How much seaweed is there?

Monitoring Macroalgae on the shore

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Macroalgae Monitoring

- Aerial Photography
- Ground truth
  - Identify species
  - Biomass estimates
- Analyze photos
- Map density

Aerial Photography Survey

7-12-10--0240
N 41.6609833° W 071.4078167°

2010/07/12
108 m

2:32:40 PM
Lat / Lon WGS 84

Narragansett Bay Estuary

Ground Truth

Chlorophyta (Green)
Rhodophyta (Red)
Phaeophyta (Brown)

Biomass Estimates

✓**1 Quadrat** (1/2 meter squared is ideal, but any size will do);
✓**Measuring tape**;
✓**1 scale** (one with a hanging clip that can weigh at up to 500 grams is ideal);
✓**Box cutter** (or razor blade to cut macroalgae overhanging quadrat sample area);
✓**Salad spinner** (to remove excess water from the macroalgae);
✓**A zip-lock bag** (to hold and weigh the sample);
✓**paper and pencil** (to record your readings); and
✓**A camera** (to capture images of your findings!)
✓ **A guide book** (XXX)

Biomass Estimates

Biomass Estimates

Biomass Estimates

Biomass Estimates

Biomass Field Sheet

Date: 8/10/10

Location: Sandy Pt

Station	Time Start	Time End	Total Weight w/bag (g)	Bag Weight (g)	Total Biomass (g)	Red (g)	Green (g)	Brown (g)	Sum (R+G+B) (g)	Comments	Density (Red)	Density (Green)	Density (Brown)	Total Cover
1	2:45 p.m.			10	168	44	124	0	178	loaded with bladed Ulva	26	73	0	4
2			330	10	320	44	284	0	328		13.7	88.7	0	4
3			292	10	282	64	214	0	278		22	75.8	0	4
4			340	10	330	66	260	0	326	a lot of mud snails in area	20	78.7	0	4
5			90	10	80	30	50	0	80		37.5	62.5	0	3

Total Biomass= Total Weight-Tare

additional comments:

~stations 1and 2 are one sample

~stations 3 and 4 are one sample

the densities for red, green, and brown are percentages, while the Total Cover is 0-4

Biomass Estimates

Area = length *multiplied by* height.
(Be sure to use consistent measurements, for example meters (m) and centimeters (cm) OR foot (ft) and inches (in) for all calculations.)
M² = length (meters) *X* height (meters)

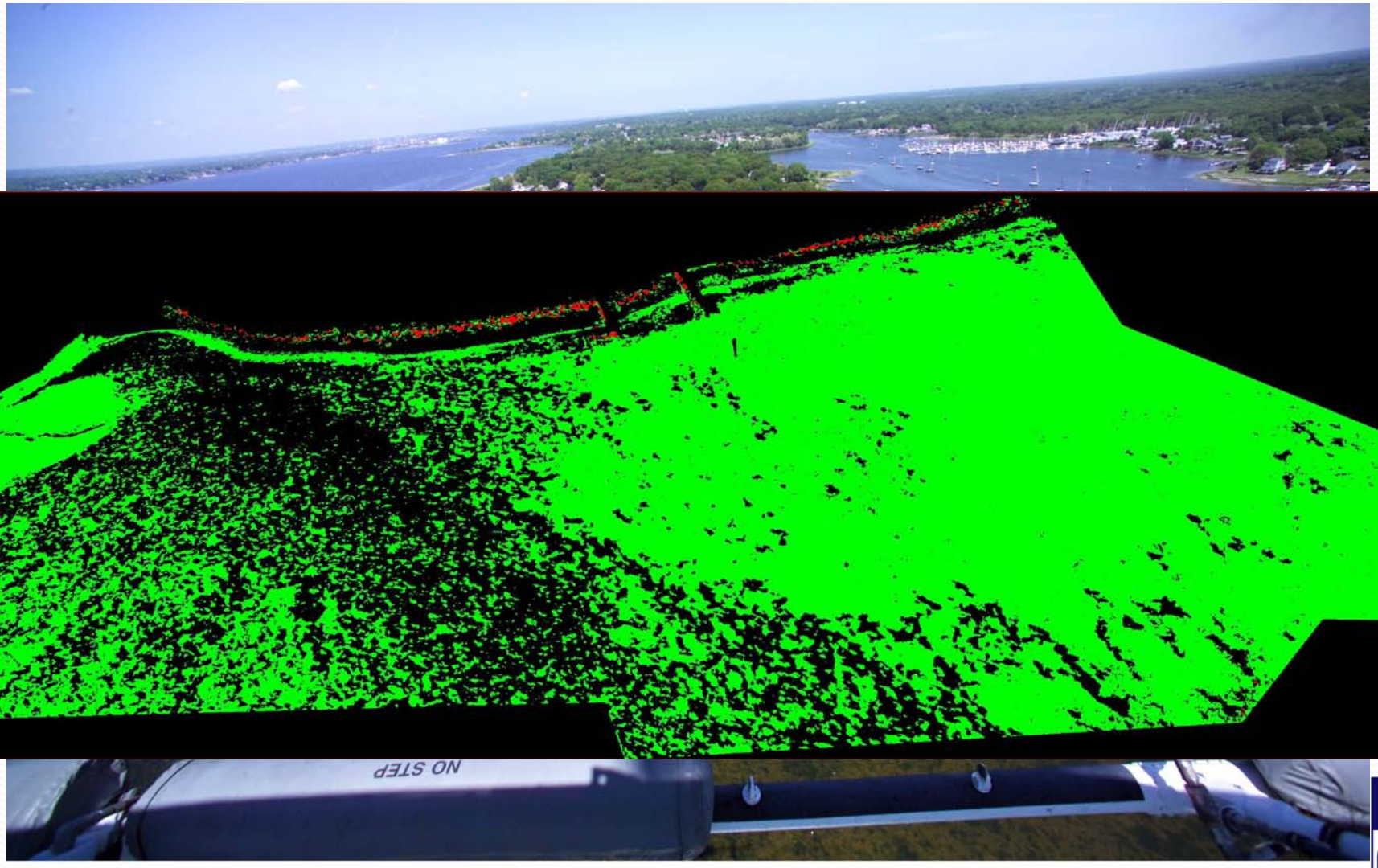
Average weight = sum of all samples *divided by* total number of samples

Grams (g) = {[sample 1(g)] **+** [sample 2(g)] **+** [sample 3(g)]**}**
÷ 3 (samples)

Percent = individual sample weight *divided by* total sample, *multiplied by* 100%
Percent(%) = Green sample (g)
÷ total sample weight (g) X 100 percent

Total cover = total area *multiplied by* average weight, *divided by* sample area
M² = total area of shoreline (meters squared) X average weight (grams)
÷ area of quadrat (meters squared)

