Chapter 2. Crop and environmental conditions in major production zones

Chapter 2 presents the same indicators—RAIN, TEMP, RADPAR, and BIOMSS— as those used in Chapter 1, and combines them with the agronomic indicators—cropped arable land fraction (CALF), maximum vegetation condition index (VCIx), and minimum vegetation health index (VHIn)— to describe crop condition in six Major Production Zones (MPZ) across all continents. For more information about these zones and methodologies used, see the quick reference guide in Annex C as well as the CropWatch bulletin online resources at www.cropwatch.com.cn.

2.1 Overview

Tables 2.1 and 2.2 present an overview of the agroclimatic (table 2.1) and agronomic (table 2.2) indicators for each of the six MPZs, comparing the indicators to their fifteen and five-year averages, respectively.

Table 2.1. April-July 2017 agroclimatic indicators by Major Production Zone, current value and departure from 15YA

	RAIN		TEMP		RADPAR	
	Current (mm)	Departure (%)	Current (°C)	Departure (°C)	Current (MJ/m^2)	Departure (%)
West Africa	671	9	27.9	-0.7	1105	-1
South America	367	13	19.0	0.1	761	-4
North America	502	21	19.3	-0.2	1286	-2
South and SE Asia	908	17	29.0	-0.6	1128	-2
Western Europe	261	-5	15.6	0.8	1160	-1
C. Europe and W. Russia	287	17	14.2	-1.8	1098	-5

*Note: Departures are expressed in relative terms (percentage) for all variables, except for temperature, for which absolute departure in degrees Celsius is given. Zero means no change from the average value; relative departures are calculated as (C-R)/R*100, with C=current value and R=reference value, which is the fifteen-year average (15YA) for the same period (April-July) for 2002-2016.*

Table 2.2. April-July 2017 agronomic indicators by Major Production Zone, current season values and departure from 5YA

	BIOMSS (gDM/m^2)		CALF (Cropped arable land fraction)		Maximum VCI Intensity
	Current	Departure (%)	Current	Departure (% points)	Current
West Africa	1773	6	90	-1	0.94
South America	914	0	98	1	0.70
North America	1352	7	94	0	0.88
S. and SE Asia	1558	5	66	-11	0.84
Western Europe	1029	-3	96	0	0.90
Central Europe and W Russia	1153	15	99	1	0.96

Note: See note for table 2.1, with reference value R defined as the five-year average (5YA) for April-July 2012-2016.

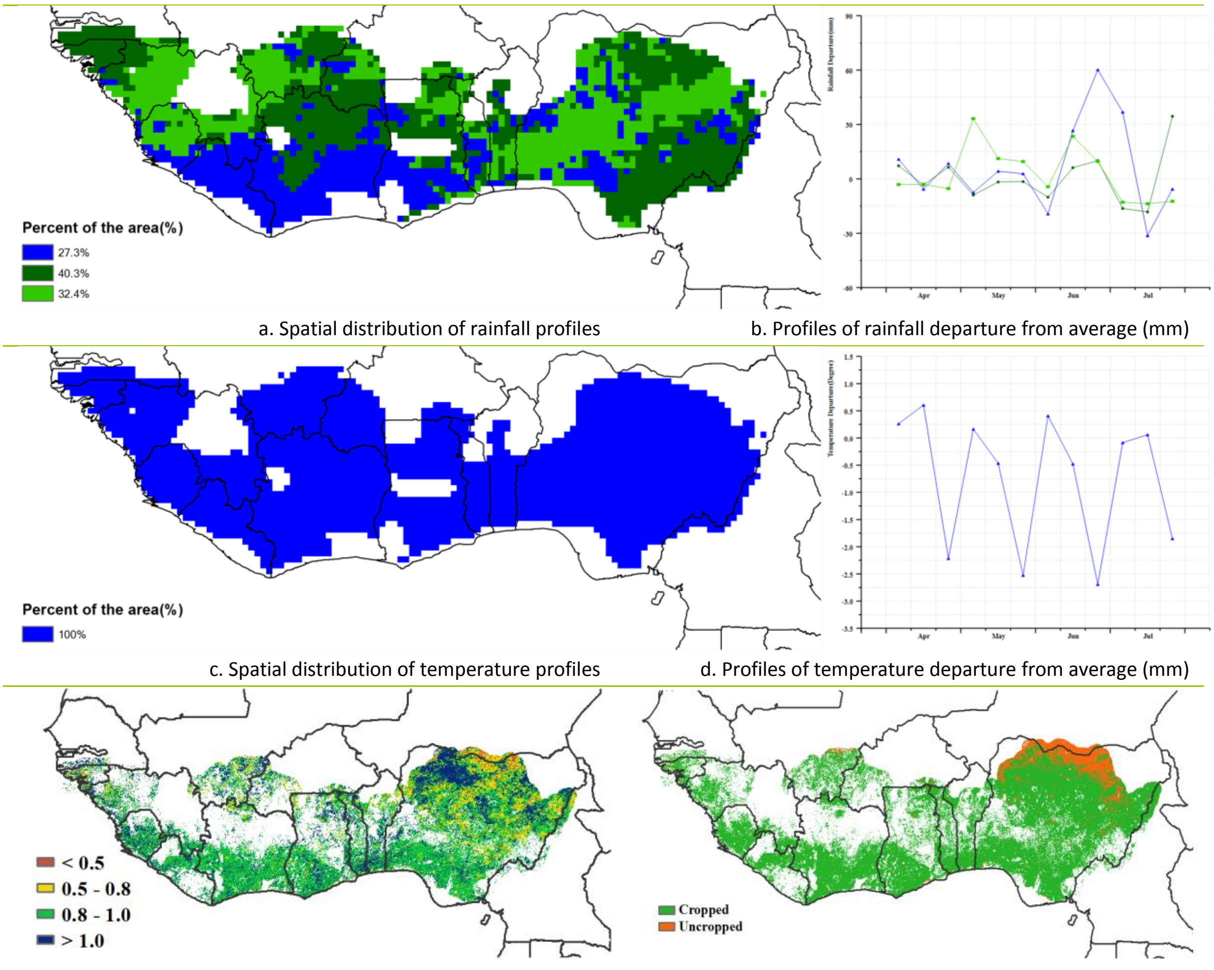
2.2 West Africa

The reporting period marks the beginning of the main rainy season and the sowing of main cereals (maize, sorghum, millet, and rice) throughout the region under both rainfed and irrigated conditions. In the south of the MPZ, in a region covering southern Côte d'Ivoire to Nigeria that tends to record bimodal rainfall, harvesting of yams is underway. In the west (Guinea to Liberia), rice plays an important role, the harvest of which extends into December and sometimes even January. In the areas that tend to record bimodal rainfall, the first maize crop is harvested in October, while the short season maize was harvested in early 2017. In contrast, cassava (the main staple in the region) is still growing, as reflected by the area of cropped arable land.

