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 http://www.cropwatch.com.cn/htm/en/bullAction!showBulletin.action#.

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. October 2018 to January 2019 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	264	10	26.9	-0.3	1250	2
North America	421	41	4.6	-0.6	495	-8
South America	725	2	23.7	-0.5	1358	1
S. and SE Asia	176	-20	22.8	0.1	1044	2
Western Europe	266	-3	6.5	-0.5	316	4
C. Europe and W. Russia	254	-2	-0.4	-0.3	241	6

*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 (October-January) for 2004-2018.*

Table 2.2. October 2018 to January 2019 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	654	6	94	1	0.94
North America	839	8	62	-9	0.81
South America	1803	2	100	3	0.75
S. and SE Asia	453	-8	95	1	0.86
Western Europe	917	3	90	0	0.86
Central Europe and W Russia	685	2	71	-2	0.79

Note: See note for table 2.1, with reference value R defined as the five-year average (5YA) for the same period (October-January) for 2014-2018.

2.2 West Africa

The agro-climatic indicators for West Africa show slightly above average conditions for the MPZ in general.

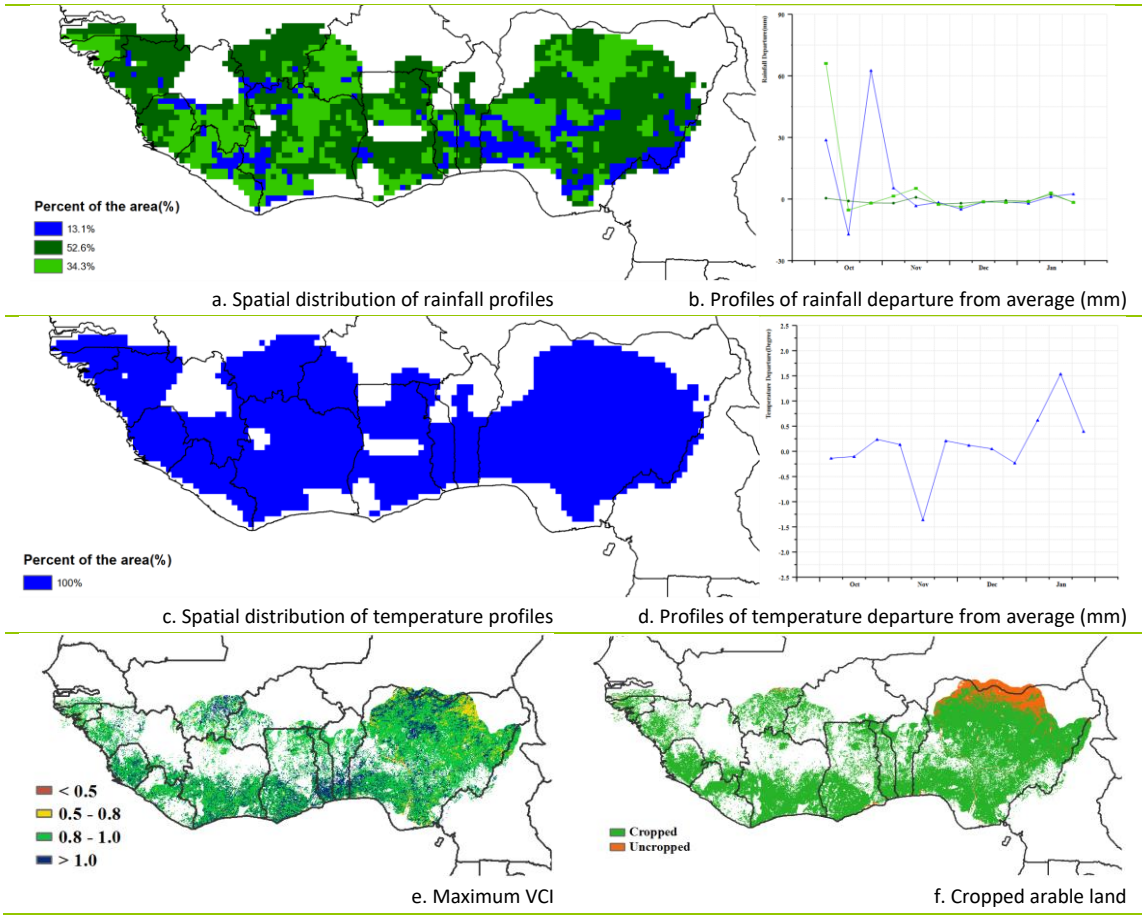
Rainfall was above average (264 mm, with a 10% positive departure) due to a large excess mostly occurring at the beginning of the monitoring period (October) in 47.4% of cropland, well distributed over the MPZ. Remaining areas had average rainfall throughout. Both temperature and sunshine were close to average (average TEMP of 26.9°C, a departure of -0.3°C and average RADPAR of 1249.7 MJ, was slightly above average by 1.8 %).

The resulting accumulated biomass potential is up (BIOMSS +6%). Nigeria experienced positive departure (>20%) mostly from the central to northern regions, while western coastal areas (Gambia, Guinea Bissau, Guinea, Sierra Leone and Liberia) experienced negative BIOMSS departures.

The MPZ showed a marginal increase in cultivated area (CALF: 94%, +1% above average) and a high VCIx (0.94), which indicates good yields except for northern parts of Côte d'Ivoire, Ghana, Guinea and Benin.

Overall, the CropWatch indicators describe favorable crop condition in most parts of the region.