Aerial Photography Analysis



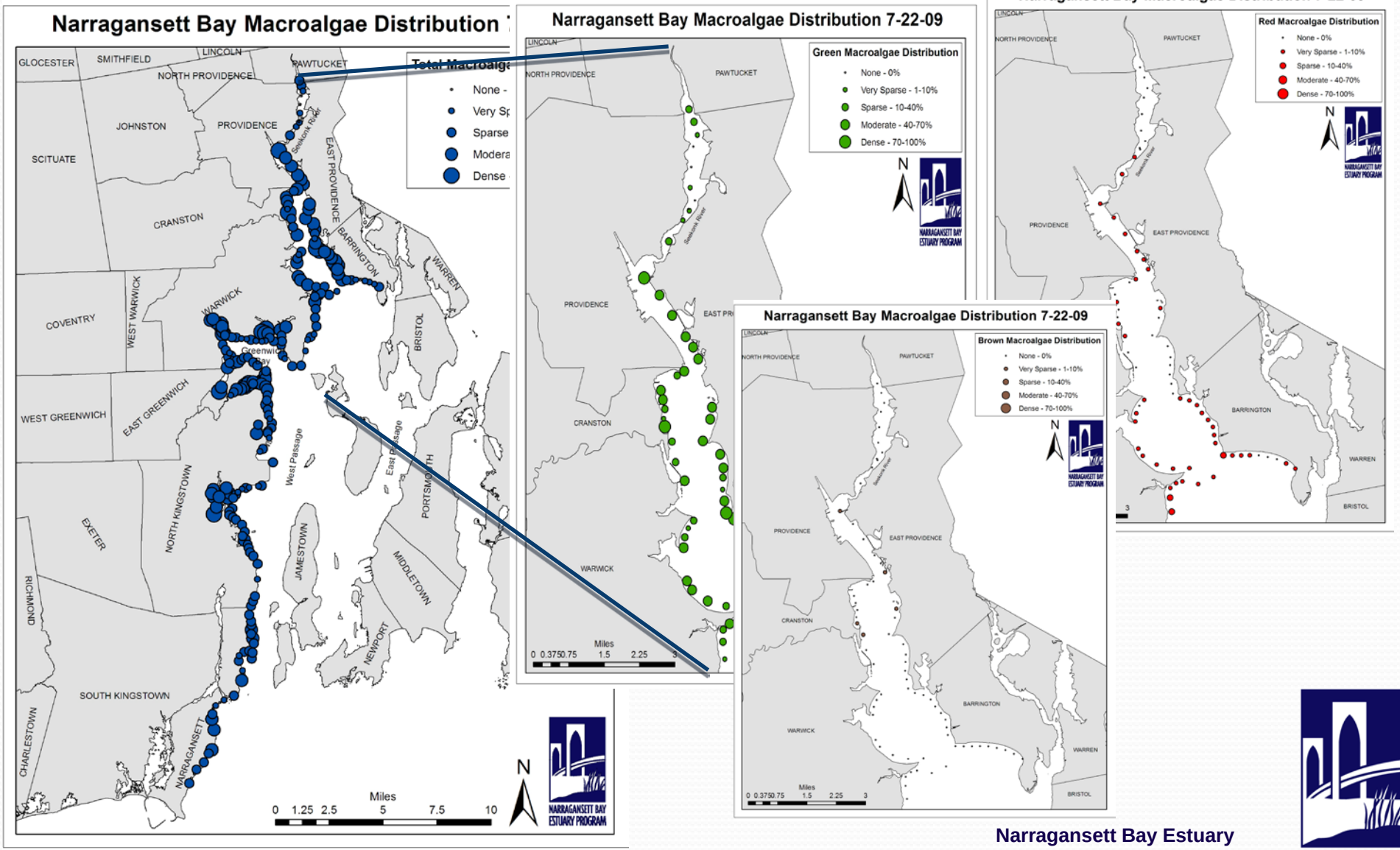
10-25-10--0020
N 41.7437833° W 071.3570333°

2010/05/25
107 m

12:27:02 PM
Lat / Lon WGS 84

Narragansett Bay Estuary

Macroalgae Mapping



Narragansett Bay Estuary

References

•NBEP introduction to macroalgae:
http://www.nbep.org/bay-science-macro.html

•NBEP macroalgae maps:
http://www.nbep.org/maps-macroalgae-2009.html (2008, 2007 maps also available, 2010 still being analyzed)

•Image J analysis:
http://www.oce.uri.edu/algae/

•Deacutis, C.F. 2008. Evidence of ecological impacts from excess nutrients in Upper Narragansett Bay. *In*: Ecosystem Based Management: A Case Study of Narragansett Bay. Springer Series in Environmental Management, eds., A. Desbonnet and B.A. Costa-Pierce, pp.349-381. New York, NY: Springer.

•Paine, D.P. 1981. Aerial photography and image interpretation for resource management. John Wiley and Sons, Inc. New York, NY. 571pp.

NARRAGANSETT BAY ESTUARY PROGRAM

Thank you