BROOKLYN COLLEGE'S CITY-AS-LAB: AN URBAN GK-12 INITIATIVE

Abstract

Brooklyn College's "City-As-Lab" project is a new GK12 initiative with a community-based urban focus. The project began in August 2007. The City-As-LAB project addresses the NRC's call for a community of partners to help to integrate spatial thinking with GIS into pre-college curriculum. The project's urban setting with its diversity of schools and abundance of informal education resources assists teachers in several high schools that are part of the "small school" movement to teach science in an authentic and community-based fashion with an emphasis on science and the environment. As a result of the project, we are creating an enduring, cooperative network of educational partners that includes Brooklyn College, Brooklyn-based "small schools", the NYC Department of Education, and informal science partners in Brooklyn. Fellows aid teachers in developing Brooklyn-based research activities incorporating geospatial technology (GPS and GIS), thereby permitting students and teachers to relate data to geographic position in their home community, and to engage with authentic scientific problems that are relevant to their urban environment. Two broad environmental research initiatives are underway. Several school teams have integrated water quality studies into their 9th and 11th grade science curriculum, with field data linked to experimental studies and to a borough-wide contaminant database. Another school with an urban planning theme is conducting neighborhood-based energy audits and relating energy use to carbon emissions. In all five schools, GK12 fellows have taken a leading role in the integration of field and classroom-based technology into science curricula.

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Academy for Environmental Leadership (AEL)

The Academy for Environmental Leadership (AEL) is a small innovative learning community serving grades 9-12 with an interdisciplinary approach to learning focused on science, mathematics, and technology to develop the capacity of students to become environmental leaders. At the school GK12 fellows help students connect research in the classroom to the outside environment.

Bushwick, Brooklyn is plagued with some of the highest rates of obesity and diabetes in NYC, attenuating the need to assess healthy food choices in this neighborhood. Students at AEL are conducting a community based food assessment, investigating the availability, affordability and proximity of food sources in this area.

The students from AEL are investigating environmental impacts on artificial systems by comparing the water conditions of their classroom aquarium to the larger environment of Prospect Park.

Additional AEL project sites

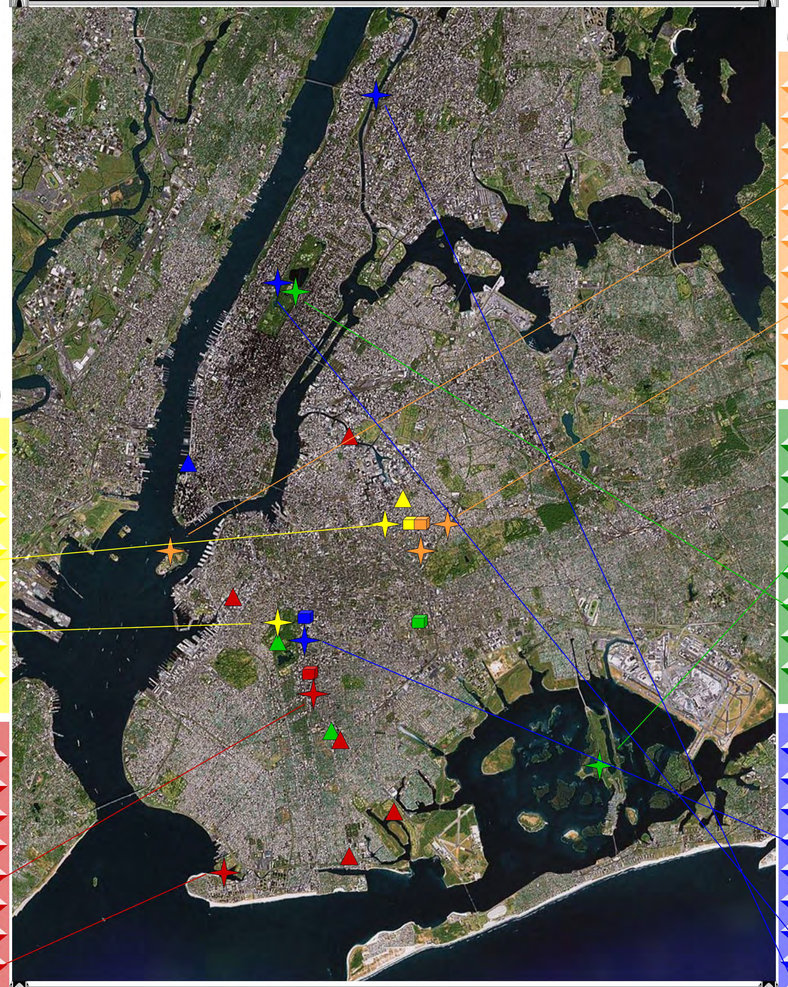
Science, Technology and Research Early College High School at Erasmus (STAR)

STAR is an Early College Network High School. High school teachers with Brooklyn College professors prepare students in science, mathematics and technology for college and the world of work. Students use the resources on Brooklyn College and other City University of New York campuses as their learning laboratories and earn college credits in addition to their high school diploma.