Based on CropWatch observations, average rainfall was 671 mm over croplands of the MPZ, corresponding to an increase of +9% for RAIN. The highest rainfall was recorded in Guinea (731 mm, +14%). The MPZ had close to average temperature (27.9°C, -0.7%) and sunshine (RADPAR with a -1.0% deviation), which gave a slight increase of the biomass production potential (BIOMSS, +6%). For the MPZ as a whole, the cropped arable land fraction (CALF) reached 90%. Precipitation is currently building up and positively supporting plant growth. According to the maximum VCI (VCIx) map in relation to crop condition, the average VCIx was above 0.8 (BIOMSS, +6%) with values exceeding 1.0 in parts of northern Nigeria, indicating generally favorable condition across the northern Savannah agro-ecological zone. Over the reporting period, Nigeria had a good share of cropped arable land reflecting the extent of agricultural production in the region.

Generally, as the growing season intensified during this reporting period, the climatic conditions were close to average, with precipitation well distributed in time. The temperature fluctuated around average within a +/-0.7°C margin after onset of the main rainy season. CropWatch indicators depict a stable and coherent climatic condition conducive for crop growth buildup leading to harvest in late 2017.

Figure 2.1. West Africa MPZ: Agroclimatic and agronomic indicators, April-July 2017



a. Spatial distribution of rainfall profiles

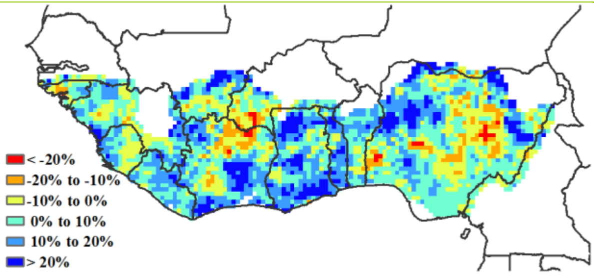
b. Profiles of rainfall departure from average (mm)

c. Spatial distribution of temperature profiles

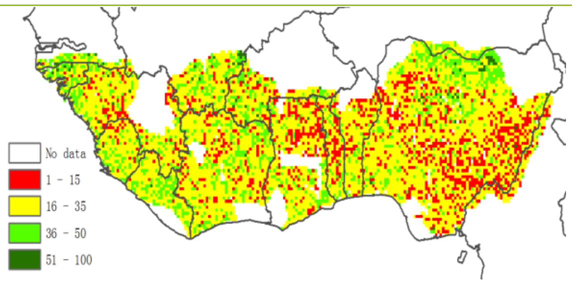
d. Profiles of temperature departure from average (mm)

e. Maximum VCI

f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

Note: For more information about the indicators, see Annex C.

2.3 North America

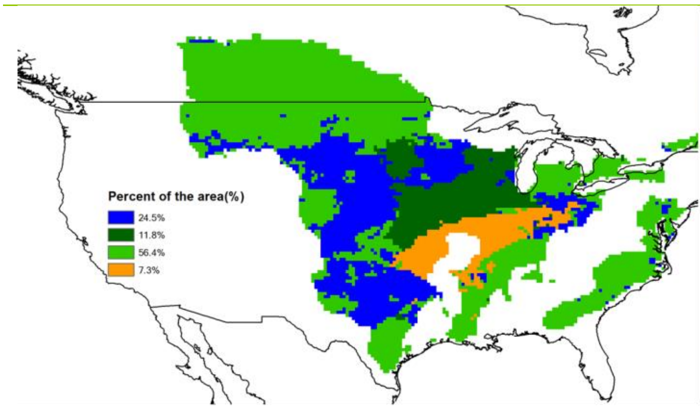
This monitoring period covers the harvesting season of winter crops and the growing season of summer crops.

The agroclimatic indicators show that rainfall (RAIN) was 21% above average, temperature (TEMP) was down by 0.2°C, while PAR (RADPAR) was 2% below average. Abundant rainfall fell over the major crop production zones, including the Northern Great Plains (RAIN, +20%), Corn Belt (+13%), and Cotton Belt to Mexican Nordeste (+20%), which would replenish soil moisture for the growth of crops. Unfavorable agroclimatic conditions were recorded in wheat production zones, with some major spring wheat areas suffering drought (including Manitoba (RAIN, -25%), Saskatchewan (-24%), North Dakota (-21%), Montana (-10%), and Oregon (-25%)), and some winter wheat states in the United States suffering flooding, especially in Oklahoma (+51%). Abundant rainfall is also confirmed by the spatial rainfall clusters in parts of Oklahoma, Missouri, and Indiana (abnormally heavy rain in late April). At the beginning of June, the western Corn Belt and some winter wheat zones suffered heavy rainfall again, while in the northern Plains and Canadian Prairie, rainfall was consistently below average. Unfortunately, the northern Plains and Canadian Prairie also suffered very high temperature (+4°C to 4.5°C) in late April, May, and June, which accelerated the loss of soil moisture.

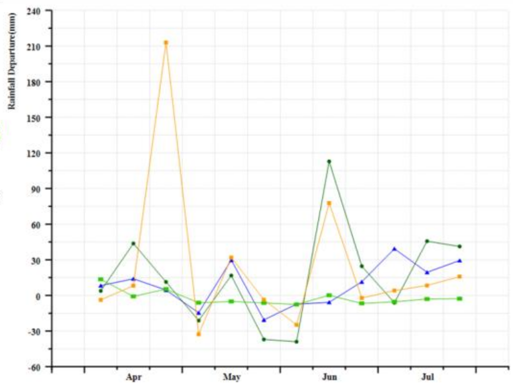
Unfavorable crop condition is confirmed by BIOMSS values of 20% below the recent average of the biomass production potential in the north of North Dakota and south of Canadian Prairie, indicating drought, which also was confirmed by the VHIn map. Agronomic indices also indicate depressed crop condition in wheat zones, especially in the north of North Dakota and Montana, as well as in the southern part of Saskatchewan in Canada where the value of VCIx was below 0.5. Agronomic indices including an unchanged cropped arable land fraction (0%) and BIOMSS (+7%) were normal in remaining areas.

In general, crop condition is below average in the North American MPZ.

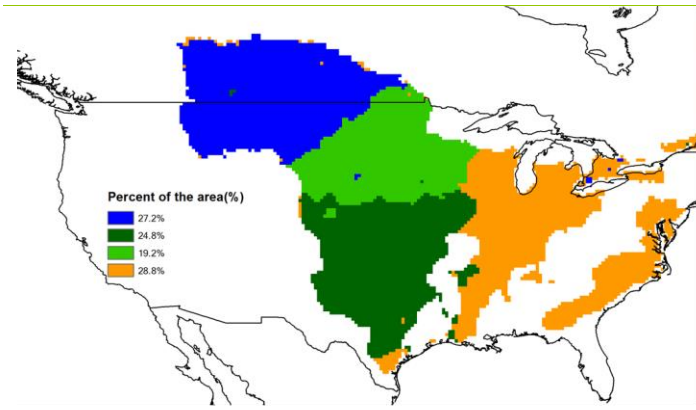
Figure 2.2. North America MPZ: Agroclimatic and agronomic indicators, April-July 2017



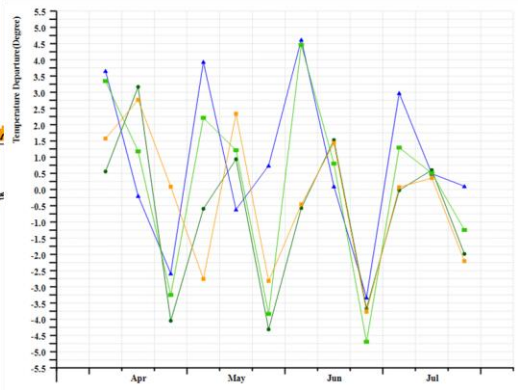
a. Spatial distribution of rainfall profiles



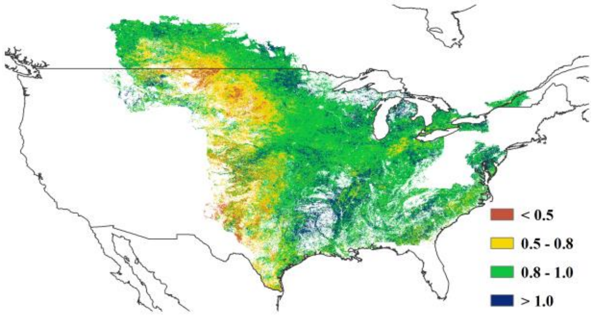
b. Profiles of rainfall departure from average (mm)



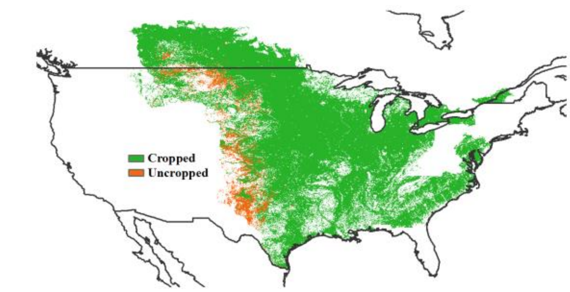
c. Spatial distribution of temperature profiles



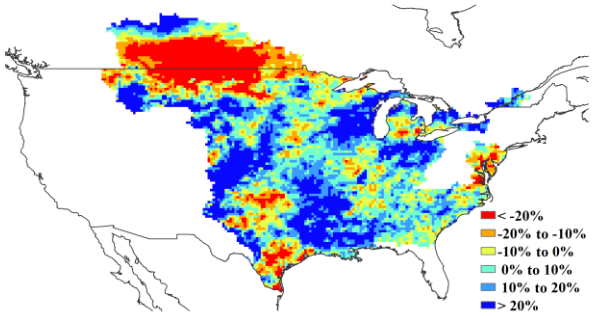
d. Profiles of temperature departure from average (mm)



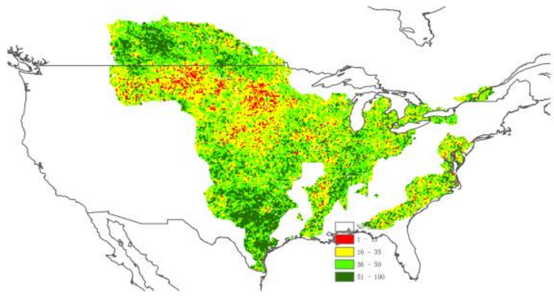
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

Note: For more information about the indicators, see Annex C.

2.4 South America

In Argentina and Uruguay, most winter crops were planted and most of the late maize was harvested over the reporting period; soybean and maize fields are in their fallow periods. In the south of Brazil, the second maize crop is growing, while most of the main maize crop has been harvested and most wheat was planted.

For the whole MPZ, rainfall (RAIN) showed a 13% increment, while radiation (RADPAR) was 4% below average and temperature was average (TEMP, 0.1°C). Temperature was above average during the last two months in the southern half of the region, probably promoting wheat growth during the winter. Precipitation is showing a continuity of data below average (a pre-condition for dryness) at the end of this period in the center and south of Brazil's main cropping areas. Precipitation in the south of Brazil was above average during May, which reduces the dry condition for this area that would otherwise be expected for the end of this reporting period.

BIOMSS for the MPZ showed an increment of less than 1% compared to its five-year average for the zone at this time of year. This indicator is showing positive departures in the south (most of Argentina), probably associated with the high temperatures observed for that area and the lack of precipitation anomalies. At the same time, lower than normal precipitation could be the cause of lower BIOMSS values in Brazil.

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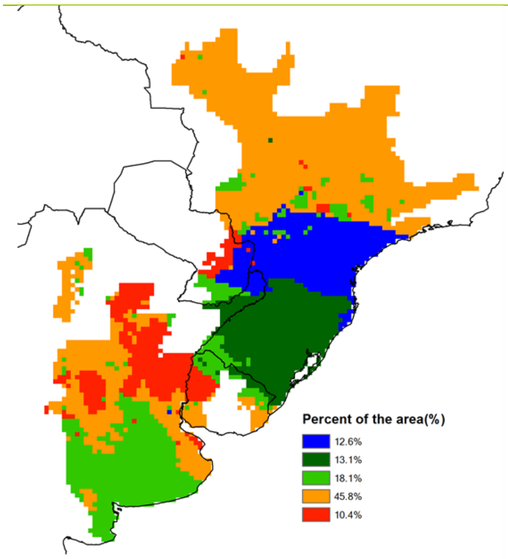
Arable land is cropped over most of the MPZ with 1% increase compared to the five year average of the Cropped Arable Land Fraction (CALF). An exception to this occurs in the central Pampas, where water logged soil may subsist locally due to the high rains from last season.

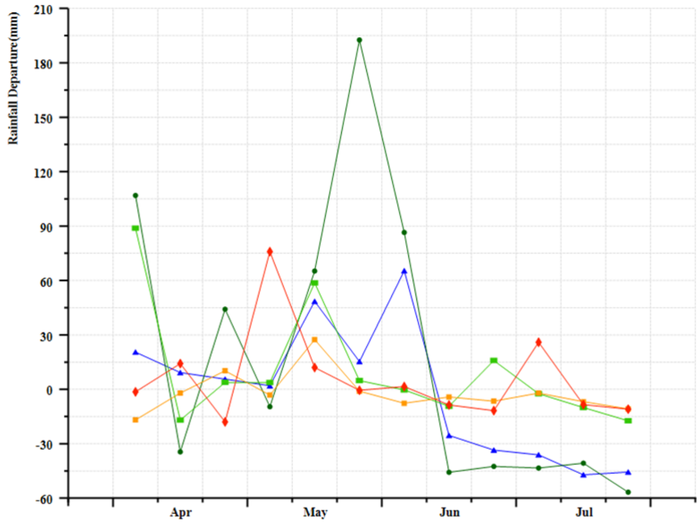
Over the reporting period, soybean--the main crop in the region--is not present in the field; changes in VCIx could reflect both the condition of the present crop (that is, wheat in Argentina and Uruguay and maize in Brazil) and changes in planted area with respect to average years. South of Buenos Aires province, the main wheat production area shows high VCIx values, which can be more accurately associated with good crop condition.

Low VHIn values in the central Pampas and the south of Brazil could result from the high temperatures observed there and are not necessarily associated with poor growing conditions as they are occurring in winter.

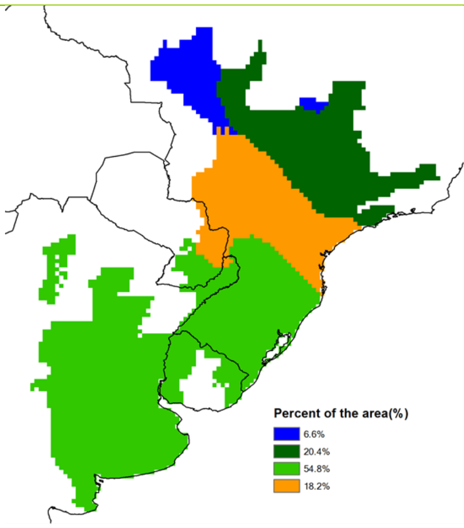
Figure 2.3. South America MPZ: Agroclimatic and agronomic indicators, April-July 2017



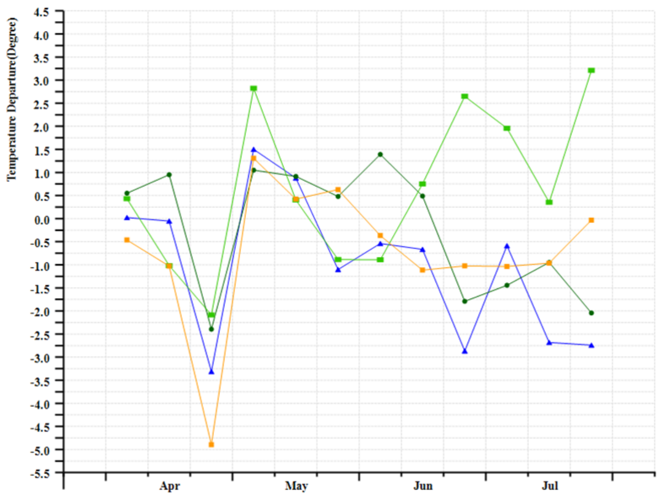
a. Spatial distribution of rainfall profiles



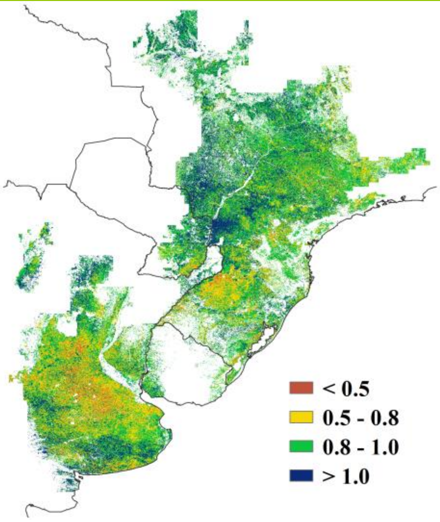
b. Profiles of rainfall departure from average (mm)



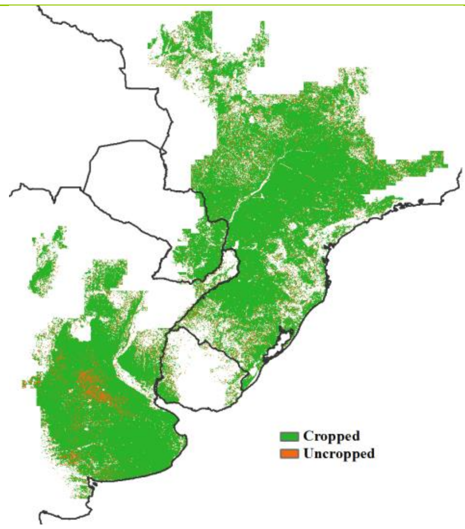
c. Spatial distribution of temperature profiles



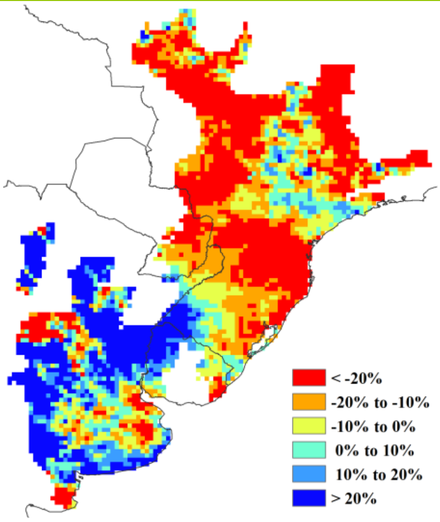
d. Profiles of temperature departure from average (mm)



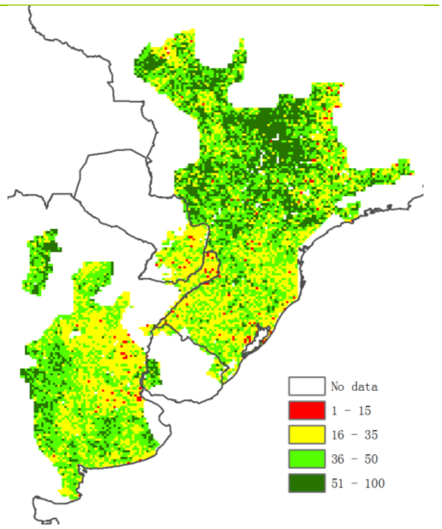
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

Note: For more information about the indicators, see Annex C.

