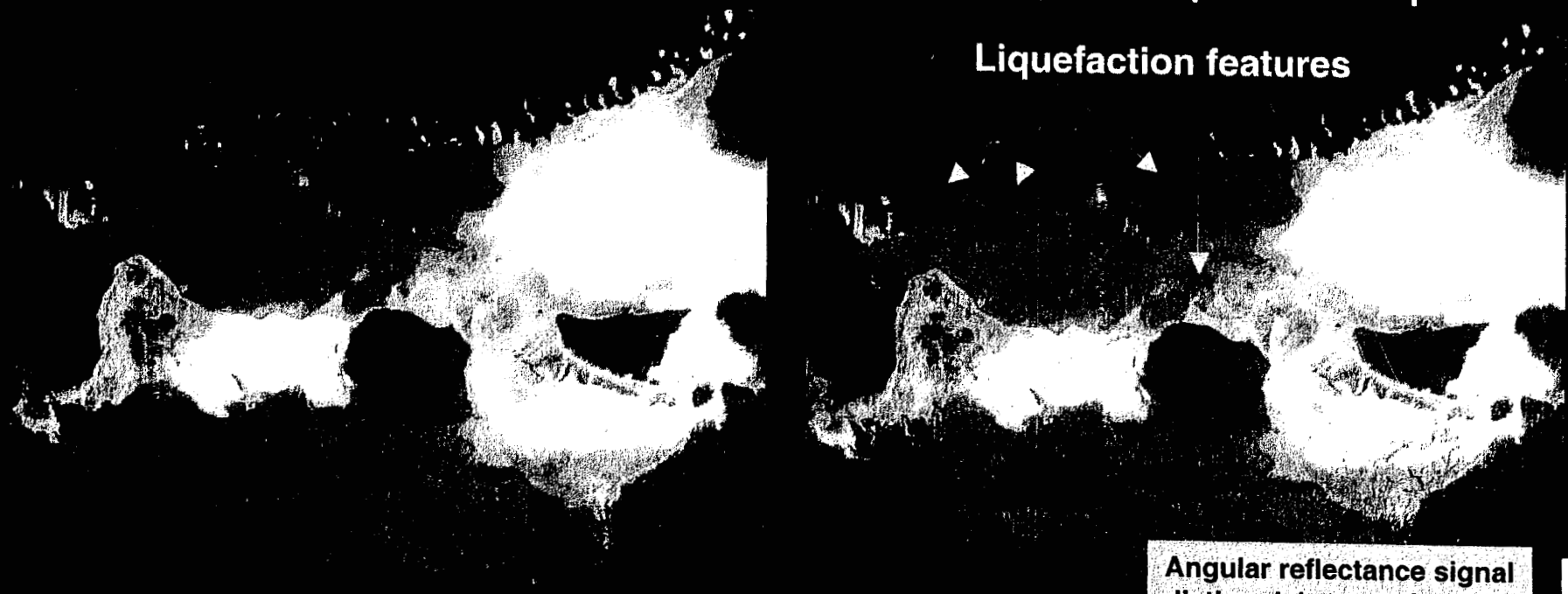
7 minutes to observe each scene at all 9 angles

Mapping surface water

15 January 2001: pre-earthquake

31 January 2001: post-earthquake

Liquefaction features



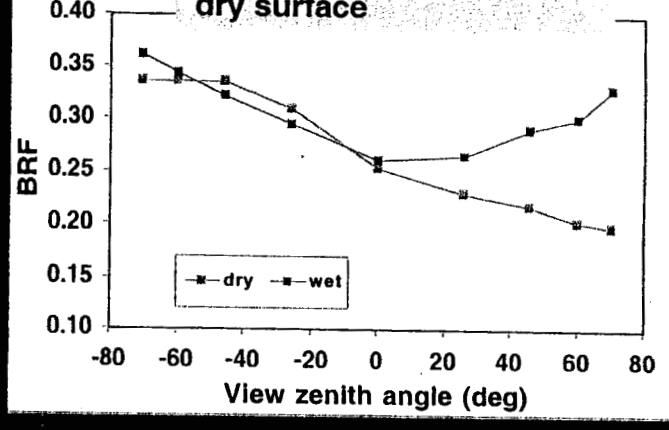
The Rann of Kachchh, India

Magnitude 7.7 earthquake, struck 26 Jan 2001

70º forward, nadir,

MISR multi-angle composite imagery and angular signatures provide the means to identify surface water.

