

2010

Climate Change (2010 State of the Bay Poster)

Casco Bay Estuary Partnership

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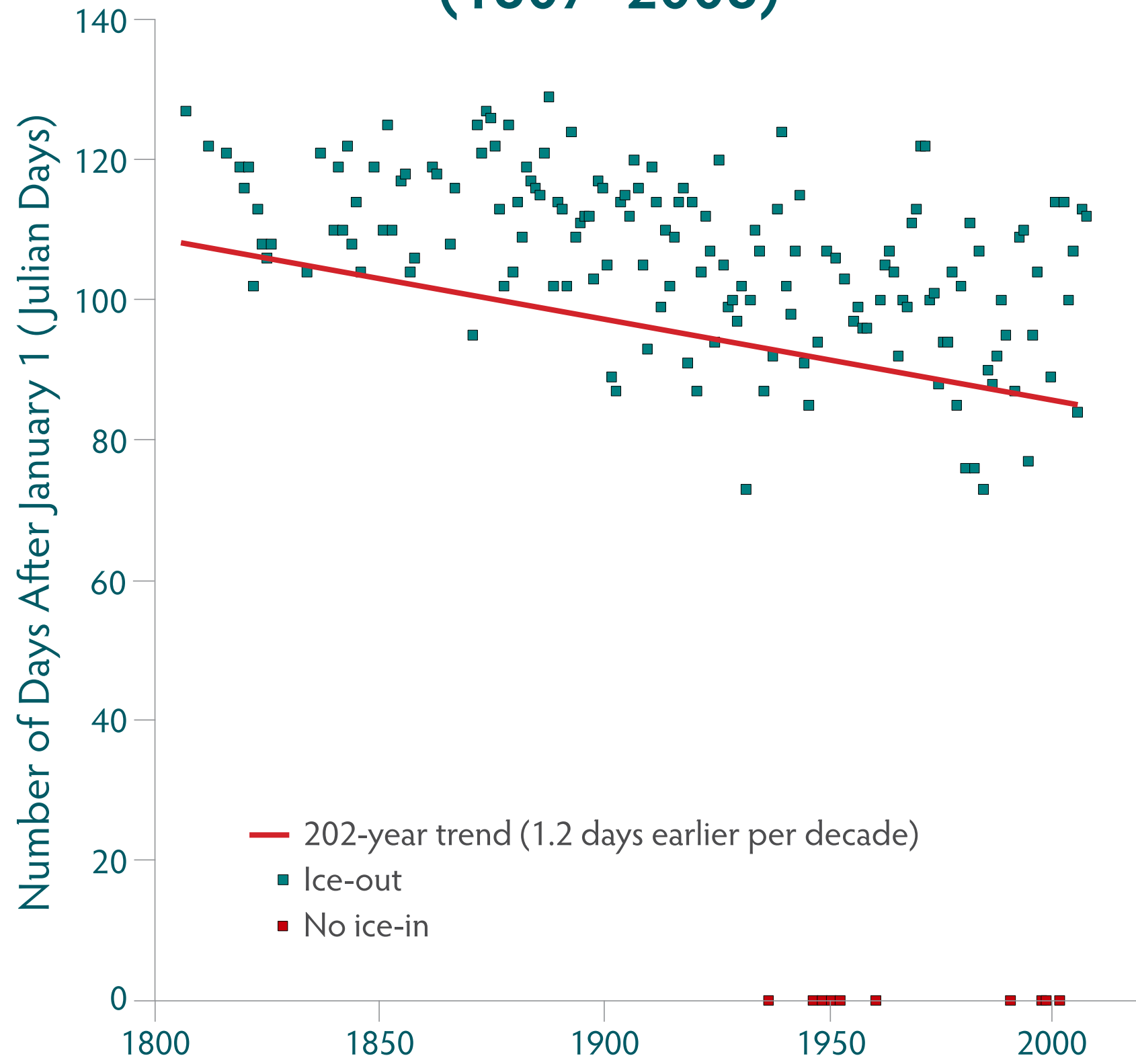
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Climate Change



