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Water Resources Data Connecticut Water Year 2005

Water-Data Report CT-05-1

U.S. Department of the Interior
U.S. Geological Survey

Conversion Factors

Multiply	By	To obtain
	Length	
inch (in.)	2.54×10^{1}	millimeter (mm)
	2.54×10^{-2}	meter (m)
foot (ft)	3.048×10^{-1}	meter (m)
mile (mi)	1.609×10^{0}	kilometer (km)
	Area	
acre	4.047×10^{3}	square meter (m^2)
	4.047×10^{-1}	square hectometer (hm^2)
	4.047×10^{-3}	square kilometer (km^2)
square mile (mi^2)	2.590×10^{0}	square kilometer (km^2)
	Volume	
gallon (gal)	3.785×10^{0}	liter (L)
	3.785×10^{-3}	cubic meter (m^3)
	3.785×10^{0}	cubic decimeter (dm^3)
million gallons (Mgal)	3.785×10^{3}	cubic meter (m^3)
	3.785×10^{-3}	cubic hectometer (hm^3)
cubic foot (ft^3)	2.832×10^{-2}	cubic meter (m^3)
	2.832×10^{1}	cubic decimeter (dm^3)
cubic foot per second per day [(ft^3/s)/d]	2.447×10^{3}	cubic meter (m^3)
	2.447×10^{-3}	cubic hectometer (hm^3)
acre-foot (acre-ft)	1.233×10^{3}	cubic meter (m^3)
	1.233×10^{-3}	cubic hectometer (hm^3)
	1.233×10^{-6}	cubic kilometer (km^3)
	Flow	
cubic foot per second (ft^3/s)	2.832×10^{1}	liter per second (L/s)
	2.832×10^{-2}	cubic meter per second (m^3/s)
	2.832×10^{1}	cubic decimeter per second (dm^3/s)
gallon per minute (gal/min)	6.309×10^{-2}	liter per second (L/s)
	6.309×10^{-5}	cubic meter per second (m^3/s)
	6.309×10^{-2}	cubic decimeter per second (dm^3/s)
million gallons per day (Mgal/d)	4.381×10^{-2}	cubic meter per second (m^3/s)
	4.381×10^{1}	cubic decimeter per second (dm^3/s)
	Mass	
ton (short)	9.072×10^{-1}	megagram (Mg) or metric ton

Temperature in degrees Celsius (° C) may be converted to degrees Fahrenheit (°F) as follows: °F = (1.8 x °C) + 32

Calendar for Water Year 2005

2004

October

S	M	T	W	T	F	S
					1	2
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17	18	19	20	21	22	23
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31						

November

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28	29	30				

December

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2005

January

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30	31					

February

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27	28					

March

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27	28	29	30	31		

April

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May

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29	30	31				

June

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July

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					1	2
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17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

August

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7	8	9	10	11	12	13
14	15	16	17	18	18	20
21	22	23	24	25	26	27
28	29	30	31			

September

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				1	2	3
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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

U.S. DEPARTMENT OF THE INTERIOR
U.S. Geological Survey
101 Pitkin St.
East Hartford, CT 06108

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U.S. Geological Survey Water Resources Data, Connecticut, Water Year 2005

Printed on recycled paper

Water Resources Data Connecticut Water Year 2005

By Jonathan Morrison, T.C. Sargent, J.W. Martin, and J.R. Norris

Water-Data Report CT-05-1

Prepared by the USGS Connecticut Water Science Center, East Hartford, Connecticut, in cooperation with the State of Connecticut and with other agencies

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
Gale A. Norton, Secretary

U.S. Geological Survey
P. Patrick Leahy, Acting Director

2005

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Information about all USGS reports and products is available by calling 1-888-ASK-USGS or on the Internet via the World Wide Web at http://www.usgs.gov/

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13. ABSTRACT *(Maximum 200 words)*
This report includes records on both surface and ground water in the State. Specifically, it contains: (1) discharge records for 52 streamflow-gaging stations and for 38 partial-record streamflow stations and miscellaneous sites; (2) stage-only records for 4 tidal-gaging stations; (3) water-quality records for 17 streamflow-gaging stations, for 18 ungaged stream sites, and temperature at 1 reservoir site; and (4) water-level records for 73 observation wells. Additional water-quality data are published for 16 miscellaneous surface-water sites and for 19 miscellaneous ground-water sites, which were not part of the systematic data-collection program.

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PREFACE

This volume of the annual hydrologic data report for Connecticut is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources. Hydrologic data for Connecticut are contained in one volume.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to the Geological Survey policy and established guidelines, the following individuals contributed significantly to the collection, processing, and tabulation of the data:

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This report was prepared in cooperation with the State of Connecticut and with other agencies under the general supervision of Virginia de Lima, Director, USGS Connecticut Water Science Center.

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SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

[Letter after station name designates types of data:
(d) discharge, (e) elevation, stage, or contents, (v) tidal volume, (c) chemical, (m) microbiological, (t) water temperature]

SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME--Continued

GROUND-WATER WELLS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

GROUND-WATER LEVELS

Page

GROUND-WATER WELLS, BY COUNTY, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME--Continued

GROUND-WATER LEVELS

Discontinued surface-water discharge or stage-only stations

The following continuous-record surface-water gaging stations have been discontinued. All listed stations had daily streamflow or stage records published for the period of record, expressed in water years. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District office at the address given on the back of the title page of this report.

STATION NUMBER	STATION NAME	DRAINAGE AREA (SQUARE MILES)	PERIOD OF RECORD
	MYSTIC RIVER BASIN		
01118668	Whitford Brook below Williams Brook near Old Mystic	12.0	1999-2002
	POQUONOCK RIVER BASIN		
01119000	Great Brook at Poquonock Bridge (stage only)	14.5	1946-67
	THAMES RIVER BASIN		
01119280	Willimantic River at Stafford Springs	52.9	1963-67
01119320	Roaring Brook near Stafford Springs	14.7	1961-66
01120000	Hop River near Columbia	73.9	1932-71
01120500	Safford Brook near Woodstock Valley	4.16	1950-81
011230695	Shetucket River at Taftville	512	1989-97; 2001
01125415	Muddy Brook near Woodstock	20.2	1979-83
01125490	Little River at Harrisville	35.7	1961-71
01126000	Fivemile River at Killingly	57.8	1938-71
01126500	Moosup River at Moosup	83.2	1933-71
01126600	Blackwell Brook near Brooklyn	16.8	1964-76
01126950	Pachaug River at Pachaug	53.2	1961-75
	CONNECTICUT RIVER BASIN		
01172003	Connecticut River below Holyoke Dam at Holyoke, MA	8,309	1983-2002
01183950	Grape Brook at Thompsonville	2.46	1967-69
01184280	Scantic River near North Somers	27.0	1967-69
01184500	Scantic River at Broad Brook	97.8	1928-71
01186100	Mad River at Winsted	18.5	1957-69
01186400	Sandy Brook at Robertsville	35.2	1968-76
01187000	West Branch Farmington River at Riverton	218	1929-55
01187400	Valley Brook near West Hartland	7.35	1940-74
01187680	Cherry Brook near Canton Center	8.12	1967-71
01187800	Nepaug River near Nepaug	23.6	1918-55; 1958-72
01187850	Clear Brook near Collinsville	.53	1917-73
01187980	Farmington River at Collinsville	360	1963-77
01189180	Hop Brook at West Simsbury	1.38	1967-71
01189190	Stratton Brook at West Simsbury	1.50	1967-71
01189200	Stratton Brook near Simsbury	5.48	1966-71
01189210	Hop Brook near Simsbury	11.2	1966-71
01189390	East Branch Salmon Brook at Granby	39.1	1964-76

Discontinued surface-water discharge or stage-only stations--Continued

The following continuous-record surface-water gaging stations have been discontinued. All listed stations had daily streamflow or stage records published for the period of record, expressed in water years. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District office at the address given on the back of the title page of this report.

STATION NUMBER	STATION NAME	DRAINAGE AREA (SQUARE MILES)	PERIOD OF RECORD
CONNECTICUT RIVER BASIN--Continued			
01189500	Salmon Brook at Granby	66.7	1946-63
01190000	Farmington River at Rainbow	583	1928-86
01190057	Podunk River near Burnham	12.9	1975-81
01190100	Piper Brook at Newington Junction	14.4	1958-71
01190200	Mill Brook at Newington	2.66	1958-71
01190300	Trout Brook at West Hartford	13.4	1958-71
01190500	South Branch Park River at Hartford	38.2	1937-72; 1973-81
01190600	Wash Brook at Bloomfield	5.62	1958-71
01191000	North Branch Park River at Hartford	25.1	1936-86
01191500	Park River at Hartford	72.1	1937-62
01192370	Porter Brook near Manchester	2.44	1976-81
01192480	Hop Brook near Manchester	11.7	1977-83
01192600	South Branch Salmon Brook at Buckingham	.92	1961-76
01192610	Salmon Brook at Glastonbury	8.19	1967-78
01192650	Roaring Brook at Hopewell	24.5	1962-71
01192700	Mattabesset River at East Berlin	46.6	1962-71
01192704	Mattabesset River at State Rt. 372 at East Berlin	48.1	1995-98
01193800	Hemlock Valley Brook at Hadlyme	2.66	1960-76
01194000	Eightmile River at North Plain	20.3	1939-66
01194825	Connecticut River at Old Saybrook	11,269	1979-98
MENUNKETESUCK RIVER BASIN			
01195000	Menunketesuck River near Clinton	11.5	1941-67
HAMMONASSET RIVER BASIN			
01195146	Pond Meadow Brook at Killingworth	5.92	1984-93
EAST RIVER BASIN			
01195200	Neck River near Madison	6.57	1961-81
QUINNIPIAC RIVER BASIN			
01195500	Quinnipiac River at Southington	17.9	1936-38; 1969-70
01196000	Eightmile River at Plantsville	14.5	1936-38; 1969-70
01196580	Muddy River near North Haven	18.0	1962-73

Discontinued surface-water discharge or stage-only stations--Continued

The following continuous-record surface-water gaging stations have been discontinued. All listed stations had daily streamflow or stage records published for the period of record, expressed in water years. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District office at the address given on the back of the title page of this report.