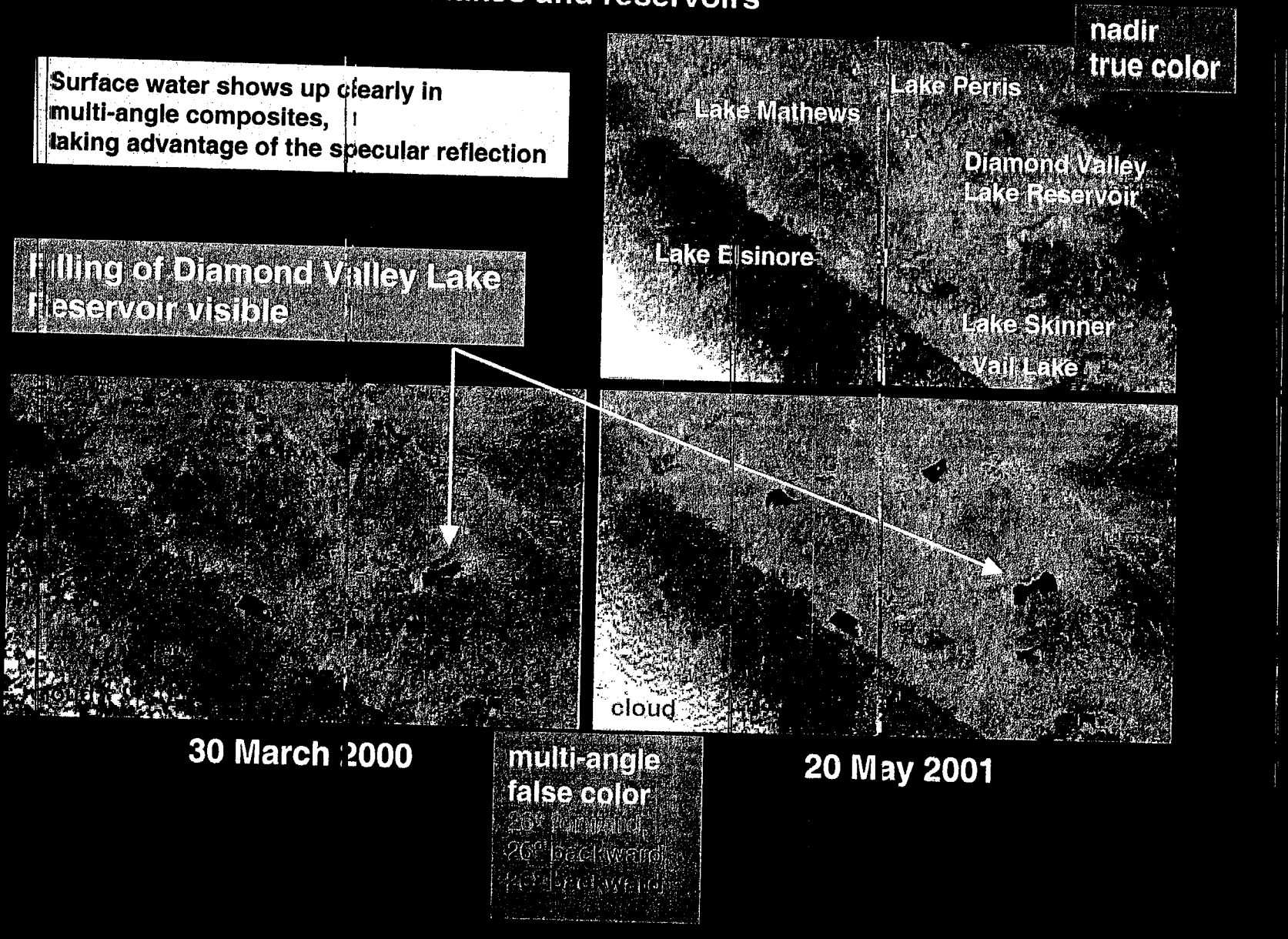
Angular reflectance signal distinguishes wet from dry surface



