



Bridgewater State University

Virtual Commons - Bridgewater State University

Watershed Access Lab Projects

Watershed Access Lab

5-7-2004

Marina Bay: A Glimpse at the Neponset River Watershed

Follow this and additional works at: https://vc.bridgew.edu/wal_projects

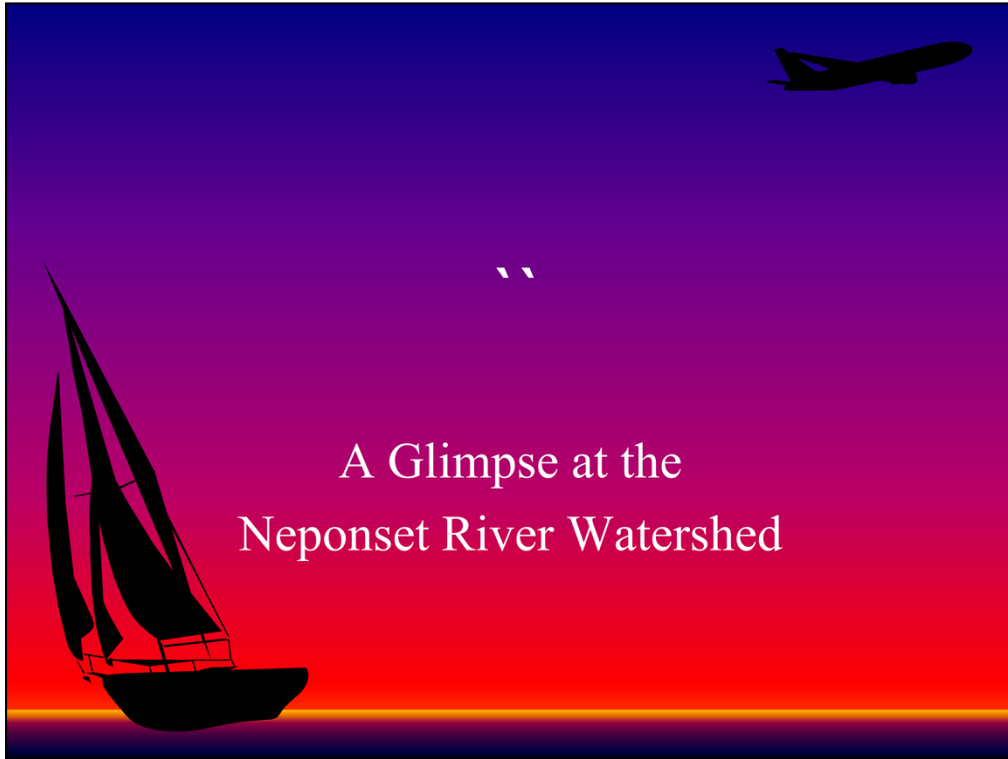


Part of the [Environmental Monitoring Commons](#), and the [Natural Resources and Conservation Commons](#)

Recommended Citation

Atlantic Middle School, North Quincy, Massachusetts (2004). *Marina Bay: A Glimpse at the Neponset River Watershed*. In Watershed Access Lab Projects. Project 21.
Available at: https://vc.bridgew.edu/wal_projects/21

This item is available as part of Virtual Commons, the open-access institutional repository of Bridgewater State University, Bridgewater, Massachusetts.



