THE URBAN ASSEMBLY
New York
HARBOR
SCHOOL

9周年，1个线上NYHS海洋科学研讨会，6月17日

9 ANNUAL, 1 VIRTUAL NYHS MARINE SCIENCE SYMPOSIUM, JUNE 17

Etching by Anonymous & Kubrick, Standley, dir. 2001: A Space Odyssey. Writ. Arthur C. Clarke. Metro Goldwyn-Mayer (MGM), 1968. Film. 2 Dec 2013.

MARINE BIOLOGY
SCIENCE RESEARCH PROGRAM
JUNE 17, 2020

ART EDITING BY MAURICIO GONZALEZ (TRANSLATION TO CANTONESE, LESLIE CHOW)

Program

09:00 AM	EMAILS SENT WITH BREAK OUT ROOM LINKS (COCCOLITHOPHORA CHECK-IN "LOUNGE")	ALL PARTICIPANTS
09:15 AM	SCHOLARS MEET IN COCCOLITHOPHORA CHECK-IN LOUNGE	MARINE RESEARCH SCHOLARS
09:45 AM	SCHOLARS PREPARE TO PRESENT IN THEIR ASSIGNED BREAK OUT ROOMS	MARINE RESEARCH SCHOLARS
10:00 AM	JUDGES MEET IN COCCOLITHOPHORA CHECK-IN LOUNGE	ADULT VOLUNTEERS
10:15 AM	JUDGES ENTER BREAK OUT ROOMS AND JUDGING BEGINS	ALL
12:00 PM	BREAK	ALL
01:30 PM	REPORT TO ORCINUS ORCA LOUNGE	ALL
01:40 PM	INTRODUCTION AND WELCOME TO AWARDS CEREMONY	DR. JEFFREY CHETIRKO, PRINCIPAL & JONAH FLORHOLMEN-BOUMAN
01:45 PM	ALUMNUS KEYNOTE ADDRESS	GRACE CARTER, BARD
02:00 PM	INDUSTRY KEYNOTE ADDRESS	HEATHER EISENLORD, J.D., PARTNER AT RPCK
02:25 PM	SENIOR SCHOLAR PRESENTATIONS	MC
02:26 PM	THE EFFECTS OF PLANT-GROWTH-PROMOTING BACTERIA ON THE AQUATIC PLANT VALLISNERIA	JONAH FLORHOLMEN-BOUMAN, SENIOR DATA ANALYST
02:45 PM	MAKING OF AN ECOSYSTEM	RANDY MAHARAJ, SENIOR LAB TECHNICIAN
02:55 PM	ANVIL USE IN THE BOREAL WRASSES TAUTOGA ONITIS AND TAUTOGOLABRUS ADSPERSUS	QUINN LAVELLE
03:05 PM	ANALYZING THE GLOBAL DISTRIBUTION OF SIPHONOPHORES	GEORGE DESJARLAIS, DATA ANALYST CAPTAIN
03:15 PM	AWARDS CEREMONY	MAURICIO GONZÁLEZ
03:20 PM	CLOSING REMARKS	MAURICIO GONZÁLEZ & MCS
03:25 PM	VIRTUAL DEPARTURE TO REALITY	

Marine Biology Research Program

SENIORS	PROJECT TITLES
DESTINY COLEY	LENS OF HARMFUL DEBRIS
GEORGE DESJARLAIS	ANALYZING THE GLOBAL DISTRIBUTION OF SIPHONOPHORES
MADELAINE DOMINGUEZ	CHANGES IN COMMUNICATION WITH FAMILY DURING A PANDEMIC
JONAH FLORHOLMEN-BOUMAN	THE EFFECTS OF PLANT-GROWTH-PROMOTING BACTERIA ON THE AQUATIC PLANT VALLISNERIA
MALIK FORD	MONITORING MICROPLASTICS ENTERING NYC WATERWAYS VIA RUNOFF
DYLAN HOM CONSTABLE	DETERMINING DISEASE RATES OF MSX AND DERMO IN RESTORED OYSTERS AND PROJECTING IMPACTS OF CLIMATE CHANGE
ISABELLA KARSCH	ART AND COVID-19
QUINN LAVELLE	ANVIL USE IN THE BOREAL WRASSES TAUTOGA ONITIS AND TAUTOGOLABRUS ADSPERSUS
SUSAN LOOK	EFFECTS OF COVID ON CRIME
RANDY MAHARAJ	MAKING OF AN ECOSYSTEM
BRIAN MEJIA	REMOTELY OPERATED VEHICLE ASSISTANCE IN MEASURING WATER QUALITY IN THE NEW YORK HARBOR
LISSETTE MEJIA	HOW DO MICROBEADS AFFECT OYSTERS' (CRASSOSTREA VIRGINICA) HEALTH AND FEEDING RATE?
JACQUELINE OBERMAYER	THE SURVIVAL OF CRASSOSTREA VIRGINICA ON ECONCRETE DISCS IN LEMON CREEK LAGOON
SUNITA PEARSON-SIEGEL	THE EXTRACTION OF MICROPLASTICS FROM THE SEDIMENT OF NEW YORK HARBOR
SHANYALEE RODRIGUEZ	COMPARING PLASTIC AND COCONUT FIBER BAGS FOR OYSTER CONSERVATION IN THE NEW YORK HARBOR
TYLER SCOTT-SIMPSON	POWER AND POLITICS IN THE WORLD OF COVID-19
JOHN QUENTIN SEERY	MANAGING PRIVATE SPACE & TIME DURING A PANDEMIC

RONNIE WARREN	WHY KEEPING A MEDO AIR PUMP IS IMPORTANT FOR AQUATIC ECOSYSTEMS

JUNIORS	**PROJECT TITLES**
GIDEON BROWN	ORIGINS OF COVID-19
KARLA CORTES	WOOD BIOMASS WITH GEOSPATIAL TECHNOLOGY
GABRIEL CASTRO	HOW CAN GEOSPATIAL TECHNOLOGY BE BENEFICIAL FOR CONSERVATION TECHNOLOGY
PROPHET DAVISON	THE EFFECTS TEXTILE DYES HAVE ON OUR ESTUARIES AND HOW OYSTERS CAN HELP
MAX FELDMAN	EFFECTS OF SUPERSTORM SANDY ON THE GENETIC DIVERSITY OF KILLIFISH IN THE NEW YORK HARBOR
PENELOPE FERNANDEZ	AMERICA'S ECONOMIC SYSTEM HAS BEEN GREATLY AFFECTED BY COVID-19
OLIVER LIEBER	FINDING THE LOCATIONS OF EAGLE NESTS IN CHATHAM COUNTY
EMILY LYSAKOVA	THE EFFECTS OF BORROW PITS ON THE ABUNDANCE OF BENTHIC FAUNA IN THE LOWER NEW YORK BAY
JASMINE MENDOZA	THE EFFECTS OF ELEVATED TEMPERATURE AND GLYPHOSATE ON DIATOM MORPHOLOGY
SARA MEZZOLI	HOW LONG WILL THE SEA LIONS TAKE TO OPEN THE PUZZLE-FEEDER?
KATHERINE MUMFORD	THE EFFECTS OF GLYPHOSATE ON PHYTOPLANKTON AND MACROALGAL COMMUNITIES IN CONNECTION TO EVOLUTIONARY RELATIONSHIPS
DAKOTA ROGERS	HOW ARE BACTERIAL AEROSOLS FROM NEW YORK URBAN AND URBAN COASTAL COMMUNITIES AFFECTING OUR HEALTH?
DAYANARA SANCHEZ	HOW DOES SEAFLOOR SOUNDS EFFECT THE SETTLEMENT RATE OF EASTERN OYSTERS (CRASSOSTREA VIRGINICA)
EMILY SHI	SPECIAL CASE STUDY: WUHAN, CHINA
LUKE SAMTON	OBSERVING PHYTOPLANKTON CONCENTRATION AND DIVERSITY IN THE HUDSON RIVER OFF YANKEE PIER GOVENORS ISLAND

PEDRO VIEIRA COSTA	USING GEOSPATIAL TECHNOLOGY FOR BIOMASS POTENTIAL
AIYANNA AVERY	
JUSTIN JAQUEZ	
DANIEL PICARELLO	

SOPHOMORES	**PROJECT TITLES**
JAYDA ALCOTT	EFFECTS OF COVID ON THE USE OF DISPOSABLE ITEMS
YIORGOS ALEXANDROU	CHORES AND ROUTINES DURING A PANDEMIC
MATTHEW AVILES	IMPACTS OF COVID ON THE PLANETARY ENVIRONMENT
MAYA BLAKE	SUMMARY ON: A SURVEY OF FISH DIVERSITY AND WATER QUALITY ON RANDALL'S ISLAND
CHELSEA CLARKE	THE EFFECT OF COVID-19 ON THE AIR QUALITY IN THE UNITED STATES
HEAVENLY DAVIS	SUMMARY ON: INTERACTIONS BETWEEN NATIVE BARNACLES, NON-NATIVE BARNACLES, AND THE EASTERN OYSTER CRASSOSTREA VIRGINICA
MIMI KATZ	SUMMARY ON: MICROPLASTICS PROFILE ALONG THE RHINE RIVER
GRACE LOWERY	HOW DO JAPANESE ALGAE EATING SHRIMP AFFECT THE AMOUNT OF PITHOPHORA ALGAE IN AN AEM?
JOSHUA MALDONADO	HOW CAN COVID-19 BE TREATED AND CONTAINED?
AELISH MULLANEY	SUMMARY ON: EYE-INDEPENDENT, L.A.C.E. AND EXPRESSION OF PHOTOTRANSDUCTION GENES IN THE SKIN OF OCTOPUS BIMACULOIDES
MADELINE NOVATT	SUMMARY OF PHYTOPLANKTON RESPONSE TO POLYSTYRENE MICROPLASTICS: PERSPECTIVE FROM AN ENTIRE GROWTH PERIOD
GIOVANNI NUNEZ	COMPARING COVID-19 WITH THE FLU VIRUS
NICK PABOTOY	EFFECTS OF GLOBALIZATION ON PANDEMICS
MARIFER SANCHEZ	SUMMARY ON: EVIDENCE OF POLYETHYLENE BIODEGRADTION BY BACTERIAL STRAINS FROM THE GUTS OF PLASTIC-EATING WAXWORMS

BRYANT SORIANO	GENETIC ENGINEERING OF VIRUSES AND POTENTIAL FOR BIOLOGICAL WARFARE
JAYLA WASHINGTON	SUMMARY ON: EFFECTS OF ACIDIC WATER IN COMBINATION WITH ALUMINUM ON SWIMMING BEHAVIOR AND SURVIVAL OF YOLK-SAC LARVAE IN GOLDFISH
FAITH YEE	PATTERNS RESULTING IN THE GEOGRAPHICAL DISTRIBUTION OF COVID-19
NICHOLAS DILELLA	
GREGORY BOWDEN	
KARINA DEOLARTE	
NYLE KAPOOR	
SARAH KRAVSKY	
CEMIYRA TORRES	

Industry Keynote Speaker

HEATHER EISENLORD

ATTORNEY
PARTNER, RPCK RASTEGAR PANCHAL

TITLE UNEXPECTED CAREER PATHS TOWARD ENVIRONMENTAL ACTIVISM AND INNOVATION

HEATHER IS A PARTNER IN THE NEW YORK OFFICE OF RPCK RASTEGAR PANCHAL, A BOUTIQUE CORPORATE LAW FIRM THAT BRINGS A DEEP UNDERSTANDING OF IMPACT INVESTING TO COMPLEX COMMERCIAL TRANSACTIONS. HEATHER REPRESENTS ENTREPRENEURS WHO BRING INNOVATIVE PRODUCTS AND SERVICES TO THE MARKET TO SUPPORT POSITIVE SOCIAL AND ENVIRONMENTAL CHANGE, AS WELL AS THE INVESTORS WHO FINANCE THOSE INNOVATIONS. SHE HAS REPRESENTED CLIENTS WORKING IN A NUMBER OF INTERSECTING FIELDS, INCLUDING CLEAN OCEANS, RENEWABLE ENERGY, CLEAN TECHNOLOGY, PUBLIC HEALTH, AFFORDABLE HOUSING, MICROFINANCE, AND SUSTAINABLE AGRIBUSINESS.