Figure 2.1. West Africa MPZ: Agroclimatic and agronomic indicators, October 2018 to January 2019.



a. Spatial distribution of rainfall profiles

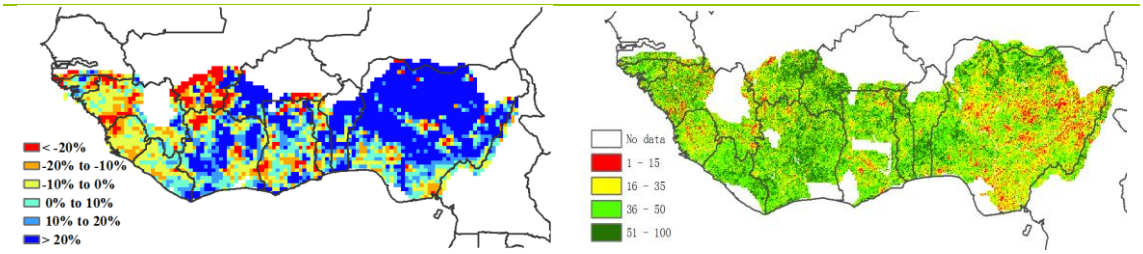
b. Profiles of rainfall departure from average (mm)

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

Only winter wheat is cultivated during the monitoring period in the North American MPZ.

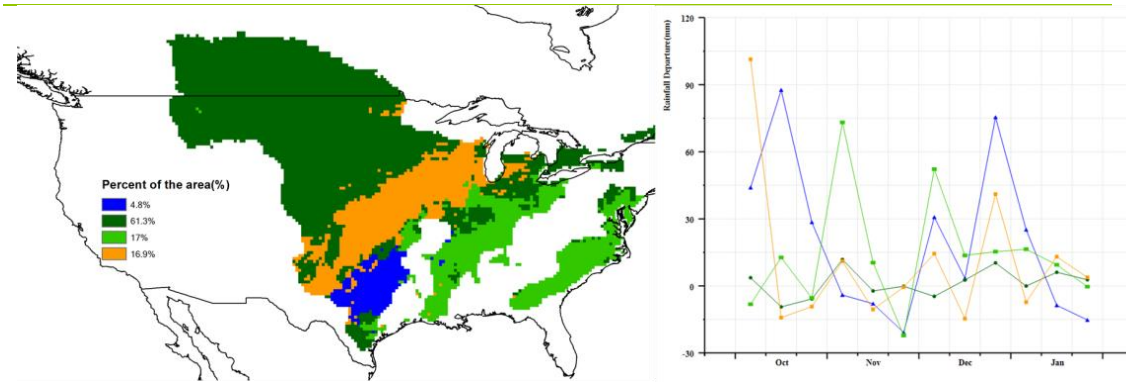
Weather was mostly humid, cold and cloudy. Precipitation was significant above average (up 41%), while TEMP was down just below by 0.6°C; sunshine, however, fell as much as 8%. Two cold waves occurred in the region, one in November and another at the end of January.

The Northern Great Plains, the most important winter wheat zone experienced as well excessive precipitation (RAIN +25%), low temperature (TEMP departure of -0.4°C) and cloudy conditions (RADPAR -6%). In the Corn Belt and the Cotton Belt to Mexican Nordeste, the precipitation anomaly reached 36% and 54%, respectively, providing ample soil moisture for the sowing of summer crops.

The potential biomass was close to the average of the last five years. The cropped arable land fraction is down 9% below the average value of the previous five years. In the southern Great Plains, potential biomass was favorable (BIOMSS departure larger than +20%) and VCIx above 1.0 indicates very favorable crop condition, especially in Texas.

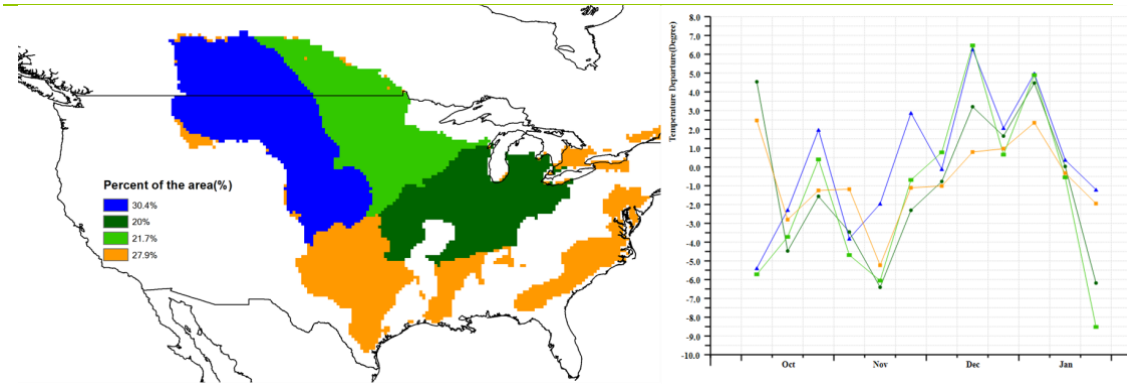
Altogether, CropWatch assesses the situation in North America as average.

Figure 2.2. North America MPZ: Agroclimatic and agronomic indicators, October 2018 to January 2019.

