

URBAN ECOLOGY  
**New York  
MARINE  
BIOLOGY**

# **4th ANNUAL NEW YORK HARBOR SCHOOL SCIENCE SYMPOSIUM**

**WEDNESDAY MAY 13, 2015**

Image Credit: [http://news.softpedia.com/news/Hudson-River-Is-Teeming-with-Antibiotic-Resistant-Bacteria-369715.shtml#sgal\\_0](http://news.softpedia.com/news/Hudson-River-Is-Teeming-with-Antibiotic-Resistant-Bacteria-369715.shtml#sgal_0)

# MARINE BIOLOGY / SCIENCE RESEARCH PROGRAM

## SCIENCE SYMPOSIUM

### PROGRAM

10:00 AM	Poster Board Set-Up in Hallways	All Marine Research Students
11:00 AM	10 <sup>th</sup> Grade Judging	Marine Research Seniors
12:00 PM	11 <sup>th</sup> and 12 <sup>th</sup> Grade Judging	Adult Volunteers
03:00 PM	Students Move Posters to Mess Hall	All Students
03:20 PM	Lunch Adults in Mess Hall	Students in 320
03:45 PM	Report to Mess Hall	All
04:00 PM	Introduction and Welcome	Kim Swanson NYHS Principal
04:00 PM	Introduction of Keynote Speaker	MC's
04:10 pm	Keynote Address	Dr. Michael Judge Biology Chair, Manhattan College
04:30 PM	Introduction of Student Speakers	MC's
04:35 PM	The Effects of Different Concrete Compositions on Benthic Organisms under an Ecodock	Tahirah Abdo NYHS, Class of 2015
04:45 PM	Rescued from the Brink: Restoration of Eelgrass <i>Zostera marina</i> to the Upper New York Bay	Nicolle Martinez NYHS, Class of 2015
04:55 PM	Awards Ceremony	Presented by Mauricio González
05:35 PM	Closing Remarks	Mauricio González & MC's
06:00 PM	Ferry Departs to Manhattan	

# MARINE BIOLOGY RESEARCH PROGRAM STUDENTS AND PROJECT TITLES

## Seniors

## Project Titles

Abdo, Tahirah	Effects of Different Concrete Compositions on Benthic Organisms under an Ecodock
Achee, Kieron	Collection of Plastic Debris within the Upper New York Bay
Anderson, Rachel	Managing a Citizen Science Program: The Harbor SEALS
Aviles, Paul Samuel	Musical Composition
Carvajal, Genesis	Geographic Information Systems
Gonzales, Jade	Geographic Information Systems
Gonzalez, Violeta	Monitoring Water Quality of Lower Hudson River Estuary around GI & Lower Manhattan
Kalogrias, Stephanos	New York Harbor Plankton
Maisonet, Brendan	McAllister Towing and Transportation (MTT)
Martinez, Nicolle	Rescued from the Brink: Restoration of Eelgrass, <i>Zostera marina</i> , to Upper New York Bay
Ramos, Averille Marquis	Paper or Plastic: Does a Baggy Wrinkle Made of Natural Fibers Attract More Macro Invertebrates than a Plastic Baggy Wrinkle?
Ramos, Orlando	How to Build and Maintain a Hydroponic System
Rosado, Bill	Hydroponics
Smith, Shawn	Music Composition
Sommer, Andrew	Invertebrate Growth on Porcelain Tiles
Wilson, Samuel	New York Harbor Plankton
Wiltshire, Jelani	Harbor Monitoring Platform

## Juniors

## Project Titles

Bates, Gabriel	Monitoring the Hudson River Sediment for Benthic Organisms
Bies, Cezanne	Oyster Restoration Genetics
Bin Khalid, Zain	Oyster Restoration Genetics
Bonanno, Raphael	The Creation of Avinter and Required Story Craft
Carrasquillo, Ivan	Determining the Amount of Plastic and Plankton in the Upper New York Bay

<b>Gilani, Mariyanna</b>	Observation of Phytoplankton in the NY Harbor
<b>Goldmansour, Luca</b>	Is Ecovative's® Mushroom Material an Effective Substitute for Styrofoam Buoys?
<b>Gutierrez, Graitchell</b>	Monitoring Invertebrates Using Cage Traps
<b>Jiminez, Marc</b>	Monitoring Atmospheric Carbon Dioxide
<b>Landet, Pierre</b>	Genotyping <i>Molgula manhattensis</i>
<b>Raimondi, Ryan</b>	Gowanus Canal Restoration Project
<b>Torres, Edgar</b>	Creating Ideal Conditions in a Recirculating System for Black Mollies
<b>Arana, Lucian</b>	
<b>Coxin-DeJesus, Tyler</b>	
<b>Domonique, Aliyah</b>	
<b>Giraldo, Maria</b>	
<b>Jordan, Evelyn</b>	
<b>Lora, Mya</b>	
<b>Montilla, Julia</b>	