BEFORE JOINING RPCK, HEATHER WAS THE DIRECTOR FOR INCLUSIVE DEVELOPMENT AT THE INTERNATIONAL SENIOR LAWYERS PROJECT (ISLP). AT ISLP, SHE BUILT AND RAN HUMAN RIGHTS PROJECTS GLOBALLY, WITH A PARTICULAR FOCUS ON KENYA, LIBERIA, MYANMAR, PAPUA NEW GUINEA, BOLIVIA, ECUADOR, AND PERU. THROUGH THOSE PROJECTS, SHE AND HER TEAM USED LEGAL TOOLS AND STRATEGIES TO PROTECT INDIGENOUS AND OTHER HIGHLY MARGINALIZED COMMUNITIES FROM THE POTENTIAL LIFE, ENVIRONMENTAL, AND LIVELIHOOD HARMS THAT OFTEN ARISE FROM MAJOR NATURAL RESOURCE AND INFRASTRUCTURE PROJECTS, SUCH AS OIL EXPLORATION AND DEVELOPMENT.

HEATHER STARTED HER LEGAL CAREER AS A BANKING AND FINANCE ASSOCIATE IN THE NEW YORK OFFICE OF A MAJOR GLOBAL LAW FIRM, SKADDEN, ARPS, SLATE, MEAGHER & FLOM LLP. PRIOR TO THAT, SHE RECEIVED HER LAW DEGREE FROM THE GEORGE WASHINGTON UNIVERSITY LAW SCHOOL, WITH HIGHEST HONORS, IN 2003. SHE EARNED HER B.A. IN POLITICAL PHILOSOPHY FROM MICHIGAN STATE UNIVERSITY IN 1996.

FUN FACTS:

- DESPITE GROWING UP IN A FAMILY WITHOUT A SINGLE MEMBER WHO HAS EVER LEFT THE UNITED STATES (ANY MANY WHO HAVE NEVER LEFT HER HOME STATE OF MICHIGAN), HEATHER BECAME AN AVID TRAVELER AFTER COLLEGE, VENTURING TO MANY COUNTRIES (45 IN TOTAL!) SOMETIMES WITH FRIENDS OR CO-WORKERS, AND SOMETIMES ON HER OWN AS A SOLO ADVENTURER. IN 2009, SHE TOOK A YEAR-LONG BREAK FROM HER CORPORATE LAW CAREER AND EMBARKED ON A TRIP AROUND WORLD, WORKING WITH VARIOUS COMMUNITIES ALONG THE WAY. WHEN SHE RETURNED FROM THAT TRIP, SHE ACCEPTED THE POSITION AT ISLP AND HAS SINCE DEDICATED HER CAREER TO HUMAN RIGHTS AND SOCIAL AND ENVIRONMENTAL JUSTICE.

- HEATHER ALSO LOVES TO DANCE, AND CO-FOUNDED A DANCE GROUP IN 2006, WHICH PERFORMS IN PARADES, ARTISTIC EVENTS, AND FUNDRAISERS ALL AROUND NYC. SHE CO-FOUNDED A SECOND GROUP IN 2017, WHICH USES DANCE AND MUSIC TO BUILD COMMUNITY AND RAISE FUNDS FOR CAUSES THAT ARE IMPORTANT TO LOCAL COMMUNITIES.

Alumnus Keynote Speaker

Grace Carter

Grace graduated from Harbor School in 2017 with a CTE certification in Marine Biology Research. There she was a part of the rowing team, Harbor SEALs and Harbor Corps. Since then she's been attending Bard College in the Hudson Valley, where she's studying to be a biologist and will be graduating in 2021. At Bard, she's the co-head of the Wellness Club where her and her team promote community and conversations about individual experiences, while simultaneously running Bard's only food pantry which aims to assist students who experience food insecurity. Currently she's interning at the Saw Kill Watershed Community where their goal is to "Protect the Saw Kill watershed and its ecological, recreational, and historic resources through hands-on science, education, and advocacy." Among her responsibilities are running their social media accounts, writing articles and soon will be producing educational videos for community members to watch at home. She's recently written a proposal about how to use microbes to remediate the excess nitrogen added to the New York waterways from CSOs. Grace has spent her quarantine with her two cats (Ninja and Chip), three chickens (Betty, Stu and Artimus) and a dog (Ely).

Senior Abstracts

DESTINY COLEY

PROJECT TITLE LENS OF HARMFUL DEBRIS

MENTOR GYUN HUR, PROFESSOR AT PARSONS UNIVERSITY

ADVISORS MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT THIS PROJECT IS A PHOTOGRAPHY PROJECT THAT IS PRESENTING THE ACCUMULATION OF POLLUTION THROUGH MODIFIED PHOTOS. THE MAIN OBJECTIVE IS TO FOCUS ON PLASTIC, DUE TO THE EXCESSIVE OVERUSE OF THIS MATERIAL THAT DISINTEGRATES HABITATS. EVEN THOUGH ACTIONS TO MINIMIZE PLASTIC USE ARE RECEIVING ACKNOWLEDGMENT, STEPS FOR LIFESTYLE CHANGES NEED TO BE ENFORCED BECAUSE OF THE, "THROW AWAY, NOT MY PROBLEM," SYSTEM AND OR MINDSET. THIS PROJECT WILL BE PRESENTED VISUALLY BECAUSE OF THE SUBLIME LEVEL THAT ART IS KNOWN TO CONNECT WITH AN AUDIENCE. THE FORM OF PHOTOGRAPHY SUBMITS AN IDEA THAT PASSIVELY EXPLAINS THE NOTES AND ANALYSIS OF SCIENTIFIC RESEARCH. THE IDEA TO CONNECT WITH THE AUDIENCE IS TO SHOW THE CONTRADICTION OF POLLUTION VS. BEAUTY (NATURE AND COLOR). LIFE IS NATURALLY ENCHANTING, BUT THE TOUCH OF POLLUTION INTERFERING WILL BE THE VISION OF OVERWHELMING BEAUTY. THE SETTING LIES IN A VAST FOREST, STAGING WITH LINEN, ORGANIC MATTER, AND PLASTIC DEBRIS. THE PHOTOS ARE THEN MODIFIED THROUGH PHOTO-SHOP AND COLLAGED TO PRESENT A DIFFERENT MESSAGE OF PLASTIC. NATURE ART PROJECTS USUALLY LACK INTUITION, SO THE GOAL IS TO STAY IN TUNE WITH THE SCENE AND SCIENCE.

BIOGRAPHY DESTINY COLEY PRACTICES PHOTOGRAPHY AND PHOTOSHOP IN HER LEISURE TIME. SHE IS A MEMBER OF THE MARINE BIOLOGY RESEARCH PROGRAM AND AFTER SCHOOL PROGRAM, SEALS. SHE HAS WORKED WITH THE BILLION OYSTER PROJECT, CUSHMAN & WAKEFIELD AND RUBY RIVERS PRODUCTION. SHE IS CURRENTLY A MENTOR FOR THE BIODIVERSITY/BENTHOS GROUP. THE YEAR PRIOR, SHE WAS THE CAPTAIN. SHE IS ALSO A MEMBER OF THE NATIONAL HONOR SOCIETY. IN THE FUTURE, SHE ASPIRES TO CONTINUE WORKING IN THE ARTS AS AN ACTIVE PARTICIPANT OR HISTORIAN.

GEORGE DESJARLAIS

PROJECT TITLE: ANALYZING THE GLOBAL DISTRIBUTION OF SIPHONOPHORES

MENTOR: ALEJANDRO DAMIAN SERRANO, PH.D. CANDIDATE

ADVISOR: MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT: SIPHONOPHORES ARE SOME OF THE MOST COMPELLING ORGANISMS ON THE PLANET. BUT, YOU MAY BE ASKING YOURSELF, "WHAT IS A SIPHONOPHORE?" A SIPHONOPHORE IS AN ANIMAL COLONY MADE UP OF MANY DIFFERENT SMALLER ANIMALS, ZOOIDS (POLYPS AND ATTACHED MEDUSAE), EACH WITH THEIR OWN UNIQUE FUNCTION. SIPHONOPHORES ARE CNIDARIANS, A PHYLUM OF ANIMALS THAT BEAR STINGING CELLS. SIPHONOPHORES BELONG TO ONE OF 4 CLASSES OF CNIDARIANS, THE HYDROZOA. THERE ARE THREE MAIN SIPHONOPHORE COLONIAL BODY PLANS: CYSTONECTS, PHYSONECTS, AND CALYCOPHORANS. ONE THING SIPHONOPHORE RESEARCHERS STILL HAVE NOT FULLY EXPLAINED IS WHY SIPHONOPHORES RESIDE AND POPULATE WHERE THEY DO, AS THESE CREATURES ARE NOT AS EXTENSIVELY RESEARCHED AS OTHERS. THIS PROJECT'S GOAL IS TO PROGRAM ADVANCED DISTRIBUTION GRAPHS COMPARING SIPHONOPHORE DISTRIBUTION TO GLOBAL CHLOROPHYLL A LEVELS. THIS WILL BE DONE BY PROGRAMMING THESE GRAPHS USING THE CODING LANGUAGE R IN THE PROGRAM RSTUDIO. WHAT WAS FOUND WAS AN OBSERVATIONAL LINK BETWEEN THE ABUNDANCE OF CHLOROPHYLL A AND SIPHONOPHORE DISTRIBUTION IN WHICH WHEN THERE ARE HIGHER LEVELS OF CHLOROPHYLL A THERE WERE MORE SIPHONOPHORES IN THE OBSERVED AREA.

BIOGRAPHY GEORGE DESJARLAIS IS A NEW YORK HARBOR SCHOOL MARINE BIOLOGY RESEARCH SCHOLAR, SENIOR, AND STONY BROOK UNIVERSITY STUDENT. HE IS USING HIS INCLINATION FOR TECHNOLOGY TO FURTHER HIS SCIENTIFIC CAREER. GEORGE IS THE DATA MANAGEMENT CAPTAIN AT THE CIVIC SCIENCE AFTER SCHOOL RESEARCH PROGRAM HARBOR S.E.A.L.S. HE USES THE SKILLS IN STATISTICS AND ANALYSIS HE LEARNS WITHIN HIS OWN RESEARCH TO FURTHER THE WORK HE DOES FOR THE HARBOR S.E.A.L.S. GEORGE IS WORKING CLOSELY WITH HIS MENTOR, A PH.D. CANDIDATE AT YALE UNIVERSITY, TO DO CUTTING EDGE, NEVER BEEN DONE BEFORE SCIENTIFIC RESEARCH. HE HAS TAUGHT HIMSELF HOW TO CODE USING THE LANGUAGE "R" WHICH IS A TRANSFERABLE SKILL HE CAN USE IN HIS COLLEGE CAREER, FURTHERING HIS PREPARATION FOR THE RIGOROUS COURSEWORK WITHIN SCIENCE PROGRAMS IN HIGHER EDUCATION.

