



3rd ANNUAL
NEW YORK HARBOR SCHOOL'S
SCIENCE SYMPOSIUM
— THURSDAY MAY 15, 2014 —

MARINE BIOLOGY / SCIENCE RESEARCH PROGRAM

SCIENCE SYMPOSIUM

PROGRAM

11:00 AM	Posters Set-Up in Hallways	All Marine Research Students
12:00 AM	10 th and 11 th Grade Presentations	All Marine Research Students
01:00 PM	Viewing all Projects Judging of 11 th and 12 th Grade Projects	All Students, Staff, & Judge Volunteers
03:55 PM	Guests and Students Arrive in Mess Hall	All
04:00 PM	Introduction and Welcome	Ms. Claire Lorenz Asst. Principal, Harbor School
04:05 PM	Introduction of Keynote Speaker	MCs & Mr. Mauricio Gonzalez Research Teacher, Harbor School
04:07 pm	Keynote Speaker <i>Science, Risk Taking, and Success from Failure</i>	Dr. Peter Morawski Research Scientist, NIH
04:30 PM	<i>Can Crassostrea virginica Filter Enterococcus faecalis?</i>	Pablo Jimenez NYHS, Class of 2014
04:40 PM	<i>My Future Career, GIS style!</i>	Makeda Bloomfield NYHS, Class of 2014
04:45 PM	<i>Recreational Activities in NYC</i>	Deanasia JeanPierre NYHS, Class of 2014
04:50 PM	<i>Police Precincts and Boroughs in NYC</i>	Makayla Kimbrough NYHS, Class of 2014
04:55 PM	<i>The Effects of Different Concrete Compositions On Benthic Organisms Under an Ecodock</i>	Tahirah Abdo NYHS, Class of 2015
05:05 PM	<i>Rescued from the Brink: Eel Grass restoration</i>	Nicolle Martinez NYHS, Class of 2015
05:20 PM	Awards Ceremony	All
05:35 PM	Closing Remarks	MCs

MARINE BIOLOGY / SCIENCE RESEARCH STUDENTS AND PROJECT TITLES

Seniors

Project Titles

Barwick, Thomas	Sight Seeing in NYC via Subway Systems
Belgrove, Tsiang	Mission Complete: Bettin' Around NYC
Bloomfield, Makeda	My Future Career, GIS style!
Jeanpierre, Deanasia	Recreational Activities in NYC
Jimenez, Pablo	Can <i>Crassostrea virginica</i> Filter <i>Enterococcus faecalis</i>
Kimbrough, Makayla	Police Precincts and Boroughs in NYC
Lopez, Anthony	Geospatial Technology
Maldonado, Jeremy	Train and Bus Routes throughout NYC
Mohammed, Raees	Maintaining and Breeding Sword Tail Fish
Roberts, Kendal	Your Child Needs a Place to Play Too
Ronan, Balarama	Stop and frisk: Operation Constrictions in NYC
Duncan, Sheridian	
Strang, Harmony	

Juniors

Project Titles

Abdo, Tahirah	The Effects of Different Concrete Compositions on Benthic Organisms Under an Eco-dock.
Achee, Kieron	Collection of Plastic Debris within the Upper NY Harbor
Anderson, Rachel	Monitoring the Atmospheric Carbon Dioxide and Black Carbon on Governors Island
Aviles, Sam	Introduction to Composition
Buckstad, Shana	Hydroponics
Carvajal, Genesis	Succession of Microorganisms in the HRE
Gonzales, Jade	How Does Climate Change Affect Potential Polar Bear Extinction?
Gonzalez, Violeta	Enterococcus and how it affects Aquatic Life
Kalogrias, Stefanos	NY Harbor Plankton Microscopy

Maisonet, Brendan	Neuston Net Plastics
Martinez, Nicolle	Rescued from the Brink: Eel Grass Restoration
Ramos, Averille	Paper or Plastic? Measuring Macrofauna with Baggy Wrinkles
Ramos, Orlando	Building a Hydroponics Frame
Rosado, Bill	Hydroponics Design
Smith, Shawn	Oyster and Sea Squirt Filtration Rate Comparison
Sommer, Andrew	Marine Growth on Porcelain Tiles
Tucker, Alisha	Oyster and Sea Squirt Filtration Rate Comparison
Wilson, Samuel	NY Harbor Plankton
Wiltshire, Jelani	HMP: Harbor Monitoring Platform
Hernandez, Jorge	

