

EXPLORING AIR QUALITY IN MALDEN

By Malden A-VOYCE Youth Cohort (2022-2023)





AGENDA

Introduction

What is A-VOYCE?

Our Project

What did we focus on? What was our process?

Findings and Conclusions

What are our takeaways?

Modifications for Future Research

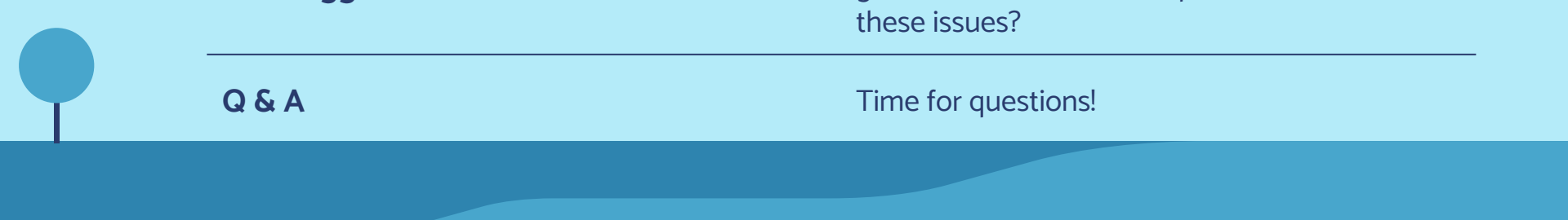
How can we expand or improve upon our research?

Our Suggestions

What can the city government/schools/nonprofits do to address these issues?

Q & A

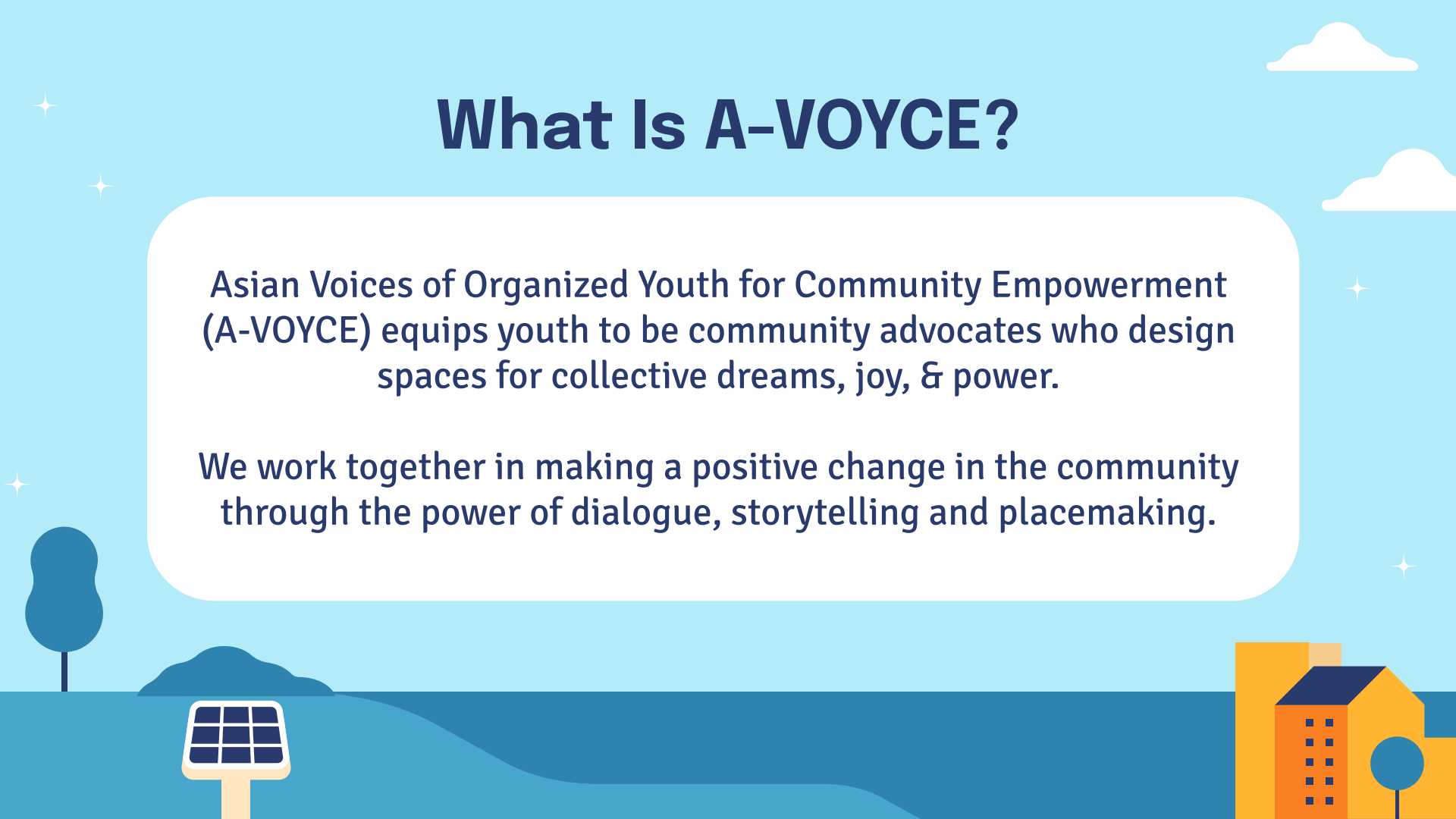
Time for questions!



