GENERAL TIME LINE

7:00 Meet at MCSM to load bus and drive to the Lamont Campus (approx. 1 hr depending on traffic)

Friday – Margie Turrin, LDEO Education Coordinator & Michael J Passow, Earth2Class

9:00	Arrive at Lamont Campus	Orientation & travel to Piermont Pier (about 15 min. away)
10:00	Rotation # 1	Group 1-Chemistry; Group 2-Coring; Group 3-Physical Factors
10:50	Rotation #2	Group 1-Coring; Group 2-Physical Factors; Group 3-Chemistry
11:30	Rotation #3	Group 1-Physical Factors; Group 2-Chemistry; Group 3-Coring
12:15		Lunch
1:00	Rotation #4	One Half--Sea Level Rise; Other Half—Seining/Fish ID
1:45	Rotation #5	One Half—Seining Fish ID; Other Half—Sea Level Rise
2:30	Wrap-up	CLEAN UP; DISCUSSION
3:00	Return to Lamont	"Time to Reflect"
5:30	Barbeque at Lamont Hall	
7:00	Go to Alpine Picnic Area	Set up tents
10:00	"Lights-out"	

Saturday – MJP

7:00	Wake-up	Pack up tents
7:45	Return to Lamont	Breakfast
9:00	Overview for the Day	
10:00	Travel to Paradise Boats, Piermont	Orientation to canoeing
10:30	Canoing in Tallman Salt Marsh	Marsh ecology
12:00	Return to Lamont	
12:30	Lunch	
2:00	Walk through the Lamont Forest	Dendrochrolonology & Climate Change
3:00	Final Thoughts and Return to MCSM	

MCSM Piermont Pier Experiences

Developed by Margie Turrin/adapted by Michael Passow

GOAL: introduction to **field-based investigations**. Differences from lab-based investigations. Building understanding of the **ecosystems** in this **brackish estuary.** Requires a **systems approach—everything connects with everything else.** Collect own data, which will be secondary data for others. Recording **metadata** is important

FOCUS: The "River that Flows Both Ways" is a **dynamic environment**. Each station helps build understanding of the total system.

What do you observe?

What does this test tell us?

Why is it important for us to know this?

What do the results mean to us?

LOGISTICS: Each student will engage in activities at each station. COLLECTING AND RECORDING DATA are the keys! It is important that at the end of each rotation the data be properly charted/posted.

Work on your observational skills—sketch, note your thoughts, discuss with others.
What might influence what you see? What is worth noting?

CHEMISTRY STATION

You will collect and analyze surface water samples.

ALL WASTES WITH REAGENTS GOES IN THE WASTE CONTAINER.

Sampling includes:

Dissolved oxygen -- This is the level of dissolved oxygen gas available for fish and other organisms. DO is affected by temperature, so you must also measure the water temperature.

Salinity -- This is the level of dissolved salts and other solids, and influences organism biochemistry. This part of the Hudson River is an estuary—tidal with both fresh and salt water layers.

pH and alkalinity—These measures of the acidity and baseness also influence organism biochemistry, especially for mollusks (shellfish.)

Nitrates and phosphates – These nutrients play roles for the microorganisms at the base of the food chains.

CORING STATION

Here you learn about the materials beneath the water and air which support the organisms. You will collect a core using a "push corer."

Key concepts include:

- You are looking at a **time sequence**.
- **Superposition** tells us the younger materials are at the top and the older ones underneath.
- Look for layering and other obvious features that record past events.
- **Describe it, measure it, small it.**
- Cut it in half—**touch it.**

Find out what you can about other coring that has been done in the Tallman Salt Marsh.

PHYSICAL STATION

Here you will measure the non-biological variables that affect the ecosystem. These include:

- **Tide levels and water depth –** The height of the water is constantly changing in response to the combined interactions of the Earth and Moon. One obvious result is that a location may be covered by water at some times and exposed to air at others. Organisms must adapt to such great changes.
- **Water currents** – The direction and speed of the flow in an estuary constantly change in response to tidal factors. When water is coming in from the ocean, it is in **flood**, and when it is going out toward the ocean, it is in **ebb**. Water movement is also influenced by winds and obstructions, such as how points of land stick out.

  The current may differ at locations across the river, even flowing in opposite directions at times. (Kayakers and other boaters must be aware of these factors to avoid problems.)
- **Turbidity**—This refers to how clear or "muddy" the water appears to be. You will learn about various factors that can affect the turbidity (such as **suspended solids, phytoplankton, zooplankton**, plant debris, turbulence stirring up the water, and pollutants.)

  Turbidity is not necessarily evidence of a "bad" environment. On the contrary, it may indicate a very "healthy" ecosystem.
- **Weather**—Aquatic and marine ecosystems, like terrestrial ecosystems, are strongly affected by local weather conditions, especially temperature, wind direction and speed, sky cover, and precipitation.

SEINING STATION

Here you will use nets to collect some of the organisms living in this portion of the Hudson River. We will have places for earlier groups to keep what they catch so later groups can see their results.

NOTES: