

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

## Pollution in the Hudson River

How has pollution changed in the last one hundred years in Hudson River ecosystem, as measured in Manhattan? By completing the following graphing activity, you should be able to answer this question to some degree.

**Step 1:** First, create a graph that contrasts the dissolved oxygen (DO) levels in the Hudson River off of 42<sup>nd</sup> St., Manhattan, from 1922 through 1997. The data represents surface and bottom average concentrations (mg/L) during the summer.

	Dissolved Oxygen mg/L surface	Dissolved Oxygen mg/L bottom
1922	5.43	3.83
1927	4.50	2.25
1932	5.97	2.96
1937	5.38	4.31
1942	6.19	3.66
1947	6.03	3.89
1952	5.93	3.42
1957	6.28	2.90
1962	5.01	2.77
1967	7.25	6.08
1972	6.68	3.56
1977	5.33	2.78
1982	6.38	4.95
1987	6.54	3.83
1992	7.32	5.50
1997	7.80	5.45

Answer these questions based on your graph:

1. What year was the DO level the highest? The lowest?
2. Why is the surface DO higher than the bottom DO? Do you think this is the same throughout the Hudson River?
3. What can you say about the overall trend of dissolved oxygen in the Hudson River at this location? How does this relate to the health of the ecosystem?
4. Do these data tell you enough about the health of the Hudson? What else would you like to know?

**Step 2:** Next, you should create a graph showing the changes in fecal coliform bacteria levels in the Hudson river at the same site at 42<sup>nd</sup> St., Manhattan between 1974 and 1999. This graph will look a bit different, since we only have data starting in 1974. The New York State Primary Contact or ‘swimming’ standard is 200 cells per 100 mL, and the Secondary Contact Standard (for wading, boating, or fishing) is 2000 cells per 100 mL. Fecal coliform bacteria concentrations are indicators of sewage-related pollution, associated with untreated wastewater. The data collected represents an average of 8-14 samples that were collected during the summer.

Year	Fecal Coliform (cells/100mL)	Year	Fecal Coliform (cells/100mL)
1974	3870	1987	810
1975	5831	1988	945
1976	8331	1989	625
1977	8657	1990	463
1978	6638	1991	481
1979	5298	1992	180
1980	4892	1993	163
1981	2984	1994	196
1982	2147	1995	55
1983	1031	1996	158
1984	384	1997	53
1985	5179	1998	72
1986	628	1999	49.5

Based on your graph, answer these questions:

1. What can you say about the overall trend in fecal coliform bacteria in the Hudson during the last 25 years?
2. When was the last time that the fecal coliform levels went above the primary contact standard levels? The secondary contact levels? What types of events might affect these numbers?
3. Based on this information, has the health of the Hudson River improved? Why or why not? Are you confident about your answer?
4. Do these data indicate that you could go swimming in the Hudson? Why or why not? What else would you like to know before making your decision?
5. Is there a relationship between the data on fecal coliform bacteria and dissolved oxygen levels? Why or why not?
6. Based on the graphs you completed and the information you received at the beginning of class regarding the Hudson River basin’s population and effluent discharge, are you surprised about what you found? Explain your answer.