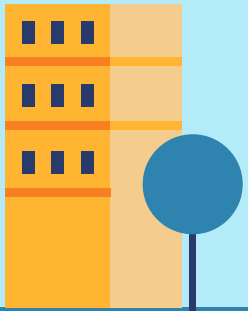
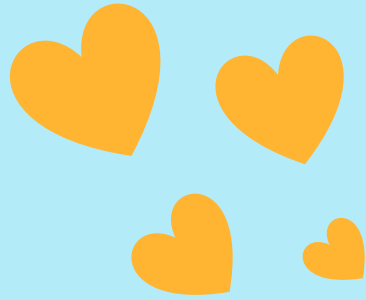
What Is A-VOYCE?

Asian Voices of Organized Youth for Community Empowerment (A-VOYCE) equips youth to be community advocates who design spaces for collective dreams, joy, & power.

We work together in making a positive change in the community through the power of dialogue, storytelling and placemaking.



OUR 2022- 2023 COHORT:





1

Our Project

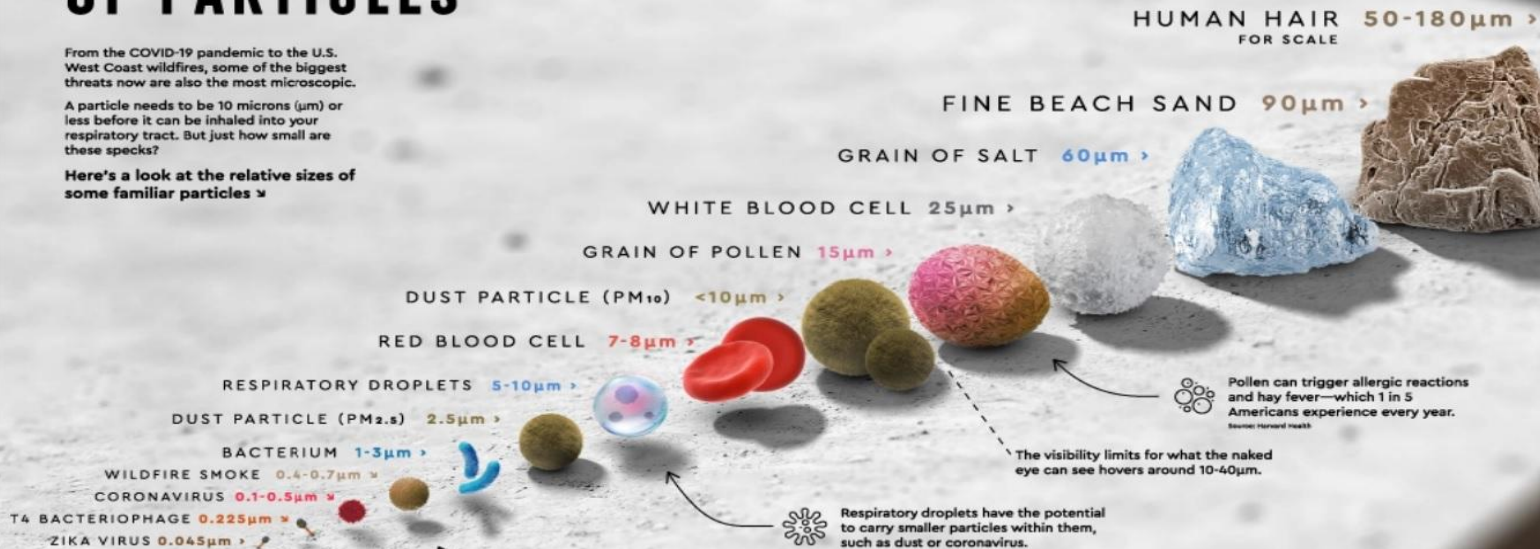
What did we focus on? What was our process?

THE RELATIVE SIZE OF PARTICLES

From the COVID-19 pandemic to the U.S. West Coast wildfires, some of the biggest threats now are also the most microscopic.

A particle needs to be 10 microns (μm) or less before it can be inhaled into your respiratory tract. But just how small are these specks?