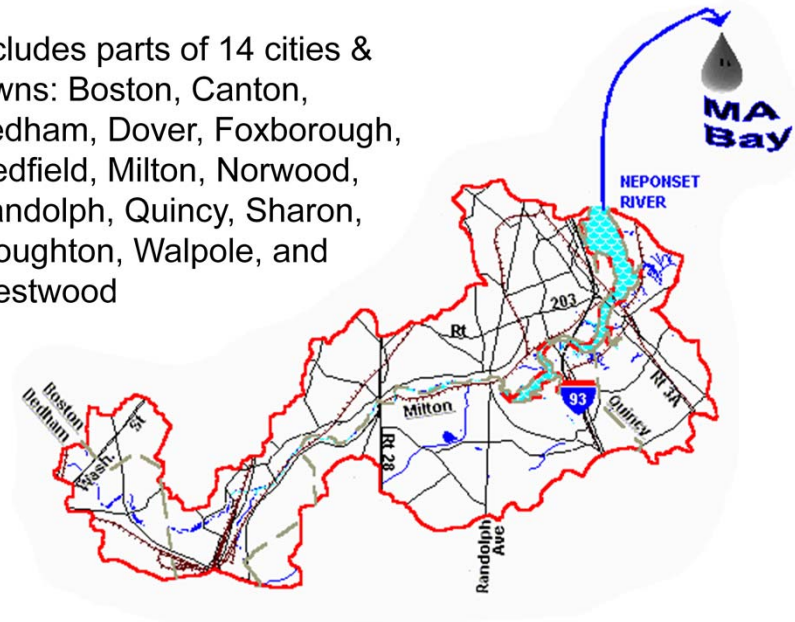
Atlantic Middle School North Quincy, MA

Ms. Glynn's Grade 8
Students as Scientists
Girl's Environmental Group



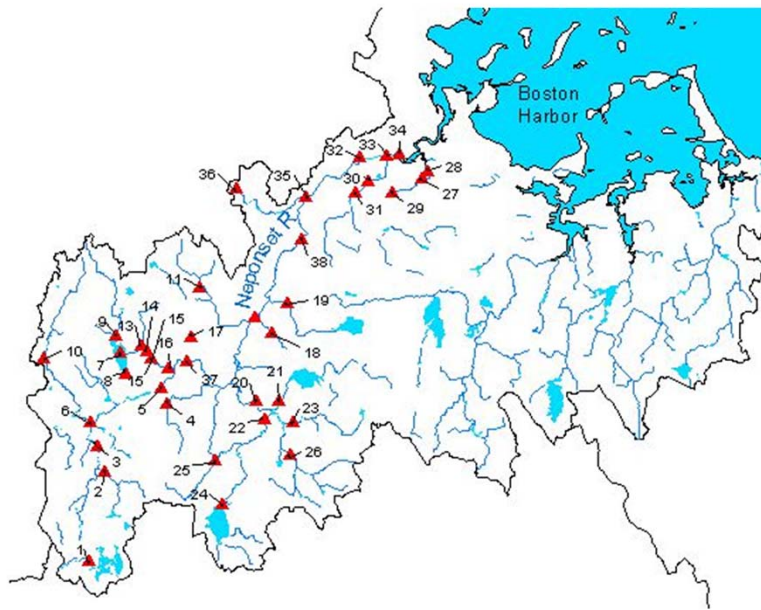
The Neponset River Watershed

Includes parts of 14 cities & towns: Boston, Canton, Dedham, Dover, Foxborough, Medfield, Milton, Norwood, Randolph, Quincy, Sharon, Stoughton, Walpole, and Westwood



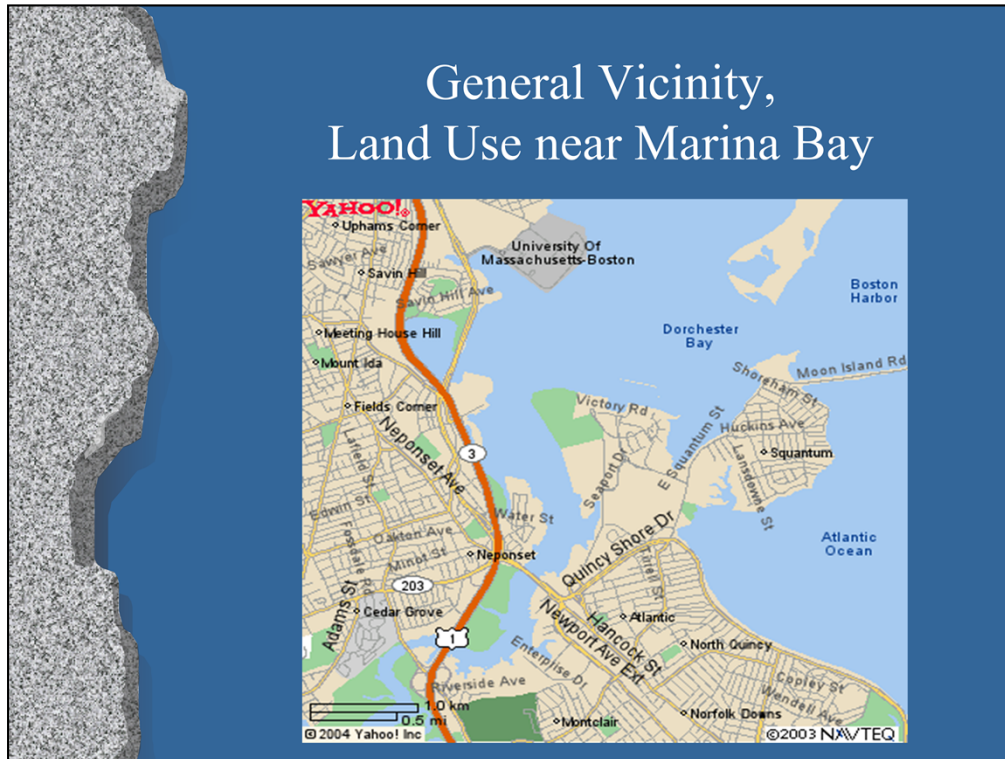
Outline view of the entire Neponset River Watershed, courtesy of NepRWA. Note the several waterways at Marina Bay. Starts in Foxborough, near the stadium