STATION NUMBER	STATION NAME	DRAINAGE AREA (SQUARE MILES)	PERIOD OF RECORD
	MILL RIVER BASIN		
01196626	Mill River at Hamden	36.5	1974-78
	HOUSATONIC RIVER BASIN		
01198500	Blackberry River at Canaan	43.8	1949-71
01198800	Hollenbeck River at Huntsville	19.1	1971-74
01198860	Deming Brook near Huntsville	1.05	1971-74
01199200	Guinea Brook at Ellsworth	3.56	1960-81
01199290	Housatonic River at Kent	756	1985-90
01201190	West Aspetuck River near New Milford	23.7	1963-72
01201500	Still River near Lanesville	67.5	1932-66
01201510	Still River at Lanesville	69.8	1967-71
01201930	Marshepaug River near Milton	9.37	1968-81
01202500	Shepaug River at Woodville	38.2	1936-66
01203510	Pootatuck River at Sandy Hook	25.0	1965-73
01204800	Copper Mill Brook near Monroe	2.46	1958-76
01205600	West Branch Naugatuck River at Torrington	33.8	1956-97
01205700	East Branch Naugatuck River at Torrington	13.6	1956-97
01206000	Naugatuck River near Thomaston	72.2	1931-59
01206400	Leadmine Brook near Harwinton	19.8	1959-73
01206500	Leadmine Brook near Thomaston	24.6	1931-59
01208012	Branch Brook near Thomaston	20.3	1971-74
01208450	Naugatuck River near Naugatuck	245	1918-24; 1928-55
	SAUGATUCK RIVER BASIN		
01208999	Little River at Sanfordtown	5.55	1965-68
01209110	Aspetuck River at Aspetuck	19.1	1962-67
01209500	Saugatuck River near Westport	79.9	1932-67
	RIPPOWAM RIVER BASIN		
01209900	Rippowam River at Stamford	33.6	1975-77
	BYRAM RIVER BASIN		
01212100	East Branch Byram River at Riversville	11.2	1963-69

Discontinued surface-water quality network stations

The following stations were discontinued as continuous-record or periodic surface-water-quality network stations prior to the 2002 water year. Discontinued network stations with less than 9 months of record have not been included. Discontinued project stations have not been included. Information regarding these stations may be obtained from the District office at the address given on the back of the title page of this report.

STATION NUMBER	STATION NAME	DRAINAGE AREA (SQUARE MILES)	PERIOD OF RECORD
	PAWCATUCK RIVER BASIN		
01118500	Pawcatuck River at Westerly, RI	295	1953, 1963, 1976-2002
01118525	Pawcatuck River near Pawcatuck	302	1974-76
	THAMES RIVER BASIN		
01122001	Natchaug River at Willimantic	174	1974-80
01125150	French River at Mechanicsville	107	1962-63; 1974-91
01125200	Quinebaug River at Putnam	288	1962; 1974-80
01127500	Yantic River at Yantic	90.0	1950; 1968-80
01127701	Thames River near Mohegan	1,382	1963; 1974-91
	CONNECTICUT RIVER BASIN		
01184100	Stony Brook near West Suffield	10.4	1980-91
01184500	Scantic River at Broad Brook	98.2	1953-60; 1995-97
01186800	Still River at Riverton	86.2	1971; 1974-91
01188085	Farmington River at Unionville	373	1974-83
01189120	Farmington River at Avon	465	1971; 1974-91
01189999	Farmington River at Rainbow Fishway at Rainbow	588	1976-93
01190015	Farmington River at Windsor	599	1974-76
01190045	Podunk River at South Windsor	3.74	1975-81
01190069	Connecticut River at Hartford	10,492	1974-76
01191510	Park River at Hartford	72.6	1974-79
01192370	Porter Brook near Manchester	2.44	1976-81
01192516	Hockanum River at East Hartford	76.1	1974-91
01192911	Connecticut River at Middletown	10,869	1974-91
01193050	Connecticut River at Middle Haddam	10,897	1967-03
01193630	Salmon River at Leesville Fishway at Leesville	111	1981-92
	LONG ISLAND SOUND		
01196656	New Haven Harbor near New Haven	--	1974-91
	HOUSATONIC RIVER BASIN		
01198135	Housatonic River near Sodom	471	1984-91
01198550	Housatonic River near Canaan	586	1974-83
01198800	Hollenbeck River at Huntsville	18.1	1971-74
01198857	Wangum Lake Brook near Huntsville	5.32	1971-74
01198860	Deming Brook near Huntsville	1.08	1971-74
01198870	Ledgy Brook near Huntsville	0.66	1971-74
01198880	Wangum Lake Brook near South Canaan	10.1	1971-74
01199000	Housatonic River at Falls Village	634	1971-74
01199900	Tenmile River at South Dover near Wingdale, NY	194	1991-95

Discontinued surface-water quality network stations--Continued

The following stations were discontinued as continuous-record or periodic surface-water-quality network stations prior to the 2002 water year. Discontinued network stations with less than 9 months of record have not been included. Discontinued project stations have not been included. Information regarding these stations may be obtained from the District office at the address given on the back of the title page of this report.

STATION NUMBER	STATION NAME	DRAINAGE AREA (SQUARE MILES)	PERIOD OF RECORD
HOUSATONIC RIVER BASIN—Continued			
01200000	Tenmile River near Gaylordsville	203	1959; 1973-75; 1980
01201485	Still River at Brookfield Center	60.6	1971-72; 1974-92
01204000	Pomperaug River at Southbury	75.1	1961; 1965-74
01201700	Lake Lillinonah near Brookfield Center	1,214	1974-91
01204510	Lake Zoar at Riverside	1,511	1974-91
01205561	Hall Meadow Brook near Drakeville	12.0	1966-67
01208828	Housatonic River at Stratford	1,941	1974-91
NORWALK RIVER BASIN			
01209570	Norwalk River at Georgetown	14.4	1964; 1966; 1976-78
01209572	Norwalk River at Cannondale	15.2	1977-78
LONG ISLAND SOUND			
01209910	Stamford Harbor at Stamford	--	1974-91

INTRODUCTION

The Water Resources Discipline of the U.S. Geological Survey (USGS), in cooperation with State and local agencies, obtains a large amount of data pertaining to the water resources of Connecticut each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the USGS, the data are published annually in this report series entitled "Water Resources Data - Connecticut."

This report includes records on both surface and ground water in the State. Specifically, it contains: (1) discharge records for 52 streamflow-gaging stations and for 38 partial-record streamflow stations and miscellaneous sites; (2) stage-only records for 4 tidal-gaging stations; (3) water-quality records for 17 streamflow-gaging stations, for 18 ungaged stream sites, and temperature at 1 reservoir site; and (4) water-level records for 73 observation wells. Additional water-quality data are published for 16 miscellaneous surface-water sites and for 19 miscellaneous ground-water sites, which were not part of the systematic data-collection program.

This series of annual reports for Connecticut began with the 1961 water year with a report that contained only data relating to the quantities of surface water. In 1964, water-quality data were added to this series and in 1967, ground-water data were added. Beginning with the 1975 water year, the report was changed to its present format.

Prior to introduction of this series, and for several subsequent water years, water-resources data for Connecticut were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Part A." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." These Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from U.S. Geological Survey, Branch of Information Services, Federal Center, Box 25286, Denver, CO 80225-0286.

Publications similar to this report are published annually by the USGS for all States. These official USGS reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this volume is identified as "U.S. Geological Survey Water-Data Report CT-05-1." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or on microfiche film by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information, including current prices, for ordering specific reports may be obtained from the USGS Connecticut Water Science Center, by writing to the address given on the back of the title page or by telephoning (860) 291-6740.

COOPERATION

The USGS and organizations in the State of Connecticut have had cooperative agreements for the systematic collection of streamflow records since 1928, for ground-water levels since 1934, and for water-quality records since 1952. Organizations that supply data are acknowledged in station descriptions. Organizations that assist in collecting data through cooperative agreements with the USGS are:

State Department of Environmental Protection, Gina McCarthy, Commissioner.

State Department of Public Health, Robert Galvin, Commissioner.

U.S. Army Corps of Engineers, Paul Marinelli, Chief, Reservoir Control Center.

Town of Fairfield, Conservation Commission, Thomas J. Steinke, Conservation Director.

Town of Ledyard, Steve Masalin, Town Engineer.

City of Holyoke (Mass.), Paul Ducheney, Superintendent, Hydroelectric Operations.

Town of Montville, John Geary, Chairman, Montville Water Pollution Control Authority.

Town of Naugatuck, Ronald S. San Angelo, Mayor.

City of New Britain, Board of Water Commissioners, Gilbert J. Bligh, Director of Water.

Town of Putnam, Daniel S. Rovero, Mayor.

Second Taxing District Water Department, S. Norwalk, John M. Hiscock, General Manager.

Town of Wallingford, Roger Dann, General Manager, Dept. of Public Utilities, Water and Sewer Div.

City of Waterbury, Kenneth Skov, Superintendent, Water Department.

Town of Windham, Michael Paulhus, First Selectman.

Town of Woodbury, Richard W. Crane, First Selectman.

Metropolitan District Commission, James Randazzo, Director of Water Treatment and Supply.

Regional Water Authority, Peter Gaewski, Director of Engineering.

SUMMARY OF HYDROLOGIC CONDITIONS

Supplemental data used to define the hydrologic conditions include precipitation records collected by the National Weather Service (see table below), and water-level records from the observation-well network that is operated by the USGS in cooperation with the State.

Precipitation at Hartford (Bradley International Airport), water year 2005.

Month	Monthly total	Departure from normal
October	1.65	-2.29
November	2.68	-1.38
December	4.23	.63
January	4.47	.63
February	2.83	-.13
March	3.69	-.19
April	5.69	1.83
May	2.07	-2.32
June	2.84	-1.01
July	7.39	3.72
August	2.34	-1.64
September	1.47	-2.66

Ground-Water Levels

Ground-water levels were measured in 13 long-term observation wells across the State. Values are compared to the period of record for each well in the table below. (See fig. 5 for well locations.)

Ground-water levels showed large variability during water year 2005 (October 2004 to September 2005). Precipitation measurements at Bradley International Airport in Windsor Locks showed 8 months with below-normal totals for the 2005 water year. Ground water in the ground-water network wells was at normal to above normal levels at the start of water year 2005; however, two shallow dug wells recorded the lowest water levels in 62 years of record during October 2004.

Ground water was generally at normal levels from October through February, despite precipitation being less than normal during that period. Levels from February through May were normal to above normal. Precipitation for this period was again below normal each month, except for April, which was above normal.

Below-normal precipitation in May and June, combined with an increase in evapotranspiration from seasonal vegetation growth, led to declining ground-water levels. With very dry soil-moisture conditions throughout most of the state, the precipitation during July—nearly twice the normal amount—was not enough to reverse the declining ground-water levels. Precipitation in August and September was well below the normal monthly totals, and ground-water levels continued to decline. The lowest ground-water levels on record were measured during August and September of 2005 in eight network wells completed in both stratified drift and till, with periods of record ranging in length from 12 to 47 years.

Individual wells responded normally throughout the year, with some exceptions. for examples, wells in Waterbury (WB-93 and WB-198) were mostly below normal for the year. Ground-water levels in wells in Mansfield, Plainfield, and South Windsor (MS-19, PL-1, and SW-64) were mostly normal to above normal.

Monthly ground-water levels for water year 2005 compared to the period of record.

