

The background image shows a construction site along a river. In the foreground, there's a body of water with a wooden railing. To the left, a large grey pipe runs along the shore. In the background, there are several buildings, including a prominent white building with a red roof and a green dome. A tall crane is visible on the right side. The sky is blue with some clouds.

Air quality around construction sites: particulate matter emissions

A study of the Haga construction site and the use of low-cost sensors

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Handledare: Ågot K. Watne och Erik Thomson

Syfte

1. Har byggarbetsplatsen i Haga påverkat luftkvaliteten i området?
2. Kan sensorn low-cost sensorer fungera som ett komplement runt byggarbetsplatser, till referensstationer?

Tillvägagångssätt

1. Analyserade historisk data från området för att undersöka om luftkvaliteten påverkats. Historiska datan var från åren 2013-2017, dessa jämfördes med 2019.
2. Monterade ihop sensorer, *Nova Particulate matter sensor SDS011*, och placerade ut dem på olika platser runt byggarbetsplatsen. Datan analyserades sedan för att se hur väl de korrelerade med referensstationen, samt varandra.



Provtagningsplatser och sensorer

Sensors nummer	Färg	Plats
16642358	Rosa	Haga
3741506	Orange	Haga
1633136	Lila	Haga
1664594	Grön	Smyrnakyrkan
2455401	Gul	Sjölins Gymnasium
16636279	Röd	Golf och bar Allén
16638457	Blå	02Landskap

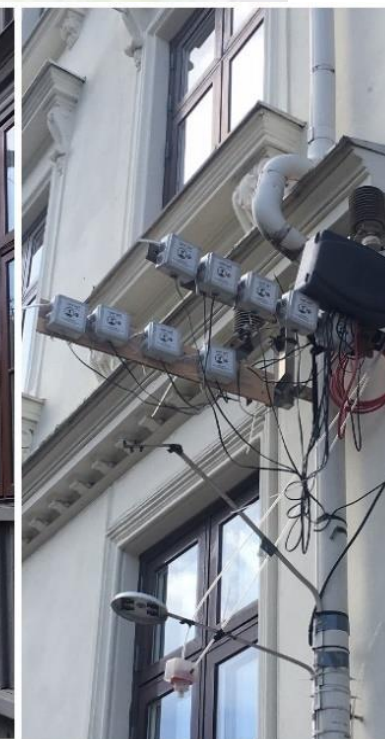
Mätperioder

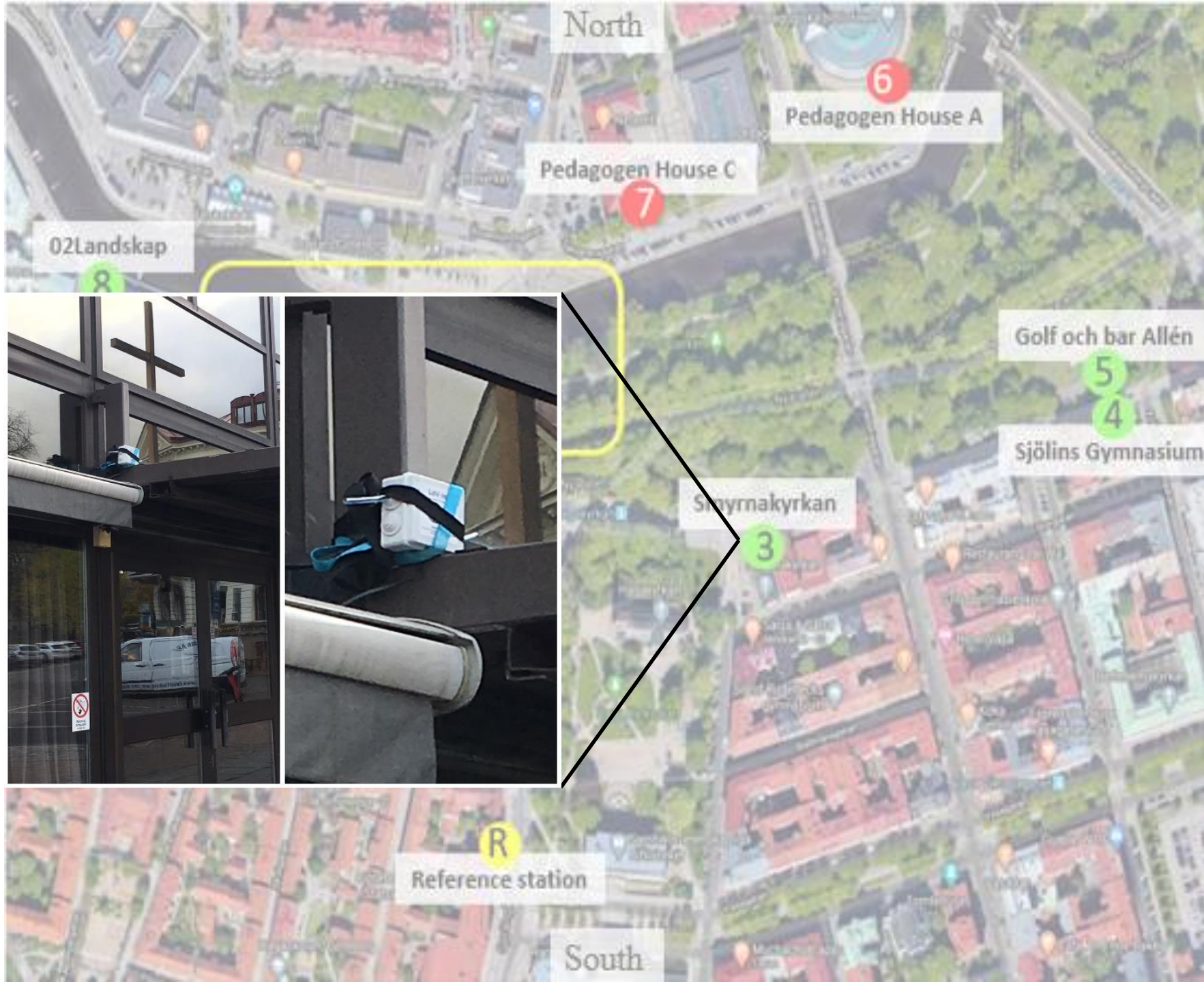
Mätperioden

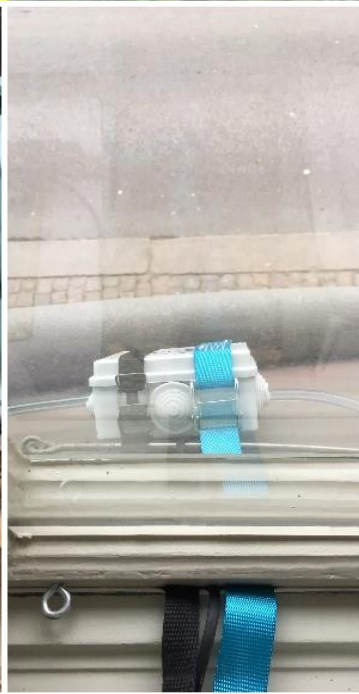
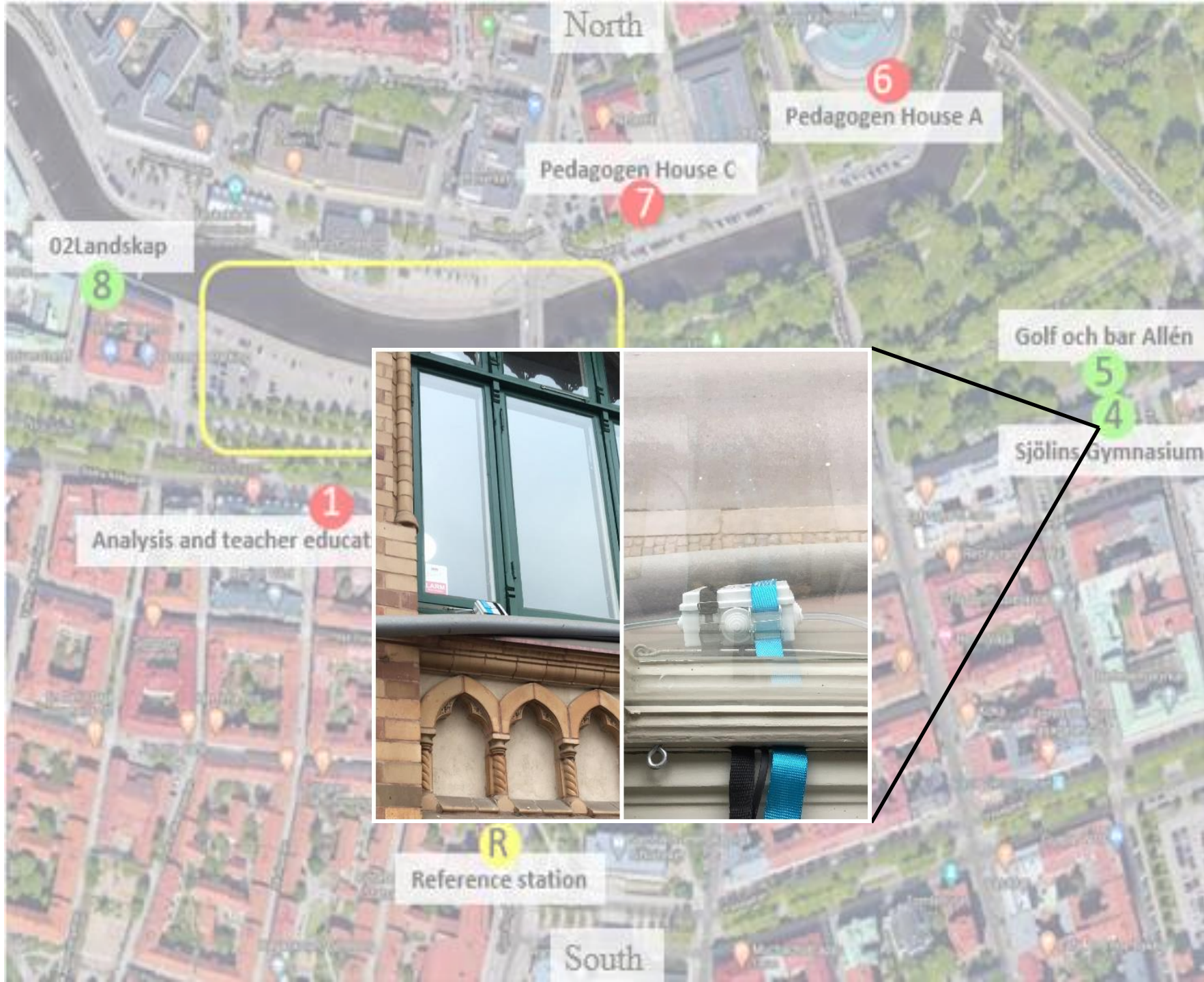
- 1 November – 31 december

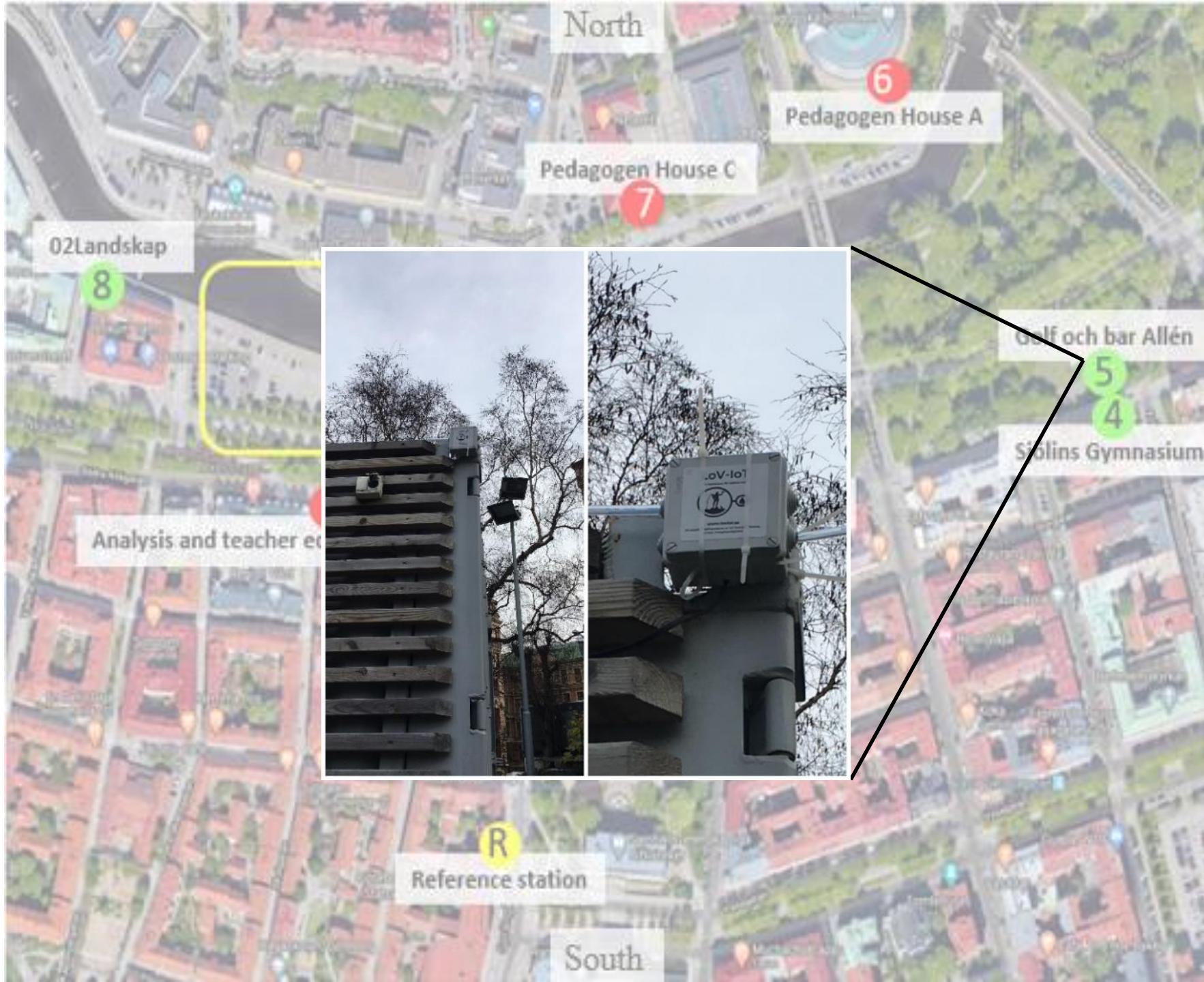
Kontrollmätningar

- Lila, orange, rosa: 2 veckor i November
- Gul, röd, blå, grön: 2 veckor i Februari

