European Commission

JRC MARS Bulletin global outlook 2017

Crop monitoring European neighbourhood

Kazakhstan

July 2017

Slightly above average yield outlook

Thermal conditions and water supply have been adequate in most of Kazakhstan, but some northern and eastern regions present a soil mositure deficit and below-average spring crop growth. Our analysis suggests an above-average yield potential for spring cereals, but further rains are needed to maintain it. Winter wheat (which is mainly confined to southern Kazakhstan) is close to maturity and also in good shape, with an above-average yield outlook.

The sowing of spring crops progressed well, since plentiful precipitation caused delays only during the completion of the sowing campaign. The development of spring crops is near-average in northern Kazakhstan, but it is somewhat delayed due to colder-than-usual conditions in the north-west. Crops are advanced in eastern Kazakhstan, due to the above-average temperatures that prevailed since late April. Soil moisture levels under spring cereals are adequate in most of Kazakhstan, but some areas of *Akmolinskaya*, *Kustanayskaya* and *Vostochno-Kazachstanskaya* present a soil moisture deficiency which limited crop growth and current yield expectations.

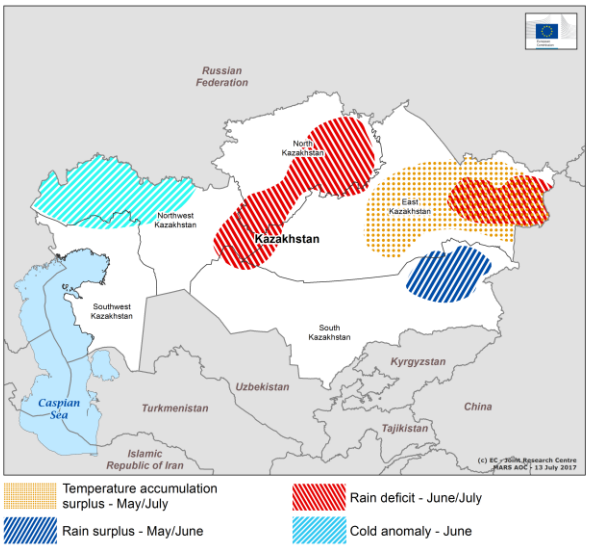
Content:

Covers the period from 1 April until 10 July

Weather conditions have mainly been favourable for winter wheat, the production of which is mainly limited to southern Kazakhstan; consequently, the yield outlook is positive.

AREAS OF CONCERN - EXTREME WEATHER EVENTS

Based on ECMWF operational model data from 01 April 2017 until 10 July 2017



Kazakhstan yield forecasts - July 2017 Bulletin

Country	Crop	Yield (t/ha)				
		Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Kazakhstan	winter wheat	1.63	2.14	**1.82**	+11	-15
	spring wheat	1.05	1.18	**1.23**	+18	+5.0
	winter barley	2.13	2.17	**2.27**	+6.2	+4.4
	spring barley	1.32	1.70	**1.54**	+17	-9.3
	grain maize	5.40	5.71	**5.61**	+3.9	-1.8

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

Sources: 1990-2016 data for yields come from Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics

2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/07/2017)

Joint Research Centre

1. Meteorological overview

After a cold first week of April, the main cereal-producing regions of Kazakhstan experienced near- to above-average thermal conditions. Rainfall was around average to above average in most of these regions, but has been below average in Akmolinskaya and the south-eastern part of Kustanayskaya, and some areas of Vostochno-kazachstanskaya.

In northern Kazakhstan (*Severo-kazachstanskaya*, *Kustanayskaya*, *Akmolinskaya*), after an unusually cold first week of April, average temperatures increased to above-zero levels, and predominantly above the long-term average until mid-May. Since then, temperatures have fluctuated around the long-term average. Thermal variability around the average was high, but did not reach extreme values. The predominantly mild temperatures provided good conditions for the normal development of spring cereals.

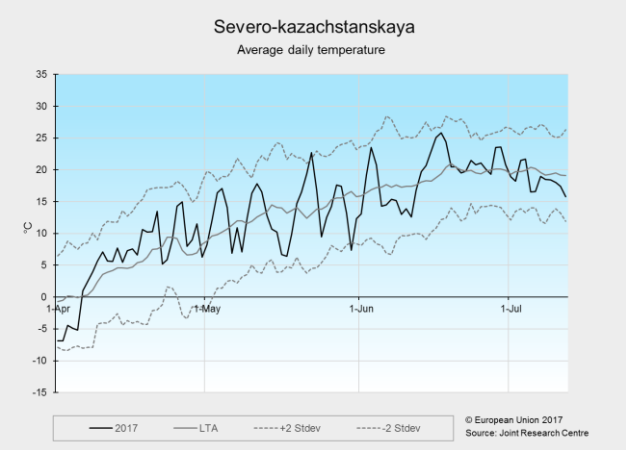
Below-average temperatures predominated in north-western Kazakhstan (*Zapadno-kazachstanskaya*), particularly in May and June, with a minimum of 11oC recorded at the end of May.

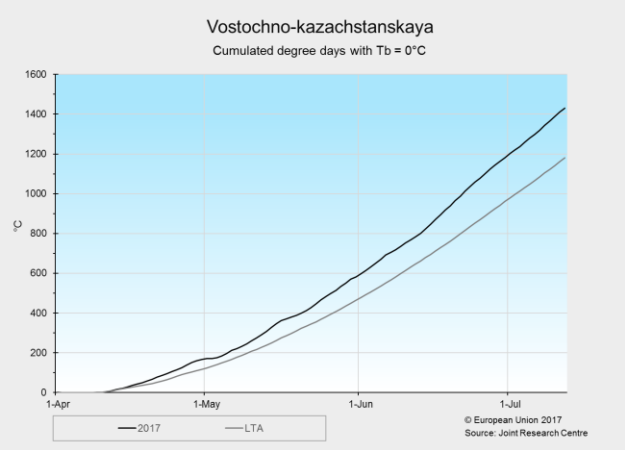
In the eastern areas (*Almatinskaya*, *Vostochno-kazachstanskaya*), thermal conditions were favourable for the development of cereals, with a prevalence of above-average temperatures from April to July, and with values higher than 20°C in mid-May and at the end of June. As a consequence, the cumulated thermal time (T_{base} = 0°C) in *Almatinskaya* and *Vostochno-kazachstanskaya* exceeded the long-term average by 6 and 21%, respectively, for the review period as a whole.

