

NUTRIENT POLLUTION IN CASCO BAY: AN EMERGING ISSUE

- Nutrient pollution is emerging as one of Casco Bay's most challenging problems. We usually think of "nutrients" as things that make food nutritious, but when we add excess nutrients to coastal waters, it boosts plant growth, which has many unintended consequences.
- Due to our region's relatively low population, Casco Bay's water quality is generally excellent compared to other coastal bays close to urban and suburban areas. However, the Bay is beginning to experience effects of excess nutrients.
- In Casco Bay, nutrient pollution is principally caused by excess nitrogen entering the Bay.
- Several areas in Casco Bay are of greatest concern: Portland Harbor, the Harraseeket, the Royal River, and the upper New Meadows.

SOURCES OF NUTRIENT POLLUTION IN CASCO BAY

PRIMARY SOURCES OF NITROGEN ENTERING THE BAY

Percentage ranges represent those predicted by four different Casco Bay research models.

■ HUMAN SEWAGE (36–58%)

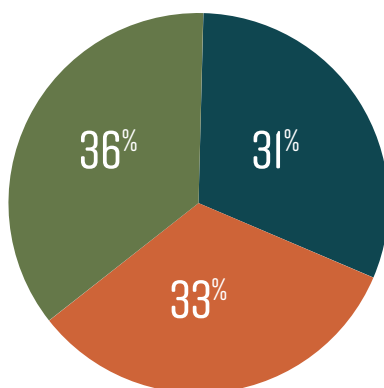
Enters Casco Bay primarily from wastewater treatment

■ STORMWATER RUNOFF (23–64%)

Urban and suburban runoff from lawns and city streets, carrying such things as fertilizer and pet waste

■ ATMOSPHERIC DEPOSITION (13–53%)

Includes emissions from vehicles and industrial sources



In 2017, thick mats of algae spread across Basin Cove in Harpswell, Back Cove in Portland, and Mill Cove in South Portland. These blooms are continuing throughout the summer of 2019. Photograph by Deb Dawson, courtesy of Friends of Casco Bay.

IMPACTS OF NUTRIENT POLLUTION ON CASCO BAY



HUMAN HEALTH

Some algal blooms are harmful to humans because they sometimes produce toxins that can make people sick if they come into contact with polluted water or consume tainted fish or shellfish.

THE BAY ECOSYSTEM

Excess nutrients lead to:

- Algal blooms, which consume large amounts of oxygen that fish, shellfish and other organisms need to survive, and sometimes create toxins that move up the food chain.
- Reduced water clarity, which reduces the ability of aquatic life to find food and which damages eelgrass beds.
- Coastal acidification: The decomposition of dead algae adds carbon dioxide to our coastal waters and makes seawater more acidic. This makes it harder for shellfish to build and maintain shells.



THE BAY ECONOMY

Casco Bay contributed \$704 million in direct economic activity to the State of Maine in 2016. The Bay also contributes to our communities' quality of life by providing recreational opportunities and supporting tourism. Nutrient pollution can have serious economic impacts on all of these things.

- Seafood industry: About **11%** of economic activity and **6%** of jobs in the Casco Bay marine economy are related to seafood harvesting and processing, industries which are directly affected by the health of Casco Bay.
- Tourism and recreation: **80%** of activity and jobs in the Casco Bay marine economy are in tourism. Activities like swimming, boating, and eating seafood are greatly impacted by visually unappealing or toxic algal blooms.
- Real estate: Waterfront property values can decline because of the unpleasant sight and odor of algal blooms and fish kills.

Resilience in a Changing Climate



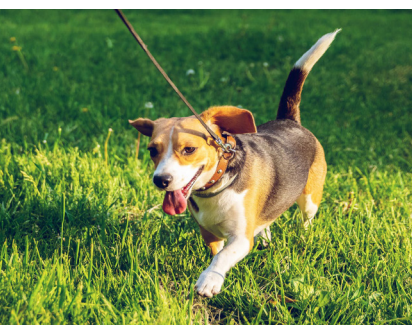
Use Bay pumpout facilities to empty your boat's sewage holding tank, or use shoreside toilet facilities before leaving the dock. Photograph by Kevin Morris, courtesy of Friends of Casco Bay.



CBEP and partners are monitoring nutrients around Casco Bay to provide real-time data on nutrient processes.



Install a rain garden or rain barrel, to help reduce the amount of stormwater entering our waterways.



Clean up your dog's waste and dispose of it properly (in trash receptacles, not down storm drains).

TAKING ACTION: CBEP AND ITS PARTNERS

- **Fertilizer ordinances.** Some Bay communities, like South Portland, are considering ordinances to restrict the use of fertilizers, one source of nitrogen.
- **Combined Sewer Overflows (CSOs).** The City of Portland is working to eliminate CSOs, which occur during storm events when a mixture of wastewater and stormwater runoff overflows the sewer collection system before reaching the wastewater treatment facility.
- **Sewage treatment.** Facilities around Casco Bay are working hard to reduce the amount of nitrogen released in their treated effluent. The Portland Water District's recent upgrade to the East End wastewater treatment facility resulted in an estimated 73% reduction in summer nitrogen discharges in 2018.

TAKING ACTION: YOU!

Here are just a few things you can do to help reduce the amount of nutrients entering our Bay:

AT HOME:

- Use less lawn and garden fertilizer – or none at all. There are local programs to promote healthy lawn care without reliance on heavy fertilizer and pesticide use. Contact us for more information.
- Maintain your septic system.
- Reduce the amount you drive, share rides, and buy cars with optimal gas mileage.

IN YOUR NEIGHBORHOOD/COMMUNITY:

- Support and/or lobby your community to address nitrogen issues through local ordinances.
- Support your community in making sewage and stormwater treatment improvements.



Photograph by Greg Williams

Population growth and climate change effects like warming waters and altered precipitation will likely make the nutrient problem more severe. The Casco Bay watershed houses nearly 20% of Maine's population and the region's population is growing. Much of the new development is dispersed in suburban and rural towns, which produce more stormwater runoff due to increased paved and hard surfaces.

Summer temperatures in Casco Bay have warmed about 3° Fahrenheit in the last 20 years. To date, Maine's cool waters, the Bay's robust tides and currents, and the relatively low population have made our Bay resilient to the moderate nutrient loads of the past, but there are limits to that resilience. Climate change is expected to increase the frequency and severity of algal blooms due to increased temperatures, increased droughts and flooding, changes in salinity, and other factors.

For more information and to read the report, *Nutrient Pollution in Casco Bay, Maine*, visit:

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CBEP is funded by the US Environmental Protection Agency under Cooperative Agreements #CE96190301, #CE00A00063, and #CE00A00299-0 with the University of Southern Maine.

AUGUST 2019


Casco Bay Estuary
PARTNERSHIP