



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

Dredging Effects on Seagrass

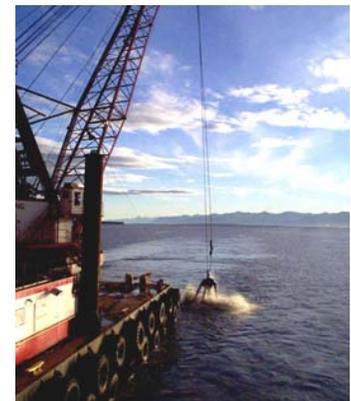
Problem

Seagrass resources worldwide have been declining, which could lead to changes in nearshore ecosystem structure and function. Seagrasses play an important ecological role in nearshore coastal ecosystems—they provide food and shelter for a diverse array of fishes and invertebrates and are also an important source of food for over-wintering waterfowl. Seagrasses baffle wave and current energy, increase sediment deposition, and stabilize bottom sediments, thereby improving water quality. While speculation on the effects of dredging on seagrass beds is plentiful, empirical data documenting these effects are not. Potential effects may be direct (e.g. physical removal of vegetation from dredging) or indirect (e.g., seagrass stress due to reduced light caused by dredging-induced turbidity or burial of grasses from dredging-induced sedimentation). In an effort to bridge this data gap, ERDC's Environmental Laboratory (ERDC-EL) is investigating interactions between dredging and seagrass distribution and cover under a 3-year research unit within the Dredging Operations and Environmental Research (DOER) Program.



Description of Research

Two New England small boat harbors (Wood Island Harbor, ME, and Scituate Harbor, MA) were examined over a 4-yr period. Both contained well-established beds of eelgrass (*Zostera marina*), an ecologically important seagrass common to the North Atlantic and Pacific coastlines of the United States. During fall and early winter of 2002/2003, 250,000 cu yd of sediments were dredged from the outer channel and inner anchorage basin of Scituate Harbor by a bucket dredge and transported to an offshore dumpsite 24 km away from the harbor. Dredging last occurred at Wood Island Harbor in 1992.



Eelgrass mapping studies were conducted at each site in 2001, 2003, and 2004, in the month of July, when eelgrass biomass was near its peak. An ERDC-developed acoustical system for mapping underwater vegetation (SAVEWS) was installed on a Corps hydrographic survey vessel that navigated a closely spaced pattern of transects through the vegetated areas of each harbor. Acoustic data were processed to generate position-referenced files of depth, eelgrass height, and coverage. Various statistical and spatial analysis techniques were applied to these data in an effort to distinguish potential dredging effects from a background of natural inter-annual variability. Wood Island Harbor is about 145 km north of Scituate Harbor; therefore, it is not considered an experimental control for the dredging site. Rather, data from this site were used as a measure of natural inter-annual variability occurring at a site not subject to dredging.

Expected Products	<p>As part of the DOER research unit, a study was completed that describes patterns of seagrass distribution in relationship to dredging activities in a New England small boat harbor. The study is documented in ERDC/EL Technical Report, TR-05-8, which is accessible through URL: http://el.erdcl.usace.army.mil/dots/doer/pdf/trel05-8.pdf)</p> <p>Additional technical reports and technical notes are anticipated.</p>
Potential Users	<p>Navigation elements of USACE Districts and Divisions, port shipping, dredging company stakeholders, Federal and state regulatory agencies, and consulting firms would be interested in this research.</p>
Projected Benefits	<p>This research will help to evaluate the potential impact and recovery of seagrass resources resulting from Federal navigation dredging activities. Research will also aid in estimating the range of natural variability in eelgrass distribution and cover in an undredged harbor.</p>
Program Manager	<p>Todd Bridges, CEERD-EM-D; phone: 601-634-3626, e-mail: Todd.S.Bridges@usace.army.mil</p>
Participating ERDC Laboratories	<p>The Engineer Research and Development Center (ERDC) Environmental Laboratory (EL) and Coastal and Hydraulics Laboratory (CHL)</p>