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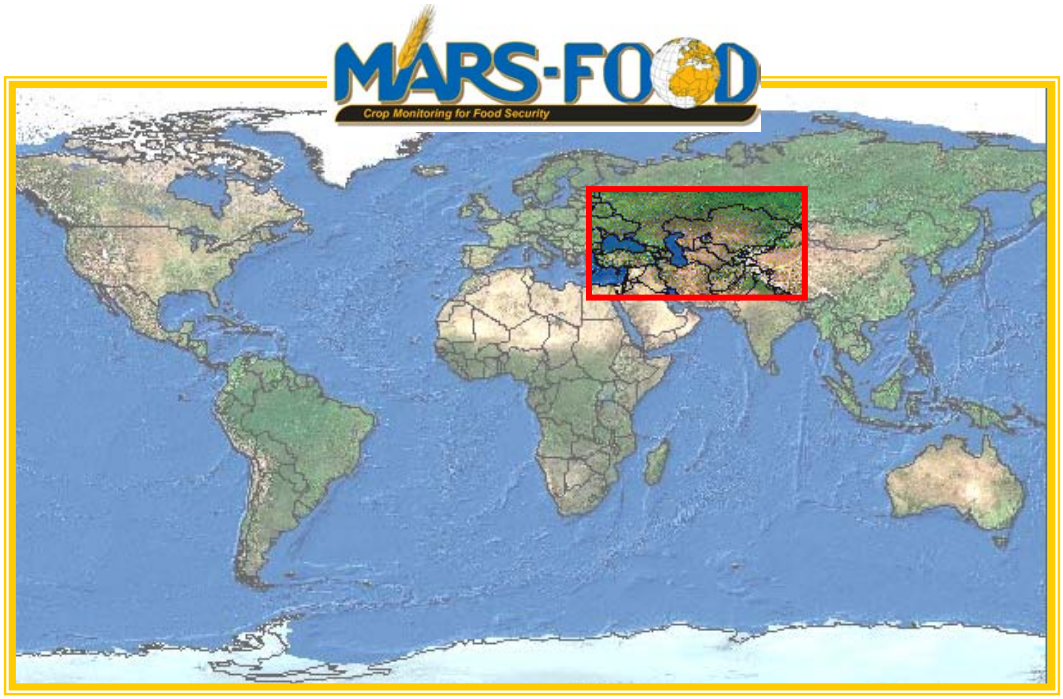
CROP MONITORING for FOOD SECURITY

Russia and Central Asian Countries

Situation at the End of October 2004
Agro-meteorological overview for September-October 2004



Introduction

The present Bulletin is dedicated to the analysis of the agro-meteorological situation in Russia and Central Asian countries during the period from the beginning of September to the end of October 2004.

Crops. This is the time for winter crops sowing and emergence in most countries of the region. Summer crops were harvested already practically in all countries of the region.

Wheat and barley are the main crops cultivated during the winter period in most countries of the region. Additionally, sugar cane and rape seed are cultivated in winter in Northern India, Northern Pakistan, Western China and Northern Nepal, as well as potatoes and fodder crops in Afghanistan, and rice in Northern India. In many countries of the region more than 90% of wheat and barley are cultivated as winter crops. But more than 90% of wheat and barley in Kazakhstan, near 70% of wheat and more than 90% of barley in Russia are spring crops. Near 90% of barley in Armenia, and Kyrgyzstan, and near 40% of wheat in Kyrgyzstan, more than 60% of barley in Tajikistan, and near 40% of barley in Georgia is cultivated in summer too.

Practically all winter crops in Russia and Kazakhstan are cultivated in rain-fed conditions. In Tajikistan, Uzbekistan, Georgia and Armenia near 30% of winter crops are irrigated. In Kyrgyzstan, Azerbaijan, Iran, Iraq and Afghanistan near 40-70% of winter crops are cultivated in irrigated conditions. And in Turkmenistan, Kuwait, Northern India, Northern Pakistan, Western China and Northern Nepal practically all winter crops are irrigated.