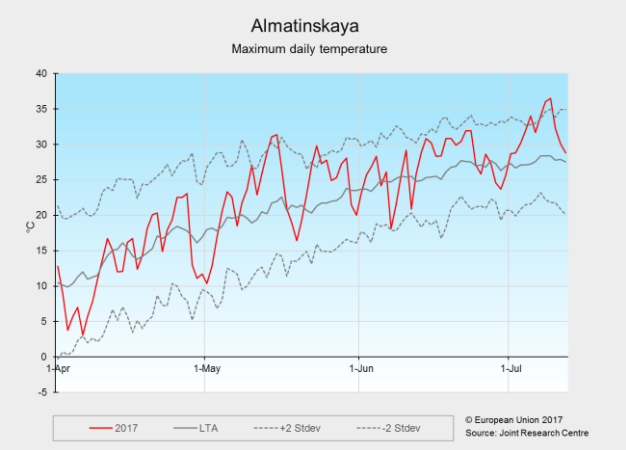
In the southern parts of the country, temperatures were mainly above average and increased sharply in late June, with daily averages reaching values above 30°C during the first week of July in *Kyzylordinskaya*, and maximum temperatures reaching 40°C during the same period.

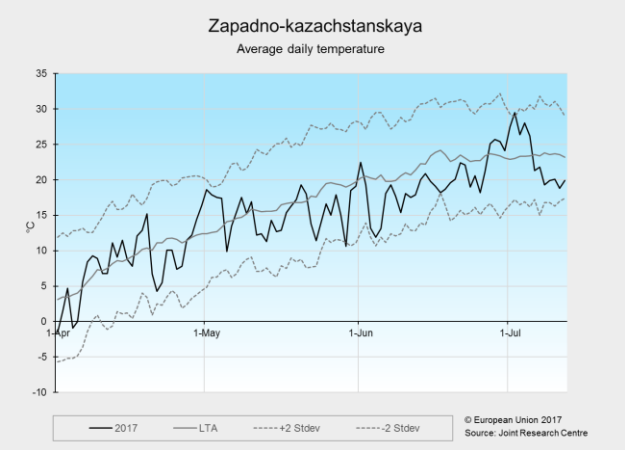
Rainfall in northern Kazakhstan was close to the long-term average in *Severo-kazachstanskaya* and northern *Kustanayskaya* during April and the first half of May, and increased to above-average levels since then. *Akmolinskaya* and the south-east part of *Kustanayskaya*, however, presented below-average rainfall from the end of April until the end of the review period. Some areas of *Vostochno-kazachstanskaya* also experienced below-average rainfall, mainly since the end of May.

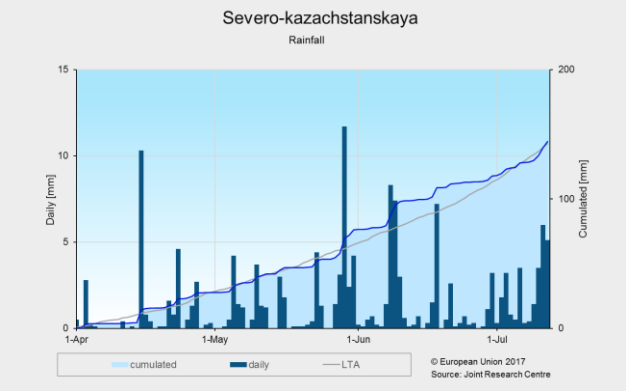
In south-eastern (*Almatinskaya*) and southern (*Kyzylordinskaya*) Kazakhstan, precipitation exceeded the average from April to July, probably slowing down the sowing progress of spring crops in May.

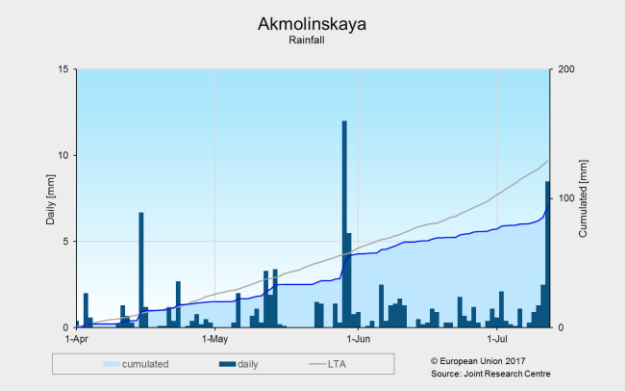


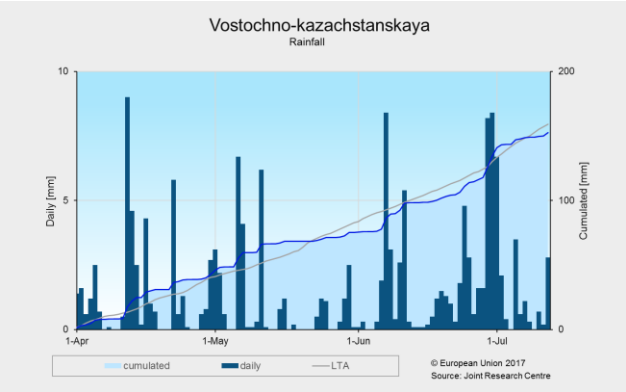


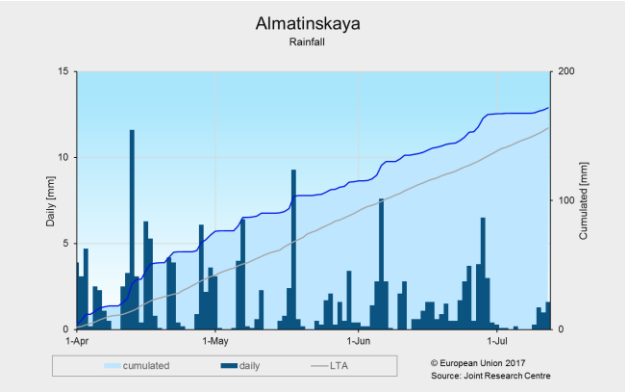












2. Crop conditions

In southern Kazakhstan, the sowing campaign of spring crops was mostly adequate, but rainfall after mid-April caused some delay and the establishment of early sown crops was hampered by colder-than-usual conditions in early April. The sowing of grain maize suffered no major constraints. In northern Kazakhstan, the sowing of spring crops started early and progressed well until the last dekad of May, when plentiful precipitation hampered the completion of the sowing campaign.

In northern Kazakhstan (the country's main spring cereal-producing region), the development of spring crops is near average, while it is advanced in eastern Kazakhstan. The water supply of spring cereals was adequate in most of the northern half of Kazakhstan, but some regions are affected by soil moisture deficiency. Model-based indicators suggest an above-average yield potential, but beneficial summer rains are crucial to realise this. Winter wheat in southern Kazakhstan is in good shape, and the yield outlook is good.

2.1 Spring sowing campaign

In the warmer southern regions of Kazakhstan (*Jambylskaya*, *Almatinskaya* and *Yujno-kazachstanskaya* Oblasts), the cultivation of winter wheat and thermophilic summer crops is dominating, but there is also spring wheat and spring barley production. The sowing of these spring cereals started in late March / early April, when average daily temperatures continuously exceeded 5°C. Sowing initially progressed well, but frequent and abundant precipitation in the second and third dekads of April caused delays. The sprouting and emergence of early sown crops was delayed due to significantly (2-4°C) colder-than-usual conditions during the first dekad of April. In May, however, crop development was accelerated due to the prevailing above-average thermal conditions.

The sowing of grain maize started in the second half of April and progressed well with no major constraints, thus allowing it to finish in mid-May in the main producing areas. Thermal conditions and soil moisture supply were adequate for the sprouting and early growth of maize.

In the northern half of Kazakhstan, the cultivation of spring crops is dominating. Thanks to the warmer-than-usual weather conditions, the sowing campaign of spring cereals (mainly spring wheat and spring barley) in these areas started in mid-April, ahead of the usual sowing period. Precipitation was typically below average or average until mid-May, which allowed for good progress. By contrast, the last dekad of May and the first dekad of June were rainy in the main regions of spring cereals cultivation (*Kustanayskaya*, *Severo-kazachstanskaya*, *Akmolinskaya*) and in the *Aktyubinskaya*, *Pavlodarskaya* and *Karagandinskaya* Oblasts, causing delays to the completion of the sowing campaign. Thermal conditions were favourable for sprouting, and the plentiful precipitation helped to maintain the soil moisture content at an adequate high level, thus providing good conditions for the early development of seedlings.

2.2 Spring and winter crop conditions

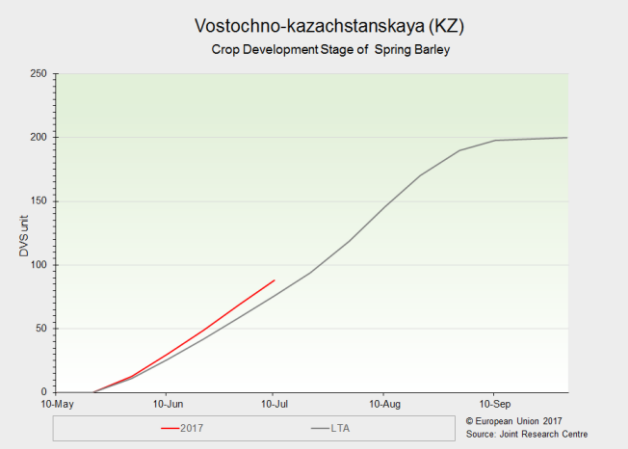
In north-western Kazakhstan (*Zapadno-kazachstanskaya*, *Aktyubinskaya Oblasts*), despite timely sowing, the development of spring cereals is delayed by about one week due to the colder-than-usual thermal conditions since late April. The soil moisture content is near-average or moderately higher than seasonal under spring wheat, thanks to the beneficial rains of May and June. According to our simulation models and remote sensing indicators, canopy expansion and biomass production are above average. In northern Oblasts (*Kustanskaya*, *Severo-kazachstanskaya*, *Akmolinskaya*), the spring crops caught up after the delayed sowing, and development returned to near average, or even slightly advanced in the case of early sown plant stands. The northern areas of the region (along the Russian border) received above-average precipitation, which provided favourable soil moisture conditions for the establishment of the spring crops. However, rainfall was sparse during the last dekad of June and the first dekad of July. This, in combination with high daily temperatures and increased crop water demand, resulted in a sharp decrease in soil moisture content. The simulated biomass accumulation and the leaf area development are still promising, but rain is crucial to avoid water stress damage and sustain good crop growth. By contrast, in the southern half of the northern Kazakhstan region (which suffered from rainfall deficiency since early June), soil moisture levels are below average under spring crops, and crop growth is less than optimal.