[+, above normal, within the highest 25 percent of record for this month; -, below normal, within the lowest 25 percent of record for this month; N, normal, within the 25- to 75-percentile range; D, dry]

Ground-water well	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP
BD-8 (Brookfield)	N	N	N	+	+	N	+	N	-	N	-	-
BU-2 (Burlington)	N	N	N	+	N	N	N	N	-	N	N	N
FF-23 (Fairfield)	N	N	N	N	+	+	+	+	N	-	-	-
GT-19 (Groton)	+	N	N	N	N	N	N	N	-	-	D	D
MF-1 (Middlefield)	+	N	N	N	N	N	N	N	N	N	-	-
MS-19 (Mansfield)	+	N	+	+	+	+	+	+	+	+	N	-
NOC-7 (N. Canaan)	N	N	N	N	N	+	N	N	N	-	N	N
NT-15 (Newtown)	+	N	N	N	+	+	N	+	-	-	N	-
PL-1 (Plainfield)	+	+	+	+	+	+	+	+	+	+	N	N
SW-64 (S. Windsor)	+	+	+	+	+	+	+	+	+	+	N	N
WB-93 (Waterbury)	-	-	-	N	-	-	-	N	-	-	-	N
WB-198 (Waterbury)	-	-	-	-	-	-	-	N	N	N	-	-
WY-1 (Woodbury)	+	+	+	+	+	+	N	N	N	N	N	N

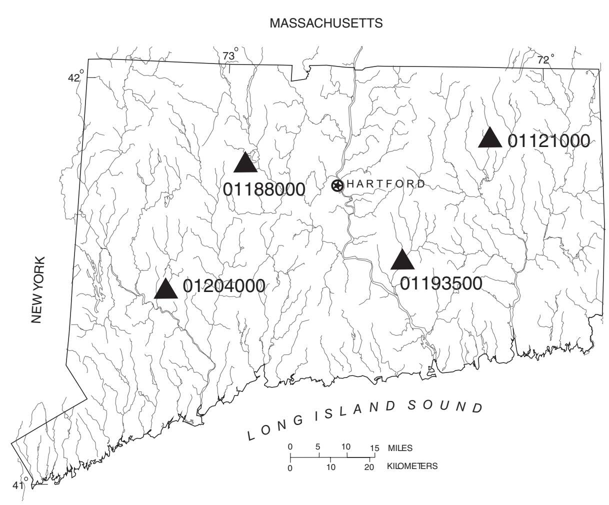
Floods and Droughts

FLOODS - No significant flooding occurred during the water year (October 2004 to September 2005). The frequencies of the maximum peak streamflow at the four index stations were less than or equal to a 2-year recurrence interval (peak streamflow having a 50-percent chance of being equaled or exceeded in any given year). The frequencies at an additional 26 stations in Connecticut with minimum flood control also were less than or equal to a 2-year recurrence interval, with the exception of the northwestern part of the State, where frequencies were equal to a 5-year recurrence interval.

DROUGHTS - Streamflows were well below normal during August and September, but a drought (meteorological, agricultural, or hydrological) was not declared by the State of Connecticut.

Streamflow

Streamflow was measured at four index stations during the 2005 water year. The four stations are Mount Hope River near Warrenville, USGS 01121000 (Northeastern Conn.), Salmon River near East Hampton, USGS 01193500 (Southeastern Conn.), Burlington Brook near Burlington, USGS 01188000 (Northwestern Conn.), and Pomperaug River at Southbury, USGS 01204000 (Southwestern Conn.) (see inset map). Streamflow at Mount Hope River and Burlington Brook are natural flow. Streamflow at Salmon River and Pomperaug River have some alterations to the natural flow occasionally affecting low flows.



Streamflow levels for the 2005 water year at the four index stations (see charts below) were generally normal or above normal from the beginning of the water year (October 2004) through July 2005. During August and September, precipitation deficits were about 2 in. statewide, and average monthly temperatures were above normal. According to the Northeast Regional Climate Center, summer 2005 was the second warmest since 1905 in the greater Hartford area (http://www.erh.noaa.gov/box/climate/). As a result of the precipitation deficit and high monthly temperatures, streamflow levels dropped well below normal during the late summer. Daily mean streamflow during August and September was less than the 98-percent monthly flow duration at Mount Hope, Salmon, and Pomperaug Rivers. Streamflow at Burlington Brook also was less than the 98-percent level during August, and increased to the 90-percent monthly flow duration during September.

A new instantaneous minimum flow (0.04 ft^3/s) was established at Mount Hope River on Sept. 11-12, 2005. The previous instantaneous minimum flow was 0.15 ft^3/s on Aug. 25, 1957. Monthly mean streamflows for August and September (0.73 and 0.56 ft^3/s) were equal to the long-term monthly minimums at this station.

Discharge at the four index stations during water year 2005 are compared to long-term discharge for the 30-year reference period 1971-2000 in several different ways. Table 1 compares the 2005 monthly mean discharges to the 30-year mean monthly discharges. Table 2 compares the 2005 monthly median discharges to the 30-year median monthly streamflow. Figure 1 compares the 2005 monthly mean discharges to the 30-year median of the monthly mean discharges.

Monthly mean discharges for water year 2005 compared to the period of record.

[N, normal, within the 25- to 75-percentile range or the middle 50-percent of the record; +, above normal, within the highest 25 percent of record for this month; -, below normal, within the lowest 25 percent of record for this month]

Streamflow-gaging station (period of record)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP
Mount Hope River (July 1940 to current year	+	N	+	N	N	N	+	N	N	N	-	-
Salmon River (July 1928 to current year)	+	N	+	+	+	N	+	N	N	N	-	-
Burlington Brook Sept. 1931 to current year)	+	N	+	+	+	N	+	N	N	+	N	N
Pomperaug River (June 1932 to current year)	N	N	+	+	N	N	N	N	N	N	-	-

Monthly median discharges for water year 2005 compared to the period of record.

[N, normal, within the 25- to 75-percentile range or the middle 50-percent of the record; +, above normal, within the highest 25 percent of record for this month; -, below normal, within the lowest 25 percent of record for this month]

Streamflow-gaging station (period of record)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP
Mount Hope River (July 1940 to current year	+	N	+	+	N	N	+	N	N	N	-	-
Salmon River (July 1928 to current year)	N	N	N	+	N	N	+	N	N	N	-	-
Burlington Brook Sept. 1931 to current year)	N	N	+	+	+	N	N	N	N	+	N	-
Pomperaug River (June 1932 to current year)	N	N	N	+	N	-	N	N	N	N	-	-

Table 1. Monthly mean and 30-year mean monthly discharges for index stations in Connecticut, water year 2005.

[Discharges in cubic feet per second; monthly mean discharges are defined as the mean of the daily means; long-term mean monthly discharges are defined as the mean of the monthly means for the period 1971–00]

	STATION NAME AND NUMBER							
	01121000 MOUNT HOPE RIVER NEAR WARRENVILLE		01188000 BURLINGTON BROOK NEAR BURLINGTON		01193500 SALMON RIVER NEAR EAST HAMPTON		01204000 POMPERAUG RIVER AT SOUTHBURY	
MONTH	MONTHLY MEAN WY 2005	MEAN MONTHLY 1971-00	MONTHLY MEAN WY 2005	MEAN MONTHLY 1971-00	MONTHLY MEAN WY 2005	MEAN MONTHLY 1971-00	MONTHLY MEAN WY 2005	MEAN MONTHLY 1971-00
October	37.4	34.4	6.37	6.62	106	102	66.0	92.8
November	45.8	53.6	7.44	9.02	148	182	81.0	128
December	106	72.9	14.7	10.2	338	255	201	174
January	116	85.4	15.6	10.8	407	301	248	191
February	85.7	76.8	9.76	10.2	300	280	151	176
March	86.6	109	13.7	16.9	300	374	181	263
April	152	93.2	18.1	15.2	520	346	268	243
May	63.2	60.2	9.00	11.3	218	239	101	165
June	17.1	41.0	4.00	7.30	60.8	165	46.5	109
July	9.28	17.4	6.69	4.07	44.6	70.5	42.1	60.1
August	.73	16.6	1.62	4.08	9.25	63.6	8.34	53.5
September	.56	17.9	1.53	4.72	10.7	59.9	6.99	58.1

Table 2. Monthly median and 30-year median monthly discharges for index stations in Connecticut, water year 2005.

[Discharges in cubic feet per second; monthly median discharges are defined as the median of the daily means; long-term median monthly discharges are defined as the median of the monthly means for the period 1971–00]

	STATION NAME AND NUMBER							
	01121000 MOUNT HOPE RIVER NEAR WARRENVILLE		01188000 BURLINGTON BROOK NEAR BURLINGTON		01193500 SALMON RIVER NEAR EAST HAMPTON		01204000 POMPERAUG RIVER AT SOUTHBURY	
MONTH	MONTHLY MEDIAN WY 2005	MEDIAN MONTHLY 1971-00	MONTHLY MEDIAN WY 2005	MEDIAN MONTHLY 1971-00	MONTHLY MEDIAN WY 2005	MEDIAN MONTHLY 1971-00	MONTHLY MEDIAN WY 2005	MEDIAN MONTHLY 1971-00
October	32.0	21.7	4.90	5.74	81.0	73.9	51.0	73.7
November	28.0	47.5	5.70	8.46	112	167	59.5	116
December	82.0	60.3	9.90	8.01	254	209	165	145
January	85.0	83.1	10.0	10.6	328	292	186	180
February	60.5	74.8	7.00	10.5	236	253	120	168
March	62.0	91.3	7.50	15.8	212	333	108	220
April	113	85.8	13.0	13.9	397	312	190	211
May	59.0	58.5	8.10	10.0	191	223	86	152
June	15.0	21.8	3.45	4.97	49.0	91.0	41.0	69.2
July	6.2	13.4	3.90	3.16	35.0	46.8	30.0	39.7
August	.49	10.8	1.40	3.42	7.70	46.2	8.30	39.0
September	.29	12.5	.90	2.65	8.20	58.3	6.20	36.2