MADELAINE DOMINGUEZ

PROJECT TITLE CHANGES IN COMMUNICATION WITH FAMILY DURING A PANDEMIC

ADVISORS MAURICIO GONZALEZ, M.SC.

ABSTRACT MY PROJECT IS ONE THE FIRST THAT WILL MAKE HISTORY THAT NO ONE WILL FORGET. COVID-19 AFFECTED EVERYONE THROUGHOUT THE WORLD. IT KILLED OVER 100,000 PEOPLE IN THE UNITED STATES. IT GIVES THE ACCURATE RESULTS WHEN YOU CAN SEARCH HOW MANY PEOPLE DIE FROM THIS HORRIFIC DISEASE. IT CHANGED MANY FAMILIES IN THEIR WAY OF COMMUNICATING AND SOCIAL DISTANCING WITH THEIR LOVE ONES, HOPEFULLY SCIENTIST AND DOCTORS CAN FIND A VACCINE FOR THIS DISEASE.

BIOGRAPHY MY ACCOMPLISHMENTS THROUGHOUT THE HARBOR SCHOOL WERE IN THE HARBOR SEALS. SPECIFICALLY, I WAS IN THE PHYSICAL-CHEMICAL ANALYSIS TEAM. I WAS IN SETH'S GROUP AT THE TIME. (2016) I HAVE SO MANY AMAZING MEMORIES IN THE LAB I WOULD SAY THAT I WILL ALWAYS REMEMBER WHEN MAURICIO GIVES HIS PEP TALK. DEEP INSIDE I WOULD SAY, "YES HE'S GIVING HIS TALK" WHEN NOBODY IN THE ROOM WOULD LIKE HIM TO TALK FOR HOURS - BUT I DID. HE KNOWS SO MUCH ABOUT THE REAL WORLD. HIS LECTURES WOULD MOTIVATE ME AND CHANGE MY MINDSET. HARBOR SCHOOL TAUGHT ME IF YOU WANT SOMETHING OUT OF LIFE YOU REALLY HAVE TO GO FOR IT AND IT WILL COME TO YOU. I REMEMBER JUNIOR YEAR SITTING NEAR THE FISH TANK WHEN SOMEONE ASKED ME, "HEY ARE YOU EXCITED FOR COLLEGE NEXT YEAR?" THE TRUTH WAS I WAS SCARED ABOUT HOW THE REAL-WORLD WORKS. IT'S NOT EASY LIKE MANY PEOPLE SAY IT IS. A YEAR LATER I'M BEYOND PROUD OF MYSELF. I HAVE MY YOUTUBE CHANNEL AND PAID PARTNERSHIP DEALS. I'M ATTENDING TO SUNY ADIRONDACK IN THE FALL AND WILL MAJOR IN CHILD PSYCHOLOGY.

JONAH FLORHOLMEN-BOUMAN

PROJECT TITLE THE EFFECTS OF PLANT-GROWTH-PROMOTING BACTERIA ON THE AQUATIC PLANT VALLISNERIA

MENTOR ANDREW MARTIN M.S.

ADVISORS STUART FINDLAY, PHD, BERNARD GLICK, PHD, ZHENYU CHENG, PHD, ELIZA GAMALER, PHD, MAURICIO GONZALEZ, M.SC.

ABSTRACT THIS PROJECT OPENS UP A NEW AREA OF RESEARCH WITH PLANTS AND BACTERIA. THE WATERWAYS OF THE WORLD ARE VITAL TO THE HEALTH OF THE SURROUNDING ECOSYSTEMS. THE SCOPE OF THIS PROJECT IS TO CLEAN AND IMPROVE THE HUDSON RIVER. OYSTERS HAVE BEEN A COMMON RESORT FOR FILTERING WATER, BUT SOMETHING ABUNDANT AS PLANTS HAVE SIMILAR ABILITIES. PLANTS ARE NECESSARY FOR A HEALTHY ECOSYSTEM AS THEY ARE AT THE BOTTOM OF THE FOOD CHAIN AND PROVIDE OXYGEN. THE ABILITY OF PLANTS TO CLEAN SOIL, OR PHYTOREMEDIATE, HAS BEEN PROVEN TO GREATLY INCREASE WITH THE USE OF PLANT-GROWTH-PROMOTING BACTERIA (PGPB). THIS BACTERIUM NOT ONLY GREATLY INCREASES THE SPEED AT WHICH PLANTS REMEDIATE POLLUTANTS, BUT IT ALSO GREATLY INCREASES THE PLANT'S HEALTH AND RESISTANCE TO STRESS. THE RELATIONSHIP BETWEEN PLANTS AND PGPB HAS ONLY BEEN STUDIED WITH TERRESTRIAL PLANTS. THIS PROJECT SERVED TO DETERMINE IF THE BACTERIA PSEUDOMONAS MIGULAE 8R6 CAN ASSIST THE AQUATIC PLANT VALLISNERIA AMERICANA. IT WAS HYPOTHESIZED THAT THE PGPB WILL ASSIST VALLISNERIA IN GROWTH AND PHYTOREMEDIATION CAPABILITIES DUE TO STUDIES ON TERRESTRIAL PLANTS SHOWING SUCH RESULTS AND DUE TO THE BACTERIA PROVIDING MANY BENEFICIAL MECHANISMS. THIS MEANS THAT THE INOCULATED PLANTS WOULD BE LARGER AND THE WATER IN THEIR BUCKETS WOULD HAVE LOWER PHOSPHATE LEVELS. THIS WAS TESTED BY INOCULATING FIVE OF TEN GROUPS OF VALLISNERIA WITH PGPB AND MONITORING NATURAL PHOSPHATE LEVELS. WATER QUALITY WAS RECORDED WEEKLY WHILE PLANT GROWTH WAS RECORDED AND BEFORE AND AFTER THE PROJECT. THE HYPOTHESIS WAS NOT SUPPORTED BECAUSE BOTH GROUPS SHOWED A SIMILAR PHOSPHATE UPTAKE RATE. THEY BOTH VARIED WITHIN 0.02 - 0.04 MG/L PER WEEK.

BIOGRAPHY JONAH FLORHOLMEN-BOUMAN IS A 17-YEAR-OLD SENIOR IN THE MARINE BIOLOGY RESEARCH PROGRAM AT THE URBAN ASSEMBLY NEW YORK HARBOR SCHOOL. HE PLANS ON BECOMING A SCIENTIST IN BIOLOGY WITH THE GOAL OF OBTAINING A PH.D. HE TAKES ALL OF THE OPPORTUNITIES AVAILABLE TO HIM IN ORDER TO GAIN THE MOST OUT OF HIS HIGH SCHOOL EXPERIENCE THAT HE CAN. DESPITE THE STRESS, HE ENJOYS HIS WORK AND HE LOOKS FORWARD TO ADVANCING FURTHER IN COLLEGE.

MALIK FORD

PROJECT TITLE MONITORING MICROPLASTICS ENTERING NYC WATERWAYS VIA RUNOFF

MENTOR RACHAEL Z. MILLER, FOUNDER/CHIEF OCEAN LOVER OF ROZALIA PROJECT FOR A CLEAN OCEAN

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT A MAJOR POLLUTANT IN THE HUDSON RIVER ESTUARY IS PLASTICS. PLASTICS DEGRADE MORE AND MORE AS THEY STAY IN WATER AND BECOME MICROPLASTICS. MICROPLASTICS ARE OFTEN MISTAKEN FOR FOOD BY MARINE ORGANISMS. THIS CAN DAMAGE THE ORGANISM'S DIGESTIVE TRACT AND CAN LEAD TO STARVATION BY A LACK OF NUTRIENTS. RUNOFF HAS BEEN RECOGNIZED AS A SIGNIFICANT PATHWAY FOR MICROPLASTICS BUT HAS NOT BEEN THOROUGHLY RESEARCHED. THIS PROJECT WILL DO SO BY SAMPLING RUNOFF AT MULTIPLE SITES AND VACUUM FILTERING THEM. ONCE FILTERED, CONTENTS ARE VIEWED UNDER MICROSCOPES. EVIDENCE OF MICROPLASTICS WERE FOUND IN EVERY SAMPLE.

BIOGRAPHY MALIK FORD IS A SENIOR IN THE MARINE BIOLOGY RESEARCH PROGRAM AT THE NEW YORK HARBOR SCHOOL. HE HAS ACHIEVED HIGH GRADES IN ALL HIS CLASSES THROUGHOUT HIGH SCHOOL AND WAS AWARDED SECOND PLACE AT THE ANNUAL SCIENCE SYMPOSIUM IN HIS JUNIOR YEAR. HE HAS BEEN WORKING ON THIS RESEARCH PROJECT SINCE HIS SOPHOMORE YEAR. WITH IT, HE STRIVES TO PLACE A STRONGER EMPHASIS ON RUNOFF REDUCTION IN URBAN PLANNING.

QUINN LAVELLE

PROJECT TITLE ANVIL USE IN THE BOREAL WRASSES TAUTOGA ONITIS AND TAUTOGOLABRUS ADSPERSUS

MENTOR CULUM BROWN, PROFESSOR, MACQUARIE UNIVERSITY

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT DESPITE KNOWLEDGE OF TOOL USE IN FISHES CURRENTLY LACKING (BROWN ET AL. 2012), OBSERVATIONAL STUDIES BY PASKO ET AL.(2010), COYER ET AL. (1995), BERNARDI ET AL. (2011), DUNN ET AL.(2015), HARBORNE AND THOLAN ET AL. (2016), PRYOR AND MILTON ET AL.(2019) AND JONES, BROWN, AND GARDENER ET AL. (2011) SHOW THAT REEF-DWELLING FISHES IN THE WRASSE FAMILY (LABRIDAE) USE ROCKS AS ANVILS TO BREAK OPEN SHELLFISH, AND IN THE CASE OF HARBORNE AND THOLAN ET AL. (2016), A VERTEBRATE JUVENILLE GREEN TURTLE (CHELONIA MYDAS). BERNARDI ET AL. (2011) SUGGESTS THAT SINCE THE SPECIES CURRENTLY KNOWN TO ENGAGE IN ANVIL USE ARE ON DIFFERENT ENDS OF THE PHYLOGENIC SPECTRUM, IT MAY BE A DEEP-SEATED BEHAVIOR ACROSS THE WRASSE FAMILY. THIS PROJECT FOUND EVIDENCE SUPPORTING BERNARDI ET AL. (2011)'S HYPOTHESIS, AS EVIDENCE OF ANVIL USE WAS FOUND IN THE TAUTOG (TAUTOGA ONITIS), WHICH INHABITS BOREAL WATERS IN THE NORTH-WESTERN ATLANTIC OCEAN. THE CUNNER (TAUTOGOLABRUS ADSPERSUS) WAS ALSO INVESTIGATED AS A POTENTIAL ANVIL USER, BUT LIMITATIONS PREVENTED CLEAR DATA FROM BEING COLLECTED WHICH WOULD INCLUDE THE CUNNER AS A TOOL-USING FISH, MEANING THAT ANVIL USE IN THE CUNNER CURRENTLY REMAINS INCONCLUSIVE. LARGER TAUTOGS WERE OBSERVED ENGAGING IN ANVIL USE-LIKE BEHAVIOR MORE SO THAN SMALLER TAUTOGS, LIKELY AS A RESULT OF OLDER FISH BEING MORE EXPERIENCED THAN SMALLER, YOUNGER FISH. ALTHOUGH ADULT TAUTOG WERE OBSERVED PICKING UP SHELLFISH IN THEIR MOUTHS AND STRIKING THEM AGAINST THE GLASS OF THEIR AQUARIUMS, NONE OF THE FISH OBSERVED SUCCEEDED IN BREAKING OPEN THE SHELLFISH FULLY.

