

Research Report on air quality

Group 6:



Introduction

We are a group of five students and in the week of April 8 we had the second part of the exchange between the Carl-Humann-Gymnasium from Essen and the Castor College in Beverwijk. During this exchange we mainly carry out practical assignments related to the environment in Essen and Beverwijk. In the air quality section we measured the air quality at various places in Beverwijk. Later we compared these data with the previously acquired data in Essen, Germany. Various factors such as traffic, sea salt, industry, and even air currents from other countries, for example, by Sahara sand can affect the air quality. Poor air quality can have a negative impact on life expectancy and increase the risk of various diseases such as lung cancer, as well as impair health. Therefore, today we focused intensively on air quality and measured it at various locations to determine the current air quality here in Beverwijk.

Research question

We were curious if there is a difference in the air quality of Essen and Beverwijk. That is why our research question is: 'What is the difference between the air quality near a busy road in Essen and Beverwijk?'

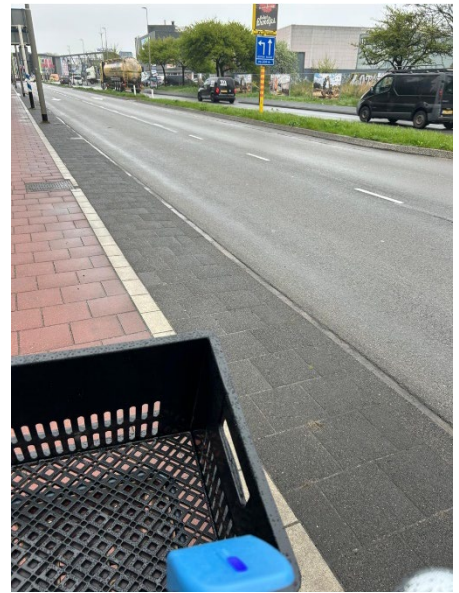
Hypothesis

We think that the air around the Parallelweg in Beverwijk is worse than the air quality in Essen near the Kraye Straße and the Steeler Straße. We assume it is like this, because there is more freight transport by Truck in Beverwijk than in Essen, this may be the case, because there is a port nearby and goods get transported from the industrial area to the port by truck using this road.

Research method

In order to be able to measure the amount of particulate matter in the air on the parallel road in Beverwijk and then compare them, we cycled along the parallel road with a device. This device measures the particulate matter present in the air. We attached this device to our bike and then started cycling. There is a light on the device that indicates when the particulate matter content changes. If this were the case, we would have stopped cycling to contest what the cause of the changing content is. The light can be in different colours. A blue light means that the particulate matter content is low and the red light means that the content is high.

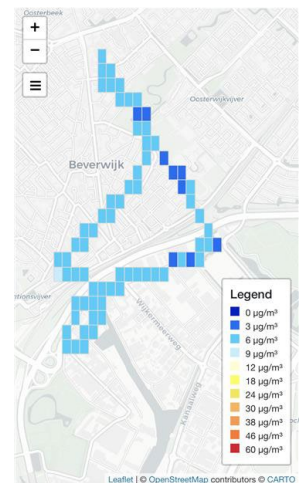
We had done something similar in Essen. We then also measured with this same device along die Kraye Straße or Steeler Straße. This road is quite similar to the parallel road. This is also the reason we chose this path. Because we have also measured the particulate matter in Essen, we can compare this with the particulate matter content that we have measured in Beverwijk.



Data and results

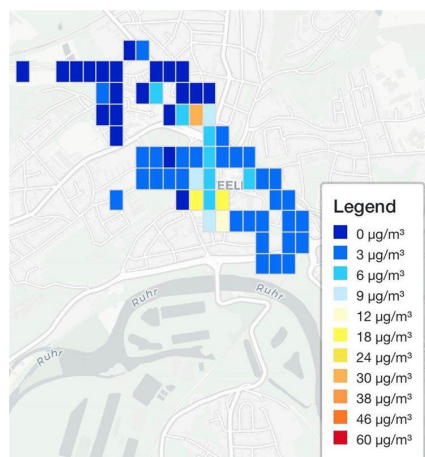
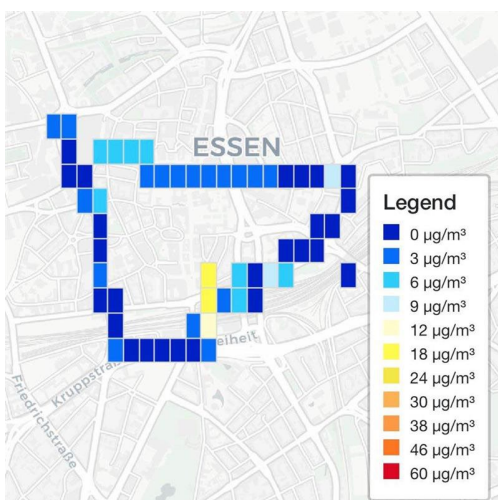
Result in Beverwijk

To properly compare Essen and Beverwijk, we also drove around in Beverwijk. We drove around the parallel road, parts of the harbor and also around the Breestraat. The possible polluters of the results in Beverwijk were Traffic, air traffic, industry, commercial companies such as the gas station and even smaller polluters such as smokers. In the photo you can see that there was little pollution in Beverwijk today. The highest level observed was $9 \mu\text{g}/\text{m}^3$ and the lowest was $3 \mu\text{g}/\text{m}^3$, but for the most part it was $6 \mu\text{g}/\text{m}^3$. You can see this because of the blue boxes on the map.



Result in Essen

In Essen, the measurements predominantly indicated good to very good air quality, consistently falling within the blue range of $0-3 \mu\text{g}/\text{m}^3$. The only exception was in areas with heavy traffic, such as a bus terminal or downtown, where the air quality registered at $18 \mu\text{g}/\text{m}^3$, placing it in the moderate yellow range. This can be attributed to the high number of parked cars, numerous buses in transit, and multiple people that were smoking. Another peak was to notice in Steele on two different parking places, there the Color was namelijk orange indicting a value for the particulate matter of at least $30 \mu\text{g}/\text{m}^3$. Overall, it can be concluded that the air quality in Essen generally remained in the good range.



Comparison

If we compare the results, you can see that the measurements of Beverwijk and Essen do not differ much. You can see that almost all blocks are blue, which means that the air quality is good and therefore the particulate matter content is low. You can see that the blocks in Beverwijk are lighter blue. Which means that the air quality is slightly worse. But in our comparison, we also must take into account the wind and weather. During the measurement in Beverwijk, there was a lot of wind. This may explain why the air quality in Beverwijk was good at the time of measurement. The wind can ensure that the particulate matter does not stay in the air for as long and also not in one place.



Conclusion

In the end, you can conclude that the air in Essen along a busy road is of better quality than the air along a busy road in Beverwijk. But this difference is not great: in Essen the particulate matter content was 0 $\mu\text{g}/\text{m}^3$ to 3 $\mu\text{g}/\text{m}^3$ and in Beverwijk 6 $\mu\text{g}/\text{m}^3$. But this could also be because the wind was blowing hard during the measurement in Beverwijk.