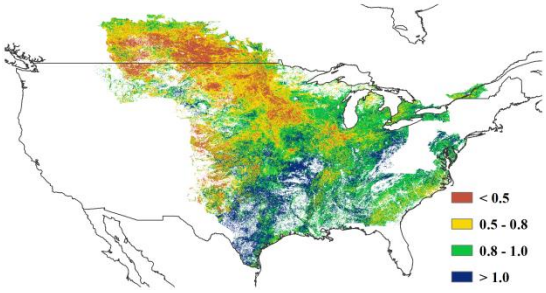


a. Spatial distribution of rainfall profiles

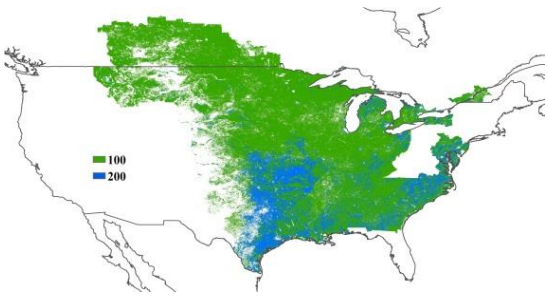
b. Profiles of rainfall departure from average (mm)



c. Spatial distribution of temperature profiles

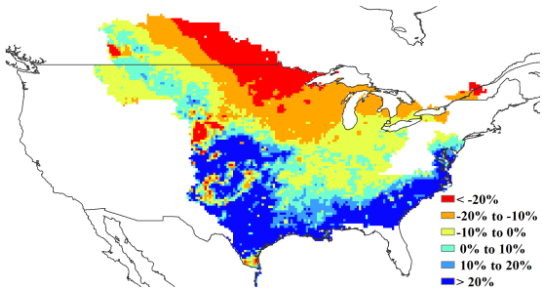


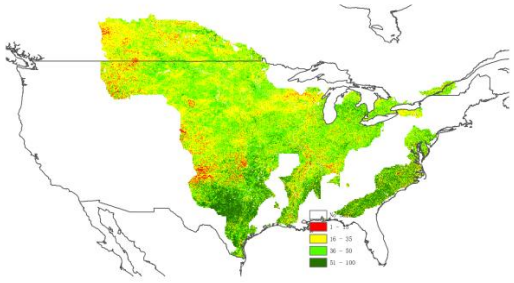
d. Profiles of temperature departure from average (mm)



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

The monitoring period covers the main growing season in the MPZ: the harvest of winter crops and the sowing and early growth stages of summer crops.

Although the region recorded close to average rainfall (+2% above average), large spatial and temporal variations were observed. Large precipitation excess affected Central and north-eastern Argentina, Uruguay and the South of Brazil (Figures 2.3.a and 2.3.b).

TEMP was about normal (a slight drop of 0.5 °C below average). The southern areas of the region including Argentina and southernmost Brazil experienced fluctuations from positive to negative while the North showed more stable patterns with some negative anomalies values in the Northwest and positive anomalies elsewhere(Figure 2.3.c and 2.3.d).

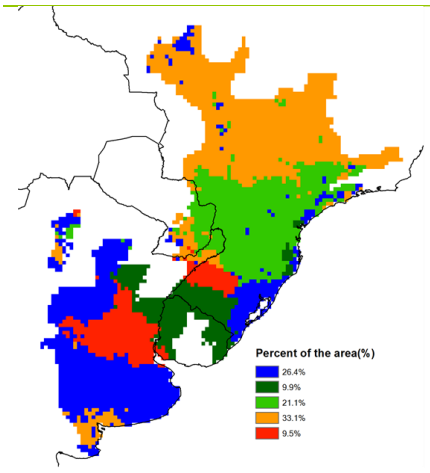
Sunshine was close to average (RADPAR anomaly +1%).

BIOMSS showed on average a slight increment of 2 % compared with the recent average. The largest positive anomalies occurred in Central Pampas and negative ones affected mainly Mato Grosso Do Sul, Parana and Sao Paulo in Brazil.

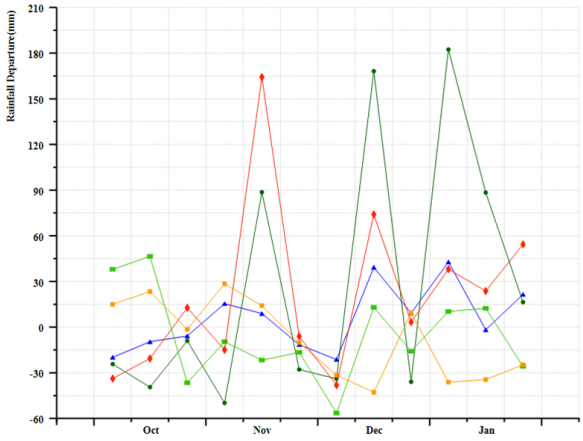
Almost all cropland was cultivated according to the Cropped Arable Land Fraction value of 100%, showing a 3 % increment compared to 5 years average. VCIx shows an average value of 0.75 for the whole MPZ but values higher than 0.8 are widespread. VHIn map shows in general good conditions too (values higher than 35%). In particular, very low values of VHIn were only observed for Central western Pampas, and scattered pixels in the Argentinian Chaco, Brazil and Paraguay.

Overall crop condition was average in the South-American MPZ.

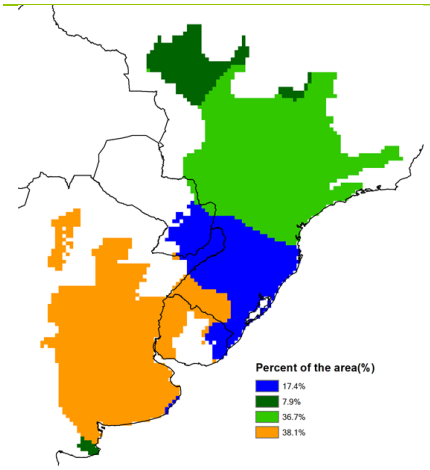
Figure 2.3. South America MPZ: Agroclimatic and agronomic indicators, October 2018 to January 2019.



