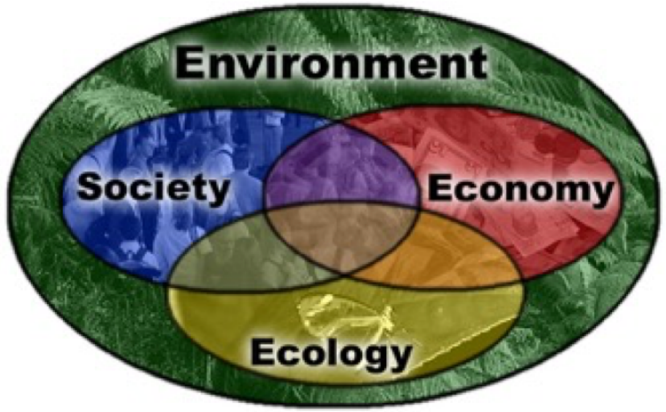
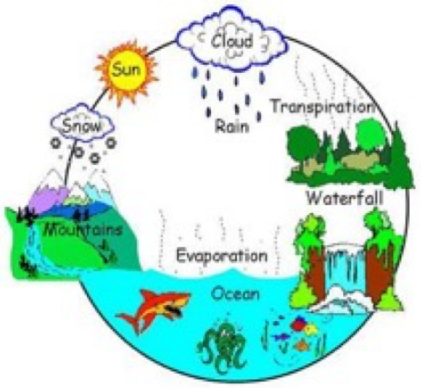
Transitioning from Data to Action:
The Genesis Project

Ways to take the information you collect and use it to make a difference in your world and the people you interact with.







Water in Our Environment (*Guiding Investigative Questions*)



- Water Quality: What is the quality of the water in our environment?
  - → Is my water safe to drink?
- Water's Impact: What impact does water, both above and below ground, have on our environment?
  - → Is my area prone to erosion?
- Water and Life: How does water in our environment impact living organisms?
  - → How has water availability been affected by human habitation in my environment?

Using the Scientific Method:

1) *Make Observations*

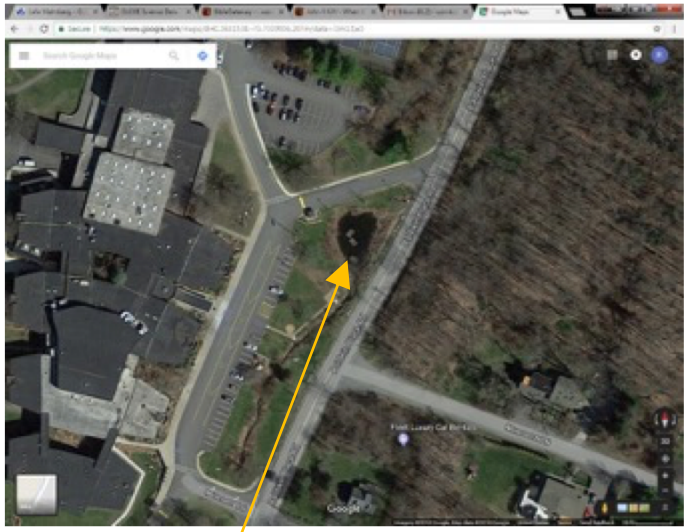


Grass clippings in stream, *sunlight* hitting water

The picture to the left shows the stream in front of Mahopac High School in Mahopac, N.Y. This small tributary is located in the New York City Watershed that provides drinking water for over 8 million people.

2) Problem Statement: What is the quality of the water in the ecosystem in front of the school?





The pond is also part of the ecosystem in front of the high school (see above). What effect could the pond and its surroundings have on the water quality parameters? This is what it looked like before the students started their work.



•The **catch basin** at the curb collects water from the pavement. It empties directly into SEAC Creek (the stream in front of Mahopac High School)

<u>3) Gather Information (aka: Research)</u> – Storm drains empty runoff water from the roads and parking lots into the stream



•Oil, antifreeze, fertilizer and road salt as well as eroded materials such as silt, sediment and sand all flow into the stream from these **storm drains.**

Teach Problem Solving: 4) *Hypothesis, 5) Experiment*



Trees for Tribs (NYS DEC):

Students hypothesized that a riparian buffer (consisting of plants provided by the state) around the water would help improve the water quality.





Riparian Buffer Project Continues During the Spring



Students in the Biology Club that meet after school learn how to establish new plants with the members of the New York State Department of Environmental Conservation; planting native flora along the 400 feet of stream on the Mahopac High School campus.



Students in the Environmental Research class celebrate Earth Day by making the planet a better place. This class is a science elective they can take if all of their core courses are finished.



Before Genesis Project: mowed grass right to the waters edge.

After Genesis Project: Native plants improve filtering and habitat.





← *Before Genesis Project*:
manicured and barren



After Genesis Project:
diverse types of plants
provide a more
balanced ecosystem →

Riparian buffers filter water *before* it enters the stream. Students install floating islands to see if they can improve water *in* the stream.



Three of these islands were installed in the pond in 2012. Students are monitoring chemical and physical parameters before and after the treatment and entering the data into the GLOBE website. The data will be graphed to look for patterns/trends to determine the efficacy of these islands.

The Genesis Girls putting plants into the floating islands.



Plant roots extending into the water along with organisms that grow on the recycled plastic under the water allow for nutrients to be absorbed, adsorbed and reused.

Floating Islands with three different groups of plants



Students wanted to see how different plant groups would survive on the islands. The types of plants used were: native grasses, aesthetically pleasing flowering plants, and herbs that were both fragrant and edible.

