NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Lamont-Doherty Earth Observatory
COLUMBIA UNIVERSITY | EARTH INSTITUTE

A Day in the Life of the Hudson River Fish Catch Activity

On a sunny June day a group of teachers and educators along the Hudson River Estuary gathered to catch fish in 3 different locations and salinities. The salinity here ranges from fairly salty to fresh as you move away from the Atlantic Ocean. Would the fish differ from one place to another? Let's find out!

- Beacon Waterfront Park in Beacon (River Mile 61)
- Croton Point Park in Croton (River Mile 35)
- Beczak Environmental Center in Yonkers (River Mile 18)

A Day in the Life of the Hudson River Fish Catch Activity

- Led by John Waldman, from Queens College, City University of New York, the group used a seine net (below) to catch the fish. Fish are scooped into the net as you walk through the water pulling the net behind.

A Day in the Life of the Hudson River Fish Catch Activity

- The group was interested in measuring not only the salinity, but the water temperature and dissolved oxygen (DO) levels as well. These are important water quality measures that can have an impact on what fish are present.
- For most fish species a healthy DO is between 5-11ppm (or mg/l)
- A YSI meter was used to measure these, and other water quality indicators.

A Day in the Life of the Hudson River Fish Catch Activity

BECZAK in Yonkers

- Our first stop was Beczak Environmental Center in Yonkers. The salinity measured 8.1 ppt, or about 1/4 that of seawater. Water in this salinity range is called brackish, a mix of salty and fresh.
- The dissolved oxygen (DO) measured 8.7 ppm. What do you think? Would we find a range of fish with this DO?
- The temperature of the water at Beczak was 27.5° C, a warm 81.5° F.

A Day in the Life of the Hudson River
Fish Catch Activity

We caught a blue crab!

- What did we catch in this location aside from this blue crab?

White Perch ✔
Mummichog ✔
Pipe fish ✔
Hogchoker ✔
Right Eyed Flounder (winter) ✔
Northern Kingfish ✔
Sea Robin ✔
Ctenophore (comb jelly) ✔
Juvenile blue crab ✔
Shrimp ✔

A Day in the Life of the Hudson River Fish Catch Activity

Young Striped Bass

CROTON PARK in Croton

- We were moving upriver away from the Atlantic Ocean. Our second stop was Croton Park in Croton where the salinity measured 4.0 ppt, or about 1/8 the measure of seawater, about half that of Beczak. Water in this salinity range is still referred to as brackish, a mix of salty and fresh.
- The dissolved oxygen (DO) measured 11.0 ppm.
- Is this level of DO enough to support a wide range of fish species?
- The temperature of the water at Beczak was 28° C, or a warm 82.4° F.

A Day in the Life of the Hudson River Fish Catch Activity

- What did we catch aside from this spottail shiner? (Do you see the spot on his tail?)

Pipefish ✔
Herring ✔
Blue Fish ✔
Striped Bass ✔
White Perch ✔
Spottail Shiner ✔
Atlantic Menhaden ✔
Shrimp ✔

A Day in the Life of the Hudson River
Fish Catch Activity

BEACON WATERFRONT

- Our last stop was Beacon Waterfront in Beacon where the salinity measured 0.2 ppt, a trace amount of salt that we would call fresh water.
- We found a huge plant bed **FILLED** with water chestnut plants (Trapa Natans), an invasive plant from Eurasia (photo above and to the left). The dissolved oxygen (DO) measured 3.3 ppm in the plant bed (!) and 5.6 ppm outside of the plant bed.
- We decided not to seine in the plant bed. Why do you think?
- The temperature of the water at Beacon was 26.8° C (~80° F) in the plant bed and 27.5° C (~81.5° F) outside the bed.

A Day in the Life of the Hudson River Fish Catch Activity

Note: We seined OUTSIDE the plant bed, due to the low oxygen levels inside the bed which we felt would limit the number of fish present.

What did we catch in this location?

Banded Killifish ✔
Tessellated Darter ✔
Spottail Shiner ✔
Striped Bass ✔
Elver (young American Eel) ✔

A Day in the Life of the Hudson River Fish Catch Activity

- Now let's see if there was any overlap in our species catch.
- On the next page you will find a diagram with 3 circles. Each circle is posted with a different salinity, one for each salinity we sampled in this workshop. Beside the circles are the lists of species caught in each location.

