



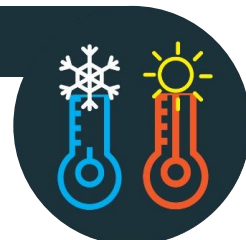
## C3S CLIMATE & ENERGY EDUCATION DEMONSTRATOR VARIABLE FACT SHEET

# AIR TEMPERATURE

Historical & Projected 1971-2100

## WHAT IS AIR TEMPERATURE?

Air temperature is the measure of how hot or cold the air is at any given time and place. Air temperature can be averaged out over longer periods of time. For example, the monthly air temperature is an average of a whole month's worth of temperature readings.



## HOW IS IT MEASURED?

Air temperature is measured in degrees Celsius ( $^{\circ}\text{C}$ ). Zero degrees Celsius ( $0^{\circ}\text{C}$ ) is the freezing point of water. Air of this temperature would need you to wrap up in warm clothes and perhaps prepare for some ice and snow.  $10^{\circ}\text{C}$  feels cool,  $20^{\circ}\text{C}$  feels warm and  $30^{\circ}\text{C}$  and higher can feel uncomfortably hot. A thermometer is what is used to measure temperature.

## DID YOU KNOW?

The hottest single temperature record to date is  $56.7^{\circ}\text{C}$  recorded in Furnace Creek Ranch, California USA in 1913, and the coldest is  $-89.2^{\circ}\text{C}$  recorded at Vostok Station in Antarctica in 1983!



## GLOSSARY

**ANNUAL AIR TEMPERATURE** The mean air temperature for an entire year (January to December) for a given place: *"The annual air temperature for France in 2006 was  $12.25^{\circ}\text{C}$ "*

**TEMPERATURE ANOMALY** The difference between what you would expect based on an average of past readings and what was recorded: *"December 2010 in Germany was  $5.61^{\circ}\text{C}$  colder than the average over the 30 years before"*

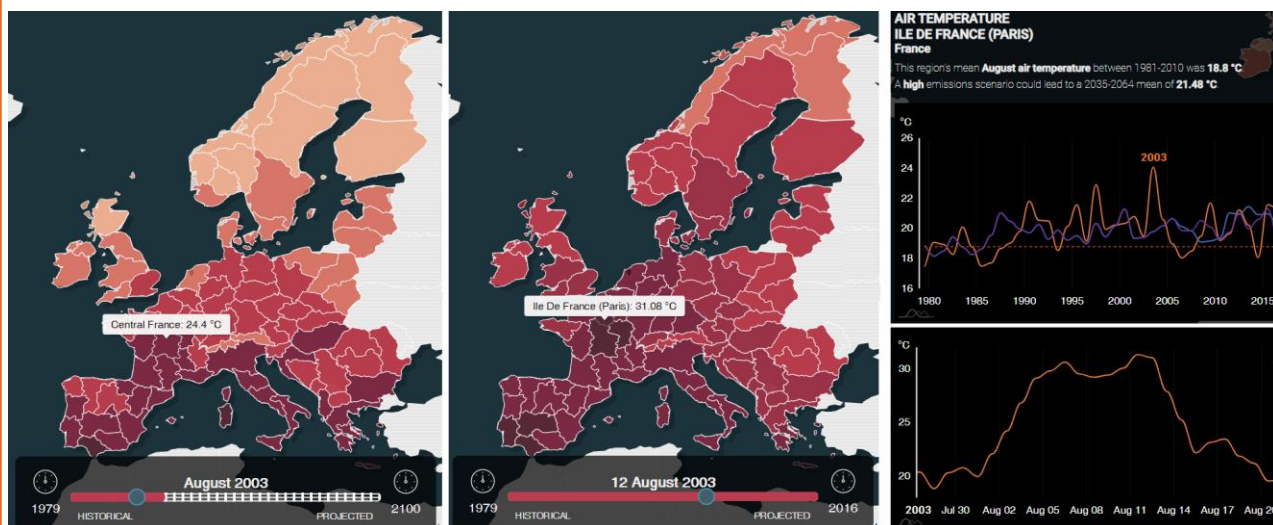
**ABSOLUTE AIR TEMPERATURE** The actual number of a given measurement from zero (0): *"The thermometer says the temperature is  $14.3^{\circ}\text{C}$ "*

## KEY MESSAGES FROM THE DATA

- Temperatures have **risen consistently** in **Europe** over the last 40 years.
- **Northern Europe** has **warmed faster** than **Southern Europe**. Climate projections into the future show this difference in rates will continue.
- Climate model projections for **Europe** indicate **major warming of about 3 to 5°C on average by 2100** for a high greenhouse gas emissions scenario.
- The projections indicate **more frequent high temperature extremes** (e.g. heatwave events).



### CASE STUDY: THE 2003 EUROPEAN HEATWAVE



**Summer 2003** saw one of the **worst heatwaves** in Europe, with a death-toll of more than 70,000. Daytime temperatures in **France** hit **40°C**, and **averages for 24 hours in the mid-20s** meant there was little relief during the night. While the heat caused human suffering, other impacts included rivers almost drying up and **wheat crop shortages**.

**i** FOR MORE DETAILS AND ACTIVITIES, AND FOR OTHER CASE STUDIES, SEE THE “RESOURCES” SECTION VIA THE MENU.

## BE DATA SMART



Be careful not to confuse temperature information on different scales. For example, you can still have a temperature of 18°C in any particular day in winter, but the average for a winter season is likely to be lower. You must know the difference between weather (changes on small time scales such as hours and days) and climate (changes on large time scales such as years and decades).

The [Copernicus Climate Change Service \(C3S\)](#) is one of the European Union’s Copernicus Earth Observation Programme services and is operated by the European Centre for Medium-Range Weather Forecast (ECMWF) on behalf of the European Commission.

SEE THE ‘REFERENCES & SOURCES’ SHEET FOR SOURCES OF INFORMATION. FOR TECHNICAL INFORMATION, LICENSE CONDITIONS, LINEAGE STATEMENT ETC SEE THE EUROPEAN CLIMATIC ENERGY MIXES (ECM) VARIABLE FACT SHEET 001: [http://ecem.wemcouncil.org/pdf/ECM\\_VFS\\_C01\\_TA\\_20171128.pdf](http://ecem.wemcouncil.org/pdf/ECM_VFS_C01_TA_20171128.pdf)

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