Exploring New York City Parks with EPA and GLOBE

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GLOBE is an acronym for:

Global Learning and Observations to Benefit the Environment

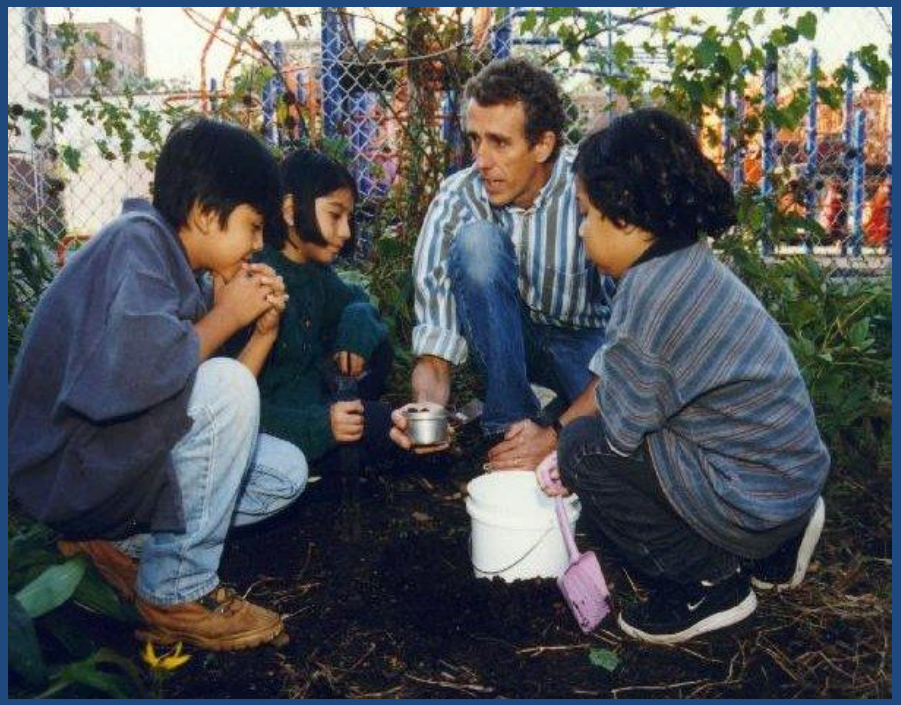
- The GLOBE Program was announced on Earth Day 1994 to address a crisis in science education. Founding organizations included:

NOAA National Oceanic and Atmospheric Administration
NASA National Aeronautics & Space Administration
NSF National Science Foundation Celebrating 50 Years
EPA United States Environmental Protection Agency
United States Department of Education
United States Department of State

- GLOBE training began in 1995; there are now >56,000 teachers in >24,000 GLOBE schools in 110 countries on all continents (including Antarctica)
- The United Nations actively supports GLOBE through UNICEF
- Alabama, Texas, North Carolina, Ohio, and West Virginia require GLOBE training in all their schools and have based their science curricula on GLOBE
- *EVERY* TEACHER in Alabama was to be GLOBE certified by 2010.
- The GLOBE School for Environmental Research graduated its first 8th grade class this June 2010 – the first school of its type in the world.

GLOBE Students Learn Authentic Science While Helping Scientists

Student measurements of local environmental conditions provide data to nationally-renowned scientists studying long-term global change. These data have been cited and praised in the world's most prestigious scientific journals



The area around each school essentially becomes a laboratory in which students learn to observe nature, ask questions, and design research projects to answer them

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GLOBE NY Metro is the GLOBE Program's Partnership for southern New York State

Responsible for recruiting, training, and providing ongoing support for GLOBE teachers, and for improving science education for all K-12 students As of today, we have trained

- ~2,000 teachers from ~ 750 public, private, and parochial schools in the metropolitan area and beyond.
- staff from NYC DEP, the Urban Park Rangers, and environmental monitoring agencies like the Bronx River Alliance and the Penn-Fountain Community Oversight Board
- The American Littoral Society, NY Botanic Garden, Bronx Zoo, Staten Island Zoo, Queens Botanic Garden

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Some of the things we learned after 5 years, 30 workshops, and several hundred teachers.

- Many Elementary Teachers were not trained in Inquiry.
- Formulating and refining a research question as a class is harder than you think.
- Many teachers and far too many students were afraid to go into natural areas. (Lions and Tigers and Bears; OH MY!)
- Principals were reluctant to let teachers take classes outside, even on school grounds.
- The equipment we supplied schools was not sufficient to work with a class.
- Data entry was, at best inconvenient for teachers and usually not done.
- For many teachers the one shot training was not enough.
- General data collection was not focused enough for teachers, they needed a goal.
- A casual reading of NYC Parks regulations seemed to forbid the types of activities we were proposing. NO one wanted to get a ticket!
- Everyone loved the GLOBE concept!
- The GLOBE NY Metro Associate Director needed more time in the field.