BIOGRAPHY I HAVE BEEN IN THE MARINE BIOLOGY RESEARCH PROGRAM (MRBP) AT THE NEW YORK HARBOR SCHOOL FOR THREE YEARS. I ALSO MAINTAINED A 3,000-GALLON AQUARIUM KNOWN AS THE ESTUARIUM, AS WELL AS PARTICIPATED IN HARBOR SEALS, A CITIZEN SCIENCE GROUP THAT MONITORS THE HEALTH OF THE UPPER NEW YORK HARBOR ESTUARY. A MAJOR ACADEMIC ACHIEVEMENT AND MEMORABLE MOMENT IN THE MBRP WAS SUCCESSFULLY COMPLETING MY RESEARCH PROJECT AND RECORDING DATA THAT SUPPORTED MY HYPOTHESIS. I AM ATTENDING ADELPHI UNIVERSITY THIS FALL TO STUDY ENVIRONMENTAL SCIENCE AND MARINE BIOLOGY SO THAT I MAY BECOME AN ICHTHYOLOGIST.

SUSAN LOOK

PROJECT TITLE EFFECTS OF COVID ON CRIME

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT I RESEARCHED HOW THE CORONAVIRUS HAS AFFECTED CRIME IN NEW YORK. I LOOKED AT DIFFERENT ARTICLES THAT SHOWED ME DIFFERENT STATISTICS ON HOW THE DIFFERENT CRIMES HAVE DECREASED SINCE THIS PANDEMIC. I DID THIS BECAUSE I WANTED TO SHOW PEOPLE HOW THE CORONAVIRUS HAS NOT ONLY IMPACTED OUR ECONOMY BUT DIFFERENT PARTS OF SOCIETY. I USED ONLINE RESOURCES TO HELP ME UNDERSTAND HOW CRIME IS IMPACTED DURING THIS TIME PERIOD. I FOUND THAT CRIME HAS INDEED BEEN IMPACTED SINCE PEOPLE ARE STAYING HOME, WHICH MEANS THAT THERE IS LESS CRIME TO COMMIT. CRIMINALS HAVE A SHORT AMOUNT OF OPPORTUNITIES TO COMMIT A CRIME SINCE THERE ARE NOT MANY PEOPLE OUT AND BUSINESSES ARE CLOSED. AS THIS PANDEMIC CONTINUES, WE CAN CONTINUE TO SEE AN INCREASE AND A DECREASE IN CRIME. THIS MEANS THAT PEOPLE ARE STARTING TO BECOME BOLDER DURING THIS PANDEMIC AND GOING OUT TO COMMIT CRIME RATHER THAN STAYING HOME.

BIOGRAPHY SUSAN LOOK IS CURRENTLY A SENIOR AT NEW YORK HARBOR SCHOOL AND IN THE MARINE BIOLOGY RESEARCH PROGRAM. THROUGHOUT HER YEARS IN MBRP, SHE HAS CREATED AND STUDIED MAPS USING THE GEOGRAPHICAL INFORMATION SYSTEM. SHE HAS BEEN PART OF HARBOR SEALS FOR TWO YEARS. HARBOR SEALS IS A PROGRAM TO UNITE CITIZEN SCIENTISTS TO MONITOR THE HEALTH OF THE HUDSON RIVER ESTUARY, EDUCATE THE PUBLIC, AND HELP RESTORE THE HARBOR SO THAT ITS WATERS ARE SUITABLE FOR SEALS AGAIN. SHE HAS TAKEN OCEANOGRAPHY COURSES TO BROADEN HER KNOWLEDGE OF THE PHYSICAL AND BIOLOGICAL ASPECTS OF THE OCEAN. SHE IS A PART OF THE NATIONAL HONOR SOCIETY AND SHE HAS WON SECOND PLACE IN THE 8TH ANNUAL NEW YORK HARBOR SCHOOL SCIENCE SYMPOSIUM WHERE SHE PRESENTED ABOUT HOW TO USE GEOGRAPHIC INFORMATION SYSTEMS TO PRESERVE GREEN SPACE IN COMMUNITIES. SUSAN WILL BE ATTENDING SUNY COBLESKILL IN THE FALL AS A BUSINESS ADMINISTRATION MAJOR.

RANDY MAHARAJ

PROJECT TITLE MAKING AN ECOSYSTEM

MENTOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT PEOPLE HAVE KEPT MANY SPECIES OF ANIMALS IN CAPTIVITY FOR MANY YEARS USING THEM AS FOOD, OR TOOLS TO HELP GET FOOD. OVER TIME THAT CHANGED, AND PEOPLE STARTED TO DEPEND ON THOSE ANIMALS FOR EMOTIONAL SUPPORT AND EDUCATIONAL USES. PEOPLE WOULD WATCH FISH AS A WAY TO COMFORT THEMSELVES WHEN FEELING STRESSED, BUT WHY? WHY DO ANIMALS HAVE THIS GRASP ON HUMAN EMOTIONS? IN THIS PROJECT, A MODELED ECOSYSTEM IS GOING TO BE MADE WITH A LOT OF DIFFERENT SPECIES LIVING IN THE SAME SPACE. EACH SPECIES WILL INTERACT WITH ANOTHER ONE WHETHER THAT BE IN A BENEFICIAL OR HARMFUL WAY JUST LIKE IN THE WILD, TO MAKE SURE THE ECOSYSTEM CAN BE COMPLETELY RUN BY ITSELF WITH LITTLE TO NO HUMAN INTERACTION TO MAINTAIN IT. THE ONLY HUMAN INTERACTION THAT THE SYSTEM WILL HAVE IS WHEN PEOPLE COME TO INTERACT WITH THE ORGANISMS, THAT WOULD BE FEEDING THEM, WATCHING THEM, OR HANDLING THEM.

BIOGRAPHY I STARTED THE MARINE BIOLOGY RESEARCH PROGRAM IN MY SOPHOMORE YEAR (2017-2018) TO STUDY WHALE AND OTHER MARINE MAMMALS. LATER IN THE PROGRAM, I CONTRIBUTED TO A GROUP AQUAPONIC SYSTEM USING TURTLES AND FELL IN LOVE WITH CARING FOR THE SYSTEMS AND THE ANIMALS. I SOON STOPPED MY PATH WITH LEARNING ABOUT MARINE MAMMALS AND STARTED TO TAKE CARE OF RECIRCULATING AQUACULTURE SYSTEMS AND STARTED TO LEARN ABOUT TAKING CARE OF MANY DIFFERENT SPECIES OF AQUATIC ORGANISMS. IN MY JUNIOR YEAR (2018-2019) I WAS ASSIGNED TO BE A LAB TECH AND I TOOK CARE OF A VERY LARGE SYSTEM FULL OF A LARGE TILAPIA. IN THE SUMMER OF 2019, I DID A LAB TECH INTERNSHIP WHERE I WOULD TAKE CARE OF THE LAB, FIXING AND CLEANING THE SYSTEMS, AND TAKING CARE OF THE ORGANISMS. IN MY SENIOR YEAR (2019-2020) I STARTED TO STEP BACK AND LET OTHER PEOPLE TAKE CARE OF THE SYSTEMS BUT ALWAYS GAVE A HELPING HAND WHEN NEEDED. I STARTED NEW SYSTEMS AND BROUGHT IN DIFFERENT ANIMALS FOR MANY DIFFERENT PROJECTS.

BRIAN MEJIA

PROJECT TITLE REMOTELY OPERATED VEHICLE ASSISTANCE IN MEASURING WATER QUALITY IN THE NEW YORK HARBOR

MENTOR JEFFREY W. LAU, PH.D., NYU

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT WATER QUALITY IS CRUCIAL FOR GATHERING AND ANALYZING DATA. SCIENTISTS USE WATER QUALITY TO DETERMINE IF THE DIFFERENT LEVELS CAN SUSTAIN LIFE. REMOTELY OPERATED VEHICLES CAN BE USED AS ASSISTANCE FOR THIS JOB SCIENTISTS USUALLY DO BY HAND. THEY CAN BE MANEUVERED AND READJUSTED TO FIT IN THE DESIRED LOCATION. THE PROBLEM THAT THIS PROJECT ADDRESSES ASKS, WHAT ARE THE LEVELS OF WATER TEMPERATURE AND LIGHT INTENSITY ALONG GOVERNORS ISLAND'S PIERS. WHILE EMPLOYING REMOTELY OPERATED TECHNOLOGY. THIS PROJECT WILL USE A MODIFIED REMOTELY OPERATED VEHICLE (ROV). ROV'S ARE IDEAL, SINCE THE SAMPLE SITES ARE HARD TO REACH. ADDITIONALLY, YOU COULD RECEIVE LIVE FEEDBACK TO VIEW WHAT MIGHT HAVE CAUSED A DIFFERENCE IN THE DATA BEING GATHERED. THE HYPOTHESIS OF THIS STUDY IS AS FOLLOWS: AS THE MACHINE INCREASES IN-DEPTH UNDERWATER, THE LIGHT INTENSITY WILL DECREASE, AND WATER TEMPERATURE WILL STAY CONSISTENT. AS FOR THE ROV, IT CAN BE HYPOTHESIZED THAT IT WILL BE EFFICIENT IN COLLECTING WATER QUALITY DATA BECAUSE THE ROV CAN COLLECT THE DATA IN ANY REQUIRED SAMPLING SITE. THE STUDY FOUND THAT THE ROV EFFICIENTLY COLLECTED WATER QUALITY OVER THE SPAN OF THREE MONTHS. THERE WERE SETBACKS ONLY DUE TO HUMAN ERROR, AND NOTHING TO DO WITH THE MACHINE ITSELF. WATER TEMPERATURE DECREASED ACROSS THAT TIME PERIOD, AND LIGHT INTENSITY DATA POINTS WERE INCONCLUSIVE.

BIOGRAPHY MY NAME IS BRIAN MEJIA, AND I AM A SENIOR AT THE NEW YORK HARBOR SCHOOL. I HAVE PARTICIPATED IN MANY AFTERSCHOOL PROGRAMS. SUCH AS COMPOSTING, GENETICS, SOCCER, AND MY FAVORITE BEING HARBOR S.E.A.L.S. I INTERNED FOR S.E.A.L.S IN THE 2018-2019 SCHOOL YEAR, AND I AM CURRENTLY INTERNING FOR THE BILLION OYSTER PROJECT. I HAVE A LOT OF HOBBIES, BUT TO KEEP IT SHORT, I LIKE TO PLAY SOCCER AND SKATE WITH MY FRIENDS. MY ACADEMIC ACHIEVEMENTS AT HARBOR SCHOOL ARE GETTING THE HIGHEST N.Y.C GLOBAL HISTORY REGENTS SCORE IN MY GRADE IN 2018 AND BEING NOMINATED TEAM CAPTAIN AND MENTOR FOR ONE OF THE TEAMS IN S.E.A.L.S. MY MOST MEMORABLE MOMENT IN THE MARINE BIOLOGY RESEARCH PROGRAM WAS MY FIRST DAY IN THE LAB, AND WHEN I FIRST USED MY UNDERWATER DRONE TO GATHER DATA FOR MY PROJECT. MY DREAM IS TO BE A MARINE BIOLOGIST.

