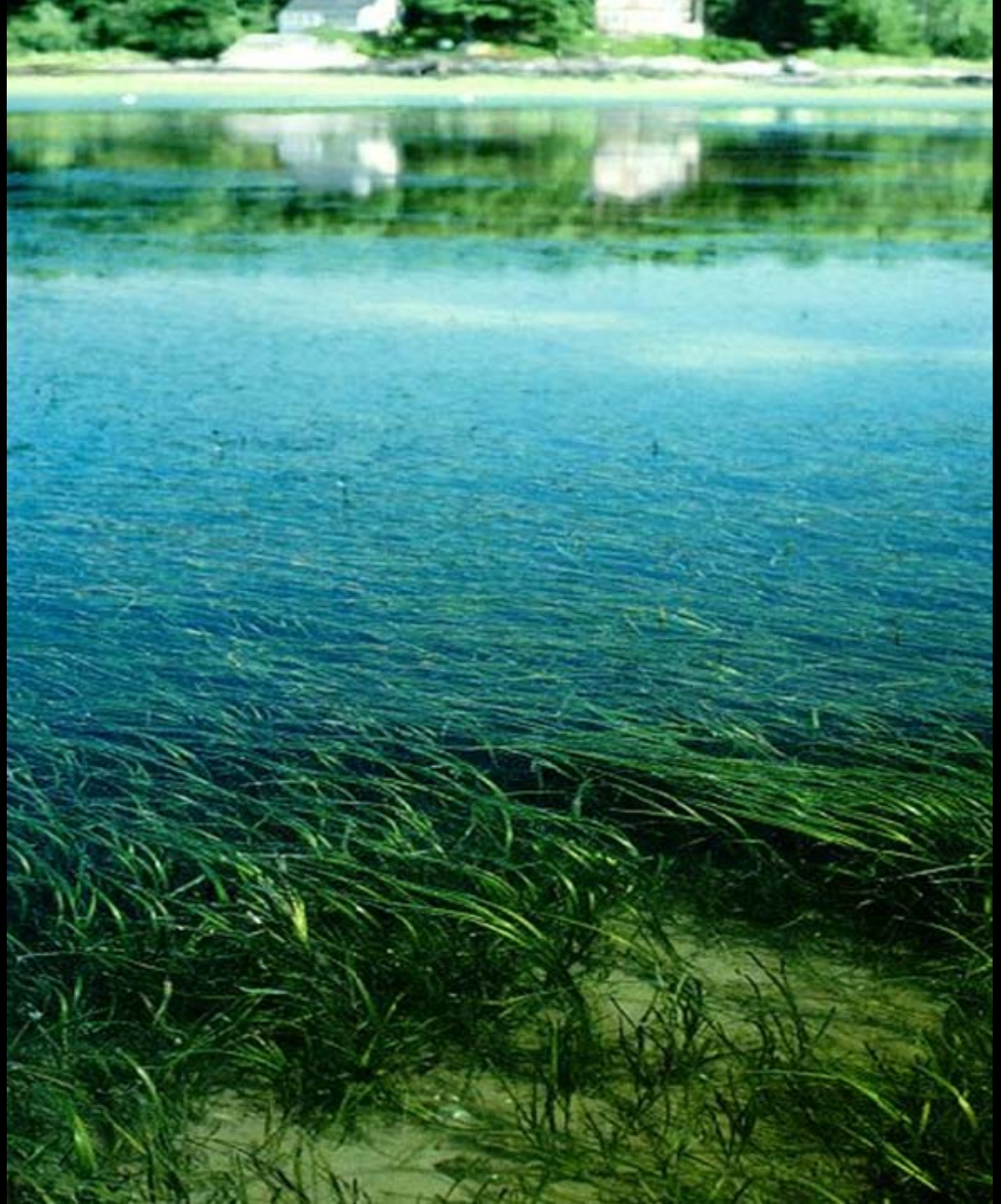
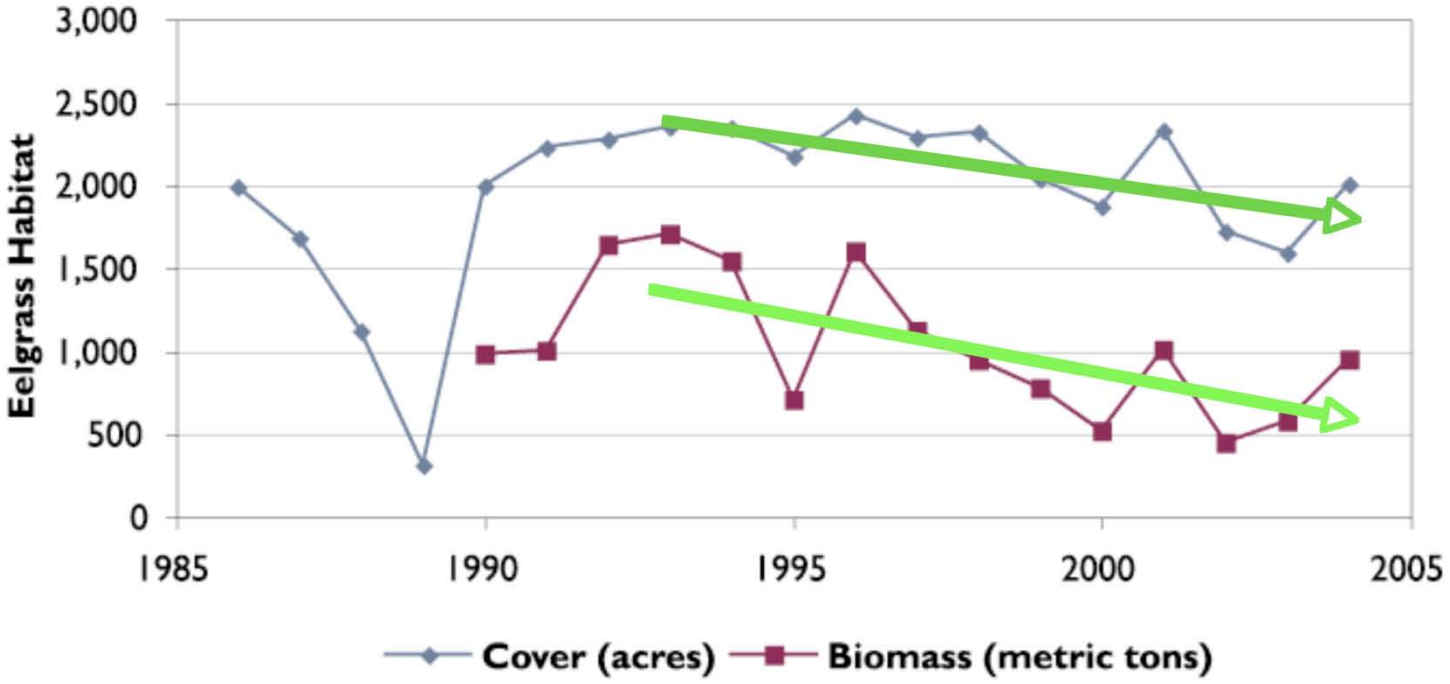
Status of Eelgrass in New Hampshire

Fred Short
UNH



Decline

Monitoring Eelgrass cover and biomass in the Great Bay (Figure 17)