Current Sampling Sites



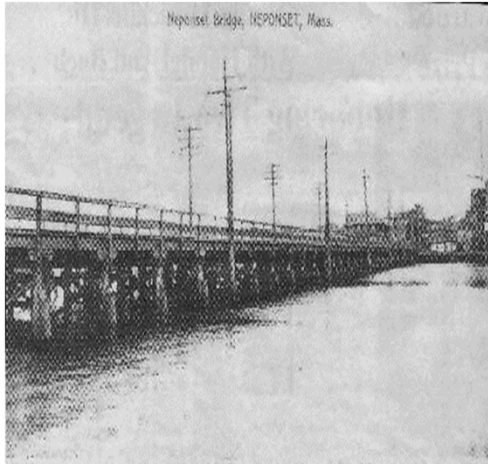
Many sampling sites throughout the watershed, conducted mostly by citizens. No studies are currently conducted for our site through NepRWA – another good reason for why we chose our site.

General Vicinity, Land Use near Marina Bay



This map shows the abundance of human land and water use in our site area. Boat traffic into the river, as well as at several local marinas in Quincy and Dorchester Bay. Also, gas tank, UMass Boston, Neponset River Bridge, MBTA, numerous residential and commercial uses.

History of the area: facilities at the entry of the Neponset River



1910 Bridge view in need of repair, from close to our site facing Neponset coal yards. Interestingly, the concrete structure that replaced this is now in danger of collapsing into the river.

- Early Boston: used for mills and docking
- By 1750, known pollution
- Through 1800's, addition of coal yards, mills, docks
- Airport on our site by 1910
- Denison airport co-owned by Amelia Earhart
- Taken over by U.S. Navy featuring Naval housing and NIKE site
- Hangers, Boatyard, & flea market until late 1980's

Coincidentally, we found this photo Wed. night our weekly local paper, The Quincy Sun. Denison airport was the site of much fanfare, featuring well known Squantum festivals and air shows. Place of death for the famous Harriet Quimby, first licensed female pilot



Current Uses of Marina Bay

- Boatyards expanded to the Northeast's largest marina
- Developers solicited businesses to move in: Boston Scientific, Boston Financial Data Services, many smaller companies
- Boardwalk built for pedestrian traffic
- Shops, eateries, bars added
- Luxury townhomes, twin towers

Because of its essentially exclusive access to 93N and close proximity to Boston, Marina Bay is home to many wealthy business people and local celebrities: Tom Brady, Ty law, Willie McGinest, Amalia Barreda, Chet Curtis, to name a few.

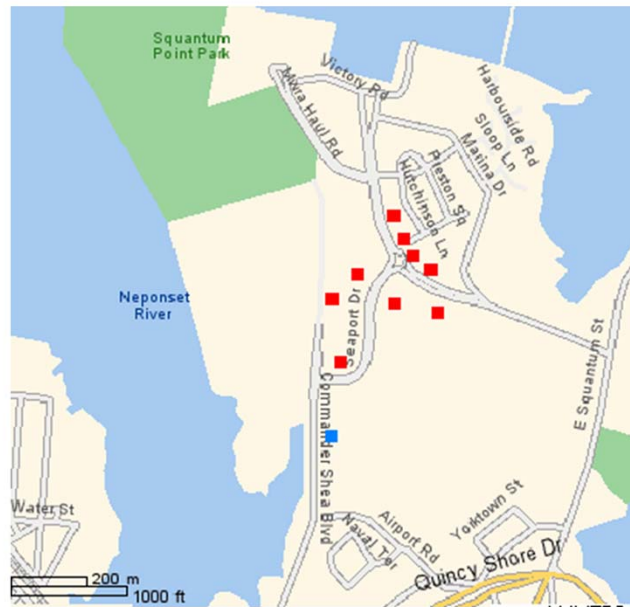
Newest additions near our site

- Seaport at Marina Bay
- Reserve at Marina Bay
- Marina Bay Skilled Nursing Center
- Construction is taking place for mixed use development
- New construction has been completed for most of Chapman's Reach luxury townhomes
- The Meadows is under construction, which will be a 136 unit luxury apartment building



