European Commission

JRC MARS Bulletin global outlook 2017

Crop monitoring European neighbourhood

Russia

September 2017

Very positive grain yield outlook

In spite of a difficult start to the harvesting campaign, the yield expectations of winter wheat are very high, especially in the Central and Volga Okrugs. The yield forecasts for spring barley and spring wheat are at a record high level; however, harvest is delayed in the colder regions, with concerns over possible yield losses if winter arrives early. Grain maize yield expectations were revised downwards (but are still positive), as a result of heatwaves in southern Russia.

Wetter- and colder-than-usual weather characterised the majority of European Russia during the first half of the summer, causing delay in crop development but providing good conditions for the grain filling of winter wheat, and canopy expansion and biomass accumulation of spring cereals and maize. Precipitation then decreased and, in August, hot and dry weather dominated in southern Russia, negatively affecting the yield formation of grain maize. Beyond the Ural Mountains, yield expectations for spring cereals are positive; however, harvesting has been hampered by rains. If there is an early start to frosts and snowfall, the harvest could be suspended. The initially very high maize yield potential decreased considerably in southern Russia, because of high temperatures and limited water supply. In central and eastern European Russia, the outlook was revised upwards, thanks to continued favourable conditions.

Table of contents:

Covers the period from 1 June 2017 until 10 September 2017

Russia yield forecasts - September 2017 Bulletin

Country	Crop	Yield (t/ha) Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Russia	winter wheat	3.18	3.76	4.07	+28	+8.3
	spring wheat	1.43	1.56	1.70	+19	+9.1
	winter barley	3.92	3.96	4.61	+18	+17
	spring barley	1.96	2.09	2.43	+24	+16
	grain maize	4.87	5.55	5.40	+11	-2.8

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg

Sources: 1996-2016 data for area and yields come from Federal State Statistics Service

2017 area copied from data of year 2016 published by Federal State Statistics Service

2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/09/2017)

Joint Research Centre

1. Meteorological overview

In June and July, below-average temperatures prevailed in all the Russian Okrugs, except in the North Caucasian and Southern Okrugs, where temperatures in July were mainly higher than usual. In August, temperatures generally persisted above average in all regions. Rainfall exceeded the average in most regions, except for the North Caucasian and Southern Okrugs, some areas of the Volga Okrug and most of the Ural Okrug.

European Russia

June presented predominantly below-average temperatures, but with high temporal variability in the North Caucasian and Southern Okrugs, whereas the rest of European Russia was colder than usual during the entire month. In July, temperatures in the North Caucasian and Southern Okrugs were mainly higher than usual, whereas colder-than-usual conditions continued in the rest of European Russia. In August, above-average temperatures prevailed in all regions of European Russia. The highest daily average and daily maximum temperatures, exceeding 30°C and 37°C respectively, were recorded in the Southern Okrug, where a persistent heatwave occurred in August.

Rainfall in general exceeded the average, except in the North Caucasian and Southern Okrugs. Cumulative rainfall was highly variable in the Volga Okrug, ranging from below-average values in *Orenburgskaya* Oblast to above-average values in the northern areas of *Penzenskaya* Oblast, *Samarskaya* Oblast and *Bashkortostan*.

Rainfall events were mainly concentrated during the months of June and July, when 70% more than usual was recorded, for example in *Samarskaya* Oblast. The below-average rainfall in the south-western regions of European Russia is attributable to scarce rainfall in August. In the Southern, North Caucasian and in some southern areas of the Central and Volga Okrug, the first two dekads of August were almost totally dry (< 10 mm rainfall), thus providing a good time window for cereal harvesting.

Ural Okrug

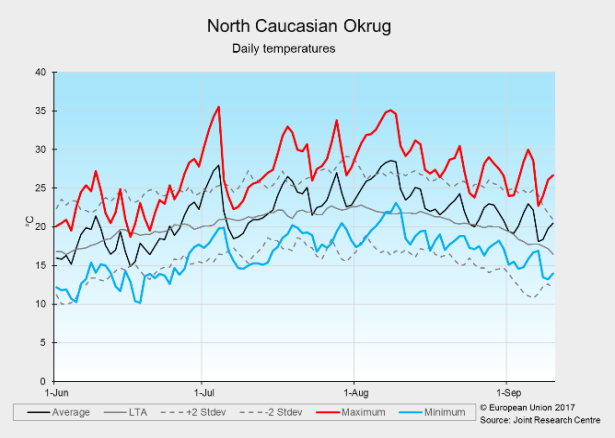
In the Ural Okrug, temperatures fluctuated markedly above and below average. Colder-than-usual weather conditions occurred for a few days during the first and last dekads of June, in the first half of July, during the first dekad of August and in mid-September. Particularly warm temperatures occurred for two weeks following 21 August, when the long-term average was exceeded by up to 8°C and maximum temperatures reached 30°C.

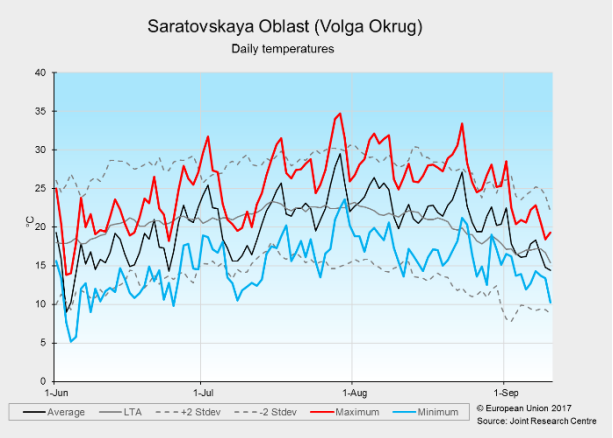
Rainfall was below average in the *Chelyabinskaya* Oblast, *Kurganskaya* Oblast and *Tyumenskaya* Oblast, whereas *Sverdlovskaya* was wetter than usual, because of the particularly heavy rainfall in the second dekad of June. In general, precipitation was concentrated in June and July.

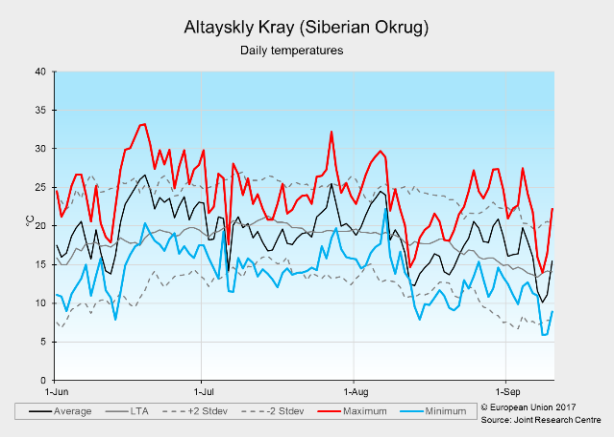
Siberian Okrug

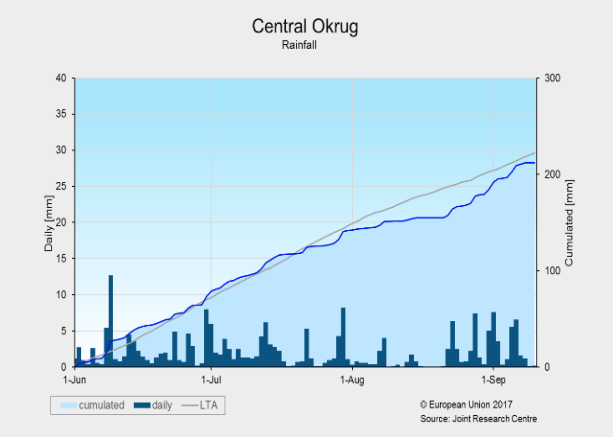
In the main agricultural areas of southern Siberia (*Krasnoyarskiy* Kray, *Tomskaya* Oblast, *Omskaya* Oblast, *Novosibirskaya* Oblast, *Kemerovskaya* Oblast, *Altayskiy* Kray), daily temperatures mostly exceeded the seasonal average, except for a few days in mid-June, mid-July, mid-August and mid-September. Temporal fluctuations were high: the lowest daily temperature reached was 6°C, in *Krasnoyarskiy* Kray in mid-September. In the most important agricultural region in Siberia (*Altayskiy* Kray), daily average temperatures ranged from 8°C in mid-September to 26°C at the end of July, whereas the maximum temperature reached 33°C at the end of June.

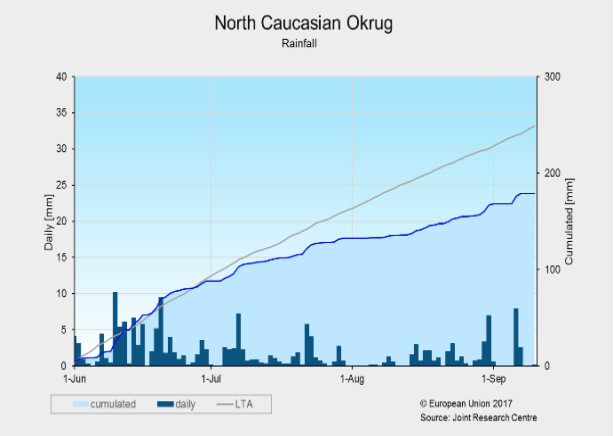
In general, precipitation was close to average, and well distributed across the review period. In the agricultural areas of southern Siberia (except *Omskaya Oblast*), rainfall became particularly frequent and abundant after mid-August, resulting in problems for the ripening of spring cereals and significant delay to the harvest. In *Altayskiy* Kray, only a few days without precipitation occurred at the end of August and the beginning of September.

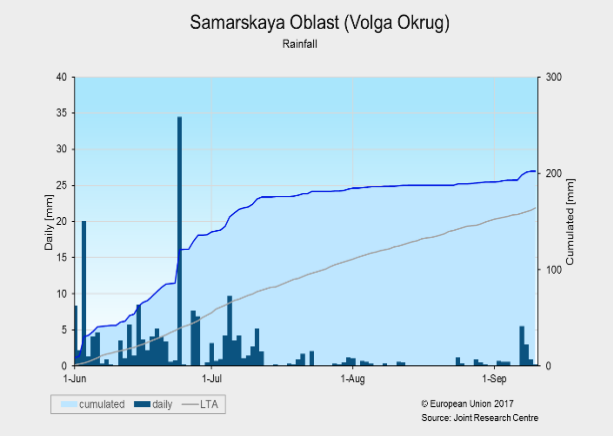

North Caucasian Okrug
Daily temperatures
°C
1-Jun
1-Jul
1-Aug
1-Sep
Average
LTA
+2 Stdev
-2 Stdev
Maximum
Minimum
© European Union 2017
Source: Joint Research Centre


Saratovskaya Oblast (Volga Okrug)
Daily temperatures
°C
1-Jun
1-Jul
1-Aug
1-Sep
Average
LTA
+2 Stdev
-2 Stdev
Maximum
Minimum
© European Union 2017
Source: Joint Research Centre


Altayskly Kray (Siberian Okrug)
Daily temperatures
°C
1-Jun
1-Jul
1-Aug
1-Sep
Average
LTA
+2 Stdev
-2 Stdev
Maximum
Minimum
© European Union 2017
Source: Joint Research Centre


Central Okrug
Rainfall
Daily [mm]
Cumulated [mm]
1-Jun
1-Jul
1-Aug
1-Sep
cumulated
daily
LTA
© European Union 2017
Source: Joint Research Centre


