



# 2021 VIRTUAL STUDENT SYMPOSIUM

**CELF CIVIC SCIENCE CAPSTONE  
EVENT RECAP + IMPACT REPORT**

MAY 22, 2021

Virtual - Nationwide

CHILDREN'S ENVIRONMENTAL LITERACY FOUNDATION

# ABOUT THE STUDENT SYMPOSIUM

Each Spring, CELF hosts our Student Symposium, the culminating event for the CELF Civic Science: Inquiry-to-Action program that brings young civic scientists together to share their research projects, data, and ideas for pollution remediation and environmental stewardship with community members, field experts, policy makers and peers from schools across the country.

On May 22, 2021, CELF hosted its 4th Annual Student Symposium event as a fully virtual interactive experience. Designed in a highly engaging new VR conference space, over 100 people were in attendance, becoming part of a transformative, national platform for our youth participants.

Whether separated by a few city blocks or hundreds of miles, the connections students felt to one another and the environmental challenges - and solutions - they each set out to discover was palpable.



**"TO BE ABLE TO  
COME TOGETHER IN  
THIS VIRTUAL  
SETTING HAS BEEN  
ABSOLUTELY  
AMAZING, AND ONE  
OF THE MOST  
TRANSFORMATIVE  
EXPERIENCES I'VE  
HAD IN ATTENDING A  
PLENARY SESSION  
OF THIS TYPE"**

**JULIET STIPECHE, JD, FORMER  
DIRECTOR OF EDUCATION,  
HOUSTON MAYOR'S OFFICE**



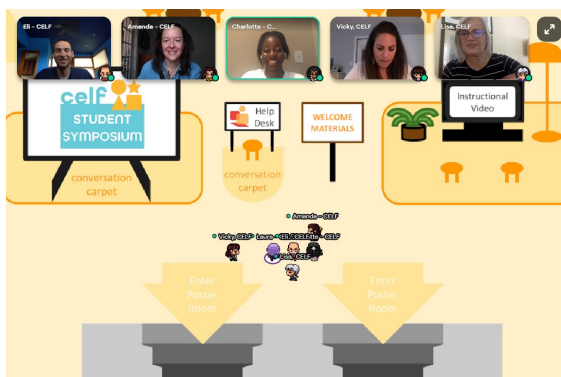
**"THIS PROJECT WAS REALLY EYE-OPENING. I HAD NO IDEA THAT I LIVED IN AN AREA CALLED ASTHMA ALLEY, BUT NOW I DO. I REALLY WANT TO CONTINUE THIS PROJECT AND LEARN MORE ABOUT AIR QUALITY IN MY COMMUNITY."**

High School student from the Bronx, NY

With guidance from their CELF-trained teachers, students from New York, Texas, Connecticut and New Jersey explored a variety of sustainability-themed issue areas related to air quality, to which they felt most closely impacted. Working collaboratively - and often remotely - each classroom group made a hypothesis and collected data in order to find an answer to their driving question.

**Student-selected topics of inquiry included:**

- Impact of air quality (AQ) on community health
- Environmental factors -such as precipitation and cloud cover- that affect AQ
- Use of pollinator gardens to improve AQ
- Connection between economics, poverty and environmental justice
- Impact of local policy and infrastructure on AQ