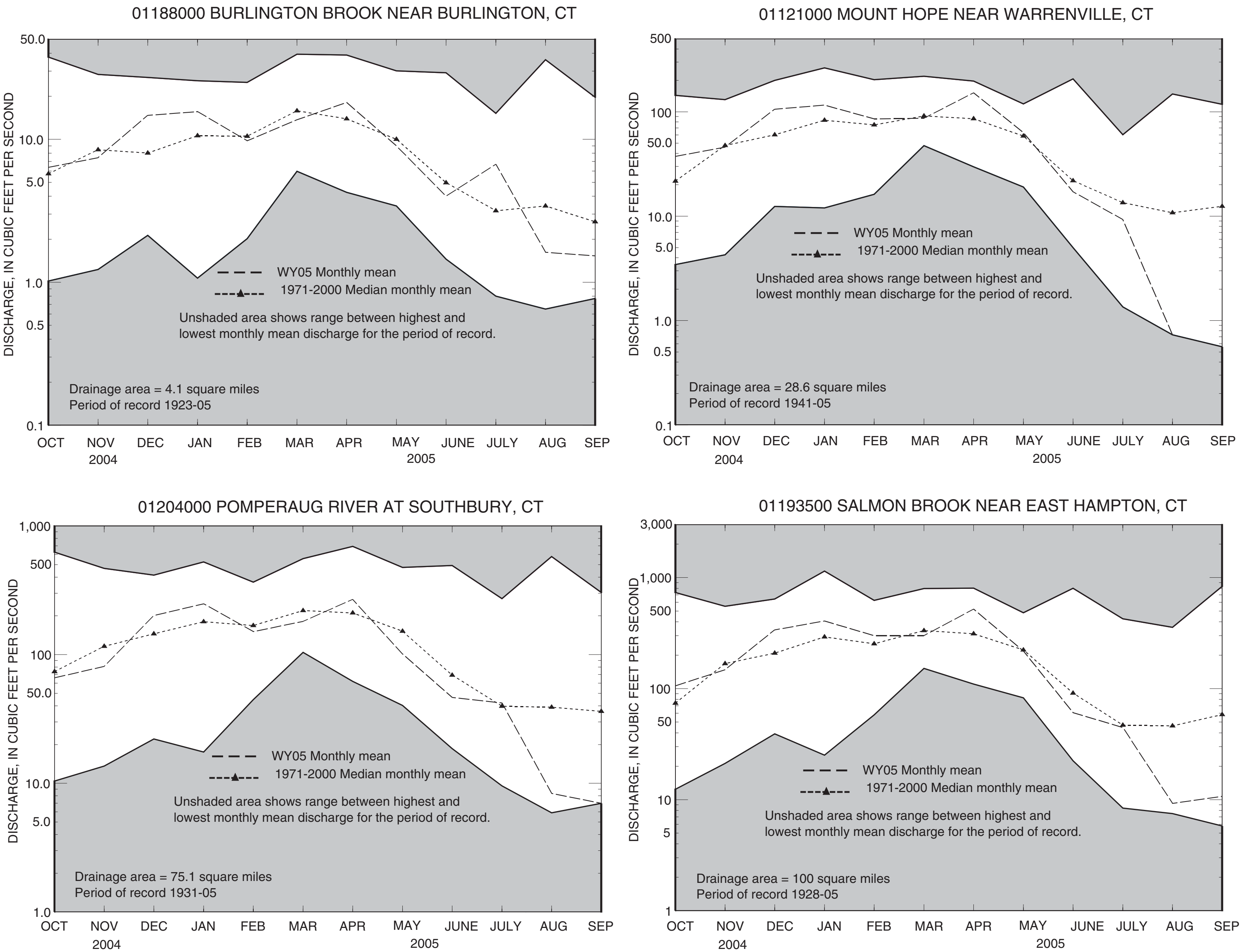


Figure 1. Graph showing comparison of mean discharge in water year 2005 to long-term median of the monthly means for 30-year period and to highest and lowest discharge for period of record at four index stations in Connecticut.

DOWNSTREAM ORDER AND STATION NUMBER

Since October 1, 1950, hydrologic-station records in USGS reports have been listed in order of downstream direction along the main stream. All stations on a tributary entering upstream from a main-stream station are listed before that station. A station on a tributary entering between two main-stream stations is listed between those stations. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary on which a station is located with respect to the stream to which it is immediately tributary is indicated by an indention in that list of stations in the front of this report. Each indentation represents one rank. This downstream order and system of indentation indicates which stations are on tributaries between any two stations and the rank of the tributary on which each station is located.

As an added means of identification, each hydrologic station and partial-record station has been assigned a station number. These station numbers are in the same downstream order used in this report. In assigning a station number, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list composed of both types of stations. Gaps are consecutive. The complete 8-digit (or 10-digit) number for each station such as 09004100, which appears just to the left of the station name, includes a 2-digit part number "09" plus the 6-digit (or 8-digit) downstream order number "004100." In areas of high station density, an additional two digits may be added to the station identification number to yield a 10-digit number. The stations are numbered in downstream order as described above between stations of consecutive 8-digit numbers.

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

The USGS well and miscellaneous site-numbering system is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude, and the next 7 digits denote degrees, minutes, and seconds of longitude; the last 2 digits are a sequential number for wells within a 1-second grid. In the event that the latitude-longitude coordinates for a well and miscellaneous site are the same, a sequential number such as "01," "02," and so forth, would be assigned as one would for wells (see fig. 2). The 8-digit, downstream order station numbers are not assigned to wells and miscellaneous sites where only random water-quality samples or discharge measurements are taken.

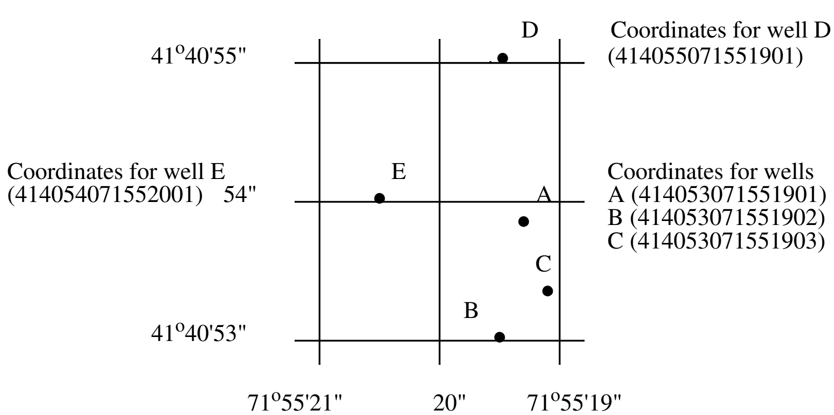


Figure 2. System for numbering wells and precipitation sites (latitude and longitude)

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Benchmark Network is a network of 61 sites in small drainage basins in 39 States that was established in 1963 to provide consistent streamflow data representative of undeveloped watersheds nationwide, and from which data could be analyzed on a continuing basis for use in comparison and contrast with conditions observed in basins more obviously affected by human activities. At selected sites, water-quality information is being gathered on major ions and nutrients, primarily to assess the effects of acid deposition on stream chemistry. Additional information on the Hydrologic Benchmark Program may be accessed from http://ny.cf.er.usgs.gov/hbn/.

National Stream-Quality Accounting Network (NASQAN) is a network of sites used to monitor the water quality of large rivers within the Nation's largest river basins. From 1995 through 1999, a network of approximately 40 stations was operated in the Mississippi, Columbia, Colorado, and Rio Grande River basins. For the period 2000 through 2004, sampling was reduced to a few index stations on the Colorado and Columbia Rivers so that a network of five stations could be implemented on the Yukon River. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment (NAWQA) Program; (3) to characterize processes unique to large-river systems such as storage and re-mobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals. Additional information about the NASQAN Program may be accessed from http://water.usgs.gov/nasqan/.

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN) is a network of monitoring sites that provides continuous measurement and assessment of the chemical constituents in precipitation throughout the United States. As the lead Federal agency, the USGS works together with over 100 organizations to provide a long-term, spatial and temporal record of atmospheric deposition generated from this network of 250 precipitation-chemistry monitoring sites. The USGS supports 74 of these 250 sites. This long-term, nationally consistent monitoring program, coupled with ecosystem research, provides critical information toward a national scorecard to evaluate the effectiveness of ongoing and future regulations intended to reduce atmospheric emissions and subsequent impacts to the Nation's land and water resources. Reports and other information on the NADP/NTN Program, as well as data from the individual sites, may be accessed from http://bqs.usgs.gov/acidrain/.

The USGS National Water-Quality Assessment (NAWQA) Program is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; to provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and to provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 42 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents is measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for water-resources managers to use in making decisions and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Communication and coordination between USGS personnel and other local, State, and Federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key Federal, State, and local water-resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities for collaboration among the agencies. Additional information about the NAWQA Program may be accessed from http://water.usgs.gov/nawqa/.

The USGS National Streamflow Information Program (NSIP) is a long-term program with goals to provide framework streamflow data across the Nation. Included in the program are creation of a permanent Federally funded streamflow network, research on the nature of streamflow, regional assessments of streamflow data and databases, and upgrades in the streamflow information delivery systems. Additional information about NSIP may be accessed from http://water.usgs.gov/nsip/.

EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS

Data Collection and Computation

The base data collected at gaging stations (fig. 3) consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and volume of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from a water-stage recorder that is either downloaded electronically in the field to a laptop computer or similar device or is transmitted using telemetry such as GOES satellite, land-line or cellular-phone modems, or by radio transmission. Measurements of discharge are made with a current meter or acoustic Doppler current profiler, using the general methods adopted by the USGS. These methods are described in standard textbooks, USGS Water-Supply Paper 2175, and the Techniques of Water-Resources Investigations of the United States Geological Survey (TWRIs), Book 3, Chapters A1 through A19 and Book 8, Chapters A2 and B2, which may be accessed from http://water.usgs.gov/pubs/twri/. The methods are consistent with the American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standardization (ISO).

For stream-gaging stations, discharge-rating tables for any stage are prepared from stage-discharge curves. If extensions to the rating curves are necessary to express discharge greater than measured, the extensions are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams and weirs), step-backwater techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharges are computed from the daily values. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features of the stream channel, the daily mean discharge is computed by the shifting-control method in which correction factors that are based on individual discharge measurements and notes by engineers and observers are used when applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the controlling section, the daily mean discharge is computed by the shifting-control method.

The stage-discharge relation at some stream-gaging stations is affected by backwater from reservoirs, tributary streams, or other sources. Such an occurrence necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage at some distance from the base gage.

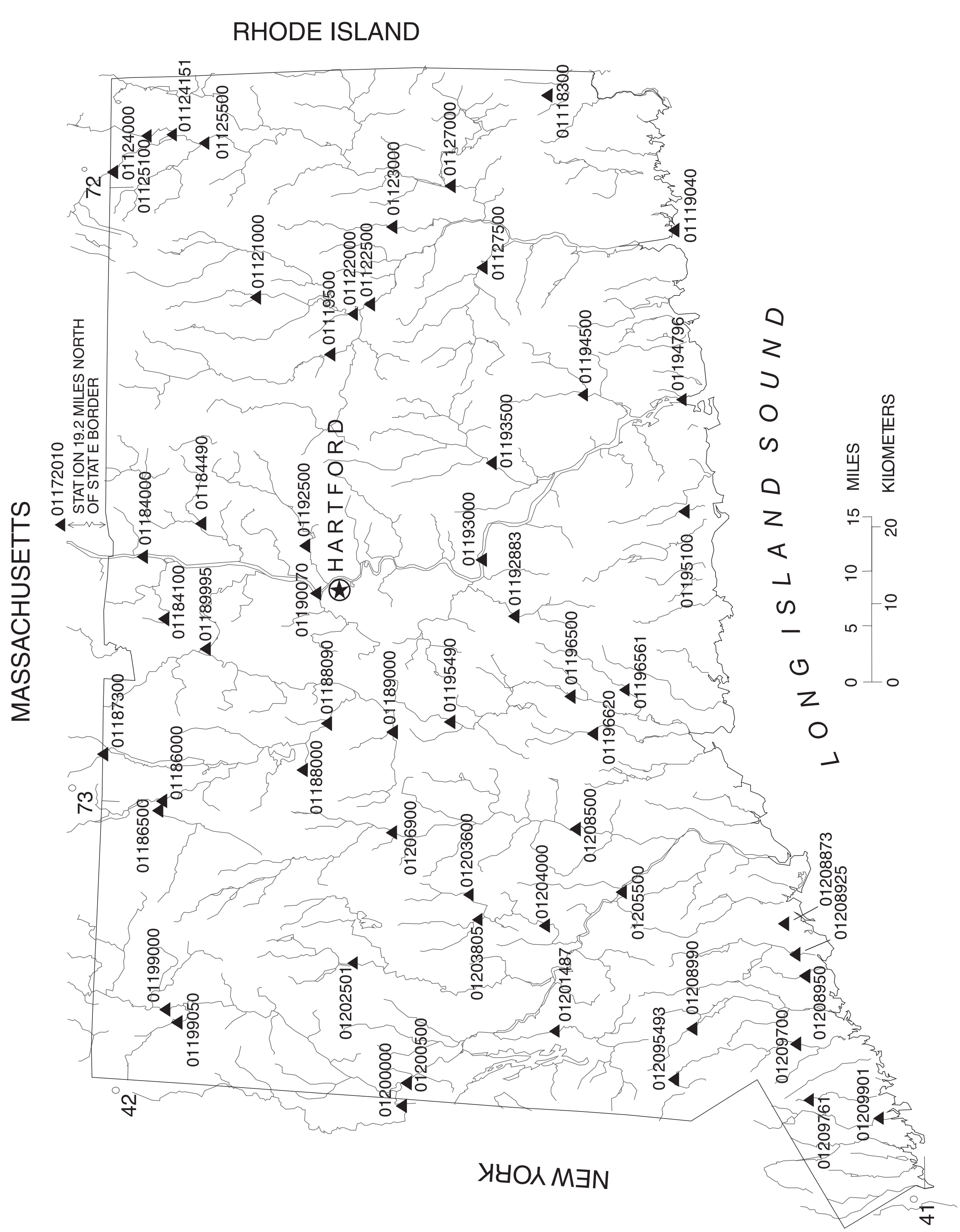


Figure 2. Location of active surface-water gaging stations.

