The JRC-Ispra Atmospheric Research Station

1. Institution in charge of the field station

The JRC-Ispra research station is run by the Climate Change Unit of the Institute for Environment and Sustainability (IES), one of the institutes that constitute the Joint Research Centre (JRC) of the European Commission.

The mission of the JRC (http://www.jrc.cec.eu.int/) is to provide scientific and technical support for the conception, development, implementation and monitoring of EU policies.

In line with the JRC mission, the aim of IES (http://ies.jrc.cec.eu.int/) is to provide support to European Union strategies for the protection of the environment contributing to a sustainable development.

The Climate Change Unit (http://ccu.ei.jrc.it/ccu/) provides scientific support for the development and monitoring of European policies in the area of regional and global air pollution and climate change, namely the Kyoto protocol and beyond. The Unit is subdivided into 3 groups of competencies:

Modeling and Data Analysis Atmosphere Biosphere Interactions Atmospheric Chemistry

Frank Raes is Head of the Climate Change Unit. He is member of the EMEP steering body, and coordinator of the ACCENT task "Synthesizing research results for the policy and the public".

The set-up of the JRC-Ispra station resulted from a proposal of the Directorate General for Environment of the European Commission, in agreement with the Joint Research Centre, to take part to EMEP (Co-operative program for monitoring and evaluation of the long-range transmission of air pollutants in Europe), following the ratification in 1982 of the Convention on Long-Range Transboundary Air Pollution by the European Community. The JRC-Ispra station is also a GAW regional site since December 1999.

2. Research interests / Particular competences

The JRC-Ispra station was first developed to measure the EMEP core parameters related to the impact of pollution on ecosystems. Concentrations SO_2, NOx, and O_3 in the gas phase, concentrations of NH_4^+, NO_3^-, and SO_4^{2-} in the particulate phase, as well as rainwater acidity, conductivity and chemical composition have thus been monitored for almost 20 years. Other parameters such as metals in aerosol, VOCs, carbonyls and PAN were also measured for several years.

Since 2002, additional measurements have been implemented to provide a comprehensive characterization of the aerosols, needed to assess their effect on health and their role in radiative forcing (see Table 1).

Sampling and analyses, on-line measurements, and data quality check and processing are carried out by Atmospheric Chemistry group of the Climate Change Unit. This group has in-depth experience with the design of experiments to characterize physical and chemical properties of aerosols and has a strong interest in the impact of aerosols on climate. It has been developing and/or optimizing new instrumentation to measure the hygroscopicity and volatility of the aerosols (twin and tandem DMPS), the short-term

variations in the composition of aerosols (artifact-free denuder-aerosol collector combination with on-line analysis), the organic + elemental carbon content of aerosol (artifact free denuder – filter pack combinations), and the size and composition of single particles (bipolar time of flight mass spectrometer).

3. Site description

a) Geographical and meteorological information

Measurement site:	JRC site, Ispra
Country:	Italy
Geographical coordinates:	45° 49’ N, 8° 38’ E
Altitude above sea level:	209 m
In operation since:	1985
Main wind direction:	Generally weak wind
	Mountain breeze effect on warm days
	Occasionally strong northerly winds (with foehn effect)
Contact person:	Jean-Philippe Putaud
Organisation:	EC-Joint Research Centre
	Institute for Environment and Sustainability

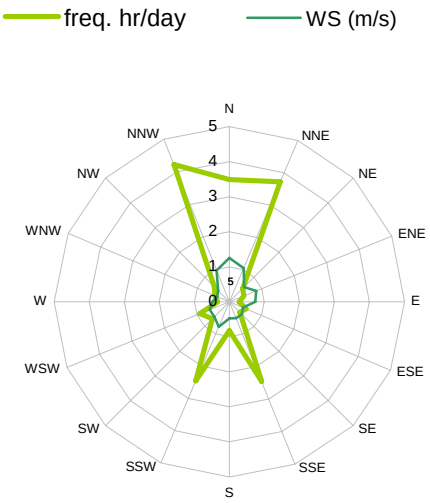

Fig. 1: distribution of wind direction and speed in 2000

The station is located by the fence of the JRC-Ispra site, situated in a semi-rural area (> 20km from large pollution sources), at the edge of one of the most polluted regions in Europe (the Po valley).

Fig. 2: general view of the JRC-Ispra Atmospheric Research Station

Weather is generally cold and sunny in winter, mild and rainy in spring and autumn, and warm and sunny in summer (with thunderstorms). Temperatures often reach < 0 °C in winter and > 30°C in summer.

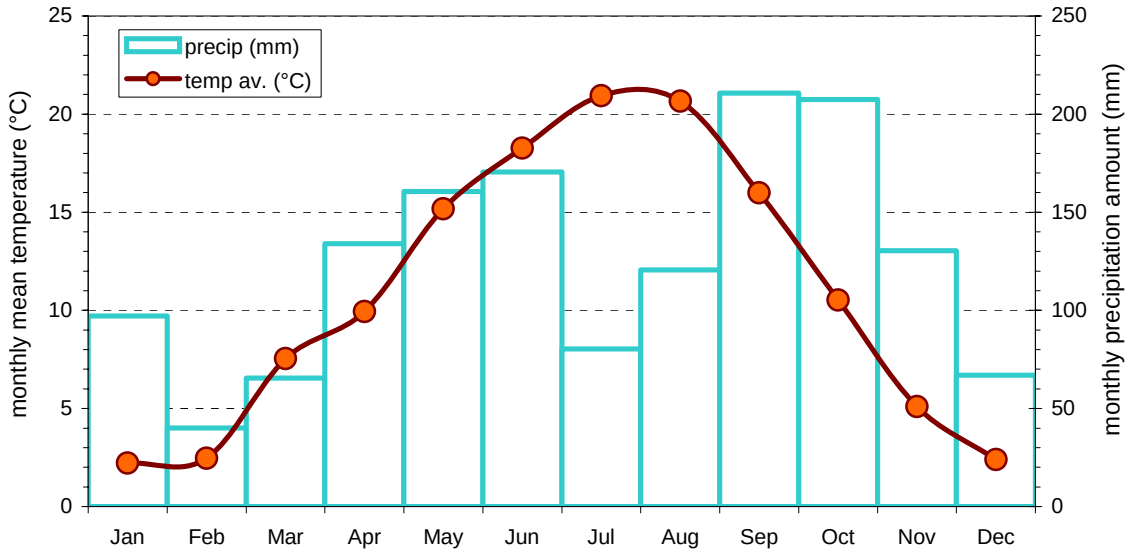

Fig. 3: 10 year average (1990-1999) meteorological parameters at the JRC-Ispra Atmospheric Research Station

b) Monitoring activities / Available instrumentation

- *Monitoring*

As an EMEP research station and GAW regional station, the JRC-Ispra station has been monitoring some core parameters for almost 20 years. On the top of these, other aerosol parameters have been added to the measurement program recently. The parameters currently measured at the JRC-Ispra station are listed in Table 1. An aerosol backscatter lidar has been set-up in November 2005. In a next future, O_3 vertical profiles and greenhouse gas concentrations will also be monitored.

- *Other available instrumentation*

Other instruments are run for shorter periods for specific scientific studies or comparison with monitoring techniques. This additional instrumentation is listed in Table 2.

c) Policy in relation to data availability and how to access data

Most data are delivered to the EMEP (http://www.nilu.no/projects/ccc/) and WDCA (http://ies.jrc.cec.eu.int/wdca/) data banks.

All data (also with better time resolutions) are available at the Climate Change Unit web page (http://ccu.jrc.it/ccu/) by selecting Data Sets and then EMEP station data.

The use of these data in publications or presentations should be acknowledged with either co-authorship for the contact PI or acknowledgments. If these data make a significant contribution to the publication or presentation, the participation of the contact PI in the data analysis and an offer of co-authorship are strongly encouraged.

Table 1. Overview of the monitoring instrumentation.

Type	Parameter	Method	Time resolution	Start
Meteorology	Wind speed		10 min	1985
	Wind direction		10 min	1985
	Pressure		10 min	1985
	Temperature		10 min	1985
	Relative Humidity		10 min	1985
	Solar Radiation	Pyranometer	10 min	1985
	Precipitation amount	Wet-only sampler	24 hr	1985
Gas Phase	SO_2	UV fluorescence	10 min	1985
	NO + NOx	Chemilumin.- Mo converter	10 min	1985
	O_3	UV aborption	10 min	1987
	CO	NDIR	10 min	1990
Particulate Phase	PM10 + PM2.5 mass conc.	Gravimetry & TEOM-FDMS	24 hr / 10 min	1985 (TSP)
	Major ions in both fractions	Ion Chromatography	24 hr	1985
	OC +EC in both fractions	Thermo- oxidative method	24 hr	2002
	Number size distribution	DMPS + APS	6 min / 10 min	2004
	Absorption coefficient	7 wavelength aethalometer	15 min	2004
	Scattering coefficient	3 wavelength nephelometer	10 min	2004
	Aerosol vertical profile	Backscatter lidar	2 min	2005
Precipitation	pH		24 hr	1985
	conductivity		24 hr	1985
	Major ions	Ion Chromatography	24 hr	1985

Table 2. Overview of the instrumentation available for measurement campaigns.

Type	Parameter	Method	Time resolution
Gas Phase	Water soluble gases (e.g. NH_3, HNO_3, etc…)	Wet denuder + on-line IC	15 min
Particulate Phase	Particle hygroscopicity	Tandem DMPS	30 min
	Particle volatility	Heated DMPS	6 min
	PM inorganic components	Aerosol collector + on-line IC	15 min
	Size segregated aerosol chemistry	Berner impactor + IC and thermal OC/EC	12-24 hr
	Single particle size and composition	Single particle mass spectrometer	N / A

d) Web-site address of the field station

http://ccu.jrc.it/ccu/ (click on “facilities” and “Atmospheric Chemistry”)

e) Access to the facility (lodging, transportation to the site, technical assistance, …)

The JRC-Ispra station is easily accessible by road (A8-A26-E62 highway, exit Castelletto Ticino or Sesto Calende) or airplane (30 min away from the Milano-Malpensa international airport).

Instrumentation to be brought into the JRC-Ispra site should go through **customs clearance** at the west gate of the JRC site.

Accommodation is possible in 3-4 hotels located at <5 km from the site, and in a residence (small furnished flats) located just in front of JRC main gate (ca. 25 Euros/night).

Technicians spend several hours a day at the station and are available for assistance.

f) Scheduled scientific activities at the site (field campaigns)

- Particulate OC artifact-free sampler validation
- EUSAAR intercomparison field campaigns

g) Association to national, European and/or international Networks

The JRC-Ispra station has been part of the:
- EMEP measurement network since November 1985.
- GAW coordinated network since December 1999.

h) Indication on specific issues for which collaboration is sought

Collaborations are particularly welcome in the field of:
- carbonaceous aerosol artifact-free sampling
- aerosol source apportionment studies (elemental and organic tracers, C isotopes)
- atmospheric particle remote sensing

i) Is there is a fee for using a facility?

No fee. Power available free of charge.

j) Name and address of contact person

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