

Monitoring of local air quality in Ny-Ålesund started July 2008

Main topics

Air quality in Ny-Ålesund

Locate local emission sources

Assess the impact of the activities in Ny-Ålesund on the environment

Detect possible influences on measurements in Ny-Ålesund and the nearby Zeppelin air monitoring station.

OR../2009

Air Quality Ny-Ålesund

Monitoring of Local Air Quality 2008-2010
Measurement Results
Draft – preliminary report

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Monitoring of local air Quality in Ny-Ålesund

Measurements started July 2008
- Halted August 2010

Awaiting funding situation and permission from the Directorate for Cultural Heritage to set up a permanent monitoring station

Kings Bay got a permission from the Directorate for Cultural Heritage in Norway to install a mobile monitoring station at the given location in the summer of 2008. The permission was granted for a maximum period of two years.



Monitoring programme:

A combination of monitors with high sampling frequency and samplers with low detection limits

Monitors

High time resolution

SO ₂	5 min.
NO _x	5 min.
CO	5 min.
BTEX	15 min

Meteorology

www.luftkvalitet.info

Air sampling

Low detection limits

Main compounds, 24h samples

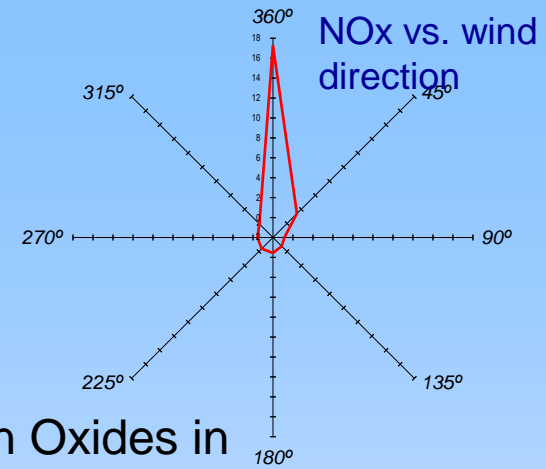
HNO₃/NO₃⁻, NH₄⁺/NH₃,

SO₂, SO₄²⁻, Na⁺, K⁺,

Ca²⁺, Mg²⁺, Cl⁻, HCl

BTEX 2 weeks samples

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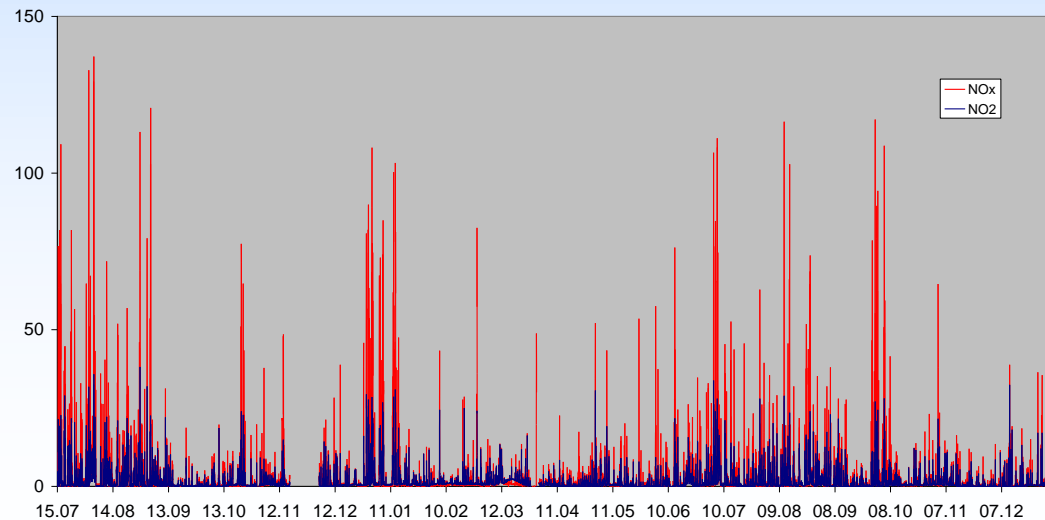


Nitrogen Oxides

As expected, the power station is a major source of Nitrogen Oxides in Ny-Ålesund showing higher values in periods of higher power consumption.



