



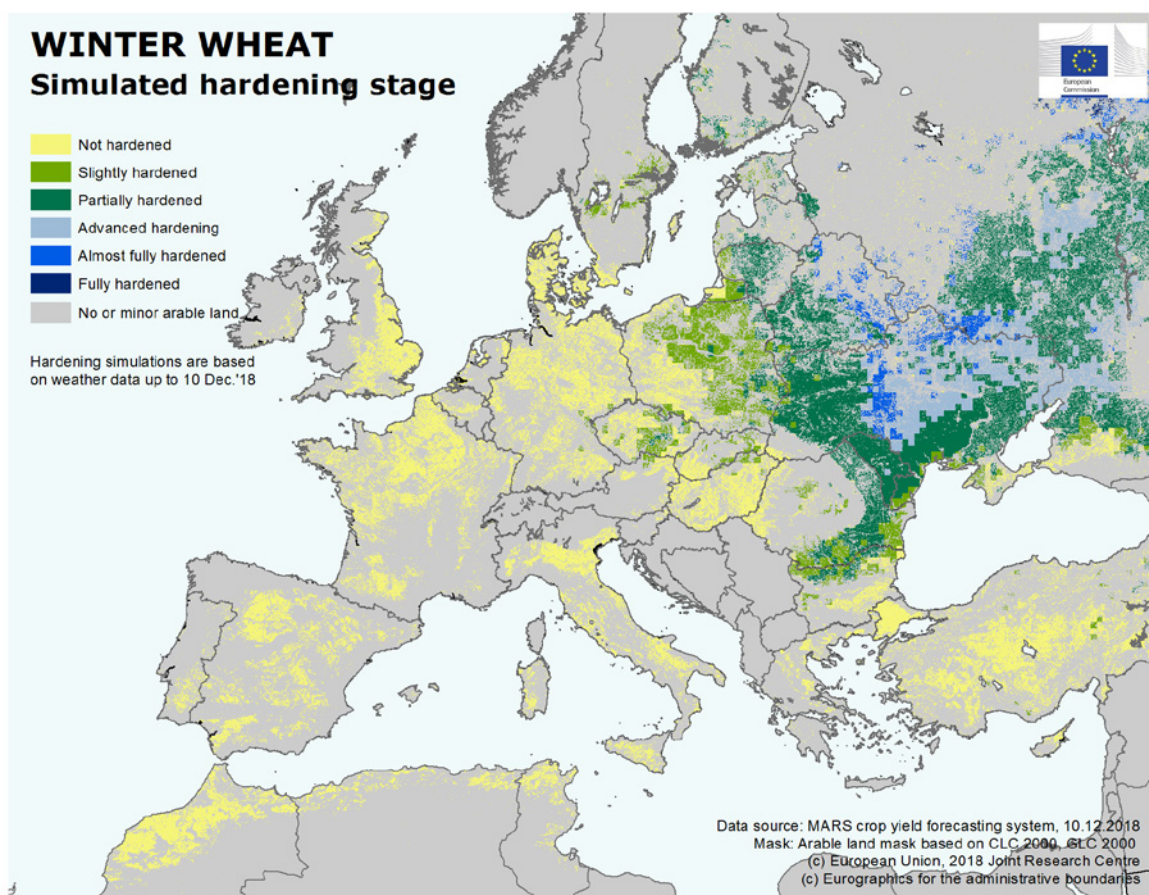
JRC MARS Bulletin

Crop monitoring in Europe

December 2018

Mild start of winter

Colder conditions forecast expected to improve frost tolerance



Hardening is the bio-physiological process whereby winter cereals gain low-temperature tolerance to withstand freezing conditions that occur during the winter dormancy period.

Currently, winter cereals are underdeveloped in large areas of Europe owing to delayed sowing and below-optimal soil moisture conditions for sprouting. Thermal conditions have been much milder than usual; therefore, the hardening of

winter wheat has started late and it seems to be weaker than usual, albeit more advanced than in 2017 around this time of the year, especially in eastern parts of Europe. The current situation is delicate, because underdeveloped crops with reduced frost tolerance are more susceptible to cold air intrusion, which could cause considerable frost damage in areas without snow cover deep enough to provide thermal insulation.

