



# Manhasset Bay Protection Committee

**Minutes: February 2, 2017, 7:30pm**

**Law Library, Town Hall**

**Attendance:** Bob Keane (Chairman, Port Washington North), Annie Mendelson (Great Neck), Chris Shannon (Councilwoman DiGeorgio's office), Chuck Idol (Baxter Estates), Dan Fucci (Nassau Co), Erin Reilly (Town of North Hempstead), Jed Siegel (Plandome Manor), Jennifer Wilson-Pines (Manorhaven), Kevin Braun (Town of North Hempstead), Pasqua Dziadul (Sands Point), Ray Herbert (Plandome), To-on Pang (Thomaston), Sean Callahan, Sarah Deonarine (Director)

Note: Action items are in ***bold highlighted, underlined italics.*** Motions are highlighted in blue.

**Meeting was called to order at 7:35pm with a quorum in attendance.**

Ray Herbert made a motion to accept the minutes of January 12, 2017 as amended for Manorhaven's update, Dan Fucci seconded. Motion carried.

The annual DEC training for volunteer alewife monitoring will be held on Thursday, March 2<sup>nd</sup> at 5:30pm in the Manhasset Public Library. MBPC is a co-sponsor of this training event.

2017 is the 20<sup>th</sup> Anniversary of MBPC and will be a topic of conversation in future meetings.

Deonarine distributed a spreadsheet of the MBPC Trust Account's income and expenditures for the 2016 calendar year. The current balance as of the meeting is \$122,946.03.

**Presentation on the Draft Manhasset Bay Water Quality Report, 2009 – 2015;** Diane Mas from Fuss & O'Neill gave a webinar presentation. The draft report was distributed at the meeting; a word version of the draft report went out the day after the meeting (appendices weren't included in the draft report, because of space constraints). The stations are as follows:

MB-1	Leeds Pond	MB-4	NUN 4
MB-2	Kennelworth	MB-5	Baxter Beach
MB-3	Manorhaven	MB-6	Manorhaven Beach

- The data is plotted as box plots: the taller the box, the greater the variability of the data.
- There is a strong correlation between the two bacteria<sup>1</sup> (but that doesn't mean causation).
- Baxter Estates (MB-5) has very high bacteria counts.
- MB-3, 5, and 6 tend to have the highest *Fecal coliform* and *Enterococcus* numbers.
- F&O looked at data west-to-east (MB-2, 4, and 5) (one of our key questions):
  - Eastern shore has higher bacteria; similar bacteria counts between western shore and central bay. This is consistent with land use differences

<sup>1</sup> The two indicator bacteria are *Fecal coliform* (1000 CFU/100ml) and *Enterococcus* (104 CFU/100ml). Fuss & O'Neill used the swimming standards for the bacteria counts. CFU = colony forming units

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- Upgrades at STPs<sup>2</sup> may account for bacteria data changes at MB-2 (2015) and MB-5 (2013-15)
- Q: Are there temporal trends? While there are no strong visual trends apparent, changes in the range of concentrations appear to be timed with STP upgrades – keep an eye on this in the future.
- IEC data was not collected on the same day as MBPC, so there isn't much matching between the data points, but F&O did still look at it. There is not a lot of variation between IEC's two open-bay stations. Some temporal variability for DO (dissolved oxygen) and secchi depth (a measure of how clear the water is). Recommendation: coordinate sampling days with IEC.
  - Are there temporal and spatial trends in DO? No strong temporal or spatial trends. DO values at midwater are good, generally greater than 3 mg/L (which is the standard).
- There was no correlation between tidal elevation (9am) and bacteria
- Q: What are potential relationships between bacteria data and rainfall and tidal data? None for 2-day prior, but statistically significant for 1-day prior and day of sampling.
  - High to moderate correlation between rainfall and bacteria. Correlation with 1-day prior is consistent with the concept of runoff.
  - Q: Can the influence of stormwater runoff be determined? Spatial characteristics for bacteria and correlations with rainfall indicate a relationship with stormwater runoff.
- Next steps: Review of draft report; revision and any additional analyses; final report and presentation in March.

#### Discussion:

- Can F&O tease out the influence of on-site wastewater systems vs. stormwater runoff? Definitely on the eastern shore we are seeing the influence of stormwater, since it's mostly sewer. The western shore (Great Neck) could be a mix of stormwater and cesspool issues.
- How many sampling points each year? MBPC has weekly sampling from roughly June to September, equating to 12-16 points per year. Can we look at rain events per year? Diane will add discussion of number of rain events per year that correlated with the same sampling event.
- MB-5 station is right on top of the Port Washington STP outfall, there is no similar MBPC station for the Great Neck STP, but IEC has a station there (they don't collect bacteria). MBPC is not sampling there anymore, because we can only access it at high tide and there's no mid-water sample here for IEC, because it is so shallow. F&O will add information on this station and will also look at IEC surface data as that will be more comparable to MBPC sampling, which is only at the surface.
- **To the group: were there any major sewage spills over the period of record (2009 – 2015)?**
- Nassau County has stream sampling data (bacteria, metals, VOCs, etc.) twice per year at Baxter Pond, Stannards Brook, Manhasset Valley, and Leeds Pond. They can provide that data.
- Discussion on moving forward with regression analysis: Diane is not sure we'd see a trend over our time period. Sometimes it's worth looking at one station, because you know there was a change that was made. But there is no visual evidence to justify going forward with a regression analysis. Looking at wet v. dry could be useful for us (per Diane). MBPC requested that the data be broken out more.

