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CropWatch Online Resources: This bulletin along with additional resources is also available on the CropWatch Website at <http://www.cropwatch.com.cn>.

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Contents

 *Note:* CropWatch resources, background materials and additional data are available online at www.cropwatch.com.cn.

Contents iii

| | |
|---|------------|
| FIGURES | iv |
| TABLES | v |
| Abbreviations | vi |
| Bulletin overview and reporting period..... | vii |
| Executive summary | 8 |
| الملخص التنفيذي | 10 |
| Résumé | 12 |
| Краткий обзор | 14 |
| Resumen | 16 |
| Chapter 1. Global agroclimatic patterns | 18 |
| 1.1 Overview | 18 |
| 1.2 Rainfall | 19 |
| 1.3 Temperature | 20 |
| 1.4 Photosynthetically active radiation | 20 |
| 1.5 Biomass | 21 |
| Chapter 2. Crop and environmental conditions in major production zones | 22 |
| 2.1 Overview | 22 |
| 2.2 West Africa | 22 |
| 2.3 North America | 24 |
| 2.4 South America | 26 |
| 2.5 South and Southeast Asia | 27 |
| 2.6 Western Europe | 29 |
| 2.7 Central Europe to Western Russia | 30 |
| Chapter 3. Main producing and exporting countries | 32 |
| 3.1 Overview | 32 |
| 3.2 Country analysis | 35 |

| | |
|--|------------|
| Chapter 4. China | 66 |
| 4.1 Overview | 66 |
| 4.2 Winter crops production | 68 |
| 4.3 Regional analysis | 69 |
| Chapter 5. Focus and perspectives | 77 |
| 5.1 Production outlook for 2015 | 77 |
| 5.2 Disaster events | 81 |
| 5.3 Crop production and trends in South America | 83 |
| 5.4 El Niño | 87 |
| Annex A. Agroclimatic indicators and BIOMSS..... | 88 |
| Annex B. 2015 production estimates..... | 95 |
| Annex C. Quick reference guide to CropWatch indicators, spatial units, and production estimation methodology..... | 96 |
| Data notes and bibliography..... | 102 |
| Acknowledgments..... | 103 |
| Online resources | 104 |

FIGURES

| | |
|--|----|
| Figure 1.1. Global map of rainfall anomaly (as indicated by the RAIN indicator) by MRU, departure from 14YA, January-April 2015 (percentage) | 19 |
| Figure 1.2. Global map of air temperature anomaly (as indicated by the TEMP indicator) by MRU, departure from 14YA, January-April 2015 (degrees Celsius) | 20 |
| Figure 1.3. Global map of PAR anomaly (as indicated by the RADPAR indicator) by MRU, departure from 14YA, January-April 2015 (percentage) | 21 |
| Figure 1.4. Global map of biomass accumulation (BIOMSS) by MRU, departure from 5YA, January-April 2015 (percentage)..... | 21 |
| Figure 2.1. West Africa MPZ: Agroclimatic and agronomic indicators, January-April 2015 | 23 |
| Figure 2.2. North America MPZ: Agroclimatic and agronomic indicators, January-April 2015 | 25 |
| Figure 2.3. South America MPZ: Agroclimatic and agronomic indicators, January-April 2015 | 26 |
| Figure 2.4. South and Southeast Asia MPZ: Agroclimatic and agronomic indicators, January-April 2015..... | 28 |
| Figure 2.5. Western Europe MPZ: Agroclimatic and agronomic indicators, January-April 2015 | 29 |
| Figure 2.6. Central Europe-Western Russia MPZ: Agroclimatic and agronomic indicators, January-April 2015 | 31 |
| Figure 3.1. Global map of rainfall (RAIN) by country and sub-national areas, departure from 14YA (percentage), January-April 2015 | 33 |
| Figure 3.2. Global map of temperature (TEMP) by country and sub-national areas, departure from 14YA (degrees), January-April 2015 | 34 |
| Figure 3.3. Global map of PAR (RADPAR) by country and sub-national areas, departure from 14YA (percentage), January-April 2015 | 34 |
| Figure 3.4. Global map of biomass (BIOMSS) by country and sub-national areas, departure from 14YA (percentage), January-April 2015 | 34 |
| Figures 3.5-3.34. Crop condition for individual countries ([ARG] Argentina- [ZAF] South Africa) for January-April 2015 | 35 |
| Figure 4.1. China spatial distribution of rainfall profiles, January-April 2015 | 67 |

| | |
|--|----|
| Figure 4.2. China spatial distribution of temperature profiles, January-April 2015 | 67 |
| Figure 4.3. China cropped and uncropped arable land, by pixel, January-April 2015 | 67 |
| Figure 4.4. China maximum Vegetation Condition Index (VCIx), by pixel, January-April 2015 | 67 |
| Figure 4.5. China VHI minimum, by pixel, January-April 2015 | 68 |
| Figure 4.6. Crop condition China Northeast region, January-April 2015 | 70 |
| Figure 4.7. Crop condition China Inner Mongolia, January-April 2015 | 71 |
| Figure 4.8. Crop condition China Huanghuaihai, January-April 2015..... | 72 |
| Figure 4.9. Crop condition China Loess region, January-April 2015..... | 73 |
| Figure 4.10. Crop condition Lower Yangtze region, January-April 2015 | 74 |
| Figure 4.11. Crop condition Southwest China region, January-April 2015..... | 75 |
| Figure 4.12. Crop condition Southern China region, January-April 2015..... | 76 |
| Figure 5.1. Flood situation in South America on February 20, 2015 | 81 |
| Figure 5.2. Trends in per capita crop production in four South American countries since 1981 | 85 |
| Figure 5.3. Sowing pools in Buenos Aires province, Argentina | 86 |
| Figure 5.4. Monthly SOI time series from January 2014 to January 2015..... | 87 |

TABLES

| | |
|--|----|
| Table 2.1. January-April 2015 agroclimatic indicators by Major Production Zone, current value and departure from 14YA | 22 |
| Table 2.2. January-April 2015 agronomic indicators by Major Production Zone, current season values and departure from 5YA | 22 |
| Table 3.1. CropWatch agroclimatic and agronomic indicators for January-April 2015, departure from 5YA and 14YA | 35 |
| Table 4.1. CropWatch agroclimatic and agronomic indicators for China, January-April 2015, departure from 5YA and 14YA..... | 66 |
| Table 4.2. China, 2015 winter crops production (thousand tons) and percentage difference with 2014, by province | 68 |
| Table 4.3. China, 2015 winter wheat area, yield, and production and percentage difference with 2014, by province | 69 |
| Table 5.1. 2015 production estimates and forecasts for maize, rice, wheat, and soybean (thousand tons) according to various country groupings | 78 |
| Table 5.2. 2015 production estimates and forecasts for maize, rice, wheat, and soybean (thousand tons) in selected countries, compared to 2014 CropWatch estimates | 79 |
| Table 5.3. Population and agricultural statistics for selected large South American countries | 84 |
| Table 5.4. Agricultural export products of selected large South American countries | 85 |
| Table A.1. January-April 2015 agroclimatic indicators and biomass by global Monitoring and Reporting Unit | 88 |
| Table A.2. January-April 2015 agroclimatic indicators and biomass by country | 89 |
| Table A.3. Argentina, January-April 2015 2014 agroclimatic indicators and biomass (by province) | 90 |
| Table A.4. Australia, January-April 2015 agroclimatic indicators and biomass (by state)..... | 90 |
| Table A.5. Brazil, January-April 2015 agroclimatic indicators and biomass (by state) | 91 |
| Table A.6. Canada, January-April 2015 agroclimatic indicators and biomass (by province) | 91 |
| Table A.7. India, January-April 2015 agroclimatic indicators and biomass (by state) | 91 |
| Table A.8. Kazakhstan, January-April 2015 agroclimatic indicators and biomass (by province) | 92 |
| Table A.9. Russia, January-April 2015 agroclimatic indicators and biomass (by oblast) | 92 |
| Table A.10. United States, January-April 2015 agroclimatic indicators and biomass (by state) | 93 |
| Table A.11. China, January-April 2015 agroclimatic indicators and biomass (by province) | 94 |
| Table B.1. Argentina, 2015 maize and soybean production, by province (thousand tons) | 95 |
| Table B.2. Brazil, 2015 maize, rice, and soybean production, by state (thousand tons)..... | 95 |
| Table B.3. United States, 2015 wheat production, by state (thousand tons) | 95 |

Abbreviations

| | |
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| 5YA | Five-year average, the average for the January-April periods from 2010 to 2014; one of the standard reference periods. |
| 14YA | Fourteen-year average, the average for the January-April periods from 2001 to 2014; one of the standard reference periods and typically referred to as “average.” |
| BIOMSS | Agroclimatic indicator for biomass production potential |
| BOM | Australian Bureau of Meteorology |
| CALF | Cropped Arable Land Fraction |
| CAS | Chinese Academy of Sciences |
| CWSU | CropWatch Spatial Units |
| DM | Dry matter |
| EBV | Ebola Virus Disease |
| EC/JRC | European Commission Joint Research Centre |
| ENSO | El Niño Southern Oscillation |
| FAO | Food and Agriculture Organization of the United Nations |
| GAUL | Global Administrative Units Layer |
| GVG | GPS, Video, and GIS data |
| ha | hectare |
| kcal | kilocalorie |
| MPZ | Major Production Zone |
| MRU | Monitoring and Reporting Unit |
| NDVI | Normalized Difference Vegetation Index |
| OCHA | UN Office for the Coordination of Humanitarian Affairs |
| PAR | Photosynthetically active radiation |
| RADI | CAS Institute of Remote Sensing and Digital Earth |
| RADPAR | PAR agroclimatic indicator |
| RAIN | Rainfall agroclimatic indicator |
| SOI | Southern Oscillation Index |
| TEMP | Air temperature agroclimatic indicator |
| Ton | Thousand kilograms |
| VCIx | Maximum Vegetation Condition Index |
| VHI | Vegetation Health Index |
| VHIn | Minimum Vegetation Health Index |
| W/m ² | Watt per square meter |

Bulletin overview and reporting period

This CropWatch bulletin presents a global overview of crop stage and condition between January 1 and April 30, 2015. It is the 97th bulletin produced by the CropWatch group at the Institute of Remote Sensing and Digital Earth (RADI) at the Chinese Academy of Sciences, Beijing. CropWatch analyses are based mostly on several standard and new ground-based and remote sensing indicators, following a hierarchical approach. The analyses cover large global zones; major producing countries of maize, rice, wheat, and soybean; and detailed assessments of Chinese regions.

In parallel to the increasing spatial precision of the analyses, indicators become more focused on agriculture as the analyses zoom into smaller spatial units. CropWatch uses two sets of indicators: (i) agroclimatic indicators—RAIN, TEMP, and RADPAR, which describe weather factors; and (ii) agronomic indicators—BIOMSS, VHIn, CALF, and VCIx, describing crop condition and development. The indicators RAIN, TEMP, RADPAR and BIOMSS do not directly describe the weather variables rain, temperature, radiation, or biomass, but rather are spatial averages over agricultural areas, which are weighted according to the local crop production potential. For more details on the CropWatch indicators and spatial units used for the analysis, please see the quick reference guide in Annex C, as well as online resources and publications posted at www.cropwatch.com.cn.

| Chapter | Spatial coverage | Key indicators |
|-------------------------|---|-------------------------------------|
| Chapter 1 | World, using Monitoring and Reporting Units (MRU), 65 large, agro-ecologically homogeneous units covering the globe | RAIN, TEMP, RADPAR, BIOMSS |
| Chapter 2 | Major Production Zones (MPZ), six regions that contribute most to global food production | As above, plus CALF, VCIx, and VHIn |
| Chapter 3 | 31 key countries (main producers and exporters) | As above plus NDVI |
| Chapter 4 | China | As above |
| Chapter 5 | Special topics: Disaster events and trends in South America | |
| Online Resources | www.cropwatch.com.cn | |

Newsletter and online resources

The bulletin is released quarterly in both English and Chinese. To sign up for the mailing list, please e-mail cropwatch@radi.ac.cn or visit CropWatch online at www.cropwatch.com.cn. Visit the CropWatch Website for additional resources and background materials about methodology, country agricultural profiles, and country long term trends.

Executive summary

The current CropWatch bulletin is based mainly on remotely sensed data. It focuses on crops that were either growing or harvested between January and April 2015. The bulletin covers prevailing weather conditions, including extreme factors, as well as crop condition and size of cultivated areas, paying special attention to the major worldwide producers of maize, rice, wheat, and soybean. Current condition in China and the likely global production prospects for crops to be harvested throughout 2015 are also described.

Global agroclimatic impacts

The most remarkable feature of the current January to April 2015 reporting period was above average temperature for almost all the CropWatch global mapping and reporting units (MRU), with temperatures for the MRUs usually about 1.0 to 1.5°C above average, which is significant when it occurs over large areas and month-long time periods. High temperature has accelerated crop development in several regions in the northern hemisphere, including southern areas of west Russia and neighboring areas, which complicates the interpretation of some of the crop condition indicators and adds uncertainty to the analyses.

Below average rainfall occurred in most tropical areas across all continents, affecting also the Horn of Africa and the east African highlands, much of southwest Europe and especially the northern Mediterranean, the southernmost areas in China, Pakistan, the western United States (California and Washington state), and northeast Australia and New-Zealand. The largest positive departures of rainfall from average occurred in the Sierra Madre in Mexico (+139%) and in eastern Asia, including also northwest India and major agricultural areas in China. Water-related disasters were reported from South America, the Caribbean (Peru and Haiti), Central Asia (Kazakhstan), and from southern Africa during the beginning of the reporting period.

>> Global agroclimatic impacts: sections 1.1-1.4; disaster events: section 5.2.

China

For the country as a whole, agroclimatic conditions were generally close to average, with local differences, especially high winter temperature in the Northeast and Southwest, affecting about ten provinces. Rainfall was above average in several major producing regions, resulting in generally favorable crop conditions, above those from last year.

>> Agroclimatic and crop condition in China: chapter 4.

Production outlook

The CropWatch global estimates for 2015 cover both already harvested crops and those currently growing or to be planted; for the latter, average conditions are assumed for later parts of the growing cycle. Compared to 2014, maize production is forecast to decrease 1.3% this year with a 0.6% increase in the southern hemisphere. The drop results mostly from lower expectations for the maize output in the United States compared with the exceptional 2014 harvest, but also low cropped arable land fraction (CALF, 55%) and a low maximum vegetation condition index (VCI_x) of 0.72 at the beginning of the planting season. Global rice projection is up 1.0%, while both wheat and soybean production are

projected to drop 1.1% compared to 2014. When focusing on the main producing and exporting countries only, maize could undergo a decrease of 1.8%; rice is projected to increase (+1.0%), and wheat and soybean could drop 1.6% and 1.7%, respectively.

In China, due to favorable conditions so far, all grain production is expected to increase by about 1% (1.1% for wheat, with maize and rice forecast to increase 1.6% and 0.6% respectively), while soybean is forecast to continue its decade-long falling trend (-1.3%). Winter wheat conditions were particularly favorable in Shandong province (production up by 4.6%) and moderately unfavorable in Hubei (-2.6%) and Anhui (-2.5%).

The largest projected increase for maize production is the one expected for Mexico (+8.2%). Among the major exporters, the situation is also very favorable for wheat in Argentina and Brazil (+14.8% and +8.7% production) and for rice in Thailand (+7.2%) and in Vietnam (+6.6%).

Most projected significant decreases in production are associated with well-identified causes, mostly involving weather and subsequent reductions in cultivated areas in extreme cases. For maize, this applies to countries such as South Africa (-12.4% production compared to 2014 and a decrease in CALF of 10 percentage points) and Ukraine (-15.0% production, only a 1 percentage point reduction in CALF, but a low VCIx of 0.69). For wheat, countries affected are Australia (-9.0% production mostly due to drought), as well as some eastern European countries and Russia (production about -8% with CALF at 65% and VCIx at 0.64).

For India, CropWatch forecasts decreases in the production of maize, rice, and wheat by 4.6%, 1.9%, and 4.5%, respectively, compared to last year's harvest.

>> CropWatch global production outlook: section 5.1; winter crops in China: section 4.2; crop condition indicators and production estimates for individual countries such as the United States and India: chapter 3 and tables 3.1 and 5.1.

Areas of concern

With El Niño conditions considered to be almost certain for the end of this year, the current CropWatch projections will likely need regular revision. Areas deserving close scrutiny include Ethiopia (projected outputs are -10.0% for maize and -7.0% for wheat), as a critical shortage of rainfall for 'Belg' crops is also likely to affect crops harvested later in the year. In the Sahel, signs (to be confirmed) point to a late onset of the rainy season. Other countries where CropWatch identified unfavorable production prospects include Cambodia and Myanmar.

>>El Niño: section 5.4; individual country analyses: section 3.2.

الملخص التنفيذي

النشرة الحالية ل CropWatch قائمة أساسا على بيانات الاستشعار عن بعد. وهي تركز على المحاصيل التي تم حصادها أو المحاصيل التي هي في طور النمو بين يناير وأبريل من العام 2015. وتوضح النشرة الظروف المناخية السائدة، بما في ذلك العوامل القصوى، فضلا عن حالة المحاصيل وحجم المساحات المزروعة، مع إيلاء اهتمام خاص للمنتجين الأساسيين للذرة والأرز والقمح وفول الصويا في جميع أنحاء العالم. كما تم وصف الوضع الحالي في الصين وكذا احتمالات توقعات الإنتاج العالمي للمحاصيل التي يتم حصادها في جميع أنحاء العالم سنة 2015.

التأثيرات المناخية الزراعية العالمية

و أهم سمة في الفترة ما بين يناير الحالي إلى أبريل 2015 المشمولة بالتقرير كانت تسجيل درجات حرارة فوق المتوسط بالنسبة لأغلب خرائط CropWatch العالمية و لوحدات التقرير (MRU) ، مع تسجيل درجات حرارة sMRU التي عادة ما تفوق 1 الى 1.5 درجة مئوية فوق المتوسط، وهو أمر مهم عندما يحدث في مناطق واسعة ولفترات زمنية على مدى الشهور. كما تم تسجيل ارتفاع في درجة الحرارة وتسارع نمو المحاصيل في عدة مناطق في نصف الشمالي من الكرة الأرضية، بما في ذلك المناطق الجنوبية من غرب روسيا والمناطق المجاورة، مما يعقد تفسير بعض المؤشرات المتعلقة بالظروف المحيطة بالمحاصيل الزراعية ويضعف القدرة على التحليل الدقيق.

تم تسجيل هطول أمطار دون المتوسط في معظم المناطق الاستوائية بجميع القارات، وسيؤثر هذا أيضا على القرن الأفريقي والمرتفعات بشرق أفريقيا، والكثير من دول جنوب غرب أوروبا وخصوصا في شمال البحر الأبيض المتوسط، و مناطق عدة جنوب الصين و باكستان، غرب الولايات المتحدة (كاليفورنيا وولاية واشنطن)، وشمال شرق أستراليا ونيوزيلندا. في المقابل تم تسجيل تساقطات تفوق المتوسط في مادري سبيرا في المكسيك (139٪) وفي شرق آسيا، وكذا شمال غرب الهند والمناطق الزراعية الرئيسية في الصين. كما تم تسجيل حدوث كوارث طبيعية مرتبطة بالمياه في كل من أمريكا الجنوبية ومنطقة البحر الكاريبي (بيرو وهايتي)، وآسيا الوسطى (كازاخستان)، وكذا جنوب أفريقيا خلال بداية الفترة المشمولة بالتقرير.

التأثيرات المناخية الزراعية العالمية: أقسام 1.1-1.4. الكوارث الحاصلة: القسم 5.2 >>

الصين

الظروف المناخية الزراعية بالنسبة للبلاد ككل قريبة من المتوسط، مع وجود اختلافات محلية، وبالخصوص في الشمال الشرقي والجنوب الغربي حيث تم تسجيل درجات حرارة عالية خلال فصل الشتاء حيث تؤثر في نحو عشر مقاطعات. وقد تم تسجيل نسب أعلى من المتوسط من التساقطات المطرية في العديد من مناطق الإنتاج الرئيسية، مما أدى إلى توفير ظروف مواتية للمحاصيل الزراعية بشكل عام، مقارنة بالعام الماضي.

حالة زراعية ومناخية والمحاصيل في الصين: الفصل 4 >>

توقعات الإنتاج

تقدر CropWatch الإنتاج العام برسم سنة 2015 بالنسبة للمحاصيل المحصودة بالفعل وتلك التي هي في طور النمو حاليا أو تلك التي سيتم غرسها، ويفترض أن تكون الظروف متوسطة للفترة المقبلة من النمو. مقارنة مع سنة 2014، من المتوقع أن ينخفض إنتاج الذرة بنسبة 1.3٪ هذا العام وزيادة بنسبة 0.6٪ في نصف الكرة الجنوبي.

معظم التوقعات تنذر بانخفاض في إنتاج الذرة في الولايات المتحدة مقارنة مع الإنتاج الاستثنائي لعام 2014، ولكن أيضا تسجيل انخفاض في نسبة الأراضي المزروعة (ك.ل.ف، 55٪) و انخفاض مؤشر حالة الغطاء النباتي القصوى ب0.72 في بداية الموسم الزراعي.

تشير التوقعات الى انخفاض الانتاج العالمي من الأرز بنسبة 1.0٪، في حين من المتوقع أن ينخفض انتاج كل من القمح وفول الصويا بنسبة 1.1٪ مقارنة مع سنة 2014. وعندما نركز على الدول الرئيسية المنتجة والمصدرة فحسب، فان انتاج الذرة يمكن أن يسجل انخفاضا بنسبة 1.8٪؛ ومن المتوقع زيادة في انتاج الأرز ب 1.0٪، في المقابل من المتوقع تسجيل انخفاض في انتاج القمح و فول الصويا بنسبة 1.6٪ و 1.7٪ على التوالي.

في الصين، وبسبب الظروف المواتية حتى الآن، فمن المتوقع أن يرتفع إنتاج الحبوب بنحو 1٪ (1.1٪ بالنسبة للقمح، وبالنسبة للذرة والأرز فمن المتوقع أن يزيد الانتاج بنسبة 1.6٪ و 0.6٪ على التوالي)، في حين أن انتاج فول الصويا سوف يواصل الانخفاض ب 1.3٪. وكانت الظروف مواتية وخاصة بالنسبة للقمح الشتوي في مقاطعة شانغونغ (ارتفاع الإنتاج بنسبة 4.6٪) وغير مواتية تماما في كل من هوبي

2.6%، وانهى 2.5%.

أكبر الزيادات في إنتاج الذرة متوقعة في المكسيك بالنسبة 8.2%. الظروف جد مواتية للرفع من الإنتاج بالدول الرئيسية المصدرة، فبالنسبة للقمح في الأرجنتين والبرازيل يتوقع ان يرتفع الإنتاج بنسبة 14.8% و 8.7% على التوالي وأما بالنسبة للأرز في كل من تايلاند وفيتنام فمن المتوقع أن يرتفع الإنتاج بنسبة 7.2% و 6.6% على التوالي.

الانخفاض الكبير في الإنتاج المتوقع التي تم تحديده بشكل جيد يرتبط أساسا بأسباب ترتبط أغلبها بالظروف المناخية وخفض في المساحات المزروعة في الحالات القصوى. بالنسبة للذرة، وهذا ينطبق على بلدان مثل جنوب أفريقيا (انخفاض في الإنتاج بـ12.4% مقارنة مع 2014 وانخفاض في ك.ل.ف ب 10 نقطة مئوية) وبأوكرانيا (انخفاض في الإنتاج بـ15.0%، وانخفاض في ك.ل.ف بنقطة مئوية واحدة فقط، مع تسجيل 0.69 من VCIx وهي نسبة ضئيلة).

بالنسبة للقمح، البلدان المتضررة هي استراليا (انخفاض في الإنتاج بـ9% و يرجع هذا الانخفاض أساسا للجفاف)، وكذلك بعض بلدان أوروبا الشرقية وروسيا (انخفاض في الإنتاج بـ9.0%، ك.ل.ف بـ65%، مع تسجيل 0.64 من VCIx). بالنسبة للهند، توقعات CropWatch لإنتاج الذرة والأرز والقمح قد تعرف انخفاضا، مقارنة بالسنة الفارطة، بالنسب التالية 4.6%- و 1.9%- و 4.5%- على التوالي.

توقعات CropWatch للإنتاج العالمي: القسم 5.1. المحاصيل الشتوية في الصين: الباب 4.2. مؤشرات حالة المحاصيل وتقديرات الإنتاج بالنسبة للولايات >> المتحدة والهند: الفصل 3 والجداول 3.1 و 5.1

مجالات الاهتمام

مع بروز ظاهرة النينيو الشبه المؤكدة في نهاية هذا العام، فإن توقعات CropWatch الحالية تحتاج على الأرجح الى مراجعة منتظمة. المناطق التي تستحق التمحيص الدقيق، تشمل كلا من إثيوبيا (الإنتاج المتوقع للذرة و القمح هو على التوالي 10%- و 7.0%-)، ونقص حاد في مياه الأمطار بالنسبة لزراعات البلج ومن المرجح أيضا أن يؤثر النقص في الأمطار على المحاصيل الزراعية في وقت لاحق من هذا العام. في منطقة الساحل، دلالات (للتأكيد) تشير إلى بداية متأخرة لموسم الأمطار. آفاق للإنتاج غير المواتية تشمل بلدان أخرى ككمبوديا وميانمار تم تحديدها بواسطة CropWatch.

النينيو: القسم 5.4. ويحلل كل بلد على حدة: القسم 3.2 >>

Résumé

Le présent bulletin CropWatch est basé principalement sur des données de télédétection. Il se focalise sur les cultures qui ont été en croissance ou récoltées entre janvier et avril 2015. Le bulletin couvre les conditions météorologiques dominantes, y compris les facteurs extrêmes, ainsi que les conditions de cultures et les superficies cultivées, tout en accordant une attention particulière aux principaux producteurs mondiaux de maïs, de riz, de blé et de soja. Les conditions actuelles en Chine et les perspectives probables de production des cultures à l'échelle mondiale en 2015 sont également présentées.

Les impacts agro-climatiques à l'échelle mondiale

La période considérée entre Janvier et Avril 2015 a été principalement caractérisée par des écarts positifs de la température par rapport à la moyenne presque pour toutes les unités spatiales de suivi (Monitoring and Reporting Units, MRU). Les températures par MRU ont été supérieures à la moyenne d'environ 1,0 à 1,5 °C, ce qui est considérable quand il se produit sur de grandes surfaces et pour de longues périodes (plusieurs mois). Les températures élevées ont accéléré le développement des cultures dans plusieurs régions de l'hémisphère nord, y compris les régions sud-ouest de la Russie et les régions voisines, ce qui complique l'interprétation de certains indicateurs de conditions de cultures et accroît l'incertitude des analyses.

Des précipitations inférieures à la moyenne ont été enregistrées dans la plupart des régions tropicales à travers tous les continents, ce qui affecte également la Corne de l'Afrique et les hauts plateaux d'Afrique de l'Est, plusieurs régions du sud-ouest de l'Europe et notamment le nord de la Méditerranée, les régions méridionales de la Chine, le Pakistan, l'ouest des États-Unis (Californie et État de Washington), et le nord-est de l'Australie et la Nouvelle-Zélande. Les plus grands écarts positifs de précipitations par rapport à la moyenne ont eu lieu dans la Sierra Madre au Mexique (+ 139%) et en Asie de l'Est, mais aussi dans le nord-ouest de l'Inde et les principales zones agricoles en Chine. Les catastrophes liées à l'eau ont été enregistrées en Amérique du Sud, les Caraïbes (Pérou et Haïti), l'Asie centrale (Kazakhstan), et en Afrique du sud pendant le début de la période considérée.

>>Impacts agroclimatiques globaux: sections 1.1 à 1.4; Catastrophes: la section 5.2.

Chine

Pour l'ensemble du pays, les conditions agro-climatiques ont été généralement proches de la moyenne, avec des différences au niveau local, en particulier pour la température hivernale élevée dans le Nord-Est et Sud-Ouest, qui a affecté environ dix provinces. Les précipitations ont été supérieures à la moyenne dans plusieurs régions productrices, ce qui a conduit à des conditions de récolte généralement favorables, supérieurs à celles de l'an dernier.

>>Conditions agro-climatiques et cultures en Chine: Chapitre 4.

Perspectives de production

Les estimations globales de Crop Watch pour l'année 2015 couvrent à la fois les cultures déjà récoltées, celles en croissance actuellement ou qui doivent encore être plantées; pour ces dernières, des conditions moyennes sont supposées pour les stades ultérieurs du cycle de croissance.

En comparaison avec l'année 2014, la production de maïs devrait diminuer de 1,3% cette année, avec une hausse de 0,6% au niveau de l'hémisphère sud. La baisse résulte principalement des faibles prévisions de la production de maïs aux États-Unis comparativement à la récolte exceptionnelle de 2014, aussi qu'avec la faible fraction de terres arables cultivée (CALF, 55%) et un indice de l'état de la végétation maximale (VCIx) ne dépassant pas 0,72 au début de la saison de plantation. La projection mondiale de la production de riz augmenterait de 1,0%, tandis que la production de blé et de soja devraient baisser de 1,1% par rapport à l'année 2014. Pour les principaux pays producteurs et exportateurs, la production de maïs pourrait subir une baisse de 1,8%; le riz devrait augmenter de 1,0%, le blé et le soja pourraient chuter de 1,6% et 1,7%, respectivement.

En Chine, en raison des conditions favorables jusqu'à présent, la production de céréales totale attendue devrait augmenter d'environ 1% (1,1% pour le blé, et 1,6% et 0,6% respectivement pour le maïs et le riz), tandis que le soja va continuer la tendance décennale à la baisse (-1,3%). Pour le blé d'hiver les conditions ont été particulièrement favorables dans la province du Shandong (production en hausse de 4,6%) alors qu'elles étaient légèrement défavorables dans celles de Hubei (-2,6%) et de Anhui (-2,5%).

La plus grande augmentation prévue de la production de maïs est celle attendue en Mexique (+ 8,2%). Parmi les principaux exportateurs, la situation est aussi très favorable pour le blé en Argentine et en Brésil (+ 14,8% et + 8,7% la production) ainsi que pour le riz en Thaïlande (+ 7,2%) et en Vietnam (+ 6,6%).

La plupart des prévisions significatives de baisse en production sont associés à des causes bien identifiées, telles que les conditions météorologiques et les réductions des superficies cultivées dans les cas extrêmes. Pour le maïs, cela s'applique à des pays tels que l'Afrique du Sud (une baisse de production de 12,4% par rapport à 2014 et une diminution de CALF de 10 points %) et l'Ukraine (une baisse de production de 15,0%, avec seulement une réduction de 1 % pour le CALF, mais un faible VCIx de 0,69). Pour le blé, les pays touchés sont l'Australie (baisse de production de 9,0% principalement en raison de la sécheresse), ainsi que certains pays de l'Europe orientale et la Russie (environ -8% pour la production avec un CALF à 65% et VCIx à 0,64).

Pour l'Inde, les prévisions de CropWatch montrent une diminution de la production, par rapport à la récolte de l'année dernière, pour le maïs, le riz et le blé avec des valeurs de 4,6%, 1,9% et 4,5%, respectivement.

>> Perspectives mondiales de production de CropWatch: section 5.1; cultures d'hiver en Chine: section 4.2; Indicateurs de l'état des cultures et estimations de la production pour des pays comme les États-Unis et l'Inde: chapitre 3, tableaux 3.1 et 5.1.

Les zones à suivre de près

Avec les conditions d'El Niño considérées à peu près certaines pour la fin de cette année, les projections actuelles de CropWatch devront être soumises à une révision régulière. Les zones qui méritent un examen particulier incluent l'Éthiopie (les productions prévues sont de -10,0% pour le maïs et -7,0% pour le blé), ainsi que la pénurie critique des précipitations pour les cultures de la saison Belg affectera probablement aussi les récoltes plus tard dans l'année. Dans le Sahel, les signes (à confirmer) indiquent un début tardif de la saison des pluies. Les autres pays où CropWatch a identifié des perspectives de production défavorables comportent le Cambodge et le Myanmar.

Краткий обзор

Текущий бюллетень CropWatch базируется в основном на данных дистанционного зондирования. Анализируются сельскохозяйственные культуры, которые были в фазе вегетации или уборки в период с января по апрель 2015 года. В Бюллетене проведен анализ преобладающих погодных условий, включая экстремальные факторы, а также состояние культур и размер посевных площадей, уделяя особое внимание странам - основным мировым производителям кукурузы, риса, пшеницы и сои. Также проведен анализ текущей ситуации в Китае и ожидания глобального производства культур, уборка урожая которых будет проведена в 2015 году.

Глобальная агроклиматическая ситуация

Наиболее примечательной особенностью периода с января по апрель 2015 была повышенная на 1.0-1.5°C (относительно нормы) средняя температура воздуха почти для всех анализируемых CropWatch регионов. Это имеет существенное значение, когда происходит на больших территориях и продолжается в течение месяцев. Высокая температура ускорила развитие культур в ряде регионов северного полушария, в том числе в южных районах запада России и на соседних территориях, что затрудняет интерпретацию некоторых показателей состояния сельскохозяйственных культур и добавляет неопределенности в анализ.

Ниже среднего количества осадков выпало в большинстве тропических зон всех континентов, включая Африканский рог, Восточно-африканские возвышенности, большую часть юго-западной Европы (особенно северное Средиземноморье), самые южные районы Китая, Пакистана, западную часть Соединенных Штатов (Калифорния и штат Вашингтон) и северо-восток Австралии и Новой Зеландии.

Крупнейшие положительные отклонения осадков от среднего многолетнего значения произошли в Сьерра-Мадре в Мексике (+ 139%) и в Восточной Азии, включая северо-запад Индии и основные сельскохозяйственные районы Китая. Бедствия, связанные с наводнениями, были зарегистрированы в Южной Америке, странах Карибского бассейна (Перу и Гаити), Центральной Азии (Казахстан) и в Южной Африке в начале анализируемого периода.

>> Глобальная агроклиматическая ситуация: раздел 1.1-1.4; катастрофические события: раздел 5.2.

Китай

Агроклиматические условия для страны в целом, в общем, были близки к средним многолетним, но с локальной вариацией. Высокая температура воздуха зимой на северо-востоке и юго-западе, оказала влияние на посевы в десяти провинциях страны. Количество осадков было выше среднего в нескольких крупных сельскохозяйственных регионах, что привело к благоприятным условиям для культур, лучшим, чем были в прошлом году.

>>Агроклиматические условия и состояние посевов в Китае: глава 4

Ожидаемый валовой сбор

Глобальные оценки CropWatch для 2015 года учитывают уже полученный урожай, ожидаемый урожай от посевов, находящихся в стадии вегетации, а также от культур, сев которых лишь предстоит в этом году. Для еще не убранных культур на оставшуюся часть вегетационного сезона анализ проводился по средним многолетним данным. По сравнению с 2014 годом, урожай

кукурузы в целом ожидается ниже на 1.3%, при этом для южного полушария ожидается его рост на 0.6%. Прогноз падения урожая кукурузы базируется в основном на ожидании его понижения в США по сравнению с отличным урожаем 2014 года, но также и на результатах анализа доли площадей посевов (CALF, 55%) и на низкой величине максимума индекса состояния растительности (VCIx=0.72) в начале вегетационного сезона. Ожидается рост глобального сбора риса на 1.0%, в то время как сбор пшеницы и сои по сравнению с 2014 годом прогнозируется ниже на 1.1%. Анализ только для стран основных производителей и экспортеров показывает, что валовой сбор кукурузы в текущем году может упасть в них на 1.8%, валовой сбор риса возрасти на 1.0%, пшеницы и сои упасть, соответственно, на 1.6% и 1.7%.

В Китае благодаря благоприятным условиям ожидается, что валовой сбор зерна возрастет почти на 1% (на 1.1% для пшеницы, на 1.6% для кукурузы и на 0.6% для риса) в то время как валовой сбор сои продолжит свой десятилетний тренд к понижению (-1.3%). Условия для озимой пшеницы были особенно благоприятны в провинции Шандонг (ожидается рост валового сбора на 4.6%) и относительно неблагоприятны в провинциях Хубей (-2.6%) и Анхуи (-2.5%).

Крупнейшее увеличение производства кукурузы ожидается в Мексике (+ 8,2%). Среди основных экспортеров ситуация очень благоприятна для пшеницы в Аргентине и Бразилии (+ 14,8% и + 8,7%) и для производства риса в Таиланде (+ 7,2%) и во Вьетнаме (+ 6,6%).

Большинство случаев негативных ожиданий валового сбора культур связано с хорошо установленными причинами: преимущественно с погодными условиями и с последующим сокращением посевных площадей в экстремальных случаях. В случае с кукурузой это относится к таким странам, как Южная Африка (-12.4% валового сбора по сравнению с 2014 годом и уменьшение доли площадей посевов (CALF) на 10 процентов) и Украина (-15.0% валового сбора, сокращение доли площадей посевов на 1 процент и низкое значение вегетационного индекса: VCIx=0,69). Для пшеницы, к странам с негативными ожиданиями относятся Австралия (ожидаемое сокращение валового сбора на 9.0% в основном из-за засухи), а также некоторые страны Восточной Европы и Россия (ожидаемое падение валового сбора на 8%, доля площадей посевов (CALF) 65% и VCIx=0.64).

Для Индии, CropWatch прогнозирует снижение урожая кукурузы, риса и пшеницы по сравнению с 2014 годом на 4,6%, 1,9% и 4,5%, соответственно.

>> CropWatch глобальные перспективы производства: раздел 5.1; озимые в Китае: раздел 4.2; индикаторы состояния посевов и оценка валового сбора в отдельных странах, таких как США и Индия: глава 3 и таблицы 3.1 и 5.1.

Регионы, вызывающие озабоченность

В связи с ожидаемым к концу года явлением Эль-Ниньо, текущие прогнозы CropWatch скорее всего будут нуждаться в уточнении. Регионы, на которые должно быть обращено пристальное внимание, включают Эфиопию (прогнозируется падение урожая на 10% для кукурузы и на 7% для пшеницы), где критическое количество осадков для сезона белж также вероятно окажет негативное влияние на культуры, уборка которых будет производиться позже в течение года. В зоне Сахеля имеются признаки (необходимо последующее уточнение) более позднего начала сезона дождей. Другие страны, для которых CropWatch дает неблагоприятный прогноз, включают Камбоджу и Мьянму.

>> Эль-Ниньо: раздел 5.4; раздел анализа ситуации в отдельных странах 3.2.

Resumen

El presente boletín de CropWatch está basado principalmente en información proveniente de sensores remotos. Se enfoca en cultivos que han crecido o han sido cosechados entre enero y abril de 2015. Este boletín considera las condiciones meteorológicas predominantes incluyendo eventos extremos, así como también la condición de cultivos y los cambios en la superficie cultivada, prestando especial atención sobre los principales países productores mundiales de maíz, arroz, trigo y soja. Las condiciones actuales en China y las perspectivas de cosecha a nivel mundial para 2015 son también descriptas.

Impacto agroclimático global

El evento más destacado del período del reporte, entre enero y abril de 2015, fue la presencia de temperaturas por encima del promedio para casi todas las unidades globales de mapeo y reporte de CropWatch (MRU), observándose en general temperaturas entre 1 y 1,5°C por encima del promedio, aspecto que se vuelve significativo al ocurrir sobre grandes áreas y en períodos de magnitud mensual. Las altas temperaturas han acelerado el desarrollo de cultivos en varias regiones del hemisferio norte, incluyendo áreas del sur de Rusia y países vecinos, lo que complica la interpretación de algunos indicadores de la condición de cultivos agregando incertidumbre al análisis.

Se observaron precipitaciones por debajo del promedio en la mayor parte de las regiones tropicales de todos los continentes, siendo afectadas también las regiones del Cuerno de África y zonas montañosas del este de África, gran parte del sudeste de Europa y especialmente el norte del Mediterráneo, el sur de China, Pakistán, el oeste de Estados Unidos (California y estado de Washington), así como el noreste de Australia y Nueva Zelanda. Las mayores diferencias positivas con el promedio ocurrieron en Sierra Madre en Méjico (+139 %) y en el este de Asia, incluyendo el noroeste de India y las principales áreas agrícolas de China. Desastres hídricos fueron reportados en Sudamérica (Perú), el Caribe (Haití), Asia central (Kazajistán), y en el sur de África durante el inicio del período reportado.

>> Global agroclimatic impacts: sections 1.1-1.4; disaster events: section 5.2.

China

Considerando al país en su conjunto, las condiciones agroclimáticas fueron en general cercanas al promedio, con diferencias locales, como las altas temperaturas invernales observadas en el noreste y sudoeste afectando cerca de 10 provincias. Las lluvias estuvieron por encima del promedio en varias de las regiones más productivas, resultando en general favorables para los cultivos, y siendo mayores que las observadas el año pasado.

>> Agroclimatic and crop condition in China: chapter 4.

Perspectivas de Producción

Las estimaciones globales de CropWatch para 2015 consideran tanto cultivos ya cosechados como aquellos actualmente en crecimiento o próximos a implantarse; en este último caso, se asumen condiciones promedio para las últimas etapas del ciclo de crecimiento. En comparación a 2014, las predicciones de producción de maíz para este año indican un 1,3% de disminución con un 0,6% de incremento en el hemisferio sur. La caída es debida principalmente a las menores expectativas de producción de maíz en los Estados Unidos en relación a la cosecha excepcional de 2014, pero también se debe a la presencia de una baja fracción de área cultivada (CALF, 55%) y un bajo valor del índice de condición vegetal máximo (VCLx) de 0,72 al inicio de la estación de crecimiento. Las predicciones globales

de arroz indican un crecimiento del 1%, mientras que tanto para trigo como para soja se prevé una caída del 1,1 % en su producción en comparación a 2014. Considerando sólo los principales países productores y exportadores, el maíz presentaría una reducción del 1,8 %, el arroz incrementos del 1%, y el trigo y la soja caídas de 1,6 y 1,7% en la producción respectivamente.

En China, debido a las condiciones favorables hasta el momento, se espera un incremento en la producción de todos los granos de cerca del 1% (1,1% para trigo, 1,6 para maíz y 0,6 para arroz), mientras que soja continuará con la tendencia decádica decreciente (-1,3%). El trigo invernal presentó condiciones favorables particularmente en la provincia de Shandong (incrementos de hasta el 4,6%) y condiciones moderadamente no favorables en Hubei (-2,6%) y Anhui (-2,5%).

El mayor incremento de producción de maíz se espera para Méjico (+8,2%). Entre los principales exportadores, la situación es también muy favorable para el trigo en Argentina y Brasil (+14,8% y +8,7% de incremento en producción, respectivamente) y para el arroz en Tailandia (+7,2%) y en Vietnam (+6,6%).

Las predicciones de caída más importantes en la producción están asociadas a causas bien identificadas, relacionadas principalmente con las condiciones meteorológicas y las subsecuentes reducciones en el área de cultivos en los casos extremos. Para maíz, esto es válido para países como Sudáfrica (caída del 12,4% en la producción en comparación con 2014 y disminución en CALF del 10 %) y Ucrania (caída del 15% en la producción con una reducción de CALF de sólo el 1%, pero con un bajo valor de VCIX: 0,69). En el caso de trigo, los países más afectados fueron Australia (disminución del 9,0 % en la producción debida principalmente a sequías), como también algunos países de Europa del este y Rusia (caída en producción de cerca del 8%, mostrando un CALF de 65% y VLCx de 0,64).

Para India, la predicción de CropWatch indica disminuciones en la producción para maíz, arroz y trigo del 4,6%, 1,9% y 4,5% respectivamente, en comparación con la cosecha del año anterior.

>> CropWatch global production outlook: section 5.1; winter crops in China: section 4.2; crop condition indicators and production estimates for individual countries such as the United States and India: chapter 3 and tables 3.1 and 5.1.

Áreas vulnerables

Teniendo en cuenta que la condición final de El Niño estará definida recién a fin de año, las proyecciones actuales de CropWatch requerirán ser revisadas periódicamente. Áreas que requieren especial atención incluyen a Etiopía (se proyectan caídas en la cosecha del 10,0 % para maíz y 7,0% para trigo), donde la escasez de lluvias para cultivos dependientes de la temporada Belg podría afectar también los cultivos cosechados en la última parte del año. En el Sahel, hay señales (que deberán ser confirmadas) de un comienzo tardío de la época de lluvias. Otros países donde CropWatch identificó perspectivas desfavorables de producción incluyen a Camboya y Myanmar.

>>El Niño: section 5.4; individual country analyses: section 3.2.

Chapter 1. Global agroclimatic patterns

Chapter 1 describes the CropWatch agroclimatic indicators for rainfall (RAIN), temperature (TEMP), and radiation (RADPAR), along with the agronomic indicator for potential biomass (BIOMSS) for sixty-five global Monitoring and Reporting Units (MRU). Rainfall, temperature, and radiation indicators are compared to their average value for the same period over the last fourteen years (called the “average”), while BIOMSS is compared to the indicator’s average of the recent five years. Indicator values for all MRUs are included in Annex A, table A.1. For more information about the MRUs and indicators, please see Annex C and online CropWatch resources at ww.cropwatch.com.cn.

1.1 Overview

The most remarkable feature of the current January to April 2015 reporting period was the above average temperatures for almost all the CropWatch global mapping and reporting units (MRU), with temperatures for the MRUs usually about 1.0 to 1.5°C above average. Record temperatures occurred in the Brazilian Nordeste (MRU-22) and southern Mongolia (MRU-47)—both with temperatures of +2.7°C above the recent average—and in eastern Siberia (MRU-51) and the U.S. West Coast (MRU-16) where the departure was +2.5°C. Significant negative temperature departures from average were observed in very limited areas of the eastern United States (especially the Corn Belt, MRU-13) with temperatures of 2.7°C below average.

Compared to temperature, rainfall and PAR show more spatial variability. In the United States West Coast, the high temperatures were accompanied by below average rainfall (-40%) and a decrease in the biomass production potential of 26%. In most other areas, the typical correlations between the variables are not observed.

Below average rainfall occurred in most tropical areas across all continents, including Southeast Asia and Central and South America. In Central and South America, especially the Caribbean (MRU-20, -29%) and western Patagonia (MRU-27, -55%) were affected, with the drop in rainfall affecting range-land development in Patagonia. In Africa, a rainfall deficit in the west (signaling a late onset of rains in the southern Sahel) is of minor relevance, but the rainfall deficits in the Horn of Africa (MRU-04) and the east African highlands (MRU-02), where radiation also increased above average, could be important and deserve increased monitoring at a finer spatial scale. Other rainfall deficit areas include much of western Europe (MRU-60) and especially the northern Mediterranean (MRU-59) where both rainfall deficit and biomass production potential for the reporting period were close to -29%.

East Asia (MRU-43) and the southernmost areas in China (MRU-33 Hainan and MRU-42 Taiwan) all suffered a water deficit close to or in excess of -40%, but the resulting biomass production drop is more severe in the areas in China (-36% to -52%) than in East Asia where the biomass potential was reduced but remained closer to average due to more favorable temperature.

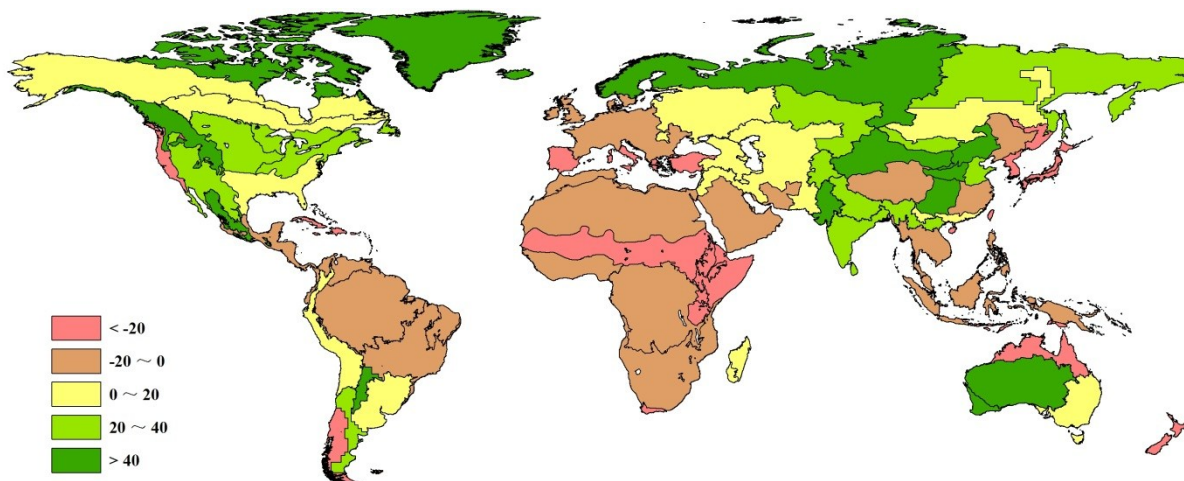
Apart from the Sierra Madre (MRU-17, +139% rainfall and -8% solar radiation), the largest positive departures of rainfall from average all occurred in Asia, namely in the Punjab to Gujarat region (MRU-48, +63%) and China’s Loess (MRU-36, +75%), Gansu-Xinjiang (MRU-32, +86%), and Inner Mongolia (MRU-35, +91%) regions. The most favorable combination of rainfall and temperature anomalies happened in Southwest China (MRU-41), with an estimated increase in biomass production potential of 63%. All

above-mentioned rainfall anomalies were accompanied by above average temperature and resulted in an increased biomass potential of the winter-crop season.