## **Sophomores**

## **Project Titles**

<b>Caceres, Iraya</b>	Inside the Artificial Ecosystem
<b>Carter, Grace</b>	Operation Spineless: Sequencing the Macro Invertebrate Species within the NY Bay
<b>Conklin, Katherine:</b>	Densovirus Associated with Sea Star Wasting Disease and Mass Mortality
<b>Gathers, Mariah</b>	Artificial Fresh Water Ecosystem
<b>Isodoro, Cindy</b>	What Effect does Compost Tea Have on a Compacted Lawn?
<b>Johnson, Tateanna</b>	How to Stop Jellyfish Blooms
<b>Martinez, Jose</b>	Jellyfish are Vectors for Bacterial Disease <i>Tenacibaculosis Maritimum</i> in Salmon
<b>Morales, Joshua</b>	The Unknown Giants: Manta Rays
<b>Nieves, Aaron</b>	Maintaining a Harbor Monitoring Platform
<b>Rosin, Jared</b>	Sequencing DNA of Organisms from the New York Estuary
<b>Scott, Kaila</b>	How to Take Care of Your Aquatic Ecosystem Model as if it Were Your Child

<b>Smith, Melanie</b>	Effects of Organic Amendments on Restoration of a Disturbed Coastal Sage Scrub Habitat
<b>Tehuitzil, Luz</b>	Ovarian Cancer
<b>Valentin, Bella</b>	How to Take Care of an Aquatic Ecosystem Model
<b>Wiemer, Erik</b>	Biodiversity of Invertebrates within the Upper New York Bay
<b>Mendez, Salma</b>	

## KEYNOTE SPEAKER



**Dr. Michael Judge** is a Professor and Chairperson of Biology at Manhattan College. His professional training includes a B.S in Zoology from the University of Rhode Island, a Ph.D. in Ecology from the University of California Davis, and post-doctoral positions at Dauphin Island Sea Lab (AL) and Stony Brook University (NY). In collaboration with colleagues, he has published 17 peer-reviewed research articles on the marine ecology of near-shore invertebrates from the Atlantic, Pacific, and Gulf coasts as well as the Caribbean. Since starting at Manhattan College in 1993, Dr. Judge has been a strong proponent of undergraduate research and has sponsored 44 senior projects. His curiosity for marine biology was sparked at a young age during family vacations to the coast and from numerous Jacques Cousteau documentaries. His fondness for marine snails defies a simple explanation.

## SENIOR ABSTRACTS



### Abdo, Tahirah

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

**Mentor:** Shimrit Perkol-Finkle, Ph.D.

**Abstract:** Coastal Infrastructures are increasing in abundance as more people look to live on the water. Coastal Infrastructures are typically made out of Portland cement. Portland cement is considered detrimental to marine organisms due to the high pH and surface alkalinity. This project will be studying the effects of different types of compositions of concrete and their capability of recruiting organisms in a horizontal placement. It was hypothesized that if different innovative concrete matrices varying in composition and texture were used to test for marine life recruitment on the ecodock, it would prove to be better than Portland cement in regards to being more biodiverse. Four sets consisting of six different concrete matrices were hung horizontally under the ecodock located on pier 101 on Governors Island. Organism recruitment was quantified by using a quadrat for percent cover and by counting. Biodiversity was measured by using the Shannon Wiener Index. Matrice 5 proved to be the most biodiverse out of all the concrete types. Texture had a slightly higher recruitment rate however it was not statistically different due to the low number of replicates.

**Biography:** Since my sophomore year I have participated in the Harbor SEALS, a citizen science program. I have been on the Principal's list in New York Harbor School since my sophomore year. I plan to study Broadcast and Mass Communications in college and become a sports broadcaster.

**Hobbies:** Ice hockey and soccer.



### **Achee, Kieron C.**

**Project Title:** Collection of Plastic Debris within the Upper New York Bay

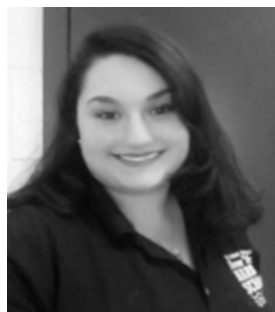
**Mentor:** Rachael Miller, co-founder of the Rozalia Project for a clean ocean

**Abstract:** Plastic debris is one of the most destructive forms of marine debris it can kill thousands of wildlife due to ingestion and can cause habitat degeneration. Most people don't realize how dangerous plastic is for the environment. So I devised a project where I collected numerous water samples to determine the plastic abundance in the New York

Harbor estuary on Governors Island's Pier 101 between January 9 and March 25, 2014. Within this experiment I checked the quantities of different plastic debris within the New York Harbor were collected using a 343 um phytoplankton net.

**Biography:** I'm currently a senior at the New York Harbor School where I am conducting a research project as well as Harbor SEALS which is a voluntary opportunity where we monitor the water quality of the Hudson River estuary. I am aspiring to become a marine biologist.