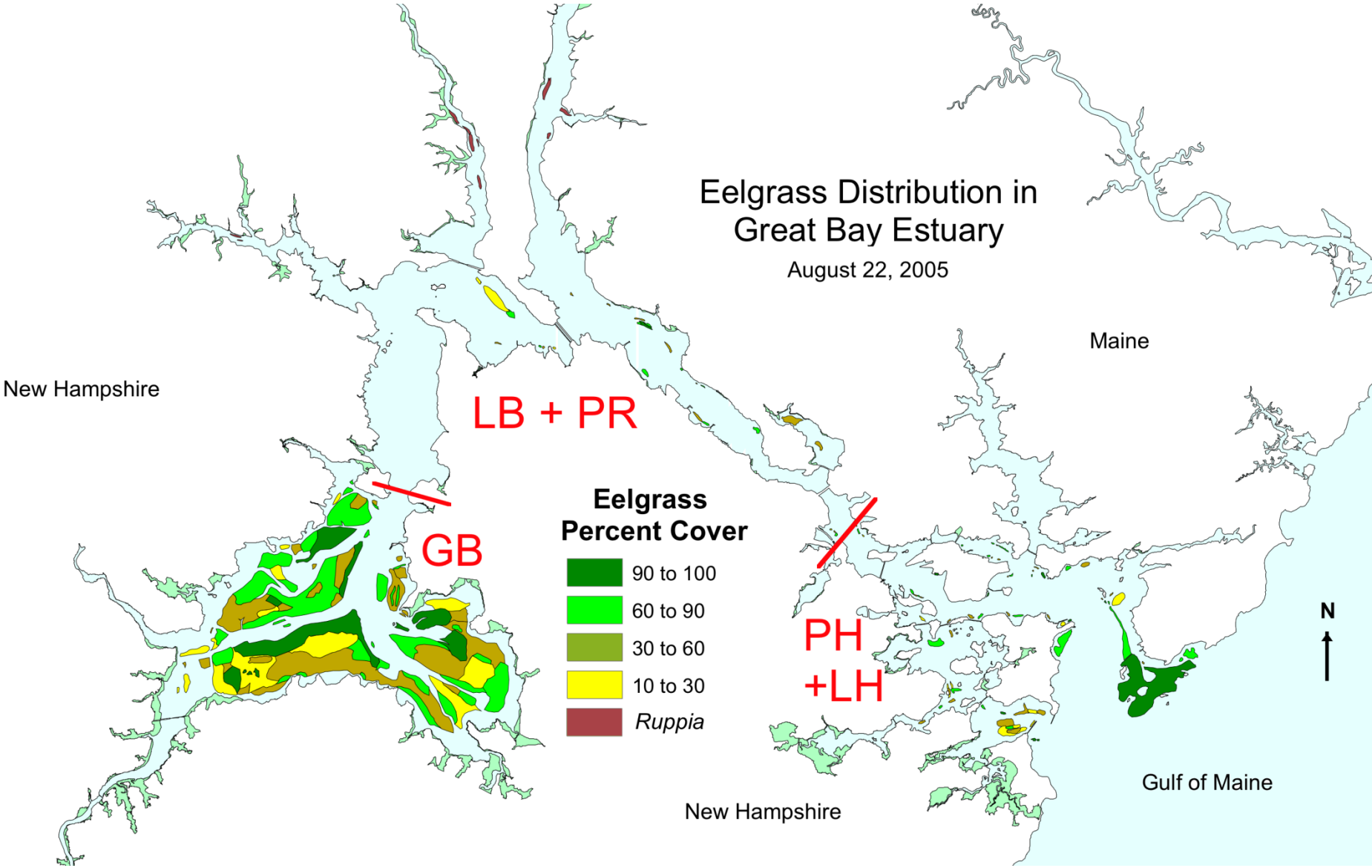


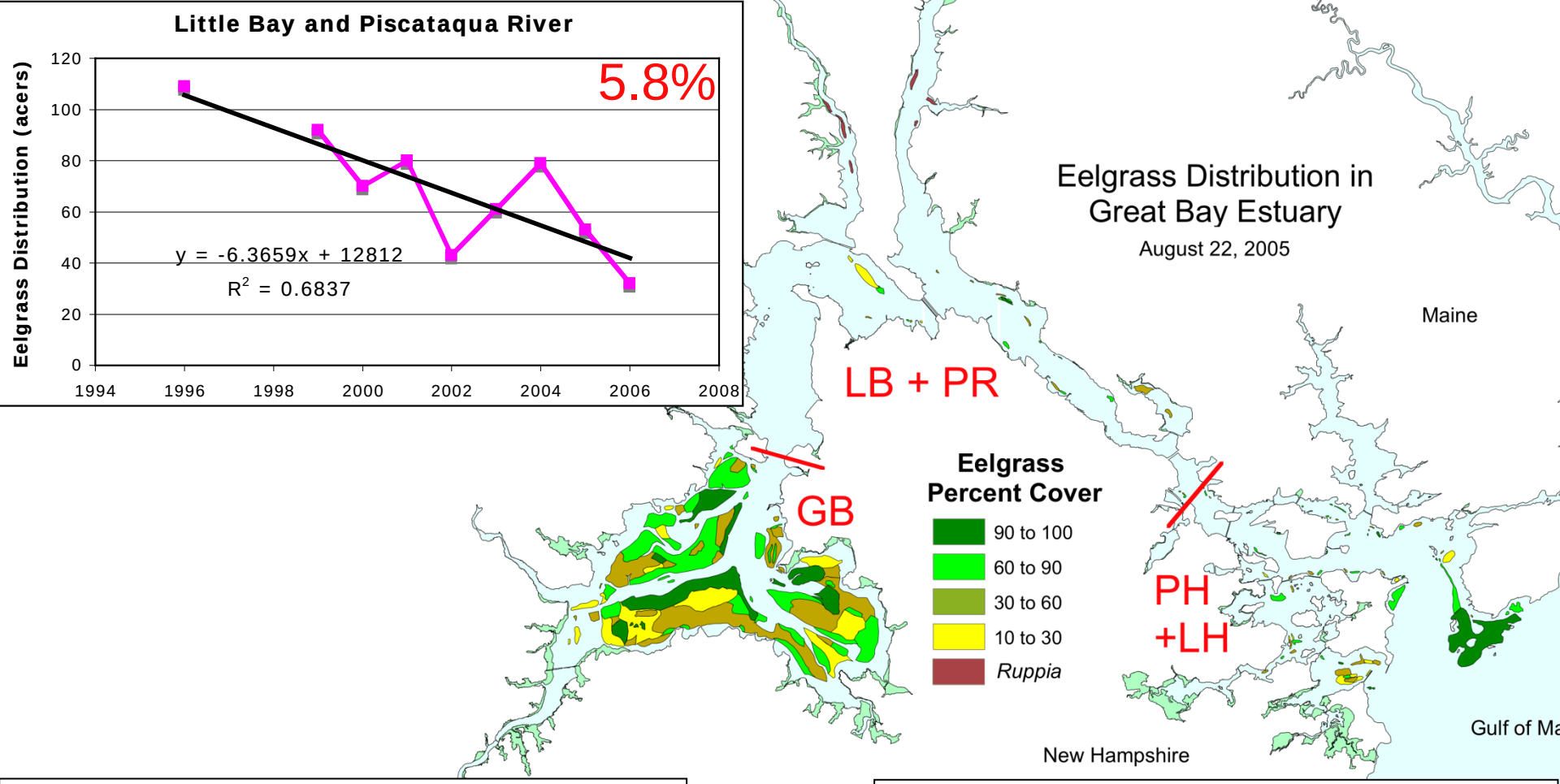
Data Source: UNH Seagrass Ecology Group

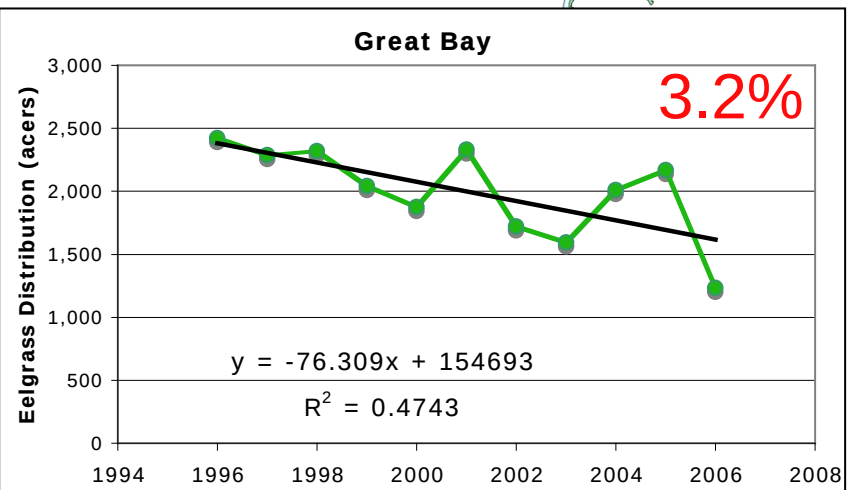
NH Port Monitoring

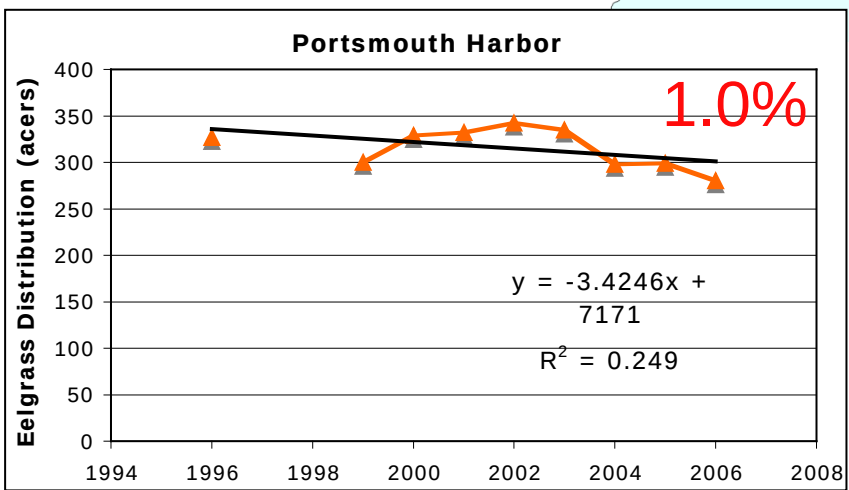
GBE eelgrass decline

GBE has Both Intertidal and Subtidal Eelgrass Beds

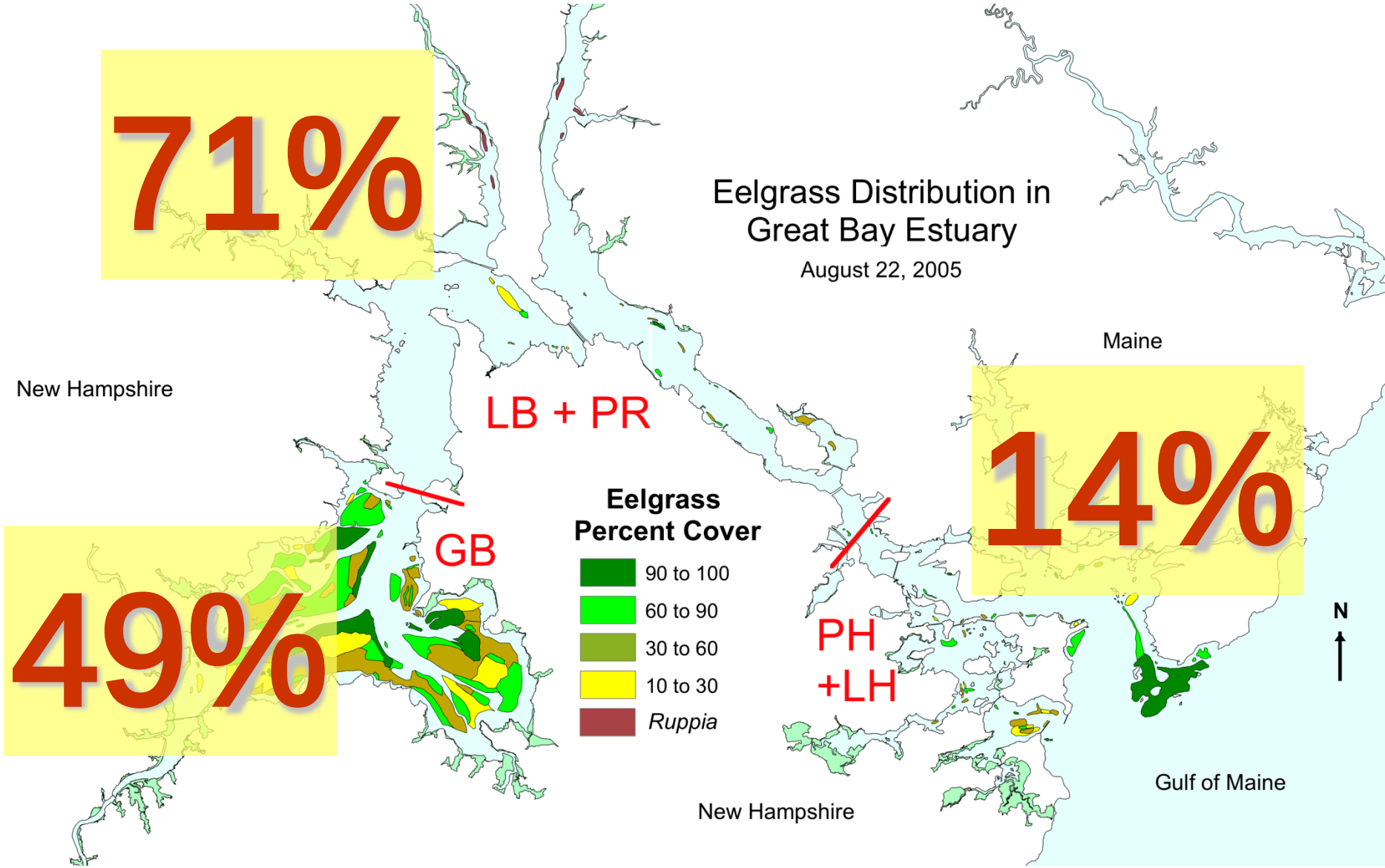



Little Bay and Piscataqua River
Eelgrass Distribution (acers)
120
100
80
60
40
20
0
1994
1996
1998
2000
2002
2004
2006
2008
5.8%
y = -6.3659x + 12812
R2 = 0.6837
Eelgrass Distribution in
Great Bay Estuary
August 22, 2005
Maine
LB + PR
GB
PH
+LH
Eelgrass
Percent Cover
90 to 100
60 to 90
30 to 60
10 to 30
Ruppia
New Hampshire
Gulf of Ma

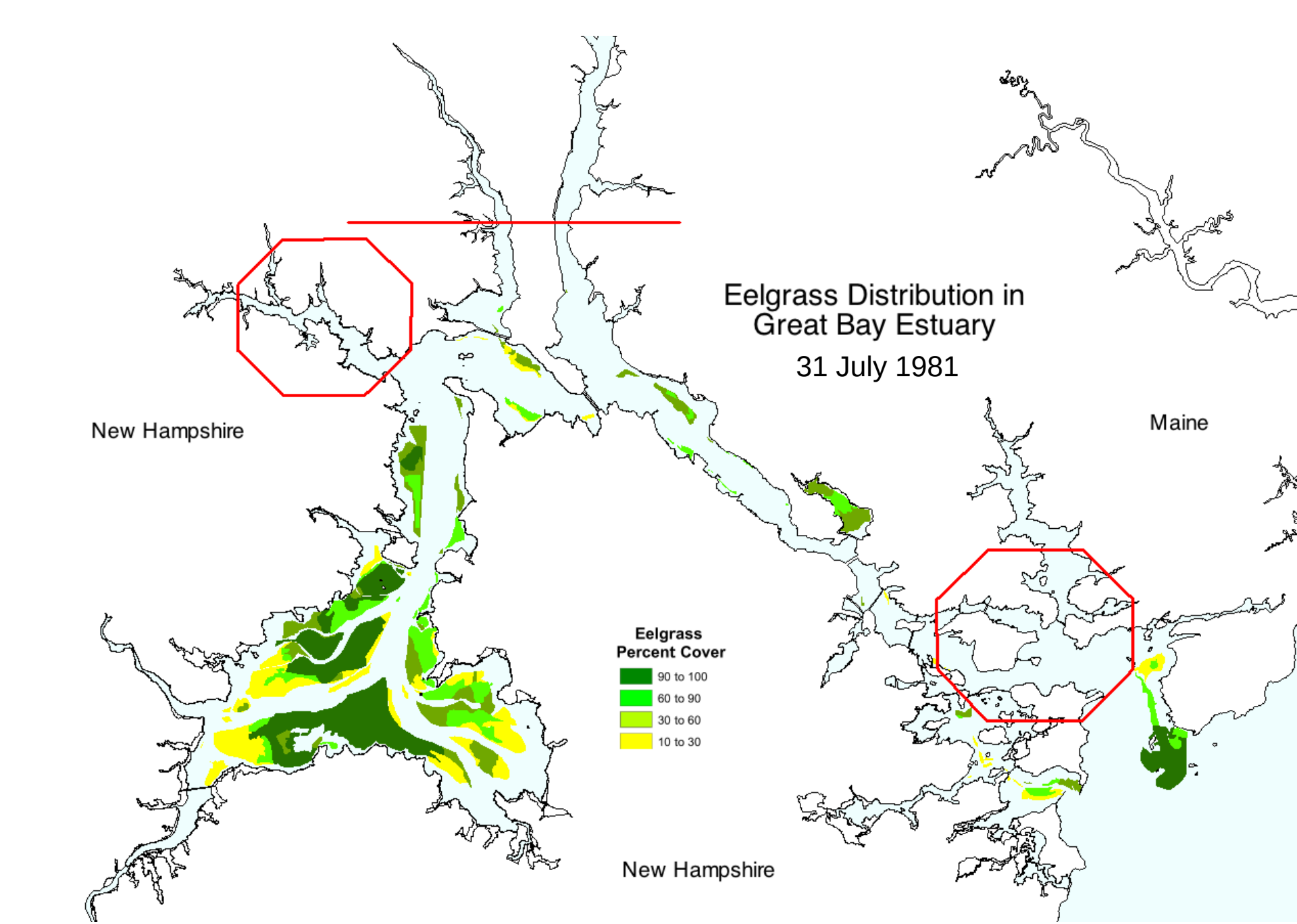

Great Bay
Eelgrass Distribution (acers)
3,000
2,500
2,000
1,500
1,000
500
0
1994
1996
1998
2000
2002
2004
2006
2008
3.2%
y = -76.309x + 154693
R2 = 0.4743

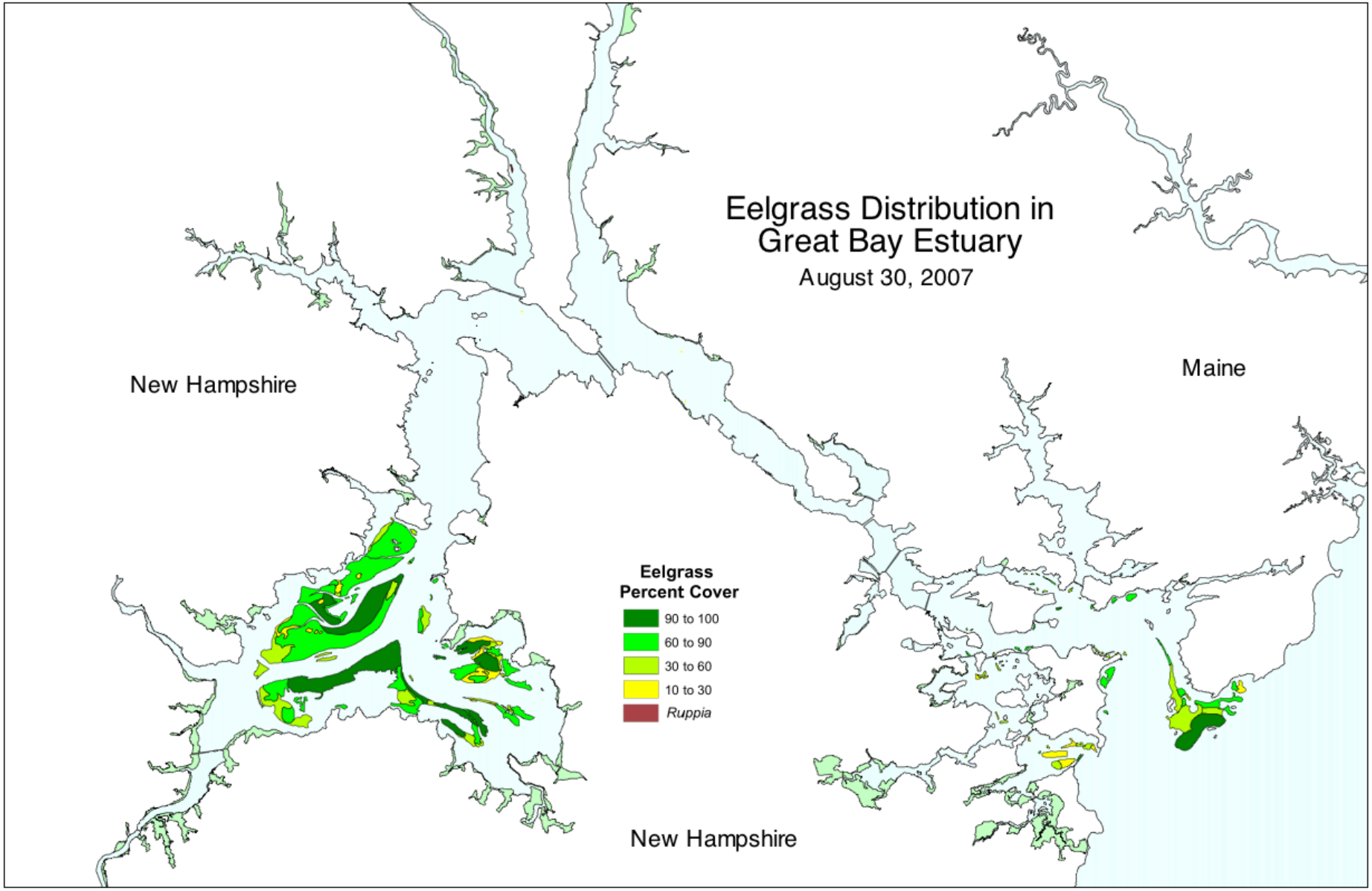

Portsmouth Harbor
Eelgrass Distribution (acers)
400
350
300
250
200
150
100
50
0
1994
1996
1998
2000
2002
2004
2006
2008
1.0%
y = -3.4246x +
7171
R2 = 0.249