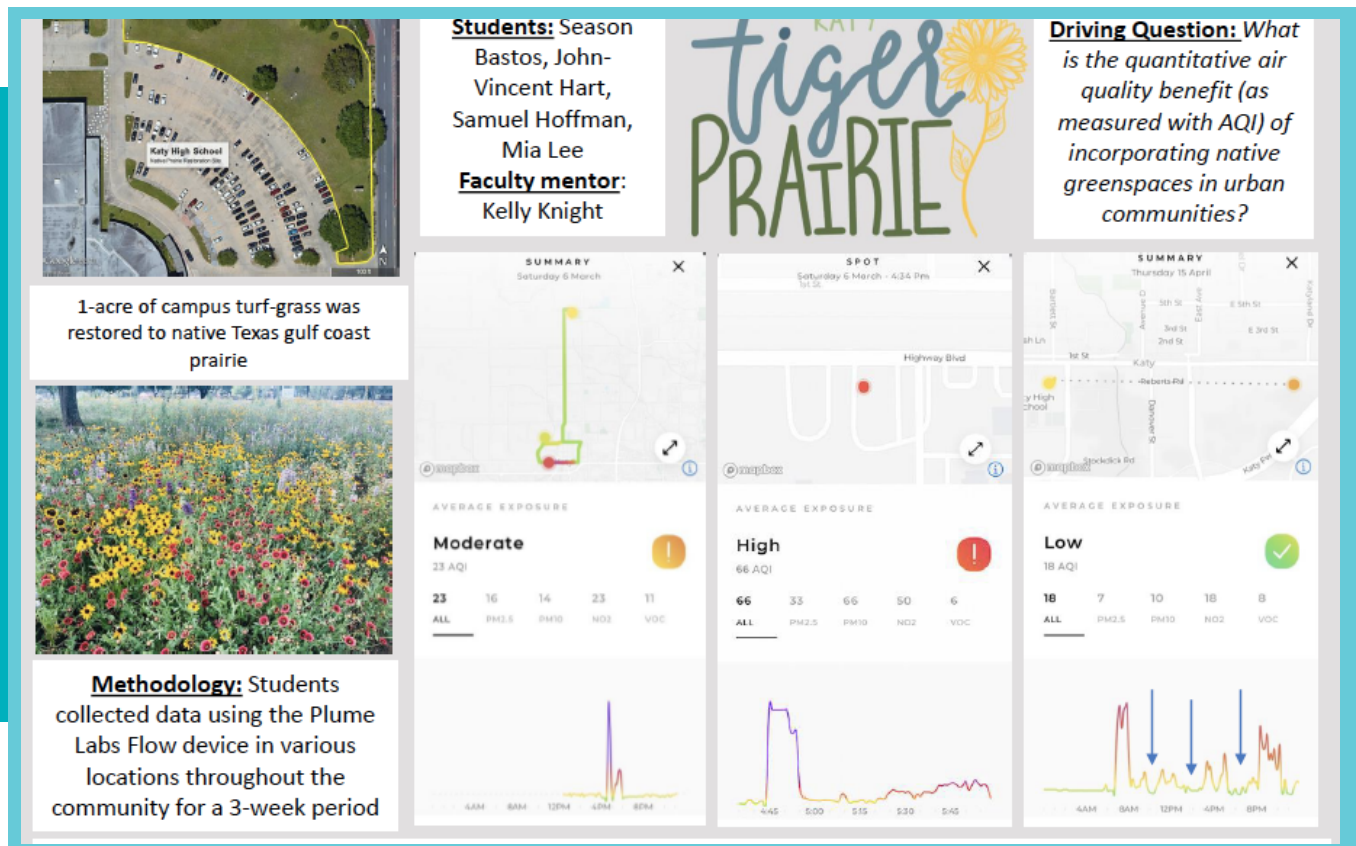


The following pages showcase 6 presentations from the nearly 40 student project submissions that CELF received for this year's Symposium



# NATIVE GREENSPACES IN URBAN COMMUNITIES

KATY HIGH SCHOOL, TEXAS



## PROJECT OVERVIEW

Students at Katy High School in Houston, Texas - a school straddled by two highways and constant vehicular traffic - set out to discover what benefits to air quality could be quantified by incorporating native green spaces - "Tiger Prairie" - in an urban community.

They tested their theory by transforming an acre of turf on their school campus into a native prairie, and then collected air quality data using their class' Flow personal pollution monitor.

## KEY CONNECTIONS TO SUSTAINABILITY



ABILITY TO MAKE A DIFFERENCE



INTERDEPENDENCE



DIVERSITY

## STUDENT ACTION TAKEN

Advocated for and succeeded in gaining teacher and administrative support for planting native spaces to improve air quality & overall health of school campus

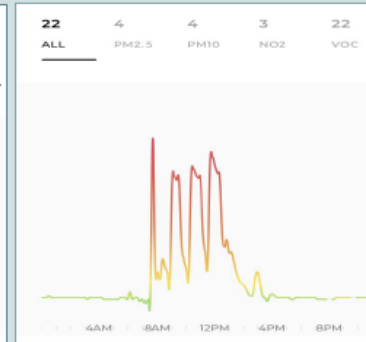
# HOW CLEAN IS THE AIR IN OUR SCHOOL?

LOUIS M. KLEIN MIDDLE SCHOOL, HARRISON, NY



**Our Investigation**  
For the month of April 2021 we have been collecting data from the air quality device to discover when and where we are breathing unsafe air during our school day and what causes it. During this month, the school installed air purifiers.