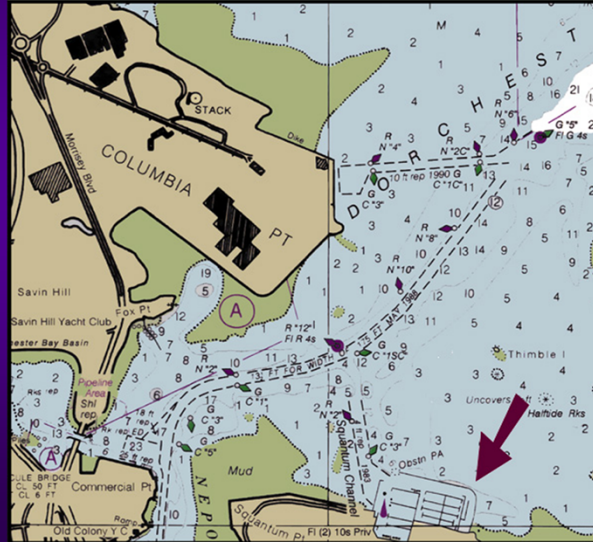
Some of the new construction next to our site was built on Lot 23, conservation land and bird sanctuary. The Neponset River Watershed Assoc went to court to fight the construction, but the land was cleared before a judge ruled. Mass. DEP current has signs posted and paths roped off to prevent further destruction of remaining conservation land.

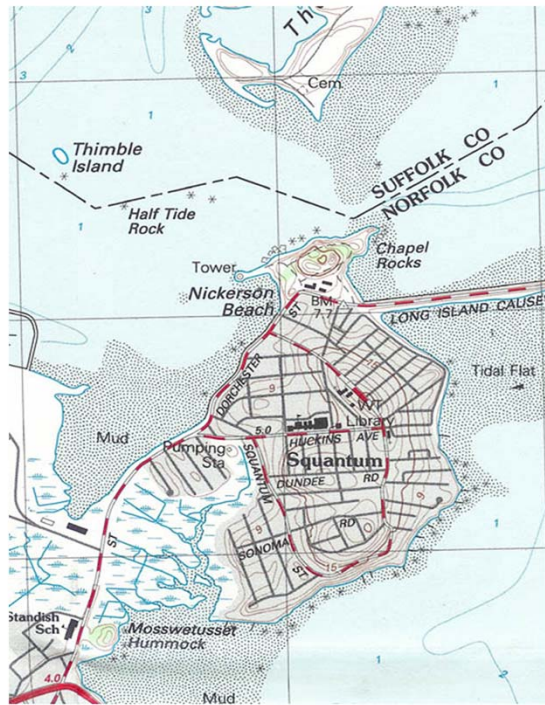
New developments near our site





NOAA Coastal Chart of Marina Bay at the Neponset River











Topographical
Map of
Quantum and
entry to Marina
Bay

*View of Marina Bay's Commercial Developments:
Boardwalk, Shops, Restaurants, Marina, Office
Buildings, & Parking for Ferry Service*



