West Eugene Air Quality Study

BEYOND TOXICS | OREGON STATE UNIVERSITY

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OSU FOOD SAFETY AND ENVIRONMENTAL STEWARDSHIP
Provided samplers, and analysis for this study.

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The West Eugene area is located next to an industrial area, and has a history of odor complaints from residents in the Bethel and Trainsong neighborhoods. The smell is often associated with a chemical called naphthalene, which is found in creosote. Creosote is used to treat wood.

This pilot study was conducted by Beyond Toxics and the Pacific Northwest Center for Translational Environmental Health Research at Oregon State University. We used 17 outdoor samplers and 13 people wore and returned personal samplers to look at chemical exposures in West Eugene in October 2021.

The Food Safety and Environmental Stewardship laboratory at Oregon State University analyzed the samplers for 63 polycyclic aromatic hydrocarbons (PAHs). These chemicals are found in fossil fuels like oil and coal, and in industrial products like creosote. Many PAHs are air pollutants.

We know people are exposed to many different chemicals, but we do not know if these chemicals may cause harm. This report includes the data from this study. We are showing a summary of all data. Individual participants will receive their data separately.

QUESTIONS	WHAT WE FOUND
Environmental data	
Are levels of chemicals higher closer to the industrial part of West Eugene?	While this was a small study, we did find that levels of PAHs were highest within 1/4 mile of the industrial area.
Do the levels of chemicals change based on wind direction?	The levels were typically higher in the Northeast and South directions. Wind direction may be influencing this.
Of the chemicals in the air, are any above recommended health guidelines?	We were interested in naphthalene. The levels in Eugene are similar to levels found in other industrial US cities. Naphthalene is commonly emitted by wood treatment facilities. JH Baxter, a wood treatment facility in the vicinity of the sampling, recently ceased operations. We sampled the air prior to the facility's closure, so we expect that levels of naphthalene and other PAHs have decreased since the closure.
Wristband data	
Are people living closer to the industrial area exposed to higher levels of chemicals?	While we had a small number of samplers, we did see higher concentrations in samplers worn by people living closest to the industrial area.

LEARN MORE ABOUT PAHs

Polycyclic aromatic hydrocarbons are a common type of air pollution produced by burning.

On the web:
- http://superfund.oregonstate.edu/all-about-PAHs

On YouTube:
- https://youtu.be/fjgvmL61e5k

Page 1 — Summary of data

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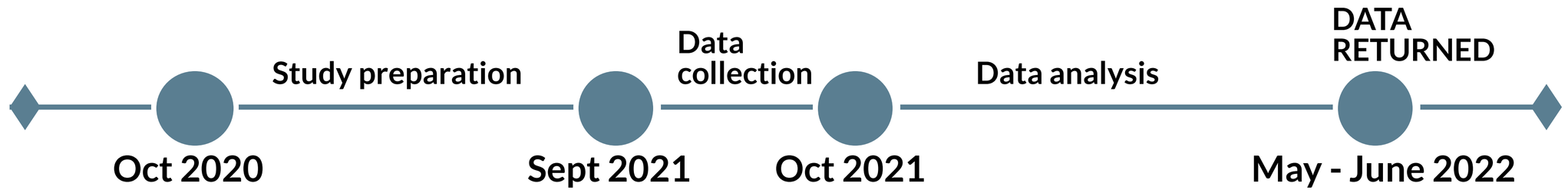
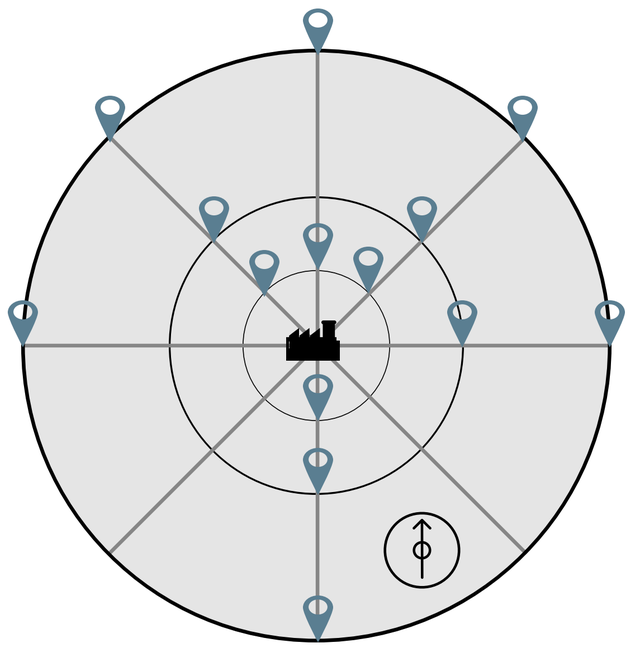
We know the West Eugene area has been reporting strong odors in the area for years. The smell is commonly associated with naphthalene, which is produced by industrial facilities in the area, especially those that treat and preserve wood. For example, creosote is often used to preserve wood, and it contains naphthalene. In 2019, JH Baxter was found responsible for a release of naphthalene, which exceeded health guidelines; it can cause headaches, confusion, lethargy and vertigo. This study was done to look at levels of naphthalene in the air, and that people are exposed to. We used two types of samplers to look for 63 PAHs. This report focuses on naphthalene as the chemical of concern.

For many chemicals, we still do not know how much will cause a negative health effect. Our ability to measure very low levels of chemicals will help us understand what amount of chemical might be toxic.

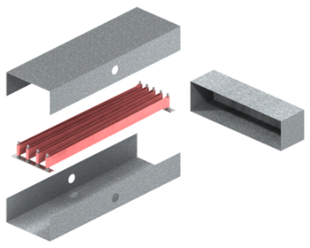




We selected locations in the North, South, East and West. This map shows the approximate areas of the 17 environmental air samplers in the area. We set out samplers 1/4 mile from the industrial area (inner ring), 1/2 mile (middle ring) and 1.0 mile (outer ring). This study design helped us determine if levels of chemicals were higher closer to the area.

Some people in these areas also wore wristbands, which let us look at how a person's exposure to PAHs might change based on how close they live to the industrial area.

Passive sampling wristbands were worn around the wrist for seven days. 13 people wore and returned a wristband.



We placed 17 air samplers at various distances and directions (North, South, etc.) in the neighborhood for seven days.

Beyond Toxics recruited people in West Eugene who volunteered to place an air sampler on their property for seven days. In the photos, you can see Eric and Arjorie from Beyond Toxics (top, bottom) and Diana (OSU) preparing samplers in West Eugene.

After seven days, the research team picked up all the samplers and brought them back to OSU, where they were analyzed. This report focuses on naphthalene as the primary chemical of interest.

To learn more about other efforts around JH Baxter, you may find this interactive StoryMap useful.
> https://storymaps.arcgis.com/stories/61e11e3a99a54ff784a68ffacaccffcc