North Caucasian Okrug
Rainfall
Daily [mm]
Cumulated [mm]
1-Jun
1-Jul
1-Aug
1-Sep
cumulated
daily
LTA
© European Union 2017
Source: Joint Research Centre

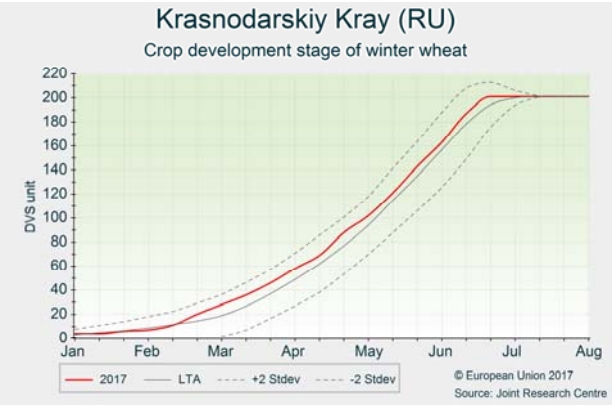

Samarskaya Oblast (Volga Okrug)
Rainfall
Daily [mm]
Cumulated [mm]
1-Jun
1-Jul
1-Aug
1-Sep
cumulated
daily
LTA
© European Union 2017
Source: Joint Research Centre

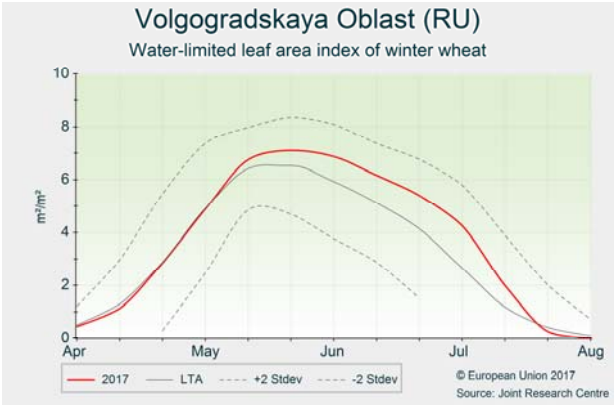
2. Crop conditions

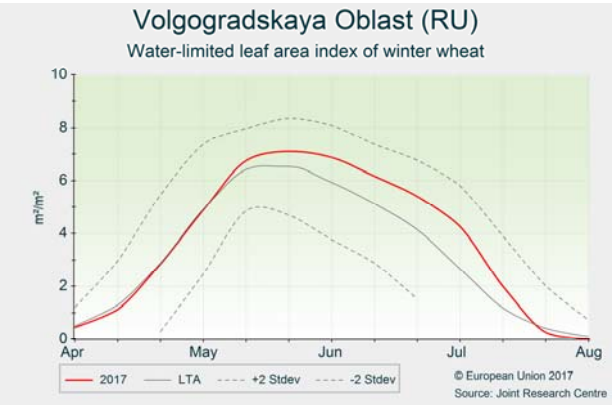
The growing season of winter wheat and spring cereals has been characterised by adequate water supply, leading to well-above-average biomass accumulation and exceptionally positive yield expectations. However, harvesting conditions of winter wheat were below optimal, primarily in the Central and Volga Okrugs, because abundant and frequent rain led to delays and loss of grain quality. The harvest of spring cereals is currently delayed in the Volga Okrug and Asian Russia, because of over-wet conditions. The water supply of grain maize was sufficient in the flowering stage, but during the grain-filling period hot weather conditions and decreased soil moisture levels lowered yield expectations in southern Russia.

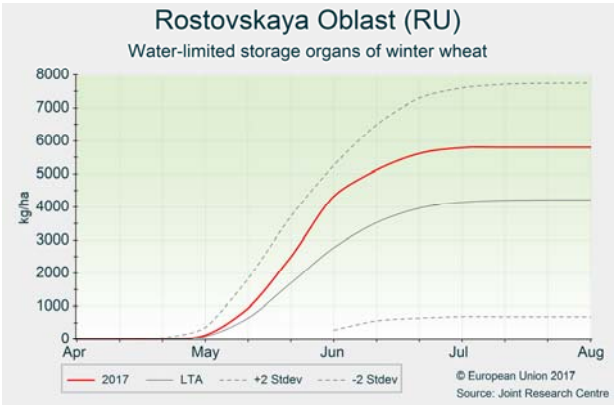
2.1 Winter crops

In the areas between the Black Sea and the Caspian Sea (e.g. *Krasnodarskiy* and *Stavropolskiy* Krays), winter wheat development in late June to early July was advanced by one to two weeks, while in the colder Volga and in the northern regions of Central Okrugs it was significantly delayed. Soil moisture levels were adequate during the flowering and grain-filling period, except in some western parts of the Central and Southern Okrugs along the Ukrainian border. The generally favourable water supply resulted in above-average leaf area and thus more efficient light interception. As a consequence, our models indicate exceptionally high biomass accumulation and yield formation, even exceeding the level of 2016, which was among the highest-yielding years. The yield outlook is exceptionally high in the Central and Volga Okrugs. The harvesting conditions of winter wheat were below optimal in July, due to abundant and frequent rain, leading to delays and a probable decrease in grain quality. The dry and hot weather in August facilitated the ripening of winter wheat in the Volga and Central Okrugs, providing good conditions for the accomplishment of the harvesting campaign.









2.2 Spring cereals

European Russia

As mentioned in the June Bulletin, early vegetative development of spring cereals had been delayed significantly in European Russia, because of a hampered sowing campaign and below-optimal thermal conditions. The colder-than-usual conditions in June and July maintained or even increased the delay. The predominantly moderately warm weather and adequate soil moisture were beneficial during the flowering stage, though over-wet conditions due to excessive rains could locally have compromised pollination and yield formation. The heatwaves that occurred in August had negligible effect on spring wheat and spring barley, which were then in the very late grain-filling or ripening stage.

