



Historical Dates of Ice-Affected Flows for 18 Rivers in New England

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By Glenn A. Hodgkins, James M. Caldwell, and Robert W. Dudley

Open-File Report 03-245

Augusta, Maine
2003

U.S. DEPARTMENT OF THE INTERIOR
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U.S. GEOLOGICAL SURVEY
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CONVERSION FACTORS AND HORIZONTAL DATUM

Multiply	By	To obtain
mile	1.609	kilometer
square mile	2.590	square kilometer
foot	0.3048	meter
cubic foot	0.02832	cubic meter

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83)

Historical Dates of Ice-Affected Flows for 18 Rivers in New England

By Glenn A. Hodgkins, James M. Caldwell and Robert W. Dudley

ABSTRACT

Historical dates of ice-affected flows for 18 rivers in New England were compiled and are presented in this report. The length of this record for the rivers ranges from 48 to 71 years, with an average of 62 years. The minimum number of days of ice-affected flow in a water year (October 1 to September 30) ranged from zero on three rivers in south-coastal Maine and coastal New Hampshire to 110 on the Allagash River in northern Maine. The maximum number of days of ice-affected flow in a water year ranged from 106 on the Royal River in south-coastal Maine to 171 on the Allagash River in northern Maine. Six streamflow-gaging stations in Maine, New Hampshire, and Vermont had their latest days of ice-affected flow in the spring of 1939.

INTRODUCTION

Documentation of changes (or lack of changes) in long-term hydrologic data series in New England and other regions of the world are important for various reasons, including validation of global climate models at a regional scale and analysis of the effects of climatic changes on regional ecosystems. River flows in the 20th century in the United States were analyzed by Lins and Slack (1999). Historical lake ice-out dates in New England have been reported (Hodgkins and James, 2002) and analyzed (Hodgkins and others, 2002). The annual dates of ice-affected river flows for the six New England States (Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island) have not been well documented.

Historical dates of ice-affected flow were compiled for 18 rivers in New England as part of a larger study to compile and analyze long-term hydroclimatological data in New England. These data are generally available from the 1930's or 1940's through 2000. The historical dates of ice-affected flow were

compiled by analyzing U.S. Geological Survey (USGS) historical data reports (the annual Water-Data Reports and their predecessor Water-Supply Papers, for States in New England) and files. This report, prepared as part of the USGS Global Change Hydrology Program, makes these data easily available to researchers and other interested parties.

This report would not have been possible without the collection, compilation, and archiving of river ice and flow data by many USGS hydrologic technicians and hydrologists over the past century, often under hazardous conditions. Glenn Smith and other USGS employees in Maine and New Hampshire compiled most of the data used in this report.

EFFECT OF ICE FORMATION ON THE COMPUTATION OF RIVER FLOWS

Some rivers have been gaged by the USGS in New England for more than 100 years. The primary product of USGS streamflow-gaging efforts has been the computation and publication of daily mean river flows. Flows typically are not measured continuously though. Instead, the river height is measured continuously and the flows subsequently computed using a river height/flow relation, usually called a rating curve. The presence of ice in a river channel affects the relation between river height and flow (Rantz and others, 1982); therefore, the presence of ice in rivers has been historically determined and recorded. The following general discussion of river ice and its effect on the computation of river flow is taken from Rantz and others (1982).

The formation of ice in river channels, in particular on control sections (the riffles downstream of a gaging station that often control the river height at the station), affects the river height/flow relation by causing backwater (a higher-than-normal river height for a given flow). This backwater varies with the quan-

tity and nature of the ice, as well as with the flow. Backwater at a gaging station can be caused by anchor ice or by surface ice. Anchor ice is an accumulation of spongy ice or slush adhering to the rocks of a riverbed. Anchor ice is believed to be either (1) frazil ice (ice crystals formed at the water surface where turbulence prevents the ice crystals from coalescing to form sheet ice) that turbulent currents have carried to the riverbed where the ice then adhered to the rocks, or (2) ice that formed as the result of supercooled water finding nucleating agents on the riverbed on which to crystallize. The ice crystals first formed on the rocks act as nucleating agents for the continued growth of the ice mass.

Regardless of how anchor ice forms, it cannot form or exist when the rocks are warmed by shortwave radiation from the sun which penetrates the water. When the morning sun strikes anchor ice that had formed the night before, and the riverbed is warmed by the incoming solar radiation, the anchor ice is released and floats to the surface.

Anchor ice may build up on the riverbed and (or) the control section to the extent that backwater results. The river-height rise starts in late evening or early morning when the ice begins to form and adhere to the rocks and raises the water level. Usually by 10 a.m., the sun has warmed the riverbed sufficiently to release the ice and the river height starts to fall. The distinguishing feature of the “anchor-ice hump” in river height records is that the rise is slow compared to the fall, whereas an actual increase in river flow would cause changes in river height in the opposite sequence, or at least the river height rise would be as rapid as the fall.

The second type of ice that causes backwater at a gaging station is surface ice. With the onset of cold weather, the water in a river gradually is cooled. Along the riverbanks where the water is quiescent and depths usually are very shallow, temperatures reach the freezing point more quickly; ice crystals form on the surface and adhere to the banks, twigs, and projecting rocks, and a thin ice sheet forms. In the absence of nuclei in the open channel on which the ice crystals may form, there may be slight supercooling of the surface layer before any ice crystals are produced.

The ice sheet builds out from the shore as supercooled water, or water carrying ice crystals, impinges on the already-formed shore ice, and the transported or newly formed ice crystals adhere to the sheet. Eventually, an ice sheet forms across the entire river. The

ensuing increase in the thickness of the ice sheet occurs almost entirely at the interface of ice and water. Surface ice, where it is in contact with the river, increases the frictional resistance and the river height will increase for a given flow.

Rises in river height caused by anchor ice are clearly recognizable from continuous river-height records. Rises in river height caused by surface ice are often recognizable from continuous river-height records. Rantz and others (1982) show examples of the effect of ice on river-height records. River-height records are supplemented by visual observations of river ice conditions, river flow measurements, and daily temperature and precipitation records.

The first ice-affected river flows in New England each fall are caused by the first substantial presence of anchor ice and (or) surface ice. The breakup of river ice in the spring, at rivers with complete or nearly complete ice cover, typically is a dramatic event with the ice cover being picked up and transported by medium or high river flows. Days of ice-affected flows each winter, in general, range from continuous or nearly continuous (from the first to last days of ice-affected flows) in far northern New England to intermittent days of ice-affected flows in southern and coastal New England.

CONSISTENCY OF DETERMINATION OF DAYS OF ICE-AFFECTED FLOW OVER TIME

The presence of ice has been determined by the USGS using the same methods from 1913 (and probably before this for several years) to the present (Hoyt, 1913; Rantz and others, 1982), with one known exception. The earliest river-height records in New England typically were collected daily by an observer, rather than by a continuous recorder, until the 1930's. The presence of ice that affects the river height/flow relation, especially anchor ice, may have been interpreted differently using these two methods of data collection. Therefore, for this report, dates of ice-affected flows are reported only for those years when continuous recorders were used at each gaging station.

HISTORICAL DATES OF ICE-AFFECTED FLOW

Records from all gaging stations on rivers in the six New England states (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)

(fig. 1) were searched for long-term, usable records. Long-term records are defined as those from a gaging station that was operated for at least 50 years with records through water year 2000. (A water year begins October 1 of the previous calendar year and ends September 30 of the current calendar year. For example, water year 2000 begins October 1, 1999 and ends September 30, 2000.) Usable records are defined as those from a gaging station where its location did not change during the period of record and where flows were not regulated substantially. Ice conditions can be very different in different locations, even a short distance upstream or downstream from any given location. Substantial regulation is defined as regulation that could affect the formation and (or) stability of ice at the station. This condition required that a river at a gaging station either had no known flow regulation over time or an amount of low-flow regulation that was judged to be not substantial. Seven of the 18 rivers considered in this report had some low-flow regulation for all or part of their period of record.

Sixteen gaging stations on rivers in New England met the criteria of this study (tables 1-3, 5, and 7-18). Records from two additional rivers in Maine did not have continuous data up to water year 2000 (Machias River at Whitneyville, Maine and West Branch Union River at Amherst, Maine; tables 4 and 6) but are included in this report because they were compiled for a USGS climate project in coastal Maine (Dudley and Hodgkins, 2002). Data collection at these two rivers was discontinued in the late 1970's. The length of record presented for the 18 rivers in this report ranges from 48 to 71 years, with an average of 62 years.

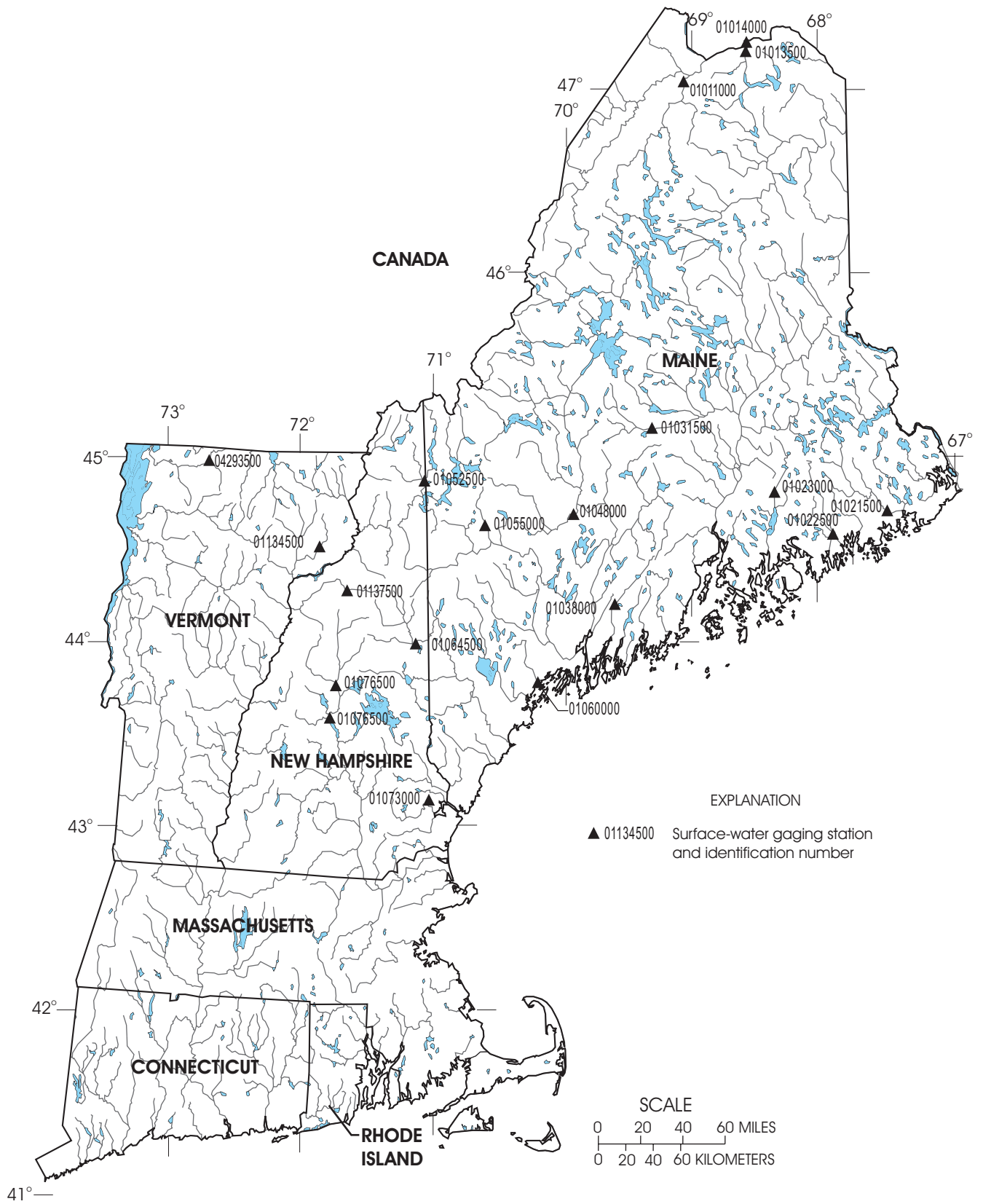
The reported days of ice-affected flows during periods of missing river-height record at a gaging station can be less accurate than if the river-height record was not missing. Individual years of record, at gaging stations with missing winter river-height record, were censored (tables 1 to 18) if there was any question about the accuracy of the ice-affected flow records. In general, the only acceptable ice-affected flow data in years with missing river-height record were short amounts of missing river-height record at sites with long, continuous periods of ice-affected flows. In these cases, the missing river-height record was not near the beginning or end of the days of ice-affected flow for the winter and there were no substantial peak flows during the period of missing record.

Historical dates of ice-affected flow for 18 rivers in New England are listed in tables 1 through 18. Ice-on in these tables refers to the first day of ice-affected flow for a period of time and ice-off refers to the last day of ice-affected flow for that period of time. A summary of the available data is contained in table 19. All known historical regulation at these sites is listed in tables 1-18. The geographic locations of the 18 gaging stations are shown in figure 1. Most of these rivers are in Maine, with a few in New Hampshire and Vermont. No long-term records were used from Massachusetts, Connecticut, or Rhode Island because no rivers in these states met the criteria of this study.

HISTORICAL EXTREMES OF DAYS OF ICE-AFFECTED FLOW

The earliest dates of ice-affected flows in the fall during the period of record of the gaging stations in this study (tables 1-18, table 19, fig. 1) ranged from October 30th on the Piscataquis River in central Maine to November 24th on the Royal River in south-coastal Maine. The latest dates of ice-affected flows in the spring ranged from March 26th on the Sheepscot River in south-coastal Maine to May 5th on the Allagash River in northern Maine. The minimum number of days of ice-affected flow in a water year ranged from zero on three rivers in south-coastal Maine and coastal New Hampshire to 110 on the Allagash River in northern Maine. The maximum number of days of ice-affected flow in a water year ranged from 106 on the Royal River in south-coastal Maine to 171 on the Allagash River in northern Maine.

Three or more gaging stations experienced extreme dates of ice-affected flow in specific water years. The earliest dates of ice-affected flow in the fall, during the period of record of three gaging stations in New Hampshire and Vermont, were in 1971. Six gaging stations in Maine, New Hampshire, and Vermont had their latest spring dates of ice-affected flow in 1939, whereas three gaging stations in northern Maine and northern New Hampshire had their latest dates in 1943. Three gaging stations in Maine and New Hampshire had their lowest number of annual days of ice-affected flows in 1999. Four stations in northern and central Maine had their highest number of days in 1943, three stations in Maine and New Hampshire had their highest number of days in 1956, and three stations in northern New England had their highest number of days in 1972.



Base from U.S. Geological Survey digital files 1:2,000,000 projection UTM, zone 19

Figure 1. U.S. Geological Survey streamflow-gaging stations with historical ice-affected flow data in New England.

Table 1. Annual periods of ice-affected flows for 01011000 Allagash River near Allagash, Maine

LOCATION.--Lat 47°04'14", long 69°04'51", Aroostook County, on left bank 3.0 miles upstream from mouth and village of Allagash (fig. 1).

DRAINAGE AREA.--1,229 square miles, not including 249 square miles drained by Chamberlain Lake through Telos Canal.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1932 - 2000.

REGULATION.--None known water years 1932 - 1968. Some regulation for recreational purposes since May 1969 by Churchill Lake, usable capacity, about 3.4 billion cubic feet, 58 miles upstream.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 14, 1998; latest date of ice-affected flow, May 5, 1943; minimum number of days of ice-affected flow, 110, 1945; maximum number of days of ice-affected flow, 171, 1943.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1932	4-Dec-31	19-Apr-32						
1933	28-Nov-32	1-Dec-32	10-Dec-32	28-Apr-33				
1934	16-Nov-33	16-Apr-34						
1935	5-Dec-34	25-Apr-35						
1936	18-Nov-35	20-Nov-35	24-Nov-35	22-Mar-36				
1937	29-Nov-36	14-Apr-37						
1938	8-Dec-37	19-Apr-38						
1939	c							
1940	c							
1941	21-Nov-40	19-Apr-41						
1942	26-Nov-41	26-Apr-42						
1943	16-Nov-42	5-May-43						
1944	1-Dec-43	29-Apr-44						
1945	13-Dec-44	1-Apr-45						
1946	22-Nov-45	22-Apr-46						
1947	3-Dec-46	26-Apr-47						
1948	24-Nov-47	13-Apr-48						
1949	19-Dec-48	13-Apr-49						
1950	24-Nov-49	28-Nov-49	3-Dec-49	19-Apr-50				
1951	21-Dec-50	15-Apr-51						
1952	15-Dec-51	24-Apr-52						
1953	5-Dec-52	1-Apr-53						
1954	18-Dec-53	19-Apr-54						
1955	7-Dec-54	18-Apr-55						
1956	21-Nov-55	20-Apr-56						
1957	19-Nov-56	22-Apr-57						
1958	4-Dec-57	22-Dec-57	10-Jan-58	19-Apr-58				
1959	27-Nov-58	28-Nov-58	30-Nov-58	5-Dec-58	7-Dec-58	21-Apr-59		
1960	9-Dec-59	26-Apr-60						
1961	30-Nov-60	1-Dec-60	6-Dec-60	28-Apr-61				
1962	18-Nov-61	4-Dec-61	11-Dec-61	19-Apr-62				

Table 1. Annual periods of ice-affected flows for 01011000 Allagash River near Allagash, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1963	12-Dec-62	23-Apr-63						
1964	10-Dec-63	21-Apr-64						
1965	c							
1966	26-Nov-65	26-Nov-65	29-Nov-65	19-Apr-66				
1967	21-Nov-66	25-Nov-66	3-Dec-66	8-Dec-66	14-Dec-66	24-Apr-67		
1968	27-Nov-67	14-Apr-68						
1969	26-Nov-68	21-Apr-69						
1970	24-Nov-69	2-Dec-69	4-Dec-69	7-Dec-69	9-Dec-69	11-Dec-69	15-Dec-69	27-Apr-70
1971	27-Nov-70	2-May-71						
1972	23-Nov-71	2-May-72						
1973	21-Nov-72	22-Nov-72	24-Nov-72	25-Nov-72	1-Dec-72	3-Apr-73		
1974	19-Nov-73	29-Apr-74						
1975	29-Nov-74	23-Apr-75						
1976	22-Nov-75	5-Apr-76						
1977	4-Dec-76	19-Apr-77						
1978	6-Dec-77	26-Apr-78						
1979	24-Nov-78	27-Mar-79						
1980	2-Dec-79	15-Apr-80						
1981	15-Dec-80	6-Apr-81						
1982	19-Dec-81	20-Dec-81	22-Dec-81	26-Apr-82				
1983	11-Dec-82	18-Apr-83						
1984	19-Dec-83	23-Apr-84						
1985	5-Dec-84	23-Apr-85						
1986	22-Nov-85	2-Apr-86						
1987	19-Nov-86	1-Apr-87						
1988	27-Nov-87	1-Dec-87	14-Dec-87	7-Apr-88				
1989	4-Dec-88	8-Apr-89						
1990	22-Nov-89	7-Apr-90						
1991	11-Dec-90	11-Apr-91						
1992	3-Dec-91	22-Apr-92						
1993	5-Dec-92	12-Apr-93						
1994	25-Nov-93	28-Nov-93	30-Nov-93	3-Dec-93	9-Dec-93	10-Dec-93	13-Dec-93	14-Dec-93
	16-Dec-93	21-Dec-93	24-Dec-93	18-Apr-94				
1995	8-Dec-94	18-Apr-95						
1996	25-Nov-95	20-Apr-96						
1997	24-Nov-96	30-Nov-96	22-Dec-96	22-Apr-97				
1998	23-Nov-97	2-Apr-98	4-Apr-98	4-Apr-98				
1999	14-Nov-98	9-Apr-99						
2000	18-Nov-99	20-Nov-99	18-Dec-99	3-Apr-00				

Table 2. Annual periods of ice-affected flows for 01013500 Fish River near Fort Kent, Maine

LOCATION.--Lat 47°14'14", long 68°34'56", Aroostook County, on right bank 300 feet upstream from highway bridge at Fort Kent Mills, 2 miles upstream from mouth, and 2 miles south of Fort Kent (fig. 1).

DRAINAGE AREA.--873 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1930 - 2000.