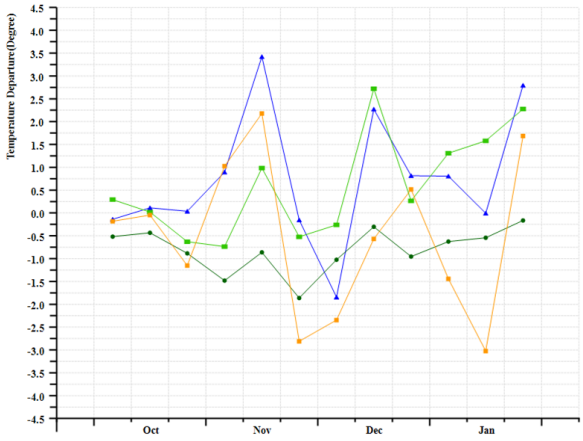
a. Spatial distribution of rainfall profiles



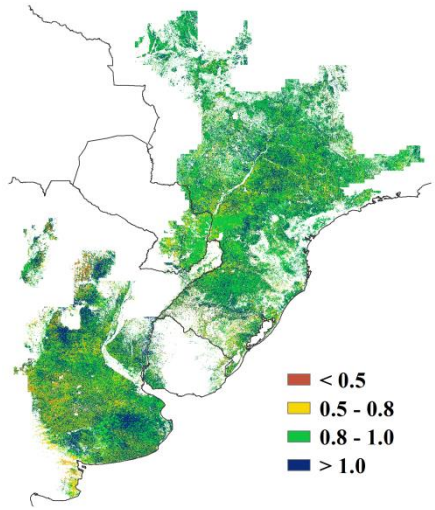
b. Profiles of rainfall departure from average (mm)



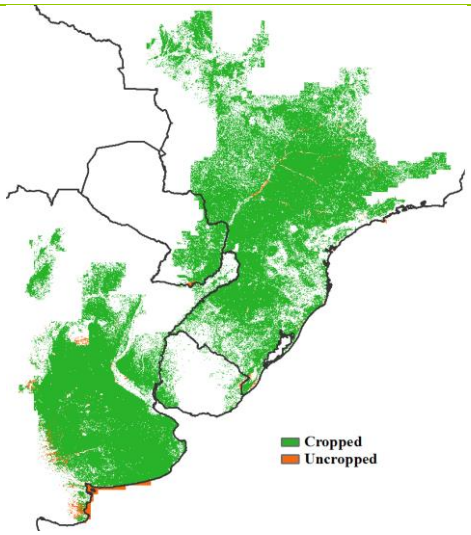
c. Spatial distribution of temperature profiles



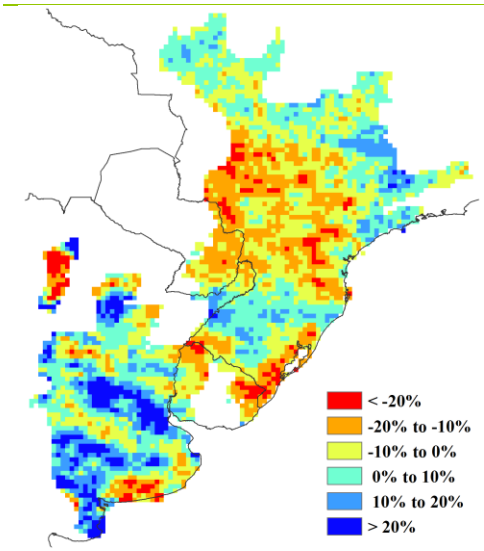
d. Profiles of temperature departure from average (mm)



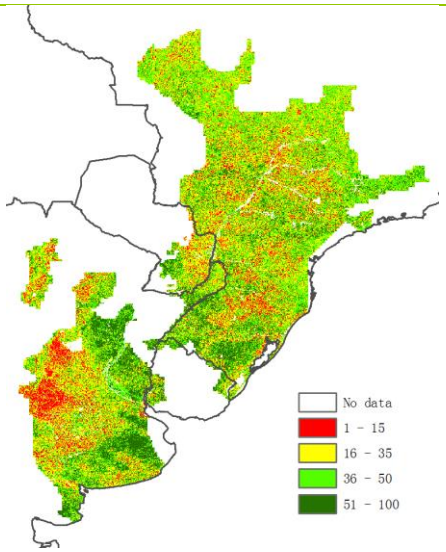
e. Maximum VCI



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

Satisfactory crop condition prevailed over the South and Southeast Asian MPZ during the monitoring period with the maximum Vegetation Condition Index (VCIx) reaching 0.86, even if the biomass production potential (BIOMSS) was 8% lower than the 5-year average. The fraction of cropped arable land (CALF) was average. Most uncropped arable land occurs in India. RAIN was well below average (-20%) but both temperature and photosynthetically active radiation were slightly above average (TEMP +0.1°C, RADPAR +2%).

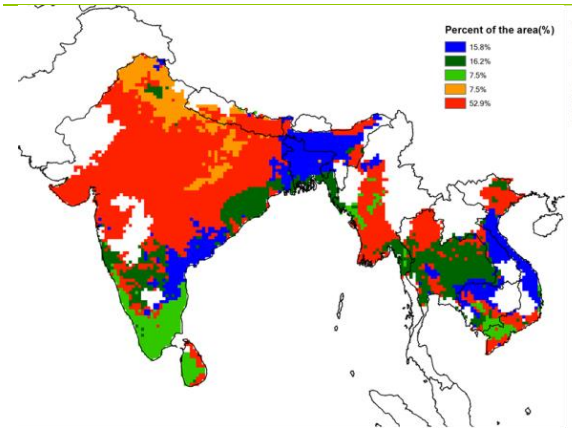
Some national RADPAR values had significant positive anomalies as for instance in the Philippines (+7%) and Cambodia (+6%). Myanmar recorded a slight negative anomaly (RADPAR -1%). Other countries recorded positive values but close to average. TEMP stayed close to average; Sri Lanka and Indonesia recorded negative departures (-0.6°C and -0.4°C respectively), while Vietnam and Thailand were both slightly warmer (0.5°C) than the average. The largest anomalies occurred at the beginning of the reporting in central India (close to +3°C anomaly in and around Madhya Pradesh, about +2.5°C anomaly in and East of Thailand). Close to average temperature prevailed throughout the monitoring period from western Myanmar across Bangladesh to most of northern India.

