

WORLD CLIMATE PROGRAMME

DATA



CALCULATION OF MONTHLY AND ANNUAL 30-YEAR STANDARD NORMALS

Prepared by a meeting of experts, Washington, D.C., USA,

March 1989

WCDP-No. 10

WMO-TD/No. 341

WORLD METEOROLOGICAL ORGANIZATION

V. CALCULATION PROCEDURES FOR SURFACE ELEMENTS

1. CALCULATION OF MONTHLY VALUES (DAILY TO MONTHLY)

Table 1 identifies the principal climatological elements and units of measure for which monthly values should be calculated.

TABLE 1. PRINCIPAL CLIMATOLOGICAL SURFACE ELEMENTS

	UNIT	PRECISION
1. Precipitation Total	mm	.1
2. Days with Precipitation Greater than or Equal to 1 mm	count	1
3. Temperature Tx, Tn, Tm	deg C	.1
4. Pressure	kPa	.01
5. Sunshine	hours	.1
6. Vapour pressure	kPa	.01

NOTE: Precision recommendations are based on consistency of calculations, even though it is meteorologically unreasonable to imply the indicated precision for annual totals.

The method of calculation is described below. When arithmetic means are to be calculated for each month of each year from daily data the following rule (hereafter referred to as the "3/5 rule") applies. If more than 3 consecutive daily values are missing or more than 5 daily values in total in a given month are missing, the monthly mean should not be computed and the year-month mean should be considered as missing. The number of days for which monthly means are calculated is N, where N can vary from 23 to 31. The symbol S in the equations indicates a summation of all N values.

- a. Precipitation Total--Totals shall be calculated for each month of each year from daily data. Monthly totals should be based on a full month's data. However, accumulated amounts during the month are acceptable in lieu of individual daily totals provided that each accumulation is for 3 or less days. If accumulated data are used, the monthly total should be identified with an "accumulation" indicator. If any daily totals are missing and the corresponding accumulated totals are also missing, the monthly total should not be computed and the year-month total should be considered as missing.
- b. Days With Precipitation Greater Than or Equal to 1mm--Totals should be calculated for each month of each year from daily data. Monthly totals should be based on a full month's data, that is, no missing daily counts are permitted.
- c. Temperature--Calculate average monthly maximum (\bar{T}_x), minimum (\bar{T}_n), and mean (\bar{T}_m) temperature from the daily values Tx, Tn, Tm as follows: