

**New England Interstate Water
Pollution Control Commission**

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**Clearwater and the New York-  
New Jersey Harbor Estuary  
Program**

**NYC Teacher  
Training Workshop**

**Final Report, September 2005  
(updated December 2005)**

**Summary**

Clearwater's Teacher Training Workshop introduced 30 New York City teachers to science-based teaching techniques, materials, and lesson plans that facilitate teaching about habitat, water quality, pollution and New York Harbor as a natural estuary. The professional workshop went beyond disseminating information and succeeded in providing teachers with lessons that help develop their critical thinking and problem solving skills in the classroom. The project consisted of a 6-hour classroom workshop at New York University (NYU) and a 6-hour workshop aboard the sloop *Clearwater*.

The project was completed, as planned, within the spring and summer of 2005. E-mail correspondence with potential participant groups was begun in February. By May we had identified major partners, primarily the Wallerstein Collaborative of New York University (WCNYU), with the Elementary School Science Association (ESSA) and the High School for Environmental Studies (HSES) as secondary partners. We invited each of these partners to send participants, and several other teachers not directly associated with these partners signed up as well through word-of-mouth. The program's 30 spaces were filled by mid-June, and there was a waiting list.

The program was designed with specific needs of the partnering organizations in mind, especially the Wallerstein Collaborative. Mary Leou and her assistant Amanda Levy of NYU were instrumental in helping Clearwater staff to craft the workshops curriculum. The workshop took place July 11<sup>th</sup> and 13<sup>th</sup>, 2005, for six hours each day. The first day took place at a classroom in Washington Place, NYU. The second day took place aboard the Hudson River Sloop *Clearwater*, leaving from the dock at the Chelsea Piers complex in Manhattan.

The morning of day one concentrated on "Estuary Essentials." Participants were introduced to each other through creative process of linking stories with beachcombing objects, then introduced to the river with an interactive twenty-foot nautical chart puzzle of the tidal Hudson. After lunch, participants learned about tides and reading tide charts, and basic chemistry of the Hudson's waters. The afternoon wrapped up with a slide tour of the entire river, from the Adirondacks to the Atlantic. The overall theme of the day was a physical and contextual overview of the entire Hudson Estuary.

The afternoon focused on the social, ethical, and policy ramifications of pollution. The day began with a discussion of how to bring the issues of pollution—and *solution to pollution*—into the classroom. Activities such as "Pay or Pollute" and "Watershed Clean-up" demonstrated that critical thinking curriculum can have a very relevant and engaging quality. After lunch, participants had an overview of environmental history, laws that affect today's urban ecosystems, and a "town meeting" style debate of

local issues. Finally, we spent the last portion of the day evaluating the course, both through testimonials and through written forms (attached).

With the principle that the best place to learn about the river is *on* the river, day two was spent on the sloop *Clearwater*. After setting a trawl to catch fish and invertebrates, participants worked as a team to haul up the sloop's 3000-pound mainsail. Smaller teams of students rotated through a series of stations including fish and using a dichotomous key; plankton and using microscopes to study diversity; navigation and steering/seamanship; water chemistry through direct observation; and history through art and original documents from the 1800s. The goal of this trip was not just to be out on the water, but to take a deeper look at separate but related topics in the Hudson pantheon. Finally, we spent the last portion of the day evaluating the course, both through testimonials and through written forms (attached to hard-copy).

During the entire program, an emphasis was placed on relevance to the local schools of teachers, potential classroom applications, and the coordination of estuary activities and formal academic requirements. The brainstorming and development of ideas between teachers was one of the most inspiring results of the workshop.

Clearwater's proven strategies for science-based field learning introduce thousands of students to the river each year. This experience has taught us that *teachers* are the critical fulcrum of broad-based environmental education. We respect New York City's teachers, and we want to give them the best tools possible, a strategy which also serves the Harbor estuary Program objectives.

