

Otsego Lake, NY ice phenology 1843-2020

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INTRODUCTION

Otsego Lake’s ice phenology, including date of ice-on (freeze) and ice-off (break-up), and duration of ice cover is summarized in this report (Table 1, Figure 1), providing an update to reports from 2005 and 2014 (Altman 2005, Waterfield 2014). The 2005 report included data for most years from 1843-2005 (Altman 2005). Missing data points have been filled by collaboration with K. Additon (Pers. Comm.). Biological Field Station faculty and staff observe lake conditions and maintain a record of annual data based on the following criteria. Dates recorded before 1967 may not have followed these criteria exactly. Early dates were often recorded by an office in the Village of Cooperstown; as such, it is unknown if the freeze dates recorded in these years reflect the condition to the North, over the deepest portion of the lake. In most years, this area remains open longer and is the last to freeze. Ice-on (freeze) dates are defined as the date on which ice completely covers the lake surface (no open water areas off shore). Ice-off, or break-up (thaw) dates are defined as the date on which ice is completely absent from the lake surface. Maintaining consistency in these criteria is a priority to ensure that researchers can utilize the dataset for analyses of long-term changes (e.g. US EPA 2012, Magnuson et al. 2000).

Table 1. Otsego Lake, NY freeze and thaw dates and duration of ice cover (days) 1843-2020.

Winter of	Freeze Date	Break-up Date	Ice Duration (days)	Winter of	Freeze Date	Break-up Date	Ice Duration (days)
1842-43		4/26/1843		1865-66	1/7/1866	4/14/1866	97
1843-44		4/13/1844		1866-67	1/3/1867	4/15/1867	102
1844-45		4/1/1845		1867-68	1/6/1868	4/16/1868	101
1845-46		4/7/1846		1868-69	12/27/1868	4/21/1869	115
1846-47		4/25/1847		1869-70	1/8/1870	4/26/1870	108
1847-48		4/10/1848		1870-71	1/4/1871	3/17/1871	72
1848-49		4/7/1849		1871-72	12/21/1871	4/27/1872	128
1849-50	02/01/1850	4/24/1850	83	1872-73	12/24/1872	5/4/1873	131
1850-51	12/30/1850	3/30/1851	90	1873-74	1/26/1874	5/5/1874	99
1851-52	12/24/1851	4/26/1852	124	1874-75	12/31/1874	5/7/1875	128
1852-53	1/17/1853	4/9/1853	82	1875-76	1/13/1876	4/26/1876	104
1853-54	1/24/1854	4/20/1854	86	1876-77	12/17/1876	4/27/1877	131
1854-55	12/20/1854	4/24/1855	125	1877-78	1/29/1878	4/1/1878	62
1855-56	1/5/1856	4/26/1856	112	1878-79	1/3/1879	4/30/1879	117
1856-57	12/18/1856	4/6/1857	109	1879-80	2/3/1880	4/7/1880	64
1857-58	2/5/1858	4/5/1858	59	1880-81	12/29/1880	4/25/1881	118
1858-59	1/9/1859	3/30/1859	89	1881-82	1/5/1882	4/6/1882	91
1859-60	12/28/1859	4/7/1860	101	1882-83	1/6/1883	4/26/1883	110
1860-61	1/8/1861	4/14/1861	96	1883-84	1/6/1884	4/22/1884	107
1861-62	1/5/1862	4/22/1862	107	1884-85	1/19/1885	4/26/1885	97
1862-63	1/17/1863	4/23/1863	96	1885-86	1/11/1886	4/13/1886	92
1863-64	1/3/1864	4/21/1864	109	1886-87	1/2/1887	5/1/1887	119
1864-65	1/8/1865	4/5/1865	87	1887-88	12/30/1887	4/30/1888	122

