A field-based study engaging Sonoma County youth in access to nature

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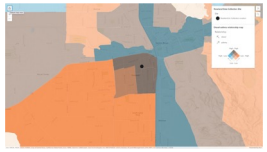
Background

- Environmental Justice (EJ) is a concern for our community neighbors in Roseland
- Our community academic collaboration, Partners for Equity and Research has been addressing EJ through youth leadership development with the North Bay Organizing Project (NBOP) and their Latinx Student Council (LSC)
- Our work with the LSC includes workshops on air quality, ecosystem services, and the health benefits of open space



Latinx Youth Environmental Justice Council - Access to Nature Spaces

- This project uses the Fairfield Osborn Preserve to
  - Collect air quality data
  - Educate students on benefits of open space
- Preparatory work included an hike at preserve, the distribution of air quality sensor, and preliminary data collection/validation







Results

- Roseland had higher AQS levels when compared to Fairfield Osborn Preserve (Table 1, Figures 2A, 2B)
- TVOCs were highly correlated with better Air Quality Score (Table 1, Figure 3)
  - every 0.1ppm increase in VOC level was associated with a decrement of 4 AQS points
- Higher TVOC levels were recorded in Roseland compared to Fairfield Osborn Preserve (Figures 1A, 1B)
- Time spent at the Fairfield Osborn Preserve is associated with better air quality and lower VOC exposure

Abbreviations:
TVOC, total volatile organic compounds
AQS, Air quality score

Discussion

Community-Engaged Research

We increased sustained engagement with the Latinx Youth Environmental Justice Council

- Distributed ~35 DIY indoor air filters to youth participants and promotores (community health workers in Sonoma County)
- We engaged in intensive environmental health curriculum engagement with youth council
- Youth Access to Nature was facilitated with hike at Fairfield Osborn Preserve



Wearable Air Monitor Data comparing Fairfield Osborn Preserve and Roseland

Figure 1A. TVOC (ppm) - Fairfield Osborn Preserv

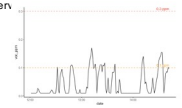


Figure 1B. TVOC (ppm) - Roseland

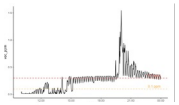


Figure 2A. AQS - Fairfield Osborn Preserve

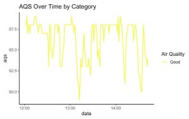


Figure 2B. AQS - Roseland

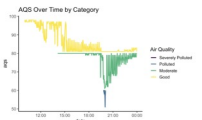
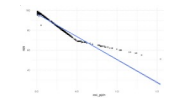


Table 1.
Linear multivariable model - combined locations

Variable	Variable coefficient (β), 95% Confidence Interval	p-value
Intercept	90.71 (89.81, 91.61)	<0.0001
VOC (ppm)	-41.95 (-42.82, -41.07)	<0.0001
Temperature (C)	0.24 (0.18, 0.30)	<0.0001
Location (Roseland)	-0.73 (-1.41, -0.06)	0.03

$$AQS_i = 90.71 - 41.95(VOC_i) + 0.24(Temperature_i) - 0.73(Roseland_i) + \varepsilon_i$$

Figure 3.
Combined locations Correlation of TVOC by AQS



Limitations and Future Directions

- Atmotube data should be validated with EPA sensors
- Latinx Youth Environmental Justice Council Atmotube training
  - Data collection in May
  - Hike at Fairfield Osborn Preserve
- Summer intensive workshop
  - Sonora, CA
- Ecosystem services curriculum development and implementation
- Regulation and nature survey
  - Implement stress-reduction competencies
  - Distribute qualitative survey to characterize stress reduction and nature benefits to EJ programming