WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, U.S. DEPARTMENT OF THE INTERIOR

HYDRO-CLIMATIC DATA NETWORK (HCDN): A U.S. GEOLOGICAL SURVEY STREAMFLOW DATA SET FOR THE UNITED STATES FOR THE STUDY OF CLIMATE FLUCTUATIONS, 1874–1988

BACKGROUND

The potential consequences of climate change to continental water resources are of great concern in the management of those resources. Critically important to society is what effect fluctuations in the prevailing climate may have on hydrologic conditions, such as the occurrence and magnitude of floods or droughts and the seasonal distribution of water supplies within a region. Records of streamflow that are unaffected by artificial diversions, storage, or other works of man in or on the natural stream channels or in the watershed can provide an account of hydrologic responses to fluctuations in climate. By examining such records given known past meteorologic conditions, we can better understand hydrologic responses to those conditions and anticipate the effects of postulated changes in current climate regimes. Furthermore, patterns in streamflow records can indicate when a change in the prevailing climate regime may have occurred in the past, even in the absence of concurrent meteorologic records.

A streamflow data set, which is specifically suitable for the study of surface-water conditions throughout the United States under fluctuations in the prevailing climatic conditions, has been developed. This data set, called the Hydro-Climatic Data Network, or HCDN, consists of streamflow records for 1,659 sites throughout United States and its Territories. The geographic distribution of the stations is shown in Figure 1.

Figure 1. HCDN stations in relation to the States.

DEVELOPMENT OF THE HCDN DATA SET

Records for the HCDN were obtained through a comprehensive search of the extensive surface-water data holdings of the U.S. Geological Survey (USGS), which are contained in the USGS National Water Storage and Retrieval System (WATSTORE). All streamflow discharge records in WATSTORE through September 30, 1988, were examined for inclusion in the HCDN in accordance with strictly defined criteria of measurement accuracy and natural conditions. No constructed records of "natural flow" were permitted, nor was any record extended or had missing values "filled in" using computational algorithms. If the streamflow at a station was judged to be free of controls for only a part of the entire period of record that is available for the station, then only that part was included in the HCDN, but only if it was of sufficient length (generally 20 years) to warrant inclusion. In addition to the daily mean discharge values, complete station identification information and basin characteristics were retrieved from WATSTORE for inclusion in the HCDN. Statistical characteristics, including the monthly mean discharge, as well as the annual mean, minimum, and maximum discharge values, were derived for the records in the HCDN data set.

CONTENTS OF THE HCDN DATA SET

The HCDN includes data values for discharge measured at 1,659 streamflow-gaging stations. Records cumulatively span the period 1874 through 1988, inclusive, and represent a total of 73,231 water years of information. The number of stations with appropriate data are shown by water year in figure 2. The number of stations with a given number of years of record found in the HCDN are shown in figure 3. Information necessary for the identification of each station in the HCDN, along with any qualifying comments about the available record for the site, and descriptive basin characteristics, are provided in paper and electronic (floppy disk) format in USGS Open-File Report 92–129, entitled "Hydro-Climatic Data Network (HCDN): A U.S. Geological Survey streamflow data set for the United States for the study of climate variations, 1874–1988," by J. R. Slack and Jurate Maciunas Landwehr. The set of discharge data values is available from the USGS NAWDEX Office and in a companion report in CD-ROM format.

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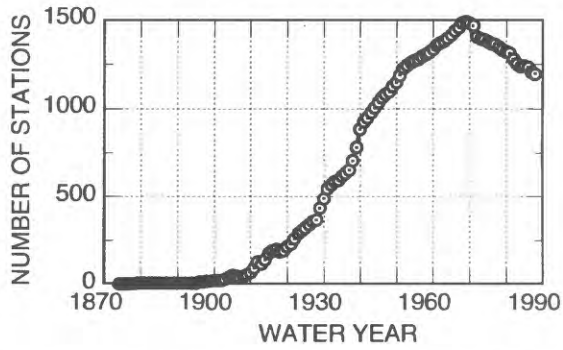

Figure 2. Number of HCDN stations with acceptable data for a given water year.

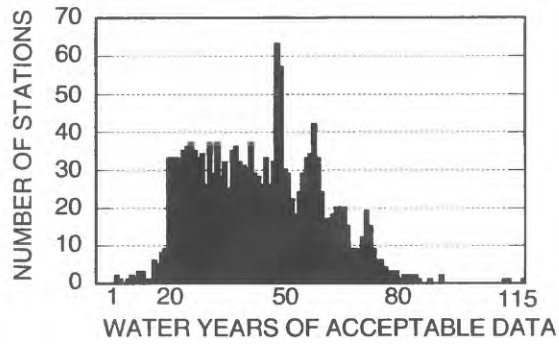

Figure 3. Number of HCDN stations by record length.

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To purchase reports or computer disks, contact:
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To obtain USGS WATSTORE data, contact:
U.S. Geological Survey
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