

State of the Bay

2 0 0 5




Casco Bay Estuary
PARTNERSHIP



The Casco Bay Estuary Partnership

The Casco Bay Estuary Partnership (CBEP, formerly the Casco Bay Estuary Project) is a collaborative effort to preserve and protect the bay's resources. The partners include local, state and federal government agencies and interested citizen groups. In 1990, the U.S. Environmental Protection Agency designated Casco Bay as "an estuary of national significance," leading to the formation of the CBEP. For the past 15 years, CBEP has received significant annual federal funding to develop and implement a plan for the bay's future. Since the *Casco Bay Plan* was adopted in 1996, the partners have been working together to meet the five goals stated in the plan:

- 🌀 Minimize the loading of pathogens, toxics, nutrients, and sediments from stormwater and combined sewer overflows.
- 🌀 Open and protect shellfish and swimming areas impacted by water quality.
- 🌀 Minimize adverse environmental impacts to ecological communities from the use and development of land and marine resources.
- 🌀 Reduce toxic pollution.
- 🌀 Promote responsible stewardship on the part of the Casco Bay community members to protect Casco Bay and its watershed.

To learn more about CBEP and our work, please visit www.cascobayestuary.org.



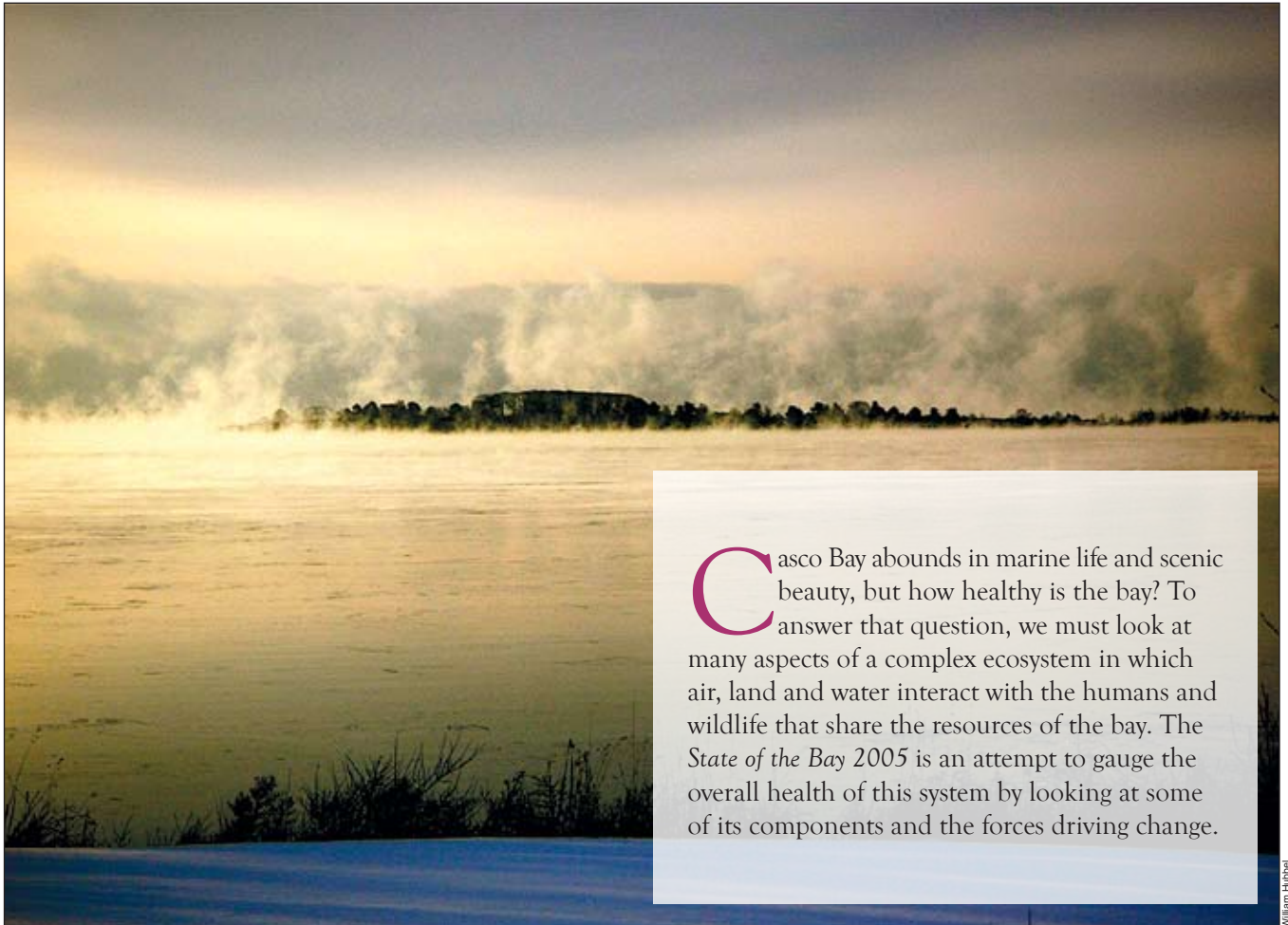
This document has been funded wholly by the U.S. Environmental Protection Agency (U.S. EPA) under Assistance Agreement #CE9817051 to the University of Southern Maine.

