

Harsh winter conditions in north-eastern Europe, possible frost kill for Central Europe.

OBSERVED TEMPERATURE AND RAINFALL

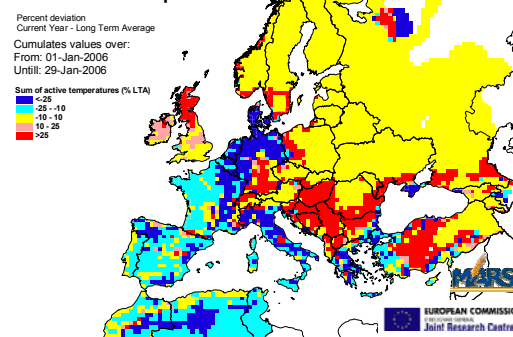
The sum of active temperature (above 0°C) was in the normal range for the north-eastern part of the continent, but for the same area a very low temperature (>-25°C) wave hit after a relatively "warmer" period (maximum temperatures of 5 up to 10°C).

IE, UK southern DE, HU, northern Balkans, central TR experimented a higher than usual accumulation of the thermal resources, meanwhile for the rest of the western Europe and Mediterranean basin the sum of positive temperatures was lower.

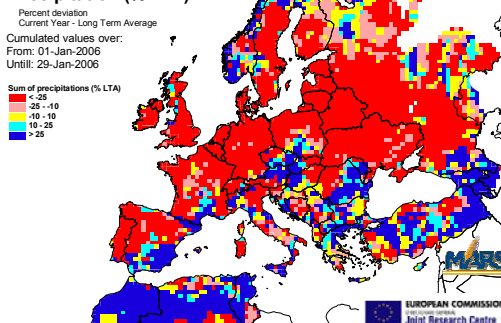
The considered period was clearly drier (-25%) than normal for most of the Europe, except some areas around Mediterranean basin (southern ES, Maghreb, southern FR, northern IT and Sicily), south-eastern RO, Balkans and Turkey) and limited areas from central Europe which experimented higher cumulated precipitation.

Snow cover was generally present in the areas subjected to very low temperatures in this period, but very often it was not enough to eliminate the impact of frost. In most of the areas with higher sums of positive temperatures (except UK and IE) waves of low temperatures (-25 – -15°C) occurred and the local impact was depending of the depth of the snow layer, the physiological status of the crop and the frost resistance *per se* of the used cultivars (not considered in this analysis). The *hardening index* was in the most cases to medium to good level and at the end of the period of analysis it was increasing (as presented in the map from the next page).

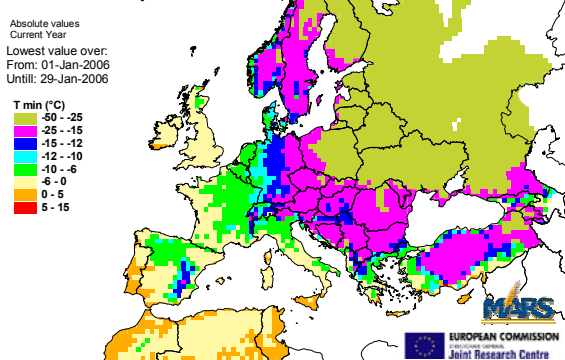
Sum of active temperatures



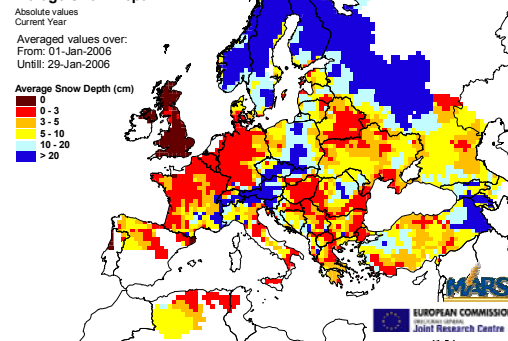
Precipitation (% LTA)