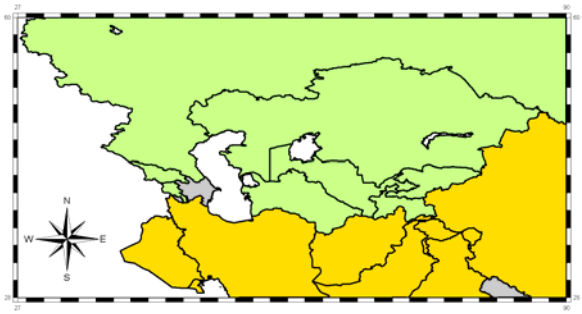
The agro-meteorological situation during the period of analysis is compared with the situation at the similar period of the previous season, and with long-term average data.

The background information is given in the following table.

country	*Production and Yield of main winter crops, 2003 (source FAO)*	
	wheat	**barley**
Russia	**34030 (1,6)**	**17946 (2,1)**
Armenia	**320 (2,6)**	**83 (1,3)**
Azerbaijan	**1575 (2,5)**	**275 (2,3)**
Georgia	**234 (1,8)**	**55 (1,3)**
Kazakhstan	**11800 (1,0)**	**2050 (1,2)**
Kyrgyzstan	**1084 (2,3)**	**146 (2,0)**
Tajikistan	**569 (1,9)**	**40 (2,0)**
Turkmenistan	**2534 (3,0)**	**31 (0,6)**
Uzbekistan	**4550 (3,7)**	**90 (1,8)**
Afghanistan	**No data**	**No data**
Iraq	**No data**	**No data**
Iran	**12900 (2,0)**	**2000 (1,4)**
Kuwait	**0,5 (2,3)**	**2,0 (1,4)**
India	**69320 (2,8)**	**1280 (1,9)**
Nepal	**1344 (2,0)**	**29 (1,1)**
Pakistan	**19210 (2,4)**	**107 (1,0)**
China	**86100 (3,9)**	**3115 (3,6)**

First figure is a production (1000 tons), figure in brackets – yield (t/ha). Green colour indicates figures which are higher than normal and red colour indicates figures which are lower than normal.

Methods. The agro-meteorological situation during the period of analysis is compared with the situation during the previous season, and with long-term average data. The monitoring of the agro-meteorological situation is based on the analysis of the following dekadal data: minimal, maximal and average air temperature, sums of precipitation and global radiation, dekadal values of the climatic water balance, and maps of the Normalized Difference Vegetation Indexes (NDVI). Meteorological data are derived from the outputs of the numerical meteorological model from ECMWF (UK), and were prepared for analysis by METEOCONSULT (NL). SPOT-VEGETATION data were used as a basis for calculation of the remote sensing indicators of crop growth. Data were preprocessed by VITO (BE). Dekadal maximal NDVI values were weighted for pixels, where crops are cultivated, for each country of the region. Weighted NDVI values were used as an indicator of crop status. Dry Matter Production maps were calculated by VITO based on SPOT-VEGETATION data and information about global radiation, applying the Monteith approach.



Winter crops status in September-October: green – **sowing-emergence***; yellow* **– land preparation-sowing***; grey –* **land preparation** *(based on long-term average data, source FAO)*

The Bulletin has the following structure. The next page contains the highlights and the main results of the analysis. The following pages are dedicated to the analysis of separate indicators of the crop growth during the period of analysis.

Acknowledgements. *The following organizations were involved in data supply: VITO (BE), METEOCONSULT (NL), ECMWF (UK).*

Disclaimer. *The geographical borders are purely a graphical representation and are only intended to be indicative. These boundaries do not necessarily reflect the official EC position.*

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Highlights Country by Country