The water supply of spring crops has been exceptionally good in the Central, Volga and North-Western Okrugs during the review period (1 June to 10 September). In general, soil moisture levels persistently exceeded the long-term average; consequently the water supply of spring barley and spring wheat was near optimal during the yield-formation period. Locally, even excessively wet conditions occurred temporarily. Moderate water scarcity occurred only in some south-western regions of the Central Okrug (in *Belgorodskaya*, *Kurskaya* and *Voronezhskaya* Oblasts) after mid-June.

According to our model simulations, biomass accumulation well exceeds the average, reaching exceptionally high levels in the central and eastern regions thanks to the favourable coincidence of adequate water supply, effective radiation utilisation and a prolonged grain-filling period. The yield expectations are particularly high for the Volga and Central Okrugs. The harvest of spring cereals has started later than usual, because of delayed crop development and abundant rainfall in western regions during the last dekad of August, as well as during the first dekad of September in the northern and eastern regions. These conditions are likely to result in below-average grain quality.

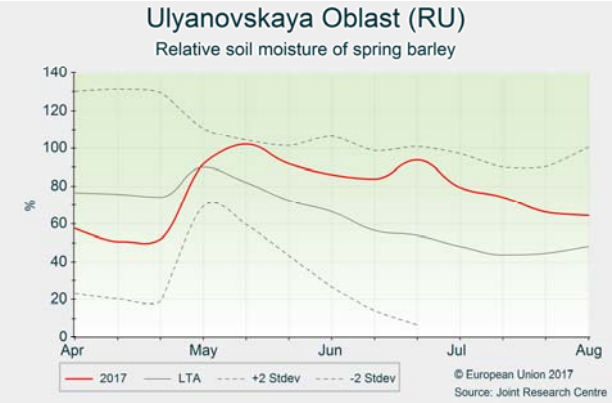
Ural Okrug

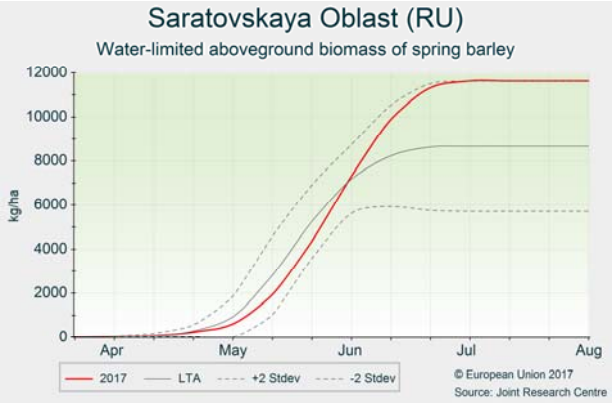
Spring crop development has been near average in most of the Ural Okrug, but it was slightly delayed in *Chelyabinskaya* Oblast. Water supply conditions were slightly below average from late June, but sufficient to sustain adequate growth and development during flowering and grain filling. Canopy expansion was above average and therefore light interception was more efficient than usual. According to our models, the soil moisture and thermal conditions allowed near- or slightly above-average biomass accumulation of spring wheat and spring barley. The yield potential is moderately higher than in 2016.

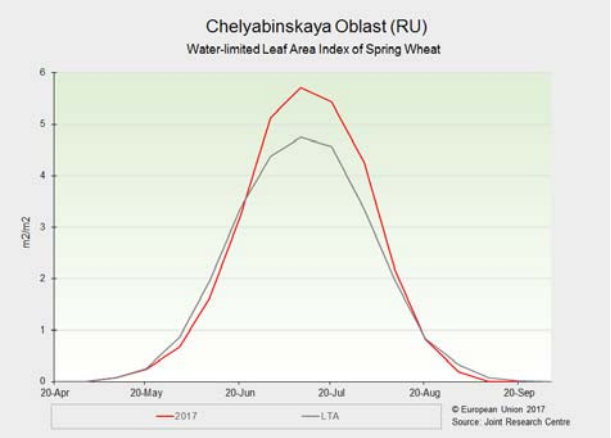
Siberian Okrug

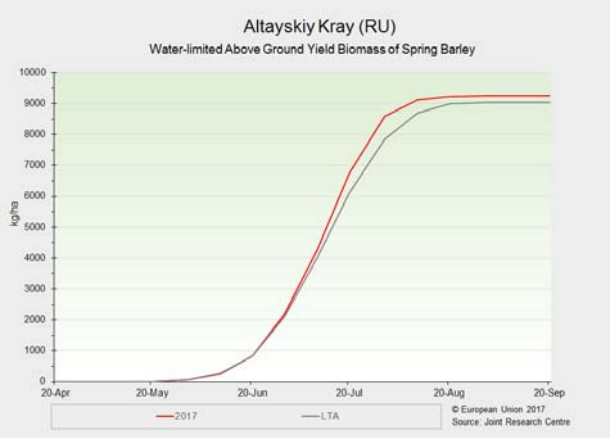
Crop development has been generally moderately advanced in Siberia thanks to the warmer-than-usual thermal conditions since late June. Beneficial rains kept soil moisture levels above average during the flowering and most of the grain-filling periods. Our models indicate near-average biomass accumulation in *Omskaya*, *Irkutskaya* and *Krasnoyarskaya* Oblasts, while elsewhere (*Novosibirskaya*, *Tomskaya* and *Kererovskaya* Oblasts, and the most important agricultural region, *Altayskiy* Kray) it exceeds the average considerably.

The yield outlook is better than in 2016. However, harvesting has been hampered in Asian Russia by frequent and plentiful rains in late August and early September. In case of an early start of frosts and snowfall, the harvest could be suspended or even terminated causing significant yield losses.



