A 'DAY IN THE LIFE' OF THE HUDSON RIVER ESTUARY
October 20, 2016
http://www.ldeo.columbia.edu/edu/k12/snapshotday/

For more rapid results this year we are asking samplers to submit their fish, salinity and D.O. data directly online at the following url from the field. Please then fax or send the full set of sampling data as noted below to Margie Turrin including fish, DO and salinity! Thank you!

http://tinyurl.com/hfrm9hx

PLEASE INCLUDE THIS COVER SHEET WITH YOUR SUBMITTAL

- **These recording sheets contain every test but you can chose to do any combination.**
- **Activities to support your field experience are available at the website link above.**
- **Please submit your results to Margie Turrin (845-365-8179 (fax) or e-mail mkt@ldeo.columbia.edu) within 24-48 hours of collection! Questions? 845-365-8494.**
- **PLEASE include this cover sheet with any data sheets you submit. THANK YOU!**

RECORDING SHEET I - BACKGROUND INFORMATION.

1. Site contact person_____
   Organization_____
   Street_____
   City_____State____Zip_____
   phone_____fax_____email_____
2. School/group name_____District_____
   Name of teacher/group leader_____
   Street_____
   City_____State_____ Zip_____
   phone_____fax_____email_____
   Number of school students_____ Number of Adults_____
   grade level/High School course_____

3. Where are you sampling. Please be as specific as possible.
(Example: swimming beach, Kingston Point, City of Kingston, Ulster County.)
_____

4. Using the map included with your packet, give your location along the Hudson estuary in river miles. (The Battery at the southern tip of Manhattan is River Mile 0; the Federal Dam at Troy is River Mile 153.)
River mile _____
GPS Latitude_____ Longitude_____
If you have a way to determine the latitude and longitude of your site, enter that here.

Name_____ DITL 2016 Observing Surroundings Location_____

Let's look at your sampling site. At this station we will describe the site and any plants in and around your collection area. Include plant materials in the water, as well as along the water's edge.

1. Sketch your sampling site. Be sure to include a compass rose showing N/S/E/W and locate the River on your sketch, and note your sampling site.

2. **Land type** around your sample site? Check all that apply.	__Pier __Grassy __Forested __Parking Lot
3. **Surrounding land uses as percentage** of 100 (for example 50% is half the usage)	___ Urban/residential ___Forested ___ Industrial/commercial ___Beach ___ Other_____
4. **Describe the shoreline** - check percentage below and then all that apply in next column: ___Sandy ___ Muddy ___Rocky	__Beach __Covered in vegetation __Banks altered __RipRap (Large rocks) __Wood Bulkhead __Concrete Bulkhead __Pipe entering the water
5. **Describe the water area** at the sampling site	__Depth __Bottom sandy __Bottom muddy __Bottom rocky __Bottom weedy
6. **Describe the water itself**	__Calm __Choppy
7. **Plants in the water (water chestnut, water celery etc.)** that you have identified & percent of total area covered. **IF NONE please check None.**	% ____ Plant_____ % ____ Plant_____ % ____ Plant_____ % ____ Plant_____ _____No Plants in the water area

Name_____ **DITL 2016 Observing Surroundings Location**_____

Observations

Note what you see in the area; are there bits of brick on the ground? lumps of coal? water chestnut seeds (devil's head-s), shell pieces or full shells? Crab shells? Is it overgrown?

From observations you have collected here can suggest of any that might "impact" the data you are collecting here?

What else do you see? Birds? Animals? Butterflies? Dragonflies? What else?

The river is used for business and pleasure. Record how it is being used.

8. **Commercial traffic**: Record any large boats, tugs, or barges traveling on the Hudson. Please record the name and color! A loaded barge is full of cargo and rides lower in the water than a light one.