REGULATION.--None known water years 1930 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 17, 1955; latest date of ice-affected flow, April 28, 1939 and 1943; minimum number of days of ice-affected flow, 48, 1958; maximum number of days of ice-affected flow, 151, 1943.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1930	28-Nov-29	5-Apr-30						
1931	28-Nov-30	26-Mar-31						
1932	14-Dec-31	13-Apr-32						
1933	17-Dec-32	19-Dec-32	2-Jan-33	2-Jan-33	6-Jan-33	14-Apr-33		
1934	9-Dec-33	13-Apr-34						
1935	4-Dec-34	11-Apr-35						
1936	25-Nov-35	27-Nov-35	5-Dec-35	18-Mar-36				
1937	1-Dec-36	2-Apr-37						
1938	21-Dec-37	27-Mar-38						
1939	16-Dec-38	28-Apr-39						
1940	12-Dec-39	16-Apr-40						
1941	27-Nov-40	15-Apr-41						
1942	11-Dec-41	31-Mar-42						
1943	29-Nov-42	28-Apr-43						
1944	12-Dec-43	20-Apr-44						
1945	19-Dec-44	26-Mar-45						
1946	13-Dec-45	25-Mar-46						
1947	12-Dec-46	10-Mar-47						
1948	30-Nov-47	7-Apr-48						
1949	c							
1950	25-Dec-49	26-Dec-49	30-Dec-49	31-Dec-49	9-Jan-50	10-Jan-50	13-Jan-50	13-Jan-50
	15-Jan-50	15-Jan-50	18-Jan-50	22-Jan-50	24-Jan-50	29-Jan-50	31-Jan-50	12-Apr-50
1951	c							
1952	19-Dec-51	16-Apr-52						
1953	19-Dec-52	23-Dec-52	27-Dec-52	28-Mar-53				
1954	20-Dec-53	19-Mar-54						
1955	8-Dec-54	5-Apr-55						
1956	17-Nov-55	12-Apr-56						
1957	26-Nov-56	28-Nov-56	2-Dec-56	5-Apr-57				
1958	9-Feb-58	28-Mar-58						
1959	3-Dec-58	4-Dec-58	11-Dec-58	9-Apr-59				
1960	23-Dec-59	25-Dec-59	28-Dec-59	29-Dec-59	1-Jan-60	3-Apr-60		
1961	10-Dec-60	16-Apr-61						

Table 2. Annual periods of ice-affected flows for 01013500 Fish River near Fort Kent, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1962	22-Dec-61	8-Apr-62						
1963	13-Dec-62	8-Jan-63	12-Jan-63	13-Apr-63				
1964	c							
1965	c							
1966	12-Dec-65	24-Mar-66						
1967	25-Dec-66	18-Apr-67						
1968	19-Dec-67	31-Mar-68						
1969	22-Nov-68	25-Nov-68	30-Nov-68	2-Dec-68	9-Dec-68	19-Apr-69		
1970	11-Dec-69	14-Dec-69	18-Dec-69	2-Apr-70				
1971	9-Dec-70	20-Apr-71						
1972	26-Nov-71	1-Apr-72						
1973	20-Dec-72	18-Mar-73						
1974	5-Jan-74	8-Apr-74						
1975	5-Dec-74	10-Apr-75						
1976	5-Dec-75	27-Mar-76						
1977	11-Dec-76	27-Mar-77						
1978	7-Dec-77	22-Apr-78						
1979	24-Nov-78	26-Mar-79						
1980	21-Dec-79	10-Apr-80						
1981	2-Dec-80	24-Feb-81						
1982	27-Dec-81	28-Dec-81	5-Jan-82	20-Apr-82				
1983	16-Dec-82	18-Dec-82	24-Dec-82	24-Dec-82	5-Jan-83	16-Jan-83	21-Jan-83	23-Mar-83
1984	20-Dec-83	31-Mar-84						
1985	22-Dec-84	24-Dec-84	1-Jan-85	29-Mar-85				
1986	3-Dec-85	8-Dec-85	16-Dec-85	7-Feb-86	25-Feb-86	12-Mar-86	20-Mar-86	23-Mar-86
	25-Mar-86	25-Mar-86						
1987	1-Dec-86	2-Dec-86	9-Dec-86	10-Dec-86	13-Dec-86	14-Dec-86	16-Feb-86	18-Feb-86
	21-Dec-86	31-Mar-87						
1988	26-Dec-87	2-Apr-88						
1989	11-Dec-88	7-Apr-89						
1990	28-Nov-89	29-Nov-89	1-Dec-89	31-Mar-90				
1991	14-Dec-90	15-Dec-90	20-Dec-90	22-Dec-90	25-Dec-90	9-Apr-91		
1992	6-Dec-91	5-Apr-92						
1993	8-Dec-92	12-Dec-92	21-Dec-92	11-Apr-93				
1994	27-Dec-93	9-Apr-94						
1995	11-Dec-94	21-Jan-95	26-Jan-95	20-Mar-95				
1996	9-Dec-95	13-Dec-95	17-Dec-95	21-Dec-95	30-Dec-95	29-Jan-96	13-Feb-96	21-Feb-96
1997	26-Dec-96	26-Dec-96	1-Jan-97	12-Apr-97				
1998	10-Dec-97	9-Mar-98	12-Mar-98	13-Mar-98				
1999	19-Dec-98	14-Mar-99						
2000	1-Jan-00	2-Jan-00	6-Jan-00	8-Jan-00	13-Jan-00	21-Mar-00		

Table 3. Annual periods of ice-affected flows for 01014000 St. John below Fish River, at Fort Kent, Maine

LOCATION.--Lat 47°15'35", long 68°35'43", on right bank at Fort Kent and 0.2 miles downstream from Fish River (fig. 1).

DRAINAGE AREA.--5,665 square miles, not including 249 square miles drained by Chamberlain Lake through Telos Canal.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1934 - 2000.

REGULATION.--None known water years 1934 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 12, 1942; latest date of ice-affected flow, April 30, 1944 and 1972; minimum number of days of ice-affected flow, 107, 1936; maximum number of days of ice-affected flow, 159, 1943.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1934	18-Nov-33	17-Apr-34						
1935	7-Dec-34	22-Apr-35						
1936	5-Dec-35	20-Mar-36						
1937	29-Nov-36	23-Apr-37						
1938	6-Dec-37	16-Apr-38						
1939	30-Nov-38	9-Dec-38	15-Dec-38	29-Apr-39				
1940	11-Dec-39	19-Apr-40						
1941	27-Nov-40	17-Apr-41						
1942	25-Nov-41	3-Dec-41	7-Dec-41	24-Apr-42				
1943	12-Nov-42	15-Nov-42	26-Nov-42	29-Apr-43				
1944	2-Dec-43	30-Apr-44						
1945	13-Dec-44	31-Mar-45						
1946	11-Dec-45	2-Apr-46						
1947	11-Dec-46	13-Apr-47						
1948	24-Nov-47	24-Nov-47	27-Nov-47	12-Apr-48				
1949	18-Dec-48	5-Apr-49						
1950	2-Dec-49	22-Apr-50						
1951	22-Dec-50	9-Apr-51						
1952	15-Dec-51	22-Apr-52						
1953	13-Dec-52	31-Mar-53						
1954	18-Dec-53	18-Apr-54						
1955	21-Dec-54	17-Apr-55						
1956	18-Nov-55	27-Nov-55	30-Nov-55	22-Apr-56				
1957	25-Nov-56	26-Nov-56	3-Dec-56	22-Apr-57				
1958	c							
1959	9-Dec-58	10-Apr-59	18-Apr-59	20-Apr-59				
1960	19-Nov-59	21-Nov-59	9-Dec-59	21-Apr-60				
1961	1-Dec-60	8-Dec-60	11-Dec-60	15-Dec-60	19-Dec-60	28-Apr-61		
1962	27-Nov-61	12-Apr-62						
1963	14-Dec-62	19-Apr-63						
1964	14-Dec-63	18-Apr-64						
1965	c							

Table 3. Annual periods of ice-affected flows for 01014000 St. John below Fish River, at Fort Kent, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1966	26-Nov-65	27-Nov-65	2-Dec-65	19-Apr-66				
1967	27-Nov-66	28-Nov-66	6-Dec-66	7-Dec-66	14-Dec-66	27-Apr-67		
1968	2-Dec-67	13-Apr-68						
1969	28-Nov-68	21-Apr-69						
1970	29-Dec-69	25-Apr-70						
1971	5-Dec-70	25-Apr-71						
1972	28-Nov-71	30-Apr-72						
1973	5-Dec-72	5-Apr-73						
1974	23-Nov-73	14-Dec-73	20-Dec-73	16-Apr-74				
1975	25-Nov-74	10-Dec-74	17-Dec-74	26-Apr-75				
1976	23-Nov-75	27-Nov-75	6-Dec-75	5-Apr-76				
1977	9-Dec-76	10-Apr-77						
1978	13-Dec-77	24-Apr-78						
1979	24-Nov-78	27-Mar-79						
1980	13-Dec-79	15-Apr-80						
1981	12-Dec-80	6-Apr-81						
1982	3-Jan-82	26-Apr-82						
1983	12-Dec-82	13-Dec-82	16-Dec-82	17-Apr-83				
1984	11-Dec-83	13-Dec-83	20-Dec-83	20-Apr-84				
1985	16-Dec-84	21-Apr-85						
1986	16-Dec-85	2-Apr-86						
1987	24-Nov-86	31-Mar-87						
1988	16-Dec-87	5-Apr-88						
1989	4-Dec-88	8-Apr-89						
1990	23-Nov-89	3-Apr-90						
1991	4-Dec-90	21-Dec-90	25-Dec-90	11-Apr-91				
1992	3-Dec-91	22-Apr-92						
1993	5-Dec-92	12-Apr-93						
1994	24-Dec-93	15-Apr-94						
1995	23-Nov-94	5-Dec-94	12-Dec-94	20-Jan-95	23-Jan-95	18-Apr-95		
1996	26-Nov-95	25-Jan-96	29-Jan-96	8-Feb-96	13-Feb-96	25-Feb-96	12-Mar-96	15-Apr-96
1997	25-Nov-96	30-Nov-96	23-Dec-96	23-Apr-97				
1998	25-Nov-97	31-Mar-98						
1999	16-Nov-98	13-Apr-99						
2000	18-Nov-99	21-Nov-99	18-Dec-99	3-Apr-00				

Table 4. Annual periods of ice-affected flows for 01021500 Machias River at Whitneyville, Maine

LOCATION.--Lat 44°43'23", long 67°31'15", Washington County, on right bank 800 feet downstream from highway bridge at Whitneyville (fig. 1).

DRAINAGE AREA.--458 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1930 - 1977.

REGULATION.--None known water years 1930 - 1977, except for some low-flow regulation by sawmill above station, 1969 - 1974.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 9, 1939; latest date of ice-affected flow, April 9, 1964; minimum number of days of ice-affected flow, 19, 1951; maximum number of days of ice-affected flow, 133, 1940.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1930	1-Dec-29	14-Mar-30						
1931	11-Dec-30	14-Dec-30	16-Dec-30	16-Dec-30	18-Dec-30	28-Mar-31		
1932	5-Dec-31	9-Dec-31	16-Dec-31	30-Dec-31	3-Jan-32	5-Jan-32	7-Jan-32	30-Mar-32
1933	12-Dec-32	13-Mar-33	16-Mar-33	16-Mar-33	22-Mar-33	28-Mar-33		
1934	28-Nov-33	4-Dec-33	12-Dec-33	29-Mar-34				
1935	9-Dec-34	6-Apr-35						
1936	4-Jan-36	15-Mar-36						
1937	26-Nov-36	2-Dec-36	18-Dec-36	20-Dec-36	22-Dec-36	23-Dec-36	1-Jan-37	6-Jan-37
	11-Jan-37	11-Jan-37	26-Jan-37	28-Jan-37	30-Jan-37	31-Jan-37	4-Feb-37	8-Feb-37
	12-Feb-37	12-Feb-37	15-Feb-37	19-Feb-37	24-Feb-37	7-Mar-37	10-Mar-37	11-Mar-37
	17-Mar-37	18-Mar-37	23-Mar-37	25-Mar-37				
1938	12-Dec-37	15-Dec-37	19-Dec-37	19-Jan-38	1-Feb-38	5-Feb-38	11-Feb-38	11-Mar-38
	15-Mar-38	15-Mar-38	21-Mar-38	26-Mar-38				
1939	4-Jan-39	6-Jan-39	12-Jan-39	6-Apr-39				
1940	9-Nov-39	9-Nov-39	11-Nov-39	15-Nov-39	26-Nov-39	29-Mar-40	6-Apr-40	7-Apr-40
1941	29-Nov-40	14-Jan-41	7-Feb-41	2-Apr-41				
1942	30-Nov-41	1-Dec-41	8-Dec-41	8-Dec-41	11-Dec-41	12-Dec-41	21-Dec-41	23-Dec-41
	6-Jan-42	18-Jan-42	20-Jan-42	26-Jan-42	29-Jan-42	30-Jan-42	1-Feb-42	6-Feb-42
	19-Feb-42	19-Feb-42	5-Mar-42	1-Apr-42				
1943	14-Dec-42	16-Mar-43	24-Mar-43	24-Mar-43	29-Mar-43	30-Mar-43	4-Apr-43	7-Apr-43
1944	11-Dec-43	22-Mar-44	29-Mar-44	29-Mar-44	2-Apr-44	3-Apr-44		
1945	17-Dec-44	1-Jan-45	6-Jan-45	12-Mar-45				
1946	11-Dec-45	15-Dec-45	17-Dec-45	18-Dec-45	20-Dec-45	22-Dec-45	13-Jan-46	20-Mar-46
1947	25-Dec-46	12-Feb-47	19-Feb-47	1-Mar-47	15-Mar-47	19-Mar-47	25-Mar-47	25-Mar-47
1948	3-Dec-47	14-Dec-47	28-Dec-47	26-Mar-48				
1949	14-Dec-48	31-Dec-48	14-Jan-49	21-Feb-49	28-Feb-49	9-Mar-49	13-Mar-49	21-Mar-49
1950	7-Jan-50	9-Jan-50	11-Jan-50	12-Jan-50	19-Jan-50	19-Jan-50	1-Feb-50	10-Feb-50
	20-Feb-50	20-Mar-50						
1951	23-Dec-50	25-Dec-50	30-Dec-50	4-Jan-51	9-Jan-51	11-Jan-51	13-Jan-51	15-Jan-51
	22-Jan-51	23-Jan-51	30-Jan-51	31-Jan-51				
1952	3-Dec-51	5-Dec-51	13-Dec-51	4-Mar-52				
1953	29-Dec-52	29-Dec-52	16-Jan-53	17-Jan-53	1-Feb-53	6-Feb-53	11-Feb-53	15-Feb-53
	22-Feb-53	23-Feb-53	1-Mar-53	2-Mar-53	10-Mar-53	12-Mar-53		

Table 4. Annual periods of ice-affected flows for 01021500 Machias River at Whitneyville, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1954	23-Dec-53	24-Dec-53	30-Dec-53	2-Jan-54	9-Jan-54	2-Feb-54	11-Feb-54	14-Feb-54
	10-Mar-54	20-Mar-54						
1955	24-Dec-54	27-Feb-55	3-Mar-55	3-Mar-55	8-Mar-55	8-Mar-55	15-Mar-55	15-Mar-55
1956	20-Dec-55	6-Apr-56						
1957	25-Dec-56	22-Jan-57	19-Feb-57	21-Feb-57	24-Feb-57	24-Feb-57	27-Feb-57	1-Mar-57
	4-Mar-57	6-Mar-57	9-Mar-57	11-Mar-57				
1958	12-Jan-58	12-Jan-58	3-Feb-58	7-Feb-58	11-Feb-58	11-Feb-58	14-Feb-58	16-Feb-58
	18-Feb-58	21-Feb-58	23-Feb-58	24-Feb-58	26-Feb-58	27-Feb-58	16-Mar-58	16-Mar-58
	18-Mar-58	19-Mar-58						
1959	6-Dec-58	7-Dec-58	10-Dec-58	23-Mar-59				
1960	1-Jan-60	4-Jan-60	9-Jan-60	14-Jan-60	16-Jan-60	22-Jan-60	24-Jan-60	6-Feb-60
	2-Mar-60	3-Mar-60	9-Mar-60	17-Mar-60	25-Mar-60	27-Mar-60	29-Mar-60	3-Apr-60
1961	3-Jan-61	3-Jan-61	5-Jan-61	6-Jan-61	9-Jan-61	13-Jan-61	15-Jan-61	15-Jan-61
	18-Jan-61	26-Feb-61						
1962	15-Dec-61	18-Dec-61	25-Dec-61	25-Dec-61	27-Jan-62	5-Feb-62	27-Mar-62	31-Mar-62
1963	12-Dec-62	19-Jan-63	23-Jan-63	11-Feb-63	15-Feb-63	18-Feb-63	20-Feb-63	20-Feb-63
	22-Feb-63	26-Mar-63						
1964	4-Dec-63	5-Dec-63	11-Dec-63	13-Dec-63	15-Dec-63	23-Dec-63	28-Dec-63	1-Jan-64
	16-Jan-64	16-Jan-64	28-Jan-64	31-Jan-64	2-Feb-64	20-Feb-64	22-Feb-64	28-Feb-64
	11-Mar-64	22-Mar-64	4-Apr-64	6-Apr-64	8-Apr-64	9-Apr-64		
1965	2-Jan-65	8-Jan-65	14-Jan-65	25-Feb-65	12-Mar-65	13-Mar-65	20-Mar-65	22-Mar-65
	24-Mar-65	24-Mar-65	27-Mar-65	29-Mar-65	31-Mar-65	31-Mar-65		
1966	20-Dec-65	25-Dec-65	9-Jan-66	13-Jan-66	16-Jan-66	16-Jan-66	28-Jan-66	29-Jan-66
	6-Mar-66	10-Mar-66	15-Mar-66	16-Mar-66				
1967	19-Dec-66	20-Dec-66	6-Jan-67	7-Jan-67	12-Jan-67	31-Mar-67		
1968	30-Dec-67	3-Feb-68	6-Feb-68	14-Feb-68	16-Feb-68	22-Feb-68		
1969	21-Dec-68	23-Mar-69						
1970	30-Nov-69	8-Dec-69	9-Jan-70	31-Jan-70	5-Feb-70	10-Feb-70	13-Feb-70	26-Mar-70
1971	10-Dec-70	13-Mar-71	16-Mar-71	4-Apr-71				
1972	29-Dec-71	10-Jan-72	19-Feb-72	8-Mar-72				
1973	17-Dec-72	31-Dec-72	6-Jan-73	18-Jan-73	28-Jan-73	2-Feb-73	17-Feb-73	22-Feb-73
1974	1-Jan-74	24-Jan-74	5-Feb-74	16-Feb-74	7-Mar-74	15-Mar-74		
1975	12-Dec-74	10-Jan-75	18-Jan-75	23-Jan-75	27-Jan-75	24-Feb-75		
1976	19-Dec-75	27-Jan-76	18-Mar-76	20-Mar-76				
1977	9-Dec-76	26-Dec-76	4-Jan-77	28-Feb-77				

Table 5. Annual periods of ice-affected flows for 01022500 Narraguagus River at Cherryfield, Maine

LOCATION.--Lat 44°36'29", long 67°56'10", Washington County, on left bank 800 feet upstream from railroad bridge at Cherryfield and 0.7 miles downstream from West Branch of Narraguagus River (fig. 1).

DRAINAGE AREA.--227 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1949 - 2000.