#### **Motion points:**

Erin Reilley made a motion for the Committee, through the Director, to sign onto the Long Island MS4 general permit comment letter (due to DEC 2/3). Jennifer Wilson-Pines seconded. The motion carried.

#### **Jennifer Wilson-Pines made motion to dismiss at 9:16**

**Upcoming meetings:** March 9, April 6, May 4, June 8, joint meeting TBD, boat tour TBD  
March 2<sup>nd</sup>, Alewife Training at Manhasset Public Library at 5:30pm

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<sup>2</sup> Sewage Treatment Plants

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# Water Quality Summary 2009-2015

Presentation to  
**Manhasset Bay Protection Committee**

February 2, 2017

# Project Purpose and Objectives

- Seven (7) years of data
  - Town of North Hempstead (MB data)
  - Interstate Environmental Commission (IEC data)
- Targeted analysis of Manhasset Bay water quality data
- Key questions –
  - What are potential relationships between bacteria data and rainfall and tidal data?
  - Are there temporal and spatial trends in bacteria data that indicate changes in water quality status?
  - Can the influence/impact of stormwater runoff be determined?
- To explore these questions, graphical and statistical analysis

# The Data

- MB Data
  - Weekly, summer
  - Fecal Coliform
  - Enterococcus
  - Air and water temperature
  - Categorical
    - *wave height*
    - *wind direction/speed*
    - *weather*



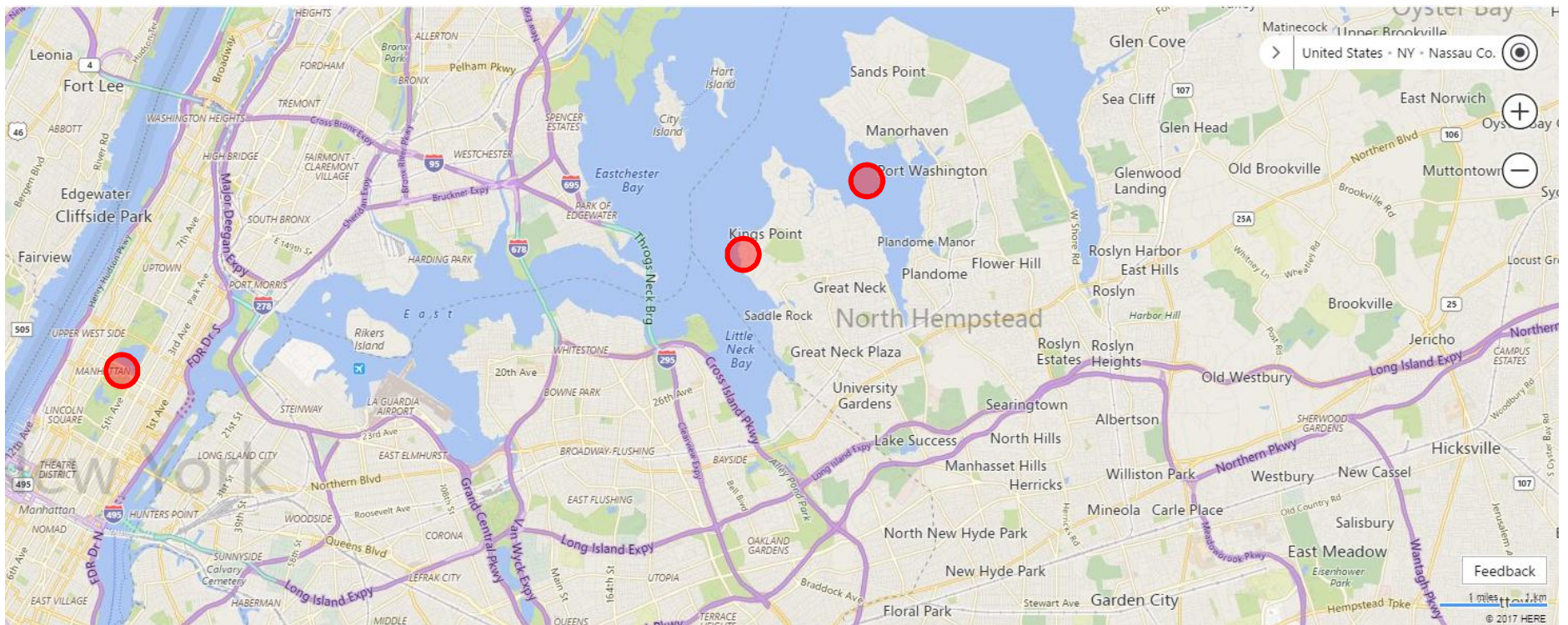
# The Data

- IEC Data
  - Weekly
  - Temperature
  - Salinity
  - Secchi disk
  - pH
  - Dissolved oxygen
  - Percent cloud cover
  - Tides (2011-2015)
  - Rainfall (Prior 24 and 48-hour)
  - Categorical variables
    - *Weather*
    - *Sea state*



