

URBAN ECOLOGY RESEARCH PROGRAM Mauricio Gonzalez, NYC 2010





HE EARTH INSTITUTE AT COLUMBIA UNIVERSITY

PURPOSE

Authentic learning experience Relevant and motivating subject matter ■ Use of genuine data to engage community Increase STEM exposure • Give an edge in college admissions Service Learning to give back Develop strong work ethic Foster leadership and team skills

PROBLEM

- Real local issues often go unseen by our inner city youth who lack appropriate exposure to them such as water and air contamination and the origin of food.
- The vehicles by which these issues arise are often the same methods that support the urban livelihood such as the transportation of goods, the production of energy, and the manufacturing of goods.

CORE PILLARS TO ADDRESS ISSUES:

Agricultural Engineering

- the engineering discipline that applies engineering science and technology to agricultural production and processing.
- Class Urban Vertical Agriculture
- Environmental Engineering
 - the application of science and engineering principles to improve the environment (air, water, and/or land resources), to provide healthy water, air, and land for human habitation and for other organisms, and to remediate polluted sites.
 - Class Marine Ecology

Vision 01: by Dickson Despommier

Urban Vertical Farm



http://www.verticalfarm.com/Images/design/chris/chris_jacobs_light.jpg

Project 01. F.D.A. courtyard which sits on stilts over an above ground subway station.



Designing the courtyard elevated garden.



Courtyard Elevated Gardens



Building the elevated garden.





Building the elevated garden.







Enjoying the courtyard elevated garden.





PROFESSIONAL SKILLS

Leadership Dedication Responsibility ■ Team work Problem solving Common sense Maturity

Project 02. Courtyard Irrigation System



Building the irrigation system.









Project 03. F.D.A. Greenhouse



Designing the straight canal hydroponics NFT system.





Designing the straight canal hydroponics NFT system.



Designing the straight canal hydroponics NFT system.











Growing tomatoes and basil on the hydroponics straight canal system.





Growing lettuce on an A-frame N.F.T. hydroponics system.







Having our pie and eating it.













FDA Greenhouse Basil Grown Organically!

Running our aquaponics system









Winning additional grants thanks to our developing program to grow more food.





STEM: Comparing efficiency of different hydroponics systems by Ediliza Peralta *et al.*

Comparing Average Basil Plant Growth Per Day Between a Straight Canal and Hydroponics



STEM: Measuring Electrical Conductivity of the nutrient solution in the hydroponics systems by Ediliza Peralta *et al.*





Dates

Designing prototype canal, aquaponics, and aeroponics systems with middle schoolers.













Project 04. Building desktop aquaponics systems.



Preparing for tomorrow's challenges.

Technical reading and writing Applied math, statistics, and logic Use of professional grade technology Balancing intelligence with common sense Oral presentations Self confidence Poise



Vision 02: by Richard Toussaint

Clean water and air in Harlem

Purdue-FDA Web page Video



Project 05. Building and running the water quality station.



Protective tube

Installing the water quality monitoring station.



Preparing the probe and testing the bluetooth antenna.





Adding the solar panel.





STEM: Dissolved Oxygen vs. Temperature in the Harlem River by Melissa Jimenez

Dissolved Oxygen and Temperature of the Harlem River 03/26 - 09/6



STEM: Linear Regression between Temperature and Oxygen in the Harlem River by Melissa Jimenez



Project 06. Air quality monitoring of CO₂, Particulate Matter, and Black Carbon.



Students taking monitors and gear out to the field





STEM: PM in Harlem train stations vs. downtown stations by Angel Batista



Average PM_{2.5} Concentrations in NYC MTA Train Platforms (Red Line), April 14, 2010

STEM: PM in the Harlem River Park by Anthony McKenzie.

Particulate Matter μ g/m³ (2.0 micron) in HRP 12/17/09 (Purple line represents EPAs maximum yearly exposure limit)



Project 07. Designing the edge by Gilenny Abreu



Inauguration of Harlem River Park



Harlem River Park Outreach





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Faurth-grader Menae of PS 197 shows off a lizzed as part of her class project on bliveres to Carolyne Koma of the Mer-ingular Area Alfrance, a co-spaniar along with District 5 of the Super Saturday! Expl.

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It is your waterfront Help make it healthy. Make it accessible. Make a difference. Make a Donatio



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Choose an activity

Waterford Future Cali

Waterfront Action Agenda

GivofWaterDay

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When: Saturday, July 24, 2010 Where: Governors Island Liberty State Park Brooklyn Bridge Park What: A free day of

Discover





Community Partners.

■ Mr. Robert Schwartz Horticultural Society of New York Cabbage Hill Farm City Parks Foundation Harlem Children Society Harlem Street Fair Hayden Foundation Columbia University Harlem Community Development Corporation Manhattan Land Trust Harlem River Park Task Force Community Board 10 C.U.N.Y. Undergrad and Grad Centers



Our Team