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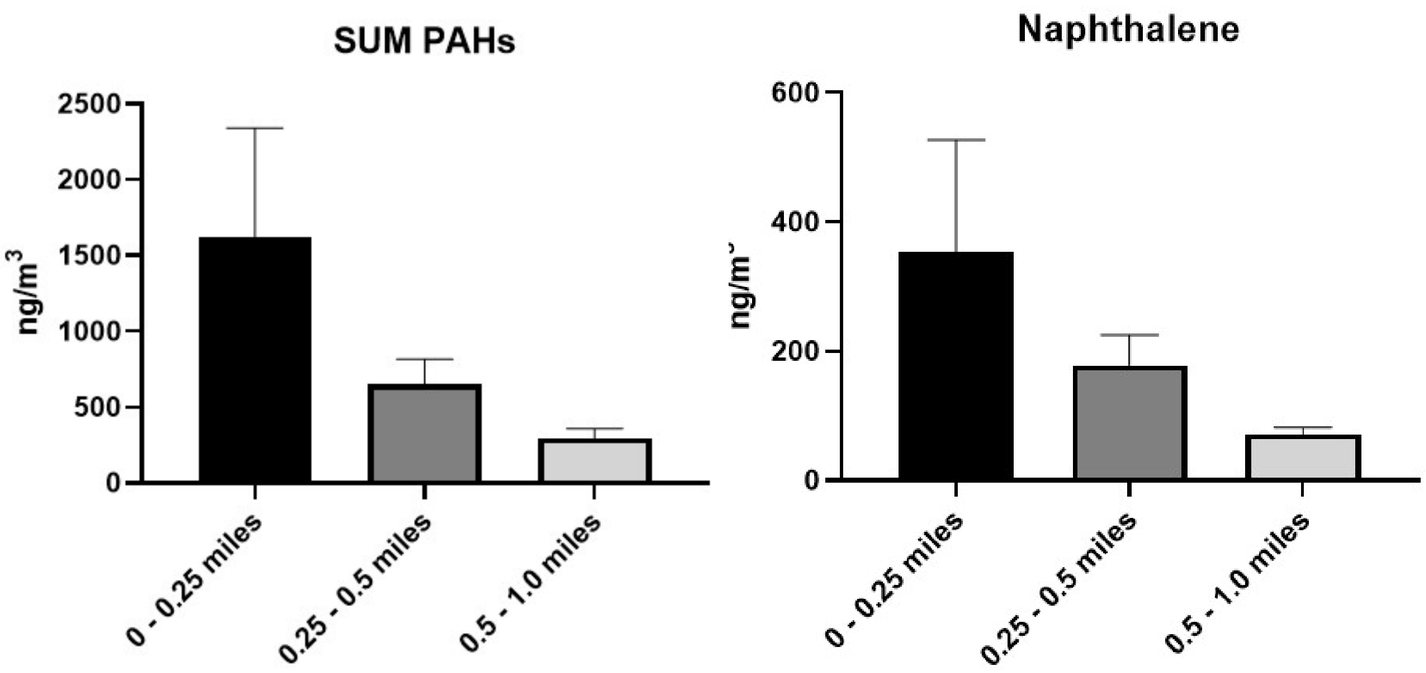
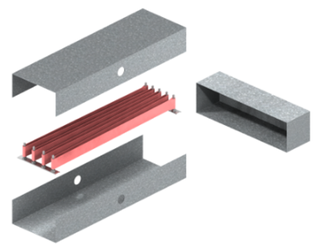
We placed **environmental** samplers in residential areas around the industrial part of West Eugene, to look for chemicals in the air. We do not know how much of a chemical is needed to cause a health effect. There are few regulatory guidelines for these chemicals. However, we and others have done studies in other areas in North America, looking for the same type of chemicals. These other studies allow us to look at similarities and differences between places. We focused on naphthalene, which is a major component of creosote.

By Distance

Our samplers were placed within one quarter of a mile, half a mile, and one mile of this part of town. We wanted to see if the amount of chemicals in the air changed the farther we got from this industrial area of town. As the distance increased, the level of chemicals decreased. We see this with all chemicals (sum PAH), and with naphthalene. Out of the 40 PAHs we detected, naphthalene had the highest average concentration.

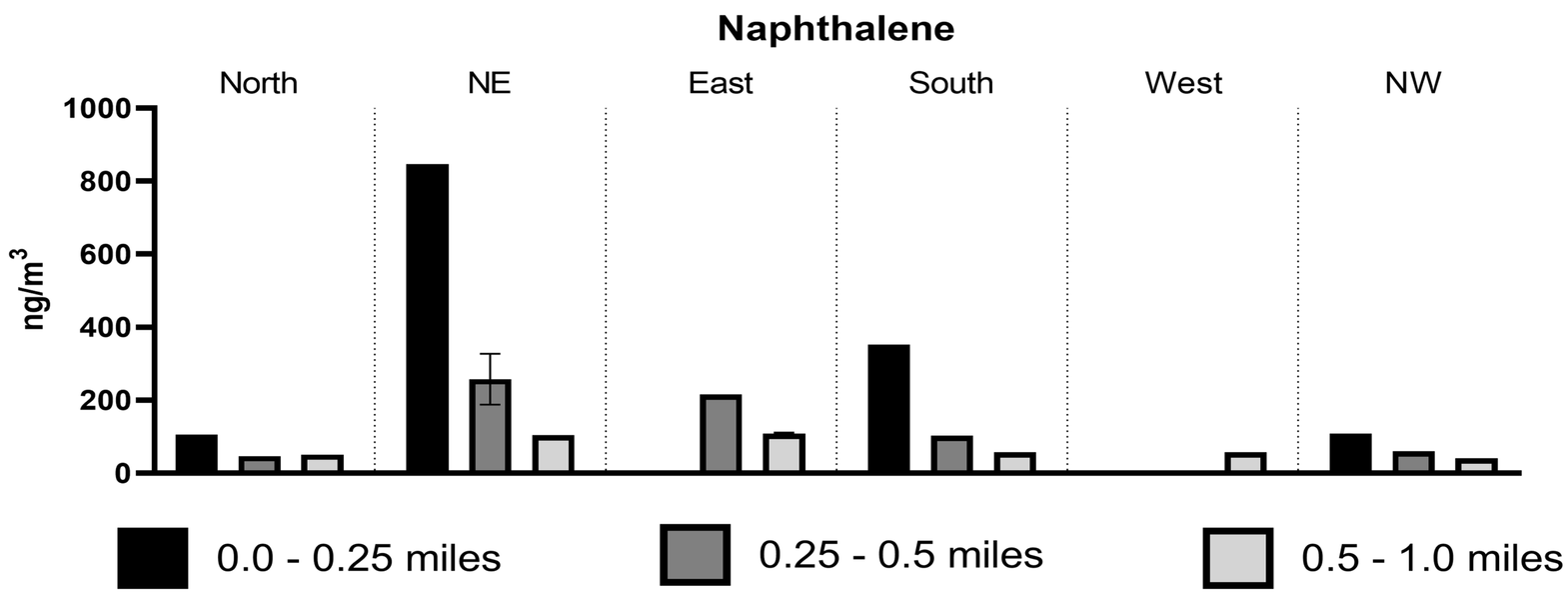
As we get farther away from the industrialized area, the levels of PAHs is lower. We can look at all PAHs detected (we add up the total in each sampler, the sum PAH), or at individual chemicals, such as naphthalene.