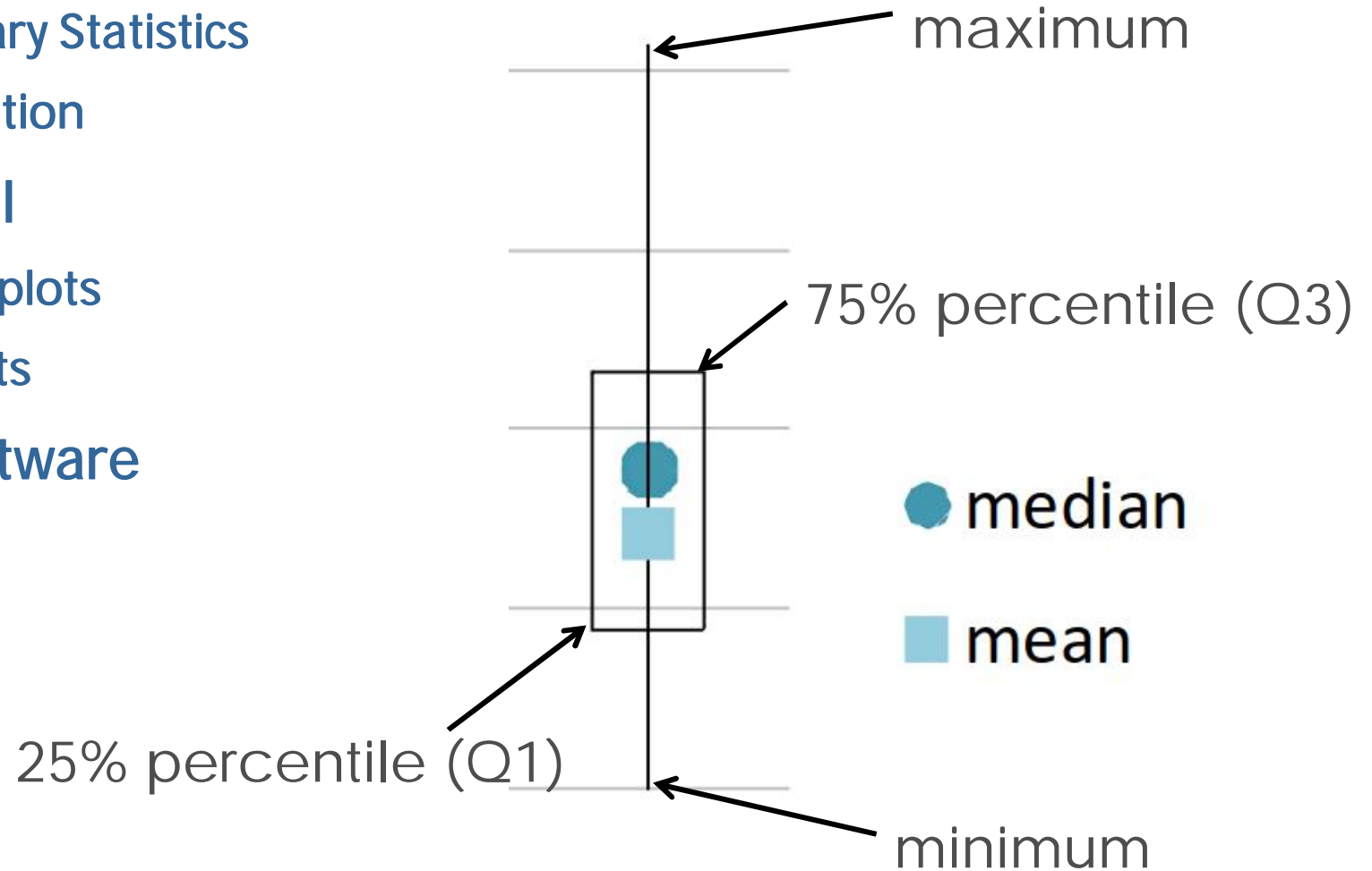
# The Data

- NOAA Rainfall
  - Central Park, NY
    - Same Day
    - Prior Day
    - Prior 2 Days
- NOAA Tide Data
  - Kings Point
    - Elevation at 9 AM



# Analysis Tools

- Statistical
  - Summary Statistics
  - Correlation
- Graphical
  - Scatterplots
  - Boxplots
- Excel software