Pawcatuck River Basin

- 01118300 Pendleton Hill Brook near Clarks Falls, CT

Poquonock River Basin

- 01119040 Poquonock River near Groton, CT

Thames River Basin

- 01119500 Willimantic River near Coventry, CT
- 01121000 Mount Hope River near Warrenville, CT
- 01122000 Natchaug River at Willimantic, CT
- 01122500 Shetucket River near Willimantic, CT

  01123000 Little River near Hanover, CT
- 01124000 Quinebaug River at Quinebaug, CT
- 01124151 Quinebaug River at West Thompson, CT

  01125100 French River at North Grosvenordale, CT
- 01125500 Quinebaug River at Putnam, CT
- 01127000 Quinebaug River at Jewett City, CT
- 01127500 Yantic River at Yantic, CT

Connecticut River Basin

- 01172010 Connecticut River at I-391 Bridge at Holyoke, MA
- 01184000 Connecticut River at Thompsonville, CT
- 01184100 Stony Brook near West Suffield, CT
- 01184490 Broad Brook at Broad Brook, CT
- 01186000 West Branch Farmington River at Riverton, CT
- 01186500 Still River at Robertsville, CT

  01187300 Hubbard River near West Hartland, CT
- 01188000 Burlington Brook near Burlington, CT
- 01188090 Farmington River at Unionville, CT

  01189000 Pequabuck River at Forestville, CT
- 01189995 Farmington River at Tariffville, CT
- 01190070 Connecticut River at Hartford, CT
- 01192500 Hockanum River near East Hartford, CT
- 01192883 Coginchaug River at Middlefield, CT
- 01193000 Connecticut River near Middletown, CT
- 01193500 Salmon River near East Hampton, CT
- 01194500 East Branch Eightmile River near North Lyme, CT
- 01194796 Connecticut River at Old Lyme, CT

Indian River Basin

- 01195100 Indian River near Clinton, CT

Quinnipiac River Basin

- 01195490 Quinnipiac River at Southington, CT
- 01196500 Quinnipiac River at Wallingford, CT

  01196561 Muddy River near East Wallingford, CT

Mill River Basin

01196620 Mill River near Hamden, CT

Housatonic River Basin

- 01199000 Housatonic River at Falls Village, CT
- 01199050 Salmon Creek at Lime Rock, CT
- 01200000 Tenmile River near Gaylordsville, CT
- 01200500 Housatonic River at Gaylordsville, CT
- 01201487 Still River at Rt. 7 at Brookfield Center, CT
- 01202501 Shepaug River at Peter's Dam at Woodville, CT
- 01203600 Nonewaug River at Minortown, CT
- 01203805 Weekeepeemee River at Hotchkissville, CT
- 01204000 Pomperaug River at Southbury, CT
- 01205500 Housatonic River at Stevenson, CT
- 01206900 Naugatuck River at Thomaston, CT
- 01208500 Naugatuck River at Beacon Falls, CT

Southwestern Coastal River Basins

01208873 Rooster River at Fairfield, CT

01208925 Mill River near Fairfield, CT

- 01208950 Sasco Brook near Southport, CT
- 01208990 Saugatuck River near Redding, CT

  012095493 Ridgefield Brook at Shields Lane at Ridgefield, CT

  01209700 Norwalk River at South Wilton, CT
- 01209761 Fivemile River near New Canaan, CT
- 01209901 Rippowam River at Stamford, CT

- Real-time data are available on the Internet

An index velocity is measured using ultrasonic or acoustic instruments at some stream-gaging stations, and this index velocity is used to calculate an average velocity for the flow in the stream. This average velocity along with a stage-area relation is then used to calculate average discharge.

At some stations, the stage-discharge relation is affected by changing stage. At these stations, the rate of change in stage is used as a factor in computing discharge.

At some stream-gaging stations in the northern United States, the stage-discharge relation is affected by ice in the winter; therefore, computation of the discharge in the usual manner is impossible. Discharge for periods of ice effect is computed on the basis of gage-height record and occasional winter-discharge measurements. Consideration is given to the available information on temperature and precipitation, notes by gage observers and hydrologists, and comparable records of discharge from other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the volume or contents for any stage are prepared from stage-area relation curves defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly changes are computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys, the computed contents may be increasingly in error due to the gradual accumulation of sediment.

For some stream-gaging stations, periods of time occur when no gage-height record is obtained or the recorded gage height is faulty and cannot be used to compute daily discharge or contents. Such a situation can happen when the recorder stops or otherwise fails to operate properly, the intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated on the basis of recorded range in stage, prior and subsequent records, discharge measurements, weather records, and comparison with records from other stations in the same or nearby basins. Likewise, lake or reservoir volumes may be estimated on the basis of operator’s log, prior and subsequent records, inflow-outflow studies, and other information.

Data Presentation

The records published for each continuous-record surface-water discharge station (stream-gaging station) consist of five parts: (1) the station manuscript or description; (2) the data table of daily mean values of discharge for the current water year with summary data; (3) a tabular statistical summary of monthly mean flow data for a designated period, by water year; (4) a summary statistics table that includes statistical data of annual, daily, and instantaneous flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration; and (5) a hydrograph of discharge.

Station Manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments follow that clarify information presented under the various headings of the station description.

LOCATION.—Location information is obtained from the most accurate maps available. The location of the gaging station with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were determined by methods given in “River Mileage Measurement,” Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

DRAINAGE AREA.—Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.—This term indicates the time period for which records have been published for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not and whose location was such that its flow reasonably can be considered equivalent to flow at the present station.

REVISED RECORDS.—If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

GAGE.—The type of gage in current use, the datum of the current gage referred to a standard datum, and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.—All periods of estimated daily discharge either will be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily discharge table. (See section titled Identifying Estimated Daily Discharge.) Information is presented relative to the accuracy of the records, to special methods of computation, and to conditions that affect natural flow at the station. In addition, information may be presented pertaining to average discharge data for the period of record; to extremes data for the period of record and the current year; and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, the outlet works and spillway, and the purpose and use of the reservoir.

COOPERATION.—Records provided by a cooperating organization or obtained for the USGS by a cooperating organization are identified here.

EXTREMES OUTSIDE PERIOD OF RECORD.—Information here documents major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the USGS.

REVISIONS.—Records are revised if errors in published records are discovered. Appropriate updates are made in the USGS distributed data system, NWIS, and subsequently to its Web-based national data system, NWISWeb (*http://water.usgs.gov/nwis/nwis*). Users are encouraged to obtain all required data from NWIS or NWISWeb to ensure that they have the most recent data updates. Updates to NWISWeb are made on an annual basis.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because no current or, possibly, future station manuscript would be published for these stations to document the revision in a REVISED RECORDS entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the USGS Water Science Center (address given on the back of the title page of this report) to determine if the published records were revised after the station was discontinued. If, however, the data for a discontinued station were obtained by computer retrieval, the data would be current. Any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the REMARKS and in the inclusion of a stage-capacity table when daily volumes are given.

Peak Discharge Greater than Base Discharge

Tables of peak discharge above base discharge are included for some stations where secondary instantaneous peak discharge data are used in flood-frequency studies of highway and bridge design, flood-control structures, and other flood-related projects. The base discharge value is selected so an average of three peaks a year will be reported. This base discharge value has a recurrence interval of approximately 1.1 years or a 91-percent chance of exceedence in any 1 year.

Data Table of Daily Mean Values

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed TOTAL gives the sum of the daily figures for each month; the line headed MEAN gives the arithmetic average flow in cubic feet per second for the month; and the lines headed MAX and MIN give the maximum and minimum daily mean discharges, respectively, for each month. Discharge for the month is expressed in cubic feet per second per square mile (line headed CFSM); or in inches (line headed IN); or in acre-feet (line headed AC-FT). Values for cubic feet per second per square mile and runoff in inches or in acre-feet may be omitted if extensive regulation or diversion is in effect or if the drainage area includes large noncontributing areas. At some stations, monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversion data or reservoir volumes are given. These values are identified by a symbol and a corresponding footnote.

Statistics of Monthly Mean Data

A tabular summary of the mean (line headed MEAN), maximum (MAX), and minimum (MIN) of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those values. The designated period will be expressed as FOR WATER YEARS __-__, BY WATER YEAR (WY), and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. The designated period will consist of all of the station record within the specified water years, including complete months of record for partial water years, and may coincide with the period of record for the station. The water years for which the statistics are computed are consecutive, unless a break in the station record is indicated in the manuscript.

Summary Statistics

A table titled SUMMARY STATISTICS follows the statistics of monthly mean data tabulation. This table consists of four columns with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, WATER YEARS __-__, will consist of all of the station records within the specified water years, including complete months of record for partial water years, and may coincide with the period of record for the station. The water years for which the statistics are computed are consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (see line headings below), except for the ANNUAL 7-DAY MINIMUM statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the heading. When the dates of occurrence do not fall within the selected water years listed in the heading, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration-curve statistics and runoff data also are given. Runoff data may be omitted if extensive regulation or diversion of flow is in effect in the drainage basin.

The following summary statistics data are provided with each continuous record of discharge. Comments that follow clarify information presented under the various line headings of the SUMMARY STATISTICS table.

ANNUAL TOTAL.—The sum of the daily mean values of discharge for the year.

ANNUAL MEAN.—The arithmetic mean for the individual daily mean discharges for the year noted or for the designated period.

HIGHEST ANNUAL MEAN.—The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.—The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.—The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.—The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.—The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. This value should not be confused with the 7-day 10-year low-flow statistic.