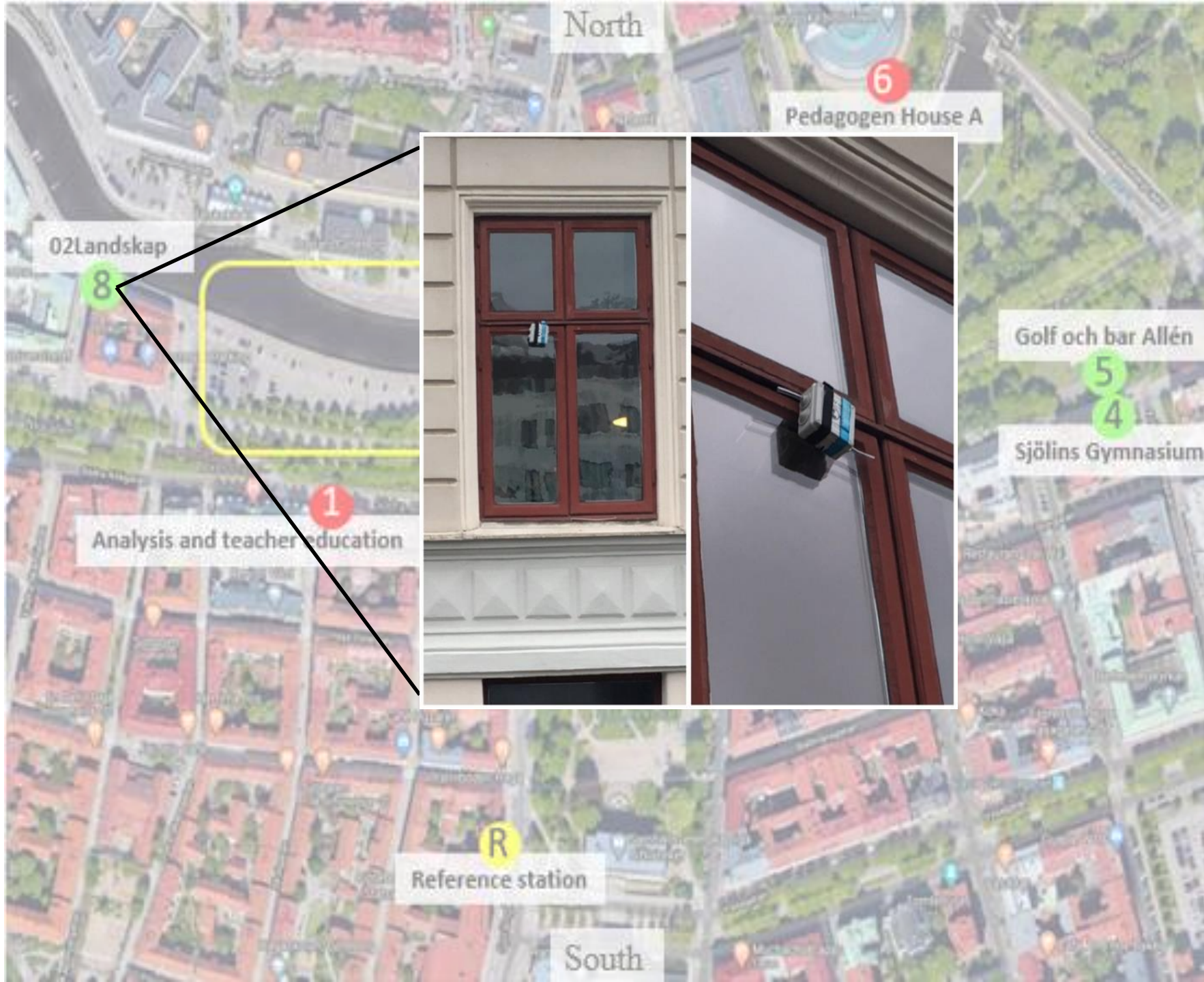






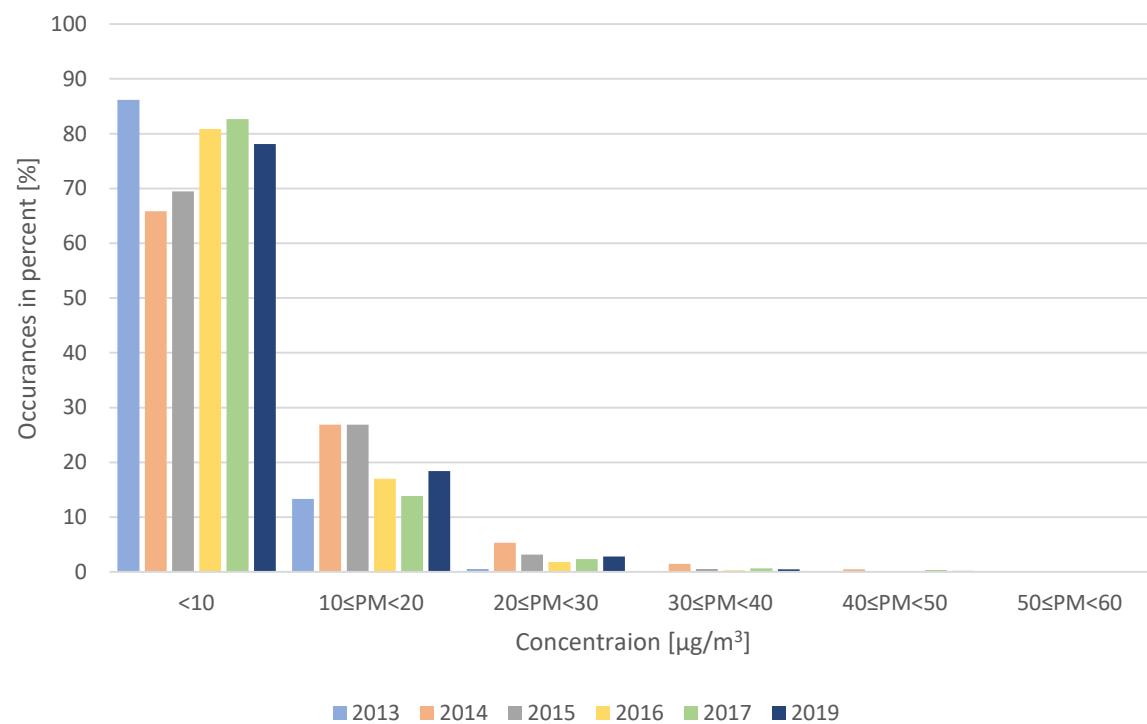




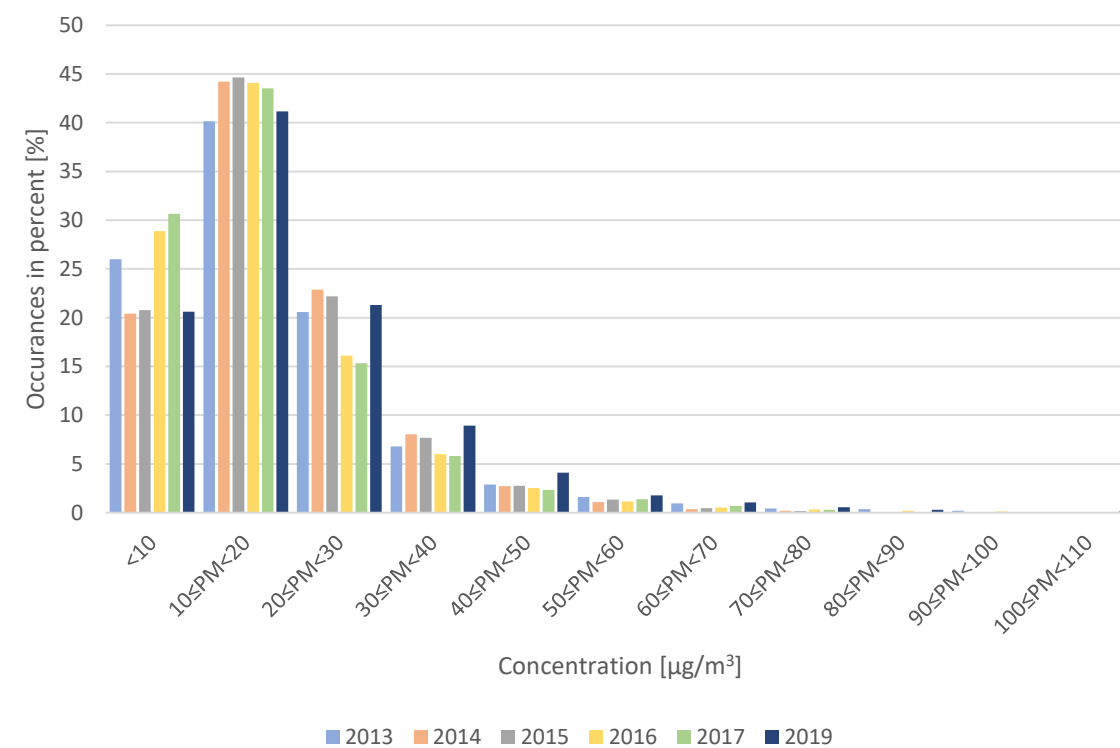


Resultat – luftkvaliteten i Haga

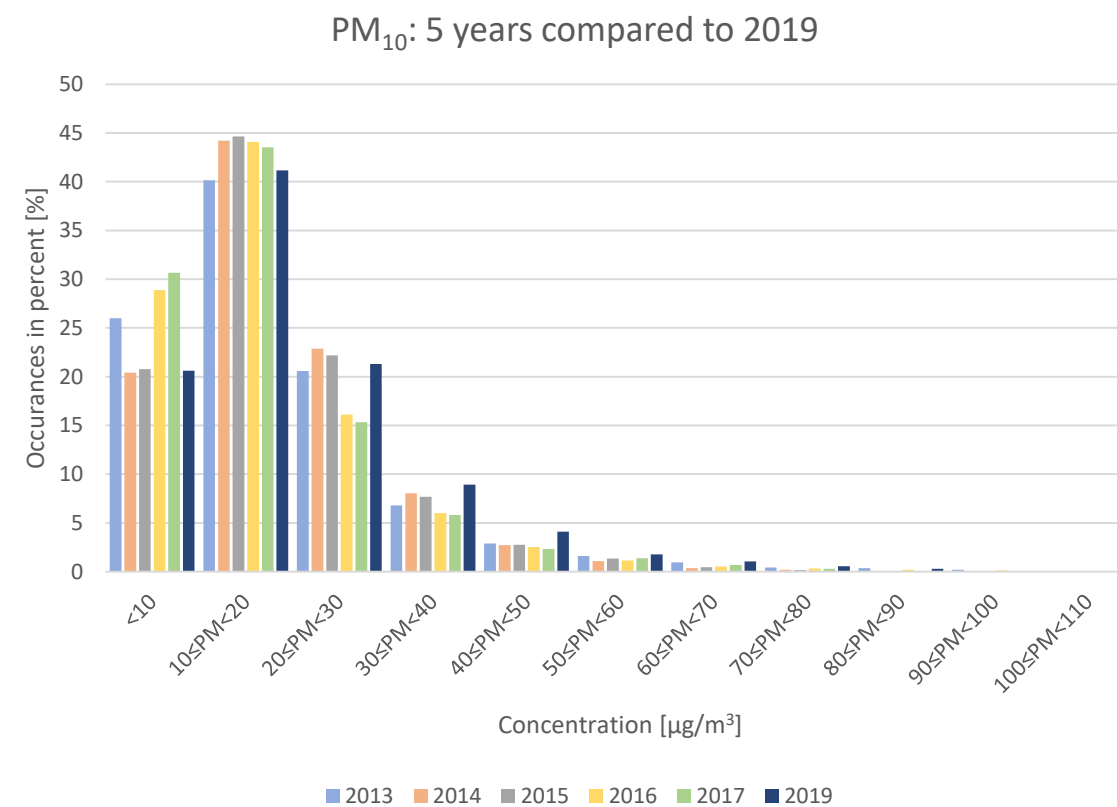
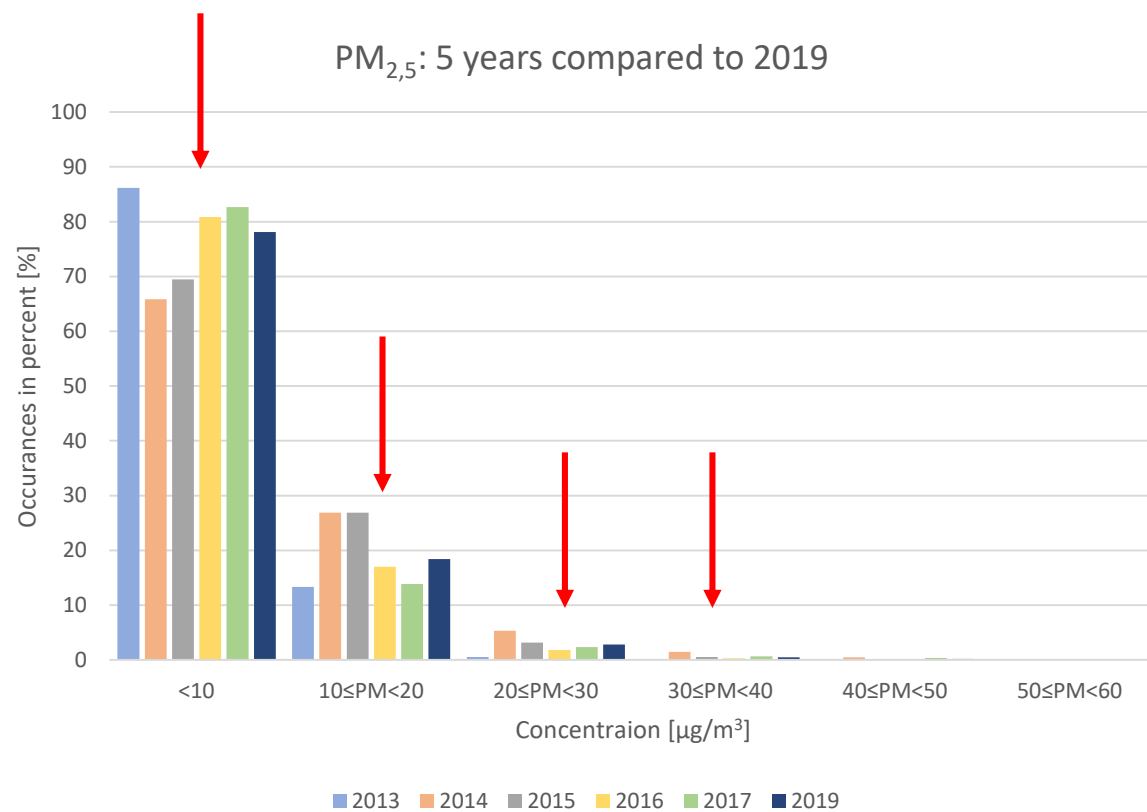
PM_{2,5}: 5 years compared to 2019



