



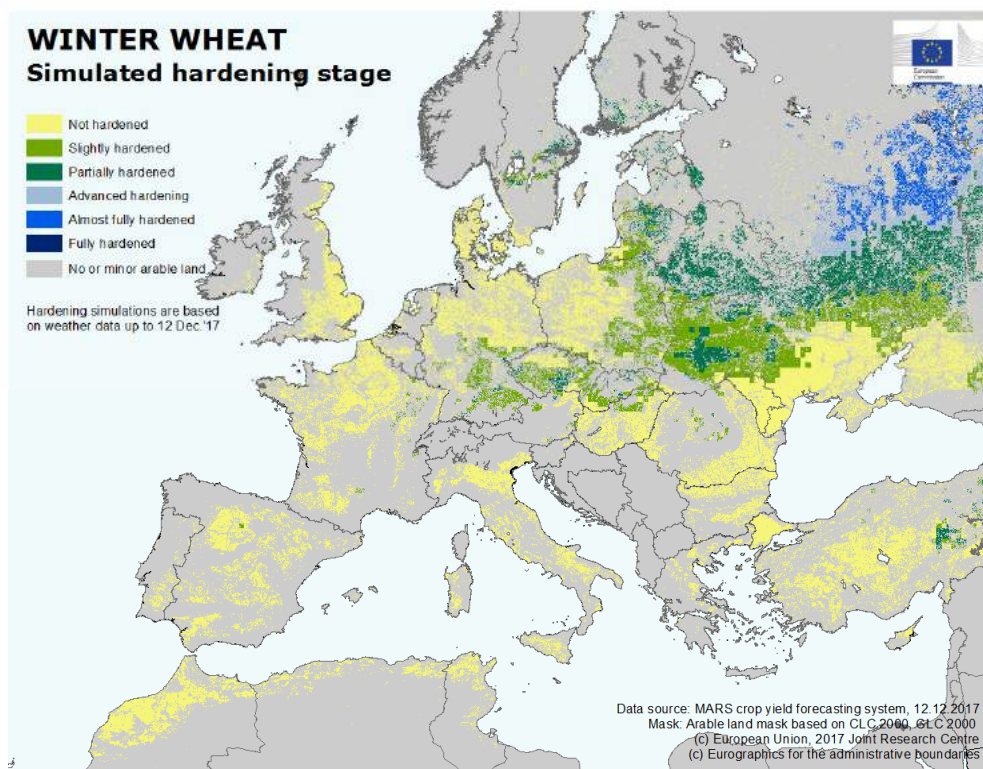
JRC MARS Bulletin

Crop monitoring in Europe

December 2017

Hardening of winter cereals is delayed

Hardly any frost kill so far, due to the absence of damaging low temperatures



Hardening is the bio-physiological process whereby winter cereals become tolerant of low temperatures, which allows them to withstand the freezing conditions that occur during their winter dormancy period. Our model simulations indicate no or weak frost tolerance in most of the EU, except for some parts of Finland, Sweden and the

Baltic States, as well as in a few spots in southern Germany, the Czech Republic, Slovakia and eastern Poland, where the winter crops are in a partial or advanced hardening state. In a wide area around the North, Baltic and Black Seas hardening is delayed, as the process began only in late November. In addition, in several regions de-hardening also occurred because of the warmer-than-usual weather conditions. The situation improved in the first half December, but the hardening of winter cereals is still considerably delayed.

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Agro-meteorological overview
Atlas

Covers the period from 1 November until 12 December

The current situation is delicate, as a cold air intrusion could cause considerable frost-kill damage in the areas that do not have an adequate depth of snow cover and have winter crops with low frost tolerance.

In Belarus, northern and western Ukraine, winter wheat is only partially hardened. Further eastwards, such as in the northern parts of the *Central Okrug* and most of the *Near Volga Okrug* in Russia winter cereals have reached advanced hardening or have almost achieved maximal frost tolerance. At the same time, winter wheat is still only

partially or slightly hardened in western and central Turkey and southern regions of Russia, as well as in central and southern Ukraine.

Due to the absence of damaging low temperatures, frost kill has been very limited so far. Local frost-kill events have been simulated in some spots in southern Russia. Taking into consideration the latest weather forecast, an increase in hardening is probable in central, northern and eastern regions of Europe. No frost kill is expected over the coming days.

Agro-meteorological overview

Meteorological review (1 November – 12 December)

Above seasonal temperatures characterised the eastern half of Europe from 1 November until 12 December. The second dekad of November and the first dekad of December were particularly mild, presenting thermal anomalies of 2-7°C above the long-term average in the territories east of the Finland-Bulgaria meridian. In the first and last dekad of November, prevailing temperatures in Morocco were 1-5°C warmer than usual.

Unusually cold weather conditions prevailed during the second dekad of November in the eastern Maghreb region (Algeria, Tunisia and Libya), resulting in temperatures 1-4°C lower than usual. In the first dekad of December, air temperatures of 1-4°C below average were recorded in France, Italy, the Alpine region and the Iberian Peninsula, as well as along the south-western coastline of the Mediterranean Sea.

