

N93-20085

TITLE: OLS DATA SYSTEM/ GLOBAL SURVEY OF LIGHTNING

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1. BACKGROUND:

A global lightning climatology is being assembled from the nighttime imagery of the DMSP Optical Linescan Sensor (OLS). Lightning saturates the visible channel of the OLS at nighttime and can be identified as a horizontal streak on the order of 50-100 km in horizontal extent. Lightning streaks apparent in the film strips located at the National Snow and Ice Data Center (NSIDC) prior to 1991 are being digitized.

2. SIGNIFICANT ACCOMPLISHMENTS IN PAST YEAR:

An initial survey was completed for the F7 satellite observation period January 1986-October 1987 and for the Q satellite for the period June-July 1973. Comparisons between the OLS lightning climatology with the Arkin GPI data set during the 1986-87 El Nino event shows similar regional variations in convective activity. The digital archive of global DMSP data began at the end of February. Software is being developed at both MSFC and NSIDC to extract, navigate, and view the OLS fine and smooth imagery.

3. FOCUS OF CURRENT RESEARCH AND PLANS:

With the demise of the OLS instrument on F8 and F9, digital lightning extraction will concentrate on F10 and F11. Digital F8, F9, and F10 data collected over Florida during July-August 1991 will be processed. Limited ground truthing of the OLS lightning signatures will be performed with the 1991 data. During the period June-August 1992 in central Florida and November 1992 to February 1993 in the Solomon Islands (during TOGA/COARE), partial ground truth data will be collected from ground-based sensors and from the Global Positioning Satellite (GPS) NDS instrument. OLS lightning data from F7, F8, and F9 are being processed for comparison with WETNET precipitation algorithms. The first routinely available global OLS Exabyte tapes in a standard format will not be available from NSIDC until summer 1992 due to the need for extensive software development to ramp-up the operational processing software. For this reason, we will extract lightning signatures from Exabyte tape copies at MSFC.

4. PUBLICATIONS

Goodman, S. J., and H. J. Christian, 1992. Lightning. Chapter to appear in Global Change Atlas, to be published in 1992 by Cambridge University Press.

Christian, H. J. and S. J. Goodman, 1992. Global observations of lightning from space, Preprints, 9th Int. Conf. on Atmospheric Electricity, St. Petersburg, Russia, June 13-17.