For RAIN, the largest anomalies were those of Nepal (-48%), Bangladesh (-38%), India (-35%) and the Philippines (-25%) as well as Myanmar where excess precipitation was recorded (+22%). Most anomalies occurred at the beginning of the reporting period in October, with the largest excesses in southern India, Sri Lanka and the Mekong Delta area, and deficits in coastal Andhra Pradesh, Bangladesh and central Vietnam.

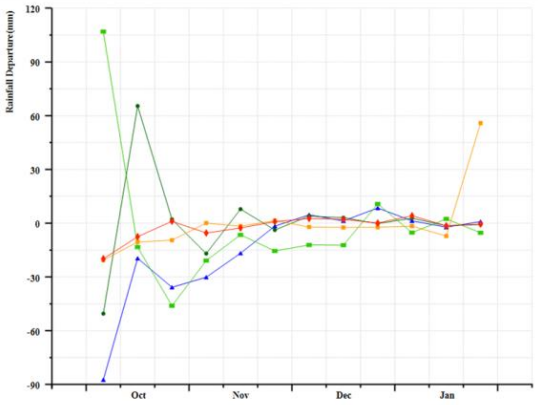
As a reflection of the agro-climatic conditions during the reporting period, the biomass accumulation potential fell below the reference of the 5YA. The largest BIOMSS departures are those in India (-24%), Philippines (-18%), Bangladesh (-18%), Myanmar (+24%), Vietnam (+23%) and Thailand (+20%).

Low values of VHI minimum were recorded mainly in India, Cambodia, Thailand, and Myanmar. Maximum VCI appeared mainly in India and Thailand.

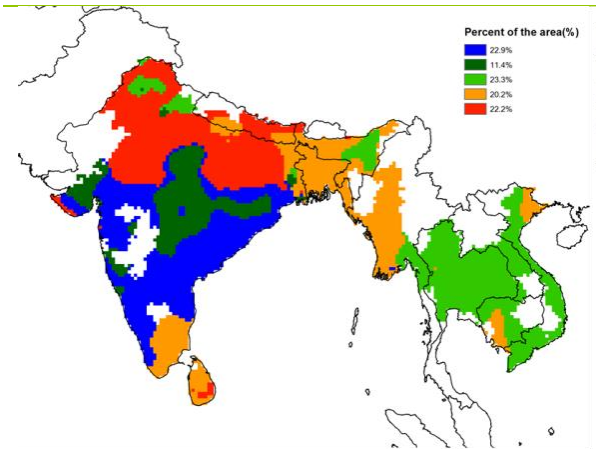
Figure 2.4. South and Southeast Asia MPZ: Agroclimatic and agronomic indicators, October 2018 to January 2019



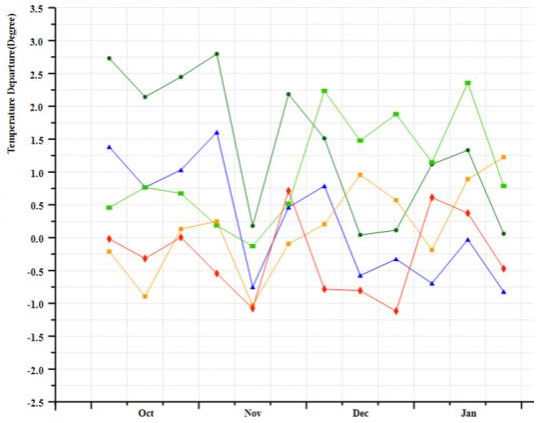
a. Spatial distribution of rainfall profiles



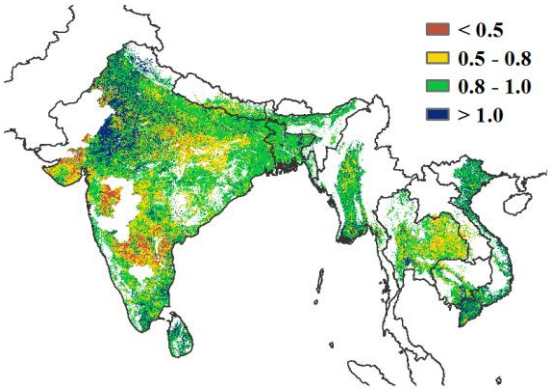
b. Profiles of rainfall departure from average (mm)



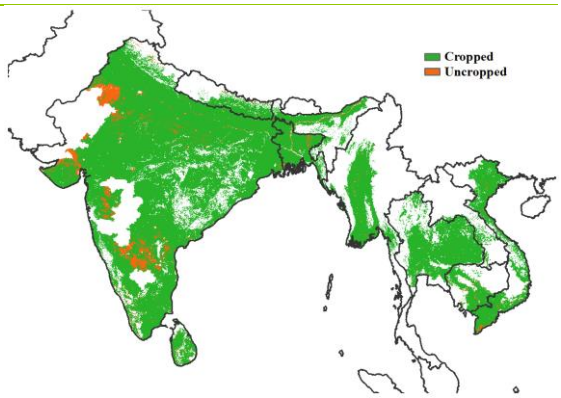
c. Spatial distribution of temperature profiles