2.5 South and Southeast Asia

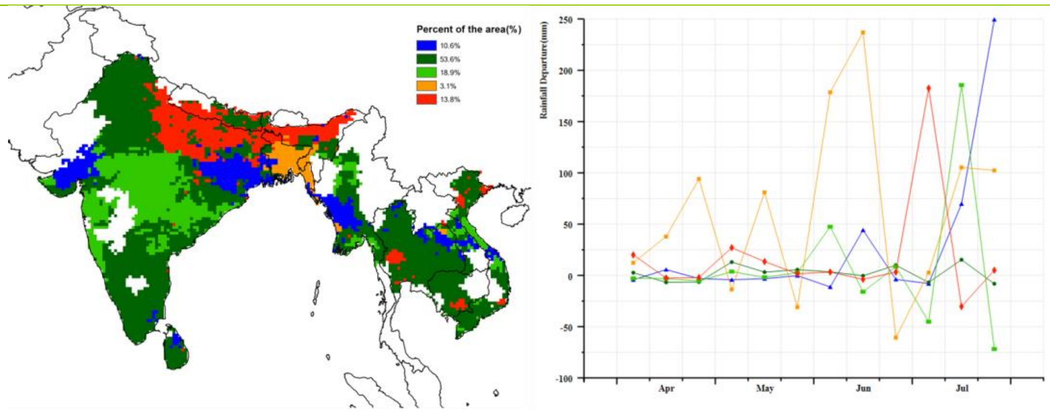
The reporting period covers a variety of phenological situations in the region, listed here by country. Bangladesh: Aman rice planting, Aus rice planting and harvesting, and Boro rice harvesting; Cambodia: maize planting, dry season rice harvesting, and wet season rice planting; India: planting of Kharif rice, maize, and soybean, as well as harvesting of Rabi rice and wheat; Myanmar and Nepal: planting of rice and maize and harvesting for wheat; Thailand: planting as well as harvesting of rice and maize crops; and Vietnam: rice planting as well as harvesting, which continues here almost year-round.

Overall, the South and Southeast Asia MPZ received about 17% above average rainfall (RAIN), nearly average temperature (TEMP, -0.6°C) and nearly normal radiation (RADPAR, -2%). All countries recorded above average precipitation: Bangladesh RAIN +46%, India +17%, Thailand +16%, Vietnam +12%, Laos +9%, Cambodia +7%, Nepal +6%, and Myanmar +3%. Particularly in June and July the weather was cooler than normal in all countries in the zone. RADPAR was low in Bangladesh (-7%) and Vietnam (-6%), for other countries in this region it was within 5% of average. With mostly favorable agroclimatic condition, the prevailing biomass accumulation potential BIOMSS was above average for most countries (Bangladesh (+15%), India (+8%), Thailand (+6%), Cambodia (+3%), Nepal (+3%), and Vietnam (+1%)), with the exception of Laos (-2%) and Myanmar (-3%).

Among the agronomic indicators, the VCIx value was generally favorable at about 0.8 and above across the region, except in India where it displays mixed patterns. The Cropped Arable Land Fraction (CALF) indicates that most countries other than India and Myanmar have almost fully cropped their arable land. Uncropped arable land occurs in central Myanmar and especially in India where central, western, and southern areas are affected. The pattern is mostly confirmed by the BIOMSS indicator, which shows also some low values in Thailand. Favorable BIOMSS departures are observed in east, west, and parts of south India, Bangladesh, most of Thailand, and in Vietnam except in the north. Cambodia shows a mixed pattern of high and low biomass potential as well. Crop stress as indicated by VHI was confined to peninsular India and south Myanmar, and only sporadically in other countries.

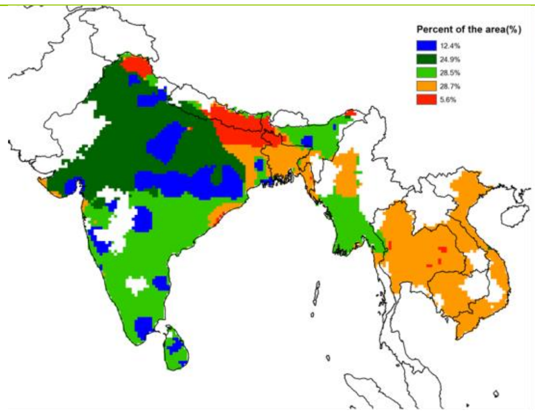
The overall situation in the MPZ was good. Because the reporting period covered mostly planting and crop growth periods, the weather in the coming months will be important.

Figure 2.4. South and Southeast Asia MPZ: Agroclimatic and agronomic indicators, April-July 2017

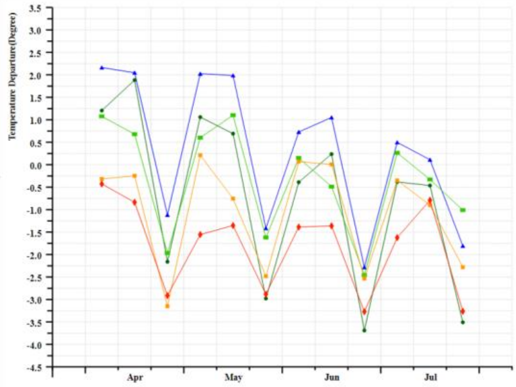


a. Spatial distribution of rainfall profiles

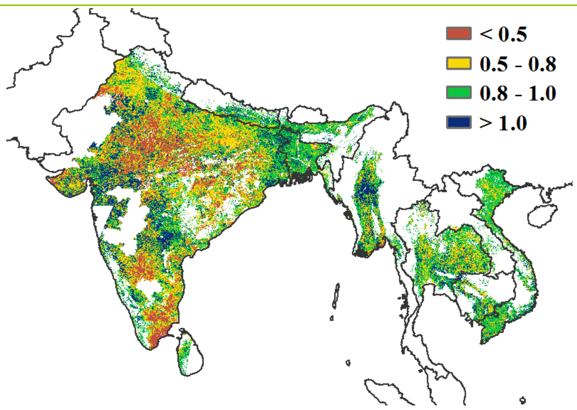
b. Profiles of rainfall departure from average (mm)