REGULATION.--None known 1949 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 22, 1989; latest date of ice-affected flow, April 12, 1956; minimum number of days of ice-affected flow, 8, 1999; maximum number of days of ice-affected flow, 127, 1956.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1949	14-Jan-49	26-Mar-49						
1950	31-Dec-49	3-Jan-50	9-Jan-50	13-Feb-50	20-Feb-50	11-Mar-50		
1951	21-Dec-50	2-Jan-51	7-Jan-51	7-Jan-51	9-Jan-51	14-Jan-51	22-Jan-51	23-Jan-51
	1-Feb-51	7-Feb-51	10-Feb-51	10-Mar-51				
1952	15-Dec-51	17-Jan-52						
1953	19-Dec-52	24-Dec-52	28-Dec-52	21-Jan-53	1-Feb-53	5-Feb-53	16-Feb-53	17-Feb-53
	21-Feb-53	1-Mar-53	5-Mar-53	11-Mar-53				
1954	22-Dec-53	23-Feb-54	4-Mar-54	4-Mar-54				
1955	c							
1956	27-Nov-55	27-Nov-55	30-Nov-55	10-Jan-56	20-Jan-56	12-Apr-56		
1957	3-Dec-56	6-Dec-56	20-Dec-56	24-Jan-57	27-Jan-57	13-Feb-57	17-Feb-57	24-Feb-57
	4-Mar-57	7-Mar-57						
1958	3-Dec-57	6-Dec-57	19-Dec-57	19-Dec-57	13-Jan-58	15-Jan-58	15-Feb-58	21-Feb-58
	23-Feb-58	24-Feb-58	26-Feb-58	27-Feb-58				
1959	c							
1960	23-Dec-59	3-Jan-60	10-Jan-60	12-Feb-60	1-Mar-60	4-Mar-60	8-Mar-60	12-Mar-60
	16-Mar-60	17-Mar-60	29-Mar-60	31-Mar-60				
1961	6-Dec-60	8-Dec-60	30-Dec-60	3-Jan-60	16-Jan-60	10-Apr-60		
1962	18-Dec-61	28-Dec-61	4-Jan-62	7-Jan-62	10-Jan-62	15-Jan-62	18-Jan-62	20-Mar-62
	26-Mar-62	26-Mar-62	28-Mar-62	29-Mar-62				
1963	12-Dec-62	11-Feb-63	13-Feb-63	13-Feb-63	15-Feb-63	18-Feb-63	20-Feb-63	4-Mar-63
	10-Mar-63	2-Apr-63						
1964	13-Dec-63	21-Dec-63	23-Dec-63	23-Dec-63	25-Dec-63	16-Jan-64	18-Jan-64	19-Jan-64
	2-Feb-64	6-Mar-64	12-Mar-64	23-Mar-64				
1965	c							
1966	19-Dec-65	24-Dec-65	28-Dec-65	24-Feb-66	8-Mar-66	16-Mar-66		
1967	13-Jan-67	4-Feb-67	12-Feb-67	31-Mar-67				
1968	31-Dec-67	3-Feb-68	6-Feb-68	28-Feb-68	4-Mar-68	8-Mar-68	14-Mar-68	17-Mar-68
1969	23-Dec-68	17-Jan-69	25-Jan-69	24-Mar-69				
1970	30-Nov-69	8-Dec-69	1-Jan-70	6-Jan-70	10-Jan-70	2-Feb-70	5-Feb-70	8-Feb-70
	12-Feb-70	26-Mar-70						

Table 5. Annual periods of ice-affected flows for 01022500 Narraguagus River at Cherryfield, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1971	4-Dec-70	4-Apr-71						
1972	16-Dec-71	12-Jan-72	19-Feb-72	18-Mar-72				
1973	17-Dec-72	1-Jan-73	6-Jan-73	22-Jan-73	6-Feb-73	21-Feb-73		
1974	31-Dec-73	21-Jan-74	8-Feb-74	19-Feb-74	14-Mar-74	16-Mar-74		
1975	22-Dec-74	11-Jan-75	26-Jan-75	24-Feb-75				
1976	18-Dec-75	25-Jan-76	29-Jan-76	7-Feb-76	14-Feb-76	17-Feb-76	18-Mar-76	20-Mar-76
1977	17-Dec-76	21-Dec-76	23-Dec-76	26-Dec-76	4-Jan-77	9-Jan-77	14-Jan-77	26-Jan-77
	1-Feb-77	16-Feb-77	21-Feb-77	23-Feb-77				
1978	7-Dec-77	21-Dec-77	26-Dec-77	5-Jan-78	14-Jan-78	26-Jan-78	10-Feb-78	10-Mar-78
1979	9-Dec-78	16-Dec-78	14-Feb-79	15-Feb-79	17-Feb-79	18-Feb-79	11-Mar-79	13-Mar-79
1980	18-Dec-79	20-Dec-79	27-Dec-79	11-Jan-80	13-Jan-80	24-Mar-80		
1981	15-Dec-80	15-Dec-80	20-Dec-80	27-Dec-80	3-Jan-81	2-Feb-81		
1982	19-Dec-81	4-Jan-82	6-Jan-82	26-Mar-82	2-Apr-82	5-Apr-82		
1983	17-Jan-83	23-Jan-83	9-Feb-83	22-Feb-83				
1984	23-Dec-83	27-Dec-83	12-Jan-84	5-Feb-84	10-Mar-84	13-Mar-84		
1985	26-Dec-84	27-Dec-84	2-Jan-85	12-Feb-85	27-Feb-85	8-Mar-85		
1986	11-Dec-85	21-Jan-86	6-Feb-86	21-Feb-86	26-Feb-86	13-Mar-86		
1987	11-Dec-86	21-Dec-86	4-Jan-87	30-Mar-87				
1988	17-Dec-87	19-Jan-88	5-Feb-88	12-Feb-88	5-Mar-88	6-Mar-88		
1989	5-Dec-88	21-Feb-89	24-Feb-89	14-Mar-89	19-Mar-89	24-Mar-89		
1990	22-Nov-89	17-Jan-90	21-Jan-90	24-Jan-90	3-Feb-90	9-Feb-90	12-Feb-90	22-Feb-90
	25-Feb-90	11-Mar-90						
1991	10-Dec-90	15-Dec-90	21-Dec-90	22-Dec-90	28-Dec-90	29-Dec-90	2-Jan-91	17-Jan-91
	20-Jan-91	27-Jan-91	1-Feb-91	2-Feb-91	11-Feb-91	14-Feb-91	16-Feb-91	20-Feb-91
	22-Feb-91	1-Mar-91						
1992	16-Dec-91	4-Jan-92	11-Jan-92	13-Jan-92	17-Jan-92	22-Jan-92	26-Jan-92	28-Jan-92
	1-Feb-92	15-Feb-92	22-Feb-92	7-Mar-92	14-Mar-92	24-Mar-92		
1993	6-Dec-92	6-Dec-92	11-Dec-92	11-Dec-92	25-Dec-92	28-Dec-92	2-Jan-93	3-Jan-93
	9-Jan-93	21-Jan-93	29-Jan-93	3-Mar-93	7-Mar-93	8-Mar-93	12-Mar-93	21-Mar-93
1994	28-Dec-93	1-Jan-94	6-Jan-94	19-Jan-94	25-Jan-94	28-Jan-94	8-Feb-94	15-Feb-94
	17-Feb-94	17-Feb-94	24-Feb-94	3-Mar-94	6-Mar-94	7-Mar-94		
1995	9-Dec-94	9-Dec-94	12-Dec-94	12-Dec-94	30-Dec-94	30-Dec-94	5-Jan-95	6-Jan-95
	11-Jan-95	11-Jan-95	25-Jan-95	26-Jan-95	29-Jan-95	29-Jan-95	3-Feb-95	15-Feb-95
	26-Feb-95	27-Feb-95	3-Mar-95	5-Mar-95				
1996	15-Dec-95	18-Jan-96	3-Feb-96	20-Feb-96	3-Mar-96	15-Mar-96		
1997	31-Dec-96	5-Jan-97	8-Jan-97	10-Jan-97	18-Jan-97	21-Jan-97	27-Jan-97	27-Jan-97
	29-Jan-97	1-Feb-97	4-Feb-97	4-Feb-97	7-Feb-97	13-Feb-97	16-Feb-97	18-Feb-97
	24-Feb-97	27-Feb-97						
1998	13-Dec-97	25-Dec-97	22-Jan-98	24-Jan-98				
1999	31-Dec-98	3-Jan-99	8-Mar-99	11-Mar-99				
2000	26-Dec-99	2-Jan-00	14-Jan-00	27-Feb-00				

Table 6. Annual periods of ice-affected flows for 01023000 West Branch Union River at Amherst, Maine

LOCATION.--Lat 44°50'25", long 68°22'22", Hancock County, on right bank 200 feet upstream from site of old tannery dam, 0.6 miles upstream from Indian Camp Brook, and 0.7 miles northwest of Amherst (fig. 1).

DRAINAGE AREA.--148 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1930 - 1979.

REGULATION.--None known water years 1930 - 1979.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 15, 1933 and 1936; latest date of ice-affected flow, April 9, 1939; minimum number of days of ice-affected flow, 22, 1958; maximum number of days of ice-affected flow, 137, 1934.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1930	28-Nov-29	10-Mar-30						
1931	2-Dec-30	4-Dec-30	12-Dec-30	31-Mar-31				
1932	3-Dec-31	3-Dec-31	6-Dec-31	8-Jan-32	11-Jan-32	12-Jan-32	28-Jan-32	1-Apr-32
1933	8-Dec-32	4-Mar-33	6-Mar-33	7-Mar-33	9-Mar-33	11-Mar-33		
1934	15-Nov-33	31-Mar-34						
1935	9-Dec-34	30-Mar-35						
1936	16-Dec-35	13-Mar-36						
1937	15-Nov-36	19-Nov-36	22-Nov-36	23-Nov-36	11-Dec-36	29-Mar-37		
1938	13-Dec-37	24-Mar-38						
1939	25-Nov-38	26-Nov-38	1-Dec-38	5-Dec-38	24-Dec-38	15-Mar-39	23-Mar-39	9-Apr-39
1940	20-Nov-39	25-Nov-39	7-Dec-39	4-Apr-40				
1941	29-Nov-40	2-Apr-41						
1942	25-Nov-41	26-Nov-41	28-Nov-41	29-Nov-41	2-Dec-41	4-Dec-41	8-Dec-41	10-Dec-41
	16-Dec-41	13-Mar-42						
1943	23-Nov-42	24-Nov-42	29-Nov-42	1-Dec-42	3-Dec-42	23-Mar-43		
1944	12-Dec-43	1-Apr-44						
1945	15-Dec-44	16-Dec-44	19-Dec-44	2-Jan-45	5-Jan-45	21-Mar-45		
1946	3-Dec-45	3-Dec-45	6-Dec-45	6-Dec-45	12-Dec-45	14-Mar-46		
1947	2-Dec-46	8-Dec-46	13-Dec-46	1-Mar-47	3-Mar-47	7-Mar-47	10-Mar-47	10-Mar-47
1948	1-Dec-47	1-Dec-47	4-Dec-47	23-Mar-48				
1949	15-Dec-48	16-Dec-48	18-Dec-48	31-Dec-48	2-Jan-49	2-Jan-49	12-Jan-49	18-Jan-49
	21-Jan-49	24-Mar-49						
1950	30-Dec-49	29-Mar-50						
1951	25-Dec-50	2-Jan-51	18-Jan-51	24-Jan-51	27-Jan-51	7-Feb-51	11-Feb-51	17-Feb-51
	2-Mar-51	3-Mar-51						
1952	16-Dec-51	23-Jan-52						
1953	19-Dec-52	21-Dec-52	28-Dec-52	19-Feb-53	22-Feb-53	4-Mar-53	11-Mar-53	12-Mar-53
1954	19-Dec-53	21-Dec-53	24-Dec-53	25-Dec-53	28-Dec-53	29-Dec-53	31-Dec-53	3-Mar-54
1955	4-Dec-54	13-Dec-54	22-Dec-54	10-Mar-55				
1956	26-Nov-55	3-Apr-56						
1957	2-Dec-56	7-Dec-56	10-Dec-56	12-Dec-56	16-Dec-56	13-Mar-57		
1958	27-Nov-57	27-Nov-57	2-Dec-57	5-Dec-57	13-Dec-57	14-Dec-57	9-Jan-58	13-Jan-58
	3-Feb-58	5-Feb-58	20-Feb-58	24-Feb-58	26-Feb-58	27-Feb-58		

Table 6. Annual periods of ice-affected flows for 01023000 West Branch Union River at Amherst, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1959	11-Dec-58	11-Mar-59						
1960	6-Jan-60	31-Mar-60						
1961	9-Dec-60	16-Dec-60	22-Dec-60	1-Apr-61	3-Apr-61	3-Apr-61		
1962	16-Dec-61	1-Apr-62						
1963	13-Dec-62	2-Apr-63						
1964	6-Dec-63	8-Dec-63	12-Dec-63	13-Dec-63	15-Dec-63	22-Mar-64		
1965	1-Dec-64	25-Mar-65						
1966	1-Dec-65	1-Dec-65	7-Dec-65	13-Mar-66				
1967	16-Dec-66	17-Dec-66	20-Dec-66	24-Dec-66	1-Jan-67	4-Apr-67		
1968	31-Dec-67	24-Mar-68						
1969	17-Dec-68	23-Mar-69						
1970	30-Nov-69	8-Dec-69	15-Dec-69	20-Dec-69	31-Dec-69	2-Feb-70	15-Feb-70	26-Mar-70
1971	3-Dec-70	6-Apr-71						
1972	5-Dec-71	10-Dec-71	15-Dec-71	23-Mar-72				
1973	10-Dec-72	25-Mar-73						
1974	31-Dec-73	20-Feb-74	13-Mar-74	15-Mar-74				
1975	20-Dec-74	25-Feb-75						
1976	16-Dec-75	25-Jan-76	31-Jan-76	2-Feb-76	5-Feb-76	19-Feb-76		
1977	4-Dec-76	12-Mar-77						
1978	6-Dec-77	21-Dec-77	28-Dec-77	29-Mar-78				
1979	21-Dec-78	23-Dec-78	26-Dec-78	29-Dec-78	5-Jan-79	28-Jan-79	30-Jan-79	30-Jan-79
	1-Feb-79	27-Feb-79	11-Mar-79	14-Mar-79				

Table 7. Annual periods of ice-affected flows for 01031500 Piscataquis River near Dover-Foxcroft, Maine

LOCATION.--Lat 45°10'31", long 69°18'55", Piscataquis County, on left bank 30 feet downstream from Lows Bridge, 1.0 mile upstream from Black Stream, and 4.7 miles upstream from Dover-Foxcroft (fig. 1).

DRAINAGE AREA.--298 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1931 - 2000.

REGULATION.--Low-water flow regulated by operation of power plants, water years 1931 - 1965. Regulation unknown, water years 1966 - 1984. Low flows may have been regulated by operation of power plant upstream, water years 1985 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, October 30, 1977; latest date of ice-affected flow, April 25, 1939; minimum number of days of ice-affected flow, 34, 1983; maximum number of days of ice-affected flow, 143, 1972.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1931	1-Dec-30	31-Mar-31						
1932	3-Dec-31	3-Dec-31	6-Dec-31	6-Dec-31	8-Dec-31	8-Dec-31	16-Dec-31	17-Dec-31
	1-Jan-32	7-Apr-32						
1933	8-Dec-32	21-Dec-32	31-Dec-32	11-Apr-33				
1934	10-Dec-33	12-Apr-34						
1935	7-Dec-34	19-Apr-35						
1936	5-Dec-35	9-Dec-35	18-Dec-35	16-Mar-36				
1937	19-Nov-36	19-Nov-36	23-Nov-36	24-Nov-36	27-Nov-36	27-Mar-37		
1938	11-Dec-37	25-Mar-38						
1939	26-Nov-38	5-Dec-38	16-Dec-38	25-Apr-39				
1940	7-Dec-39	13-Apr-40						
1941	c							
1942	1-Dec-41	3-Dec-41	7-Dec-41	13-Dec-41	15-Dec-41	31-Dec-41	3-Jan-42	3-Jan-42
	7-Jan-42	4-Apr-42						
1943	29-Nov-42	16-Apr-43						
1944	29-Nov-43	29-Nov-43	6-Dec-43	9-Dec-43	11-Dec-43	21-Apr-44		
1945	2-Dec-44	7-Dec-44	14-Dec-44	14-Dec-44	16-Dec-44	16-Dec-44	19-Dec-44	27-Mar-45
1946	29-Nov-45	5-Dec-45	8-Dec-45	25-Mar-46				
1947	14-Dec-46	19-Dec-46	26-Dec-46	23-Mar-47	27-Mar-47	29-Mar-47	3-Apr-47	4-Apr-47
1948	22-Nov-47	2-Apr-48						
1949	16-Dec-48	1-Jan-49	11-Jan-49	11-Jan-49	14-Jan-49	27-Mar-49		
1950	24-Nov-49	24-Nov-49	26-Nov-49	27-Nov-49	6-Dec-49	19-Dec-49	31-Dec-49	2-Jan-50
	8-Jan-50	20-Mar-50	24-Mar-50	25-Mar-50	29-Mar-50	1-Apr-50	5-Apr-50	6-Apr-50
1951	24-Dec-50	24-Jan-51	29-Jan-51	20-Feb-51	1-Mar-51	3-Mar-51	5-Mar-51	5-Mar-51
	9-Mar-51	10-Mar-51						
1952	c							
1953	1-Dec-52	11-Dec-52	14-Dec-52	29-Jan-53	2-Feb-53	11-Mar-53	14-Mar-53	27-Mar-53
1954	23-Dec-53	9-Apr-54						
1955	4-Dec-54	9-Dec-54	12-Dec-54	16-Dec-54	22-Dec-54	29-Mar-55		
1956	20-Nov-55	23-Nov-55	25-Nov-55	27-Nov-55	29-Nov-55	6-Apr-56		

Table 7. Annual periods of ice-affected flows for 01031500 Piscataquis River near Dover-Foxcroft, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1957	25-Nov-56	26-Nov-56	28-Nov-56	29-Nov-56	1-Dec-56	5-Dec-56	11-Dec-56	11-Dec-56
	18-Dec-56	20-Dec-56	22-Dec-56	23-Dec-56	26-Dec-56	27-Dec-56	30-Dec-56	11-Mar-57
1958	26-Nov-57	27-Nov-57	3-Dec-57	11-Dec-57	2-Jan-58	17-Jan-58	1-Feb-58	9-Mar-58
1959	26-Nov-58	6-Apr-59						
1960	20-Dec-59	6-Mar-60	10-Mar-60	12-Mar-60	19-Mar-60	27-Mar-60	29-Mar-60	29-Mar-60
	1-Apr-60	4-Apr-60						
1961	8-Dec-60	17-Dec-60	21-Dec-60	29-Mar-61				
1962	3-Dec-61	3-Dec-61	10-Dec-61	29-Dec-61	3-Jan-62	31-Mar-62		
1963	25-Nov-62	29-Nov-62	15-Dec-62	13-Apr-63				
1964	4-Dec-63	7-Dec-63	15-Dec-63	13-Feb-64	15-Feb-64	19-Feb-64	23-Feb-64	25-Feb-64
	28-Feb-64	29-Feb-64	6-Mar-64	6-Mar-64	10-Mar-64	21-Mar-64	23-Mar-64	24-Mar-64
	28-Mar-64	6-Apr-64	9-Apr-64	10-Apr-64				
1965	16-Nov-64	27-Nov-64	2-Dec-64	18-Mar-65	20-Mar-65	26-Mar-65	28-Mar-65	29-Mar-65
	31-Mar-65	4-Apr-65						
1966	30-Nov-65	1-Dec-65	8-Dec-65	12-Dec-65	20-Dec-65	17-Mar-66	21-Mar-66	25-Mar-66
	3-Apr-66	5-Apr-66						
1967	30-Dec-66	3-Apr-67						
1968	16-Dec-67	17-Dec-67	28-Dec-67	2-Apr-68				
1969	2-Dec-68	3-Dec-68	7-Dec-68	12-Dec-68	24-Dec-68	12-Apr-69		
1970	7-Dec-69	8-Dec-69	20-Dec-69	26-Dec-69	2-Jan-70	3-Feb-70	7-Feb-70	10-Feb-70
	16-Feb-70	27-Mar-70						
1971	3-Dec-70	9-Apr-71						
1972	1-Dec-71	21-Apr-72						
1973	2-Dec-72	2-Dec-72	16-Dec-72	18-Mar-73				
1974	31-Dec-73	4-Mar-74	11-Mar-74	15-Mar-74	22-Mar-74	30-Mar-74		
1975	18-Dec-74	20-Mar-75	26-Mar-75	5-Apr-75				
1976	17-Dec-75	27-Jan-76	15-Feb-76	15-Feb-76	27-Feb-76	10-Mar-76	12-Mar-76	12-Mar-76
	16-Mar-76	18-Mar-76						
1977	20-Nov-76	25-Nov-76	3-Dec-76	27-Mar-77				
1978	30-Oct-77	8-Nov-77	8-Dec-77	13-Apr-78				
1979	30-Nov-78	20-Dec-78	23-Dec-78	21-Mar-79				
1980	9-Dec-79	26-Mar-80						
1981	5-Dec-80	21-Feb-81	23-Feb-81	14-Mar-81				
1982	20-Dec-81	2-Apr-82	5-Apr-82	11-Apr-82				
1983	3-Jan-83	6-Jan-83	11-Jan-83	11-Jan-83	16-Jan-83	23-Jan-83	3-Feb-83	4-Feb-83
	10-Feb-83	28-Feb-83						
1984	20-Dec-83	28-Mar-84						
1985	2-Jan-85	13-Feb-85						
1986	27-Nov-85	2-Dec-85	6-Dec-85	28-Jan-86	16-Feb-86	14-Mar-86		
1987	13-Nov-86	25-Nov-86	6-Dec-86	25-Dec-86	3-Jan-87	30-Mar-87		
1988	4-Dec-87	9-Dec-87	15-Dec-87	28-Mar-88				
1989	5-Dec-88	29-Mar-89	2-Apr-89	6-Apr-89				
1990	21-Nov-89	31-Mar-90						
1991	6-Dec-90	9-Mar-91						

Table 7. Annual periods of ice-affected flows for 01031500 Piscataquis River near Dover-Foxcroft, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1992	3-Dec-91	29-Mar-92						
1993	19-Nov-92	20-Nov-92	6-Dec-92	10-Apr-93				
1994	25-Nov-93	27-Nov-93	24-Dec-93	8-Apr-94				
1995	24-Nov-94	25-Nov-94	27-Nov-94	27-Nov-94	8-Dec-94	23-Dec-94	28-Dec-94	17-Jan-95
	24-Jan-95	22-Mar-95						
1996	25-Nov-95	20-Jan-96	31-Jan-96	22-Feb-96	27-Feb-96	13-Mar-96		
1997	14-Nov-96	18-Nov-96	24-Nov-96	1-Dec-96	21-Dec-96	24-Dec-96	26-Dec-96	30-Mar-97
1998	23-Nov-97	26-Nov-97	8-Dec-97	24-Feb-98	6-Mar-98	8-Mar-98	13-Mar-98	26-Mar-98
1999	12-Dec-98	24-Jan-99	29-Jan-99	2-Feb-99	8-Feb-99	16-Feb-99	21-Feb-99	28-Feb-99
	2-Mar-99	2-Mar-99	9-Mar-99	10-Mar-99				
2000	2-Dec-99	6-Dec-99	16-Dec-99	28-Mar-00				

Table 8. Annual periods of ice-affected flows for 01038000 Sheepscot River at North Whitefield, Maine

LOCATION.--Lat 44°13'23", long 69°35'38", Lincoln County, on left bank 50 feet upstream from highway bridge on State Route 126 at North Whitefield, at mouth of Finn Brook, and 0.3 miles east of North Whitefield village (fig. 1).