Time: name color North or Southbound loaded or light

_____

Time: name color North or Southbound loaded or light

_____

Time: name color North or Southbound loaded or light

_____

9. **Recreational Traffic:** List recreational vessels you see on the Hudson (sail, speedboats)

Time: name color North or Southbound loaded or light

_____

Time: name color North or Southbound loaded or light

_____

Time: name color North or Southbound loaded or light

_____

Name_____ DITL 2016 Physical Conditions Data Location_____

(weather, tides, currents)

1. **Location**: We will be comparing data with other groups along the Hudson, so it is important to note our exact location. Location Name _____
   Using your Hudson River Estuary map, give your location in ***river miles***: _____ and if possible
   GPS Latitude:_____ GPS Longitude: _____

2. **Tides**: Tides cause the water of the Hudson River to rise and fall due to the gravitational pull of the sun and the moon. Tides can be measured over time with a **Tide Meter Stick**, or another marker to see if the water is rising, falling, or staying the same. First record the time, then check the water level using your measuring stick or tape. Check the stick again regularly (every 15 to 30 minutes) and record.	Start time: _____ Water height in cm.___* Check time: _____ Water height in cm.___ Check time: _____ Water height in cm.___ Check time: _____ Water height in cm.___ Check time: _____ Water height in cm.___ Check time: _____ Water height in cm.___ Check time: _____ Water height in cm.___ *if on a dock measure down from the dock
3. **Currents**: Currents record the direction of water movement. A current moving downriver is called ***ebb***, a current moving upriver it is called ***flood***, and if there is no current it is ***still***. Toss an orange or a solid stick as far as you can out into the river and watch to see which way it moves. **Record: Ebb** or **Flood** or **Still**. Time its movement for 30 secs and record, then divide by 30 to get per cm/sec of movement. *To determine knots: measure distance orange or stick travels in 30 secs. Divide by 30 for cm/sec and then divide by 51.4 for knots. The formula for knots is (cm/sec)/51.4	Time: _____ Circle: ebb - flood – still* __Cm/30secs___Cm/sec ___Knots Time: _____ Circle: ebb - flood – still* __Cm/30secs___Cm/sec ___Knots Time: _____ Circle: ebb - flood – still* __Cm/30secs___Cm/sec ___Knots Time: _____ Circle: ebb - flood – still* __Cm/30secs___Cm/sec ___Knots * Note if anything about the shoreline could cause the current near shore to flow in a different direction than the current in the middle of the Hudson?
4. **Air Temperature**: How to convert: $^{\circ}C = 0.556 \times (^{\circ}F - 32^{\circ})$ $^{\circ}F = (1.8 \times ^{\circ}C) + 32^{\circ}$	Time:____Air temperature: _____°F ____ °C Time:____Air temperature: _____°F ____ °C Time:____Air temperature: _____°F ____ °C
5. Wind speed: If you use the Beaufort chart record Beaufort force #. If you use a wind meter record number registered AND units.	Time:____Beaufort # __ Wind Meter: __ Units___ Wind Direction (comes from) ____
6. Cloud Cover: Select from the scale provided a percentage of cloud cover.	Time: ____ __clear ___partly cloudy__mostly cloudy,__overcast (<25%) (26-50%) (51-75%) (>75%)
7. Rain (Precipitation) Today & Weather for the past 3 days: Rain can affect our readings and so can extreme changes in temperature over a short period. We record weather today and for the last 3 days.	Time: ___Rain ___ If checked note how steadily it rained _____ Briefly describe the weather for the last 3 days: Rain, wind, unusual temperatures?_____

Name_____ **Location** _____ **Time**_____

2016 SALINITY Recording Sheet: When we measure salinity we are measuring the amount of salt present in water. Much of this salt is sodium chloride, just like table salt. The main source of salt in the Hudson is seawater (~35,000 ppm) pushing in from the ocean. There are only small amounts of salt in the fresh water entering the river from the eroding rocks and road salt.
* Expected Hudson Range: ~40 ppm in the freshwater section to ~29,000 ppm in harbor*
Put a checkmark in the box next to the measuring method you are using. Follow the instructions for completing the test and then record your results below.

- TITRATOR STRIPS measure chloride by color change (to white) along a scale.