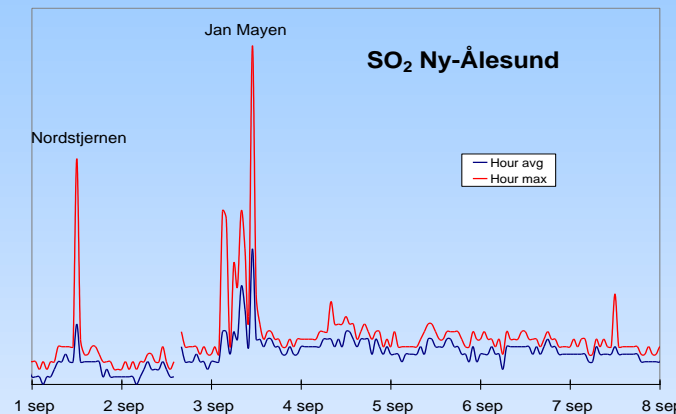
High levels mid-late summer indicates that emissions from marine vessels might be of the same order of magnitude



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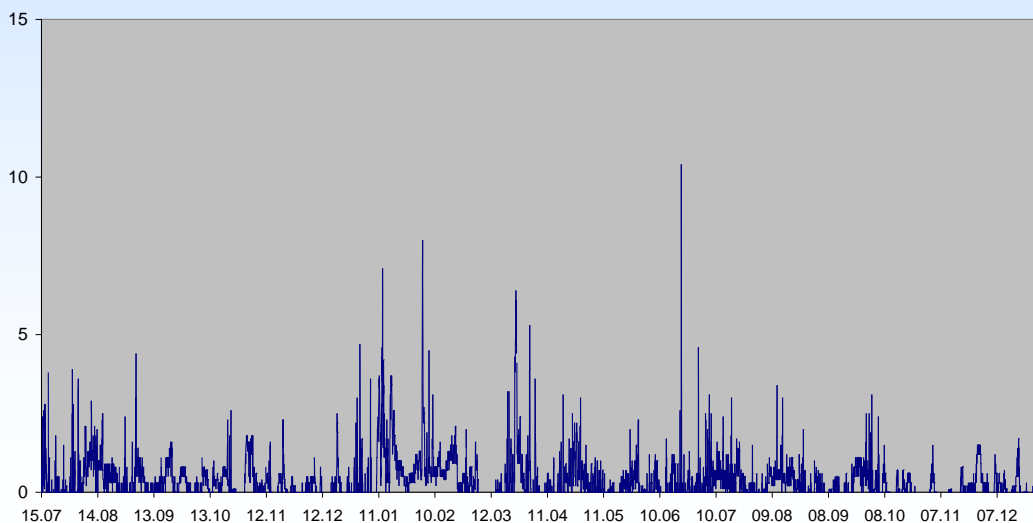
Sulphur dioxide - SO_2

Generally low values
comparable to Zeppelin
dominated by long range transport
of polluted air



No major source of SO_2 in Ny-Ålesund but some peak-values coincide with arrival of larger vessels.

These episodes have not been detected at Zeppelin.



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Nitrification

Nitrification of soil in the surroundings of Ny-Ålesund from local emissions are low due to slow reaction rates of NO_x.

However, since nitrogen is a limiting factor for plants and microbes in the arctic, small changes may have an impact on plant community composition and production.

Acidification

Acidification due to SO₂ is low and dominated by long range transport of polluted air



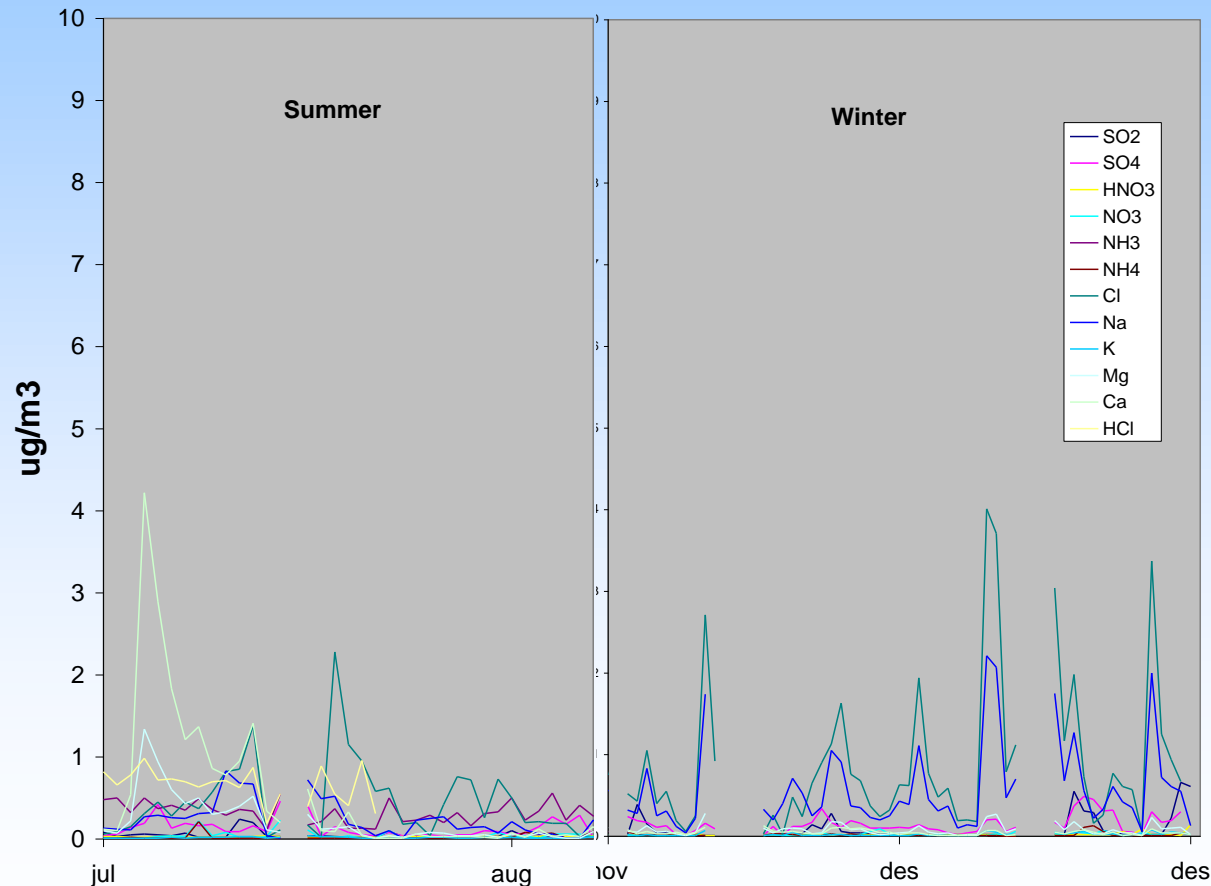
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Other inorganic compounds

