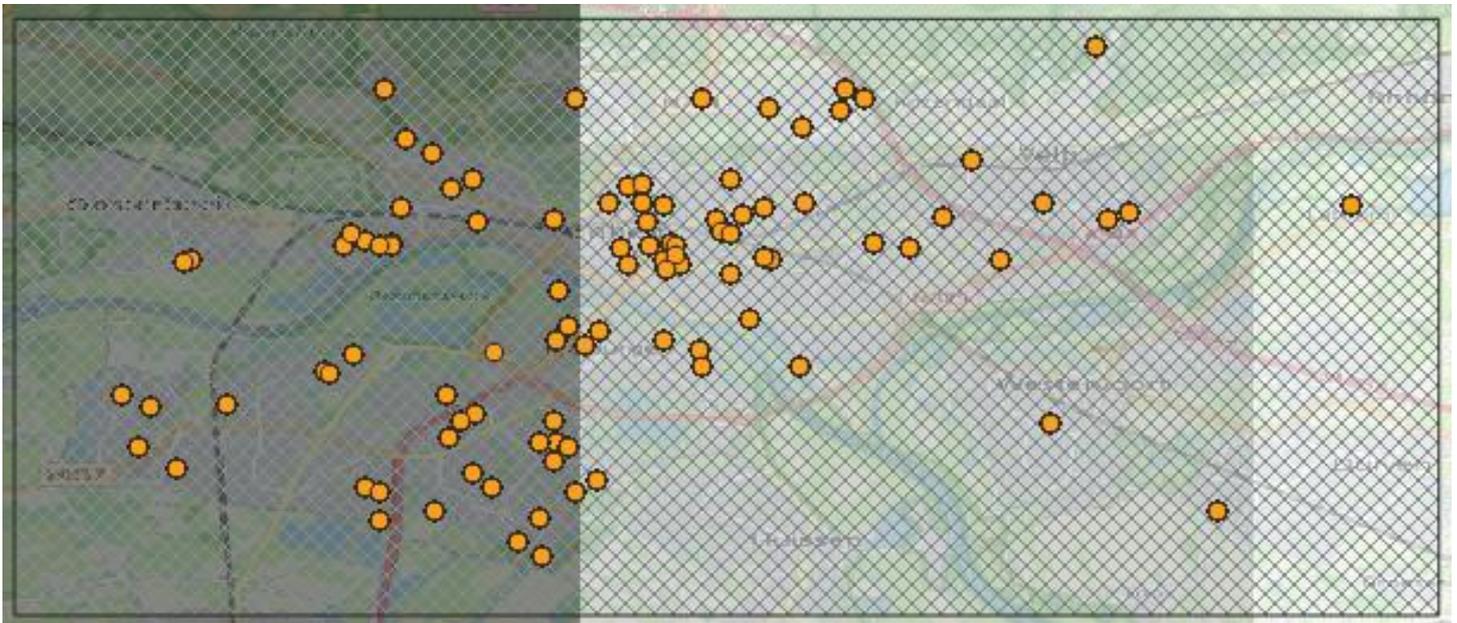


## Analysis of Particulate Matter data in Arnhem generated by the Air Data Citizen Science monitoring network versus the PM data generated by the CAMS satellite.