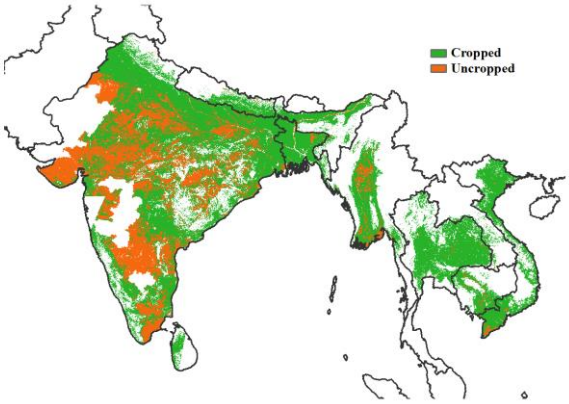
c. Spatial distribution of temperature profiles



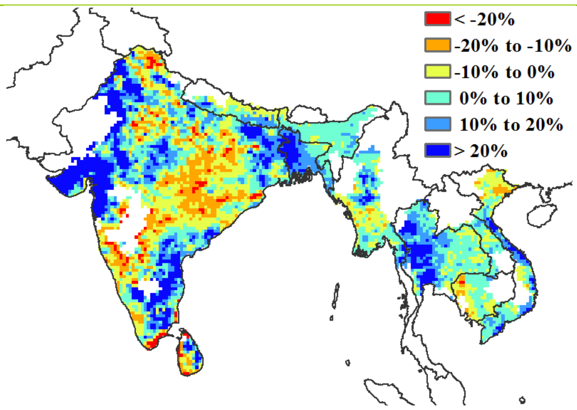
d. Profiles of temperature departure from average (mm)



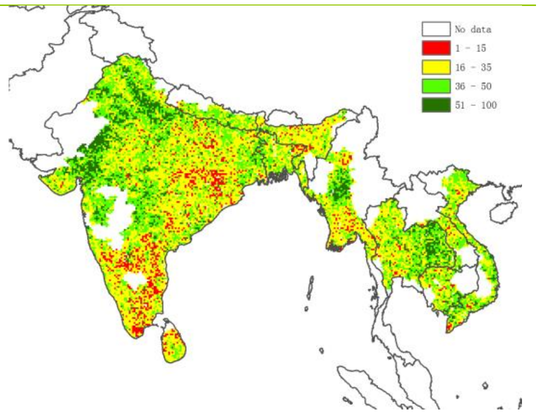
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

Note: For more information about the indicators, see Annex C.

2.6 Western Europe

In general, crop condition was above average in most parts of the continental Western European MPZ during this reporting period, favoring winter crop grain filling and harvesting, as well as growth of spring crops. The figures present an overview of CropWatch agroclimatic and agronomic indicators for this MPZ.

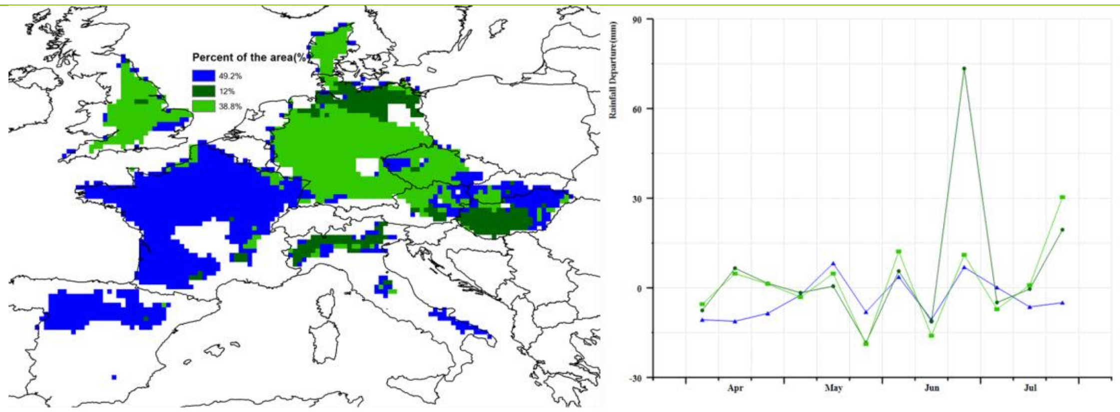
The agroclimatic indicators show that total rainfall was 5% below average over the region, resulting from marked negative departures in Spain, most of France, central and east Italy, central and east Slovakia, north Hungary, northeast Austria, and the west and east of the Czech Republic. The most severely affected three countries were Spain (RAIN, -29%), Italy (-26%), and France (-23%). Exceptional positive departures, however, were recorded (i) from mid-April to late April, mid-May, early and late June, and after mid-July over most of Germany, England, Denmark, most of the Czech Republic, northwest Austria, the southwest of Slovakia, and southern Hungary and (ii) in mid-May and early and late June in Spain, most of France, and in the center and east of Italy. Abundant precipitation was recorded in northern Germany, southern Hungary, the middle England, and in northeast Austria from mid-June to early-July. More rain is needed in some Western European countries for summer crops. Radiation for the MPZ as a whole was slightly below average with RADPAR at -1%.

Temperature for the MPZ as a whole was above average (+0.8°C); below average temperatures were observed from mid-April to early May in most of Italy, northern England, southwest and west France, and in northern Denmark. Low minimum temperatures that set in after mid-April are likely to have affected flowering rapeseed in eastern France, western and southern Germany, the Czech Republic, Slovakia, Austria, and Hungary. Unusually cold conditions occurred in large parts of western, central, and northern Europe, affecting rapeseed flowering in Germany and Central Europe in May. A less severe cold spell occurred at the beginning of May, mainly affecting the Czech Republic and Slovakia. Warmer-than-usual weather conditions prevailed in the Iberian Peninsula, France, southeastern England, and Italy. An extreme heat spell affected the Iberian Peninsula, Italy, and southern Hungary at the beginning of June.