Here's a look at the relative sizes of some familiar particles \gg

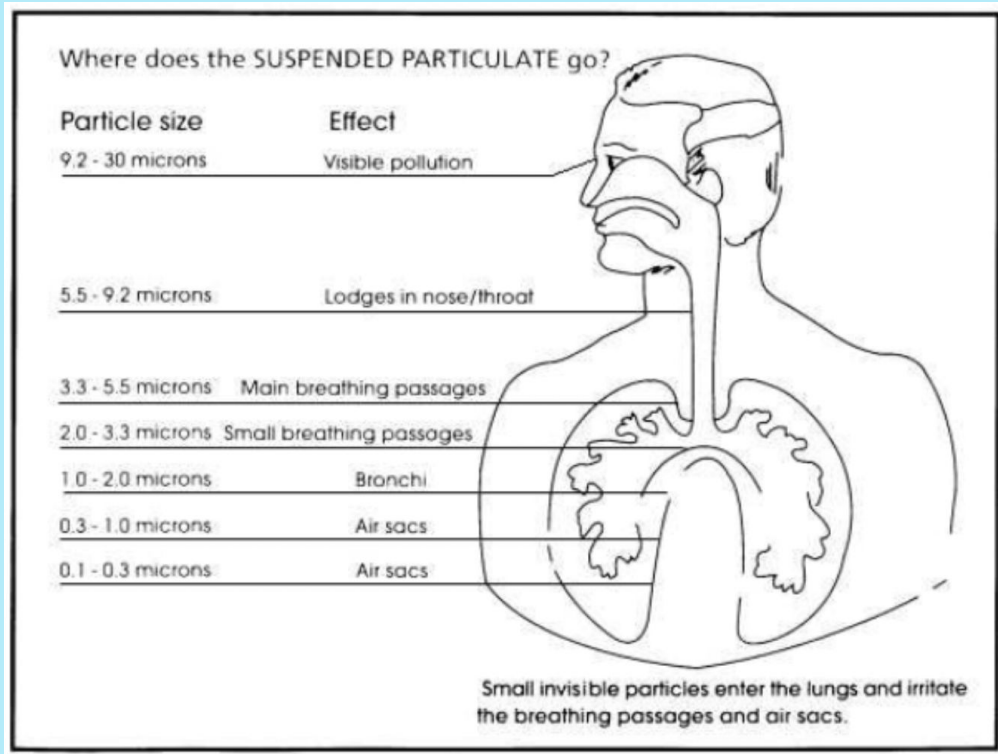


SOURCES Cleanstream, Daniel Loberley, EPA, Financial Times, News Medical, Science Direct, SCMR, Susan Sokolowski, Patoczek, U.S. Dept. of Energy
COLLABORATORS RESEARCH + WRITING Carren Ang, Ivan Ghosh | DESIGN + ART DIRECTION Harman Scholt

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Air Quality and Human Health



Particulate Matter (PM)

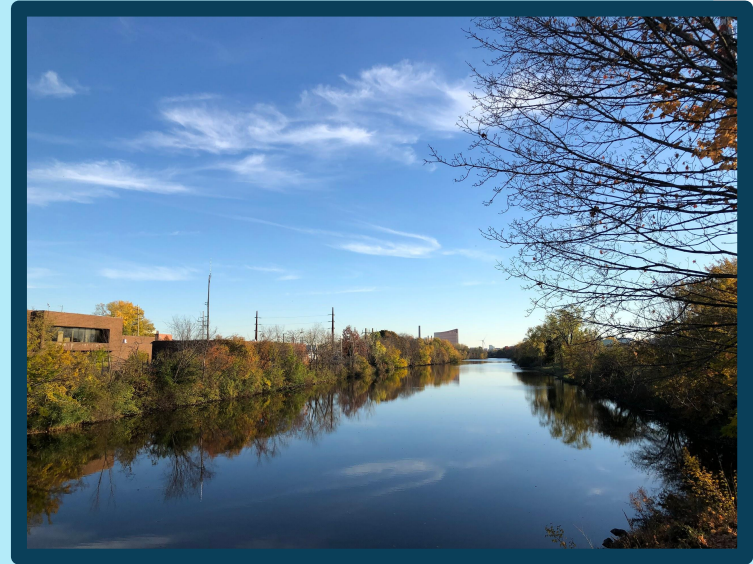
can lead to a number of health conditions including:

- Heart Disease
- Asthma
- Lung Cancer


Our Project

This year, we conducted research on air quality in partnership with Mystic River Watershed Association.

We collected air quality data with air quality sensors, and we surveyed the perspectives young Malden residents (ages 13 to 25) on air quality and environmental justice.



The Malden River at Medford Street Bridge
(photo credit: Kesta Fang)

A stylized illustration of a landscape. The sky is light blue with white clouds, stars, and a large white thought bubble. The ground is dark blue with a tree on the left, a house on the right, and hills. The text is inside the thought bubble.

*How might we creatively
educate Malden residents
about air quality?*

PROJECT TIMELINE

01

BRAINSTORMING

January-February

02

DATA COLLECTION

March-April

03

SURVEYING

April

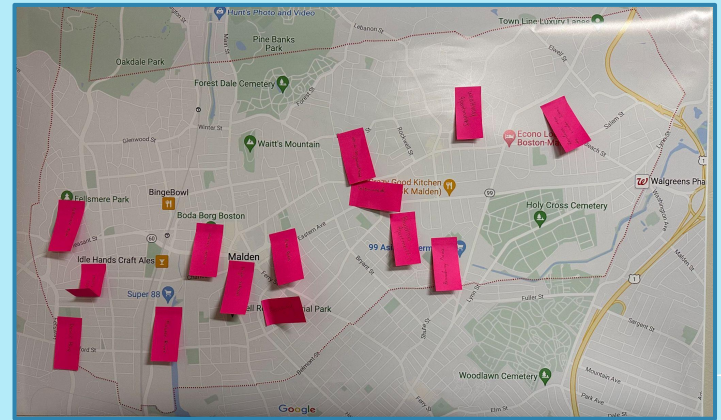
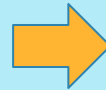
04