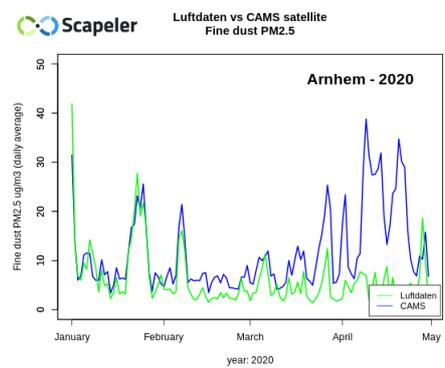
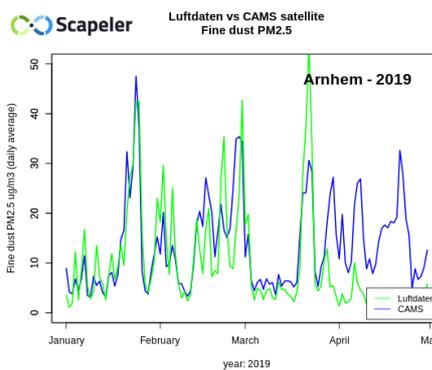
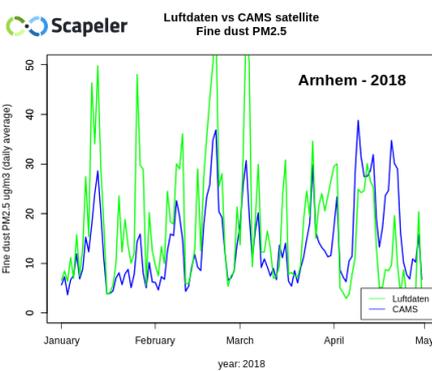
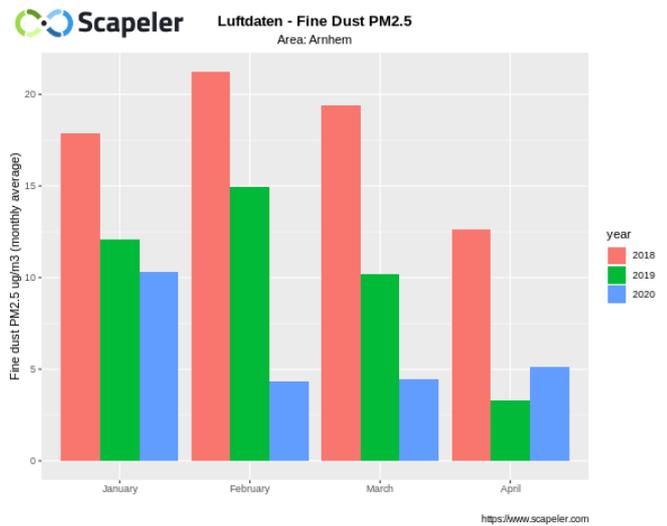
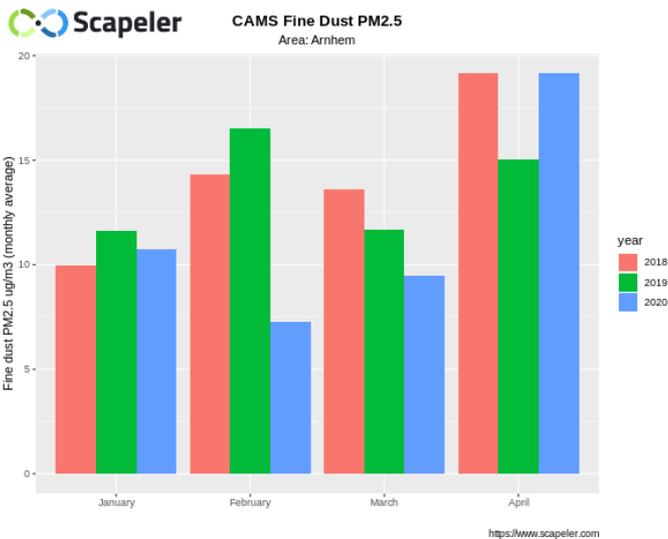
The EDSP ECO [Air Data Project](#) purpose was to find out the quality of our air in Arnhem (NL). To obtain this information, volunteers have installed over 130 Particulate Matter sensors in our region. These sensors send data regarding Particulate Matter (PM 2.5 and PM 10), temperature and humidity values via the internet to a central database located at the university of Stuttgart in Germany. This is where the original [LuftDaten](#) open source project was founded. The Air Data Project is supported by the Dutch Tree Foundation, the Undercurrent organisation, the city council of Arnhem, the National Institute for Health and Environment (RIVM), Milieudefensie, the Nature and Environmental Federation of Gelderland (GNMF), the Municipal health service (GGD), the ODRA and the Radboud University. The data can be viewed online via the following websites: [Fine dust map from LuftDaten](#), the [AirTube website](#), the [SamenMeten Portal of the RIVM](#), and the [Air measurement website from the GGD, the RIVM, the Environmental Service Rijnmond and the ODRA](#).



### Data analysis

Data analysis agency [Scapeler](#) compared the Particulate Matter values generated by the Air Data Citizen Science monitoring network with the data generated by the [CAMS Satellite](#) which also measures Particulate Matter and some interesting results came up. The Covid\_19 lockdown and its side effects resulted in an extraordinary situation. The map above shows the city of Arnhem and the 105 Particulate Matter sensors, marked with orange dots, which are connected to the Air Data project. Only 105 out of 130 sensors are selected as not all of the sensors were operational. The grey rectangle shows the area from which the satellite data has been selected. The area selected for the CAMS data is larger than the area containing our Particulate Matter sensors.

The next graphs show the average PM2.5 values measured per month and are grouped per year obtained from the CAMS Satellite as well as from the Air Data Citizens Science monitoring network. Our Air Data network only became fully operational at the end of 2019 which means that the data obtained in 2018 and 2019 is based on 6 or less Particulate Matter sensors. The graphs below depicts the average daily values from both the CAMS Satellite and the Air Data network so the data can be compared.



## Our conclusions

We expected the results collected by our Particulate Matter sensors would be too high under specific circumstances during periods of heavy fog or a high humidity for example. However, the comparison made by data analysis agency Scapeler shows that when more sensors became operational and a dense network was formed, the results of the data collected by the sensors showed lower Particulate Matter values than the data collected by the CAMS Satellite. The first three months of 2020 show almost identical results measured by our Particulate Matter sensor network compared to the CAMS Satellite data. But April shows higher values measured by the CAMS Satellite which was unexpected and the reason is unknown. We contact the CAMS project team and asked if they know what could be the cause of this significant difference. As the Particulate Matter values measured by the CAMS Satellite remain higher than the values measured by the Air Data network it indicates the air quality in Arnhem could be worse than we initially anticipated which isn't considered as good news. However, we are pleased the values measured by our Particulate Matter sensors of the Air Data network are lower than expected and the measurements are nearly identical compared to the CAMS satellite. As a result the local government needs to take our data into account and should make sure the air quality in our city is improved. Follow-up projects of the EDSP ECO Air Data program can be found by clicking the following link: <https://www.edsp.nl/eco/environmental-data-monitor.html>

**EDSP ECO** is a research and project agency run by volunteers and we focus on creating environments to support organisations around the world who are working to protect our planet, end poverty and create prosperity. We provide support in various ways like building and administering websites for free, provide research capacity, create and offer digital campaigns, connect parties involved, hold public readings and interviews and create and deploy environmentally friendly solutions. We actively and relentlessly target and pursue politicians and companies responsible for climate change and pollution too. [www.edsp.eco](http://www.edsp.eco)