

# QUARTERLY ECONOMIC REPORT

## WATER QUALITY IN MAINE

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## Water Quality in Maine

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### About This Report

The Maine Development Foundation staffs the Maine Economic Growth Council, an independent body created in statute to develop a long-term vision for Maine's economic growth and assess our progress toward that vision. The Council's vision is a high quality of life for all Maine people, supported by a vibrant and sustainable economy, vital communities, and a healthy environment. The Council's annual *Measures of Growth* is a reliable and trusted report that tracks Maine's progress on a number of critical indicators. These quarterly newsletters, produced in partnership with the University of Maine School of Economics (SOE), explore these topics further.

## Water Quality in Maine

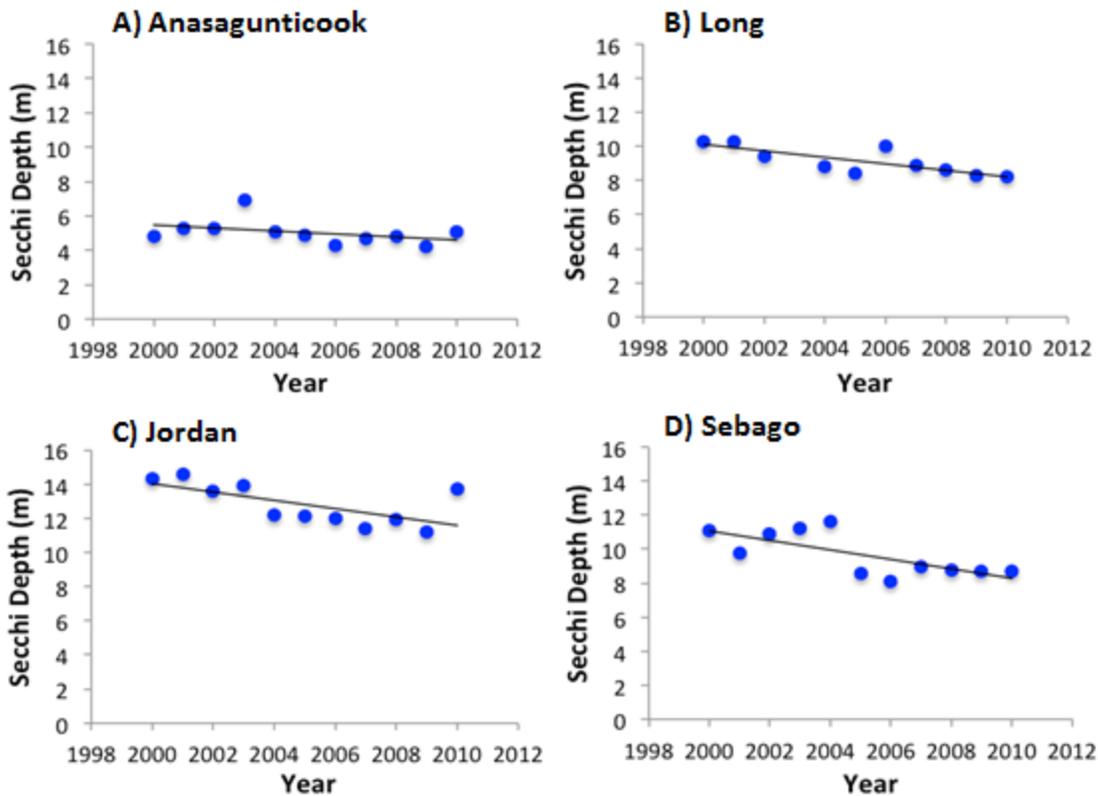
Water is an essential resource in Maine. High water quality contributes to economic growth through tourism and recreational activities, supports lakeshore property and aesthetic values, and lowers the costs of drinking water treatment. According to the 2015 *Measures of Growth* report, Maine lakes and rivers are approximately 20-60% cleaner than other lakes and rivers in the rest of the United States. Keeping Maine waters clean is a high priority for the state and the state's residents as evidenced by the approval of a \$10 million bond in 2014 to protect drinking water sources, restore wetlands, and create jobs<sup>1</sup>.

While Maine waters are pristine, since 1998 Secchi disk<sup>2</sup> depth readings across several of Maine's lakes have become shallower, indicating the water is getting less clear (see Figure 1 on the following page).

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<sup>1</sup> The bond was passed by votes of 30-2 in the Maine Senate and 129-19 in the House and by 65% of Maine voters.

<sup>2</sup> A black and white circular disk used to measure the clarity of bodies of water; it measures the depth at which a person can no longer distinguish between the two colors.



**Figure 1.** Average yearly change in Secchi disk transparency from 2000 to 2010 across four Maine lakes that also serve as drinking water sources. Data courtesy of Lakes of Maine ([www.lakesofmaine.org](http://www.lakesofmaine.org)).

While water clarity alone does not determine the health of the lake or stream, it is an easy way to note changes in the water body. The Maine Department of Environmental Protection (DEP) website notes that, “there is no single feature of lakes that affects people’s enjoyment of the resource more than water clarity.” There are several possible explanations behind decreased Secchi depth, including recovery from acid deposition due to implementation of the Clean Air Act, deposition from sea salt, changes in temperature, and increased heavy rainfall events. While Maine water quality remains high, it does appear to be declining.