Front cover image: Landsat satellite image, 30 meter resolution, Spring 2001-2003.
Back cover photo: William Hubbell.

Table of Contents

| | |
|--|----|
| Introduction | 4 |
| Indicator 1: Population | 7 |
| Indicator 2: Impervious Surface | 10 |
| Indicator 3: Combined Sewer Overflows | 13 |
| Indicator 4: Shellfish | 15 |
| Indicator 5: Swimming Beaches | 18 |
| Indicator 6: Protected Land | 20 |
| Indicator 7: Undeveloped Land | 22 |
| Indicator 8: Waterbirds | 25 |
| Indicator 9: Eelgrass | 28 |
| Indicator 10: Sediments | 30 |
| Indicator 11: Mussels | 33 |
| Indicator 12: Water Quality | 36 |
| Indicator 13: Inland Water Quality | 40 |
| Indicator 14: Stewardship | 43 |
| Summary | 48 |
| Future Directions | 50 |

What Influences the State of Casco Bay and How is Casco Bay Estuary Partnership (CBEP) Measuring It?



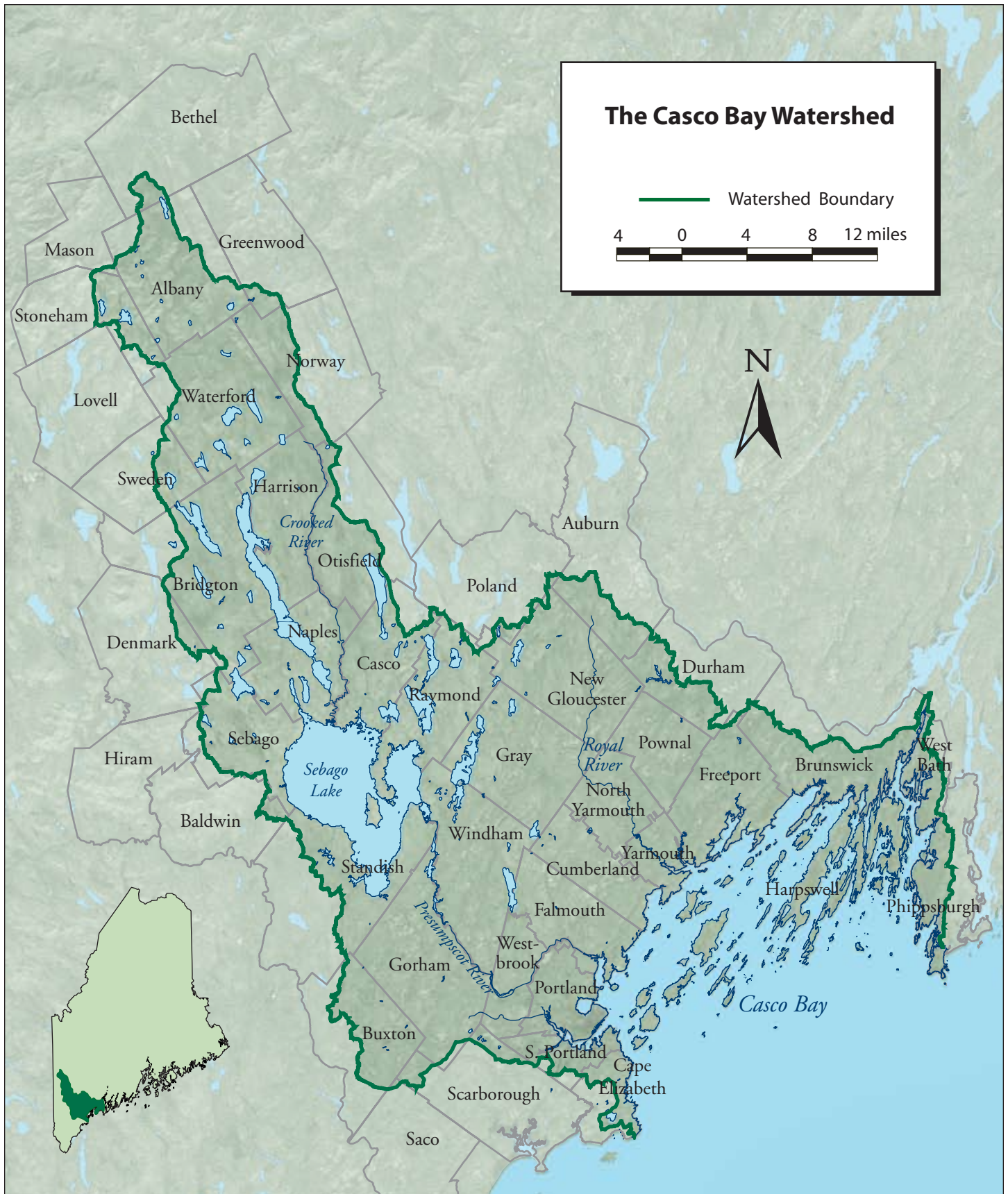
Casco Bay abounds in marine life and scenic beauty, but how healthy is the bay? To answer that question, we must look at many aspects of a complex ecosystem in which air, land and water interact with the humans and wildlife that share the resources of the bay. The *State of the Bay 2005* is an attempt to gauge the overall health of this system by looking at some of its components and the forces driving change.

Sea smoke on Casco Bay off the coast of Cumberland Foreside.

Casco Bay and Its Watershed