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We wanted to come up with a program that addressed those issues. Our Goals:

- Provide a forum for schools doing GLOBE related studies to share results. (First Annual GLOBE Research Symposium).
- Encourage teachers to bring their classes into nearby natural areas, usually a City park. Make the park an extension of their classroom!
- Engage students in at least one, long term, research project using GLOBE protocols.
- Get NYC Parks personnel working with us, so no one goes to jail.
- Familiarize district administrators with the GLOBE program and get their blessing to let principals have classes leave the building.
- Provide more in depth training in specific protocols.
- Get students to do science, not just talk about it.
- Get the Associate Director out of his office and working in natural areas.

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- In 2006 we won a Regional EPA Environmental Education Award of $50,000.00 to try it.
  - We had to ask for two extensions on the grant because of major reorganizations within the NY City Dept. of Education.
  - Among other things they abolished the districts and left us with no discernable administrative leaders to work with.
  - In 2008 they do it again.
- In Fall 2008 we begin anyway, recruiting teachers directly from the list of GLOBE certified teachers we have trained.
  - We specifically target schools near parks with large natural areas and/or a pond or stream.
  - This becomes a teacher by teacher, school by school effort.
  - The teachers are enthusiastic and help us sell the plan to their respective principals.
  - We ended up with 30 teachers from 20 schools working in 8 parks.
- Principals and teachers sign a letter of commitment that outlines what participation will entail.
  - Taking the students outdoors and into local parks.
  - Getting dirty.
  - At least a one year commitment.
  - Participation of some students in the year end Science Symposium.

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Getting Started

Each teacher was given a short list of recommended Protocols, that included:

- Recommended grade, we were working with 2nd grade through high school.
- A brief description of the protocol.
- Some suggested research ideas.
- Suggestions on how it might be organized in a class day.
- Timeline, what would be the actual time required daily, weekly, monthly.
- Would this be a research project using the "Scientific Method" or a scientific survey?
- A GLOBE NY Metro Rep met with each teacher and helped them make realistic choices and plans based on class grade, nearby study areas, their comfort level, level of school support.
- After choosing protocols classroom sets of equipment were ordered. (Interestingly, a classroom set of equipment for the selected activities stayed very close to $200.00 a set.)

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Centralized training was not an option because of our decentralized recruitment. (Which worked well with the goal to get the Associate Director out of the office.)

- The original plan was for a GLOBE NY Metro instructor to lead the initial trip or two. This was sometimes enough but we sometimes needed to lead five or six trips before teachers felt confidant.
- This was not a one way passing of knowledge, we learned a lot about classroom management and how to structure small group learning teams from the participating teachers.
  - We learned to make sure there were defined roles for each person in a group for each discrete activity.
  - We were forced to either find or create identification resources appropriate for different grades.
  - We learned to identify and point out to teachers where activities strayed from strict science and overlapped with literacy or math so that the teachers could draw on different resources in the school to support the overall effort.

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Collecting Samples for a study of whether soil fertility changes with the seasons.

GLOBE instructor guiding students through a soil characterization of a sample taken with a Dutch Auger on school grounds.

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But you can do the sorting, counting and analysis in the comfort of a warm classroom.

To prove that freshwater invertebrate populations change with the seasons you sometimes have to break some ice.

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Students learn that a 2 hour field trip can mean 2 days doing the lab work.

Then comes the compilation and analysis of our data.

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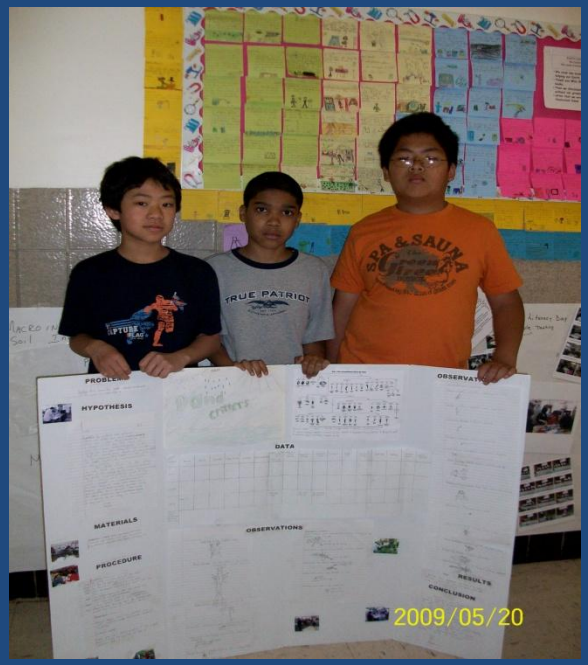
Making sense of findings