1

Agro-meteorological
overview

2

Atlas maps

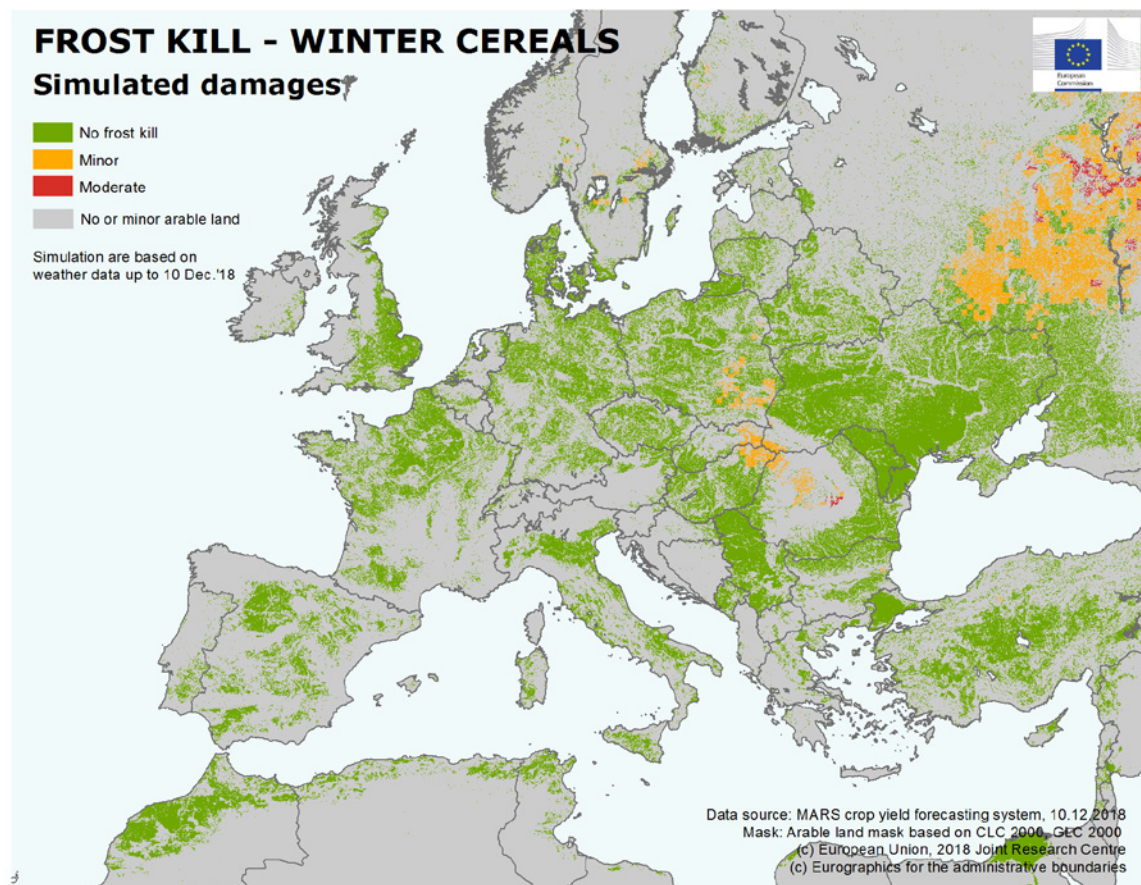
Our model simulations indicate no or weak frost tolerance in the western half of Europe, the Mediterranean region, southern parts of the Balkan Peninsula and western Turkey. In eastern and northern parts of the EU, hardening has started and winter crops have reached a slight or partial hardening stage in the Baltic countries, eastern Poland, northern Bulgaria and eastern Romania as well as in some parts of Finland, Sweden, the Czech Republic and Slovakia.

In south-western Belarus, and southern and western Ukraine, winter wheat is typically just partially hardened, although the central and north-eastern regions of both countries present more advanced frost tolerance. Along the western border of Russia, winter wheat has reached advanced hardening and is locally almost fully hardened. Further eastward (such as in the northern parts of the Southern okrug, most of the Central okrug, and southern and south-western regions of the Volga okrug), winter wheat is expected to be partially hardened and locally advanced. Areas with a maximum level of frost tolerance are confined to the very northern and very eastern winter wheat cultivation regions of European Russia.

In the first days of December, some minor/local frost-kill events may have occurred in central Romania, eastern Slovakia, north-eastern Hungary and eastern Poland due to the absence of adequate crop frost tolerance and low minimum temperatures (ranging between $-16\text{ }^{\circ}\text{C}$ and $-13\text{ }^{\circ}\text{C}$). Local frost-kill events have also been simulated in some parts of Sweden and Finland.

In Russia, our frost-kill model suggests slight frost-kill damage of winter wheat in the Central okrug and in northern parts of the Southern okrug (e.g. Volgogradskaya oblast). Moderate, and locally considerable, frost-kill damage is probable in the Volga okrug (especially in the western and southern territories) as a consequence of severe cooling and absence of snow during the second dekad of November.

Taking into consideration the latest medium-range weather forecast, winter hardening is likely to increase in central, northern and eastern Europe as a consequence of colder-than-usual conditions. On the basis of the temperature drops forecast, no frost kill is expected until the end of the forecast period (20 December).



1. Agro-meteorological overview

1.1. Meteorological review (1 November-10 December)

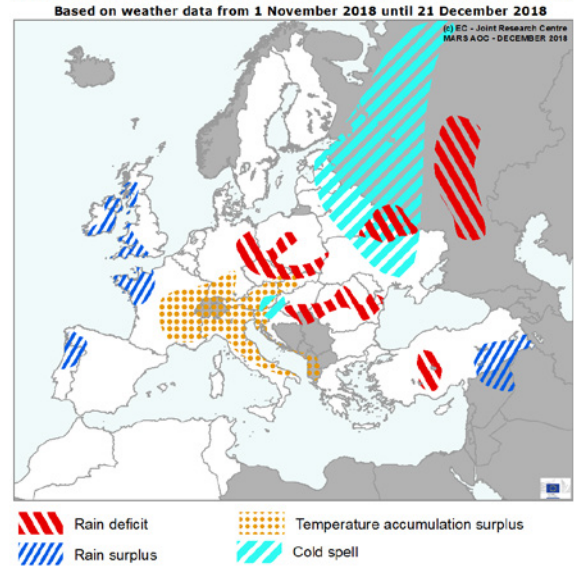
The period under analysis was significantly **warmer than usual** in Scandinavia and most of western and central Europe. Temperature anomalies in northern Scandinavia reached between 4 °C and 6 °C above the long-term average, while in eastern France, Italy, Austria, and along the eastern Adriatic coast, temperature anomalies between 2 °C and 4 °C above the long-term average prevailed.