ANALYZING

May

01

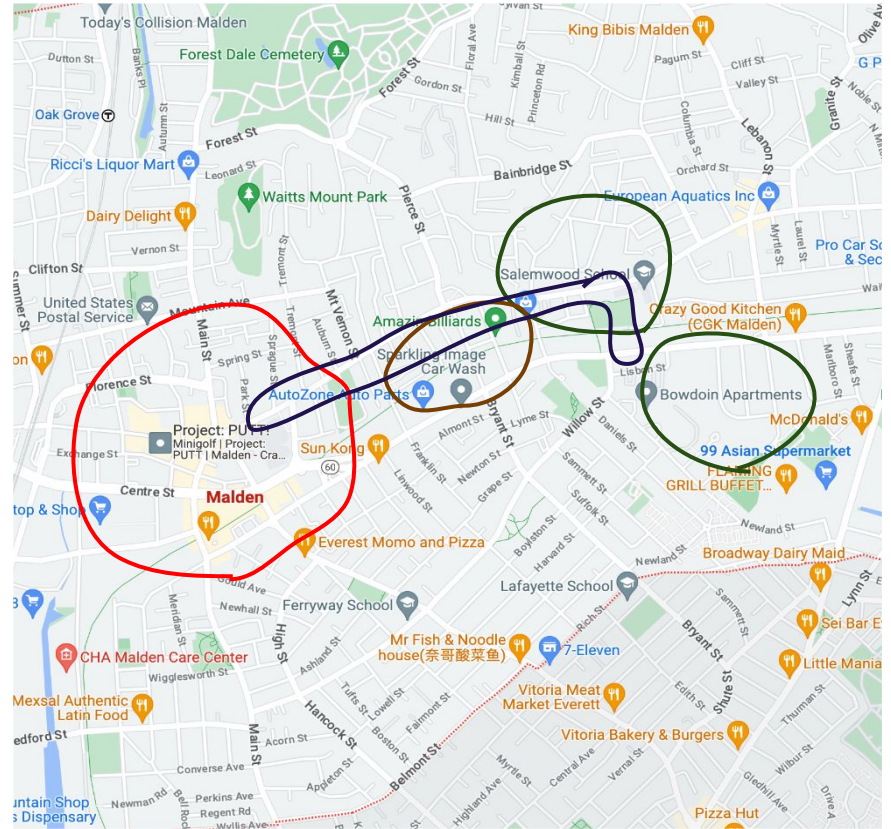
BRAINSTORMING

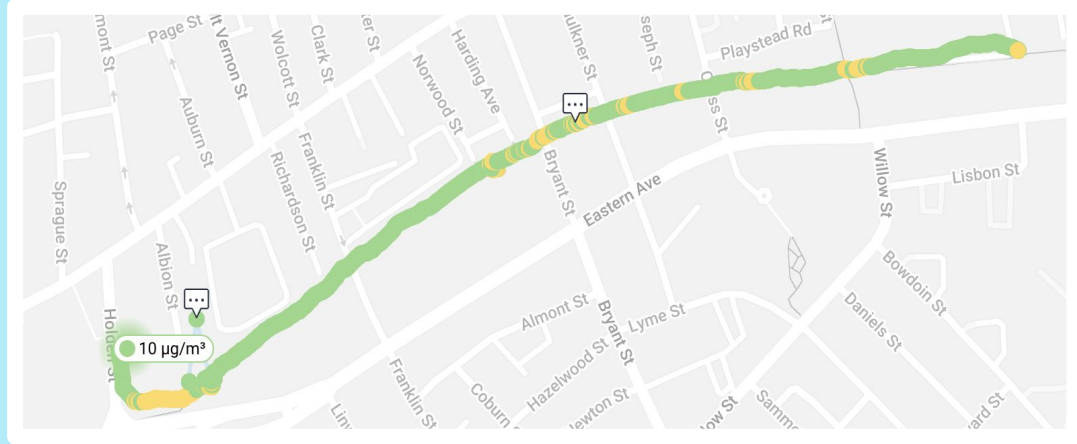


02

DATA COLLECTION

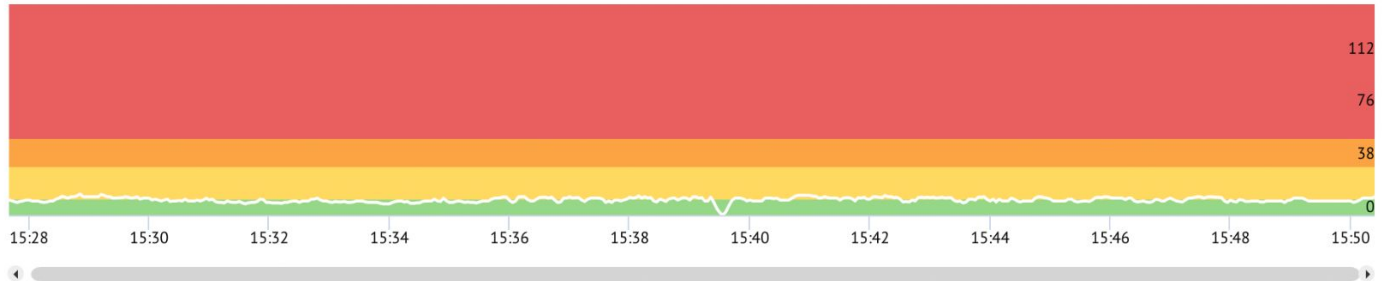
- **TIME FRAME:** 3/1 - 4/26
- **AREAS OF FOCUS:**
 - Bike Path (Holden St. to Bryant St.)
 - Malden Center
 - Salem & Bowdoin Apts
 - Mystic Valley Charter, Fellsmere Park & Devir Park
- **TOOLS:**
 - AirBeam 3 air quality sensors
 - The AirCasting app





ada
DCClark
AirBeam3-PM2.5
● avg. 11 $\mu\text{g}/\text{m}^3$
● min. 0 ● max. 15
04/13/23 15:27-15:50

zoom 1min 5min 30min 1hr 12hrs All



Export Session



03

SURVEYING

- Focused on local residents, aged 13-25
- Translated into four languages:
 - English, Chinese, Portuguese and Spanish
- Asked for thoughts and suggestions for change and how familiar participants are to existing environment issues, like air quality, and environment justice
- Posted flyers at school, youth center, and other areas



Malden Center
(photo credits: Kesta Fang)

Want to
win
\$50?

Help A-VOYCE collect data
for our air quality project
by filling out our short
survey!
Ages: 13-25

Survey
closes
5/1



SCAN ME

您想有機會
贏得
\$50?