1.2 Rainfall

Over the reporting period, rainfall (as indicated by the CropWatch RAIN indicator) showed a large variation across regions. Figure 1.1 presents a global map. On the African continent, insufficient rainfall affected several areas, including the East African highlands (MRU-02; RAIN, -29%), the Horn of Africa (MRU-04, -27%), the Sahel (MRU -08, -29%), Equatorial central Africa (MRU-01, -13%), Western Cape (MRU-10,-43%), and North Africa-Mediterranean (MRU-07, -15%). Rainfall amounts in some of the major African production zones were close to normal or below average, including in the Gulf of Guinea (MRU-03, -8%) and Southern Africa (MRU-09,-7%). As a result of most of the agricultural production being rain-fed and practiced by smallholders, Africa's food security may be at risk if drought continues in next monitoring period, especially in the east African Highlands and the Sahel. Below average rainfall also occurred around the Mediterranean and in West Europe, including Mediterranean Europe (MRU-59,-29%) and Turkey, and non-Mediterranean Western Europe (MRU-60,-19%). Rainfall in continental Southeast Asia (MRU-50) and maritime Southeast Asia (MRU-49) showed values that were 10% below average. Some regions of Northeast Asia also suffered below average rainfall, including East Asia (MRU-43,-38%) and Southern Japan and Korea (MRU-46, -27%). South America experienced close to or below average rainfall, including in Brazil's Nordeste (MRU-22, -17%), Northern South and Central America (MRU-19,-10%), the Amazon (MRU-24,-7%), and central-eastern Brazil (MRU-23,-2%). Other regions where rainfall showed significant negative departures include the U.S. West Coast (MRU-16, -40%), China Hainan (MRU-33, -42%), the Lower Yangtze region in China (MRU-37, -16%), and China Taiwan (MRU-42, -45%).

Figure 1.1. Global map of rainfall anomaly (as indicated by the RAIN indicator) by MRU, departure from 14YA, January-April 2015 (percentage)



Note: Data for January-April 2015, compared with the fourteen-year average (14YA) for the same period 2001-2014.

In North America, rainfall was above average in British Columbia to Colorado (MRU-11, +54%), Northern Great Plains (MRU-12, +37%), Corn Belt (MRU-13, +38%), Cotton Belt to Mexican Nordeste (MRU-14, +17%), Sub-boreal America (MRU-15, +18%), and Sierra Madre (MRU-17, +139%). Some regions of Southern America also received abundant rainfall, including central-north Argentina (MRU-25, +55%) and the Pampas (MRU-67, +10%). In Asia, some important crop zones received abundant rainfall, such as the southern Himalayas (MRU-44,+23%), Southern Asia (MRU-45, +35%), Punjab to Gujarat (MRU-48, +63%), and in China Huanghuaihai (MRU-34, +21%), Inner Mongolia (MRU-35, +91%), the Loess region(MRU-36, +76%), Southwest China (MRU-41, +59%), and Southern China (MRU-40, +9%). Other regions also

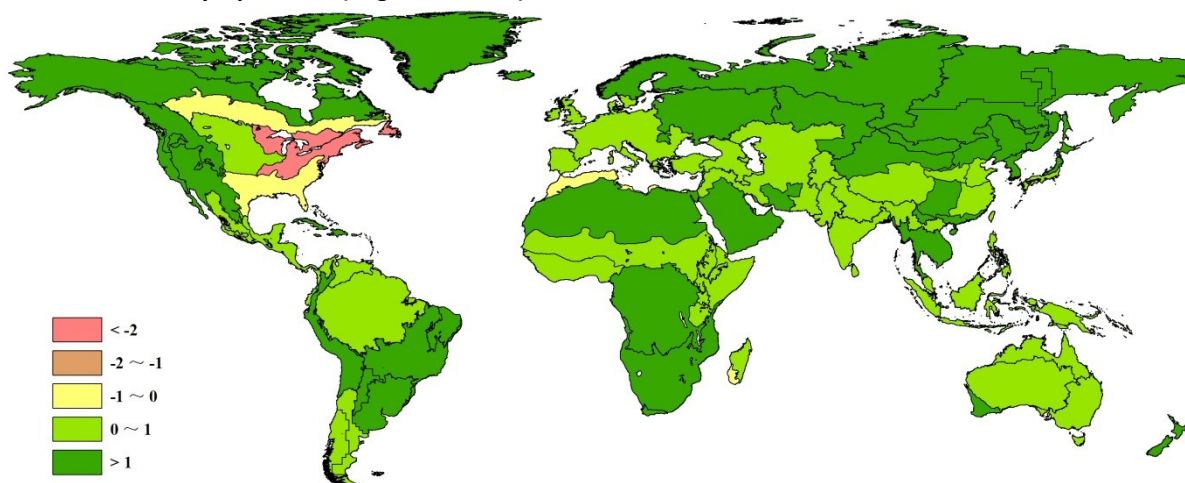
received abundant rainfall, including Boreal Eurasia (MRU-57, +52%) and the Ural to Altai Mountains (MRU-62, +26%).

1.3 Temperature

Over the reporting period, almost the entire world experienced above-average temperature (TEMP) conditions compared with the recent average (figure 1.2). The only area that experienced below-average temperature by more than 0.5°C was in the east of North America: the Corn Belt (MRU-13, -2.7°C) and Cotton Belt to Mexican Nordeste (MRU-14, -0.8°C).

In addition, in 32 MRUs across the world temperature anomalies exceed 1.0°C differences. The largest positive temperature departures are found in Brazil's Nordeste (MRU-22, +2.7°C), southern Mongolia (MRU-47, +2.7°C), the U.S. West Coast (MRU-16, 2.5°C), Eastern Siberia (MRU-51, +2.5°C), Boreal Eurasia (MRU-57, +2.5°C), and British Columbia to Colorado (MRU-11, +2.2°C).

Figure 1.2. Global map of air temperature anomaly (as indicated by the TEMP indicator) by MRU, departure from 14YA, January-April 2015 (degrees Celsius)



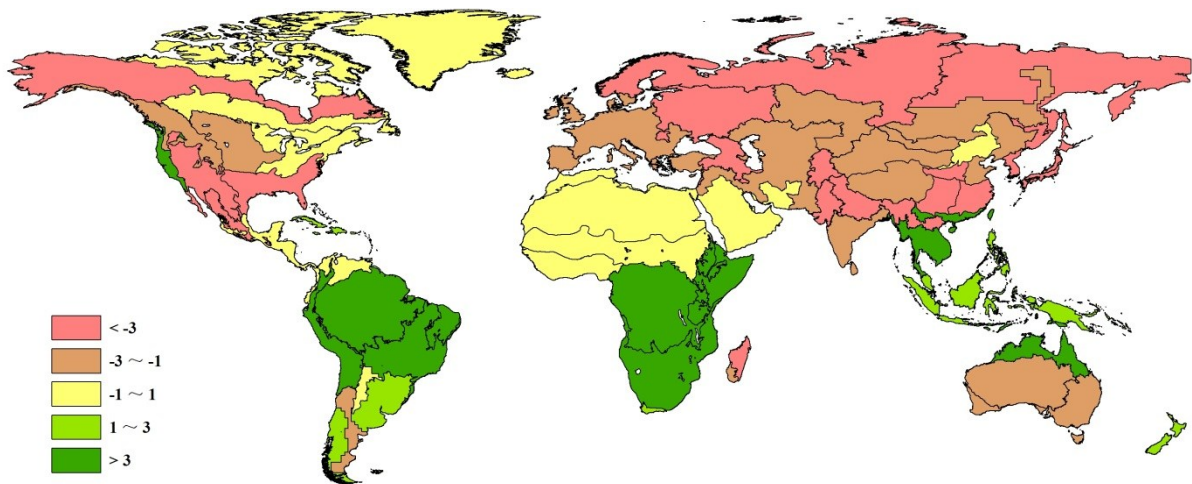
Note: Data for January-April 2015, compared with the fourteen-year average (14YA) for the same period 2001-2014.

1.4 Photosynthetically active radiation

For the reporting period, particular mention must be made of radiation (RADPAR) decreases in most parts of the North American and Eurasian continents, which are paralleled by abundant rainfall in several areas, for instance Sierra Madre (MRU-17, -8%), Boreal Eurasia (MRU-57, -7%; though not a region of agricultural relevance), and Punjab to Gujarat in South Asia (MRU-48, -5%). The largest PAR decrease—of 10%—in the last four months occurred in the U.S. Cotton Belt to Mexican Nordeste (MRU-14). In contrast, in the Southern Hemisphere radiation in most MRUs is above or close to average. The areas with marked positive departures include (i) Central eastern Brazil (MRU-23, +6%) and the Amazon (MRU-24, -5%) in South America; (ii) Northern Australia (MRU-53, +4%) and Southeast Asian mainland (MRU-50, +4%); and (iii) Equatorial central Africa (MRU-01, + 8%), where the largest positive departure was recorded, as well as the adjacent MRUs including the East African highlands (MRU-02, +6%) and the Horn of Africa (MRU-04, +4%).

Most regions of China show a decrease in RADPAR, including three major grain producing regions: the Loess region (MRU-36, -4%), South West China (MRU-41, -5%), and the Lower Yangtze (MRU-37, -3%). Only Southern China (MRU-40) and Taiwan (MRU-42) received above average RADPAR (both at +3%), while the largest positive anomaly in China was recorded in Hainan (MRU-33) with +12%. Figure 1.3 presents the global map of PAR increases or decreases compared to average.

Figure 1.3. Global map of PAR anomaly (as indicated by the RADPAR indicator) by MRU, departure from 14YA, January-April 2015 (percentage)



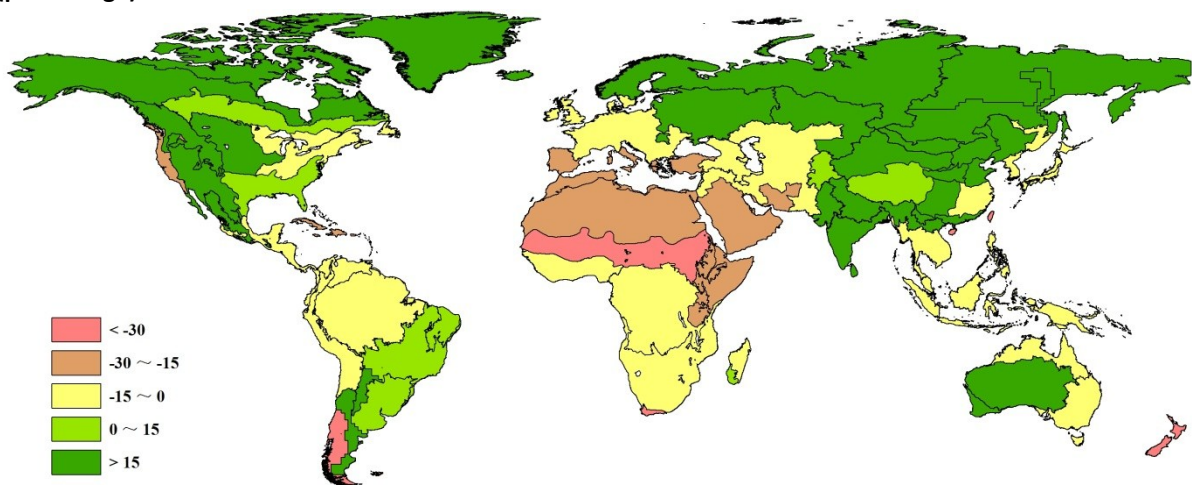
Note: Data for January-April 2015, compared with the fourteen-year average (14YA) for the same period 2001-2014.

1.5 Biomass

BIOMSS is a synthetic agro-climatic indicator that takes into account rainfall and temperature to estimate the potential biomass accumulation. Recent departures from average for the 65 global MRUs are shown in figure 1.4. As shown in the figure, as a result of the "favorable" temperature condition in this monitoring period, BIOMSS is above the five-year average in most parts of Asia, northern Europe, and North America. The greatest positive biomass departures are found in Punjab to Gujarat (MRU-48, 60%), China's Inner Mongolia (MRU-35, 62%), Southwest China (MRU-41, 63%), Nullarbor to Darling (MRU-55, 63%), Gansu-Xinjiang (China; MRU-32, 79%), and Sierra Madre (MRU-17, 140%).

In most parts of Africa, South America, and western Europe, biomass expectations are below the recent five-year average. In Hainan (China; MRU-33, -52%), the Western Cape (South Africa; MRU-10, -43%), western Patagonia (MRU-27, -39%), New Zealand (MRU-56, -38%), Taiwan (China; MRU-42, -36%), and the Sahel (MRU-8; -35%), the biomass accumulation potential was more than 30% below average as a result of rainfall.

Figure 1.4. Global map of biomass accumulation (BIOMSS) by MRU, departure from 5YA, January-April 2015 (percentage)



Note: Data for January-April 2015, compared with the five-year average (5YA) for the same period 2010-2014.

Chapter 2. Crop and environmental conditions in major production zones

Chapter 2 presents the same indicators—RAIN, TEMP, RADPAR, and BIOMSS—used in Chapter 1, and combines them with the agronomic indicators—cropped arable land fraction (CALF) and maximum vegetation condition index (VCIx)—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 six MPZs, comparing the indicators to their fourteen- and five-year averages.

Table 2.1. January-April 2015 agroclimatic indicators by Major Production Zone, current value and departure from 14YA

| | RAIN | | TEMP | | RADPAR | |
|--------------------------------|--------------|-------------------------|--------------|--------------------------|------------------------------|-------------------------|
| | Current (mm) | Departure from 14YA (%) | Current (°C) | Departure from 14YA (°C) | Current (MJ/m ²) | Departure from 14YA (%) |
| West Africa | 158 | -10 | 29.2 | 0.7 | 1251 | 1 |
| South America | 694 | 3 | 24.8 | 1.2 | 1169 | 4 |
| North America | 372 | 28 | 4.0 | -0.7 | 780 | -5 |
| South and SE Asia | 149 | 21 | 24.2 | 0.5 | 1143 | -2 |
| Western Europe | 163 | -27 | 6.4 | 1.0 | 590 | 0 |
| C. Europe and W. Russia | 177 | 4 | 0.5 | 1.3 | 522 | -3 |

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 fourteen-year average (14YA) for the same period (January-April) for 2001-14.

Table 2.2. January-April 2015 agronomic indicators by Major Production Zone, current season values and departure from 5YA

| | BIOMSS (gDM/m ²) | | Cropped arable land fraction | | Maximum VCI |
|-------------------------------------|------------------------------|------------------------|------------------------------|------------------------|-------------|
| | Current | Departure from 5YA (%) | Current (% of pixels) | Departure from 5YA (%) | Current |
| West Africa | 487 | -16 | 65 | -8 | 0.61 |
| South America | 1808 | 5 | 89 | 0 | 0.86 |
| North America | 823 | 15 | 55 | 1 | 0.72 |
| South and Southeast Asia | 516 | 34 | 83 | 3 | 0.81 |
| Western Europe | 674 | -13 | 92 | 1 | 0.86 |
| Central Europe and W. Russia | 676 | 12 | 65 | -5 | 0.64 |

Note: Departures are expressed in relative terms (percentage) for all variables. 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 five-year (5YA) average for the same period (January-April) for 2010-2014.

2.2 West Africa

With some minor variations due to elevation and terrain features, most of the West African MPZ was in the dry season in January and February, when the last 2014 crops were being harvested. In March and

April, the southernmost areas, particularly in the center and east, have started planting maize and rainfed rice. Figure 2.1 illustrates agroclimatic and agronomic indicators for the MPZ for the reporting period.

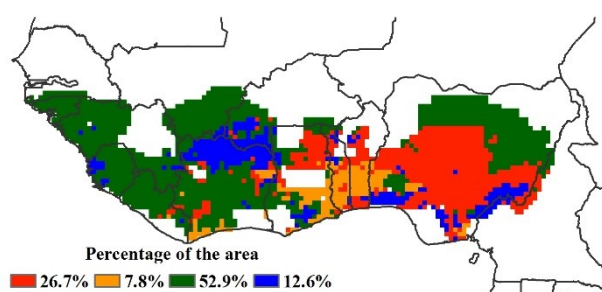
Compared with average conditions, for January to April the region as a whole underwent a rainfall deficit in the order of 10%, accompanied by slightly positive temperature and radiation departures. Taking into account the skewed statistical distribution of rainfall (that is, average rainfall overestimates amounts actually expected), it is still early to say if the slight deficit is likely to impact crops production, although it is likely to have delayed planting in some of the northernmost areas (the Sahelian areas) of the MPZ, especially in north Ghana (RAIN -8%), Côte d'Ivoire (RAIN -6% and TEMP +1.4°C), Nigeria (RAIN -12%), and the southernmost parts of Mali and Burkina Faso. In Liberia, which is the only country in the MPZ where rice is a major staple next to cassava and yams, a rainfall deficit of 13% was recorded. The only country that recorded a marked rainfall excess was Togo (+18%), but this may have been offset by higher than average temperature (+1.1°C).

The rainfall profiles and clusters show that rainfall deficits occurred throughout the region in April, with the north and west usually experiencing RAIN departures around -10mm in the north and west. The April deficit is more marked (close to -30mm) from northern Côte d'Ivoire to Central Nigeria, where it follows abundant rainfall (+40 mm) in March. Also in April, the whole region experienced above average temperatures (TEMP, +1.0°C).

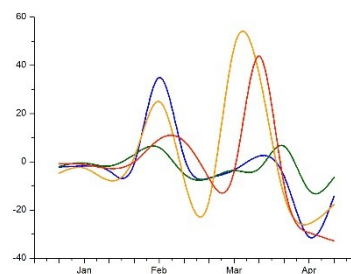
Generally, a somewhat late onset of the season compared with average is confirmed by the maximum VCI, for which low values occur in the north of Côte d'Ivoire, in Ghana, Togo, Benin, and across northern-central Nigeria. This is also where low VHI values tend to concentrate. Two additional crop-related indicators (fraction of cropped arable land (CALF) and BIOMSS) departures, expressed as the departure from the average of the recent five seasons only, confirm a drop in production potential close to or below 20% in the north of the MPZ, except in the very west where drops and improvements coexist, resulting in mixed but average conditions. Spatial variations in CALF are somehow difficult to interpret in southern Mali and adjacent Côte d'Ivoire, where the indicator values may result from early planting in March, following February rains.

Altogether, the indicators in the region are consistent with the expected seasonal behavior of climate and crops, with a possible false start of the cropping season in the northernmost areas in the west and slight delay of the Sahelian season in the central east, from Burkina Faso to Nigeria.

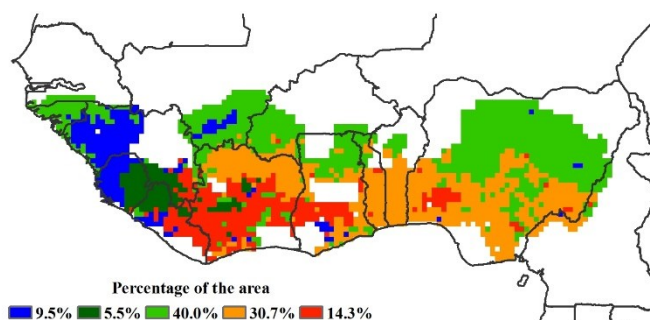
Figure 2.1. West Africa MPZ: Agroclimatic and agronomic indicators, January-April 2015



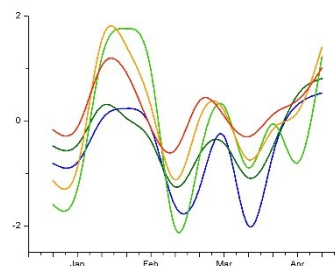
a. Spatial distribution of rainfall profiles



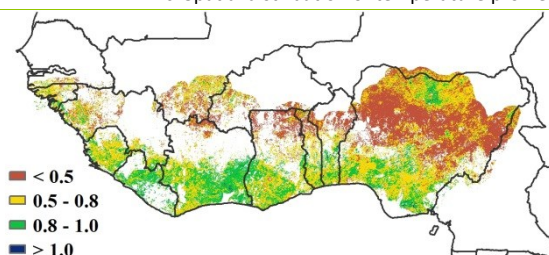
b. Profiles of rainfall departure from average (mm)



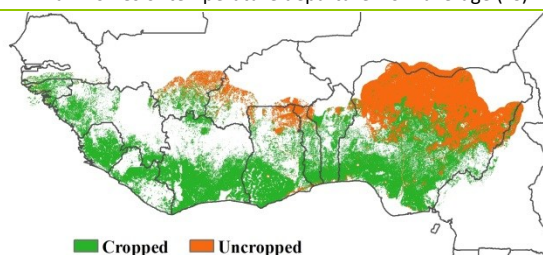
c. Spatial distribution of temperature profiles



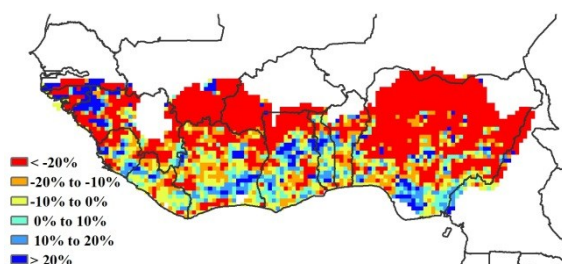
d. Profiles of temperature departure from average (°C)



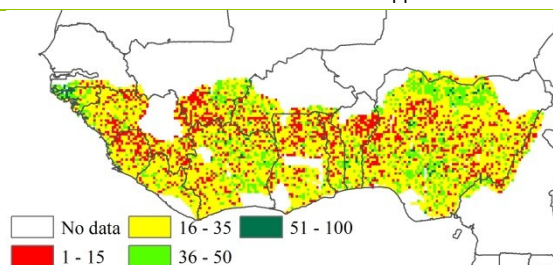
e. Maximum VCI



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

In general, crop condition of winter crops is above average in the North American MPZ (figure 2.2). Summer crops (maize, soybean, and spring wheat) are close to planting, and winter crops were in the middle of their growing season. Overall, the agroclimatic indicators show that rainfall was 28% above average, while temperature and radiation were both below average (-0.7°C and -5% , respectively).

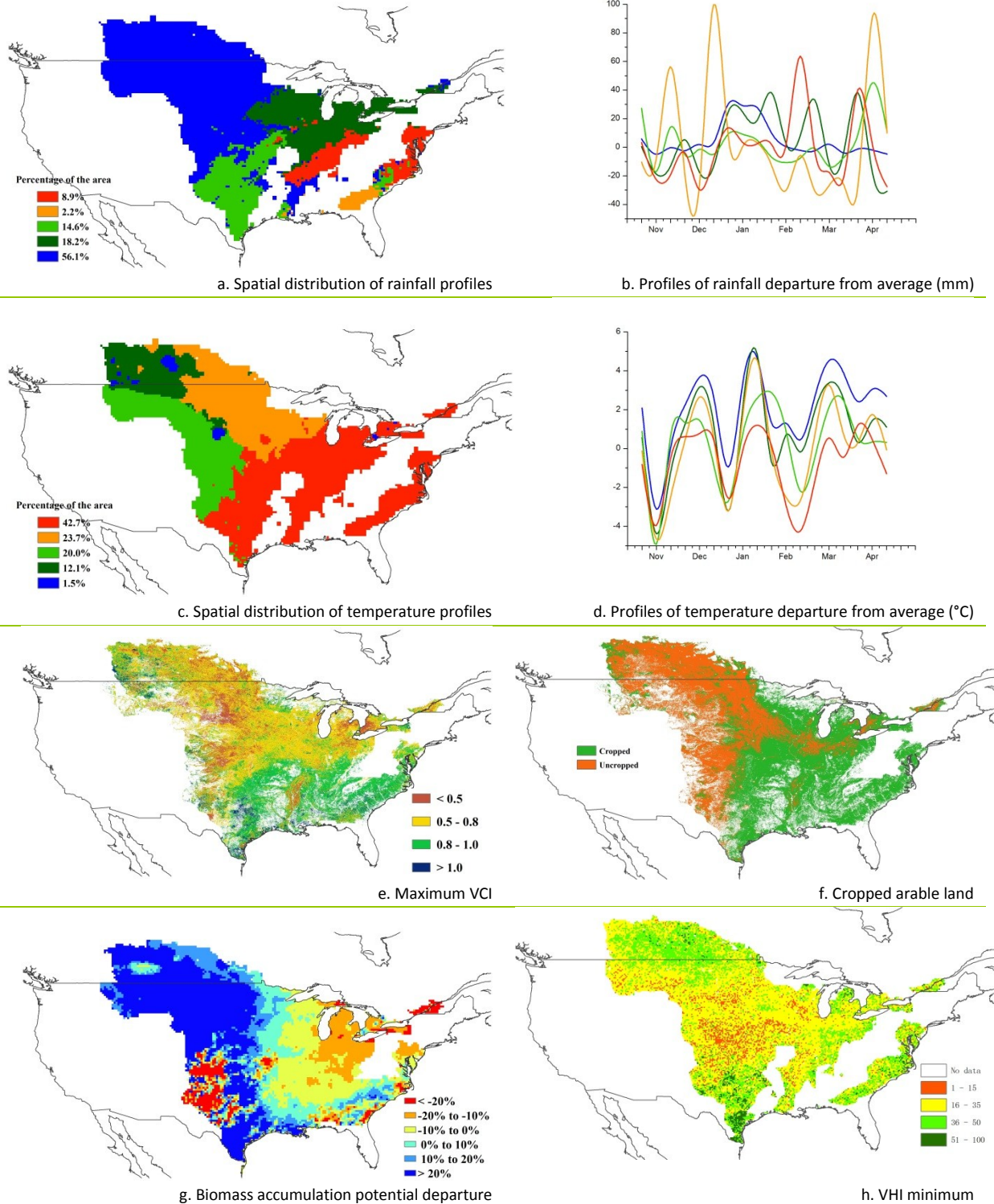
Among the main winter crops zones, abundant rainfall was recorded in the southern plains, Texas (RAIN, +35%), Oklahoma (+32%), Kansas (+16%), and in Nebraska (+48%), which is favorable for the growth of winter wheat. Temperature (TEMP) was close to average in the Southern Plains, including Kansas (+0.2), Texas (-0.8), Oklahoma (-0.7), and Nebraska (+1.0). Radiation (RADPAR) in the MPZ is below or close to average: Texas (-11%), Oklahoma (-6%), Nebraska (0%), and Kansas (+1%).

In the Corn Belt, rainfall was above average, including Illinois (+22%), Indiana (+30%), Iowa (+24%), Missouri (+26%), and Ohio (+52%), benefiting the planting of maize and soybean. The northern plains also received abundant rainfall, including in Montana (+149%), North Dakota (+129%), and South Dakota (+98%), which provides needed soil moisture for the planting of spring wheat and barley. In Canada, rainfall was above average for the provinces of Alberta (+23%), Manitoba (+1%), and Saskatchewan (+12%).

Overall, the accumulated biomass potential (BIOMASS) showed a positive departure of 15% compared to average, due to abundant rainfall, especially in the southern plains, indicating good performance of

winter crops in Texas (+52%), Oklahoma (+35%), Kansas (+18%), and Nebraska (+41%). Maximum VCI (the VCI_x) is 0.72, while the fraction of cropped arable land (CALF) increased 1%.

Figure 2.2. North America MPZ: Agroclimatic and agronomic indicators, January-April 2015



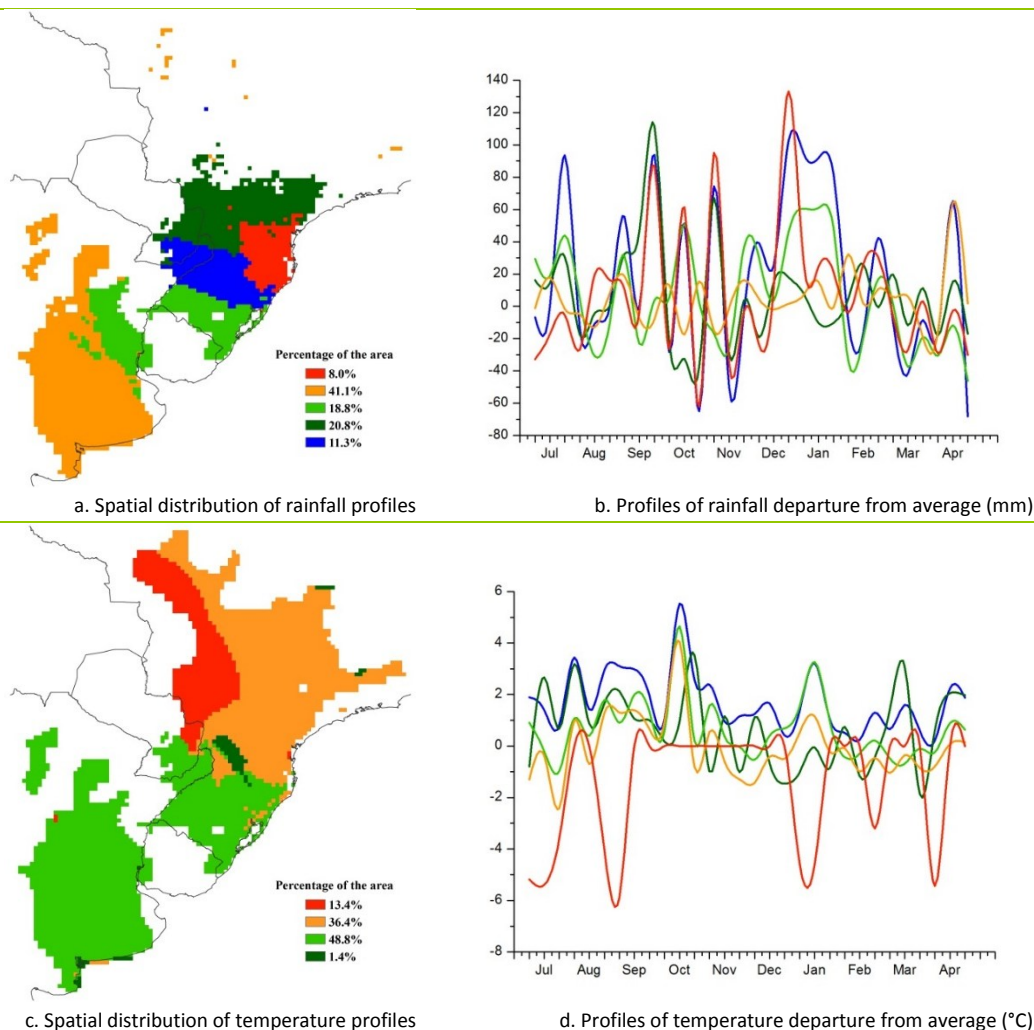
Note: For more information about the indicators, see Annex C.

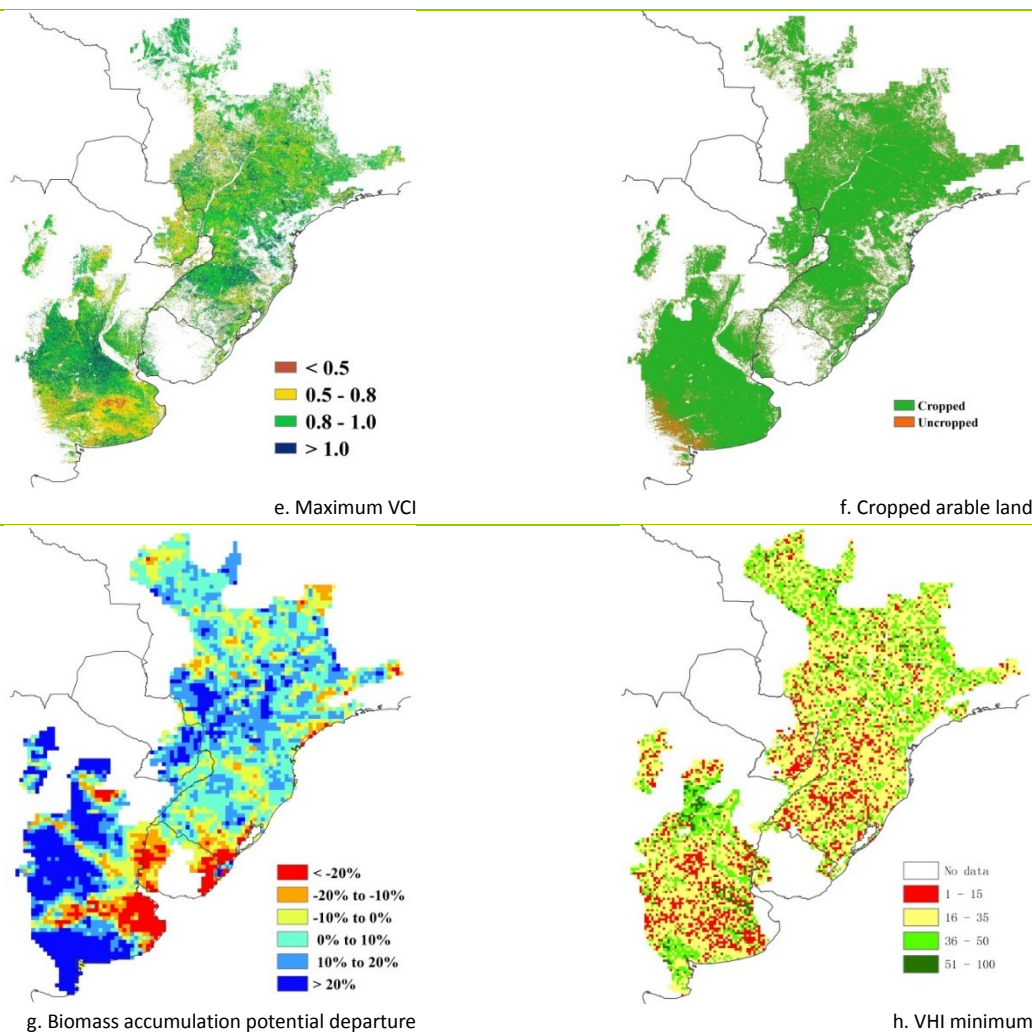
2.4 South America

In general, crops did well in the South America MPZ from January to April 2015; figure 2.3 presents the indicators for this MPZ. Favorable agroclimatic conditions were observed with average rainfall and radiation, and 1.2°C above average temperature which contributes to the 5% above average value for BIOMSS. Spatially, below average BIOMSS occurs in Paraguay and in central and northeast Buenos Aires, where below average rainfall in late January combined with high temperature in early January was unfavorable for crops. The minimum vegetation health index confirms the water deficit that occurred in those regions over the last four months. As is shown in the spatial pattern of rainfall departure, abundant rainfall was recorded in most of southern Brazil (including Rio Grande Do Sul, Santa Catarina, and Parana) around December and January. The north of the MPZ suffered low rainfall in January; rainfall in Argentina fluctuated significantly but was generally average over the reporting period. Temperature was in general favorable for crops in the MPZ, except for the regions from Southern Mato Grosso Du Sol north to Central Mato Grosso where extreme temperature deficits occurred in early January, mid-February, and again late March, hampering crop development.

According to the map showing the maximum vegetation condition index (VCIx), crop condition was below average in central Buenos Aires province. Average VCIx for the MPZ is 0.86 over the reporting period. The cropped arable land fraction (CALF) in the MPZ is 99%, which is the same level as the previous five-year average, with only some arable land in an area from Bahia Blanca to Santa Rosa uncropped.

Figure 2.3. South America MPZ: Agroclimatic and agronomic indicators, January-April 2015



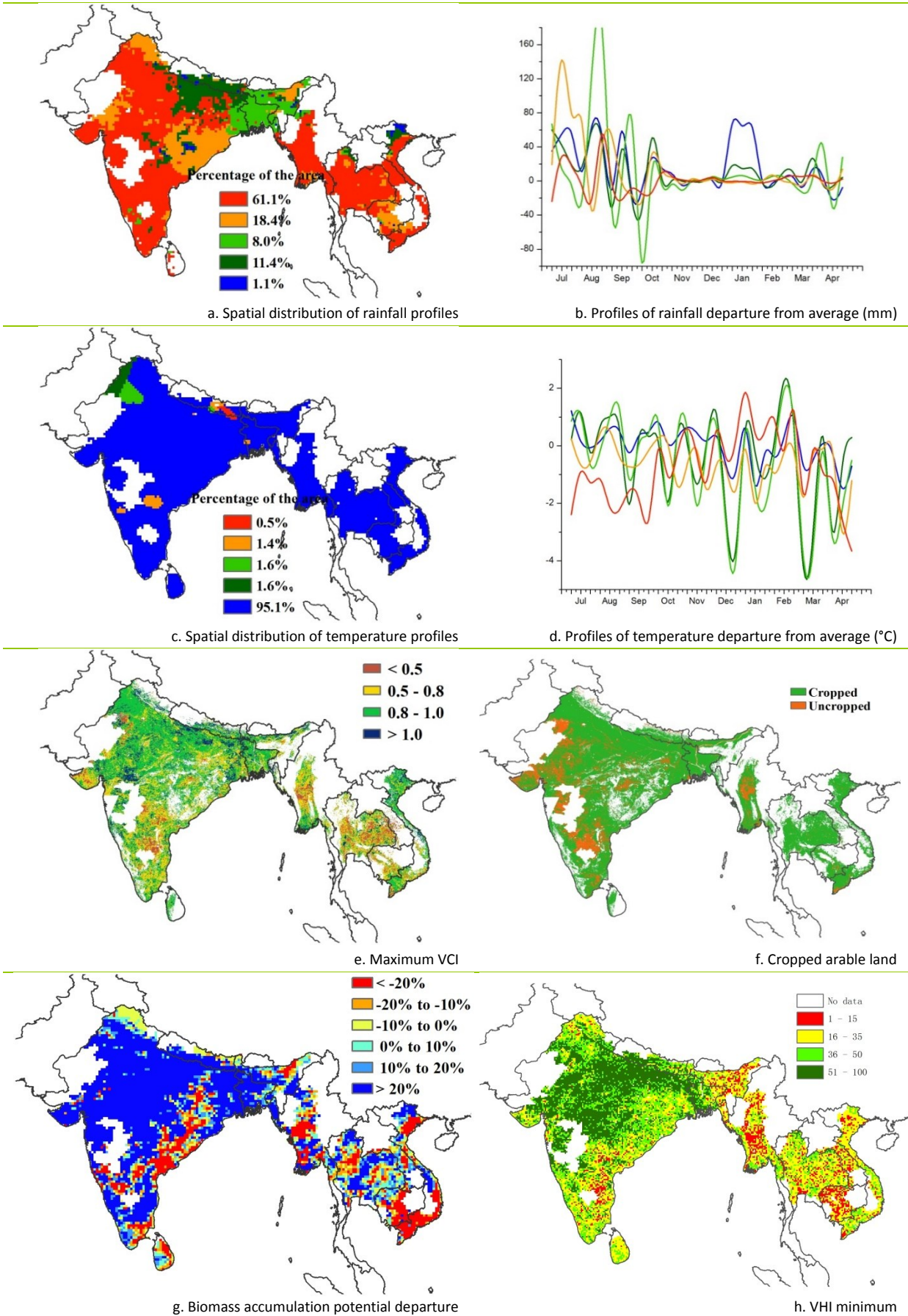


Note: For more information about the indicators, see Annex C.

2.5 South and Southeast Asia

The monitoring period is the growing and harvesting season of winter rice, wheat, and maize for this MPZ. The crop condition of the zone was average and locally below average, especially in central Myanmar and northeast Thailand. In the MPZ as a whole, the rainfall indicator (RAIN) was 21% higher than average, but lower than average rainfall was observed in Cambodia (-18%), Thailand (-11%), and Vietnam (-7%). TEMP was average and RADPAR was 2% below average in the region. The biomass accumulation and cropped arable land fraction both increased compared to the last five-year average (34% and 3%, respectively), but the average hides large local disparities. Maximum VCI mostly ranges from 0.5 to 1; VCIx values below 0.5 were observed in central Myanmar and some parts of Thailand, indicating less favorable crop condition. Due to reduced rainfall in Cambodia, Thailand, Vietnam, and Myanmar, minimum VHI values were low and indicate less favorable crop condition. Figure 2.4 summarizes CropWatch findings for this MPZ.

Figure 2.4. South and Southeast Asia MPZ: Agroclimatic and agronomic indicators, January-April 2015



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

2.6 Western Europe

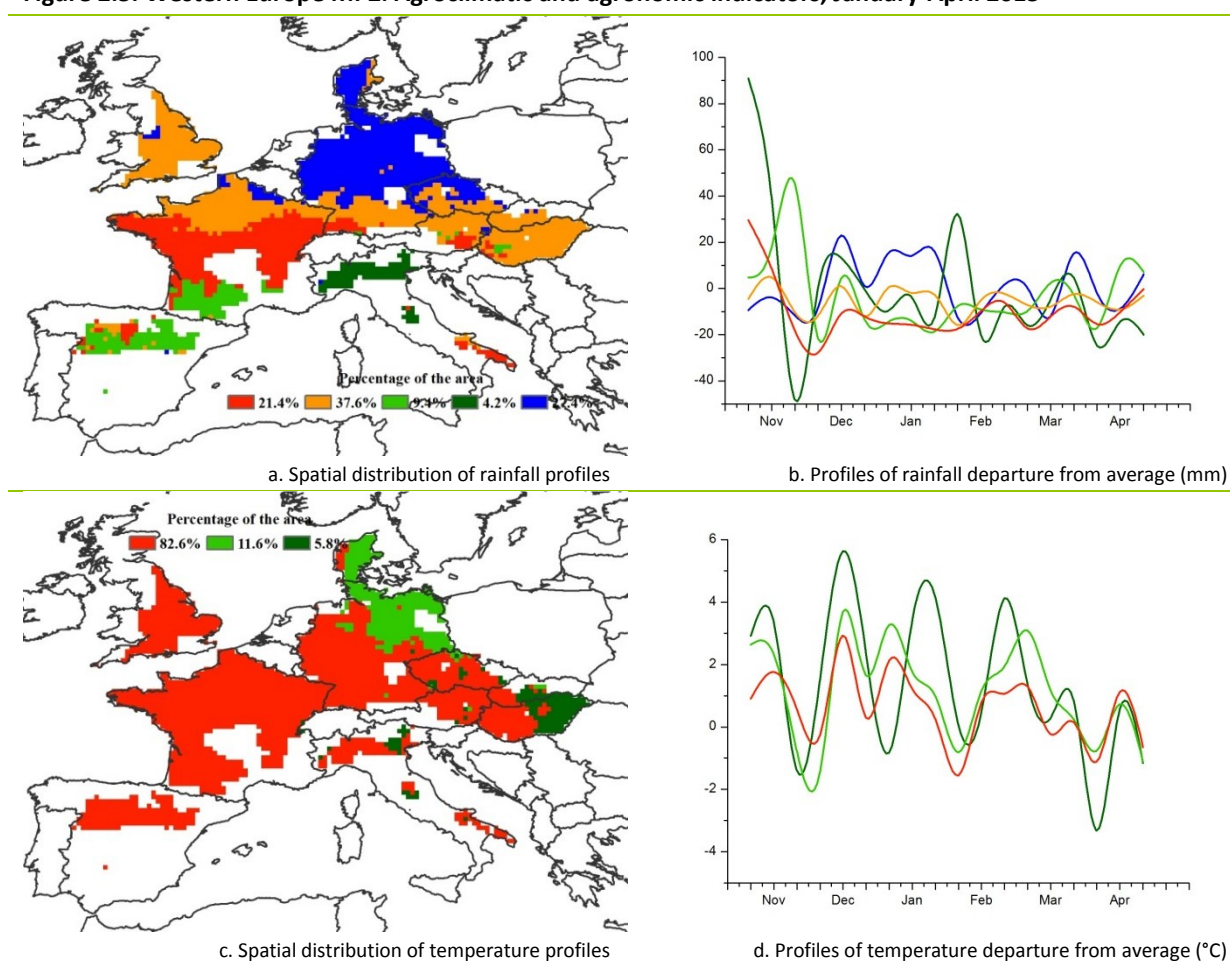
In general, crop condition was above average in most parts of Western Europe during this reporting period, especially for winter crop growth and spring sowings. Figure 2.5 presents an overview of CropWatch agroclimatic and agronomic indicators.

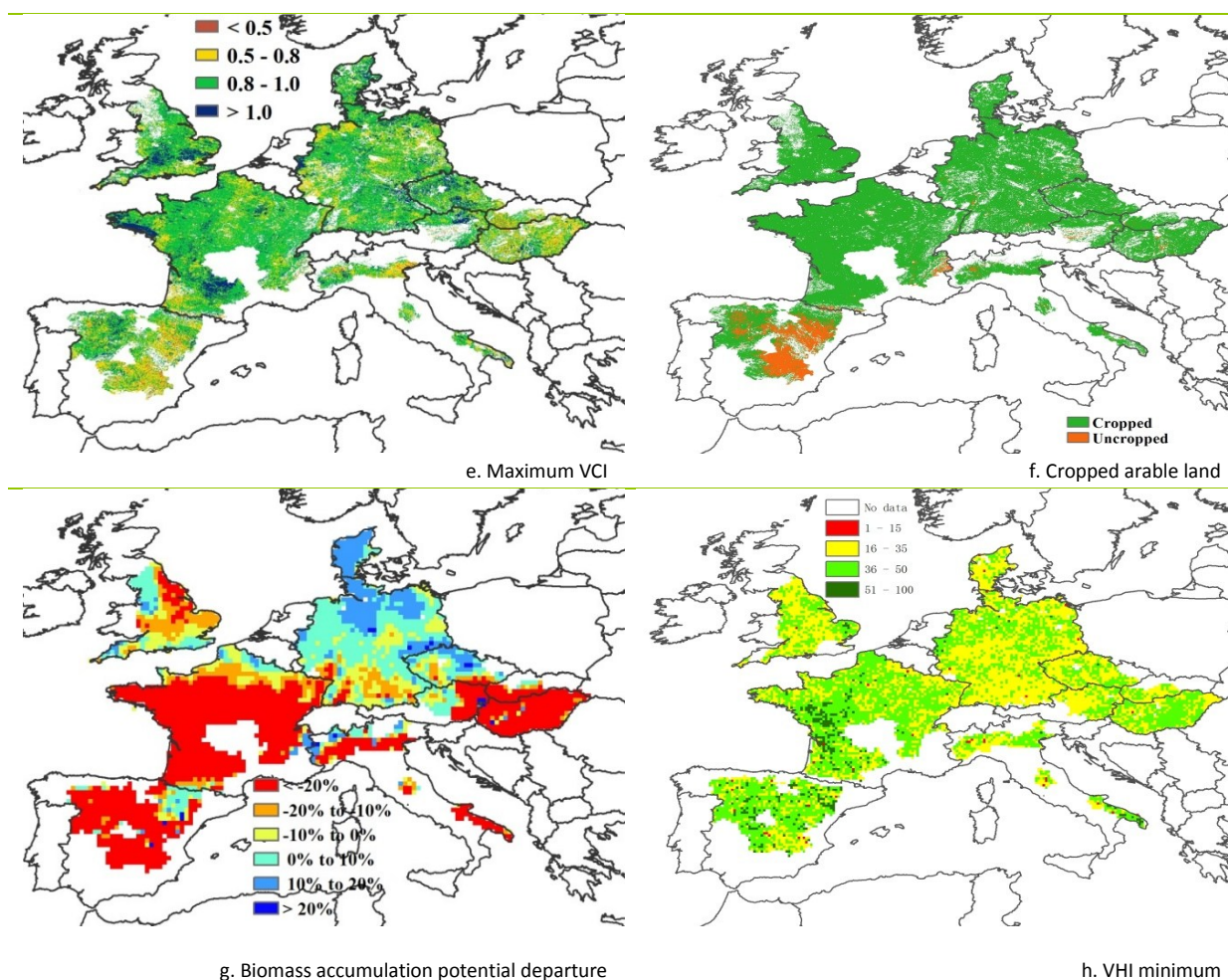
Total precipitation was 27% below the recent fourteen-year average, with exceptional positive departures over northern Italy from early January to early February and most parts of Germany in early January and March. Temperature showed an increase of 1.0°C and radiation was about average. Due to the rainfall deficit, the biomass accumulation potential, BIOMSS, was below (-13%) the recent five-year average. The spatial distribution of BIOMSS shows that the lowest values (-20% and below) occur over most of France, Spain, Italy, Hungary, and the eastern United Kingdom. In contrast, BIOMSS in most other regions was 10% above average.