**Hobbies:** Swimming and Archery



### **Anderson, Rachel**

**Project Title:** Managing a Citizen Science Program: The Harbor SEALS

**Mentor:** Mauricio Gonzalez and Sam Janis, Urban Assembly New York Harbor School

**Abstract:** To manage the New York Harbor sea, estuary, air and land (SEALS) program, a citizen science monitoring program hosted by the Marine Biology Department of the New York Harbor School, many steps are involved. Some of the daily tasks include helping to organize the sampling equipment (YSI Probe, Dissolved Oxygen test kits, test strips)

checking in with interns to see if any assistance is required, make sure all work is being done correctly and efficiently, and assisting in setting up dates to sample and celebrate events. Project management is so important, without it there would be inaccurate data and disorganized sampling.

**Biography:** As a senior in the Marine Biology Research at the New York Harbor School, Rachel plans on continuing to study in the field of Marine Biology while attending the University of New Haven in Connecticut. Rachel has been an active member of the schools garden club going on four years this year and, during her sophomore and junior year, a member of the Harbor School swim team, the Harbor Sharks.

**Hobbies:** Knitting, swimming, archery, writing, reading, shopping and spending time with her family.



### **Aviles, Paul Samuel**

**Project Title:** Musical Composition

**Mentor:** Mauricio Gonzalez

**Abstract:** Everyone has a passion, whether it be watching paint peel or trying to be your own superhero. This project is a way of trying to be your own superhero. In musical composition you are able to say things you might not be able to particularly say in a different format. Music allows for a freer and lighter approach and can have lasting

effects on both the composer and the listener.

**Biography:** Singer Songwriter from Brooklyn, hoping to aspire to become a professional.

**Hobbies:** Singing, acting, playing guitar, longboarding, reading, open mic nights, poetry, awkward dancing, face-making.



### **Carvajal, Genesis**

**Project Title:** Geographic Information Systems

**Mentor:** Mauricio Gonzalez, New York Harbor School

**Biography:** Genesis is a Marine Biology Research student that has experience working in Hydroponics where plants are grown with water as a main resource, Ecological Succession studying the percent cover and biodiversity of microorganisms on different substrates and the Geographic Information System where it is required to learn about maps and how they can be created for the benefit of any human. She enjoys many artistic hobbies like dancing, singing, and acting; and she enjoys sports like baseball. She loves to cook and is known for shopping. She is always on the honor roll and has been on the Dean's List which is 90 average and above for 5 marking periods. She aspires to continue her education in college and Medical School to become a Neonatologist and work in the Neonatal Intensive Care Unit (Intensive Care for Infants) to help save babies in critical health.



### **Gonzales, Jade**

**Project Title:** Geographic Information Systems

**Mentor:** Mauricio Gonzalez, New York Harbor School

**Abstract:** GIS stands for Geographic information system. It's a mapping technology that allows people to study the Earth through digital models that represent the real world.

**Biography:** Future student at SUNY Oswego, majoring in zoology and psychology studies. I am a part of the Marine Biology Research program and I am a part of different clubs in the school.

**Hobbies:** Rowing, cheerleading, Harbor SEALs and part of an A Capella group called the Aquapellas.



### **Gonzalez, Violeta**

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

**Mentor:** Michael Judge, Ph.D professor and Chairperson, Biology

**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.

**Biography:** My name is Violeta Gonzalez, and I am senior in high school at the Urban Assembly New York Harbor School and a part of the Marine Biology Research Program. I am aspiring to become a veterinarian specializing in conservation medicine, and help restore tigers and polar bears back to the wild. At the Harbor School I am part of the Harbor SEALs which is a volunteer opportunity where students sample and monitor the quality of the water of the Hudson River Estuary. While at the Harbor School, I have been on Dean's list (above a 90 average) since my second semester of sophomore year. I will be studying biology and zoology at SUNY Oswego, and will later go to graduate school and study veterinary medicine.

**Hobbies:** Reading and taking care of my many pets.



### **Kalogrias, Stephanos**

**Project Title:** New York Harbor Plankton

**Mentor:** Sam Wilson, NY Harbor Foundation

**Abstract:** My Marine Biology Project is Monitoring Plankton levels in the New York estuary by Monitoring Plankton, a very common bio indicator, we can assess changing levels of certain variables in the estuary and what it means for the safety of life in the estuary, and life on the estuary.

**Biography:** My Name is Stefanos Kalogrias I attend the New York Harbor School. Some of my academic achievements in harbor school include scoring above a 90 on every science regent's exam, achieving a college readiness in mathematics certificate and coming in 2nd in the school symposium in the year 2013.



### **Maisonet, Brendan**

**Project Title:** McAllister Towing and Transportation (MTT)

**Mentor:** Andrew McAllister, VP/CIO of MTT

**Abstract:** I applied for an internship named Scholars at Work through work-based learning. There I got paired up with McAllister tug boat company and started work the last week of February. I work Monday through Friday from 1 o'clock to 4 o'clock. I had all my classes rescheduled in order to leave by mid-day and still graduate on time. At first there was a

problem fitting all my classes in that time frame. As a result rowing substituted as my gym class.