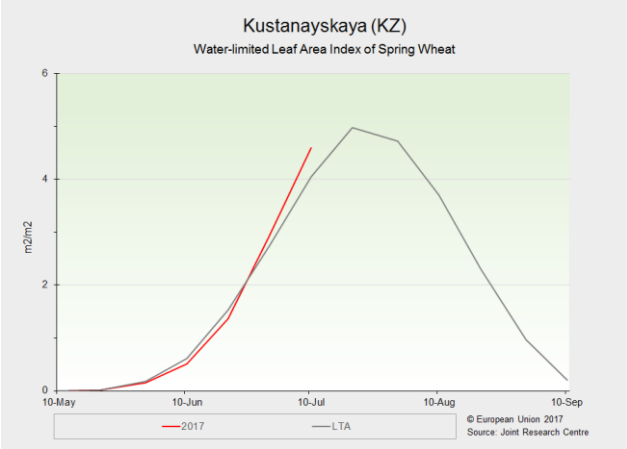
In southern and especially in eastern Kazakhstan, the development of spring cereals is considerably accelerated, because of the unusually high positive thermal anomaly. Precipitation in these regions has mostly been above average since the beginning of June; therefore water supply doesn't constrain the biomass accumulation, and the spring crops are in good shape.

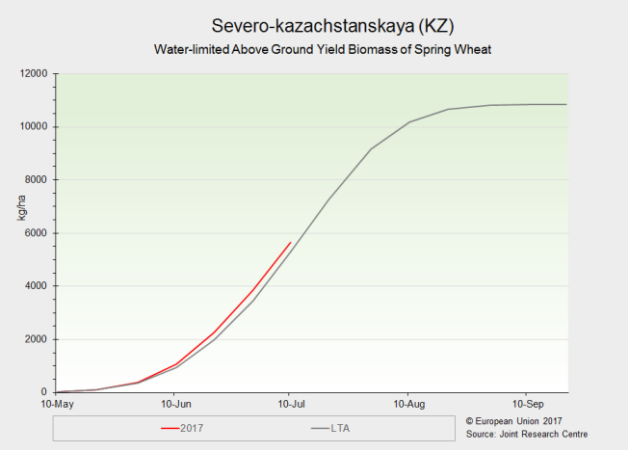
With respect to winter wheat, in southern Kazakhstan, the re-greening during early spring was delayed, but crop development accelerated considerably later in May. Currently (in early July) the phenological status is slightly advanced or near average. Depending on the region, the crop is in a very late stage of grain filling or in the ripening/ripened stage. Above-average precipitation during this growing season helped conserve the soil moisture, but also increased the weed and pest pressure, and may have lowered the grain quality. The abundant rainfall after mid-June could have caused some delay to the start of harvesting. Crop model indicators suggest substantially better-than-usual yield biomass accumulation. Therefore, the yield expectation for winter

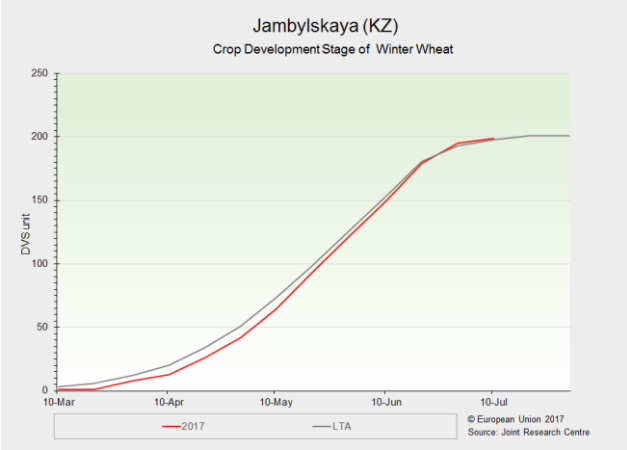
wheat is set above the trend.

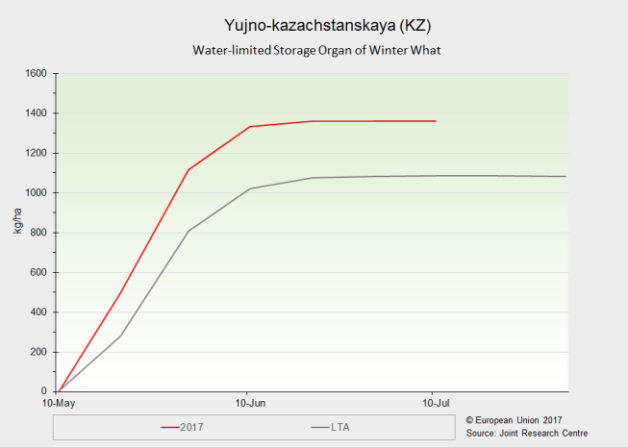
In Kazakhstan, grain maize is generally irrigated. Therefore, biomass accumulation is close to the potential level and the inter-annual variation of crop model indicators is relatively small. The phenological development of grain maize is slightly advanced, and is currently approaching the flowering stage. The canopy development and above-ground biomass accumulation are similar to previous years.