By Direction

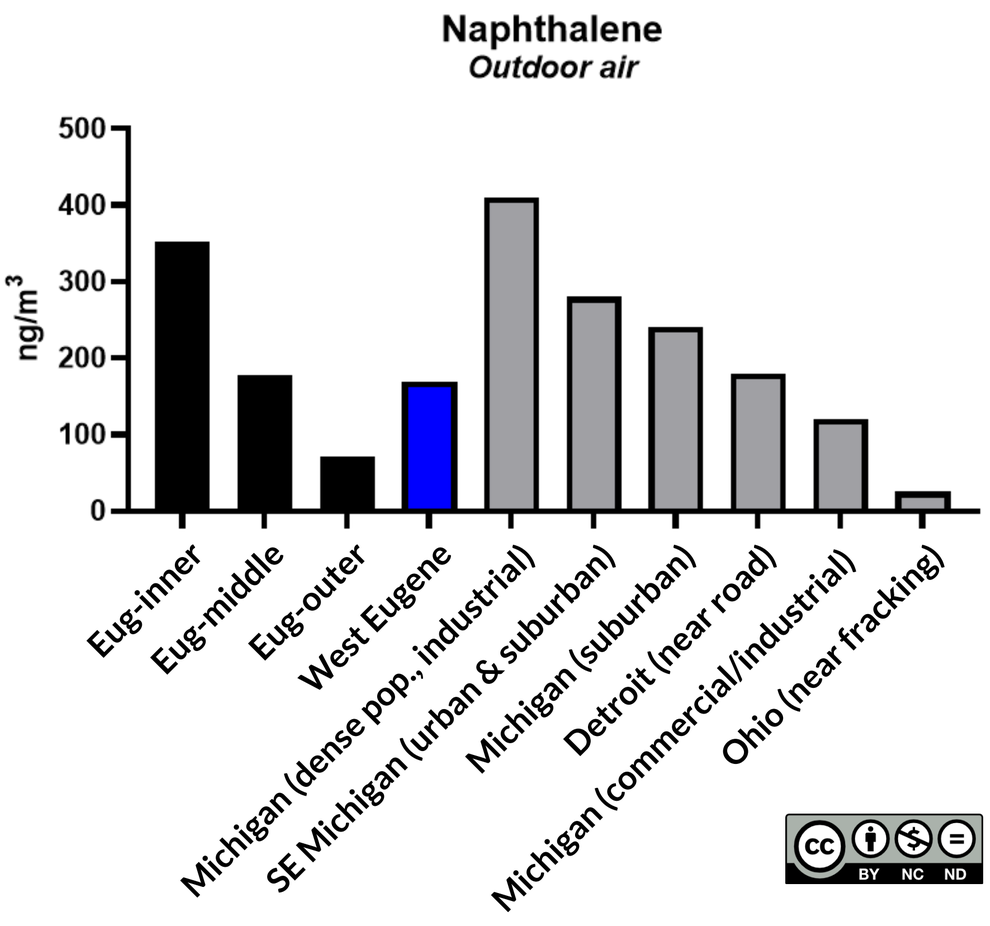
We were interested to see if the amount of chemicals in the air was higher or lower based on cardinal direction and wind direction. The level was highest in the **Northeast**, followed by the **South**. We were unable to place some samplers in the East and West.