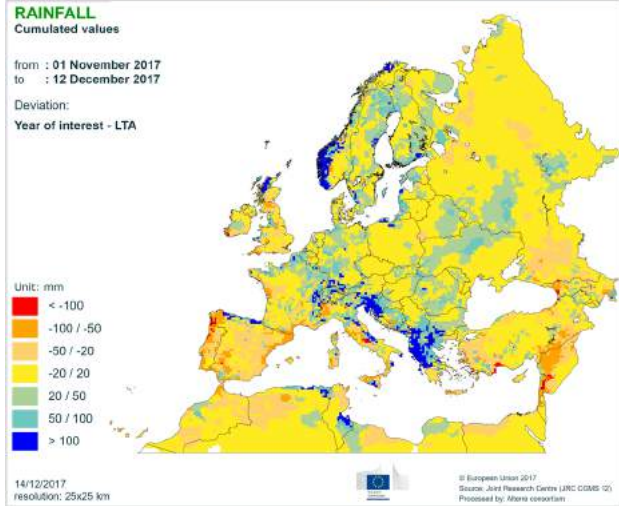
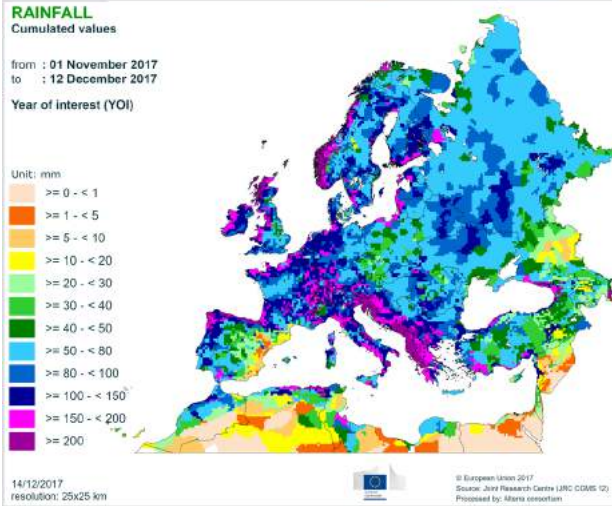
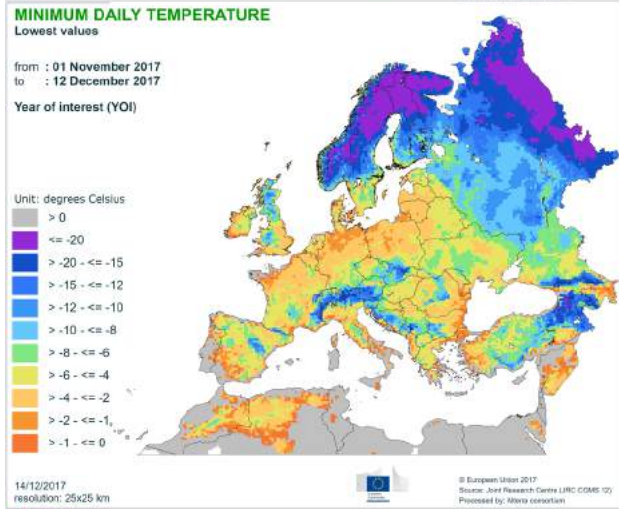
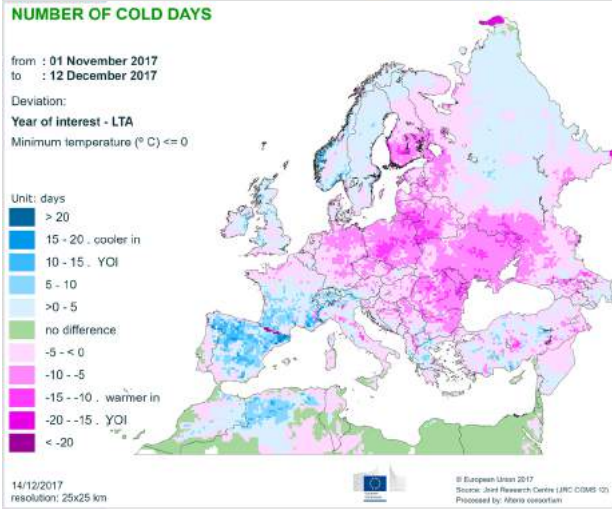
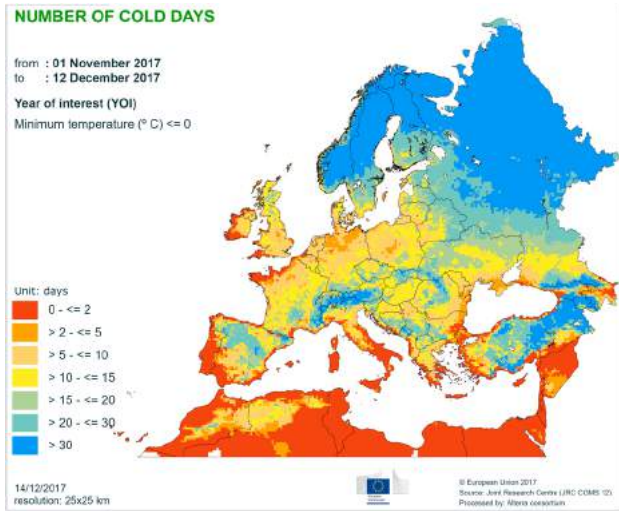
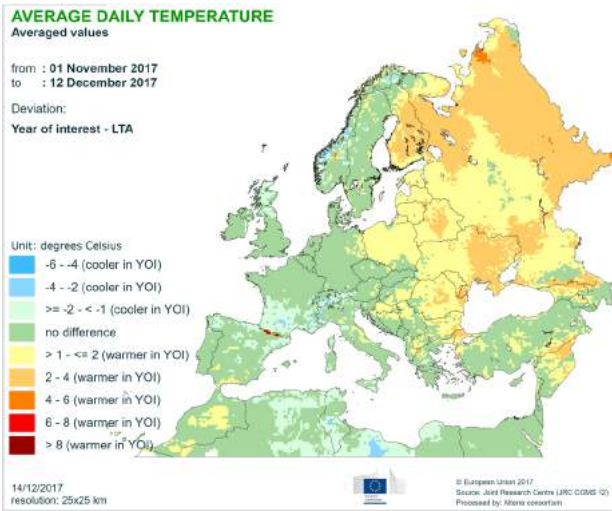
Frost events ($T_{\min} < 0^{\circ}\text{C}$) were infrequent, and there were only 4-14 days in the central areas of the continent between Germany and western Russia. At the same time, considerably increased incidence of frost was observed in southern France and Spain.