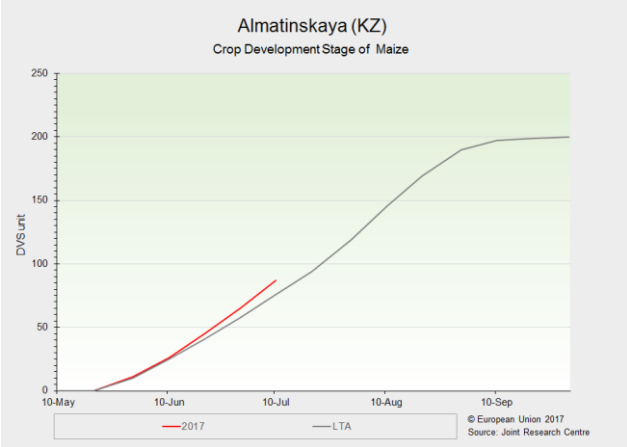




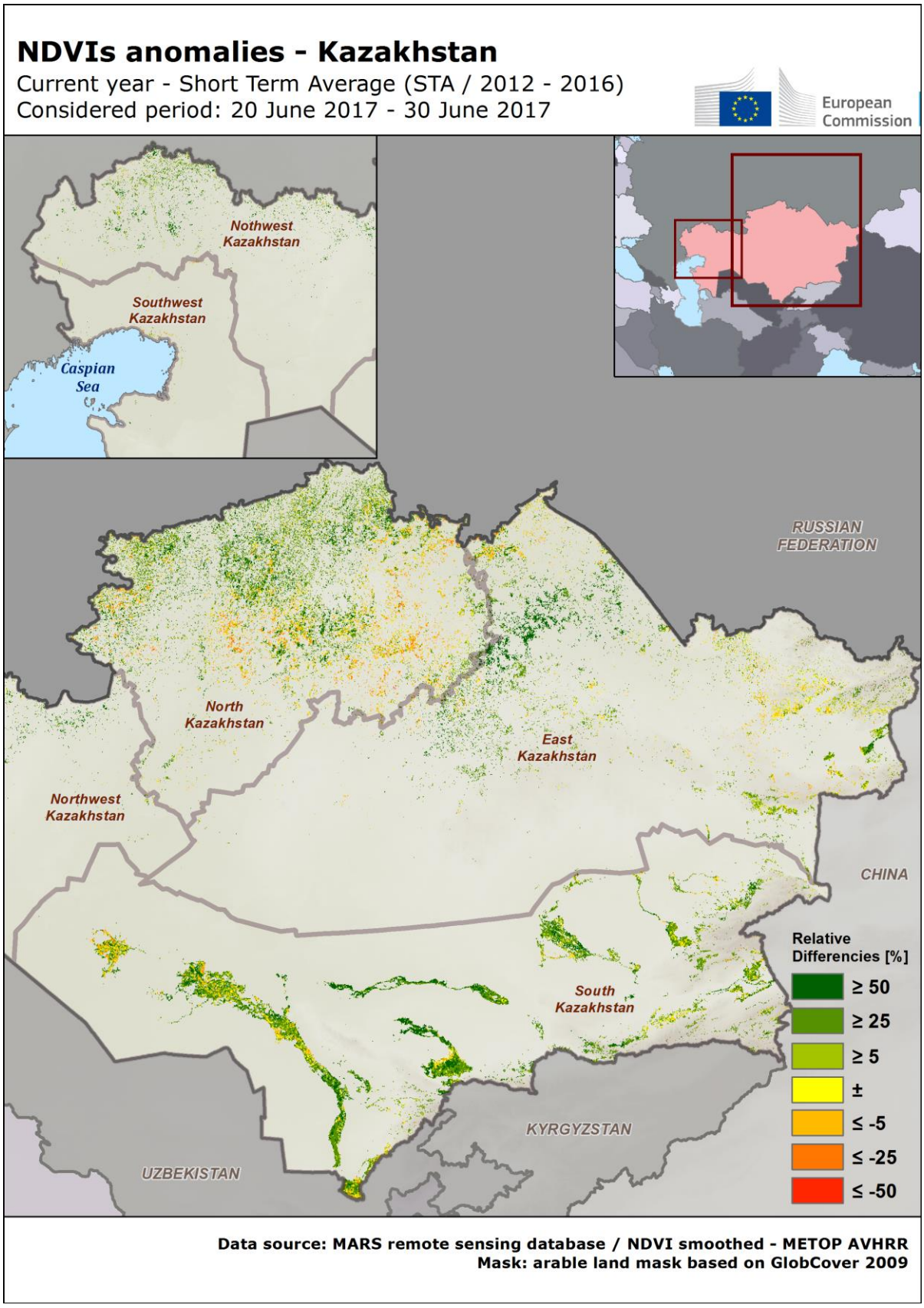








3. Remote sensing maps



4. Crop yield forecast tables

Kazakhstan yield forecasts - July 2017 Bulletin

Country	Crop	Yield (t/ha)				
		Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Kazakhstan	winter wheat	1.63	2.14	**1.82**	+11	-15
	spring wheat	1.05	1.18	**1.23**	+18	+5.0
	winter barley	2.13	2.17	**2.27**	+6.2	+4.4
	spring barley	1.32	1.70	**1.54**	+17	-9.3
	grain maize	5.40	5.71	**5.61**	+3.9	-1.8

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

Sources: 1990-2016 data for yields come from Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics

2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/07/2017)

Kazakhstan yield forecasts for winter wheat - July 2017 Bulletin

Country	Yield (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Kazakhstan	1.63	2.14	**1.82**	+11	-15
East Kazakhstan	1.97	2.19	**2.22**	+13	+1.7
North Kazakhstan	1.23	1.20	**2.01**	+63	+67
Nothwest Kazakhstan	1.62	3.14	**1.76**	+9.1	-44
South Kazakhstan	1.62	2.08	**1.78**	+10	-14
Southwest Kazakhstan	-	-	**-**	-	-

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

Sources: 1990-2016 data for area and yields come from Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics
2017 area copied from data of year 2016 published by Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics
2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/07/2017)

Kazakhstan yield forecasts for spring wheat - July 2017 Bulletin

Country	Yield (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Kazakhstan	1.05	1.18	**1.23**	+18	+5.0
East Kazakhstan	0.98	1.13	**1.17**	+19	+3.9
North Kazakhstan	1.07	1.18	**1.25**	+17	+6.4
Nothwest Kazakhstan	0.64	1.16	**0.86**	+34	-26
South Kazakhstan	1.73	1.98	**1.95**	+13	-1.8
Southwest Kazakhstan	-	-	**-**	-	-