The average maximum VCI values reach a high value of 0.86, indicating favorable crop condition. More than 92% of the arable lands were cropped, which is 1 percentage point above the recent five-year average. Most uncropped arable land is concentrated in Spain and southeast France. Accordingly, maximum VCI was lower as well, compared with other regions in the MPZ. Areas with low minimum VHI were partially scattered in Spain and northern Italy.

Generally, crop condition in Western Europe was favorable, but—depending on spring and early summer rain—limited soil water storage may make itself felt later in the season.

Figure 2.5. Western Europe MPZ: Agroclimatic and agronomic indicators, January-April 2015





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

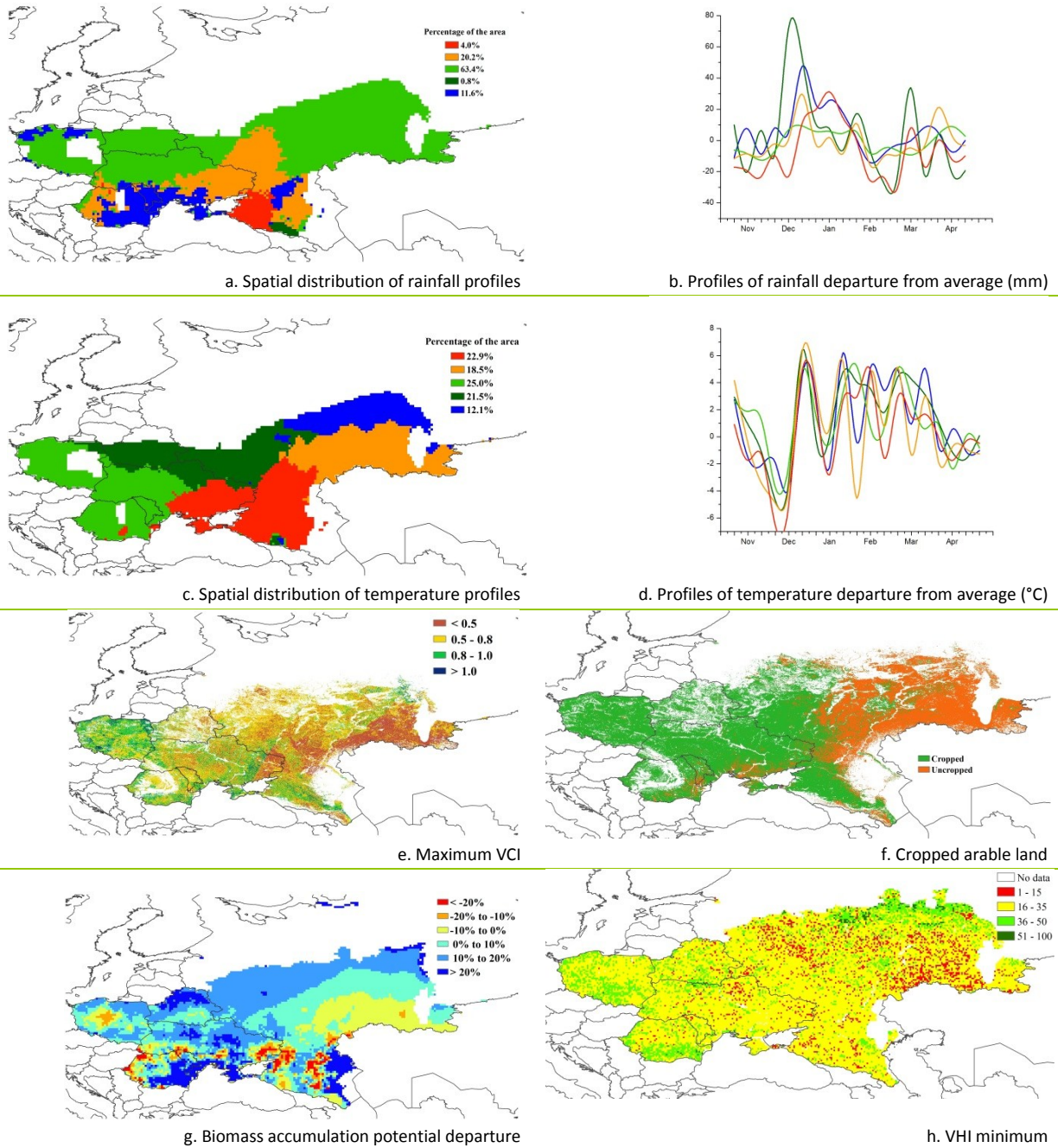
2.7 Central Europe to Western Russia

Between January and April 2015, winter crops in this MPZ were mostly at the vegetative stage (see figure 2.6). The agroclimatic indicators show predominantly normal conditions. RAIN was slightly above average (+4%), while RADPAR was below by 3%. The TEMP anomaly, however, was significant and reached +1.3°C; the resulting BIOMSS increase compared to the five-year average was 12%. Across the MPZ, the crop condition degrades from west to east, with favorable condition in Poland and relatively poor condition in western Russia.

Temperature profiles show correlated variations among most countries of the MPZ, with above average temperature from mid-January to late March in Poland, Romania, Belarus, the western Ukraine, and in the northern part of western Russia. Low temperatures occurred in several waves, affecting the whole region (as in December) or only part of it. The region of Russia adjacent to Kazakhstan, including the oblasts of Orenburg, Samar, Saratov, and Chelyabinsk, as well as the Republic of Bashkortostan, were particularly affected (-8°C compared with average in December; -4°C in late January), leading to poor crop condition (maximum VCI below 0.5). As indicated by the rainfall profiles, almost all areas of the MPZ suffered a significant rainfall deficit in February, especially in the Krasnodar and Stavropol Krays and the oblast of Rostov, with a more than 20% decrease in rainfall compared with average. Starting in March, rainfall recovered to above average in most areas, which was beneficial to the key growing season of winter crops. According to the map showing BIOMSS, a large positive biomass departure (more than 20%) is likely for Tulcea, Braila, and Calarasi in Romania; Grodno and Vitebsk in Belarus; the Kalmyk and Dagestan Republics; and the oblast of Astrakhan.

Only 65% of the arable lands were cropped in the January to April period, which represents a decrease of 5% compared to the recent five-year average. Most uncropped arable land was scattered in Russia (the easternmost part of the MPZ). The maximum VCI (VCI_{max}=0.64) is fair but low compared with other MPZs.

Figure 2.6. Central Europe-Western Russia MPZ: Agroclimatic and agronomic indicators, January-April 2015



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

Chapter 3. Main producing and exporting countries

Building on the global patterns presented in previous chapters, this chapter assesses the situation of crops in 30 key countries that represent the global major producers and exporters or otherwise are of global or CropWatch relevance. In addition, the overview section (3.1) also pays attention to other countries worldwide, to provide some spatial and thematic detail to the overall features described in section 1.1. In section 3.2, the CropWatch monitored countries are presented, and for each country maps are included illustrating NDVI-based crop condition development graphs, maximum VCI, and spatial NDVI patterns with associated NDVI profiles. Additional detail on the agroclimatic and BIOMSS indicators, in particular for some of the larger countries, is included in Annex A, tables A.2-A.11. Annex B includes 2014 production estimates for Argentina, Brazil, and the United States.

3.1 Overview

Figures 3.1-3.4 illustrate the global distribution of CropWatch indicators for rainfall, temperature, radiation, and biomass—respectively the RAIN, TEMP, RADPAR, and BIOMSS indicators, showing their increase or decrease for this monitoring period compared to last year's January-April period. Details by country are presented in table 3.1.

Globally, as already mentioned in Chapter 1, over the reporting period droughts affected the Caribbean and northern Mediterranean. Within these two regions, the most seriously affected countries are Dominica (rainfall 84% below average) and Portugal¹ (-85%). In South America, the water deficit affects the Dominican Republic (-66%) and several countries in the north, especially Ecuador, Colombia, Venezuela (with departures from average between -20 and -30%), and Suriname where the deficit reached 63%. All those countries were at the stage of either harvesting their second crop or planting the main crop. Among the Mediterranean countries, the deficit during the reporting period (basically covering the dormancy period of winter crops) varies between -42% and -50% in Spain, Italy, and Greece. The rainfall deficit also extends to other countries to the north, including Hungary and in an area from the Czech Republic to France (-50%), but particularly including Albania, Bosnia, and Croatia where the rainfall deficit exceeds 60%. The crop stage in this area is comparable with the situation along the Mediterranean, and spring rainfall will be critical.

In Europe, the Baltic and Scandinavian countries recorded abundant precipitation in the range of 40 to 65% above average amounts. This above average precipitation was associated with temperature records (2.5 to 3.5°C above average, also affecting Belarus) and large radiation deficits. (The radiation deficits exceed -10% and reach a record -17% in Estonia.) Among the various weather variables, the large amount of rainfall is the most relevant as it contributes to soil moisture.

Excess precipitation was recorded for several countries in South America (see also section 5.1). This includes Peru and Bolivia, along with neighboring areas, but also Mexico, with one of the largest positive departures recorded at country level for the reporting period (+118%, with -8% sunshine). Excess precipitation also occurred in parts of western Africa (Guinea Bissau, Senegal, Gambia, Mauritania, as

¹ Strictly speaking, Portugal is not a Mediterranean country, but it's its climate is similar to that of Spain.

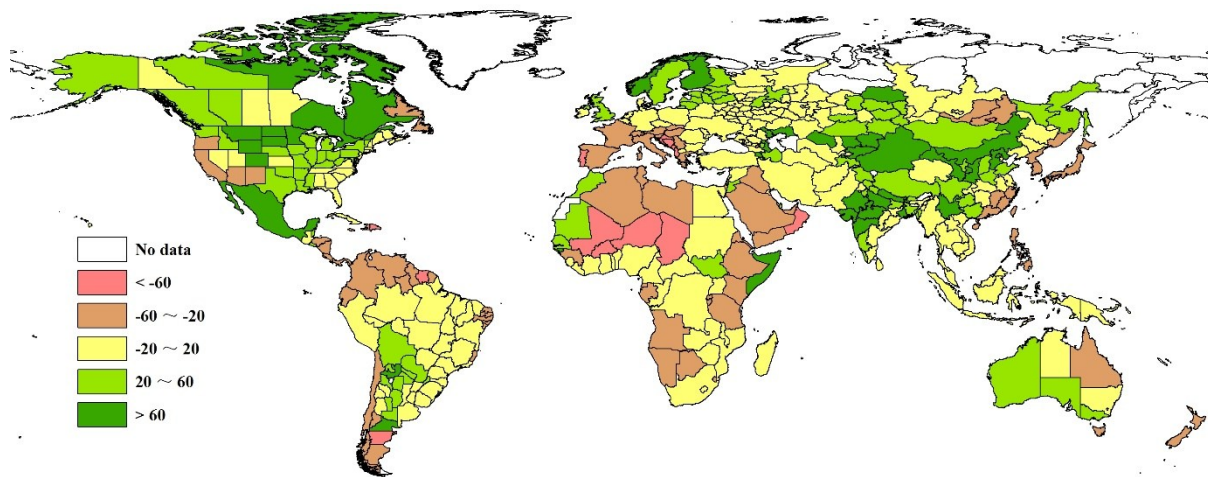
well as Morocco) where the excess precipitation of +20 or 30% and the early start of the season in some Sahelian countries could lead, if precipitation continues, to record biomass and crop production (the biomass potential reached +120% in Mauritania and +100% in Senegal). This is paralleled by a late onset of the season (decreased rainfall) in Guinea and some central Sahelian countries (Burkina Faso and the area from Mali to Chad). However, this rainfall deficit is still limited for the time being but nevertheless deserves close monitoring during this El Niño season.² The same applies to Kenya, Tanzania (20 to 30% deficit), and especially Eritrea (-56%). In Ethiopia, the early but “minor” Belg season suffered a water deficit (-25%).

Several central African countries (Cameroon, the Democratic Republic of Congo, and the Central African Republic) underwent favorable sunshine conditions, which occurred at the late phenological stages of cereals in the Democratic Republic of Congo (RADPAR, +11%) and early cycle or planting time in the other countries. Even if this was associated with a slight rainfall deficit (up to -10% for RAIN), shortage of sunshine (RADPAR) is usually a limiting factor in the region and the overall effect on crop production is positive.

Much of central and eastern Asia underwent wet conditions. Dry conditions however are reported from parts of Russia (the Chita Oblast and the Buryat Republic) as well as the Promorsky Kray and neighboring Japan, the Democratic People's Republic of Korea, and the Republic of Korea (below average rainfall of -30 to -40%). Further south, the rainfall deficit also affects the Philippines (-40%) and parts of east and south China from Jiangsu to Guangdong and Hainan. On the contrary, many central Asian regions (from Inner Mongolia to the Caspian and the eastern Black Sea, including Armenia where rainfall was 63% above average) enjoyed favorable rainfall. Above average rainfall also extended south into western India and southeast China (Yunnan), including earth-quake stricken Nepal (+101%).

Finally, drought conditions affected north-east Australia and New-Zealand (-51%).

Figure 3.1. Global map of rainfall (RAIN) by country and sub-national areas, departure from 14YA (percentage), January-April 2015



² The El Niño signal is usually stronger in southern and eastern Africa than in West Africa.

Figure 3.2. Global map of temperature (TEMP) by country and sub-national areas, departure from 14YA (degrees), January-April 2015

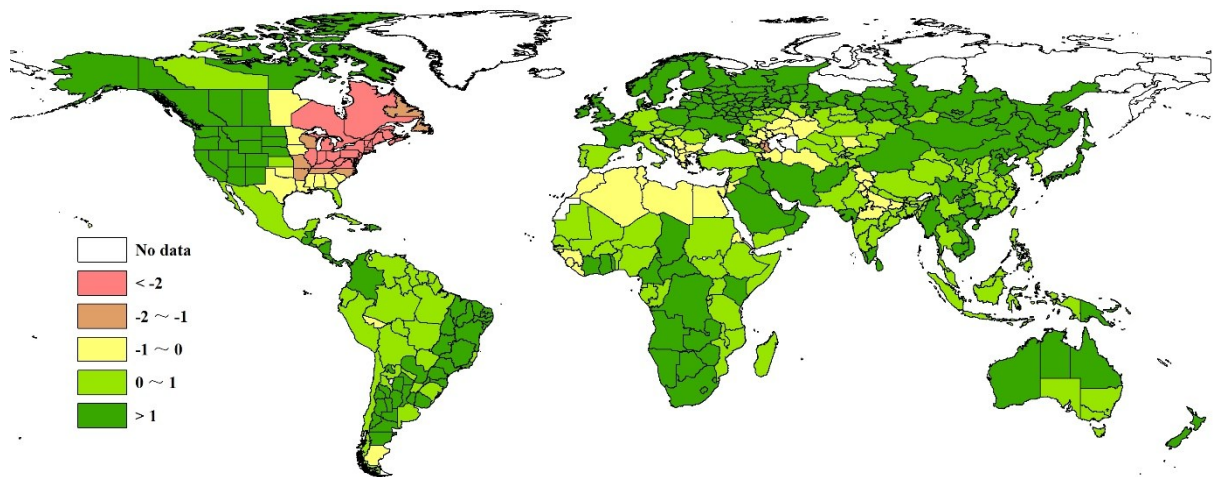


Figure 3.3. Global map of PAR (RADPAR) by country and sub-national areas, departure from 14YA (percentage), January-April 2015

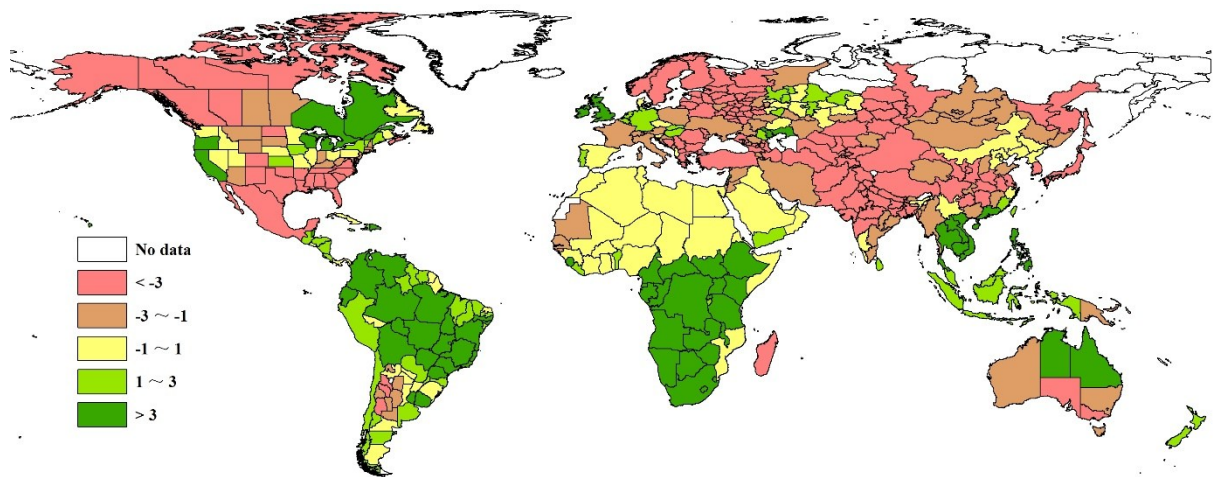


Figure 3.4. Global map of biomass (BIOMSS) by country and sub-national areas, departure from 14YA (percentage), January-April 2015

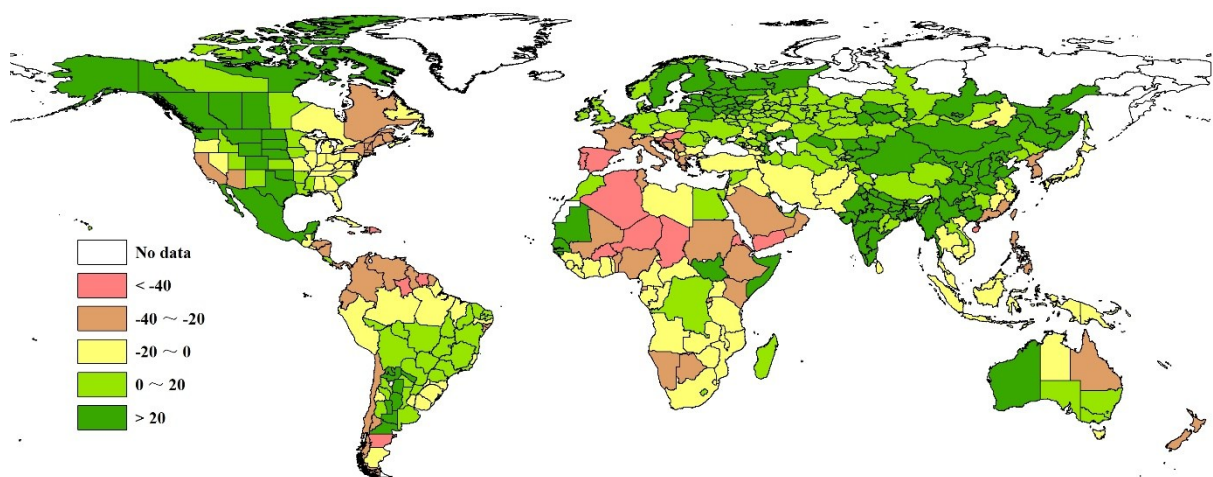


Table 3.1. CropWatch agroclimatic and agronomic indicators for January-April 2015, departure from 5YA and 14YA

| Country | Agroclimatic indicators | | | Agronomic indicators | | |
|----------------|-------------------------------|-----------|------------|------------------------------|----------|-------------|
| | Departure from 14YA (2001-14) | | | Departure from 5YA (2010-14) | | Current |
| | RAIN (%) | TEMP (°C) | RADPAR (%) | BIOMSS (%) | CALF (%) | Maximum VCI |
| Argentina | 21 | 1.1 | 0 | 13 | 1 | 0.84 |
| Australia | -2 | 0.8 | -1 | -1 | -16 | 0.54 |
| Bangladesh | 36 | 0.6 | -4 | 54 | 0 | 0.88 |
| Brazil | -6 | 1.2 | 5 | 1 | 0 | 0.85 |
| Cambodia | -18 | 1.2 | 6 | -16 | 1 | 0.65 |
| Canada | 38 | -0.5 | 0 | 8 | / | 0.71 |
| China | 5 | 1.2 | -2 | 25 | 3 | 0.86 |
| Egypt | -17 | -0.6 | -1 | 9 | 0 | 0.75 |
| Ethiopia | -25 | 0.4 | 6 | -22 | -4 | 0.54 |
| France | -46 | 1.8 | -2 | -27 | 1 | 0.88 |
| Germany | -1 | 0.4 | 3 | 16 | 0 | 0.87 |
| India | 32 | 0.3 | -4 | 52 | 3 | 0.83 |
| Indonesia | -7 | 0.7 | 2 | -2 | 0 | 0.89 |
| Iran | -6 | 1 | -2 | -10 | 2 | 0.76 |
| Kazakhstan | 23 | 0.4 | -2 | 17 | / | 0.60 |
| Mexico | 114 | 0.2 | -8 | 101 | 16 | 0.95 |
| Myanmar | 8 | 1.1 | -1 | 24 | 1 | 0.76 |
| Nigeria | -12 | 0.7 | 1 | -24 | -14 | 0.53 |
| Pakistan | 16 | 0.3 | -5 | -5 | 3 | 0.81 |
| Philippines | -41 | 0.6 | 6 | -36 | 0 | 0.85 |
| Poland | 7 | 1.4 | -1 | 14 | 0 | 0.83 |
| Romania | -2 | 0.6 | -3 | 5 | -8 | 0.76 |
| Russia | 12 | 1.6 | -3 | 15 | -1 | 0.61 |
| S. Africa | -6 | 1.3 | 5 | -6 | -10 | 0.68 |
| Thailand | -11 | 0.7 | 5 | -1 | 1 | 0.70 |
| Turkey | 10 | 0.1 | -5 | -6 | 3 | 0.84 |
| United Kingdom | 21 | 1 | 3 | 2 | 0 | 0.87 |
| Ukraine | -3 | 1.4 | -3 | 15 | -1 | 0.69 |
| United States | 24 | -0.4 | -4 | 10 | 1 | 0.74 |
| Uzbekistan | 11 | 0.3 | -5 | 18 | / | 0.66 |
| Vietnam | -7 | 1.1 | 6 | -6 | 0 | 0.83 |

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 five-year (5YA) or fourteen-year average (14YA) for the same period (January-April). Some winter crops are grown in Canada, Kazakhstan, and Uzbekistan (marked with “/”).

3.2 Country analysis

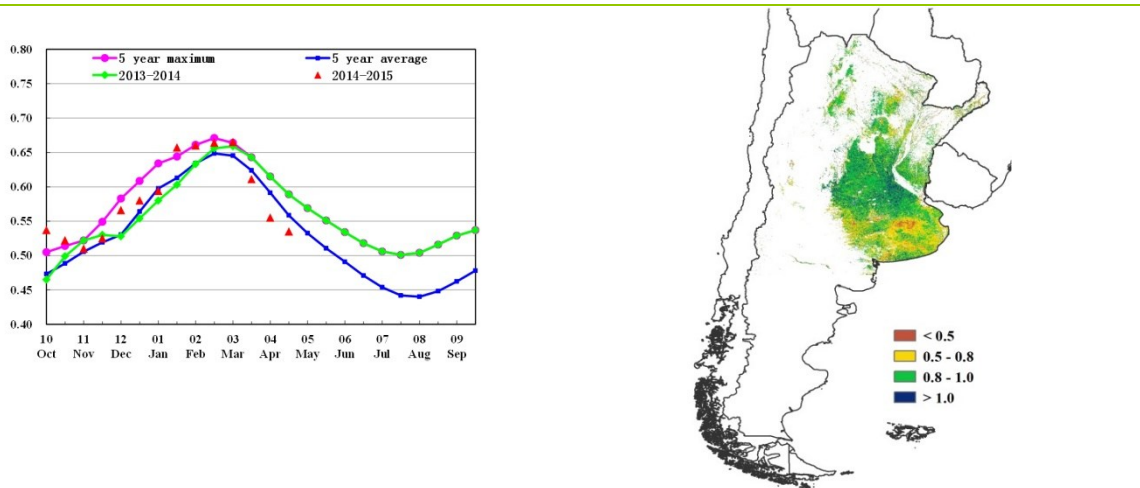
This section presents CropWatch results for each of thirty key countries (China is addressed in Chapter 4). The maps refer to crop growing areas only and include (a) Crop condition development graph based on NDVI average over crop areas, comparing the January-April 2015 period to the previous season and the five-year average (5YA) and maximum. (b) Maximum VCI (over arable land mask) for January 1 – April 30 2015 by pixel; (c) Spatial NDVI patterns up to April 2015 according to local cropping patterns and compared to the 5YA; and (d) NDVI profiles associated with the spatial pattern under (c). See also Annex A, tables A.2-A.10, and Annex B, tables B.1-B.3, for additional information about indicator values and production estimates by country. Country agricultural profiles are posted on www.cropwatch.com.cn.

Figures 3.5-3.34. Crop condition for individual countries ([ARG] Argentina- [ZAF] South Africa) for January-April 2015

[ARG] Argentina

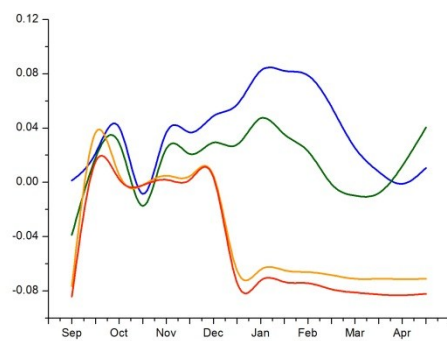
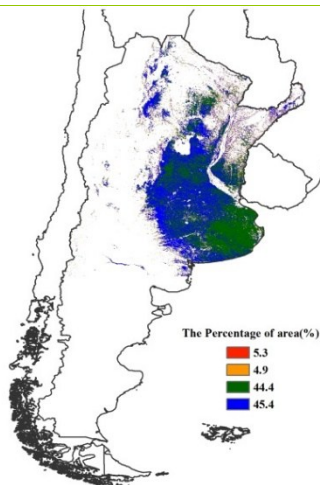
In general, crops in Argentina underwent favorable conditions from January to April. Currently, maize and soybean are at maturity stage and the harvest is ongoing. Nationally, abundant precipitation (RAIN, 21% above average) and favorable temperatures (TEMP, +1.1°C) accelerated the development and maturation of maize and soybean. Good agroclimatic conditions were also observed in major producing provinces, except for Entre Rios, with 8% below average rainfall. Overall, the NDVI development graph shows above average crop condition and advanced crop phenology. The NDVI peak exceeds the corresponding 2014 and five-year average values, which indicates above average yield prospects. As confirmed by spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles, NDVI has been above the five-year average since November 2014 in 90% of arable land in Argentina. The remaining 10% of land, where condition was below average, is located in scattered spots in northern Argentina, mostly in Mesopotamia and the Chaco Region. Compared with average, only Central Buenos Aires shows below average crop condition. For 2015, CropWatch puts maize and soybean production for the country at 25.3 million tons and 52.2 million tons, respectively, close to the 2014 production levels (see table B.1 in Annex B).

Figure 3.5. Argentina crop condition, January-April 2015



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

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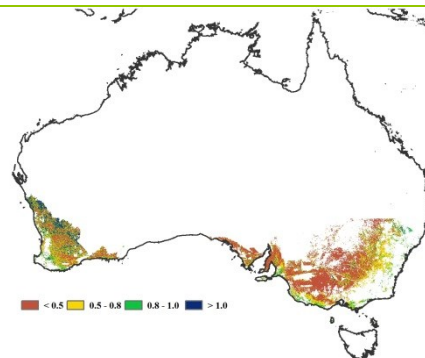
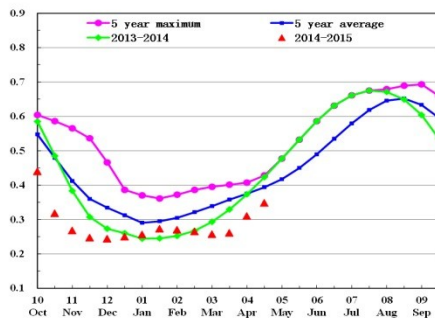
[AUS] Australia

Indicators in Australia show generally below average condition for the period between January and April in 2015, but differences between indicators make it difficult to assess the intensity of the anomaly. The reporting period is out of season for wheat and barley, which are the main crops for Australia. As a result, it is not surprising that the maximum VCI is generally only 0.54. The maximum VCI is below 0.5 for most of the Eastern Australian regions, including Victoria (except for southeastern areas), the middle and south of New South Wales, and the southeast of South Australia, which is consistent with the monitored result of a 16% decrease of the fraction of cropped arable land (CALF) compared with the recent five-year average.

Also compared to the recent five years, the spatial NDVI patterns and the corresponding time profiles show the condition of crops as below average, especially for the western part of Western Australia, southeastern part of South Australia, all over Victoria except for its southeastern area, and the southwestern part of New South Wales, together accounting for about 76.4% of the monitored area.

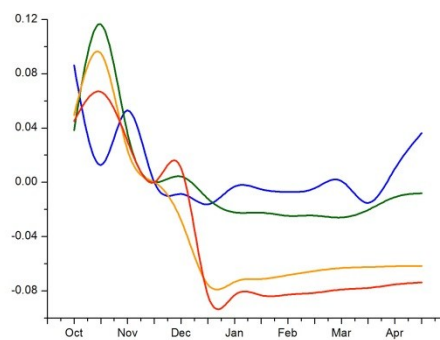
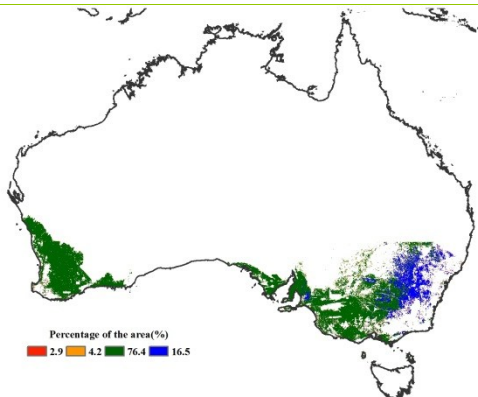
Globally, agroclimatic indicators display average conditions (RAIN, -2%; TEMP, +0.8°C; and RADPAR, - 1%), resulting in an average potential accumulated biomass (BIOMSS) of -1% compared to average. The "average" RAIN results from a marked deficit in Queensland and Tasmania (below -30%), combined with positive departures in other areas (+19% in New South Wales, +33% in South Australia, +22% for Victoria, and +48% for Western Australia) where soil moisture conditions now are favorable for the planting of wheat and barley in the coming month.

Figure 3.6. Australia crop condition, January-April 2015



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



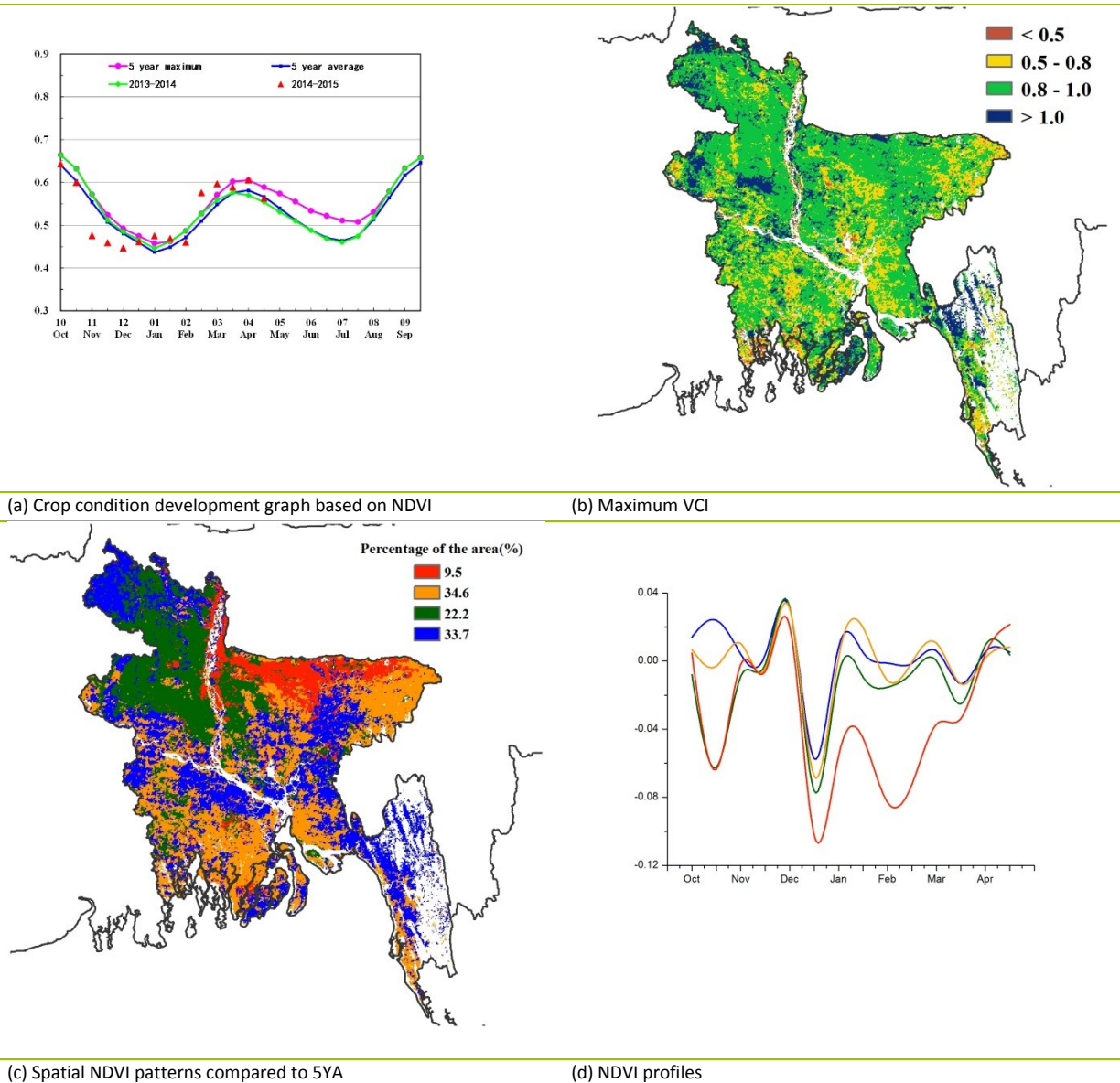
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

[BGD] Bangladesh

The monitoring period is the growing and harvesting season of irrigated boro rice. Overall, the CropWatch indicators indicate favorable crop condition for the reporting period. Rainfall was 36% above average, temperature was average, and PAR was low (-4%), nevertheless resulting in a biomass accumulation potential of 54% above the five-year average. The national NDVI profile was above the average of the previous five years from February to early April but dropped to average at the end of the month. The maximum VCI ranged from 0.5 to 1, indicating favorable crop condition for the entire country. Spatial NDVI profiles followed similar patterns for the whole country: after a marked drop at the end of 2014 and early 2015, values started increasing in early January and remained positive but close to average for the remainder of the monitoring period. Exceptions are in northeast Rajshahi and the north of Dhaka and Sylhet, where the recovery was much more gradual, affecting about 9.5% of the country.

Figure 3.7. Bangladesh crop condition, January-April 2015

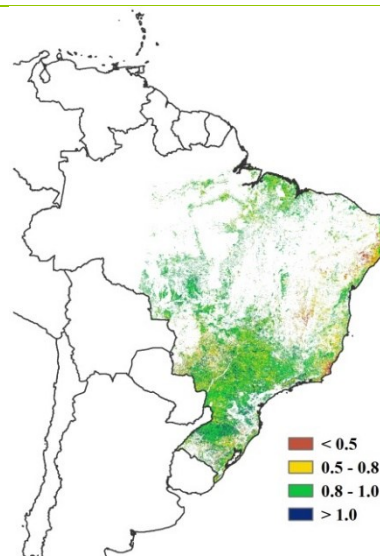
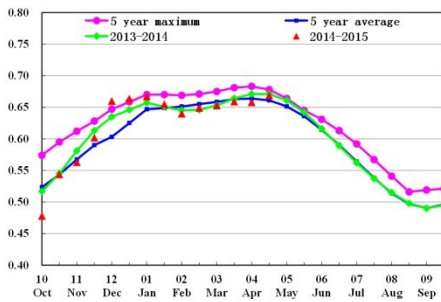


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[BRA] Brazil

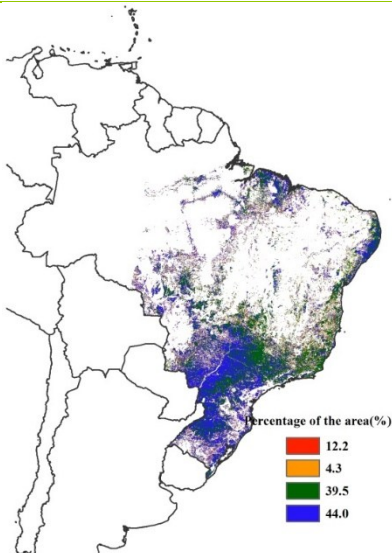
Overall crop condition was average in Brazil during the reporting period. The harvest of soybean, rice, and first season maize are almost completed and the second maize is reaching maturity stage. Rainfall was 803 mm from January to April, 6% below average, but still sufficient for crops. Air temperature was 1.2°C above average and radiation 5% higher. The NDVI development graph shows average condition at the national level. Spatial patterns and NDVI departure profiles compared to the five-year average clearly indicate above average conditions in Southern Brazil, including Mato Grosso Du Sol, Rio Grande Du Sol, Santa Catarina, and Parana, where crops benefited from above average rainfall. Below average crop condition is distributed in Goias, Minas Gerais, and Sao Paulo due to a water deficit. Significantly below average NDVI is scattered in northern Brazil as a result of drought. Regions with maximum VCI values below 0.5 confirm the below average condition. CropWatch puts maize, rice, and soybean production for Brazil at the same level as during 2014 (see also table B.2 in Annex B).

Figure 3.8. Brazil crop condition, January-April 2015

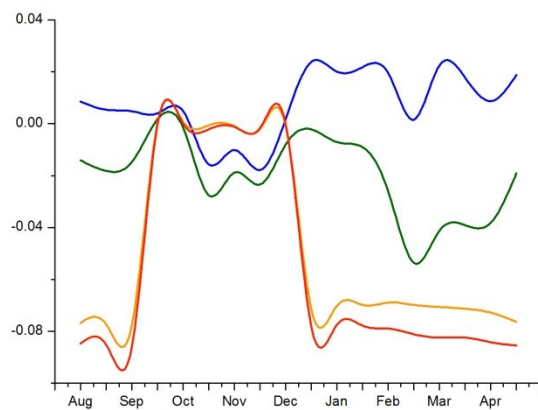


(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



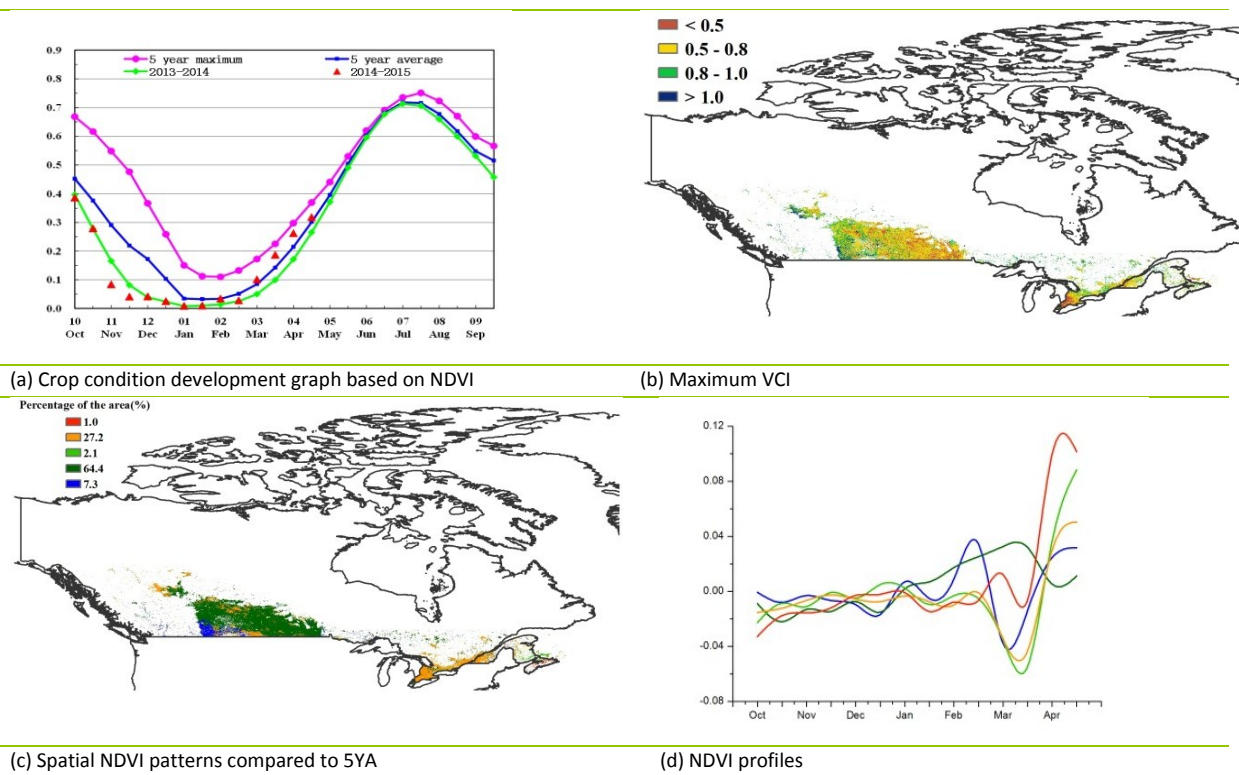
(d) NDVI profiles

[CAN] Canada

In general, crop condition as assessed by NDVI is above average in the current monitoring period. Except for limited winter crop areas, however, crops were not yet planted due to the cold weather conditions. In terms of the CropWatch agroclimatic indicators, RAIN was 38% above average, which will benefit the coming planting season of summer crops; TEMP was close to average(-0.5° C), and RADPAR was average. In the main agricultural province of Alberta, the following indicator values were recorded: RAIN, +23%; TEMP, 2.1°C; RADPAR -3%; and—the resulting biomass production potential—BIOMASS +29%.

The NDVI development profile is above average after March, which indicates the good performance of winter crops in Canada. At the same time, accumulated biomass showed a positive departure of 8%. The maximum VCI was 0.71.

Figure 3.9. Canada crop condition, January-April 2015

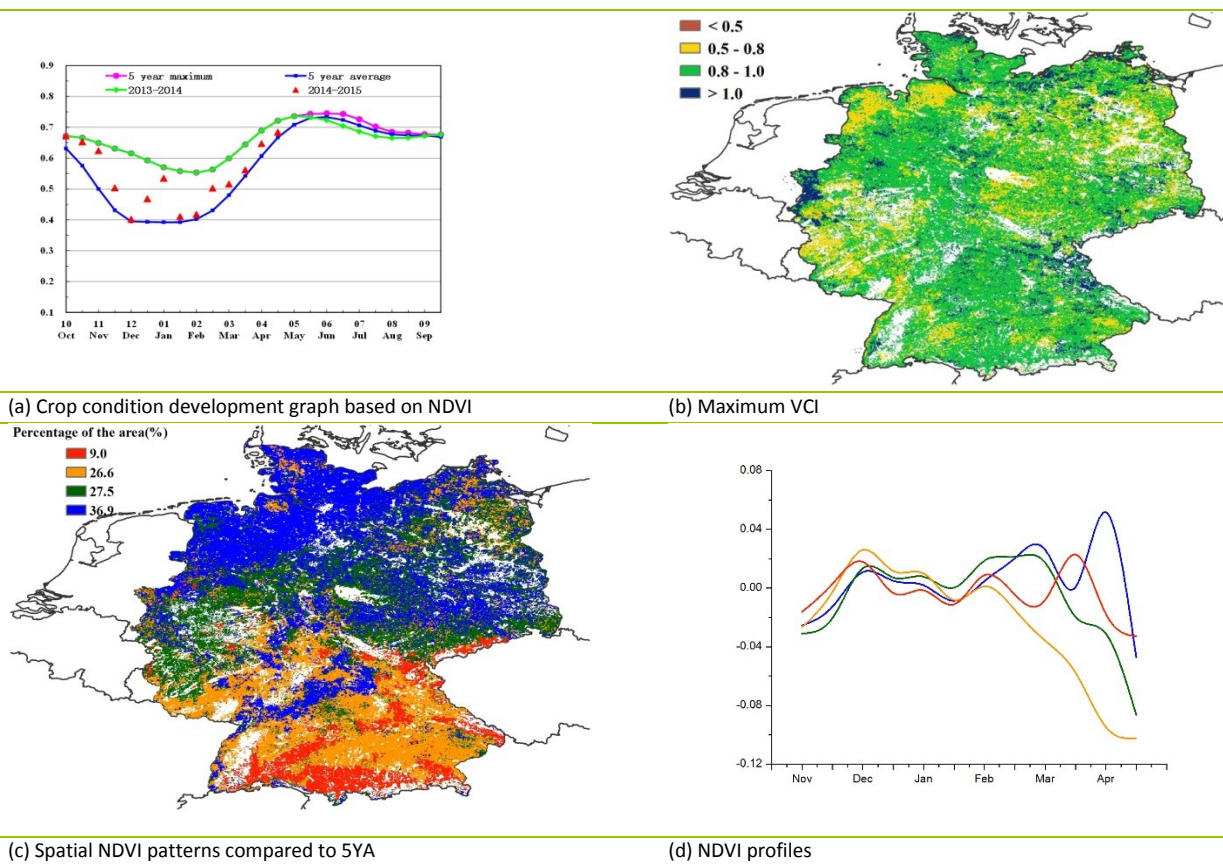


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[DEU] Germany

Crop condition in Germany was generally above average but below last year's over the reporting period. Currently, winter wheat and winter barley are in the vegetative stages and maize is being planted. The CropWatch agroclimatic indicators show that the reporting period recorded a 1% drop in RAIN compared to average, a 0.4°C increase in TEMP, and 3% above average RADPAR at the national level, which promoted the development of crops. With the positive thermal anomalies, BIOMSS is expected to increase by 16% compared to the five-year average at the national scale. The overall crop condition based on NDVI development also shows above average condition. The spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles confirm that NDVI is above average for most arable land in Germany. In total, 27.5% of crop areas scattered across west, central, and eastern Germany showed apparently below average condition since March 2015, which is probably due to crops being early this year compared with average timing. The high maximum VCI values shown on the maximum VCI map also present overall good crop condition, with a VCIX of 0.87 for the country overall. Generally, the values of the agronomic indicators mentioned above result in above average condition for most winter crop areas in Germany, although still below last year's condition.