Date	VOC	All
4-7	14	14
4-8	15	15
4-12	13	13
4-14	22	22
4-15	17	17
4-16	10	10
4-20	11	11
4-21	10	10



## Data Analysis

- VOCs (Volatile Organic Compounds) were the highest pollutant on a daily basis.
- The air quality got worse when we use cleaning products

## Conclusion

- We discovered that the cause of air pollution in our school is mostly due to harmful cleaning products along with the extra cleaning of our classrooms due to COVID
- Moving forward, our schools must change their typically used cleaning products to those that are

## PROJECT OVERVIEW

Students were curious about the indoor air quality at their school. They collected data for an entire month, and were surprised to learn that the cleaning products used by their school were causing VOC levels to spike throughout the day.

Due to precautions related to Covid-19, classrooms are being cleaned more frequently and with stronger, potentially harmful products. The students presented suggestions for reducing VOC levels for a healthier learning environment.

## KEY CONNECTIONS TO SUSTAINABILITY



ABILITY TO MAKE  
A DIFFERENCE



SYSTEMS



PLACE

## STUDENT ACTION TAKEN

Plans to appeal to school facilities team for use of environmentally-friendly cleaning products to reduce VOCs in classrooms

# COMPARING AIR QUALITY IN THE BRONX & MANHATTAN

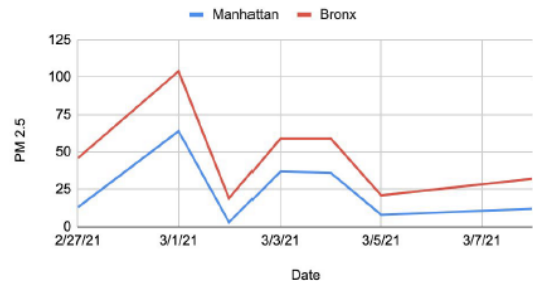
WEST END SECONDARY SCHOOL, NEW YORK, NY

## Research Question & Hypothesis

**Research Question:** Are PM 2.5 Rates Higher in the Bronx Than Other Boroughs? If so, what can we do to solve it?

**Hypothesis:** The Bronx Has Been Disproportionately Affected By PM 2.5 Than the Rest of the City.

PM 2.5 Comparison in Manhattan and the Bronx



My PurpleAir results graphed. The red line represents air quality in the Bronx and the blue line represents Manhattan. The x-axis resembles the date and the

## The Complicated History of Robert Moses and the Bronx

While many may see Robert Moses as a Pioneer for parks, natural landscape, and more, at heart he was really a racist. While his conservation methods and advocacy are true, they were fueled by his hatred for African Americans and Latinos. In locations in the Bronx, he purposely built three highways strategically around Mott Haven, preventing the residents from leaving their neighborhoods and buses and also dumping tons of polluted air such as 2.5 from car exhaust into these minority communities. It's because of acts of racism like this that also push the Bronx into having one of the highest levels of pollution in the city. Many delivery depots keep their factories in the Bronx while catering to locations such as Manhattan. At the same time, these delivery services won't deliver or be present in certain areas as they deemed them "dangerous". Most of these "dangerous" areas are primarily made up of African Americans and Latinos.



Robert Moses overlooking a model of New York City

## What We Can Do With This Information

What we can do now, learning that the Bronx has higher PM 2.5 rates than Manhattan, is how to make a difference. I do believe that advocating for change such as PM 2.5 regulations, more care for implementing natural resources, and how regular exposure to PM 2.5 can lead to health risks, especially in a pandemic that attacks one's respiratory systems. Now knowing the shocking truth regarding historic racism, years in the making, and more has resulted in atrociously high PM 2.5 rates in the Bronx, we now know what we must advocate for. That we must understand that communities are suffering, people have severe health problems, and many of these issues stem from PM 2.5 and other pollutants. We can reach out to organizations that specialize in reducing PM 2.5 and pollution in the city as well.

## PROJECT OVERVIEW

Jose had heard reports in the news about the connections between poor air quality in communities of color and higher rates of Covid-19 in the Bronx. For his project, he set out to collect AQ data -both live readings and photo documentation- that would help show the inequities between Manhattan and Bronx neighborhoods.

To support his data, Jose dug deeper into the history of infrastructure, systemic racism, and legacy of Robert Moses that led to increased levels of air pollution.