Eelgrass Losses from 1996 through 2006




0 7-31-81 USDA 40 33015 180-26


Eelgrass Distribution in
Great Bay Estuary
31 July 1981
New Hampshire
Maine
Eelgrass
Percent Cover
90 to 100
60 to 90
30 to 60
10 to 30
New Hampshire

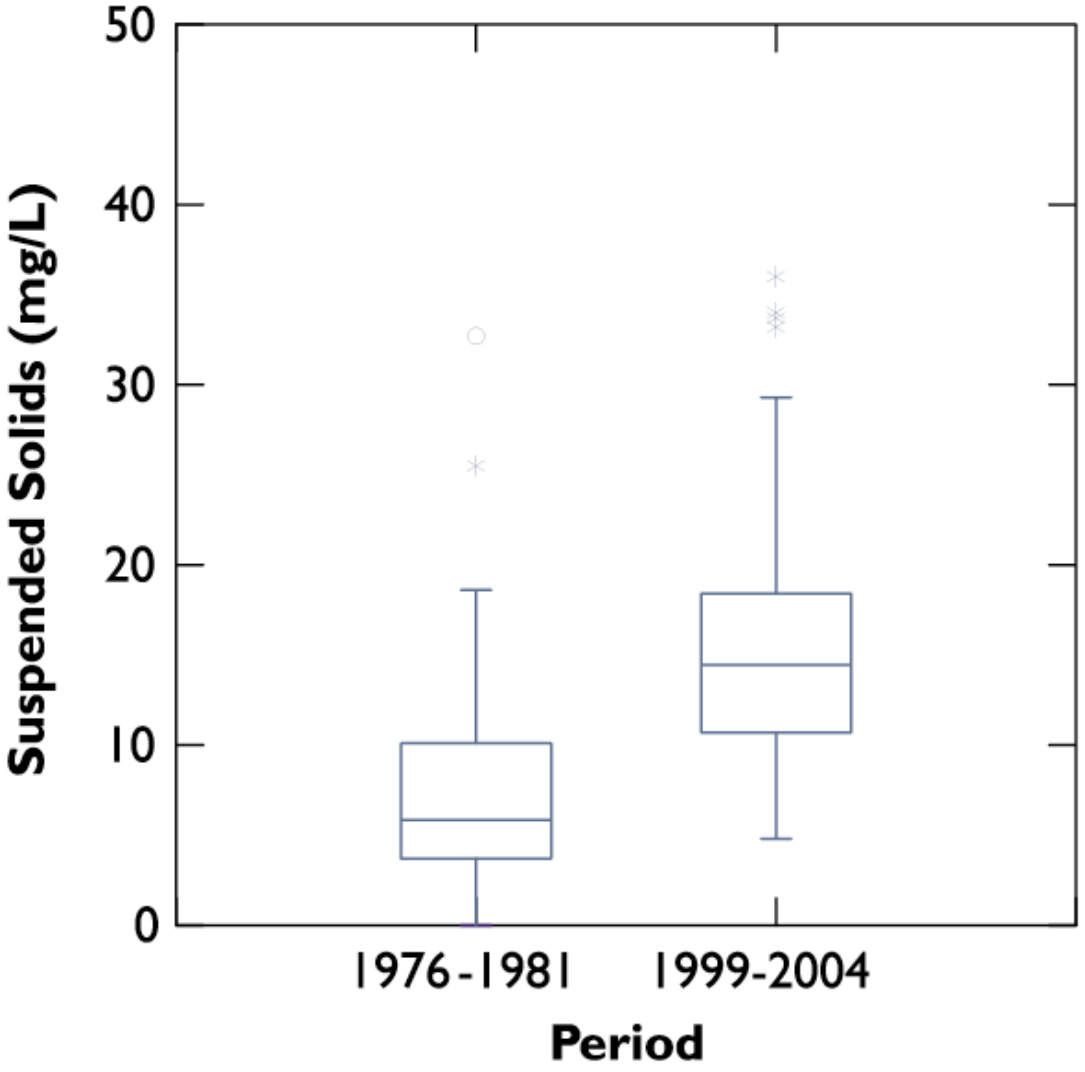

Eelgrass Distribution in
Great Bay Estuary
August 30, 2007
New Hampshire
Maine
Eelgrass
Percent Cover
90 to 100
60 to 90
30 to 60
10 to 30
Ruppia
New Hampshire

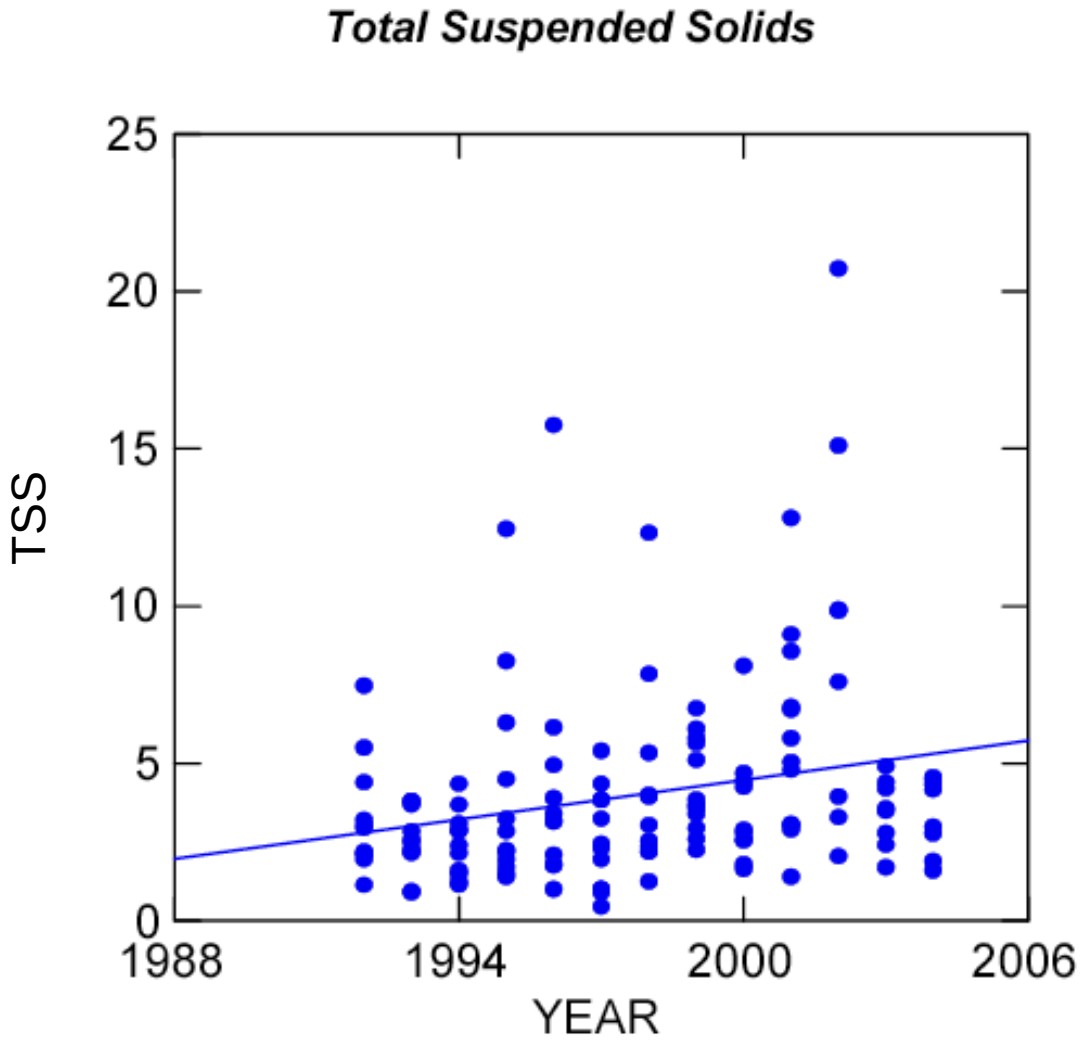
Causes

- Nitrogen loading
- Sediment loading

Suspended solids concentrations measured at Adams Point at low tide (Figure 7)