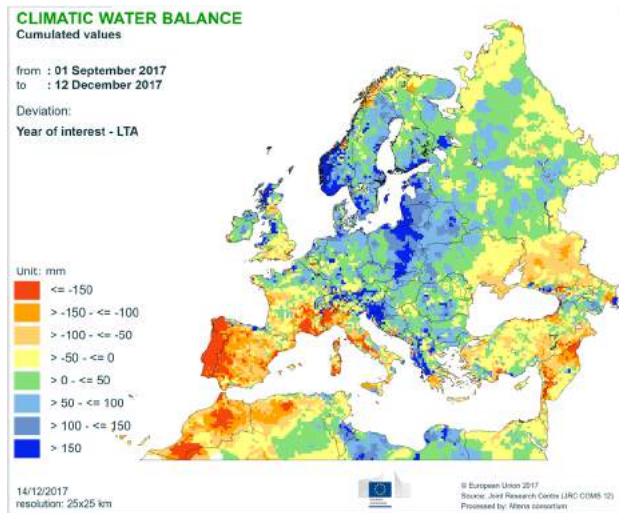
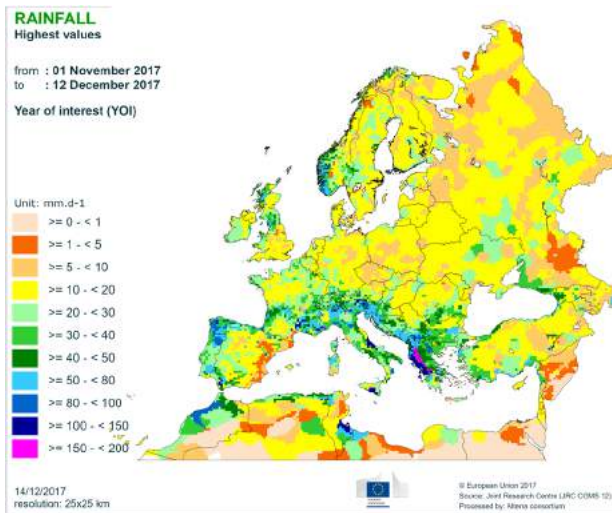
Wetter-than-usual weather conditions were

experienced in northern and eastern France, the majority of Germany, the Alpine region, western Scotland and most of Scandinavia, as well as in Slovakia, Romania, the southern and north-western parts of the Balkan Peninsula, and central and western Ukraine, much as in the *Central Okrug* of Russia.

Intensive precipitation events with cumulative daily rainfall exceeding 100 mm were observed locally in northern and central Italy, Sicily, south-eastern France, the south-western coastline of the Balkan Peninsula, southern Tunisia and some spots in the Alpine region and the Iberian Peninsula. Torrential rainfall events may have caused local flooding and waterlogging.

Drier-than-usual conditions occurred in southern and western France, some regions of Ireland, England, the majority of the Iberian Peninsula, the western side of Italy, southern Russia, western Turkey, Morocco and western Algeria and also in the eastern Mediterranean region. The cumulative climatic water balance since 1 September (beginning of autumn) indicates a significant (> 100 mm) water deficit in southern France, Spain, Portugal, north-western Italy and the western Maghreb, as well as in some regions of Turkey and southern Russia.





Weather forecast (14–22 December)

A widespread low-pressure system is expanding from the North Sea towards central Europe. The weather front is currently moving across central Europe and will progress eastwards in the following days. This synoptic situation will bring unstable weather with frequent rainfall especially north of the Alps, along the eastern Adriatic coast, in Greece and in large areas in eastern Europe. During the second half of the forecast period (after 18 December) the development of a wide ridge over south-western Europe is anticipated, extending to eastern parts of Europe. This situation will favour the inflow of warmer air masses towards eastern and northern Europe.

Warmer-than-usual weather conditions will be mainly observed in northern and eastern Europe and Turkey. Northern Europe will mainly experience temperature anomalies between 1 and 4°C above the long-term average, whereas the anomalies in eastern Europe and Turkey are forecast to reach up to 8°C above the long-term-average.