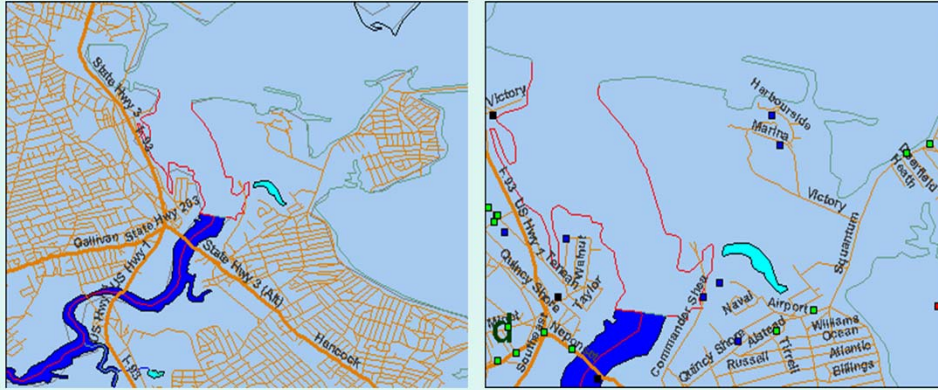


According to the MWRA

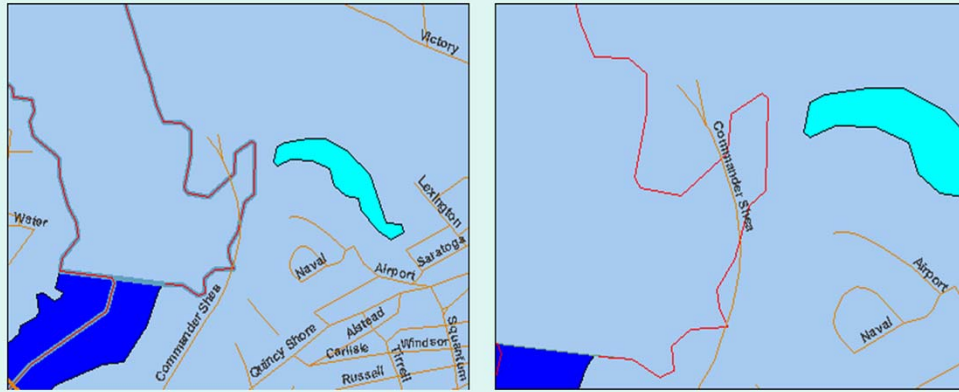
- Seven Combined Sewer Overflows (CSO) at North Dorchester Bay 
 - One directly across from our site 
 - Each activated 1-21 times per year
 - Approximate overflow discharge 8 million gallons into North Dorchester Bay 
 - Additionally, 108 rain events/year discharge approximately 144 MG of stormwater 
- 
- 

Two additional CSOs are located along the Neponset within a few miles of our site

Marina Bay: impaired waters and facilities



Our site: view of impaired waters within 0.5 miles



Our Sampling Site is to the right of Commander Shea Blvd.

Our site: condos and T in background,
as well as sample site at pipes



View from sampling site with new construction in the background; old bridge and outfall remnant visible



Overflow into our sampling area through
an old manmade structure



New construction across from our site,
with Boston Scientific in the background



View of bus yard, auto body shop, &
community center: debris flow toward site



Commander Shea Blvd. connector to
93N, only access to our site



Riverside, receives flows from our site,
abuts Boston Scientific





Water Sample Analysis

LaMotte Kits

- pH
- Dissolved Oxygen
- Turbidity
- Nitrate $\text{NO}_3\text{-N}$
- Phosphate
- Carbon Dioxide
- Est. Total Dissolved Solids

Science Source Kit

- Copper
- Ammonium
- Lead
- Hydrogen Sulfide
- Oil

Also FIA & IC

- Fluoride, Bromide, & Sulfates
- Phos. & $\text{NO}_3\text{-N}$

LaMotte Test Results

	pH	D.O.	Turb.	NO ₃ N	Phos.	CO ₂	TDS
MB1	7.5	2.6	10 jtu	0.25	0	1.0	1.0
MB2	8.5	1.6	10 jtu	0.25	0	1.2	n/a
MB3	8.0	2.4	0	0.25	0	1.2	n/a
MB4	8.0	4.5	0	0.25	0	1.0	n/a
MB5	8.0	5.6	10 jtu	0.25	0	1.0	n/a
MB6	7.5	9.8	60 jtu	0.25	0	1.2	n/a
MB7	7.5	4.2	0	0.25	0	0	1.0
MB8	8.0	4.5	0	0.5	0	0.8	1.0
MB9	7.0	3.2	0	1.0	0	0.7	1.0
MB10	7.5	2.4	0	0.25	0	0.8	1.0

Phosphate test results are actually for Orthophosphates. Sample # 6 was taken at low tide.



Science Source Kit

- **Possible invalid results**
- **Test strip methods**
- **No indication of the following:**

Copper

Ammonium

Lead

Hydrogen Sulfide

Oil

FIA test results: Fall 03

	mg Phos./L	mg N-NO ₃ /L
Nov. 22- 1	0.022	0.42
Nov. 30- 2	0.019	0.47
Nov. 30- 2	0.019	0.46

Possibly skewed because of high salt content in samples

FIA results: Winter/Spring 04

	mg Phos./L	mg N-NO ₃ /L
Mar. 6- 3	0.022	0.19
Mar. 13- 4	0.023	0.43
Mar. 16- 5	0.023	0.46
Mar. 20- 6	0.042	0.35
Mar. 20- 6	0.042	0.36
Mar. 27- 7	0.027	0.33
Mar. 30- 8	0.017	0.99
Apr. 3- 9	0.024	1.12
Apr. 6- 10	0.017	0.59
Apr. 6- 10	0.018	0.60