**Biography:** I've been on the rowing team for 3 years. I was also on the football team. I like to play numerous instruments during my free time.

**Hobbies:** Photography and just going on adventures



### **Martinez, Nicolle**

**Project Title:** Rescued from the Brink: Restoration of Eelgrass, *Zostera marina*, to the Upper New York Bay

**Mentor:** Stephen Schott, Cornell Southold Extension

**Abstract:** Eelgrass populations have declined since the 1930's from the coasts of Japan, North America, and Europe and has since failed to fully return (Muehlstein, 1989). This declination affected bivalve, mollusk, and waterfowl populations as well as negatively



impacted the fishery industry based around it, which made human intervention necessary (Muehlstein, 1989). Eelgrass was planted in Pier 5 in Sunset, Brooklyn by being woven into 8" burlap circles. Each trial has consisted of approximately 20 tortillas set into clusters of 3, with 10-12 blades of eelgrass woven through each one, with eelgrass being planted every 3-4 months. Surviving eelgrass is currently being monitored using a quadrat to determine percent coverage over time, which will give insight into the growth, spread, or declination of the vegetation. By assessing the percent coverage, visually interpreting the overall health of planted eelgrass, and measuring chemical and physical parameters of the water, relationships between the eelgrass and its surroundings were determined. With water quality remaining relatively cyclic through the seasons, the eelgrass has survived thus far. The Pier 5 site has been determined as suitable for the survival and spread of transplanted eelgrass. Having gone from 38.5% coverage to 29.5% coverage over a 9 month period, the eelgrass restoration is a success, with success being defined as a percent coverage of at least 20% over a 2 month period. This project and its findings will serve as a baseline for methods and reference for future eelgrass restoration projects in the Upper New York Bay and areas like it.

**Biography:** Marine Biology Student Researcher, 1st Place Environmental Science project in the 2015 NYCSEF finals, NOAA Taking the Pulse of the Planet Award recipient, RICOH 2015 Sustainable development award recipient, Regional Water Prize Award recipient, prospective student of Columbia University, 2015 Wangari Maathai Award recipient, and Gates Millennium finalist. A Capella singer. Political activist and public speaker working towards civil empowerment for environmentally friendly policies and civil legislature changes.

**Hobbies:** A Capella, Netflix binge-watching, impromptu science presenting.



### **Ramos, Averille Marquis**

**Project Title:** Paper or Plastic: Does a baggy wrinkle made of natural fibers attract more macro invertebrates than a plastic baggy wrinkle?

**Mentor:** Dr. Ido Sella, Econcrete Co.

**Abstract:** Macrofauna attract larger organisms which in turn helps build a healthy and functional ecosystem and provide food for people. Macrofauna are organisms that are small but can still be seen with the eye. While more development is occurring on water fronts, there is less room for these sessile aquatic fauna to attach themselves. Baggy-

wrinkles can solve that problem. Traditionally they are used for sail boats but with their fuzzy texture, they provide lots of nooks and crannies for organisms to live. Plastic, though it does last a considerable amount of years in the water, will never chemically decay. There will always be that one microscopic piece. This project measures the effectiveness of a plastic baggy-wrinkle against hemp baggy-wrinkle. Over a course of several months more aquatic macrofauna did collect on the hemp baggy-wrinkle but it eventually sank due to unaccounted and unforeseen factors.

**Biography:** A young unconventional lad with many skills such as photography, woodwork, using Microsoft, presenting, measuring water quality, drawing, playing guitar, and immediately taking a leadership role when it is absent, Averille is taking one year off before going to college to ponder what he'll do for the rest of his life. With a mindset to preform every task 100% completing every detail, his high school career reveals wonderful accomplishments which include the youngest intern at The Nature Conservancy, an internship to Germany with American Field Service, and Participating in a United Nations Conference about the future of C.T.E. in schools. Extracurricular activities include measuring water quality for the E.P.A., team captain of dragon style kung-Fu and lion dancing team, freshmen advisor, Senior Patrol Leader, and a Docent and volunteer at the South Street Seaport Museum. He has a greed for knowledge and more can be said but to describe one-self is as to bite your own teeth.

**Hobbies:** Playing guitar, skate-boarding, photography, presenting, reading and helping others.



## Ramos, Orlando

**Project Title:** How to build and maintain a Hydroponic System?

**Mentor:** Angela Dee Roberts

**Abstract:** Lighting in a hydroponic system is crucial for the development of plants. Without lighting there are no plants. Whether be is an artificial light bulb or natural sunlight through a window in a greenhouse. Without lighting you aren't growing anything. Water and nutrients are just one part to grow plants, lighting is by far the most important.