Table 1. Otsego Lake Ice Phenology Cont'd

Winter of	Freeze Date	Break-up Date	Ice Duration (days)	Winter of	Freeze Date	Break-up Date	Ice Duration (days)
1888-89	1/19/1889	4/11/1889	82	1928-29	1/15/1929	3/29/1929	73
1889-90	2/22/1890	4/8/1890	45	1929-30	1/23/1930	4/7/1930	74
1890-91	12/25/1890	4/15/1891	111	1930-31	1/14/1931	4/10/1931	86
1891-92	1/20/1892	4/5/1892	76	1931-32	2/25/1932	4/22/1932	57
1892-93	12/28/1892	4/18/1893	111	1932-33	2/25/1933	4/17/1933	51
1893-94	1/13/1894	3/22/1894	63	1933-34	12/29/1933	4/11/1934	103
1894-95	12/29/1894	4/20/1895	112	1934-35	1/12/1935	4/13/1935	91
1895-96	1/6/1896	4/20/1896	91	1935-36	1/27/1936	3/30/1936	63
1896-97	1/18/1897	4/21/1897	92	1936-37	1/28/1937	4/20/1937	82
1897-98	1/28/1898	3/18/1898	44	1937-38	1/10/1938	3/23/1938	72
1898-99	1/10/1899	4/24/1899	104	1938-39	1/18/1939	4/24/1939	96
1899-00	1/9/1900	4/19/1900	101	1939-40	12/28/1939	4/27/1940	121
1900-01	1/19/1901	4/17/1901	88	1940-41	1/7/1941	4/17/1941	100
1901-02	1/17/1902	3/29/1902	71	1941-42	1/16/1942	4/8/1942	82
1902-03	1/19/1903	3/17/1903	57	1942-43	12/20/1942	4/12/1943	113
1903-04	12/29/1903	4/24/1904	117	1943-44	12/24/1943	4/20/1944	118
1904-05	1/23/1905	4/19/1905	86	1944-45	12/28/1944	3/26/1945	88
1905-06	2/3/1906	4/14/1906	70	1945-46	1/20/1946	3/24/1946	63
1906-07	12/26/1906	4/4/1907	99	1946-47	2/8/1947	4/11/1947	62
1907-08	1/12/1908	4/8/1908	87	1947-48	1/5/1948	3/27/1948	82
1908-09	1/8/1909	4/9/1909	91	1948-49	2/6/1949	3/26/1949	48
1909-10	12/30/1909	3/28/1910	88	1949-50	2/8/1950	4/17/1950	68
1910-11	1/4/1911	4/23/1911	109	1950-51	1/28/1951	4/9/1951	71
1911-12	1/7/1912	4/19/1912	103	1951-52	1/8/1952	4/10/1952	93
1912-13	2/18/1913	3/21/1913	31	1952-53	2/2/1953	3/23/1953	49
1913-14	1/14/1914	4/19/1914	95	1953-54	1/14/1954	3/9/1954	54
1914-15	12/26/1914	4/19/1915	114	1954-55	1/21/1955	4/11/1955	80
1915-16	1/8/1916	4/17/1916	100	1955-56	12/23/1955	4/8/1956	107
1916-17	2/12/1917	4/18/1917	65	1956-57	1/11/1957	4/16/1957	95
1917-18	12/13/1917	4/14/1918	122	1957-58	2/1/1958	4/18/1958	76
1918-19	2/8/1919	3/28/1919	48	1958-59	12/29/1958	4/18/1959	110
1919-20	12/18/1919	4/17/1920	121	1959-60	1/12/1960	4/17/1960	96
1920-21	1/18/1921	3/19/1921	60	1960-61	1/3/1961	4/26/1961	113
1921-22	1/3/1922	4/11/1922	98	1961-62	1/18/1962	4/18/1962	90
1922-23	1/6/1923	4/11/1923	95	1962-63	1/16/1963	4/17/1963	91
1923-24	1/24/1924	4/17/1924	84	1963-64	1/12/1964	4/15/1964	94
1924-25	12/28/1924	3/27/1925	89	1964-65	1/15/1965	4/25/1965	100
1925-26	1/13/1926	4/23/1926	100	1965-66	1/15/1966	4/19/1966	94
1926-27	12/19/1926	4/10/1927	112	1966-67	1/19/1967	4/9/1967	80
1927-28	1/27/1928	4/7/1928	71	1967-68	1/2/1968	4/5/1968	94

