

Research Note

POTENTIAL EVAPOTRANSPIRATION FOR VIEQUES ISLAND, PUERTO RICO, WITH THE HARGREAVES AND SAMANI MODEL¹

The objective of this study was to estimate potential evapotranspiration (PET, mm/day) for January through December with the Hargreaves and Samani² model:

$$PET = 0.0023 \times R_A \times (T + 17.8) \times (TMAX - TMIN)^{0.5} \dots\dots //1/$$

where R_A is extraterrestrial radiation in mm per day, T is mean daily temperature in degrees Celsius, $TMAX$ and $TMIN$ are mean daily maximum and minimum temperatures in °C, PET and R_A are in the same units of equivalent water evaporation (mm per unit of time).

The weather station is located on Vieques Island³ at 73.5 m above sea level, lat. 18° 7' N and long. 65° 26' W, Puerto Rico. The weather station is assigned #9766 by US Weather Bureau Service. For January through December and at 18° latitude, R_A values were calculated by Goyal (1988).⁴

$TMAX$, $TMIN$ and T for this location are given in publication No. 86-45 of the Weather Bureau, US Department of Commerce. Monthly PET was estimated with R_A , $TMAX$, $TMIN$ and T in combination with equation //1/. PET estimates are given below:

	R_A	$TMAX$, °C	$TMIN$, °C	T , °C	PET , mm/day
January	11.68	29.1	20.5	24.8	3.36
February	13.02	29.3	20.7	25.0	3.75
March	14.65	29.8	20.5	25.2	4.42
April	15.83	30.3	21.4	25.9	4.75
May	16.30	31.0	22.9	27.0	4.76
June	16.38	31.6	23.6	27.6	4.84
July	16.38	32.0	23.8	27.9	4.94
August	15.80	32.3	23.9	28.1	4.85
September	15.23	31.8	23.7	27.8	4.53
October	13.62	31.6	23.3	27.4	4.08
November	12.11	30.8	22.4	26.6	3.58
December	11.29	29.8	21.2	25.5	3.29
Annual, mm per year	—	—	—	—	1555.8

¹Manuscript submitted to Editorial Board 3 July 1987.

This study was conducted under CBAG-23, "Irrigation Estimations in Puerto Rico."

²Hargreaves, G. H. and Z. A. Samani, 1985. Reference crop evapotranspiration from temperature. Applied Engineering in Agriculture, ASAE. 1 (2): 96-9.

³Climatography of the United States No. 86-45 of Puerto Rico and US Virgin Islands. US Department of Commerce, Washington, D. C.

⁴Goyal, M. R., 1988. Potential evapotranspiration for the south east of Puerto Rico with the Hargreaves-Samani technique. *J. Agric. Univ. P. R.*, 72 (1): 000.

PET varies from 3.29 to 4.94 mm per day from January through December. Minimum PET was 3.29 mm per day from December and the maximum PET was 4.94 mm per day during July. Annual PET was 1555.8 mm/year (based on 365 days) compared to 1704.6 for the south coast of Puerto Rico.⁴ Since the Weather Station is located in the agricultural sector of Vieques Island, these PET values can be used to plan irrigation and water management projects. Es-

timating crop water requirements on the basis of PET in combination with soil and crop characteristics is very useful in determining irrigation requirements during the crop season. Procedure of how to utilize PET for irrigation requirements was outlined for Puerto Rico by Goyal⁵; it is also for Vieques Island.

Megh R. Goyal
Department of Agricultural
Engineering