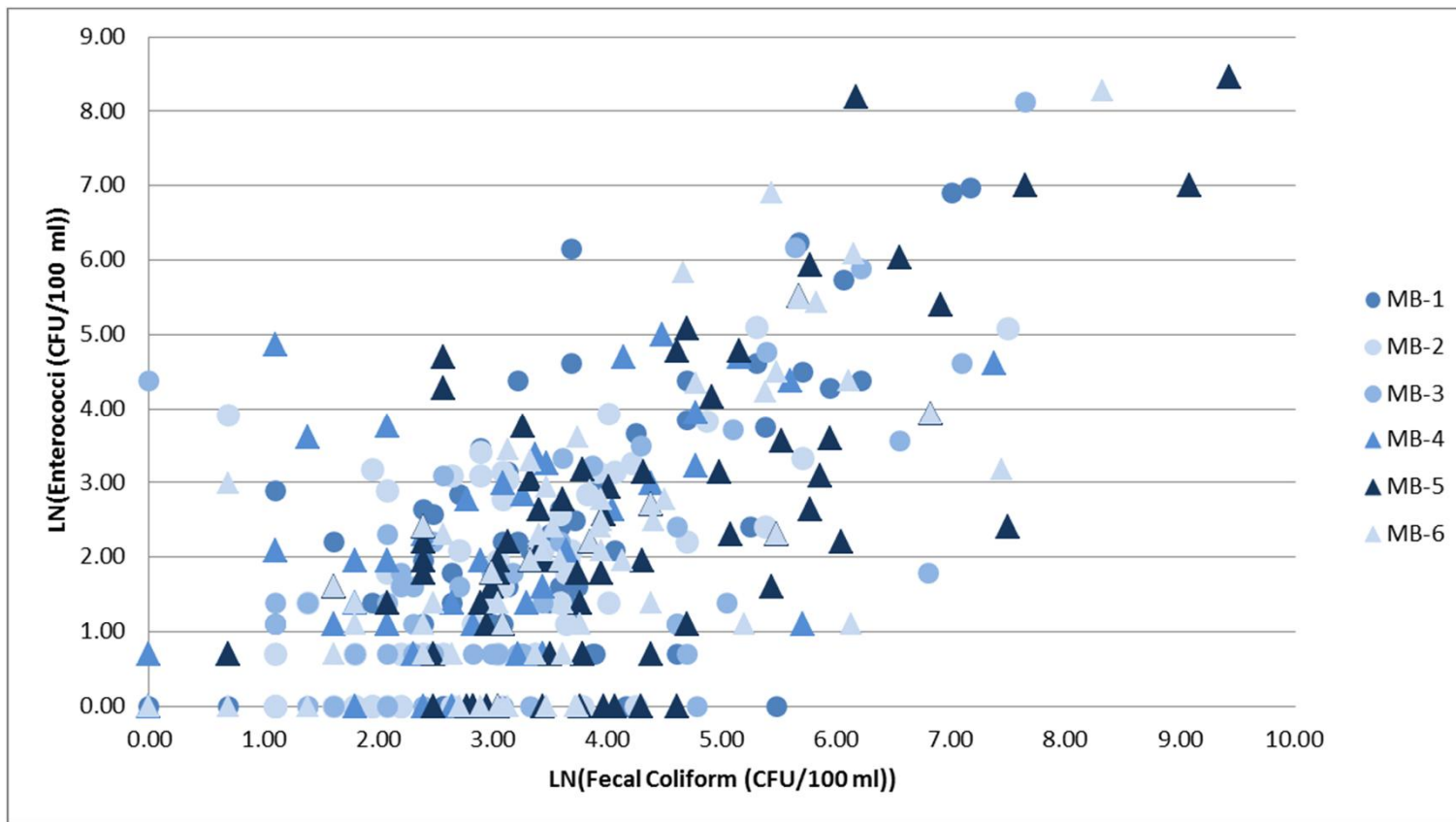
# Summary Statistics

- Making comparison
- Benchmarking against standards
- By station, by year (temporal differences)
- By year, by station (spatial differences)
- Tables or expressed graphically in boxplots

# Indicator Organism Bacteria

- Strong correlation between Fecal Coliform and Enterococci

	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6
r	0.600	0.574	0.596	0.565	0.663	0.693
p-value	0.00	0.00	0.00	0.00	0.00	0.00



# Summary Statistics

- Period of Record – Bacteria

Fecal Coliform (CFU/100ml)						
	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6
Median	22	11	10	7	35	23
q1	10	4.5	4	3	17	10
min	0.1	0.1	0.1	0.1	0.1	0.1
max	1300	1800	2100	1600	12400	4100
q3	40.5	29.5	26	20.25	102.5	51
Mean	76.02	44.47	80.99	39.59	356.24	126.38

Enterococci (CFU/100ml)						
	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6
Median	3	1	1	0.1	5.5	3
q1	0.1	0.1	0.1	0.1	1	0.1
min	0.1	0.1	0.1	0.1	0.1	0.1
max	1070	164	3400	147	4700	3900
q3	11.5	8	4	5.5	16.75	11
Mean	46.71	9.68	51.19	11.29	135.40	74.23

