In conclusion, Tables 3 and 4 show that potential ET over the state is essentially the same for the May-to-November period because of small variations in climate. The differences in potential ET from south to north occur mostly in the winter months but amount to only about 9% on an annual basis. Net radiation is very similar over the 25° to 31° north latitude band throughout Florida, especially for the six or eight warmer months when ET rates are highest. Vapor pressures, temperatures, and vapor pressure deficits are also very similar during these periods. Wind movement is not extremely variable either. Therefore, potential ET, as a climate-driven process, is very similar throughout the state, with most of the differences occurring during the winter portion of the year.

3.0 EXPERIMENTAL VERIFICATION OF EVAPOTRANSPIRATION

The modified Penman combination method for computing ET_p is based on sound analysis of physical processes (rather than totally on correlation techniques). We have further shown that ET_p is similar throughout Florida, except during the winter season. There are several cases where climatic data and experimental data are available simultaneously, so that calculations of potential ET can be verified using the water budget method. The water budget method equates water input to an area during a specified time period: rainfall (RF) plus irrigation (IR) is equated to the change in soil water storage (ΔS) plus water output from the area during the same time period in the form of surface runoff (RO), ET, and percolation from the root zone (PN). A measure of ET is obtained by measuring all other variables in the following equation:

$$ET = RF + IR - RO - PN + \Delta S, \tag{19}$$

where all variables are expressed in depth per unit time.

Experimentally, the measurements of RO, PN, and ΔS are difficult, and data that can be used for water budget measurements are scarce. Here, we present data from several watersheds in Florida with varying types of vegetation and surface types to demonstrate their effects on ET. Natural surfaces in Florida watersheds (based on wetness) could be classified as: (1) open bodies of water (lakes and streams), (2) wetlands (swamps, marshes), (3) upland soils (pine/palmetto, hardwood hammocks, range, pastures, croplands), and (4) muck soil croplands. The wetter surfaces would be expected to have higher ET than the drier surfaces. Often these surfaces grade from one to another.

Mineral soils of Florida vary widely in the amount of water they hold (30-fold, derived from Stewart et al., 1963, and Carlisle et al., 1978). During drought conditions, soils with low water holding capacities will limit ET sooner than soils with high water holding capacities.