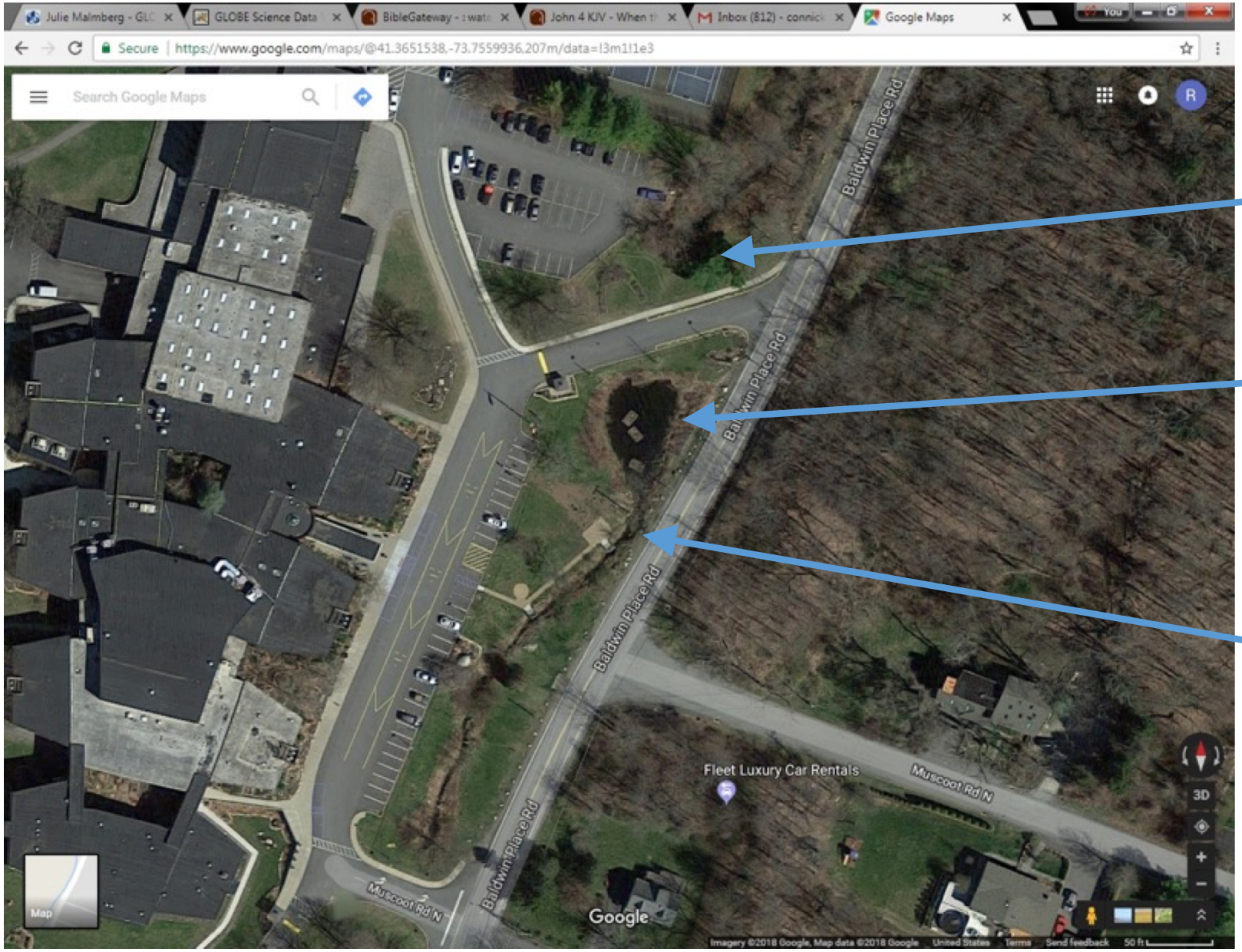
Students identified sites above and below the pond, determined what parameters would be important to test and collected water quality information for comparison to try to determine the effects the treatments they applied would have.







Water flows from Pre-pond Site → The Pond → The Post-Pond Site



Pre-pond site

Pond (the 3 light rectangles are the floating islands)

Post-pond site

Water flows from the top of the photo to the bottom (north to south)

Aerial view of Mahopac High School (on the left) and the study sites

Running water quality tests



Students ran water quality tests for: water temperature, dissolved oxygen, pH, alkalinity, conductivity, salinity, chlorides, nitrates, phophates, turbidity and transparency. At times they also measured the depth, width and velocity of the stream to determine flow rate.

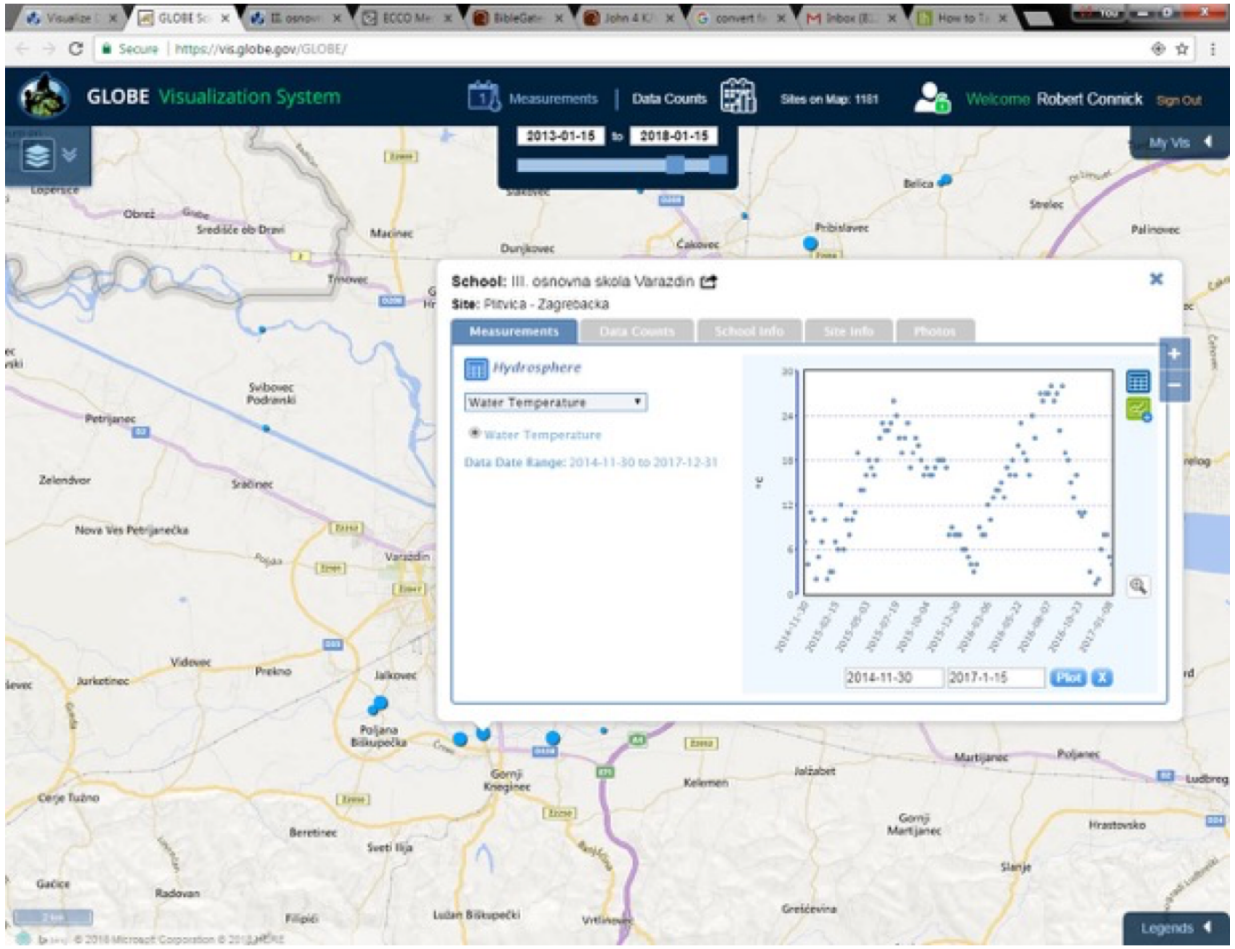
Some data needed to be collected outside: Rain, snow, sleet or hail; nothing stops these students from their appointed rounds for collecting data.