Stevens, Linda

Sophomores

Project Titles

Bates, Gabriel	Monitoring my Aquatic Ecosystem Model
Bies, Cézanne	The Walrus and Carpenter: Searching for Genetic Similarities and Differences between Wild and Native Populations of <i>Crassostrea virginica</i>
Bin Khalid, Zain	Genetic Differences in Farmed and Wild Oysters – <i>Crassostrea virginica</i>
Bonanno, Raphael	Differentiation in the Genetics of the NY Harbor
Carrasquillo, Ivan	Plastic vs Plankton
Dejesus, Tyler	GMO Fish: Frankenstein in the Fishing Industry
Domonique, Aliyah	Observing the Relationship Between CO2 Levels and Illness among Office Workers
Gilani, Mari Yanna	Playing God with Ecosystems
Giraldo, Maria	Plankton Studies in Buzzards Bay, Massachusetts USA
Goldmansour, Luca	Cultivating the Mycelium <i>Tolyposcladium</i> Fungus and its Effect on Cancer
Gonzalez, Dennis	Plankton vs. Plastic
Gutierrez, Graitchell	Comparison of Bacterial Communities of Beaches on the East and West Coast of the USA.
Jimenez, Marc	Environmental Effects of Increased Atmospheric CO2 Levels

Jordan, Evelyn	Implications for Phytoplankton Succession
Landet, Pierre	Search for Genetic Differences between Wild and Farmed Oyster Populations
Lora, Mya	How to Maintain and Monitor an Aquatic Ecosystem Model
Montilla, Julia	How to Raise an AEM like it was your Child
Raimondi, Ryan	My Aquatic Artificial Habitat
Torres, Edgar	Material Investment in Sword Tail Fish
Arana, Lucian	

KEYNOTE SPEAKER



Peter Morawski received his Ph.D. in Immunology from the University of Pennsylvania, Perelman School of Medicine, and his B.A. in Biology from La Salle University, in Philadelphia. He is now a post-doctoral fellow in the Laboratory of Immunogenetics at the National Institute for Allergy and Infectious Disease with an interest in the immunologic basis of autoimmune disease. His current work focuses on brain infiltrating white blood cells in mouse models of Lupus. Peter also has a passion for teaching, with experience instructing Immunology, Biochemistry, and Molecular Biology. Following his post-doctoral work at the NIH, he aims to open his own laboratory to continue researching Lupus, and teaching both undergraduate and graduate students.

SENIOR ABSTRACTS

Barwick, Thomas

Project Title: Waterfront and Landscape Accessibility by NYC Subway

Advisor: Mauricio Gonzalez, M.Sc.

Abstract: New York City waterfront parks and landscapes are easily accessible by the city's subway system. There are many days where people find that they have nothing to do, so they just stay at home. This is New York City, there's always something to see! This map that I have created lays out all of the NYC Landmarks as well as waterfront parks along with the train stations near these locations.

Biography: Marine Bio Research student, aspiring Nurse Practitioner. Hopeful student at Hunter College, 3rd baseman, chef, into a wide variety of TV series.

Belgrove, Tsiang

Project Title: GIS creative map

Advisors: Mauricio Gonzalez, M.Sc.

Abstract: The purpose of GIS is to create, share, and apply useful map-based information products that support the work of organizations as well as to create and manage the supporting geographic information. In my map I created a map for all means of transportation in the borough of Brooklyn. When creating this map the problem was adding two layers to one specific orientation when you zoom in completely. I fixed this problem by combining both layers and adding a double colored layer.

Biography: I am a senior I've been part of the NYHS track team from 09-11. I've received a Certificate of Merit for achieving the College Readiness Standard in English Language Arts. I aspire to someday become a journalist for VICE or any magazine that touches any type of social justice topics.

Bloomfield, Makeda

Project Title: Nursing Homes and Hospitals in NYC

Advisor: Mauricio Gonzalez, M.Sc.

Abstract: Hospitals lay a number role in the health and well beings of someone's life. Nursing homes and hospitals constitute different settings with a different organization and care provided. A hospital is what is often referred to a tertiary medical facility. People admitted to hospital require acute medical services and receives greater levels of trained staff. Nursing homes are specific to long term or end of life care. They are designed to mimic the home environment and are usually specifically for the aged in society, and that's by using fewer trained staff and lots of manually trained staff. Using Arc GIS, the map provided shows all hospitals and nursing homes in NYC boroughs.

Biography: Chef, dancing, and watching action movies

JeanPierre, Deanasia

Project Title: Recreational Activities in NYC

Mentor: Mauricio Gonzalez, M.Sc.

