

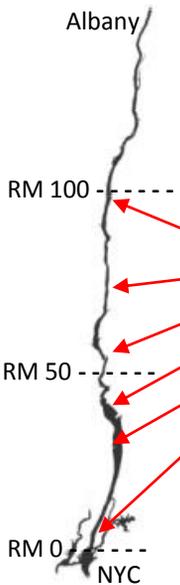
A Day in the Life of the Hudson River 2016: Salinity *Teacher Version*

Your site: _____ If measured, your salinity on Oct 20, 2016: _____

2016 was the fourteenth year of A Day in the Life of the Hudson River. 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.

Salinity Data Table

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.



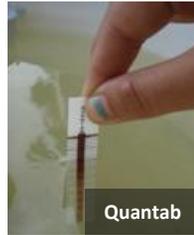
RM	Site	2011	2012	2013	2015	2016
97	Ulster Landing	18 ppm	28 ppm	40 ppm	46 ppm	39 ppm
76	Poughkeepsie	32 ppm	28 ppm	32 ppm	46 ppm	136 ppm
57	Kowawese	26 ppm	96 ppm	447 ppm	196 ppm	2,768 ppm
41	Verplanck	55 ppm	1,610 ppm	3,212 ppm	2,398 ppm	4,428 ppm
25	Piermont Pier	1,250 ppm	4,428 ppm	5,136 ppm	4,816 ppm	6,366 ppm
4	Pier 84 NYC	1,383 ppm	8,580 ppm	9,415 ppm	9,964 ppm	11,071 ppm



Hydrometer



Refractometer



Quantab

People use different tools to measure salinity. The table above was made using data from quantabs, but groups also use hydrometers and refractometers to measure salt in the water.

1. The salt front (the leading edge of dilute sea water entering the Hudson) is located where salinity reaches 100 ppm.

- a. In which of the five years shown in Table 1 did the salt front reach up to or past Verplanck?

2012, 2013, 2015, 2016 (all years shown except 2011)

- b. Which sites were considered freshwater in 2016?

Ulster Landing (Kingston)

- c. What might be a reason for the **differences** in salinity at all sites between 2016 and 2011? Hint: How might weather affect salinity?

The summer and fall this year were very dry, so the saltwater was able to move upriver. In October 2011, freshwater runoff from Tropical Storms Irene and Lee was still moving through the watershed, pushing the salt down.

2. Where was the salt front on October 20, 2016?

Use a pencil to plot salinity readings for 2016 (found in the table above) on the graph below.

- Place a point for salinity readings from Piermont to Ulster Landing directly above the listed river mile.
- Using a ruler, draw a line from one point to the next. Start at the point for the lowest river mile and continue to the highest.
- The salt front is located where salinity equals 100 ppm of chlorides. Using your graph plot and the horizontal line at 100 ppm, estimate (in river miles) the position of the salt front on October 20.

River Mile ~80