PM₁₀: 5 years compared to 2019

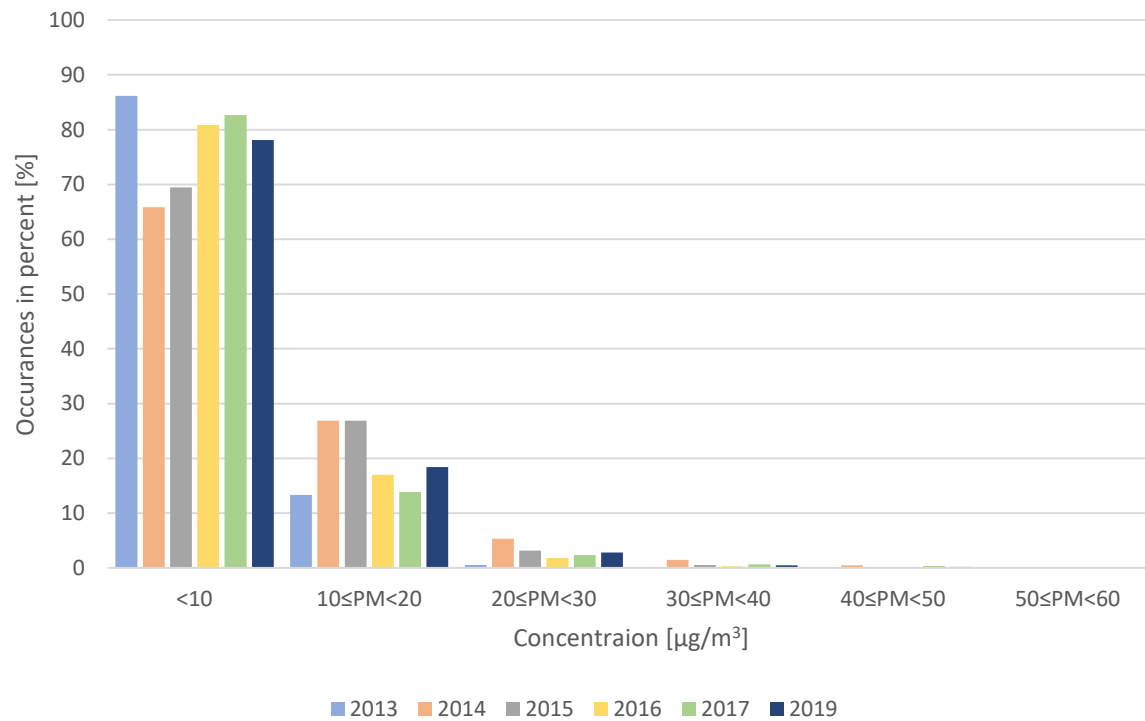


Resultat – luftkvaliteten i Haga

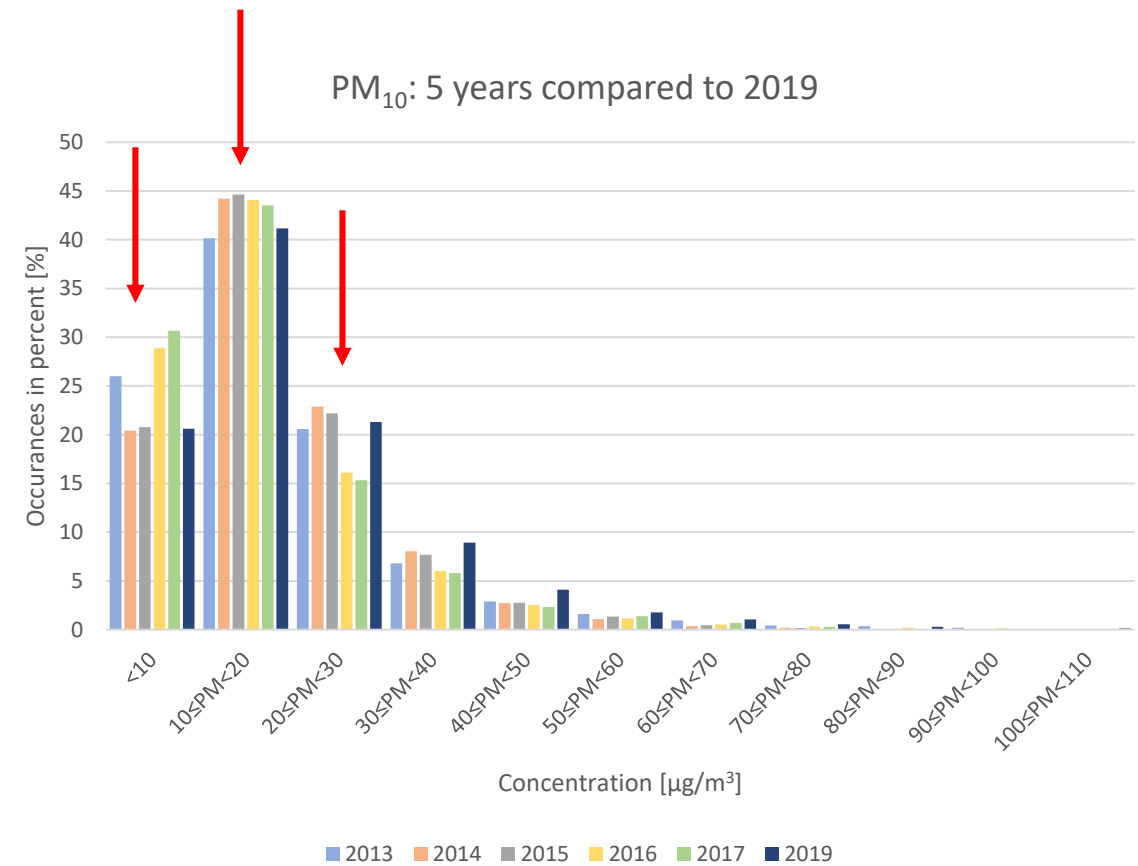


Resultat – luftkvaliteten i Haga

PM_{2,5}: 5 years compared to 2019

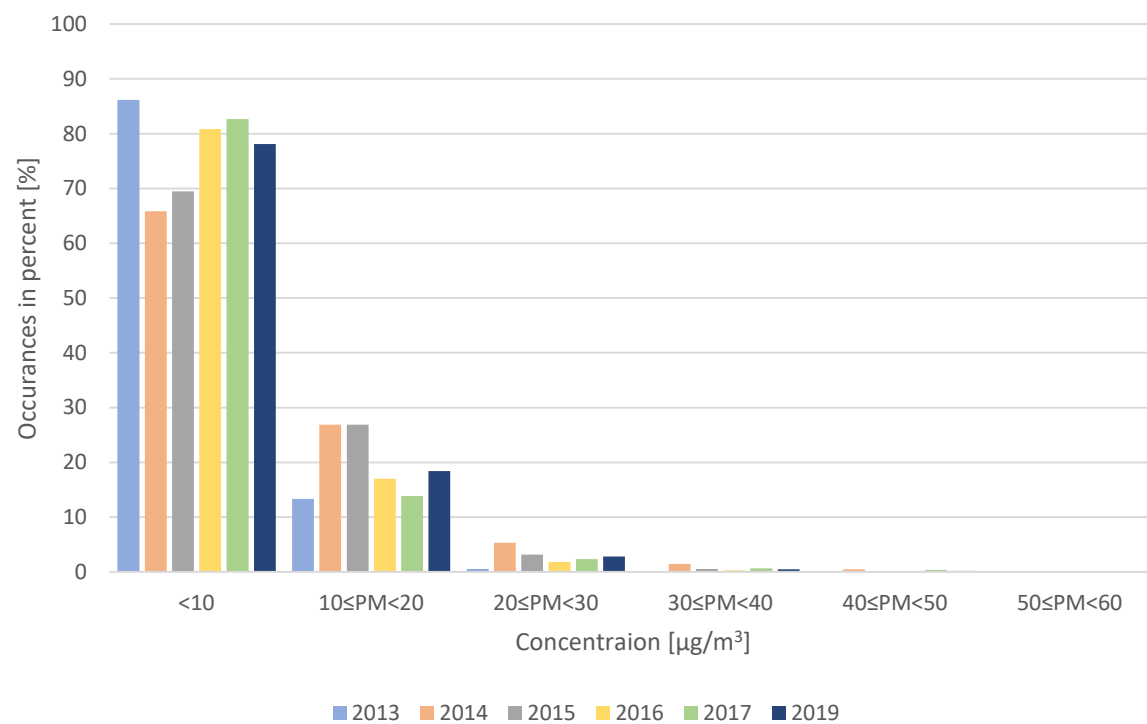


PM₁₀: 5 years compared to 2019

