# SRNWP data pool: the meteorological site of San Pietro Capofiume, Italy

## Site characteristics

#### Description

The site is located in the middle of the Po Valley. The Po valley, in the Northern Italy, is a large plain in a semi-closed basin surrounded by complex orography, the Alps to the North and Appennines to the South-East, and closed to the east by the Adriatic sea. As a flatland basin shielded by mountains, calm wind, strong temperature inversions and fog are very frequent. In the summer it is not unusual the formation of super-cells.

#### Location

latitude	44.654N
longitude	11.623E
elevation	$9 \mathrm{m} \mathrm{asl}$
slope	0.1%
land cover	grassland, surrounded by crop

#### Soil

layer depth (cm)	sand $(\%)$	silt $(\%)$	clay $(\%)$
0 - 10	62	24	14
10 - 35	61	23	16
35 - 50	67	18	15
50 - 80	74	18	8
80 -120	7	56	37
120 - 165	9	73	18
165 - 200	62	27	11

• WRB (1998) classification: CalcariFluvicCambisols

#### Contact person

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## Instruments and measurements



Figure 1: Map of the measurement field at San Pietro Capofiume

#### Surface meteorological station

An emometer is at 10m height, thermohygrometer at 2m, radiometer at about 3m. Data are available in real time for ARPA-SIMC, monthly or every 6 months for SRNWP data pool.

Instrument	Variable	Time res.
Cup anemometer (Vaisala	Wind speed $(ms^{-1})$	1h
QMW110)		
	Wind direction (degrees)	1h
Radiometer (Kipp & Zo-	Downward short-wave radiation $(Wm^2)$	1h
nen CNR1)		
	Upward short-wave radiation $(Wm^2)$	1h
	Downward long-wave radiation $(Wm^2)$	1h
	Upward long-wave radiation $(Wm^2)$	1h
Thermohygrometer	Temperature (K)	1h
(Vaisala QMH102)		
	Relative humidity (%)	1h
Barometer (Vaisala	Atmospheric pressure (hPa)	1h
PMT16A)		
Rain gauge (Vaisala	Precipitation rate (mm/h)	1h
QMR102)		
Leaf wetness sensor	Leaf wetness (minutes)	1h
(Vaisala QLW101)		

#### Ground station

Sensors are located into the ground at increasing depths: [10, 25, 45, 70, 100, 135, 180] cm. Data are available in real time for ARPA-SIMC, monthly or every 6 months for SRNWP data pool.

Instrument		Variable	Time res.
Time-Domain	Reflec-	Soil water $\operatorname{content}(m^3/m^3)$	1h
tometer			
Resistive thermo	meters	Soil temperature $(m^3/m^3)$	1h

#### **Radiosounding station**

Radiosonde launches are performed regularly at 00UTC, occasionally also at 12UTC. During IOP sometimes also at 06UTC and 18UTC. Data in TEMP format are available in real time for ARPA-SIMC, on request for SRNWP data pool. Raw data with higher vertical resolution are available during IOPs on request.

Instrument		Variable	Time res.
Radiosonde	(Vaisala	Temperature (K)	6h to 24h
RS92)			
		Relative humidity (%)	6h to 24h
		Wind speed $(ms^{-1})$	6h to 24h
		Wind direction (degrees)	6h to 24h
		Virtual potential temperature (K)	6h to 24h

# ${\it Micrometeorological\ station}$

Data are available on reques	t during some for s in years 2009-2015.
Data are available on reques	t during some IOPs in yours 2000 2013

Instrument	Variable	Time res.
Sonic anemometer	Wind speed $(ms^{-1})$	1h
(Metek USA-1 Research)		
	Wind direction (degrees)	1h
	"Sonic" temperature (K)	$1\mathrm{h}$
	St. dev. of wind direction $(ms^{-1})$	$1\mathrm{h}$
	St.dev. of the 3 wind components $(ms^{-1})$	$1\mathrm{h}$
	Turbulent kinetic energy $(m^2/s^2)$	$1\mathrm{h}$
	St.dev. of temperature (K)	1h
	Covariances between wind components(-)	$1\mathrm{h}$
	Covariances between wind components and	$1\mathrm{h}$
	temperature (-)	
	Friction velocity $(ms^{-1})$	1h
	Ratio between anemometer height and Monin-	1h
	Obukhov length	
	Scale temperature (K)	1h
	Uncorrected turbulent heat flux $(Wm^2)$	1h
	Structure parameters of u,v,w,T	1h
Infrared Gas Analyzer	Water vapor mass concentration $gm^{-3}$	1h
(LiCor LI-7500)		
	Carbon dioxide mass concentration $(gm^{-3})$	$1\mathrm{h}$
	St.dev. of water vapor mass concentration	1h
	$(mgm^{-3})$	
	St.dev. of carbon dioxide mass concentration	$1\mathrm{h}$
	$(mgm^{-3})$	
Sonic anemometer + In-	Vertical flux of water vapor $gm^{-2}$ s	1h
frared Gas Analyzer		
	Vertical flux of carbon dioxide $(gm^{-2} s)$	1h
	Turbulent latent heat flux $(Wm^{-2})$	1h
	Corrected turbulent sensible heat flux $(Wm^{-2})$	$1\mathrm{h}$
Radiometer (Kipp & Zo- nen CNR1)	Downward short-wave radiation $(Wm^2)$	1h
,	Upward short-wave radiation $(Wm^2)$	1h
	Downward long-wave radiation $(Wm^2)$	$1\mathrm{h}$
	Upward long-wave radiation $(Wm^2)$	$1\mathrm{h}$
	Net radiation $(Wm^2)$	$1\mathrm{h}$
	Sky temperature (K)	$1\mathrm{h}$
	Ground temperature (K)	$1\mathrm{h}$
	Albedo (-)	$1\mathrm{h}$
Ground heat flux plate	Heat flux into the ground at 5cm depth $(Wm^2)$	1h
(Hukseflux)		

#### Ground based remote sensing station

Data are available on request during some IOPs in years 2009-2013.

Instrument	Variable	Time res.
LiDAR-ceilometer	Range corrected signal (dB)	15m
(Vaisala LD-40)		

## Air quality station

Data are available in real time for ARPA-SIMC, on request for SRNWP data pool.

Instrument	Variable	Time res.
Air quality station	Nitrogen dioxide mass concentration $(\mu g m^{-3})$	1h
	Ozone mass concentration $(\mu g m^{-3})$	1h
	$PM_{10}$ mass concentration $(\mu gm^{-3})$	24h