## KEY CONNECTIONS TO SUSTAINABILITY



ABILITY TO MAKE A DIFFERENCE



FAIRNESS/EQUITY



SYSTEMS

## STUDENT ACTION TAKEN

- Advocacy to address policy that impacts AQ and community health
- Shared research and importance of youth voice with MS students in Syracuse, NY.

# SCHOOL CAMPUS AIR QUALITY STUDY

**HARMONY SCHOOL OF FINE ARTS & TECHNOLOGY  
SUGAR LAND, TX**

## Driving (Inquiry) Question

**What are the pollution levels at our campus?**

### Legend

AQI < 20

AQI 21-50

AQI > 50

## Lunch Outdoor Air Quality



**Why do we study the air quality by the road?**

We study the air quality by the road of our campus to see what the air quality would be, which was not very good as expected.

## March 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	Battery was low so there are no calculations on 25th		

www.printable-calendar.com

**Presented By:**  
Steven R & Zion C  
Mrs. Kulow  
HSART  
8th grade

## April 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

www.printable-calendar.com

## PROJECT OVERVIEW

Students observed that the air quality around their school is noticeably stinky and smoggy. They mapped out their "place," identifying 3 manufacturing businesses surrounding the campus and conducting air quality testing where the air felt most polluted.

Next year, rising 8th grade students will collect additional data and eventually connect with the 3 manufacturers to share the data and offer proposals for remediation.

## KEY CONNECTIONS TO SUSTAINABILITY



SYSTEMS



COMMUNITY



PLACE

## STUDENT ACTION TAKEN

Students will present longitudinal AQ data to nearby manufacturing companies and propose strategies for air pollution remediation.

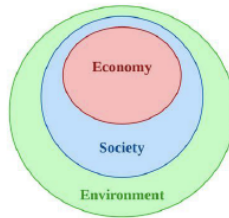


# ENVIRONMENTAL JUSTICE & ECONOMICS

THE HEWITT SCHOOL, NEW YORK, NY

## Environmental Justice and Economics

How is environmental justice economically viable?



Negative environmental externalities account for uncompensated environmental effects of production and consumption

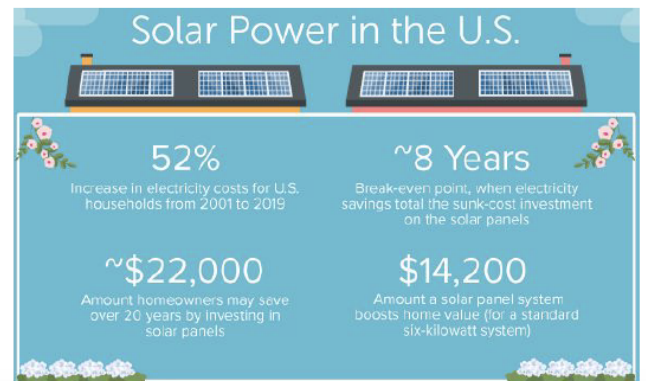
### Electricity bill:

#### Product Cost

Coal extraction  
Equipment  
Transfer of coal to electricity  
Transportation

#### Social Cost

Increased health care costs  
Pollution effects on animals and farming  
Effects on tourism  
Limit physical or mental functions



The Hewitt School  
Caroline Baillie & Zaynab Badrous

### PROJECT OVERVIEW

Caroline and Zaynab chose to explore the economic benefits of creating a more environmentally just society, to create a compelling case for individuals to make more sustainable choices for the benefit of the community as a whole.

They outlined various factors and externalities that contribute to the social and production costs of electricity, and offered solar power as a cost-effective, sustainable solution.

### KEY CONNECTIONS TO SUSTAINABILITY



LONG-TERM EFFECTS



COMMUNITY



LIMITS

### STUDENT ACTION TAKEN

Students will use the research gathered in this project to advocate for adoption of solar power in their local community.