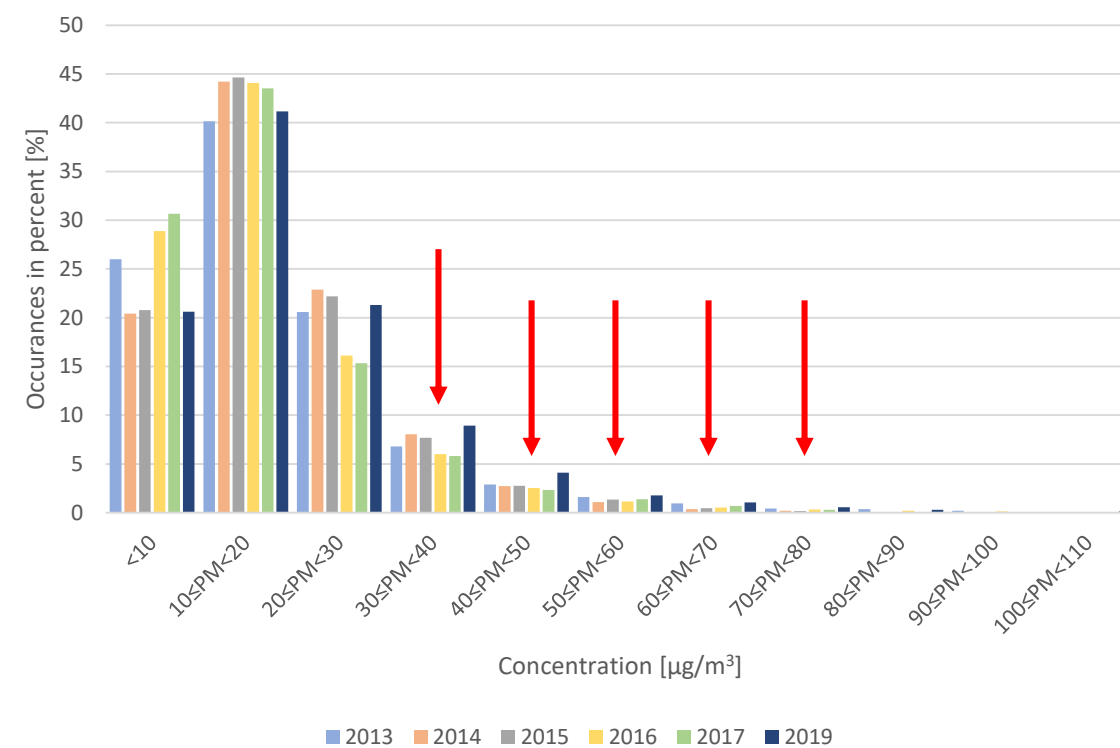


Resultat – luftkvaliteten i Haga

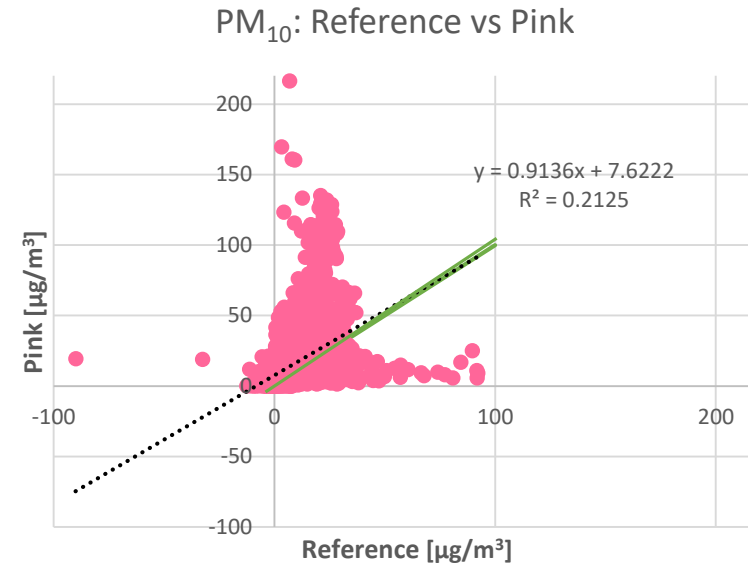
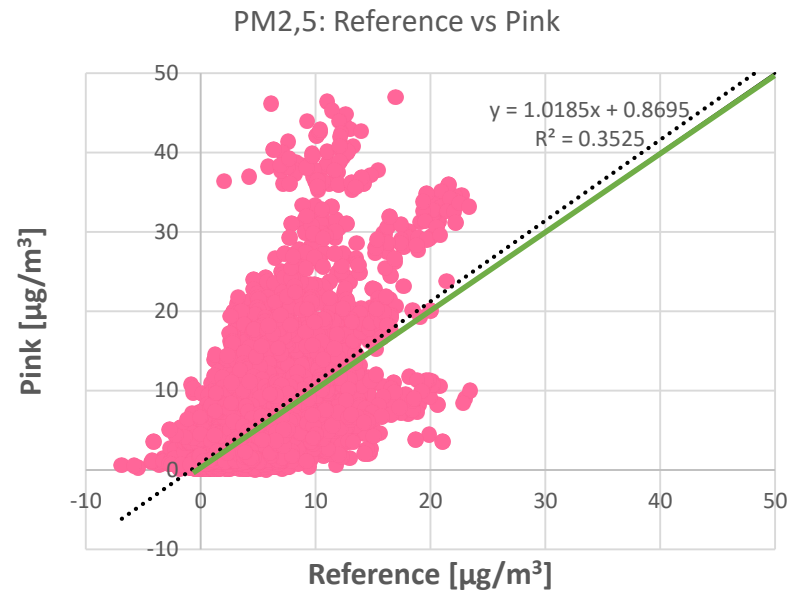
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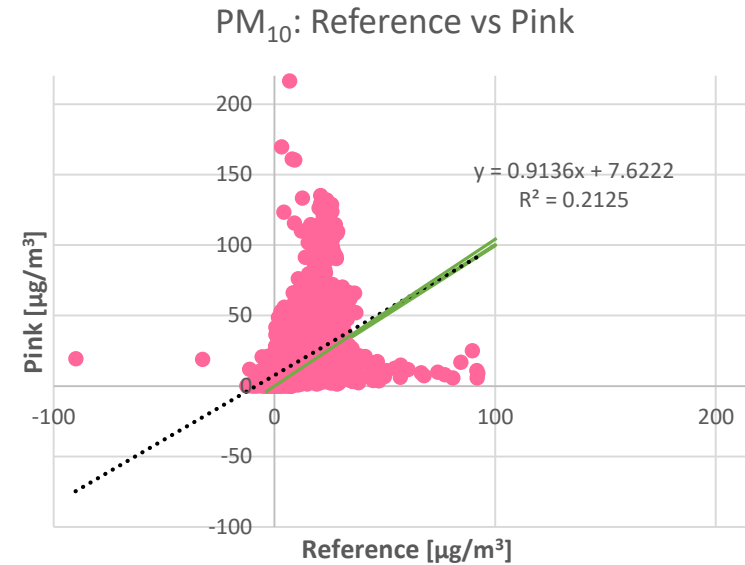
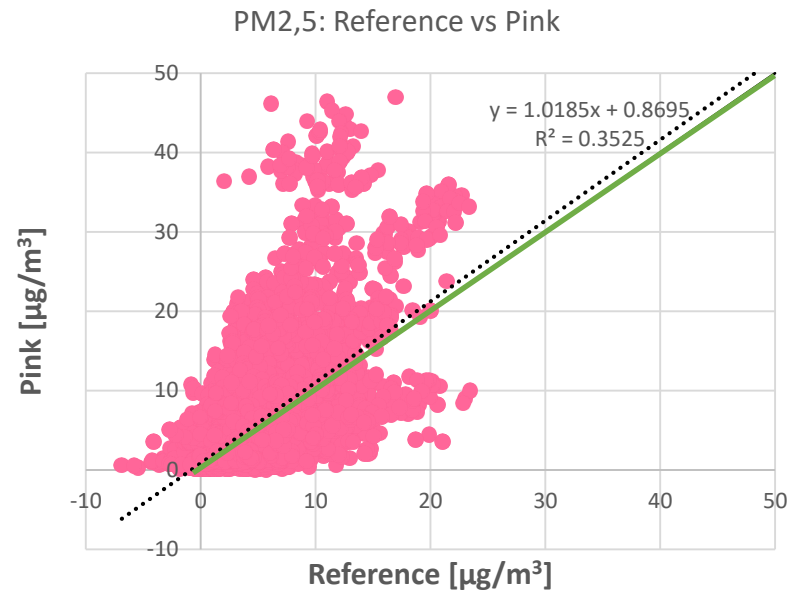