Slightly colder-than-usual weather conditions are expected in the Alps, Italy and the Maghreb. Daily mean temperatures will be between 2 and 4°C below the long-term average

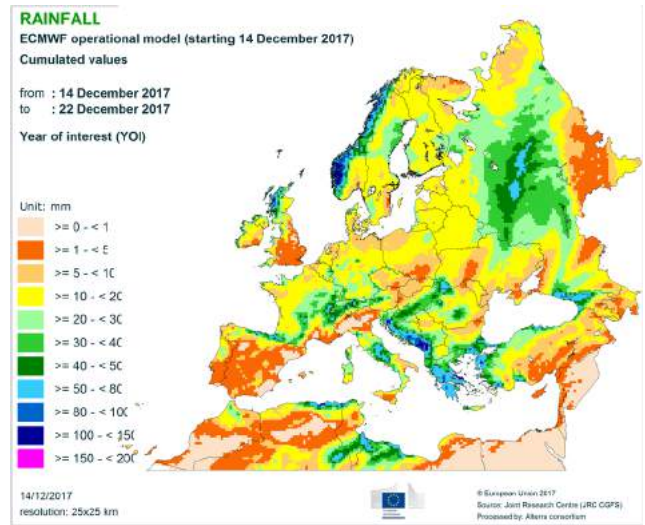
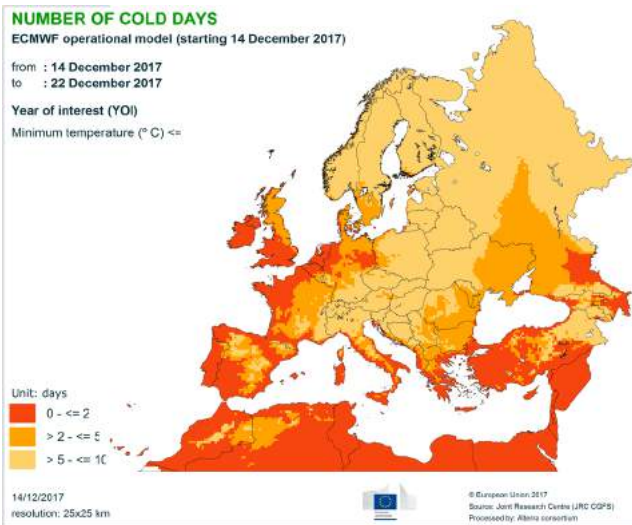
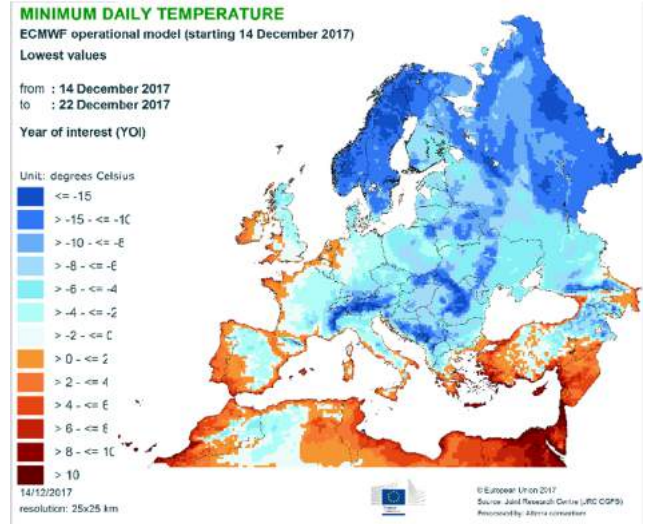
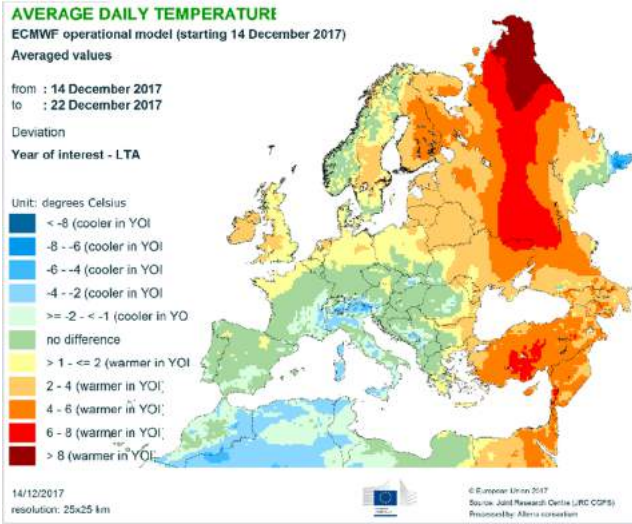
Daily minimum temperatures in major parts of western, central and eastern Europe (with the exception of the northern part of European Russia) are forecast to remain above –6°C. Regionally, and in mountainous areas, the temperature will drop below this level. Northern Europe will experience minimum temperatures below –10°C. Mediterranean areas are

forecast to remain frost free.

Dry conditions are expected in a large area of the Iberian Peninsula (except the northern part), northern Italy, the south-eastern UK and large areas of the Maghreb.