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

Sources: 1990-2016 data for area and yields come from Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics
2017 area copied from data of year 2016 published by Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics
2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/07/2017)

Kazakhstan yield forecasts for winter barley - July 2017 Bulletin

Country	Yield (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Kazakhstan	2.13	2.17	**2.27**	+6.2	+4.4
East Kazakhstan	-	-	**-**	-	-
North Kazakhstan	-	-	**-**	-	-
Nothwest Kazakhstan	-	-	**-**	-	-
South Kazakhstan	2.13	2.17	**2.27**	+6.2	+4.4
Southwest Kazakhstan	-	-	**-**	-	-

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

Sources: 1990-2016 data for area and yields come from Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics
2017 area copied from data of year 2016 published by Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics
2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/07/2017)

Kazakhstan yield forecasts for spring barley - July 2017 Bulletin

Country	Yield (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Kazakhstan	1.32	1.70	**1.54**	+17	-9.3
East Kazakhstan	1.08	1.44	**1.39**	+29	-3.4
North Kazakhstan	1.35	1.68	**1.57**	+17	-6.3
Nothwest Kazakhstan	0.56	1.25	**0.85**	+51	-32
South Kazakhstan	1.70	2.10	**1.78**	+4.7	-16
Southwest Kazakhstan	-	-	-	-	-

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

Sources: 1990-2016 data for area and yields come from Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics
2017 area copied from data of year 2016 published by Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics
2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/07/2017)

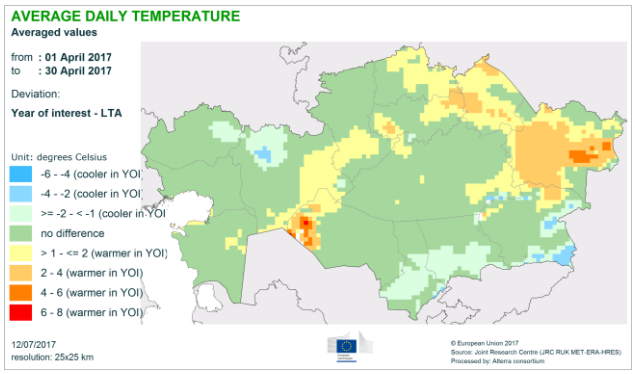
Kazakhstan yield forecasts for grain maize - July 2017 Bulletin

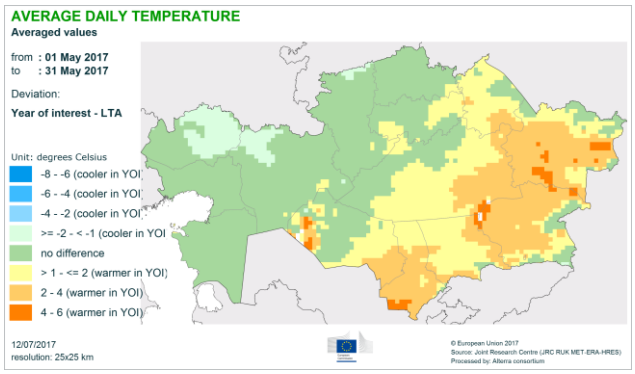
Country	Yield (t/ha)				
	Avg 5yrs	2016	MARS 2017 forecasts	%17/5yrs	%17/16
Kazakhstan	5.40	5.71	**5.61**	+3.9	-1.8
East Kazakhstan	-	-	-	-	-
North Kazakhstan	-	-	-	-	-
Nothwest Kazakhstan	-	-	-	-	-
South Kazakhstan	5.40	5.71	**5.61**	+3.9	-1.8
Southwest Kazakhstan	-	-	-	-	-

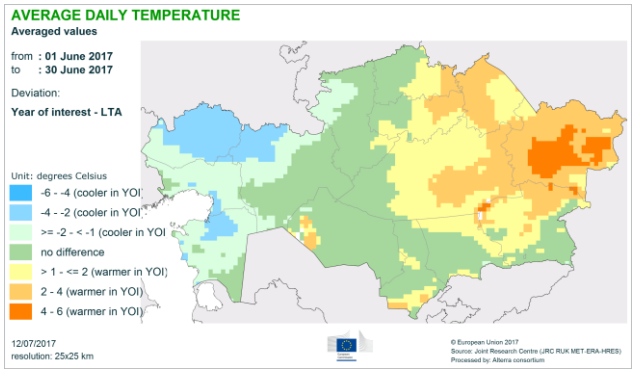
Note: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 10 kg

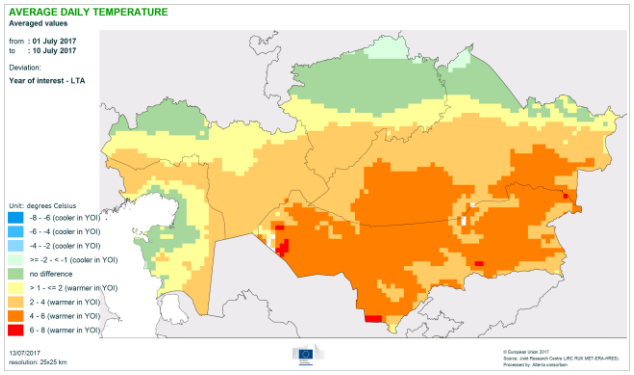
Sources: 1990-2016 data for area and yields come from Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics
2017 area copied from data of year 2016 published by Ministry of National Economy of the Republic of Kazakhstan - Committee on Statistics
2017 yields from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 10/07/2017)