Mapping surface water

Southern California lakes and reservoirs

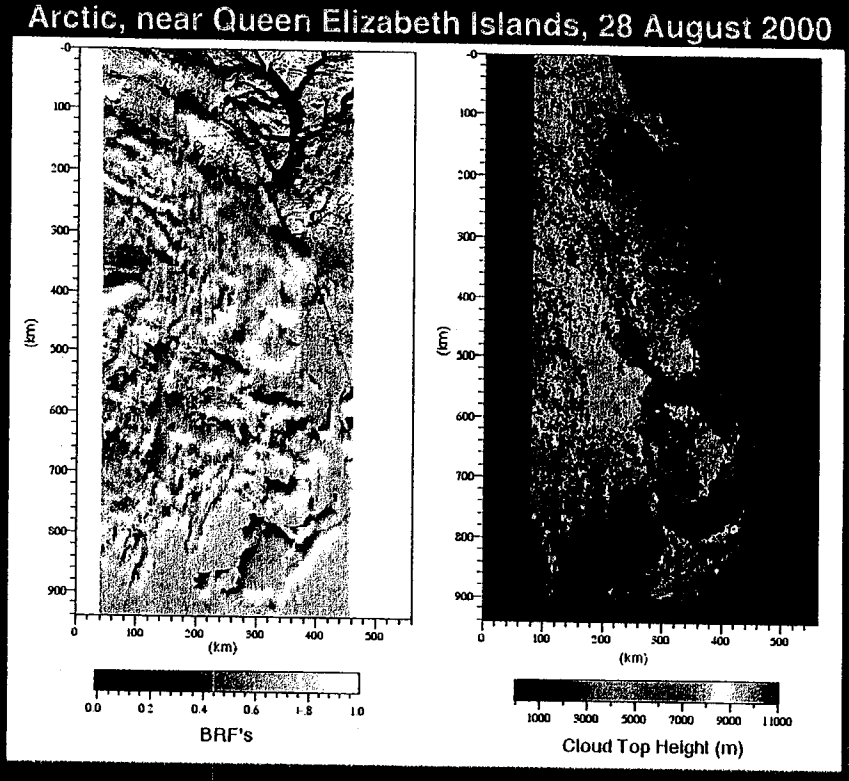
Surface water shows up clearly in multi-angle composites, taking advantage of the specular reflection



Discriminating polar clouds from snow and ice

Red band bidirectional reflectance factor

Band-differenced angular signature



Bidirectional reflectance factor

Stereoscopically-derived cloud-top height

Discerning clouds from ice or snow, a difficult challenge for multi-spectral techniques, is straightforward with MISR angular signatures and stereoscop c retrievals.

Acknowledgment: L. Di Girolamo, University of Illinois, C.Moroney, JPL

Monitoring regional and global aerosols

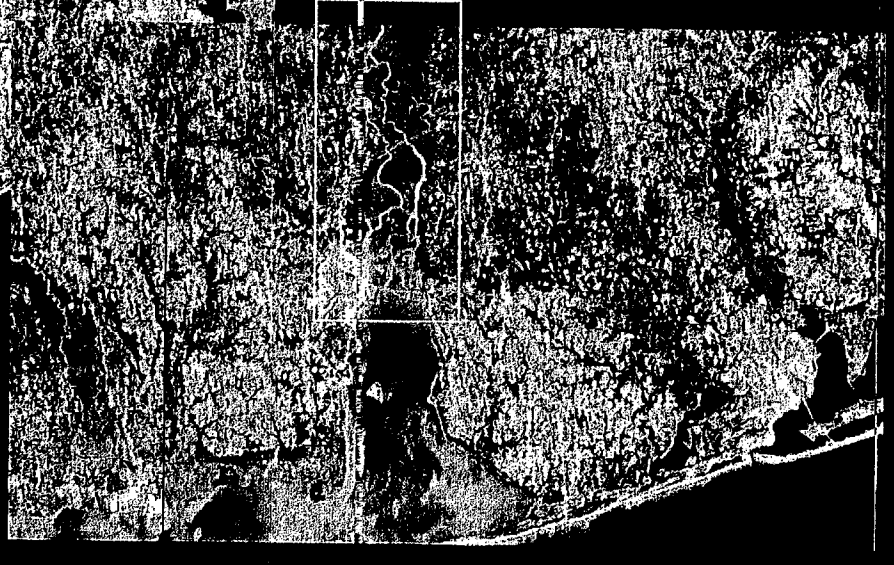
Southern California and southwestern Nevada
January 9, 2001

Retrieving aerosol properties, over a wide variety of surface types, is made possible using MISR's new measurements and algorithms.