Table 1. Otsego Lake Ice Phenology Cont'd

Winter of	Freeze Date	Break-up Date	Ice Duration (days)	Winter of	Freeze Date	Break-up Date	Ice Duration (days)
1968-69	12/26/1968	4/15/1969	110	1995-96	1/4/1996	4/15/1996	102
1969-70	1/2/1970	4/24/1970	112	1996-97	1/19/1997	4/6/1997	77
1970-71	1/9/1971	4/30/1971	111	1997-98	2/16/1998	3/31/1998	43
1971-72	1/17/1972	4/25/1972	99	1998-99	2/24/1999	4/6/1999	41
1972-73	1/8/1973	3/18/1973	69	1999-00	1/19/2000	3/25/2000	66
1973-74	1/12/1974	4/14/1974	92	2000-01	12/29/2000	4/21/2001	113
1974-75	1/21/1975	4/20/1975	89	2001-02	did not freeze		0
1975-76	2/29/1976	3/29/1976	29	2002-03	1/14/2003	4/17/2003	93
1976-77	12/27/1976	4/12/1977	106	2003-04	1/10/2004	4/13/2004	94
1977-78	1/15/1978	4/17/1978	92	2004-05	1/21/2005	4/11/2005	80
1978-79	1/10/1979	4/6/1979	86	2005-06	2/8/2006	2/17/2006	
1979-80	1/25/1980	4/11/1980	77	2005-06	2/26/2006	4/1/2006	43
1980-81	12/25/1980	4/13/1981	109	2006-07	2/12/2007	4/23/2007	71
1981-82	12/25/1981	4/20/1982	116	2007-08	1/27/2008	4/9/2008	75
1983-84	1/11/1984	4/14/1984	94	2008-09	1/10/2009	4/4/2009	84
1984-85	1/30/1985	4/5/1985	65	2009-10	1/23/2010	3/29/2010	65
1985-86	1/7/1986	3/30/1986	82	2010-11	1/14/2011	4/12/2011	88
1986-87	1/23/1987	4/4/1987	71	2011-12	did not freeze		0
1987-88	1/7/1988	4/1/1988	85	2012-13	1/24/2013	4/13/2013	79
1988-89	1/5/1989	4/1/1989	86	2013-14	1/22/2014	4/14/2014	82
1989-90	12/22/1989	3/21/1990	89	2014-15	1/14/2015	4/18/2015	94
1990-91	1/22/1991	3/28/1991	65	2015-16	2/14/2016	3/12/2016	27
1991-92	1/25/1992	4/17/1992	83	2016-17	did not freeze		0
1992-93	1/19/1993	3/14/1993	87	2017-18	1/1/2018	4/24/2018	113
1993-94	1/6/1994	4/20/1994	104	2018-19	1/16/2019	4/13/2019	87
1994-95	2/7/1995	3/30/1995	51	2019-20	2/9/2020	3/20/2020	40

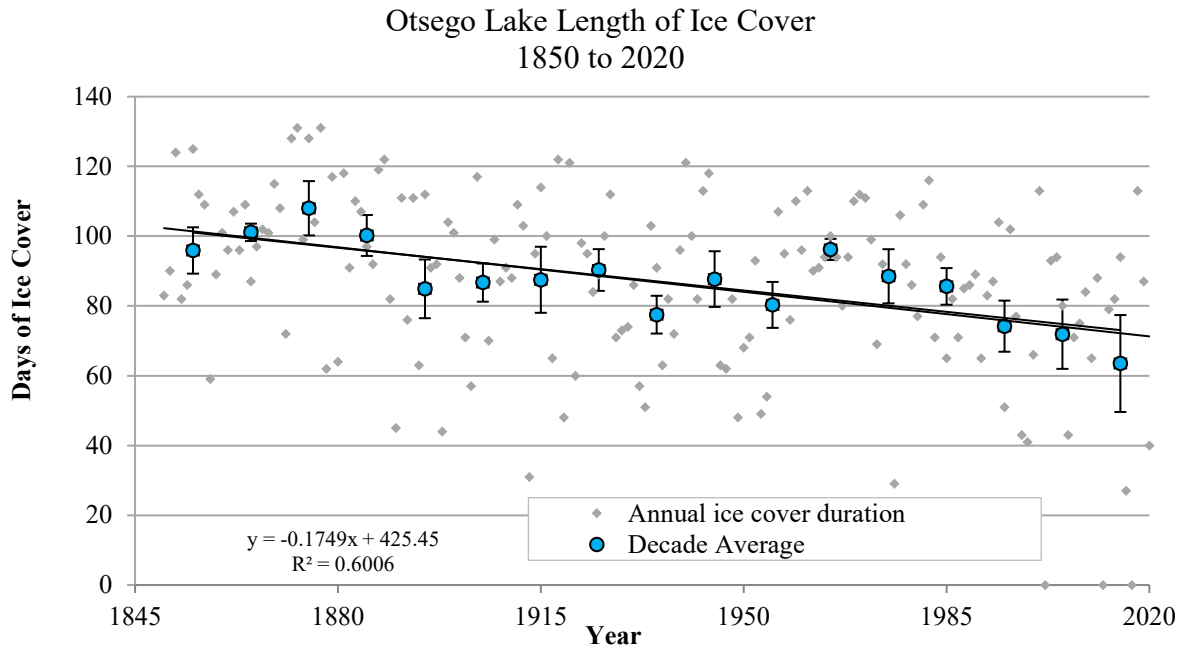


Figure 1. Duration of ice cover (days) on Otsego Lake, NY 1850-2020, by year and by 10 year mean. Linear trend line and R^2 values included for time period 1850-2020.

Long-term trends in the duration of ice cover follow those exhibited by many lakes throughout the northern hemisphere. In general, temperate lakes are freezing later and thawing earlier (Magnuson et al. 2000). The rate of change in Otsego Lake's length ice cover in more recent years (1960-2020) is greater than that seen from 1850-2020, based on decade mean ice cover duration (Figure 1). The ecological effects of such changes are currently a focus of researchers around the world.

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