# EVENT-BASED IMPACTS ON AIR QUALITY

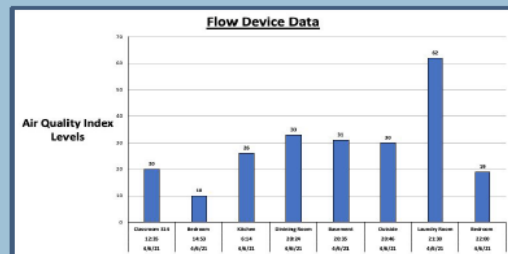
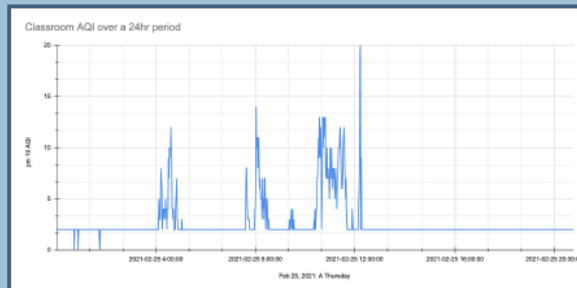
ROGERS PARK MIDDLE SCHOOL, DANBURY, CT

## Driving Question

What types of daily life events cause higher AQI levels?



## Event Based Air Quality in Danbury, CT



## Additional Information

- \* Students took the device home to get readings on their everyday activities
- \* They compared them to a 24 reading cycle from the school
- \* Students were not able to meet with each other to compare individual data

**Students:** Fabian, Anthony, Alana, Emilyn, Genta, Lucas, Jonathan, Dalilah, Geidy, Miguel, Gabby, & Estrella

Rogers Park Middle School Grades 7 & 8 Science

## PROJECT OVERVIEW

These middle school students investigated the impacts of daily activities within various rooms in their homes, gathering data using the Flow device. Working remotely, they compared readings with classmates and analyzed their findings to make conclusions.

Many discovered laundry room have high particulate matter readings. Students took ownership of the project with enthusiasm and were empowered to make changes to improve AQI within their homes.

## KEY CONNECTIONS TO SUSTAINABILITY



LONG-TERM EFFECTS



COMMUNITY



PLACE

## STUDENT ACTION TAKEN

Students began to make changes in their daily home routines in order to lower AQI readings. Plume Labs -who heard this presentation at the Symposium- will also share student findings as part of their impact reporting.

# SPECIAL GUESTS, ATTENDEES & SUPPORTERS

## GUEST SPEAKERS AND PANELISTS INCLUDED:

### GRACE CLEARY

Hewitt School student in NYC & former Civic Science program participant

### FAY GORE

Mid-Atlantic Regional Director of Education for National Geographic Society

### TYLER KNOWLTON

Director of Communication, Communities and Partnerships for Plume Labs

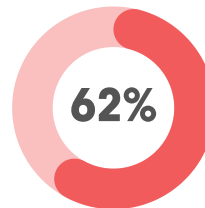
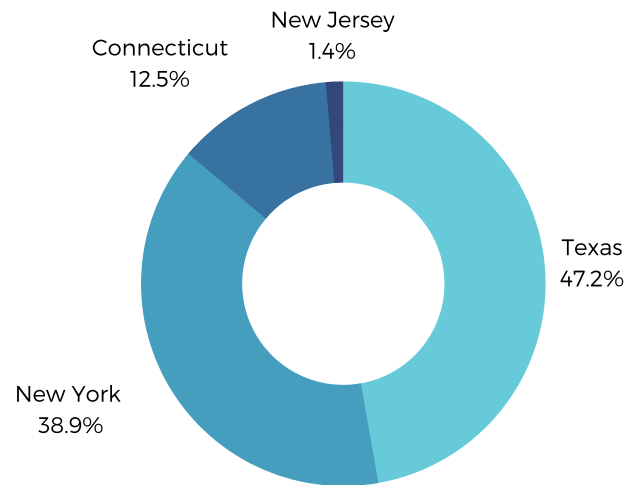
### SARAH JOHNSON

Executive Director of the Air Quality Program for the New York City Department of Health and Mental Hygiene

### JULIET STIPECHE, JD

Former Director of Education for the Houston Mayor's Office

## CIVIC SCIENCE PROGRAM PARTICIPANTS:



Title I Schools

**100+**

Attendees, including students, teachers, administrators, and community stakeholders

“It is truly impressive how students, teachers, & community leaders can come together to try & solve environmental problems. I learned new things & got to be a proud teacher watching my students perform... thank you for all you do to help protect our planet and expand the message of sustainability.”

**MIKE GARGUILO**

Teacher at Tarrytown Public Schools, NY

## SYMPOSIUM PARTNERS & SUPPORTERS INCLUDE:



With special thanks to our individual supporters: Lise Strickler & Mark Gallogly, Diane Fletcher-Hoppe, and CELF's Board of Directors