Differentiating surface vegetation

nadir
true color

nadir
near-infrared
false color



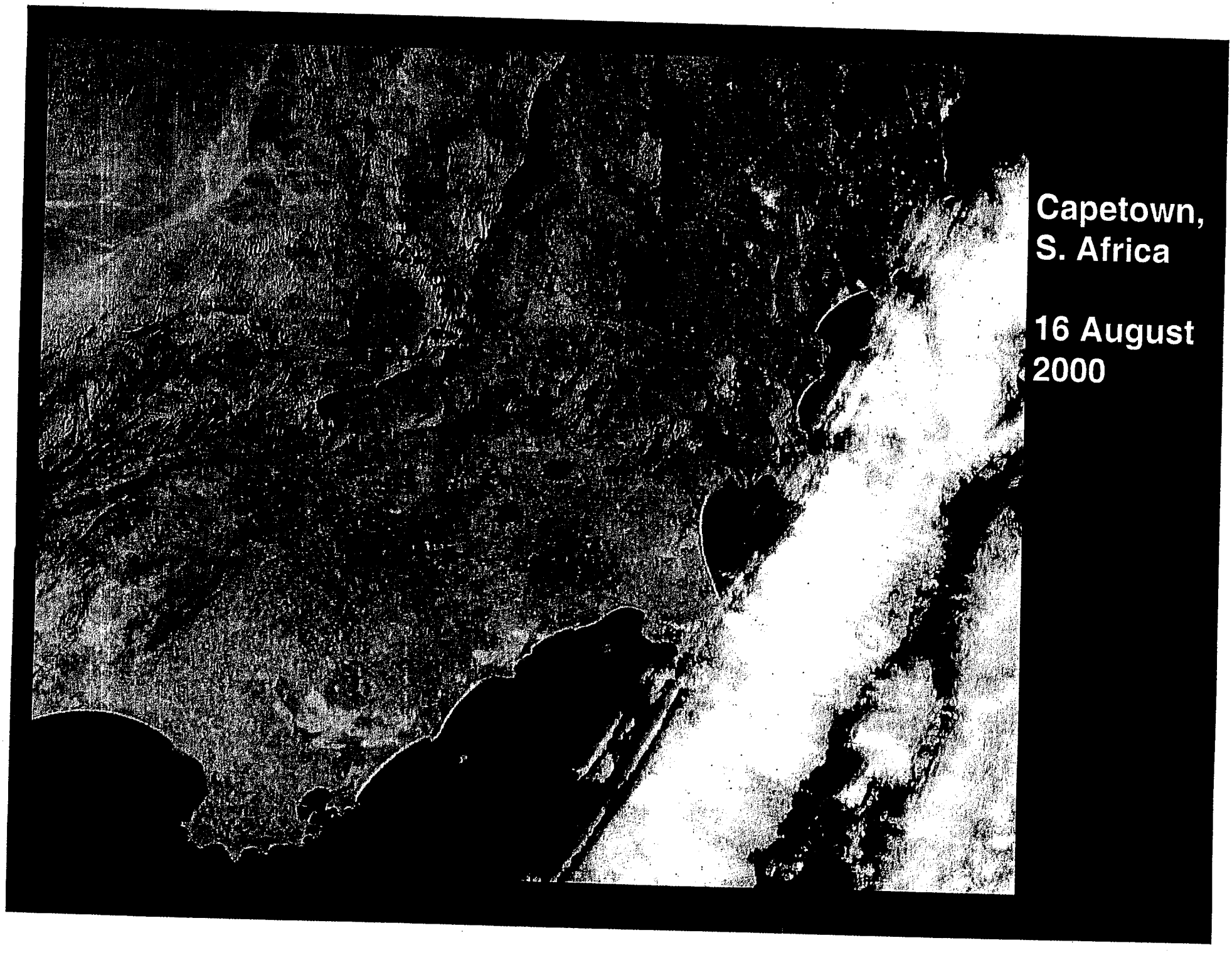
multi-angle
false color
(forward, nadir, backward)