MAXIMUM PEAK FLOW.—The maximum instantaneous peak discharge occurring for the water year or designated period. Occasionally the maximum flow for a year may occur at midnight at the beginning or end of the year, on a recession from or rise toward a higher peak in the adjoining year. In this case, the maximum peak flow is given in the table and the maximum flow may be reported in a footnote or in the REMARKS paragraph in the manuscript.

MAXIMUM PEAK STAGE.—The maximum instantaneous peak stage occurring for the water year or designated period. Occasionally the maximum stage for a year may occur at midnight at the beginning or end of the year, on a recession from or rise toward a higher peak in the adjoining year. In this case, the maximum peak stage is given in the table and the maximum stage may be reported in the REMARKS paragraph in the manuscript or in a footnote. If the dates of occurrence of the maximum peak stage and maximum peak flow are different, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

INSTANTANEOUS LOW FLOW.—The minimum instantaneous discharge occurring for the water year or for the designated period.

ANNUAL RUNOFF.—Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

> Acre-foot (AC-FT) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.
>
> Cubic feet per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area.
>
> Inches (INCHES) indicate the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

10 PERCENT EXCEEDS.—The discharge that has been exceeded 10 percent of the time for the designated period.

50 PERCENT EXCEEDS.—The discharge that has been exceeded 50 percent of the time for the designated period.

90 PERCENT EXCEEDS.—The discharge that has been exceeded 90 percent of the time for the designated period.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first table lists annual maximum stage and discharge at crest-stage stations, and the second table lists discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements are often made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for a special reason are called measurements at miscellaneous sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified. This identification is shown either by flagging individual daily values with the letter “e” and noting in a table footnote, “e–Estimated,” or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

Accuracy of Field Data and Computed Results

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretations of records.

The degree of accuracy of the records is stated in the REMARKS in the station description. “Excellent” indicates that about 95 percent of the daily discharges are within 5 percent of the true value; “good” within 10 percent; and “fair,” within 15 percent. “Poor” indicates that daily discharges have less than “fair” accuracy. Different accuracies may be attributed to different parts of a given record.

Values of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 ft^3/s; to the nearest tenths between 1.0 and 10 ft^3/s; to whole numbers between 10 and 1,000 ft^3/s; and to three significant figures above 1,000 ft^3/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharge values listed for partial-record stations.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, values of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Other Data Records Available

Information of a more detailed nature than that published for most of the stream-gaging stations such as discharge measurements, gage-height records, and rating tables is available from the USGS Water Science Center. Also, most stream-gaging station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the USGS Water Science Center (see address that is shown on the back of the title page of this report).

EXPLANATION OF PRECIPITATION RECORDS

Data Collection and Computation

Rainfall data generally are collected using electronic data loggers that measure the rainfall in 0.01-inch increments every 15 minutes using either a tipping-bucket rain gage or a collection well gage. Twenty-four hour rainfall totals are tabulated and presented. A 24-hour period extends from just past midnight of the previous day to midnight of the current day. Snowfall-affected data can result during cold weather when snow fills the rain-gage funnel and then melts as temperatures rise. Snowfall-affected data are subject to errors. Missing values are indicated by this symbol "---" in the table.

Data Presentation

Precipitation records collected at surface-water gaging stations are identified with the same station number and name as the stream-gaging station. Where a surface-water daily-record station is not available, the precipitation record is published with its own name and latitude-longitude identification number.

Information pertinent to the history of a precipitation station is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, period of record, and general remarks.

The following information is provided with each precipitation station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.—See Data Presentation in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

PERIOD OF RECORD.—See Data Presentation in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

INSTRUMENTATION.—Information on the type of rainfall collection system is given.

REMARKS.—Remarks provide added information pertinent to the collection, analysis, or computation of records.

EXPLANATION OF WATER-QUALITY RECORDS

Collection and Examination of Data

Surface-water samples for analysis usually are collected at or near stream-gaging stations. The quality-of-water records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives the period of record for all water-quality data; the period of daily record for parameters that are measured on a daily basis (specific conductance, water temperature, sediment discharge, and so forth); extremes for the current year; and general remarks.

For ground-water records, no descriptive statements are given; however, the well number, depth of well, sampling date, or other pertinent data are given in the table containing the chemical analyses of the ground water.

Water Analysis

Most of the methods used for collecting and analyzing water samples are described in the TWRIs, which may be accessed from *http://water.usgs.gov/pubs/twri/*.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary considerably with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled at several verticals to obtain a representative sample needed for an accurate mean concentration and for use in calculating load.

Rating the accuracy of continuous water-quality records

[≤ less than or equal to; ±, plus or minus value shown; °C, degree Celsius; >, greater than; %, percent; mg/L, milligram per liter; pH unit, standard pH unit]

Measured field parameter	**Ratings of accuracy (Based on combined fouling and calibration drift corrections applied to the record)**			
	Excellent	**Good**	**Fair**	**Poor**
Water temperature	≤ ± 0.2 °C	> ± 0.2 – 0.5 °C	> ± 0.5 – 0.8 °C	> ± 0.8 °C
Specific conductance	≤ ± 3%	> ± 3 – 10%	> ± 10 – 15%	> ± 15%
Dissolved oxygen	≤ ± 0.3 mg/L or ≤ ± 5%, whichever is greater	> ± 0.3 – 0.5 mg/L or > ± 5 – 10%, whichever is greater	> ± 0.5 – 0.8 mg/L or > ± 10 – 15%, whichever is greater	> ± 0.8 mg/L or > ± 15%, whichever is greater
pH	≤ ± 0.2 units	> ± 0.2 – 0.5 units	> ± 0.5 – 0.8 units	> ± 0.8 units
Turbidity	≤ ±0.5 turbidity units or ≤ ±5%, whichever is greater	> ± 0.5 – 1.0 turbidity units or > ±5 – 10%, whichever is greater	> ± 1.0 – 1.5 turbidity units or > ±10 – 15%, whichever is greater	> ± 1.5 turbidity units or > ±15%, whichever is greater

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum and minimum values (and sometimes mean or median values) for each constituent measured and are based on 15-minute or 1-hour intervals of recorded data beginning at 0000 hours and ending at 2400 hours for the day of record.

SURFACE-WATER-QUALITY RECORDS

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because discharge data are useful in the interpretation of surface-water quality. Records of surface-water quality in this report involve a variety of types of data and measurement frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A *continuous-record station* is a site where data are collected on a regularly scheduled basis. Frequency may be one or more times daily, weekly, monthly, or quarterly. A *partial-record station* is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A *miscellaneous sampling site* is a location other than a continuous- or partial-record station, where samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between *continuous records* as used in this report and *continuous recordings* that refer to a continuous graph or a series of discrete values recorded at short intervals. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 4.

Accuracy of the Records

One of four accuracy classifications is applied for measured physical properties at continuous-record stations on a scale ranging from poor to excellent. The accuracy rating is based on data values recorded before any shifts or corrections are made. Additional consideration also is given to the amount of publishable record and to the amount of data that have been corrected or shifted.

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

Onsite Measurements and Sample Collection

In obtaining water-quality data, a major concern is assuring that the data obtained represent the naturally occurring quality of the water. To ensure this, certain measurements, such as water temperature, pH, and dissolved oxygen, must be made onsite when the samples are collected. To assure that measurements made in the laboratory also represent the naturally occurring water, carefully prescribed procedures must be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for onsite measurements and for collecting, treating, and shipping samples are given in TWRIs Book 1, Chapter D2; Book 3, Chapters A1, A3, and A4; and Book 9, Chapters A1-A9. Most of the methods used for collecting and analyzing water samples are described in the TWRIs, which may be accessed from http://water.usgs.gov/pubs/twri/. Also, detailed information on collecting, treating, and shipping samples can be obtained from the USGS Water Science Center (see address that is shown on the back of title page in this report).

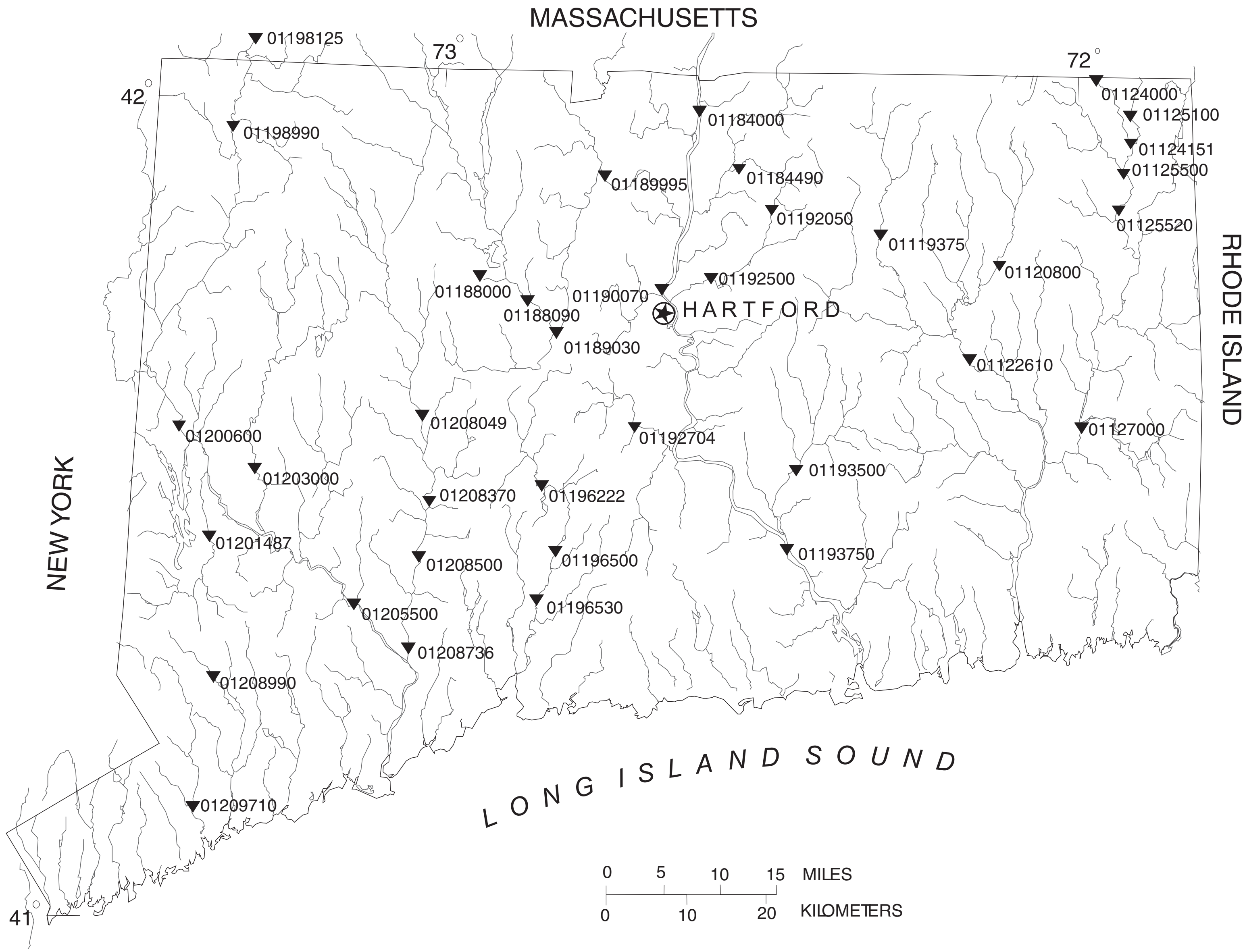


Figure 3. Location of active surface-water-quality stations.