請填寫我們的簡短調查問卷，幫助
A-VOYCE 收集空氣質量的數據！
年齡：13-25

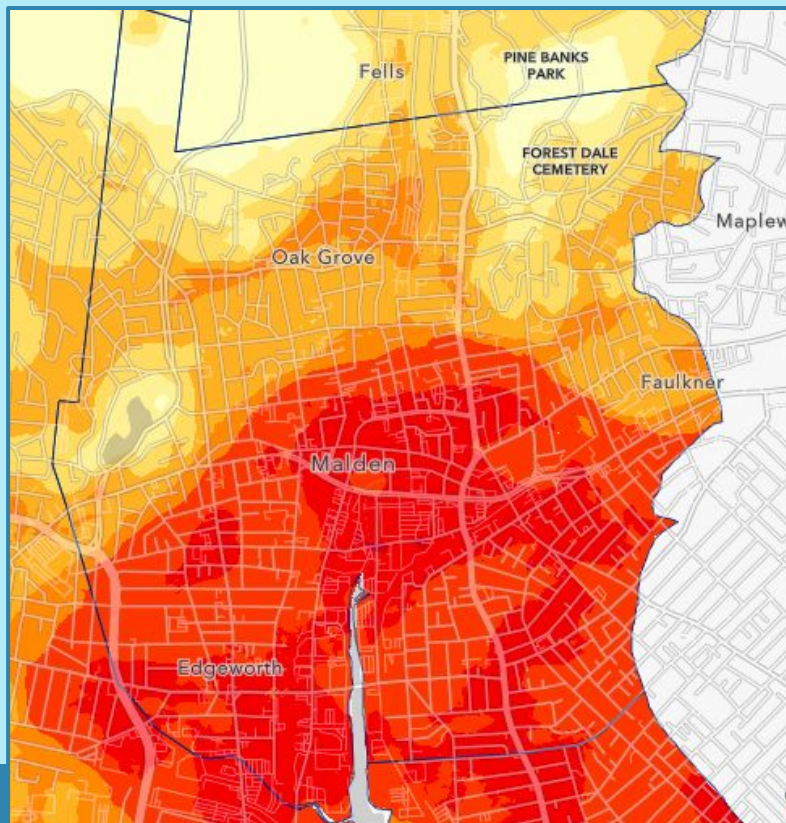
調查截止
日期
5/1



SCAN ME

04 ANALYZING

Wicked Hot Mystic Data Explorer



Wicked Hot Mystic Afternoon Heat Model

Modeled Air Temperature

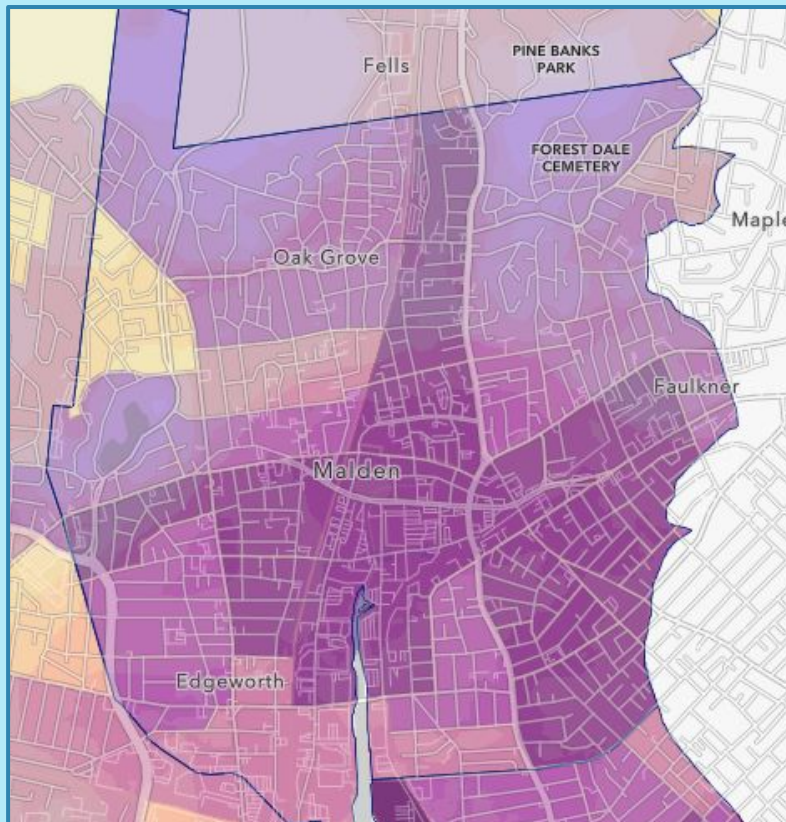
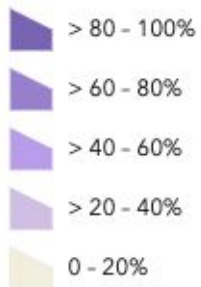


04 ANALYZING

Wicked Hot Mystic Data Explorer

Percent BIPOC Population

Percent BIPOC (Black, Indigenous, People of Color) Population



- ▶ 👁 Base Layers ...
- ▼ 👁 Heat Vulnerability Risk Factors ...
 - 👁 MA Environmental Justice Communities ...
 - 👁 Heat Vulnerability Index ...
 - 👁 Percent BIPOC Population ...
 - 👁 Median Household Income ...
 - 👁 English Language Isolation ...
- ▶ 👁 Land Cover Characteristics ...
- 👁 Wicked Hot Mystic Afternoon Heat Model ...



2

Findings and Conclusions

What are our takeaways?

Our Findings: Air Quality

As seen on our [AirCasting map](#), the air quality in Malden is overall at healthy levels:



Areas of Interest