Low Range Tabs _____ High Range Tabs_____ On strip's scale, white color ends at _____.
Read across the conversion table and RECORD: Units_____%NaCl_____ mg/L Cl _____

- DROP COUNT TEST KITS usually measure chloride using color change as a liquid chemical is added to the sample drop by drop.

How many drops were needed for the sample to change color? _____ drops

Number of drops times conversion factor (from instructions) equals chloride concentration.

_____ X _____ = _____ mg/L Cl

- HYDROMETERS measure water's density (its specific gravity) using a floating object. As salinity increases, density increases, and the object floats higher.

If using a plastic hydrometer with a pointer, record salinity here: _____ parts per thousand (ppt)

If using a glass hydrometer floating in a water sample: Record the temperature of the water sample _____ °C
Record the specific gravity (to the fourth decimal place) from the hydrometer scale where the stem breaks the water's surface. Read at water level, not at the top of the meniscus. _____
Record salinity from the specific gravity conversion table: _____ parts per thousand (ppt)

- REFRACTOMETERS measure how light is bent—refracted—as it enters water. Refraction varies with density, which in turn varies with salinity (density increases with salinity).

Read salinity where the shadowline crosses the display scale: _____ parts per thousand (ppt)

- METERS measure how well water conducts electricity (better as salinity increases). They may show conductivity, salinity, or chloride concentration; be sure to specify units.

Reading _____ Units of measurement _____

Name_____ DITL 2016 Chemical Description Location_____

pH – Expected Range - Most fish prefer 6.5 to 8.5 - pH measures how acidic or basic (alkaline) a solution is measured on a scale from 0 to 14. Neutral is 7.0, Acidic is lower than 7.0 and Basic is higher than 7.0. There are NO UNITS used with pH.

Circle equipment used for the test:

Test Strips color match test kit meter pH pen

Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: _____
Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: _____
Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: _____
Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: _____

- ***Salinity - Expected Range - ~40 ppm in freshwater section up to 29,000 ppm in harbor**. A measure of the amount of salt present in the water (we are measuring the chloride). Ocean salinity is measured in 'Parts per thousand' (PPT). Fresher water with smaller amounts in 'Parts per million' (ppm) or mg/l.
- (Note: There are other measures of salinity: 'Practical salinity units' (PSU), Conductivity as mS/cm (millisiemens) or uS/cm (Microsiemens) but we focus on ppt and ppm)

Circle equipment used for the test (what each measures is listed below each equipment):

Drop count test kit (chloride) Quantab strips (chloride) meter (PPT or mS/cm) refractometer (PPT) hydrometer (PPT)

Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: ____ (note correct units)
Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: ____ (note correct units)
Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: ____ (note correct units)
Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: ____ (note correct units)

*(NOTE THERE IS AN INDIVIDUAL CALCULATION SHEET FOR SALINITY)

- **Water temperature Expected High Temperature in October would by < 25°C**

Record water temperature in degrees Celsius or degrees Fahrenheit. TO convert between the two

°C = 0.556 X (°F - 32°) °F = (1.8 X °C) + 32°

* Time: _____ water depth (feet):_____
Reading 1: _____ °C _____°F Reading 2: ____ °C _____°F Average: _____ °C _____ °F

* Time: _____ water depth (feet):_____
Reading 1: _____ °C _____°F Reading 2: ____ °C _____°F Average: _____ °C _____ °F

* Time: _____ water depth (in feet): _____
Reading 1: _____ °C _____°F _____°F Reading 2: ____ °C Average: _____ °C _____ °F

Alkalinity

Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: _____

Nitrates

Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: _____

Phosphates

Time: _____ Reading 1: _____ Reading 2: _____ Reading 3: _____

Name_____ **DITL 2016 Chemical Description Location**_____

Dissolved oxygen (DO) Healthy Expected Range 5.0-11.0 mg/L

The amount of dissolved oxygen in the water is one of the most important factors in telling how healthy that ecosystem is. Many variables affect DO, including temperature, time of day, presence of plants, and wind conditions. DO measurements are given in mg/l and as percent saturation. 100% saturation means that the water cannot hold any more oxygen at that temperature. If more oxygen is added (such as by a high wind or a waterfall) the oxygen will go from the water into the air. **Circle equipment used for the test:**

meter drop count kit other

For test temperature use average from water temperature (#3) above. For % saturation calculation use chart on bottom of page.

