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## Eelgrass Distribution in the Great Bay Estuary 2002

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# **Eelgrass Distribution in the Great Bay Estuary 2002**

A Final Report to

The New Hampshire Estuaries Project

Submitted by

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## Introduction

Eelgrass (*Zostera marina*) is an essential habitat for the Great Bay Estuary (GBE) because it provides food for wintering waterfowl and habitat for juvenile fish. Eelgrass is the basis of an estuarine food chain that supports many of the recreational, commercial and ecologically important species in the estuary. Additionally, eelgrass filters estuarine waters, removing both nutrients and suspended sediments from the water column. Eelgrass in the Great Bay Estuary is the largest monoculture in the State of New Hampshire and is considered a vital resource to the State's marine environment. The UNH Seagrass Ecology Group has mapped the distribution of eelgrass in Great Bay every year from 1986 to 2001 (Short, unpublished data). Eelgrass in the entire Great Bay Estuary system (Great Bay, Little Bay, tidal tributaries, Piscataqua River, and Portsmouth Harbor) was mapped in 1996, 1999, 2000, and 2001.

Eelgrass cover in Great Bay has been relatively constant for the past 10 years at approximately 2,000 acres. Earlier, in 1989, there was a dramatic decline in eelgrass beds to only 300 acres (15% of normal levels). The cause of this crash was an outbreak of a slime mold *Labryrinthula zosterae*, commonly called "wasting disease". Recently, the greatest extent of eelgrass in the GBE was observed in 1996.

In 2002, the NH Estuaries Project provided financial support to the University of New Hampshire to digitize eelgrass distribution information in Great Bay Estuary for the years 1999-2001. That project was completed and those historic eelgrass coverages are now in the NHEP database.

In 2003, the NHEP committed to support the annual monitoring program for eelgrass starting with aerial photography of eelgrass coverage for 2003 and mapping of eelgrass distribution from information gathered in 2002. The present report presents eelgrass distribution information for 2002.

## Project Goals and Objectives

UNH completed this project under contract to the NH Estuaries Project. The project goals and objectives per the contract were to:

- (1) map eelgrass distribution in GBE for 2002 based on aerial photography and ground truth;
- (2) acquire aerial photography of the Great Bay Estuary in 2003;
- (3) conduct eelgrass ground truth observations of the 2003 aerial imagery..

The final work product was agreed to be ArcInfo files of eelgrass distribution throughout the Great Bay Estuary in 2002, all necessary documentation/metadata for the ArcInfo files, and a final report describing the results and any deviations from the protocols established in the QA Project Plan.

## Methods

The methods for this project followed the procedures specified in the approved QA Project Plan (Short and Trowbridge, 2003).

## Results and Discussion

The shapefiles containing the eelgrass distribution data were provided to the NHEP Coastal Scientist by email on 1/31/04. Metadata for the shapefiles is as follows:

Codes for cover classes:

p = 10 to 30 % cover  
h = 30 to 60 % cover  
sb = 60 to 90 % cover  
d = 90 to 100 % cover

Eelgrass percent cover below 10% cannot be detected in the aerial photography.