A Day in the Life of the Hudson River Fish Catch Activity

- Working in ‘normal view’ (THIS WILL NOT WORK IN PRESENTATION FORMAT), drag the names of each species into the correct salinity circle. If a species was found in 2 salinities place it in the overlap area of those two salinities. Was any species found in all 3 salinities? If so place it in the overlap area of all three salinities.
- (An alternative to working in power point is to draw these overlapping circles on the board and complete the exercise as a class, or print the ppt have the students complete the exercise for homework.)

NOTE: If you are working in ppt once you place the species either DUPLICATE THE PAGE OR DO NOT CLICK SAVE or you will not be able to do this activity again!

A Day in the Life of the Hudson River
Fish Catch Activity

Salinity 8.1 ppt

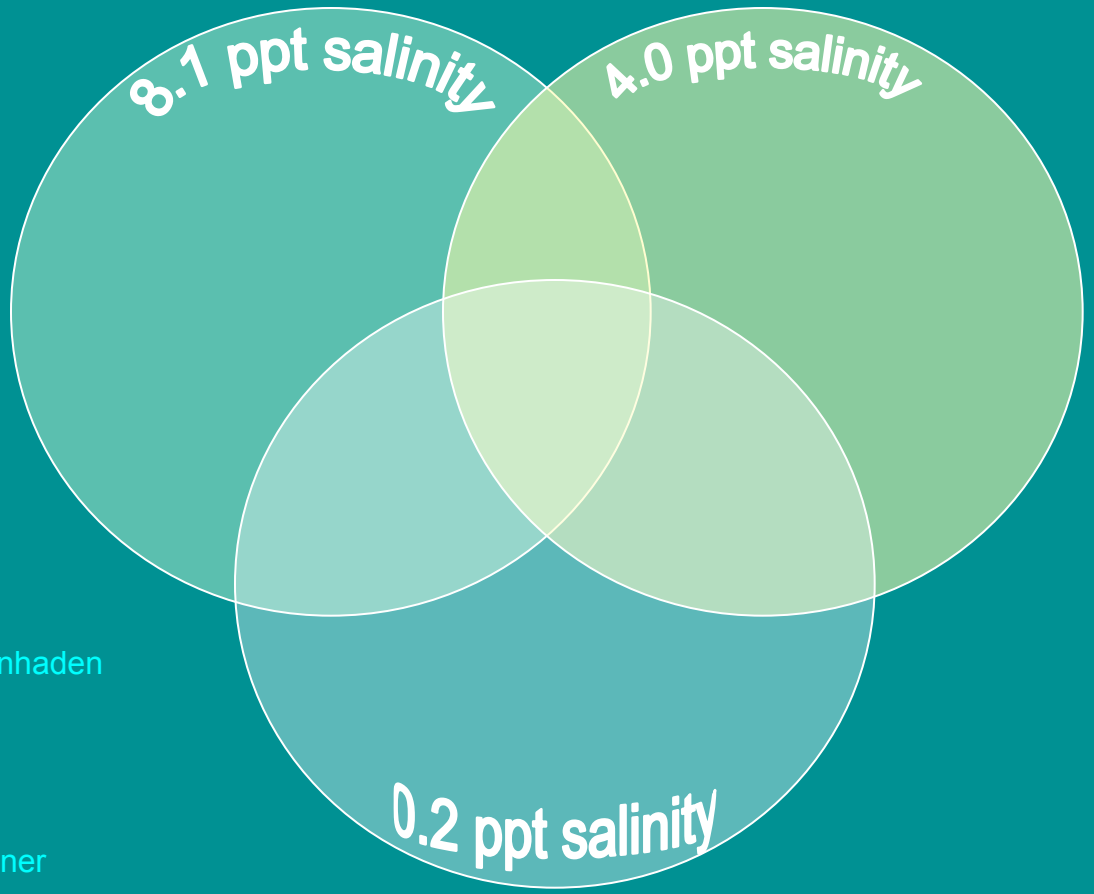
Mummichog
Hogchoker
White Perch
Winter Flounder
Pipefish
Northern Kingfish
Sea Robin
Ctenophore
Blue crab
Shrimp

Salinity 4.0 ppt

Pipefish
Shrimp
White Perch
Herring
Striped Bass
Blue Fish
Atlantic Menhaden
Spottail Shiner

Salinity 0.2 ppt

Tessellated Darter
Spottail Shiner
American Eel elver
Striped Bass
Banded Killifish



Drag each fish species into The circle with the appropriate Salinity.