These were areas that we want to highlight because these were data sets that captured PM levels that were notably higher. Feel free to click on each data set and explore!

Data sets

- [Jade, Bowdoin Apts](#) - 3/20/23
- [Kesta, Salemwood / Bowdoin Apts](#) -3/02/23
- [Angela, Salemwood](#) -3/23/23
- [Ivan, Downtown Malden](#) - 3/29/23
- [Ivan, Downtown Malden](#) - 4/6/23

Our Conclusions: Air Quality

- Poorest air quality areas tended to be parking lots, schools around rush hour, and historically industrial areas
 - Ex. Downtown Malden & housing authority neighborhoods
- The highest PM, upward of 20 PM, was recorded in the housing authority neighborhood
 - In contrast, other neighborhoods averaged 7 PM
- Better air quality areas tended to be green spaces averaged 0-1 PM
 - Ex. the bike path, Denvir Park & Fellsmere Park
- Trend of poor air quality in low-income and BIPOC neighborhoods

Demographics

Total Number of Survey Responses: 140

Versions

Responses(%)

English

136 (97.1%)

Chinese

2 (1.4%)

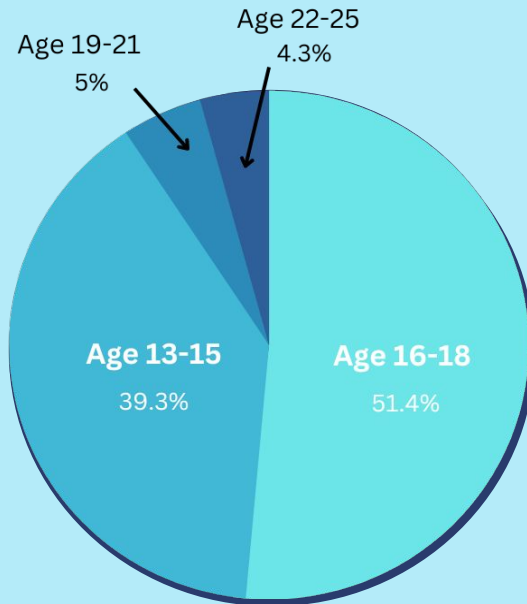
Spanish

2 (1.4%)