DRAINAGE AREA.--145 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1939 - 2000.

REGULATION.--Some regulation at low flows, water years 1939 - 1947 by sawmills at North Whitefield and Coopers Mills. Some regulation at low flows by sawmill at North Whitefield, water years 1948 - 1986. No known regulation water years 1987 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 22, 1972; latest date of ice-affected flow, March 26, 1956; minimum number of days of ice-affected flow, 0, 1999; maximum number of days of ice-affected flow, 113, 1948.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1939	2-Dec-38	3-Dec-38	27-Dec-38	29-Dec-38	3-Jan-39	5-Jan-39	18-Jan-39	19-Jan-39
	23-Jan-39	24-Jan-39	26-Jan-39	25-Feb-39				
1940	25-Nov-39	26-Nov-39	7-Dec-39	27-Feb-40	1-Mar-40	3-Mar-40	11-Mar-40	15-Mar-40
	24-Mar-40	24-Mar-40						
1941	14-Dec-40	15-Dec-40	17-Dec-40	19-Dec-40	24-Dec-40	24-Dec-40	4-Jan-41	9-Jan-41
	12-Jan-41	17-Jan-41	21-Jan-41	22-Jan-41	24-Jan-41	31-Jan-41	5-Feb-41	6-Feb-41
	17-Feb-41	17-Feb-41	27-Feb-41	27-Feb-41	1-Mar-41	1-Mar-41	3-Mar-41	6-Mar-41
	18-Mar-41	19-Mar-41						
1942	1-Dec-41	1-Dec-41	6-Dec-41	12-Dec-41	17-Dec-41	25-Dec-41	29-Dec-41	5-Feb-42
	10-Feb-42	14-Feb-42	20-Feb-42	21-Feb-42	3-Mar-42	4-Mar-42		
1943	8-Dec-42	9-Dec-42	14-Dec-42	14-Dec-42	17-Dec-42	24-Dec-42	27-Dec-42	28-Dec-42
	1-Jan-43	23-Feb-43	26-Feb-43	28-Feb-43	4-Mar-43	5-Mar-43	8-Mar-43	9-Mar-43
1944	14-Dec-43	14-Dec-43	16-Dec-43	17-Dec-43	21-Dec-43	26-Dec-43	28-Dec-43	31-Dec-43
	2-Jan-44	3-Jan-44	9-Jan-44	11-Jan-44	15-Jan-44	21-Jan-44	25-Jan-44	25-Jan-44
	27-Jan-44	14-Feb-44	17-Feb-44	22-Feb-44	24-Feb-44	24-Feb-44	2-Mar-44	6-Mar-44
	10-Mar-44	11-Mar-44	19-Mar-44	19-Mar-44				
1945	27-Dec-44	31-Dec-44	6-Jan-45	19-Mar-45				
1946	2-Dec-45	3-Dec-45	5-Dec-45	6-Dec-45	11-Dec-45	12-Dec-45	19-Dec-45	25-Dec-45
	28-Dec-45	29-Dec-45	2-Jan-46	3-Jan-46	14-Jan-46	18-Jan-46	20-Jan-46	8-Mar-46
1947	3-Dec-46	3-Dec-46	10-Dec-46	11-Dec-46	13-Dec-46	20-Dec-46	26-Dec-46	4-Feb-47
	11-Feb-47	15-Feb-47	19-Feb-47	1-Mar-47	3-Mar-47	5-Mar-47		
1948	1-Dec-47	22-Mar-48						
1949	25-Dec-48	28-Dec-48	21-Jan-49	22-Jan-49	30-Jan-49	31-Jan-49	2-Feb-49	7-Feb-49
	12-Feb-49	12-Feb-49	18-Feb-49	18-Feb-49	21-Feb-49	22-Feb-49	28-Feb-49	28-Feb-49
	8-Mar-49	8-Mar-49	20-Mar-49	20-Mar-49				
1950	13-Dec-49	17-Dec-49	31-Dec-49	4-Jan-50	7-Jan-50	8-Mar-50		
1951	9-Jan-51	9-Jan-51	14-Jan-51	14-Jan-51	21-Jan-51	23-Jan-51		
1952	28-Dec-51	28-Dec-51	5-Jan-52	7-Jan-52	9-Jan-52	10-Jan-52	12-Jan-52	12-Jan-52
	13-Feb-52	14-Feb-52	1-Mar-52	4-Mar-52				
1953	2-Dec-52	2-Dec-52	27-Dec-52	29-Dec-52	4-Jan-53	9-Jan-53	14-Mar-53	18-Mar-53
1954	9-Jan-54	9-Jan-54	11-Jan-54	14-Jan-54	17-Jan-54	18-Jan-54	21-Jan-54	23-Jan-54
	27-Jan-54	30-Jan-54	9-Feb-54	11-Feb-54				

Table 8. Annual periods of ice-affected flows for 01038000 Sheepscot River at North Whitefield, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1955	12-Jan-55	10-Feb-55						
1956	5-Dec-55	9-Jan-56	28-Jan-56	2-Feb-56	4-Feb-56	4-Feb-56	7-Feb-56	17-Feb-56
	19-Feb-56	19-Feb-56	22-Feb-56	27-Feb-56	29-Feb-56	29-Feb-56	1-Mar-56	1-Mar-56
	3-Mar-56	14-Mar-56	17-Mar-56	22-Mar-56	24-Mar-56	26-Mar-56		
1957	30-Dec-56	22-Jan-57	30-Jan-57	31-Jan-57	3-Feb-57	7-Feb-57	9-Feb-57	9-Feb-57
	12-Feb-57	14-Feb-57	16-Feb-57	16-Feb-57	20-Feb-57	22-Feb-57	26-Feb-57	1-Mar-57
1958	2-Dec-57	3-Dec-57	5-Dec-57	6-Dec-57	5-Feb-58	6-Feb-58	10-Feb-58	20-Feb-58
	23-Feb-58	23-Feb-58						
1959	14-Dec-58	27-Dec-58	31-Dec-58	31-Dec-58	1-Jan-59	1-Jan-59	15-Jan-59	18-Jan-59
	28-Jan-59	28-Jan-59	30-Jan-59	4-Feb-59	6-Feb-59	9-Feb-59	12-Feb-59	12-Feb-59
	16-Feb-59	16-Feb-59	19-Feb-59	27-Feb-59	1-Mar-59	1-Mar-59	8-Mar-59	12-Mar-59
	15-Mar-59	15-Mar-59	19-Mar-59	19-Mar-59				
1960	1-Jan-60	2-Jan-60	9-Jan-60	13-Jan-60	17-Jan-60	17-Jan-60	31-Jan-60	1-Feb-60
	5-Feb-60	5-Feb-60	1-Mar-60	3-Mar-60	10-Mar-60	12-Mar-60	16-Mar-60	16-Mar-60
	26-Mar-60	26-Mar-60						
1961	13-Dec-60	15-Dec-60	24-Dec-60	5-Mar-61				
1962	16-Dec-61	16-Dec-61	22-Dec-61	27-Dec-61	4-Jan-62	5-Jan-62	11-Jan-62	12-Jan-62
	14-Jan-62	14-Jan-62	24-Jan-62	24-Jan-62	28-Jan-62	4-Feb-62	6-Feb-62	8-Feb-62
	11-Feb-62	13-Feb-62	16-Feb-62	16-Feb-62	19-Feb-62	20-Feb-62	24-Feb-62	26-Feb-62
	2-Mar-62	4-Mar-62						
1963	21-Dec-62	23-Dec-62	25-Dec-62	25-Dec-62	27-Dec-62	5-Jan-63	12-Jan-63	6-Mar-63
	8-Mar-63	10-Mar-63	15-Mar-63	16-Mar-63				
1964	19-Dec-63	21-Dec-63	23-Dec-63	23-Dec-63	26-Dec-63	2-Jan-64	5-Jan-64	6-Jan-64
	11-Jan-64	18-Jan-64	20-Jan-64	21-Jan-64	3-Feb-64	4-Feb-64	9-Feb-64	13-Feb-64
	15-Feb-64	19-Feb-64	22-Feb-64	28-Feb-64	1-Mar-64	1-Mar-64		
1965	c							
1966	12-Dec-65	12-Dec-65	20-Dec-65	24-Feb-66				
1967	6-Jan-67	7-Jan-67	11-Jan-67	12-Jan-67	15-Jan-67	15-Jan-67	18-Jan-67	21-Jan-67
	28-Jan-67	13-Mar-67	17-Mar-67	21-Mar-67				
1968	29-Dec-67	2-Feb-68	20-Feb-68	27-Feb-68	5-Mar-68	8-Mar-68	14-Mar-68	15-Mar-68
1969	9-Dec-68	12-Dec-68	23-Dec-68	31-Dec-68	2-Jan-69	7-Jan-69	9-Jan-69	9-Jan-69
	11-Jan-69	12-Jan-69	16-Jan-69	17-Jan-69	21-Jan-69	23-Jan-69	27-Jan-69	29-Jan-69
	4-Feb-69	9-Feb-69	13-Feb-69	18-Feb-69	28-Feb-69	2-Mar-69	5-Mar-69	10-Mar-69
1970	11-Jan-70	12-Jan-70	14-Jan-70	31-Jan-70	24-Feb-70	27-Feb-70	3-Mar-70	4-Mar-70
	7-Mar-70	10-Mar-70						
1971	7-Dec-70	14-Feb-71	25-Feb-71	25-Feb-71	3-Mar-71	6-Mar-71	9-Mar-71	10-Mar-71
	13-Mar-71	13-Mar-71						
1972	1-Dec-71	6-Dec-71	8-Dec-71	9-Dec-71	16-Dec-71	19-Dec-71	21-Dec-71	13-Feb-72
	20-Feb-72	27-Feb-72	4-Mar-72	4-Mar-72	7-Mar-72	7-Mar-72	10-Mar-72	11-Mar-72
	14-Mar-72	14-Mar-72						
1973	22-Nov-72	24-Nov-72	1-Dec-72	4-Dec-72	17-Dec-72	18-Dec-72	21-Dec-72	21-Dec-72
	28-Dec-72	31-Dec-72	5-Jan-73	22-Jan-73	30-Jan-73	2-Feb-73	10-Feb-73	12-Feb-73
	17-Feb-73	19-Feb-73	25-Feb-73	1-Mar-73				
1974	8-Jan-74	21-Jan-74	10-Feb-74	10-Feb-74	13-Feb-74	13-Feb-74	15-Feb-74	16-Feb-74
	19-Feb-74	19-Feb-74						

Table 8. Annual periods of ice-affected flows for 01038000 Sheepscot River at North Whitefield, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1975	3-Jan-75	3-Jan-75	6-Jan-75	6-Jan-75	15-Jan-75	15-Jan-75	18-Jan-75	23-Jan-75
	30-Jan-75	5-Feb-75	8-Feb-75	15-Feb-75	17-Feb-75	17-Feb-75	8-Mar-75	10-Mar-75
1976	29-Dec-75	6-Jan-76	9-Jan-76	26-Jan-76				
1977	3-Dec-76	5-Dec-76	11-Dec-76	19-Dec-76	22-Dec-76	1-Mar-77	6-Mar-77	12-Mar-77
1978	7-Dec-77	22-Dec-77	18-Jan-78	24-Jan-78	28-Jan-78	26-Feb-78	28-Feb-78	9-Mar-78
1979	2-Dec-78	3-Dec-78	9-Dec-78	14-Dec-78	18-Dec-78	20-Dec-78	1-Jan-79	7-Jan-79
	11-Jan-79	12-Jan-79	16-Jan-79	29-Jan-79	9-Feb-79	20-Feb-79	24-Feb-79	28-Feb-79
1980	13-Dec-79	16-Dec-79	18-Dec-79	21-Dec-79	15-Jan-80	11-Feb-80	16-Feb-80	20-Feb-80
	26-Feb-80	4-Mar-80	8-Mar-80	14-Mar-80	16-Mar-80	16-Mar-80	19-Mar-80	21-Mar-80
1981	6-Dec-80	11-Feb-81						
1982	26-Dec-81	31-Dec-81	2-Jan-82	19-Mar-82				
1983	12-Dec-82	20-Dec-82	1-Jan-83	4-Jan-83	14-Jan-83	23-Jan-83	27-Jan-83	2-Feb-83
	9-Feb-83	1-Mar-83						
1984	11-Jan-84	23-Jan-84	31-Jan-84	3-Feb-84	7-Feb-84	10-Feb-84		
1985	2-Jan-85	13-Feb-85						
1986	15-Dec-85	15-Dec-85	18-Dec-85	22-Dec-85	26-Dec-85	27-Dec-85	29-Dec-85	31-Dec-85
	3-Jan-86	9-Jan-86	4-Feb-86	4-Feb-86	6-Feb-86	17-Feb-86	20-Feb-86	20-Feb-86
	23-Feb-86	23-Feb-86	26-Feb-86	1-Mar-86	8-Mar-86	10-Mar-86		
1987	14-Dec-86	14-Dec-86	28-Dec-86	12-Mar-87				
1988	30-Dec-87	31-Dec-87	3-Jan-88	3-Jan-88	6-Jan-88	19-Jan-88	23-Jan-88	24-Jan-88
	27-Jan-88	30-Jan-88	3-Feb-88	19-Feb-88	21-Feb-88	22-Feb-88		
1989	17-Dec-88	17-Dec-88	23-Dec-88	23-Dec-88	27-Dec-88	27-Dec-88	4-Jan-89	7-Jan-89
	21-Jan-89	22-Jan-89	3-Feb-89	11-Feb-89	17-Feb-89	26-Feb-89	7-Mar-89	9-Mar-89
1990	8-Dec-89	10-Dec-89	12-Dec-89	1-Jan-90	14-Jan-90	15-Jan-90	20-Jan-90	22-Jan-90
	5-Feb-90	6-Feb-90	20-Feb-90	21-Feb-90	25-Feb-90	27-Feb-90	1-Mar-90	1-Mar-90
	5-Mar-90	8-Mar-90						
1991	8-Jan-91	14-Jan-91	19-Jan-91	19-Jan-91	21-Jan-91	23-Jan-91	25-Jan-91	26-Jan-91
	1-Feb-91	2-Feb-91	12-Feb-91	12-Feb-91	17-Feb-91	17-Feb-91	22-Feb-91	24-Feb-91
1992	3-Dec-91	7-Dec-91	16-Dec-91	17-Dec-91	25-Dec-91	27-Dec-91	31-Dec-91	31-Dec-91
	1-Jan-92	1-Jan-92	16-Jan-92	17-Jan-92	19-Jan-92	22-Jan-92	25-Jan-92	25-Jan-92
	3-Feb-92	4-Feb-92	6-Feb-92	7-Feb-92	10-Feb-92	13-Feb-92	15-Feb-92	15-Feb-92
	1-Mar-92	2-Mar-92						
1993	8-Dec-92	10-Dec-92	25-Dec-92	25-Dec-92	27-Dec-92	28-Dec-92	2-Jan-93	3-Jan-93
	10-Jan-93	11-Jan-93	14-Jan-93	20-Mar-93				
1994	3-Jan-94	28-Jan-94	8-Feb-94	8-Mar-94				
1995	8-Jan-95	14-Jan-95	5-Feb-95	5-Mar-95				
1996	9-Dec-95	19-Jan-96	4-Feb-96	5-Feb-96	7-Feb-96	7-Feb-96	13-Feb-96	19-Feb-96
1997	27-Nov-96	30-Nov-96	1-Jan-97	1-Jan-97	8-Jan-97	8-Jan-97	12-Jan-97	12-Jan-97
	15-Jan-97	15-Jan-97	17-Jan-97	20-Jan-97	24-Jan-97	24-Jan-97	27-Jan-97	27-Jan-97
	4-Feb-97	4-Feb-97	7-Feb-97	14-Feb-97	16-Feb-97	18-Feb-97	13-Mar-97	14-Mar-97
1998	11-Dec-97	18-Dec-97	21-Dec-97	24-Dec-97	29-Dec-97	29-Dec-97	31-Dec-97	2-Jan-98
	12-Jan-98	16-Jan-98	23-Jan-98	24-Jan-98	27-Jan-98	27-Jan-98	6-Feb-98	9-Feb-98
	15-Feb-98	15-Feb-98						
1999	no days of ice affected-flows							
2000	13-Jan-00	27-Feb-00	29-Feb-00	29-Feb-00				

Table 9. Annual periods of ice-affected flows for 01048000 Sandy River near Mercer, Maine

LOCATION.--Lat 44°42'26", long 69°56'21", Somerset County, on right bank 0.9 miles upstream from Bog Stream, 2.1 miles north of Mercer, and 8.6 miles upstream from mouth (fig. 1).

DRAINAGE AREA.--516 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1929 - 2000.

REGULATION.--None known water years 1929 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 17, 1992; latest date of ice-affected flow, April 19, 1975; minimum number of days of ice-affected flow, 75, 1951; maximum number of days of ice-affected flow, 136, 1943.

ABBREVIATIONS.--c, data censored; m, data missing.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1929	29-Nov-28	6-Apr-29						
1930	1-Dec-29	17-Mar-30						
1931	12-Dec-30	30-Mar-31						
1932	4-Dec-31	5-Dec-31	15-Dec-31	25-Dec-31	30-Dec-31	5-Apr-32		
1933	12-Dec-32	11-Apr-33						
1934	19-Nov-33	21-Nov-33	23-Nov-33	25-Nov-33	27-Nov-33	29-Nov-33	1-Dec-33	5-Apr-34
1935	11-Dec-34	11-Apr-35						
1936	17-Dec-35	13-Mar-36						
1937	19-Nov-36	28-Mar-37						
1938	13-Dec-37	11-Mar-38	20-Mar-38	25-Mar-38				
1939	c							
1940	6-Dec-39	13-Apr-40						
1941	27-Nov-40	27-Nov-40	29-Nov-40	5-Apr-41				
1942	27-Nov-41	29-Nov-41	1-Dec-41	1-Apr-42				
1943	24-Nov-42	25-Nov-42	29-Nov-42	2-Dec-42	6-Dec-42	14-Apr-43		
1944	2-Dec-43	10-Apr-44						
1945	6-Dec-44	8-Dec-44	10-Dec-44	18-Dec-44	21-Dec-44	29-Mar-45		
1946	29-Nov-45	8-Dec-45	13-Dec-45	25-Mar-46				
1947	10-Dec-46	11-Dec-46	14-Dec-46	16-Dec-46	25-Dec-46	6-Feb-47	9-Feb-47	31-Mar-47
1948	30-Nov-47	26-Mar-48						
1949	14-Dec-48	14-Dec-48	17-Dec-48	31-Dec-48	10-Jan-49	28-Mar-49		
1950	10-Dec-49	16-Dec-49	28-Dec-49	3-Apr-50				
1951	27-Dec-50	11-Mar-51						
1952	12-Dec-51	13-Dec-51	15-Dec-51	7-Apr-52				
1953	6-Dec-52	11-Dec-52	23-Dec-52	24-Dec-52	30-Dec-52	30-Dec-52	11-Jan-53	24-Jan-53
		28-Jan-53	25-Mar-53					
1954	15-Dec-53	4-Apr-54						
1955	3-Dec-54	15-Dec-54	23-Dec-54	9-Apr-55				
1956	21-Nov-55	10-Jan-56	21-Jan-56	11-Apr-56				
1957	27-Nov-56	4-Dec-56	25-Dec-56	31-Mar-57				
1958	28-Nov-57	17-Dec-57	1-Jan-58	4-Jan-58	8-Jan-58	2-Apr-58		
1959	27-Nov-58	3-Apr-59						

Table 9. Annual periods of ice-affected flows for 01048000 Sandy River near Mercer, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1960	19-Dec-59	5-Apr-60						
1961	3-Dec-60	8-Apr-61						
1962	22-Dec-61	1-Apr-62						
1963	26-Nov-62	2-Dec-62	11-Dec-62	11-Apr-63				
1964	13-Dec-63	10-Apr-64						
1965	1-Dec-64	21-Dec-64	19-Jan-65	8-Apr-65				
1966	23-Nov-65	26-Mar-66						
1967	14-Dec-66	1-Apr-67						
1968	27-Nov-67	2-Apr-68						
1969	12-Dec-68	14-Dec-68	17-Dec-68	12-Apr-69				
1970	25-Nov-69	9-Dec-69	15-Dec-69	28-Dec-69	2-Jan-70	12-Feb-70	20-Feb-70	21-Feb-70
	24-Feb-70	19-Mar-70						
1971	3-Dec-70	4-Dec-70	8-Dec-70	13-Apr-71				
1972	8-Dec-71	28-Mar-72						
1973	2-Dec-72	19-Mar-73						
1974	26-Dec-73	16-Mar-74						
1975	15-Dec-74	19-Mar-75	30-Mar-75	19-Apr-75				
1976	14-Dec-75	29-Mar-76						
1977	30-Nov-76	6-Dec-76	11-Dec-76	17-Mar-77				
1978	7-Dec-77	9-Jan-78	15-Jan-78	18-Apr-78				
1979	23-Nov-78	26-Nov-78	28-Nov-78	3-Jan-79	5-Jan-79	25-Mar-79		
1980	m							
1981	m							
1982	m							
1983	m							
1984	m							
1985	m							
1986	m							
1987	m							
1988	1-Dec-87	1-Dec-87	4-Dec-87	11-Dec-87	15-Dec-87	5-Apr-88		
1989	4-Dec-88	30-Mar-89						
1990	21-Nov-89	18-Mar-90						
1991	6-Dec-90	7-Dec-90	10-Dec-90	14-Dec-90	17-Dec-90	20-Dec-90	29-Dec-90	31-Mar-91
1992	4-Dec-91	12-Mar-92	27-Mar-92	28-Mar-92				
1993	17-Nov-92	21-Nov-92	6-Dec-92	31-Mar-93				
1994	24-Dec-93	7-Apr-94						
1995	12-Dec-94	17-Jan-95	25-Jan-95	24-Mar-95				
1996	c							
1997	26-Nov-96	1-Dec-96	31-Dec-96	7-Apr-97				
1998	28-Nov-97	10-Mar-98	15-Mar-98	17-Mar-98				
1999	13-Dec-98	21-Mar-99						
2000	22-Dec-99	23-Mar-00						

Table 10. Annual periods of ice-affected flows for 01052500 Diamond River near Wentworth Location, New Hampshire

LOCATION.--Lat 44°52'39", long 71°03'28", Coos County, on left bank 1.0 mile upstream from mouth and 1.6 miles north of Wentworth Location (fig. 1).

