

D 1.11 Weather data and forecasts

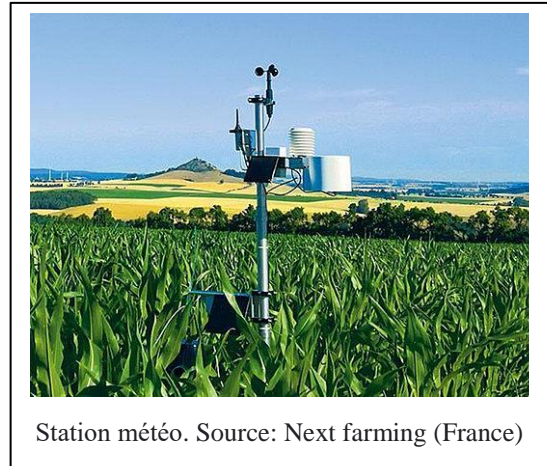
What is weather data?

Weather data refers to observation information about the weather and climate of a particular location at a given time which record by a weather monitoring station, barometers, radar, thermometers, computer models. This information includes temperature, dew point humidity, relative humidity, total horizontal solar radiation, wind speed and direction and atmospheric pressure ect.

There are three types of weather forecasts, long, medium and short ranges.

A weather sensor is a device that collects data related to the weather and the environment using a variety of sensors. Weather sensors are also called weather centres, weather stations, meteorological stations, weather monitoring stations, automatic climate stations, and weather forecasters.

The sensor of a weather detector can include a thermometer to measure temperature, a barometer to measure atmospheric pressure, as well as other sensors to measure rain, wind, humidity and more. Weather sensors are integrated from different technologies such as from simple manual types to digital technology. Some machines can connect to a computer or the internet, so the collected data can be analysed using weather station software.



Station météo. Source: Next farming (France)

Weather station data can be used to assess current weather conditions and predict future weather forecasts, such as high/low temperatures, cloud cover and chance of rain. Weather alarms are used by meteorologists, gardeners, farmers, outdoor enthusiasts, students, pilots or those who like weather data or rely on weather to make decisions.

How is weather data collected?

Weather data is collected through the below sites and systems:

- Aerial monitoring data over Eurasia to build 500mb average position elevation maps of the squid season;
- Japan's JRA-55 reanalyzed data to develop seasonal mean maps at standard barometric levels;
- Monitoring data of surface meteorological factors by day in the forecast area and its vicinity;
- CLIM data (which is a monthly climate data bulletin published in a country);
- Statistical data on average and extreme values of meteorological factors according to the forecast period;
- ENSO data;
- Simulation data, forecasts of numerical models of season duration.

What are weather forecasts and how does it work in agriculture?

Today, weather forecasting has developed with great advances in technology, serving more and more effectively socio-economic fields, including agriculture. In actual operation, the preparation of a weather report includes many activities: monitoring, data exchange, analysis, forecasting and distribution of forecast products. These are essential components of weather forecasting services.

Meteorological observation and monitoring

To prepare a weather forecast, it firstly needs to get a detailed picture of the current weather conditions in a particular area. This requires regular and accurate monitoring of the atmospheric layers from low to high by surface and high-altitude observation stations and remote sensing systems such as satellites and meteorological radars. The quality of the weather forecast depends very much on the completeness and accuracy of the initial state observations of the atmosphere.

Data analysis

Meteorological observations over a large area are plotted on a weather map, with different icons representing wind, temperature, clouds, barometric pressure and other weather factors. As a result, forecasters can quickly identify all the weather elements at a given location, analyse circulation patterns, and locate important weather systems such as air masses, front, trench, low pressure, high pressure, storm, etc. Weather maps include surface maps and unreal and past elevation maps, to give a four-dimensional picture of the atmospheric state and conditions. weather pattern. Thermodynamic diagrams are also analysed from atmospheric observation data to help forecasters determine the stability of the atmosphere in the vertical direction to assess the possibility of strong convection which is one of the main causes of dangerous weather phenomena such as turbulence, thunderstorms, storms, etc.

Challenges in weather forecasting

Different spatial and temporal scales of weather systems and climate phenomena pose forecasting challenges of varying degrees.

Links to relevant topics

<https://www.fao.org/3/x5672e/x5672e09.htm>

<https://www.agroforecast.eu/>

<https://sencrop.com/eu/agricultural-weather/>

<https://blog.narrative.io/the-complete-guide-to-weather-data>

<https://www.nextfarming.fr/agriculteur/produits/surveillance-de-lexploitation/next-station-meteo>

Keywords

data collection



weather

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weather forecasts

weather station

sensors for weather



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