

# Executive Summary

## Colby Environmental Assessment Team

Eutrophication as a result of human activity is a threat to lake water quality globally and within the state of Maine. Great Pond, in the Belgrade Lakes region of Maine, has traditionally been an oligotrophic lake that is experiencing early signs of eutrophication and is currently classified as a mesotrophic lake. In the fall of 2012, the Colby Environmental Assessment Team (CEAT) measured the primary sources of nutrient loading to Great Pond including the catchment and the lake sediment, current water quality in Great Pond, and the potential impact of the variable milfoil invasion on the lake's water quality. An increase in nutrients (especially phosphorus) since 2008 was found in the water column and coming in from the tributaries. The sediments as well as the water column were found to have significant sources of both phosphorus (P) and nitrogen (N). The infestation of invasive macrophytes appears to increase the organic matter in the sediment, and alters the water column and sediment nutrient distribution. The water quality data collected during the fall of 2012 was compared with data from previous years to study the water quality trends. Using past data, future projections could be made about the future of the lake as well as how management programs are and will be a source of help for the health of Great Pond. Furthermore, we examined land use patterns in the Great Pond watershed as well as erosion and areas within the watershed that pose the highest risk for nutrient loading. We conclude with a series of future scenarios for the state of Great Pond given current trends in land use and nutrient release from bottom sediments during periods of bottom water hypoxia and with recommendations to improve the water quality in Great Pond. These assessments aim at understanding the impacts these variables have on lake water quality. By examining nutrient levels, we can depict how Great Pond may be heading toward eutrophication. These results will

be pertinent to all stakeholders in the Great Pond watershed. Great Pond stills stands a mesotrophic lake but has the potential to move towards eutrophication from sources including internal nutrient loading and increasing development trends in the watershed. But with the mitigation and prevention programs, knowledge about the sites of highest concern and the notable nutrient loading sources a collaborative effort could keep Great Pond in this mesotrophic state.