DRAINAGE AREA.--152 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1942 - 2000.

REGULATION.--None known water years 1942 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 7, 1971; latest date of ice-affected flow, April 25, 1943; minimum number of days of ice-affected flow, 54, 1984; maximum number of days of ice-affected flow, 149, 1956.

ABBREVIATIONS.--c, data censored; m, data missing.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1942	24-Nov-41	16-Mar-42	22-Mar-42	22-Mar-42	27-Mar-42	29-Mar-42	13-Apr-42	16-Apr-42
1943	30-Nov-42	8-Apr-43	22-Apr-43	25-Apr-43				
1944	1-Dec-43	14-Apr-44						
1945	4-Dec-44	2-Jan-45	7-Jan-45	21-Mar-45				
1946	28-Nov-45	15-Mar-46	22-Mar-46	24-Mar-46				
1947	18-Dec-46	21-Dec-46	26-Dec-46	30-Mar-47	7-Apr-47	7-Apr-47	11-Apr-47	11-Apr-47
1948	26-Nov-47	22-Mar-48	25-Mar-48	28-Mar-48				
1949	12-Dec-48	29-Dec-48	13-Jan-49	9-Mar-49				
1950	5-Dec-49	2-Apr-50						
1951	20-Dec-50	5-Apr-51	9-Apr-51	11-Apr-51				
1952	c							
1953	1-Dec-52	11-Dec-52	20-Dec-52	26-Mar-53				
1954	18-Dec-53	11-Feb-54	15-Feb-54	8-Apr-54				
1955	m							
1956	19-Nov-55	11-Jan-56	16-Jan-56	19-Apr-56				
1957	25-Nov-56	20-Apr-57						
1958	5-Dec-57	9-Dec-57	5-Jan-58	28-Feb-58				
1959	28-Nov-58	3-Apr-59						
1960	16-Dec-59	20-Dec-59	22-Dec-59	1-Apr-60	5-Apr-60	5-Apr-60		
1961	1-Dec-60	8-Dec-60	10-Dec-60	22-Apr-61				
1962	30-Nov-61	5-Dec-61	11-Dec-61	1-Apr-62	7-Apr-62	9-Apr-62		
1963	10-Dec-62	14-Mar-63	16-Mar-63	10-Apr-63	12-Apr-63	14-Apr-63		
1964	9-Dec-63	9-Dec-63	13-Dec-63	22-Jan-64	26-Jan-64	28-Mar-64	30-Mar-64	3-Apr-64
1965	26-Nov-64	31-Mar-65						
1966	21-Nov-65	26-Mar-66	15-Apr-66	17-Apr-66				
1967	6-Dec-66	4-Apr-67						
1968	30-Nov-67	2-Apr-68						
1969	8-Dec-68	12-Jan-69	25-Jan-69	2-Feb-69	14-Feb-69	11-Apr-69		
1970	26-Nov-69	27-Nov-69	29-Nov-69	11-Dec-69	15-Dec-69	27-Dec-69	3-Jan-70	17-Mar-70
	19-Mar-70	17-Apr-70						
1971	3-Dec-70	4-Dec-70	6-Dec-70	13-Apr-71				
1972	7-Nov-71	31-Mar-72						
1973	17-Dec-72	18-Mar-73						

Table 10. Annual periods of ice-affected flows for 01052500 Diamond River near Wentworth Location, New Hampshire--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1974	4-Jan-74	11-Feb-74	24-Feb-74	28-Feb-74	5-Mar-74	4-Apr-74		
1975	17-Dec-74	11-Jan-75	16-Jan-75	25-Jan-75	30-Jan-75	5-Feb-75	10-Feb-75	14-Feb-75
	16-Feb-75	19-Feb-75	6-Mar-75	7-Mar-75	9-Mar-75	15-Mar-75		
1976	15-Dec-75	14-Jan-76	23-Feb-76	27-Mar-76				
1977	11-Nov-76	11-Nov-76	22-Nov-76	25-Nov-76	2-Dec-76	7-Dec-76	12-Dec-76	15-Dec-76
	19-Dec-76	14-Feb-77	11-Mar-77	12-Mar-77				
1978	7-Dec-77	25-Dec-77	1-Jan-78	7-Jan-78	13-Jan-78	7-Mar-78	13-Mar-78	26-Mar-78
1979	23-Nov-78	3-Jan-79	7-Jan-79	20-Feb-79	26-Feb-79	28-Feb-79	5-Mar-79	7-Mar-79
1980	4-Dec-79	5-Dec-79	11-Dec-79	26-Dec-79	29-Dec-79	3-Mar-80	18-Mar-80	25-Mar-80
	29-Mar-80	15-Apr-80						
1981	9-Dec-80	9-Dec-80	12-Dec-80	23-Feb-81				
1982	2-Jan-82	16-Apr-82						
1983	8-Dec-82	26-Dec-82	31-Dec-82	12-Jan-83	14-Jan-83	6-Mar-83	14-Mar-83	15-Mar-83
	20-Mar-83	28-Mar-83						
1984	21-Dec-83	23-Jan-84	16-Feb-84	22-Feb-84	28-Feb-84	28-Feb-84	1-Mar-84	12-Mar-84
1985	c							
1986	4-Dec-85	20-Jan-86	28-Jan-86	5-Feb-86	8-Feb-86	13-Mar-86		
1987	1-Dec-86	3-Dec-86	6-Dec-86	31-Mar-87				
1988	27-Nov-87	29-Nov-87	3-Dec-87	8-Dec-87	17-Dec-87	25-Dec-87	27-Dec-87	27-Mar-88
	29-Mar-88	4-Apr-88						
1989	1-Dec-88	29-Mar-89						
1990	c							
1991	8-Dec-90	16-Mar-91						
1992	3-Dec-91	14-Dec-91	16-Dec-91	27-Mar-92				
1993	5-Dec-92	31-Mar-93						
1994	25-Nov-93	28-Nov-93	9-Dec-93	10-Dec-93	24-Dec-93	14-Apr-93		
1995	25-Nov-94	29-Nov-94	13-Dec-94	24-Dec-94	27-Dec-94	15-Jan-95	29-Jan-95	9-Mar-95
1996	1-Dec-95	19-Jan-96	2-Feb-96	22-Feb-96	1-Mar-96	19-Mar-96		
1997	25-Nov-96	1-Dec-96	9-Dec-96	17-Dec-96	21-Dec-96	23-Dec-96	1-Jan-97	6-Apr-97
1998	15-Nov-97	27-Mar-98						
1999	12-Dec-98	5-Apr-99						
2000	30-Nov-99	23-Mar-00						

Table 11. Annual periods of ice-affected flows for 01055000 Swift River near Roxbury, Maine

LOCATION.--Lat 44°38'32", long 70°35'17", Oxford County, on left bank 0.2 miles downstream from Philbrick Brook, 2.1 miles downstream from Roxbury, and 7.2 miles upstream from mouth (fig. 1).

DRAINAGE AREA.--96.9 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1931 - 2000.

REGULATION.--None known water years 1931 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 9, 1992; latest date of ice-affected flow, April 23, 1939; minimum number of days of ice-affected flow, 49, 1975 and 1984; maximum number of days of ice-affected flow, 138, 1956.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1931	15-Dec-30	25-Mar-31						
1932	6-Dec-31	1-Apr-32						
1933	8-Dec-32	3-Apr-33						
1934	18-Nov-33	19-Nov-33	27-Nov-33	28-Nov-33	30-Nov-33	14-Dec-33	17-Dec-33	4-Apr-34
1935	9-Dec-34	12-Dec-34	23-Dec-34	28-Mar-35				
1936	4-Dec-35	10-Dec-35	23-Dec-35	12-Mar-36				
1937	18-Nov-36	10-Dec-36	24-Dec-36	8-Jan-37	12-Jan-37	13-Jan-37	16-Jan-37	15-Feb-37
	24-Feb-37	6-Apr-37						
1938	13-Dec-37	24-Jan-38	30-Jan-38	24-Mar-38				
1939	26-Nov-38	4-Dec-38	16-Dec-38	19-Dec-38	23-Dec-38	8-Jan-39	11-Jan-39	12-Jan-39
	15-Jan-39	3-Mar-39	28-Mar-39	2-Apr-39	15-Apr-39	23-Apr-39		
1940	6-Dec-39	13-Apr-40						
1941	29-Dec-40	15-Mar-41	2-Apr-41	7-Apr-41				
1942	3-Dec-41	28-Dec-41	30-Dec-41	3-Jan-42	5-Jan-42	10-Mar-42		
1943	21-Nov-42	27-Nov-42	30-Nov-42	2-Dec-42	10-Dec-42	7-Apr-43		
1944	30-Nov-43	11-Apr-44						
1945	13-Dec-44	18-Mar-45						
1946	28-Nov-45	8-Dec-45	11-Dec-45	19-Mar-46				
1947	4-Dec-46	12-Dec-46	17-Dec-46	6-Feb-47	10-Feb-47	13-Mar-47	19-Mar-47	20-Mar-47
1948	25-Nov-47	1-Dec-47	5-Dec-47	22-Mar-48				
1949	c							
1950	17-Dec-49	5-Apr-50						
1951	c							
1952	14-Dec-51	8-Apr-52						
1953	28-Dec-52	25-Mar-53						
1954	18-Dec-53	5-Apr-54						
1955	4-Dec-54	18-Dec-54	22-Dec-54	7-Apr-55				
1956	19-Nov-55	10-Jan-56	16-Jan-56	9-Apr-56				
1957	c							
1958	c							
1959	24-Nov-58	24-Feb-59	21-Mar-59	3-Apr-59				
1960	13-Dec-59	4-Apr-60						

Table 11. Annual periods of ice-affected flows for 01055000 Swift River near Roxbury, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1961	6-Dec-60	17-Dec-60	27-Dec-60	16-Feb-61	20-Feb-61	22-Feb-61	26-Feb-61	2-Mar-61
	4-Mar-61	31-Mar-61	5-Apr-61	11-Apr-61				
1962	10-Dec-61	15-Mar-62	17-Mar-62	25-Mar-62	27-Mar-62	3-Apr-62		
1963	10-Dec-62	11-Dec-62	14-Dec-62	7-Jan-63	29-Jan-63	16-Mar-63	26-Mar-63	2-Apr-63
1964	2-Dec-63	8-Dec-63	11-Dec-63	27-Feb-64	4-Mar-64	10-Apr-64		
1965	2-Dec-64	27-Dec-64	31-Dec-64	10-Mar-65	20-Mar-65	25-Mar-65	27-Mar-65	29-Mar-65
	31-Mar-65	1-Apr-65						
1966	30-Nov-65	3-Dec-65	8-Dec-65	21-Mar-66	25-Mar-66	25-Mar-66		
1967	4-Dec-66	18-Jan-67	21-Jan-67	1-Apr-67				
1968	30-Nov-67	1-Dec-67	23-Dec-67	25-Mar-68				
1969	8-Dec-68	26-Dec-68	14-Jan-69	15-Mar-69	24-Mar-69	24-Mar-69	29-Mar-69	8-Apr-69
1970	24-Nov-69	9-Dec-69	17-Dec-69	17-Dec-69	19-Dec-69	27-Dec-69	4-Jan-70	10-Feb-70
	14-Feb-70	17-Feb-70	20-Feb-70	25-Mar-70	30-Mar-70	31-Mar-70	6-Apr-70	6-Apr-70
	9-Apr-70	13-Apr-70						
1971	5-Dec-70	28-Dec-70	14-Feb-71	13-Apr-71				
1972	15-Nov-71	8-Jan-72	14-Feb-72	18-Feb-72	16-Mar-72	28-Mar-72		
1973	9-Dec-72	1-Jan-73	7-Jan-73	12-Jan-73	14-Jan-73	21-Jan-73	30-Jan-73	1-Feb-73
	10-Feb-73	9-Mar-73						
1974	31-Dec-73	20-Jan-74	27-Jan-74	12-Feb-74	14-Feb-74	14-Feb-74	16-Feb-74	25-Feb-74
	5-Mar-74	8-Mar-74	11-Mar-74	15-Mar-74	24-Mar-74	1-Apr-74		
1975	16-Dec-74	11-Jan-75	15-Jan-75	27-Jan-75	22-Feb-75	24-Feb-75	2-Mar-75	6-Mar-75
	8-Mar-75	8-Mar-75						
1976	18-Dec-75	26-Dec-75	7-Jan-76	10-Jan-76	4-Feb-76	20-Feb-76	23-Feb-76	27-Feb-76
	4-Mar-76	14-Mar-76	21-Mar-76	24-Mar-76				
1977	22-Nov-76	28-Nov-76	1-Dec-76	7-Dec-76	10-Dec-76	12-Mar-77		
1978	7-Dec-77	19-Dec-77	29-Dec-77	9-Jan-78	13-Jan-78	28-Feb-78	24-Mar-78	25-Mar-78
	31-Mar-78	4-Apr-78	7-Apr-78	10-Apr-78				
1979	22-Nov-78	8-Dec-78	11-Dec-78	13-Dec-78	15-Dec-78	22-Dec-78	25-Dec-78	28-Dec-78
	31-Dec-78	19-Feb-79	21-Feb-79	27-Feb-79	4-Mar-79	7-Mar-79	13-Mar-79	21-Mar-79
1980	4-Dec-79	6-Dec-79	11-Dec-79	5-Apr-80				
1981	22-Nov-80	24-Nov-80	4-Dec-80	21-Feb-81	13-Mar-81	17-Mar-81	21-Mar-81	22-Mar-81
	28-Mar-81	9-Apr-81						
1982	20-Dec-81	24-Dec-81	4-Jan-82	26-Feb-82				
1983	9-Dec-82	3-Feb-83	5-Feb-83	5-Mar-83				
1984	21-Dec-83	25-Dec-83	30-Dec-83	31-Dec-83	2-Jan-84	5-Jan-84	15-Feb-84	23-Mar-84
1985	6-Dec-84	11-Dec-84	21-Dec-84	22-Feb-85	3-Mar-85	11-Mar-85	19-Mar-85	19-Mar-85
	21-Mar-85	22-Mar-85	25-Mar-85	26-Mar-85				
1986	4-Dec-85	28-Dec-85	31-Dec-85	7-Jan-86	20-Jan-86	20-Jan-86	24-Jan-86	24-Jan-86
	29-Jan-86	23-Mar-86						
1987	13-Nov-86	17-Nov-86	6-Dec-86	28-Mar-87				
1988	17-Dec-87	3-Feb-88	13-Feb-88	28-Feb-88	10-Mar-88	11-Mar-88	25-Mar-88	27-Mar-88
1989	5-Dec-88	29-Mar-89						

Table 11. Annual periods of ice-affected flows for 01055000 Swift River near Roxbury, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1990	23-Nov-89	17-Mar-90						
1991	12-Dec-90	15-Dec-90	26-Dec-90	28-Mar-91				
1992	4-Dec-91	13-Dec-91	17-Dec-91	11-Mar-92	14-Mar-92	26-Mar-92		
1993	9-Nov-92	10-Nov-92	17-Nov-92	21-Nov-92	5-Dec-92	30-Jan-93	2-Feb-93	8-Feb-93
	19-Mar-93	20-Mar-93	26-Mar-93	2-Apr-93	4-Apr-93	8-Apr-93		
1994	25-Nov-93	26-Nov-93	9-Dec-93	10-Dec-93	23-Dec-93	22-Feb-94	8-Apr-94	10-Apr-94
1995	24-Nov-94	29-Nov-94	13-Dec-94	25-Dec-94	29-Dec-94	16-Jan-95	29-Jan-95	9-Mar-95
1996	1-Dec-95	5-Dec-95	10-Dec-95	23-Dec-95	2-Feb-96	20-Feb-96	22-Feb-96	22-Feb-96
	1-Mar-96	15-Mar-96						
1997	27-Nov-96	30-Nov-96	8-Dec-96	11-Dec-96	1-Jan-97	31-Jan-97	19-Feb-97	26-Mar-97
1998	29-Nov-97	18-Jan-98	13-Feb-98	17-Feb-98	14-Mar-98	15-Mar-98		
1999	13-Dec-98	19-Jan-99	24-Jan-99	24-Jan-99	29-Jan-99	4-Mar-99		
2000	18-Dec-99	15-Mar-00	18-Mar-00	18-Mar-00				

Table 12. Annual periods of ice-affected flows for 01060000 Royal River at Yarmouth, Maine

LOCATION.--Lat 43°47'57", long 70°10'45", Cumberland County, on right bank 150 feet upstream from East Main Street bridge in Yarmouth (fig. 1).

DRAINAGE AREA.--141 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1950 - 2000.