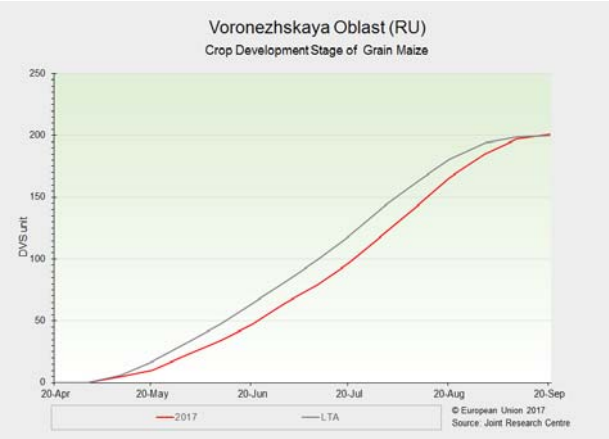


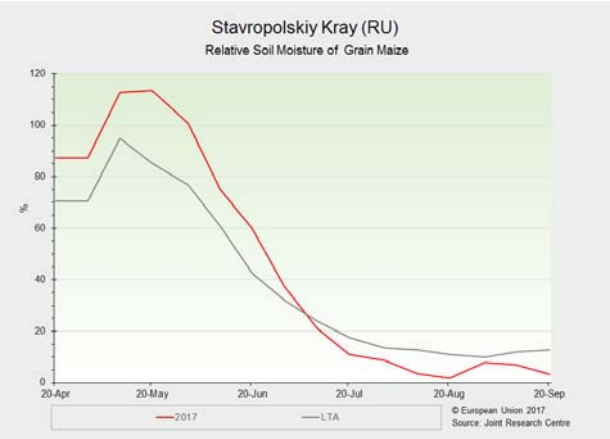




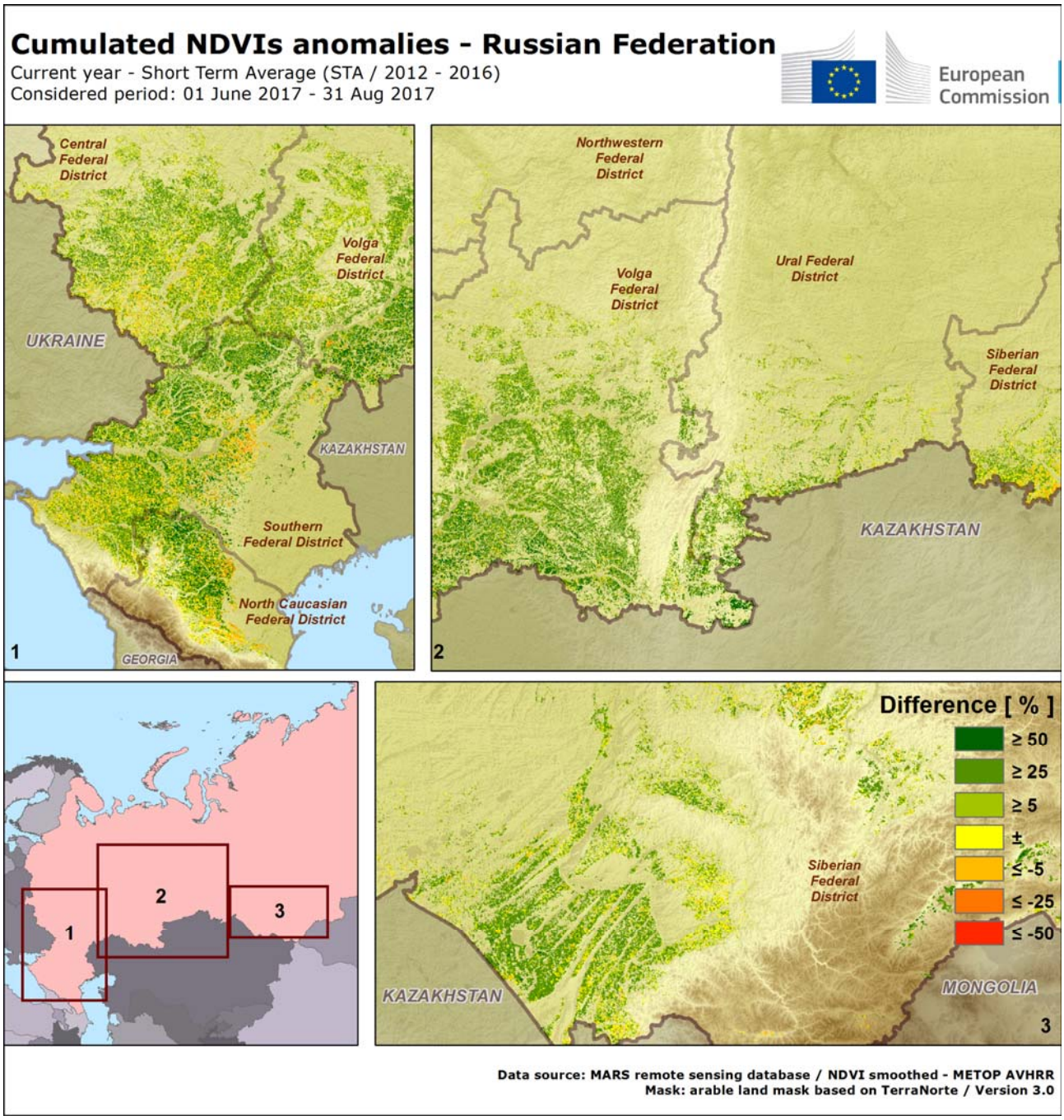
2.3 Grain maize

During the vegetative phase, crop development was moderately delayed in the North Caucasian and Southern Okrugs. Maize phenology suffered considerable delay in the northern and eastern regions of European Russia, therefore flowering occurred one to three weeks later than usual in these areas. Abundant and frequent rainfall in June provided adequate water supply conditions for the flowering phase of maize. However, soil moisture storage decreased quickly in July and August because of scarce rainfall and the high frequency of hot days in most of southern and western Russia. Our model simulations suggest that biomass accumulation was promising until late July, but insufficient soil moisture and extremely high temperatures have compromised photosynthetic activity since then, leading to a considerable decrease in the yield potential. The yield expectations for these areas are now close to the trend and remain below last year's record level. In contrast, the grain maize yield outlook is remarkably positive for the main producing regions of the Volga Okrug, where grain maize did not suffer from water scarcity during either the flowering or the early grain-filling period. On balance, the initially very high maize yield expectations for Russia were revised downwards, but are still positive. The harvest of grain maize is progressing well in the Southern and North Caucasus Okrugs, but elsewhere grain maize is still in the ripening stage and the harvest is just about to start.


Voronezhskaya Oblast (RU)
Crop Development Stage of Grain Maize
DVS unit
250
200
150
100
50
0
20-Apr
20-May
20-Jun
20-Jul
20-Aug
20-Sep
2017
LTA
© European Union 2017
Source: Joint Research Centre


Stavropolskiy Kray (RU)
Relative Soil Moisture of Grain Maize
%
120
100
80
60
40
20
0
20-Apr
20-May
20-Jun
20-Jul
20-Aug
20-Sep
2017
LTA
© European Union 2017
Source: Joint Research Centre

3. Remote sensing maps



4. Crop forecast tables

Russia yield forecasts - September 2017 Bulletin

Country	Crop	Yield (t/ha)				
		Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Russia	winter wheat	3.18	3.76	4.07	+28	+8.3
	spring wheat	1.43	1.56	1.70	+19	+9.1
	winter barley	3.92	3.96	4.61	+18	+17
	spring barley	1.96	2.09	2.43	+24	+16
	grain maize	4.87	5.55	5.40	+11	–2.8

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg

Sources: 1996-2016 data for area and yields come from Federal State Statistics Service

2017 area copied from data of year 2016 published by Federal State Statistics Service

2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/09/2017)

Russia yield forecasts for winter wheat - September 2017 Bulletin

Country	Yield (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Russia	3.18	3.76	4.07	+28	+8.3
Central Okrug	3.37	3.78	4.41	+31	+17
North-Western Okrug	3.86	3.30	4.30	+11	+30
Southern Okrug	3.54	4.20	4.34	+23	+3.4