Abstract: New York City, the most populated city in the United States, is famous for its Financial District located in Lower Manhattan. New York City has had a significant impact on the commerce, finance, media, art, fashion and research industry. New York City is the best place for a business broker but what about the kids and the families that want to get out and just have fun? Some people don't know about all the recreational activities located in the heart of New York City ranging from movie theaters to kayaking. There are hundreds of museums and movies theaters located all over the Big Apple but some may not know this. This is why this map was created, to help people locate and find museums and theaters within the city.

Biography: Marine Biology student. Aspiring fashion designer and professional photographer. Future student at SUNY Albany, majoring in Computer Science or Biology with a minor in business management. Enjoys being alone and listening to music (indie pop is my favorite genre). Wants to become a Certified Registered Nursing Assistant in the near future.

Jimenez, Pablo

Project Title: Can *Crassostrea virginica* Filter *Enterococcus faecalis*

Mentor: Mauricio Gonzalez, M.Sc.

Abstract: *Enterococcus faecalis* is a bacterium which is capable of causing a wide variety of different infections and diseases. Oysters, a filter feeder, are capable of filtering bacterium and other pollutants. Eight experiment tanks were set up, four with oysters, four without to serve as the control to see the filtration capacity of the *Crassostrea virginica*. The results showed that the oyster tanks had a significant decrease in *Enterococcus faecalis* colonies. We concluded that *Crassostrea virginica* does have an impact on *Enterococcus faecalis* concentration; we presume this is due to the enterococci size cells matching the filtration range of the *Crassostrea virginica*.

Using the statistical hypothesis test, the derived t-test equals 2.16 exceeds the critical value of $t=1.943$ with degrees of freedom at 6. Therefore, the null hypothesis is rejected and it is concluded that the mean MPN for the experimental group was significantly lower than the mean MPN of degrees of freedom for the control group. In terms of the research problem, it appears that oysters significantly lower the amounts of MPN in the experimental tanks.

Bio: I am the very first student in NYHS history to ever get accepted into NYCSEF. I am also an aspiring art student that is devoted to making animations and posters for advertisements. My hobbies include biking, drawing and animation while surfing the web for communication design posters. I hope to one day be good enough in communications design to get accepted into FIT for an AAS in communications design. Then from there, I can pursue a degree in animation and interactive media to one day rise through the ranks and become an executive producer of an animation TV show.

Lopez, Anthony

Project Title: Geospatial Technology

Mentors: Mauricio Gonzalez, M.Sc.

Abstract: Geospatial technology consists of geometrics, gathering, storing, processing, and delivering geographic information, or spatially referenced information. Geospatial technology can be broken down into groups, one of which I learned how to use in my time at the MBRP program. A geographic information system (GIS) is a computer system designed to capture, store, analyze, and present all types of geographical data.

Biography: I am a twelfth grade student currently attending, The Urban Assembly New York Harbor School. During the years of high school I have received the award of high honor roles. I was enlisted in the dean's list and perfect attendance. I want to become educated so I can receive knowledge and an education that will benefit me. I am planning on going to a University

Maldonado, Jeremy

Project Title: NYC Transportation

Mentor: Mauricio Gonzalez, M.Sc.

Abstract: My GIS project is on train and bus routes in the five boroughs of New York City. The rationale of my project would be to show how most of NYC's transit focus's around Manhattan and expands to each borough. With this map it would be easy to show where there is transit.

Biography: Marine Biology student, Honor Roll, High Honor Roll, Dean's List, Completing a review of literature project, Harbor seals, volunteering at the Brooklyn Bridge Program. A memorable moment in MBRP was going upstate to black rock forest and getting in the river and testing the water, we got to hike up the mountain and take in the beautiful scenery.

Ronan, Balarama

Project Title: Stop and Frisk: Operation Constrictions

Mentor: Mauricio Gonzalez, M.Sc.

Abstract: The NYPD started the "Stop and Frisk Operation" in 2002 at first it was barely noticed by the citizens of New York, however it began to become a common practice and Stop and Frisk rates dramatically increased by 2008, resulting in thousands of complaints against the NYPD for racial profiling young African American and Hispanic folks. My team and I set out to see if the concentration of stop and frisk operations would be more evident in neighborhood communities which held predominantly black and Hispanic citizens. What we found was disturbing; over 85% of the stop and frisk operations conducted in 2012 were situated in either East New York or Harlem both having predominantly black and Hispanic populations. Our findings suggested that, yes the stop and frisk program did target these communities and the people within them.