REGULATION.--Some diurnal fluctuation at low flows caused by mill above station, water years 1950 - 1985. Low flows may have been regulated by operation of mills upstream, water years 1986 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 24, 1989; latest date of ice-affected flow, April 2, 1964; minimum number of days of ice-affected flow, 0, 1976; maximum number of days of ice-affected flow, 106, 1987.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1950	24-Dec-49	25-Dec-49	5-Jan-50	9-Mar-50				
1951	19-Dec-50	20-Dec-50	26-Dec-50	26-Dec-50	27-Jan-51	5-Feb-51	9-Feb-51	17-Feb-51
	27-Feb-51	27-Feb-51	1-Mar-51	1-Mar-51	3-Mar-51	10-Mar-51		
1952	10-Dec-51	10-Dec-51	15-Dec-51	19-Dec-51	27-Dec-51	30-Dec-51	4-Jan-52	22-Jan-52
	29-Jan-52	3-Feb-52	8-Feb-52	8-Feb-52	10-Feb-52	16-Feb-52	19-Feb-52	20-Feb-52
	23-Feb-52	25-Feb-52	1-Mar-52	2-Mar-52	15-Mar-52	16-Mar-52		
1953	28-Dec-52	29-Dec-52	31-Dec-52	31-Dec-52	2-Feb-53	6-Feb-53	10-Feb-53	12-Feb-53
	14-Feb-53	14-Feb-53	20-Feb-53	20-Feb-53	1-Mar-53	2-Mar-53	8-Mar-53	8-Mar-53
1954	19-Dec-53	19-Dec-53	24-Dec-53	24-Dec-53	1-Jan-54	1-Jan-54	8-Jan-54	9-Jan-54
	15-Jan-54	22-Jan-54	27-Jan-54	31-Jan-54	12-Feb-54	14-Feb-54		
1955	c							
1956	7-Dec-55	7-Dec-55	21-Dec-55	13-Jan-56	19-Jan-56	31-Mar-56		
1957	30-Nov-56	5-Dec-56	18-Dec-56	19-Dec-56	26-Dec-56	27-Dec-56	30-Dec-56	23-Jan-57
	27-Jan-57	6-Mar-57	10-Mar-57	12-Mar-57	16-Mar-57	17-Mar-57		
1958	c							
1959	1-Dec-58	3-Dec-58	7-Dec-58	10-Dec-58	17-Dec-58	18-Jan-59	30-Jan-59	11-Feb-59
	21-Feb-59	1-Mar-59						
1960	21-Dec-59	25-Dec-59	1-Jan-60	2-Jan-60	5-Jan-60	7-Jan-60	9-Jan-60	29-Mar-60
1961	9-Dec-60	9-Dec-60	15-Dec-60	15-Dec-60	27-Dec-60	12-Mar-61	17-Mar-61	18-Mar-61
	21-Mar-61	21-Mar-61						
1962	16-Dec-61	16-Dec-61	20-Jan-62	14-Mar-62				
1963	13-Dec-62	21-Dec-62	30-Dec-62	14-Jan-63	17-Jan-63	15-Feb-63	17-Feb-63	21-Feb-63
	23-Feb-63	4-Mar-63	27-Mar-63	27-Mar-63				
1964	6-Dec-63	6-Dec-63	12-Dec-63	26-Dec-63	30-Dec-63	4-Jan-64	10-Jan-64	12-Feb-64
	12-Mar-64	25-Mar-64	30-Mar-64	2-Apr-64				
1965	6-Dec-64	21-Dec-64	29-Dec-64	4-Jan-65	14-Jan-65	15-Jan-65	25-Jan-65	5-Mar-65
	11-Mar-65	25-Mar-65						
1966	7-Jan-66	5-Mar-66	9-Mar-66	12-Mar-66	14-Mar-66	17-Mar-66	21-Mar-66	22-Mar-66
1967	17-Dec-66	23-Dec-66	6-Jan-67	13-Mar-67	19-Mar-67	22-Mar-67		
1968	21-Dec-67	11-Feb-68	14-Feb-68	5-Mar-68	17-Mar-68	20-Mar-68		
1969	18-Dec-68	19-Dec-68	23-Dec-68	13-Mar-69	16-Mar-69	23-Mar-69		
1970	30-Nov-69	9-Dec-69	17-Dec-69	25-Dec-69	31-Dec-69	3-Feb-70	19-Feb-70	27-Mar-70

Table 12. Annual periods of ice-affected flows for 01060000 Royal River at Yarmouth, Maine--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1971	4-Dec-70	28-Feb-71						
1972	1-Jan-72	18-Mar-72						
1973	12-Dec-72	25-Dec-72	4-Jan-73	22-Jan-73	13-Feb-73	2-Mar-73	4-Mar-73	14-Mar-73
1974	3-Jan-74	21-Jan-74	1-Feb-74	16-Feb-74				
1975	23-Dec-74	23-Dec-74	26-Dec-74	26-Dec-74	1-Jan-75	19-Mar-75		
1976	no days of ice-affected flows							
1977	13-Dec-76	27-Feb-77						
1978	7-Dec-77	25-Dec-77	29-Dec-77	6-Jan-78	15-Jan-78	24-Jan-78	31-Jan-78	5-Feb-78
	10-Feb-78	27-Feb-78	1-Mar-78	11-Mar-78				
1979	3-Jan-79	13-Mar-79						
1980	17-Dec-79	18-Dec-79	28-Dec-79	11-Jan-80	16-Jan-80	14-Mar-80		
1981	6-Dec-80	3-Feb-81						
1982	16-Feb-82	30-Mar-82						
1983	12-Dec-82	14-Dec-82	18-Dec-82	18-Dec-82	4-Jan-83	5-Jan-83	13-Jan-83	23-Jan-83
	5-Feb-83	1-Mar-83						
1984	20-Dec-83	10-Jan-84	12-Jan-84	10-Feb-84	14-Feb-84	22-Feb-84	4-Mar-84	4-Mar-84
	7-Mar-84	12-Mar-84						
1985	c							
1986	11-Dec-85	21-Jan-86	3-Feb-86	20-Feb-86				
1987	8-Dec-86	23-Mar-87						
1988	30-Dec-87	1-Feb-88	12-Feb-88	20-Feb-88				
1989	10-Dec-88	12-Mar-89						
1990	24-Nov-89	24-Nov-89	1-Dec-89	25-Jan-90	17-Feb-90	22-Feb-90		
1991	11-Dec-90	17-Dec-90	26-Dec-90	1-Mar-91				
1992	16-Dec-91	26-Dec-91	31-Dec-91	5-Jan-92	11-Jan-92	23-Jan-92	25-Jan-92	16-Feb-92
	28-Feb-92	1-Mar-92						
1993	12-Dec-92	21-Dec-92	24-Dec-92	22-Jan-93	26-Jan-93	27-Mar-93		
1994	26-Dec-93	14-Feb-94	25-Feb-94	3-Mar-94				
1995	12-Dec-94	13-Dec-94	29-Dec-94	30-Dec-94	11-Jan-95	12-Jan-95	26-Jan-95	30-Jan-95
	3-Feb-95	24-Feb-95	26-Feb-95	28-Feb-95	9-Mar-95	11-Mar-95	13-Mar-95	14-Mar-95
1996	12-Dec-95	16-Jan-96	31-Jan-96	7-Feb-96	12-Feb-96	19-Feb-96	28-Feb-96	6-Mar-98
	9-Mar-96	12-Mar-96	16-Mar-96	17-Mar-96				
1997	31-Dec-96	1-Jan-97	8-Jan-97	8-Jan-97	12-Jan-97	15-Jan-97	17-Jan-97	19-Jan-97
	24-Jan-97	24-Jan-97	27-Jan-97	12-Feb-97	14-Feb-97	16-Feb-97	25-Feb-97	25-Feb-97
	8-Mar-97	9-Mar-97	13-Mar-97	14-Mar-97	17-Mar-97	17-Mar-97	23-Mar-97	24-Mar-97
1998	19-Feb-98	21-Feb-98						
1999	23-Dec-98	27-Dec-98	31-Dec-98	31-Dec-98	26-Jan-99	1-Feb-99	6-Feb-99	11-Feb-99
	15-Feb-99	16-Feb-99	21-Feb-99	28-Feb-99	6-Mar-99	10-Mar-99		
2000	21-Dec-99	21-Dec-99	23-Dec-99	27-Dec-99	6-Jan-00	6-Jan-00	13-Jan-00	2-Feb-00
	16-Feb-00	27-Feb-00	1-Mar-00	3-Mar-00				

Table 13. Annual periods of ice-affected flows for 01064500 Saco River near Conway, New Hampshire

LOCATION.--Lat 43°59'27", long 71°05'29", Carroll County, on left bank at Odell Falls, 1.8 miles downstream from Swift River and Conway (fig. 1).

DRAINAGE AREA.--385 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1930 - 2000.

REGULATION.--None known water years 1930 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 13, 1986; latest date of ice-affected flow, April 28, 1939; minimum number of days of ice-affected flow, 16, 1933; maximum number of days of ice-affected flow, 133, 1939.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1930	9-Jan-30	21-Mar-30						
1931	12-Dec-30	12-Dec-30	14-Dec-30	15-Dec-30	17-Dec-30	25-Mar-31		
1932	13-Dec-31	20-Dec-31	30-Jan-32	7-Feb-32	20-Mar-32	24-Mar-32		
1933	21-Dec-32	23-Dec-32	26-Dec-32	29-Dec-32	31-Dec-32	4-Jan-33	23-Jan-33	26-Jan-33
1934	12-Dec-33	29-Mar-34						
1935	6-Dec-34	17-Mar-35						
1936	31-Dec-35	13-Mar-36						
1937	c							
1938	11-Dec-37	25-Jan-38	30-Jan-38	22-Mar-38				
1939	17-Dec-38	28-Apr-39						
1940	7-Dec-39	21-Dec-39	26-Dec-39	6-Apr-40				
1941	27-Nov-40	2-Dec-40	16-Dec-40	23-Dec-40	25-Dec-40	30-Dec-40	8-Jan-41	13-Jan-41
	16-Jan-41	22-Mar-41						
1942	22-Dec-41	17-Mar-42						
1943	10-Dec-42	26-Mar-43						
1944	17-Dec-43	1-Apr-44						
1945	c							
1946	28-Nov-45	14-Mar-46						
1947	4-Dec-46	9-Dec-46	18-Dec-46	2-Mar-47	4-Mar-47	5-Mar-47	7-Mar-47	9-Mar-47
1948	24-Dec-47	23-Mar-48						
1949	c							
1950	c							
1951	21-Dec-50	23-Jan-51	29-Jan-51	9-Mar-51				
1952	c							
1953	3-Dec-52	5-Dec-52	19-Dec-52	24-Jan-53	1-Feb-53	5-Feb-53	21-Feb-53	22-Feb-53
	2-Mar-53	10-Mar-53	14-Mar-53	23-Mar-53				
1954	15-Dec-53	22-Dec-53	25-Dec-53	23-Feb-54	13-Mar-54	16-Mar-54		
1955	3-Dec-54	15-Dec-54	21-Dec-54	29-Mar-55				
1956	22-Nov-55	10-Jan-56	20-Jan-56	24-Mar-56				
1957	24-Nov-56	7-Dec-56	10-Dec-56	14-Dec-56	20-Dec-56	15-Mar-57		
1958	c							
1959	27-Nov-58	4-Apr-59						
1960	22-Dec-59	4-Jan-60	7-Jan-60	8-Jan-60	13-Jan-60	11-Feb-60	15-Feb-60	18-Feb-60
	20-Feb-60	29-Feb-60	3-Mar-60	9-Mar-60	12-Mar-60	13-Mar-60		

Table 13. Annual periods of ice-affected flows for 01064500 Saco River near Conway, New Hampshire--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1961	c							
1962	c							
1963	c							
1964	11-Dec-63	7-Apr-64						
1965	3-Dec-64	31-Mar-65						
1966	19-Dec-65	20-Dec-65	22-Dec-65	8-Mar-66	13-Mar-66	15-Mar-66		
1967	18-Dec-66	19-Dec-66	12-Jan-67	2-Apr-67				
1968	22-Dec-67	25-Mar-68						
1969	24-Dec-68	24-Dec-68	28-Dec-68	8-Apr-69				
1970	23-Nov-69	10-Dec-69	19-Dec-69	24-Dec-69	2-Jan-70	2-Feb-70	14-Feb-70	14-Apr-70
1971	1-Dec-70	11-Apr-71						
1972	15-Dec-71	18-Apr-72						
1973	13-Dec-72	30-Dec-72	5-Jan-73	21-Jan-73	31-Jan-73	1-Feb-73	25-Feb-73	26-Feb-73
1974	14-Jan-74	22-Jan-74	1-Feb-74	22-Feb-74	12-Mar-74	16-Mar-74		
1975	20-Dec-74	27-Feb-75	3-Mar-75	17-Mar-75				
1976	14-Dec-75	2-Feb-76	7-Feb-76	22-Feb-76				
1977	2-Dec-76	6-Dec-76	11-Dec-76	12-Mar-77				
1978	6-Dec-77	14-Dec-77	29-Dec-77	9-Jan-78	14-Jan-78	20-Mar-78		
1979	24-Nov-78	26-Nov-78	28-Nov-78	3-Jan-79	6-Jan-79	15-Jan-79	18-Jan-79	22-Feb-79
	24-Feb-79	7-Mar-79						
1980	16-Dec-79	25-Dec-79	27-Dec-79	4-Feb-80	9-Feb-80	11-Feb-80	14-Feb-80	18-Mar-80
1981	3-Dec-80	4-Dec-80	23-Dec-80	1-Feb-81				
1982	8-Dec-81	12-Dec-81	16-Dec-81	29-Dec-81	11-Jan-82	26-Mar-82		
1983	11-Dec-82	14-Dec-82	23-Dec-82	24-Dec-82	4-Jan-83	4-Jan-83	6-Jan-83	11-Jan-83
	17-Jan-83	22-Jan-83	28-Jan-83	2-Feb-83	5-Feb-83	23-Feb-83	7-Mar-83	8-Mar-83
	27-Mar-83	30-Mar-83						
1984	19-Dec-83	18-Mar-84						
1985	20-Dec-84	28-Dec-84	2-Jan-85	12-Feb-85	17-Feb-85	22-Feb-85	27-Feb-85	11-Mar-85
	15-Mar-85	27-Mar-85	1-Apr-85	5-Apr-85	10-Apr-85	15-Apr-85		
1986	8-Dec-85	19-Jan-86	27-Jan-86	25-Mar-86				
1987	13-Nov-86	25-Nov-86	6-Dec-86	30-Mar-87				
1988	27-Nov-87	29-Nov-87	7-Dec-87	10-Dec-87	18-Dec-87	27-Mar-88		
1989	5-Dec-88	27-Mar-89						
1990	25-Nov-89	14-Mar-90						
1991	12-Dec-90	18-Dec-90	26-Dec-90	28-Feb-91				
1992	4-Dec-91	5-Dec-91	16-Dec-91	11-Mar-92				
1993	6-Dec-92	16-Dec-92	21-Dec-92	30-Mar-93				
1994	25-Dec-93	26-Mar-94						
1995	25-Nov-94	27-Nov-94	9-Dec-94	11-Dec-94	13-Dec-94	13-Dec-94	15-Dec-94	16-Dec-94
	18-Dec-94	19-Dec-94	30-Dec-94	31-Dec-94	3-Jan-95	6-Jan-95	8-Jan-95	16-Jan-95
	24-Jan-95	25-Feb-95	28-Feb-95	8-Mar-95				
1996	26-Nov-95	18-Jan-96	23-Jan-96	28-Jan-96	2-Feb-96	19-Mar-96		
1997	31-Dec-96	18-Jan-97	7-Mar-97	25-Mar-97				

Table 13. Annual periods of ice-affected flows for 01064500 Saco River near Conway, New Hampshire--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1998	10-Dec-97	5-Jan-98	12-Jan-98	24-Feb-98				
1999	24-Dec-98	1-Mar-99						
2000	23-Dec-99	2-Mar-00						

Table 14. Annual periods of ice-affected flows for 01073000 Oyster River near Durham, New Hampshire

LOCATION.--Lat 43°08'55", long 70°57'56", Strafford County, on left bank, 200 feet upstream from Old Concord Road bridge, 2.5 miles west of Durham, and 7 miles upstream from mouth (fig. 1).

DRAINAGE AREA.--12.1 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1936 - 2000.

REGULATION.--None known water years 1936 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 16, 1996; latest date of ice-affected flow, April 7, 1940; minimum number of days of ice-affected flow, 0, 1984; maximum number of days of ice-affected flow, 109, 1959.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1936	3-Jan-36	5-Jan-36	21-Jan-36	18-Mar-36				
1937	3-Dec-36	4-Dec-36	8-Dec-36	8-Dec-36	17-Dec-36	18-Dec-36	21-Dec-36	22-Dec-36
	11-Jan-37	11-Jan-37	15-Jan-37	20-Jan-37	27-Jan-37	3-Feb-37	24-Feb-37	7-Mar-37
	9-Mar-37	13-Mar-37						
1938	3-Dec-37	3-Dec-37	10-Dec-37	10-Dec-37	16-Jan-38	16-Jan-38	18-Jan-38	21-Jan-38
1939	4-Jan-39	5-Jan-39	25-Jan-39	27-Jan-39	4-Feb-39	7-Feb-39	15-Feb-39	16-Feb-39
	23-Feb-39	27-Feb-39	12-Mar-39	12-Mar-39				
1940	27-Dec-39	14-Jan-40	20-Jan-40	10-Feb-40	16-Feb-40	5-Mar-40	12-Mar-40	15-Mar-40
	25-Mar-40	25-Mar-40	31-Mar-40	31-Mar-40	7-Apr-40	7-Apr-40		
1941	4-Dec-40	4-Dec-40	9-Jan-41	17-Jan-41	19-Jan-41	21-Jan-41	24-Jan-41	11-Feb-41
	15-Feb-41	18-Feb-41	24-Feb-41	1-Mar-41	6-Mar-41	8-Mar-41	11-Mar-41	23-Mar-41
	30-Mar-41	31-Mar-41						
1942	21-Dec-41	22-Dec-41	31-Dec-41	31-Dec-41	5-Jan-42	17-Jan-42	29-Jan-42	31-Jan-42
	3-Feb-42	7-Feb-42	10-Feb-42	17-Feb-42	21-Feb-42	27-Feb-42	3-Mar-42	4-Mar-42
	10-Mar-42	11-Mar-42	13-Mar-42	16-Mar-42				
1943	30-Nov-42	30-Nov-42	4-Dec-42	4-Dec-42	17-Dec-42	27-Dec-42	29-Dec-42	30-Dec-42
	4-Jan-43	2-Mar-43						
1944	11-Dec-43	13-Dec-43	15-Dec-43	10-Jan-44	12-Jan-44	17-Feb-44	19-Feb-44	10-Mar-44
1945	c							
1946	1-Dec-45	4-Dec-45	12-Dec-45	8-Jan-46	17-Jan-46	24-Jan-46	27-Jan-46	6-Feb-46
	9-Feb-46	9-Mar-46						
1947	c							
1948	21-Nov-47	21-Nov-47	28-Nov-47	28-Nov-47	20-Dec-47	18-Feb-48	22-Feb-48	3-Mar-48
	5-Mar-48	23-Mar-48						
1949	12-Dec-48	31-Dec-48	4-Jan-49	4-Jan-49	7-Jan-49	9-Jan-49	21-Jan-49	10-Feb-49
	12-Feb-49	12-Feb-49	25-Feb-49	7-Mar-49	12-Mar-49	15-Mar-49		
1950	c							
1951	15-Dec-50	15-Dec-50	27-Dec-50	28-Dec-50	8-Jan-51	13-Jan-51	22-Jan-51	23-Jan-51
	28-Jan-51	2-Feb-51	5-Feb-51	7-Feb-51	9-Feb-51	19-Feb-51		
1952	27-Nov-51	28-Nov-51	17-Dec-51	20-Dec-51	28-Dec-51	31-Dec-51	9-Jan-52	10-Jan-52
	25-Feb-52	26-Feb-52	3-Mar-52	4-Mar-52				
1953	16-Dec-52	1-Feb-53						
1954	17-Dec-53	17-Dec-53	6-Jan-54	21-Jan-54	1-Feb-54	2-Feb-54	11-Feb-54	22-Feb-54