- FC – 1000 CFU/100 ml; Entero – 104 CFU/100 ml

# Summary Statistics

- Period of Record – Bacteria

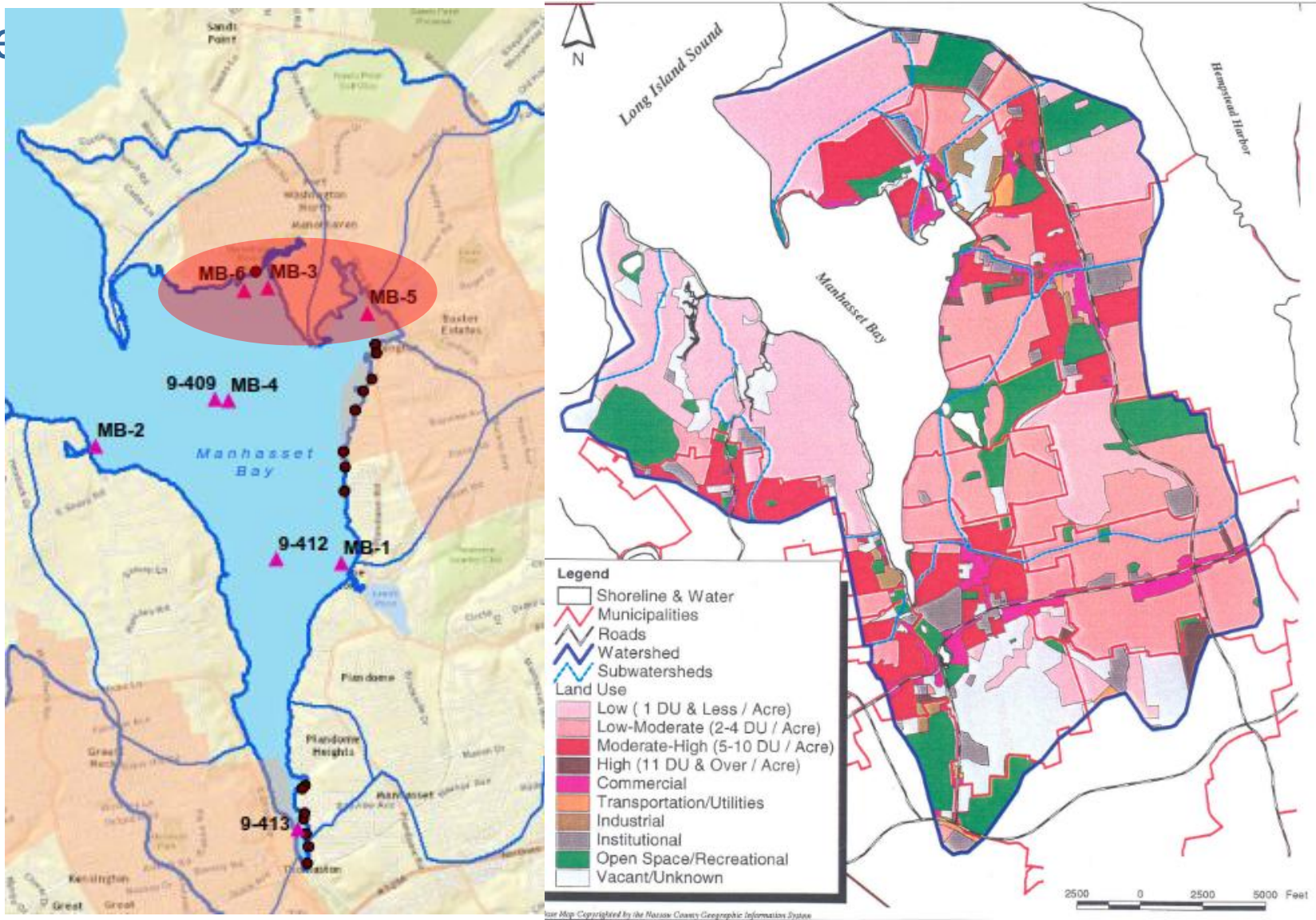
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min	0.1	0.1	0.1	0.1	0.1	0.1
max	1300	1800	2100	1600	12400	4100
q3	40.5	29.5	26	20.25	102.5	51
Mean	76.02	44.47	80.99	39.59	356.24	126.38

Enterococci (CFU/100ml)						
	MB-1	MB-2	MB-3	MB-4	MB-5	MB-6
Median	3	1	1	0.1	5.5	3
q1	0.1	0.1	0.1	0.1	1	0.1
min	0.1	0.1	0.1	0.1	0.1	0.1
max	1070	164	3400	147	4700	3900
q3	11.5	8	4	5.5	16.75	11
Mean	46.71	9.68	51.19	11.29	135.40	74.23

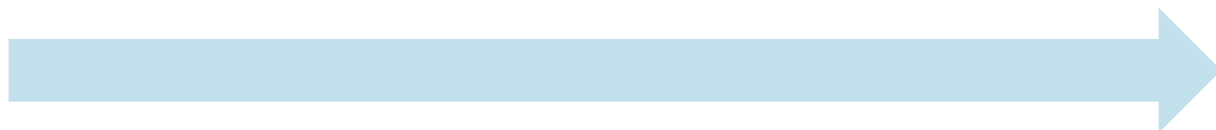
# Summary Statistics

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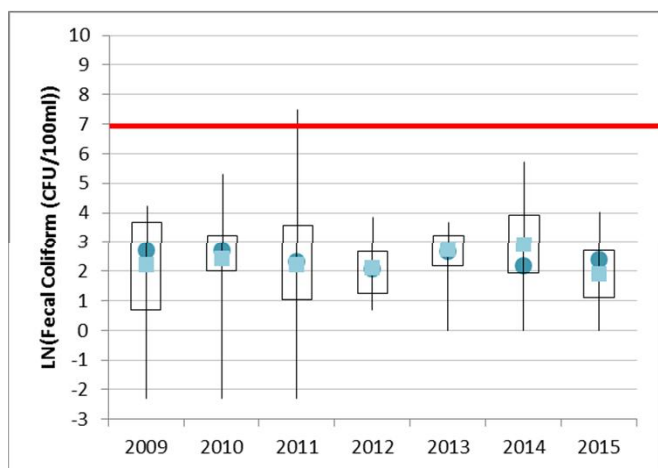