Water quality may be threatened in the future by a changing climate and changes in use by recreationalists, tourists, and industry. These changes in water clarity, and potentially water quality, pose high economic costs. Sebago Lake has seen a decrease in water clarity of about two meters since 1998; this and additional losses in clarity translate into tens of millions of dollars in lost economic value. Additionally, increases in heavy precipitation may increase the need for water filtration or updated treatment infrastructures for drinking water and, while exact costs are not well documented, they would be high. Home property values would likely be affected as well. A study by the University of Maine and Maine DEP estimated that 15% of the cost of the average property sale (\$24,121 of the total cost of \$161,457)<sup>3</sup> on China Lake was dependent on water quality. If water quality continued to decline,

<sup>3</sup> All monetary results are in 2015 dollars.

more than \$24 million dollars could be lost (Michael et al. 1996; MDEP 2005). Continued Secchi disk transparency declines could result in substantial monetary losses for Maine residents.

There is a discrepancy in the reported water quality of Maine lakes and rivers and the coastal beaches they feed. These beaches rank 27<sup>th</sup> in beach water quality out of the 30 states that are on a coast or the Great Lakes. Differences in the methodology used by the DEP to measure lake and stream water quality and by the Natural Resources Defense Council (NRDC) to measure beach water quality account for some of this discrepancy and do not allow for direct comparisons. The DEP follows the U.S. Environmental Protection Agency's (EPA) system, which categorizes water bodies based on the designated uses (recreational, agricultural, industrial, and navigational) and fish, shellfish, and wildlife they can support. The suitability of a water body for the uses is based on physical, chemical, and biological characteristics. While all of these uses are important to Maine's economic growth, aesthetic value and water clarity, which can have substantial economic costs, are not identified.

The NRDC reports beach water quality to the U.S. EPA using the Beaches Environmental Assessment and Coastal Health (BEACH) Act, which assists state and local governments in developing and funding monitoring programs. There is no required consistency in how many beaches are monitored across states. With fewer beaches than other coastal states, Maine's beaches are monitored more frequently, and occurrences of bacteria or sewage overflows in the water may be more commonly identified. Beach water quality may be very good but advisories still may be posted due to a sewage or septic overflow from a home. Therefore, the number of beach advisories (and in rare cases, closures) does not always accurately represent the quality of the water. The comparatively high concentration of people living and working near the Maine coast, which brings the source of the pollution closer to the problem area, also accounts for some of the difference in lake and stream and coastal water quality. Several of the water quality areas of concern in Maine are in population centers.

Maine water quality is also essential to the shellfish industry. The Maine Division of Marine Resources regulates shellfish flat closures based on cleanliness and harvesting status, heavy rainfall and flooding, and toxic algal blooms. Coastal water quality and its impact on shellfish fisheries is of large concern for harvesters and wholesalers, as closures result in large economic losses throughout the year and particularly in the summer. A 2008 report calculated a \$3.4 million loss in sales for Maine businesses and a \$1.75 million loss in Maine residents' income from a hypothetical one-week shellfish flat closure in August (Athearn 2008). Improving water quality to limit closures and protect public health would help reduce future threats of large economic losses.

The quality of Maine's water resources is vital to the livelihood of many Mainers and the well-being of Maine communities. The Maine Volunteer Lake Monitoring Program, which began monitoring lakes in 1971, is one example of the governmental and non-profit organizations helping to monitor and regulate the quality and use of Maine's waters. The goal is to preserve not only water quality but also effectively allow Maine businesses and communities to use the valuable assets that Maine water resources provide to promote economic growth. Also, perceptions of the physical and aesthetic characteristics of water bodies, such as water clarity, are important to the public and provide economic value.

## References

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- MDEP. 2005. *The Economics of Lakes*. Maine Department of Environmental Protection, Augusta, ME. <http://www.maine.gov/dep/blwq/doclake/research.htm>. Accessed 3/15/15.

## About the Maine Development Foundation (MDF)

MDF is a private, non-partisan membership organization that drives sustainable, long-term economic growth for the state of Maine. MDF's strategic focus is a productive workforce that is educated, healthy, innovative, and engaged in their community and the economy. MDF stimulates new ideas, develops leaders, and provides common ground for solving problems and advancing issues by empowering leaders, strengthening communities, and guiding public policy with trusted economic research. Created in statute in 1978, MDF is a unique and trusted non-profit 501(c)(3) corporation that works statewide across all sectors. Visit MDF's website at [www.mdf.org](http://www.mdf.org) for more information.

MDF Program Director Ryan Neale is the researcher and author of the *Measures of Growth* report and oversees the production of this report series.

## About the University of Maine's School of Economics (SOE)

The SOE serves as the University's hub of economics research and teaching while also embracing broader social science perspectives through its primary and affiliated faculty in law, social psychology, and human ecology. The faculty works closely with stakeholder groups to generate more information and policy recommendations to help solve Maine and national needs. SOE offers both undergraduate and graduate programs (such as resource economics and policy, financial economics, and international economics) that train students to think analytically and critically about social, environmental, and economic issues, and lead to careers in economics, law, public service, business, and other applied policy fields. Explore SOE's website (<http://www.umaine.edu/soe/>) to learn more about their academic and research programs, and their faculty, staff, and students.