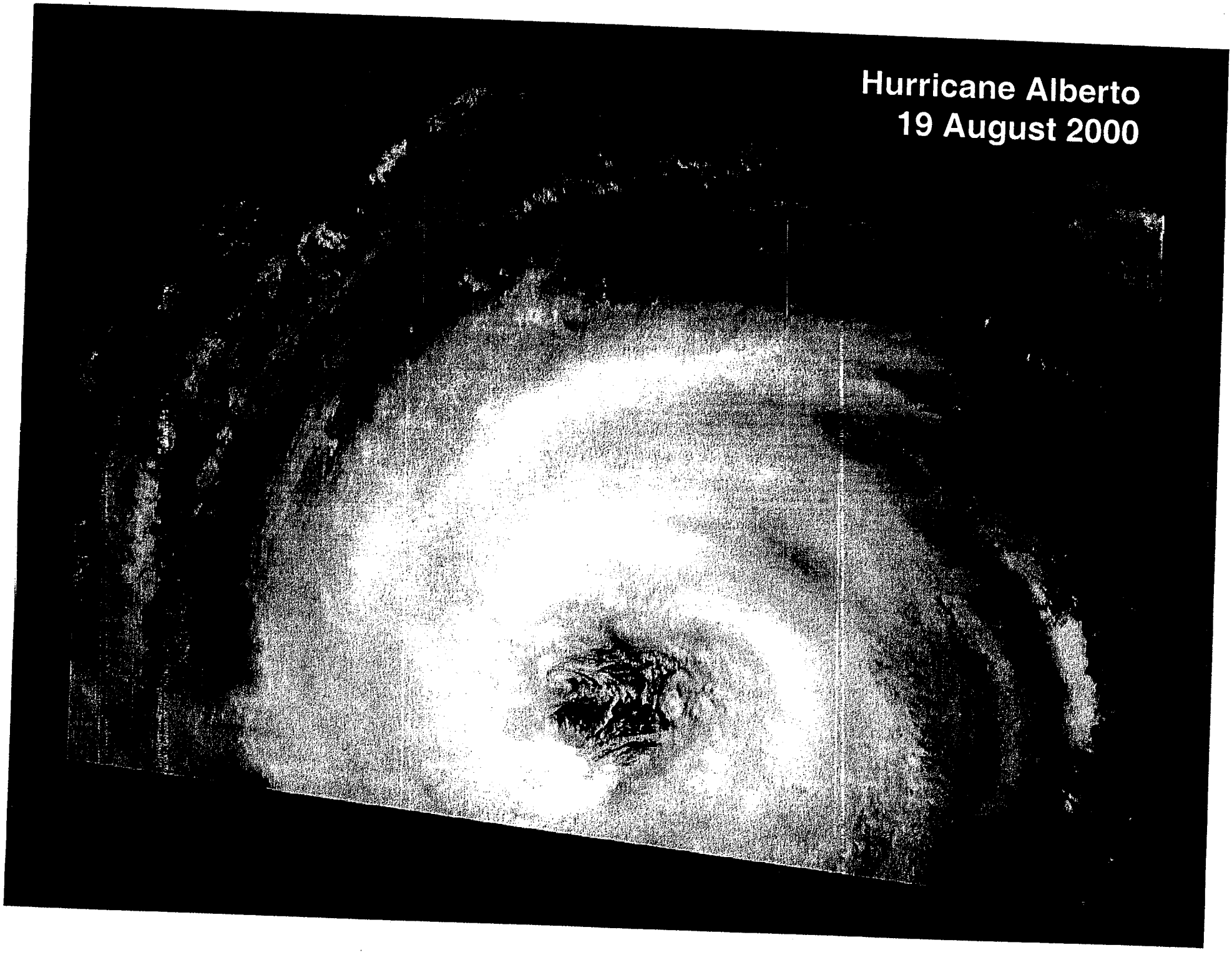
Mississippi, Alabama, Florida
15 October 2001

