

METEO FRANCE



Weather Solution for Energy

www.meteofrance.com

www.energy@meteo.fr

Certified ISO 9001-2000 standards

METEO FRANCE

National Weather Service

Certified to ISO 9001-2000 standards, METEO FRANCE is involved in all meteorological fields: development, research, climatology, observation and forecasting.

World leader

- Member of the World Meteorological Organization (WMO)
- Member of the European Centre for Medium-Range Weather Forecasts (ECMWF)
- Active throughout the world
- Considerable computing power
- Precise global forecasts using its own forecast models (ARPEGE, ALADIN) and access to ECMWF models
- Expertise in world climatology
- A dynamic commercial activity in specialised sectors

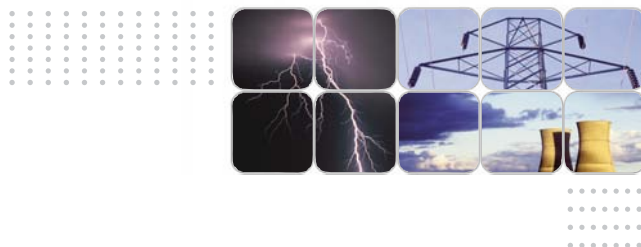
Its subsidiaries ...

METEO FRANCE INTERNATIONAL (MFI) is a joint venture with EGIS (Groupe Caisse des Dépôts) and works internationally to both renew and modernize meteorological services by providing turnkey solutions.

METEORAGE is a joint venture with VAISALA. METEORAGE is responsible for detecting and issuing warnings on the occurrence of storm lightning.

PREDICT SERVICES is a joint venture with BRL and INFOTERRA (EADS Astrium Group). PREDICT Services supplies data enabling rapid and targeted decision-making when flash floods occur.

METNEXT is a joint venture with NYSE Euronext. METNEXT operates in the meteorological risk management sector has two distinct branches : METNEXT Corporate Solutions for businesses who need to organize their activities in relation to the weather and METNEXT Finance & Insurance, which enable brokers, underwriters and financial intermediaries to arrange protection against weather variations.



Energy Solutions by METEO FRANCE offer tailored services, over several forecast periods, over a world geographical field, to better manage and anticipate meteorological variations on:

- Production
- Consumption
- Transport
- Storage
- Distribution

Our clients :

C O F A T H E C



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WEATHER FORECASTS

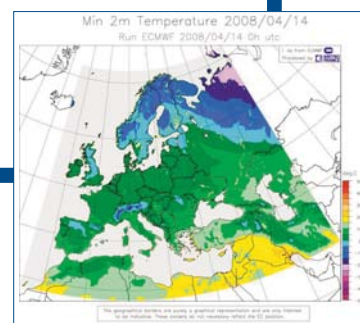
Up to 5 days (*deterministic forecasts*)

Meteorological data available from more than 2,500 measurement points worldwide and from more than 800 measurement points in Europe:

EVERY 3 HOURS	EVERY 6 HOURS	DAILY
<ul style="list-style-type: none"> • Air temperature • Air humidity 	<ul style="list-style-type: none"> • Air temperature • Wind direction and speed forecasted at 10m from the ground • Maximum wind • Cloudiness • Cumulative rainfall for the next 6 and 24 hours • Atmospheric conditions 	<ul style="list-style-type: none"> • Minimum and maximum daily air temperatures • Minimum and maximum daily air humidity values

Forecast production frequency:

Once daily at 12.00 UTC with the ECMWF model and up to twice a day (at 00.00 UTC and 12.00 UTC) in Europe with the ARPEGE French model.



Temperature forecast

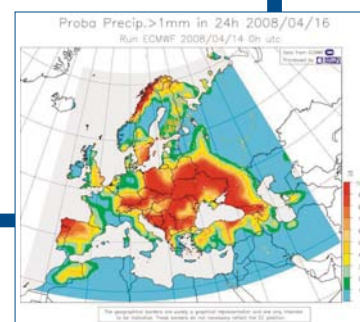
From 5 to 10 days (*probabilistic forecasts*)

Data available from more than 1,400 measurement points in North America and Europe:

EVERY 3 HOURS	EVERY 6 HOURS	DAILY
<ul style="list-style-type: none"> • Air temperature 	<ul style="list-style-type: none"> • Air temperature • Wind direction and speed forecasted at 10m from the ground • Cloudiness • Cumulative rainfall for the next 6 and 24 hours 	<ul style="list-style-type: none"> • Minimum and maximum daily air temperatures

Forecast production frequency:

Twice a day, at 00.00 UTC and 12.00 UTC



Rainfall forecast exceeding 1 mm

All this data can be sent to you using the most recent transmission methods: ftp, email, etc. in your chosen file format (graphics, text, etc.)

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METEOROLOGICAL DATA POST-PROCESSED AND ADAPTED: TEMPERATURE

Temperature variations are better understood through adjusting the statistical models used, to have:

- The best adaptation to local conditions
- Dynamic and statistical processing
- A high-availability accurate processed parameter

Up to 7 days (*deterministic forecasts*)

Data available from more than 6,000 measurement points worldwide:

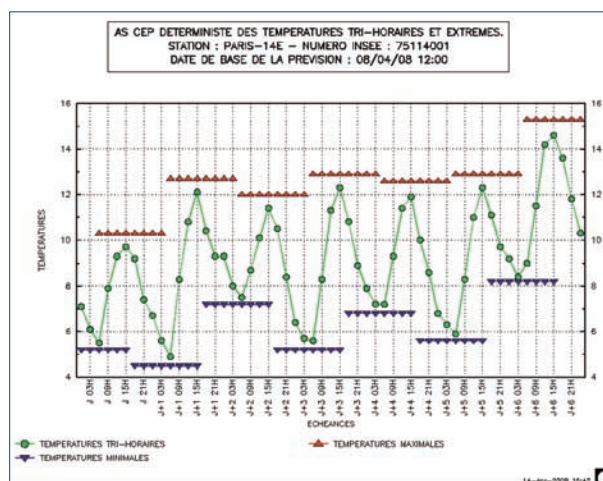
EVERY 3 HOURS

DAILY

Minimum and maximum daily air temperatures

Forecast production frequency:

Once daily at 00.00 UTC with the ECMWF model



Up to 14 days (*probabilistic forecasts*)

Data available from more than 3,000 measurement points in North America and in Europe:

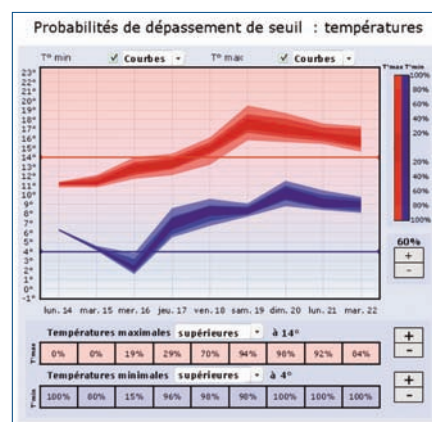
EVERY HOUR

DAILY

Minimum and maximum daily air temperatures

Forecast production frequency:

Twice a day, at 00.00 UTC and 12.00 UTC with the ECMWF model



Temperature forecast which exceeds the threshold

All this data can be sent to you using the most recent transmission methods: ftp, email, etc. in your chosen file format (graphics, text, etc.)

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CLIMATOLOGICAL DATA

To carry out a site survey, to initialize or to adjust energy management and decision support tools, **METEO FRANCE** can provide:

An observations data bank

- Continuously controlled
- Comprising more than 8,000 measurement points worldwide
- Which includes data going back over period of at least ten years
- Continuously fed
- Ready to be integrated into all numerical models and decision support systems

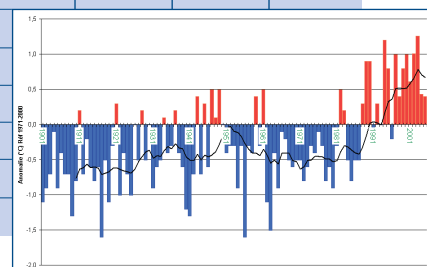
In particularly the following data included is:

- **Temperatures**
- **Rainfall**
- **Wind**
- **Cloudiness**

Various statistical products and studies can then be produced from this data, for the required time intervals (daily, weekly, every ten days, monthly, etc.)

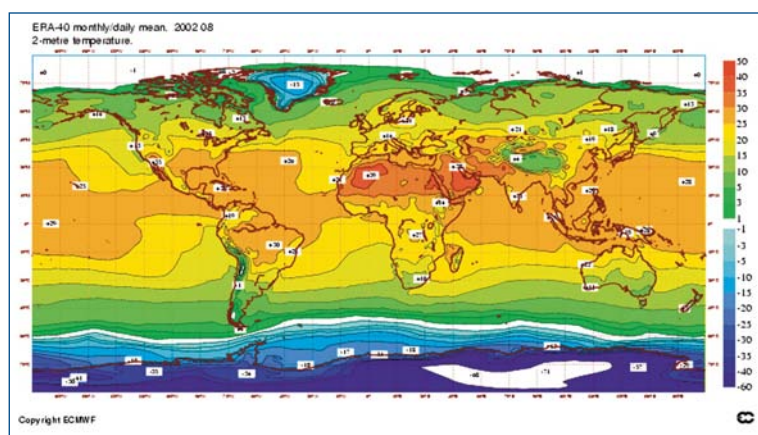
MONTH	CITY	Average Minimum Temperature	Average Maximum Temperature	Minimum Temperature	Maximum Temperature	Days of freezing	Days of 32 °C	Rainfall mm	Rainy days
	EDINBURGH	3,3	8,2	- 5,0	17,1	6	0	44,3	6
	MANCHESTER	3,1	10,1	- 17,0	18,2	7			
	CARDIFF	3,3	10,6	- 8,2	21,2	0			
MARCH	LONDON	3,0	9,5	- 8,2	21,8	8			
	CULDROSE	6,4	10,1	- 1,1	16,4	0			
	BELFAST	3,5	9,2	- 12,5	19,2	7			
	CORK	4,2	11,1	- 5,2	21,0	9			

Example of table of monthly statements in the UK



Graph temperatures compared to mean

A climatology established through the analysis and the reanalysis of data from global numerical models: an additional tool to the observations



From the ERA40 reanalysis of the European for Medium-Range Weather Forecasts, a full, uniform and consistent climatology over time and space is available to meet your most demanding requirements.

This enables values for the entire globe to be obtained through a reanalysis of the atmospheric conditions.

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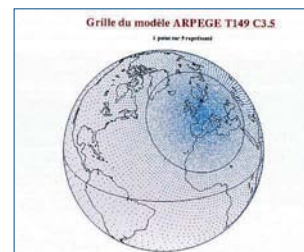


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METEO FRANCE can provide MORE PRECISE FORECASTS using numerical models ALADIN, ARPEGE and ECMWF

- For all areas of activity
- Frequently updated

Up to 7 days (deterministic forecasts)
Data available



EVERY 3 HOURS

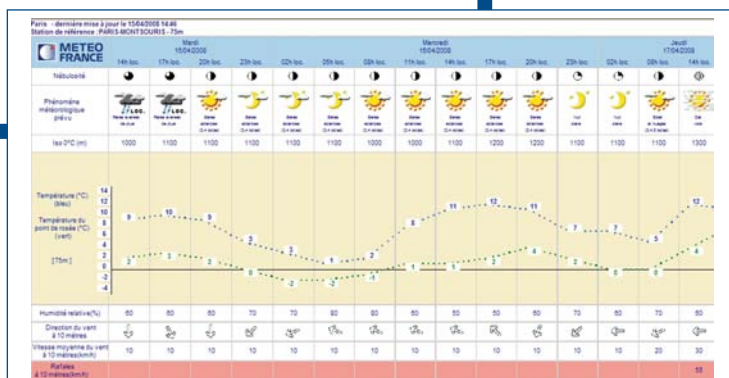
- Air temperature
- Air humidity
- Cloudiness
- The cumulative rainfall over a period of 3, 6 and 24 hours
- Wind direction and speed forecasted at several altitudes

DAILY

- Minimum and maximum daily air temperature
- Minimum and maximum daily air humidity values

Forecast production frequency:

4 times daily, at 00.00 UTC, 06.00 UTC, 12.00 UTC and 18.00 UTC up to 4 days with the numerical model Arpege or Aladin. Twice a day, at 00.00 UTC and 12.00 UTC up to 7 days with the European numerical model (ECMWF).



Atmogramme ® on site

Up to 14 days (probabilistic forecasts)
Data available

EVERY 3 HOURS

- Air temperature

EVERY 6 HOURS

- Air temperature
- The wind direction and speed at 10m from the ground up to 10 days

DAILY

- Minimum and maximum daily air temperatures
- The cumulative rainfall for the next 24 hours up to 9 days

Forecast production frequency:

Twice a day, at 00.00 UTC and 12.00 UTC

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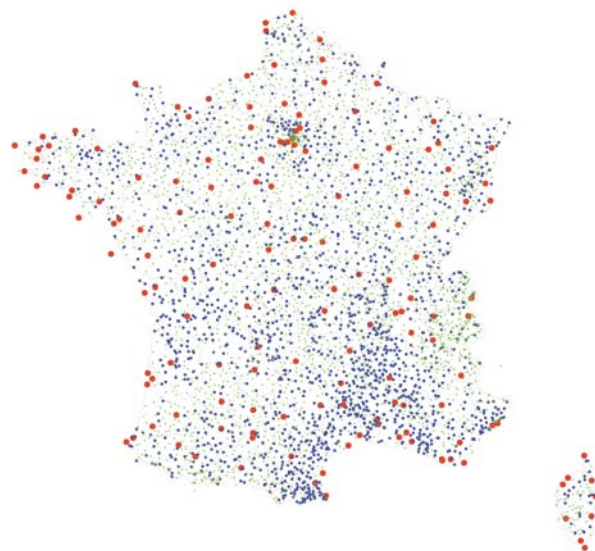
HIGH-DENSITY DATA FOR FRANCE

- More than 1,500 weather stations (in real time)
- 3,171 measurement points (in past time)
- 24 rainfall radars
- 7 radio sounding stations

Also guaranteeing:

- A complete, fully controlled climatological database

To initialise and update computation models or confirm results, METEO FRANCE offers climatological data available 24/7:



OBSERVED

- Air temperature
- Cloudiness
- Wind measured at 10m from the ground
- Rainfall
- Air humidity
- Atmospheric pressure

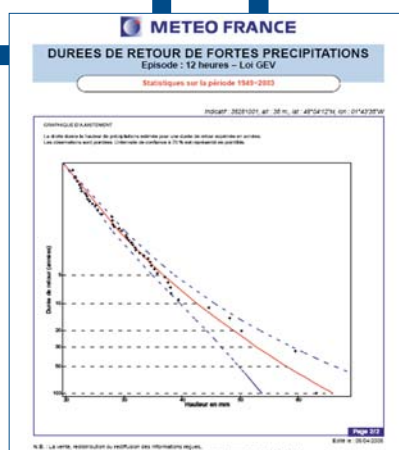
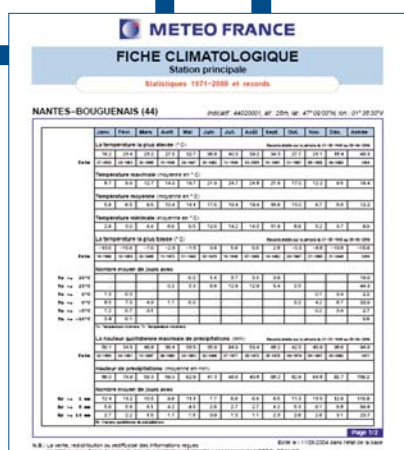
CALCULATED

- Ten-day mean
- Monthly mean
- Annual mean
- Seasonal mean
- Reference mean
- Return periods

DIFFERENT TIME INTERVALS

- Every hour
- Every 3 hours
- Daily

Climatological sheet for a point of measurement



Heavy rainfall return periods for a point of measurement

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