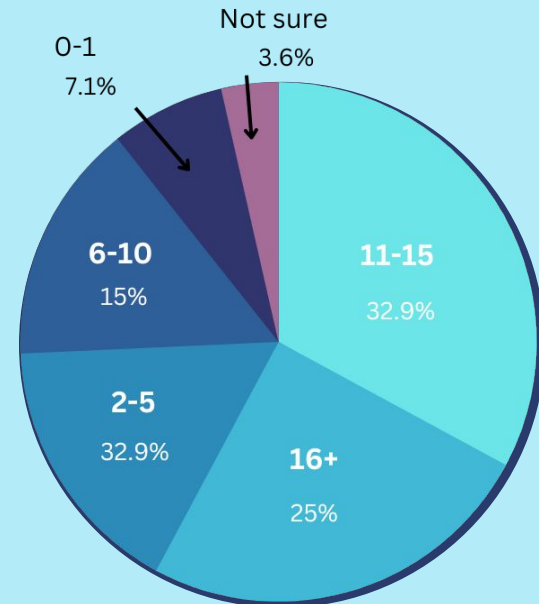
Portuguese

0 (0%)

Ages:



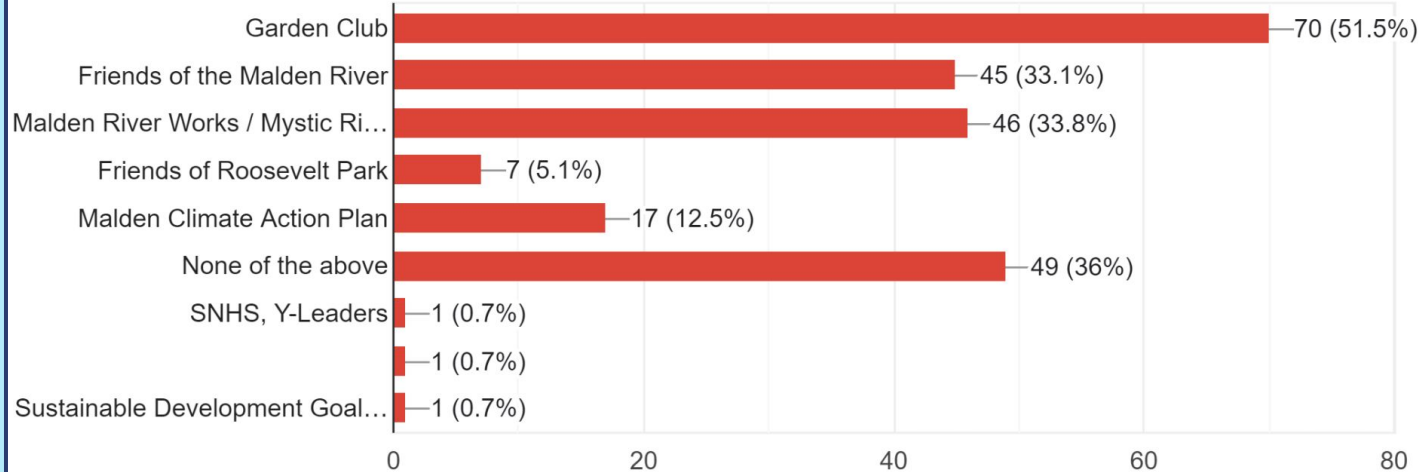
Years Lived in Malden:



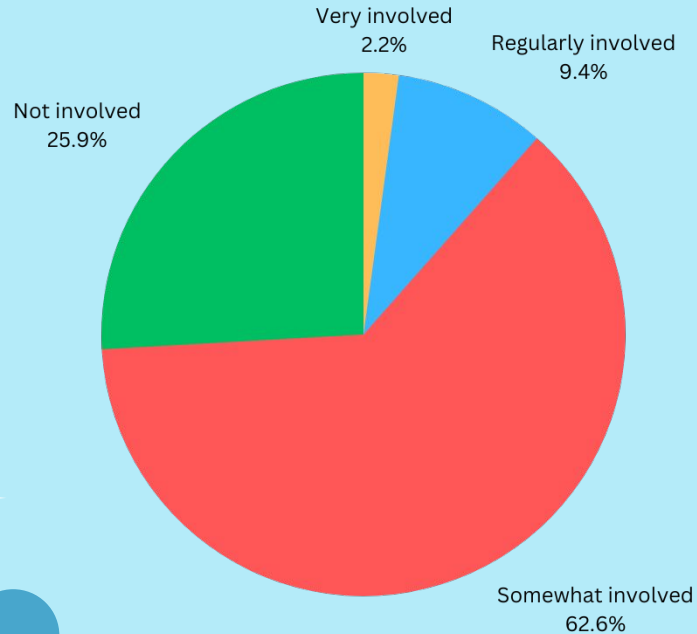
Our Findings: Survey

Are you familiar with the following environmental groups/orgs/movements? (check what applies)

136 responses



Our Findings: Survey



Despite being very familiar with environmental justice issues and groups, few youth are involved in making change:

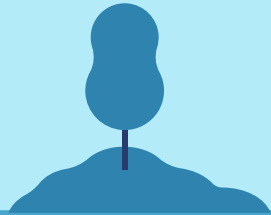
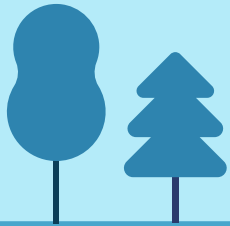
- Somewhat involved (i.e. occasionally take action for the environment, eg: picking up trash) - **62.6%**
- Not very involved (i.e. do not regularly take action for the environment) - **25.9%**



3

Modifications for Future Research

How can we expand or improve upon our research?