	Russia	Agro-meteorological conditions during September-October 2004 were favourable for winter crop sowing, and close to the previous year. The emergence of winter crop is likely to be similar to the previous year.
	Armenia	Agro-meteorological conditions during September-October 2004 were favourable for winter crop sowing, but slightly worse comparing with the previous year. The emergence of winter crop is likely to have delay.
	Azerbaijan	Agro-meteorological conditions during September-October 2004 were favourable for land preparation and winter crop sowing, and better than in the previous year.
	Georgia	Agro-meteorological conditions during September-October 2004 were favourable for winter crop sowing, and slightly worse comparing with the previous year. The emergence of winter crop is likely to be similar to the previous year.
	Kazakhstan	Agro-meteorological conditions during September-October 2004 were favourable for winter crop sowing, and better than in the previous year. The emergence of winter crop is likely to be with delay comparing with the previous year.
	Kyrgyzstan	Agro-meteorological conditions during September-October 2004 were favourable for winter crop sowing, and close to the previous year. The emergence of winter crop is likely to be with delay comparing with the previous year.
	Tajikistan	Agro-meteorological conditions during September-October 2004 were unfavourable for winter crop sowing due to insufficient moisture, and worse than in the previous year. The sowing and emergence of winter crop is likely to be with delay.
	Turkmenistan	Agro-meteorological conditions during September-October 2004 were unfavourable for winter crop sowing due to insufficient moisture, but close to the previous year. The sowing and emergence of winter crop is likely to be with delay.
	Uzbekistan	Agro-meteorological conditions during September-October 2004 were unfavourable for winter crop sowing due to insufficient moisture, but close to the previous year. The sowing and emergence of winter crop is likely to be with delay.
	Afghanistan	Agro-meteorological conditions during September-October 2004 were unfavourable for winter crop sowing due to insufficient moisture, but close to the previous year.
	Iran	Agro-meteorological conditions during September-October 2004 were unfavourable for winter crop sowing due to insufficient moisture, but close to the previous year.
	Iraq	Agro-meteorological conditions during September-October 2004 were unfavourable for winter crop sowing due to insufficient moisture, but close to the previous year.
	Kuwait	Agro-meteorological conditions during September-October 2004 were unfavourable for winter crop sowing due to insufficient moisture, but better than in the previous year.
	Northern India	Agro-meteorological conditions during September-October 2004 were favourable for winter crop sowing, and close to the previous year.
	Northern Nepal	Agro-meteorological conditions during September-October 2004 were favourable for winter crop sowing, and better than in the previous year.
	Northern Pakistan	Agro-meteorological conditions during September-October 2004 were unfavourable for winter crop sowing due to insufficient moisture, but close to the previous year.
	Western China	Agro-meteorological conditions during September-October 2004 were favourable for winter crop sowing, and close to the previous year.

Results of the analysis

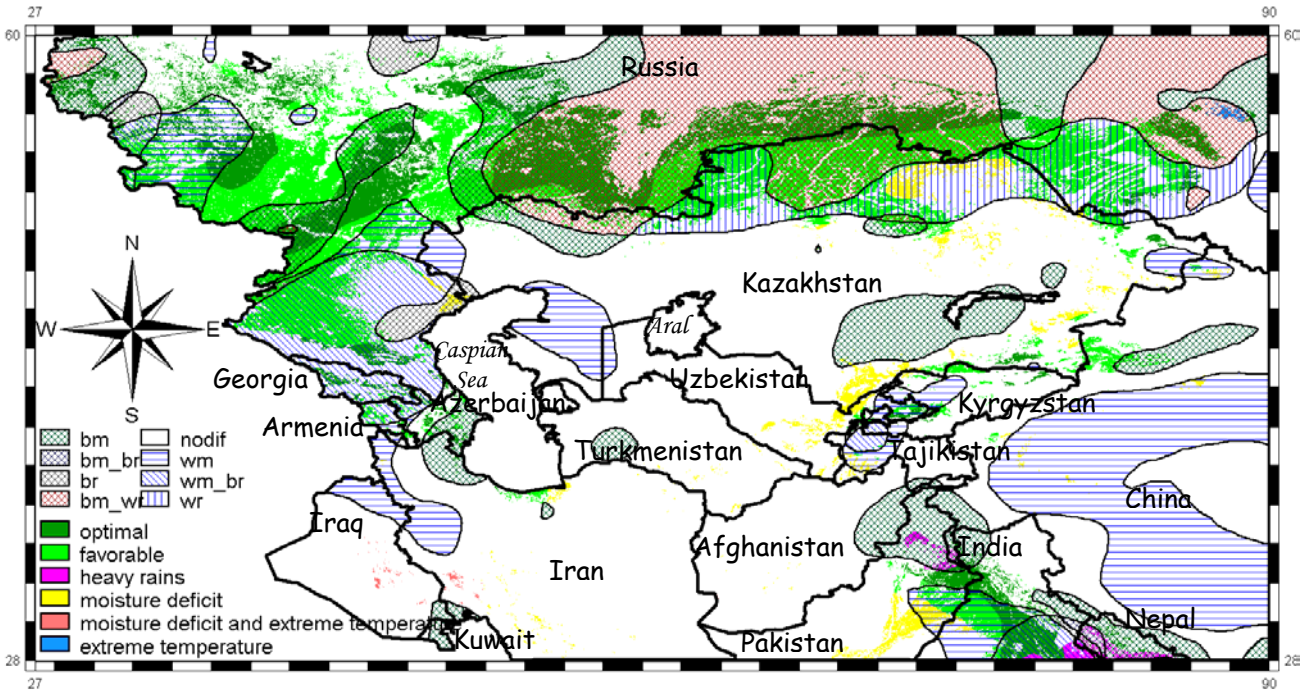
The meteorological conditions during September-October 2004 were favourable for winter crop sowing in Russia, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Northern India, Northern Nepal, and Western China. Insufficient amount of precipitation were received in Tajikistan, Turkmenistan, Uzbekistan, Afghanistan, Iraq, Iran, Kuwait, Northern Pakistan, and in some regions of Kazakhstan. But in most of these countries sowing of winter crop will take place only in November. Heavy rains which took place during the period of analysis in some regions of Nepal, Pakistan and India, and extreme air temperature in Iraq and Iran were not very significant for land preparation for winter crop sowing in these countries.