Whereas the first half of November was warmer than usual in most of Europe, temperatures dropped in the second half of the month. This drop in temperatures was most significant in the western Black Sea region, eastern Ukraine and eastern parts of European Russia. In these regions, the period under review as a whole was **colder than usual** with recorded temperatures between 1 °C and 4 °C below the long-term average. Minimum temperatures reached below – 5 °C in eastern Europe; minimum temperatures below – 15 °C were confined to northern Romania, western Ukraine, part of Scandinavia and central and northern parts of European Russia.

Drier-than-usual weather prevailed in eastern and north-eastern Europe, with precipitation cumulates as low as 80 % below the long-term average. Cumulative precipitation did not exceed 30 mm in southern Poland, northern and eastern parts of the Czech Republic, and parts of eastern Germany; precipitation deficit in these regions has persisted since the beginning of spring. Drier-than-usual conditions during the period under review have also been recorded in Romania, northern Ukraine, the central Balkan region and the central part of European Russia.

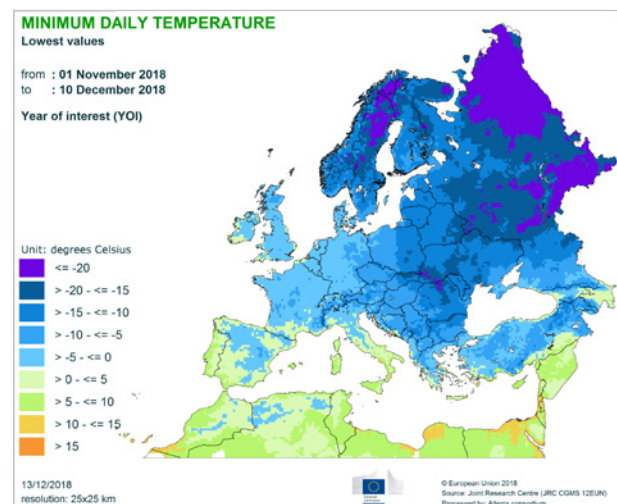
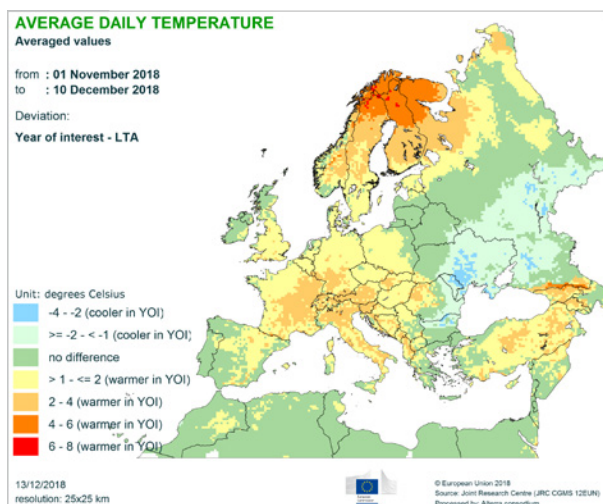
Wetter-than-usual conditions appeared in the western Mediterranean region, Portugal, northern France, the British Isles and southern Scandinavia and also regionally in Turkey.