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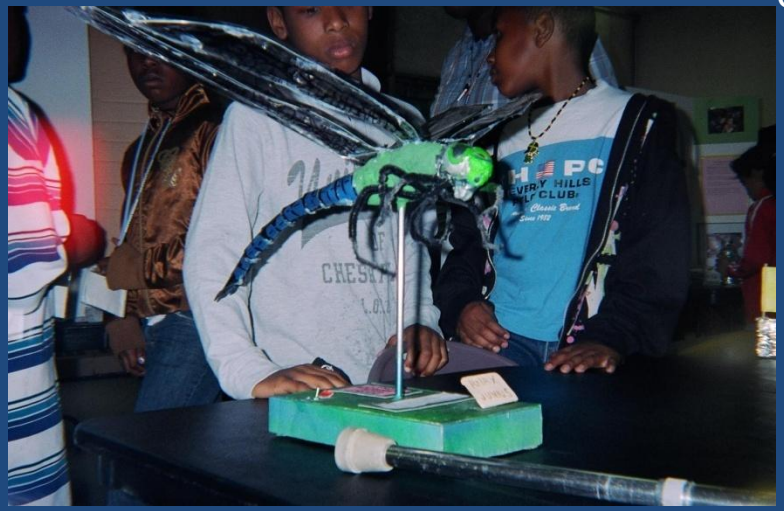
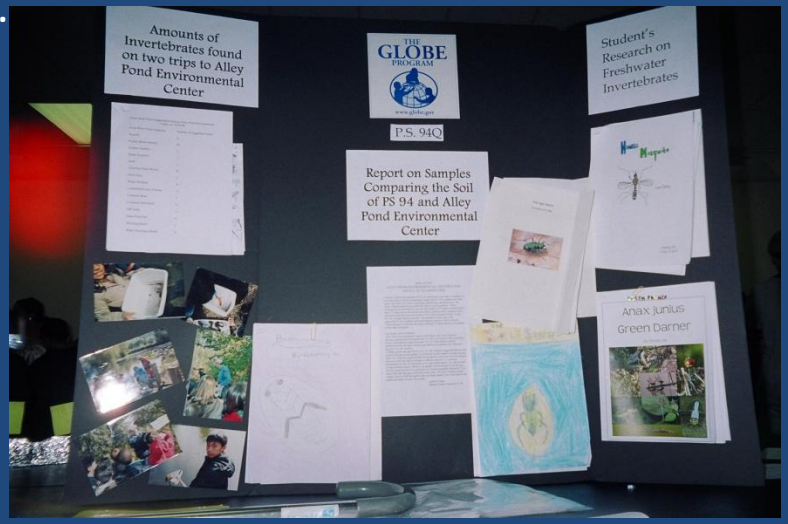
Collaboration and strengthening of the GLOBE NY Metro community as we gather at the year end symposium.





- 150 students from 17classes and 10 schools attended.
- Held on the Queens College campus.
- We gave tours and for many students this was their first College campus.
- We lost the participation of all our middle schools because of a last minute ban on field trips imposed by the central administration.

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Holding the event on campus was a purposeful decision to add gravitas to the process and give students a chance to participate in a meaningful way in a “college event”.

•Key note speaker from a well known environmental monitoring agency, spoke to the importance of being an informed citizen and the value of the students efforts.

•Participants received professional style conference name tags.

•We provided lunch

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Benefits and What Next?

- All the teachers and many of the school principals that completed the program expressed interest in continuing the symposiums.
  - They saw, increased engagement in science by their students, even on non—GLOBE activities.
  - Students were writing with much more enthusiasm. Quality and quantity had improved.
  - Science cluster teachers reported that the classroom teachers they had done the field work with had gone from reluctant participants to hearty proponents and were more proactive in looking at ways to piggyback other curriculum areas onto the field work.
- Over 600 students made multiple field trips into their local parks over the course of the year.
  - The teachers had always believed that field trips were fun and exciting but now were actively looking at more ways to incorporate field work into the regular routine.
- We are actively looking for support to run the symposium as an annual event.
  - We continue to train teachers and visit them in their schools and see GLOBE and the use of nearby parks as valuable classroom tools.
  - Some schools are still running with the program encouraging GLOBE research projects for their own school science fairs but think that the focus of the larger scale “college event” is a great catalyst for expanded adoption of using GLOBE in local parks.