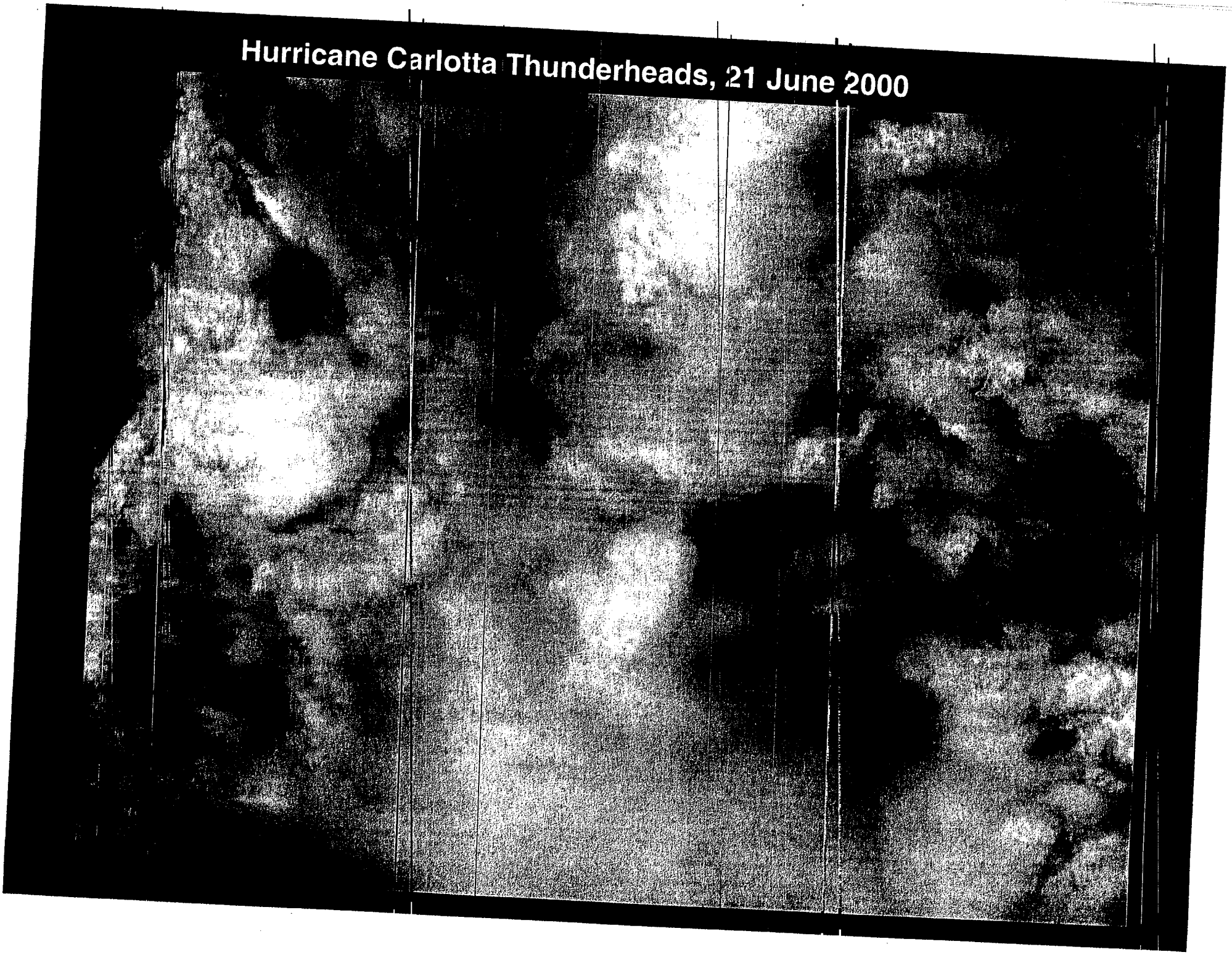
Gulf coast wetlands along the Pascagoula, Mobile-Tensaw, and Escambia Rivers are *spectrally* similar to surrounding vegetation but have a distinctive *angular* signature.