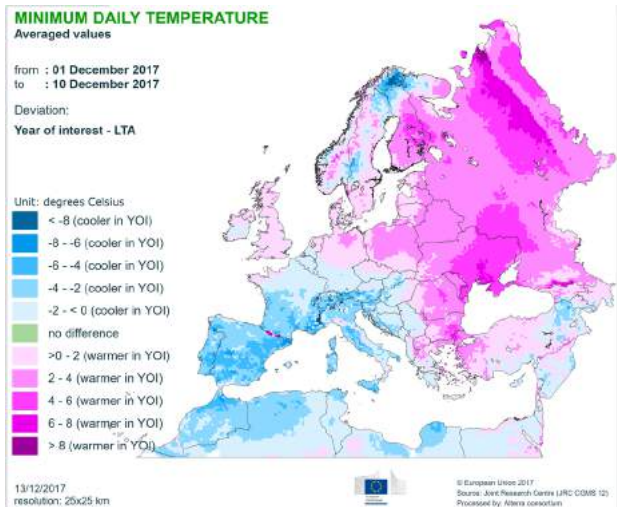
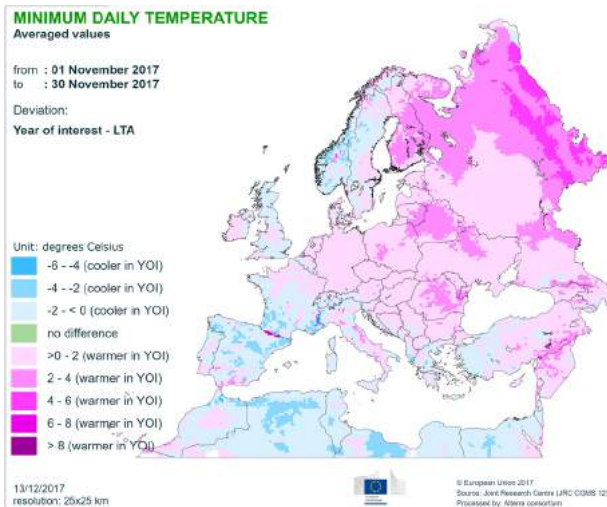
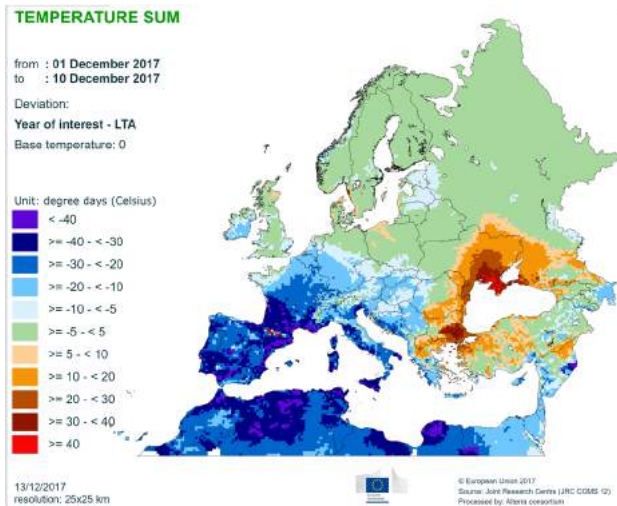
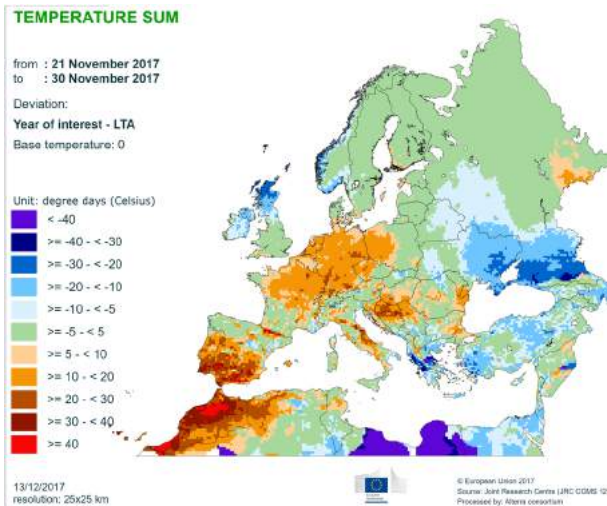
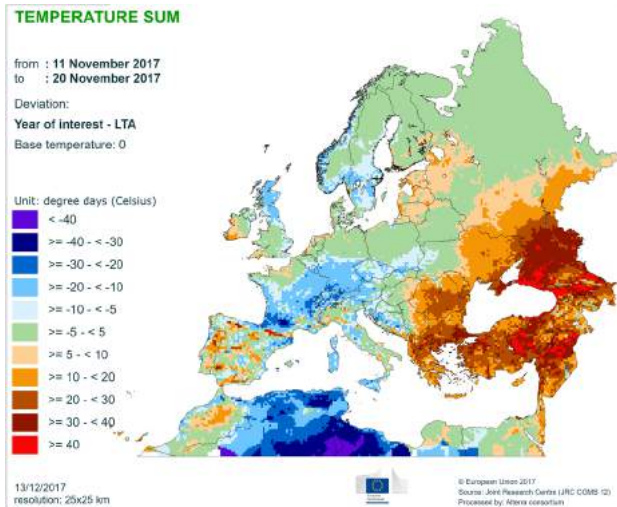
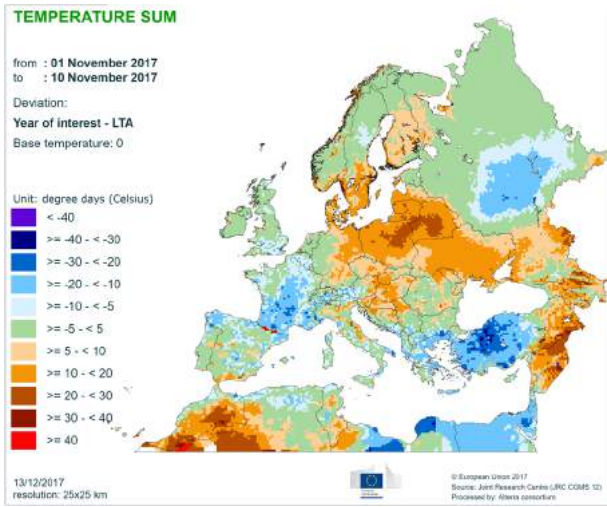
Precipitation above 30 mm is forecast in the region north of the Alps, central Italy, the eastern Adriatic coast, Greece, the northern Balkans, the central part of European Russia and western Scandinavia. Cumulative precipitation values may locally exceed 100 mm along the eastern Adriatic coast and in south-western Norway.