Students collecting data in *pre-pond site* and in the *Hudson River*.





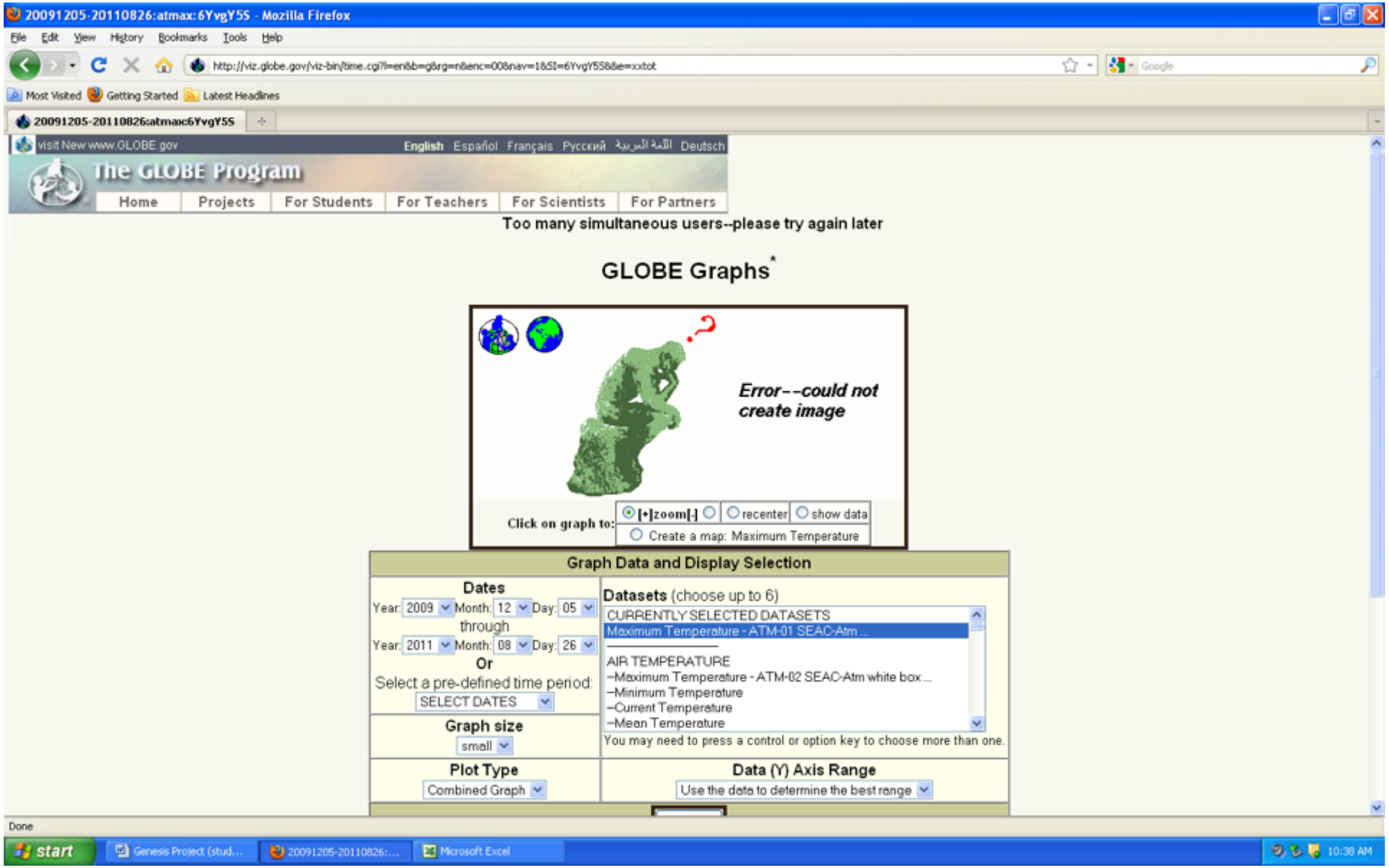
Find a place to put your GLOBE - GLOBE.GOV