Resultat – Referens vs rosa



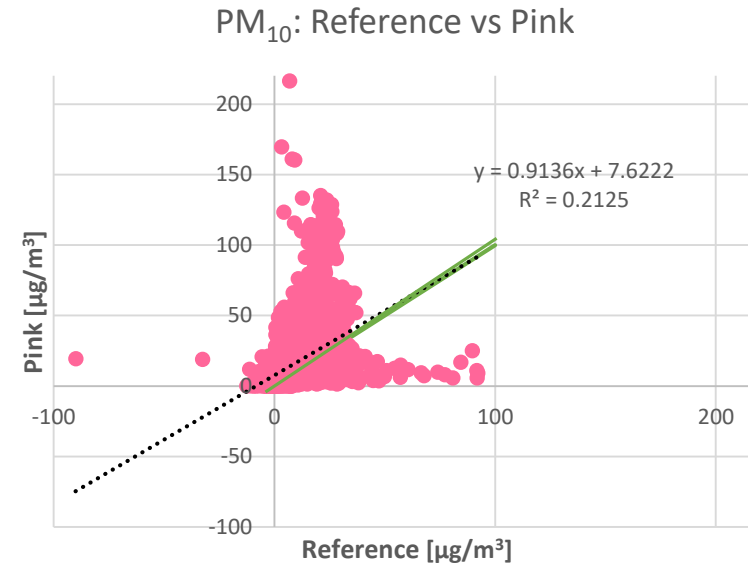
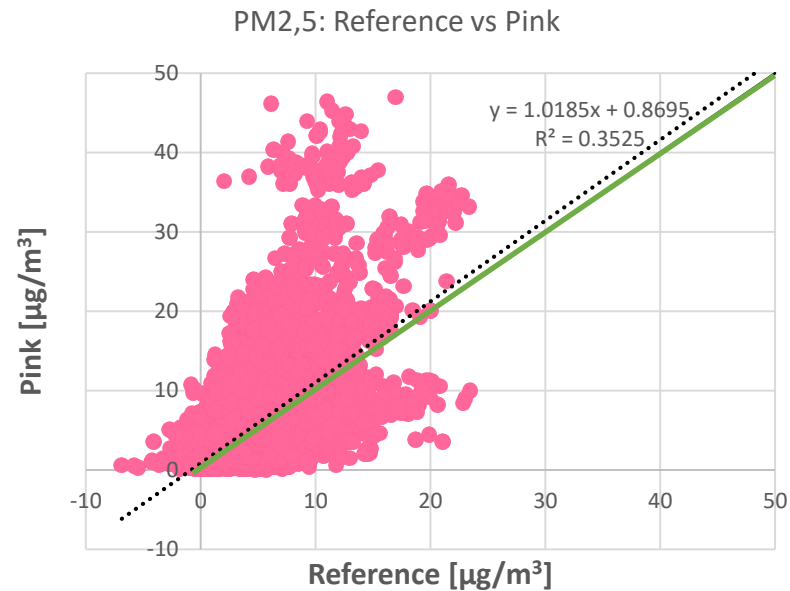
Sensors	Correlation coefficient	Equation
PM _{2,5} : Pink vs Reference	0,59	$y = 1,02 + 0,87$
PM ₁₀ : Pink vs Reference	0,46	$y = 0,91x + 7,62$
PM _{2,5} : Orange vs Reference	0,58	$y = 1,42x + 0,35$
PM ₁₀ : Orange vs Reference	0,47	$y = 0,97x + 7,80$

Resultat – Referens vs rosa



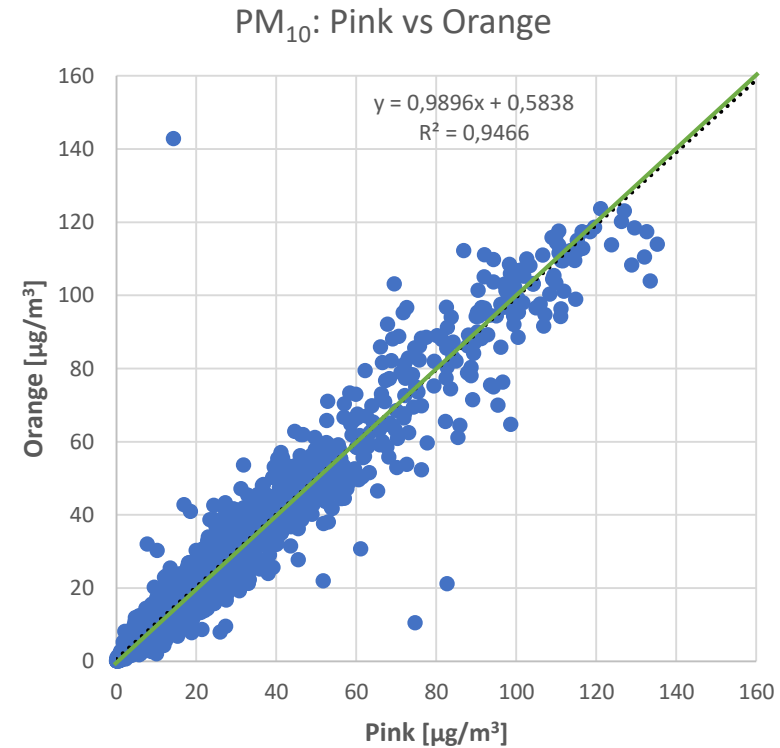
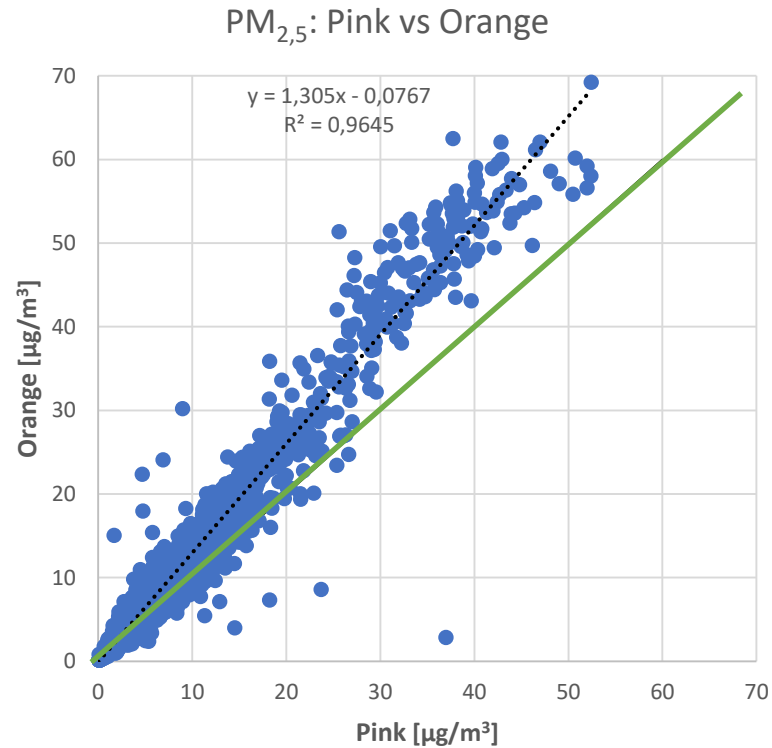
Sensors	Correlation coefficient	Equation
PM _{2,5} : Pink vs Reference	0,59	$y = 1,02 + 0,87$
PM ₁₀ : Pink vs Reference	0,46	$y = 0,91x + 7,62$
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Resultat – Referens vs rosa



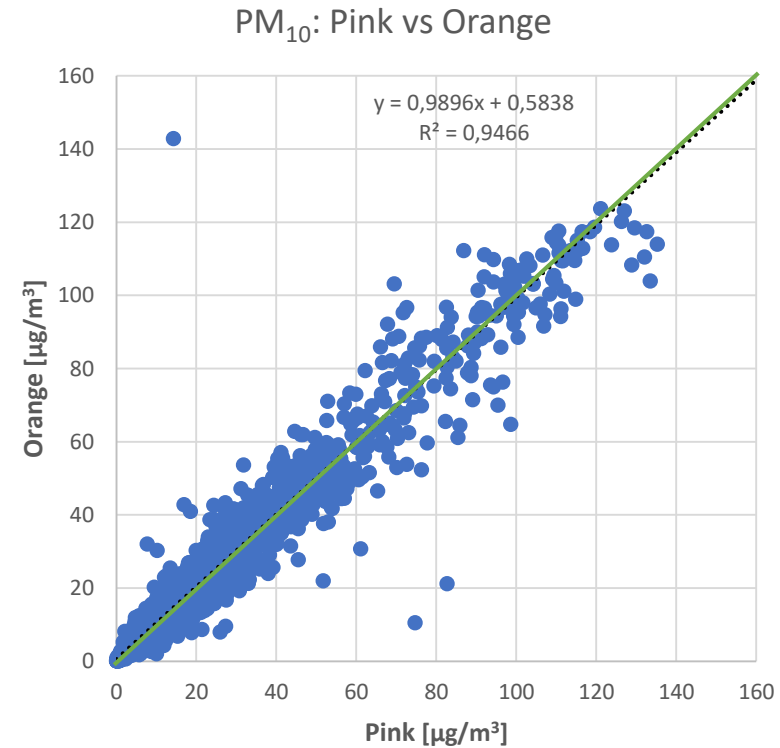
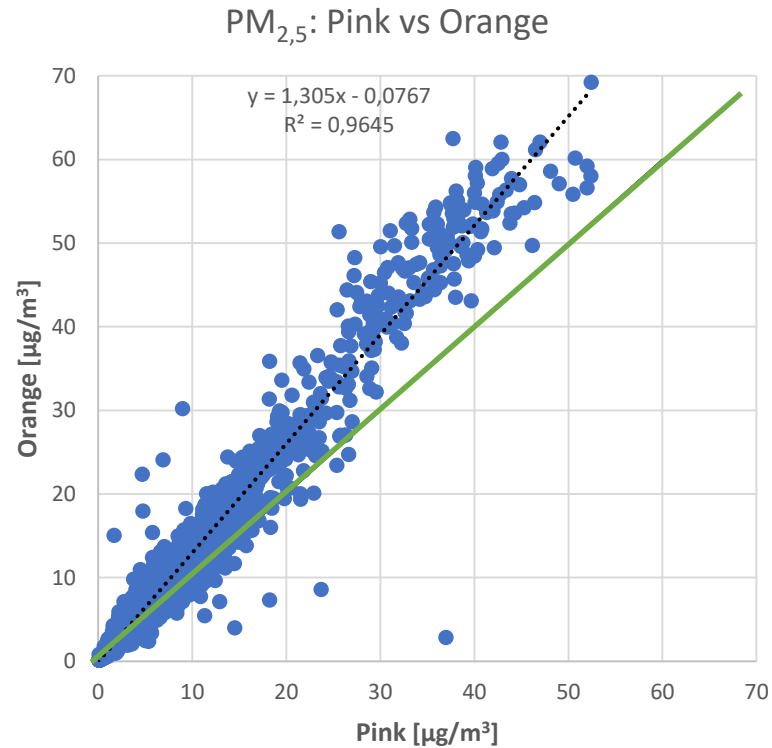
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Resultat – sensorerna jämfört med varandra