Table 14. Annual periods of ice-affected flows for 01073000 Oyster River near Durham, New Hampshire--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
	3-Mar-54	3-Mar-54	5-Mar-54	6-Mar-54				
1955	17-Dec-54	17-Dec-54	25-Jan-55	7-Feb-55	17-Mar-55	19-Mar-55	28-Mar-55	29-Mar-55
1956	19-Dec-55	20-Dec-55	25-Dec-55	10-Jan-56	18-Jan-56	25-Jan-56	8-Feb-56	24-Feb-56
	26-Feb-56	13-Mar-56	21-Mar-56	27-Mar-56				
1957	19-Dec-56	23-Jan-57	2-Feb-57	15-Feb-57	26-Feb-57	27-Feb-57		
1958	13-Dec-57	13-Dec-57	2-Jan-58	21-Jan-58	26-Jan-58	28-Jan-58	9-Feb-58	26-Feb-58
1959	14-Dec-58	14-Dec-58	17-Dec-58	3-Apr-59				
1960	15-Dec-59	15-Dec-59	2-Jan-60	2-Jan-60	9-Jan-60	26-Jan-60	10-Mar-60	13-Mar-60
1961	9-Dec-60	15-Dec-60	18-Dec-60	20-Feb-61				
1962	22-Dec-61	24-Dec-61	31-Dec-61	7-Jan-62	11-Jan-62	16-Jan-62	18-Jan-62	15-Feb-62
	19-Feb-62	20-Feb-62	24-Feb-62	4-Mar-62	16-Mar-62	19-Mar-62		
1963	19-Dec-62	20-Dec-62	25-Dec-62	25-Dec-62	29-Dec-62	29-Dec-62	30-Dec-62	8-Mar-63
	25-Mar-63	26-Mar-63						
1964	17-Dec-63	2-Jan-64	7-Jan-64	9-Jan-64	13-Jan-64	21-Jan-64	10-Feb-64	12-Feb-64
	18-Feb-64	28-Feb-64						
1965	15-Jan-65	22-Jan-65	29-Jan-65	6-Feb-65	8-Feb-65	10-Feb-65	20-Feb-65	28-Feb-65
1966	10-Jan-66	14-Feb-66	19-Feb-66	2-Mar-66				
1967	23-Dec-66	21-Jan-67	24-Jan-67	6-Mar-67	17-Mar-67	23-Mar-67		
1968	22-Dec-67	21-Jan-68	12-Feb-68	25-Mar-68				
1969	8-Dec-68	11-Dec-68	16-Dec-68	18-Dec-68	25-Dec-68	11-Jan-69	13-Jan-69	14-Jan-69
	16-Jan-69	21-Jan-69	2-Feb-69	9-Feb-69	6-Mar-69	8-Mar-69	20-Mar-69	20-Mar-69
	25-Mar-69	3-Apr-69						
1970	23-Dec-69	26-Dec-69	6-Jan-70	5-Feb-70	11-Feb-70	12-Feb-70	22-Feb-70	8-Mar-70
	13-Mar-70	14-Mar-70	21-Mar-70	2-Apr-70				
1971	13-Dec-70	16-Dec-70	20-Dec-70	25-Dec-70	8-Jan-71	10-Jan-71	13-Jan-71	25-Mar-71
1972	1-Dec-71	4-Dec-71	8-Jan-72	10-Jan-72	17-Jan-72	18-Jan-72	26-Jan-72	27-Jan-72
	31-Jan-72	9-Feb-72	12-Feb-72	18-Feb-72	1-Mar-72	7-Mar-72	10-Mar-72	12-Mar-72
1973	4-Dec-72	4-Dec-72	10-Dec-72	11-Dec-72	17-Dec-72	29-Dec-72	6-Jan-73	18-Jan-73
	2-Feb-73	4-Feb-73	17-Feb-73	22-Feb-73				
1974	18-Dec-73	19-Dec-73	2-Jan-74	21-Jan-74	7-Feb-74	20-Feb-74	26-Feb-74	1-Mar-74
1975	26-Dec-74	28-Dec-74	17-Jan-75	19-Jan-75	21-Jan-75	24-Jan-75	2-Feb-75	3-Feb-75
	28-Feb-75	18-Mar-75						
1976	15-Dec-75	19-Dec-75	11-Jan-76	12-Jan-76	20-Jan-76	23-Jan-76	17-Feb-76	17-Feb-76
1977	28-Dec-76	11-Mar-77						
1978	7-Dec-77	14-Dec-77	26-Dec-77	8-Jan-78	15-Jan-78	25-Jan-78	28-Jan-78	10-Feb-78
	15-Feb-78	25-Feb-78	2-Mar-78	5-Mar-78	10-Mar-78	21-Mar-78		
1979	9-Jan-79	9-Feb-79	12-Feb-79	14-Feb-79	21-Feb-79	22-Feb-79		
1980	3-Dec-79	23-Dec-79	30-Dec-79	11-Jan-80	15-Jan-80	9-Mar-80		
1981	16-Dec-80	1-Feb-81						
1982	1-Jan-82	3-Jan-82	11-Jan-82	30-Jan-82				
1983	19-Jan-83	23-Jan-83	9-Feb-83	16-Feb-83	22-Feb-83	26-Feb-83		
1984	no days of ice affected-flows							
1985	4-Dec-84	10-Dec-84	2-Jan-85	23-Jan-85	25-Jan-85	29-Jan-85	1-Feb-85	12-Feb-85
1986	9-Jan-86	18-Jan-86	29-Jan-86	31-Jan-86				

Table 14. Annual periods of ice-affected flows for 01073000 Oyster River near Durham, New Hampshire--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1987	15-Dec-86	16-Dec-86	8-Jan-87	11-Feb-87	17-Feb-87	19-Feb-87	21-Feb-87	28-Feb-87
	1-Mar-87	4-Mar-87						
1988	25-Dec-87	28-Dec-87	2-Jan-88	18-Jan-88	7-Feb-88	10-Feb-88		
1989	21-Dec-88	23-Dec-88	25-Dec-88	30-Dec-88	16-Jan-89	19-Jan-89	27-Jan-89	31-Jan-89
	1-Feb-89	28-Feb-89	1-Mar-89	12-Mar-89				
1990	26-Nov-89	31-Dec-89	5-Jan-90	14-Jan-90	22-Jan-90	24-Jan-90	31-Jan-90	31-Jan-90
	1-Feb-90	8-Feb-90	14-Feb-90	21-Feb-90	2-Mar-90	6-Mar-90		
1991	16-Dec-90	22-Dec-90	6-Jan-91	8-Jan-91	10-Jan-91	10-Jan-91	13-Jan-91	14-Jan-91
	19-Jan-91	26-Jan-91	28-Jan-91	31-Jan-91	1-Feb-91	11-Feb-91	14-Feb-91	28-Feb-91
1992	4-Dec-91	7-Dec-91	17-Dec-91	27-Dec-91	6-Jan-92	24-Feb-92	26-Feb-92	3-Mar-92
1993	3-Dec-92	15-Dec-92	25-Dec-92	28-Dec-92	12-Jan-93	20-Jan-93	1-Feb-93	15-Feb-93
	21-Feb-93	28-Feb-93	1-Mar-93	1-Mar-93				
1994	25-Dec-93	9-Mar-94						
1995	8-Dec-94	8-Dec-94	11-Dec-94	12-Dec-94	14-Dec-94	22-Dec-94	24-Dec-94	26-Dec-94
	1-Jan-95	4-Jan-95	7-Jan-95	9-Jan-95	16-Jan-95	25-Jan-95	3-Feb-95	7-Mar-95
1996	23-Dec-95	27-Dec-95	4-Jan-96	18-Jan-96	6-Feb-96	6-Feb-96	11-Feb-96	15-Feb-96
1997	16-Nov-96	20-Nov-96	7-Dec-96	7-Dec-96	10-Feb-97	13-Feb-97	26-Feb-97	26-Feb-97
	9-Mar-97	10-Mar-97	18-Mar-97	20-Mar-97				
1998	24-Nov-97	24-Nov-97	20-Dec-97	21-Dec-97	31-Dec-97	31-Dec-97	14-Feb-98	15-Feb-98
	23-Mar-98	25-Mar-98						
1999	12-Dec-98	14-Dec-98	2-Jan-99	2-Jan-99	30-Jan-99	31-Jan-99	1-Feb-99	1-Feb-99
	21-Feb-99	23-Feb-99	5-Mar-99	6-Mar-99				
2000	6-Jan-00	6-Jan-00	15-Jan-00	25-Jan-00	30-Jan-00	30-Jan-00		

Table 15. Annual periods of ice-affected flows for 01076500 Pemigewasset River at Plymouth, New Hampshire

LOCATION.--Lat 43°45'33", long 71°41'10", Grafton County, on right bank, 150 feet downstream from Holderness Road bridge in Plymouth, 0.1 miles northeast of Plymouth Town Hall, and 0.3 miles downstream from Baker River (fig. 1).

DRAINAGE AREA.--622 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1941 - 2000.

REGULATION.--Some fluctuation in low flows caused by operation of power plants above station water years 1941 - 1952. No known regulation water years 1953 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 15, 1971; latest date of ice-affected flow, April 10, 1978; minimum number of days of ice-affected flow, 73, 1981; maximum number of days of ice-affected flow, 132, 1972.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1941	29-Nov-40	26-Mar-41	30-Mar-41	30-Mar-41				
1942	8-Dec-41	9-Dec-41	11-Dec-41	20-Mar-42				
1943	1-Dec-42	1-Dec-42	8-Dec-42	29-Mar-43				
1944	30-Nov-43	2-Dec-43	5-Dec-43	8-Dec-43	11-Dec-43	3-Apr-44		
1945	30-Nov-44	30-Nov-44	2-Dec-44	7-Dec-44	11-Dec-44	23-Mar-45		
1946	2-Dec-45	3-Dec-45	5-Dec-45	6-Dec-45	11-Dec-45	16-Mar-46		
1947	15-Dec-46	22-Mar-47	28-Mar-47	30-Mar-47				
1948	4-Dec-47	24-Mar-48						
1949	14-Dec-48	16-Dec-48	19-Dec-48	30-Dec-48	4-Jan-49	5-Jan-49	10-Jan-49	24-Mar-49
1950	23-Nov-49	24-Nov-49	26-Nov-49	27-Nov-49	1-Dec-49	1-Dec-49	4-Dec-49	21-Dec-49
	23-Dec-49	28-Dec-49	30-Dec-49	5-Apr-50				
1951	15-Dec-50	16-Dec-50	19-Dec-50	27-Mar-51				
1952	21-Nov-51	22-Nov-51	26-Nov-51	5-Dec-51	12-Dec-51	27-Mar-52		
1953	30-Nov-52	2-Dec-52	6-Dec-52	6-Dec-52	19-Dec-52	21-Dec-52	28-Dec-52	18-Mar-53
1954	17-Dec-53	21-Dec-53	23-Dec-53	2-Mar-54	7-Mar-54	7-Mar-54	16-Mar-54	18-Mar-54
	4-Apr-54	5-Apr-54						
1955	3-Dec-54	29-Mar-55	31-Mar-55	31-Mar-55				
1956	21-Nov-55	23-Nov-55	26-Nov-55	27-Nov-55	29-Nov-55	2-Dec-55	6-Dec-55	10-Jan-56
	18-Jan-56	10-Feb-56	16-Feb-56	20-Feb-56	22-Feb-56	2-Mar-56	4-Mar-56	4-Mar-56
	7-Mar-56	13-Mar-56	15-Mar-56	7-Apr-56	9-Apr-56	9-Apr-56		
1957	20-Nov-56	20-Nov-56	24-Nov-56	25-Nov-56	29-Nov-56	5-Dec-56	8-Dec-56	21-Mar-57
1958	26-Nov-57	27-Nov-57	2-Dec-57	10-Dec-57	13-Dec-57	20-Dec-57	3-Jan-58	17-Mar-58
1959	28-Nov-58	5-Apr-59						
1960	15-Dec-59	15-Dec-59	20-Dec-59	31-Mar-60				
1961	3-Dec-60	4-Dec-60	8-Dec-60	26-Mar-61				
1962	1-Dec-61	1-Dec-61	9-Dec-61	10-Dec-61	13-Dec-61	1-Apr-62		
1963	12-Dec-62	3-Apr-63						
1964	2-Dec-63	2-Dec-63	5-Dec-63	6-Dec-63	11-Dec-63	18-Mar-64		
1965	1-Dec-64	20-Mar-65	30-Mar-65	1-Apr-65				
1966	8-Dec-65	9-Dec-65	13-Dec-65	14-Dec-65	19-Dec-65	20-Mar-66		
1967	4-Dec-66	9-Dec-66	13-Dec-66	14-Dec-66	16-Dec-66	31-Mar-67		
1968	16-Nov-67	18-Nov-67	20-Nov-67	22-Nov-67	28-Nov-67	13-Dec-67	15-Dec-67	21-Dec-67

Table 15. Annual periods of ice-affected flows for 01076500 Pemigewasset River at Plymouth, New Hampshire--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
	24-Dec-67	24-Mar-68						
1969	27-Nov-68	28-Nov-68	9-Dec-68	5-Apr-69				
1970	4-Dec-69	10-Dec-69	17-Dec-69	5-Apr-70				
1971	6-Dec-70	3-Apr-71						
1972	15-Nov-71	15-Nov-71	23-Nov-71	1-Apr-72				
1973	23-Nov-72	24-Nov-72	2-Dec-72	14-Mar-73				
1974	4-Dec-73	4-Dec-73	19-Dec-73	20-Dec-73	3-Jan-74	3-Jan-74	5-Jan-74	7-Mar-74
	10-Mar-74	15-Mar-74	22-Mar-74	23-Mar-74				
1975	27-Nov-74	8-Dec-74	16-Dec-74	17-Dec-74	26-Dec-74	21-Mar-75		
1976	4-Dec-75	8-Dec-75	12-Dec-75	14-Dec-75	17-Dec-75	27-Mar-76		
1977	1-Dec-76	16-Mar-77						
1978	6-Dec-77	10-Apr-78						
1979	c							
1980	29-Nov-79	24-Dec-79	1-Jan-80	28-Mar-80				
1981	12-Dec-80	22-Feb-81						
1982	c							
1983	c							
1984	20-Dec-83	19-Mar-84						
1985	6-Dec-84	12-Dec-84	22-Dec-84	31-Dec-84	1-Jan-85	14-Mar-85		
1986	c							
1987	7-Dec-86	24-Mar-87						
1988	16-Dec-87	29-Mar-88						
1989	6-Jan-89	25-Mar-89						
1990	26-Nov-89	29-Mar-90						
1991	15-Dec-90	29-Dec-90	2-Jan-91	13-Mar-91				
1992	4-Dec-91	28-Mar-92						
1993	9-Dec-92	4-Apr-93						
1994	6-Dec-93	8-Dec-93	11-Dec-93	14-Dec-93	16-Dec-93	16-Dec-93	24-Dec-93	1-Apr-94
1995	24-Nov-94	28-Nov-94	30-Nov-94	3-Dec-94	11-Dec-94	23-Dec-94	30-Dec-94	17-Jan-95
	27-Jan-95	18-Mar-95						
1996	1-Dec-95	1-Dec-95	3-Dec-95	3-Dec-95	7-Dec-95	31-Dec-95	1-Jan-96	20-Jan-96
	30-Jan-96	29-Feb-96	8-Mar-96	13-Mar-96				
1997	31-Dec-96	28-Mar-97						
1998	28-Nov-97	30-Nov-97	2-Dec-97	3-Dec-97	9-Dec-97	19-Dec-97	21-Dec-97	26-Dec-97
	29-Dec-97	3-Jan-98	7-Jan-98	8-Jan-98	13-Jan-98	26-Feb-98	14-Mar-98	14-Mar-98
	22-Mar-98	23-Mar-98						
1999	18-Dec-98	20-Dec-98	23-Dec-98	19-Mar-99				
2000	2-Dec-99	2-Dec-99	19-Dec-99	20-Dec-99	23-Dec-99	10-Mar-00	19-Mar-00	19-Mar-00

Table 16. Annual periods of ice-affected flows for 01134500 Moose River at Victory, Vermont

LOCATION.--Lat 44°30'42", long 71°50'13", Essex County, on right bank, 0.5 miles northeast of Victory, 0.8 miles downstream from Cold Brook, 1.1 miles upstream from Stanley Brook, 3.1 miles north of North Concord, and 5.1 miles southwest of Burke Road and River Road intersection in Gallup Mills (fig. 1).

DRAINAGE AREA.--75.2 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1948 - 2000.

REGULATION.--None known water years 1948 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 13, 1952; latest date of ice-affected flow, April 18, 1950; minimum number of days of ice-affected flow, 38, 1975; maximum number of days of ice-affected flow, 139, 1950.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1948	25-Nov-47	7-Dec-47	14-Dec-47	14-Dec-47	16-Dec-47	24-Mar-48		
1949	3-Dec-48	5-Dec-48	10-Dec-48	31-Dec-48	3-Jan-49	5-Jan-49	11-Jan-49	27-Mar-49
1950	23-Nov-49	24-Nov-49	27-Nov-49	27-Nov-49	2-Dec-49	13-Dec-49	16-Dec-49	18-Apr-50
1951	c							
1952	21-Nov-51	22-Nov-51	25-Nov-51	1-Dec-51	3-Dec-51	3-Dec-51	11-Dec-51	26-Mar-52
	28-Mar-52	28-Mar-52	30-Mar-52	30-Mar-52	2-Apr-52	3-Apr-52		
1953	13-Nov-52	15-Nov-52	1-Dec-52	5-Dec-52	12-Dec-52	8-Jan-53	16-Jan-53	22-Mar-53
1954	4-Dec-53	4-Dec-53	16-Dec-53	11-Mar-54	16-Mar-54	19-Mar-54	23-Mar-54	23-Mar-54
	25-Mar-54	25-Mar-54	28-Mar-54	28-Mar-54				
1955	15-Nov-54	15-Nov-54	2-Dec-54	19-Dec-54	22-Dec-54	27-Dec-54	4-Jan-55	30-Mar-55
1956	23-Nov-55	23-Nov-55	25-Nov-55	26-Nov-55	29-Nov-55	29-Nov-55	2-Dec-55	2-Dec-55
	7-Dec-55	7-Dec-55	9-Dec-55	9-Dec-55	16-Dec-55	10-Jan-56	28-Jan-56	29-Jan-56
	31-Jan-56	2-Feb-56	4-Feb-56	4-Feb-56	17-Feb-56	17-Feb-56	22-Feb-56	7-Apr-56
	11-Apr-56	13-Apr-56						
1957	24-Nov-56	25-Nov-56	29-Nov-56	1-Dec-56	3-Dec-56	7-Mar-57	17-Mar-57	17-Mar-57
1958	26-Nov-57	27-Nov-57	2-Dec-57	6-Dec-57	14-Dec-57	15-Dec-57	17-Dec-57	19-Dec-57
	24-Dec-57	26-Dec-57	30-Dec-57	30-Mar-58				
1959	27-Nov-58	26-Mar-59	3-Apr-59	3-Apr-59	7-Apr-59	8-Apr-59		
1960	21-Dec-59	31-Mar-60						
1961	2-Dec-60	4-Dec-60	8-Dec-60	31-Mar-61				
1962	9-Dec-61	1-Apr-62						
1963	11-Dec-62	28-Mar-63						
1964	3-Dec-63	9-Dec-63	11-Dec-63	6-Mar-64	11-Mar-64	12-Mar-64	1-Apr-64	1-Apr-64
1965	19-Nov-64	19-Nov-64	1-Dec-64	6-Apr-65				
1966	1-Dec-65	1-Dec-65	8-Dec-65	9-Dec-65	19-Dec-65	22-Mar-66		
1967	3-Dec-66	6-Dec-66	8-Dec-66	30-Mar-67				
1968	17-Nov-67	18-Nov-67	21-Nov-67	22-Nov-67	29-Nov-67	6-Dec-67	12-Dec-67	14-Dec-67
	17-Dec-67	31-Mar-68						
1969	27-Nov-68	28-Nov-68	7-Dec-68	3-Apr-69				
1970	26-Nov-69	26-Nov-69	28-Nov-69	28-Nov-69	1-Dec-69	8-Dec-69	17-Dec-69	7-Apr-70
1971	5-Dec-70	1-Apr-71						
1972	15-Nov-71	16-Nov-71	24-Nov-71	25-Nov-71	3-Dec-71	31-Mar-72		

Table 16. Annual periods of ice-affected flows for 01134500 Moose River at Victory, Vermont--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1973	17-Nov-72	17-Nov-72	19-Nov-72	19-Nov-72	16-Dec-72	13-Mar-73		
1974	c							
1975	28-Nov-74	1-Dec-74	26-Dec-74	7-Jan-75	16-Jan-75	30-Jan-75	20-Feb-75	23-Feb-75
	9-Mar-75	10-Mar-75						
1976	15-Dec-75	4-Mar-76						
1977	c							
1978	27-Nov-77	30-Nov-77	4-Dec-77	11-Apr-78				
1979	c							
1980	18-Dec-79	25-Dec-79	27-Dec-79	29-Mar-80				
1981	3-Dec-80	21-Feb-81						
1982	c							
1983	27-Nov-82	29-Nov-82	9-Dec-82	16-Dec-82	19-Dec-82	25-Dec-82	31-Dec-82	11-Jan-83
	14-Jan-83	24-Jan-83	26-Jan-83	3-Feb-83	6-Feb-83	7-Mar-83	24-Mar-83	2-Apr-83
1984	c							
1985	20-Dec-84	29-Dec-84	5-Jan-85	25-Feb-85				
1986	c							
1987	19-Nov-86	21-Nov-86	6-Dec-86	8-Mar-87				
1988	18-Dec-87	20-Dec-87	27-Dec-87	1-Feb-88	6-Feb-88	25-Mar-88		
1989	21-Dec-88	15-Mar-89						
1990	c							
1991	c							
1992	c							
1993	10-Dec-92	29-Mar-93						
1994	11-Dec-93	10-Apr-94						
1995	10-Dec-94	24-Dec-94	30-Dec-94	15-Jan-95	24-Jan-95	16-Mar-95		
1996	3-Dec-95	14-Mar-96						
1997	21-Dec-96	23-Dec-96	31-Dec-96	27-Mar-97				
1998	28-Nov-97	4-Dec-97	8-Dec-97	7-Jan-98	12-Jan-98	14-Feb-98	19-Feb-98	9-Mar-98
	12-Mar-98	27-Mar-98						
1999	24-Dec-98	13-Mar-99						
2000	25-Dec-99	4-Jan-00	14-Jan-00	27-Feb-00				

Table 17. Annual periods of ice-affected flows for 01137500 Ammonoosuc River at Bethlehem Junction, New Hampshire

LOCATION.--Lat 44°16'08", long 71°37'52", Grafton County, on left bank, 0.2 miles upstream from Pierce Bridge and Bethlehem Junction, 3.0 miles east of US 302 and State Highway 142 intersection in Bethlehem, 3.4 miles downstream from Little River, and 4.5 miles west of US 3 and 302 intersection in Twin Mountain (fig. 1).

DRAINAGE AREA.--87.6 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1940 - 2000.