Thames River Basin

01119375 Willimantic River at Merrow, CT

01120800 Natchaug River at Chaplin, CT

01122610 Shetucket River at South Windham, CT

01124000 Quinebaug River at Quinebaug, CT

01124151 Quinebaug River at West Thompson, CT

01125100 French River at North Grosvenordale, CT

01125500 Quinebaug River at Putnam, CT

01125520 Quinebaug River at Cotton Rd Bridge nr Pomfret Landing, CT

01127000 Quinebaug River at Jewett City, CT

Connecticut River Basin

01184000 Connecticut River at Thompsonville, CT

01184490 Broad Brook at Broad Brook, CT

01188000 Burlington Brook near Burlington, CT

01188090 Farmington River at Unionville, CT

01189030 Pequabuck River at Farmington, CT

01189995 Farmington River at Tariffville, CT

01190070 Connecticut River at Hartford, CT

01192050 Hockanum River near Rockville, CT

01192500 Hockanum River near East Hartford, CT

01192704 Mattabesset River at Rt 372 at East Berlin, CT

01193500 Salmon River near East Hampton, CT

01193750 Connecticut River at East Haddam, CT

Quinnipiac River Basin

01196222 Quinnipiac River near Meriden, CT

01196500 Quinnipiac River at Wallingford, CT

01196530 Quinnipiac River at North Haven, CT

Housatonic River Basin

01198125 Housatonic River near Ashley Falls, MA

01198990 Falls Village Reservoir at Falls Village, CT (temperature only)

01200600 Housatonic River near New Milford, CT

01201487 Still River at Rt 7 at Brookfield Center, CT

01203000 Shepaug River near Roxbury, CT

01205500 Housatonic River at Stevenson, CT

01208049 Naugatuck River near Waterville, CT

01208370 Naugatuck River below Fulling Mill Brook at Union City, CT

01208500 Naugatuck River at Beacon Falls, CT

01208736 Naugatuck River at Ansonia, CT

Saugatuck River Basin

01208990 Saugatuck River near Redding, CT

Norwalk River Basin

01209710 Norwalk River at Winnipauk, CT

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at the time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the USGS Water Science Center.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross section.

During periods of rapidly changing flow or rapidly changing concentration, samples may be collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration are computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples are collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observation, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included for some stations.

Laboratory Measurements

Samples for biochemical oxygen demand (BOD) and indicator bacteria are analyzed locally. All other samples are analyzed in the USGS laboratory in Lakewood, Colorado, unless otherwise noted. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chapter C1. Methods used by the USGS laboratories are given in the TWRIs, Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapters A1, A3, and A4. The TWRI publications may be accessed from *http://water.usgs.gov/pubs/twri/*. These methods are consistent with ASTM standards and generally follow ISO standards.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of “daily values” of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.—See Data Presentation information in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

DRAINAGE AREA.—See Data Presentation information in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

PERIOD OF RECORD.—This indicates the time periods for which published water-quality records for the station are available. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.—Information on instrumentation is given only if a water-quality monitor temperature record, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.—Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.—Records provided by a cooperating organization or obtained for the USGS by a cooperating organization are identified here.

EXTREMES.—Maximums and minimums are given only for parameters measured daily or more frequently. For parameters measured weekly or less frequently, true maximums or minimums may not have been obtained. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.—Records are revised if errors in published water-quality records are discovered. Appropriate updates are made in the USGS distributed data system, NWIS, and subsequently to its Web-based national data system, NWISWeb (_http://waterdata.usgs.gov/nwis_). Users of USGS water-quality data are encouraged to obtain all required data from NWIS or NWISWeb to ensure that they have the most recent updates. Updates to the NWISWeb are made on an annual basis.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remark codes may appear with the water-quality data in this section:

Printed Output	Remark
E	Value is estimated.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
M	Presence of material verified, but not quantified.
N	Presumptive evidence of presence of material.
U	Material specifically analyzed for, but not detected.
A	Value is an average.
V	Analyte was detected in both the environmental sample and the associated blanks.
S	Most probable value.

Water-Quality Control Data

The USGS National Water Quality Laboratory collects quality-control data on a continuing basis to evaluate selected analytical methods to determine long-term method detection levels (LT-MDLs) and laboratory reporting levels (LRLs). These values are re-evaluated each year on the basis of the most recent quality-control data and, consequently, may change from year to year.

This reporting procedure limits the occurrence of false positive error. Falsely reporting a concentration greater than the LT-MDL for a sample in which the analyte is not present is 1 percent or less. Application of the LRL limits the occurrence of false negative error. The chance of falsely reporting a nondetection for a sample in which the analyte is present at a concentration equal to or greater than the LRL is 1 percent or less.

Accordingly, concentrations are reported as less than LRL for samples in which the analyte either was not detected or did not pass identification. Analytes detected at concentrations between the LT-MDL and the LRL and that pass identification criteria are estimated. Estimated concentrations will be noted with a remark code of "E." These data should be used with the understanding that their uncertainty is greater than that of data reported without the E remark code.

Data generated from quality-control (QC) samples are a requisite for evaluating the quality of the sampling and processing techniques as well as data from the actual samples themselves. Without QC data, environmental sample data cannot be adequately interpreted because the errors associated with the sample data are unknown. The various types of QC samples collected by a USGS Water Science Center are described in the following section. Procedures have been established for the storage of water-quality-control data within the USGS. These procedures allow for storage of all derived QC data and are identified so that they can be related to corresponding environmental samples. These data are not presented in this report but are available from the USGS Water Science Center.

Blank Samples

Blank samples are collected and analyzed to ensure that environmental samples have not been contaminated in the overall data-collection process. The blank solution used to develop specific types of blank samples is a solution that is free of the analytes of interest. Any measured value signal in a blank sample for an analyte (a specific component measured in a chemical analysis) that was absent in the blank solution is believed to be due to contamination. Many types of blank samples are possible; each is designed to segregate a different part of the overall data-collection process. The types of blank samples collected by this USGS Water Science Center are:

Field blank—A blank solution that is subjected to all aspects of sample collection, field processing preservation, transportation, and laboratory handling as an environmental sample.

Trip blank—A blank solution that is put in the same type of bottle used for an environmental sample and kept with the set of sample bottles before and after sample collection.

Equipment blank—A blank solution that is processed through all equipment used for collecting and processing an environmental sample (similar to a field blank but normally done in the more controlled conditions of the office).

Sampler blank—A blank solution that is poured or pumped through the same field sampler used for collecting an environmental sample.

Filter blank—A blank solution that is filtered in the same manner and through the same filter apparatus used for an environmental sample.

Splitter blank—A blank solution that is mixed and separated using a field splitter in the same manner and through the same apparatus used for an environmental sample.

Preservation blank—A blank solution that is treated with the sampler preservatives used for an environmental sample.

Reference Samples

Reference material is a solution or material prepared by a laboratory. The reference material composition is certified for one or more properties so that it can be used to assess a measurement method. Samples of reference material are submitted for analysis to ensure that an analytical method is accurate for the known properties of the reference material. Generally, the selected reference material properties are similar to the environmental sample properties.

Replicate Samples

Replicate samples are a set of environmental samples collected in a manner such that the samples are thought to be essentially identical in composition. Replicate is the general case for which a duplicate is the special case consisting of two samples. Replicate samples are collected and analyzed to establish the amount of variability in the data contributed by some part of the collection and analytical process. Many types of replicate samples are possible, each of which may yield slightly different results in a dynamic hydrologic setting, such as a flowing stream. The types of replicate samples collected in this center are:

Concurrent samples—A type of replicate sample in which the samples are collected simultaneously with two or more samplers or by using one sampler and alternating the collection of samples into two or more compositing containers.

Sequential samples—A type of replicate sample in which the samples are collected one after the other, typically over a short time.

Split sample—A type of replicate sample in which a sample is split into subsamples, each subsample contemporaneous in time and space.

Spike Samples

Spike samples are samples to which known quantities of a solution with one or more well-established analyte concentrations have been added. These samples are analyzed to determine the extent of matrix interference or degradation on the analyte concentration during sample processing and analysis.

EXPLANATION OF GROUND-WATER-LEVEL RECORDS

Generally, only ground-water-level data from selected wells with continuous recorders from a basic network of observation wells (fig. 5) are published in this report. This basic network contains observation wells located so that the most significant data are obtained from the fewest wells in the most important aquifers.

Site Identification Numbers

Each well is identified by means of (1) a 15-digit number that is based on latitude and longitude and (2) a local number that is produced for local needs. (See NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES in this report for a detailed explanation).”

Data Collection and Computation

Measurements are made in many types of wells, under varying conditions of access and at different temperatures; hence, neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will ensure that measurements at each well are consistent.

Most methods for collecting and analyzing water samples are described in the TWRIs referred to in the Onsite Measurements and Sample Collection and the Laboratory Measurements sections in this report. In addition, TWRI Book 1, Chapter D2, describes guidelines for the collection and field analysis of ground-water samples for selected unstable constituents. Procedures for onsite measurements and for collecting, treating, and shipping samples are given in TWRIs Book 1, Chapter D2; Book 3, Chapters A1, A3, and A4; and Book 9, Chapters A1 through A9. The TWRI publications may be accessed from *http://water.usgs.gov/pubs/twri/*. The values in this report represent water-quality conditions at the time of sampling, as much as possible, and that are consistent with available sampling techniques and methods of analysis. These methods are consistent with ASTM standards and generally follow ISO standards. Trained personnel collect all samples.