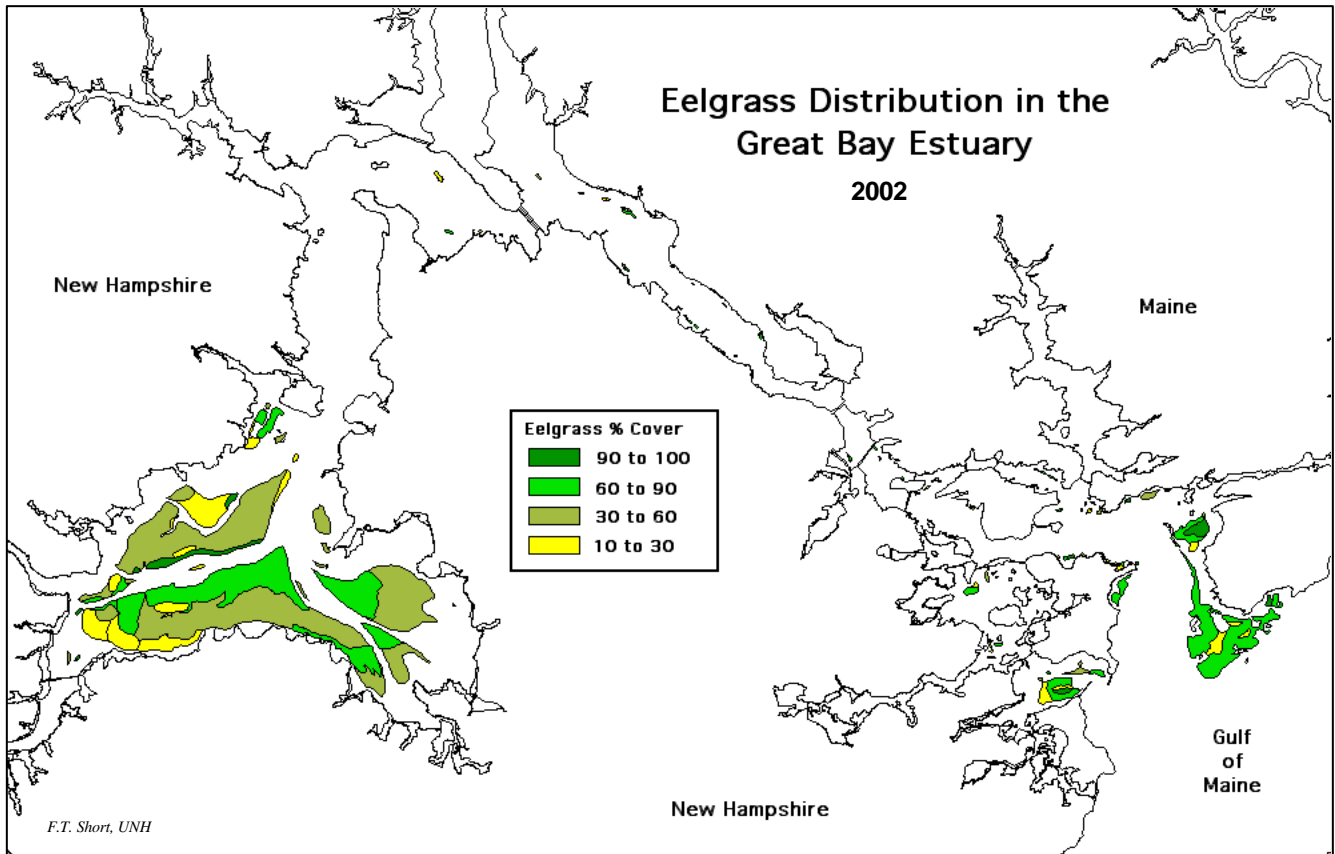
In 2002, eelgrass percent cover decreased in many areas of the Great Bay Estuary. Although eelgrass was present throughout much of its expected range in the estuary, there was lower plant density than in previous years, which represents an overall decrease in eelgrass abundance.

There was loss of entire dense eelgrass beds between 2001 and 2002 in the northwest area of the Great Bay adjacent to Adams Point. Also, the eelgrass bed along the eastern side of Great Bay near Thomas Point diminished in size. There was a loss of eelgrass bed extent and density in Greenland Bay. Losses in Great Bay were the result of a wasting disease outbreak.

In Little Bay between 2001 and 2002, the size of the remaining eelgrass beds diminished. There was no eelgrass present in the Oyster River. The reason(s) for the Little Bay eelgrass losses are unknown, although wasting disease may have contributed

In the Piscataqua River, two new, small eelgrass beds appeared in 2002, on the Maine side of the river across from the General Sullivan Bridge. However, there was an overall loss of density in eelgrass beds in the Piscataqua in 2002 compared to 2001, caused by the persistent aftereffects of the year 2000 wasting disease episode.

In Portsmouth Harbor and Little Harbor, there was some reduction of plant percent cover although not as much as the reduction seen in Great Bay. The Portsmouth Harbor and Little Harbor losses of eelgrass were not due to wasting disease, but rather to reduction in water clarity and to activities such as dredging and boating.



### Conclusions and Recommendations

1. Continue annual monitoring of eelgrass in the Great Bay Estuary.
2. Restore eelgrass in Little Bay and the Oyster and Bellamy Rivers.
3. Conduct quantitative monitoring of the wasting disease in the Great Bay Estuary.
4. Institute best management practices in the Great Bay Estuary to reduce boating and mooring impacts to eelgrass.

### References

Short and Trowbridge (2003) UNH Eelgrass Monitoring Program, Quality Assurance Project Plan, Version 1, Final. University of New Hampshire and NH Estuaries Project, June 30, 2003.