



# **Pilot Project to Harvest Sea Lettuce**

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Removal of *Ulva lactuca* from Jamaica Bay

2010 Restore America's Estuaries  
NOVEMBER 16, 2010

# Project Background

- ❖ Sea lettuce (*Ulva lactuca*) – green marine algae
- ❖ Jamaica Bay- recurring blooms from February through April, and August through September
- ❖ Grows on hard substrates
- ❖ Floats in dense mats
- ❖ Mesotrophic estuaries- provides habitat for fish and macrocrustaceans
- ❖ Eutrophic estuaries- detrimental effects...



## Detrimental Effects of Excessive Blooms

- ❖ Suffocates benthic invertebrates
- ❖ Suppresses spawning/nesting activities
- ❖ Interferes with recreational boating and fishing activity
- ❖ Decomposition releases N and P, decreases DO
- ❖ Noxious odors while decomposing.
- ❖ Food source for Canada geese
  - ❖ JFK Airport- more bird strikes than any other airport since 1990.



# Project Background

- ❖ Delaware Department of Natural Resources and Environmental Control (DNREC) has conducted an annual macroalgae harvesting program since 1997
- ❖ Sea lettuce (*Ulva lactuca*), red weed (*Agardhiella tenera*), *Enteromorpha flexuosa* and *Chaetomorpha* sp.
- ❖ Custom made algae skimmer



- ❖ The Nature Conservancy, through NOAA's Community Based Restoration Program, has implemented a volunteer effort ("Alien Algae Cleanups")
- ❖ Mechanical harvesters are not practical, and the macroalgae is removed by hand



# Project Purposes

- ❖ Develop program to harvest excess algae and sea lettuce
- ❖ Evaluate harvest methods with minimum impact to other organisms
- ❖ Find a beneficial use for harvested sea lettuce
- ❖ Analyze total N and P reduction



# Proof of Concept

Intake conveyor  
ramp



Holding area/Ramp up to  
dumpster if necessary (20 cu yd)



# Proof of Concept



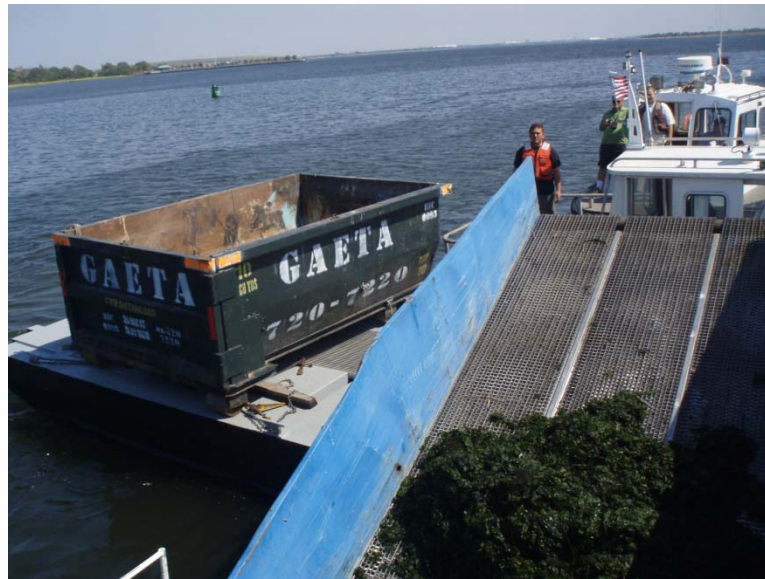
# Proof of Concept



# Proof of Concept

**2.5 yds<sup>3</sup> (1.9 m<sup>3</sup>) in  
90 minutes of  
skimming.**

**Offloaded into  
dumpster in 15  
minutes.**



# Bycatch



## Results

- ❖ Manual removal- 1.2 m<sup>3</sup>
  
- ❖ Skimmer removal- 3 m<sup>3</sup>
  
- ❖ Amount of N & P removed
  - ❖ N=mean 5.55% by weight
  - ❖ P=mean 0.24% by weight

## Summary

- ❖ Proof of concept
- ❖ Removed shading and smothering of benthic inverts/fishes
- ❖ Possibly apply to oyster & eelgrass projects.
  
- ❖ Beneficial uses
  - ❖ NYCDOS took 2.5 yds<sup>3</sup> for composting
  - ❖ Biofuel

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Biohabitats

HydroQual

HAZEN AND SAWYER



## Next Steps



**Questions?**