### **Goals Reached**

This project directly addressed NYNJ HEP Goal 5: Stewardship, "everyone who lives and works in the estuary acts as a steward for the ecosystem", specifically,

- Target 19: Increase both in-class and out of class estuary-related education in grades K-12 by 10% by 2005, and by 25% by 2009, from a 2003 baseline level
- Target 21: By 2004, HEP will recognize an increasing number of groups and individuals as stewards and friends of the estuary.

In order to help the NYNJHEP meet these goals, Clearwater's Teacher Training Workshop succeeded in several goals:

- Participants learned the basic vocabulary and scientific principles of the New York Harbor Estuary ecosystem.
- Participants integrated estuary-based curriculum into a wide range of "traditional" subjects in math, science, language arts, social studies, and physical education.
- Participants analyzed complex environmental issues on the Hudson River, including PCB contamination and waterfront development, and synthesized numerous solutions to these issues.
- Participants investigated first-hand the chemical and biological health of the estuary using sampling gear, chemical test kits, and navigational aids.
- Participants collected a robust list of literature, personal contacts, and web-based services to encourage estuary topics in the classroom.
- Through focused brainstorming sections, participants encouraged each other with ideas and plans to implement estuary curriculum elements in their classroom

*Teacher Training Workshop for the Urban Estuary* demonstrated that the science of the Hudson River's health integrates seamlessly with a wide range of subjects and age groups. The environmental concepts of habitat, pollution, and ecology are best taught hands-on with local examples, so that experience can grow into the caring and into stewardship that grounds education and keeps it meaningful. Hudson River

curriculum provide relevant and personally resonant ways to help young people meet New York State learning standards.

### **Challenges/ Adaptations**

The program ran extremely smoothly, with just a few challenges and adjustments. We had originally planned to have two 3-hour classroom sessions on two separate days, but we found that because of room availability and participant scheduling it was more effective to have one 6-hour classroom day.

Weather provided an interesting element to our on-board program. Despite some bouts of drizzle and rain, the participants showed remarkable resilience and a willingness to “get out there”, which is a success in and of itself! Because of the rain, it did make it harder for some participants to hear everything going on, and several of the learning stations had to be shortened in order to accommodate below-decks access.

### **Results of Evaluations**

The project had many, many successes, demonstrated both through the informal interviews we held with students as well as the written formal evaluations. In general, teachers finished the workshop feeling a “deeper connection” to the Hudson and its related waterways. Many teachers spoke of the desire they had always had to incorporate local environmental issues into their coursework, and that this workshop had given them the tools to do so. Teachers spoke of the excellent balance the workshop provided between well-presented information, engaging hands-on activities, and solid academic tie-ins.

Written evaluations were distributed to all participants, then collected by NYU Wallerstein Collaborative staff and returned to Clearwater. The evaluations consisted of both quantitative ranking questions on various aspects of the program, as well open-ended questions about participant motivation and feedback.

The overwhelming majority of ranking questions received a “5”, the highest rating of excellence. Select comments include:

“Training teachers to provide students with this sort of opportunity is a wonderful gift to our city.”

“I can’t wait to use what I learned in my classroom.”

“I think I gained much more than I thought I possibly could. I am going back to school with a wealth of knowledge and outdoor activities that I did not know existed in New York City.”

One of the best measures of evaluation is how teachers carry on this course into their classroom and activities. To facilitate this, we reserved a part of each day to brainstorm and list ideas about classroom integration of Hudson River Topics. Among the activities that teachers came up with include:

- ◆ Create a “Hudson River in a Bottle” to discuss pollution issues as various elements are added to the bottle.
- ◆ Graph and analyze the Hudson’s salt front from on-line data provided by the United States Geological Survey.
- ◆ Analyze the pH of rainwater to explore acid rain.
- ◆ Use pre-frozen mini-glaciers to study the geologic formation of the Hudson.
- ◆ Role-play species and processes within high and low saltmarsh habitats.
- ◆ Model an oil spill and attempt to clean up with various methods.
- ◆ Create an “Artist’s Journal” of Hudson River sights and landscapes.
- ◆ Compare early Hudson settlers to today’s inhabitants through art and stories.
- ◆ Look at different species adaptations in different aquatic environments