In general the meteorological situation for winter crop sowing in current year was better than in the previous year in Azerbaijan, Kazakhstan, Kuwait, and Northern Nepal, and was worse in Armenia, Georgia, and Tajikistan.

The remote sensing indicators show that the emergence of winter crops in 2004 is likely to be similar to the previous year in Russia, and Georgia. The emergence of winter crop in Armenia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan was delaying in current year, or the crop status is worse comparing with the similar date of the previous year.

Meteorological conditions for winter crops sowing	favourability in current season	comparing with previous season
Russia	favourable	=
Armenia	favourable	-
Azerbaijan	favourable	+
Georgia	favourable	-
Kazakhstan	favourable	+
Kyrgyzstan	favourable	=
Tajikistan	insufficient moisture	-
Turkmenistan	insufficient moisture	=
Uzbekistan	insufficient moisture	=
Afghanistan	insufficient moisture	=
Iraq	insufficient moisture	=
Iran	insufficient moisture	=
Kuwait	insufficient moisture	+
Northern India	favourable	=
Northern Nepal	favourable	+
Northern Pakistan	insufficient moisture	=
Western China	favourable	=

Favourability of meteorological conditions during September-October 2004 for winter crops (in color):
color on the map shows favorability and main limitations (see legend on the left)
Comparison with the conditions of previous year:
hatchings show units, where: **br** *– better radiation regime;* **bm** *– better moisture regime;* **wr** *– worse radiation regime;* **wm** *– worse moisture regime*



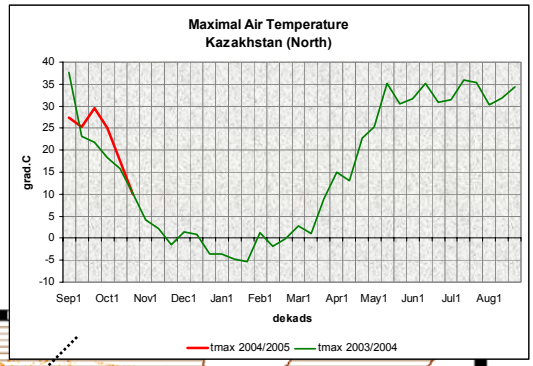
Global Radiation and Temperature Conditions

