$$I = \sum_{j=1}^{12} (i) \text{ , where } i = \left(\frac{T_m}{5}\right)^{1.514}$$

T_m = mean monthly temperature, °C, and

$$a = (6.75 \times 10^{-7} I^3) - (7.71 \times 10^5 I^2) + 0.01792\, I + 0.49239. \quad (13)$$

The Thornthwaite method greatly overpredicts ET_p during the summer months in Florida because it does not consider the increased cloud cover (compared to winter months) in summer. In order to compare this method with other methods, an empirical coefficient, k_3, is used to estimate ET_p from PET, i.e.,

$$ET_p = k_3\, PET. \quad (14)$$

2.3.4 Blaney-Criddle Method

Blaney and Criddle (1950) developed a formula for arid climates for predicting monthly ET_p from percent of daylight hours in the month and the average monthly temperature as

$$ET_p = k_4 f$$

where ET_p = monthly potential ET in mm (15)

k_4 = coefficient for the Blaney-Criddle method
f = monthly ET factor = $25.4\, PD\, (1.8\, T_m + 32)/100$
T_m = mean monthly temperature in °C, and
PD = percent of annual daylight hours in the month.

The Blaney-Criddle equation has been widely used and modified, but when used in Florida, it greatly overpredicts the ET for summer months. The equation does not account for the high percent of cloud cover in Florida during the summer.

2.3.5 Modified Blaney-Criddle Method using Solar Radiation

The Blaney-Criddle (1950) method was modified by Shih et al. (1977). They substituted the measured solar radiation instead of the percent of daylight hours used in Equation 15. The equation used to estimate the potential ET was expressed as:

$$ET_p = k_5\, 25.4\, MR_s\, (1.8\, T_m + 32)/TMR_s \quad (16)$$

where ET_p = monthly potential ET in mm
k_5 = coefficient for the Radiation-Modified Blaney-Criddle method
MR_s = monthly incoming solar radiation in cal/cm^2
T_m = mean monthly temperature in °C, and
TMR_s = annual sum of mean monthly solar radiation in cal/cm^2.