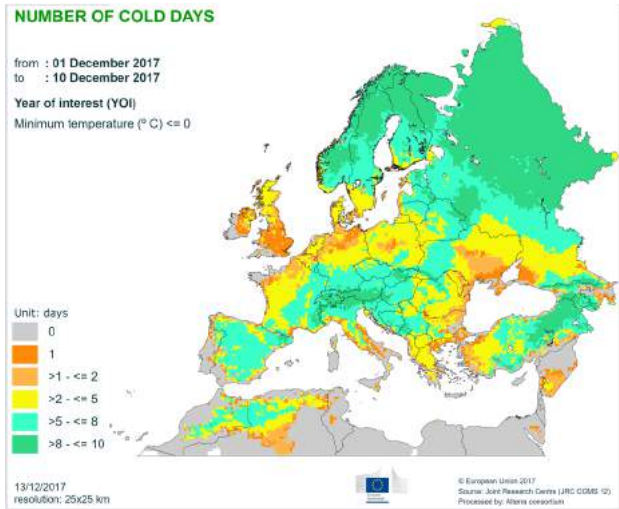
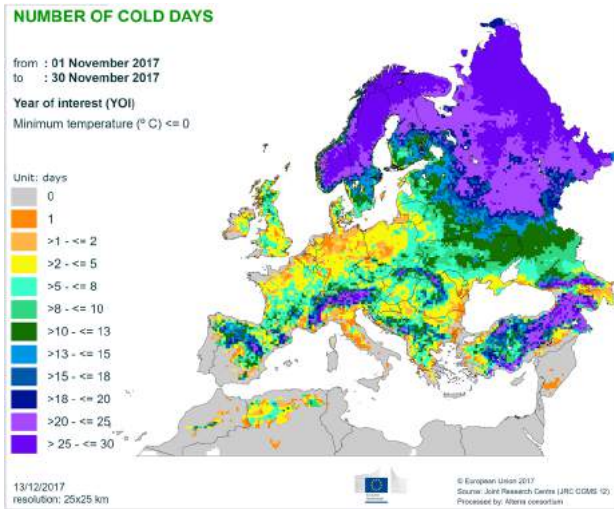
The long-range weather forecast for the next three months (January-February-March) points to probably warmer-than-usual conditions in the entire region of central and eastern Europe. Wetter-than-usual conditions are also likely in southern Scandinavia.