Biography: Soon to be a UAlbany student, majoring in criminal justice plays football, boxes on weekends, health enthusiast. Favorite subject is split between English and History. All work no play mentality at school, does not endorse slacking off. Determined, steadfast, dedicated.



JUNIOR ABSTRACTS

Abdo, Tahirah

Project Title: The Effects of Different Concrete Compositions on Benthic Organisms under an Ecodock

Mentor: Shimrit Perkol-Finkel, M.Sc.

Advisor: Samiyra Abdus-Samad, NYHS '14

Abstract: As the years go by more and more people want to live on the shore. With the increasing population along with people wanting to live on the water, coastal infrastructure is needed. Seventy-five percent of the world population will be living on the water by 2025 (Bulleri 2010). The use of coastal infrastructure is needed however; it may have some detrimental effects on surrounding organisms. . Portland cement is the most commonly used cement in construction and has been used in the past on piers. Portland cement is not a good thing to use because while it does support the increasing human population wanting to live on the water, it cannot serve as an efficient substrate for marine organisms to colonize. This is due to the fact that concrete has a high surface alkalinity and compound not natural to the ocean (Abdus-Samad 2013). The physical appearance of the substrate also has an effect on how and what colonizes (Bulleri 2010). It is hypothesized that the differing compositions and surface texture of EConcrete will have more recruitment of organisms.

Achee, Kieron C.

Project title: Collection of Plastic Debris within the Upper New York Harbor

Mentor: Rachael Miller, Co-founder of the Rozalia project for a Clean Ocean

Abstract: plastic abundance in the New York Harbor estuary was determined on Governors Island on pier 101 between January 9 and March 25, 2014. Within this experiment the quantities of different plastic debris within the New York Harbor were collected using a 500-micron phytoplankton net.

Anderson, Rachel

Project Title: Re-Circulating Systems

Advisor: Mauricio Gonzalez, M.Sc.

Abstract: How does a re-circulating system work? If there is a problem, how do you fix it and what exactly is it for? My project demonstrates how to set up and maintain a re-circulating system in order to sustain the life's of organisms living in the system through the monitoring of water quality parameters to suite the organisms needs. It is expected that the system will run smoothly without any problems, but we have observed that we often have problems with Ammonia (NH₃) and low pH levels. From this we have concluded so far, that this system still needs work before (if ever) it reaches perfect stable conditions.

Carvajal, Genesis

Project Title: Ecological Succession of Microorganisms in the Hudson River Estuary

Advisor: Mauricio Gonzalez, M.Sc.

Abstract: Ecological Succession is occurring in the world right now and what makes it important is that the biodiversity in estuarine communities is changing. Since we live around the Hudson River Estuary, we need learn how to depend on the organisms that are present now and predict what type of organisms can colonize in future. What is being studied is the abundance of microorganisms at different depth of the river. We expect to find a great abundance of periphyton and sessile colonizing organisms like sponges and bryozoans.

Gonzales, Jade

Project Title: How might Climate Change Affect the Possible Extinction of Polar Bears?

Advisor: Mauricio Gonzalez, M.Sc.

Abstract: Climate change has been an issue for years. People don't realize or take it into consideration that there are animals in the arctic that are losing their homes. The polar bear (*Ursus maritimus*) is the largest carnivore on land and they are losing their habitat to climate change. If the rate of climate change continues to increase then the polar bear population will decrease. The climate change and the polar bear population are in direct correlation with each other.

Gonzalez, Violeta

Project Title: Monitoring the Water Quality of the Lower Hudson River Estuary Around GI and Lower Manhattan

Mentor: Michael Judge, Ph.D, Manhattan College

Advisor: Mauricio Gonzalez, M.Sc.

Abstract: Industrial waste in the Upper New York Harbor, part of the Hudson River Estuary, is the primary cause for poor water quality. The continuous discharge of pollutants into the Harbor over many years adversely affected many of the various organisms that live in the Harbor. Despite improvement of the water quality due to waste reduction and the clean water act there is still concern that contamination may threaten marine life in the Harbor (Andrew C. Revkin, 1995). Water quality data of the New York Harbor has been collected by New York City since 1909. The data has served to help monitor the ecological health of the New York Harbor over the years. In 1909 the data shows that the levels of dissolved oxygen read as low as 2mg/L, with fluctuations between 3mg/L and 4mg/L. This remained constant all the way up to 1968. The objective of this project is to measure several parameters of water quality at various locations around Governor's Island and lower Manhattan. The measurements include standard water quality parameters (e.g. dissolved oxygen, pH, temperature, phosphates, ammonia, salinity, and nitrates); water currents; effect of rain on enterococcus (fecal bacterial), and the sustainability of water for recreational use. The goal is to acquire information to educate the public and to ensure that the water quality continues to improve, and not worsen as the region expands its industry, technology, transportation and recreational opportunities. Having two stations around Governors Island and two stations around lower Manhattan will allow for making comparisons between both groups of data.