Closest to the industrial area, levels of naphthalene are highest in the Northeast. Levels in the South, which has more industry, are the second highest.

By other studies

We compared our data to other studies that have also looked at naphthalene levels in residential areas. We wanted to know if these levels were higher, lower, or similar to other cities in North America. Here, we show how the chemicals found in and around West Eugene compare to other areas in North America. The black bars show the levels in the different rings, with the Eug-inner bar representing the samplers closest to industrial sites, while the blue bar shows the average found in all 17 samplers. The levels seen in Eugene are similar to other areas of the U.S., with the highest concentrations similar to industrialized areas of Michigan.



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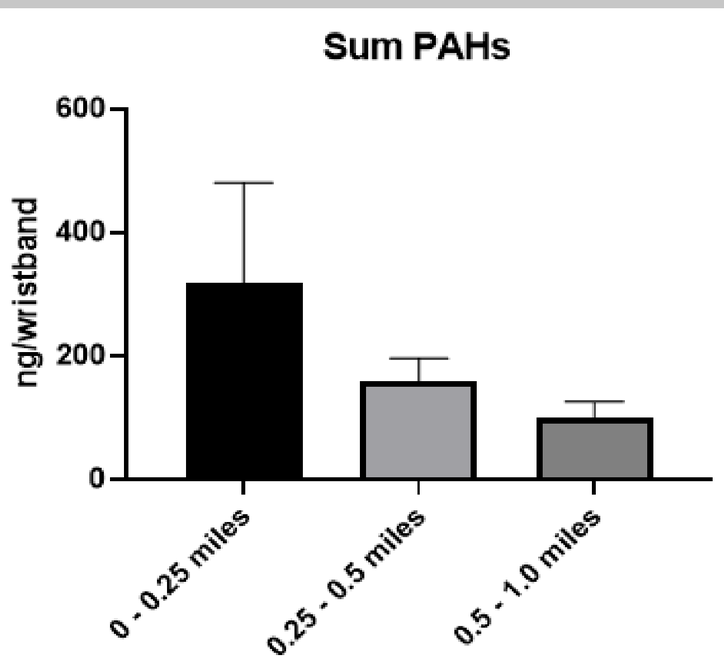
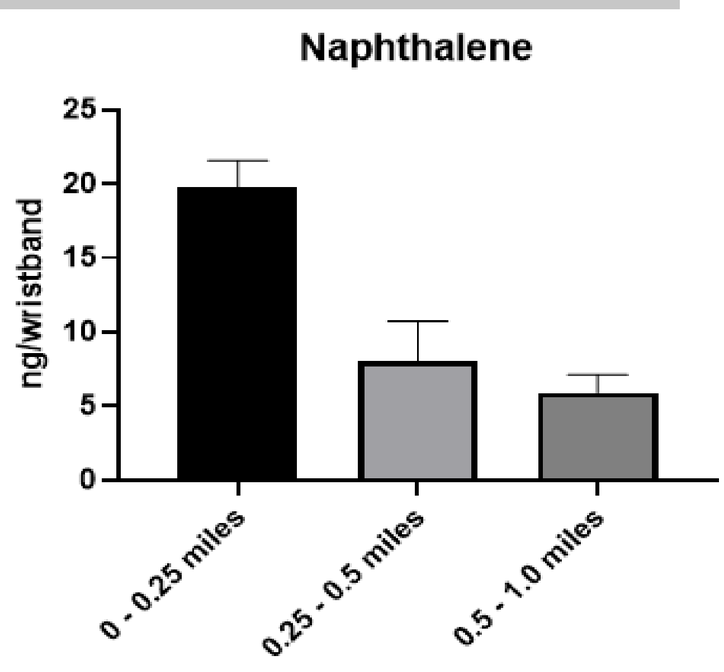
We asked residents in West Eugene, living near an industrial area to wear **wristbands**, to look for chemicals they might be exposed to. Again, we do not know how much of a chemical is needed to cause a health effect. We only had thirteen wristbands but in general, we saw similar trends to what we saw with the environmental samplers. Levels of chemicals were highest in wristbands worn by people living closest to the industrial area.