Casco Bay and its watershed (the 985 square miles of land that drain to the bay) is located at the heart of the most densely populated area in Maine. While the watershed represents only 3% of Maine's land area, its 41 municipalities include a quarter of the state's population. The watershed stretches from the coast at Cape Elizabeth east to Cape Small in Phippsburg, and northwest to Bethel in the western mountains of Maine. There are 578 miles of shoreline, including 785 islands, islets and exposed ledges in Casco Bay. The water surface covers nearly 200 square miles.

Twelve lake and river systems feed the bay, including Sebago Lake and the Presumpscot, Stroudwater, Royal and Fore Rivers. The bay supports a wealth of industries including shipping and petroleum transport, commercial fishing, tourism and recreation, and shellfish harvesting. Research done by the University of Southern Maine in 1988 estimated the value of the fisheries industry to Casco Bay at \$120 million and the tourism and recreation industry at \$250 million per year. A 1995 study estimated the overall value of the Casco Bay soft-shell clam industry at \$11.6 to \$15.7 million per year (Heinig *et al.* 1995).



The watershed for Casco Bay encompasses 985 square miles of land that drain into the bay. This land area represents approximately 3% of Maine's land area but is home to over a quarter of Maine's population. Forty-one municipalities from Bethel to the bay are located at least partially within the watershed. Twelve major lake and river systems flow to the bay including Sebago Lake and the Presumpscot, Stroudwater, Royal and Fore Rivers.