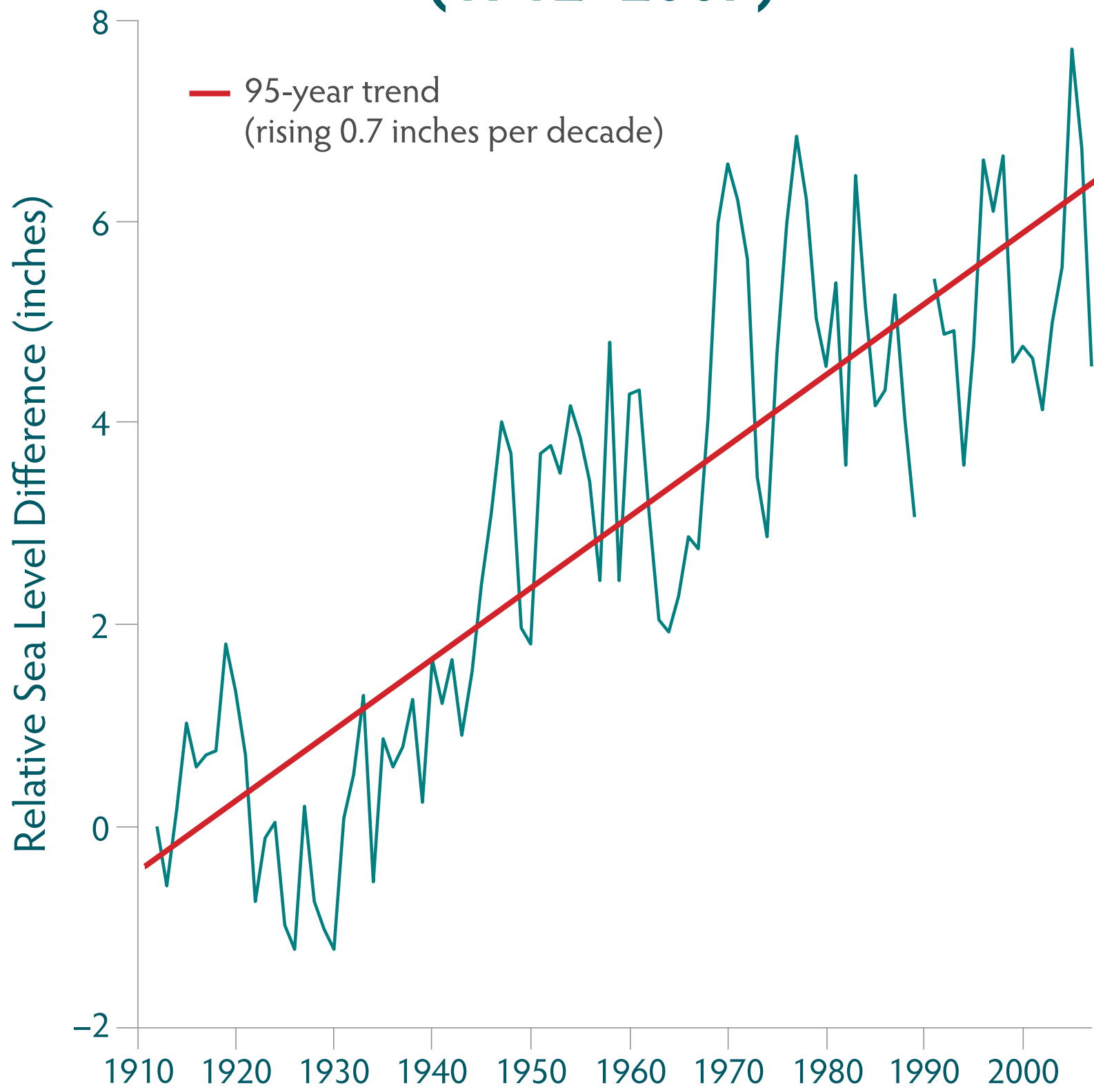
Three workers pose with thick blocks of ice on Sebago Lake circa 1920.

Day of Ice-Out at Sebago Lake (1807–2008)



The day of ice-out is defined as the number of days past January 1st until the lake is considered ice-free. Average ice-out dates are about three weeks earlier now than they were in the mid-1800s. While ice-out dates in May were fairly common before 1800, they have occurred only three times since 1900. The day of ice-out has become an average of 1.2 days earlier each decade since the early 1800s. Red squares indicate years in which the lake did not freeze over (Wake *et al.* 2009).

Sea Level Rise at Portland Harbor (1912–2007)



Relative sea level (inches) measured at the Portland Harbor tidal gauge, 1912 to 2007. The 1912 value has been subtracted from annual values to illustrate the change in sea level relative to the start of the record. The red line is the linear regression applied to the time series, and is used to calculate the rate of change: about 0.7 inches/decade (Wake *et al.* 2009).

Estimates of Future Sea Level Rise at Portland Harbor

Emissions Scenario	Lower		Higher	
Year	2050	2100	2050	2100
1998 stillwater elevation (ft)	8.9	8.9	8.9	8.9
Subsidence of coastline	0.024	0.043	0.024	0.043
Changes in ocean circulation	NE	0.52	NE	0.79
Global average sea level	0.66	1.6	1.4	4.6
Total stillwater elevation ¹ (ft)	9.5	11.1	10.3	14.3

Above are estimates of future changes in tidal elevation at the Portland tide gauge under lower and higher greenhouse gas emissions scenarios. Changes in elevation will reflect (1) subsidence of the Maine coastline; (2) dynamic changes due to changes in ocean currents; and (3) eustatic (global) changes in sea level due principally to changes in the volume of ocean water (Wake *et al.* 2009).

- The Casco Bay region is warmer and wetter than it was a century ago.
- Sea level is projected to rise between two and five feet at Portland by the end of this century.
- Both drought and flooding are likely to be more common than in the past.
- Changes are likely in the chemistry of our coastal waters, including acidification that affects shellfish and other species.