Data Source: UNH Jackson Estuarine Laboratory

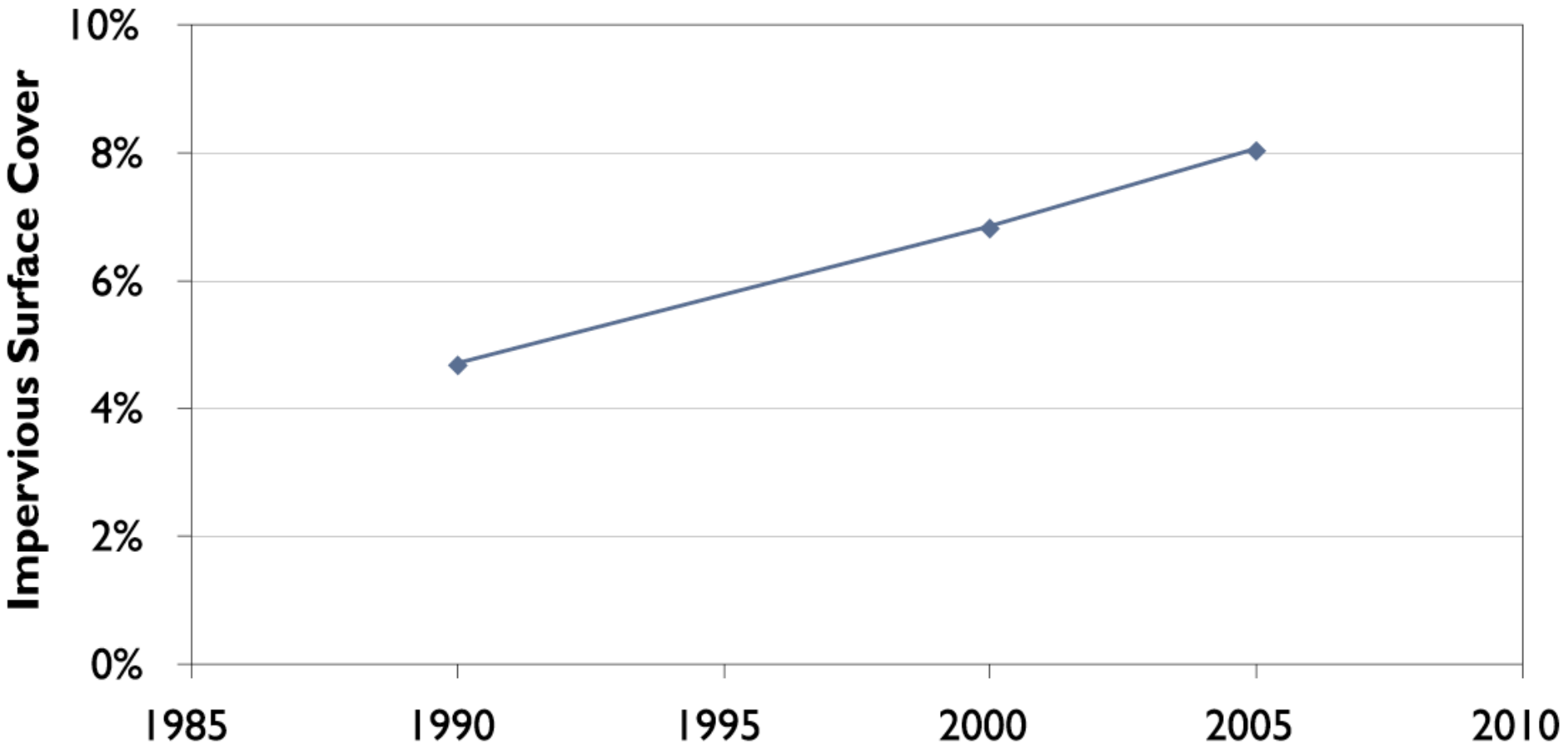




Statistically Signficant Trends

TSS = 0.209 * YEAR -413 Percent Change 1992-2004 = 76%

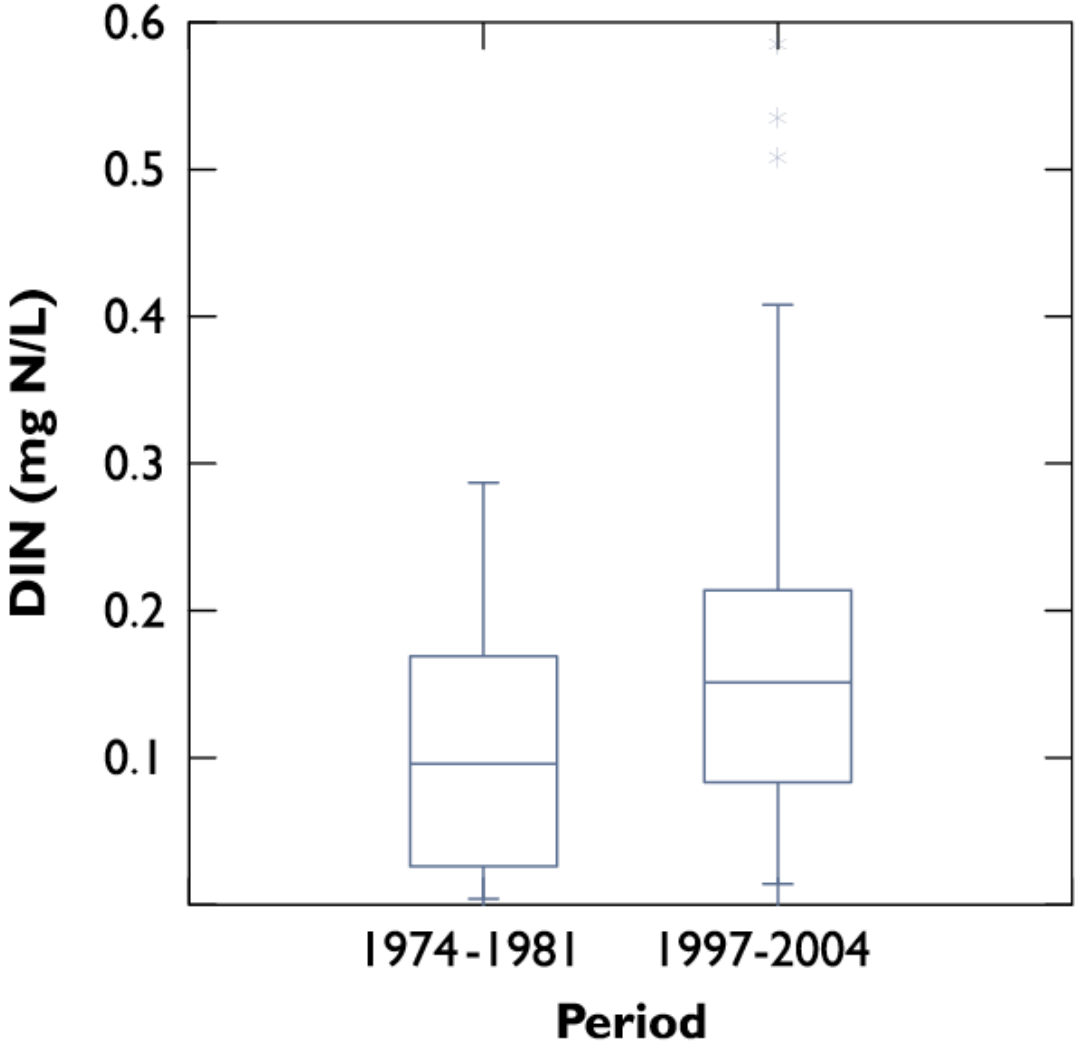
Percent of land area covered by impervious surfaces in the coastal watershed in 1990, 2000, and 2005 (Figure 19)