William Hubbel

Measuring the State of the Bay

As we work together to preserve and protect the health of Casco Bay, environmental monitoring allows us to measure our progress. Monitoring data can be used to establish a baseline of information, assess trends over time, and gauge whether our actions are helping us to meet the five stated environmental goals in the *Casco Bay Plan*. Through the Casco Bay Monitoring Program, CBEP and our partners are tracking a series of key environmental indicators. An environmental indicator is a measure of environmental quality that can be reliably used to assess the current condition of the environment as well as trends over time.

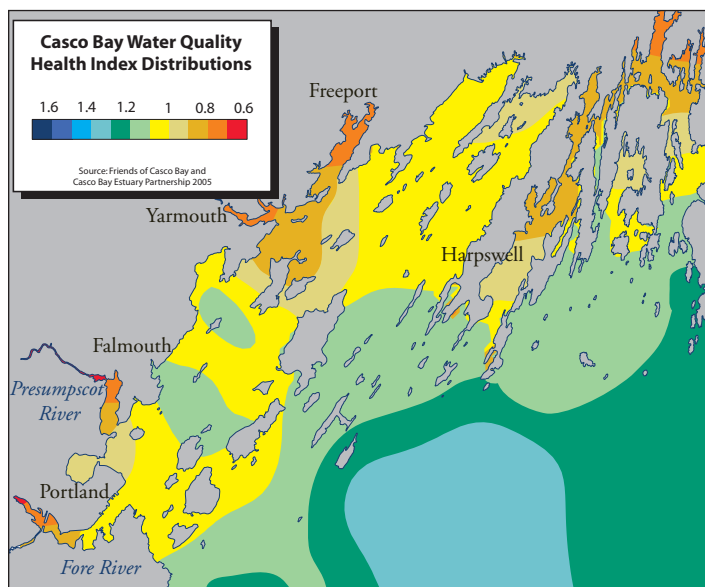
In *State of the Bay 2005* we use fourteen indicators ranging from population change to the levels of toxics in blue mussels to address questions about the health of Casco Bay and to measure our progress towards meeting the goals of the Casco Bay Plan. The indicators used in this report are helping us to answer the question: “What is the state of Casco Bay and its watershed?” We hope that the indicators are meaningful and that they convey information on the status of environmental quality in Casco Bay in a simple, concise format through text and illustrative graphics.

Human Impacts

Humans have a profound influence on the health of the bay’s ecosystem, relying on the bay and its watershed for drinking water, recreation, food, transportation, industry, and waste disposal. Thirty years ago, because of pollution and habitat degradation resulting from human activities, significant portions of Casco Bay were closed to recreation, fishing and shellfishing. For example, the lower Presumpscot River was devoid of fish and both Back Cove and the Fore River were so polluted that human contact with the water was a health hazard.

Today, there are measurable improvements in the health of the bay. State and federal clean water laws, the cooperation of business, industry and municipalities, and the implementation of the *Casco Bay Plan* are all helping to address the environmental impacts of human activities on the environment. Many formerly closed shellfishing areas are open. The lower Presumpscot River offers a banquet of fish for hungry coastal birds. East End Beach in Portland is open for swimming and sailboarders are enjoying the waters of Back Cove.

Not all the news is good, however. With a growing population and increasing development pressure there are still significant concerns. Stormwater runoff from paved areas, lawns and farms is carrying a cocktail of bacteria, oil and chemicals, many of them toxic, into the waterways that lead to the bay. Pollutants carried in wind and rain from both distant and nearby sources (incinerators, power plants and cars, for example) are deposited in the bay. These “nonpoint” sources of pollution are a challenge to control because they rely, in large part, on changes in individual behavior.



Data such as the water quality health index, above, serve as important indicators for evaluating the watershed’s health (see page 38 for full map and description of index).

References

- Casco Bay Estuary Program. 1996. *Casco Bay Plan*.
- Colgan, C. and F. Lake. 1988. *The Economic Value of Casco Bay*. University of Southern Maine. Maine Coastal Program/Maine State Planning Office.
- Heinig, C., P. Moore, D. W. Newburg and L. R. Moore. 1995. *Economic Analysis of the Soft-Shell Clam Industry (Mya arenaria) in Casco Bay*. Casco Bay Estuary Program.