By Distance

Thirteen people wore and returned wristbands. Most wristbands were worn in the middle and outer rings (between 0.25-1.0 miles). We found 22 out of 63 PAHs, but on average only 14 were found per wristband.

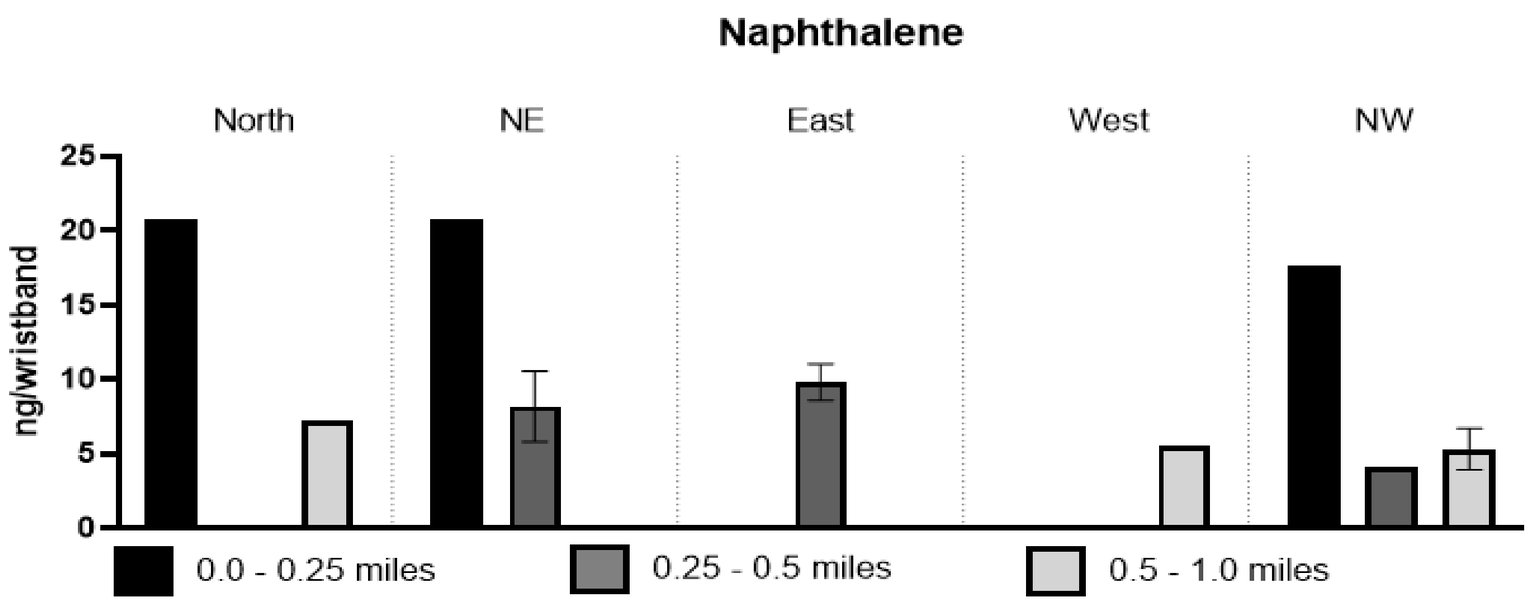
While we did not have as many wristbands, we saw a similar trend, that levels were lower in wristbands worn by people living farther away from the industrialized area. This was true for all chemicals when added together (sum PAHs), and for naphthalene.





By Direction

We did not have wristband data for all directions. For the data we have, we see that concentrations of naphthalene are higher closer to the industrial area. We saw the highest levels in the northern direction. This is similar to what we saw with the environmental samplers.



We did not sample in the South, as that is an industrialized area. Our goal was to sample in residential areas, and we sampled largely in the North, which is where many odor complaints have come from.

Please do not hesitate to reach out if you have additional questions.
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CONFLICT OF INTEREST STATEMENT
Kim Anderson and Diana Rohlman have a conflict of interest related to this study. These researchers own or are related to someone who owns a company that provides services related to the silicone wristbands and that interest could influence research that you are participating in.