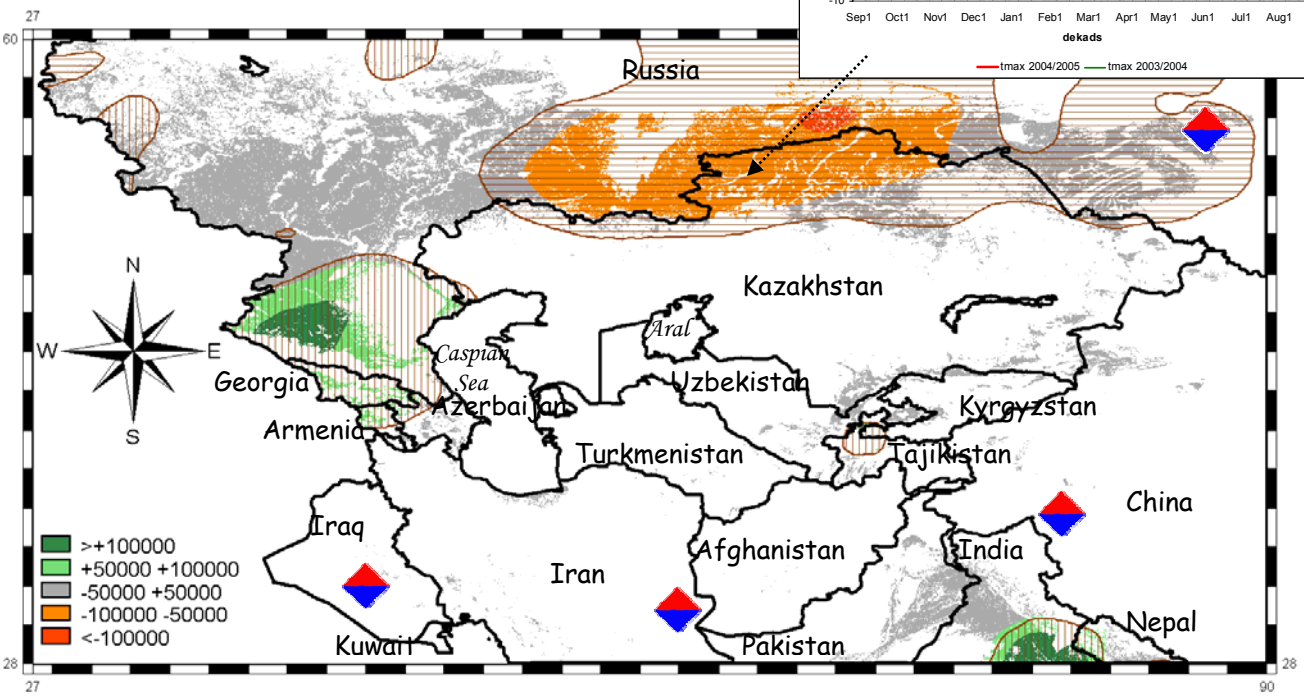
The amount of radiation is not very significant factor for land preparation and winter crop sowing.
The radiation sum during September-October 2004 was close to **normal** in all countries of the region. A slightly more than normal amount of radiation was received by croplands in the southern Iran and Afghanistan.
Comparison with the **previous year** shows that less radiation during September-October 2004 was received only by croplands in the northern Kazakhstan and in western Siberia of Russia. More radiation was received in Armenia, Georgia, and Northern India. The radiation sum was close to the previous year in other countries of the region.
The **air temperature** during September-October 2004 was close to normal practically in all countries of the region. 'Cold" days (with minimal air temperature below -4^{0}C) were observed during period under analysis only in Siberian part of Russia, and in mountain regions of China, India, Afghanistan, and Kyrgyzstan. Days with the maximal air temperature above + 40^{0}C were observed in September-October in Iraq, Kuwait, southern Iran, and southern Afghanistan.

Global radiation (September-October)	comparing with previous year
Russia	=
Armenia	+
Azerbaijan	=
Georgia	+
Kazakhstan	-
Kyrgyzstan	=
Tajikistan	=
Turkmenistan	=
Uzbekistan	=
Afghanistan	=
Iraq	=
Iran	=
Kuwait	=
Northern India	+
Northern Nepal	=
Northern Pakistan	=
Western China	=

Difference in Global Radiation Sum (kJ/m^2) for the period September-October between 2004 and 2003 (only for croplands, in colours). Hatching shows regions with a difference higher than 5% (vertical–positive, horizontal–negative).