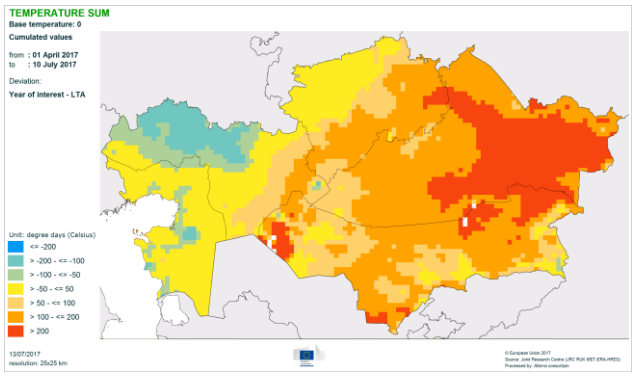
5. Atlas

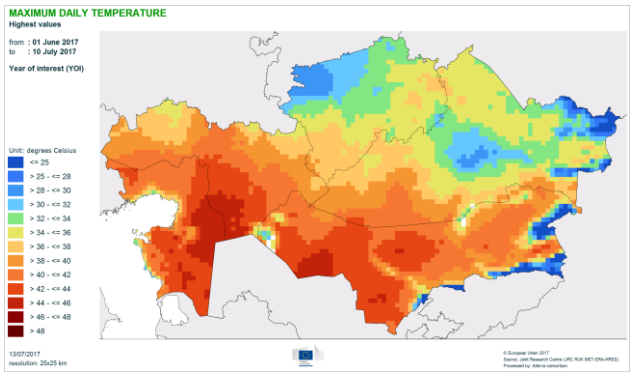









TEMPERATURE SUM
Base temperature: 0
Cumulated values
from : 01 April 2017
to : 10 July 2017
Deviation:
Year of interest - LTA
Unit: degree days (Celsius)
<= -200
> -200 - <= -100
> -100 - <= -50
> -50 - <= 50
> 50 - <= 100
> 100 - <= 200
> 200
13/07/2017
resolution: 25x25 km


MAXIMUM DAILY TEMPERATURE
Highest values
from : 01 June 2017
to : 10 July 2017
Year of interest (YOI)
Unit: degrees Celsius
<= 25
> 25 - <= 28
> 28 - <= 30
> 30 - <= 32
> 32 - <= 34
> 34 - <= 36
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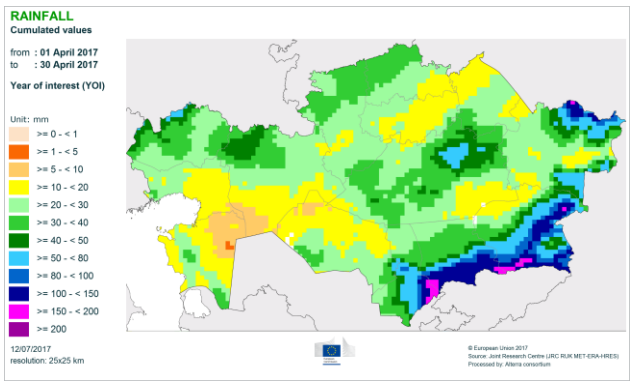
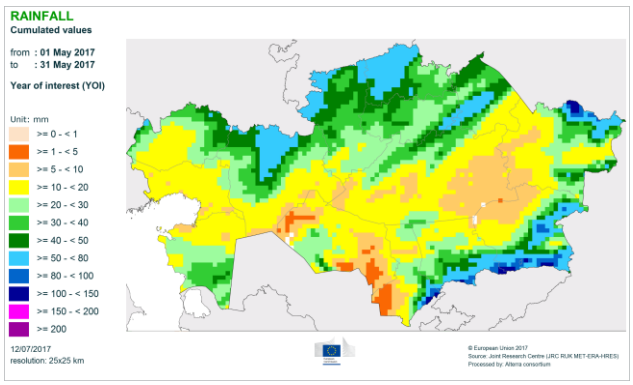
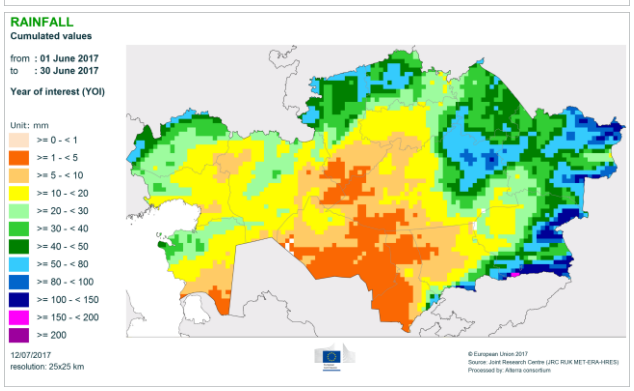
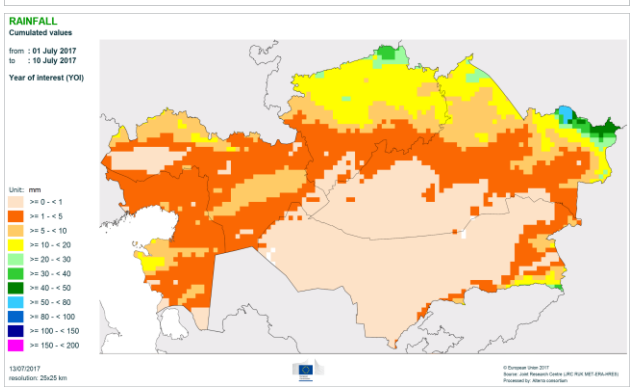
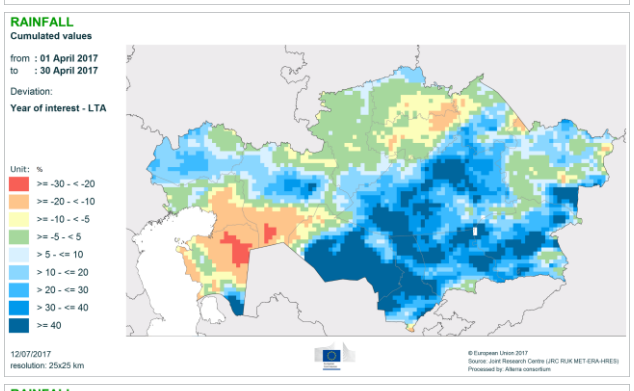
> 38 - <= 40
> 40 - <= 42
> 42 - <= 44
> 44 - <= 46
> 46 - <= 48
> 48
13/07/2017
resolution: 25x25 km