North Caucasian Okrug	3.42	4.11	4.17	+22	+1.5
Volga Okrug	2.07	2.82	3.23	+56	+14
Urals Okrug	1.90	2.14	1.92	+0.7	–11
Siberian Okrug	2.13	2.14	2.22	+4.2	+3.8

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg

Sources: 1996-2016 data for area and yields come from Federal State Statistics Service

2017 area copied from data of year 2016 published by Federal State Statistics Service

2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/09/2017)

Russia yield forecasts for spring wheat - September 2017 Bulletin

Country	Yield (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Russia	1.43	1.56	1.70	+19	+9.1
Central Okrug	2.68	2.85	3.50	+31	+23
North-Western Okrug	2.54	2.63	2.71	+6.9	+3.2
Southern Okrug	1.43	1.71	1.65	+15	–3.7
North Caucasian Okrug	-	-	-	-	-
Volga Okrug	1.42	1.48	1.72	+21	+16
Urals Okrug	1.37	1.59	1.70	+24	+7.0
Siberian Okrug	1.36	1.46	1.52	+11	+4.0

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg

Sources: 1996-2016 data for area and yields come from Federal State Statistics Service

2017 area copied from data of year 2016 published by Federal State Statistics Service

2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/09/2017)

Russia yield forecasts for winter barley - September 2017 Bulletin

Country	Yield (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Russia	3.92	3.96	4.61	+18	+17
Central Okrug	-	-	-	-	-
North-Western Okrug	-	-	-	-	-
Southern Okrug	4.44	3.96	4.99	+12	+26
North Caucasian Okrug	3.42	3.95	4.10	+20	+3.7
Volga Okrug	-	-	-	-	-
Urals Okrug	-	-	-	-	-
Siberian Okrug	-	-	-	-	-

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg

Sources: 1996-2016 data for area and yields come from Federal State Statistics Service
2017 area copied from data of year 2016 published by Federal State Statistics Service
2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/09/2017)

Russia yield forecasts for spring barley - September 2017 Bulletin

Country	Yield (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Russia	1.96	2.09	2.43	+24	+16
Central Okrug	2.78	2.73	3.67	+32	+34
North-Western Okrug	2.41	2.41	2.42	+0.4	+0.5
Southern Okrug	1.78	2.22	2.10	+18	–5.5
North Caucasian Okrug	2.12	2.59	2.60	+23	+0.4
Volga Okrug	1.63	1.78	2.07	+27	+16
Urals Okrug	1.60	1.65	1.79	+12	+8.5
Siberian Okrug	1.62	1.83	1.81	+11	–1.2

Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg

Sources: 1996-2016 data for area and yields come from Federal State Statistics Service
2017 area copied from data of year 2016 published by Federal State Statistics Service
2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/09/2017)

Russia yield forecasts for grain maize - September 2017 Bulletin

Country	Yield (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Russia	4.87	5.55	5.40	+11	–2.8
Central Okrug	5.57	6.50	6.46	+16	–0.7
North-Western Okrug	6.43	6.55	6.75	+5.0	+3.1
Southern Okrug	4.44	4.96	4.92	+11	–0.8
North Caucasian Okrug	5.24	6.12	5.03	–4.0	–18
Volga Okrug	3.48	3.77	4.41	+27	+17
Urals Okrug	-	-	-	-	-
Siberian Okrug	-	-	-	-	-