LISSETTE MEJIA

PROJECT TITLE HOW DOES MICROBEADS AFFECT OYSTERS' (CRASSOSTREA VIRGINICA) HEALTH AND FEEDING RATE?

MENTOR ELIZABETH BURMESTER, PH.D., BILLION OYSTER PROJECT

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT AROUND THE WORLD, THERE'S A LOT OF WASTE BEING DUMPED INTO OUR WATERWAYS, PRODUCTS LIKE MICROBEADS, PLASTIC STRAWS, ETC., HAVE AFFECTED AND ARE STILL AFFECTING OUR WATERWAYS AND THE ORGANISMS WITHIN. OYSTERS ARE A KEYSTONE SPECIES IN THE NEW YORK HARBOR DUE TO THEIR ABILITY TO FILTER OUT EXCESS NITRATES, AMMONIA, AND OTHER TOXINS. OYSTER REEFS BUILD A NATURAL SEAWALL- PREVENTING STORM DAMAGE, AS WELL AS PROVIDING A HOME TO OTHER ORGANISMS WHICH COULD POTENTIALLY LIVE IN THESE REEFS. IT IS CRUCIAL TO UNDERSTAND THE EFFECTS OF ALL TYPES OF POLLUTION EXPOSURE ON THE EASTERN OYSTER, CRASSOSTREA VIRGINICA, TO PROTECT THE NEW YORK HARBOR AND ALL OTHER ECOSYSTEMS THAT ARE INTERCONNECTED WITH OYSTERS. THE RISK INCREASES IF PLASTIC CONTINUES TO ENTER THE OCEAN. "THE CALCULATED PLASTIC WASTE ENTERING OUR OCEANS FOR 2010 AT 4-12 MILLION TONS PER YEAR" (SUSSARELLA, 2016). PLASTIC TENDS TO BREAK DOWN INTO SMALLER PARTICLES CALLED MICROPLASTICS. ONE FORM OF MICROPLASTIC IS MICROBEADS WHICH ARE THE SMALLER PLASTIC PIECES LESS THAN FIVE MILLIMETERS. THIS PROJECT WAS AN EXPERIMENTAL STUDY TO UNDERSTAND THE EFFECTS OF MICROBEAD EXPOSURE ON OYSTERS REGARDING THEIR HEALTH RATE WHICH INCLUDES CHECKING THEIR GROWTH, SURVIVABILITY, AND FEEDING RATE. THIS MEANS YOU MUST CHECK UP ON WHETHER THEY EAT THE MICROBEADS PLACED INTO THE TANKS.

BIOGRAPHY LISETTE MEJIA IS A 17-YEAR-OLD STUDENT AT THE NEW YORK HARBOR SCHOOL IN THE MARINE BIOLOGY RESEARCH PROGRAM. FOR THE LAST TWO YEARS IN THE PROGRAM, LISETTE HAS BEEN WORKING ON HER INDEPENDENT RESEARCH PROJECT WHICH AIMED TO OBSERVE THE EFFECTS OF MICROBEAD EXPOSURE TO OYSTERS AND THEIR FEEDING HABITS. IN THE COMING YEARS LISETTE WILL GRADUATE HIGH SCHOOL AND ATTEND THE COLLEGE OF STATEN ISLAND, WHERE SHE WILL OBTAIN HER BACHELOR'S DEGREE IN SOCIAL PSYCHOLOGY.

JACQUELINE OBERMAYER

PROJECT TITLE THE SURVIVAL OF CRASSOSTREA VIRGINICA ON ECONCRETE DISCS IN LEMON CREEK LAGOON

MENTOR ELIZABETH BURMESTER, PH D, BILLION OYSTER PROJECT

ADVISOR SEAN POWERS, PH D, DEPARTMENT OF MARINE SCIENCES UNIVERSITY OF SOUTH ALABAMA

ABSTRACT OYSTER REEFS ARE A BOUNDLESS OUTLET FOR BIODIVERSITY, GIVING OPPORTUNITY FOR AN ASSORTMENT OF SPECIES TO BENEFIT THROUGH THEIR INTRICATE REEF STRUCTURES PROVIDING SAFETY AND ECOSYSTEM STABILITY. OYSTER POPULATIONS IN THE NEW YORK HARBOR HAVE DIMINISHED SIGNIFICANTLY DUE TO OVER HARVESTING AND POLLUTION. TO REINTRODUCE OYSTERS INTO THE NEW YORK HARBOR, THIS PROJECT WILL BE USING MODIFIED CONCRETE DISCS WITH A LOWER PH VALUE IN ORDER TO CREATE A MORE INVITING SUBSTRATE. THE DISCS ARE SET WITH OYSTER SPAT AND WERE INSTALLED IN LEMON CREEK LAGOON IN AUGUST OF 2018. THE GROWTH AND SURVIVAL RATES WILL BE RECORDED IN THE SPRING AND AGAIN IN THE FALL. IT IS HYPOTHESIZED THAT ABOUT 75% WILL SURVIVE AND WILL GROW ABOUT THREE TO FOUR CENTIMETERS. THE SUCCESS AND SURVIVAL OF THE OYSTERS ON THE CONCRETE DISCS WILL BE ABLE TO INTRODUCE A NEW METHOD INTO OYSTER RESTORATION.

BIOGRAPHY MY NAME IS JACQUELINE OBERMAYER. I HAVE BEEN A SPIRITED STUDENT THROUGHOUT MY TIME AT HARBOR SCHOOL. I HAVE PARTICIPATED IN SEVERAL EXTRA CURRICULARS SUCH AS HARBOR SEALS AS THE OPERATIONS ANALYST, THE ROWING TEAM AS A FOUR-TIME FIRST PLACE WINNING COXSWAIN, AND HARBOR CORPS. I'VE ALSO HAD BRIEF STENTS IN GSA, STUDENT COUNCIL BOATBUILDING VOLLEYBALL CLUB AND FOOTBALL CLUB. AT HARBOR I'VE HAD THE OPPORTUNITY TO ADVANCE MY KNOWLEDGE OF SCIENCE AND RESEARCH. IN THE MARINE BIOLOGY RESEARCH PROGRAM, I'VE BEEN GIVEN SO MANY OPPORTUNITIES TO WORK WITH AND GROW WITH MY PEERS.

SUNITA PEARSON-SIEGEL

PROJECT TITLE THE EXTRACTION OF MICROPLASTICS FROM THE SEDIMENT OF NEW YORK HARBOR

MENTOR KAY CRITCHELL, PH.D., MARINE SPATIAL ECOLOGY AND CONSERVATION LAB, DEAKIN UNIVERSITY, VICTORIA, AUSTRALIA

ADVISORS MAURICIO GONZÁLEZ, M.SC., NYHS; BEAU RANHEIM, SECTION CHIEF, MARINE SCIENCES, NEW YORK CITY ENVIRONMENTAL PROTECTION

ABSTRACT PLASTICS ARE KNOWN TO BE THE MOST WIDESPREAD TYPE OF DEBRIS IN THE OCEAN. PLASTIC DEBRIS HAS POLLUTED AND STILL IS POLLUTING BOTH MARINE AND FRESHWATER SYSTEMS IN MANY WAYS: FROM INEFFECTIVE OR IMPROPER WASTE MANAGEMENT, INTENTIONAL OR ACCIDENTAL DUMPING AND LITTERING ON SHORELINES OR AT SEA, OR THROUGH STORMWATER RUNOFF. WHEN EXPOSED TO THE ELEMENTS, LARGER PLASTICS CAN DEGRADE TO SMALLER PIECES OF PLASTIC. WHEN THEY ARE UNDER 5MM, THE NATIONAL OCEANIC AND ATMOSPHERIC ASSOCIATION (NOAA) HAS DEFINED THEM AS MICROPLASTICS. DUE TO THEIR BIOAVAILABILITY, MICROPLASTICS ARE COMMONLY INGESTED AS FOOD BY BOTH SMALL AND LARGE MARINE ORGANISMS AND THIS POSES A SERIOUS RISK TO MARINE ECOSYSTEMS. THIS PROJECT WILL MONITOR AND QUANTIFY THE AMOUNT OF MICROPLASTICS IN THE SEDIMENT OF NEW YORK HARBOR BY EXTRAPOLATING FROM SAMPLES COLLECTED AT PIER 101 AND YANKEE PIER ON GOVERNORS ISLAND, NEW YORK, NY. THE MICROPLASTICS WILL BE EXTRACTED FROM THE SEDIMENT AND A CONCLUSION WILL BE DRAWN ABOUT WHAT THIS MEANS FOR THE ECOSYSTEMS THAT CONTAIN THESE MICROPLASTICS. SAMPLING WILL BE COMPLEX WITH MULTIPLE CONTROLLED VARIABLES SUCH AS LEAVING BLANK FILTERS OUT WHEN SAMPLING IN ORDER TO ACCOUNT FOR MICROPLASTICS IN THE AIR. PROCEDURES INCLUDE BUT ARE NOT LIMITED TO BENTHIC GRAB, VACUUM PUMP, AND MICROSCOPIC IDENTIFICATION OF MICROPLASTICS. IT IS PREDICTED THAT THERE WILL BE MICROPLASTICS AT THESE LOCATIONS DUE TO THE FLOW OF POLLUTION IN THE HUDSON RIVER.

BIOGRAPHY MY NAME IS SUNITA PEARSON-SIEGEL AND I HAVE A PROFOUND LOVE FOR ENVIRONMENTAL SCIENCE AND BIOLOGY. I AM INTRIGUED BY THE WORLD AROUND ME, ESPECIALLY ANIMALS. MY ULTIMATE DREAM IS TO WORK WITH ANIMALS IN ANY PROFESSION, MAYBE ANIMAL CONSERVATION, OR MAYBE EVEN PRE-VETERINARY STUDIES. MOST OF MY TIME IS TAKEN UP BY MY STUDIES, BUT I ENJOY RIDING HORSES IN MY OFF TIME. I COMPETE ON A VARSITY ATHLETICS EQUESTRIAN TEAM CALLED THE METROPOLITAN EQUESTRIAN TEAM. IT IS PART OF A NON-PROFIT ORGANIZATION CALLED THE INTERSCHOLASTIC EQUESTRIAN ASSOCIATION. RIDING AND SCIENCE HAVE SHAPED MY LIFE AS I KNOW IT TODAY. I WILL BE ATTENDING MOUNT HOLYOKE COLLEGE, THE FIRST WOMEN'S COLLEGE IN AMERICA, IN THE FALL.

TYLER SCOTT-SIMPSON

PROJECT TITLE POWER AND POLITICS IN THE WORLD OF COVID-19

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

BIOGRAPHY ALAS, THE BIOGRAPHY BEFORE YOU IS NOT FROM THE MOUTH OF AN ASPIRING SCIENTIST.