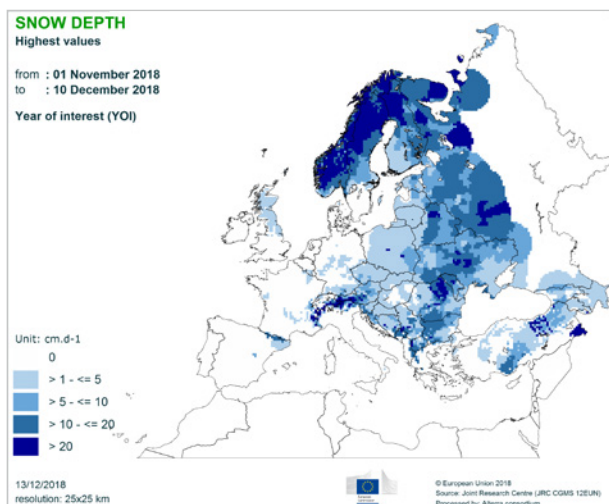
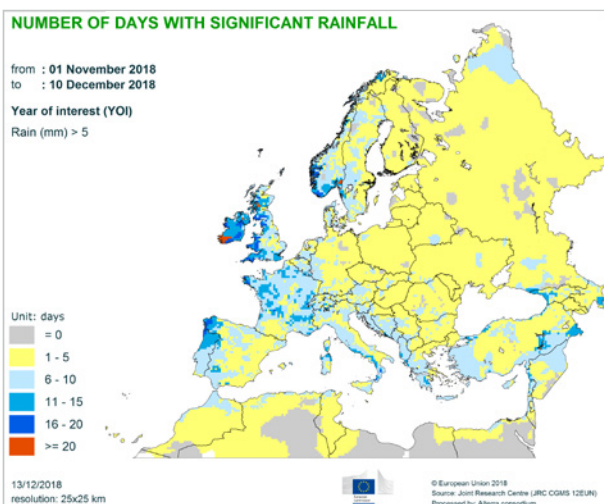
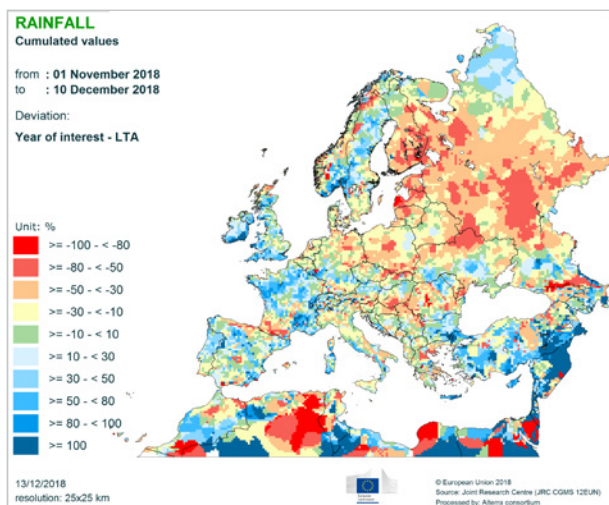
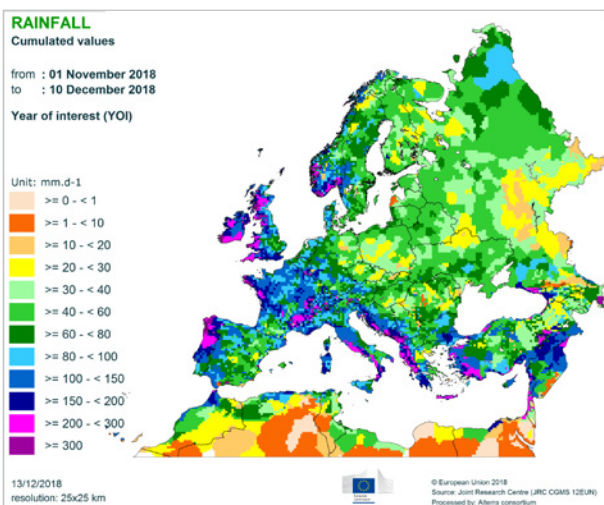
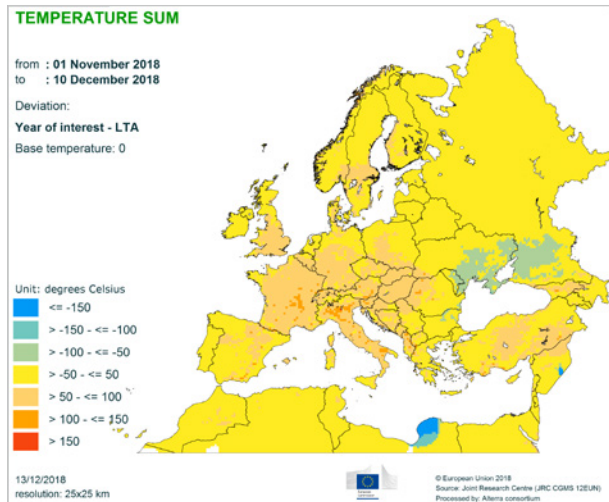
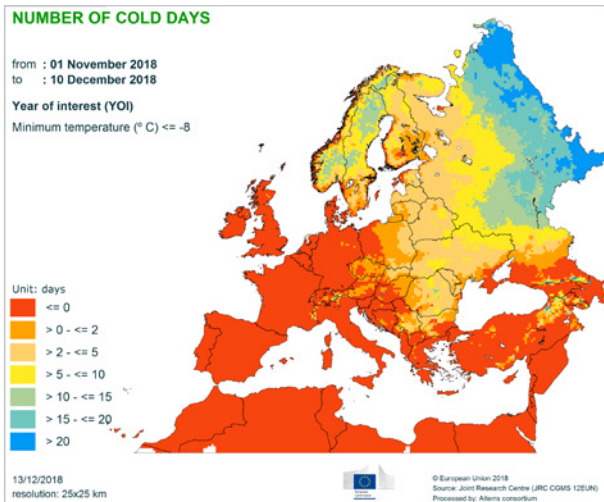
AREAS OF CONCERN - EXTREME WEATHER EVENTS



Abundant rainfall with cumulates greater than 200 mm was recorded on the Adriatic coast of the Balkan Peninsula, on the south-western coast of the Apennine Peninsula, regionally in southern and western (coastal) France, and in the north-western part of the Iberian Peninsula, Ireland, the western coastal part of the UK and southern Norway.

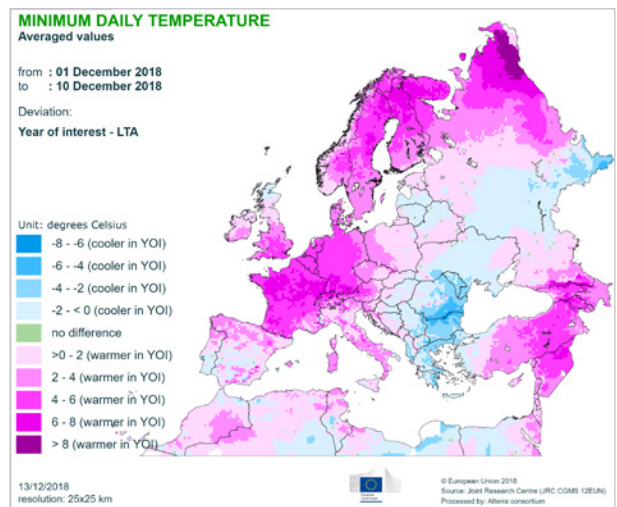
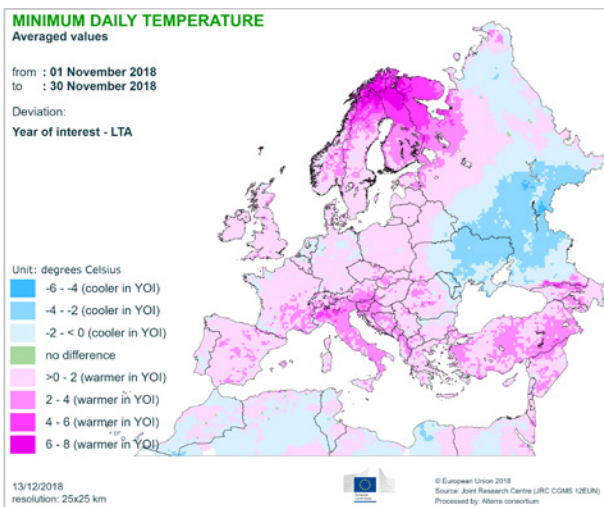
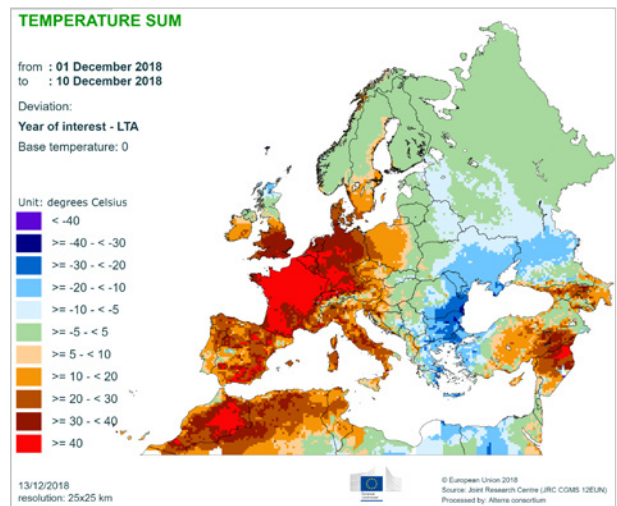
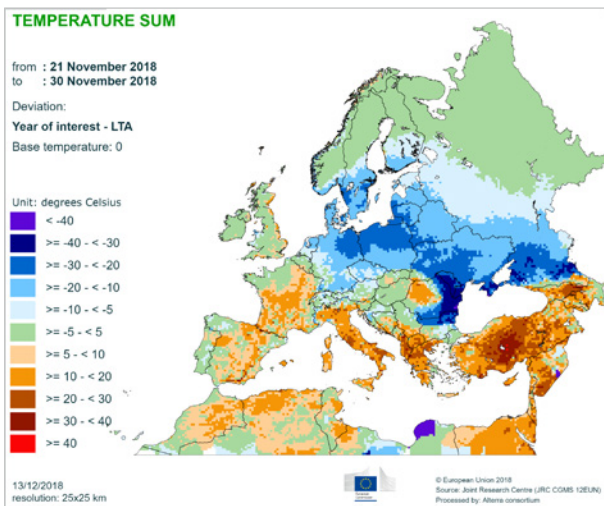
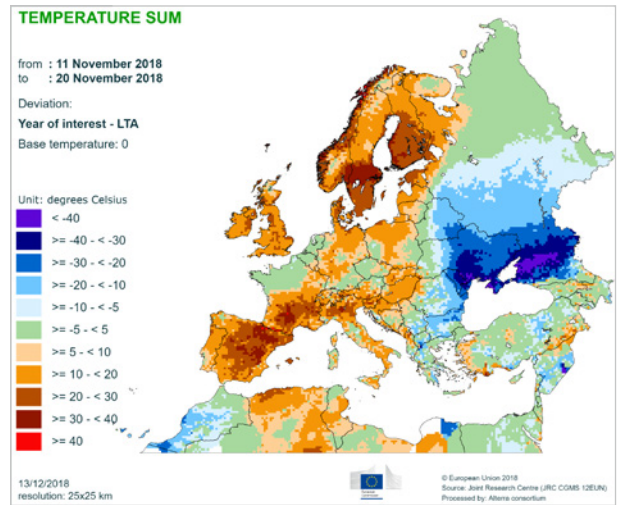
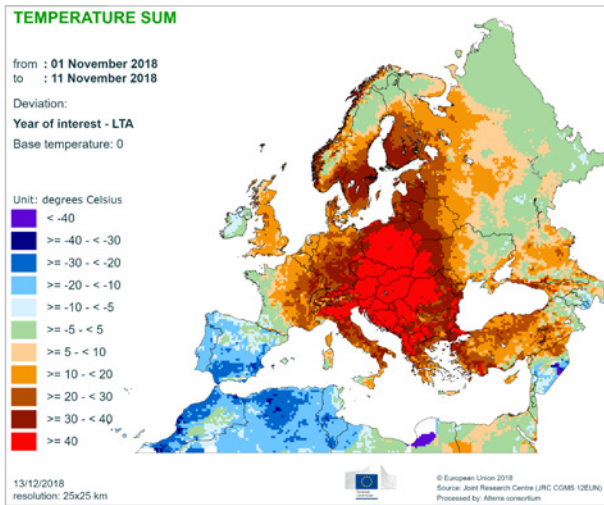
Whereas the first half of November was largely snow free in Europe, a **snow layer** appeared in the second half of the month and deepened during the first dekad of December in large parts of eastern and northern Europe, and in the Alpine region.