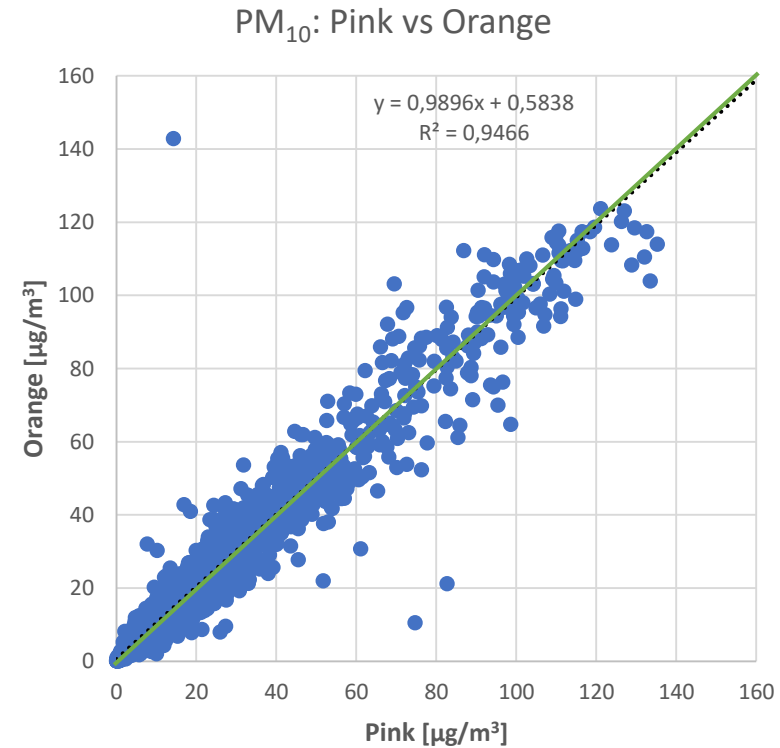
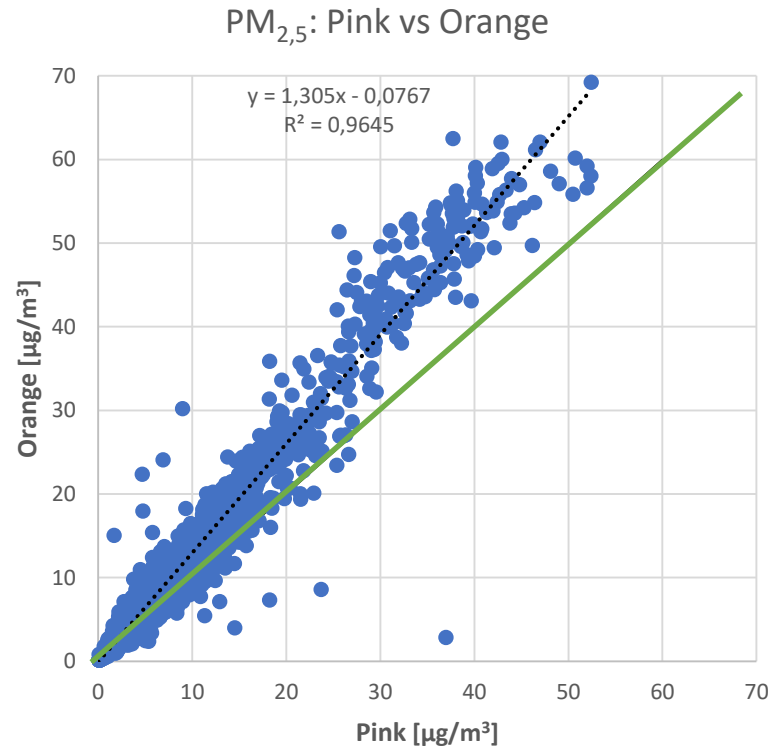
Sensors	Correlation coefficient	Equation
PM _{2,5} : Pink vs Orange	0,98	$y = 1,31x - 0,08$
PM ₁₀ : Pink vs Orange	0,97	$y = 0,99x + 0,58$

Resultat – sensorerna jämfört med varandra



Sensors	Correlation coefficient	Equation
PM _{2,5} : Pink vs Orange	0,98	$y = 1,31x - 0,08$
PM ₁₀ : Pink vs Orange	0,97	$y = 0,99x + 0,58$

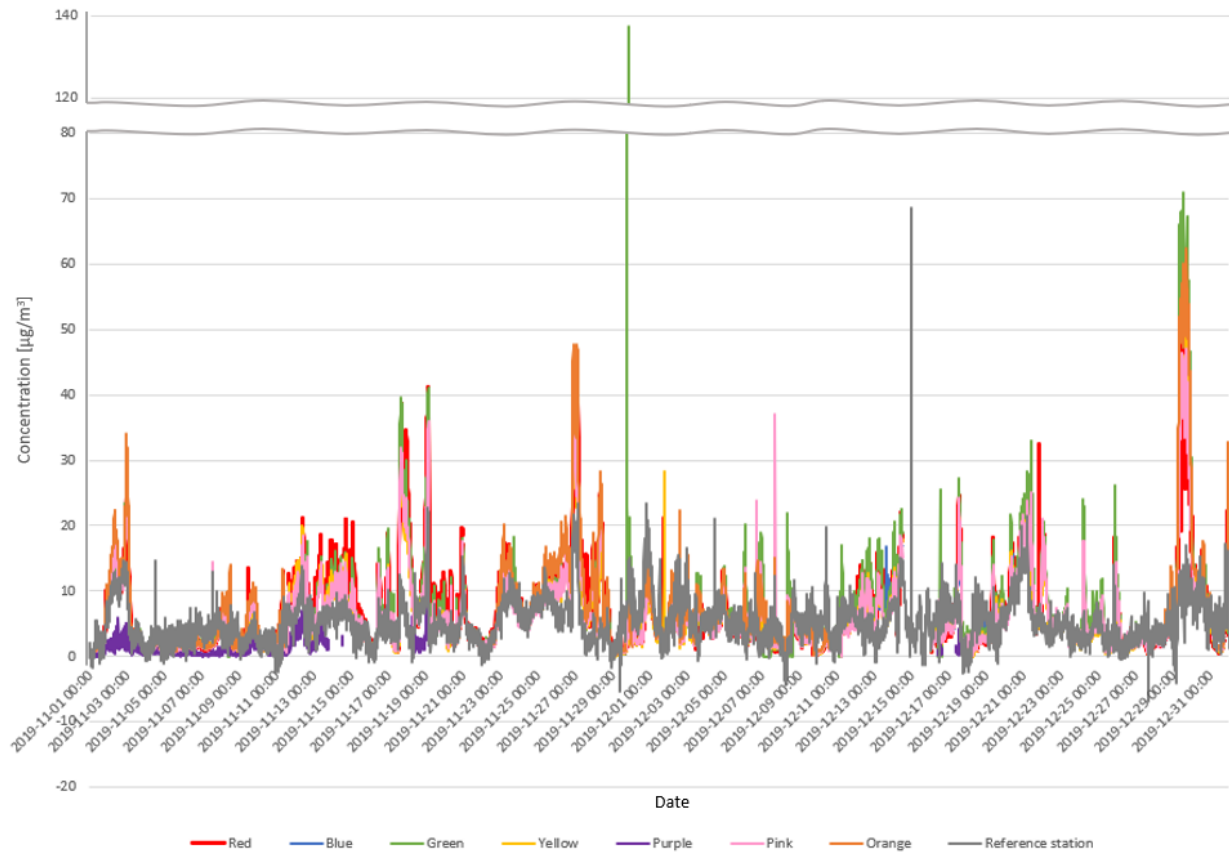
Resultat – sensorerna jämfört med varandra



