



State of the Bay

2015

State of the Bay 2015

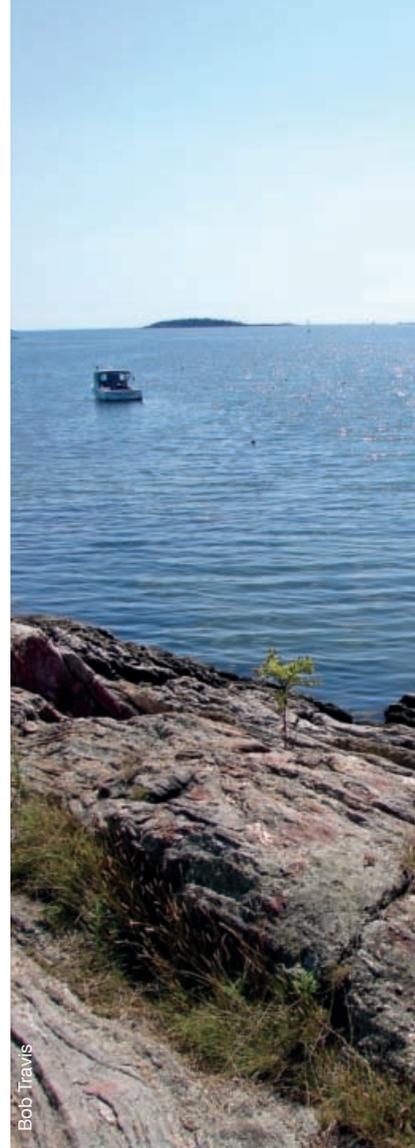
The Casco Bay Estuary Partnership helps track and report on changing conditions within the Bay and its watershed. Every five years, in its State of the Bay report, the Partnership portrays how Casco Bay is faring—what trends are evident, what progress is visible, and what new challenges are emerging. By tracking indicators at regular intervals over decades, the Partnership helps identify the collective work needed to sustain the region.

State of the Bay 2015, summarized here and detailed online at www.cascobayestuary.org/state-of-the-bay-2015, reveals a complex array of factors shaping the ecology and economy of the Casco Bay region. There's a mix of encouraging news, interspersed with unsettling trends. The warming climate represents a vast and unpredictable driver of regional change—with hotter ocean and air temperatures, more frequent and extreme precipitation, and rising seas (already evident in flooding at extreme high tides).

Indicators used in the past (and included in the 2015 report) do not fully account for the dynamic interplay of forces currently at work on Casco Bay. Future reports will include new indicators to help gauge the pace and impacts of far-reaching change.



Don Shall



Bob Travis



Bob Travis

Researchers Anticipate Increased Climate Stressors

Regional air temperatures have increased gradually for decades, and could rise between 2° and 6°F by mid-century. Since the mid-1990s, Casco Bay's average water temperatures have increased about 3°F. Local data and the *2015 Update of Maine's Climate Future* confirm that Maine is experiencing higher annual precipitation and more frequent extreme precipitation events. The Maine Geological Survey currently estimates that Casco Bay will experience a 2- to 4-foot rise in sea level by 2100.

According to a Maine Legislative Commission report, ocean acidification is taking place at a rate at least 100 times faster than at any other time in the past 200,000 years. Coastal acidification, in which the impact of atmospheric CO₂ is aggravated by degraded water quality, is also increasing. Casco Bay's first comprehensive acidification monitoring station was established in May 2015.



SeagrassLI.net

Eelgrass Beds Decline as Green Crab Numbers Explode

A seagrass that forms extensive intertidal and subtidal beds, eelgrass provides food for migratory winter waterfowl and nursery habitat for fish and shellfish. Casco Bay has traditionally had abundant eelgrass beds, but a 2013 aerial survey confirmed that the Bay had lost more than half of the eelgrass beds evident a decade earlier (due, in part, to clipping and uprooting of vegetation by the invasive European green crab).

Recognizing the need for a rapid and coordinated response, CBEP convened a series of meetings in 2013 and 2014 that sparked formation of a broad partnership focused on eelgrass conservation. In 2015, a pilot study was launched to identify suitable sites for large-scale eelgrass restoration, gauge effective eelgrass transplant methods, and determine which environmental factors contribute to restoration success.

For more information and references, see the full *State of the Bay*



Maine DEP

Spreading Invasive Species Disrupt Ecosystems and Fisheries

Non-native marine organisms are well established in Casco Bay, with some now among its most widespread species. The common periwinkle was introduced from Europe more than a century ago, European oysters are abundant, and non-native colonial tunicates (like the bright orange chain tunicate) grow throughout the Bay and foul fishing gear.