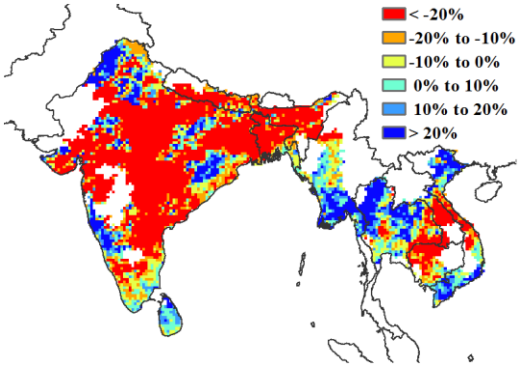
d. Profiles of temperature departure from average (mm)



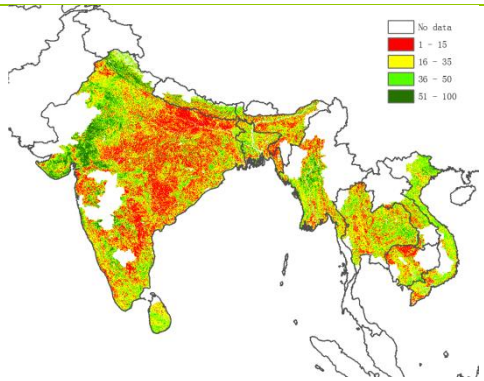
e. Maximum VCI



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

Crop condition was generally above average in most parts of the continental Western European MPZ during this reporting period. The harvest of summer crops was completed, and winter crops were planted and reached over-wintering stages.

The agroclimatic indicators show that total rainfall across the MPZ (as measured by the RAIN indicator) was 3% below average, resulting from marked negative departures in (1) large parts of Germany, Czech Republic, Slovakia, Austria, Hungary, south of Denmark, Northern and northeastern France from early to mid-October, November, mid-December and after mid-January. The negative departures also cover (2) most of Spain, United Kingdom, north of Denmark, West, South and Southeast of France, central and southeastern Italy in early October, mid-November, after late-December, and (3) north of Italy from early to mid-October, mid-November to early December and after late December. The most severely affected countries were Denmark (RAIN -30%) and United Kingdom (RAIN -13%).Substantially drier than usual conditions in large parts of Western Europe hampered the sowing and emergence of winter crops. However, in northern Italy, the persistent wet weather continued from mid-October to early November and delayed field operations. More rain is needed in the coming months to raise soil moisture levels, and create favorable conditions for the growth of winter crops.

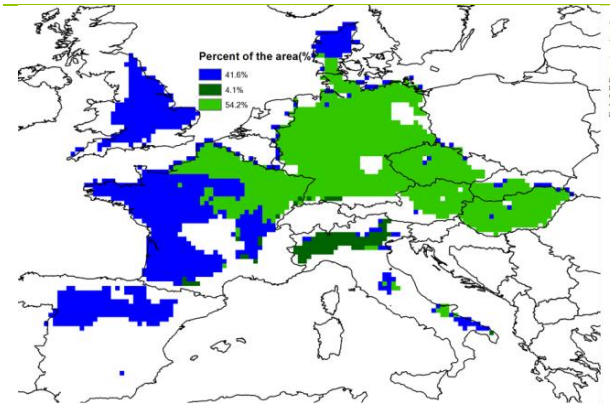
Temperature (TEMP) for the MPZ as a whole was below average (-0.5°C), but radiation was well above average with RADPAR at +4%.Below average temperatures were only observed (1) in the United Kingdom, Spain, France, south of Germany from late October to mid-November and after January; (2) most of Germany and Denmark in late October, late November, mid-December and after late January; (3) Italy, Czech Republic, Slovakia, Austria and Hungary in late November, mid-December and after early January. Sources indicate that no damaging frost has appeared so far.

The biomass accumulation potential was 3% above the recent five-year average. The lowest BIOMSS values (-20% and less) occurred in most of central France and Spain. In contrast, BIOMSS was above average (sometimes exceeding a 10% departure) over western and south-western France, eastern of Spain, eastern Hungary, northern and south-eastern Italy.

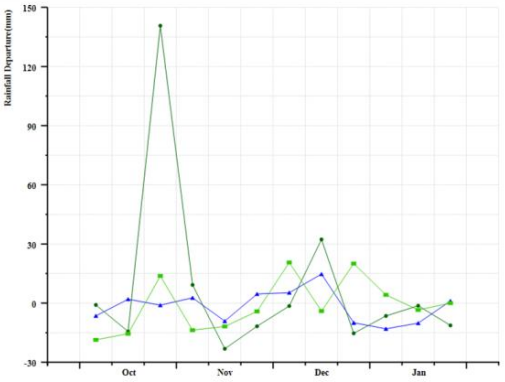
The average maximum VCI for the MPZ reached a value of 0.86 during this reporting period, indicating favorable crop condition in spite of low values in some regions. More than 90% of arable land was cropped, which is the same as the recent five-year average. Most uncropped arable land is concentrated in Spain, and scattered pixels in France, Italy, Slovakia and Hungary.

Generally, the condition of winter crops in the MPZ was above average at the end of the reporting period. However, more rain will be needed to ensure adequate soil moisture supply when the winter crops resume vegetative growth in spring.