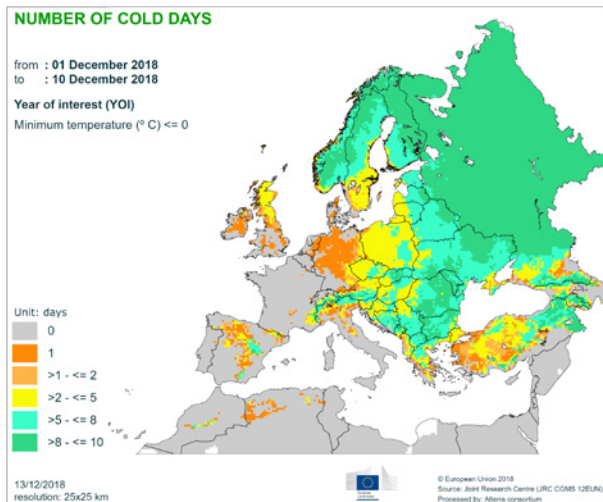
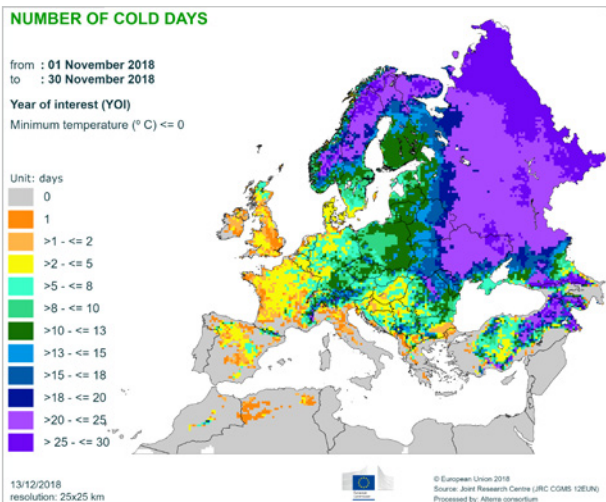




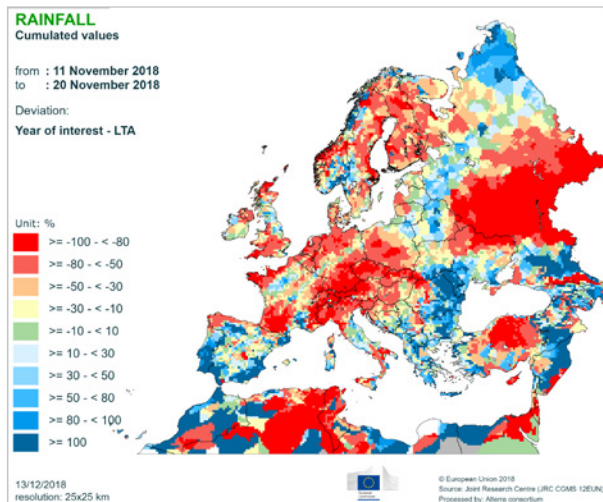
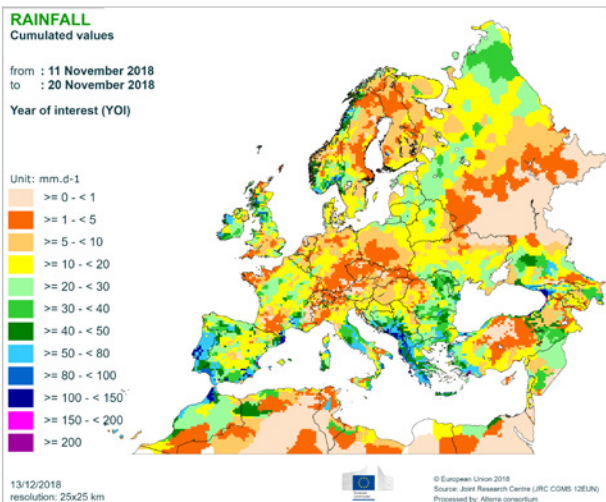
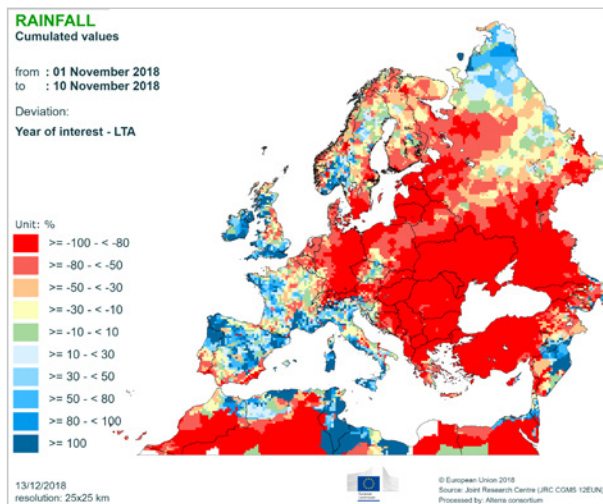
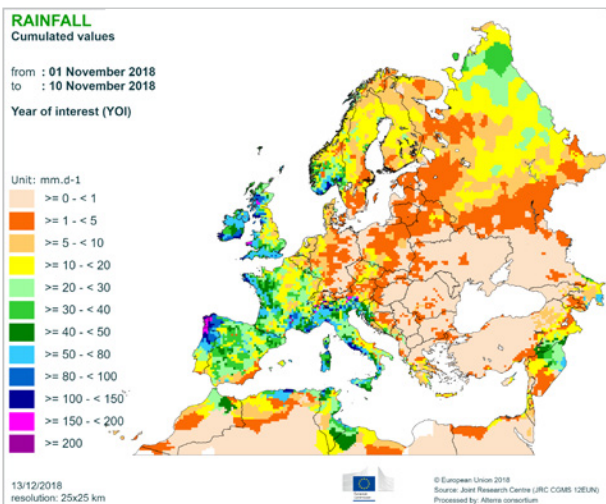
2. Atlas maps