Students and faculty, assisted by GK12 fellows are examining environmental issues related to water and climate change. Projects include, assessing the efficacy of water treatment methods (Iodine, UV light, activate carbon, filtration, softening and deionization) and water's carbon dioxide absorption abilities. A long term goal of the project is the creation and maintenance of a geospatial database of water quality indicators across the entire New York City area.

To date 8 sampling sites have been established throughout the New York City area, and are measuring: PO_4, NH_4, CO_2, O_2, NO_3, Cl_2, and pH), temperature, micro organisms and plant life. The data is being mapped onto a geospatial database. STAR is currently working to connect this project with the efforts of the New York City Department of Environmental Protection.

AEL water quality sampling sites.



FOR MORE INFORMATION GO TO: HTTP://BRIDGES.BROOKLYN.CUNY.EDU/CAL/

Brooklyn College of the City University of New York, is home base for the GK12 "City-As-Lab" project. Many of the GK12 fellows teach and conduct research on campus, and college facilities including advanced computer labs are available to the participating schools.

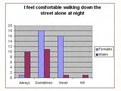
Academy of Urban Planning

The Academy of Urban Planning incorporates an urban planning, theme-based curriculum that draws students out of the classroom and into their communities to develop skills that will move them toward higher education and professional careers.

Students from the Academy of Urban Planning assisted by GK12 fellows explored Governors Island and learned about its history as well as future plans for the development of the island. They took pictures and created Google Maps of the island featuring historic landmarks.

Students from the Academy of Urban Planning assisted by GK12 fellows worked with an architect to imagine how the community might use an empty lot just a few blocks from the school. They created models using Google SketchUp and presented their ideas to a panel of teachers, community leaders and design professionals.

The students from the Academy of Urban Planning assisted by GK12 fellows created surveys on public space use, abstracted the data and analyzed the results from a gender perspective. The students discussed why or why not some young women may feel less safe in public spaces than young men and the impact of this.



Teachers Preparatory School

Teachers Preparatory School (grades 6-12) is dedicated to preparing tomorrow's educational leaders. GK12 fellows are working with teachers at the school to develop reusable city-as-lab educational units involving Jamaica Bay, Prospect Park and Central Park. GK12 fellows are also assisting the schools administration in overhauling and upgrading the schools technology infrastructure.

Teachers Preparatory School students and faculty, assisted by GK12 fellows, participated in the 2007 Jamaica Bay BioBlitz (a wildlife species count, that used GPS plotting).

Teachers Preparatory School students and faculty have conducted GPS/GIS field trips in central park. Students located and described rock formations discussed as part of their earth science curriculum using only GPS coordinates.

Additional Teachers Prep project sites.

Brooklyn Academy of Science and the Environment (BASE)

BASE is a New York City Public High School that integrates the missions and resources of Prospect Park and the Brooklyn Botanic Garden to offer academic excellence and rigor. The community of staff, families and community partners support students in becoming critical thinkers, active learners and problem solvers who are scientifically literate, engaged citizens who value and respect the environment.

In cooperation with the Prospect Park Alliance all first-year BASE students participate in weekly field studies trips in the fall and the spring to the Prospect Park Boat House. This year a longitudinal water quality study has been initiated that encompasses multiple sites in the park, and will involve each incoming Freshman class. Students explore the chemical and physical characteristics of this man-made water system over time, and directly engage in many aspects of the science inquiry process.

BASE students as part of their experiments in NY water quality, attended The American Museum of Natural History's WATER exhibition (runs 11/3/07 through 5/26/08).

BASE students assisted by GK12 fellows visited Highbridge park as part of their study of city water quality. Highbridge park is of particular importance to the history of water quality in NY because of the Old Croton Aqueduct.

Additional BASE project sites.