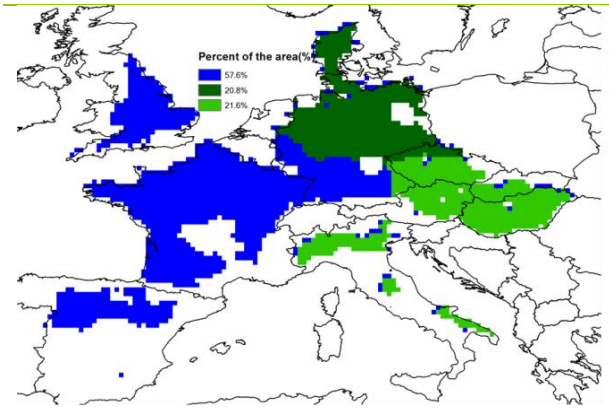
Figure 2.5. Western Europe MPZ: Agroclimatic and agronomic indicators, October 2018 to January 2019.



a. Spatial distribution of rainfall profiles

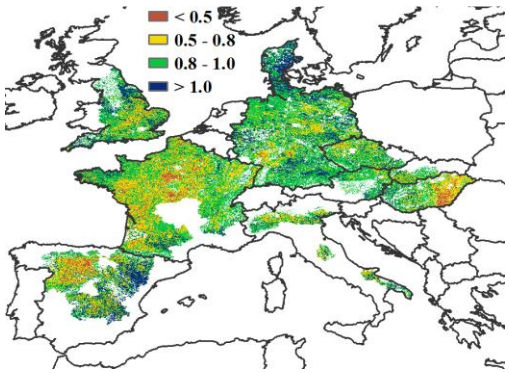


b. Profiles of rainfall departure from average (mm)

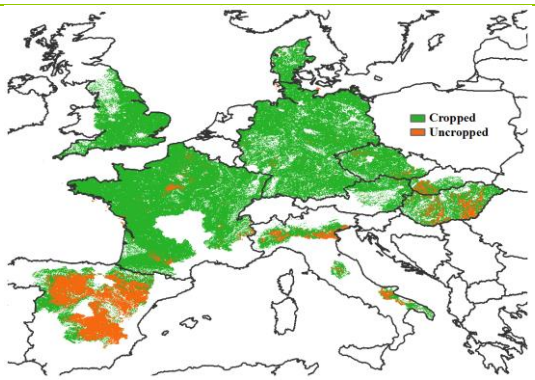


c. Spatial distribution of temperature profiles

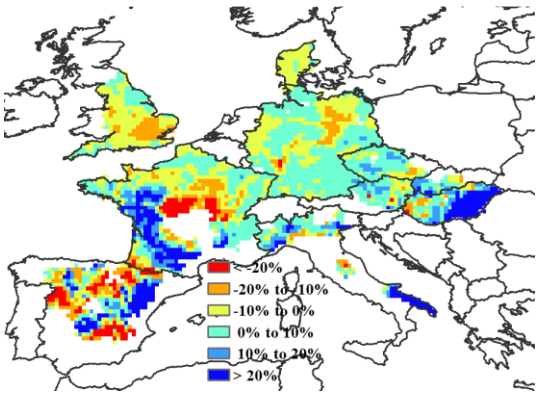
d. Profiles of temperature departure from average (mm)



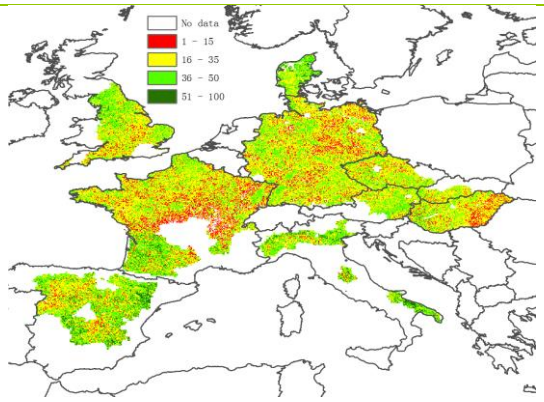
e. Maximum VCI



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

The harvest of summer crops was completed at the beginning of the monitoring period, and winter crops were in their early vegetative stages under generally average weather conditions in most parts of the MPZ.

The region experienced above normal radiation conditions, with a 6% increase in RADPAR compared to average, while rainfall slightly decreased 2% and temperature dropped by 0.3°C.

Favorable rainfall occurred in November and December in Romania (RAIN +35%), Moldova, Southern Ukraine (RAIN, +19% for whole country) and Southwestern Russia, including the Krays of Krasnodar and Stavropol, the Oblast of Rostov and the Karachay-Cherkessia Republic. The maximum precipitation occurred in late-December when it reached 75% above average in Romania, Moldova and south-western Ukraine. Below average rainfall affected the MPZ's north-eastern part (almost 34.2% of the MPZ, all in Russia) from mid-October to mid-January, covering the Oblasts of Orenburg, Samarsky and Ulyanov and the Republics of Bashkortostan and Tatarstan.