I REMEMBER SITTING DOWN WITH MY CLASS IN OUR TENTH-GRADE YEAR OF MBRP AND BEING EXPLAINED BY OUR TEACHER MAURICIO THE DIFFERENT LEVELS OF RESEARCH PROJECTS WE COULD UNDERTAKE DURING OUR COMING YEARS AS UPPERCLASSMEN (AND WOMEN): THERE WERE THE LAB-TECHNICIAN AND GIS POSITIONS, AND THE GUIDED BOP RESEARCH PROJECTS, AND THEN THE INDEPENDENT STUDIES OF SCIENCE - ALL OF WHICH I HAD ASSUMED I FOUND INTERESTING. I FIND VALUE IN SCIENCE, BUT AFTER A COUPLE OF ECOLOGY INTERNSHIPS AND YOUNG-SCIENTISTS' PROGRAMS, I REALIZED I WOULD FIND MY LIFE REALLY POINTLESS IF I WERE TO PURSUE SUCH A CAREER. THINGS ARE STILL POINTLESS, IT'S JUST WITH FILMMAKING, I CAN BE DISTRACTED FOR A WHILE. I, AND DESTINY COLEY (TO A POINT), SEEMINGLY DECIDED TO DITCH THE WHOLE CURRICULUM THING AND DO OUR OWN RESPECTIVE THINGS. I DON'T DOUBT THE VALIDITY OF ANY OTHER MBRP TRACK, BUT I AM INCREDIBLY HAPPY I CHOSE THE ONE I DID; I HAD TO FIGURE THINGS OUT ON MY OWN, AND I HAD TO DECIDE WHAT I WANTED ON MY OWN. I AM GRATEFUL I HAD THE PEOPLE I DID AROUND ME, BUT I AM INCREDIBLY HAPPY I GOT TO FIGURE THINGS OUT (TO A DEGREE) ON MY OWN.

LET'S HOPE THIS FILM WORKS OUT! IN ALL HONESTY, I HAVEN'T FINISHED IT AT THE TIME OF WRITING THIS BIOGRAPHY. ACTUALLY, THE REASON I WRITE THIS NOW IS THAT I'M UPLOADING ABOUT TWENTY MINUTES OF FOOTAGE TO FINAL CUT PRO AND IT'S TAKING AGES TO IMPORT; IT'S BEEN ABOUT AN HOUR AND THE RENDER IS ONLY ABOUT HALFWAY DONE.

I HOPE YOU ENJOY MY PROJECT, ACTUALLY, THAT'S NOT TRUE. I HOPE YOU APPRECIATE THE WORK I WILL PRODUCE TO YOU, BUT I CERTAINLY DON'T HOPE YOU ENJOY IT: IT'S NOT EXACTLY SOMETHING YOU SHOULD ENJOY WATCHING. I HOPE YOU TAKE SOMETHING FROM IT. IT'S NOT MEANT TO BE A PIECE OF ENTERTAINMENT, SO IF YOU DON'T TAKE AWAY ANYTHING FROM THE FILM IT'S A PRETTY POINTLESS PIECE OF WORK.

EITHER WAY, BEST. I HOPE YOU ENJOY THE REST OF THE WORKS AT THE SCIENCE SYMPOSIUM AT LEAST.

JOHN QUENTIN SEERY

PROJECT TITLE MANAGING PRIVATE SPACE & TIME DURING A PANDEMIC

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

BIOGRAPHY JOHN QUENTIN SEERY IS A SENIOR AT THE NEW YORK HARBOR SCHOOL. HE IS A HARD-WORKING AND HELPFUL STUDENT IN THE MARINE BIOLOGY LAB. HE IS PART OF THE LAB/FIELD TECHNOLOGY PROGRAM. HE TREATS EVERYONE AROUND HIM LIKE A TEAMMATE, WITH RESPECT. HE HAS WORKED FOR 3 YEARS IN HARBOR SEALS, A PROGRAM DESIGNED TO MONITOR THE HEALTH OF THE NEW YORK HARBOR. HE MAY NOT HAVE BEEN TEAM CAPTAIN BUT HE HAS BEEN NOTHING SHORT OF A WONDERFUL ASSET. HE IS ALSO THE GIS ANALYST AT THE LAB.

RONNIE WARREN

PROJECT TITLE WHY KEEPING A MEDO AIR PUMP IS IMPORTANT FOR AQUATIC ECOSYSTEMS

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT THE MEDO LINEAR PISTON AIR PUMP IS COMPACT, QUIET, AND VIBRATION FREE. THEY HAVE VERY LOW ENERGY CONSUMPTION AND ARE ONE OF THE MOST DURABLE PUMPS ON THE MARKET. THE HIGHLY RELIABLE LINEAR PISTON DESIGN LEADS TO ENHANCED PERFORMANCE AND LONGER OPERATING LIFE.

BIOGRAPHY RONNIE WARREN IS CURRENTLY A SENIOR AT NEW YORK HARBOR SCHOOL AND IN THE MARINE BIOLOGY RESEARCH PROGRAM. DURING HIS STAY AT THE MARINE BIOLOGY RESEARCH PROGRAM, HE HAS ACCUMULATED 2 YEARS' WORTH OF WORK EXPERIENCE WITH 2 DIFFERENT ORGANIZATIONS. HE ALSO PARTICIPATED IN EXTRACURRICULAR ACTIVITIES LIKE STUDENT COUNCIL AND HARBOR SEALS. RONNIE WAS ADMITTED INTO THE NATIONAL TECHNICAL HONOR SOCIETY AND NATIONAL HONOR SOCIETY FOR 2 STRAIGHT YEARS. HE'S ALSO WON FIRST PLACE TWICE AT THE NEW YORK HARBOR SCHOOL'S ANNUAL SCIENCE SYMPOSIUM IN THE LAB/FIELD TECH DIVISION. RONNIE PLANS ON PURSUING A CAREER IN EDUCATION AND BUSINESS.

DYLAN HOM CONSTABLE

ISABELLA KARSCH

SHANYALEE RODRIGUEZ

Junior Abstracts

NAME GABRIEL CASTRO

PROJECT TITLE HOW CAN GIS TECHNOLOGY CAN BE BENEFICIAL TO CONSERVATION TECHNOLOGY?

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT FOR THIS RESEARCH PROJECT MY GOAL WAS TO NAVIGATE AND LABEL THE BUFFER AREAS FOR ENDANGERING PLANT AND ANIMAL SPECIES. THE PLANT SPECIES IN THIS SCENARIO CONSISTED OF A SMALL PATCH OF HARPERELLA PLANTS AND THE ANIMAL SPECIES CONSISTED OF GOLDEN AND BALD EAGLES. MAPPING THESE SPECIES OF PLANTS AND ANIMALS IS QUITE VALUABLE, THE CONDITIONS SURROUNDING THESE SPECIES ARE A RESULT OF THE GROWING WORLD OF MANKIND. THE GOAL OF THIS PROJECT IS TO PROTECT THEM IN A WORLD THAT GROWS AROUND THEM AND DISTURBS THEIR WAY OF LIFE WHETHER THEY LIKE IT OR NOT. NORMALLY THIS WOULD BE A DIFFICULT TASK TO DEDICATE SEPARATE LANDMASSES TO KEEP THESE ORGANISMS SAFE. WITH GIS IT IS MORE WITHIN THE SCOPE OF POSSIBILITY BECAUSE IT CAN TRACK THESE ORGANISMS AT THEIR PRECISE LOCATION IN WHICH THE LOCAL STATE GOVERNMENT CAN BE GIVEN THIS DATA, SO THEY HAVE THE DATA THEY NEED TO CREATE A BLUEPRINT. I ACCOMPLISHED THIS TASK USING ARCMAPS, A GIS PROGRAM THAT IS USED TO ANALYZE AND CREATE MAP DATA IN WAYS THAT ALLOW FOR PRECISE DATA. THE DATA AND PROCEDURE WERE PROVIDED BY THE TEXTBOOK AGIS STEM BY HANNABETH, ROTZLER, AND SMITH. WHAT I FOUND DURING THIS PROCESS WAS THAT MOST OF THESE EAGLES ARE ACTUALLY PROTECTED BY AN ACT PASSED BY THE FEDERAL GOVERNMENT CALLED THE “BALD AND GOLDEN EAGLE PROTECTION ACT”. HOWEVER, THE ISSUE WAS THAT THE MAP I WAS USING TO PLACE DATA FOR CHATHAM COUNTY WAS OVER 600 FEET PAST WHERE THE PROTECTED AREA FOR THESE EAGLES WAS. THE PURPOSE AND MEANING OF THIS MAP IN THE END ARE TO ESTABLISH A FOUNDATION WHICH CAN BE BUILT UPON FOR THESE SPECIES, IN WHICH PEOPLE CAN WORK ON FUTURE PROJECTS TO MAKE EFFORTS IN KEEPING THESE ORGANISMS FROM BECOMING EXTINCT.

NAME PROPHET DAVISON

TITLE THE EFFECTS TEXTILE DYES HAVE ON OUR ESTUARIES AND HOW OYSTERS CAN HELP

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT MY PLANS WERE TO CREATE AN EXPERIMENT THAT TESTED THE ABILITY FOR OYSTERS TO FILTER TEXTILE DYES.

I DID THIS BECAUSE THE FASHION INDUSTRY IS ONE OF THE MAIN POLLUTERS AND NOT MANY PEOPLE ARE AWARE OF THIS. THIS INCLUDES POLLUTING ARE RIVERS WITH RUN OFF DYE.

BEFORE COVID I WAS GOING TO SET UP AN EXPERIMENT WITH A TOTAL OF 16 TANKS 4 OF EACH COLOR, RED, YELLOW, BLUE, AND PURPLE. THE FIRST ARE PRIMARY COLORS AND ONE MIXED COLOR, THIS WOULD ALLOW ME TO GET AN ACCURATE READ OF HOW THE OYSTERS ARE ABLE TO FILTER THE TEXTILE DYES.

NAME MAX FELDMAN

TITLE EFFECTS OF SUPERSTORM SANDY ON THE GENETIC DIVERSITY OF KILLIFISH IN THE NEW YORK HARBOR

MENTOR LOUISE BODT, LANG SCIENCE PROGRAM

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT THIS STUDY WAS MOTIVATED BY THE IDEA THAT CATASTROPHIC EVENTS SUCH AS SUPERSTORM SANDY COULD POSSIBLY AFFECT THE POPULATION GENETICS OF FUNDULUS HETEROCLITUS, MORE COMMONLY KNOWN AS THE KILLIFISH OR THE MUMMICHOG. KNOWLEDGE OF HOW CATASTROPHIC EVENTS SUCH AS SUPERSTORM SANDY AFFECT ECOSYSTEMS CAN BE CRUCIAL TO RESTORING ECOSYSTEMS IN THE FUTURE. THE KILLIFISH IS AN ATLANTIC DISTRIBUTED FISH WITH TWO DISTINCT HAPLOTYPES BEING A "NORTHERN" HAPLOTYPE FOR ALL KILLIFISH NORTH OF NEW JERSEY IN FRESHWATER OR ESTUARINE ECOSYSTEMS AND NEVER SOUTH OF NEW JERSEY. THE "NORTHERN" HAPLOTYPE IS KNOWN TO BE MORE RESILIENT TO HYPOOSMOTIC HABITATS (WHITEHEAD, 2009). SAMPLES WERE COLLECTED AROUND NEW YORK HARBOR FOR DNA TO BE EXTRACTED AND ANALYZED. THE CONCLUSION WAS MADE THAT SUPERSTORM SANDY DIDN'T HAVE ANY EVIDENT EFFECT ON THE DNA. IN ADDITION, IT WAS DISCOVERED THAT EITHER A NEW SPECIES OF FUNDULUS HAS OCCURRED OR THAT A FUNDULUS SPECIES STRICTLY FROM THE MIDWEST IN FRESHWATER HAS MIGRATED TO THE NEW YORK HARBOR AND THRIVED. THESE RESULTS SHOW THAT SUPERSTORM SANDY MAY NOT HAVE AFFECTED THE POPULATION GENETICS OF FUNDULUS HETEROCLITUS BUT DO SHOW THAT A NEW FUNDULUS SPECIES MAY HAVE BEEN DESCRIBED OR THAT A FRESHWATER SPECIES ADAPTED TO ESTUARINE AND OCEANIC ENVIRONMENTS.

