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METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

Air Quality Measurements at the Virolahti background station Finnish Meteorological Institute

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Air Quality Measurements at the Finnish Meteorological Institute

Finnish Meteorological Institute is responsible for the national background air quality monitoring.

Our monitoring network consists of about twenty background measurement stations in different parts of the country and a laboratory in Helsinki. Most of our measurements are part of international measurement programmes



Air Quality measurement stations

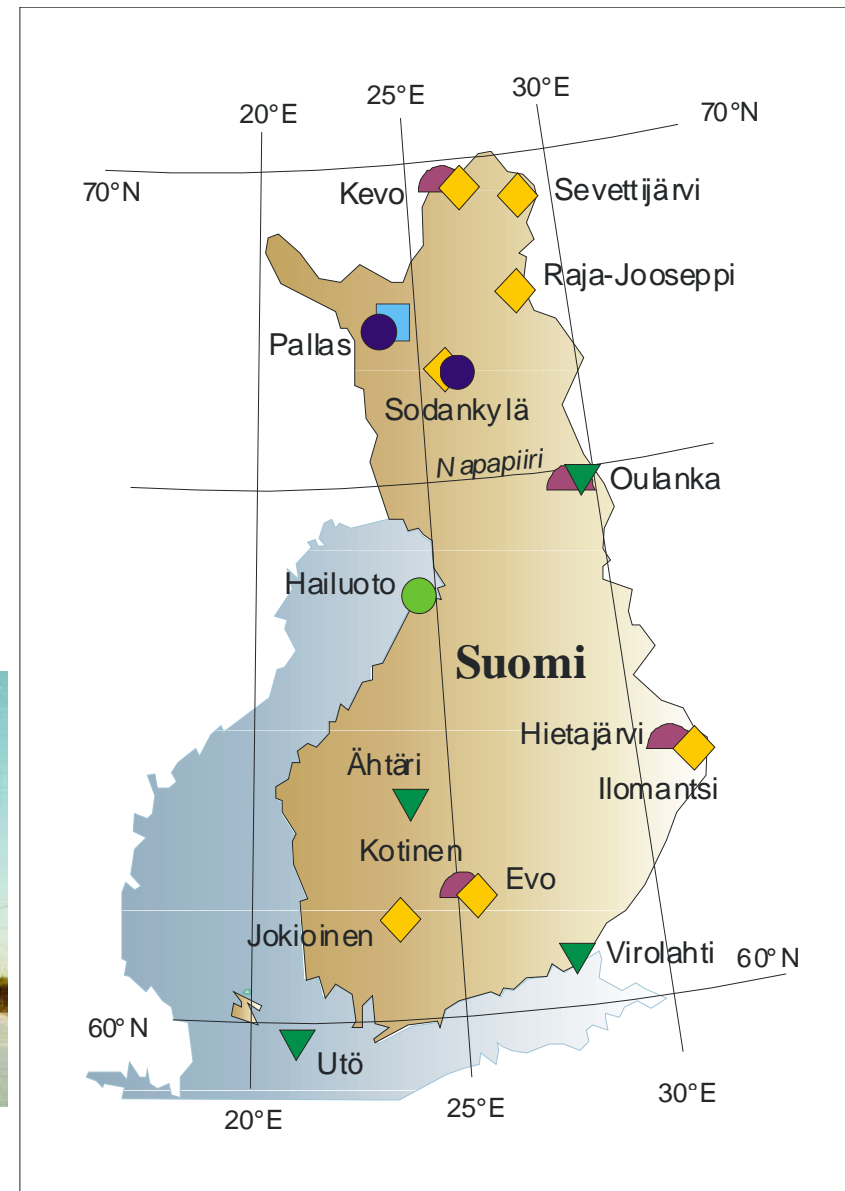
- ▼ EMEP
- GAW (WMO)
- ◐ Integrated monitoring
- HELCOM
- AMAP
- ◆ Other stations



Koivuniemi (17.12.1991)

Virolahti EMEP station

Lat 60° 31` 37.4", Lon 27° 40` 32.8"





Air quality measurements are used:

- The reasearch of air chemistry and to detect the changes in air quality
- To verify the air chemistry models
- To follow the effects of the emission reduction agreements
- To evaluate the loads of air pollutants have on terrestrial and sea ecosystems.



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At the background stations the gas and particle samples are collected as daily or weekly samples and precipitation samples as weekly or monthly samples.

In the laboratory the following ions are analyzed from gas- and particle samples: SO₂, SO₄, NH₄, (HNO₃+NO₃), Cl, (NH₃+NH₄), Na, K, Ca ja Mg.

and from precipitation samples:
Cl, NO₃, SO₄, Na, K, Ca, Mg, NH₄, Al, As, Cd, Cu, Fe, Mn, Ni, Pb, V, Zn, Co ja Cr also acidity (pH) and conductivity are measured.

Starting from 2007 trace metals will be measured from particles (PM₁₀) at three stations



Packing the filters for air sampling at the laboratory



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Open face filter sampler





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Summer sampler



Winter sampler





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Anion analysis with ion chromatography





Measurement program at Virolahti EMEP station – Meteorological measurements

- **Automatic weather station (AWS): Vaisala Milos500**
 - Humidity : HMP35D
 - Wind direction and speed : WAV15
 - Temperature : Pt100

- **SYNOP observations 8 times per day**



Measurement program at Virolahti EMEP station – Air Quality Measurements

Sampling:

- **Precipitation, main ions, weekly**
 - pH, SJK, Cl, NO₃-N, SO₄-S, Na, K, Ca, Mg, NH₄-N
- **Precipitation, trace elements, 2 parallel samples, monthly***
 - Al, As, Cd, Cu, Fe, Mn, Ni, Pb, V, Zn, Co, Cr
- **Precipitation, PAH compounds, monthly***
- **Precipitation, Hg, monthly***
- **3-level-filters, daily**
 - SO₄-S, SO₂-S, Na, K, Ca, Mg, (NH₃+NH₄)-N, (HNO₃+NO₃)-N
- **PM₁₀ samples, trace elements, daily**
 - Al, As, Cd, Cu, Fe, Mn, Ni, Pb, V, Zn, Co, Cr
- **VOC canister samples, 2 per week**
- **PM₁₀ samples, PAH, daily**

*(week->monthly, samples compined at the station)



Measurement program at Virolahti EMEP station – Air Quality Measurements

Continuous monitoring:

- O_3 : Thermo 49C
- NO_2 - NO - NO_x : Horiba APNA
- SO_2 : Thermo 43S
- PM_{10} : Eberline FH62IR
- $PM_{2,5}$: Eberline FH62IR
- Hg : to be started in 2007