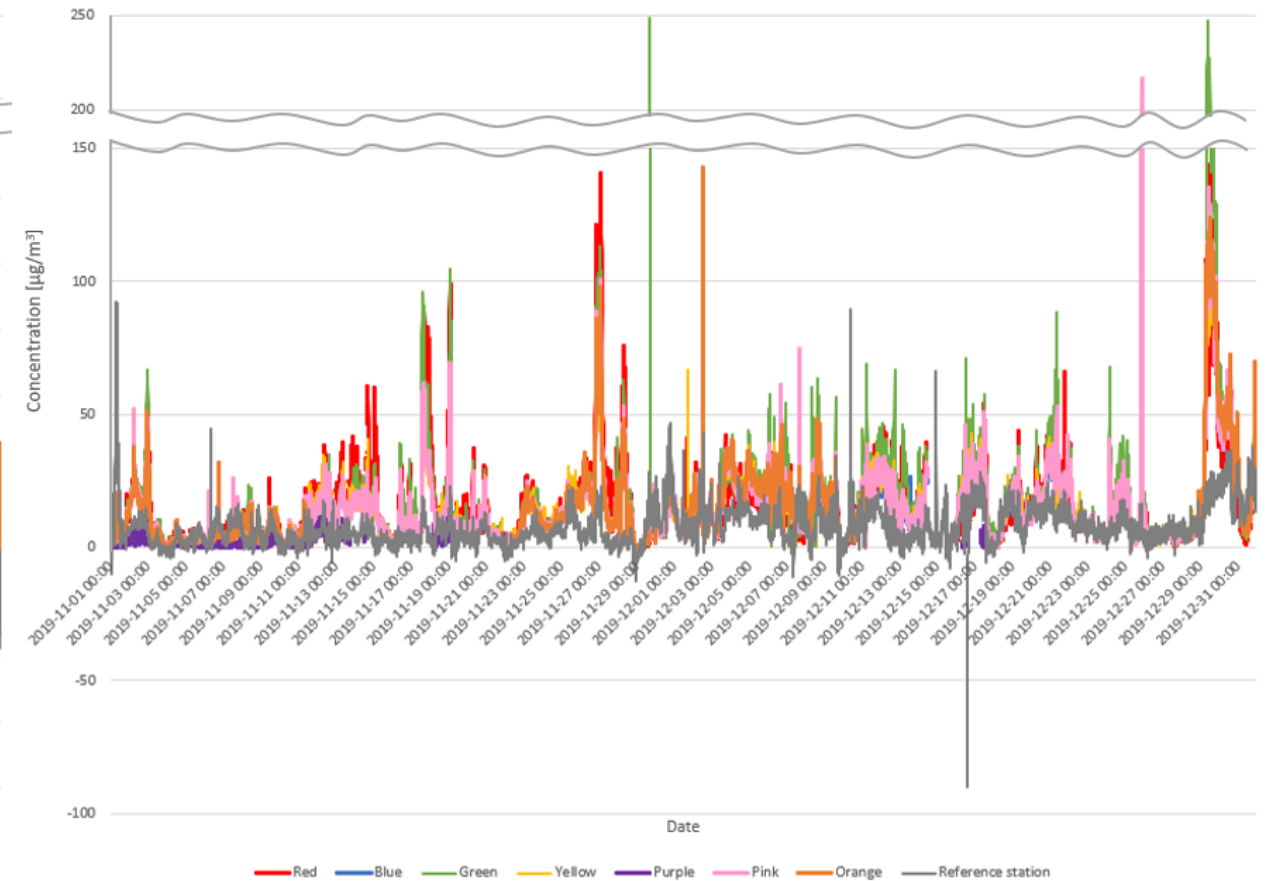
Sensors	Correlation coefficient	Equation
PM _{2,5} : Pink vs Orange	0,98	$y = 1,31x - 0,08$
PM ₁₀ : Pink vs Orange	0,97	$y = 0,99x + 0,58$

Resultat – sensorernas tidsserie

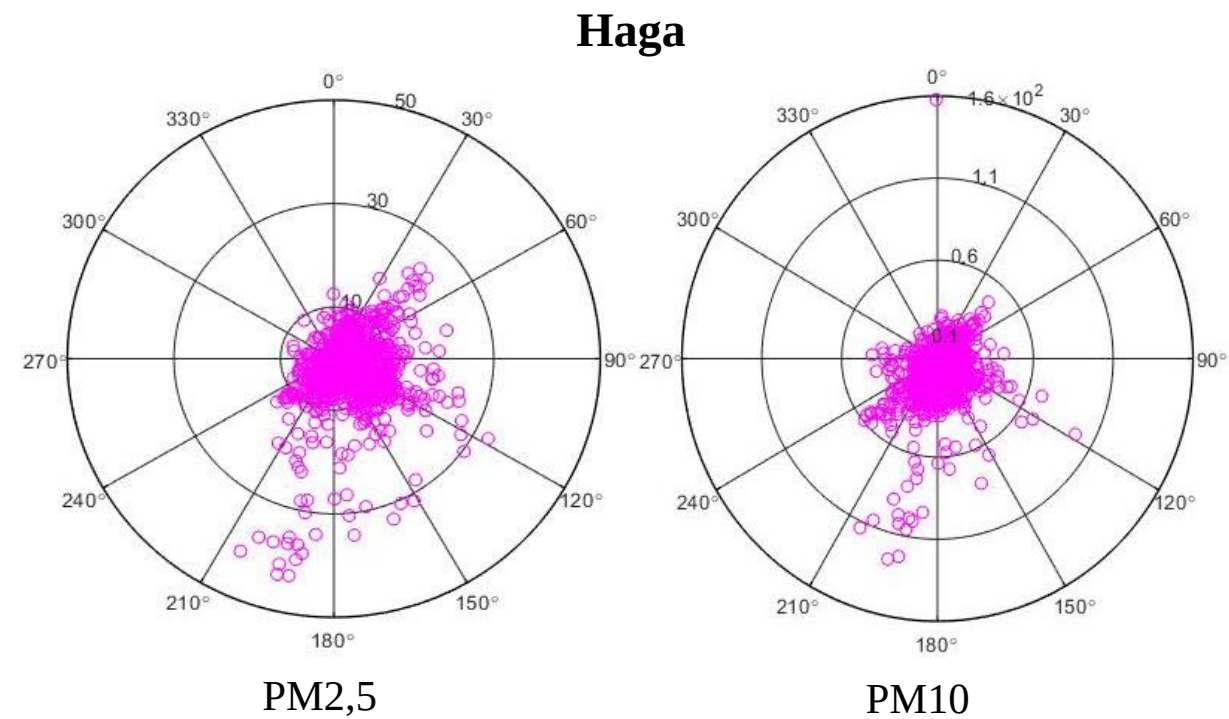
PM2,5: 1st of November - 31st of December



PM10: 1st of November - 31st of December



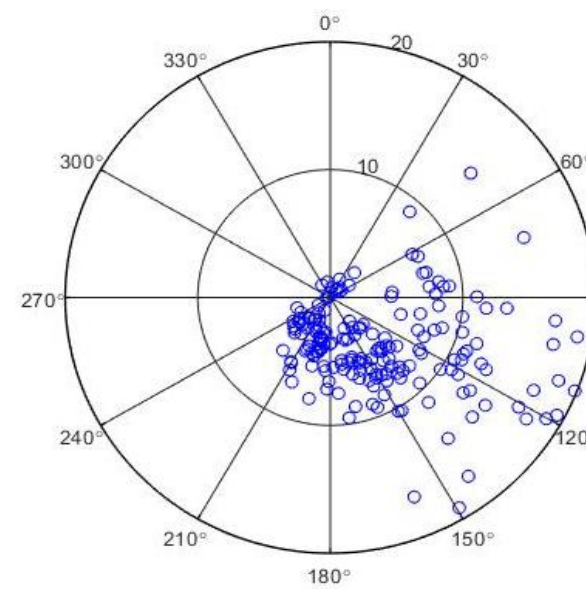
Resultat – vindriktningar



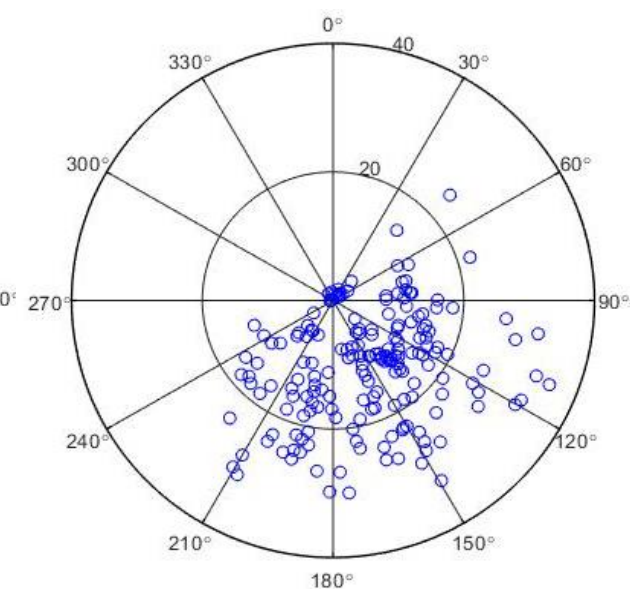
Resultat – vindriktningar



02Landskap



PM_{2,5}



PM₁₀

Diskussion och Slutsats

- Luftkvaliteten i Haga har påverkats – för PM10
- För sensorn fanns vissa utmaningar
 - Låg korrelation med referensinstrumentet – olika mättekniker
 - Hög luftfuktighet under mätperioden
 - Kontrollmätningarna utfördes inte samtidigt → normaliserades ej
 - Mätplatserna och vindriktning



Tack för att ni har lyssnat!