Some interference suspected due to high salt content

IC results

	Fluoride	Bromide	Sulfates
11/22 -1	0.44	21.52	1041.74
11/30 -2	0.56	26.86	1400.16
3/6 - 3	0.6	25.8	1310.84
3/13- 4	n/a	32.14	1677.42
3/16- 5	n/a	28.62	1535.52
3/27- 7	4.04	96.32	1104.68

Heavy rain at end of March

Additional Observations

- Local Wildlife: we observed birds, some water fowl. Notified by QPD of coyotes
- Significant coyote population has decimated wild cats and rabbits, squirrels, as well as neighborhood dogs
- We observed various bird species due in large part to the DEP protected parcel
- Shells found most likely washed into site

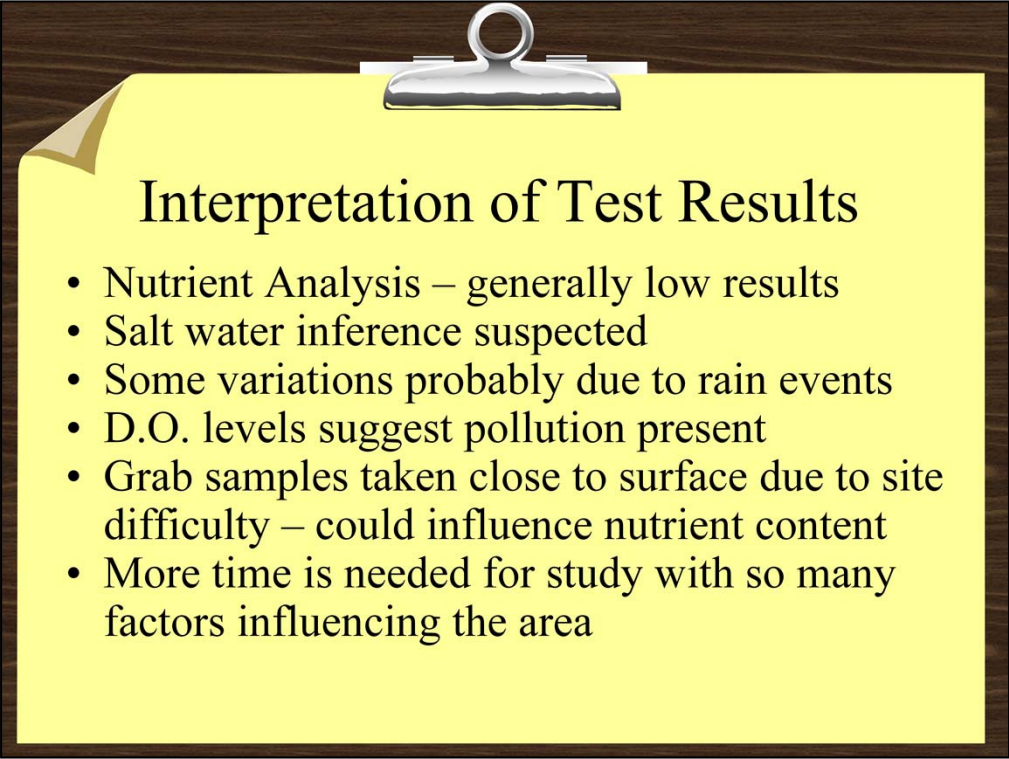
During the late winter and early spring, little life was observed. We suspect this was largely because of the extreme cold this winter. Also, coyotes have limited all other smaller populations.



Conclusions

Indicators of poor health:

- reduction of open space & wildlife
- increase construction & traffic
- some flow reduction – stagnant
- CSO overflows
- remnants of prior human use
- designated impaired waters
- historically polluted



Interpretation of Test Results

- Nutrient Analysis – generally low results
- Salt water inference suspected
- Some variations probably due to rain events
- D.O. levels suggest pollution present
- Grab samples taken close to surface due to site difficulty – could influence nutrient content
- More time is needed for study with so many factors influencing the area

The End
We Send Special Thanks To:

- Dr. Kevin Curry & Kim McCoy
- Atlantic Middle School Staff
- Principal Laura Bogan
- Asst. Principal Adam Wolf
- First Student Bus Company for getting us here!