# Summary Statistics

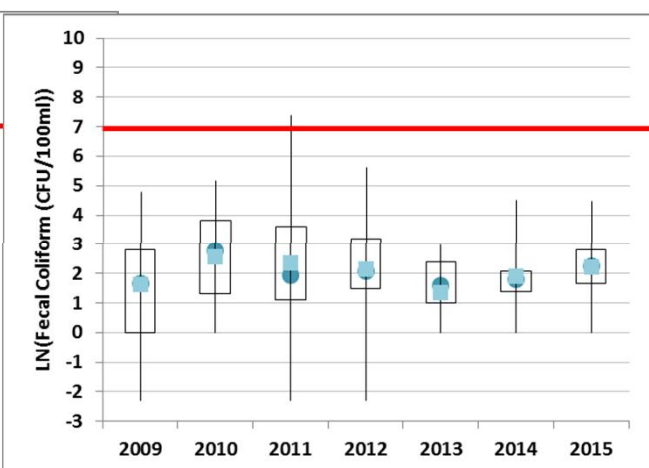
West



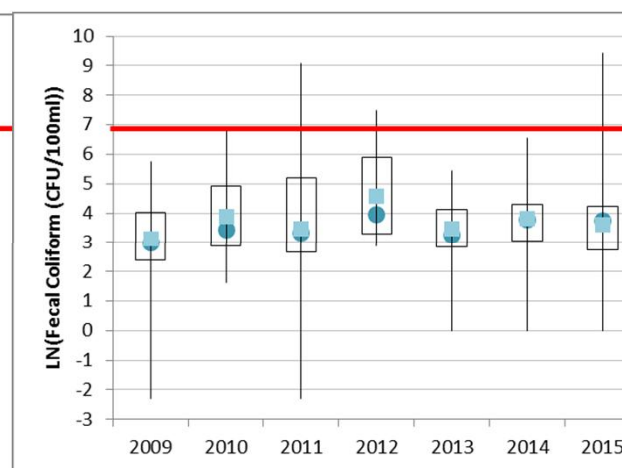
East



MB-2



MB-4



MB-5

# Key Question

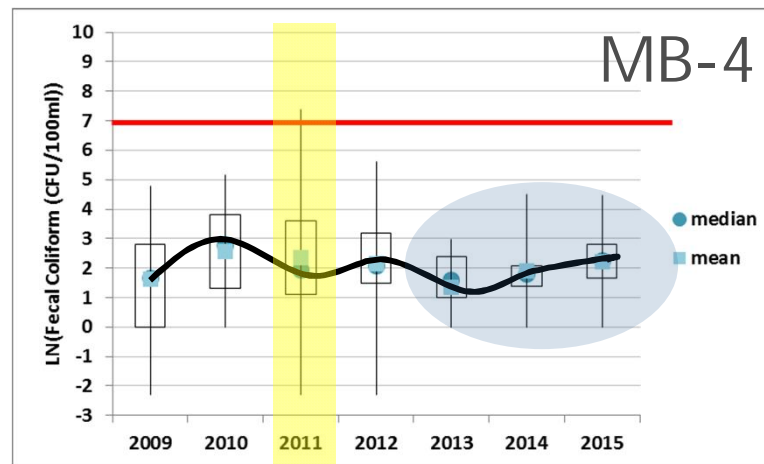
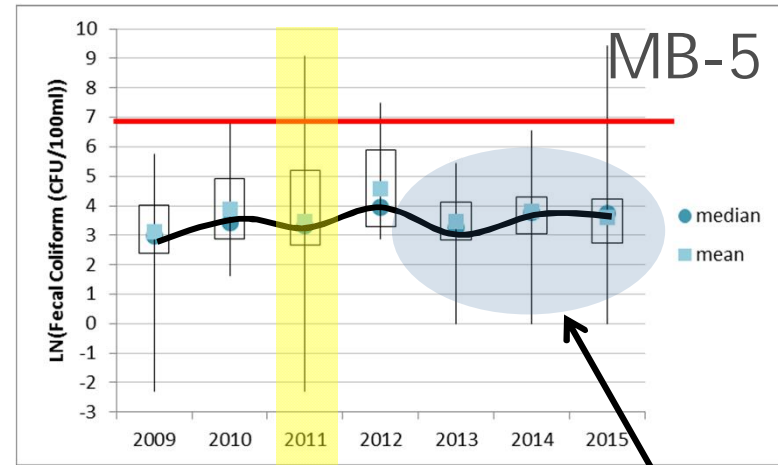
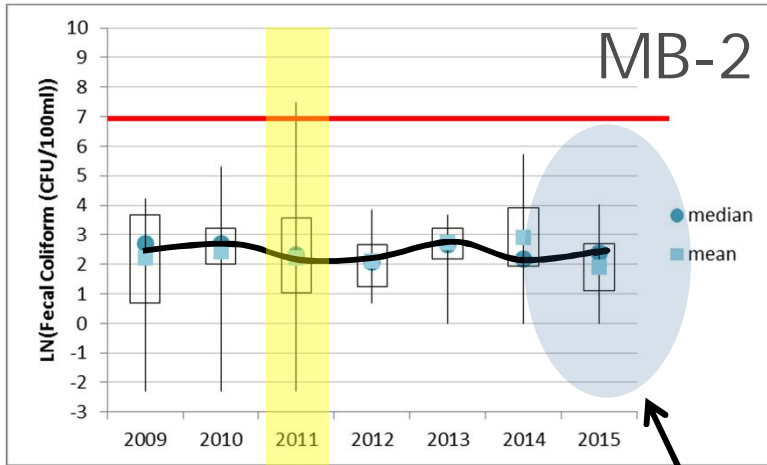