Due to hot (especially after mid-May) and dry weather conditions, the biomass accumulation potential BIOMSS was 3% below the recent five-year average. The lowest BIOMSS values (-20% and less) occurred in France, the United Kingdom, Spain, Italy, southwest Germany, the south of Hungary, southern Czech Republic, and northwest Austria. In contrast, BIOMSS was above average (sometimes exceeding a 10% departure) in the north of Germany and the north of the Czech Republic, south Slovakia, and the north of Hungary. The average maximum VCI for the MPZ reached a value of 0.90 during this reporting period, indicating favorable crop condition. More than 96% of arable lands were cropped, which is the same as the recent five-year average. Most uncropped arable land is concentrated in Spain and southeast Italy.

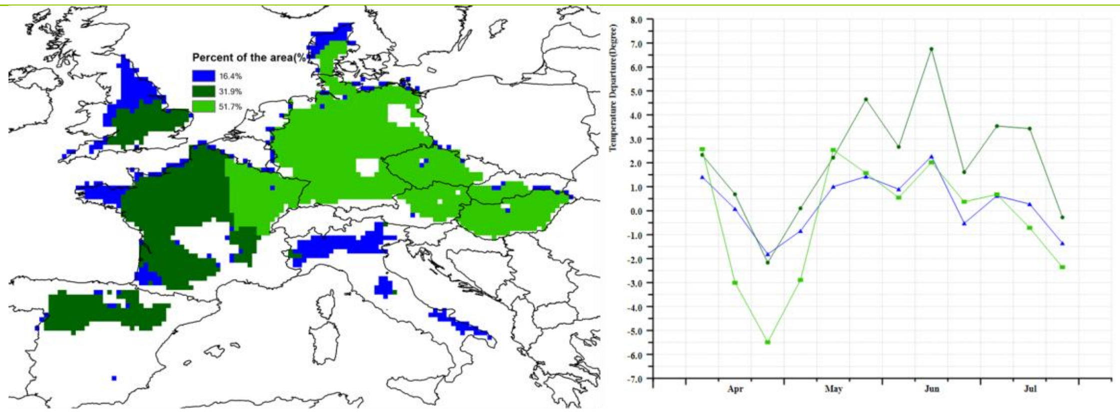
Generally, crop condition in the Western Europe MPZ was mixed: just fair in the west and favorable in the east. More rain is needed in summer crop production areas to sustain good yields.

Figure 2.5. Western Europe MPZ: Agroclimatic and agronomic indicators, April-July 2017



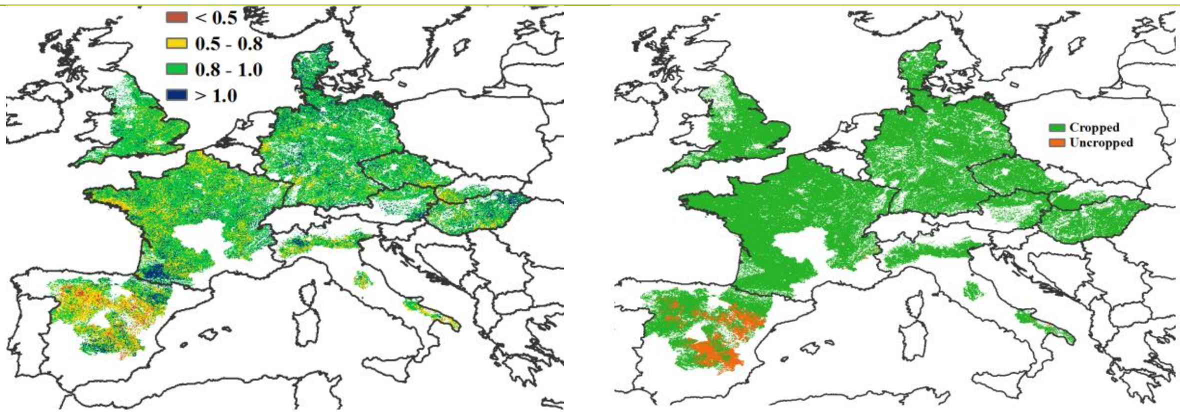
a. Spatial distribution of rainfall profiles

b. Profiles of rainfall departure from average (mm)



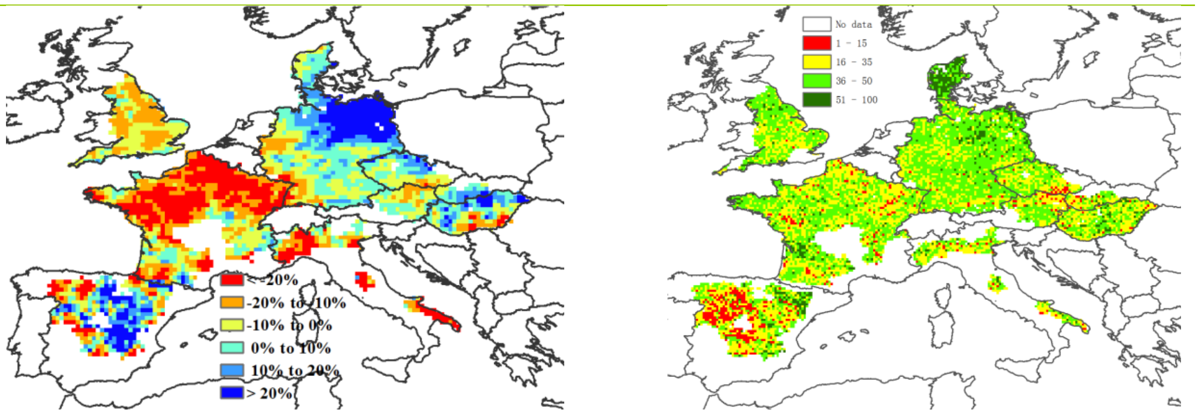
c. Spatial distribution of temperature profiles

d. Profiles of temperature departure from average (mm)



e. Maximum VCI

f. Cropped arable land



g. Biomass accumulation potential departure

h. VHI minimum

Note: For more information about the indicators, see Annex C.