Since 2000, scientists have conducted regional rapid assessment surveys throughout the Northeast roughly every three years. Data gathered at two Casco Bay sites in 2013 found 20 introduced species between the two sites. An additional 11 species were of uncertain origin, and may be introduced. Recent surveys revealed the presence of several new invaders such as the Asian shore crab and the European rock shrimp that were not seen in surveys a decade ago.



Lee Dassler

Work to Remove Fish Barriers Progresses Slowly

The watershed's network of rivers, streams and lakes historically supported large populations of migratory fish, including shad, blueback herring and alewife. Roads, dams and other structures that disrupt natural stream processes have long impaired their ability to move within this network, nearly eliminating populations of several species.

CBEP staff, working with Trout Unlimited volunteers and others, collected detailed data in 2009 and 2010 on more than 1,400 road/stream crossings in the Casco Bay watershed. Roughly a third of these crossings prevent fish passage, and most partially obstruct passage (for certain species or at particular times). Since that assessment, several local partners have led efforts to restore aquatic habitat connectivity by removing one barrier at a time. Migratory fish can now access part of the lower Presumpscot River watershed, but many other waterways remain inaccessible.

2015 report at www.cascobayestuary.org/state-of-the-bay-2015.

ADDITIONAL INDICATORS

Conserved Lands More Than Double over Two Decades

The total acreage of permanently protected lands in the watershed's lower 16 municipalities has more than doubled, from 3.5 percent of the region (7,300 acres) in 1997 to 9.1 percent (18,960 acres) in 2015.

Bay Water Quality Faces Emerging Concerns

While variable, Casco Bay's water quality remains generally good, but acidification is a concern, along with moderately high nitrogen levels, increasing water temperatures, and a possible long-term decline in water clarity.

Road Salt Harms Urban Streams

Ongoing monitoring by the Long Creek Watershed Management District confirms that winter salt degrades the health of urban streams, and that focused stormwater management could improve those waterways.

Shellfish Bed Closures See Little Change

Federal and state shellfish sanitation rule changes now prohibit shellfish harvesting in a higher percent (25.6) of Bay waters than previously, but the proportion of softshell clam flats permanently closed to harvesting has changed little.

Osprey Numbers Appear Mixed

Late-summer surveys of wading birds on six tidal flats showed an average (over four years) of more than 13,000 birds feeding (mostly small sandpipers); the Bay's osprey populations are robust, but nesting productivity is lower now than in the late 1970s.

Elevated Lead and PAHs Found in Some Shellfish Samples

Periodic monitoring of shellfish tissues indicates that most Casco Bay shellfish have low contaminant levels, with some samples from the Bay's most industrialized parts showing elevated levels.

Lakes and Streams Typically Have Good Water Quality

Water quality in most of the Casco Bay watershed remains good, with cause for concern in selected urban and suburban streams and signs of declining water clarity in a small number of lakes.

Less Untreated Sewage Enters Bay after Heavy Rains

Communities bordering Casco Bay are making significant progress reducing Combined Sewer Overflow discharges, but planned solutions are time-consuming and expensive.

Impervious Surfaces Degrade Water Quality

Two-thirds of the Casco Bay watershed has low enough impervious surface cover to support Maine's strictest ("Class A") stream water-quality standards, but levels in 6.1 percent—mostly in Portland and South Portland—make it hard to meet even Maine's lowest "Class C" standards.

Two Beaches Face Periodic Advisories due to Pathogens

Routine water-quality sampling by the Maine Healthy Beaches program reveals recurrent challenges at two Casco Bay beaches, East End Beach in Portland and Willard Beach in South Portland, which both receive cautionary swimming advisories numerous times each year.

Education and Stewardship Engage Citizens with Casco Bay

Roughly 4,000 students participate in regional marine and environmental education programs run by schools, nonprofits and agencies that seek to increase environmental literacy and promote sound stewardship.

Footprint of Development Expands

The region's population grew over the past decade at a slow but steady pace. Between 1996 and 2010, the watershed's forested cover decreased by 16.8 square miles (declining to 65 percent of the watershed's land area) and developed areas increased by 8.53 square miles (reaching 10 percent of the watershed's land area).



Casco Bay Estuary Partnership

Casco Bay encompasses more than 200 square miles bordering Maine's largest metropolitan area. While only 3 percent of the state's total land mass, the Bay's watershed holds roughly 18 percent of its population and includes portions of 48 municipalities.

The Casco Bay Estuary Partnership (CBEP) mobilizes collective action to strengthen the Bay's ecological and economic vitality, fostering a shared commitment to Casco Bay. It focuses scientific expertise and financial resources on helping watershed communities address regional challenges such as water pollution, habitat degradation and climate adaptation.

Since Casco Bay was named an "estuary of national significance" in 1990, CBEP has served as a convener and information hub—engaging individuals, organizations and government agencies in shared actions to sustain Casco Bay. CBEP is one of 28 community-based partnerships that participate in the National Estuary Program of the US Environmental Protection Agency.



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