Reprinted from

Symposium on

Machine Processing of

Remotely Sensed Data

June 29 - July 1, 1976

The Laboratory for Applications of
Remote Sensing

Purdue University
West Lafayette
Indiana

IEEE Catalog No.
76CH1103-1 MPRSD

Copyright © 1976 IEEE
The Institute of Electrical and Electronics Engineers, Inc.

A REMOTE SENSING-AIDED SYSTEM FOR

EVAPORATION AND WATERSHED-WIDE

EVAPOTRANSPIRATION ESTIMATION

Siamak Khorram and Randall W. Thomas
Space Sciences Laboratory
Berkeley, California

ABSTRACT

Timely, spatial, and relatively inexpensive remotely sensed data when combined with other conventional ground meteorological data can potentially provide accurate, location specific estimates of evaporation and evapotranspiration. Reliable evaporation data are required for planning, designing and operating reservoirs, ponds, shipping canals, and irrigation and drainage systems. Data on evapotranspiration are useful for estimating irrigation requirements, rainfall disposition, yield of ground water basins, water yields from mountain watershed, streamflow depletion in river basins, and in crop production management.

The approach uses a multistage, multiphase sampling technique employing three increasingly involved levels of information. The input variables for level I models are surface temperature, radiation components, relative humidity, and cloud cover; the data came from Landsat, meteorological satellites, meteorological stations, and topographic data. The data for level II models are temperature, humidity, and wind profiles in the soil-vegetation zone along with wind friction velocity, radiation, rainfall, and ground cover. At level III, evapotranspiration models employing a combination of empirical, energy balance, and aerodynamic methods will be applied.