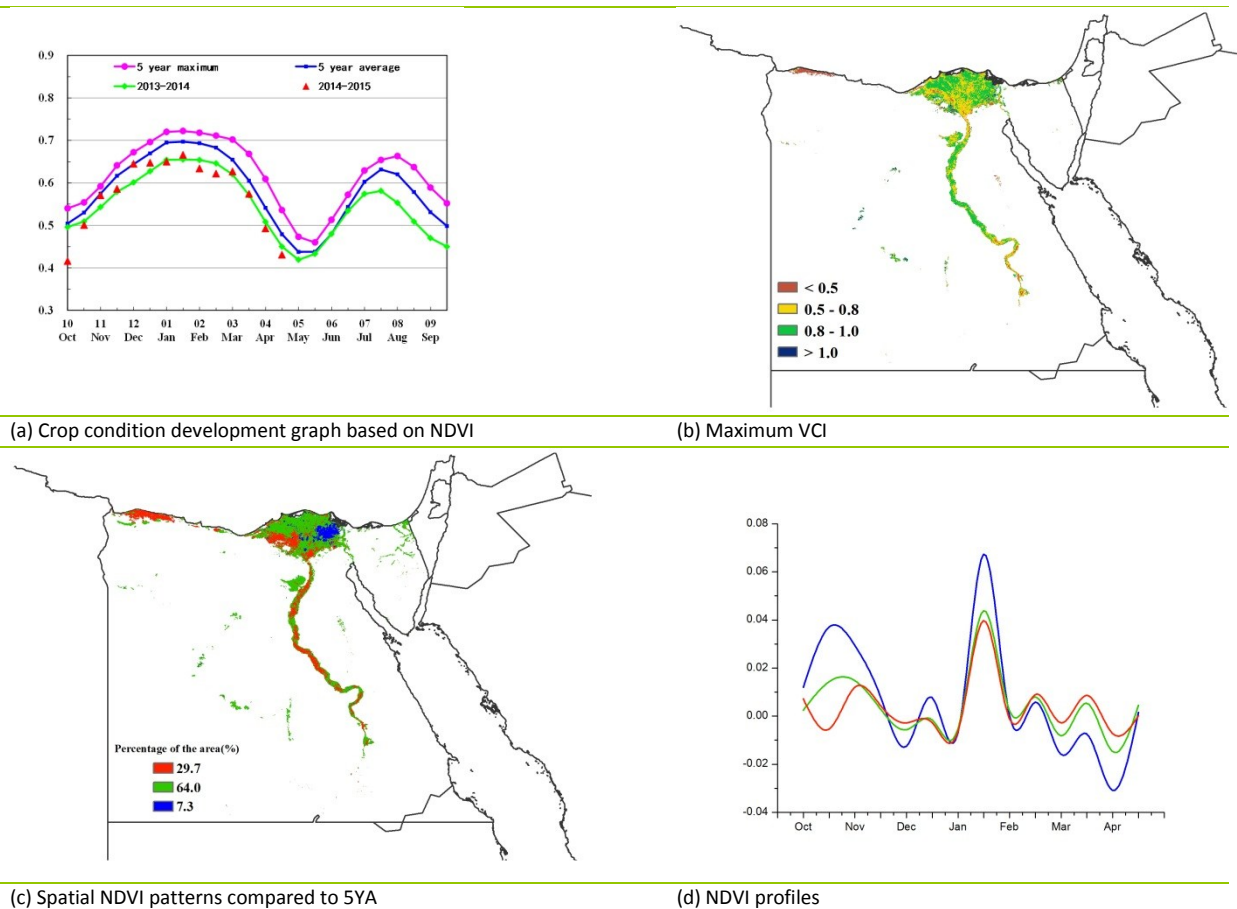
Figure 3.10. Germany crop condition, January-April 2015



[EGY] Egypt

Harvest of winter crops (wheat and barley) is currently underway, while planting of summer crops (maize and rice) has started. As virtually all crops are irrigated, rainfall plays a very minor part in the outcome of Egyptian agricultural production. The RAIN indicator over agricultural areas dropped by a significant value of 17% compared to average, while RADPAR fell 1% and temperature was just slightly below average (-0.6°C). National NDVI values were below the recent five-year average throughout the season and generally comparable to their values in 2013-14, in agreement with a stable CALF value. Values for the maximum VCI (0.75) and BIOMSS (+9%) both indicate a season very comparable with the previous one (and thus a “good average year”) with some differences, such as the somewhat less favorable conditions in the eastern Delta.

Figure 3.11. Egypt crop condition, January-April 2015

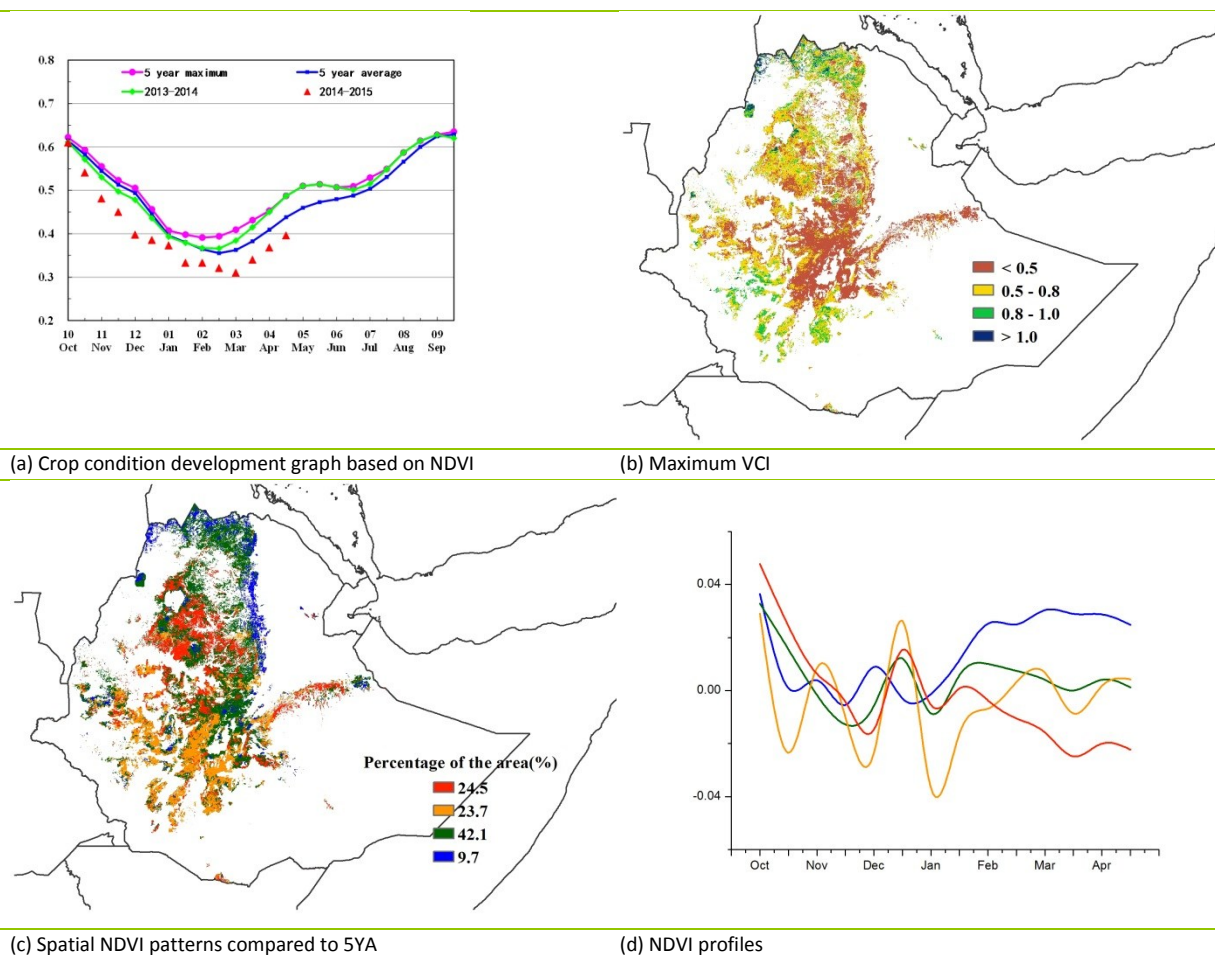


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[ETH] Ethiopia

Since the planting of Belg crops (in February) until now, overall conditions in the country were definitely less favorable than during the rather good previous season, possibly as a result of the “hesitant” El Niño conditions that have been prevailing for about a year now. Overall, the country suffered a rainfall deficit close to 25% in the early months of 2015, with a slight drop in sunshine (RADPAR, -1%) and resulting in a drop of biomass production potential of 22%. The period covered by this bulletin almost exactly corresponds to the Belg season, which is thus very unlikely to have performed normally, as also confirmed by a 4% drop in CALF and a VCIx that stayed below 0.5 in much of the country. According to the NDVI profiles for the period from February to April, above-average conditions prevailed in about 10% in the country; 60% of cropped areas can be described as comparable to the average of the previous five years, while about 25% show poor and deteriorating conditions, mostly in north and east Amhara and the north eastern fringe of Oromya. Although the Belg season plays a minor role compared to the main Meherseason (by definition, the crops harvested after August) in terms of cultivated area and production, a poor Belg season indicates that soil moisture conditions are not as good as during an average year even for MEHER crops. In addition, a poor Belg season means that grasslands and animals suffer, and that food prices increase. Even if the harvest of Meher crops takes place as late as December for some of the Meher crops, overall prospects are currently unfavorable in Ethiopia and deserve close monitoring.

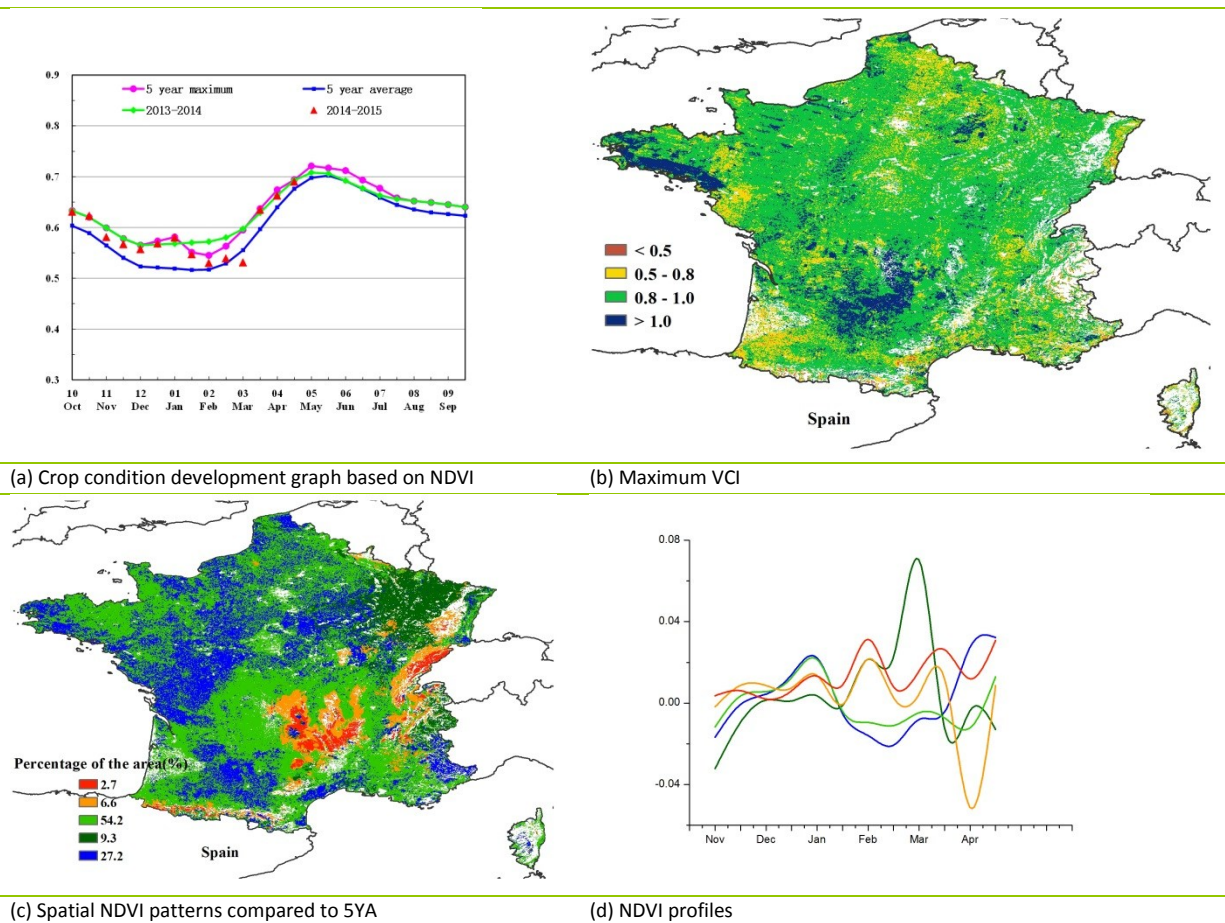
Figure 3.12. Ethiopia crop condition, January-April 2015



[FRA] France

Crop condition in France was generally favorable over the reporting period. Currently, winter wheat, winter barley, and spring barley are in the vegetative stages, and maize is being planted. Compared with the five-year average, CropWatch agroclimatic indicators show warmer than average weather at the national scale. BIOMSS presents a 27% decrease compared to average as a result of the scarcity of rainfall (-46%) and low radiation (-2%). As shown by the crop condition development graph, national NDVI values were well above average and even close to the five-year maximum, except for a noticeable drop at the beginning of March. The spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles also indicate that NDVI values over the country for most arable land in France are below average from early January to the end of March due to low rainfall. The maximum VCI map nevertheless presents overall good crop condition. Generally, due to suitable temperature, the agronomic indicators mentioned above indicate a favorable condition for most winter crop areas of France; however, more rain is needed in the next few months in France.

Figure 3.13. France crop condition, January-April 2015

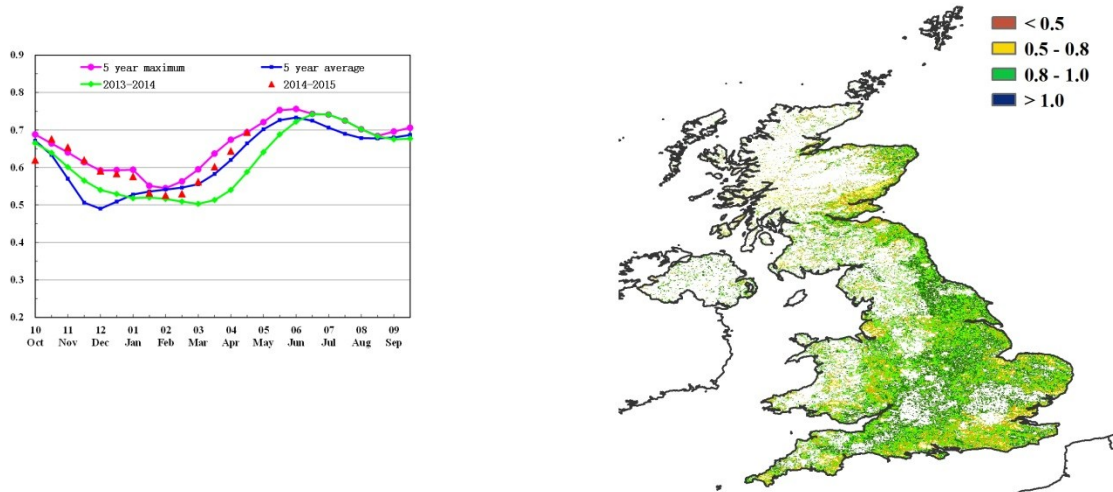


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[GBR] United Kingdom

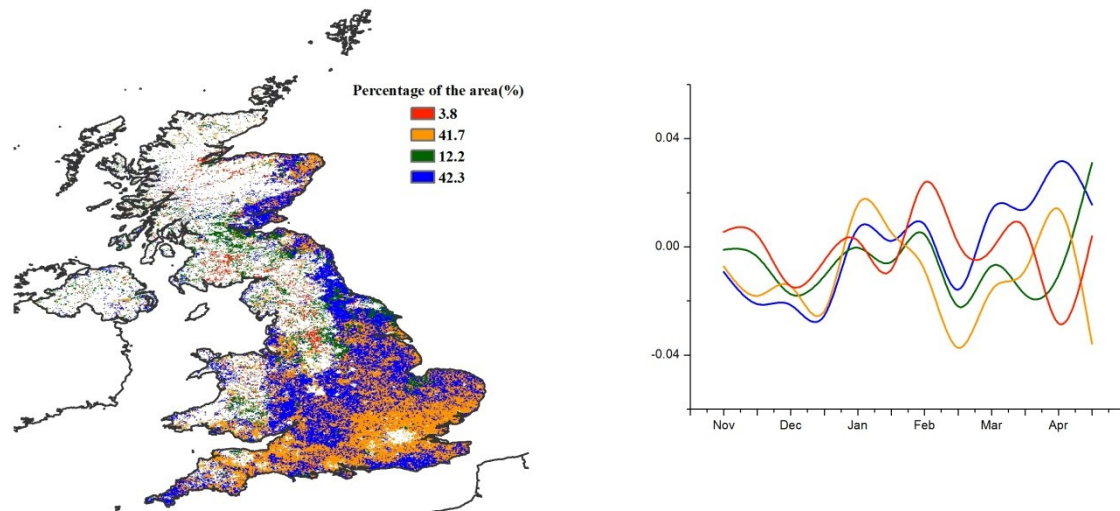
Crop in the United Kingdom showed generally favorable condition over the reporting period. Currently, wheat, winter barley, spring barley, and rapeseed are in the vegetative stages. The United Kingdom experienced sufficient rainfall and favorable temperature, which promoted the development of winter crops. Compared to the average, the country experienced an increase in the RAIN indicator of 21%, an increase in TEMP of 1°C, and 3% more RADPAR. With the positive moisture and thermal anomalies, BIOMSS is expected to increase by 2% compared to the five-year average at the national scale. As shown by the crop condition development graph, national NDVI values were below average from early January to early March, after which they rose above average and even close to the five-year maximum. The spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles also indicate above average NDVI values over the country for more than 42.3% of arable land after March. A recent deterioration occurred in the southeast (41.7% of the cropped areas). This spatial pattern is also reflected by the maximum VCI in the different areas, with a VCIx of 0.87 for the country overall. Generally, the agronomic indicators mentioned above indicate favorable condition for most winter crop areas of the United Kingdom at this point in the season.

Figure 3.14. United Kingdom crop condition, January-April 2015



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



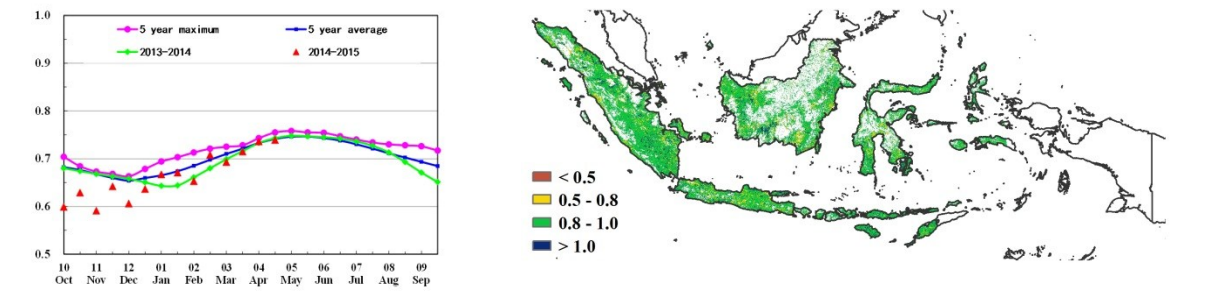
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

[IDN] Indonesia

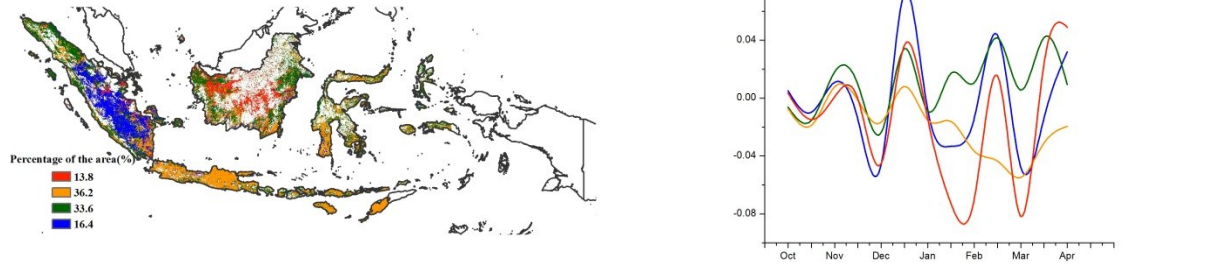
This monitoring period covers the growing and harvesting stages of rainy season maize and rice in Indonesia. Crop condition was average from January to April, resulting from mostly average environmental conditions: RAIN, +7%; RADPAR, +2%; and TEMP, +0.7°C. In April, heavy rain caused flooding in South Sulawesi and West Java, which accounts for the below average crop condition in this region. The national NDVI profile was also below average until the end of March. Starting in April, NDVI values are between normal and above-normal. The biomass accumulation shows a slight 2% decrease compared to the average of the recent five years. CropWatch estimates that the production of rice and other crops in Indonesia will be average.

Figure 3.15. Indonesia crop condition, January-April 2015



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

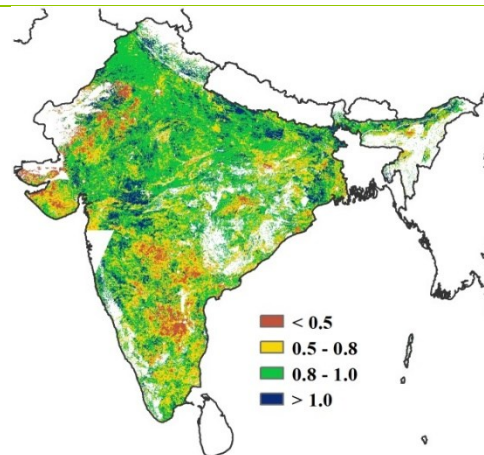
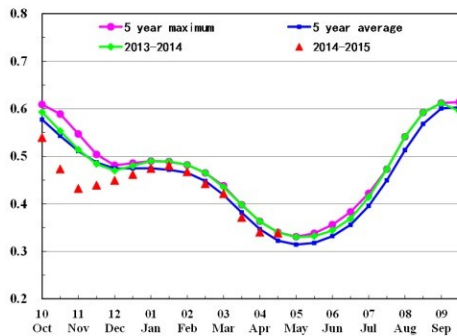
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[IND] India

The reporting period corresponds to the growing and harvesting seasons of rabi crops. Overall, the CropWatch indicators suggest crop condition for India is average during the reporting period. All the major rabi crop producing states experienced above average rainfall, including Andhra Pradesh (RAIN, +15%), Bihar (+52%), Gujarat (+340%), Haryana (+48%), Kerala (+33%), Karnataka (+26%), Maharashtra (+100%), Madhya Pradesh (142%), Orissa(+14%), Punjab (+20%), Rajasthan (+92%), Tamil Nadu (+11%), Uttar Pradesh (+85%), and West Bengal (+68%). High rainfall lead to positive biomass accumulation in these regions. Temperatures (TEMP) were average over the region, while PAR was below average in several states including Bihar (RADPAR, -7%), Haryana (-6%), Himachal Pradesh (-9%), Jharkhand (-6%), Madhya Pradesh (-6%), Punjab (-7%), Uttar Pradesh (-8%), Uttarakhand (-9%), and West Bengal (-5%). Overall, however, weather conditions were favorable and resulted in average crop condition, except in some regions where high unseasonal rainfall destroyed some rabi crops.

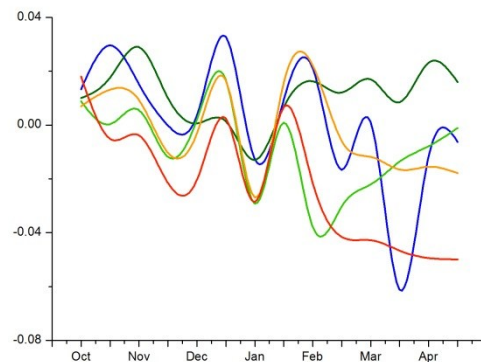
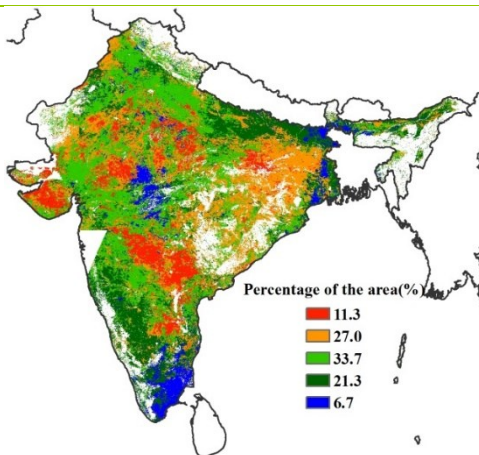
Crop condition development was generally comparable with the previous five year's average and never reached the level of the previous five year's maximum. Across the region, maximum VCI values ranged from below 0.5 to larger than 1.0. Low VCI values of below 0.5 were recorded in Andhra Pradesh, Maharashtra, Gujarat, Rajasthan, and Haryana, indicating poor crop condition in these areas. The NDVI values for the entire country reached favorable values during early January and started dropping in early February. In northern and southern India, NDVI values increased gradually from early February to April, while in central India NDVI values decreased gradually from mid-January on forward. In Tamil Nadu, West Bengal, and Madhya Pradesh, NDVI underwent a marked drop in early March but recovered in early April.

Figure 3.16. India crop condition, January-April 2015



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

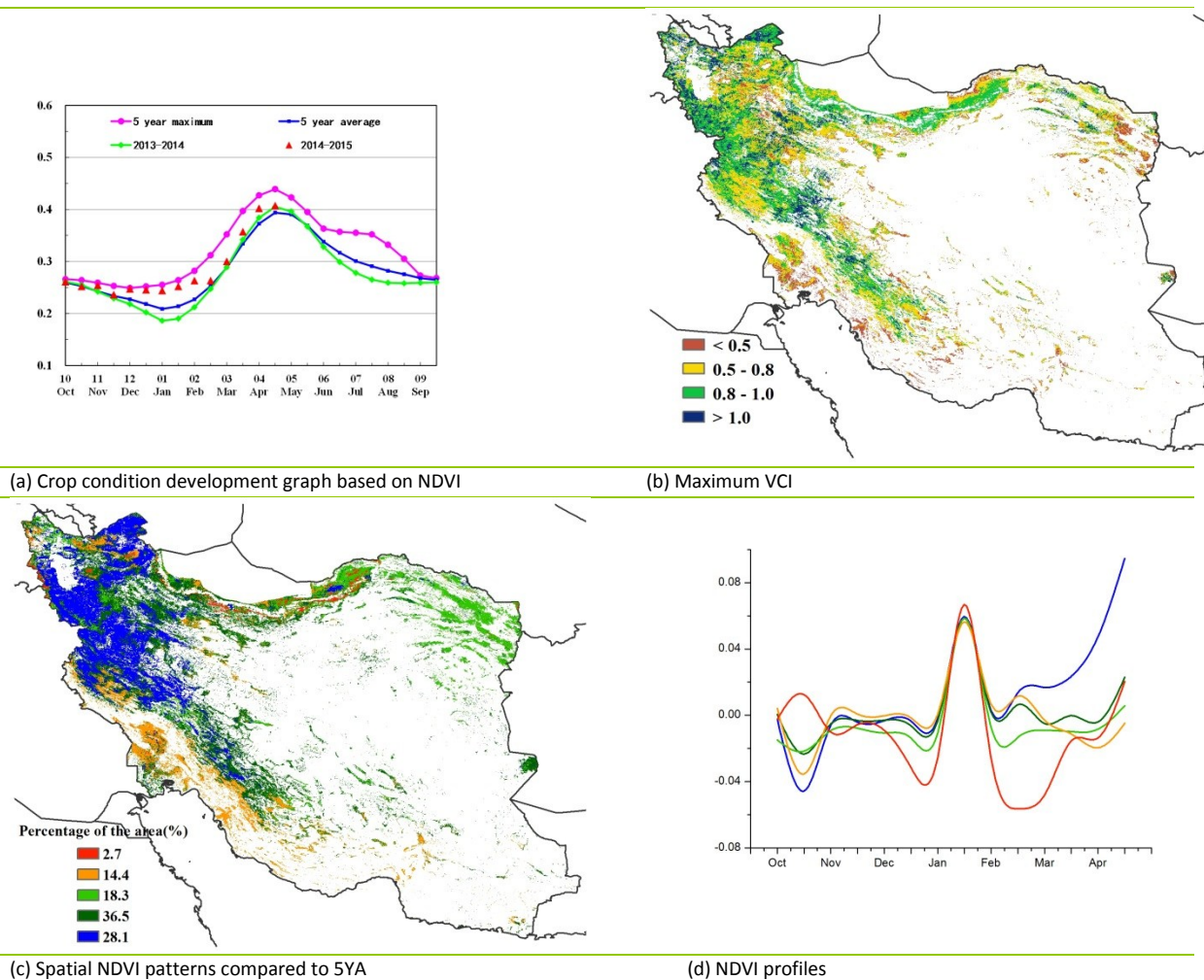
(d) NDVI profiles

[IRN] Iran

Crop condition from January to April 2015 was generally above average in Iran. During this period, winter wheat was grown and barley harvested. Accumulated rainfall (RAIN) and radiation (RADPAR) were below average in the monitoring period, while the temperature (TEMP) was above. CropWatch agroclimatic indices for the current season indicate unfavorable conditions for winter crop growth, which are confirmed by the decrease of the BIOMSS indicator by 10%. The national average of the maximum VCI (0.76) was just above average conditions, and the area of cropped arable land (CALF) increased by 2% compared to the five-year average.

Crop conditions close to or above the five-year average are mainly distributed in the northwest region. Other regions, such as the Khuzestan and Fars provinces in the southwest region, and Razavi Khorasan and North Khorasan province of the northeast region, generally experienced below average crop condition from February to April. Overall, Iran's latest 2014-15 winter crop outcome is estimated average, but more favorable in the northwest.

Figure 3.17. Iran crop condition, January-April 2015

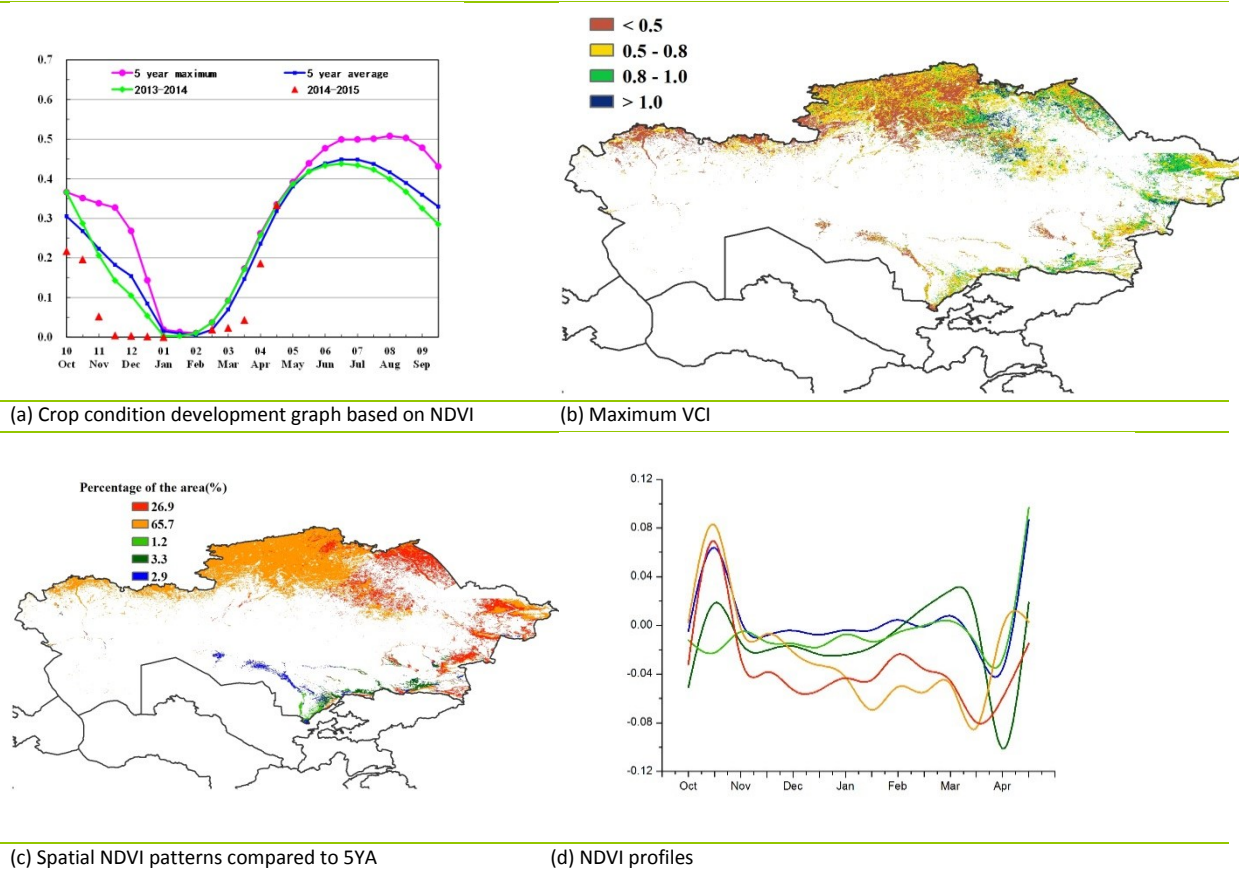


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[KAZ] Kazakhstan

As shown by the national NDVI development graph, no winter crops are normally cultivated in Kazakhstan; spring crops are currently at the sowing and vegetative stages. As described in the section on disasters (section 5.2), Kazakhstan was—globally—one of the countries most severely affected by floods. In fact, during the reporting period, rainfall was above average by 23%, while temperature was average and PAR accumulation was 2% lower than average. The floods occurred from late March to mid-April and were due to the combined occurrence of rainfall and rapid snowmelt, affecting mostly four regions in central and eastern Kazakhstan (Akmola, Karaganda, Pavlodar and North Kazakhstan Oblasts). However, as a result of the high rainfall, the biomass production potential is also up 17% compared to the average of the recent five years. Current NDVI profiles and values of maximum VCI are about average, but more favorable in the east and south. Because of the stored soil moisture, crop prospects are good.

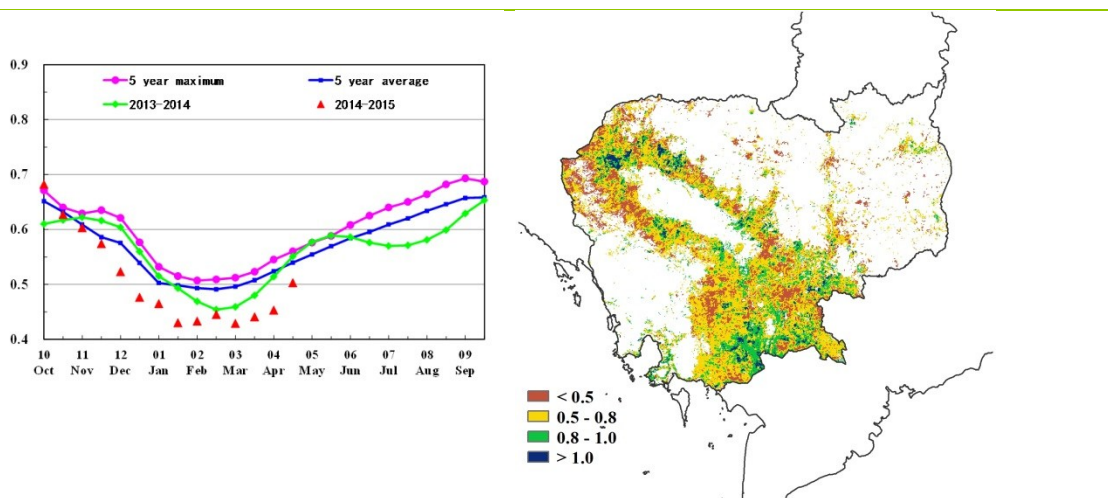
Figure 3.18. Kazakhstan crop condition, January-April 2015



[KHM] Cambodia

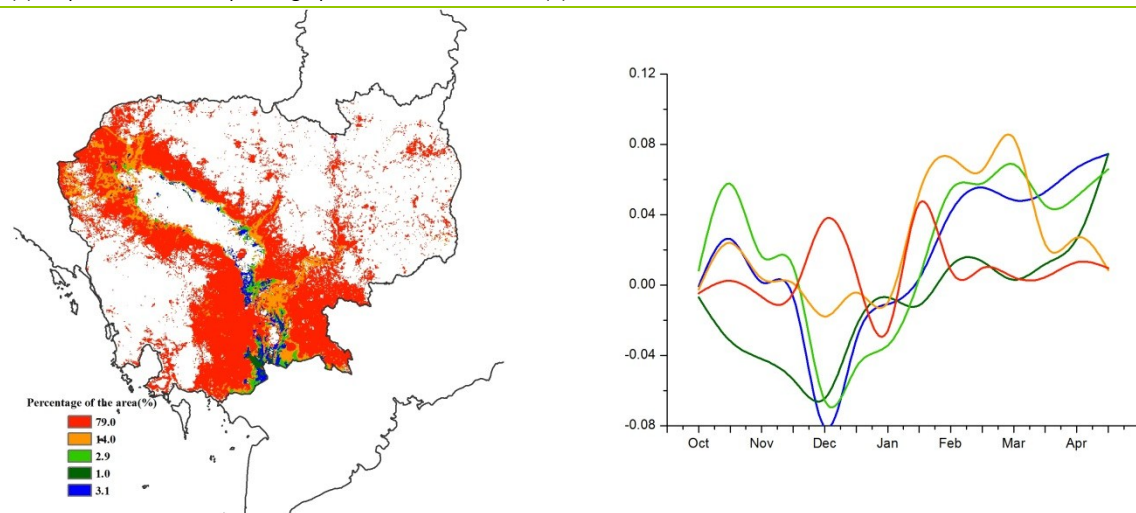
The period from January to April 2015 covers the entire growing period of the second (dry season) rice crop and the harvest of the main (wet season) rice crop in Cambodia. The fraction of cropped arable land (CALF) was about the same as the recent five-year average. Low vegetation condition indices (VCIx) occur in a scattered way in most parts of the country. For the period under consideration, the CropWatch environmental indices show markedly below average rainfall (-18%), while temperature increased significantly by 1.2°C above average and PAR was 6% above average. Consequently, the extremely low rainfall decreased the biomass accumulation expectations (expressed by BIOMSS) by 16% compared to the recent five-year average. Crop condition of Cambodia assessed from nationwide NDVI was also below average during the entire reporting period. The profiles and NDVI clusters also show that crop condition in only 20% of the cropped area was above average from late January to the end of April (mainly concerning Phnom Penh, Kandal, Kampong Cham, and northwest Cambodia).

Figure 3.19. Cambodia crop condition, January-April 2015



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

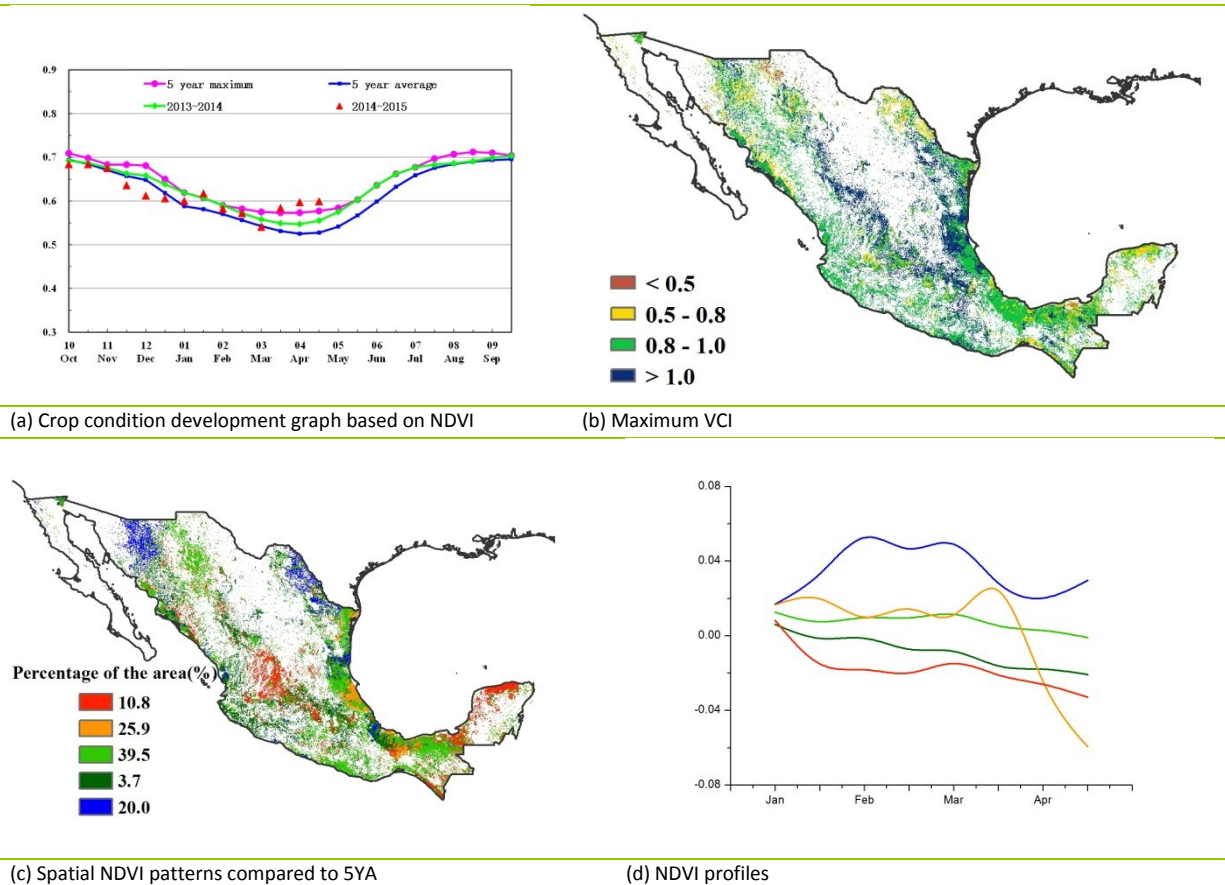
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[MEX] Mexico

In general, crop condition was favorable in this monitoring period, which was the harvesting season of Mexico's secondary 2014 maize and winter wheat, as well as the planting season of the main 2015 maize crop. During the monitoring period, rainfall showed a significant positive departure (RAIN, +114%) compared to average; temperature was slightly above average (TEMP, +0.2°C), while radiation (RADPAR) underwent a marked drop of 8%.

As a result of the abundant rainfall, NDVI development profiles after March indicated the favorable performance of crops, with close to 60% (59.5%) of crop areas showing conditions better than those during the last five years. The average maximum VCI reaches 0.95 and even exceeds 1.0 in some regions in the center and east. On average, the biomass accumulation potential (BIOMSS) about doubled compared with the recent five-year averages (+101%). At the same time, the cropped arable land fraction (CALF) showed a positive departure of 16%. Combining both the increase of yield and CALF, significantly above average crop production can be expected.

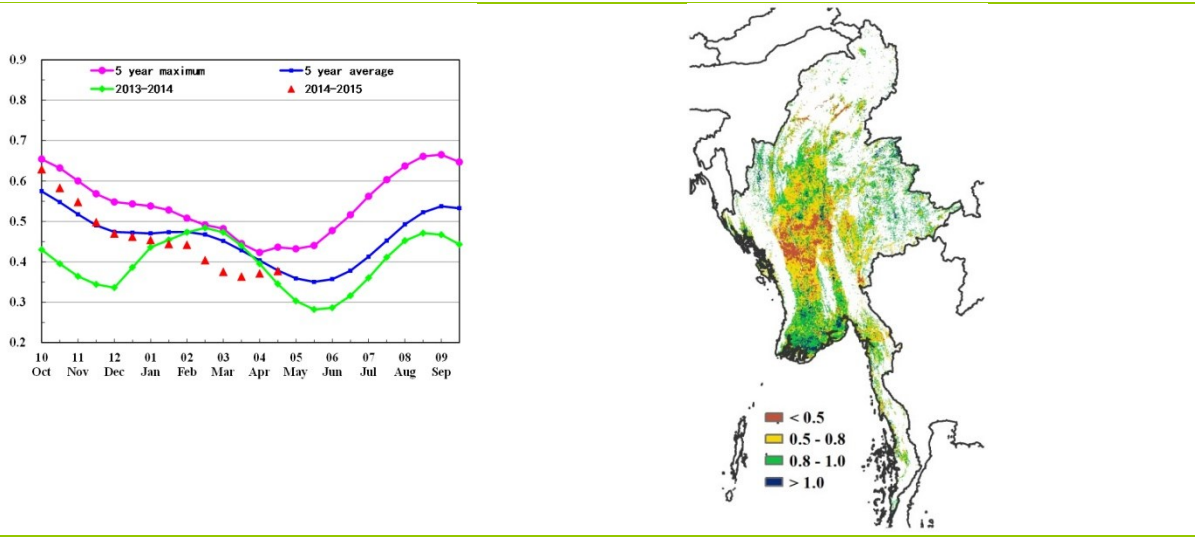
Figure 3.20. Mexico crop condition, January-April 2015



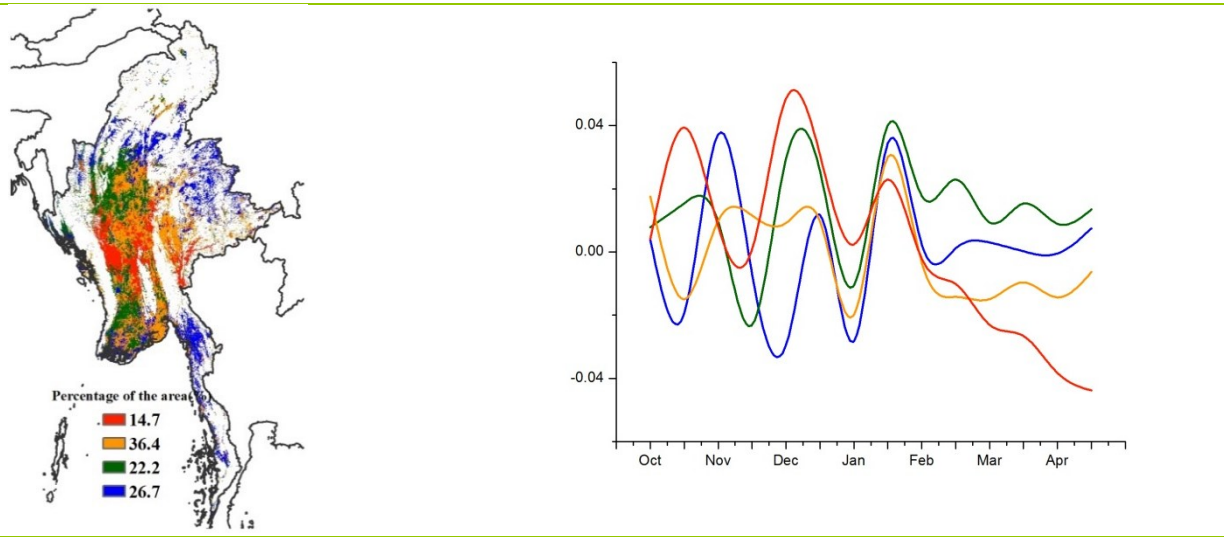
[MMR] Myanmar

The reporting period corresponds to the growing and harvesting season of winter rice in Myanmar. Based on the CropWatch indicators, the overall crop condition in the country is assessed as poor. Although rainfall (RAIN) increased 8% over average and temperatures (TEMP) were 1.1°C higher than average, the crop condition was significantly below average in some areas. The overall biomass accumulation potential (BIOMSS) is estimated to be 24% above the five-year average, while PAR was somewhat low (RADPAR, -1%). Crop condition development was below the values for 2014 and the average of the previous five years. Based on maximum VCI values below 0.5 and unfavorable NDVI profile patterns, CropWatch assesses crop condition to be poor in the central divisions of Magway and Mandalay. Remaining regions display maximum VCI values between 0.5 and 0.8. Spatial NDVI profiles followed similar patterns for the entire country up to February, with very positive values from early January to early February. Conditions remained close to average in most of the country, but gradually deteriorated in the above-mentioned divisions.

Figure 3.21. Myanmar crop condition, January-April 2015



(a) Crop condition development graph based on NDVI (b) Maximum VCI



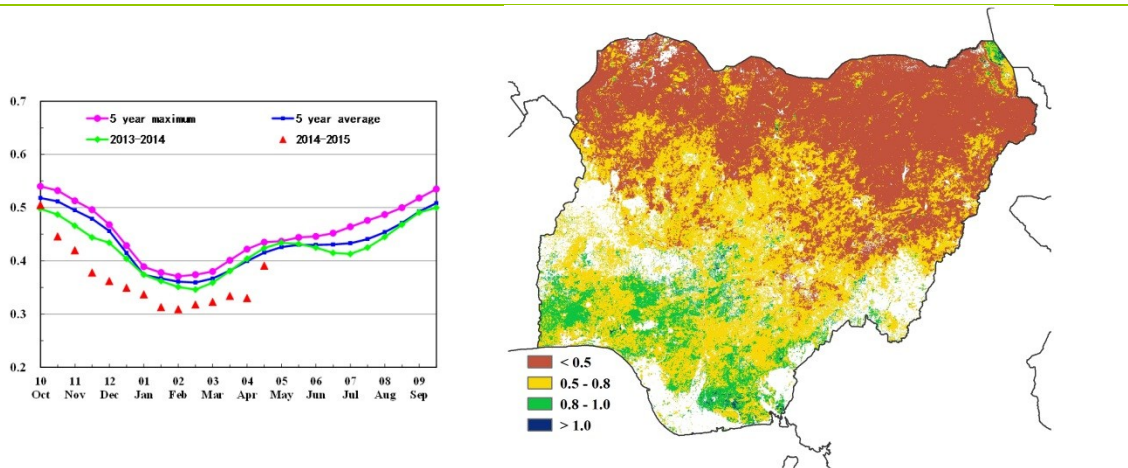
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

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[NGA] Nigeria

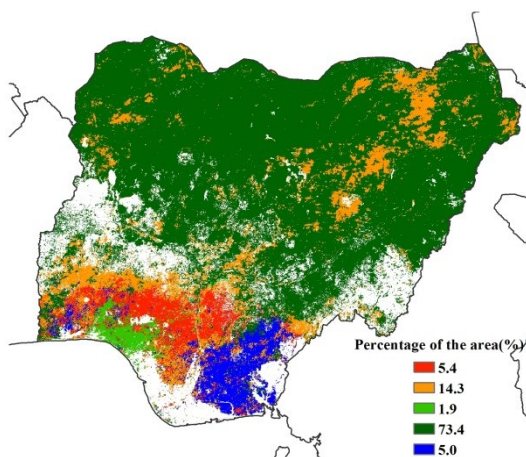
Cassava and yams are dominant crops in Nigeria, especially in the south. Cereals (maize and rainfed rice) play a major role in the southern-central part of the country where planting takes place from the middle of the current reporting period, from the end of March to April. Compared with the average, rainfall was generally low (-12%) with an increase in sunshine (RADPAR +1%), average VCIx, but a marked decrease of the fraction of cultivated arable land (CALF), the second highest drop of all the countries monitored by CropWatch. In the main maize producing areas, which correspond to the median belt of the country, conditions were generally average, according to the NDVI clusters. Below average conditions occurred mostly at the beginning of April, but the end of the month indicated some recovery as planting progressed. In line with the overall analysis of the west African region, the most plausible interpretation of the CropWatch indicators is that conditions were generally average so far, but that crop phenology is delayed in the Sahelian part of the country.

Figure 3.22. Nigeria crop condition, January-April 2015

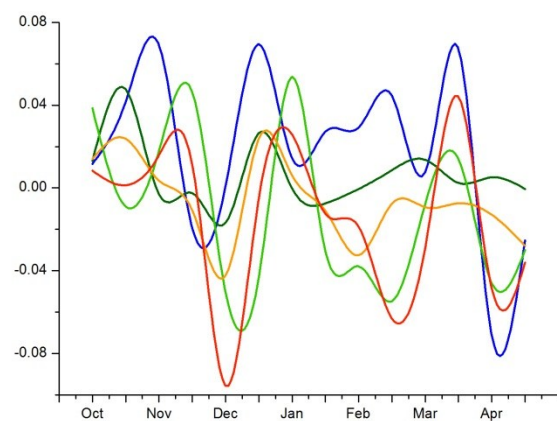


(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



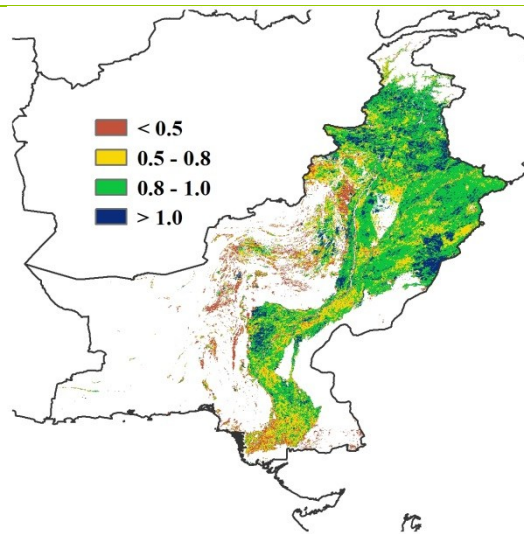
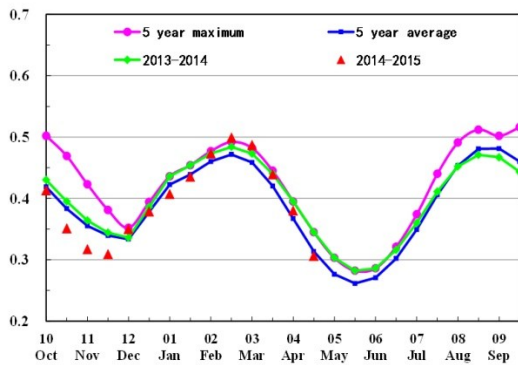
(d) NDVI profiles

[PAK] Pakistan

This monitoring period covers the growing and harvesting stages of winter wheat and barley. Compared with average, RAIN was in excess (+16%) for the country, while RADPAR accumulation was decreased (-5%); meanwhile TEMP was average. Compared to the last five-years, BIOMSS was also below average (-5%).

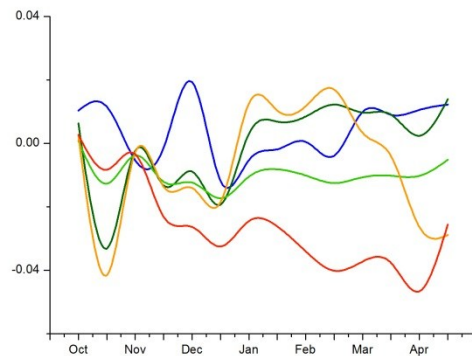
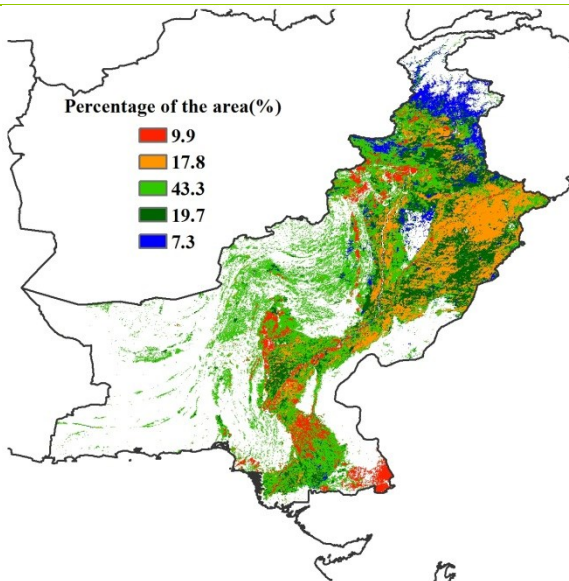
The national NDVI development graph indicates that crop condition was unfavorable in early January, but later gradually improved and peaked in late February, reaching values comparable to the maximum of the past five years. It then deteriorated and was a little below the recent five-year average at the end of April, due to local excess precipitation and drought, as mentioned in section 5.2. The lowest maximum VCI values (below 0.5) occur in north Balochistan, south NWFP, and south Sindh. According to the NDVI profiles, about 10% (9.9%) of the cropped areas display consistently below average conditions from the beginning of December, much of it in Sindh, especially in the southeast but also the more central areas. On the other hand, about 70% of areas have shown close to average conditions. Altogether, crop condition is estimated to be just average and locally above average.

Figure 3.23. Pakistan crop condition, January-April 2015



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



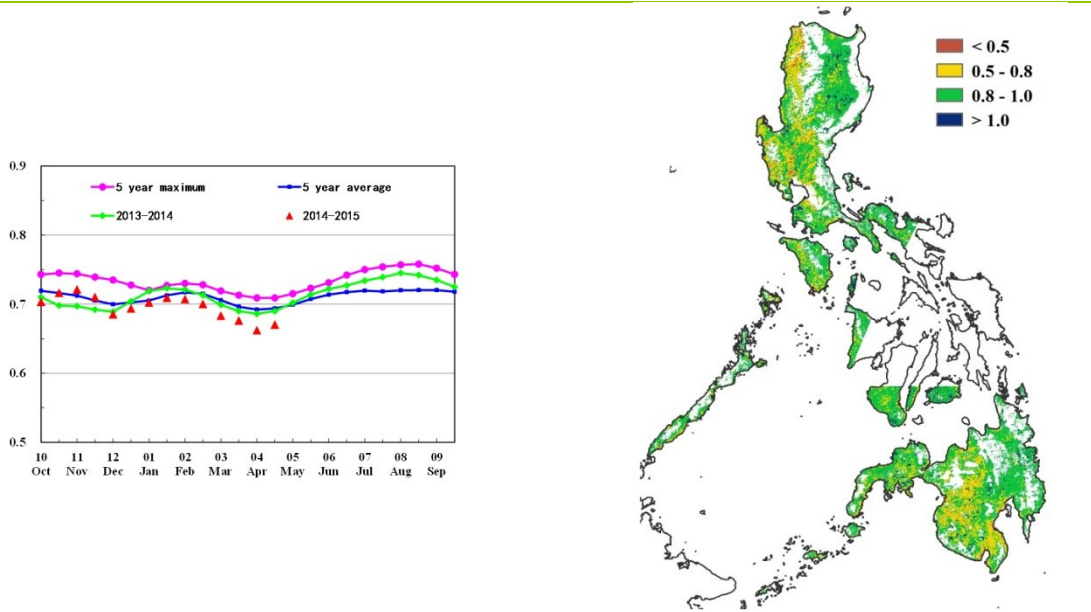
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

[PHL] The Philippines

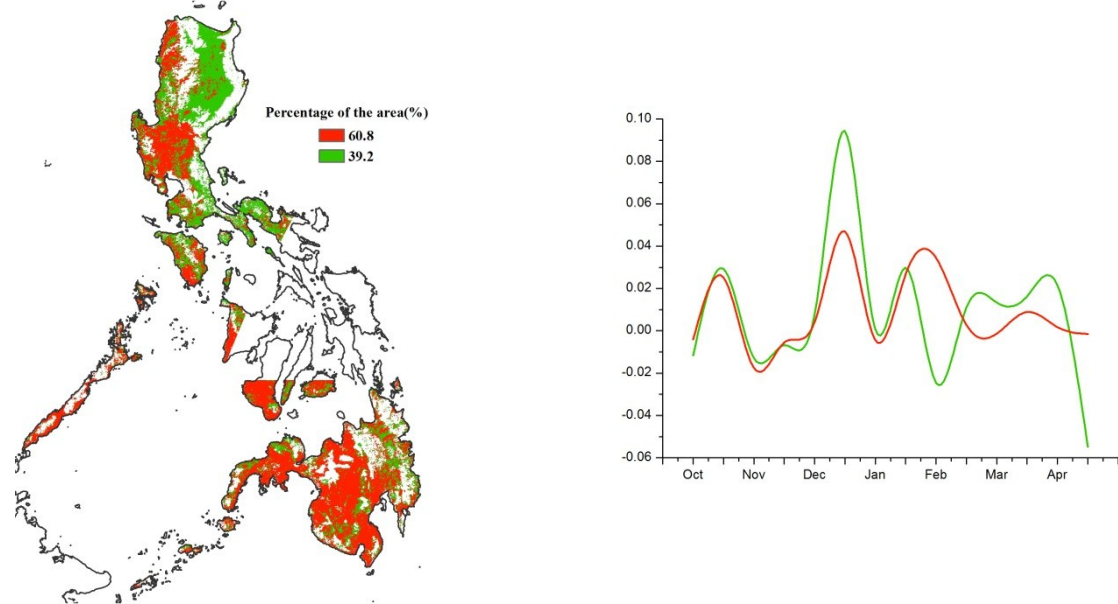
The monitoring period covers the harvesting stage of secondary rice and maize, as well as the sowing stage of main rice and maize in the Philippines. Crop condition in the country was consistently below average from January to April. Overall, the Philippines experienced a dry and warm season with insufficient moisture supply: rainfall decreased by 41% compared with average, possibly resulting from El Niño conditions, accompanied with increased temperature (+0.6°C) and RADPAR (+6%). As a result of the rainfall deficit, the biomass production potential decreased by 36% compared to average, which is confirmed by the NDVI development graph. According to the NDVI clusters, crop condition in Luzon declined sharply from early-April, as a possible result of cyclone Maysak (see also section 5.2 on disasters). Altogether, the output of the main season is expected to be below or just average.

Figure 3.24. Philippines crop condition, January-April 2015



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

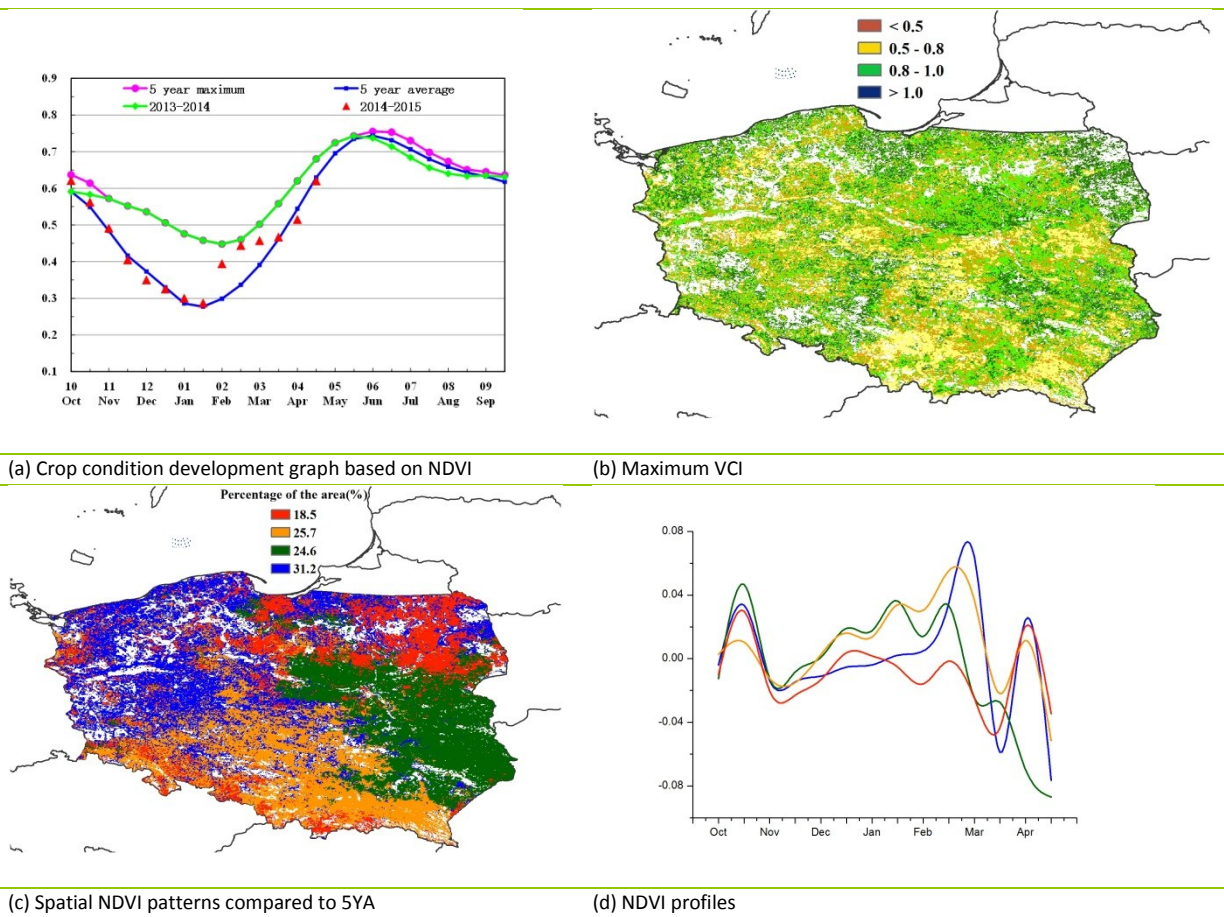
(d) NDVI profiles

[POL] Poland

Poland enjoyed favorable conditions during this monitoring period (maximum VCI=0.83), which corresponds with the wintering stage of winter wheat; maize seeding starts in the beginning of April. The cropped arable land fraction (CALF) for the country is the same as the average of the last five years. Weather during January to April was wetter and warmer than average, with RAIN up 7% and TEMP 1.4°C, which is significant at the national scale over a four-month period. RADPAR dropped 1% below average and the potential biomass indicator BIOMSS was 14% above average due to the combination of abundant precipitation and mild weather.

Due to the favorable weather condition during the wintering stage, the crop condition in Poland is very good in most parts of the country (maximum VCI values over 0.8), and the phenology of winter crops must be much advanced. As shown by the spatial NDVI patterns, in about 81.5% of Poland, including Poznan, Warsaw, and Bialystok, the NDVI is close to average before February and significantly above average in the three months after. Because of this, the production of the country's winter crop is predicted to be very satisfactory.

Figure 3.25. Poland crop condition, January-April 2015



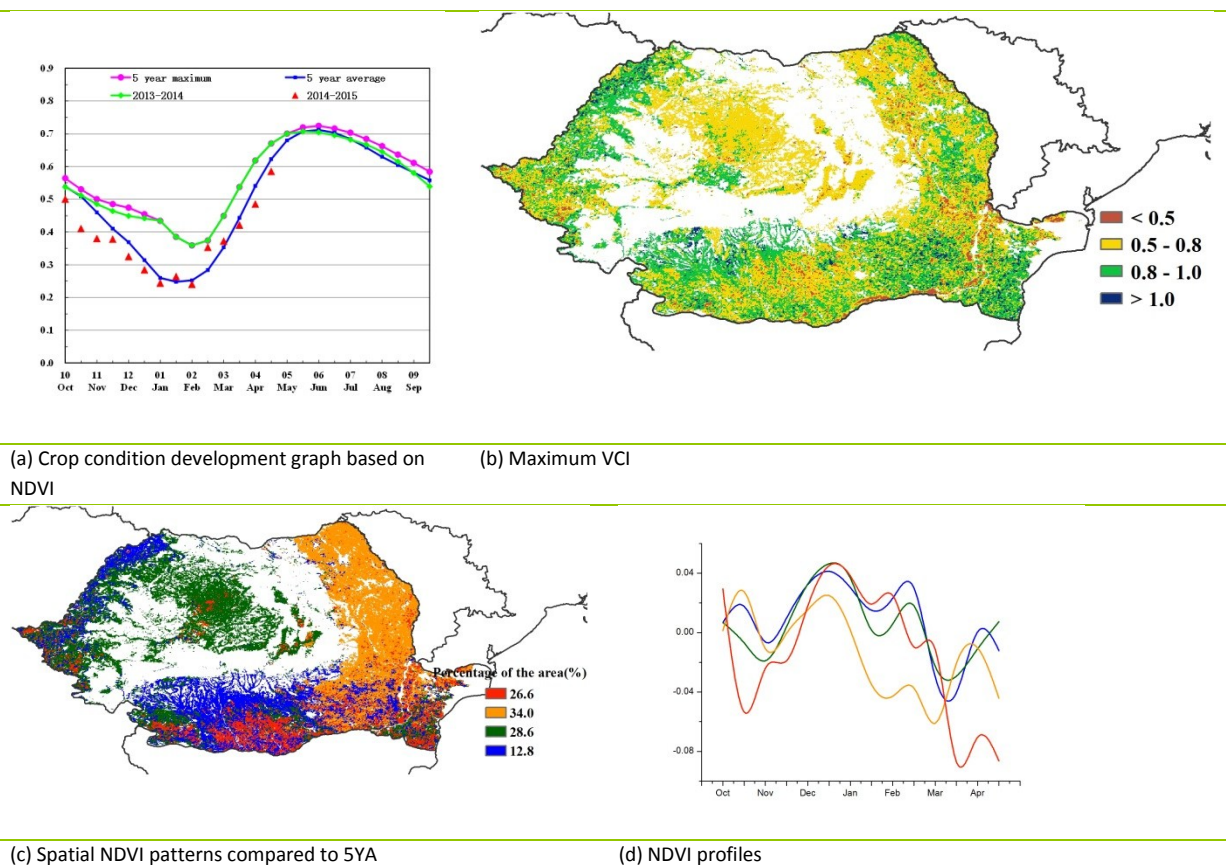
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[ROU] Romania

Romania presented average crop conditions over the monitoring period (maximum VCI=0.76), a period corresponding with the wintering stage of winter wheat. The seeding of maize starts from the beginning of April. During this monitoring period, the fraction of cropped arable land (CALF) was 8% below its five-year average. Overall, weather was warm with temperature (TEMP) 0.6°C above average. Precipitation was lower than usual (RAIN, -2%), while the potential biomass was up (BIOMSS, +5% over average), due to the warm weather. The phenology of winter crops in Romania will be somewhat advanced due to the warm weather.

As shown by the spatial NDVI patterns, in most parts of the country the crop condition is below average starting in March. In the southeast, including Bucharest, Alexandria, and Craiova, crops were affected by water logging from January to March; all NDVI curves experienced a significant decline. Crop condition in other parts of Romania is fair. Overall, the expectation for national winter wheat production in Romania is average.

Figure 3.26. Romania crop condition, January-April 2015

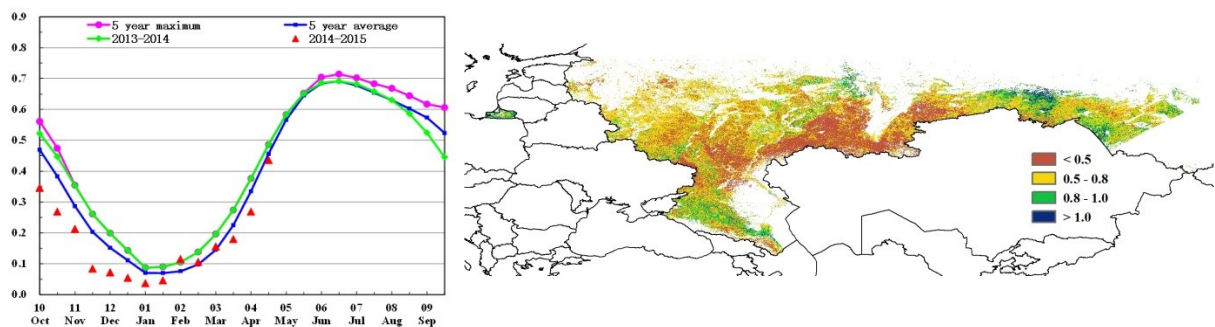


[RUS] Russia

Russia experienced poor crop condition from January to April (VCIx=0.61), which coincided with the wintering stage of winter wheat and early planting of spring wheat. The fraction of cropped arable land (CALF) dropped 1 percentage point when compared to the five-year average. Russia experienced warm and wet conditions in these four months. Precipitation exceeds the recent average (+12%), and the temperature anomaly is significant at +1.6°C. Mainly due to the weather conditions, the BIOMSS indicator rose 15% above the five-year average.

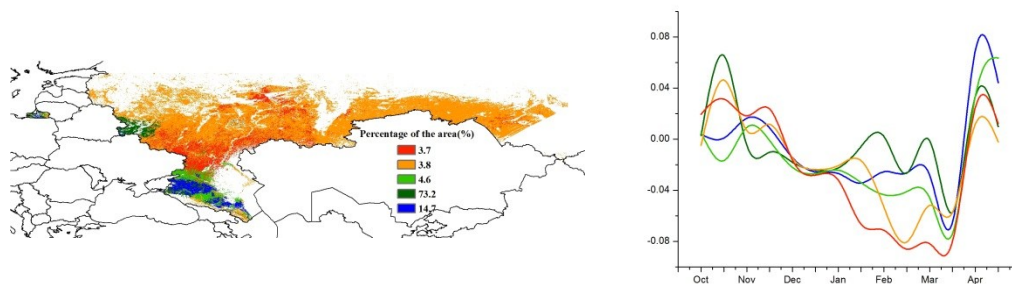
Significantly below average NDVI values occurred in more than 85% of Russia's agricultural area between December and the end of March. As a result of serious frost in autumn and early winter in southern Russia, crop condition is mostly poor, with VCIx values below 0.5 in the central-south of Russia including the Orenburg Oblast, Bashkortostan Republic, Samara Oblast, and Saratov Oblast. During this monitoring period, NDVI was below the average of the last five years in most of the country until the end of April, which may be partly due to phenology, but not during the winter months. Altogether, crop condition for Russia is estimated to be just fair.

Figure 3.27. Russia crop condition, January-April 2015



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

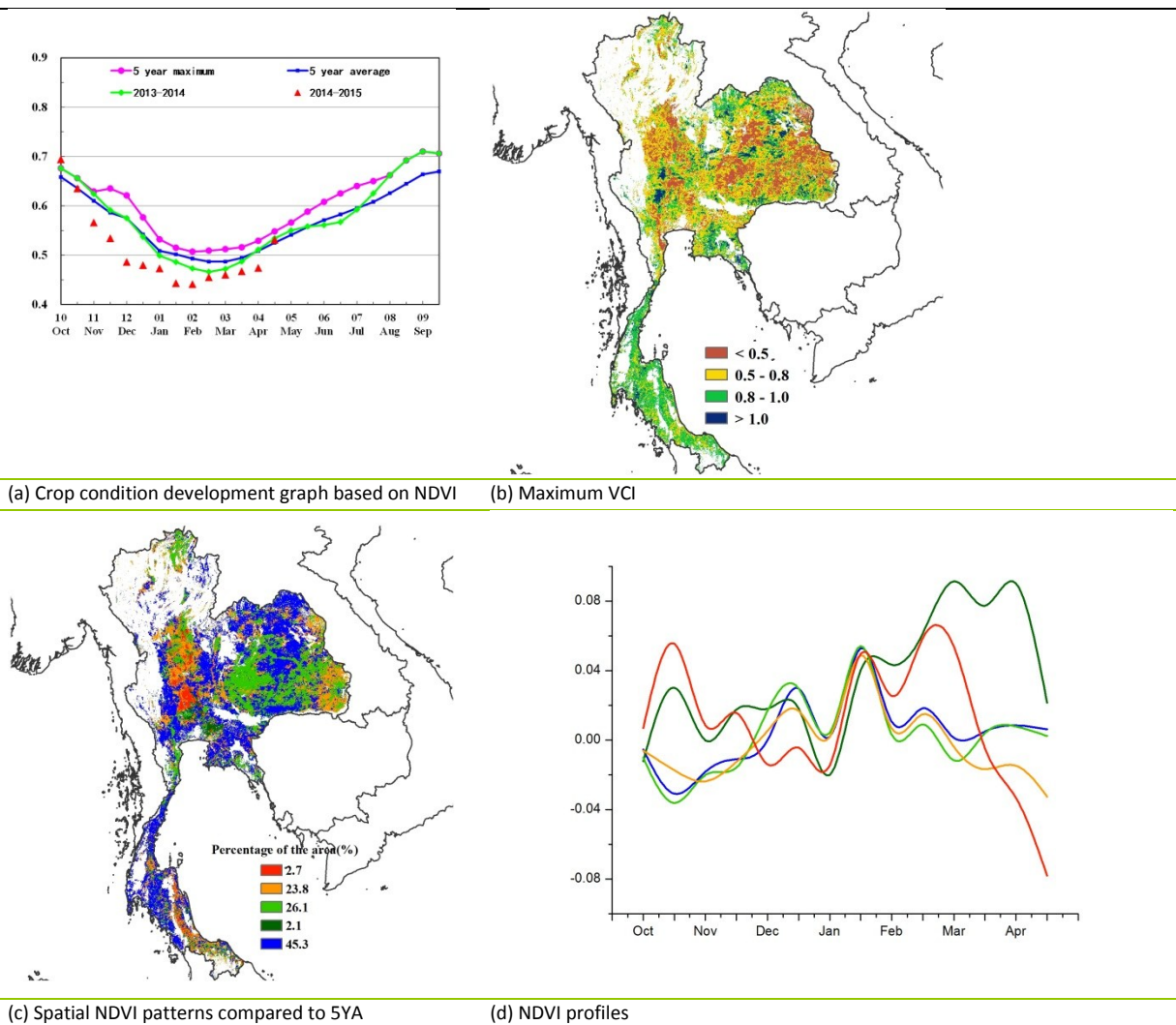
(d) NDVI profiles

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[THA] Thailand

The crop condition from January to April 2015 was below average in Thailand. The harvest of the 2014 main rice crop was completed in January, while the second season rice has reached maturity and was ready to be harvested in April. Accumulated rainfall was below the average in the monitoring period, while the temperature and radiation were above. The agroclimatic indices indicate poor growing conditions, which are confirmed by the slight decrease of the BIOMSS indicator by 1%. The VCix map shows that crop condition was poor in most of the central and north-eastern regions. NDVI profiles confirm that crop condition was mostly below average from March to April, which is the growing period of second rice crop. The Chachoengsao province is the only area where crop condition was above average over the monitoring period.

Figure 3.28. Thailand crop condition, January-April 2015

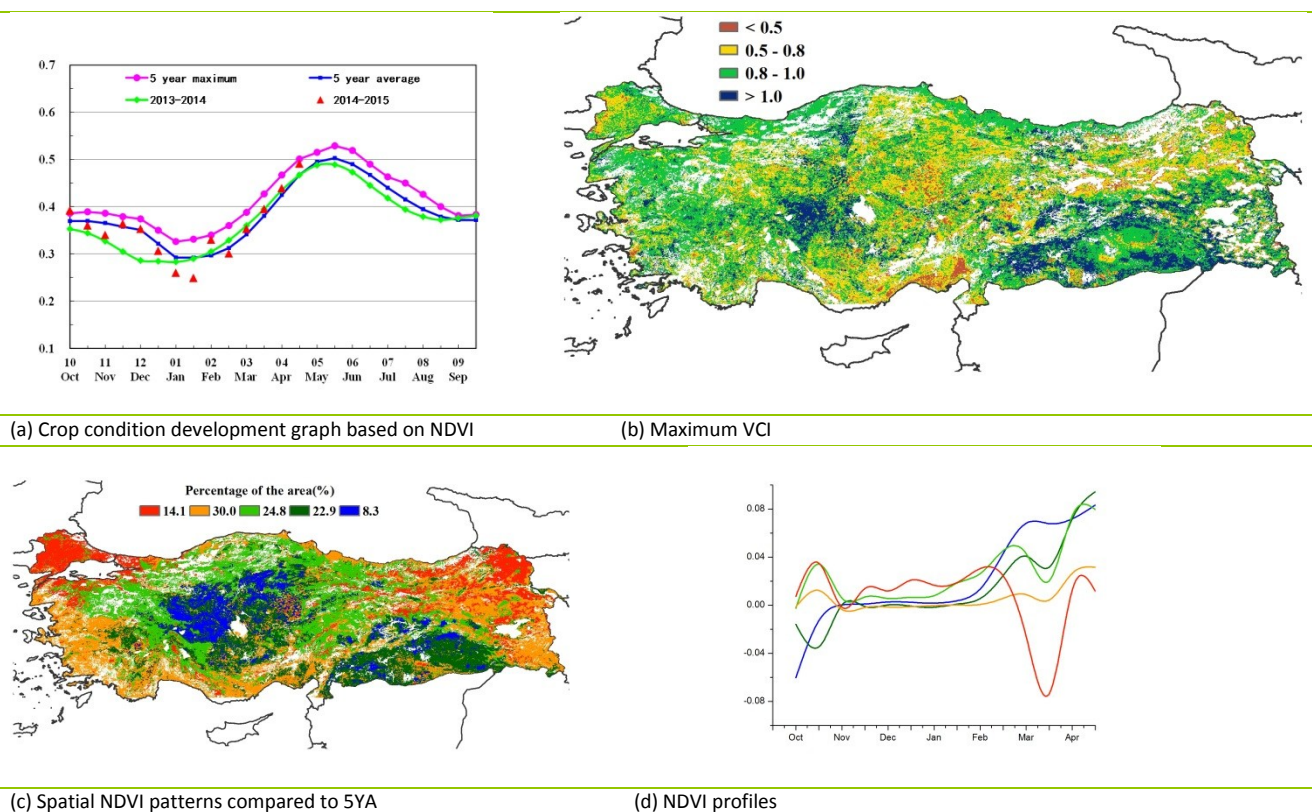


[TUR] Turkey

The crop condition from February to April 2015 was generally above average in Turkey. Winter grains are grown during this period, and planting of summer crops started in April. Accumulated rainfall (RAIN) and temperature (TEMP) from January to April were above average (although only slightly so for TEMP), while radiation (RADPAR) was below average. The agroclimatic conditions nevertheless resulted in a BIOMSS decrease of 6% below the average of the previous five years. The maximum VCI (0.84) was above average conditions, and the fraction of cropped arable land (CALF) increased by 3 percentage points compared to the recent five-year average. These changes indicate a comparable production of winter crops this year in comparison with last year.

Crop condition close to or above the five-year average for January to April was found in most areas across the country. Only the northern part of the Eastern Anatolia and the Thrace regions underwent unfavorable conditions from February to March, and recovered to the average level in April. The outcome for the winter crop season is expected to be favorable.

Figure 3.29. Turkey crop condition, January-April 2015



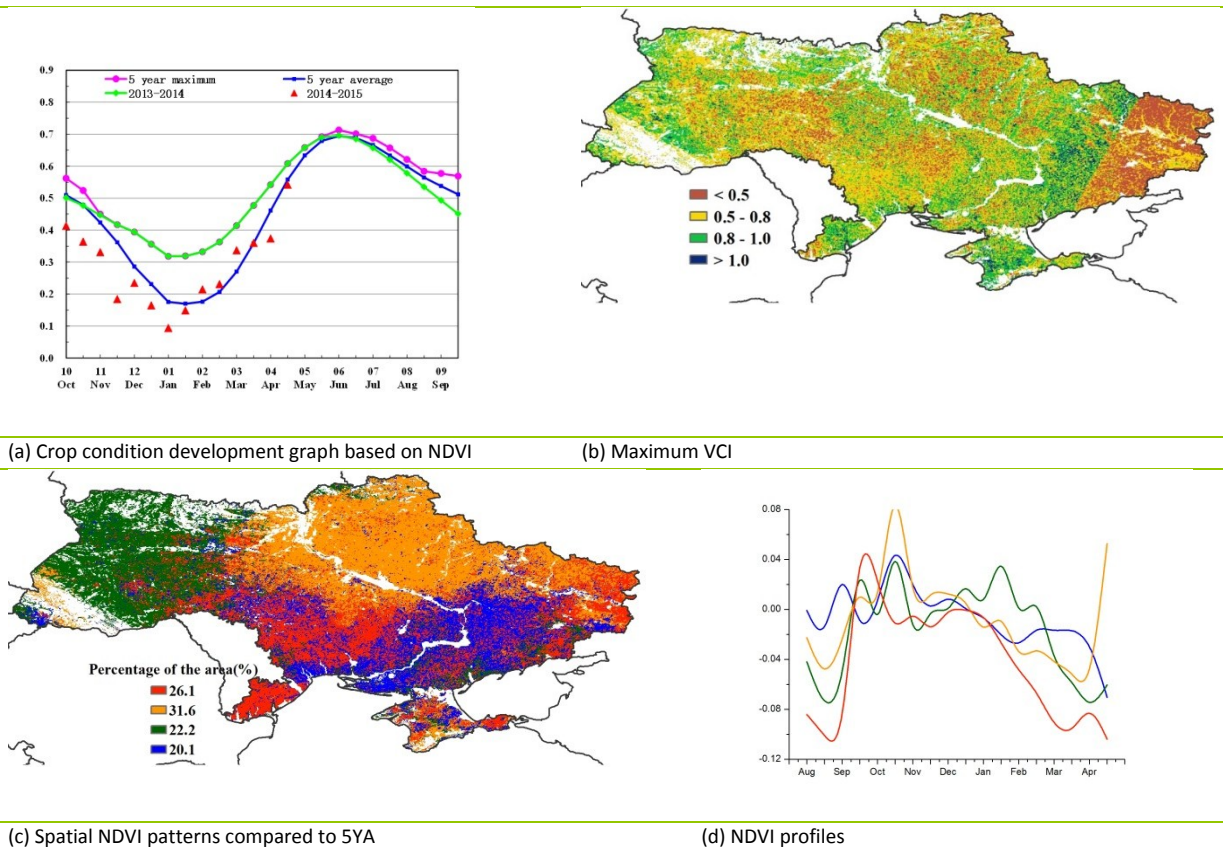
Note: The sharply delineated line through Antalya and Ankara (figure (b)) stems from a methodological issue that is also affecting the maps for Russia and Ukraine.

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[UKR] Ukraine

Over this reporting period, winter crops in the Ukraine are growing while summer crops (mostly maize) are being planted. Nationwide, rainfall and PAR were slightly below average (-3%), while the warmer conditions (TEMP, +1.4°C) led to a 15% increase in potential biomass accumulation for winter crops. Meanwhile, NDVI was close to average, with marked fluctuations, but well below last year's values. According to the cluster map of NDVI, almost the entire country's crop condition has been constantly deteriorating since December (about 70% of the country), and particularly in the southern half (21.6% of agricultural areas). NDVI profiles show a sharp "recovery" in the northern half of the country (center and east areas only; Chernihivs'ka, Sums'ka, Poltavs'ka, and Kyiv's'ka), probably as a result of maize planting. The VCI map shows a patchwork of mixed low and high values.³ The crop condition of winter crops seems to be below average in much of the country at the end of April, unless low values result from early harvest brought about by high temperature.

Figure 3.30. Ukraine crop condition, January-April 2015



³ The sharply delineated low values in the east result from a methodological issue (also, to a lesser extent, visible for Turkey and Russia) and are unrelated to the situation on the ground.

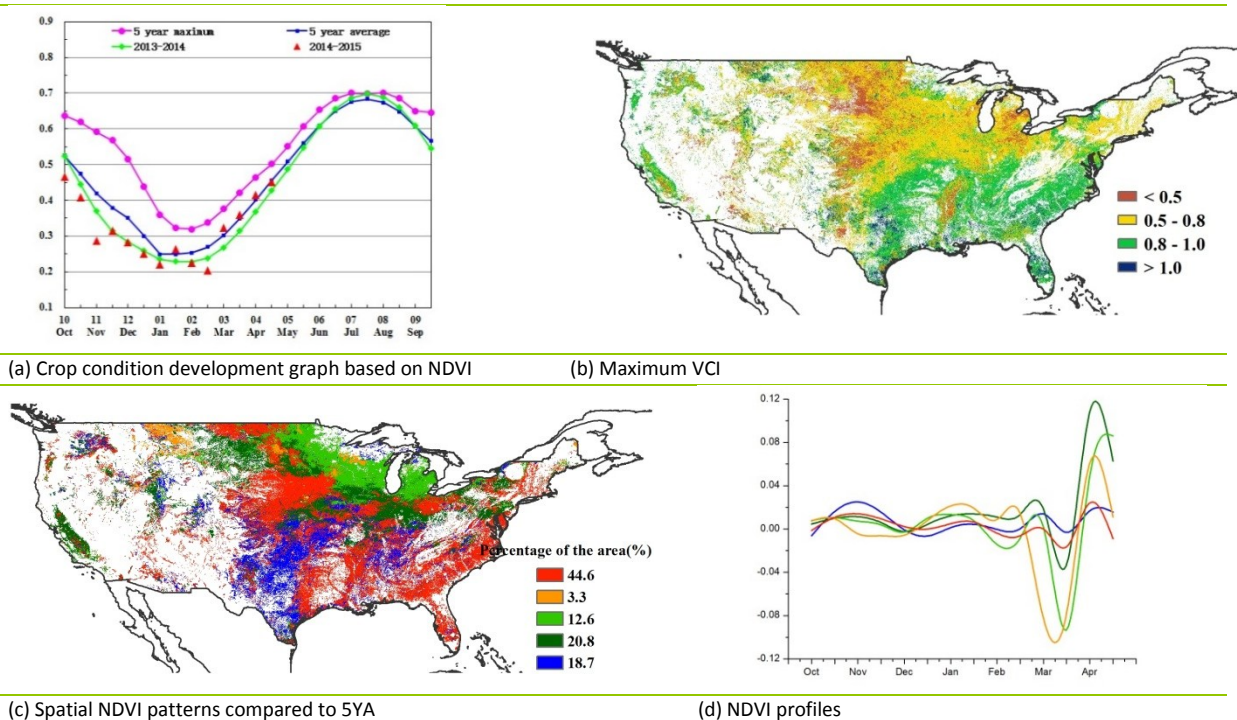
[USA] United States

In general, CropWatch indicators concur to describe the condition of winter wheat as above average in the United States over the monitoring period, which covers the growing season of winter crops and planting season of summer crops. Overall, the rainfall indicator (RAIN) shows a 24% departure above average, with average temperature (TEMP, -0.4°C) and a 4% decrease in radiation (RADPAR). Thanks to the favorable weather, the main winter crops zone of the southern plains received abundant rainfall, including Texas (+35%), Oklahoma (+32%), Kansas (+16%), and in Nebraska (+48%). TEMP was close to below average in Texas (-0.8), Oklahoma (-0.7), Kansas (+0.2), and Nebraska (+1.0). RADPAR was below or close to average in Texas (-11%), Oklahoma (-6%), Kansas (+1%), and Nebraska (0%). As a result, the BIOMSS indicator shows a significant positive departure in Texas (+52%), Oklahoma (+35%), Kansas (+18%) and Nebraska (+41%). As mentioned in the description of the North American zone (section 2.3), the Corn Belt received abundant rainfall, which will benefit summer crops. However, at the same time, serious drought conditions occurred on the U.S. West Coast, including California (-48%) and Oregon (-35%).

Overall, the biomass accumulation potential (BIOMSS) shows a 10% positive departure compared to the recent five-year average; CALF increased by 1%; and VCIx was 0.74. The NDVI development profile showed average crop condition, but better than the condition for the same period last year. In the southern plains, winter crops showed good performance: in Texas; the maximum VCI (VCIx) was above 0.8 and even above 1 in some areas, which is consistent with BIOMSS. California is the largest vegetable and fruits producing state in the United States. As a result of advanced irrigation technologies, crops in this state showed a good condition with VCIx above 0.8, in spite of the drought but at the cost of increased groundwater consumption. Groundwater depletion in this region is a serious long-term risk.

According to the NDVI profiles and patterns, crop condition was close to average from October 2014 to late February and March 2015. In March, the NDVI value dropped sharply due to drought in most western and northern states. This was followed by timely rainfall in northern states and the southern plains, so that crop condition rapidly recovered and locally exceeds the average. If the rainy weather condition continues, the combination of the increase in cropped arable land areas and good crop condition will lead to above average winter wheat production. Table B.3 in Annex B presents the 2015 wheat production outlook for the country.

Figure 3.31. United States crop condition, January-April 2015

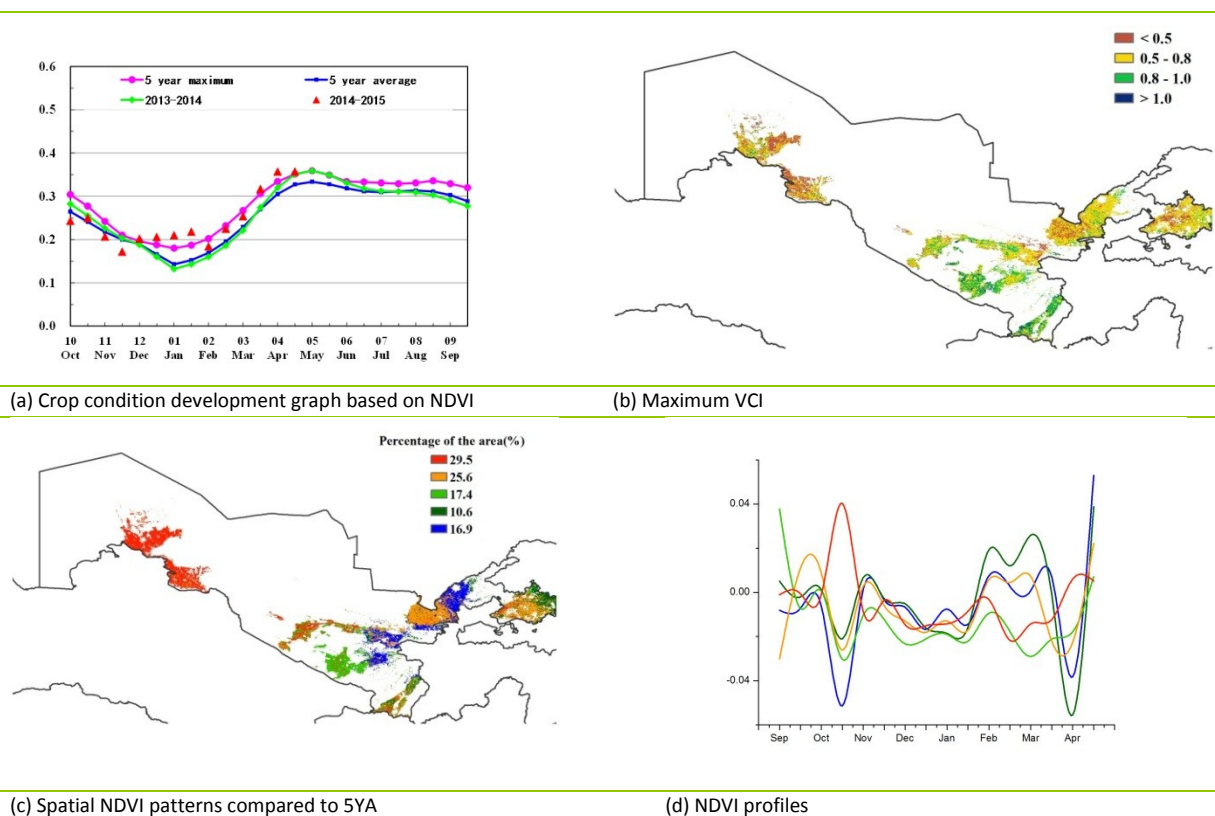


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[UZB] Uzbekistan

This analysis covers the growing stage of winter cereals and the sowing stage of coarse grains, including maize, in Uzbekistan from January to April in 2015. The crop condition was generally favorable. The country as a whole showed a significant increase of rainfall (RAIN, +11%) but average temperature (TEMP). Radiation (RADPAR, -5%) was low, but the combined effect of RAIN and TEMP is an increase in BIOMSS of the order of 18% over the previous five-year average. This assessment is confirmed by the national NDVI development graph, which shows that crop condition was above last the five-year average and even exceeded the last five-year maximum in January and April. NDVI cluster graphs and profiles show a favorable picture in most parts of the country from February to March, while in the west (the cotton growing area of Karakalpakstan) and south (Kagan, Qarshi, and Surkhondaryo), crop condition showed a drop from early February. In late March, a sudden drop in NDVI also occurred in parts of the country's central and east areas (Samarkand, Jizzakh, Tashkent, Namangan, and Andijon). Current condition, however, is either average or above average. Altogether, prospects are favorable in Uzbekistan's food producing areas.

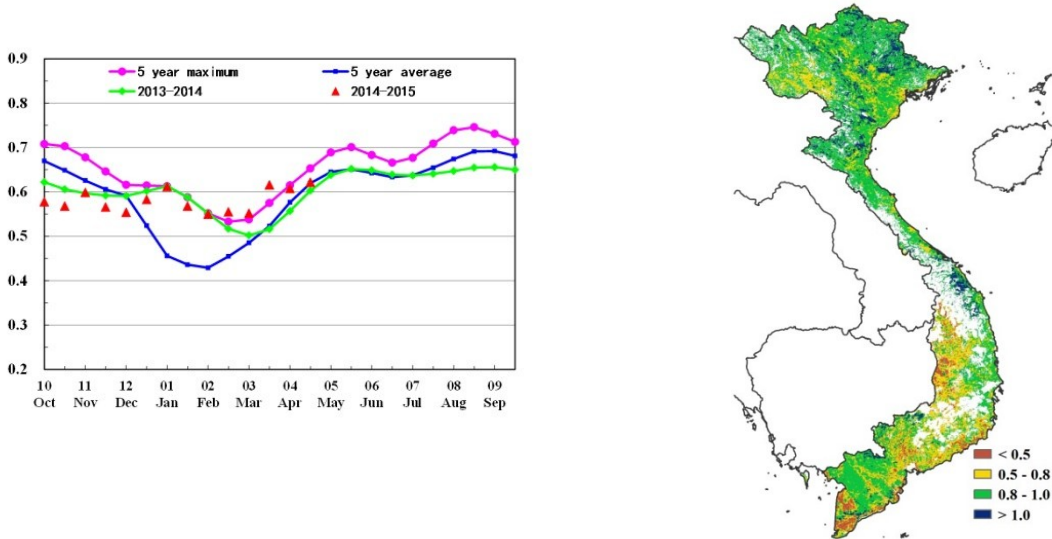
Figure 3.32. Uzbekistan crop condition, January-April 2015



[VNM] Vietnam

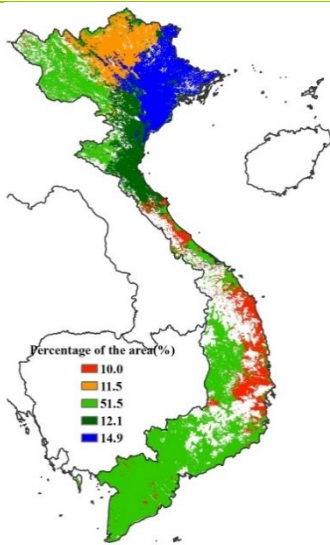
The period covered by this bulletin is of relevance for winter/spring rice in Vietnam. The fraction of cropped arable land (CALF) in the country was close to the average of the previous five years. Most of the rice cultivation regions are distributed in the Red River delta in northern Vietnam and the Mekong River delta in southern Vietnam. Vegetation condition indices (maximum VCI) were above 0.8 in most of the two main rice producing areas, with the exception of the southern tip of Vietnam due to the salt water intrusion. For the period under consideration, the CropWatch environmental indices show markedly below average rainfall (RAIN, -14%) and a correlated slight increase in PAR (RADPAR, 6%) and temperature (TEMP, 1.1°C) in comparison with the previous fourteen years. The insufficient rainfall limited the biomass accumulation and resulted in a 6% decrease in the BIOMSS indicator compared with the average of the previous five years. Crop condition departed little from the five-year average during the entire monitoring period. The northern part of Vietnam (mainly in Lao Cai, Ha Giang, and Tuyen Quang, roughly 11.5% of the cropped area) suffered below average crop condition due to the dry weather and crop diseases from January to the end of April, as shown by the NDVI profiles and clusters.