Maisonet, Brendan B.

Project Title: Neuston Net Plastics

Mentor: Rachael Z. Miller, Founder and Executive Director for Rozalia Project

Abstract: Collecting samples off pier 101 in Governors Island, the problem: Is there a substantial amount of plastic debris off pier 101. The hypothesis is there is a lot amount of plastic debris off pier 101. I'm doing this for the unique data that will be collected since there is not any kind of it in New York City's history.

Martinez, Nicolle

Project Title: Rescued from the Brink: Eelgrass Restoration

Mentor: Stephen Schott, Cornell Cooperative Extension

Advisors: Bart Chezar, Indy Citizen Scientist & Mauricio Gonzalez, NYHS

Abstract: The planting and monitoring of Eelgrass spread, survival, and success is necessary in understanding how to better restore the declined sub aquatic vegetation. Restoring Eelgrass to the Upper New York Bay would aid in future restoration attempts, where past attempts have been few and limited. The assessment of a planting site and the monitoring of the Eelgrass are key to understanding the impacts of eelgrass to the specific area and whether or not future restoration attempts would be plausible. By planting Eelgrass that have been woven into 8" burlap circles and regularly monitoring the vegetation and the surrounding area, overall survival success can be determined. It is hypothesized that planted eelgrass in this area will survive and spread on its own via horizontal rhizomes. Since planting in 2012, the Eelgrass has survived. Quadrantal percent coverage will be used to assess the spread of the vegetation. This study will result in an assessment and determination of the plausible future restoration attempts and methods.

Ramos, Averille M.

Project Title: Paper or Plastic: Measuring Benthic Macrofauna on Baggywrinkles

Mentor: Ido Sella, PH.D, Founder and CTO of EConcrete®, Partner at SeArc – Ecological Marine Consulting

Abstract: Measuring macrofauna on natural rope baggy-wrinkle and plastic baggy-wrinkle. Plastic breaks down physically but not chemically. Plastic will always be in the ocean. This is an observational experiment that test what organisms grow better on; plastic baggy-wrinkle or manila rope baggy-wrinkle. Hopefully organisms will accumulate less on the plastic baggy-wrinkle. Plastic is smooth and may be slippery surface for organisms. Though plastic lasts longer in water, paper does less damage to the ocean. The paper baggy-wrinkle will have to be replaced multiple times compared to the plastic one because it will break down faster. With positive results the quality of the ocean can be changed for the better

Sommer, Andrew

Project Title: Marine Growth on porcelain plates

Advisor: Peter Zdrojewski

Abstract: In NYC, there are large amounts of porcelain thrown into landfills each year. Instead of wasting the porcelain, it can be used as a valuable resource for marine invertebrates to settle on. The experiment tests if light penetration will affect the growth of sessile invertebrates in the Hudson River Estuary. Porcelain tiles are placed at 5 different depths and light measurements are monitored by a sensor. It is hypothesized that the tile receiving the most light will experience the most growth and biodiversity of species at the end of the study

Wiltshire, Jelani

Project title: 7 Water Quality Parameters, a Harbor Monitoring Platform, and an Oyster Reef

Mentor: Sam Janis, New York Harbor Foundation

Advisor: Mauricio Gonzalez, M.Sc.

Abstract: Can a harbor monitoring platform be built and gather the correct data for a newly built oyster reef? A harbor monitoring system is one single place where you can gather water quality data and view what is going on down below the water using the camera. What we will use to gather data will be is YSI Inc. EVO2 Water Quality Monitoring Sonde, and, to study water currents, the SonTek water velocity sensor. The type of camera that will be used is a Wild Goose Imaging Clean Sweep. The importance of this project is to restore our water back to what it once was and restore oysters to the harbor.



THE MBRP WOULD LIKE TO THANK THE FOLLOWING PEOPLE FOR THEIR SUPPORT:

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Research Scientist, NIH

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Mr. Murray Fisher

Ms. Anne DeGennaro

Ms. Carly Shields

Ms. Angela DeRoberts

Ms. Carrie Christensen

Mr. Marc VanBreukelen

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Staff

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