* Time: _____Water temperature in °C ____ DO (mg/l) or PPM: ____% saturation _____

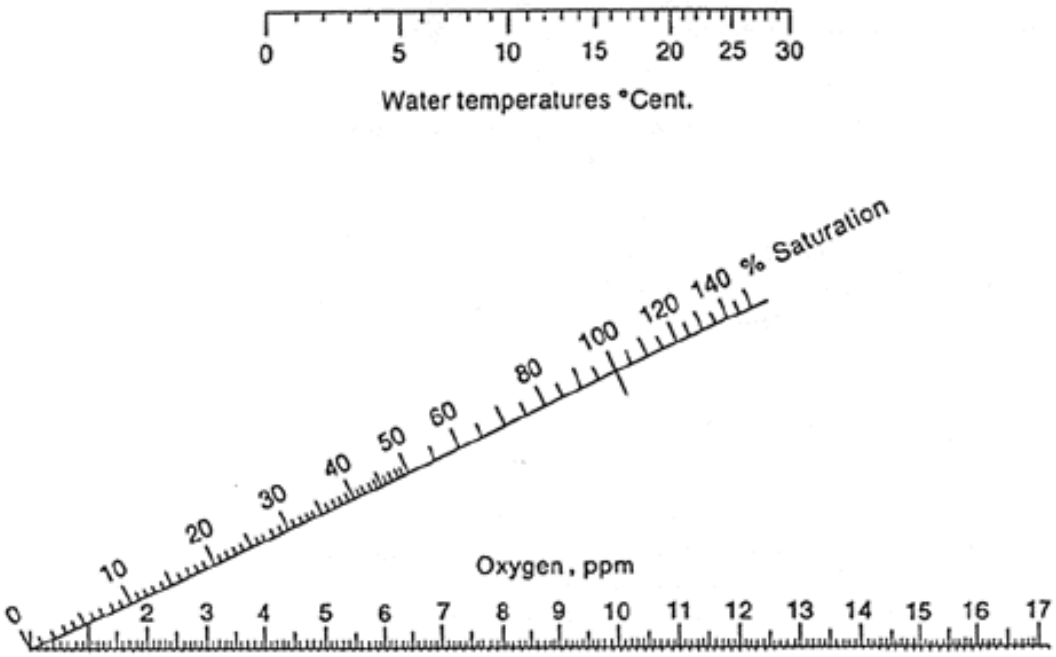
* Time: _____Water temperature in °C ____ DO (mg/l) or PPM: ____% saturation _____

* Time: _____Water temperature in °C ____ DO (mg/l) or PPM: ____% saturation _____

5. % Saturation of Dissolved Oxygen (DO) Healthy Expected Range 90% or above

Source of chart: http://wateronthewb.org/under/waterquality/oxygen.html

For a quick and easy determination of the percent saturation value for dissolved oxygen at a given temperature, use the saturation chart below. Locate your DO reading on the bottom scale (ppm equals mg/L). Locate the temperature of the water in degrees C on the top scale. Draw a straight line between the temperature and DO. The % saturation is the value where the line intercepts the saturation scale.



Name:_____ 2016 Turbidity **Location:_____**

1. **Turbidity** is a cloudiness of the water. Light can penetrate farther in clear water than it can in turbid water. Estuaries like the Hudson River are naturally turbid. Turbidity can be caused by phytoplankton and zoo planktons, bits of dead plants, salt, sand and mud. Measure the turbidity at your site on the river – be careful if you are collecting water for a site tube NOT to step in the water as you collect it or you will add turbidity to your sample.

