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AVAILABILITY OF HYDROLOGIC DATA FOR MONTGOMERY COUNTY, MARYLAND

By

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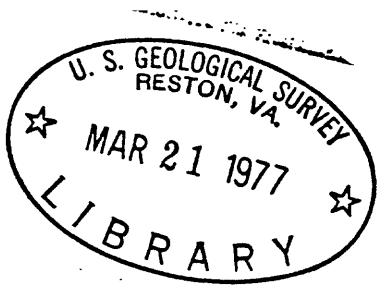

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INTRODUCTION

To enable land- and water-resource managers, urban planners, consultants, and government officials to make informed decisions concerning present and future land use, a hydrologic data base is necessary. This map was prepared with the aim of informing these individuals concerning the availability of various hydrologic data. These data include streamflow, quality of surface and ground water, flood-prone areas, geophysical data, and climate. In addition to data collection, several interpretive areal investigations have been prepared covering various aspects of the hydrology of Montgomery County. Numbers in parentheses in the following discussion are keyed to the list of selected references. Much of the data collected by the U.S. Geological Survey is available for inspection in the Maryland District office at 208 Carroll Building, 8600 La Salle Road, Towson, Md., 21204.

STREAMFLOW

Daily streamflow records have been collected at five gaging stations on unregulated streams for periods ranging from 20 to 54 years, and at one gaging station on a regulated stream for 10 years. Daily records are also available for six sites formerly operated as part of a research project, but since discontinued. Records of discharge for the active stations are published annually on a water-year (October 1 to September 30) basis (23, 24, 25, 26, 27, 28, 29). Published data include daily discharges, peak discharges above a selected base, mean monthly discharges, yearly mean discharges, and information such as station location and length of record.

Six low-flow partial-record stations and one crest-stage partial-record station are operated in the county. These partial-record stations are part of a statewide network designed to supplement data collected at the daily streamflow stations by increasing the number of streams on

which low flows and peak discharges are monitored. Records of base-flow discharge measurements and annual peak flows are published annually (27, 29).

Statistical estimates of peak discharges and low flow for various probabilities (recurrence intervals) have been compiled for the data stations (4, 31) and are based on observed streamflow at the stations. These statistical estimates can be used to develop products such as the 7-day, 10-year low-flow (the minimum average 7-day flow rate with a 1 in 10 chance of occurring in a given year) map or the relationship of the 0.01 probability flood (the instantaneous peak flow rate with a 1 in 100 chance of occurring in a given year) to drainage area, as shown by insets on the accompanying map. Flood-frequency and low-flow data are not available for regulated streams. Additionally, flood-frequency data are not available for the low-flow partial-record stations because they are measured only during periods of base flow.

Basin characteristics for most of the long-term surface-water stations have been compiled (10). The basin characteristics listed in the compilation were found to have some significance in determining one or more flow characteristics of streams. The compilation includes such factors as drainage area, channel slope, main-channel length, and mean basin precipitation. Basin size (drainage area) was the one basin characteristic that proved significant in estimating all streamflow characteristics.

SURFACE-WATER QUALITY

Systematic chemical-quality data have been collected at Seneca Creek for 11 years, and chemical, physical, and biological data have been collected at the Potomac River for 2 years. These two water-quality stations on the Potomac River and Seneca Creek, along with a daily sediment station on North Branch Rock Creek having 9 years of record, are currently being operated. For the chemical-quality stations, the sampling schedule usually consists of monthly samples, which are checked for temperature, dissolved oxygen, pH, specific conductance, and fecal coliform. Additionally, an annual sample is analyzed more completely for chemical properties. Results of the analyses are published annually on a water-year basis (28, 29).

Sediment sampling was conducted at an additional 9 stations, which are now discontinued. Available data consists of daily or partial-record sediment loads and particle-size analyses for periods ranging up to 13 years during 1963-75.

AREAL INVESTIGATIONS

Areal investigations, examining the water resources of an entire basin or area, have been conducted by various groups. These studies have encompassed such varied topics as reconnaissance and intensive water-quality monitoring, public water supply and demand, floods and flood characteristics, vegetation in relation to flood frequency, sedimentation reconnaissance, hydrology and sedimentation in an urbanizing area, time of travel of a tracer dye in a stream, movement of a simulated solute in an estuary, water-resources development, and the meteorology and hydrology of Hurricane Agnes (1, 2, 3, 5, 6, 7, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 32, 33, 34, 35, 36, 37).

FLOOD-PRONE AREAS

The U.S. Geological Survey has delineated the flood-prone areas for major streams in much of Montgomery County. These areas, subject to inundation by a flood with a 1-percent probability of occurring in a given year, are shown on a series of seventeen 7 1/2-minute quadrangle maps that are available for inspection. Generally, flood-prone areas for streams with drainage basins smaller than about 10 square miles are not mapped because of a lack of data. For a few streams in the county, flood-hazard areas have been delineated by the U.S. Army Corps of Engineers, and these locations are also shown on the maps of flood-prone areas (30).

GROUND-WATER QUALITY

Water-quality data are available for about 45 wells. Most of these wells have been sampled only once, but data from multiple samples are available for a few wells. Data are available for temperature, specific conductance, pH, and color, as well as a more comprehensive chemical analysis. Additional information is available concerning the geologic unit tapped by the well, the altitude of the land surface, and the depth to bottom of sampled interval. The results of the analyses are available for inspection and will be published by the Maryland Geological Survey as a basic-data report.

GEOPHYSICAL DATA

Approximately 10 water wells within the county have been geophysically logged by the U.S. Geological Survey or private firms. These logs may include any combination of the following types: single-point electric, multipoint electric, gamma, and caliper. Such logs are useful in locating

and evaluating ground-water supplies. Information regarding the types of logs available for a particular well is available in the U.S. Geological Survey Maryland District office. Copies of the logs are also available for inspection.

CLIMATOLOGICAL DATA

Climatological data are collected at seven locations. Data include: precipitation, temperature, evaporation, wind, heating degree-days (a useful index for determining heating and cooling requirements), and depth of snow on the ground. The data are published on a monthly basis (8), and generally provide daily values of the various parameters, although hourly precipitation is published for some stations. Additional precipitation data are available from eight discontinued recording rain gages which were operated for varying periods during 1963-74 as part of an urban hydrology research project conducted by the U.S. Geological Survey.

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