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A Final Report to

The Piscataqua Region Estuaries Partnership

Submitted by

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Eelgrass Mapping: Great Bay Estuary for 1981

Methods

The methods for this project followed the procedures specified in the approved QA Project Plan (Short and Trowbridge, 2003). Eelgrass meadow polygons for 1981 were mapped from USDA black-and-white aerial photographs, on file at the Strafford County and Rockingham County (NH) offices. The photographs were scanned and analyzed digitally after “rubber sheeting” the images to fit the Great Bay Estuary base map. The 1981 photographs were not ortho-photographs and some distortion across each photograph was evident. To minimize this effect, multiple photographs for each area were used to geo-reference actual locations on the eelgrass distribution map. Some areas of the estuary did not have adequate 1981 images to allow mapping; these areas are marked in red on the map (Figure 1). Ground truth verification of distribution was done by comparison to eelgrass mapping done by NH Fish and Game (Nelson, 1981). Eelgrass cover classes were determined using the standard protocol (Short and Trowbridge, 2003) with the added limitations of black-and-white photograph.

Results and Discussion

The shapefiles containing the eelgrass distribution data for 1981 have been provided to the NHEP Coastal Scientist by email. 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 cover below 10% cannot be detected in the aerial photography.

Results and Discussion

Historic eelgrass distribution was mapped for July 31, 1981 from USDA black and white aerial photography (photo number 40 330__ 180). The mapping shows extensive eelgrass distribution throughout the Great Bay Estuary, except in areas where the photography was not adequate to interpret the images (primarily Portsmouth Harbor, the Oyster River, and the upper Bellamy River). As the maps shows, and as verified by the NH Fish and Game maps of the same time frame (Nelson, 1981), there was much more eelgrass in Little Bay and the Piscataqua River in 1981 than 2007, the most recent mapping date for the estuary. (NH Fish and Game maps were created from boat surveys of eelgrass.)

In Little Bay, eelgrass was found on many of the shallow flats as well as deeper areas. In the Piscataqua River, there were eelgrass beds and patches along both the Maine and New Hampshire sides of the river, although the NH Fish and Game mapping only

covered the New Hampshire side. In Great Bay, extensive and sometimes dense eelgrass was found, roughly comparable to the 1996 findings, which showed the greatest eelgrass distribution mapped to date.

The 1981 eelgrass distribution and cover map for the Great Bay Estuary represents an “earliest available” comprehensive map of the resource, as no earlier photography has been found with adequate tidal conditions to allow eelgrass mapping.

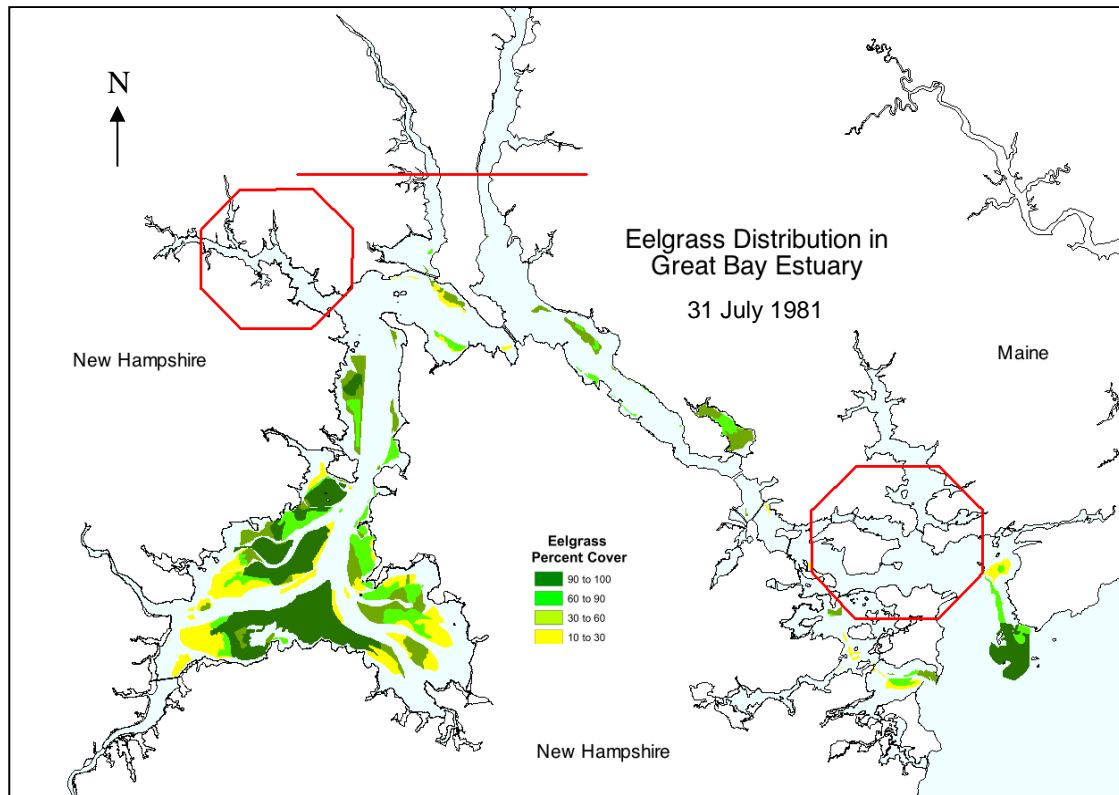


Figure 1. Eelgrass distribution and percent cover for the Great Bay Estuary in 1981, based on aerial photography (USDA) and ground truthing obtained from a NH Fish and Game survey (Nelson, 1981). Red octagons indicate areas where photography was not adequate for mapping and no imagery was available north of the red line.

Nelson, J.I. 1981. Inventory of the Natural Resources of Great Bay Estuarine System. Volume 1. NH Fish and Game Dept., Concord, NH. 254 pp.

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