Figure 3.33. Vietnam crop condition, January-April 2015



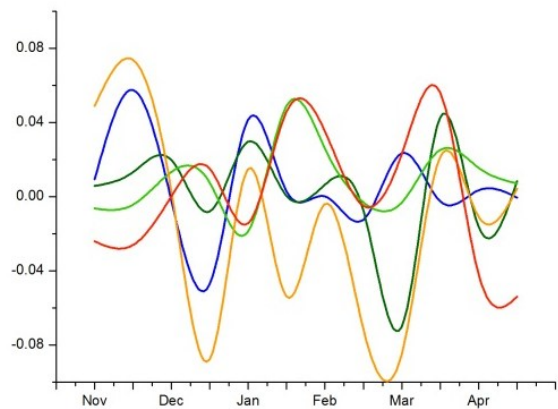
(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

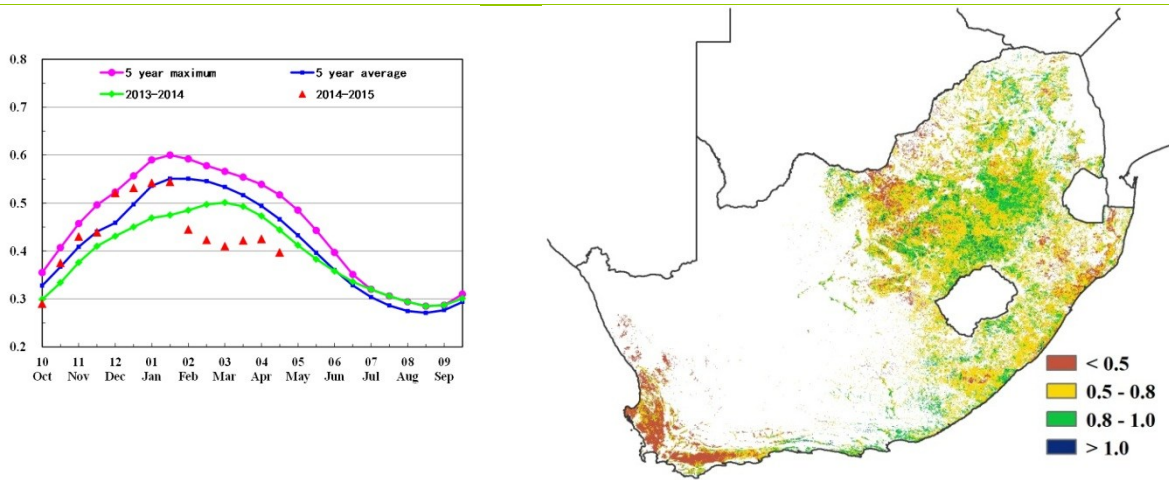
(d) NDVI profiles



[ZAF] South Africa

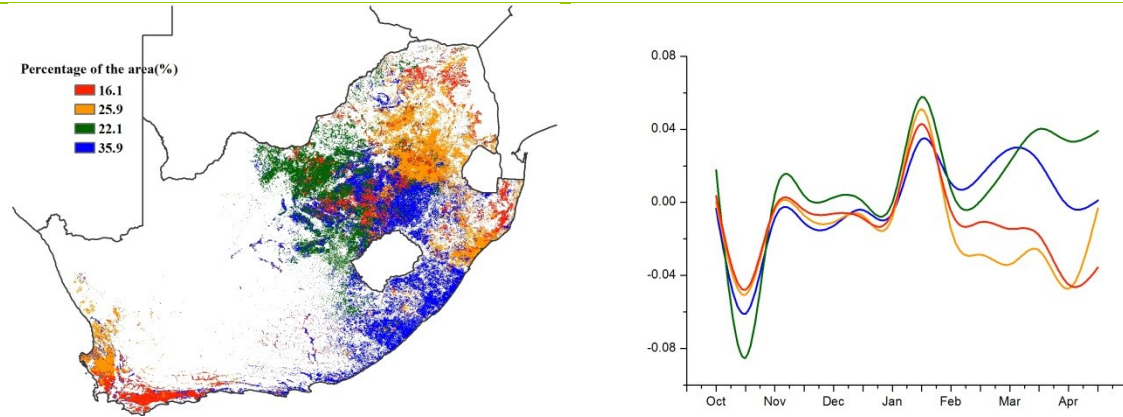
Summer crops (maize and soybean) are currently being harvested in the east (up to June) and somewhat later in the west (June-July). The CropWatch agroclimatic indicators concur to describe the current season as generally poor. Overall rainfall was 6% below average, accompanied by relatively high temperature (+1.3°C) and abundant sunshine (RADPAR +5%), all resulting in a biomass production potential deficit (BIOMSS) of 6%. The cropped arable land fraction (CALF) decrease below the average of the last five years reaches 10%, one of the highest values among the countries monitored by CropWatch. Overall NDVI profiles are well below the average of the recent five years. NDVI clusters indicate average conditions (or even above average) in about 60% of agricultural areas, while poorer than expected crop condition prevails in the remaining areas, especially in Kwazulu-Natal (where coastal areas are more severely affected than the west), Mpumalanga, parts of the Free State, as well as the Northern province except its westernmost areas.

Figure 3.34. South Africa crop condition, January-April 2015



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

Chapter 4. China

Chapter 4 presents a detailed analysis for China, focusing on the seven most productive agro-ecological regions of the east and south. After a brief overview of the 2014-2015 winter crops growing season (section 4.1) and the production outlook for 2015 (4.2), detailed analyses including maps and profiles are provided for NDVI, VCIx, and BIOMSS in the regions (4.3). Additional information on the agroclimatic indicators for agriculturally important Chinese provinces are listed in table A.11 in Annex A.

4.1 Overview

The CropWatch agroclimatic indicators were generally close to average in China over the monitoring period; RAIN was 5% above average, while RADPAR was -2%. Table 4.1 provides an overview of the agroclimatic and agronomic indicators for selected provinces. Although temperature fluctuated severely, TEMP was above average in all regions and provinces during the period, which indicates that the country experienced a warm season (TEMP, +1.2°C), especially in Inner Mongolia (+1.4°C), Northeast China (1.6°C), and Southwest China (1.3°C). In about ten provinces, the departure in temperature exceeded 1°C, including Anhui and Sichuan province. Rainfall was below average in the Lower Yangtze (RAIN, -16%) and Northeast China (-2%), but particularly so in the southern islands of Hainan (-45%) and Taiwan (-42%). Rainfall was more than 80% above average in Inner Mongolia, Gansu, Shaanxi, and Zhejiang provinces. PAR (RADPAR) was below the average, except for Inner Mongolia (0%) and Southern China (+3%); it was about average in almost all the provinces except Hunan and Guizhou, where the departure exceeded 8%. High temperature and abundant rainfall resulted in BIOMSS values larger than 50% above the average in the Loess region and Southwest China.

Table 4.1. CropWatch agroclimatic and agronomic indicators for China, January-April 2015, departure from 5YA and 14YA

| Region | Agroclimatic indicators | | | Agronomic indicators | | |
|-----------------|-------------------------------|-----------|------------|------------------------------|----------|-------------|
| | Departure from 14YA (2001-14) | | | Departure from 5YA (2010-14) | | Current |
| | RAIN (%) | TEMP (°C) | RADPAR (%) | BIOMSS (%) | CALF (%) | Maximum VCI |
| Huanghuaihai | 21 | 0.9 | -2 | 31 | 0 | 0.89 |
| Inner Mongolia | 91 | 1.4 | 0 | 62 | / | 0.89 |
| Loess region | 76 | 0.8 | -4 | 54 | 2 | 0.89 |
| Lower Yangtze | -16 | 0.8 | -3 | -1 | 1 | 0.84 |
| Northeast China | -2 | 1.6 | -1 | 21 | / | 0.64 |
| Southern China | 9 | 1 | 3 | 22 | -1 | 0.85 |
| Southwest China | 59 | 1.3 | -5 | 63 | -2 | 0.88 |

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 five (5YA) or fourteen-year average (14YA) for the same period (January-April).

Figures 4.1 to 4.5 illustrate China's spatial distribution of rainfall (figure 4.1) and temperature profiles (figure 4.2), and maps of cropped and uncropped arable land (figure 4.3), maximum VCI (figure 4.4.), and VHI minimum (figure 4.5). Both high and low maximum VCI values are scattered in almost all provinces, with high values mainly located in the east of Guizhou, north Jiangsu, and south Shandong, and low values (below 0.5) in the north of Hunan and south of Hubei, indicating unfavorable crop condition in these areas. Low rainfall in the Lower Yangtze region resulted in low biomass, while above average temperature in the other six regions may lead to high biomass: the potential biomass was 60% above average in Inner Mongolia and Southwest China. Normal rainfall in the Northeast region resulted in average soil moisture, which is conducive to the sowing and emergence of spring wheat, soybean, and

maize. During the growing season of winter wheat, suitable temperature and adequate rainfall in the major production provinces may result in a higher production than the previous year.

Overall, the cropped arable land fraction (CALF) was 3% above the five-year average for China. Because of relatively low temperatures, most of the uncropped land is found in the Northeast and Northwest China regions, as well as in Inner Mongolia. The sowing of spring crops has been under way since late April. The CALF of the Loess region and Lower Yangtze region was above average (increases of 2% and 1%, respectively), while it was below average in Southern China and Southwest China (-1% and -2%, respectively), indicating a decrease in the cropped area for this period. Minimum VHI indicates that southern Anhui, the northeast of Hunan, and central Shanxi province all experienced mild water stress, while in other regions water was adequate for crop growth or planting, especially in the east of Shandong and almost the entire Henan province.

Figure 4.1. China spatial distribution of rainfall profiles, January-April 2015

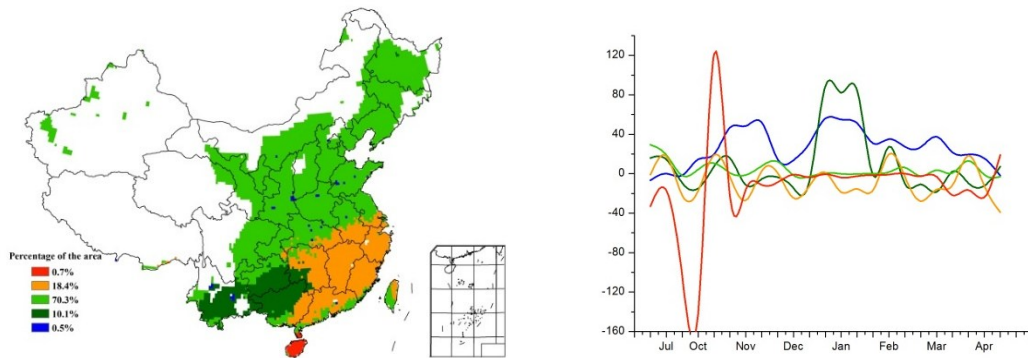


Figure 4.2. China spatial distribution of temperature profiles, January-April 2015

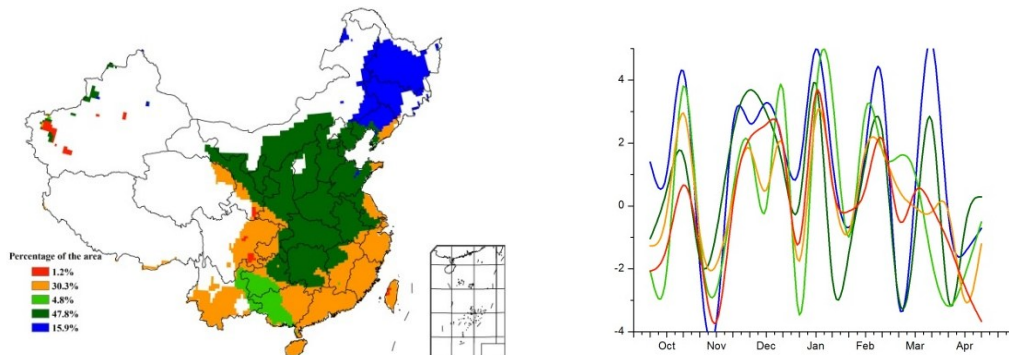


Figure 4.3. China cropped and uncropped arable land, by pixel, January-April 2015

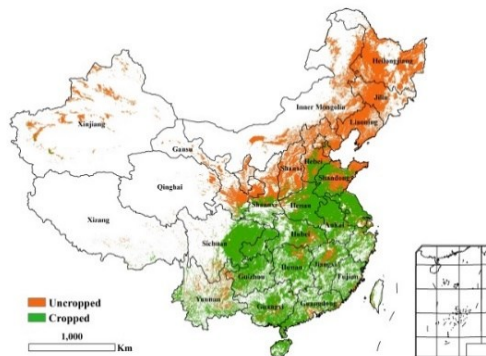


Figure 4.4. China maximum Vegetation Condition Index (VCIx), by pixel, January-April 2015

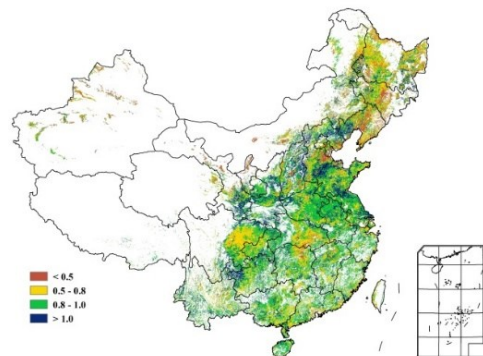
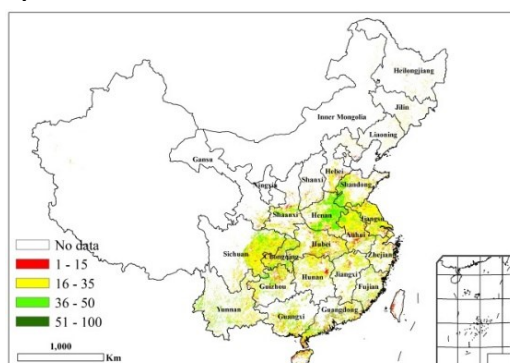


Figure 4.5. China VHI minimum, by pixel, January-April 2015

4.2 Winter crops production

Favorable conditions during the wintering period in China have provided good prospects for winter crops: the total production in China is expected to reach 125.4 million tons, an increase of 1.85 million tons or 1.5% compared to 2014 (table 4.2). Only three of the eleven major winter crops producing provinces—Anhui, Hubei, and Gansu—show decreased production compared to the previous year. A combination of decreases in both yield and planted area resulted in lower production in Anhui and Hubei. The most significant decrease in planted area (-6.3%) was observed in Gansu, but this was compensated by a 5.3% increase in yield. Shandong and Henan—the top two winter crops producing provinces—benefited from favorable agro-climatic conditions, with 4.3% and 1.1% increases in production respectively. Increased production was also observed in Shanxi, Jiangsu, Chongqing, Sichuan, and Shaanxi.

Table 4.2. China, 2015 winter crops production (thousand tons) and percentage difference with 2014, by province

| | 2014 (thousand ton) | 2015 | | | Production (thousand ton) |
|------------------------|------------------------|--------------------|---------------------|--------------------------|---------------------------------|
| | | Area change (%) | Yield change (%) | Production change (%) | |
| Hebei | 10783 | 0.9 | 1.0 | 1.9 | 10989 |
| Shanxi | 2170 | -0.5 | 1.2 | 0.7 | 2184 |
| Jiangsu | 9995 | 1.7 | -1.2 | 0.6 | 10050 |
| Anhui | 12122 | -1.2 | -1.8 | -3.0 | 11764 |
| Shandong | 22107 | 2.4 | 1.8 | 4.3 | 23062 |
| Henan | 25862 | 0.2 | 0.8 | 1.1 | 26139 |
| Hubei | 6120 | -0.6 | -3.6 | -4.2 | 5865 |
| Chongqing | 2297 | -0.8 | 1.9 | 1.1 | 2323 |
| Sichuan | 5495 | 0.9 | 1.5 | 2.4 | 5626 |
| Shaanxi | 4389 | -0.4 | 0.6 | 0.1 | 4395 |
| Gansu | 3108 | -6.3 | 5.3 | -1.3 | 3067 |
| Sub total | 104448 | - | - | 1.0 | 105465 |
| Other provinces | 19093 | - | - | 4.3 | 19921 |
| National total* | 123541 | 0.9 | 0.6 | 1.5 | 125386 |

Note: * National total production does not include Taiwan province.

In China, winter wheat is an important part of the winter crop output, and over the past ten years winter wheat has accounted for 91% of that output. For 2015, CropWatch puts the Chinese winter wheat production forecast at 113.5 million tons, 1.1% above the previous year's production (table 4.3). Both yield and planted area contributed to the increased production. Only three provinces suffered from reduced yield due to abnormal weather conditions. This included Hubei, which suffered from continuous rainy weather that interfered with yield formation and ripening. In northern Jiangsu and Anhui, rainfall

followed by windy weather resulted in wheat lodging and decreased yield. The planted area of winter wheat area was stable (the variation was less than 1%) compared to 2014, except in Jiangsu, Shandong, and Gansu provinces. Increased wheat planting in the first two provinces was the result of a shift away from rapeseed in Jiangsu and from cotton in Shandong.

Up to early May, most winter wheat was heading towards the grain-filling stage. If the agroclimatic conditions stay favorable until harvest, the production of winter crops in China will be above the 2014 record.

Table 4.3. China, 2015 winter wheat area, yield, and production and percentage difference with 2014, by province

| | Area (kha) | | | Yield (kg/ha) | | | Production (thousand ton) | | |
|------------------------|------------|-------|------|---------------|------|------|---------------------------|--------|------|
| | 2014 | 2015 | Δ(%) | 2014 | 2015 | Δ(%) | 2014 | 2015 | Δ(%) |
| Hebei | 2016 | 2035 | 0.9 | 5262 | 5315 | 1.0 | 10609 | 10815 | 1.9 |
| Shanxi | 511 | 509 | -0.5 | 4097 | 4146 | 1.2 | 2095 | 2109 | 0.7 |
| Jiangsu | 1990 | 2036 | 2.3 | 4775 | 4709 | -1.4 | 9501 | 9586 | 0.9 |
| Anhui | 2625 | 2605 | -0.7 | 4334 | 4256 | -1.8 | 11375 | 11088 | -2.5 |
| Shandong | 4103 | 4217 | 2.8 | 5334 | 5430 | 1.8 | 21886 | 22898 | 4.6 |
| Henan | 4945 | 4961 | 0.3 | 5207 | 5239 | 0.6 | 25747 | 25992 | 0.9 |
| Hubei | 1052 | 1043 | -0.9 | 4229 | 4152 | -1.8 | 4450 | 4328 | -2.7 |
| Chongqing | 360 | 356 | -1.1 | 3111 | 3144 | 1.1 | 1119 | 1118 | -0.1 |
| Sichuan | 1266 | 1272 | 0.5 | 3629 | 3673 | 1.2 | 4596 | 4673 | 1.7 |
| Shaanxi | 1017 | 1016 | -0.2 | 3885 | 3901 | 0.4 | 3953 | 3962 | 0.2 |
| Gansu | 419 | 392 | -6.3 | 3874 | 4075 | 5.2 | 1622 | 1599 | -1.4 |
| Sub total | 20305 | 20442 | 0.7 | - | - | - | 96953 | 98170 | 1.3 |
| Other provinces | 3199 | 3253 | 1.7 | - | - | - | 15274 | 15332 | 0.4 |
| National total* | 23503 | 23694 | 0.8 | 4775 | 4790 | 0.3 | 112228 | 113502 | 1.1 |

Note: * National total production does not include Taiwan province.

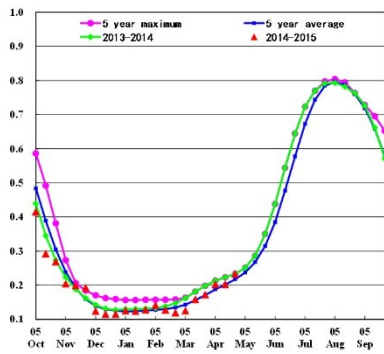
4.3 Regional analysis

Figures 4.6 through 4.12 present crop condition information for each of China's seven regions. The provided information is as follows: (a) Crop condition development graph based on NDVI, comparing the current season up to April 2015 to the previous season, to the five-year average (5YA), the five-year maximum; (b) Spatial NDVI patterns from January to April 2015 (compared to the 5YA); (c) NDVI profiles associated with the spatial patterns under (b); (d) maximum VCI (over arable land mask); (e) biomass for January-April 2015. Additional information about agroclimatic indicators and BIOMSS for China is provided in Annex A, table A.11.

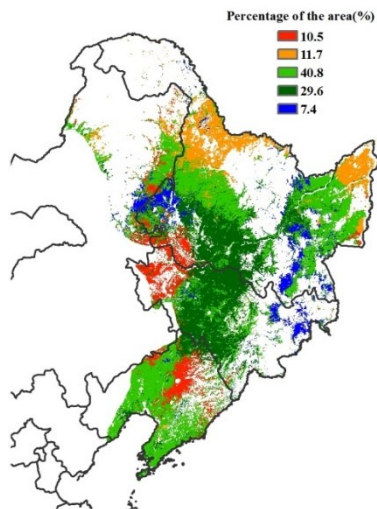
Northeast region

No crops are cultivated in northeast China from January to mid-April. Maize and soybean sowing both start in late April only. CropWatch agroclimatic indicators show markedly above average temperature (+1.6°C) compared with average; on the contrary, rainfall and PAR show a slight decrease by 2% and 1%, respectively. Abundant snow over the last winter ensured good soil moisture, which will benefit spring crops in 2015.

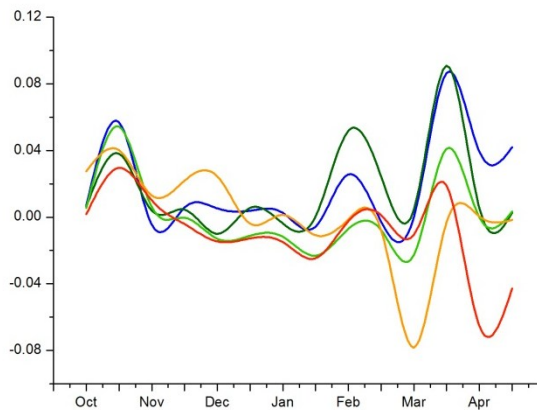
Figure 4.6. Crop condition China Northeast region, January-April 2015



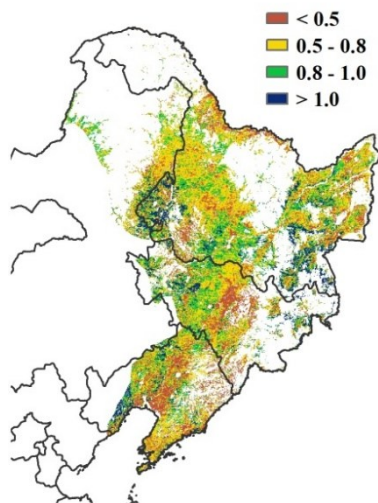
(a) Crop condition development graph based on NDVI



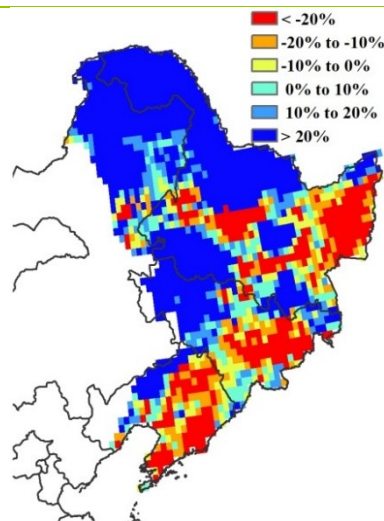
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI

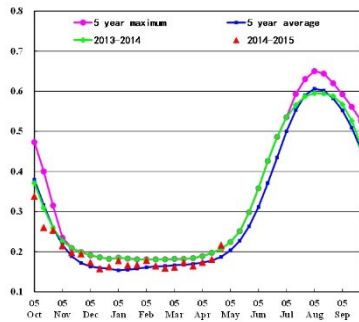


(e) Biomass

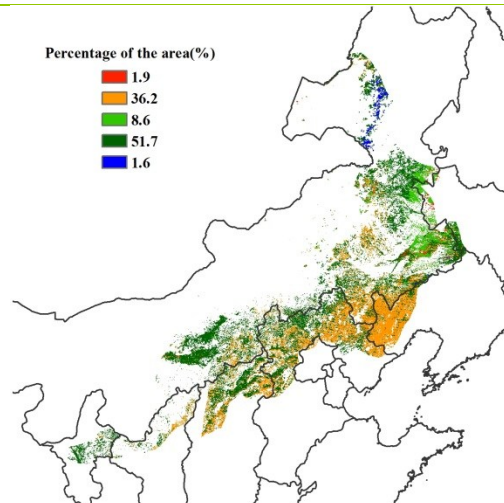
Inner Mongolia

Due to the low temperatures, no crops are cultivated between January and April in this region. Along with gradually increasing temperatures, crops are starting to be sowed from late April on forward. Considering the last four months, rainfall and temperature indices were well above average (RAIN +79% and TEMP +1.4°C), resulting in a large potential biomass increase of 62% and record VCIx. If favorable conditions are maintained over the whole cycle, the outcome may be an exceptionally good season.

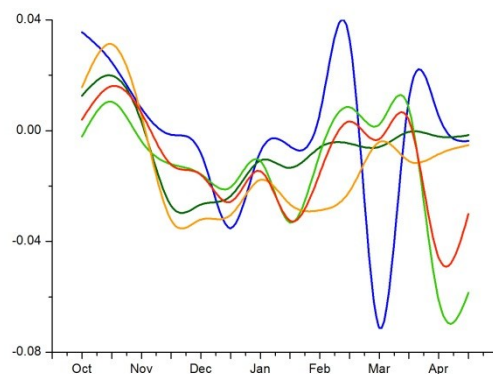
Figure 4.7. Crop condition China Inner Mongolia, January-April 2015



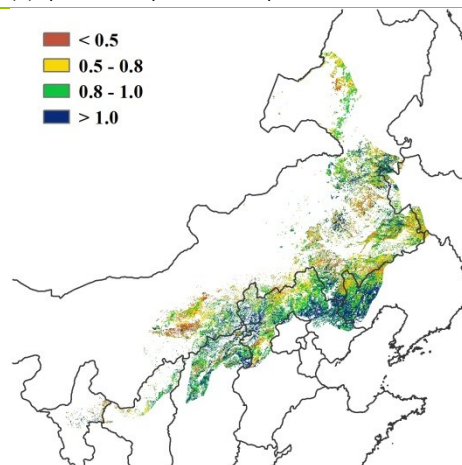
(a) Crop condition development graph based on NDVI



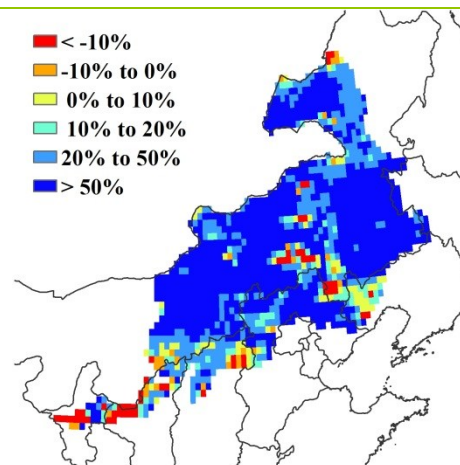
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI

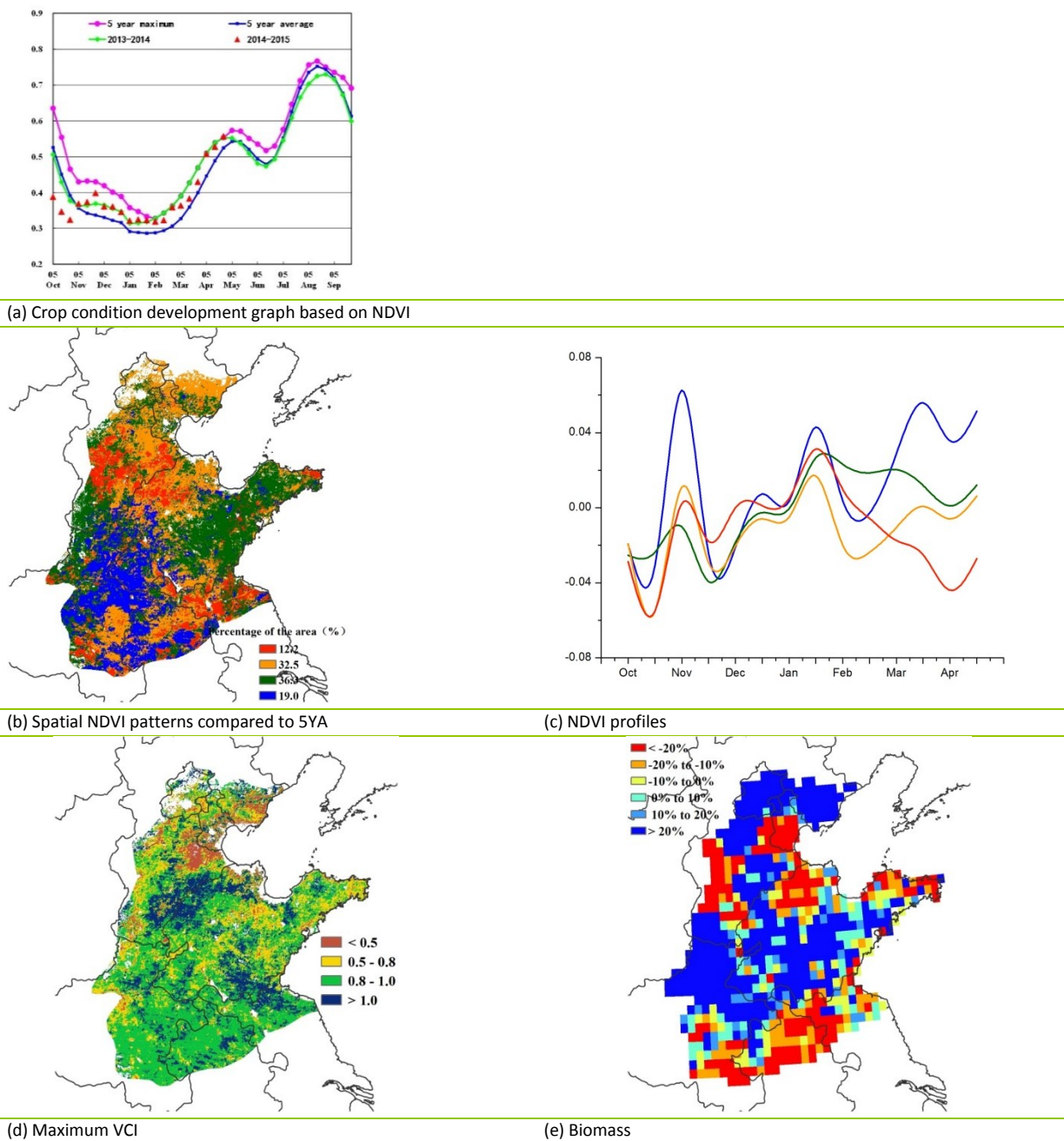


(e) Biomass

Huanghuaihai

The condition of winter crops in the Huanghuaihai region has been generally favorable so far. By early May, winter crops (mainly winter wheat and rapeseeds) were heading to their grain-filling stage, and the crops will be harvested by early June. Over the reporting period, agroclimatic conditions were favorable for crops, with 21% above average rainfall (RAIN), 0.9°C higher temperature (TEMP) and average radiation (RADPAR), which overall resulted in an increase of 31% in the biomass accumulation potential (BIOMSS). Spatially, below average BIOMSS is observed in northern Jiangsu, northern Anhui, and the coastal region of Bohai Bay. These areas coincide with below average NDVI regions from February to April, according to the spatial patterns and NDVI departure profiles compared with the five-year average. The overall NDVI development graph shows above average crop condition at and after the wintering stage. By late April, crop condition reached the same level as in 2014. According to the maximum VCI map, below average conditions occurred south of Tianjing, which is an area where crops are sown in spring or summer and sowing was delayed.

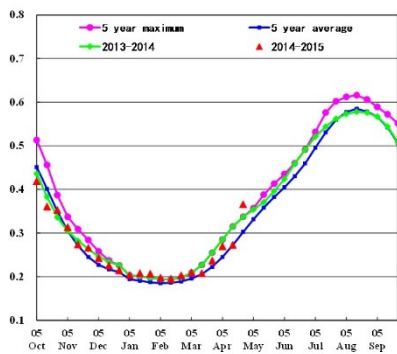
Figure 4.8. Crop condition China Huanghuaihai, January-April 2015



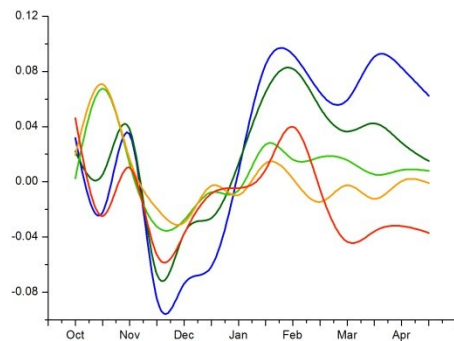
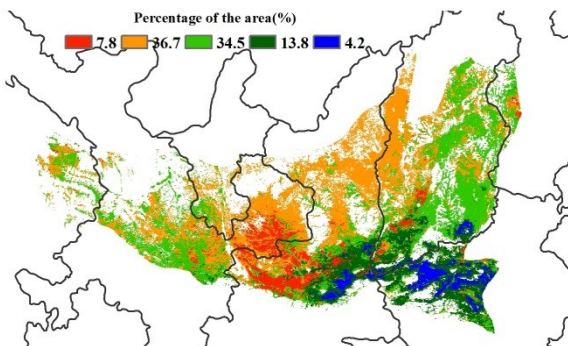
Loess region

The average NDVI profile indicates that crop condition in the Loess region is better than last year's and also above the five-year average. The main crops are spring wheat and winter wheat. Winter wheat was sowed in October and will be harvested in early June. During the monitoring period, rainfall and temperature exceeded average by 76% and 0.8 degrees, respectively. Radiation, however, was decreased by 4%, which is correlated with excess precipitation. The additional detail provided by the NDVI clusters and profiles shows that the crop condition fluctuated widely over the monitoring period. However, at the end of April, condition was better than the five-year average in most parts of the region, especially in the northeast of Henan province. CALF increased 2% when compared with the five-year average, which indicates more land is cropped. The potential biomass was 54 percent above the average, especially in the north of Shaanxi and south of Hebei provinces.

Figure 4.9. Crop condition China Loess region, January-April 2015

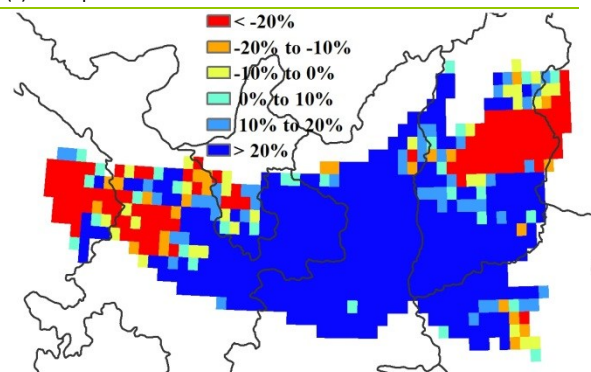
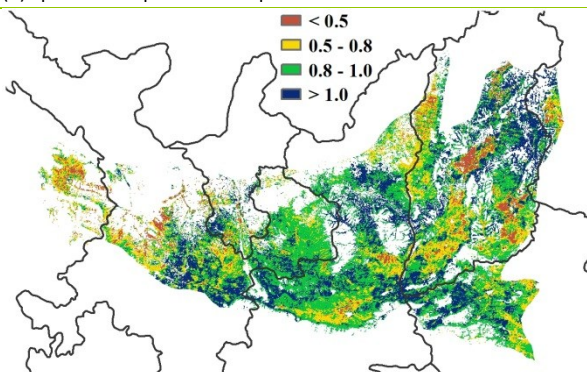


(a) Crop condition development graph based on NDVI



(b) Spatial NDVI patterns compared to 5YA

(c) NDVI profiles



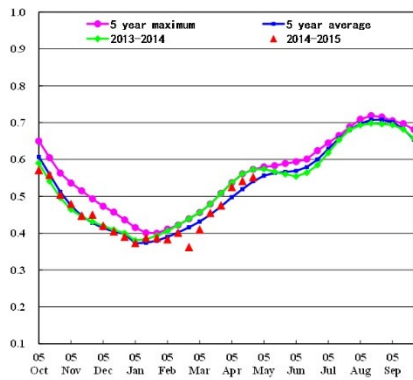
(d) Maximum VCI

(e) Biomass

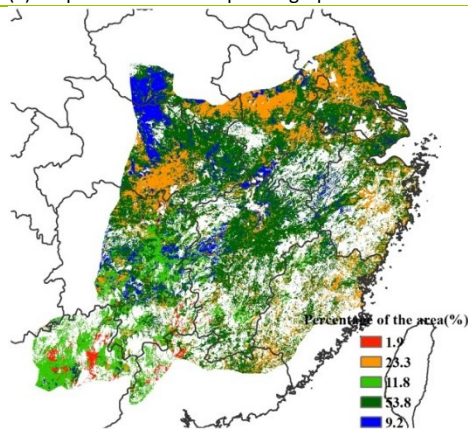
Lower Yangtze region

The average NDVI development curves show that crop condition in this area is below last year's level, but above the five-year average. In the north of the region (such as in Henan, Anhui, and Jiangsu provinces) winter wheat is sowed in October and harvested in late May and early June; in the south, early rice is planted in late April and early May. The agroclimatic indicators show that rainfall and PAR were below the average, while the temperature anomaly reached 0.8°C. The NDVI clusters and profiles show that crop condition fluctuated between October and April in most parts of the area, but nevertheless remained above average during most of the monitoring period. In mid-April, due to low rainfall, crop condition in the whole region decreased. In the south of Jiangsu and east of Hunan, crop condition was persistently above the recent five-year average, as confirmed by the map of the maximum VCI. The fraction of cropped arable land (CALF) is 1% above average. The biomass production potential (BOMSS) was below average in most of the region, particularly in the north of Guangdong, Fujian, and Zhejiang provinces.

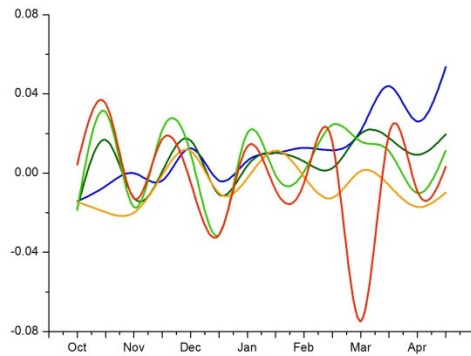
Figure 4.10. Crop condition Lower Yangtze region, January-April 2015



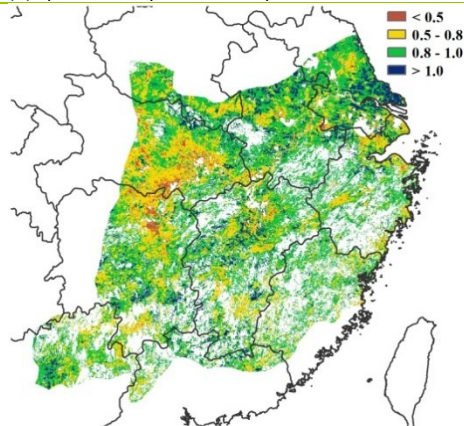
(a) Crop condition development graph based on NDVI



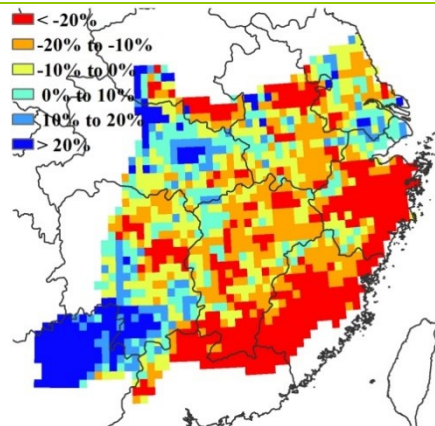
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI

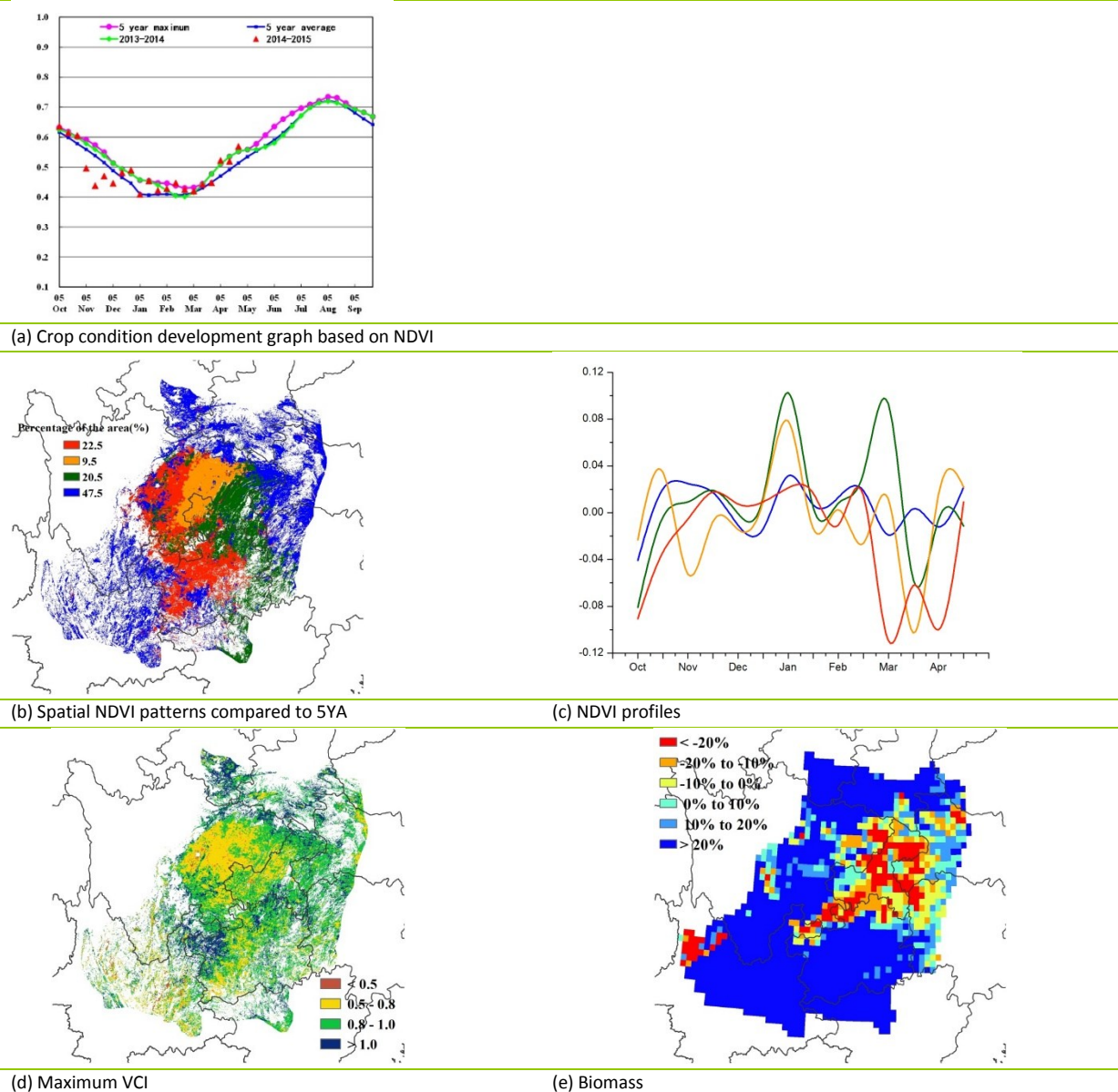


(e) Biomass

Southwest China

In Southwest China, the monitoring period covers the planting of maize and single rice⁴ and the late stages of winter wheat. The ongoing growing season can generally be described as having a somewhat above average condition. Crop condition was average from January to March, after which it improved to above average. The agroclimatic indicators (RAIN, +59%; TEMP, +1.3°C; and RADPAR, -5% compared to average) show abundant rainfall, a marked positive temperature anomaly, and a significant loss of sunshine. Potential accumulated biomass (BIOMSS) reaches +63% compared with the recent five-year average. The CALF was relatively stable, decreasing 2% compared to the average of the last five seasons. Marked spatial differences, however, occur within the region, with east Sichuan, Chongqing (where rainfall was 14% below average), most of Guizhou, and part of northwest Guangxi showing below average conditions at the end of March; these areas will require close monitoring. Altogether, condition of crops is currently at least average (VCIx of 0.88). Combined with likely pockets of poor crops and decreased CALF, average production is likely.

Figure 4.11. Crop condition Southwest China region, January-April 2015

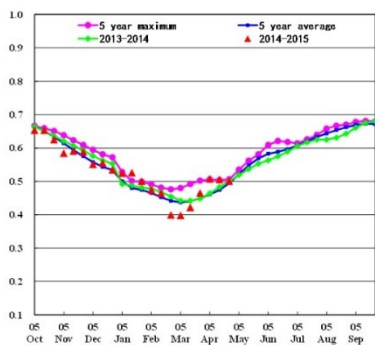


⁴ Single rice" is the crop grown in areas where only one rice crop is produced every year, as opposed to southern areas with cropping intensities above 100%.

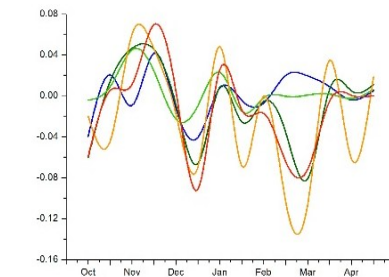
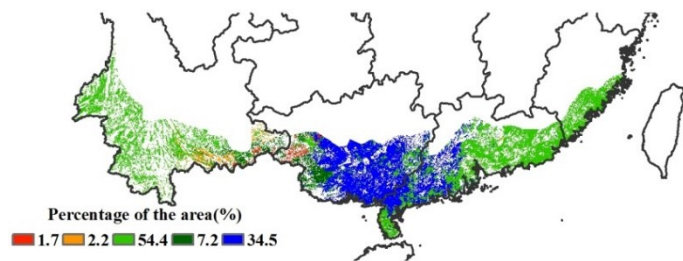
Southern China

In southern China, the period from January to April mainly covers the planting of early rice and the growing season of winter wheat. The crop condition was generally average during the entire period. In February and the beginning of March, crop condition was below average in Southwest Guangxi and part of Southeast Yunnan, accounting for about 11.1% of the monitored region in Southern China. The result is confirmed by the NDVI profiles and results from drought in Guangxi starting in March (as reported by the National Climate Center of China). Condition returned to average between mid-March and April, to the extent that, compared to the recent five-year average, 88.9% of the monitored regions in Southern China, including south Yunnan, south Guangxi and Guangdong, and south Fujian display average levels at the end of the reporting period. The agroclimatic indicators (RAIN, +9%, TEMP, +1°C, and RADPAR, +3%) also show average to better than average conditions and result in a BIOMSS increase of 22% over the average of the last five years. The maximum VCI is 0.85 with almost stable CALF (-1%). Compared to the recent average, a 47% decrease of rainfall occurred in Fujian, and a 43% drop in Guangdong, which should thus be watched closely in the coming months.