Hydroponics is when plants are grown in water without soil. The water acts as the soil having all the necessary nutrients in the water. It's a recirculating system by there being a tub of water that has the nutrients already inside. The water is pumped into the system and into the pipes where the plants are being grown. The water then comes back down into the tub where it can be reused. No other water is needed. The plants that are going to grow are tomatoes and Basil plants. Short term plants such as basil usually thrive in hydroponic growing. Tomatoes on the other hand are a long term plants and will be more of a challenge to grow. Growing hydroponically instead of traditionally to me is better. Our world is becoming more reliable on nuclear power so soon our soil will have nuclear waste in it then that will be getting in our food source. With hydroponics anyone can do build a system in their own homes and give themselves their own food without having to worry about bugs killing their plants because they can have those plants growing safely in their home.

**Biography:** Recently accepted to St. John's University. Captain of championship school football team. Pursuing a career in History to teach students.

**Hobbies:** Playing video games, spending time with family, reading, writing stories, and listening to the Red Hot Chili Peppers, Metallica, The Offspring, Linkin' Park, and many more great bands.



## Rosado, Bill

**Abstract:** My name is Bill and I am a senior student of the marine biology research program. The topic of my presentation will be on hydroponics which is being able to grow plants without the usual soil, water, and sunlight, but more specifically on 6 different types of hydroponic systems. In the future I would like to have another student not only continue on what I have worked on but create other hydroponics model.



## Smith, Shawn

**Project Title:** Music Composition

**Abstract:** The Music Composition project consists of two musicians working to perfect the sound of the Folk Genre. Since teaming up after discovering each other's abilities, Sam and SHVWN have been working on various folk songs. Sam writes lyrics and plays guitar while SHVWN plays the piano and composes the songs together in order to create audio files.

**Biography:** Shawn is a Marine Biology Research student who has been playing the piano since the age of 7. He DJs at parties and creates Electronic Dance Music using Ableton Live 9 Suite and FL Studio.

**Hobbies:** Being outdoors



## **Sommer, Andrew**

**Project Title:** Invertebrate Growth on Porcelain Tiles

**Mentor:** Peter Zdrojewski

**Abstract:** Porcelain is a common building material and is often thrown away, forgotten, and sent to landfills. 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. After measuring percent cover and finding the calculating biodiversity using Hill's index, it was determined it was determined that there is a correlation between light intensity and biodiversity. Tiles receiving more light have generally had more biodiversity than tiles experiencing less light penetration.

**Biography:** My name is Andrew Sommer, and I am a senior at the New York Harbor School. Currently, I am researching if porcelain tiles can be used as a viable substrate for invertebrates to settle on. I am in the Marine Biology Research Program at the New York Harbor School and work as a data manager in the Harbor SEALS. Some of my fondest memories of the marine biology program include presenting at conferences such as the Omega Conference and the Northeast Aquaculture Conference. In the past years, I have also participated in clubs such as soccer and a composting internship. And, in the summer of 2013, I attended The Island School where I learned about coral reef ecology and food systems. I am on track to graduate from the Harbor School as Valedictorian. In college, I plan to major in biology with a strong emphasis on research and applied mathematics. My long term career goal is to research diseases and microorganisms in the field of either immunology or pathology.

**Hobbies:** Cooking, Soccer



## **Wilson, Samuel**

**Project Title:** New York Harbor Plankton

**Mentor:** Mauricio Gonzalez

**Abstract:** This research is new to the New York Harbor and has only been seen with a couple other organizations, "River Project" and the "Bio Bus" working with Columbia University. Our goals for this project are to see a correlation between species, variety, and density of plankton, Zoo and Phyto, with climate/seasonal changes. Our belief is that there

is in fact a correlation between climate changes a plankton. Plankton are bio-indicators of how healthy a body of water is. In the long run this data could be used to help make the New York Harbor healthier along with the organisms that live in and around it. To reach an official conclusion on this type of research you'd have to conduct it for years and years. We only had about 2 years. So our data can help contribute to further research that one may begin later on.

**Biography:** I started NYHS as an insecure and shy boy. It proved to be a difficult task to adapt to this new school environment. Eventually I learned about the Marine Biography Research Program and I was able to make new friends and pursue my hopes of becoming a marine biologist. Now that I'm finishing up my project I no longer want to pursue marine biology. Instead I want to pursue wildlife biology, due to work experiences over my summer with the Nature Conservancy. I have learned so much over the past 3 years at MBRP. I did water quality, AEM monitoring, hydroponics and a 2 year independent research project. I have successfully worked for the Nature Conservancy and have participated in several science fairs and symposiums. I am going to go to college in upstate New York. There I hope that I can take what I have learned and become successful in whatever field I go on to pursue.



