Name _____   Class _____   Date _____

Historic Pollution in the Hudson River

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

Step 1: Create a graph that shows the population over time for both the lower/mid and upper Hudson regions. Make sure to create a secondary axis for the Upper Hudson data so that you can more accurately compare the population growth. Answer the questions that follow.

Lower and Mid Hudson Data

	population	Population in millions
1900	3418471	3.42
1910	4668274	4.67
1920	5535541	5.54
1960	9343582	9.34
1970	10660574	10.66
1980	9846458	9.85
1999	8501530	8.5

Upper Hudson Data

Year	Population	Population in millions
1900	398122	0.4
1910	493931	0.5
1920	569431	0.57
1960	1013483	1.01
1970	1338258	1.34
1980	1531927	1.53
1999	1418593	1.42

1. What happened to the population of the lower/mid Hudson region during the last 100 years?
2. What happened to the population of the upper Hudson region during the last 100 years?
3. How do you think these changes could have impacted the river?

Step 2: Create a graph that shows that happened to one of the other variables in both locations (lower/mid and upper): Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Total Nitrogen (TN), and Total Phosphorous (TP). You'll notice that data is available in two units for the Upper Hudson data; use the metric tons/day unit instead of pounds/day. You will have two lines on your graph, and you should create a secondary axis so that you can see the data more clearly. Then, answer these questions.

Lower and Mid Hudson Data

	BOD mt/day	TN mt/day	TP mt/day	TSS mt/day
1900	273.11	54.14	6.13	273.11
1910	372.88	74.07	8.38	372.42
1920	439.89	87.67	9.83	437.7
1960	431.17	101.6	27.94	445.87
1970	407.18	126.55	35.73	425.3
1980	317.37	110.79	21.6	335.13
1999	103.33	97.25	13.66	104.68

Upper Hudson Data

Year	BOD lbs/day	BOD mt/day	TN lbs/day	TN mt/day	TP lbs/day	TP mt/day	TSS lbs/day	TSS mt/day
1900	58438	26.56	10625	4.83	2125	0.97	58438	26.56
1910	70665	32.12	13014	5.92	2617	1.19	69644	31.66
1920	75880	34.49	14492	6.59	2950	1.34	71046	32.29
1960	136275	61.94	29285	13.31	6205	2.82	107218	48.74
1970	187182	85.08	43863	19.94	9775	4.44	146736	66.70
1980	79774	36.26	35848	16.29	7804	3.55	75938	34.52
1999	20513	9.32	32680	14.85	3638	1.65	22539	10.24

1. Describe the change in your variable over the last 100 years. Why did it change? Have things improved? Why or why not? Are the changes the same in the upper Hudson area and the lower/mid Hudson area? Why or why not?
2. Compare your results with other members of your class. Describe the changes in all four variables over time. Why did things change? Have things improved? Why or why not?
3. Which variable, BOD, TSS, TN, or TP, shows the most dramatic improvement? How did you determine this? What effect do you think these improvements have had on the river? Which variable showed the least improvement?
4. Were you surprised by any of the results? Why or why not?