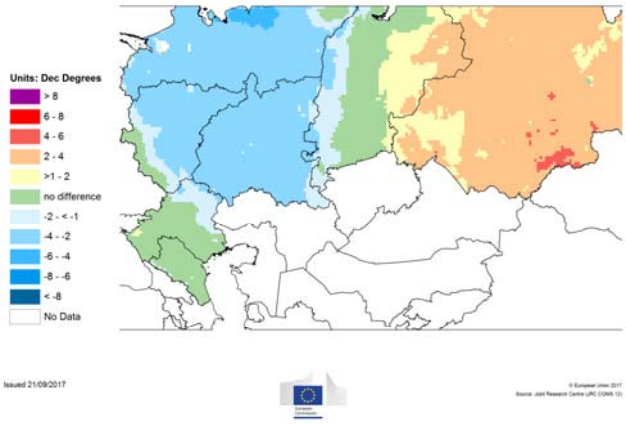
Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg

Sources: 1996-2016 data for area and yields come from Federal State Statistics Service
2017 area copied from data of year 2016 published by Federal State Statistics Service
2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/09/2017)

5. Atlas

AVERAGE DAILY TEMPERATURE
Averaged Values (Year of interest - LTA)

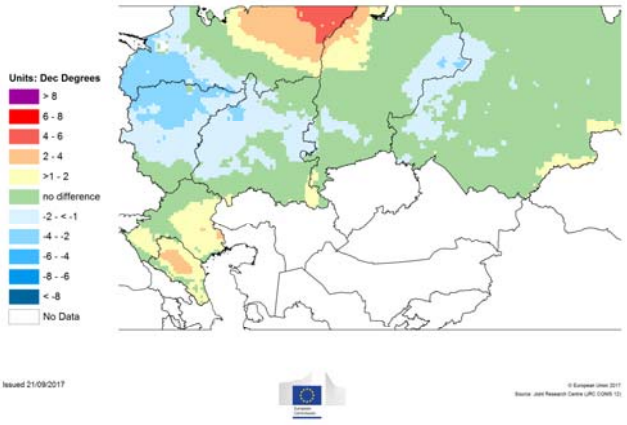
from: 01/06/2017
to: 30/06/2017



Issued 21/09/2017

AVERAGE DAILY TEMPERATURE
Averaged Values (Year of interest - LTA)

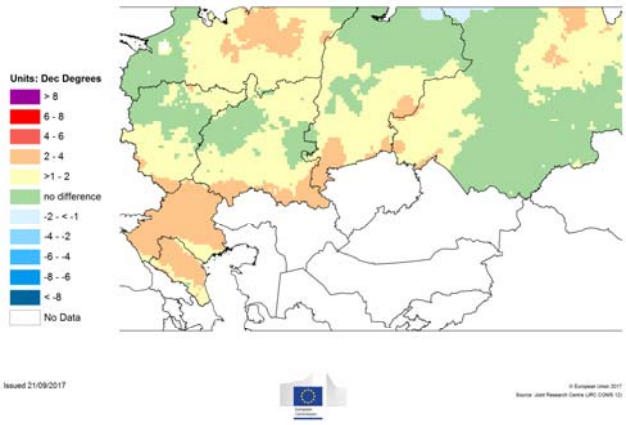
from: 01/07/2017
to: 31/07/2017



Issued 21/09/2017

AVERAGE DAILY TEMPERATURE
Averaged Values (Year of interest - LTA)

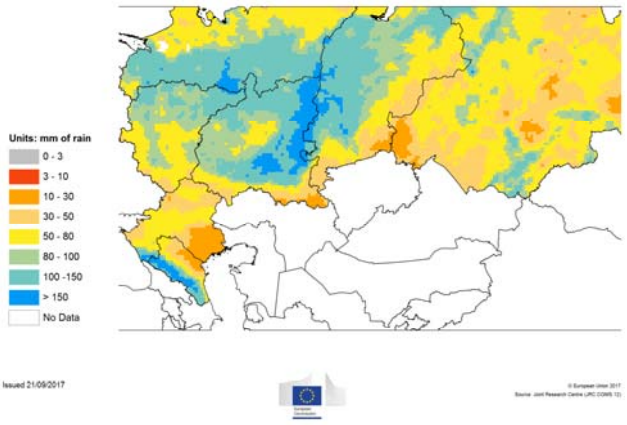
from: 01/08/2017
to: 31/08/2017



Issued 21/09/2017

RAINFALL
Cumulated Values (Year of interest)

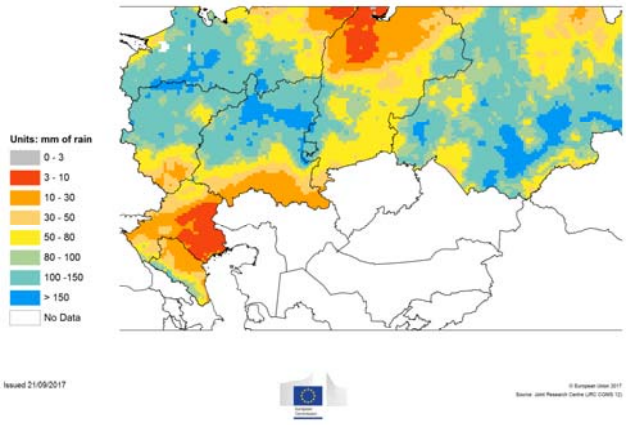
from: 01/06/2017
to: 30/06/2017



Issued 21/09/2017

RAINFALL
Cumulated Values (Year of interest)

