HAWAIIAN ISLANDS

160° 159° 158° 157° 156° 155°

22° 21° 20° 19°

GENERAL ORIENTATION OF TRADE WINDS

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PACIFIC OCEAN

Wainiha River station 16108000 (N=5)

East Branch of N. Fork Wailua River station 16068000 (N=4)

Waialae Stream station 16019000 (N=5)

Punaluu Stream stations 16303000 and 16302000 combined (N=4)

Makaha Stream station 16211600 (N=4)

Kalihi Stream station 16229000 (N=5)

Halawa Stream station 16400000 (N=5)

Honokohau Stream station 16620000 (N=4) (1989-90 incomplete)

Hanawi Stream station 16508000 (N=4)

Kawainui Stream station 16720000 (N=4)

Honolii Stream station 16717000 (N=4)

DISCHARGE

MONTH

J F M A M J J A S O N D

Niihau

Kauai

Oahu

Molokai

Lanai

Kahoolawe

Maui

Hawaii

435

275

155

25

355

235

EXPLANATION

BAR GRAPHS OF MONTHLY DISCHARGE

Mean monthly total flow

- Mean annual total flow

Mean monthly base flow

- Mean annual base flow
- Daily mean flow equaled or exceeded 90 percent of the time (Q_{90})

Discharge values are in cubic feet per second and are based on data from water years 1968-2000.

STREAMFLOW-GAGING STATION

LINES OF EQUAL MEAN ANNUAL RAINFALL, IN INCHES
(modified from Giambelluca and others, 1986; no data shown for the islands of Kahoolawe and Niihau)

- 40
- 80
- 120
- VALUE INDICATED

0 20 40 MILES

0 20 40 KILOMETERS

The islands can be divided into two primary physiographic zones, windward and leeward, which relate to the exposure of these areas to the northeasterly trade winds and orographic rainfall. In general, windward areas receive higher rainfall than leeward areas.

For most areas in the State of Hawaii, the wet season occurs during the months of October through April and the dry season is from May through September, although exceptions to this pattern are not uncommon. Like rainfall, seasonal streamflow patterns are spatially variable. Monthly streamflow generally is higher during the wet season than the dry season. However, seasonal streamflow variations may be less pronounced in windward areas where base flow is significant and rainfall is persistent.

In areas that receive significant ground-water discharge, base flow represents a large fraction of total flow. In parts of eastern Kauai, ground-water discharge from a vertically extensive freshwater-lens system contributes to stream base flow. In much of windward Oahu and in the windward part of west Maui, streams receive ground-water discharge from dike-impounded ground-water bodies and base flow represents a large fraction of total flow, particularly where streams have eroded deep valleys in dike-intruded areas.

The base-flow component of daily streamflow was estimated using a computerized base-flow separation model (Wahl and Wahl, 1995). Two parameters, f (turning-point test factor) and N (number of days in window), are assigned. For all streams, a value of 0.9 was used for the turning-point test factor, f. The model divides the daily streamflow record into non-overlapping N-day periods and determines the minimum flow within each N-day window. If the minimum flow within a given N-day window is less than f times the adjacent minimums, then the central window is made a turning point on the base-flow hydrograph. The length of the N-day window for a stream is an indicator of the time over which direct runoff occurs following a storm.

Base modified from U.S. Geological Survey National Hydrography Dataset, 1:24:000, Albers equal area projection, standard parallels 20°00' and 22°00', central meridian 157°30', NAD83 datum. Shaded relief from U.S. Geological Survey 10-meter digital elevation data.