Figure 4.12. Crop condition Southern China region, January-April 2015

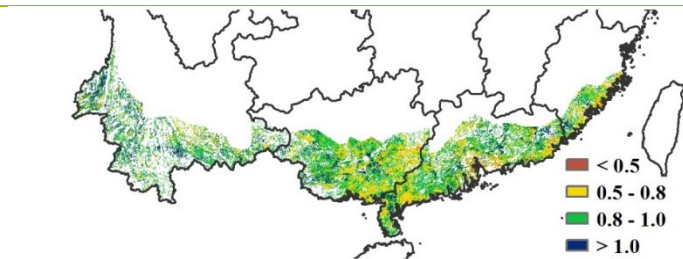


(a) Crop condition development graph based on NDVI

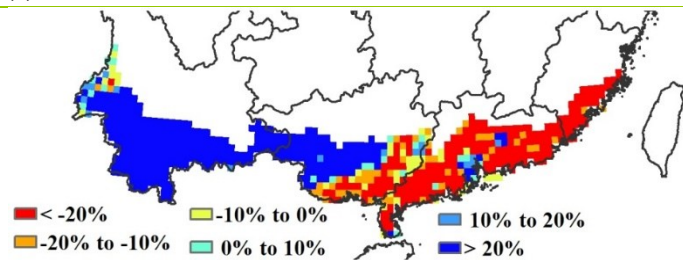


(b) Spatial NDVI patterns compared to 5YA

(c) NDVI profiles



(d) Maximum VCI



(e) Biomass

Chapter 5. Focus and perspectives

This focus section complements CropWatch analyses presented in chapters 1 through 4 by providing additional information about topics of interest to global agriculture. Section 5.1 includes a production outlook for 2015, while the other three sections focus on disaster events (5.2), agricultural developments in South America (section 5.3), and an update on El Niño (5.4).

5.1 Production outlook for 2015

The CropWatch production outlook for 2015 is presented for groups of countries (table 5.1) and the 31 countries more specifically monitored by CropWatch. Both outlooks are based on estimates of various types, as some pertain to crops already harvested and being harvested, while others are projections (for crops not yet harvested) based on an assumption that the period after April 2015 will be “average” (i.e., characterized by average values of NDVI, which is the main CropWatch predictor). For minor producers, estimates are based on trends. Additional detail about the various estimates is provided in the notes to tables 5.1 and 5.2.

It is also stressed that El Niño conditions are now considered to be almost certain for the end of this year (see section 5.4), which means the current projections will likely need regular revision. Although El Niño is theoretically associated with favorable rainfall in east Africa and drought in southern Africa, the phenomenon is never typical; nevertheless, the situation in Ethiopia is characteristic of a perturbed climate system.

Country groupings

According to CropWatch global estimates (table 5.1), the level of production of maize will be down 1.3% this year in comparison to the output of 2014; rice and wheat production will increase by about 1% (1.0% and 0.9%, respectively), and soybean production will drop 1.1% compared to 2014.

When focusing on the main producing countries alone, maize will undergo a decrease of 1.8%; rice will increase (+1.0%), and wheat and soybean will drop 1.6% and 1.7%, respectively.

If the analysis is restricted to the countries where harvest is currently ongoing or completed (which is the case in about one-fourth to half of the major producing countries), the estimates suggest changes of -0.6% (-0.3%)⁵ for maize, +1.2% (+1.2%) for rice, -1.8% (-1.4%) for wheat, and +0.0% (+0.2%) for soybean, which describes a slightly better situation than the global prediction. The percentages do not vary significantly if minor producers are included.

Rather interesting projections are achieved when considering only the three major exporting countries of each commodity, i.e., the United States, Argentina, and Brazil for maize; Thailand, Vietnam, and Pakistan for rice; the United States, France, and Canada for wheat, and the United States, Brazil, and Argentina for soybean. In this case, both maize and soybean production are down (-2.9% and -1.7%, respectively), while rice achieves a spectacular 6.2% increase, and wheat production grows 1.5%. The situation in the remaining countries is virtually unchanged for maize and rice (0.0% and 0.3%), while wheat (+0.8%) and soybean (+1.4%) undergo modest increases.

⁵Numbers between brackets also include minor producers of the southern hemisphere.

Table 5.1. 2015 production estimates and forecasts for maize, rice, wheat, and soybean (thousand tons) according to various country groupings

| | Maize | | Rice | | Wheat | | Soybean | |
|---|--------|------|--------|-----|--------|------|---------|------|
| | 2015 | Δ% | 2015 | Δ% | 2015 | Δ% | 2015 | Δ% |
| Repetition of the last three lines of table 5.2 | | | | | | | | |
| Total | 947614 | -1.3 | 750216 | 1.0 | 712292 | 0.9 | 285879 | -1.1 |
| CNTR31 | 838491 | -1.8 | 676378 | 1.0 | 614372 | -1.6 | 266336 | -1.7 |
| OTS+OTN (*) | 109123 | 2.4 | 73838 | 1.5 | 97920 | 1.7 | 19543 | 7.9 |
| Four major producers in the southern hemisphere and remaining countries | | | | | | | | |
| ARG+AUS+BRA+ZAF | 115784 | -0.9 | 15567 | 3.4 | 45087 | -1.0 | 142511 | 0.2 |
| CNTR27 (**) | 722707 | -1.9 | 660811 | 0.9 | 569285 | 0.9 | 123825 | -3.8 |
| Four major producers in the southern hemisphere together with other southern hemisphere countries | | | | | | | | |
| ARG+AUS+BRA+ZAF+OTS | 137609 | -0.4 | 30335 | 2.5 | 64671 | -0.2 | 146420 | 0.4 |
| CNTR27+OTN | 810005 | -1.5 | 719881 | 1.0 | 647621 | 1.0 | 139459 | -2.6 |
| Estimated and forecast productions for major producers (CNTR31) | | | | | | | | |
| Estimated (= "Harvesting") | 230778 | -0.6 | 387948 | 1.2 | 133238 | -1.8 | 155729 | 0.0 |
| Forecast (= "To be harvested") | 607713 | -2.3 | 288430 | 0.7 | 481134 | -1.5 | 110607 | -4.0 |
| "Harvesting" countries where harvest takes place during the months from January to April (***) including minor producers (OTS for Estimated, OTN for Forecast) | | | | | | | | |
| Estimated | 252603 | -0.3 | 402716 | 1.2 | 152822 | -1.4 | 159638 | 0.2 |
| Forecast | 695011 | -1.7 | 347500 | 0.9 | 559470 | -1.1 | 126241 | -2.7 |
| Percent harvested (****) | 27 | | 54 | | 20 | | 56 | |
| Three major exporters | | | | | | | | |
| 3 major exporters | 424672 | -2.9 | 98361 | 6.2 | 131750 | 1.5 | 227413 | -1.7 |
| CNTR28+OTR (**) | 522942 | 0.0 | 651855 | 0.3 | 580542 | 0.8 | 58466 | 1.4 |

Notes: (*) OTR stands for the 130 countries that are not part of the 31 main producers monitored by CropWatch (see chapter 3) and listed in table 5.2.; OTN and OTS stand for "other north" and "other south," separating these 130 countries in "north" and "south" based on the latitude of their centroid (OTR=OTN+OTS). In total, 80% of OTRs fall under OTN. (**) CNTR27 includes the major producers (CNTR31) minus Argentina (ARG), Australia (AUS), Brazil (BRA), and South Africa (ZAF). CNTR28 covers the 31 countries minus the three major producers for each crop. (***) This includes all countries where the respective crops were being harvested during at least one of the months between January and April, including areas where harvest ended in January, areas where it started in April, as well as all intermediate situations. (These same countries are shown in *italics* in table 5.2.) Countries that grow multiple crops over the season were nevertheless assigned to this group; this applies mostly to equatorial countries, for instance Indonesia where a first rice crop is harvested from November to January, and the second from June to December. (****) The approach described under (***) above overestimates actual harvest progress in countries with multiple cropping, except for rice.

Individual countries

In China, due to favorable conditions so far, all grain production is up close to 1.0% (1.1% for wheat and an increase forecast at 1.6% and 0.6% for maize and rice, respectively), while soybean will continue its decade-long falling trend (-1.3%) according to the forecast.⁶

The largest projected increase for maize production is the estimate for Mexico (+8.2%). For wheat, both Argentina and Brazil show significant gains (+14.8% and +8.7%), as well as Iran (+5.3%) and neighboring Turkey (+5.2%). Rice did particularly well in two major exporters: Thailand (+7.2%) and Vietnam (+6.6%).

Most of the notable projected decreases in production are associated with well-identified causes, mostly weather and the resulting reduction in cultivated areas in extreme cases. For maize, this applies to South Africa (-12.4% in maize production) and Ukraine (-15.0%); for wheat to Australia (-9.0%) and some eastern European countries and Russia (around -8%). In Ethiopia, a critical shortage of rainfall for *belg*⁷ crops is also likely to affect crops harvested later in the year, leading to estimated decreases in production of -10.0% for maize and -7.0% for wheat.

In India, CropWatch forecasts are very close to early estimates issued by several government agencies. For maize, rice, and wheat the decrease compared to last year's harvest amounts to -4.6%, -1.9%, and -4.5%, respectively.

⁶Numbers in italics refer to the forecasts based on average conditions, rather than on assessments of the currently completed or ongoing harvest; see also table 5.2.

⁷"Belg" refers to crops harvested before August; all crops harvested from August to December belong to the "Meher" season.

Table 5.2. 2015 production estimates and forecasts for maize, rice, wheat, and soybean (thousand tons) in selected countries, compared to 2014 CropWatch estimates

| | Maize | | Rice | | Wheat | | Soybean | |
|--------------------------|---------------|-------------|----------------|---------------|--------------|--------------|---------------|--------------|
| | 2015 | Δ% | 2015 | Δ% | 2015 | Δ% | 2015 | Δ% |
| Argentina (+) | 25332 | 1.0 | 1805 | 4.5 | 12053 | 14.8 | 52230 | -0.4 |
| Australia (-) | 557 | 7.4 | 1779 | 19.6 | 24581 | -9.0 | 89 | 5.9 |
| Bangladesh (+) | 2229 | 0.5 | 52669 | 3.5 | 1311 | 1.5 | 64 | 0.1 |
| | | | Boro | 29495 | 4.2 | | | |
| | | | Aus&Aman | 23175 | 2.7 | | | |
| Brazil (=) | 78921 | 0.3 | 11983 | 1.2 | 6710 | 8.7 | 89487 | 0.5 |
| Cambodia (-) | 1048 | 1.4 | 9248 | -2.3 | | | 103 | -6.1 |
| | | | Main | 7149 | 0.3 | | | |
| | | | Dry | 2099 | -10.2 | | | |
| Canada (+) | 12114 | 1.7 | | | 34564 | 3.8 | 5569 | 2.7 |
| China (+) | 195118 | 1.6 | 202323 | 0.6 | 121009 | 1.1 | 12914 | -1.3 |
| | | | Early | 35645 | 0.7 | Winter | 113502 | 1.1 |
| | | | Single | 131586 | 1.1 | Sprint | 7507 | 0.0 |
| | | | Late | 35092 | -1.5 | | | |
| Egypt (=+) | 5875 | -1.3 | 6603 | 4.3 | 9870 | 3.7 | 22 | -6.7 |
| Ethiopia (-) | 6068 | - | 180 | -1.2 | 4084 | -7.0 | 72 | 0.0 |
| | | 10.0 | | | | | | |
| France (+) | 14590 | -3.1 | 58 | -29 | 38976 | -2.0 | 105 | -2.5 |
| Germany (+) | 5202 | 2.3 | | | 26452 | -4.4 | 3 | 12 |
| India (=) | 19251 | -4.6 | 153936 | -1.9 | 91396 | -4.5 | 11146 | -4.1 |
| | | | Rabi | 133924 | -1.4 | | | |
| | | | Kharif | 20012 | -5.6 | | | |
| Indonesia (=) | 18554 | 1.0 | 70398 | 1.6 | | | 743 | -4.1 |
| | | | Main | 66526 | 1.8 | | | |
| | | | Second | 3872 | -1.3 | | | |
| Iran (=) | 2591 | 3.3 | 2935 | 2.4 | 14061 | 5.3 | | |
| Kazakhstan (+) | 603 | 4.4 | 365 | 1.5 | 13263 | -4.2 | 252 | 12.2 |
| Mexico (+) | 25925 | 8.2 | 184 | 2.0 | 3736 | 2.2 | 323 | 10.9 |
| Myanmar (-) | 1747 | 1.8 | 28196 | -0.9 | 188 | 0.7 | 177 | -6.9 |
| | | | Main | 22557 | -1.6 | | | |
| | | | Second | 5639 | 1.7 | | | |
| Nigeria (=) | 10319 | -3.4 | 5221 | 2.2 | 98 | - | 760 | 9.1 |
| | | | | | | 18.1 | | |
| Pakistan (=) | 4717 | 0.1 | 9482 | -0.1 | 24554 | 0.7 | | |
| Philippines (=) | 7463 | -0.6 | 19284 | -0.4 | | | 1 | -4.1 |
| | | | Main | 10812 | -0.3 | | | |
| | | | Second | 8472 | -0.5 | | | |
| Poland (+) | 4479 | 6.7 | | | 9121 | -6.4 | | |
| Romania (=) | 10316 | -3.8 | 42 | -9.8 | 6806 | -7.3 | 161 | 5.6 |
| Russia (=) | 11875 | 1.0 | 910 | -6.2 | 48510 | -8.9 | 1449 | -4 |
| South Africa (-) | 10974 | - | | | 1743 | -6.6 | 705 | 4.7 |
| | | 12.4 | | | | | | |
| Thailand (=) | 5090 | 0.2 | 41965 | 4.5 | | | 225 | 10.3 |
| | | | Main | 34476 | 7.4 | | | |
| | | | Second | 7489 | -6.7 | | | |
| Turkey (+) | 5827 | 0.6 | 949 | 2.0 | 21808 | 5.2 | 229 | 15.7 |
| Ukraine (=) | 25475 | - | 160 | 1.0 | 20873 | -9.6 | 3673 | -4.7 |
| | | 15.0 | | | | | | |
| U.K. (+) | | | | | 14206 | -2.8 | | |
| United States (=) | 320419 | -3.9 | 8388 | -7.3 | Winter | 58210 | 2.6 | 85696 |
| | | | | | | | | -4.7 |
| Uzbekistan (=) | 423 | 9.2 | 401 | 11.4 | 6189 | -1.3 | | |
| Vietnam (=) | 5389 | 3.6 | 46914 | 6.6 | | | 138 | - |
| | | | Winter /Spring | 21111 | 7.7 | | | 13.6 |

| | Maize | | Rice | | Wheat | | Soybean | | |
|------------------|--------|------|-------------------|--------|-------|--------|---------|--------|------|
| | 2015 | Δ% | 2015 | Δ% | 2015 | Δ% | 2015 | Δ% | |
| | | | Summer /Autumn | 25803 | 5.8 | | | | |
| Sub total | 838491 | -1.8 | | 676378 | 1.0 | 614372 | -1.6 | 266336 | -1.7 |
| Other countries | 109123 | 2.4 | | 73838 | 1.5 | 97920 | 1.7 | 19543 | 7.9 |
| Total | 947614 | -1.3 | | 750216 | 1.0 | 712292 | -1.1 | 285879 | -1.1 |

Note: Figures in orange are estimates or a revision of the estimates in CropWatch 2015 February bulletin. Figures in blue are estimates based on actual NDVI up to late April (some crops already harvested) or a combination of actual and average NDVI data from May to December for crops currently in the field and to be harvested up to the end of the growing period. Figures in red color are forecast value purely based on average NDVI data from planting to harvest. Figures in italics are forecast based on FAOSTAT data using a linear trend. For China, a more complex approach combining agrometeorology and remote sensing is used. Other figures are either estimates based on a combination of actual and average NDVI data from May to December, or on the average of trend value and remote sensing estimates. The sign after the country name (+, =, -, or a combination) is a subjective estimation (SE) of the quality of the growing season based on the country analyses in Chapter 3. "Other countries" is the sum of 2015 projected 2009-2013 trends from 134 countries from FAOSTAT, with negative projected values set to 0. Whenever the remote sensing-based estimate for the 30 countries above markedly contradicted the SE, the average of the FAOSTAT-based trend and the NDVI remote sensing estimate was adopted.

5.2 Disaster events

Introduction—A decade of disasters

According to a recent report by the UN Food and Agriculture Organization (FAO), natural disasters over the decade ending in 2013 affected close to two billion people and caused around 500 billion U.S. dollars in damage. Because an exact breakdown of impacts between different economic sectors is usually very imprecise (if available at all), it is hard to estimate agricultural losses specifically. These losses would include direct losses of production, as well as long-term effects on infrastructure, perennial crops, and land and animal stocks, which all can only be recovered and rebuilt over several years, if not more. In general, however, agricultural losses are the largest in places where agriculture contributes the most to the GDP, and the FAO report estimates that, in developing countries and for medium and large scale disasters, about 22 percent of the losses occur in agriculture. Among all disasters, floods are among the most frequently occurring (about 60 percent of disasters), followed by storms and droughts. Losses due to either excess water or from water shortage are about comparable in economic terms.

Overview of the current reporting period

The current reporting period is typical in that water-related disasters, such as floods and landslides, dominate the list of reports from various sources, in particular for disasters in Latin America, the Caribbean (for example Peru and Haiti), Central Asia (Kazakhstan), and southern Africa (also reported in the recent February 2015 CropWatch bulletin).

The recent period was further characterized by an unusually high frequency of volcanic eruptions and earthquakes, in Latin America and Asia, although geophysicists insist the events are not connected. Of particular relevance was the 7.8 magnitude earthquake that struck the Gorkha area northwest of Kathmandu (Nepal) on April 25, causing extensive suffering and damage involving an estimated 8,000 deaths, 16,000 injured, and around 600,000 houses damaged, of which about half completely destroyed.

Hailstorms, heavy rains, and floods

Although disasters in different parts of the world are difficult to compare, sources seem to indicate that the most serious floods affected Peru, Argentina, and Bolivia, Kazakhstan, Haiti, and southern Africa. Several floods were also reported for Asia.

Peru, Argentina, and Bolivia. In Peru, persistent rain started in September 2014 and by February this year had affected more than 30,000 people in several districts (Arequipa, Loreto, Cusco, Amazonas, and San Martin); 2,000 people were homeless as a result of the rains. By the end of March, as much as 115,000 people had been affected, with damages reported for 27,000 homes. The rains also caused 27 deaths and displaced many people in the Pando province of Bolivia (bordering Brazil) where the river waters rose to 14 meters above their normal level (figure 5.1). In

Figure 5.1. Flood situation in South America on February 20, 2015



Source: ReliefWeb
(http://reliefweb.int/sites/reliefweb.int/files/resources/ECDM_20150220_SouthAmerica_Floods.pdf); Based on a map prepared by EC/JRC for OCHA.

Argentina, floods affected the province of Cordoba in February and again at the beginning of March when close to 4,500 people had to be relocated from Cordoba, Santa Fe, San Luis, Catamarca, and Santiago del Estero. Other floods from South America include one on April 4 in northern Paraguay. At the end of March, Chile recorded the heaviest rain in 80 years in the usually very dry Atacama desert region.

Kazakhstan. According to ReliefWeb, floods repeatedly occurred in Kazakhstan in the Karaganda Oblast between March 23 and April 16, affecting about 15,000 people in 35 villages. The floods were caused by high temperatures and rapid snow-melt. A state of emergency had to be declared for eastern and northern regions of Akmola, Karaganda, and Pavlodar. The floods destroyed homes, roads, and bridges, and disrupted electricity and water supplies.

Haiti. In Haiti, abundant precipitation on April 4-5 2015 affected almost 9,000 families, mostly in the West department. Six people died in the capital, and close to 9,000 houses were flooded. Unregulated construction in high risk areas and insufficient infrastructure maintenance are considered to be the main causes of the disaster.

Southern Africa. In southern Africa, floods killed 64 people, including many children, in the middle of March near Lobito in Angola, as well as 50 people in the central Tanzanian region of Shinyanga at the beginning of the month. Floods in Shinyanga also destroyed infrastructure and thereby hindering relief operations. At the end of February, floods near Antananarivo and the surrounding area (Madagascar) killed 14 people and displaced more than 21,000. These floods followed heavy seasonal rainfall that had started in December 2014 and extended into January in the general area of the Zambezi basin, causing floods that affected close to 500,000 people in Malawi, Mozambique, Madagascar, and Zimbabwe. In Malawi, about 50 percent of the districts suffered significant losses to crops, livestock, and infrastructure, especially in the southern lowlands. As already mentioned, the floods also worsened a cholera outbreak. In Mozambique alone 65,000 hectares of crops were destroyed, putting the food security of half a million people at risk in the coming months. Altogether, the early 2015 south-African floods have, directly and indirectly, affected close to one million people.

Asia. In April, floods were also reported from Vietnam (Lam Dong province in the central highlands), Bihar in India (killing 35 people), Mymensingh and Kishoreganj districts of Bangladesh on April 19 (killing 8 people and leaving hundreds of houses damaged), and China's Sichuan province (claiming 7 lives). Earlier, February witnessed floods in Indian-administered Kashmir (killing at least 17 people) and northern Pakistan.

Disease outbreaks

Floods in various places have also increased the risk of diseases, such as for example floods in January 2015 that created stress situations conducive to the development of cholera in Malawi and Mozambique in February. Cholera also affected Kenya in February, while a plague outbreak occurred in Madagascar and a measles epidemic in the Sudan in March. Recent reports mention no new cases of Ebola virus disease in West Africa, although more time will be needed before the region can be declared Ebola free.

Cyclones

Over the reporting period, no cyclones were reported that created massive damages, although cyclones still affected select areas. In Madagascar, the above-mentioned floods that occurred in February were partly due to the abundant soil moisture resulting from the passage of tropical storm Chedza, which

crossed the island mid-January.⁸ In Australia, on February 20, cyclone Marcia—a category 5 severe tropical cyclone—hit central Queensland, causing about 600 million U.S. dollars in damages.

At the end of March and in early April, the early season typhoon Maysak (or Chedeng as the typhoon is called in the Philippines) was the most powerful pre-April typhoon on record in the Northwestern Pacific Ocean. Maysak reached the north of Luzon in the Philippines after affecting Micronesia where it claimed 12 lives, damaging crops and infrastructure.

Droughts

Significant drought is mostly reported from Pakistan and the western United States, in particular California and Washington State (including the Olympic Peninsula, the east side of the central Cascade Mountains including Yakima and Wenatchee, and the Walla Walla region). California has introduced measures to save water and ration it for some uses. The water shortage is due to a combination of factors, such as reduced rainfall and snowfall this winter in areas including the Sierra Nevada mountains, as well as a tradition of unrestrained ground water use.

In Pakistan, in the Tharparkar district in Sindh region, drought has claimed the lives of at least 40 people in February alone, with more than 500 lives claimed over the last three years. Although Tharparkar is a semi-arid region, multi-annual droughts are unusual for the area.

Cold and snow

Extreme winter weather was reported from the Middle East in January, especially from Lebanon and Syria where it has compounded the problem associated with the civil unrest and the resulting humanitarian crisis. In February, news reports included those about cold weather emergency situations in both the United States (in Tennessee) and Afghanistan, where avalanches in Badakhshan province killed 12 and destroyed houses.

The recent reporting period also brought a—still to be confirmed—new world record of snowfall. In the town of Capracotta in central Italy, one day brought 2560 mm of snow. The previous record for a 24-hour snow fall was from Silver Lake, Colorado in the United States, where 75.8 inches (or 1925 mm) had fallen in 1921.

5.3 Crop production and trends in South America

Introduction

Two of the major world food crops originate in South America: cassava, which has now become pan-tropical, and potatoes, today cultivated worldwide in temperate areas as a summer crop.⁹ Globally, Brazil ranks fourth in terms of cassava production (after Nigeria, Thailand, and Indonesia) with a per capita production of about 40 kg per year, which compares with similar values for cassava production in Colombia, averages of 32 kg per capita for the sub-continent,¹⁰ and average of 14 kg per capita for all cassava producing countries.

⁸ Tropical storm Chedza was also reported on in the previous, February 2015, CropWatch bulletin.

⁹ Several crops originate in South America; American crops include sisal, cassava, yams, maize, opuntia (prickly pear), papaya, ground-nuts, several beans, pineapple, potato, tomato, sweet potato, sunflower, cocoa, vanilla, plus a number of local crops (such as quinoa), some of which some are gaining worldwide popularity.

¹⁰ The sub-continent includes the 15 countries south of Colombia and Venezuela, plus territories of disputed status or administered by countries not part of the region.

While cassava remains an important crop in tropical South America, the continent has lost the supremacy of potato production as only Peru appears in the top twenty of world producers, ranking 17th. Within the region, however, Peru, Bolivia, and Chile, three Andean countries, lead in terms of per capita potato production with respectively 80, 63, and 59 kg per capita per year, while regional and global averages are only 30 kg per capita per year.

In terms of value, meat (especially beef), soybean, and sugarcane dominate South American agricultural production, with values in the range of 40 billion U.S. dollars for beef, and 32 and 27 billion U.S. dollars respectively for soybeans and sugarcane. Rice and maize crops rank as numbers 7 and 8 (after milk, pork, and poultry) in terms of value, with both crops providing values in the range of 6 billion U.S. dollars.

Agricultural statistics

Brazil is the giant of South America by most standards, including area, population, nominal GDP,¹¹ and agricultural production. Table 5.3 summarizes some statistics for the most populated countries in the region. As shown in the table, urbanization rates are high among the seven listed countries, while the prevalence of under-nutrition also remains considerable in some of the countries. Arable land has been mostly stable over the recent years, with a marked decline only in Colombia (-5%). The fraction of surface water used in agriculture varies significantly between equatorial countries that are well endowed with water, such as Brazil and Colombia, and the more temperate and mountainous areas such as Peru and Chile. The daily availability of food reflects the relative importance of the crops. Not shown in the table are meat products (including poultry), which do play an important part in the region's economy.

Table 5.3. Population and agricultural statistics for selected large South American countries

| Country | Pop. (millions) | Under-nutrition (%) | Urbanization rate (%) | Δarable land (%) | Surface water used for agri. (%) | 2011 Daily per capita availability (kcal) | | | | | |
|-----------|-----------------|---------------------|-----------------------|------------------|----------------------------------|---|-------|------|-------------|--------|-------|
| | | | | | | Wheat | Sugar | Rice | Soybean oil | Potato | Maize |
| Brazil | 205 | 15↓ | 85 | +1 | 55 | 385 | 386 | 347 | 328 | n.a. | 208 |
| Colombia | 48 | 13= | 76 | -5 | 39 | 250 | 246 | 285 | 135 | n.a. | 245 |
| Argentina | 43 | 5= | 93 | +2 | 66 | 872 | 404 | 80 | 66 | 66 | 82 |
| Peru | 31 | 11↓ | 78 | +1 | 85 | 342 | 206 | 522 | 74 | 223 | 186 |
| Chile | 18 | 5= | 90 | +1 | 70 | 873 | 440 | n.a. | 115 | 133 | 203 |
| Ecuador | 16 | 18↓ | 69 | -1 | 92 | 303 | 174 | 419 | 126 | n.a. | n.a. |
| Bolivia | 11 | 24↓ | 68 | +2 | 57 | 392 | 258 | 281 | 67 | n.a. | 286 |

Note: Countries included in the table have a population above 10 million, according to July 2015 projections from Wikipedia. Under-nutrition data is for 2010-2012, arrows (↓, ↑) indicate the change since 1999-2001, while “=” indicates a change smaller than 1 percent. Percentage increases in arable land data are for the period 2007-2012, while surface water data is from 2002. Daily per capita availability of crops is based on 2011 data; n.a. indicates the crop is not among the ten most available crops in that country. Source: All data based on FAOSTAT.

Agricultural export products and crop production trends

Over the recent decades, the region has undergone some spectacular agricultural developments, with some countries developing into major global producers of maize and soybeans, but also sugarcane, coffee, cocoa, and several other commodities such as fruits (bananas, grapes, and nuts), palm oil, and vegetables, with production taking advantage of the large diversity of climates—from temperate to equatorial—occurring in the region. For coffee, globally Brazil is the number one producer, with Colombia and Peru ranked 4 and 6; for cocoa Brazil is number 6, Ecuador 7, Peru 10, and Colombia 11. In addition

¹¹ In 2013 Brazil's nominal GDP was between that of the United Kingdom and Italy; nominal GDP is computed at official exchange rates and does not take into account the cost of living.

to the many food products, hides and wool are also among the main export products of the region. (See table 5.4).

Table 5.4. Agricultural export products of selected large South American countries

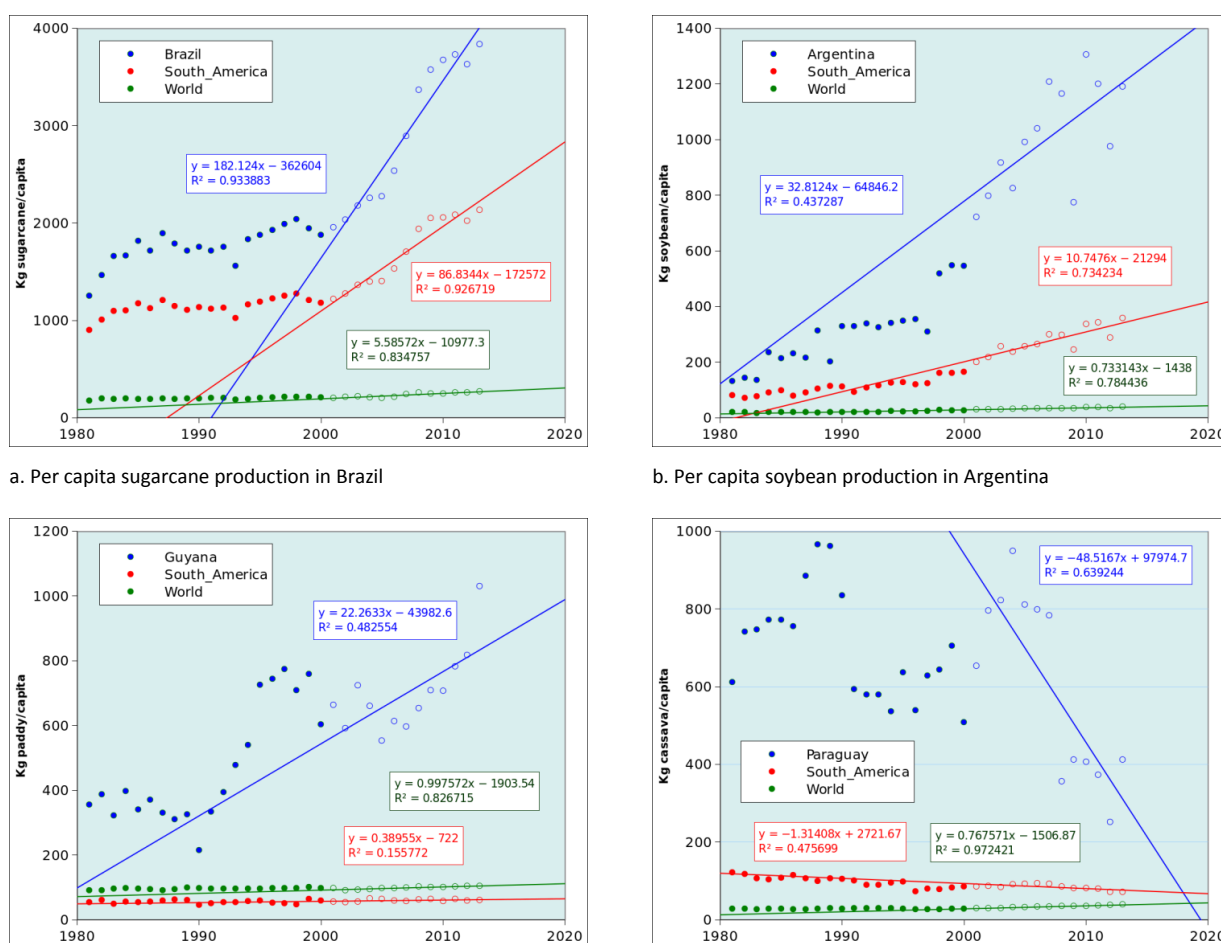
| Country | Destination | Top three of agricultural exports by value |
|-----------|---|--|
| Brazil | China, the Netherlands, and Russia | Soy, sugar, and coffee |
| Colombia | United States, Belgium, and Japan | Coffee, banana, and sugar |
| Argentina | China, Brazil, and the Netherlands | Soybean, maize, and wheat |
| Peru | United States, Germany, and the Netherlands | Coffee, vegetables, and grapes |
| Chile | United States, China, and United Kingdom | Grapes, fruit, and potatoes |
| Ecuador | United States, Russia, and Germany | Bananas, cocoa, and palm oil |
| Bolivia | Venezuela, Colombia, and Peru | Soy, nuts, and oil |

Source: FAOSTAT.

Figure 5.2 illustrates some typical trends of per capita crop production in South American countries, including Brazil, Argentina, Guyana, and Paraguay. In Brazil (figure 5.2(a)), the trend for sugarcane production drastically changed after 2001; today, the annual rate of production increase per person in Brazil (182 kg/person) is more than double the regional average (87 kg/person) and more than 30 times global averages. Inter-annual variability is relatively limited, as most of the crop is irrigated.

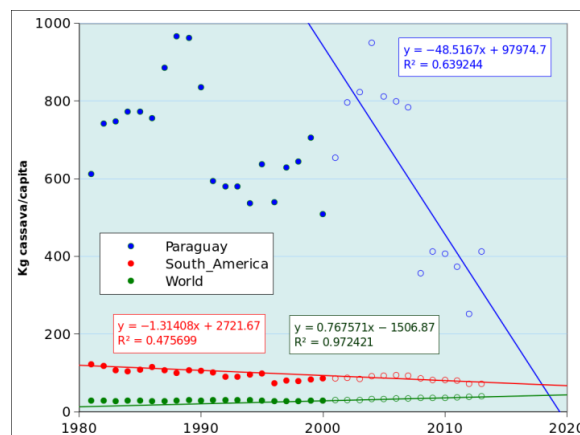
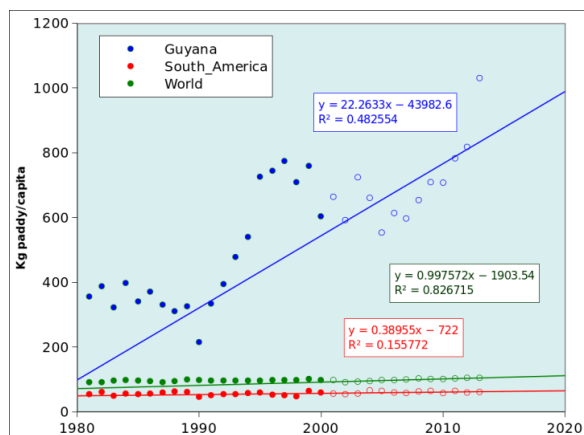
Only a fraction of sugarcane production in Brazil is used for food, as the country, starting in the 1930s, has developed a unique program of running cars on a mix of ethanol (made from sugarcane) and gasoline, currently accounting for 25 percent of the world ethanol fuel consumption. Mixing ratios of 1/1 have been practiced in the past, but the current proportion is 1 ethanol to 3 gasoline.

Figure 5.2. Trends in per capita crop production in four South American countries since 1981



a. Per capita sugarcane production in Brazil

b. Per capita soybean production in Argentina



c. Per capita rice production in Guyana

d. Per capita cassava production in Paraguay

Note: Trend lines refer to the period from 2001 to 2013.

Soybean in Argentina (figure 5.2(b)) is the prototype of the South-American agricultural success story with yields, areas, and production steadily increasing over the last thirty years, although with more variability than sugarcane in Brazil. In fact, Argentina has experienced several years of drought, which also affected maize and especially wheat crops. The drought has occurred despite a trend of increasing rainfall for the region between 1951 and 2012 (Marengo et al., 2014).

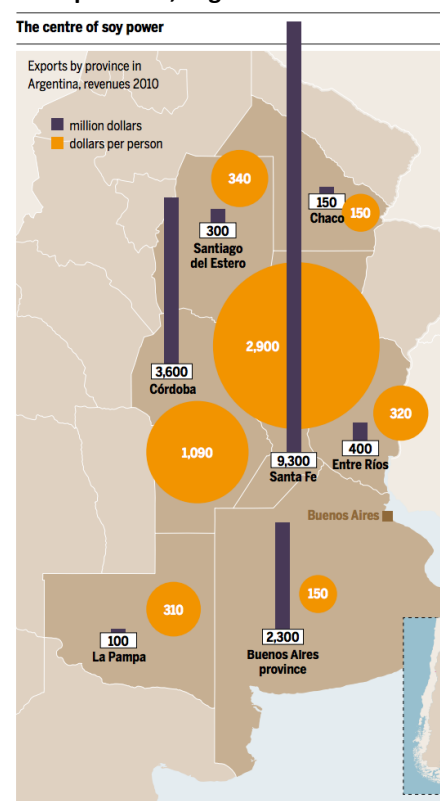
Over the years, a new production model for producing soybeans has become in use in the country. Starting in the 1990s, but particularly from the early 2000s after the severe economic crisis that affected the country, a system called the “pool de siembra” (or “sowing pool”) has been used. Under this model, a pool is funded by several investors who adopt an industrial approach to farming by using large rented areas and shared equipment, eventually dividing benefits. The sowing pool system currently covers about 25 percent of the soybean production in Argentina and typically cultivates 15,000 to 30,000 hectares (and up to 100,000 hectares) per pool. The system relies heavily on advanced mechanization, low or no tillage, and pesticides (glyphosate), and it has been criticized as unfairly competing with more traditional small crop and livestock producers; adversely affecting the soil, the environment, and human health; and contributing to increased social tensions. The model has started expanding into neighboring countries, where it competes with other crops, for instance cassava in Paraguay, resulting in spectacular drops in production (figure 5.2(d)). Figure 5.3 presents an overview of sowing pools in Buenos Aires province in Argentina.

Figure 5.2(c) illustrates that South America also has seen some interesting development of crops not immediately associated with the continent, such as rice in Guyana. Other examples are sorghum in Brazil, potatoes in Colombia, paddy in Paraguay, and barley in Argentina; in Argentina, per capita barley production increased about tenfold over the last two decades.

Current developments in perspective

Over the recent decades South American agriculture has undergone spectacular changes, especially an explosion in the production and exports of maize and soy beans. The changes have been driven mostly by increasing demand for animal feeds and the development of Asian economies, which have become major importers of the two commodities. As mentioned in the previous CropWatch bulletin, agriculturally less developed regions in the world, including Africa, are currently trying to build on the South-American and Thai experience and have started implementing plans that aim to repeat the success of the Brazilian Cerrado and northeast Thailand. Due to worldwide urbanization and the fast development of emerging economies, there is no sign of abating demand, which means a lot of potential for further agricultural development in South America and Africa remains. However, more attention should be paid to the

Figure 5.3. Sowing pools in Buenos Aires province, Argentina



Source: HBF 2014

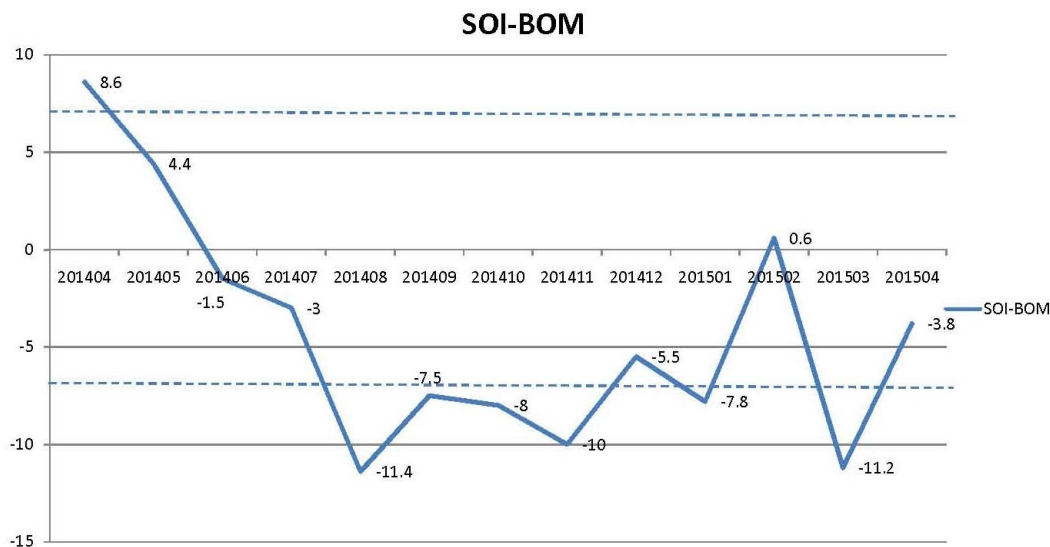
sustainability of new developments, as there are growing signs that the eventual costs of these developments in terms of adverse impacts on the environment and human health may be very high.

5.4 El Niño

El Niño reports have turned into an “alert status” during this monitoring period. Figure 5.4 illustrates the behavior of the Southern Oscillation Index (SOI) of the Australian Bureau of Meteorology (BOM) from April 2014 to April 2015. Sustained negative values of SOI below -7 indicate a likely El Niño event, while sustained positive values above +7 are typical of La Niña. Values within the range (-7 to +7) indicate neutral conditions. As shown in the figure, the SOI dropped rapidly from +8.6 to -11.4 between April 2014 and August 2014, after which it maintained a low value of around -7.0 with only a positive value of 0.6 in February 2015. In April 2015, the index was -3.8. Considering the consistently low value of the SOI, high sea surface temperature over El Niño thresholds, and weaker trade winds than average, the status of the ENSO Tracker at the BOM is raised to “Alert” as of April 2015, and it is foreseen that a full-fledged and real El Niño is developing.

Several extreme weather events that happened in the world recently are consistent with El Niño. Paraguay and Argentina suffered severe floods caused by sustained heavy rainfall in June 2014, while Brazil in 2014 has experienced its most severe drought since 1930. In addition, the middle and eastern parts of the United States have suffered 6 large snow storms over the recent winter, and Southern China is now encountering sustained heavy rainfall. CropWatch will keep a close look at El Niño in the coming months.

Figure 5.4. Monthly SOI time series from January 2014 to January 2015



Source: Australian Bureau of Meteorology (<http://www.bom.gov.au/climate/glossary/soi.shtml>).

Annex A. Agroclimatic indicators and BIOMSS

Tables in this Annex provide additional information about the agroclimatic indicators—RAIN, TEMP, and RADPAR—and BIOMSS for the Monitoring and Reporting Units (MRU) (table A.1), thirty-one main producing and exporting countries (A.2), regions or provinces within large countries—Argentina, Australia, Brazil, Canada, India, Kazakhstan, Russia, and the United States (tables A.3 through A.10), and China (table A.11). All tables illustrate current values for the indicators along with the departure from average (fourteen-year average for RAIN, TEMP, and RADPAR and five-year average for BIOMSS) in percentage or degrees Celsius.

Table A.1. January-April 2015 agroclimatic indicators and biomass by global Monitoring and Reporting Unit

| | 65 Global MRUs | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|----|------------------------------------|--------------|---------------|--------------|----------------|------------------------------|---------------|-------------------------------|--------------|
| | | Current (mm) | 14YA dep. (%) | Current (°C) | 14YA dep. (°C) | Current (MJ/m ²) | 14YA dep. (%) | Current (gDM/m ²) | 5YA dep. (%) |
| 1 | Equatorial central Africa | 458 | -13 | 26.4 | 1.1 | 1216 | 8 | 1425 | -5 |
| 2 | East African highlands | 164 | -29 | 21.2 | 0.6 | 1344 | 6 | 567 | -24 |
| 3 | Gulf of Guinea | 175 | -8 | 29.1 | 0.6 | 1231 | 1 | 568 | -13 |
| 4 | Horn of Africa | 268 | -27 | 25.4 | 0.9 | 1317 | 4 | 853 | -17 |
| 5 | Madagascar (main) | 1110 | 11 | 25.3 | 0.7 | 1044 | -4 | 1926 | 0 |
| 6 | Southwest Madagascar | 608 | 17 | 25.8 | 0.0 | 1171 | -3 | 1374 | 7 |
| 7 | North Africa-Mediterranean | 138 | -15 | 11.8 | -0.2 | 960 | -1 | 453 | -22 |
| 8 | Sahel | 17 | -29 | 30.1 | 0.7 | 1372 | 0 | 52 | -35 |
| 9 | Southern Africa | 472 | -7 | 25.1 | 1.1 | 1226 | 5 | 1227 | -9 |
| 10 | Western Cape (South Africa) | 64 | -43 | 19.6 | 1.1 | 1310 | 2 | 232 | -43 |
| 11 | British Columbia to Colorado | 298 | 54 | -1.0 | 2.2 | 762 | -3 | 574 | 32 |
| 12 | Northern Great Plains | 224 | 37 | 0.4 | 0.7 | 785 | -1 | 677 | 32 |
| 13 | Corn Belt | 459 | 38 | -1.9 | -2.7 | 731 | 1 | 625 | -12 |
| 14 | Cotton Belt to Mexican Nordeste | 427 | 17 | 11.2 | -0.8 | 811 | -10 | 1110 | 14 |
| 15 | Sub-boreal America | 147 | 18 | -8.8 | -0.6 | 599 | 0 | 379 | 7 |
| 16 | West Coast (North America) | 170 | -40 | 9.3 | 2.5 | 846 | 4 | 504 | -26 |
| 17 | Sierra Madre | 155 | 139 | 16.0 | 0.5 | 1167 | -8 | 577 | 140 |
| 18 | SW U.S. and N. Mexican highlands | 93 | 24 | 10.3 | 1.7 | 1022 | -5 | 372 | 26 |
| 19 | Northern South and Central America | 220 | -10 | 26.9 | 0.8 | 1097 | 1 | 632 | -11 |
| 20 | Caribbean | 143 | -29 | 25.2 | 1.1 | 1113 | 2 | 493 | -25 |
| 21 | Central-northern Andes | 634 | 0 | 17.7 | 1.1 | 1055 | 4 | 1335 | -2 |
| 22 | Nordeste (Brazil) | 385 | -17 | 28.9 | 2.7 | 1253 | 3 | 1157 | 8 |
| 23 | Central eastern Brazil | 747 | -2 | 26.9 | 1.3 | 1169 | 6 | 1884 | 4 |
| 24 | Amazon | 1015 | -7 | 27.6 | 0.7 | 999 | 5 | 2162 | -4 |
| 25 | Central-north Argentina | 697 | 55 | 25.7 | 1.1 | 1073 | -1 | 1755 | 33 |
| 26 | Pampas | 617 | 10 | 24.0 | 1.2 | 1161 | 2 | 1615 | 4 |
| 27 | Western Patagonia | 66 | -55 | 14.9 | 0.6 | 1200 | 3 | 268 | -39 |
| 28 | Semi-arid Southern Cone | 197 | 30 | 19.2 | 0.8 | 1156 | -3 | 592 | 21 |
| 29 | Caucasus | 286 | 6 | 3.2 | 0.0 | 782 | -4 | 748 | -2 |
| 30 | Pamir area | 292 | 26 | 3.9 | 0.4 | 916 | -6 | 682 | 4 |
| 31 | Western Asia | 159 | 1 | 7.9 | 0.9 | 895 | -3 | 532 | -4 |
| 32 | Gansu-Xinjiang (China) | 82 | 86 | -0.9 | 1.1 | 873 | -3 | 326 | 79 |
| 33 | Hainan (China) | 78 | -42 | 22.7 | 1.8 | 1023 | 12 | 257 | -52 |
| 34 | Huanghuaihai (China) | 106 | 21 | 7.3 | 0.9 | 883 | -2 | 440 | 31 |
| 35 | Inner Mongolia (China) | 76 | 91 | -2.7 | 1.4 | 866 | 0 | 325 | 62 |
| 36 | Loess region (China) | 98 | 76 | 3.8 | 0.8 | 895 | -4 | 401 | 54 |

| 65 Global MRUs | | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|----------------|---------------------------------|---------|-------------|---------|--------------|----------------------|-------------|---------------------------|-------------|
| | | Current | 14YA | Current | 14YA | Current | 14YA | Current | 5YA |
| | | (mm) | dep. (%) | (°C) | dep. (°C) | (MJ/m ²) | dep. (%) | (gDM/ m ²) | dep. (%) |
| 37 | Lower Yangtze (China) | 367 | -16 | 11.7 | 0.8 | 754 | -3 | 1071 | -1 |
| 38 | Northeast China | 71 | -2 | -5.0 | 1.6 | 776 | -1 | 323 | 21 |
| 39 | Qinghai-Tibet (China) | 151 | -7 | 2.3 | 0.5 | 1037 | -3 | 399 | 1 |
| 40 | Southern China | 250 | 9 | 16.8 | 1.0 | 883 | 3 | 812 | 22 |
| 41 | Southwest China | 237 | 59 | 10.9 | 1.3 | 752 | -5 | 755 | 63 |
| 42 | Taiwan (China) | 113 | -45 | 17.5 | 0.6 | 939 | 3 | 446 | -36 |
| 43 | East Asia | 113 | -38 | -1.0 | 1.1 | 763 | -4 | 435 | -4 |
| 44 | Southern Himalayas | 198 | 23 | 19.4 | 0.3 | 1043 | -4 | 665 | 40 |
| 45 | Southern Asia | 135 | 35 | 26.0 | 0.5 | 1201 | -3 | 457 | 45 |
| 46 | Southern Japan and Korea | 289 | -27 | 7.3 | 0.5 | 770 | -6 | 912 | -11 |
| 47 | Southern Mongolia | 32 | 33 | -4.9 | 2.7 | 830 | -2 | 165 | 32 |
| 48 | Punjab to Gujarat | 83 | 63 | 23.0 | 0.5 | 1132 | -5 | 335 | 60 |
| 49 | Maritime Southeast Asia | 983 | -10 | 26.2 | 0.8 | 1017 | 2 | 2026 | -6 |
| 50 | Mainland Southeast Asia | 143 | -10 | 27.1 | 1.0 | 1202 | 4 | 526 | -5 |
| 51 | Eastern Siberia | 158 | 26 | -8.2 | 2.5 | 575 | -6 | 353 | 21 |
| 52 | Eastern Central Asia | 50 | 3 | -11.8 | 1.8 | 683 | -3 | 223 | 19 |
| 53 | Northern Australia | 664 | -21 | 27.3 | 0.9 | 1133 | 4 | 1568 | -12 |
| 54 | Queensland to Victoria | 240 | 8 | 21.2 | 0.7 | 1206 | -2 | 848 | -3 |
| 55 | Nullarbor to Darling | 128 | 49 | 21.9 | 1.2 | 1283 | -2 | 557 | 63 |
| 56 | New Zealand | 133 | -52 | 15.5 | 1.2 | 1050 | 2 | 565 | -38 |
| 57 | Boreal Eurasia | 274 | 52 | -2.8 | 2.5 | 398 | -7 | 518 | 23 |
| 58 | Ukraine to Ural mountains | 176 | 9 | -0.3 | 1.7 | 485 | -4 | 655 | 15 |
| 59 | Mediterranean Europe and Turkey | 190 | -29 | 7.8 | 0.0 | 779 | -2 | 641 | -28 |
| 60 | W. Europe (non Mediterranean) | 190 | -19 | 5.5 | 1.0 | 572 | -1 | 743 | -6 |
| 61 | Boreal America | 251 | 17 | -7.2 | 1.6 | 442 | -9 | 369 | 20 |
| 62 | Ural to Altai mountains | 136 | 26 | -6.2 | 1.4 | 594 | -2 | 452 | 19 |
| 63 | Australian desert | 141 | 49 | 22.9 | 0.4 | 1293 | -2 | 595 | 22 |
| 64 | Sahara to Afghan deserts | 67 | -15 | 18.5 | 1.2 | 1156 | -1 | 232 | -17 |
| 65 | Sub-arctic America | 54 | 86 | -21.4 | 3.5 | 177 | 0 | 56 | 173 |

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 five-year (5YA) or fourteen-year average (14YA) for the same period between January and April.