NAME PENELOPE FERNANDEZ

TITLE AMERICA'S ECONOMIC SYSTEM HAS BEEN GREATLY AFFECTED BY COVID-19

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT MY PRESENTATION TALKS ABOUT HOW OUR ECONOMIC SYSTEM HAS GRADUALLY BEGUN TO DECLINE DUE TO BEING QUARANTINED DURING COVID-19 AND HOW THIS CREATES A PROBLEM FOR PEOPLE WHO ARE RELIANT ON OUTSIDE SOURCES. MY PROJECT ADDRESSES THE PROBLEM BY STATING IT, GOING OVER HOW OUR ECONOMIC SYSTEM IS FAILING AND HOW WE AS A COMMUNITY OR YOU BY YOURSELF CAN IMPROVE IT. THE HYPOTHESIS THAT WAS CREATED FROM THIS WAS A LACK OF SUFFICIENCY IN PEOPLE'S LIVES CAUSING THEM TO BE SOLELY RELIANT (AS THEY ARE NOW) ON THE GOVERNMENT. AN IMPORTANT CONCLUSION THAT WAS CHALKED UP FROM THIS WAS HOW TO PROTECT YOURSELF WHILE QUARANTINING OR SOCIAL DISTANCING AND SOLUTIONS TO CREATING A SAFER ENVIRONMENT.

NAME OLIVER LIEBER

TITLE FINDING THE LOCATIONS OF EAGLE NESTS IN CHATHAM COUNTY

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT WHAT I DID FOR MY PROJECT WAS ABOUT CONSERVATION OF BALD EAGLES. I DID THIS BECAUSE I LIKE EAGLES AND I THINK CONSERVATION IS IMPORTANT BECAUSE IT IS HOW PEOPLE CAN HELP SAVE ANIMALS. I FOLLOWED THE INSTRUCTIONS IN THE BOOK TO CREATE A MAP THAT SHOWS US THE WHERE THE EAGLES LIVE. I FOUND WHERE THE BALD EAGLES LIVE AND WHY THAT AREA IS IMPORTANT. IT IS IMPORTANT BECAUSE THEY NEED THE TERRITORY WHERE THEY CAN LIVE IN A NATURAL ENVIRONMENT. IT MEANS THAT CERTAIN AREAS SHOULD NOT BE DESTROYED BECAUSE THEY ARE IMPORTANT TO THE SURVIVAL OF ANIMALS.

NAME EMILY LYSAKOVA

TITLE THE EFFECTS OF BORROW PITS ON THE ABUNDANCE OF BENTHIC FAUNA IN THE LOWER NEW YORK BAY

MENTOR: HENRY BOKUNIEWICZ, PH. D, STONY BROOK UNIVERSITY SOMAS

ADVISORS ROBERT M. CERRATO, PH. D, STONY BROOK UNIVERSITY SOMAS
MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT THE WORLD'S COMMON PRACTICE OF MARINE SAND MINDING EXCAVATION HAS A HEAVY EFFECT ON NOT ONLY THE PHYSICALITY OF THE BOTTOM OF WATER BODIES, BUT THE MARINE COMMUNITIES LIVING WITHIN THESE BOTTOMS, SPECIFICALLY WITHIN THE BENTHIC LAYER. BORROW PITS ARE LEFT BEHIND AFTER MINING SITES ARE ABANDONED. THIS RAPID HABITAT CHANGE DISRUPTS AND CHANGES OF THE ORIGINAL FAUNA, WITH MANY SPECIES TO EITHER LEAVE THE AREA, AND OTHERS TO QUICKLY COME IN AND FLOURISH. THIS OCCURRED WITHIN THE TWO PITS NEAR HOFFMAN AND SWINBURNE ISLANDS IN THE LOWER NEW YORK BAY OF THE NEW YORK HARBOR, WHERE THE PITS HAVE BEEN ABANDONED FOR OVER 40 YEARS. BY COMPARING DATA FROM 1984, OUR AIMS ARE: HOW HAS THE BENTHIC ABUNDANCE WITHIN THESE BORROW PITS CHANGED AFTER 40 YEARS, AND HOW DOES THE DIVERSITY OF THE ORGANISMS CONNECT TO THE PHYSICAL STATE OF THE BORROW PITS? THE EXPECTED OUTCOME OF THESE UPDATED SAMPLES IS THAT AFTER THE BORROW PITS HAVE CHANGED, A SLOW RISE OF EQUILIBRIUM BENTHIC SPECIES HAS RETURNED TO THE BORROW PITS AND ARE TO SLOWLY RE-ESTABLISH A NEW COMMUNITY OF FAUNA.

NAME JASMINE MENDOZA

TITLE THE EFFECTS OF ELEVATED TEMPERATURE AND GLYPHOSATE ON DIATOM MORPHOLOGY

MENTOR JAMES CERVINO, PH.D.

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT IN THIS STUDY ONE TRIES TO FIGURE OUT THE DETRIMENTAL EFFECTS OF GLYPHOSATE AND ELEVATED TEMPERATURE ON DIATOMS. IN THE STUDY IT ALSO COMPARES PAST STUDIES ON THE COMBINED EFFECTS OF GLYPHOSATE AND ELEVATED ON ZOOXANTHELLAE. THE EXPERIMENT IS MEANT TO REPLICATE THE CURRENT PREDICAMENT OF THE OCEAN THAT IS FACING GLOBAL WARMING AND OTHER ANTHROPOGENIC POLLUTIONS. THE STUDY IS MEANT TO REFLECT THE DAMAGE ON ALGAE CAUSED BY HUMANS.

NAME KATHERINE MUMFORD

TITLE THE EFFECTS OF GLYPHOSATE ON PHYTOPLANKTON AND MACROALGAL COMMUNITIES IN CONNECTION TO EVOLUTIONARY RELATIONSHIPS

MENTOR MICHAEL JUDGE, PH.D. MANHATTAN COLLEGE

ABSTRACT D. IN TODAY'S INDUSTRIALIZED WORLD, ONE ISSUE THAT COMMONLY AFFECTS A MARINE ECOSYSTEM IS EUTROPHICATION, OR WHEN

THERE IS EXCESSIVE NUTRIENTS IN THE WATER, LEADING TO AN IMMENSE GROWTH OF PLANT LIFE, AND A DEPLETION OF OXYGEN, WHICH CAUSES THE DEATH OF MARINE FAUNA. THIS PROCESS OF EUTROPHICATION IS COMMONLY CAUSED BY NUTRIENT RUNOFF FROM AGRICULTURAL LAND, AND THESE NUTRIENTS TEND TO COME IN THE FORM OF HERBICIDES. THE MOST GLOBALLY USED HERBICIDE IS GLYPHOSATE, WHICH CAN KILL CELLS THROUGH DISRUPTING AROMATIC ACID SYNTHESIS. THROUGHOUT THIS PROJECT, THE PROBLEM THAT WILL BE RESEARCHED IS: HOW DOES THE MACROALGAE FUCUS VESICULOSIS AND VARIOUS SPECIES OF PHYTOPLANKTON REACT TO DIFFERENT LEVELS OF GLYPHOSATE, AND HOW IS THIS RELATED TO TAXONOMIC RELATIONSHIPS? THE ORGANISMS OF PHYTOPLANKTON AND FUCUS VESICULOSIS WERE CHOSEN DUE TO THE LITTLE RESEARCH THAT HAS ALREADY BEEN DONE ON THEM AND THEIR ABUNDANCE IN THE LOCAL ECOSYSTEM. DATA WILL BE TAKEN ON GROWTH OR DEATH OF THE ORGANISMS WITH THE MEASURES OF CHLOROPHYLL A FOR PHYTOPLANKTON, AND DRY AND WET WEIGHT FOR THE MACROALGAE. IT IS HYPOTHESIZED THAT EACH SPECIES OF ORGANISM WILL REACT DIFFERENTLY TO THE GLYPHOSATE, DUE TO THE FACT THAT THE GLYPHOSATE WILL CHANGE THE PRODUCTION OF PROTEINS IN DIFFERENT WAYS. WITH THIS RESEARCH, IT WILL BE DETERMINED WHAT THE EFFECTS OF GLYPHOSATE ARE ON THESE ORGANISMS AND WILL BE A MEASURE OF HOW GLYPHOSATE AND THE ORGANISMS INTERACT WITH AND CHANGE THEIR NATURAL ENVIRONMENTS.

NAME DAKOTA ROGERS

TITLE HOW ARE BACTERIAL AEROSOLS FROM NEW YORK URBAN AND URBAN COASTAL COMMUNITIES AFFECTING OUR HEALTH?

MENTOR ELIAS DUEKER, PH.D., BARD COLLEGE

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT MY MAIN GOAL FOR THIS PROJECT IS TO TRY AND SEE IF THERE IS ANY CORRELATION BETWEEN HEALTHY AND UNHEALTHY BACTERIAL AEROSOLS COMING FROM THE WATER AND AIR THROUGHOUT URBAN AND URBAN COASTAL COMMUNITIES IN NYC. THIS IS IMPORTANT ESPECIALLY THROUGH TIMES LIKE THESE BECAUSE THESE RESULTS CAN BENEFIT IN THE LONG RUN. COVID - 19, A PANDEMIC THAT IS HEAVILY AFFECTING PEOPLE'S HEALTH AROUND THE WORLD, ESPECIALLY IN NEW YORK STATE. ONCE I GET MY DATA, I CAN SEE IF THERE IS A CERTAIN CONNECTION BETWEEN THE TYPE OF BACTERIA FOUND IN CERTAIN AREAS, TO HUMAN HEALTH. I PROPOSE GETTING MY DATA THROUGH WATER AND AIR SAMPLING FROM DIFFERENT SITES AROUND NYC. ONCE I GET MY SAMPLES, I WOULD TRY AND ANALYZE WHAT TYPE OF BACTERIA TYPE OR BACTERIA COLONY WAS LIVING IN THESE

AREA SAMPLES, DETERMINING IF THEY ARE AFFECTING HUMAN HEALTH OR NOT. BECAUSE OF THE CURRENT SITUATION THAT WE ARE LIVING IN, I WAS UNABLE TO OBTAIN ANY DATA FOR MY RESEARCH.

NAME DAYANARA SANCHEZ

TITLE HOW DOES SEAFLOOR SOUND AFFECT THE SETTLEMENT RATE OF EASTERN OYSTERS (CRASSOSTREA VIRGINICA)?