Generally low levels of inorganic compounds

Ions dominated by sea salt (NaCl)

Some elevated values for mineral compounds during summer due to road work



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Aromatic hydrocarbons - BTEX

Main source of BTX is gasoline and diesel released from combustion engines.

Some peak values during the snowmobile season, but overall low values in Ny-Ålesund.

A recent study from Longyearbyen shows that snowmobiles with two stroke engines can be a major pollution source, due to incomplete combustion.

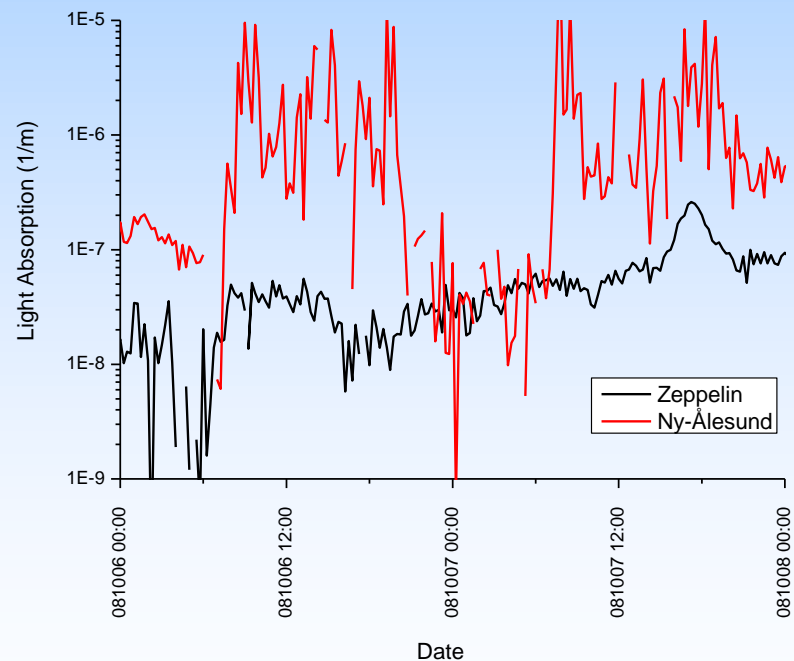
The total number of such vehicles in Ny-Ålesund is low and the local topography helps dispersing the pollutants, giving overall low concentrations of such compounds in the air.

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Soot and particles

Parallell measurements indicate that emissions in Ny-Ålesund has little influence on measurements at the Zeppelin measurement station due to local meteorology/topography

Measurements at Zeppelin seems to be influenced by emissions from vessels going further east into Kongsfjorden



Monitoring of Local Air Quality in Ny-Ålesund

Main conclusions

The air in Ny-Ålesund is clean

- Overall low levels of air pollutants
- National health limits has not been exceeded during the measurement period for any of the compounds monitored.

The major pollutant is Nitrogen oxides from the power plant and from large vessels

Emissions from Ny-Ålesund have little influence on measurements at Zeppelin

Measurements at Zeppelin might be disturbed by emissions from Kongsfjorden east of Ny-Ålesund