Data Source: UNH Complex Systems Research Center

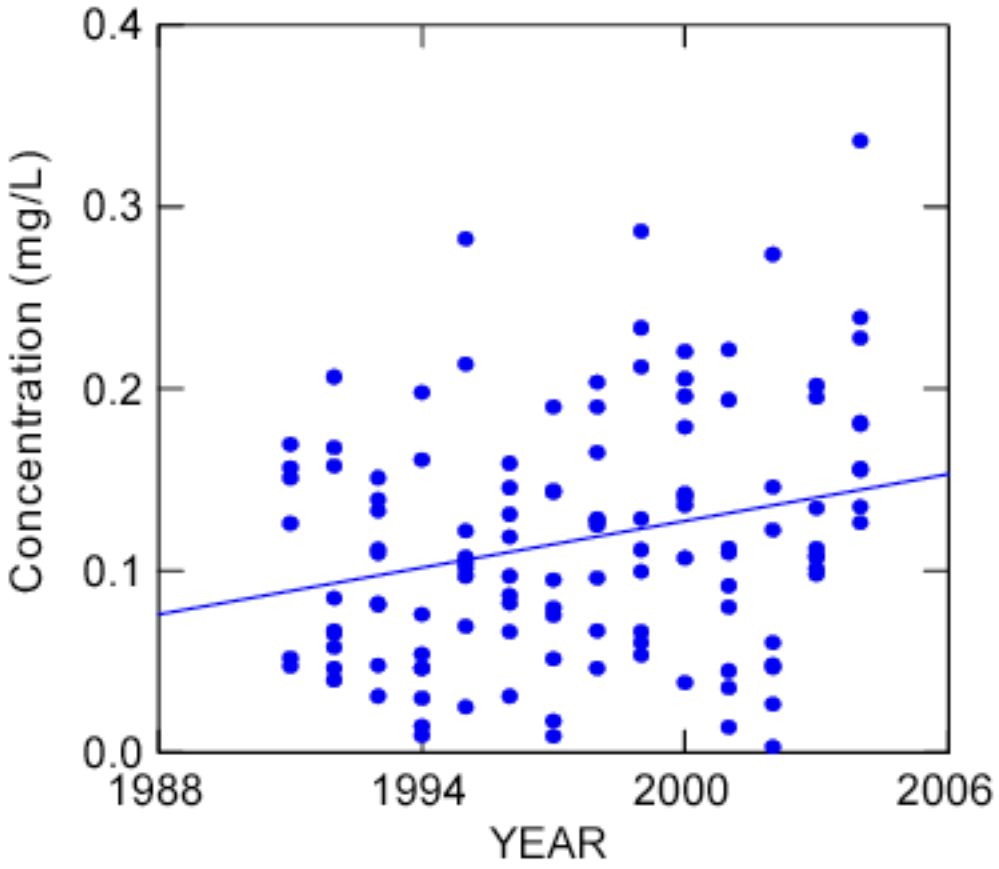
Dissolved inorganic nitrogen concentrations measured at Adams Point at low tide (Figure 6)

Data Source: UNH Jackson Estuarine Laboratory



Chapmans Landing in the Squamscott River

Nitrogen, Nitrate + Nitrite as N

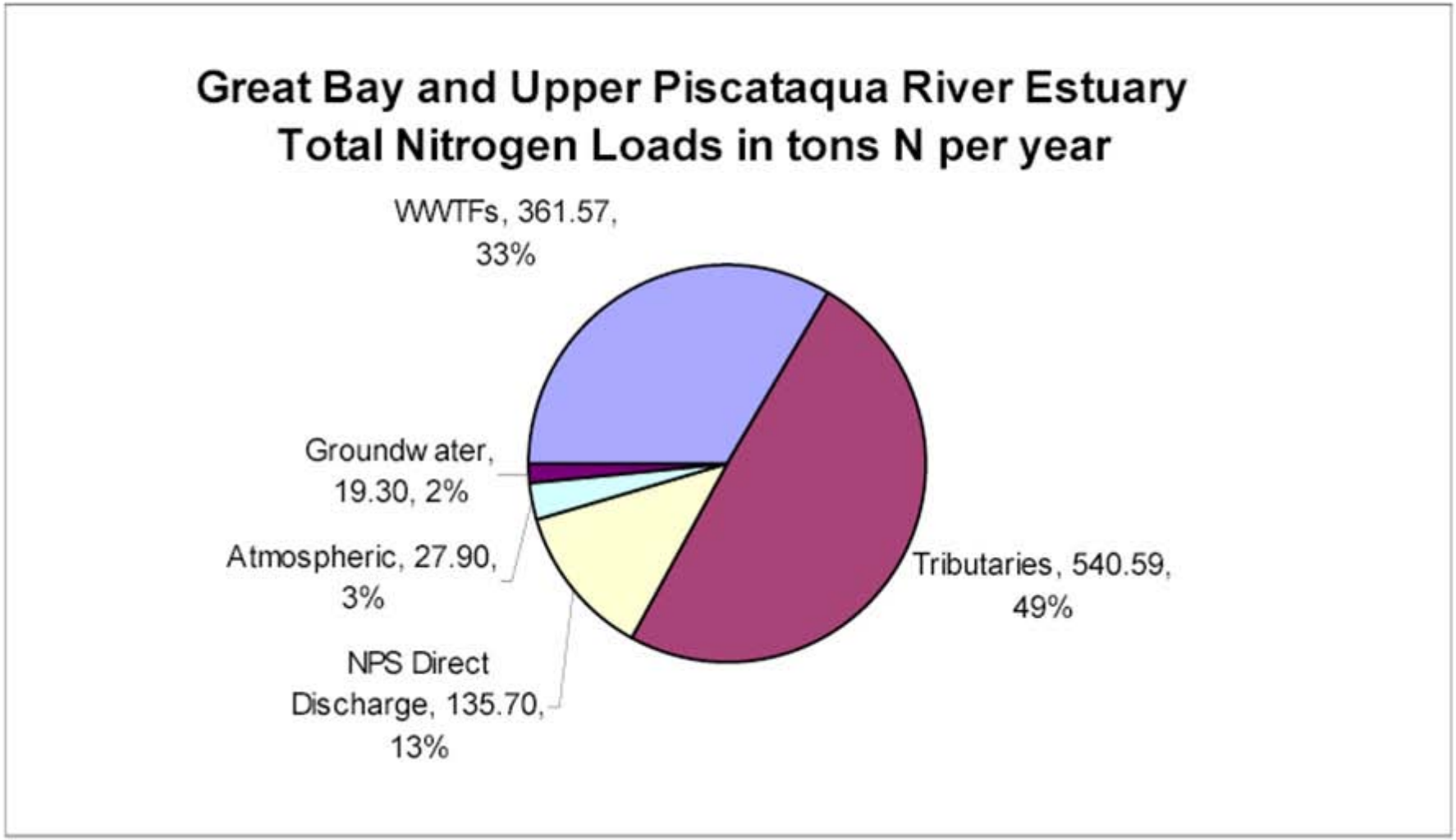


Statistically Signficant Trends

Nitrogen, Nitrate+Nitrite as N = 0.00428 * YEAR - 8.440 (P=0.005)