- extreme air temperature





Precipitation Sum

The amount of precipitation during September-October 2004 was extremely limited in Iraq, Kuwait, Turkmenistan, southern Iran, and southern Afghanistan. Oppositely, a number of dekads with amount of precipitation more than 100 mm per dekad was observed in some regions of Northern Pakistan, and Northern Nepal.

In general the amount of precipitation was higher than **normal** during this period in Russia, Kazakhstan, Kyrgyzstan, and Tajikistan, and was lower than normal in Iraq, Kuwait, southern Iran and western Afghanistan.

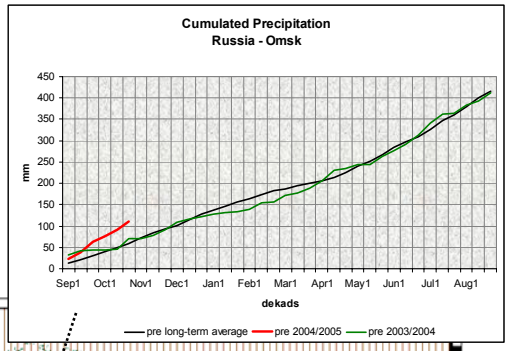
More precipitation than in **previous year** was observed during the period under analysis in the central and Siberian part of the European Russia, in Azerbaijan, Kazakhstan, and Northern Nepal, and less was observed in Armenia, Georgia, Kyrgyzstan, Tajikistan, and Northern India. The biggest negative difference was observed for Northern India, Georgia, and Southern Russia.

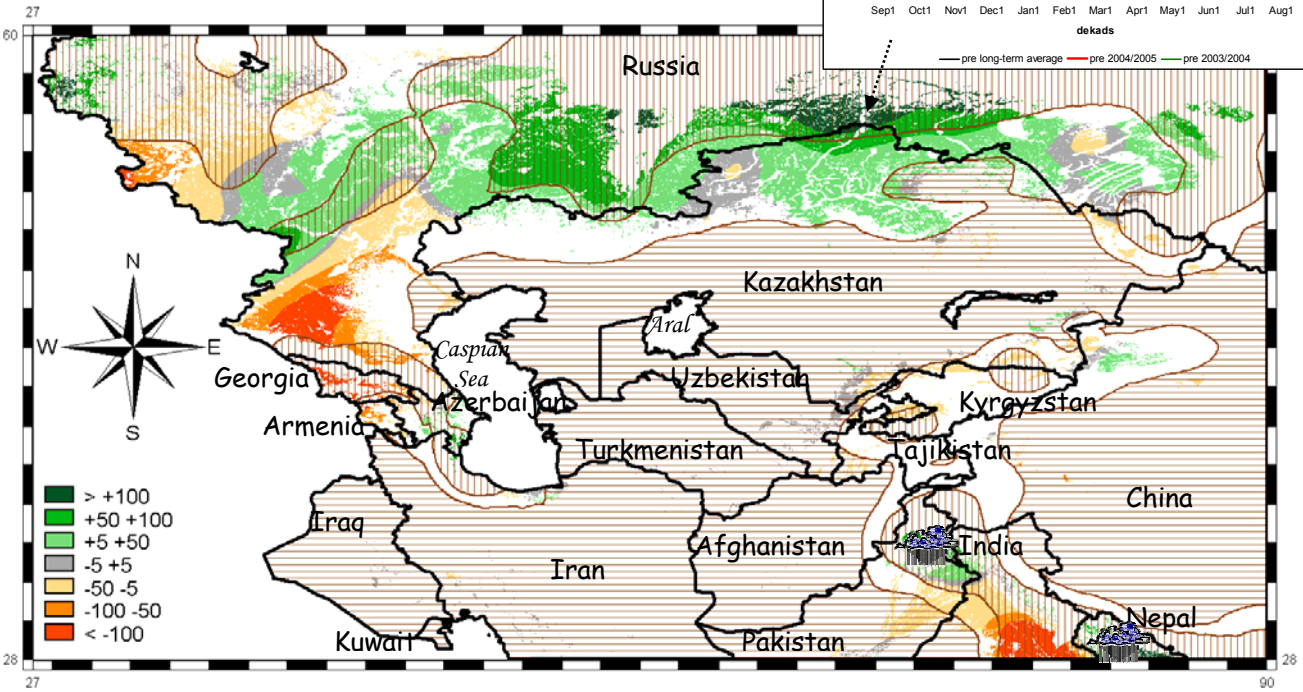
The comparison of the amount of precipitation cumulated for the current **vegetative season** with the similar period of the previous season shows that current season is more favourable in terms of precipitation for winter crop sowing in the central part of European Russia, in Northern Kazakhstan, and in Azerbaijan, and worse in other countries of the region.

