

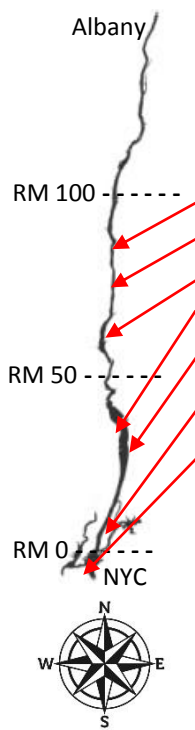
A Day in the Life of the Hudson and Harbor 2018: Salinity *Teacher Version*

Your site: _____ If measured, your salinity on Oct 16, 2018: _____

2018 was the sixteenth year of A Day in the Life of the Hudson and Harbor. Thanks to all of the participants who made this year a success! Let's compare some of the data you collected with data from earlier years.

Why do we measure salinity? Because the Hudson River is an estuary, there is freshwater from the land and streams mixing with saltwater from the ocean. At different locations along the river, there will be different amounts of salt in the water, with more salt closer to the ocean and New York Harbor.

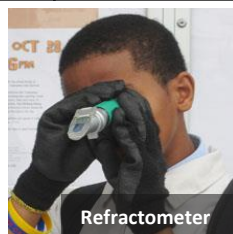
Salinity can be reported in many different units. Here the units are **parts per million (ppm)** of chloride (Cl^-) to help compare results from sites far apart on the estuary. In saltier areas, like New York City, salinity is usually measured in **parts per thousand (ppt)**. **River miles (RM)** are measured north from the Battery in NYC.



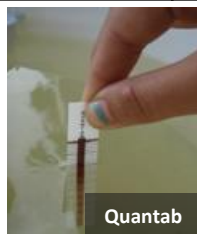
RM	Site	2018	2017	2016	2013
RM 100	84 Norrie Point	32 ppm	32 ppm	46 ppm	39 ppm
	76 Poughkeepsie	32 ppm	32 ppm	136 ppm	39 ppm
	61 Beacon	32 ppm	424 ppm	1089 ppm	603 ppm
	25 Piermont Pier	99 ppm	6,642 ppm	6,366 ppm	5,133 ppm
RM 50	22 Hastings	2,768 ppm	8,857 ppm	8,303 ppm	5,133 ppm
	4 Pier 84 NYC	3,875 ppm	11,624 ppm	11,071 ppm	10,517 ppm
RM 0	NY Harbor Staten Island	9,964 ppm	16,606 ppm	-	14,946 ppm



Hydrometer



Refractometer



Quantab

People use different tools to measure salinity. Hydrometers and refractometers are best used in saltier water, while quantabs are best for fresh and slightly salty water.

1. The **salt front** (the leading edge of dilute sea water entering the Hudson) is located where salinity reaches 100 ppm. Based on the data in the table above, which site was closest to the salt front in 2018?

Piermont

2. Which sites on this table were freshwater this year (less than 100 ppm)?

Beacon, Poughkeepsie, Norrie Point

3. In which year was the salt front the furthest **south**? Why do you think that is the case? (Hint: How could weather affect salinity?)

This year the salt front was unusually far south, all the way at Piermont (River Mile 25). A rainy summer and fall and a saturated watershed pushed the saltwater downriver this year.

4. In which year was the salt front the furthest **north**? Why do you think that is the case?

In 2016 the salt front was north of Poughkeepsie. 2016 was a dry year, allowing the saltwater to move far upriver.