Percent Change 1991-2004 = 63%

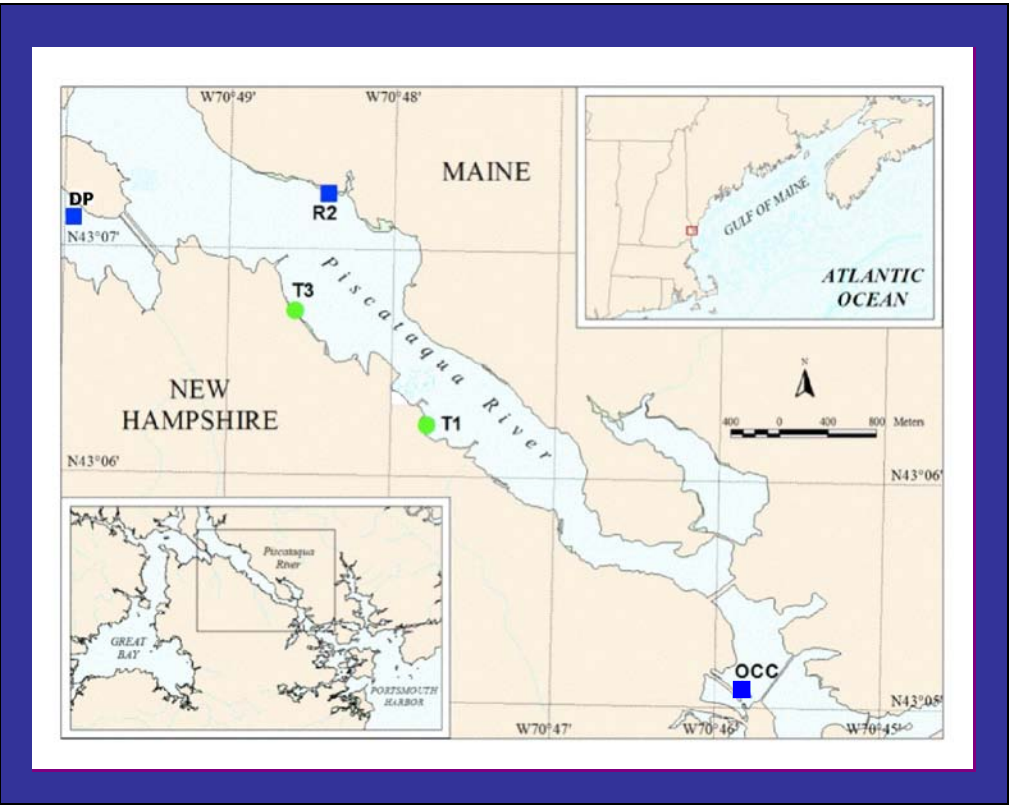
Figure 30: Total nitrogen loads to the Great Bay and Upper Piscataqua River estuaries by source category assuming 50% of WWTF loads in the lower Piscataqua River enter the system



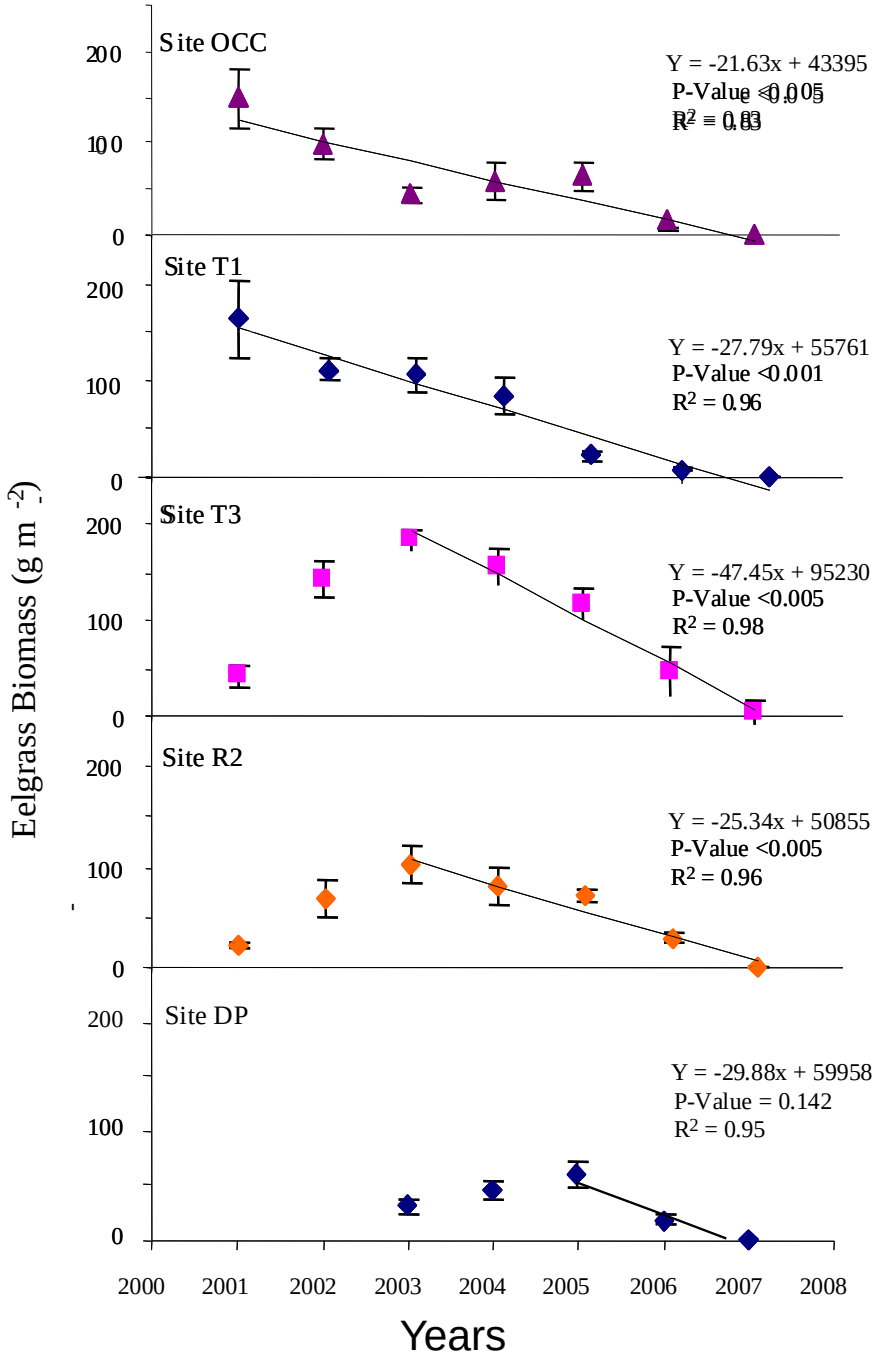
Status and Trends

- Portsmouth Harbor — Stable
- Piscataqua River — Total Loss
- Little Bay — Total Loss
- Great Bay — Declining

Piscataqua River Eelgrass Decline



Beem and Short, 2009



ACKNOWLEDGEMENTS

- New Hampshire Port Authority
- University of New Hampshire
- Piscataqua Regional Estuaries Program