Fish Catch Based on Salinity

A Day in the Life of the Hudson River Fish Catch Activity

Yonkers: Salinity 8.1 ppt

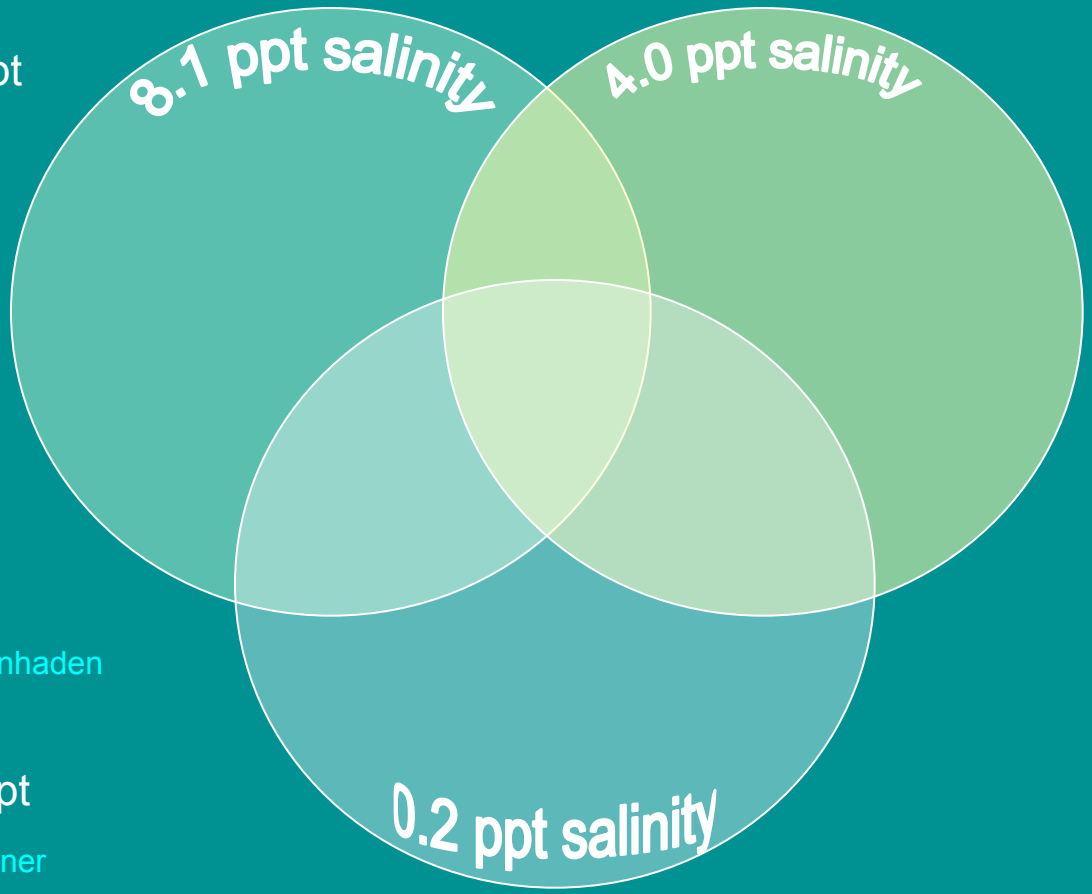
Mummichog
Hogchoker
White Perch
Winter Flounder
Pipefish
Northern Kingfish
Sea Robin
Ctenophore
Blue crab
Shrimp

Croton: Salinity 4.0 ppt

Pipefish
Shrimp
White Perch
Herring
Striped Bass
Blue Fish
Atlantic Menhaden
Spottail Shiner

Beacon: Salinity 0.2 ppt

Tessellated Darter
Spottail Shiner
American Eel elver
Striped Bass
Banded Killifish



Drag each fish species into The circle with the appropriate Salinity.

Fish Catch Based on Salinity

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Discussion

- For a fish or species to live in a range of different salinities it has to be fairly adaptable. Can you name two fish species caught in this event that would seem to be fairly adaptable?
- You are working with real data from a real trip to the river. If we were to go to the same spot on the river every day for a week in June would we:
  - Expect to catch the exact same thing every day?
  - Would we expect to catch a similar assortment of fish?
  - Explain your answer.

A few of the Fish From the Workshop

Hogchoker

Mummichog

Young American Eel (Elver)

Pipefish

Using the web as a resource see if you can find images of other fish caught during this one day event…

And Join us this year for “A Day in the Life of the Hudson & Harbor”!

http://www.ldeo.columbia.edu/dayinthelife/