Precipitation (September-October)	comparing with previous year
Russia	+
Armenia	-
Azerbaijan	+
Georgia	-
Kazakhstan	+
Kyrgyzstan	-
Tajikistan	-
Turkmenistan	=
Uzbekistan	=
Afghanistan	=
Iraq	=
Iran	=
Kuwait	=
Northern India	-
Northern Nepal	+
Northern Pakistan	=
Western China	=

Difference in Precipitation Sum (mm) for the period September-October between 2004 and 2003 (only for croplands, in colours). Horizontal hatching shows regions with amount of precipitation less than 60 mm during September-October 2004, vertical hatching shows regions with amount of precipitation more than 120 mm for the same period.

- "heavy" rains (more than 100 mm of precipitation per dekad)





Climatic Water Balance

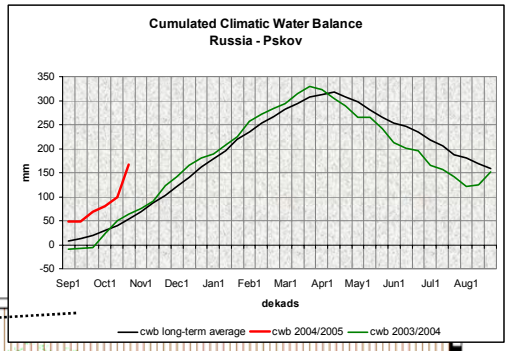
The dekads with positive climatic water balance were dominant during September-October 2004 in Russia, Georgia, Azerbaijan, Kyrgyzstan, Tajikistan, Northern Nepal, and Northern Kazakhstan. The climatic water balance was negative in other countries of the region.

The climatic water balance was equal or better than **long-term average data** in most countries of the region. Only during some dekads it was worse in Caucasus countries and in Northern India.