Are there temporal and **spatial trends** in bacteria data that indicate changes in water quality status?

Yes, the bacteria concentrations on the eastern shore of Manhasset Bay are higher than those from stations on the western shore.

Consistent with land use differences.

# Summary Statistics – Visual Trends





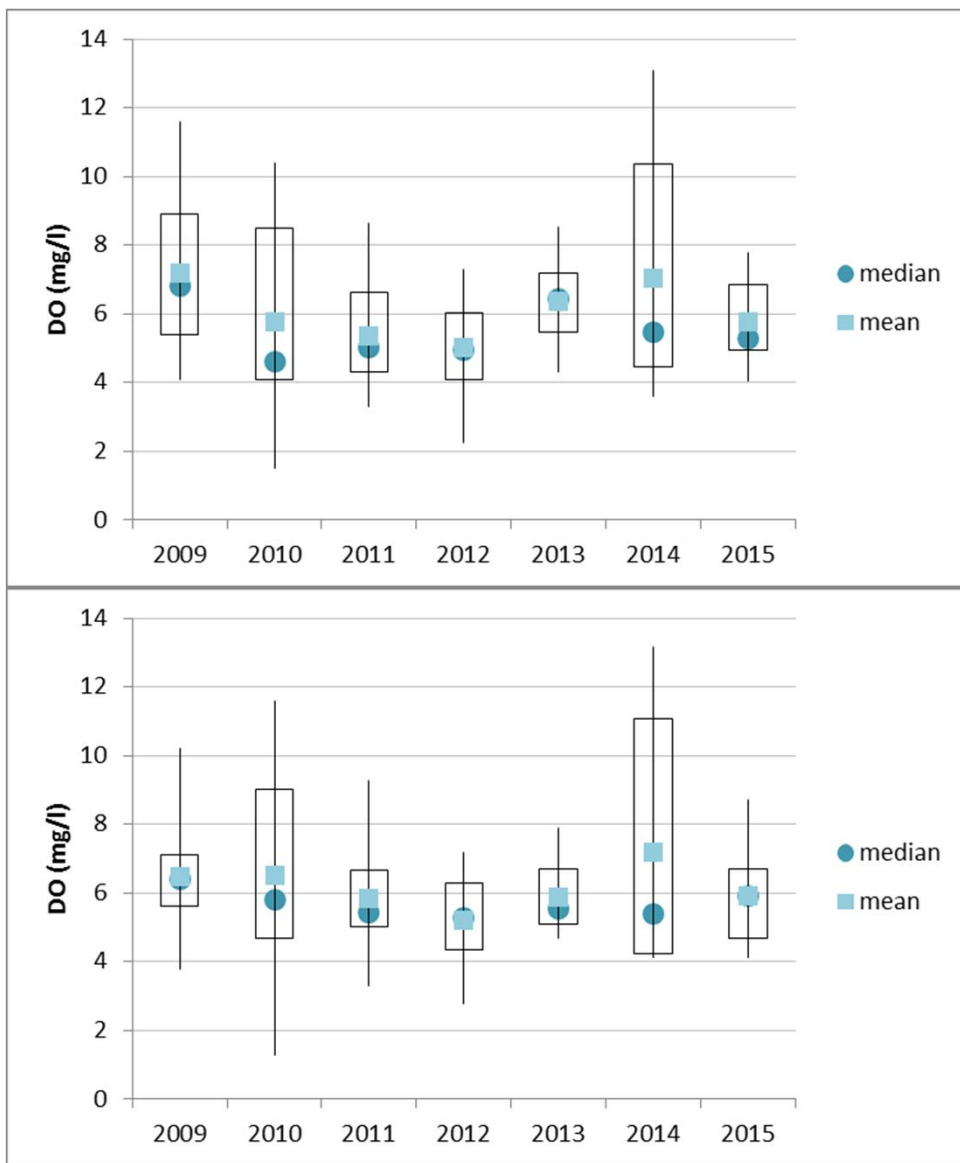
# Key Question



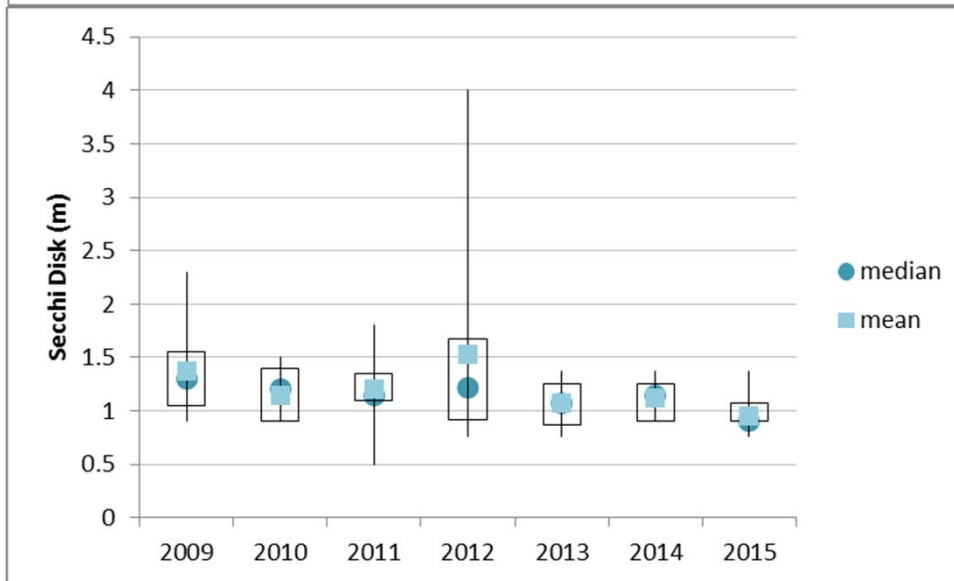
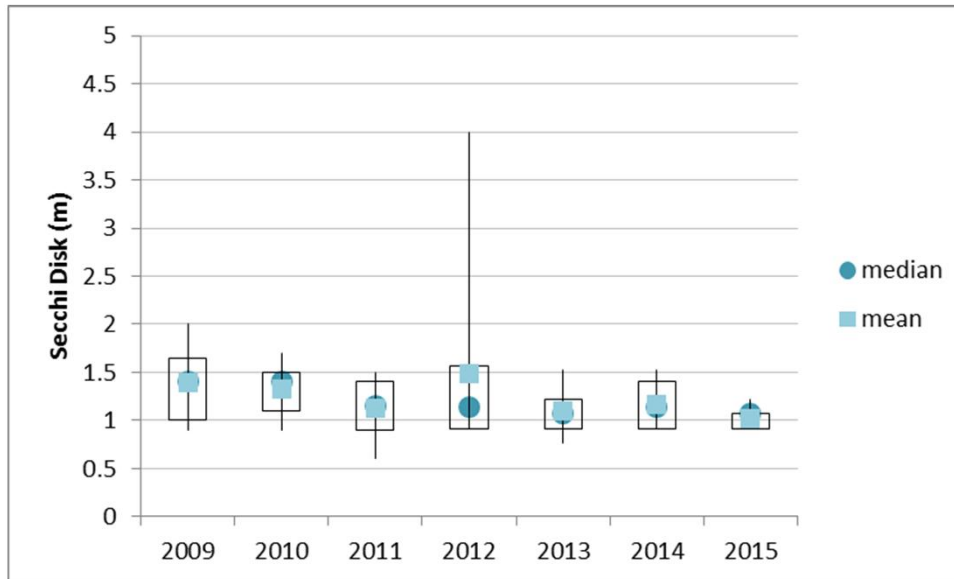
Are there **temporal** and spatial trends in bacteria data that indicate changes in water quality status?

While there are no strong visual trends apparent, changes in the range of concentrations appear to be timed with STP upgrades.

# IEC – Dissolved Oxygen



# IEC – Secchi Disk (Transparency)



# Key Question



Are there **temporal and spatial trends** in DO or transparency data that indicate changes in water quality status?

There are no strong visual or temporal spatial trends apparent and DO values at midwater are generally  $>3$  mg/l.

Note: 3 mg/l is the acute standard for SA/SB/SC/SD waters

# Correlations

- Rainfall and Tides ~ Bacteria
  - Looking across the period of record
  - Tidal elevation at 9 AM – No correlation
  - Rainfall – day of sample, 1 day prior, 2 days prior



	Same Day	1 Day Prior
MB-1	0.240-0.390	0.242-0.255
MB-2	0.262-0.429	0.356-0.907
MB-3	0.286-0.561	0.361-0.404
MB-4	0.229-0.513	0.383-0.906
MB-5	0.217-0.314	0.327-0.395
MB-6	0.270-0.404	0.238-0.278

- Moderate to high
- Noted at all stations

# Key Question



What are potential **relationships** between bacteria data and rainfall and tidal data?

Yes, there is a moderate to high correlation between rainfall and bacteria concentrations.

Correlations higher with day prior, which is conceptually consistent with rainfall-runoff.

# Key Question



Can the **influence/impact** of stormwater runoff be determined?

Spatial characteristics of bacteria (west vs. east vs. center) and correlations with rainfall indicate a relationship with stormwater runoff.

# Next Steps

- Review of Draft Report
- Revision and Any Additional Analysis
- Final Report and Presentation (March)



Questions?

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