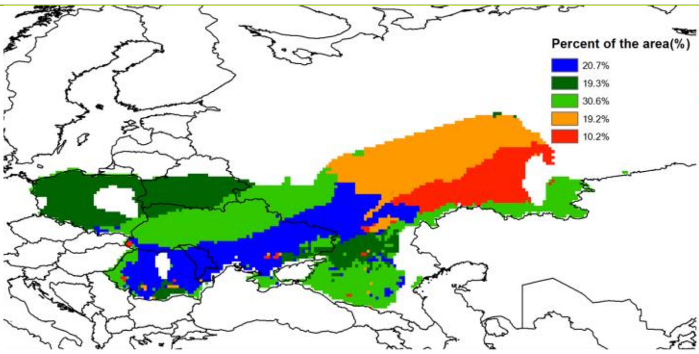
2.7 Central Europe to Western Russia

During the current monitoring period, most parts of the Central Europe to Western Russia MPZ presented favorable conditions of winter and summer crop (average VCIx=0.96). The whole MPZ experienced colder (TEMP 1.8°C below average), wetter (RAIN, +17%) and less sunny (RADPAR, -5%) than average weather. This provided good soil moisture but slowed down crop growth.

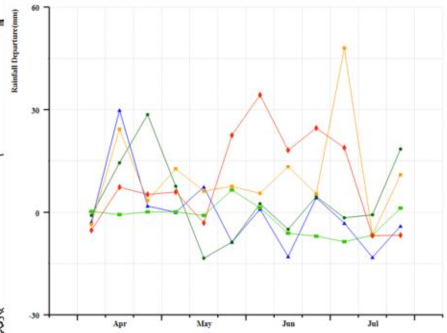
As indicated by the temperature profiles, lowest temperatures (5.5°C below average in May) affected especially the east part of the MPZ, which is west and south Russia. In Belarus and Poland, temperature dropped rapidly from early April (with more than 5°C below average at the end of the month), but then recovered to average in June. Rainfall profiles show that most parts of western Russia (accounting for most arable land in this area, including the Oblasts of Sverdlovskaya, Permskaya, Kirovskaya and the Bashkortostan Republic) received well above average rainfall from April to mid-July, with almost 45% above average rainfall in early July. In Belarus, Poland, Romania, and southern Ukraine, which together make up almost 40% of the MPZ, rainfall decreased from early May and stayed at an average or slightly below average level from May to June.

Almost all of the arable land was actually cropped during the reporting period (with a CALF of +1 % over average). Due to the favorable moisture condition across the entire MPZ, the accumulated potential biomass (BIOMSS) is much above the five-year average (BIOMSS, +15%). However, most of Ukraine and Timis in Romania showed a drop (more than 20%) in BIOMSS, which is consistent with low VHIn values in central Ukraine. Most areas of the MPZ show maximum VCI values above 1, except Ukraine. Overall, with most parts indicating above average crop conditions and favorable agroclimatic factors, prospects for crop production are promising in Central Europe to Western Russia.

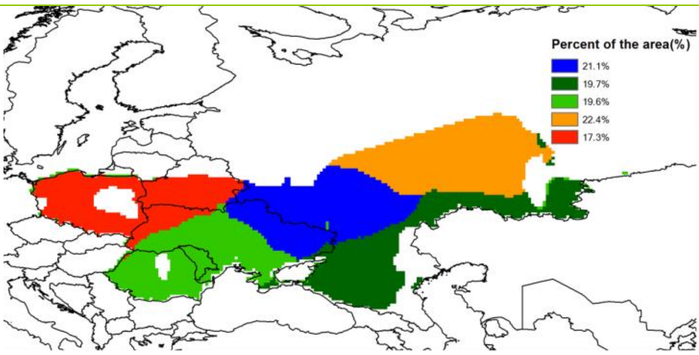
Figure 2.6. Central Europe-Western Russia MPZ: Agroclimatic and agronomic indicators, April-July 2017



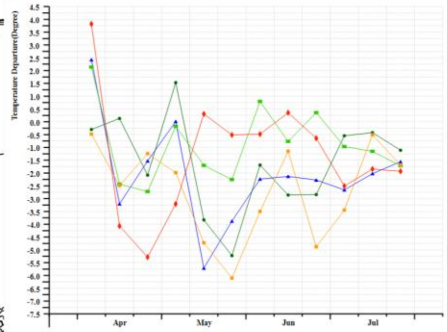
a. Spatial distribution of rainfall profiles



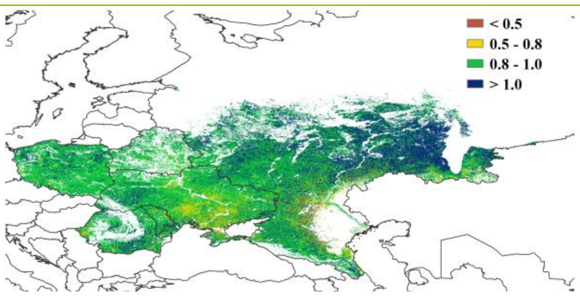
b. Profiles of rainfall departure from average (mm)



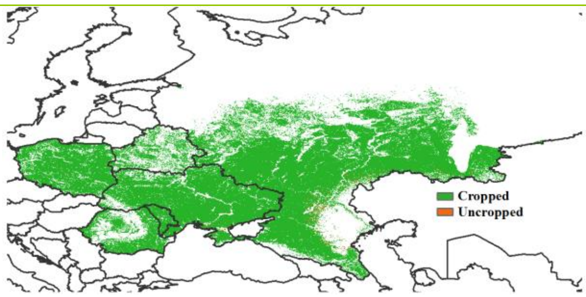
c. Spatial distribution of temperature profiles



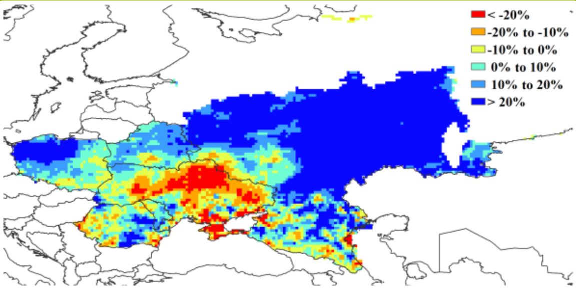
d. Profiles of temperature departure from average (mm)



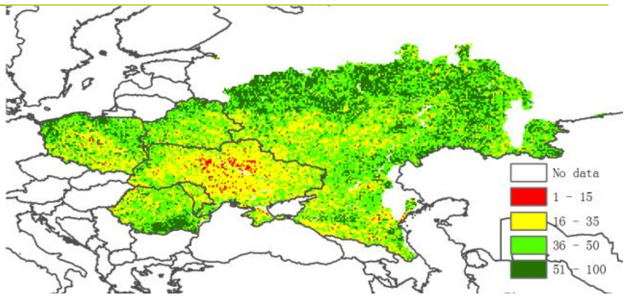
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

Note: For more information about the indicators, see Annex C.