

N93-20079

TITLE: COORDINATED FIELD STUDY for CaPE: Analysis of Energy and Water Budgets

INVESTIGATORS: Steven Goodman/MSFC
Claude Duchon/Univ. of Oklahoma
Ed Kanemasu/UGA
Eric Smith/FSU
Bill Crosson/USRA
Chip Laymon/USRA
Jeff Luvall/MSFC

1. BACKGROUND:

The objectives of this hydrologic cycle study are to understand and model 1) surface energy and land-atmosphere water transfer processes, and 2) interactions between convective storms and surface energy fluxes. A surface energy budget measurement campaign was carried out by an interdisciplinary science team during the period July 8 - August 18, 1991 as part of the Convection and Precipitation/Electrification Experiment (CaPE) in the vicinity of Cape Canaveral, FL. Among the research themes associated with CaPE is the remote estimation of rainfall. Thus, in addition to surface radiation and energy budget measurements, surface mesonet, special radiosonde, precipitation, high-resolution satellite (SPOT) data, geosynchronous (GOES) and polar orbiting (DMSP SSM/I, OLS; NOAA AVHRR) satellite data, and high altitude airplane data (AMPR, MAMS, HIS) were collected.

2. SIGNIFICANT ACCOMPLISHMENTS IN PAST YEAR:

Initial quality control of the seven surface flux station data sets begun. Ancillary data sets being collected and assembled for analysis. Browsing of GOES and radar data begun to classify days as disturbed/undisturbed to identify the larger scale forcing of the pre-convective environment, convection storms and precipitation. The science analysis plan has been finalized and tasks assigned to various investigators.

3. FOCUS OF CURRENT RESEARCH AND PLANS:

The surface, airplane, and satellite data sets will be used in process studies and model development. Present emphasis is to study the recovery of the boundary layer after a rain event and to determine the magnitude of the atmospheric components of the daily hydrologic cycle during the CaPE experiment. The calculation of the rain budget has begun and employs radars and rain gauges to produce an optimal rainfall data base on hourly and daily time scales. There are over 100 gauges in the 100 x 100 km² budget study area. The Ex-BATS model development has begun, and testing of a GIS for integrating data sets is under evaluation. SPOT-derived NDVI will be produced with the GIS.

4. PUBLICATIONS:

Cooper, H. J., and E. A. Smith, 1992. The importance of short term forecasting of thunderstorms to launch operations at Cape Canaveral, Bull. Am. Meteor. Soc., submitted.