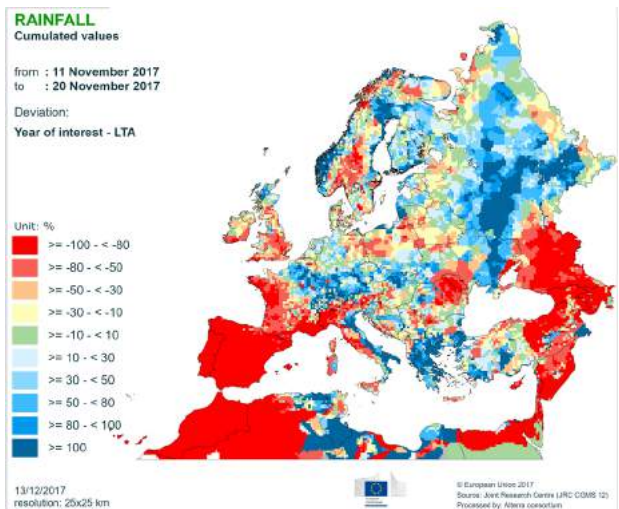
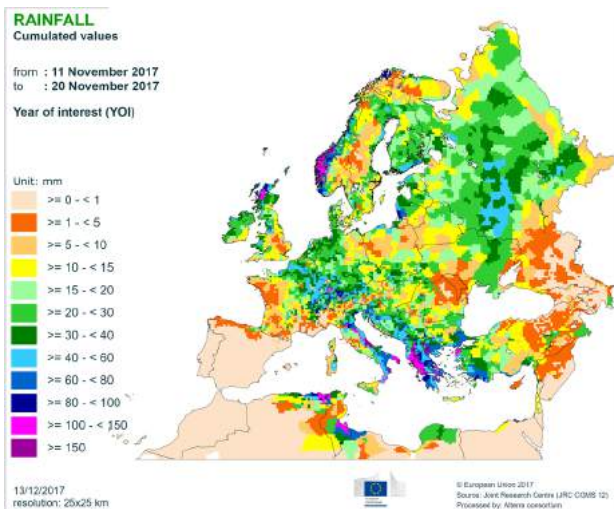
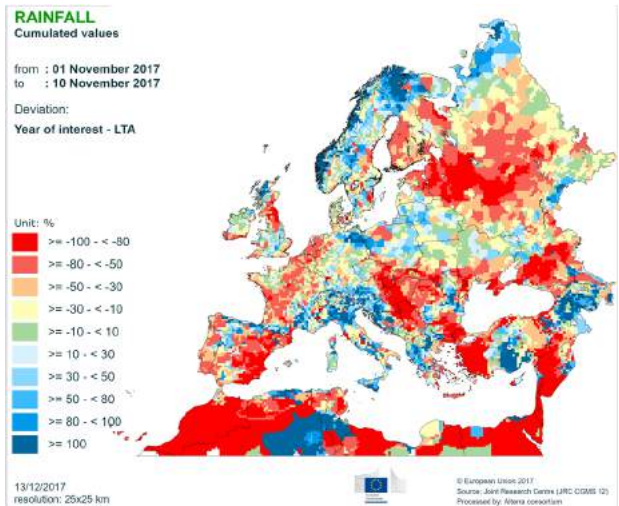
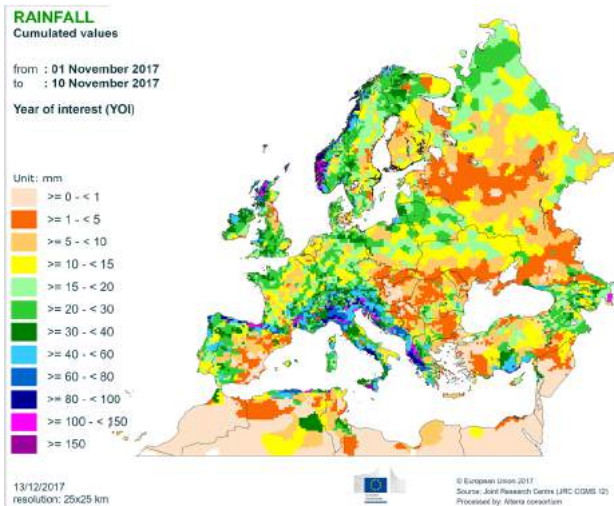
Atlas

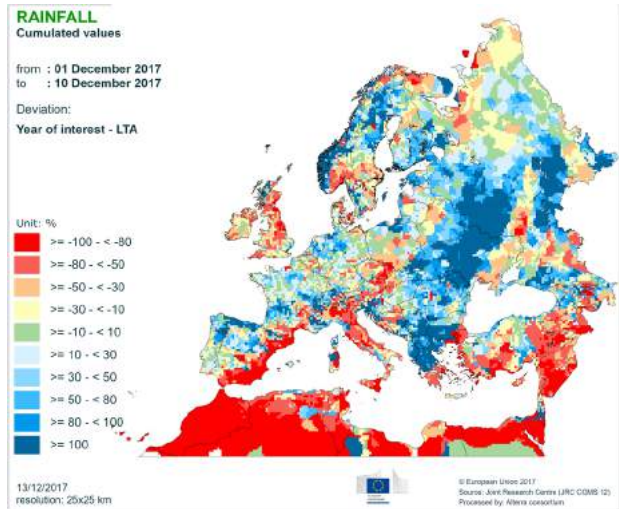
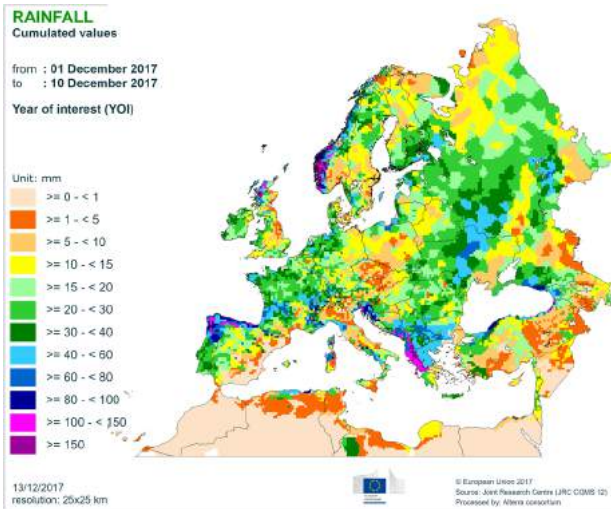
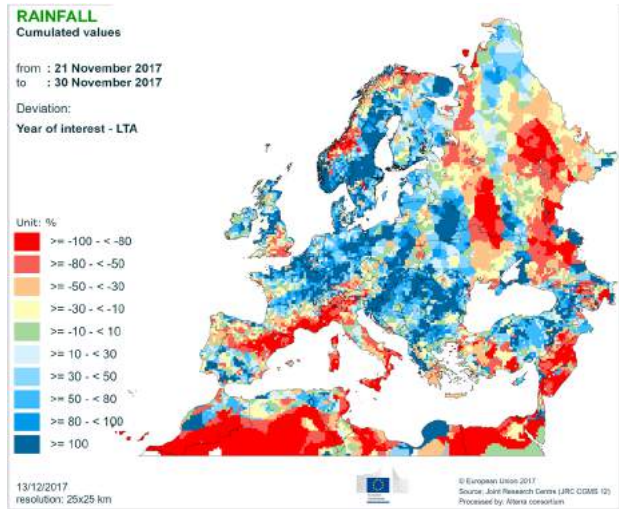
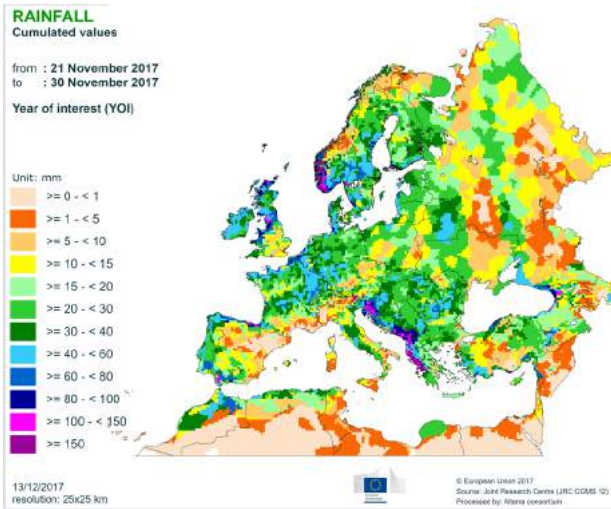
Temperature regime