Future Research Changes



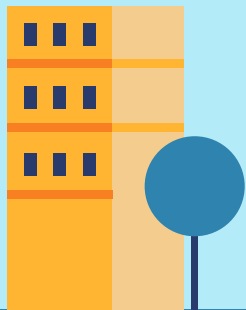
Consider the role of race/ethnicity and class

Examine the role of race and ethnicity in determining exposure to air pollution in greater depth; entail investigating how past patterns of prejudice and segregation have disproportionately impacted communities of color.



Expand the geographic scope

Broaden the geographic scope to encompass less populated areas that are still relevant. These areas may also be disproportionately impacted by air pollution and should not be overlooked in research efforts.



Future Research Changes



Posters in different areas

Consider relocating the posters to a variety of places. Perhaps we could explore displaying them in the outdoor spaces surrounding Malden, where they would be more visible to both drivers and pedestrians.



Expanding the age limit

Expand the age limit, encompassing a broader range of age groups. By widening the scope of age demographics, we can gather a wealth of information about the environmental concerns that are most pressing to different age groups.



Future Research Questions to Pursue

01

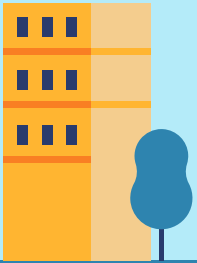
How do different factors, such as traffic patterns and proximity to industrial areas, affect air quality in different communities?

02

What is the relationship between air quality, social determinants of health, and health outcomes in various communities?

03

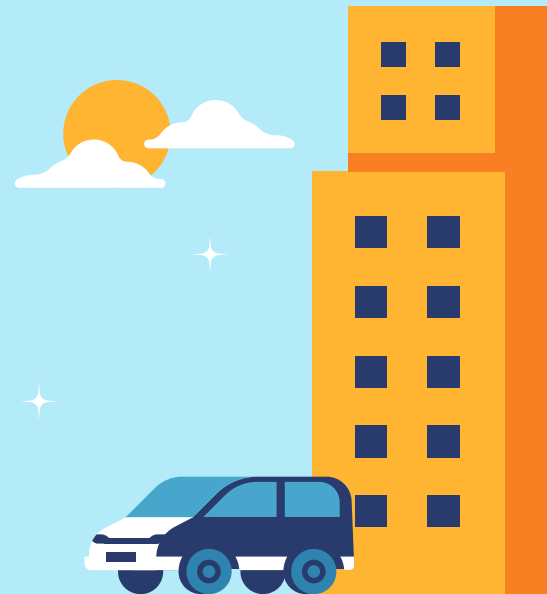
How will different environmental factors from industrial areas affect different age groups?



4

Our Suggestions

What can the city government/schools/nonprofits do to address these issues?



Findings

- Lots of concern about trash and smoking
 - Littering and improper waste disposal negatively impacts public spaces
 - Smoking concerns revolve around the health hazards of secondhand smoke

“I wish people littered less. Smoked and vaped less. It’s really devastating to see our community be covered up in toxic materials that shouldn’t be there.”

Suggestions

- Increased signage regarding trash and smoking
- Increased number of trash cans
- Designated places for smoking to avoid secondhand smoke for vulnerable demographics



Findings

- Youth want more opportunities and organizations to help and learn about the environment
 - Need to spread awareness of existing environmental groups
 - Want more opportunities and outreach from organizations for more involvement of youth
 - Clean-ups around Malden
 - Recycling

“[We want] City sponsored and organized community projects, or efforts to address environmental concerns. Citywide informational and promotional campaigns/efforts relevant to environmental justice.”

Suggestions

- Expand outreach for environmental activism
- Have more incentives and paid opportunities to engage youth on environmental justice issues
- Spread education about environmentally friendly opportunities and activities



Findings

- Youth are worried about the lack of natural green space around Malden
 - Lack of walkable streets forces more people to use cars + buses as the main mode of transportation
 - Lack of natural green space increases heat and decreases the air quality around city

“I’m worried that as Malden continues to develop as a city, it’s inevitable that more people would travel in and out of Malden using cars, which would decrease the quality of the air over time.”

Suggestions

- More efficient use of natural green spaces (instead of artificial turf) to offset more carbon and use less water
- Create a more walkable community!
 - Inspired by Memorial Drive weekend closures and Michelle Wu’s “Open Streets” campaign
 -



Questions To Leave You With

1. What steps could we take to improve air quality for Malden residents?
2. How might we create more programs to get youth involved in environmental justice?
3. How might the city educate the residents about upcoming environmental projects?

THANK YOU!



Thank you to the Mystic and their wonderful staff, Marissa and Daria!

For more information about A-VOYCE and ACDC, please visit asiancdc.org!



Q & A