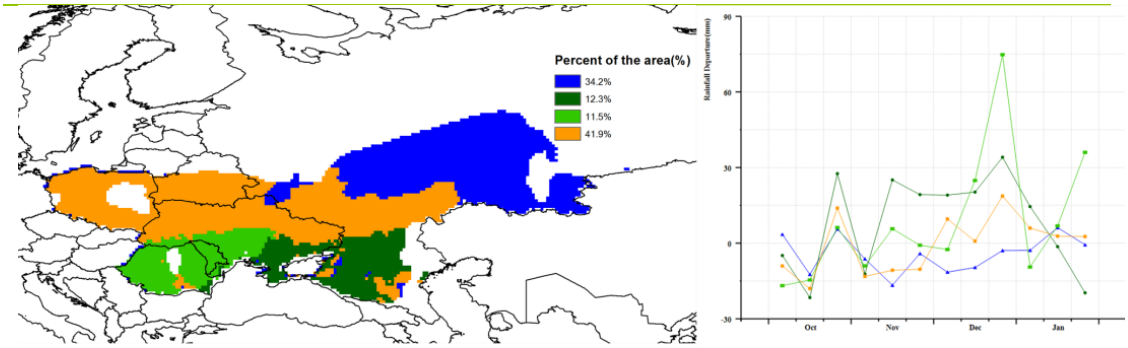
Temperature profiles show correlated variations in the whole MPZ except the eastern part (in Russia) mainly in October and November. Almost all areas of Central Europe to Western Russia enjoyed above average temperature from October to late-November, which benefited the development of winter crops. The coldest area occurred in late-November in southwestern Russia and northeastern Ukraine, with a severe cold spell 4.5°C below average.

Due to overall average rainfall and temperatures during the monitoring period in most parts of central Europe and western Russia, the biomass production potential (BIOMSS) for the MPZ as a whole remained stable with an increase of 2% over average. The BIOMASS map also indicates the average situation in the whole northern MPZ and the above-average condition in southern MPZ. The maximum VCI (0.79) is relatively low among all MPZs.

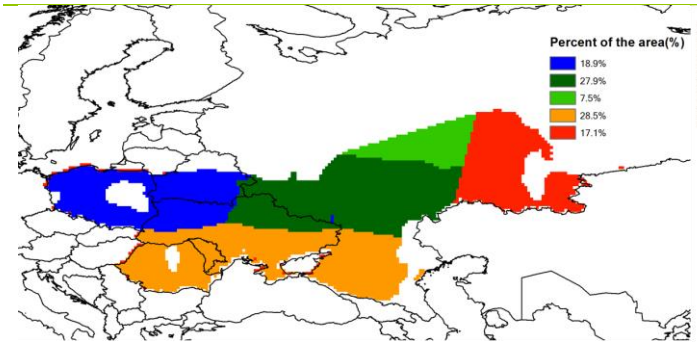
According to the maximum VCI map of this monitoring period, most pixels of the MPZ were in the range of 0.5-0.8 and 0.8-1.0. Uncropped arable land occurs mostly in eastern and southern Ukraine, and southwestern Russia. CALF decreased by 2% over the reference period.

In general, with most parts indicating average crop conditions, prospects for crop production are promising in Central Europe to Western Russia.

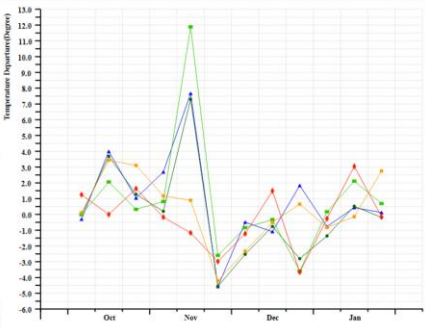
Figure 2.6. Central Europe-Western Russia MPZ: Agroclimatic and agronomic indicators, October 2018 to January 2019.



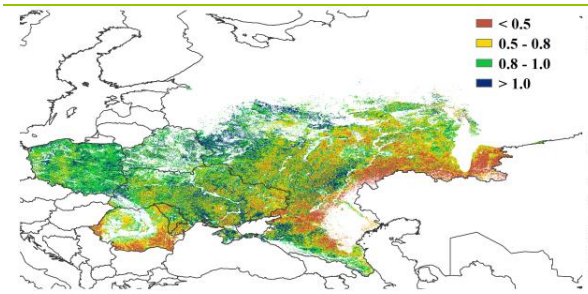
a. Spatial distribution of rainfall profiles b. Profiles of rainfall departure from average (mm)



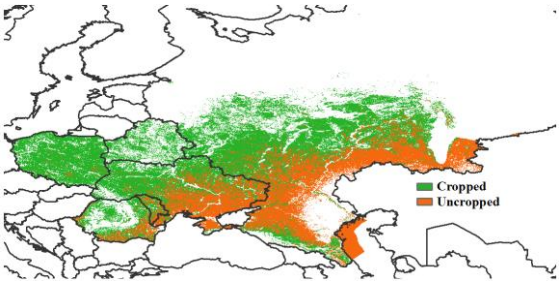
c. Spatial distribution of temperature profiles



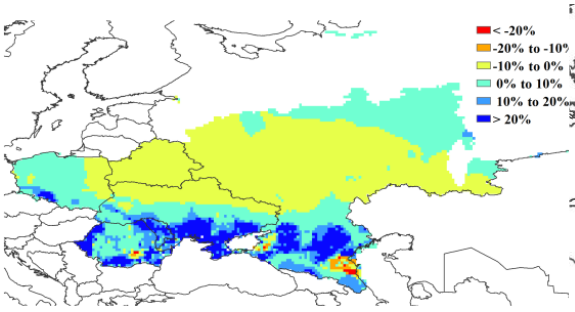
d. Profiles of temperature departure from average (mm)



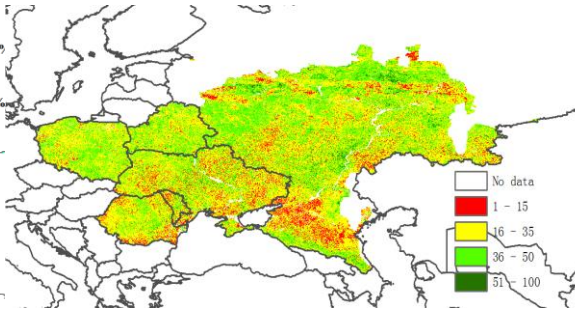
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

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