REGULATION.--None known water years 1940 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 8, 1960; latest date of ice-affected flow, April 12, 1940; minimum number of days of ice-affected flow, 21, 1999; maximum number of days of ice-affected flow, 128, 1965 and 1980.

ABBREVIATIONS.--c, data censored.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1940	24-Nov-39	25-Nov-39	2-Dec-39	3-Dec-39	9-Dec-39	31-Mar-40	2-Apr-40	2-Apr-40
	6-Apr-40	7-Apr-40	12-Apr-40	12-Apr-40				
1941	3-Dec-40	30-Dec-40	6-Jan-41	26-Mar-41	31-Mar-41	9-Apr-41		
1942	11-Dec-41	14-Dec-41	20-Dec-41	24-Dec-41	29-Dec-41	2-Jan-42	5-Jan-42	9-Mar-42
	11-Mar-42	13-Mar-42						
1943	29-Nov-42	2-Dec-42	10-Dec-42	28-Mar-43				
1944	30-Nov-43	30-Nov-43	1-Dec-43	1-Dec-43	11-Dec-43	6-Apr-44		
1945	3-Dec-44	9-Dec-44	11-Dec-44	18-Mar-45				
1946	30-Nov-45	7-Dec-45	11-Dec-45	10-Mar-46	14-Mar-46	15-Mar-46		
1947	2-Dec-46	5-Dec-46	9-Dec-46	10-Dec-46	16-Dec-46	16-Dec-46	21-Dec-46	10-Mar-47
	13-Mar-47	18-Mar-47	21-Mar-47	23-Mar-47				
1948	25-Nov-47	10-Dec-47	13-Dec-47	22-Mar-48				
1949	3-Dec-48	5-Dec-48	9-Dec-48	31-Dec-48	11-Jan-49	23-Mar-49		
1950	27-Nov-49	27-Nov-49	3-Dec-49	13-Dec-49	17-Dec-49	18-Dec-49	29-Dec-49	4-Jan-50
	8-Jan-50	1-Apr-50						
1951	16-Dec-50	28-Jan-51	31-Jan-51	27-Mar-51				
1952	28-Nov-51	4-Dec-51	13-Dec-51	23-Mar-52	30-Mar-52	31-Mar-52		
1953	29-Nov-52	11-Dec-52	17-Dec-52	12-Jan-53	16-Jan-53	25-Jan-53	30-Jan-53	23-Feb-53
	27-Feb-53	16-Mar-53	18-Mar-53	22-Mar-53				
1954	16-Dec-53	16-Dec-53	18-Dec-53	3-Jan-54	19-Jan-54	31-Jan-54	13-Feb-54	23-Feb-54
	26-Feb-54	26-Feb-54	1-Mar-54	1-Mar-54	5-Mar-54	9-Mar-54	11-Mar-54	13-Mar-54
	17-Mar-54	19-Mar-54	23-Mar-54	23-Mar-54	25-Mar-54	25-Mar-54	28-Mar-54	28-Mar-54
	30-Mar-54	4-Apr-54						
1955	c							
1956	27-Nov-55	10-Jan-56	14-Jan-56	22-Feb-56	26-Feb-56	29-Mar-56	2-Apr-56	2-Apr-56
	4-Apr-56	6-Apr-56						
1957	5-Dec-56	7-Dec-56	27-Dec-56	15-Jan-57	17-Jan-57	20-Jan-57	23-Jan-57	23-Jan-57
	30-Jan-57	19-Feb-57	26-Feb-57	27-Feb-57				
1958	11-Nov-57	12-Nov-57	25-Nov-57	28-Nov-57	2-Dec-57	10-Dec-57	13-Dec-57	20-Dec-57
	25-Dec-57	26-Dec-57	3-Jan-58	29-Jan-58	5-Feb-58	22-Feb-58	1-Mar-58	5-Mar-58
	9-Mar-58	28-Mar-58						
1959	26-Nov-58	13-Feb-59	18-Feb-59	19-Feb-59	7-Mar-59	9-Mar-59	20-Mar-59	23-Mar-59

Table 17. Annual periods of ice-affected flows for 01137500 Ammonoosuc River at Bethlehem Junction, New Hampshire--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
	25-Mar-59	26-Mar-59	28-Mar-59	30-Mar-59	2-Apr-59	3-Apr-59		
1960	11-Dec-59	11-Dec-59	18-Dec-59	31-Mar-60				
1961	8-Nov-60	8-Nov-60	24-Nov-60	26-Nov-60	5-Dec-60	5-Dec-60	10-Dec-60	26-Jan-61
	9-Mar-61	12-Mar-61	17-Mar-61	17-Mar-61	21-Mar-61	23-Mar-61		
1962	2-Dec-61	2-Dec-61	9-Dec-61	9-Dec-61	14-Dec-61	24-Jan-62	29-Jan-62	5-Apr-62
1963	12-Dec-62	28-Mar-63	31-Mar-63	31-Mar-63	1-Apr-63	1-Apr-63		
1964	4-Dec-63	9-Dec-63	18-Dec-63	30-Dec-63	8-Jan-64	5-Mar-64	10-Mar-64	20-Mar-64
	31-Mar-64	31-Mar-64	1-Apr-64	1-Apr-64				
1965	2-Dec-64	26-Dec-64	29-Dec-64	29-Dec-64	31-Dec-64	11-Apr-65		
1966	1-Dec-65	2-Dec-65	8-Dec-65	23-Mar-66				
1967	3-Dec-66	9-Dec-66	13-Dec-66	2-Apr-67				
1968	16-Nov-67	17-Nov-67	29-Nov-67	12-Dec-67	24-Dec-67	26-Feb-68	29-Feb-68	3-Mar-68
	17-Mar-68	23-Mar-68						
1969	7-Dec-68	31-Jan-69	9-Feb-69	10-Feb-69	1-Mar-69	8-Apr-69		
1970	27-Nov-69	28-Nov-69	2-Dec-69	10-Dec-69	15-Dec-69	27-Dec-69	1-Jan-70	4-Feb-70
	20-Feb-70	7-Mar-70	9-Mar-70	9-Mar-70	21-Mar-70	24-Mar-70	27-Mar-70	6-Apr-70
1971	5-Dec-70	24-Jan-71	9-Feb-71	11-Feb-71	14-Feb-71	19-Mar-71	23-Mar-71	28-Mar-71
	31-Mar-71	1-Apr-71	3-Apr-71	5-Apr-71				
1972	14-Nov-71	18-Nov-71	23-Nov-71	12-Dec-71	28-Dec-71	18-Mar-72		
1973	16-Dec-72	1-Jan-73	4-Jan-73	4-Feb-73	11-Feb-73	16-Nov-73	19-Nov-73	8-Mar-73
1974	17-Dec-73	18-Dec-73	1-Jan-74	11-Feb-74	22-Feb-74	23-Feb-74	26-Feb-74	27-Feb-74
	4-Mar-74	4-Mar-74	6-Mar-74	6-Mar-74	17-Mar-74	17-Mar-74		
1975	2-Dec-74	2-Dec-74	11-Jan-75	12-Jan-75	16-Jan-75	27-Feb-75	2-Mar-75	2-Mar-75
	5-Mar-75	5-Mar-75	9-Mar-75	12-Mar-75	16-Mar-75	16-Mar-75	20-Mar-75	20-Mar-75
1976	c							
1977	2-Dec-76	6-Dec-76	22-Dec-76	13-Mar-77				
1978	5-Dec-77	25-Jan-78	30-Jan-78	28-Mar-78				
1979	21-Nov-78	5-Dec-78	12-Dec-78	2-Jan-79	7-Jan-79	5-Mar-79		
1980	4-Dec-79	9-Apr-80						
1981	13-Dec-80	30-Dec-80	2-Feb-81	28-Feb-81	1-Mar-81	3-Mar-81		
1982	21-Dec-81	26-Mar-82						
1983	10-Dec-82	16-Dec-82	20-Dec-82	11-Jan-83	13-Jan-83	24-Jan-83	26-Jan-83	3-Feb-83
	5-Feb-83	28-Mar-83						
1984	c							
1985	7-Dec-84	13-Dec-84	23-Dec-84	25-Dec-84	29-Dec-84	29-Dec-84	5-Jan-85	13-Feb-85
	18-Feb-85	24-Feb-85						
1986	c							
1987	21-Dec-86	21-Dec-86	2-Jan-87	2-Jan-87	29-Jan-87	11-Mar-87		
1988	20-Dec-87	14-Jan-88	17-Jan-88	17-Jan-88	24-Jan-88	31-Jan-88	7-Feb-88	16-Feb-88
	3-Mar-88	10-Mar-88						
1989	10-Dec-88	15-Dec-88	17-Dec-88	26-Dec-88	28-Dec-88	5-Jan-89	8-Jan-89	13-Jan-89
	15-Jan-89	16-Jan-89	1-Feb-89	2-Feb-89	4-Feb-89	5-Feb-89	12-Feb-89	23-Feb-89
	6-Mar-89	14-Mar-89	19-Mar-89	23-Mar-89				
1990	25-Nov-89	1-Dec-89	3-Dec-89	4-Dec-89	6-Dec-89	3-Jan-90	5-Jan-90	6-Jan-90

Table 17. Annual periods of ice-affected flows for 01137500 Ammonoosuc River at Bethlehem Junction, New Hampshire--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
	11-Jan-90	13-Jan-90	15-Jan-90	8-Feb-90	14-Feb-90	14-Feb-90	16-Feb-90	20-Feb-90
	2-Mar-90	10-Mar-90						
1991	27-Dec-90	7-Jan-91	9-Jan-91	28-Feb-91	11-Mar-91	14-Mar-91		
1992	16-Dec-91	10-Mar-92						
1993	9-Dec-92	28-Mar-93						
1994	2-Dec-93	4-Dec-93	14-Dec-93	6-Apr-94				
1995	24-Nov-94	28-Nov-94	10-Dec-94	11-Dec-94	13-Dec-94	20-Dec-94	28-Dec-94	16-Jan-95
	4-Feb-95	11-Mar-95						
1996	1-Dec-95	2-Dec-95	5-Dec-95	21-Jan-96	5-Feb-96	22-Feb-96		
1997	31-Dec-96	4-Jan-97	12-Jan-97	5-Feb-97	19-Feb-97	20-Feb-97	22-Feb-97	22-Feb-97
	9-Mar-97	9-Mar-97	23-Mar-97	24-Mar-97				
1998	8-Dec-97	16-Dec-97	23-Dec-97	24-Dec-97	2-Jan-98	2-Jan-98	7-Jan-98	8-Jan-98
	22-Jan-98	22-Jan-98	24-Jan-98	1-Feb-98	3-Feb-98	6-Feb-98	12-Feb-98	12-Feb-98
	15-Feb-98	17-Feb-98	23-Feb-98	23-Feb-98	1-Mar-98	4-Mar-98		
1999	1-Jan-99	7-Jan-99	10-Jan-99	13-Jan-99	16-Jan-99	17-Jan-99	19-Jan-99	19-Jan-99
	24-Jan-99	24-Jan-99	13-Feb-99	13-Feb-99	23-Feb-99	25-Feb-99	1-Mar-99	1-Mar-99
	4-Mar-99	4-Mar-99						
2000	20-Dec-99	21-Dec-99	26-Dec-99	5-Jan-00	14-Jan-00	3-Feb-00	5-Feb-00	7-Feb-00
	15-Feb-00	20-Feb-00	24-Feb-00	28-Feb-00				

Table 18. Annual periods of ice-affected flows for 04293500 Missisquoi River at East Berkshire, Vermont

LOCATION.--Lat 44°57'36", long 72°41'49", Franklin County, on left bank, 0.4 miles upstream of State Highway 105 bridge, 1.9 miles north of intersection of State Highways 105 and 118 in East Berkshire, 1.9 miles upstream from Trout River, 2.6 miles southwest of Town Hall in Richford, and 3.6 miles downstream from North Branch (fig. 1).

DRAINAGE AREA.--479 square miles.

PERIOD OF RECORD.--Methods of data collection considered consistent water years 1934 - 2000.

REGULATION.--Possible slight regulation at low flows water years 1934 - 2000.

EXTREMES FOR PERIOD OF RECORD.--Earliest date of ice-affected flow, November 14, 1939 and 1971; latest date of ice-affected flow, April 19, 1939; minimum number of days of ice-affected flow, 69, 2000; maximum number of days of ice-affected flow, 149, 1972.

ABBREVIATIONS.--c, data censored; m, data missing.

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1934	15-Nov-33	2-Dec-33	10-Dec-33	6-Apr-34				
1935	c							
1936	5-Dec-35	15-Mar-36						
1937	25-Nov-36	9-Apr-37						
1938	9-Dec-37	25-Mar-38						
1939	25-Nov-38	5-Dec-38	15-Dec-38	19-Apr-39				
1940	14-Nov-39	30-Nov-39	6-Dec-39	10-Apr-40				
1941	26-Nov-40	29-Dec-40	6-Jan-41	7-Apr-41				
1942	c							
1943	24-Nov-42	24-Nov-42	29-Nov-42	27-Mar-43	3-Apr-43	4-Apr-43	7-Apr-43	8-Apr-43
	11-Apr-43	11-Apr-43						
1944	25-Nov-43	4-Dec-43	6-Dec-43	6-Apr-44				
1945	2-Dec-44	17-Mar-45						
1946	26-Nov-45	15-Mar-46						
1947	23-Nov-46	24-Nov-46	30-Nov-46	8-Dec-46	11-Dec-46	6-Apr-47		
1948	27-Nov-47	20-Mar-48						
1949	3-Dec-48	6-Dec-48	11-Dec-48	31-Dec-48	4-Jan-49	5-Jan-49	11-Jan-49	23-Mar-49
1950	23-Nov-49	22-Dec-49	25-Dec-49	26-Dec-49	29-Dec-49	3-Jan-50	6-Jan-50	4-Apr-50
1951	17-Dec-50	31-Mar-51						
1952	21-Nov-51	22-Nov-51	25-Nov-51	4-Dec-51	11-Dec-51	1-Apr-52		
1953	2-Dec-52	9-Dec-52	15-Dec-52	24-Mar-53				
1954	14-Dec-53	6-Apr-54						
1955	3-Dec-54	4-Apr-55						
1956	25-Nov-55	11-Apr-56						
1957	24-Nov-56	26-Nov-56	29-Nov-56	7-Dec-56	9-Dec-56	19-Mar-57	21-Mar-57	26-Mar-57
	28-Mar-57	30-Mar-57						
1958	26-Nov-57	29-Nov-57	3-Dec-57	7-Dec-57	13-Dec-57	20-Dec-57	2-Jan-58	30-Mar-58
1959	26-Nov-58	5-Apr-59						
1960	20-Nov-59	20-Nov-59	1-Dec-59	1-Dec-59	11-Dec-59	15-Dec-59	18-Dec-59	3-Apr-60
1961	2-Dec-60	2-Dec-60	4-Dec-60	4-Dec-60	9-Dec-60	15-Mar-61	17-Mar-61	23-Mar-61
1962	30-Nov-61	3-Dec-61	9-Dec-61	10-Dec-61	12-Dec-61	30-Mar-62		
1963	11-Dec-62	31-Mar-63						

Table 18. Annual periods of ice-affected flows for 04293500 Missisquoi River at East Berkshire, Vermont--Continued

Water year	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off	Ice on	Ice off
1964	2-Dec-63	8-Dec-63	10-Dec-63	14-Mar-64	17-Mar-64	24-Mar-64	30-Mar-64	4-Apr-64
	6-Apr-64	6-Apr-64						
1965	30-Nov-64	6-Apr-65						
1966	20-Nov-65	20-Nov-65	8-Dec-65	13-Dec-65	19-Dec-65	31-Mar-66		
1967	21-Nov-66	23-Nov-66	3-Dec-66	8-Dec-66	14-Dec-66	2-Apr-67		
1968	16-Nov-67	13-Dec-67	16-Dec-67	22-Mar-68				
1969	7-Dec-68	7-Apr-69						
1970	28-Nov-69	28-Nov-69	1-Dec-69	11-Dec-69	16-Dec-69	10-Apr-70		
1971	6-Dec-70	11-Apr-71						
1972	14-Nov-71	17-Nov-71	24-Nov-71	16-Apr-72				
1973	17-Nov-72	27-Nov-72	30-Nov-72	14-Mar-73				
1974	3-Dec-73	3-Dec-73	15-Dec-73	22-Dec-73	1-Jan-74	4-Apr-74		
1975	27-Nov-74	7-Dec-74	16-Dec-74	11-Jan-75	15-Jan-75	20-Mar-75		
1976	10-Dec-75	20-Mar-76	29-Mar-76	29-Mar-76				
1977	1-Dec-76	13-Mar-77	15-Mar-77	24-Mar-77				
1978	26-Nov-77	30-Nov-77	6-Dec-77	15-Apr-78				
1979	20-Nov-78	21-Mar-79						
1980	1-Dec-79	6-Dec-79	9-Dec-79	31-Mar-80				
1981	c							
1982	10-Dec-81	26-Mar-82						
1983	28-Nov-82	29-Nov-82	9-Dec-82	16-Dec-82	19-Dec-82	26-Dec-82	21-Dec-82	11-Jan-83
	14-Jan-83	19-Mar-83						
1984	8-Dec-83	12-Dec-83	19-Dec-83	23-Mar-84				
1985	5-Dec-84	17-Dec-84	20-Dec-84	29-Dec-84	1-Jan-85	26-Mar-85		
1986	4-Dec-85	26-Mar-86						
1987	20-Nov-86	26-Nov-86	6-Dec-86	25-Mar-87				
1988	23-Nov-87	23-Nov-87	18-Dec-87	25-Mar-88				
1989	m							
1990	21-Nov-89	16-Mar-90	22-Mar-90	25-Mar-90				
1991	11-Dec-90	19-Dec-90	28-Dec-90	28-Dec-90	4-Jan-91	4-Mar-91		
1992	c							
1993	c							
1994	17-Dec-93	15-Apr-94						
1995	11-Dec-94	15-Jan-95	25-Jan-95	15-Mar-95				
1996	1-Dec-95	19-Jan-96	30-Jan-96	25-Feb-96	3-Mar-96	15-Mar-96		
1997	24-Nov-96	1-Dec-96	31-Dec-96	2-Apr-97				
1998	3-Dec-97	23-Dec-97	7-Jan-98	7-Jan-98	16-Jan-98	26-Mar-98		
1999	19-Dec-98	2-Apr-99						
2000	19-Dec-99	7-Jan-00	14-Jan-00	2-Mar-00				



Table 19. Summary of days of ice-affected flows for 18 rivers in New England

[USGS, U.S. Geological Survey; years of minimum and maximum number of days of ice-affected flows are water years (2000 water year runs from October 1, 1999 to September 30, 2000)]

USGS gaging station number	River name	Period of record	Earliest date of ice-affected flow	Latest date of ice-affected flow	Minimum number of days of ice-affected flow and year	Maximum number of days of ice-affected flow and year
01011000	Allagash	1932-2000	November 14, 1998	May 5, 1943	110, 1945	171, 1943
01013500	Fish	1930-2000	November 17, 1955	April 28, 1939 and 1943	48, 1958	151, 1943
01014000	St. John	1934-2000	November 12, 1942	April 30, 1944 and 1972	107, 1936	159, 1943
01021500	Machias	1930-1977	November 9, 1939	April 9, 1964	19, 1951	133, 1940
01022500	Narraguagus	1949-2000	November 22, 1989	April 12, 1956	8, 1999	127, 1956
01023000	West Branch Union	1930-1979	November 15, 1933 and 1936	April 9, 1939	22, 1958	137, 1934
01031500	Piscataquis	1931-2000	October 30, 1977	April 25, 1939	34, 1983	143, 1972
01038000	Sheepscot	1939-2000	November 22, 1972	March 26, 1956	0, 1999	113, 1948
01048000	Sandy	1929-2000	November 17, 1992	April 19, 1975	75, 1951	136, 1943
01052500	Diamond	1942-2000	November 7, 1971	April 25, 1943	54, 1984	149, 1956
01055000	Swift	1931-2000	November 9, 1992	April 23, 1939	49, 1975 and 1984	138, 1956
01060000	Royal	1950-2000	November 24, 1989	April 2, 1964	0, 1976	106, 1987
01064500	Saco	1930-2000	November 13, 1986	April 28, 1939	16, 1933	133, 1939
01073000	Oyster	1936-2000	November 16, 1996	April 7, 1940	0, 1984	109, 1959
01076500	Pemigewasset	1941-2000	November 15, 1971	April 10, 1978	73, 1981	132, 1972
01134500	Moose	1948-2000	November 13, 1952	April 18, 1950	38, 1975	139, 1950
01137500	Ammonoosuc	1940-2000	November 8, 1960	April 12, 1940	21, 1999	128, 1965 and 1980
04293500	Missisquoi	1934-2000	November 14, 1939 and 1971	April 19, 1939	69, 2000	149, 1972

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