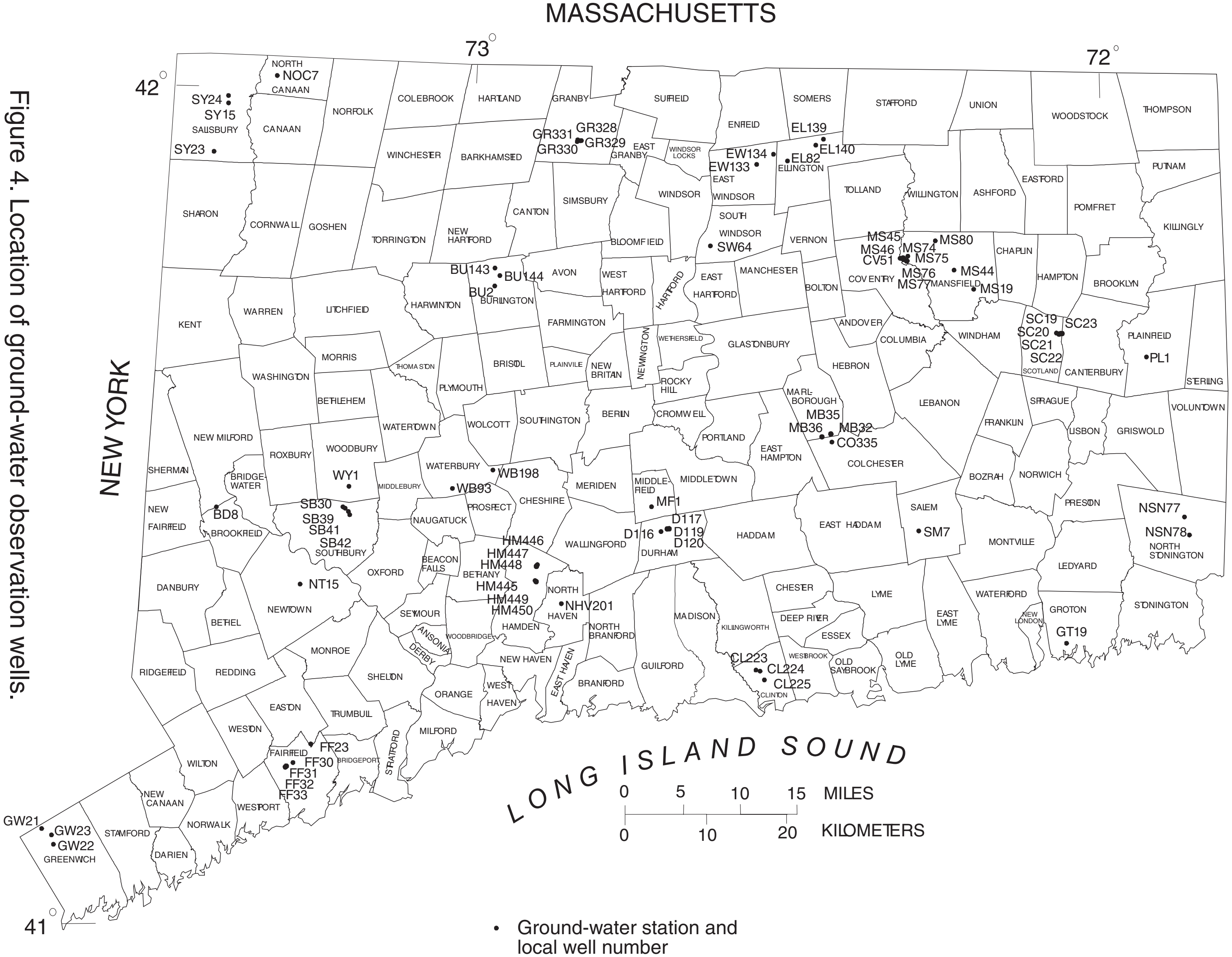


Figure 4. Location of ground-water observation wells.

FAIR-FIELD COUNTY
Well
41300707
3250501
Local
number
BD8
Well
41125607
3153101
Local
number
FF23
Well
41112407
3172201
Local
number
FF30
Well
41111807
3175801
Local
number
FF31
Well
41110307
3181301
Local
number
FF32
Well
41105807
3182001
Local
number
FF33
Well
41062807
3413301
Local

number GW21
Well 410443073414101 Local number GW22
Well 410515073415901 Local number GW23
Well 412429073165101 Local number NT15

HARTFORD COUNTY

Well 414615072581601 Local number BU2
Well 414704072580501 Local Number BU143
Well 414649072574401 Local Number BU144
Well 415450072332201 Local number EW133
Well 415548072311301 Local number EW134
Well 415649072494801 Local number GR328
Well 415647072495901 Local number GR329
Well 415643072502201 Local number GR330
Well 415653072501701 Local number GR331
Well 413535072253701 Local number MB32
Well 413554072270201 Local number MB35
Well 413518072264501 Local number MB36
Well 413724072551101 Local number SW64

LITCHFIELD COUNTY

Well 420125073193001 Local number NOC7
Well 415925073252001 Local number SY15
Well 415559073253401 Local number SY23
Well 415956073241501 Local number SY24
Well 413202073122401 Local number WY1

MIDDLESEX COUNTY

Well 411832072325501 Local number CL223
Well 411826072322401 Local number CL224
Well 411735072315001 Local number CL225
Well 412809072420701 Local number D116
Well 412825072410501 Local number D117
Well 412724072411902 Local number D119
Well 412824072411901 Local number D120
Well 413033072432001 Local number MF1

NEW HAVEN COUNTY

Well 412423072352801 Local number HM445
Well 412546072541702 Local number HM446
Well 412546072541701 Local number HM447
Well 412541072542001 Local number HM448
Well 412417072541901 Local number HM449
Well 412417072541902 Local number HM450
Well 412307072515201 Local number NHV201
Well 412954073125201 Local number SB30
Well 413002073131001 Local number SB39
Well 412935073122701 Local number SB41
Well 412916073121701 Local number SB42
Well 413134073021701 Local number WB93
Well 413245072584201 Local number WB198

NEW LONDON COUNTY

Well 413457072252201 Local number CO335
Well 412013072030601 Local number GT19
Well 412931071514201 Local number NSN77
Well 412746071510601 Local number NSN78
Well 412824072173301 Local number SM7

TOLLAND COUNTY

Well 414833072190301 Local number CV51
Well 415458072291901 Local number EL82
Well 415640072275801 Local number EL139
Well 415312072280201 Local number EL140
Well 414548072114501 Local number MS19
Well 414741072134501 Local number MS44
Well 414825072185601 Local number MS45
Well 414825072185602 Local number MS46
Well 414843072182601 Local number MS74
Well 414815072183401 Local number MS75
Well 414814072183101 Local number MS76
Well 414844072182701 Local number MS77
Well 414831072173002 Local number MS80

WINDHAM COUNTY

Well 414054071552001 Local number PL1
Well 414243072040501 Local number SC19
Well 414237072034401 Local number SC20
Well 414240072032201 Local number SC21
Well 414240072033201 Local number SC22
Well 414240072032202 Local number SC23

personnel collected all samples. The wells sampled were pumped long enough to ensure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casings.

Water-level measurements in this report are given in feet with reference to land-surface datum (lsd). Land-surface datum is a datum plane that is approximately at land surface at each well. If known, the elevation of the land-surface datum above sea level is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (EOM).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth of water of several hundred feet, the error in determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

Data Presentation

Water-level data are presented in alphabetical order by county. The primary identification number for a given well is the 15-digit site identification number that appears in the upper left corner of the table. The secondary identification number is the local or county well number. Well locations are shown and each well is identified by its local well or county well number on a map in this report (fig. 5).

Each well record consists of three parts: the well description, the data table of water levels observed during the water year, and, for most wells, a hydrograph following the data table. Well descriptions are presented in the headings preceding the tabular data.

The following comments clarify information presented in these various headings.

LOCATION.—This paragraph follows the well-identification number and reports the hydrologic-unit number and a geographic point of reference. Latitudes and longitudes used in this report are reported as North American Datum of 1927 unless otherwise specified.

AQUIFER.—This entry designates by name and geologic age the aquifer that the well taps.

WELL CHARACTERISTICS.—This entry describes the well in terms of depth, casing diameter and depth or screened interval, method of construction, use, and changes since construction.

INSTRUMENTATION.—This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on continuous, monthly, or some other frequency of measurement.

DATUM.—This entry describes both the measuring point and the land-surface elevation at the well. The altitude of the land-surface datum is described in feet above the altitude datum; it is reported with a precision depending on the method of determination. The measuring point is described physically (such as top of casing, top of instrument shelf, and so forth), and in relation to land surface (such as 1.3 ft above land-surface datum). The elevation of the land-surface datum is described in feet above National Geodetic Vertical Datum of 1929 (NGVD 29); it is reported with a precision depending on the method of determination.

REMARKS.—This entry describes factors that may affect the water level in a well or the measurement of the water level, when various methods of measurement were begun, and the network (climatic, terrane, local, or areal effects) or the special project to which the well belongs.

PERIOD OF RECORD.—This entry indicates the time period for which records are published for the well, the month and year at the start of publication of water-level records by the USGS, and the words “to current year” if the records are to be continued into the following year. Time periods for which water-level records are available, but are not published by the USGS, may be noted.

EXTREMES FOR PERIOD OF RECORD.—This entry contains the highest and lowest instantaneously recorded or measured water levels of the period of published record, with respect to land-surface datum or sea level, and the dates of occurrence.

Water-Level Tables

A table of water levels follows the well description for each well. Water-level measurements in this report are given in feet with reference to either sea level or land-surface datum (lsd). Missing records are indicated by dashes in place of the water-level value.

For wells not equipped with recorders, water-level measurements were obtained periodically by steel or electric tape. Tables of periodic water-level measurements in these wells show the date of measurement and the measured water-level value.

Hydrographs

Hydrographs are a graphic display of water-level fluctuations over a period of time. In this report, current water year and, when appropriate, period-of-record hydrographs are shown. Hydrographs that display periodic water-level measurements show points that may be connected with a dashed line from one measurement to the next. Hydrographs that display recorder data show a solid line representing the mean water level recorded for each day. Missing data are indicated by a blank space or break in a hydrograph. Missing data may occur as a result of recorder malfunctions, battery failures, or mechanical problems related to the response of the recorder’s float mechanism to water-level fluctuations in a well.

GROUND-WATER-QUALITY DATA

Data Collection and Computation

The ground-water-quality data in this report were obtained as a part of special studies in specific areas. Consequently, a number of chemical analyses are presented for some wells within a county but not for others. As a result, the records for this year, by themselves, do not provide a balanced view of ground-water quality statewide.

Most methods for collecting and analyzing water samples are described in the TWRIs, which may be accessed from *http://water.usgs.gov/pubs/twri/*. Procedures for onsite measurements and for collecting, treating, and shipping samples are given in TWRI, Book 1, Chapter D2; Book 5, Chapters A1, A3, and A4; and Book 9, Chapters A1-A6. Also, detailed information on collecting, treating, and shipping samples may be obtained from the USGS Water Science Center (see address shown on back of title page in this report).

Laboratory Measurements

Analysis for sulfide and measurement of alkalinity, pH, water temperature, specific conductance, and dissolved oxygen are performed onsite. All other sample analyses are performed at the USGS laboratory in Lakewood, Colorado, unless otherwise noted. Methods used by the USGS laboratory are given in TWRI, Book 1, Chapter D2 and Book 5, Chapters A1, A3, and A4, which may be accessed from *http://water.usgs.gov/pubs/twri/*.

ACCESS TO USGS WATER DATA

The USGS provides near real-time stage and discharge data for many of the gaging stations equipped with the necessary telemetry and historic daily mean and peak-flow discharge data for most current or discontinued gaging stations through the World Wide Web (WWW). These data may be accessed from *http://water.usgs.gov*.

Water-quality data and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on various media. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each USGS Water Science Center. (See address that is shown on the back of the title page of this report.)

DEFINITION OF TERMS

Specialized technical terms related to streamflow, water-quality, and other hydrologic data, as used in this report, may be accessed from *http://water.usgs.gov/ADR_Defs_2005.pdf*. Terms such as algae, water level, and precipitation are used in their common everyday meanings, definitions of which are given in standard dictionaries. Not all terms defined in this alphabetical list apply to every State. See also table for converting English units to International System (SI) Units. Other glossaries that also define water-related terms are accessible from *http://water.usgs.gov/glossaries.html*.

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