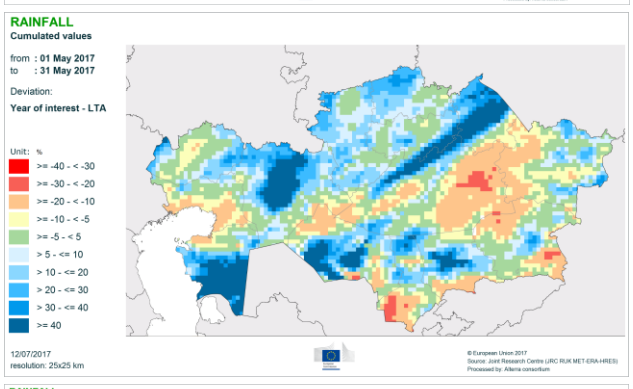

RAINFALL
Cumulated values
from : 01 April 2017
to : 30 April 2017
Year of interest (YOI)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150 - < 200
>= 200
12/07/2017
resolution: 25x25 km

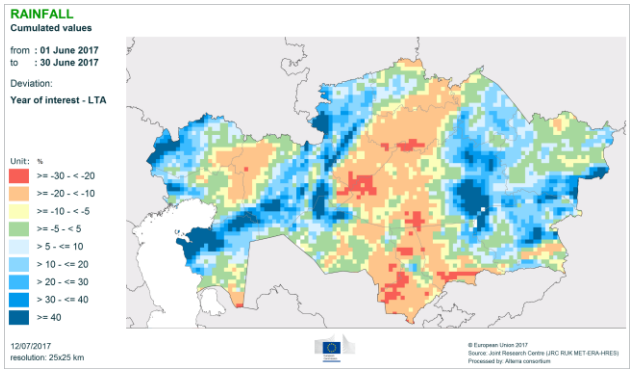

RAINFALL
Cumulated values
from : 01 May 2017
to : 31 May 2017
Year of interest (YOI)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150 - < 200
>= 200
12/07/2017
resolution: 25x25 km

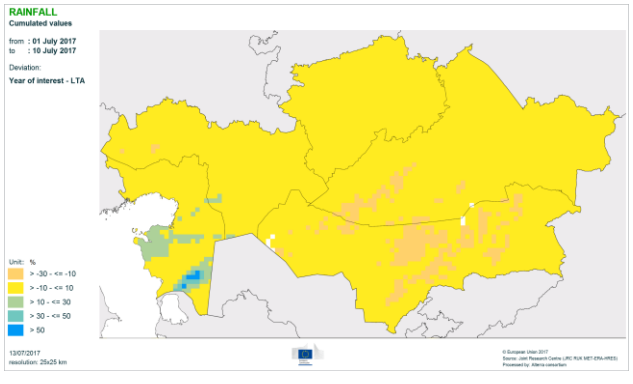

RAINFALL
Cumulated values
from : 01 June 2017
to : 30 June 2017
Year of interest (YOI)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150 - < 200
>= 200
12/07/2017
resolution: 25x25 km


RAINFALL
Cumulated values
from : 01 July 2017
to : 10 July 2017
Year of interest (YOI)
Unit: mm
>= 0 - < 1
>= 1 - < 5
>= 5 - < 10
>= 10 - < 20
>= 20 - < 30
>= 30 - < 40
>= 40 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100 - < 150
>= 150 - < 200
13/07/2017
resolution: 25x25 km


RAINFALL
Cumulated values
from : 01 April 2017
to : 30 April 2017
Deviation:
Year of interest - LTA
Unit: %
>= -30 - < -20
>= -20 - < -10
>= -10 - < -5
>= -5 - < 5
> 5 - <= 10
> 10 - <= 20
> 20 - <= 30
> 30 - <= 40
>= 40
12/07/2017
resolution: 25x25 km


RAINFALL
Cumulated values
from : 01 May 2017
to : 31 May 2017
Deviation:
Year of interest - LTA
Unit: %
>= -40 - < -30
>= -30 - < -20
>= -20 - < -10
>= -10 - < -5
>= -5 - < 5
> 5 - <= 10
> 10 - <= 20
> 20 - <= 30
> 30 - <= 40
>= 40
12/07/2017
resolution: 25x25 km


RAINFALL
Cumulated values
from : 01 June 2017
to : 30 June 2017
Deviation:
Year of interest - LTA
Unit: %
>= -30 - < -20
>= -20 - < -10
>= -10 - < -5
>= -5 - < 5
> 5 - <= 10
> 10 - <= 20
> 20 - <= 30
> 30 - <= 40
>= 40
12/07/2017
resolution: 25x25 km


RAINFALL
Cumulated values
from : 01 July 2017
to : 10 July 2017
Deviation:
Year of interest - LTA
Unit: %
> -30 - <= -10
> -10 - <= 10
> 10 - <= 30
> 30 - <= 50
> 50
13/07/2017
resolution: 25x25 km

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MARS stands for Monitoring Agricultural Resources

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.