Sierra Nevadas

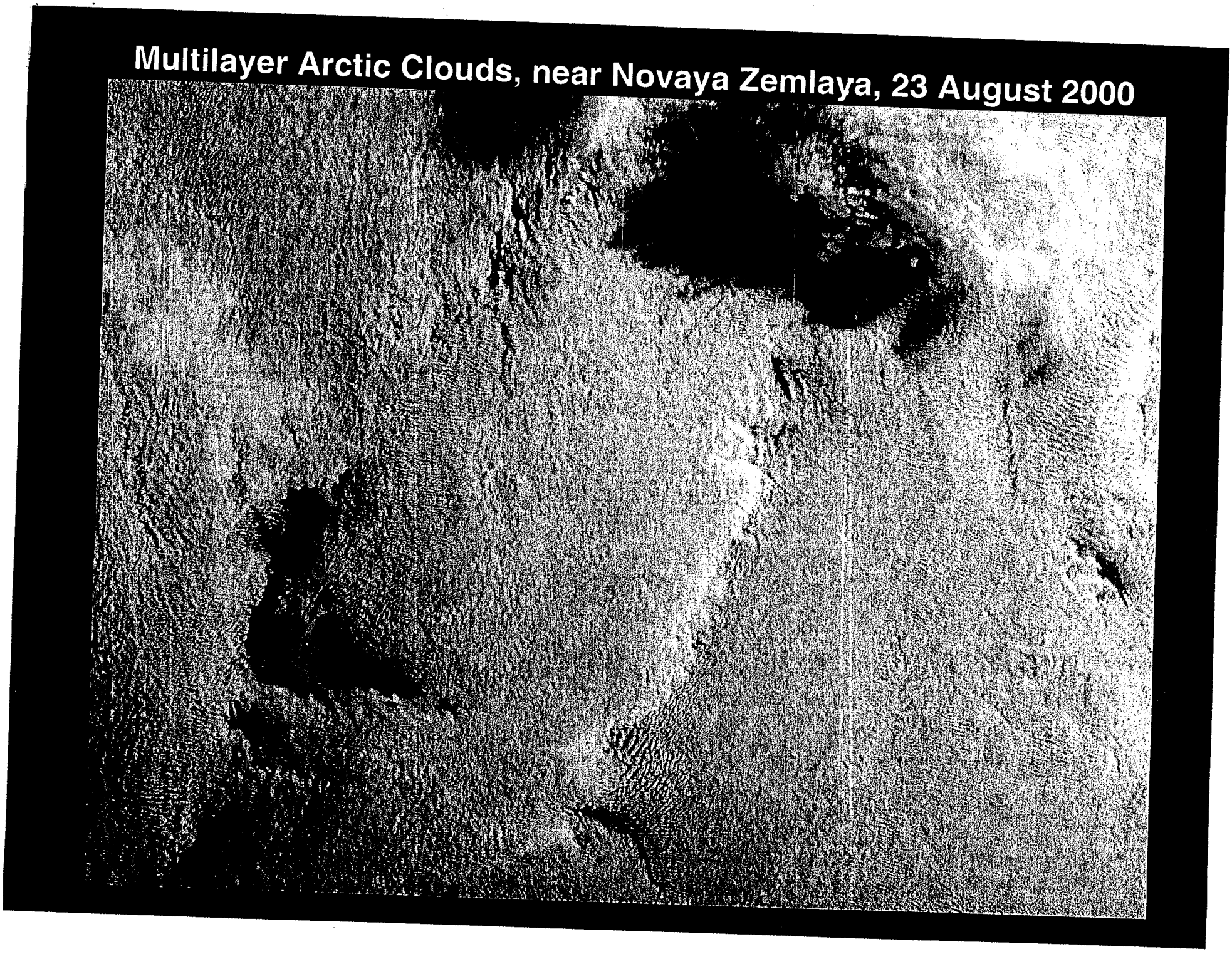
12 August 2000


Capetown,
S. Africa
16 August
2000


Hurricane Alberto
19 August 2000

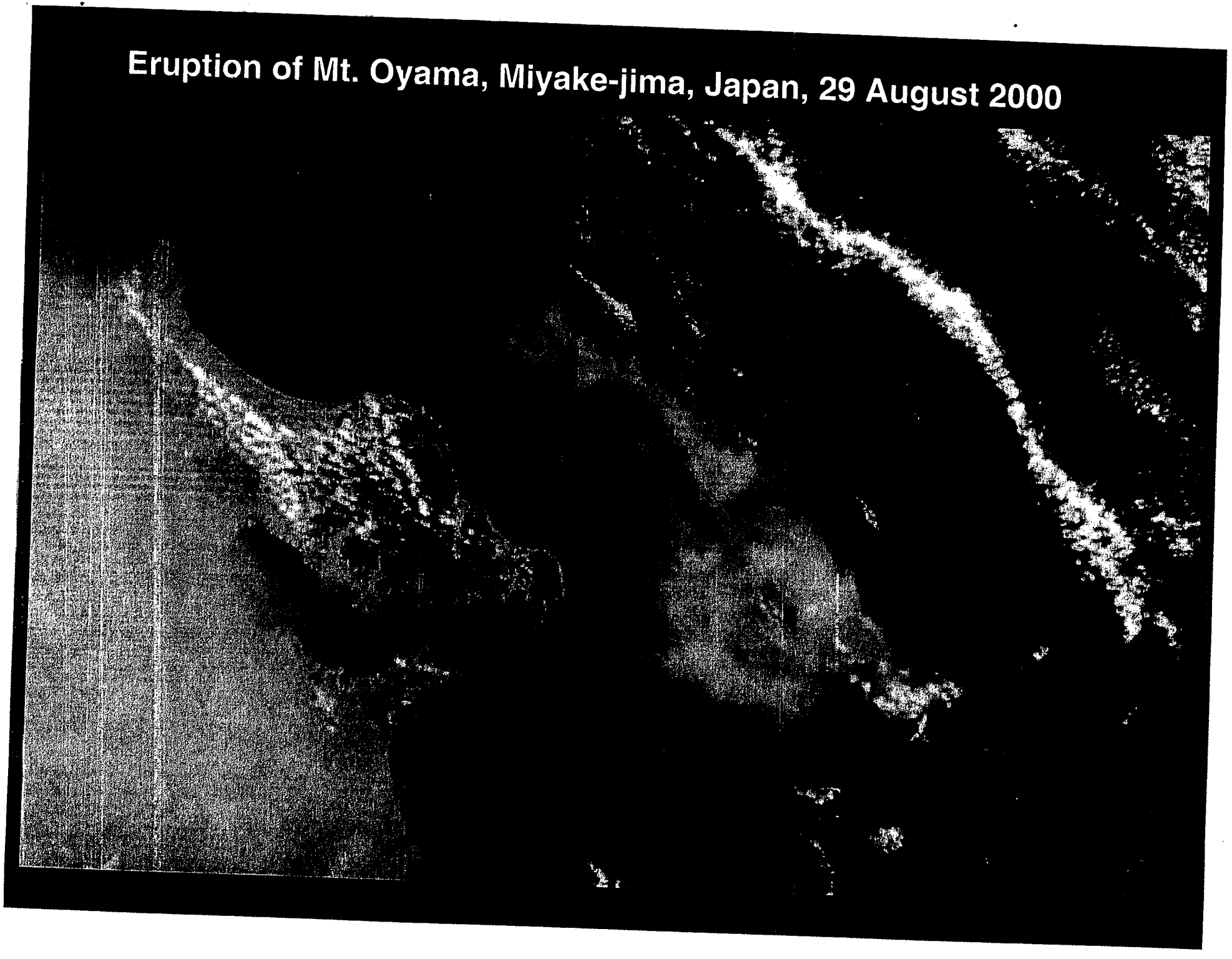

Hurricane Carlotta Thunderheads, 21 June 2000

Multilayer Arctic Clouds, near Novaya Zemlaya, 23 August 2000



Alaskan Wildfire and Cirrus Clouds

25 June 2000


Eruption of Mt. Oyama, Miyake-jima, Japan, 29 August 2000

Conclusions

Multi-angle imaging provides a unique way of looking at the Earth

MISR data products and visualization tools are available through the Langley Atmospheric Sciences Data Center DAAC
http://eosweb.larc.nasa.gov

More visualizations are available on the MISR web site
http://www-misr.jpl.nasa.gov