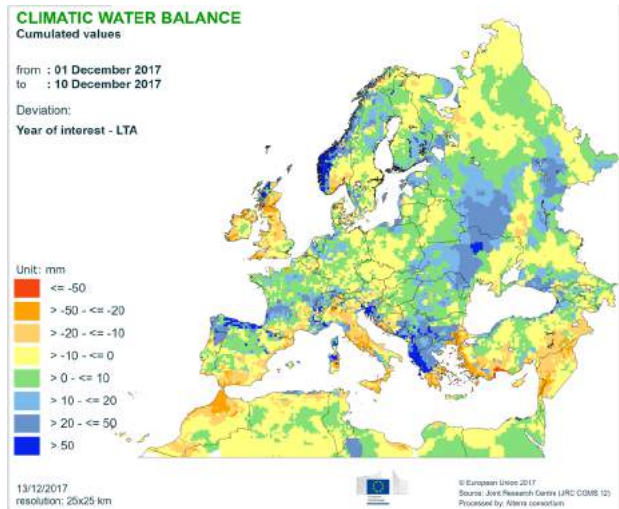
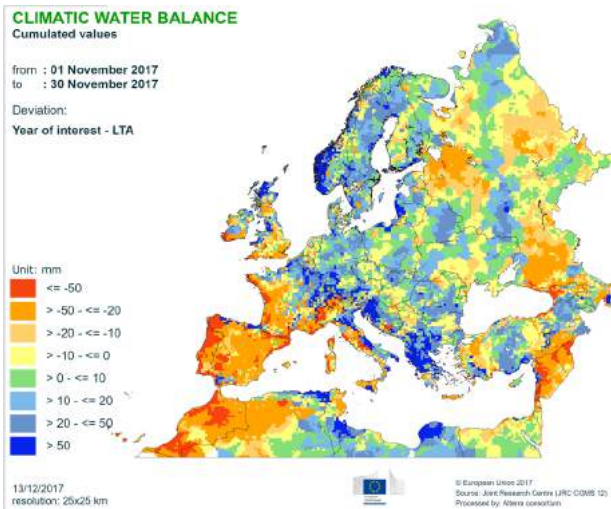


Precipitation





Climatic water balance



JRC MARS Bulletins 2017

Date	Publication	Reference
23 Jan	Agromet. analysis	Vol. 25 No. 1
20 Feb	Agromet analysis	Vol. 25 No. 2
27 Mar	Agromet analysis, yield forecast	Vol. 25 No. 3
24 Apr	Agromet analysis, remote sensing, yield forecast, sowing conditions	Vol. 25 No. 4
22 May	Agromet analysis, remote sensing, yield forecast, pasture analysis,	Vol. 25 No. 5
26 Jun	Agromet analysis, remote sensing, yield forecast, pasture update, rice analysis	Vol. 25 No. 6
24 Jul	Agromet analysis, remote sensing, yield forecast, pasture update	Vol. 25 No. 7
21 Aug	Agromet analysis, remote sensing, yield forecast, pasture update	Vol. 25 No. 8
18 Sep	Agromet analysis, remote sensing, rice analysis, yield forecast	Vol. 25 No. 9
23 Oct	Agromet analysis, remote sensing, sowing conditions, yield forecast	Vol. 25 No. 10
27 Nov	Agromet analysis, sowing conditions, sugar beet review, yield forecast	Vol. 25 No. 11
18 Dec	Agromet analysis	Vol. 25 No. 12

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MARS stands for Monitoring Agricultural Resources

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Technical note:

The long-term average (LTA) used within this Bulletin as a reference is based on an archive of data covering 1975-2016.