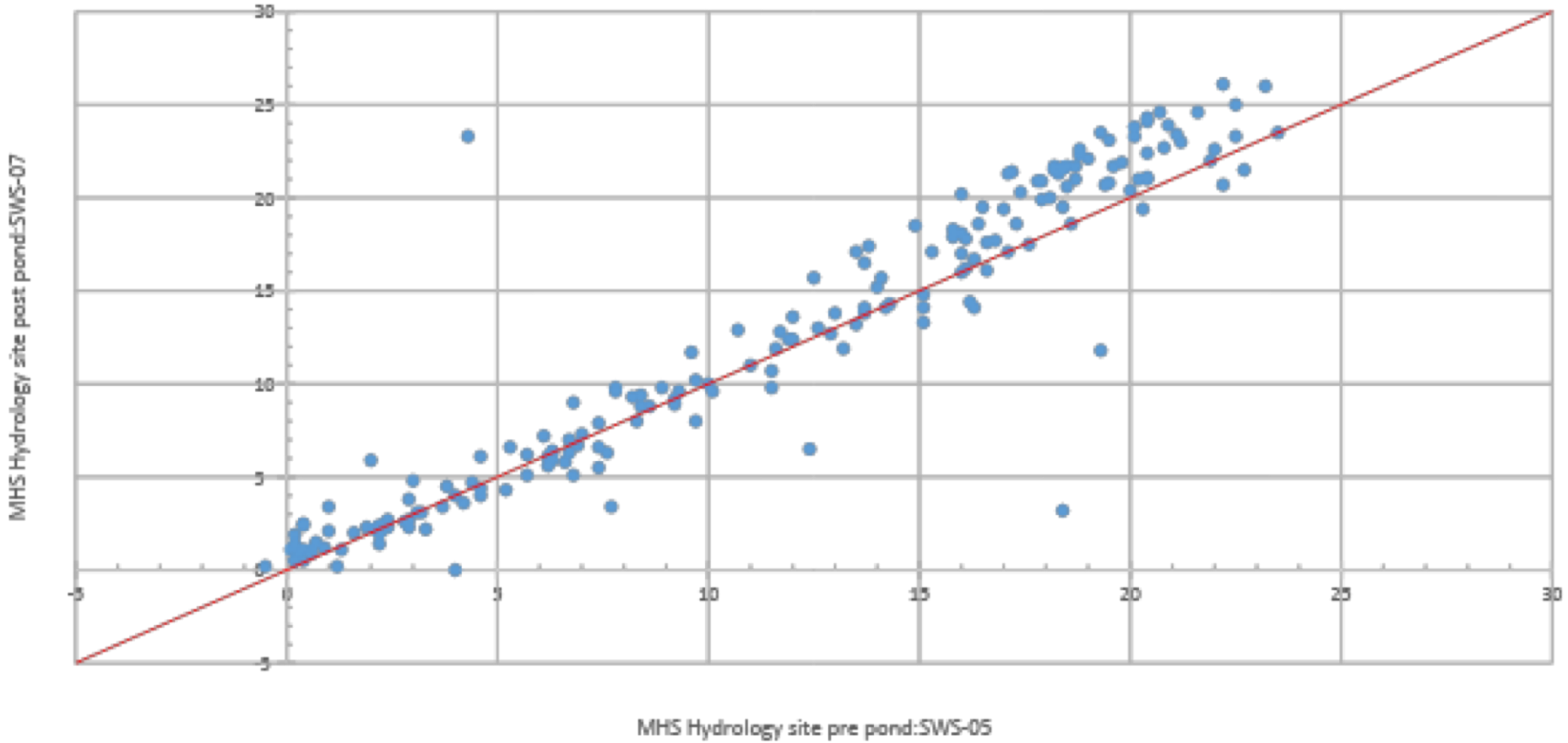
One of the most important parts of the study was to find a place to put all of the data that would be collected so it could be analyzed by the students. They could then use it to draw conclusions and determine if their treatments supported their hypothesis.

Example: Water Temperature Data collected by the primary school in Varazdin, Croatia. Data can be graphed and/or downloaded into Excel as a .csv file and then converted to an Excel file for further analysis.

GLOBE website August 2011, they've come a long way!!



6) Analyze Results, 7) Make conclusion: Using GLOBE data, the graph below shows pre- and post-pond temperatures plotted against each other. The red line is the 1:1 line, so it looks like there is a larger difference above 13 degrees. This suggests that when temperatures are hotter in the summer, the pond is having a greater affect on water temperature.



Making Connections (aka 8 - Communicate your results):

College students visit Mahopac High School



Dr. Katie Schneider (located at the extreme left of the photo) from New York University brings her students up to MHS to teach them about the NY City watershed. Mahopac students teach NYU students how to collect water samples from both an impacted stream (one affected by development) and a non- impacted stream. Here students use a salinity-conductivity-temperature meter to collect data at the non-impacted site.

Teach kids then let them teach.



The hope is to continue the water quality tests and discuss possible ways of trying to improve the numbers. Here, Mahopac High School students are working with and teaching New York University students how to do water quality tests in the lab. The data is collected and then compared with the NYS standards for water quality in streams.

Leaf Pack Experiment: Macroinvertebrates are also important to keep track of.



A damselfly obtained from one of the student leaf packs



Leaf pack tied to a cinderblock in a stream

Trout in the Classroom

Students raise trout in the classroom during the year and release them into a local stream with the NY city students. This now provides them with a reason to keep the water clean. As the photo shows, you don't have to be a big kid to enjoy a fish release. We are also hoping to produce future environmental stewards.



Trout tank in the classroom

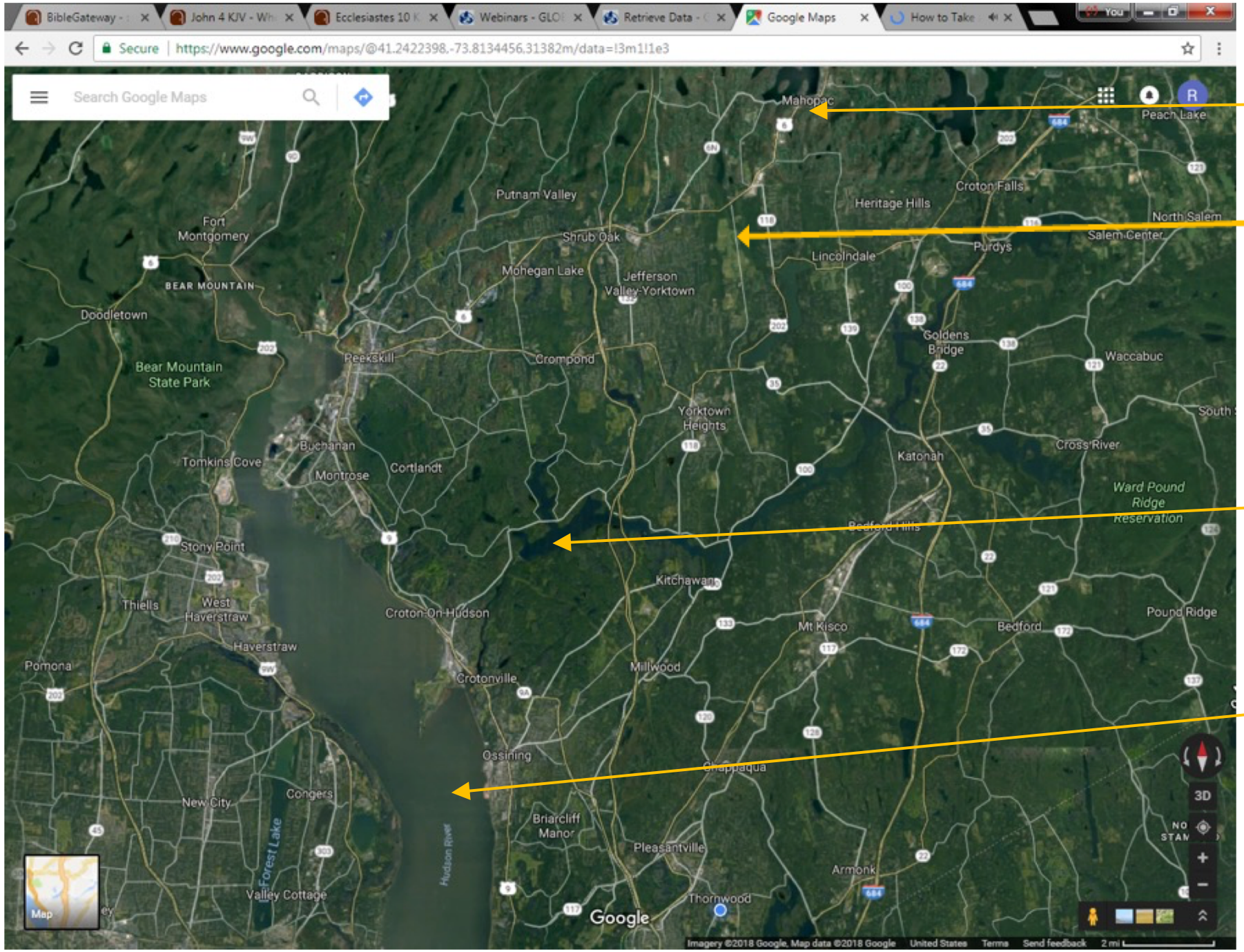


Dad and daughter bonding during trout release

Students hold crayfish for the first time:
(Notice the size of those claws!!)



Students collected macroinvertebrates from the stream where the trout are released and found a healthy, diverse population. Unfortunately, the stream in front of the school lacked the mayflies, caddiesflies and stoneflies that indicate good water quality. Tests for transparency indicate a high amount of sediments from stormwater runoff.



Mahopac High School

Muscoot River (trout release area)

Croton Reservoir (water supply for New York City)

Hudson River

Connect to real world situations



Mahopac and NYU students traveled to the Croton Dam to be taught by New York City scientists and police officers. This dam holds back water to the Croton Reservoir which provides 10% of NY City's drinking water.

After the water tests and trout release, the students take a trip to the old aqueduct that carried drinking water to New York City.



The Old Aqueduct: Students entered into the pipes that used to carry the water to NY City. It took 90 million bricks and 5 years to build. The water flowed strictly by gravity. No pumps were involved. A new system is now in place to perform the task.



Nine MHS students and five NYU students participated in the 1st meeting. The MHS students whose names are listed went on to college to pursue a degree in the field of ecology.

Find ways to incorporate studies into classes



As a chemistry teacher, I used the cold water trout tank and the room temperature fish tank to teach the students how temperature affects oxygen saturation in water. We then looked up the acceptable state values for oxygen content for our stream and then tested the stream in front of the school. Needless to say, the kids enjoyed the real life lesson.

Quality education requires inspired, passionate teachers. I have been blessed to work with many.



Mr. Quackenbush and Mr. Rizzo (on ramp for physically disabled individuals)



Mrs. Johnson, myself and Mrs. Hildebrandt (GLOBE teacher Skyping from Ohio)

Where does your inspiration come from??

- The Genesis Project was named for the book of Genesis from which the inspiration to start this project came from: "And the LORD God took the man, and put him into the garden of Eden to dress it and to keep it."
- From this revelation, I felt one of man's purposes was to take care of our resources.
- "The more I study nature, the more I stand amazed at the work of the Creator. I pray while I am engaged at my work in the laboratory." Louis Pasteur (established the germ theory of disease): As quoted in The Literary Digest (18 October 1902)
- I've done this for 40 + years and am still excited about what I do.. What drives you??



Let students experience nature





The ecosystem in front of the school has been turned into an outdoor classroom. Boy scouts assisted in the project.



A pathway made of ecologically friendly, water permeable pavers and **ramps** were installed so people with physical disabilities could also perform water quality tests

Students get observed by the pros



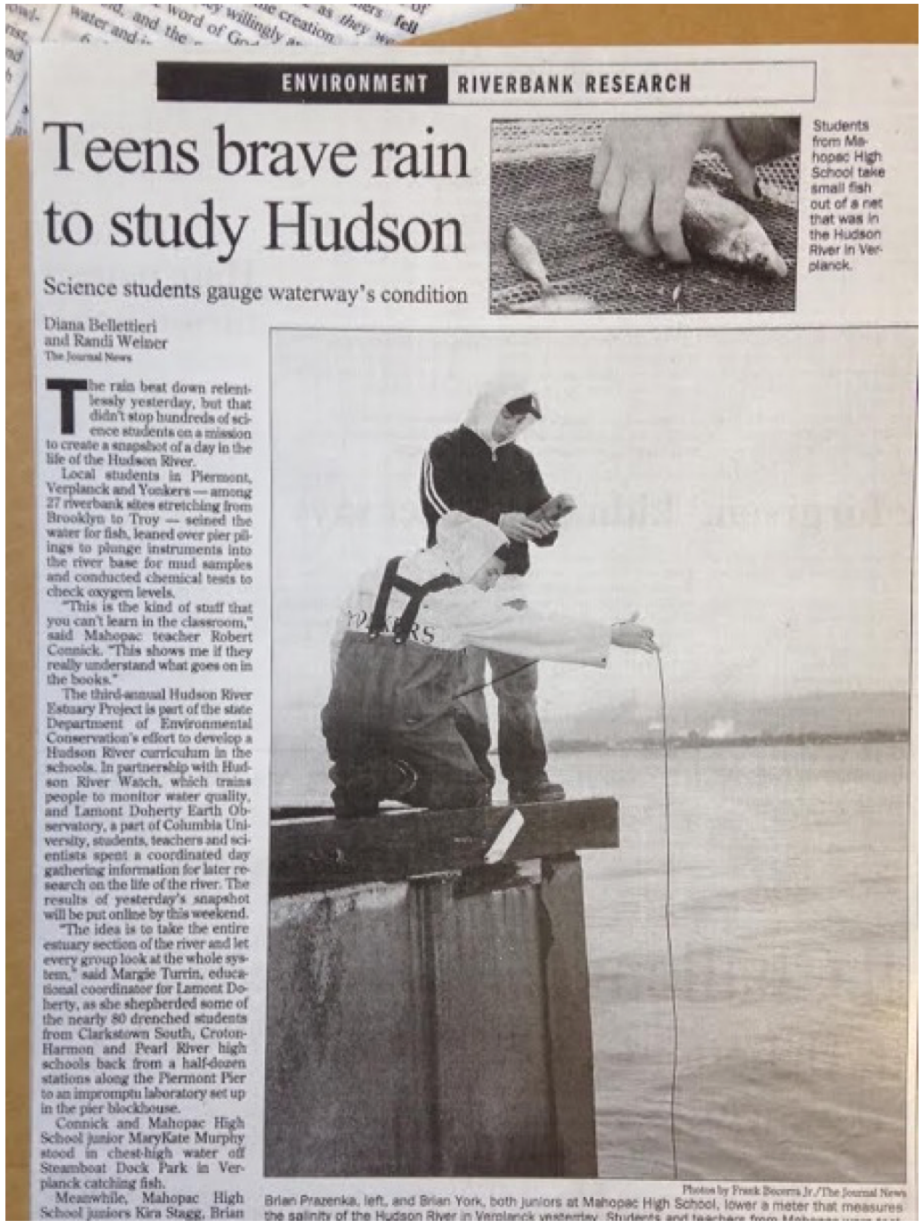
Students demonstrate how they perform water quality tests under the watchful eye of Dr. Karen Moore, GLOBE scientist and water quality expert. Students need to know the importance of accuracy and precision when collecting data that can be used by other individuals.

Snapshot Day/A Day in the Life



Students spend a day on the Hudson River collecting biological, chemical and physical data. This is important because the stream that runs in front of Mahopac High School that the students collect data on eventually enters into this river. The hope is that they will learn what they do locally contributes to what happens globally.

Genesis in the News: The first Snapshot Day



ENVIRONMENT | RIVERBANK RESEARCH

Teens brave rain to study Hudson

Science students gauge waterway's condition

Students from Mahopac High School take small fish out of a net that was in the Hudson River in Verplanck.

Diana Bellettieri and Randi Weiner
The Journal News

The rain beat down relentlessly yesterday, but that didn't stop hundreds of science students on a mission to create a snapshot of a day in the life of the Hudson River.

Local students in Piermont, Verplanck and Yonkers — among 27 riverbank sites stretching from Brooklyn to Troy — seined the water for fish, leaned over pier pilings to plunge instruments into the river base for mud samples and conducted chemical tests to check oxygen levels.

"This is the kind of stuff that you can't learn in the classroom," said Mahopac teacher Robert Connick. "This shows me if they really understand what goes on in the books."

The third-annual Hudson River Estuary Project is part of the state Department of Environmental Conservation's effort to develop a Hudson River curriculum in the schools. In partnership with Hudson River Watch, which trains people to monitor water quality, and Lamont Doherty Earth Observatory, a part of Columbia University, students, teachers and scientists spent a coordinated day gathering information for later research on the life of the river. The results of yesterday's snapshot will be put online by this weekend.

"The idea is to take the entire estuary section of the river and let every group look at the whole system," said Margie Turrin, educational coordinator for Lamont Doherty, as she shepherded some of the nearly 80 drenched students from Clarkstown South, Croton-Harmon and Pearl River high schools back from a half-dozen stations along the Piermont Pier to an impromptu laboratory set up in the pier blockhouse.

Connick and Mahopac High School junior MaryKate Murphy stood in chest-high water off Steamboat Dock Park in Verplanck catching fish.

Meanwhile, Mahopac High School juniors Kira Stagg, Brian

Photos by Frank Becerra Jr./The Journal News

Brian Prazenka, left, and Brian York, both juniors at Mahopac High School, lower a meter that measures the salinity of the Hudson River in Verplanck yesterday. Students and teachers from Mahopac were [illegible]



The first time the students visited the Hudson River, a tropical storm was going through the area. This event was scheduled rain or shine. Needless to say, they came through with flying colors. MaryKate (soaking wet girl in the picture on the right) still sends me fudge every Christmas.



PAGE 2 PUTNAM COUNTY PRESS/TIMES

First-place winners Gabe Burchett, Heather Gorodess and Steven Pike, seniors at Mahopac High School, with their trophies from the GLOBE fair.

Mahopac Students Win Competition at NASA

Mahopac High School seniors Gabe Burchett, Heather Gorodess and Steven Pike recently won first place in the Global Learning and Observation to Benefit the Environment, Northeast and Mid-Atlantic Science Fair at the NASA Goddard Space Flight Center in Greenbelt, Md. They won the award for their research project, "Winter's Impact on New York City's Drinking Water."

MHS students Alissa Copeland and Lorene Stasiuk also presented their research project, "Effects of Floating Islands on Water Temperature in a Storm Water Basin," at the competition.

Both sets of students were invited to the GLOBE fair to present their research on the water quality of the SEAC Creek in front of the school, part of the Croton Watershed that feeds into the New York City Reservoir. A panel of NASA judges rated the presentations.