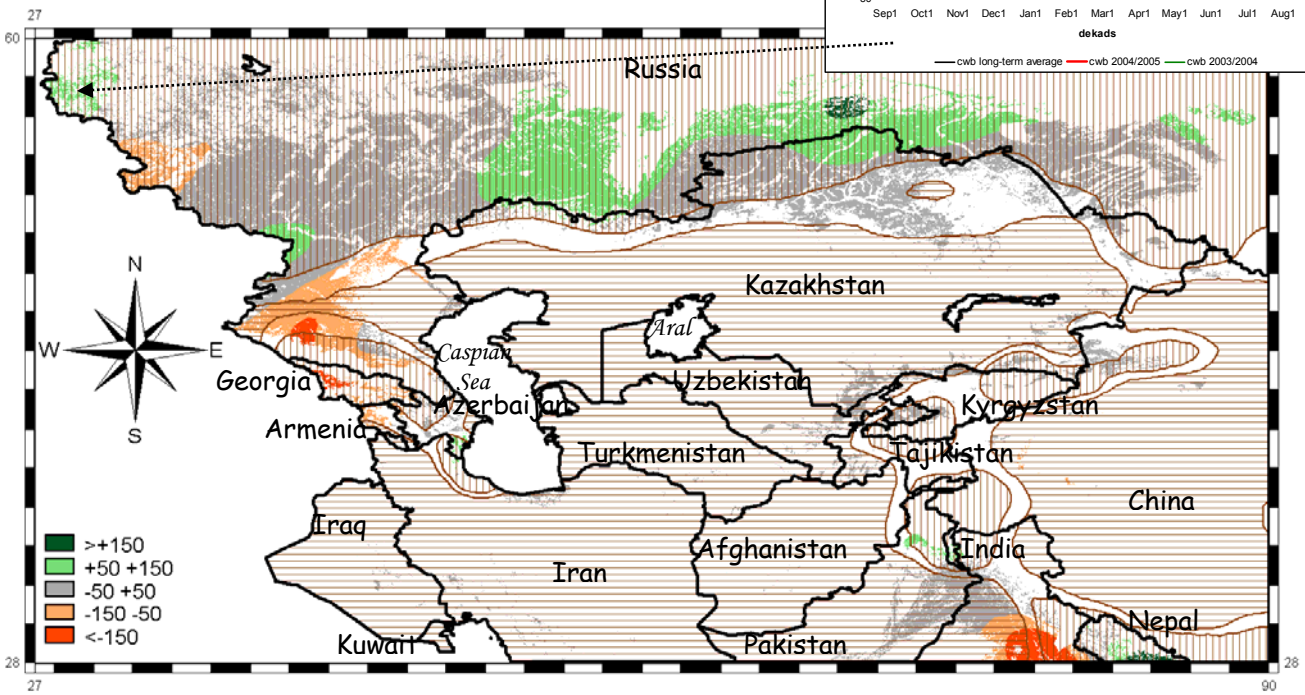
Situation is better for the period September-October in the current year than in the **previous year** only for cropping areas in Northern Nepal, and in some regions of Russia, and worse in Armenia, Georgia, and Northern India. The situation with climatic water balance in other countries was close to the previous year.

The comparison of the climatic water balance cumulated for the current **vegetative season** with the similar period of previous season shows that the current season is more favourable in terms of climatic water balance for winter crop sowing in Iran, Azerbaijan, Western China, and some regions of Russia. It was worse in Georgia, Armenia, Tajikistan, Northern Pakistan, and Northern India.

Climatic Water Balance (September-October)	comparing with previous year
Russia	=
Armenia	-
Azerbaijan	=
Georgia	-
Kazakhstan	=
Kyrgyzstan	=
Tajikistan	=
Turkmenistan	=
Uzbekistan	=
Afghanistan	=
Iraq	=
Iran	=
Kuwait	=
Northern India	-
Northern Nepal	+
Northern Pakistan	=
Western China	=



Difference in Climatic Water Balance (mm) for the period September-October between 2004 and 2003 (only for croplands, in colours). Hatching shows regions with negative (horizontal) and positive (vertical) water balance during September-October 2004.



Remote Sensing Indicators

Remote sensing indicators were applied only for the countries where winter crops during the period of analysis were at the development stage after emergence. Thus, for Azerbaijan, Afghanistan, Iraq, Iran, Kuwait, Northern India, Northern Nepal, Northern Pakistan, and Western China the analysis of remote sensing indicators wasn't conducted.

Based on the analysis of the NDVI behaviour it is possible to conclude that at the end of October the winter crop status in Russia varies from region to region. But, in general for the main winter crop cultivating regions the status is close to the previous year. The NDVI curves shows that the winter crops status is slightly worse in other countries of the region, which could be explained by delay of winter crop emergence or by its worse conditions after the emergence.

The NDVI behaviour for the most countries is close to the season 2002/2003.

The analysis of the Dry Matter Production modelling results shows that more dry matter than in previous year was produced in October only in northern and central part of the European Russia. Dry matter production was close to the previous year in Georgia, and Kyrgyzstan. Less dry matter was produced in other countries of the region, which again can indicate the delay in winter crop emergence comparing with the previous year.

Remote sensing indicators of winter crop status	comparing with previous year
Russia	=
Armenia	-
Azerbaijan	
Georgia	=
Kazakhstan	-
Kyrgyzstan	-
Tajikistan	-
Turkmenistan	-
Uzbekistan	-
Afghanistan	
Iraq	
Iran	
Kuwait	
Northern India	
Northern Nepal	
Northern Pakistan	
Western China