Minimum temperature



Average Snow Depth

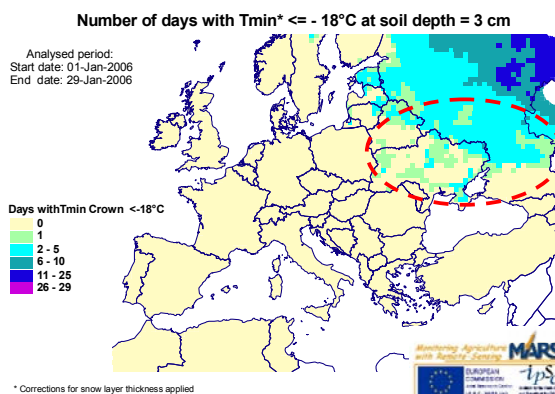
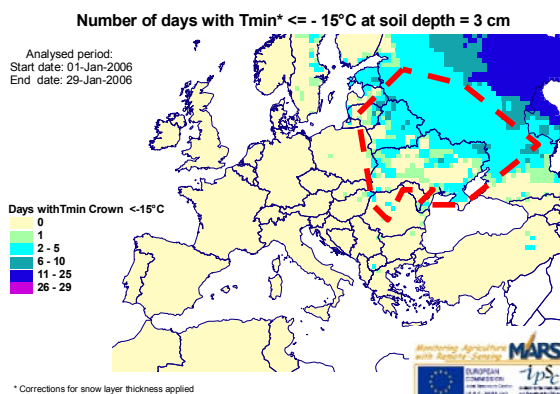
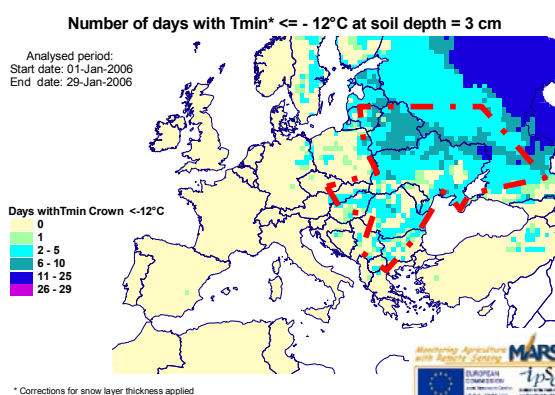
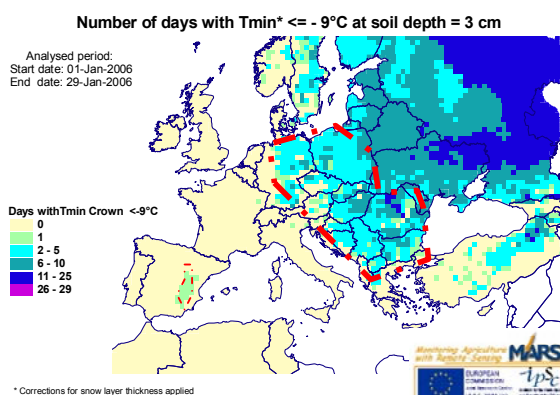
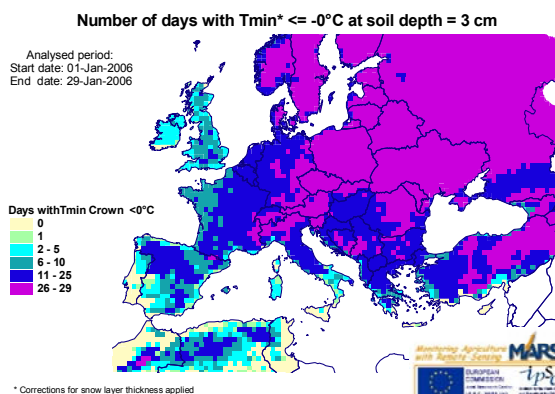
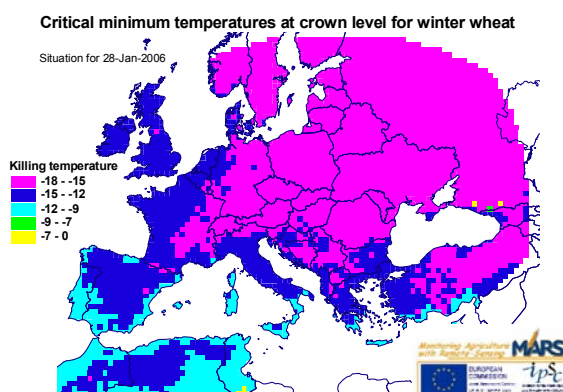


The effect of is analysed through a formula (Aase and Siddoway, 1979) which allows to evaluate the value of negative temperatures at the "crown" level (-3 cm below the soil level) as a function of the snow depth. The damages at crown level (in contrast with the foliar damages) are not reversible and very often are followed by plant death. With the *hardening index* is possible to estimate the critical temperatures at crown level for a specific day.

The maps presented are indicating that freezing conditions ($\geq 0^{\circ}\text{C}$) of soil at 3 cm occurred in many days of the considered period for most of the European area.

The distribution of number of days with the temperature of soil below -9°C is indicating a **frost risk** for crops like winter barley or even frost sensitive winter wheat cultivars in Central Europe. At the end of the considered period (29 January) a frost spell (about -14°C minimum air temperature) was reported for limited areas of south-eastern ES. Winter wheat was probably affected ($\geq -12^{\circ}\text{C}$ at 3 cm) in HU, RO and northern BG.

Severe frost problems were indicated for Ukraine (above the usual 10% from the sowing surface) and Russia. The duration of the severe frost ($\geq -18^{\circ}\text{C}$ at crown level) for Russia was about 2 and 5 days.



NEXT DAYS' SITUATION

(ECMWF 10-day weather forecasts – Jan. 30 – Feb. 9)

Temporary increase of temperatures followed by a new reduction. Mainly dry condition in EU (except Italy and Greece). Good water supply in Med countries. Intense rain in Sicily and Sardinia.

From today for a couple of days, a general but temporary increase of the temperatures is foreseen. The increase should be more consistent and probable in northern Europe (DK, BE, NL, LU, south SE, north and central DE, west PL). However, from the 2nd of February, a new Siberian cold air flux will blow towards the European continent, influencing all the east and central part. The **minimum temperatures** will drop again several degrees below 0°C in Russia, Ukraine. In Belorussia they likely will be even below -20°C. In south-east DE, HU, CK and SK the minimum values could be around -10/-15°C.

Due to the synoptic circulation, **intense showers** are possible today in Sicily and Sardinia. In the next days, **rainfall** will be scarce on the majority of the continent (except in Baltic's) until the 5th-6th of February. In the following days, consistent rains are forecasted in the Mediterranean countries and France. In particular on the 8th and 9th the rain will be concentrated in south France, Italy, Balkans, Greece and Turkey. Over there, the consequent increase of the soil water reservoirs will be a concrete advantage for the winter active crops.