The Mahopac students said it was thrilling to be in the company of such renowned researchers. "Being in the presence of NASA scientists was really

FREE FREE

Communicate Your Results

The GLOBE Northeast/Mid-Atlantic (U.S.) Regional Student Research Symposium: Teachers, Students, US Partnerships, scientists and alumni from the Northeast/Mid-Atlantic geographic area (DE, DC, CT, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV) were invited to gather and discuss GLOBE student research projects. Mahopac students worked hard and prepared well for the competition. Their project "Winter's Impact on NYC Drinking Water" was enjoyed by those at the symposium.

yourmahopac.com

Mahopac News

Vol. 5 No. 11 Mahopac's Only Local Paper, *Mailed to You*, Reaching More Homes Than Anybody Else, Thursday, May 1, 2014



SPORTS

Indians have strong week on the tennis court.

pg. 38

MOTHER'S DAY

Locals wish their moms a Happy Mother's Day.

pg 20

BUSINESS & REAL ESTATE	45
CLASSIFIEDS	47
HOME & GARDEN	26
LEISURE	44
MOTHER'S DAY	19
OPINION	10
SCHOOLS & CAMPS	33
SPORTS	36

MAHOPAC CENTRAL SCHOOL DISTRICT

John Kopicki, your next superintendent

What's in store for Tom Manko?

BY MARC WEINREICH
OF MAHOPAC NEWS

The Mahopac Board of Education moved forward last week with the hiring process for John Kopicki as the school's next superintendent. The board is in the midst of negotiating a salary with Kopicki and once approved he will work with outgoing Superintendent Tom Manko to make the transition effective this summer.

The 49-year-old Kopicki, currently in his third year as superintendent at Forest City Regional School District in northeastern Pennsylvania, was not available for comment when reached by phone. Once the salary negotiations have been finalized, he will work on moving to the Mahopac area from Clarks Summit, Pennsylvania, where he currently resides with his wife, their son and two daughters. Kopicki and the other then-finalist, Wappingers Central School District Superintendent Marco Pochintesta, spoke to *Mahopac News* in the April 17 edition.

Board President Ray Cote told *Mahopac News* this past Monday night that a public meeting will be held in early May to give a better understanding of the thought process behind the salary negotiations, including facts and figures for neighboring superintendents as well as other factors that the board's attorney is using to work with Kopicki's legal representative. By comparison, Carmel Central School District Superintendent, Dr. James M. Ryan, is earning $272,096 this school year; Yorktown schools Superintendent Ralph Napolitano is making $269,401 for the current academic year; and Raymond Blanch, the Superintendent for the Somers school district, is earning $245,180 this year, according to seethroughny.net.

Cote said that one thing he can guarantee is that Kopicki will not earn more than the $208,000 Manko is earning this year. Manko's first day on the job was July 1, 2009 and he will officially step down on June 30 this year. The 59-year-old had initially been hired at a salary of $205,000 per year, but had asked the board for a raise after his three-year contract expired in 2012. He has since been earning an annual salary of $208,000.

Manko is set to be honored at a going-away party at the Putnam County Golf Course on May 1. He told *Mahopac News* last week that he has been offered the position of President at a Parochial school in Buffalo, and is in preliminary talks for a Superintendent role at a "large public school district" outside of Buffalo. He said he is also looking into consulting as he works on moving closer to family in Western New York.

Cote said that the decision between Kopicki and Pochintesta was based in part on their willingness to move to Mahopac.

"They were both phenomenal candidates," Cote said. "It was difficult to chose between them. [The Board of Education] reached the decision collectively and it really came down to the feeling of the board that John was the right choice. What put John perhaps a step ahead is that he's willing to move to the community, whereas Marco made it clear in the interview process that he would remain living in Connecticut if given the position."

The Board of Education issued a statement to the community on April 30 confirming that Kopicki's deal would be finalized after a series of next steps:

"If the negotiations proceed as expected, the contract will be presented for approval of the Board of Education and Mr. Kopicki will be appointed as the next Superintendent," read the statement. "Mr. Kopicki will assume this post after he has successfully completed some New York State Education Department requirements which is anticipated to be on or about July 1, 2014."

MHS scholars teach NYU students

PHOTO: BELLA DOCARMO

Mahopac High School students pose with NYU students (front row) at the Croton Reservoir waterfall last Friday. The Mahopac students were there to teach those from NYU about water quality testing procedures as part of a joint effort from both schools to give young adults an understanding of how to apply their skills outside the classroom. (Top row, left to right): Ryan Conlin, Matt Farinelli, Robert Connick, (second row) Tommy Tabacchi, Amber Wendler, Lauren Martin, Emily Pope, Katie Schneidor, (third row) Joanne Caguano, Marina Glinias, Eileen He (front row NYU students), Davis Saltonstall, Anna Crouch, Isabel Wang, Mailinda Moore, Stephanie Viola. For more, see our centerspread inside!



Mahopac students work with and teach New York University students how to generate water quality data in the New York City watershed. Because the water quality in the reservoirs has dropped over the years, the city is building a very large filtration plant to provide clean water. Our hope is to educate city people about their water so they will try and conserve it.



Inner-city HS students travel to Mahopac to learn about nature

By Eric Gross
Staff Reporter

MAHOPAC — Leshawn Gibbs didn't know what to expect when he traveled to Mahopac.

"I heard it was a nice beautiful place but I didn't realize how beautiful it was," said the George Wingate High School senior during an exchange program at Mahopac High School.

Under the leadership of teachers Robert Connick from Mahopac and Matthew George of Wingate, 27 students from the Brooklyn campus took a two hour trek to Putnam last week and participated in the Trout in the Classroom program—a statewide initiative that allows children from urban areas to experience a hands-on feel of the environment in its purest form.

Matthew George, science AP teacher at Wingate, described the field trip as "two different worlds coming together. Our kids had the opportunity to travel upstate and experience nature. This was a rare and unique experience for us. The differences in culture and attitude between the two groups proved to be a great learning experience for the children as well as the adults."

Antonio Francis, another student from Brooklyn, echoed his teacher. "This was a great experience. We can learn from a book but this is the real world. Releasing trout into a stream was exceptionally cool," he said.

Uchechi Lawrence said she was skeptical to take the trip. "I thought it was going to be a waste of time but now that I'm here, I really enjoyed the opportunity to learn about the out-of-doors," she said.

Connick explained that the project began several years ago when discussion and debate centered on "water wars - New York City versus neighbors in the northern watershed. When the memorandum of agreement was ratified, we in Mahopac were able to garner funds from the MOA fund as well as the National Fish and Wildlife Association, the National Soil and Water Conservation Association in addition to a number of private foundations."

Connick met George at a conference in SUNY New Paltz and the two men formed a bond to build connections between the water keepers and the water users. "What a great group of kids to interact with. They were enthusiastic when sampling stream activities that included the gathering of specimens and chemically analyzing the stream water," he said.

Connick had special praise for Lauri Taylor of the Putnam Soil and Water Conservation District as well as Paul Thiesing, a New York City DEP educator, John Genovesi of Trout Unlimited, Beth Rhines of the Teatown Reservation and Ann Fanizzi, chairperson of the Coalition to Preserve Open Space.

Fanizzi reflected on the days when she was in the classroom teaching inner-city children in the South Bronx. "Our new friends from Brooklyn have joined our local Putnam youngsters by grasping the idea that water is a partnership among all of us. In order to improve water quality, everyone must strive - both residents of New York City who depend on the water and we in Putnam County who must protect the resource," she said.

Mahopac teacher Robert Connick (left) smiles in appreciation when Wingate High School teacher Joan Stone and her students present the Mahopac High School with a plaque in appreciation of the excursion from the inner city to the country.

MHS/George Wingate H.S. Trout Release:

Since we are in the NY City watershed, that makes us the "water keepers". Those that live in NY city are the "water users". It is our hope to build bridges and put faces between and on the two groups of people.

Quotes from the Water Quality Day at MHS:

"Our kids had the opportunity to travel upstate and experience nature. This was a rare and unique experience for us" (Wingate Science Teacher)

"This was a great experience. We can learn from a book but this is the real world. Releasing trout into a stream was exceptionally cool." Antonio F. (Brooklyn H.S. Student)

<u>Building Bigger Bridges: Working with Medicinska Skola Varazdin in Croatia during the ENSO campaign.</u> We are hoping to involve more schools in studying water quality on a more consistent basis.



MEDICINSKA ŠKOLA
1958
VARAŽDIN

← Site: Plitvica – SWS-01

Water in Our Environment (*Guiding Investigative Question*)



- Water Quality: What is the quality of the water in our environment?

  Is my water safe to drink?

1) From the water quality tests the students have run, the main problems with the water in the stream in front of MHS are sediments, conductivity and bacteria.
2) To try and mitigate these problems, the students have planted a riparian buffer around the stream. The Genesis grants have also provided money to install special storm drains to help remove more of the sediments.

Water in Our Environment (*Guiding Investigative Question*)

- Water's Impact: What impact does water, both above and below ground, have on our environment?

  Is my area prone to erosion?

1) Students have noticed a drop in transparency when there is a storm and have seen muddy stormwater entering the stream.
2) The hope is to work with the town officials in keeping the storm drain catch basins clean and to continue planting in areas that show signs of erosion.

Water in Our Environment (*Guiding Investigative Question*)

- Water and Life: How does water in our environment impact living organisms? How has water availability been affected by human habitation in my environment?

1) The healthy macroinvertebrate populations of the trout stream compared to the less diverse, lower quality macro population collected in front of MHS show that the development around the stream has affected these organisms
2) The town has started using a brine solution in the winter instead of road salt to keep the roads safe. Student analysis of the data has shown an improvement in conductivity levels and presented their findings at the The GLOBE Northeast/Mid-Atlantic (U.S.) Regional Student Research Symposium

Water in Our Environment:(*Guiding Investigative Question - Continued*)

- Water and Life: How does water in our environment impact living organisms? How has water availability been affected by human habitation in my environment?

3) Taking care of the water in the stream is important because it is a tributary to the NY City reservoir system that provides drinking water for more than 8.5 million people.

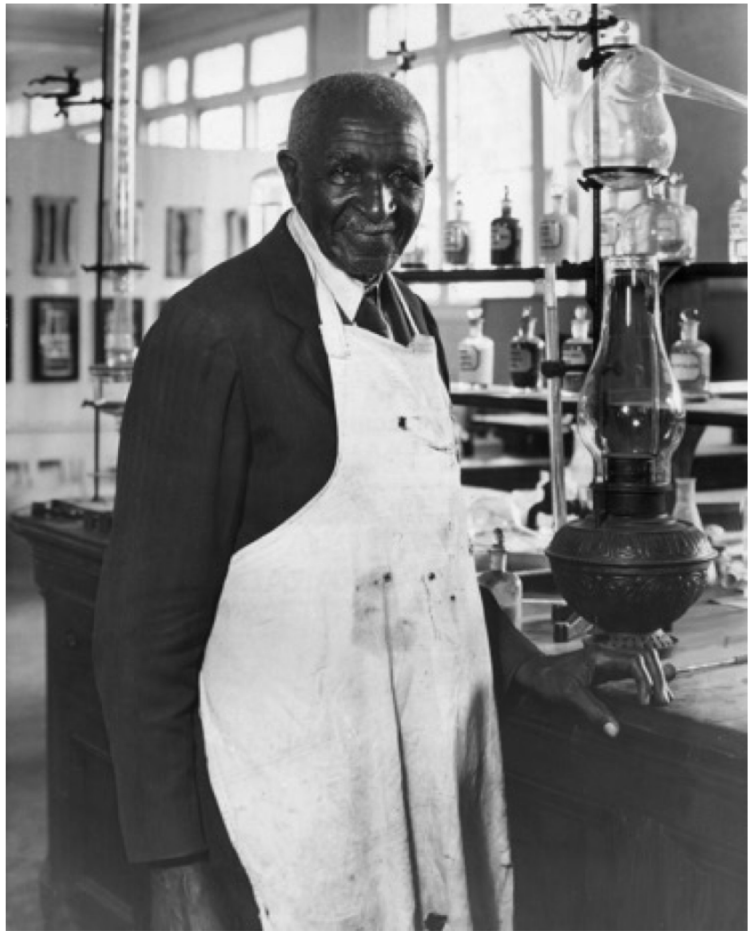


GLOBE visits Mahopac and looks over the Genesis Project: Members of GLOBE include: Julie Malmberg, Chris Hoadley, Keith Maull, Ovo Dibie



George Washington Carver (Agricultural Chemist): Developed 300 products from peanuts and more than 100 new products from sweet potatoes). Below is a quote from his favorite poem "Equipment" by Edgar A. Guest.

You are the handicap you must face,
You are the one who must choose your place,
You must say where you want to go,
How much you will study the truth to know.
God has equipped you for life, but He
Lets you decide what you want to be.



Just the beginning!