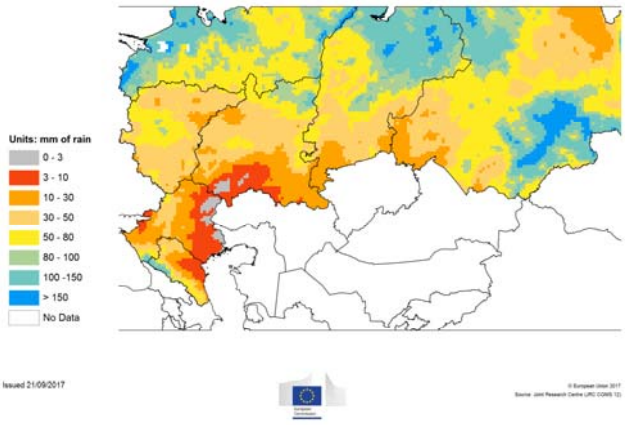
from: 01/07/2017
to: 31/07/2017



Issued 21/09/2017

RAINFALL
Cumulated Values (Year of interest)

from: 01/08/2017
to: 31/08/2017



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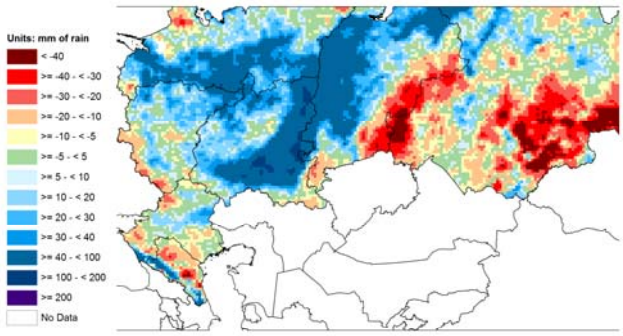
RAINFALL
Cumulated Values (Year of interest - LTA)

from: **01/06/2017**
to: **30/06/2017**



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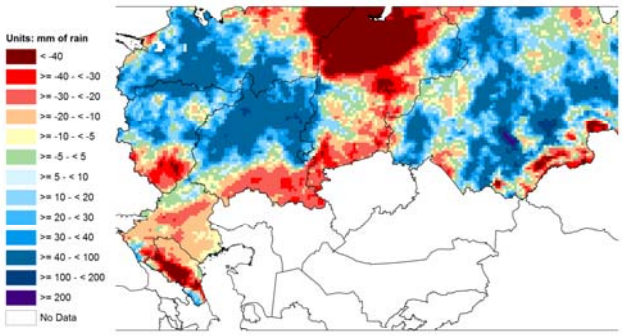
RAINFALL
Cumulated Values (Year of interest - LTA)

from: **01/07/2017**
to: **31/07/2017**



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RAINFALL
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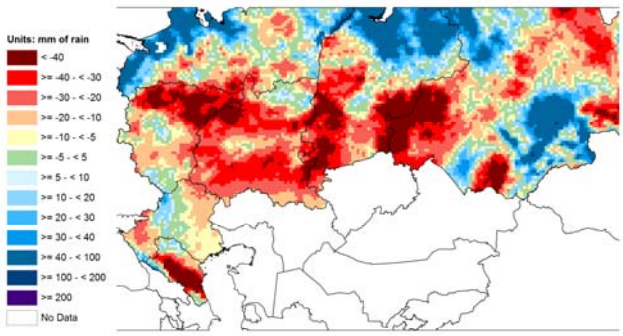

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RAINFALL
Cumulated Values (Year of interest - LTA)

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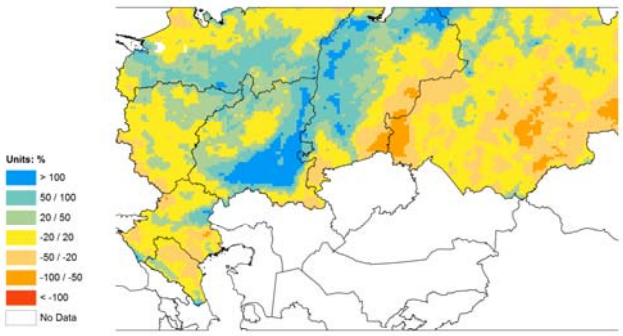

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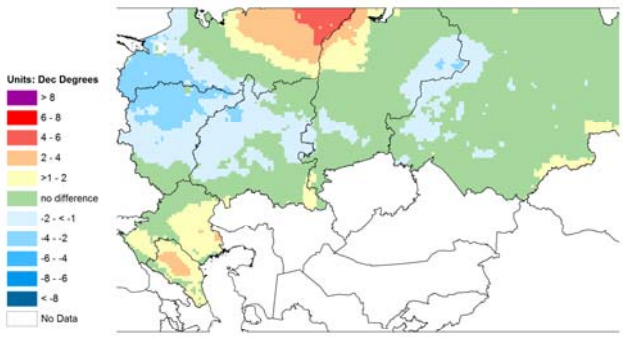
AVERAGE DAILY TEMPERATURE
Averaged Values (Year of interest - LTA)

from: **01/07/2017**
to: **31/07/2017**



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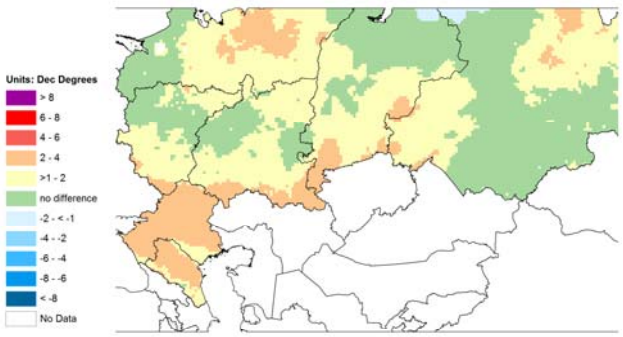
AVERAGE DAILY TEMPERATURE
Averaged Values (Year of interest - LTA)

from: **01/08/2017**
to: **31/08/2017**



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MARS stands for Monitoring Agricultural Resources

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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.