MENTOR ELIZABETH BURMESTER, PH.D. RESTORATION ECOLOGIST, BILLION OYSTER PROJECT

ADVISORS MAURICIO GONZÁLEZ, M.SC., NYHS; ZOSIA BAUMANN, PH.D. STAFF SCIENTIST, BILLION OYSTER PROJECT

ABSTRACT THE NEW YORK HARBOR IS A PORT CITY HIGHLY DEPENDENT ON ITS WATERWAYS WHICH LEADS TO NEGLECT OF THE HARBOR INTO BECOMING POLLUTED, AND CURRENTLY STILL CONSTANTLY BEING POLLUTED. IN THE PAST, THERE WAS AN ABUNDANCE OF OYSTER REEFS, WITH A POPULATION THAT WAS ABLE TO FILTER OUT THE HARBOR WITHIN DAYS. HOWEVER, DUE TO VARIOUS FACTORS SUCH AS FISH INDUSTRIES, DISEASE, AND POLLUTION, OYSTER REEFS WERE DIMINISHED TO A DWINDLING AMOUNT. IT TOOK 100 YEARS TO ALMOST ELIMINATE A POPULATION THAT TOOK OVER A MILLENNIAL TO FORM. HAVING CONTAMINATED AND POLLUTED WATER RESULTS IN NEGATIVE EFFECTS ON THE ECOSYSTEM, WHICH AFFECTS NOT ONLY THE AQUATIC LIFE LIVING WITHIN THOSE WATERWAYS BUT ALSO THE PEOPLE LIVING NEAR IT. THIS PROJECT IS TO FOCUS ON AND COLLECT EXTENSIVE INFORMATION ON SPEEDING UP THE OYSTER SETTLING PROCESS AND EFFICIENCY. BY INDUCING OYSTER LARVAE IN THEIR PEDIVELIGER STATE WITH OYSTER REEF SOUND AND COMPARING IT TO OTHER SEAFLOOR SOUNDS. THE EXPECTED RESULTS ARE A HIGHER SETTLING PERCENTAGE WHEN LARVAE ARE INDUCED WITH OYSTER REEF SOUNDS COMPARED TO ANOTHER SEAFLOOR AMBIANCE. THIS CAN PROVIDE EXTENSIVE INFORMATION ON ACCELERATING OYSTERS SETTLING STAGE GIVING THEM A BETTER SURVIVAL CHANCE SUPPORTING THE OYSTER REEF RESTORATION PROCESS

NAME LUKE SAMTON

TITLE OBSERVING PHYTOPLANKTON CONCENTRATION AND DIVERSITY IN THE HUDSON RIVER OFF YANKEE PIER GOVENORS ISLAND

MENTORS: NINA HITCHINGS & DR. MICHAEL MCCANN

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT PHYTOPLANKTON ARE AN INCREDIBLY IMPORTANT PART OF LIFE, THEY ARE RESPONSIBLE FOR 70% OF OXYGEN PRODUCTION. THE HUDSON RIVER IS A CONSTANTLY TRAVELED, HEAVILY POLLUTED WATER BODY. THE GOAL OF THIS PROJECT IS TO FIND A BASELINE COMMUNITY STRUCTURE OF PHYTOPLANKTON IN THE HUDSON RIVER, BASED ON TESTING DONE AT YANKEE PIER GOVERNORS ISLAND. THE DATA WAS INCONCLUSIVE BECAUSE THE PROJECT WAS CUT SHORT DUE TO COVID-19. THE WIDESPREAD IMPLICATIONS OF THIS PROJECT COULD GIVE SCIENTISTS NEW WAYS TO EVALUATE THE HEALTH OF OUR ESTUARIES, BY BASING IT OFF PHYTOPLANKTON CONCENTRATION AND DIVERSITY, THIS WAY USING PHYTOPLANKTON AS A BIOINDICATOR

NAME PEDRO VIEIRA COSTA

TITLE USING GEOSPATIAL TECHNOLOGY FOR BIOMASS POTENTIAL

ADVISOR MAURICIO GONZÁLEZ, M.SC., NYHS

ABSTRACT • I CREATED A MAP OF AN AREA'S BIOMASS POTENTIAL, LOCATING THE MOST PROMINENT SOURCE OF BIOMASS FUELS. I DID THIS, SO I CAN SEE WHICH LOCATION WAS THE GREATEST CANDIDATE IN PRODUCING BIOMASS ENERGY. THIS IS WAY TO DEMONSTRATE THAT THERE ARE SOURCES OF RENEWABLE ENERGY THAT ARE NOT BEING EXPLORED, WHILE THE BURNING OF FOSSIL FUELS IS CONSTANT, WHICH IS MUCH MORE HARMFUL TO THE ENVIRONMENT. THIS PROJECT WAS MADE WITH THE USE OF THE GIS TEXTBOOK: AGIS IN SCIENCE TECHNOLOGY, ENGINEERING AND MATHEMATICS- STUDENT MANUAL, WHICH WAS THE GUIDE TO FORM THE MAP, BY THOROUGHLY FOLLOWING THE STEPS I WAS ABLE TO FULLY MAP THE AREA. I FOUND THAT THE GREATEST CANDIDATE FOR PRODUCING BIOMASS ENERGY WERE JUNIPER AND CONIFER PLANTS IN STATE OWNED PROPERTY. THIS MEANS THAT THESE AREAS HAVE THE GREATEST BIOMASS POTENTIAL AND BOTH TYPES OF PLANT CAN BE USED AS RENEWABLE FUELS TO PRODUCE ENERGY.

AIYANNA AVERY

GIDEON BROWN

KARLA CORTES

JUSTIN JAQUEZ

SARA MEZZOLI

DANIEL PICARELLO

EMILY SHI

In Memory of Bev Means

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

Keynote Speakers	Heather Eisenlord, JD
	Grace Carter, Bard, Alumnus
Special Honorees	
Nan Richardson	NYHS Parent
Dr. Kathleen Nolan	St. Francis College
Dr. Neal Phillips	Bronx Community College
Dr. Sunil Bhaskaran	Bronx Community College
NYHS Parent/Teacher Association	
Marge Richards	PTA President
Lissa Wolfe	Treasurer
Nan Richardson	Recording Secretary
Elizabeth Kirk	Aquaculture CTE At Large Rep
Kellie Knight	Marine Biology Research CTE At Large Rep
Ellen Dobbyn-Blackmore	Marine Policy & Advocacy CTE At Large Rep
Louise Mulvihill	Marine Systems Technology CTE At Large Rep
Lori Hanchin Chang	Marine Systems Technology CTE At Large Rep
Emma Acker	Ocean Engineering CTE At Large Rep
Ian McGrath	Ocean Engineering CTE At Large Rep
Franklin Okumu	Professional Diving CTE At Large Rep
Maureen Packer	Vessel Operations CTE At Large Rep
Donna Coppola	Freshmen At Large Rep
Lisa Vicenti	Freshmen At Large Rep
Bill Seery	Senior At Large Rep
Sharon Locatell	Senior At Large Rep
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Dr. Jeffrey Chetirko	Principal
Aneal Helms	Assistant Principal
Jackye Stephenson	Assistant Principal
Diana Halluska	Assistant Principal
Ronni Ettinger	Parent Coordinator **(Thanks for support with booklet, Ronni!)**
Jessica Cuevas	College & Career Counselor
Yuderca Castillo	Guidance Counselor
Jennifer Feltes	Guidance Counselor
Christina Ramirez	Social Worker
Paul Garcia	Dean
Cadian Leys	School Secretary
Bev Means	School Aide
Pam Edwards	School Aide
Belia Lopez	School Aide
George Peterkin	School Aide
Marlon Scott	School Aide
Billion Oyster Project	
Pete Malinowski	Executive Director
Matthew Haiken	Institutional Funding Officer
Katie Mosher	Director of Restoration

Zofia Baumann	Staff Scientist
Liz Burmester	Staff Scientist

Volunteers and Judges

Anita Morawski	INDY
Christine Marizzi	BioBus
Christopher Girgenti	Randall's Island Park Alliance
Cyd Bloomfield	Stony Brook, Alumnus
Deidre Walker	NYHS
Dereck Skeete	MEC CUNY
George Pingeon	NYHS
Greg Borman	DOE
Jackie Wu	Randall's Island Park Alliance
Jeffrey Levinton	SUNY Stony Brook
Jessica Cuevas	NYHS
Karen Holmberg	NYU
Kathleen Nolan	St. Francis College
Kimberly Worsham	Flush LLC
Liz Reeve	Randall's Island Park Alliance
Michael Judge	Manhattan College
Nailea Rodriguez	Bard, Alumnus
Nan Richardson	NYHS PTA
Neal Phillip	BCC
Nicholas Ring	SUNY Stony Brook, Alumnus
Nicolle Martinez	AMNH, Alumnus
Nikos Konstantinides	NYU
Sarah Gribbin	NYHS
Sean Lynch	NYHS
Thomas Gorrell	SVA

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Dr. Elias Dueker	Bard College
Dr. Stuart Findlay	Cary Institute of Ecosystem Studies
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Dr. Bernard Glick	University of Waterloo
Mauricio Gonzalez	NYHS, Director MBRP
Nina Hitchings	Columbia University
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Dr. Michael Judge	Manhattan College
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Andrew Martin	INDY
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Dr. Sean Powers	University of South Alabama
Beau Ranheim	Section Chief, Marine Sciences, NYC DEC
Dr. Alejandro Damian Serrano	Dunn Labs, Yale University

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Prepared by Sunita Pearson-Siegel, Susan Look, Marifer Sanchez-Gaspar, and Mr. Mauricio Gonzalez, MBRP

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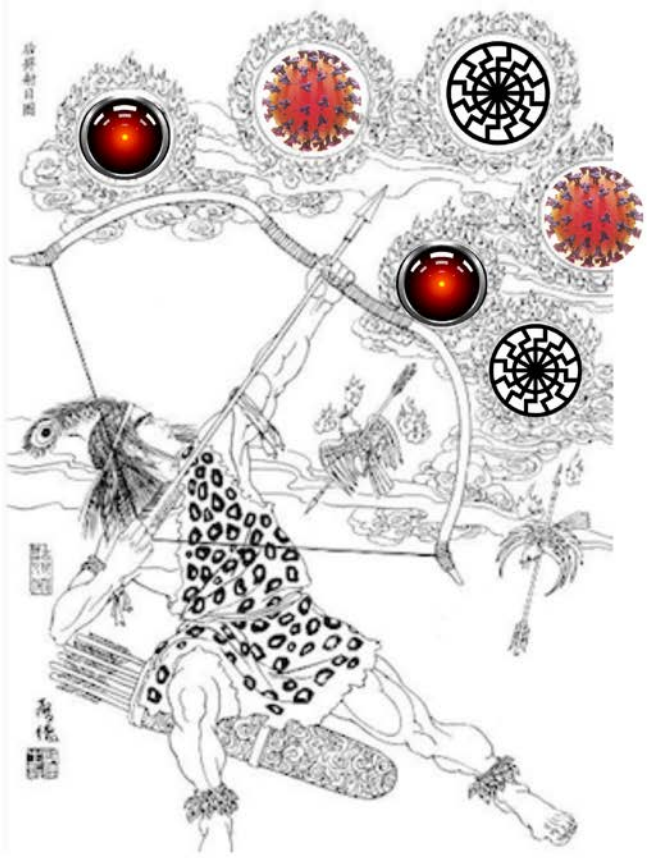

HOU YI LEGEND HERO

Screenshot from Hillfox Art Series

9周年，1个线上NYHS海洋科学研讨会，6月17日

9 ANNUAL, 1 VIRTUAL NYHS MARINE SCIENCE SYMPOSIUM, JUNE 17