## **Wiltshire, Jelani**

**Project Title:** Harbor Monitoring Platform

**Mentor:** Sam Janis, NYHS and Richard G. Copenhaver (Field Services Engineer)

**Abstract:** Water is a very important substance in our lives and has been for a very long time. Oysters have historically been an important organism in the harbor and have become rarer in more recent years. This project is attempting to help restore the harbor to what it once was with a harbor monitoring platform. A harbor monitoring platform is one single place where you can gather water quality data and view what is going on down below the water using the camera. The goal of this project is to support the restoration of our water to what it once was in order to generate oysters the harbor. With the placement of additional live oysters in the select locations in the harbor.

**Biography:** I attend the New York Harbor School as a senior in the marine biology research program, my project consists of building a harbor monitoring platform and placing it in an oyster reef. While at Harbor School I have been involved in many activities, including the sailing team, music club, and presenting at the Omega Conference. I've also sung in the choir at my church. I look forward to graduating high school and moving on to college and continuing my education.

**Hobbies:** Sports, music, comedy, working in the lab, making people laugh, watching movies, computer tweaking and video games.

## **JUNIOR ABSTRACTS**

### **Bates, Gabriel**

**Project Title:** Monitoring the Hudson River Sediment for Benthic Organisms

**Abstract:** What can the benthos tell us about the Hudson River? To understand this we must first understand what the benthos is. The benthic layer is the sediment at the bottom of any body of water while the benthos is the organisms living on top and within of that sediment. Consisting of a vast amount of microorganisms which are affected by even the slightest change in the environment, these benthic organisms can potentially be used to determine the health of the Hudson River. The benthic organisms of the Hudson River will be observed by taking sediment samples from the benthic sediment with use of the Ekman grab.

### **Bies, Cezanne**

**Project title:** Oyster Restoration Genetics

**Mentor:** Prof. Matt Hare

**Advisors:** Mauricio Gonzalez, Sam Janis, Pete Malinowski

**Abstract:** Bacterial contamination, over harvesting, pollution, and sewage overflows have depleted the Eastern Oyster population. Many restoration projects are using wild and cultured oysters to replenish the decreasing numbers, however, do not have enough scientific data comparing the survivorship and genome between wild and cultured Eastern Oysters. The idea behind this project is to genetically compare the second generation's fitness and growth of cultured and native Eastern Oysters (*Crassostrea virginica*). We predict the survivorship of the oysters in the cage should follow a descending asymptote.

## **Bin Khalid, Zain**

**Project title:** Oyster Restoration Genetics

**Mentor:** Prof. Matt Hare

**Advisors:** Mauricio Gonzalez, Sam Janis, Pete Malinowski

**Abstract:** Bacterial contamination, over harvesting, pollution, and sewage overflows have depleted the Eastern Oyster population. Many restoration projects are using wild and cultured oysters to replenish the decreasing numbers, however, do not have enough scientific data comparing the survivorship and genome between wild and cultured Eastern Oysters. The idea behind this project is to genetically compare the second generation's fitness and growth of cultured and native Eastern Oysters (*Crassostrea virginica*). We predict the survivorship of the oysters in the cage should follow a descending asymptote.

## **Bonanno, Raphael**

**Project title:** The Creation of Avinter and Required Story Craft

**Abstract:** As an alternative to a standard project, which I discovered was not within my aptitude range, I was given permission to develop and structure a personal project of mine, which was a high fantasy genre story in the world of Avinter. Avinter was a very good demonstration of my skills and capabilities as in order to complete it I had undergone research and practice advanced techniques in story craft that most other aspiring authors train for long periods of time to accomplish, and combined several artistic and aesthetic elements into the story, another skill of mine. By the end of the year, it was my goal to complete a basic outline of the plot and its characters, which I am proud to say I have completed.

## **Carasquillo, Ivan**

**Project title:** Determining the Amount of Plastic and Plankton in the Upper New York Bay

**Advisor:** Mauricio Gonzalez, NYHS

**Mentor:** Kieron Achee, NYHS Senior

**Abstract:** Pollution is a worldwide problem that affects people as well as animals. Plastics ending up in a variety of water bodies is an example of pollution. Plastics break down into smaller pieces but do not fully decompose like organic matter does, which poses a threat to filter feeding organisms that cannot distinguish the difference between their natural food, plankton, and the pollutant, plastic. By collecting samples of the Upper New York Bay water, we can determine the amount plastic particles there are compared to plankton and see if it is a safe place for filter feeding organisms to live in. From the data required, there was evidence that in North Pacific Central Gyre the abundance of plankton was greater than that of plastic but the mass of plastic was greater than that of plankton.

## **Gilani, Mariyanna**

**Project title:** Observation of Phytoplankton in the NY Harbor

**Mentor:** Mauricio Gonzalez, Marine Biologist, NYHS

**Abstract:** There are tens of thousands of plankton in the world and a lot of them haven't been discovered. For my project I collect samples of plankton and observe and identify them. Phytoplankton are very important for the world, they provide almost 50% of the Earth's oxygen. I feel proud to be able to observe such an important species and be able to find undiscovered ones. Some I have found include diatoms, rotifers, and copepods.