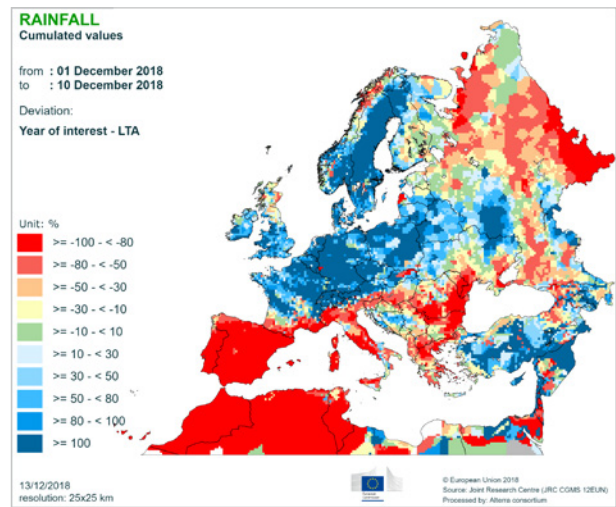
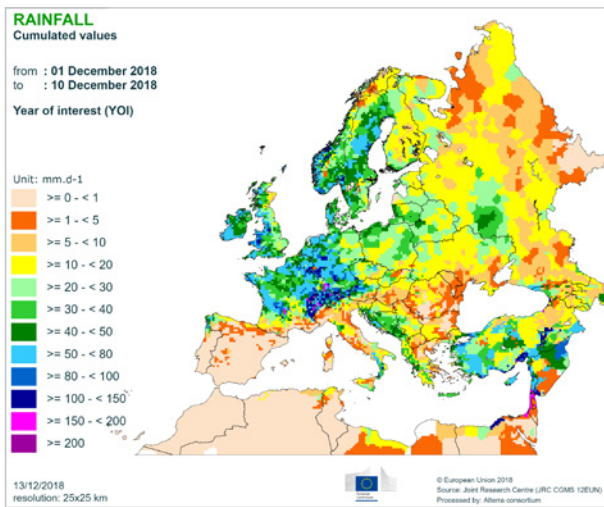
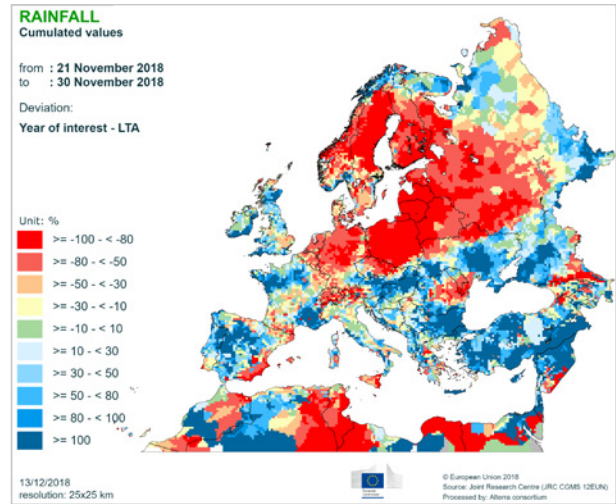
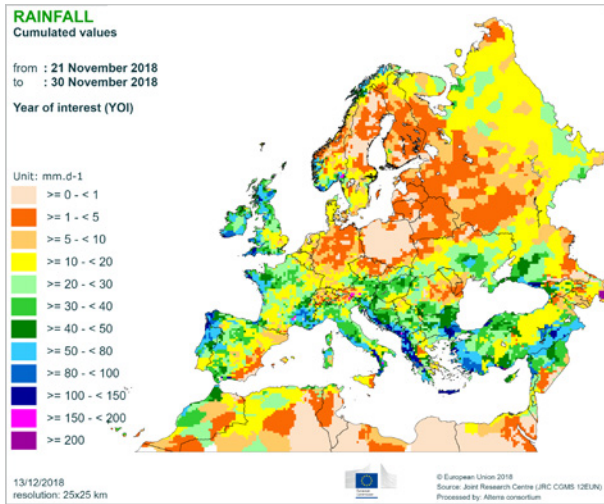
Temperature regime