   Time: _____ Circle equipment used

1)Secchi disk (cm) 2) Long Sight tube (cm) 3) Short Site Tube (JTU)

4)Turbidimeter (NTU)

_____	_____	_____	_____
Reading	Reading 2	Reading 3	Average

(Make sure that you **RECORD** the correct unit for the piece of equipment that you are using; feet, cm, meters, JTU's or NTU's)

Observations

Is the water really turbid? How would you describe it in words?

NOTE in 2016 we will not be collecting chlorophyll samples.

Name_____DITL 2016 Fish and Macroinvertebrates ID Location_____

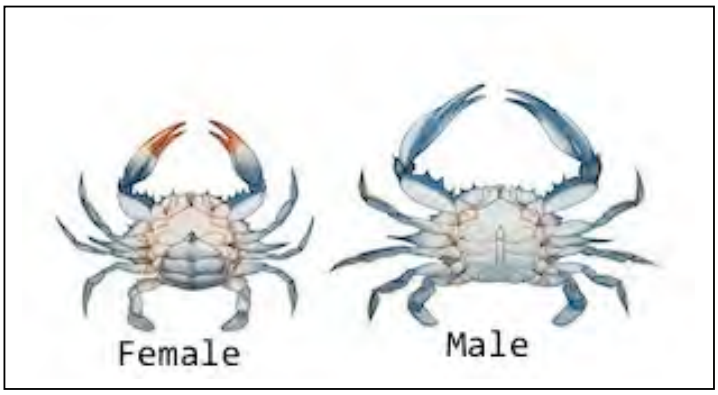
Please use separate sheet for each seine OR note what was caught in each seine by noting seine #.

TIME_____ LENGTH OF NET_____

Fish Species:	# of individuals:	Size of largest (unit)	
1. _____	_____	_____	____
2. _____	_____	_____	____
3. _____	_____	_____	____
4. _____	_____	_____	____
5. _____	_____	_____	____
6. _____	_____	_____	____
7. _____	_____	_____	____
8. _____	_____	_____	____
9. _____	_____	_____	____
10. _____	_____	_____	____
11. _____	_____	_____	____
12. _____	_____	_____	____

Macroinvertebrates (For crabs include type (blue, mud, Asian etc.) & sex (M/F)

1. _____#_____
2. _____#_____
3. _____#_____
4 _____#_____
5._____#_____
6. _____#_____
7 _____#_____
8. _____#_____
9. _____#_____



If your group can compute Catch Per Unit Of Effort Please Record This here.

Seine #___ Time____ Catch Total_____ Length of Pull_____ Computed CPUE_____

DAY in the LIFE PUSH CORE SEDIMENT LOG

GRAB ID#	Site Name	DATE	FORM COMPLETED BY:
			GROUP #

TIME	LATITUDE	LONGITUDE	WATER DEPTH	LOCATION

	Yes	No			Descriptors - Please note additional observations
H_2S smell					H_2S smells of rotten eggs, suggesting anaerobic bacteria
Oil					Oil creates a slight smell, a slickness and a sheen
Oxidized top*					*oxidation (reaction with oxygen) creates a distinctly lighter colored layer of sediment.
					estimate dimensions of oxided layer, etc. and draw below

	Absent	Rare	Common	Abundant	Additional Comments
Clay					very fine material - grey color & rich dense feel
Mud					smooth feel between fingers - brown color
Sand					gritty feeling between fingers
Gravel					pea sized pieces of stone
Pebbles					pieces of stone larger than pea
Leaves					
Wood					
Shells Oysters (dead/alive?)					
Freshwater mussels (except zebra)					
Zebra mussels					
macroinvertebrates					
Brick					
Coal					
Slag					industrial byproduct - chunky look, light, air filled
Living vegetation:					
Length of Core:					Length of Oxidized core top (if present):
If Bagged - Number On Core Collection Bag					

Sketch of your core below with measurements for each section & total core (be sure to label the top and bottom):

<--BOTTOM TOP -->

form updated 8/11/13