## Goldmansour, Luca

**Project title:** Is Ecovative's© Mushroom Material an Effective Substitute for Styrofoam Buoys?

**Mentor:** Sue Van Hooke, Chief Mycologist at Ecovative©

**Abstract:** Using mycelium, which is the vegetative growth of fungus, as well as corn husk, Ecovative Design® has developed a biodegradable substance meant as an ecologically friendly substitute for Styrofoam. Styrofoam has been proven to be a large portion of the widespread plastic litter throughout the northwestern Atlantic Ocean (Colton, Knapp, & Burns, *et al.* 1974). Reducing the concentration of Styrofoam being polluted into world's oceans, through the utilization of the mushroom material (M.M.), would begin to relieve the stress of a great ecological burden. One specific intended use of the mushroom material is to replace Styrofoam fishing buoys. This study determined the water quality effects of the M.M., as Ecovative© would be ineffective in its aim of benefiting the marine environment if the M.M. causes certain water quality parameters to exceed or fall below certain established tolerance levels. Specifically, this projects goal was to determine the M.M.'s effects on pH, temperature, salinity, and dissolved oxygen.

## Gutierrez, Graitchell

**Project title:** Monitoring Invertebrates Using Cage Traps

**Mentor:** Mollie Thurman, Instructor at the BioBase/BioBus

**Abstract:** The Hudson River estuary is home to over 150 species that are listed as either threatened, endangered, or of special concern in New York State. Some of these invertebrates include chironomid midges, oligochaete worms, hydroids, gastropods, and amphipods. Monitoring the invertebrates within the Hudson River estuary allows us to have a rough estimate of the current environmental stresses affecting the estuary. This also allows us to have a better understanding of what materials should be used when building within the estuary to help keep invertebrate populations stable. This project will allow a better understanding of the estuary's health, the populations within the estuary and also allow us to understanding which materials are best for the estuary.

## Jimenez, Marc

**Project title:** Monitoring Atmospheric Carbon Dioxide

**Abstract:** Over the years, the amount of Carbon dioxide concentration in the atmosphere has increased. This increase of Carbon dioxide causes the rise in Earth's overall temperature, and that would result in damage on a global scale. People constantly hear that the amount of the rise in greenhouse gasses and that's how this project fits into this subject. In this observational project the purpose is to witness the constant rise in carbon dioxide and by taking samples from 2 different locations on Governors Island. This project will try figure out the difference in CO2 when factors like elevation and wind come into play. By taking samples from the center of Governors Island and near the estuary, we can determine that the concentration of CO2 in the center would be higher, the expected outcome.

## Landet, Pierre

**Project title:** Genotyping *Molgula manhattensis*

**Mentor:** Alberto Stolfi

**Advisor:** Mauricio Gonzalez

**Abstract:** One of the major ascidian species in the New York Harbor is *Molgula manhattensis*. *M.manhattensis* was first classified in 1843 by James Ellsworth De Kay, an american zoologist. What we do know about it is that it is native to the Eastern Seaboard and Gulf of Mexico, and has been introduced to coastlines around the world including: Eastern North Atlantic, Pacific and Australia. It inhabits brackish and marine waters up to 90m in depth and is usually attached to hard surfaces; natural or manmade. *Molgula manhattensis* is in the class Ascidiacea and they're are interesting to study because they are a very simple form which have changed little since they first appeared more than 500 million years ago. Knowing the genome sequence would help us understand how it lives and what makes it different from other species of *Molgula* are important to study because they are abundant, and have such a large role in the ecosystem. Research on other species have led to some intriguing data, such as what they reveal about the environment. In addition *Molgula* make good test subjects for evolution research because of the genetic variety between species. Samples of *M.manhattensis* have been collected from the waters of New York Harbor and stored in tanks at New York University. Our goal is to successfully sequence the genomic DNA of *M.manhattensis* to confirm that it is indeed its own species. The data collected will be used in addition for additional research and study.

## Raimondi, Ryan

**Project title:** Gowanus Canal Restoration Project

**Mentor:** Eymund Diegel- Gowanus Canal- Forensic Hydrologist

**Advisor:** Mauricio Gonzalez

**Abstract:** Will the Gowanus Canal show any forms of improvement by means of what results will be given? The Canal has been infamously renowned for enormous concentration of pollutants that dwell within the greenish murky depths. But, what will the health of the canal be over the course of carefully monitoring it over two years? The data collected so far will depict conditions of the man-made river, and how other issues may be resolved in the greater future. This will benefit the human society around it by improving the canal for recreational use and using it for future housing alongside it. Thus, monthly testing shall be done in order to obtain a better understanding of the many factors that affect the canal. The chemical parameters will be at a very unhealthy state (in regards to basic parameters) and the water itself will have data below normal rates. Nonetheless, there may be little change that will occur throughout my tests due to the many poisons, oil, and sewage that make the water unbearable to support any form of existence. However, the primary question is how will progress over a simple two year cycle prior to the research project?