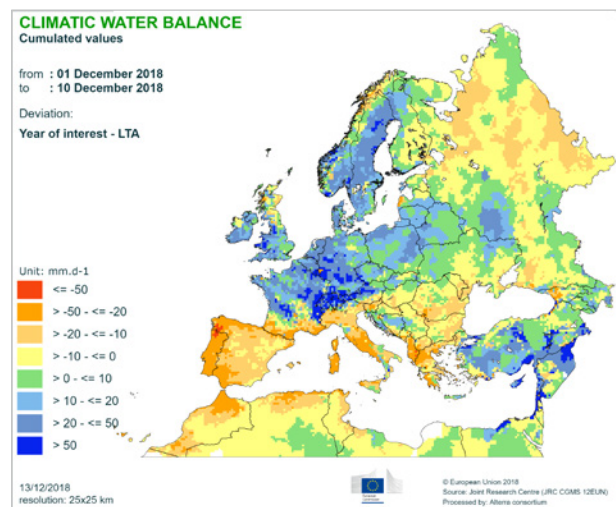
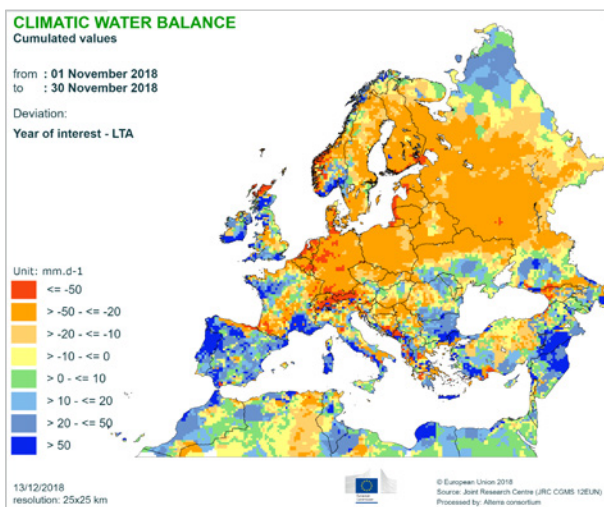


Precipitation





Climatic water balance



JRC MARS Bulletins 2018

Date	Publication	Reference
22 Jan	Agromet analysis	Vol. 26 No 1
19 Feb	Agromet analysis, durum wheat update and yield forecast	Vol. 26 No 2
19 Mar	Agromet analysis, yield forecast, pasture analysis	Vol. 26 No 3
16 Apr	Agromet analysis, remote sensing, yield forecast, sowing conditions, pasture analysis	Vol. 26 No 4
22 May	Agromet analysis, remote sensing, yield forecast, sowing update, pasture analysis	Vol. 26 No 5
18 Jun	Agromet analysis, remote sensing, yield forecast, pasture update, rice analysis	Vol. 26 No 6
23 Jul	Agromet analysis, remote sensing, yield forecast, harvesting conditions, pasture update	Vol. 26 No 7
27 Aug	Agromet analysis, remote sensing, yield forecast, pasture update, harvesting update	Vol. 26 No 8
17 Sep	Agromet analysis, remote sensing, yield forecast, harvesting update	Vol. 26 No 9
22 Oct	Agromet analysis, remote sensing, yield forecast, rice analysis, harvesting update, sowing conditions	Vol. 26 No 10
26 Nov	Agromet analysis and yield forecast, harvesting update, sowing updates	Vol. 26 No 11
17 Dec	Agromet analysis	Vol. 26 No 12

The current **JRC MARS Bulletin — Crop monitoring in Europe** is a JRC–European Commission publication from MARS4CAST (JRC Unit D5 — Directorate for Sustainable Resources)

JRC MARS Bulletins are available at:
<https://ec.europa.eu/jrc/en/mars/Bulletins>
<http://agri4cast.jrc.ec.europa.eu/>

Analysis and reports

A. Bussay, A. Ceglar, I. Cerrani, D. Fumagalli, S. Garcia Condado, L. Panarello, L. Seguini, A. Toreti, M. van den Berg, A. Zucchini

Reporting support

Prepress projects, I. Biavetti

Editors

M. van den Berg, M. van der Velde

Data production

MARS4CAST (JRC Unit D5), Wagenigen Environmental Research (NL), MeteoGroup (NL), VITO (BE) and CMCC (IT)

Contact

JRC D5/MARS4CAST
JRCMARSBULLETIN@ec.europa.eu

*MARS stands for Monitoring Agricultural Resources

Legal notice:

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of this publication.

Disclaimer:

The geographic borders are purely a graphical representation and are only intended to be indicative. The boundaries do not necessarily reflect the official Commission position.

Technical note:

The long-term average (LTA) used within this bulletin as a reference is based on an archive of data covering 1975–2017.

Mission statement: As the science and knowledge service of the European Commission, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle.