A Day in the Life of the Hudson and Harbor 2020: Salinity *Teacher Version*

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.

Albany	RM	Site	2020	2019	2018	2017	2016
ſ	92	Kingston	36 ppm	69 ppm	Less than	43 ppm	40 ppm
5					30 ppm		
PM 100	76	Poughkeepsie	64 ppm	45 ppm	Less than	32 ppm	178 ppm
RIVI 100					30 ppm		
	58	New Windsor	1,036 ppm	45 ppm	Less than	5,426	1,506
					30 ppm	ppm	ppm
	30	Upper Nyack	5,535 ppm	1,602	46 ppm	5,426	5,037
RM 50				ppm		ppm	ppm
	25	Piermont	6,089 ppm	2,426	74 ppm	6,642	13,000
				ppm		ppm	ppm
cher	4-6	Manhattan	16,300	5,800	7,000	11,624	21,000
RM 0		(West Side)	ppm	ppm	ppm	ppm	ppm



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.

- a. Which sites from the table were considered freshwater in 2020? *Kingston, Poughkeepsie*
- b. In what year shown did the salt front reach the farthest north? Why might this be? Hint: How might weather affect salinity? 2016 had a very dry summer and fall, allowing for saltwater to push upriver past Poughkeepsie
- c. In what year shown was the salt front the farthest south? What conditions would cause this? In 2018 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 in 2018.

2. Where was the salt front on October 22, 2020?

Use a pencil to plot salinity readings for 2020 (found in the table above) on the graph on the next page.

- a. Place a point for salinity readings from Piermont to Kingston directly above the listed river mile.
- b. 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.
- c. 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 22.

River Mile <u>~74</u>



River Mile