## Torres, Edgar

**Project title:** Creating the Ideal Conditions in a Recirculating System to allow Black Mollies to Grow, Reproduce and Live Healthy

**Mentor:** Alberto Stolfi

**Advisor:** Mauricio Gonzalez

**Abstract:** Creating the ideal conditions in a recirculating system is the first step of many to allow short tail Mollies to grow, reproduce, and live healthy. The fish that are being used in this experiment are one of the few fish that are very tolerant to the surrounding waters they are in. Capable of handling the stress of changing water conditions within their environment, this is why they are good type of fish to work with when dealing with trials of errors and success. The Recirculating system is a machine that recycles the water being used in it, having been used to grow fish as well as plants in many places. They are great to use and easy to handle, so by combining the two I wish to create the conditions black mollies need to live in and then learn to move on to other fishes and see how that performs.

# THE MARINE BIOLOGY RESEARCH PROGRAM WOULD LIKE TO THANK THE FOLLOWING PEOPLE FOR THEIR SUPPORT:

## ***NYHS Parent/Teacher Association***

Ms. Adrienne Ferenczy  
Ms. Celia Baruchin and Ms. Siri Kagan  
Ms. Anna Lucena  
Ms. Paulette Roberts  
Ms. Nerissa Alvarez  
Mr. Ray Campbell

President PTA  
Co-Presidents PTA  
Secretary, PTA  
Treasurer  
Senior Parent at-Large  
Freshman Parent at-Large

## ***NYHS Administrators + Support Staff***

Ms. Kimberly Swanson  
Mr. Derek Premo  
Ms. Modesta Peralta  
Ms. Nellie Garrow-Coleman  
Ms. Cadian Leys  
Ms. Pam Edwards  
Mr. Bev Means  
Mr. Marlon Scott

High School Principal  
Assistant Principal  
Assistant Principal  
Social Worker  
Principal's Secretary  
School Aide  
School Aide  
School Aide

## ***New York Harbor Foundation***

Mr. Murray Fisher  
Mr. Matthew Haiken  
Ms. Robina Taliaferrow  
Mr. Sam Janis

President and Founder  
Administrative Officer  
Business Manager  
Restoration Program Manager

## ***Guest Speaker***

Dr. Michael Judge

Manhattan College Professor and Dept. Chair

## ***Volunteers and Judges***

Ms. Nerissa Alvarez  
Mr. David Anderson  
Ms. Gail Averill  
Mr. Nick Bandouveris  
Ms. Celia Baruchin  
Mr. Ed Carter  
Ms. Theresa Case  
Captain Jim Chambers  
Ms. Alice Chiu  
Ms. Marissa Dedominicis  
Ms. Angela DeRoberts  
Ms. Janice Derow  
Mr. William Echavarria  
Ms. Susan Farmer  
Mr. Murray Fisher  
Ms. Cate Hagarty  
Mr. Matt Haiken  
Mr. Jim Hall  
Mr. Sam Janis  
Ms. Madeline Jaye

Guardian  
Guardian  
Family  
Guardian  
Guardian  
Guardian  
Guardian  
PAC  
Guardian  
PAC  
PAC  
Guardian  
St. Francis College  
Staff  
Harbor Foundation  
Staff  
Harbor Foundation  
PAC  
Harbor Foundation  
Guardian



Ms. Alison Kerney  
Ms. Anna Lucena  
Mr. Jeremy Lynch  
Ms. Anita Morawski  
Dr. Kathy Nolan's Undergrad Students  
NYHS MBRP Alumni  
Mr. Derek Premo  
Ms. Jen Primosch  
Ms. Theresa Smith- Deverteuil  
Dr. Alberto Stolfi  
Ms. Keisha Sullivan  
Ms. Kim Swanson

Guardian  
Guardian  
Staff  
Guardian  
Volunteers  
Volunteers  
Assistant Principal  
Staff  
Guardian  
PAC  
Guardian  
Principal

### ***Mentors/Advisors***

Mr. Bart Chezar  
Ms. Marissa Dedominicis  
Ms. Angela DeRoberts  
Dr. Matthew Hare  
Mr. Sam Janis  
Dr. Michael Judge  
Mr. Matthew Leahey  
Ms. Andrea Lieske  
Ms. Rachel Miller  
Dr. Shimrit Perkol-Finkel  
Dr. Ido Sella  
Mr. Steven Schott  
Dr. Alberto Stolfi  
Dr. Sue Van Hooke  
Mr. Peter Zdrojewski

Indy Citizen Scientist  
Earth Matter  
PAC  
Cornell University  
New York Harbor Foundation  
Manhattan College  
SeaSavers Inc.  
Earth Matter  
Rozalia Project  
SeaARC  
SeaARC  
Cornell Extension  
New York University  
Ecovative©  
Island School

Thank you to the entire Urban Assembly New York Harbor School  
for its help and patience throughout the year!

**S**pecial thanks to our families for all the love and support they provide us each and every day.