Table A.2. January-April 2015 agroclimatic indicators and biomass by country

| 31 Countries | | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|--------------|------------|---------|------------------|---------|-------------------|----------------------|------------------|-----------------------|------------------|
| | | Current | 14YA | Current | 14YA | Current | 14YA | Current | 5YA |
| | | (mm) | Departure (%) | (°C) | Departure (°C) | (MJ/m ²) | Departure (%) | (gDM/m ²) | Departure (%) |
| [ARG] | Argentina | 584 | 21 | 23.4 | 1.1 | 1150 | 0 | 1519 | 13 |
| [AUS] | Australia | 255 | -2 | 21.9 | 0.8 | 1213 | -1 | 812 | -1 |
| [BGD] | Bangladesh | 275 | 36 | 23.6 | 0.6 | 1060 | -4 | 824 | 54 |
| [BRA] | Brazil | 803 | -6 | 26.8 | 1.2 | 1127 | 5 | 1883 | 1 |
| [CAN] | Canada | 257 | 38 | -7.0 | -0.5 | 632 | 0 | 423 | 8 |
| [CHN] | China | 217 | 5 | 8.2 | 1.2 | 813 | -2 | 587 | 25 |
| [DEU] | Germany | 212 | -1 | 4.7 | 0.4 | 533 | 3 | 878 | 16 |
| [EGY] | Egypt | 50 | -17 | 15.7 | -0.6 | 1040 | -1 | 197 | 9 |
| [ETH] | Ethiopia | 141 | -25 | 21.9 | 0.4 | 1338 | 6 | 507 | -22 |
| [FRA] | France | 137 | -46 | 8.1 | 1.8 | 608 | -2 | 571 | -27 |
| [GBR] | U. Kingdom | 329 | 21 | 6.5 | 1.0 | 477 | 3 | 945 | 2 |
| [IDN] | Indonesia | 1106 | -7 | 26.4 | 0.7 | 1001 | 2 | 2232 | -2 |
| [IND] | India | 133 | 32 | 23.6 | 0.3 | 1151 | -4 | 457 | 52 |

| 31 Countries | | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|--------------|--------------|--------------|--------------------|--------------|---------------------|------------------------------|--------------------|-------------------------------|-------------------|
| | | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| [IRN] | Iran | 188 | -6 | 8.5 | 1.0 | 985 | -2 | 581 | -10 |
| [KAZ] | Kazakhstan | 135 | 23 | -5.5 | 0.4 | 654 | -2 | 473 | 17 |
| [KHM] | Cambodia | 144 | -18 | 29.0 | 1.2 | 1234 | 6 | 530 | -16 |
| [MEX] | Mexico | 173 | 114 | 19.7 | 0.2 | 1098 | -8 | 571 | 101 |
| [MMR] | Myanmar | 99 | 8 | 24.7 | 1.1 | 1176 | -1 | 416 | 24 |
| [NGA] | Nigeria | 123 | -12 | 29.4 | 0.7 | 1307 | 1 | 317 | -24 |
| [PAK] | Pakistan | 188 | 16 | 15.5 | 0.3 | 1022 | -5 | 435 | -5 |
| [PHL] | Philippines | 334 | -41 | 26.0 | 0.6 | 1121 | 6 | 834 | -36 |
| [POL] | Poland | 183 | 7 | 3.9 | 1.4 | 494 | -1 | 818 | 14 |
| [ROU] | Romania | 194 | -2 | 3.6 | 0.6 | 618 | -3 | 792 | 5 |
| [RUS] | Russia | 155 | 12 | -4.0 | 1.6 | 531 | -3 | 494 | 15 |
| [THA] | Thailand | 173 | -11 | 27.1 | 0.7 | 1203 | 5 | 639 | -1 |
| [TUR] | Turkey | 326 | 10 | 4.2 | 0.1 | 806 | -5 | 828 | -6 |
| [UKR] | Ukraine | 169 | -3 | 2.8 | 1.4 | 542 | -3 | 774 | 15 |
| [USA] | U.S.A. | 356 | 24 | 4.8 | -0.4 | 800 | -4 | 747 | 10 |
| [UZB] | Uzbekistan | 215 | 11 | 6.6 | 0.3 | 785 | -5 | 727 | 18 |
| [VNM] | Vietnam | 156 | -7 | 23.0 | 1.1 | 999 | 6 | 556 | -6 |
| [ZAF] | South Africa | 304 | -6 | 21.1 | 1.3 | 1266 | 5 | 999 | -6 |

See note table A.1.

Table A.3. Argentina, January-April 2015 2014 agroclimatic indicators and biomass (by province)

| | | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|---------------------|--|--------------|--------------------|--------------|---------------------|------------------------------|--------------------|-------------------------------|-------------------|
| | | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| Buenos Aires | | 449 | 3 | 21.1 | 0.9 | 1200 | 2 | 1372 | 5 |
| Chaco | | 742 | 36 | 26.5 | 1.2 | 1155 | 0 | 1799 | 19 |
| Cordoba | | 617 | 39 | 22.8 | 1.2 | 1138 | -1 | 1750 | 27 |
| Corrientes | | 696 | 13 | 25.6 | 0.9 | 1169 | 1 | 1657 | 2 |
| Entre Rios | | 541 | -8 | 23.9 | 1.1 | 1203 | 3 | 1452 | -4 |
| La Pampa | | 491 | 33 | 22.1 | 1.4 | 1181 | -3 | 1439 | 20 |
| Misiones | | 869 | 26 | 25.1 | 1.0 | 1136 | 2 | 1772 | -3 |
| Santiago del Estero | | 630 | 41 | 25.8 | 1.3 | 1081 | -1 | 1684 | 25 |
| San Luis | | 531 | 38 | 22.1 | 1.4 | 1138 | -3 | 1621 | 31 |
| Salta | | 866 | 72 | 24.3 | 0.8 | 1019 | 0 | 1820 | 41 |
| Santa Fe | | 623 | 15 | 24.5 | 1.4 | 1167 | 0 | 1713 | 11 |
| Tucuman | | -1 | 0 | -1.0 | 0.0 | -1 | 0 | -1 | 0 |

See note table A.1.

Table A.4. Australia, January-April 2015 agroclimatic indicators and biomass (by state)

| | | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|-----------------|--|--------------|--------------------|--------------|---------------------|------------------------------|--------------------|-------------------------------|-------------------|
| | | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| New South Wales | | 273 | 19 | 21.8 | 0.8 | 1216 | -2 | 943 | 4 |
| South Australia | | 128 | 33 | 19.5 | 0.3 | 1212 | -4 | 567 | 5 |
| Victoria | | 211 | 22 | 18.4 | 0.4 | 1159 | -4 | 829 | 5 |
| W. Australia | | 179 | 48 | 22.4 | 1.2 | 1281 | -2 | 599 | 55 |

See note table A.1.

Table A.5. Brazil, January-April 2015 agroclimatic indicators and biomass (by state)

| | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|--------------------|--------------|--------------------|--------------|---------------------|------------------------------|--------------------|-------------------------------|-------------------|
| | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| Ceara | 547 | -19 | 28.4 | 1.5 | 1179 | 3 | 1550 | 7 |
| Goias | 780 | -7 | 26.1 | 1.0 | 1217 | 8 | 2100 | 5 |
| Mato Grosso Do Sul | 702 | 3 | 27.5 | 0.9 | 1204 | 6 | 1951 | 3 |
| Mato Grosso | 1016 | -1 | 27.5 | 0.9 | 1114 | 7 | 2396 | 4 |
| Minas Gerais | 586 | -9 | 25.8 | 2.0 | 1231 | 7 | 1548 | 5 |
| Parana | 699 | 4 | 25.0 | 1.7 | 1137 | 6 | 1970 | 5 |
| Rio Grande Do Sul | 698 | 14 | 23.8 | 0.9 | 1130 | 1 | 1679 | -2 |
| Santa Catarina | 777 | 10 | 22.9 | 1.6 | 1076 | 2 | 1923 | -2 |
| Sao Paulo | 715 | -5 | 25.7 | 1.7 | 1173 | 7 | 1984 | 2 |

See note table A.1.

Table A.6. Canada, January-April 2015 agroclimatic indicators and biomass (by province)

| | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|--------------|--------------|--------------------|--------------|---------------------|------------------------------|--------------------|-------------------------------|-------------------|
| | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| Alberta | 131 | 23 | -4.0 | 2.1 | 596 | -3 | 518 | 29 |
| Manitoba | 103 | 1 | -8.7 | -0.2 | 661 | -2 | 397 | 11 |
| Saskatchewan | 106 | 12 | -7.1 | 1.0 | 644 | -2 | 442 | 20 |

See note table A.1.

Table A.7. India, January-April 2015 agroclimatic indicators and biomass (by state)

| | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|------------------------|--------------|--------------------|--------------|---------------------|------------------------------|--------------------|-------------------------------|-------------------|
| | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| Arunachal Pradesh | 422 | -18 | 16.3 | 0.8 | 884 | 0 | 1172 | 6 |
| Andhra Pradesh | 69 | 15 | 27.7 | 0.4 | 1238 | -1 | 289 | 44 |
| Assam | 300 | -18 | 22.4 | 0.8 | 954 | 1 | 997 | 12 |
| Bihar | 106 | 52 | 23.2 | -0.3 | 1089 | -7 | 474 | 68 |
| Chandigarh | -1 | 0 | -1.0 | 0.0 | -1 | 0 | -1 | 0 |
| Chhattisgarh | 82 | 6 | 24.9 | 0.3 | 1177 | -3 | 397 | 17 |
| Daman and Diu | -1 | 0 | -1.0 | 0.0 | -1 | 0 | -1 | 0 |
| Delhi | 130 | 41 | 20.7 | -0.5 | 1061 | -6 | 595 | 34 |
| Dadra and Nagar Haveli | 23 | 422 | 25.7 | 0.4 | 1252 | -3 | 120 | 516 |
| Gujarat | 23 | 340 | 26.4 | 1.1 | 1235 | -4 | 111 | 263 |
| Goa | 6 | -69 | 27.0 | -0.1 | 1298 | -2 | 33 | -37 |
| Himachal Pradesh | 323 | 27 | 4.1 | -0.4 | 1003 | -9 | 662 | 6 |
| Haryana | 159 | 48 | 19.7 | -0.5 | 1050 | -6 | 648 | 43 |
| Jharkhand | 87 | 12 | 23.5 | 0.4 | 1131 | -6 | 401 | 24 |
| Kerala | 342 | 33 | 28.1 | 1.5 | 1244 | -1 | 901 | 20 |
| Karnataka | 102 | 26 | 26.5 | 0.6 | 1281 | -1 | 350 | 27 |
| Meghalaya | 446 | 0 | 19.2 | 0.6 | 1015 | -3 | 1200 | 51 |
| Maharashtra | 69 | 100 | 25.9 | 0.0 | 1231 | -3 | 331 | 98 |
| Manipur | 363 | 14 | 17.8 | 0.4 | 1043 | -3 | 1061 | 39 |
| Madhya Pradesh | 117 | 142 | 23.5 | -0.4 | 1147 | -6 | 513 | 139 |
| Mizoram | 317 | 29 | 20.7 | 0.3 | 1098 | -3 | 896 | 40 |

| | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|---------------|--------------|--------------------|--------------|---------------------|------------------------------|--------------------|-------------------------------|-------------------|
| | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| Nagaland | 268 | -11 | 17.7 | 0.5 | 992 | -1 | 990 | 27 |
| Orissa | 100 | 14 | 25.6 | 0.6 | 1181 | -2 | 410 | 11 |
| Puducherry | 176 | 39 | 27.8 | 0.8 | 1212 | -1 | 469 | 13 |
| Punjab | 166 | 20 | 18.7 | -0.3 | 991 | -7 | 647 | 31 |
| Rajasthan | 55 | 92 | 23.1 | 0.4 | 1148 | -5 | 242 | 84 |
| Sikkim | 335 | 73 | 7.2 | 0.8 | 976 | -9 | 603 | 6 |
| Tamil Nadu | 130 | 11 | 28.5 | 1.3 | 1247 | -2 | 468 | 46 |
| Tripura | 340 | 39 | 22.9 | 0.2 | 1060 | -2 | 835 | 29 |
| Uttarakhand | 299 | 47 | 9.9 | 0.4 | 1024 | -9 | 803 | 29 |
| Uttar Pradesh | 151 | 85 | 21.9 | -0.5 | 1076 | -8 | 670 | 70 |
| West Bengal | 198 | 68 | 24.2 | 0.8 | 1093 | -5 | 706 | 65 |

See note table A.1.

Table A.8. Kazakhstan, January-April 2015 agroclimatic indicators and biomass (by province)

| | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|---------------------------|--------------|--------------------|--------------|---------------------|------------------------------|--------------------|-------------------------------|-------------------|
| | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| Akmolinskaya | 108 | 23 | -8.0 | 0.1 | 613 | -2 | 398 | 10 |
| Karagandinskaya | 126 | 38 | -7.3 | 0.5 | 659 | -5 | 431 | 18 |
| Kustanayskaya | 100 | -1 | -7.3 | 0.1 | 605 | 1 | 427 | 8 |
| Pavlodarskaya | 79 | 10 | -6.9 | 1.4 | 603 | -4 | 398 | 25 |
| Severo kazachstanskaya | 102 | 7 | -7.3 | 1.0 | 570 | 1 | 415 | 11 |
| Vostochno kazachstanskaya | 149 | 20 | -8.1 | 0.7 | 699 | -4 | 386 | 17 |
| Zapadno kazachstanskaya | 113 | -7 | -4.3 | -0.8 | 612 | 0 | 512 | -1 |

See note table A.1.

Table A.9. Russia, January-April 2015 agroclimatic indicators and biomass (by oblast)

| | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|-----------------------|--------------|--------------------|--------------|---------------------|------------------------------|--------------------|-------------------------------|-------------------|
| | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| Bashkortostan Rep. | 156 | 3 | -5.7 | 1.0 | 526 | 0 | 443 | 7 |
| Chelyabinskaya Oblast | 92 | -16 | -5.4 | 1.9 | 547 | 2 | 440 | 14 |
| Gorodovikovsk | -1 | 0 | -1.0 | 0.0 | -1 | 0 | -1 | 0 |
| Krasnodarskiy Kray | 194 | -3 | -1.0 | 2.0 | 567 | -3 | 601 | 15 |
| Kurganskaya Oblast | 91 | -6 | -5.9 | 1.8 | 537 | 0 | 450 | 14 |
| Kirovskaya Oblast | 200 | 26 | -4.1 | 1.7 | 439 | 1 | 494 | 14 |
| Kurskaya Oblast | 168 | 3 | 0.6 | 1.6 | 514 | -5 | 724 | 15 |
| Lipetskaya Oblast | 167 | 4 | -0.4 | 1.7 | 506 | -6 | 669 | 17 |
| Mordoviya Rep. | 179 | 18 | -2.6 | 1.2 | 482 | -3 | 555 | 10 |
| Novosibirskaya Oblast | 144 | 46 | -7.3 | 2.4 | 517 | -6 | 427 | 22 |
| Nizhegorodskaya O. | 194 | 27 | -2.1 | 2.0 | 450 | -2 | 577 | 18 |
| Orenburgskaya Oblast | 144 | 2 | -6.0 | -0.2 | 574 | -2 | 456 | 2 |
| Omskaya Oblast | 129 | 29 | -7.1 | 2.3 | 531 | -1 | 429 | 17 |
| Permskaya Oblast | 173 | 12 | -5.6 | 1.6 | 443 | 0 | 451 | 13 |
| Penzenskaya Oblast | 154 | -1 | -3.1 | 0.7 | 516 | -3 | 548 | 7 |
| Rostovskaya Oblast | 179 | -15 | 2.0 | 0.4 | 583 | -1 | 709 | -2 |

| | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|----------------------|-----------------|--------------------------|-----------------|---------------------------|---------------------------------|--------------------------|----------------------------------|-------------------------|
| | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| Ryazanskaya Oblast | 175 | 8 | -1.0 | 1.9 | 460 | -7 | 634 | 18 |
| Stavropolskiy Kray | 182 | -7 | 3.6 | -0.2 | 621 | -2 | 763 | 2 |
| Sverdlovskaya Oblast | 109 | -3 | -5.2 | 2.3 | 479 | 2 | 470 | 17 |
| Samarskaya Oblast | 148 | 3 | -4.7 | 0.1 | 556 | 2 | 498 | 3 |
| Saratovskaya Oblast | 126 | -13 | -3.0 | 0.1 | 571 | -2 | 568 | 4 |
| Tambovskaya Oblast | 184 | 17 | -1.5 | 1.1 | 507 | -7 | 617 | 10 |
| Tyumenskaya Oblast | 105 | 4 | -6.6 | 2.1 | 516 | 1 | 442 | 15 |
| Tatarstan Rep. | 142 | -1 | -4.3 | 1.0 | 508 | 0 | 496 | 8 |
| Ulyanovskaya Oblast | 132 | -9 | -4.1 | 0.5 | 524 | -1 | 508 | 6 |
| Udmurtiya Rep. | 166 | 10 | -4.7 | 1.5 | 464 | 2 | 476 | 13 |
| Volgogradskaya O. | 163 | 5 | -0.5 | 0.3 | 579 | -3 | 667 | 4 |
| Voronezhskaya Oblast | 179 | 13 | 0.0 | 1.2 | 530 | -5 | 702 | 13 |

See note table A.1.

Table A.10. United States, January-April 2015 agroclimatic indicators and biomass (by state)

| | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|--------------|-----------------|--------------------------|-----------------|---------------------------|---------------------------------|--------------------------|----------------------------------|-------------------------|
| | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| Arkansas | 677 | 47 | 8.5 | -1.5 | 762 | -10 | 1302 | 3 |
| California | 120 | -48 | 10.3 | 2.7 | 960 | 4 | 404 | -33 |
| Idaho | 249 | 52 | 1.1 | 2.5 | 805 | 1 | 592 | 12 |
| Indiana | 484 | 30 | 1.3 | -2.7 | 759 | -2 | 825 | -11 |
| Illinois | 417 | 22 | 1.7 | -2.1 | 785 | 0 | 861 | -4 |
| Iowa | 306 | 24 | 0.0 | -0.8 | 815 | 2 | 773 | 8 |
| Kansas | 220 | 14 | 5.4 | 0.2 | 891 | 1 | 735 | 18 |
| Michigan | 412 | 45 | -4.0 | -3.2 | 731 | 4 | 531 | -12 |
| Minnesota | 278 | 66 | -4.1 | -0.2 | 732 | 0 | 572 | 17 |
| Missouri | 455 | 26 | 4.8 | -1.1 | 802 | 0 | 1011 | -2 |
| Montana | 254 | 149 | 0.2 | 2.1 | 748 | -2 | 721 | 70 |
| Nebraska | 231 | 48 | 2.9 | 1.0 | 853 | 0 | 823 | 41 |
| North Dakota | 227 | 129 | -3.7 | 1.0 | 725 | -4 | 582 | 47 |
| Ohio | 510 | 52 | 0.3 | -3.0 | 746 | 0 | 766 | -14 |
| Oklahoma | 360 | 32 | 8.4 | -0.7 | 841 | -6 | 1071 | 35 |
| Oregon | 167 | -35 | 5.7 | 2.1 | 738 | 3 | 616 | -11 |
| South Dakota | 259 | 98 | 0.7 | 1.4 | 792 | -2 | 781 | 52 |
| Texas | 296 | 35 | 12.6 | -0.8 | 856 | -11 | 881 | 52 |
| Washington | 329 | 34 | 5.0 | 2.1 | 650 | 1 | 862 | 32 |
| Wisconsin | 370 | 46 | -3.4 | -1.5 | 750 | 4 | 590 | -1 |

See note table A.1.

Table A.11. China, January-April 2015 agroclimatic indicators and biomass (by province)

| | RAIN | | TEMP | | RADPAR | | BIOMSS | |
|----------------|-----------------|--------------------------|-----------------|---------------------------|---------------------------------|--------------------------|----------------------------------|-------------------------|
| | Current (mm) | 14YA Departure (%) | Current (°C) | 14YA Departure (°C) | Current (MJ/m ²) | 14YA Departure (%) | Current (gDM/m ²) | 5YA Departure (%) |
| Anhui | 309 | -2 | 9.8 | 0.4 | 810 | -4 | 885 | 0 |
| Chongqing | 161 | -14 | 10.8 | 1.8 | 644 | -2 | 612 | 2 |
| Fujian | 258 | -47 | 13.1 | 0.9 | 821 | 3 | 877 | -24 |
| Gansu | 97 | 95 | 2.6 | 0.7 | 910 | -5 | 350 | 61 |
| Guangdong | 197 | -43 | 17.4 | 1.3 | 826 | 6 | 691 | -27 |
| Guangxi | 428 | 51 | 16.4 | 1.5 | 690 | -1 | 1118 | 46 |
| Guizhou | 286 | 53 | 11.6 | 1.5 | 624 | -9 | 925 | 67 |
| Hebei | 74 | 64 | 3.3 | 1.2 | 894 | 0 | 325 | 50 |
| Heilongjiang | 72 | 6 | -6.8 | 1.6 | 742 | -2 | 318 | 31 |
| Henan | 139 | 21 | 8.5 | 0.8 | 863 | -3 | 583 | 38 |
| Hubei | 319 | 14 | 9.7 | 0.9 | 752 | -5 | 926 | 21 |
| Hunan | 388 | -7 | 11.6 | 1.0 | 654 | -8 | 1208 | 14 |
| Jiangsu | 205 | -3 | 8.8 | 0.4 | 837 | -4 | 753 | 4 |
| Jiangxi | 404 | -28 | 12.7 | 0.8 | 749 | -2 | 1181 | -8 |
| Jilin | 77 | 1 | -3.9 | 1.2 | 818 | 1 | 352 | 18 |
| Liaoning | 71 | -12 | 0.1 | 1.5 | 844 | -1 | 341 | 1 |
| Inner Mongolia | 71 | 81 | -4.8 | 1.7 | 825 | 0 | 308 | 66 |
| Ningxia | 43 | 36 | 2.2 | 0.8 | 920 | -5 | 200 | 18 |
| Shaanxi | 140 | 90 | 5.4 | 0.6 | 825 | -5 | 540 | 73 |
| Shandong | 105 | 40 | 6.9 | 1.0 | 891 | -2 | 446 | 40 |
| Shanxi | 79 | 52 | 2.0 | 0.9 | 907 | -2 | 348 | 42 |
| Sichuan | 147 | 43 | 10.1 | 1.2 | 793 | -4 | 571 | 49 |
| Yunnan | 289 | 178 | 13.7 | 0.7 | 1019 | -1 | 818 | 126 |
| Zhejiang | 292 | -36 | 10.5 | 0.8 | 792 | -1 | 950 | -19 |

See note table A.1.

Annex B. 2015 production estimates

Tables B.1 –B.3 present 2015 CropWatch production estimates for Argentina, Brazil and United States.

Table B.1. Argentina, 2015 maize and soybean production, by province (thousand tons)

| | Maize | | Soybean | |
|---------------------|--------------|------------|--------------|-------------|
| | 2015 | Δ% | 2015 | Δ% |
| Buenos Aires | 7141 | 0.3 | 15062 | -1.3 |
| Córdoba | 7052 | 1.3 | 12050 | 0.7 |
| Entre Rios | 1111 | -2.7 | 3278 | -1.6 |
| San Luis | 1113 | 6.1 | | |
| Santa Fe | 4219 | 1.3 | 10471 | 0.1 |
| Santiago Del Estero | 1215 | 1.0 | | |
| Sub total | 21851 | 1.0 | 40861 | -0.4 |
| Others | 3481 | 1.1 | 11369 | -0.5 |
| Argentina | 25332 | 1.0 | 52230 | -0.4 |

Δ% indicates percentage difference with 2014.

Table B.2. Brazil, 2015 maize, rice, and soybean production, by state (thousand tons)

| | Maize | | Rice | | Soybean | |
|--------------------|--------------|-------------|--------------|------------|--------------|------------|
| | 2015 | Δ% | 2015 | Δ% | 2015 | Δ% |
| Goiás | 8511 | 0.8 | | | 9988 | 0.3 |
| Mato Grosso | 19651 | 0.2 | | | 26096 | 0.6 |
| Mato Grosso Do Sul | 7658 | 1.8 | | | 6331 | 0.6 |
| Minas Gerais | 7389 | 0.7 | | | 3629 | -0.1 |
| Paraná | 15022 | 0.0 | | | 17154 | 0.1 |
| Rio Grande Do Sul | 4864 | -0.1 | 8595 | 1.2 | 13608 | 1.1 |
| Santa Catarina | 3038 | -0.6 | 1028 | -0.4 | 1708 | -0.5 |
| São Paulo | 3822 | 1.4 | | | 2172 | -0.4 |
| Sub total | 69954 | 0.5 | 9623 | 1.0 | 80687 | 0.5 |
| Others | 6888 | -23.7 | 2313 | -0.2 | 8800 | 0.8 |
| Brazil | 76843 | -2.3 | 11936 | 0.8 | 89487 | 0.5 |

Δ% indicates percentage difference with 2014.

Table B.3. United States, 2015 wheat production, by state (thousand tons)

| | Wheat | | | | |
|----------------------|--------------|----------|----------------|------|-----|
| | 2015 | Δ% | 2015 | Δ% | |
| Arkansas | 711 | 5 | Nebraska | 1711 | -11 |
| California | 407 | 4 | North Carolina | 1094 | -10 |
| Colorado | 2481 | 2 | North Dakota | 766 | -49 |
| Idaho | 2948 | 11 | Ohio | 1139 | 4 |
| Illinois | 1236 | 1 | Oklahoma | 1498 | 16 |
| Indiana | 711 | 3 | Oregon | 1141 | 3 |
| Kansas | 7825 | 17 | South Dakota | 2030 | -37 |
| Kentucky | 949 | -4 | Tennessee | 870 | 2 |
| Michigan | 1002 | 3 | Texas | 2515 | 37 |
| Missouri | 1229 | 5 | Washington | 3922 | 25 |
| Montana | 5475 | 0 | | | |
| Sub total | 41660 | 3 | | | |
| Other states | 16550 | 3 | | | |
| United States | 58210 | 3 | | | |

Δ% indicates percentage difference with 2014.

Annex C. Quick reference guide to CropWatch indicators, spatial units, and production estimation methodology

The following sections give a brief overview of CropWatch indicators and spatial units, along with a description of the CropWatch production estimation methodology. For more information about CropWatch methodologies, visit CropWatch online at www.cropwatch.com.cn.

CropWatch indicators

The CropWatch indicators are designed to assess the condition of crops and the environment in which they grow and develop; the indicators—RAIN (for rainfall), TEMP (temperature), and RADPAR (photosynthetically active radiation, PAR)—are not identical to the weather variables, but instead are value-added indicators computed only over crop growing areas (thus for example excluding deserts and rangelands) and spatially weighted according to the agricultural production potential, with marginal areas receiving less weight than productive ones. The indicators are expressed using the usual physical units (e.g., mm for rainfall) and were thoroughly tested for their coherence over space and time. CWSU are the CropWatch Spatial Units, including MRUs, MPZ, and countries (including first-level administrative districts in select large countries). For all indicators, high values indicate "good" or "positive."

| INDICATOR | | | |
|---|---|---|--|
| BIOMSS | | | |
| Biomass accumulation potential | | | |
| Crop/ Ground and satellite | grams dry matter/m ² , pixel or CWSU | An estimate of biomass that could potentially be accumulated over the reference period given the prevailing rainfall and temperature conditions. | Biomass is presented as maps by pixels, maps showing average pixels values over CropWatch spatial units (CWSU), or tables giving average values for the CWSU. Values are compared to the average value for the last five years (2010-14), with departures expressed in percentage. |
| CALF | | | |
| Cropped arable land and cropped arable land fraction | | | |
| Crop/ Satellite | [0,1] number, pixel or CWSU average | The area of cropped arable land as fraction of total (cropped and uncropped) arable land. Whether a pixel is cropped or not is decided based on NDVI twice a month. (For each four-month reporting period, each pixel thus has 8 cropped/uncropped values). | The value shown in tables is the maximum value of the 8 values available for each pixel; maps show an area as cropped if at least one of the 8 observations is categorized as "cropped." Uncropped means that no crops were detected over the whole reporting period. Values are compared to the average value for the last five years (2010-14), with departures expressed in percentage. |
| CROPPING INTENSITY | | | |
| Cropping intensity Index | | | |
| Crop/ Satellite | 0, 1, 2, or 3; Number of crops growing over a year for each pixel | Cropping intensity index describes the extent to which arable land is used over a year. It is the ratio of the total crop area of all planting seasons in a year to the total area of arable land. | Cropping intensity is presented as maps by pixels or spatial average pixels values for MPZs, 31 countries, and 7 regions for China. Values are compared to the average of the previous five years, with departures expressed in percentage. |

| INDICATOR | | | |
|--|---|--|---|
| NDVI | | | |
| Normalized Difference Vegetation Index | | | |
| Crop/Satellite | [0.12-0.90] number, pixel or CWSU average | An estimate of the density of living green biomass. | NDVI is shown as average profiles over time at the national level (cropland only) in crop condition development graphs, compared with previous year and recent five-year average (2010-14), and as spatial patterns compared to the average showing the time profiles, where they occur, and the percentage of pixels concerned by each profile. |
| RADPAR | | | |
| CropWatch indicator for Photosynthetically Active Radiation (PAR), based on pixel based PAR | | | |
| Weather/Satellite | W/m ² , CWSU | The spatial average (for a CWSU) of PAR accumulation over agricultural pixels, weighted by the production potential. | RADPAR is shown as the percent departure of the RADPAR value for the reporting period compared to the recent fourteen-year average (2001-14), per CWSU. For the MPZs, regular PAR is shown as typical time profiles over the spatial unit, with a map showing where the profiles occur and the percentage of pixels concerned by each profile. |
| RAIN | | | |
| CropWatch indicator for rainfall, based on pixel-based rainfall | | | |
| Weather/Ground and satellite | Liters/m ² , CWSU | The spatial average (for a CWSU) of rainfall accumulation over agricultural pixels, weighted by the production potential. | RAIN is shown as the percent departure of the RAIN value for the reporting period, compared to the recent fourteen-year average (2001-14), per CWSU. For the MPZs, regular rainfall is shown as typical time profiles over the spatial unit, with a map showing where the profiles occur and the percentage of pixels concerned by each profile. |
| TEMP | | | |
| CropWatch indicator for air temperature, based on pixel-based temperature | | | |
| Weather/Ground | °C, CWSU | The spatial average (for a CWSU) of the temperature time average over agricultural pixels, weighted by the production potential. | TEMP is shown as the departure of the average TEMP value (in degrees Centigrade) over the reporting period compared with the average of the recent 14 years (2001-14), per CWSU. For the MPZs, regular temperature is illustrated as typical time profiles over the spatial unit, with a map showing where the profiles occur and the percentage of pixels concerned by each profile. |
| VCIx | | | |
| Maximum vegetation condition index | | | |
| Crop/Satellite | Number, pixel to CWSU | Vegetation condition of the current season compared with historical data. Values usually are [0,1], where 0 is "NDVI as bad as the worst recent year" and 1 is "NDVI as good as the best recent year." Values can exceed the range if the current year is the best or the worst. | VCIx is based on NDVI and two VCI values are computed every month. VCIx is the highest VCI value recorded for every pixel over the reporting period. A low value of VCIx means that no VCI value was high over the reporting period. A high value means that at least one VCI value was high. VCI is shown as pixel-based maps and as average value by CWSU. |
| VHI | | | |
| Vegetation health index | | | |
| Crop/Satellite | Number, pixel to CWSU | The average of VCI and the temperature condition index (TCI), with TCI defined like VCI but for | Low VHI values indicate unusually poor crop condition, but high values, when due to low temperature, may be difficult to interpret. VHI is |

| INDICATOR | | | |
|---------------------------------|-----------------------|---|---|
| | | temperature. VHI is based on the assumption that "high temperature is bad" (due to moisture stress), but ignores the fact that low temperature may be equally "bad" (crops develop and grow slowly, or even suffer from frost). | shown as typical time profiles over Major Production Zones (MPZ), where they occur, and the percentage of pixels concerned by each profile. |
| VHI | | | |
| Minimum Vegetation health index | | | |
| Crop/Satellite | Number, pixel to CWSU | VHI is the lowest VHI value for every pixel over the reporting period. Values usually are [0, 100]. Normally, values lower than 35 indicate poor crop condition. | Low VHI values indicate the occurrence of water stress in the monitoring period, often combined with lower than average rainfall. The spatial/time resolution of CropWatch VHI is 16km/week for MPZs and 1km/dekad for China. |

Note: Type is either "Weather" or "Crop"; source specifies if the indicator is obtained from ground data, satellite readings, or a combination; units: in the case of ratios, no unit is used; scale is either pixels or large scale CropWatch spatial units (CWSU). Many indicators are computed for pixels but represented in the CropWatch bulletin at the CWSU scale.

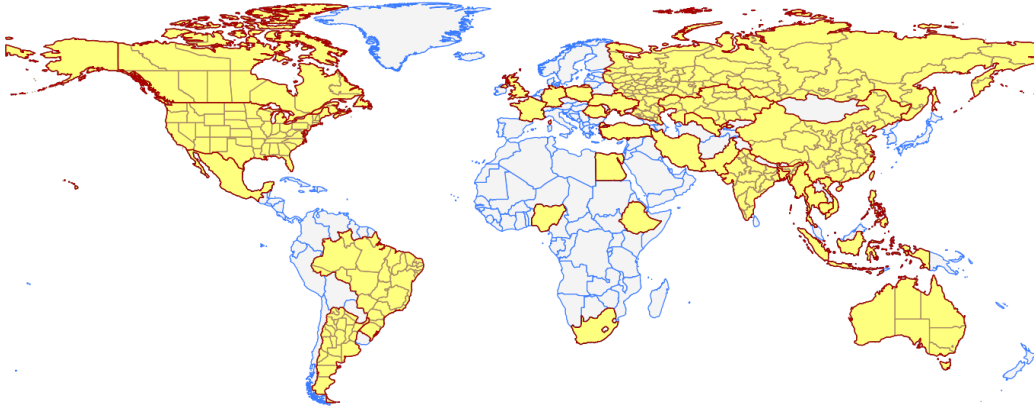
CropWatch spatial units (CWSU)

CropWatch analyses are applied to four kinds of CropWatch spatial units (CWSU): Countries, China, Major Production Zones (MPZ), and global crop Monitoring and Reporting Units (MRU). The tables below summarize the key aspects of each spatial unit and show their relation to each other. For more details about these spatial units and their boundaries, see the CropWatch bulletin online resources.

| SPATIAL UNITS | |
|--------------------------|---|
| CHINA | |
| Overview | Description |
| Seven monitoring regions | The seven regions in China are agro-economic/agro-ecological regions that together cover the bulk of national maize, rice, wheat, and soybean production. Provinces that are entirely or partially included in one of the monitoring regions are indicated in color on the map below. |

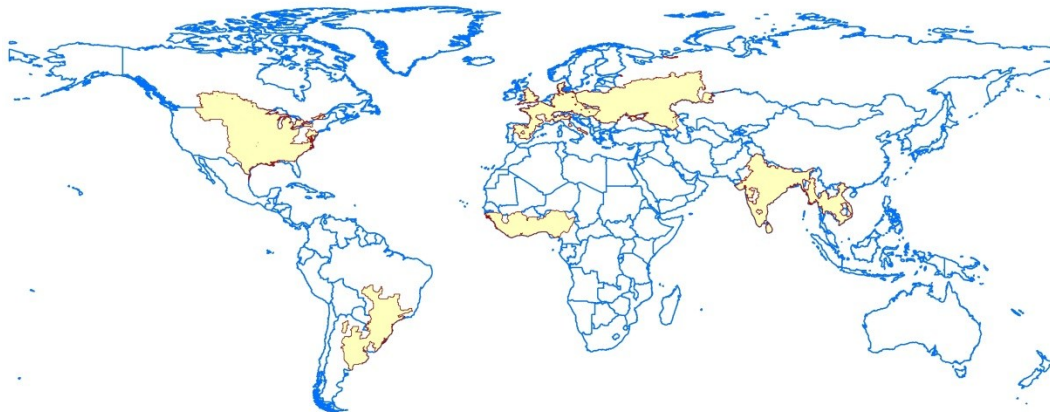
Countries (and first-level administrative districts, e.g., states and provinces)

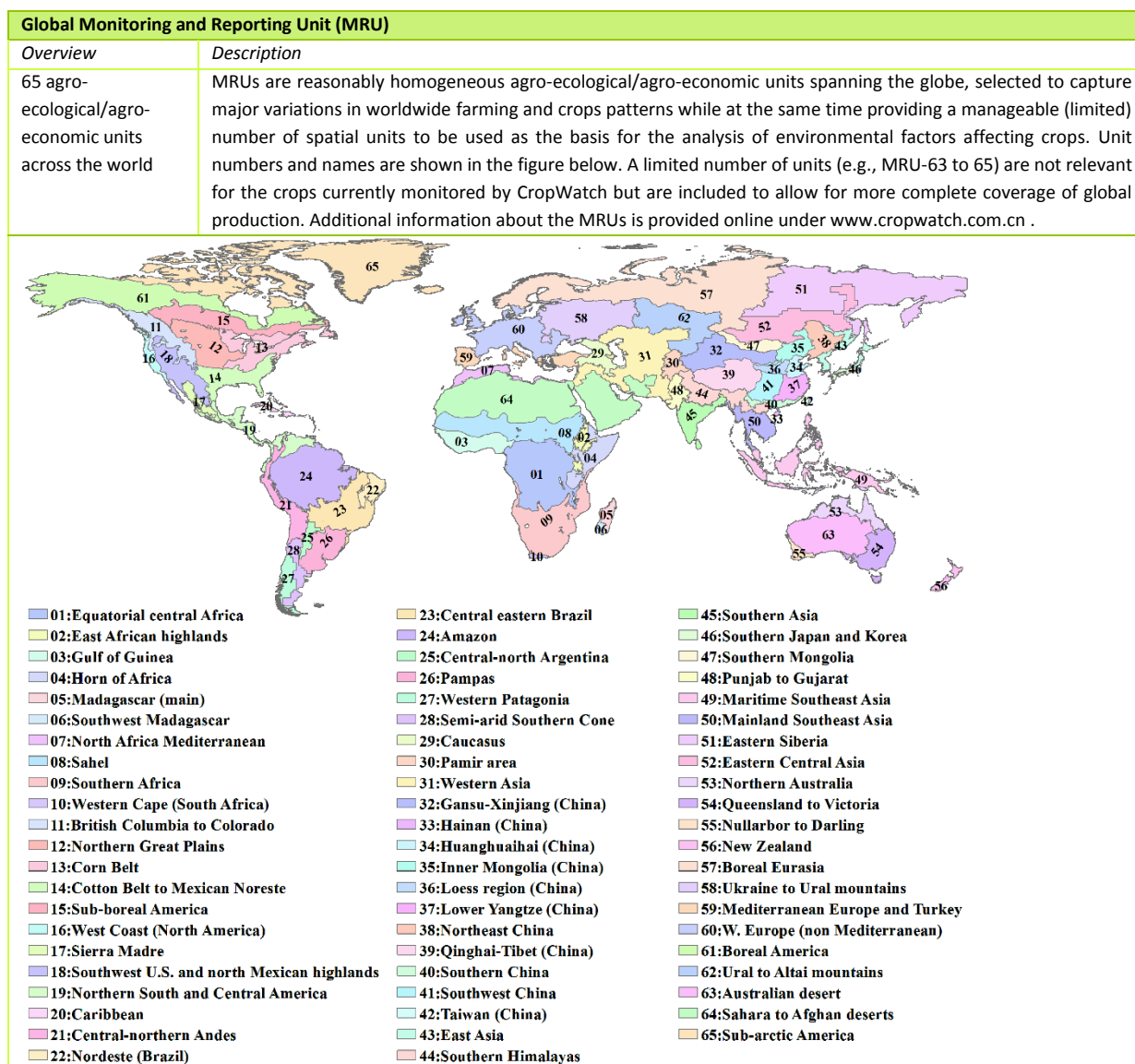
| Overview | Description |
|---|--|
| <p>“Thirty plus one” countries to represent main producers/exporters and other key countries.</p> | <p>CropWatch monitored countries together represent more than 80% of the production of maize, rice, wheat and soybean, as well as 80% of exports. Some countries were included in the list based on criteria of proximity to China (Uzbekistan, Cambodia), regional importance, or global geopolitical relevance (e.g., four of five most populous countries in Africa). The total number of countries monitored is “thirty plus one,” referring to thirty countries and China itself. For the nine largest countries—Canada, United States, Brazil, Argentina, Russia, Kazakhstan, India, China, and Australia, maps and analyses may also present results for the first-level administrative subdivision. The CropWatch agroclimatic indicators are computed for all countries and included in the analyses when abnormal conditions occur. Background information about the countries’ agriculture and trade is available on the CropWatch Website, www.cropwatch.com.cn.</p> |



Major Production Zones (MPZ)

| Overview | Description |
|--|---|
| <p>Six globally important areas of agricultural production</p> | <p>The six MPZs include West Africa, South America, North America, South and Southeast Asia, Western Europe, and Central Europe to Western Russia. The MPZs are not necessarily the main production zones for the four crops (maize, rice, soybean, wheat) currently monitored by CropWatch, but they are globally or regionally important areas of agricultural production. The seven zones were identified based mainly on production statistics and distribution of the combined cultivation area of maize, rice, wheat and soybean.</p> |





Production estimation methodology

The main concept of the CropWatch methodology for estimating production is the calculation of current year production based on information about last year's production and the variations in crop yield and cultivated area compared with the previous year. The equation for production estimation is as follows:

$$Production_i = Production_{i-1} * (1 + \Delta Yield_i) * (1 + \Delta Area_i)$$

where i is the current year, $\Delta Yield_i$ and $\Delta Area_i$ are the variations in crop yield and cultivated area compared with the previous year; the values of $\Delta Yield_i$ and $\Delta Area_i$ can be above or below zero.

For the 31 countries monitored by CropWatch, yield variation for each crop is calibrated against NDVI time series, using the following equation:

$$\Delta Yield_i = f(NDVI_i, NDVI_{i-1})$$

where $NDVI_i$ and $NDVI_{i-1}$ are taken from the time series of the spatial average of NDVI over the crop specific mask for the current year and the previous year. For NDVI values that correspond to periods after the current monitoring period, average NDVI values of the previous five years are used as an average expectation. $\Delta Yield_i$ is calculated by regression against average or peak NDVI (whichever yields the best regression), considering the crop phenology of each crop for each individual country.

A different method is used for areas. For China, CropWatch combines remote-sensing based estimates of the crop planting proportion (cropped area to arable land) with a crop type proportion (specific type area to total cropped area). The planting proportion is estimated based on an unsupervised classification of high resolution satellite images from HJ-1 CCD and GF-1 images. The crop-type proportion for China is obtained by the GVG instrument from field transects. The area of a specific crop is computed by multiplying farmland area, planting proportion, and crop-type proportion of the crop.

To estimate crop area for wheat, soybean, maize, and rice outside China, CropWatch relies on the regression of crop area against cropped arable land fraction of each individual country (paying due attention to phenology):

$$Area_i = a + b * CALF_i$$

where a and b are the coefficients generated by linear regression with area from FAOSTAT or national sources and CALF the Cropped Arable Land Fraction from CropWatch estimates. $\Delta Area_i$ can then be calculated from the area of current and the previous years.

The production for "other countries" (outside the 31 CropWatch monitored countries) was estimated as the linear trend projection for 2014 of aggregated FAOSTAT data (using aggregated world production minus the sum of production by the 31 CropWatch monitored countries).

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Online resources



This bulletin is only part of the CropWatch resources available. Visit **www.cropwatch.com.cn** for access to additional resources, including the methods behind CropWatch, country profiles, and other CropWatch publications. For additional information or to access specific data or high-resolution graphs, simply contact the CropWatch team at cropwatch@radi.ac.cn.

Online Resources posted on www.cropwatch.com.cn:

- ✓ **Definition of spatial units**
A description of the four spatial levels of analysis: Monitoring and Reporting Units (MRU), Major Production Zones (MPZ), selected countries, and the use of sub-national administrative areas.
- ✓ **Methodology**
Overview of CropWatch data sources and methods.
- ✓ **Time series of indicators**
Background data on agroclimatic indicators presented in a series of tables.
- ✓ **Country profiles**
Short profiles for each of the 30 countries and China highlighting key facts of interest to agriculture.
- ✓ **Country long term trends**
Quick overview of average crop area, yield, and production values for maize, rice, soybean, and wheat for recent years, along with long-term (2001-12) trends (based on FAOSTAT data).

CropWatch bulletins introduce the use of several new and experimental indicators. We would be very interested in receiving feedback about their performance in other countries. With feedback on the contents of this report and the applicability of the new indicators to global areas, please contact:

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