estimate of E_o by an empirical constant to estimate ET_p for a crop, i.e.,

$$ET_p = k_1 E_o. \tag{18}$$

Van Bavel and Verlinden (1956) used $\alpha = 0.05$ and found that $k_1 = 0.7$ in Equation 10 provided a good estimate of ET_p for a well-watered vegetated surface. In applying the Penman method to estimate ET_p for general applications, the use of $\alpha = 0.05$ and Equation 18 is recommended for reference ET_p values. Actual ET can then be estimated by multiplying the reference ET_p estimate by a crop coefficient which will be discussed in later sections. For comparison purposes, we used $\alpha = 0.05$ in Equation 10 to estimate E_o and $k_1 = 0.7$ in Equation 18 to estimate ET_p. The results of potential ET estimated by the Penman method for the stations of Hialeah, Lakeland, and Milton are listed in Table 3. In Table 3, ET_p was also calculated by using $\alpha = 0.23$ in Equation 10.

Assuming the basin-wide vegetated crop reached full canopy, the annual total ET_p varied from 1119 mm in Milton to 1227 mm in Hialeah. The difference is only 108 mm or 9%. This means that the annual total ET_p in Florida increases slightly from north to south.

However, if ET_p was computed on a November-to-April and on a May-to-October basis as shown in Table 4, the difference between the sourthern and northern parts of the state was shown to occur during the November-to-April period. This difference amounts to a 30% deviation. The May-to-October period did not show a significant difference in ET_p over the entire state. The climate is usually similar throughout the state during the May-to-October period, i.e., hot and humid. However, during the November-to-April period, the climate is cooler and usually wetter at Milton than at Hialeah.

Table 4. Calculated seasonal potential evapotranspiration by Penman method for three locations in Florida.

Parameter[1]	Time of Year	Hialeah (25°50′ N. Lat.)	Lakeland (28°01′ N. Lat.)	Milton (30°47′ N. Lat.)
		mm	mm	mm
$\alpha = 0.23$	Nov.–April	545	494	416
	May–Oct.	829	841	828
$\alpha = 0.05$	Nov.–April	709	634	544
	May–Oct.	1046	1061	1055
$\alpha = 0.05$	Nov.–April	496	451	381
$k_1 = 0.7$	May–Oct.	732	743	738

[1]The Penman Method (Equation 10) was applied in three ways: (1) with $\alpha = 0.23$ to represent a full crop canopy, (2) with $\alpha = 0.05$ to represent a freely evaporating water surface, and (3) with $\alpha = 0.05$ and $k_1 = 0.7$ to estimate a reference ET_p value using Equations 10 and 18.