

Eutrophication in the Gulf of Maine's Estuarine Waters

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The Gulf of Maine and its watershed encompass more than 170,000 km² and is home to over 6.5 million Canadians and Americans. Despite its long-standing importance to fisheries and natural resources and current interest in exploration of wind and tide as renewable energy sources, the ecosystem as a whole is not well understood. Acknowledging the need to look at the Gulf of Maine as a region-wide system, the Gulf of Maine Council on the Marine Environment (GOMC) launched an effort in 2004 to identify and deliver priority indicators of ecosystem health through the Ecosystem Indicator Partnership (ESIP). Subcommittees were established for seven theme areas (coastal development, climate change, contaminants, eutrophication, aquatic habitats, fisheries and aquaculture). Currently more than 140 expert advisors from local, state/provincial and federal governments, along with academics and partners from non-government organizations participate in one or more of these subcommittees. Following a consensus-based process, the subcommittees selected priority indicators for each of the theme areas.

One of the key theme areas for ESIP is eutrophication resulting from point and non-point nutrient pollution. Four indicators have been selected to track trends in eutrophication (nitrogen loading, dissolved oxygen, water clarity, and chlorophyll *a*). Data for these indicators have been analyzed in as many as twenty-two embayments from Massachusetts through Nova Scotia. All of the data collected from around the Gulf of Maine are currently available in ESIP's Indicator Reporting Tool (www2.gulfofmaine.org/esip/reporting). An overview of these data for the four indicators will be made available via a fact sheet scheduled for release in 2011. Local development, land use and land-use practices can have implications for water quality as well as implications for overall ecosystem health. Analysis of ecological indicators provides planners and managers with the understanding necessary for making informed decisions. The ESIP Indicator Reporting Tool provides an easy to use way for managers to visually display the data. The ability to evaluate spatial and temporal trends using the Indicator Reporting Tool assists local managers in making choices based upon sound science for both their own system and the greater region. In addition to evaluating spatial and temporal changes in estuarine condition the data can be combined with land use information to develop pressure-state models useful in management. Once the Indicator Tool is fully populated, local and regional managers will have a one-stop portal to evaluate changes in eutrophication both temporally and spatially.