CropWatch Bulletin

QUARTERLY REPORT ON GLOBAL CROP PRODUCTION

Monitoring Period: April - July 2015

August 31, 2015
Vol. 15, No. 3 (total No. 98)

Institute of Remote Sensing and Digital Earth
Chinese Academy of Sciences

August 2015

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

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Abbreviations

5YA	Five-year average, the average for the April-July periods from 2010 to 2014; one of the standard reference periods.
14YA	Fourteen-year average, the average for the April-July 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
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
GMO	Genetically Modified Organism
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 April 1 and July 31, 2015. It is the 98th 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: Production outlook, disaster events, trends in North America, and El Niño.	
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 CropWatch bulletin, prepared by the Institute of Remote Sensing and Digital Earth (RADI) at the Chinese Academy of Sciences, relies on environmental and satellite-based agronomic indicators to qualitatively and quantitatively assess worldwide food production. In addition to China, analyses focus on all major production areas and important exporting countries. The bulletin further reports on ongoing trends, disaster events, and other circumstances and events of interest to global agriculture and food security, such as a perspective on the occurrence of El Niño. This bulletin also introduces a new section about the phytosanitary condition of crops in China.

The current reporting period from April to July 2015 covers the harvest of winter crops and the growth of summer crops in the northern hemisphere, as well as the growth of winter crops in the southern hemisphere. After providing an overview of global agroclimatic conditions with some typical agronomic impacts in the major production zones (MPZs), the Bulletin looks in detail at the major producers, including China, focusing on maize, rice, wheat, and soybeans.

Overall agro-environmental and agronomic conditions between April and July 2015

Globally, rainfall—as indicated by the CropWatch RAIN indicator—exceeded average by 4%, while temperature (TEMP) was 0.4°C above average; July was also the warmest July on record so far. The resulting biomass production potential was 1% above the five-year average. Sunshine (measured by RADPAR) was average. On the whole, the reporting period was characterized by an unusual frequency of extreme conditions, some of them clearly associated with El Niño. Selected extreme conditions include:

- *High temperature and rainfall in parts of central Asia.* Parts of central Asia (southern Mongolia, Gansu-Xinjiang in China, and the Ural to Altai mountains and adjacent areas) recorded high temperature combined with abundant rainfall, sometimes more than the double the expected amounts. Some major pastoralist areas have enjoyed particularly favorable biomass production conditions for rangeland and crops. For instance, CropWatch estimates the wheat output of Kazakhstan to increase 15%, resulting from favorable conditions and one of the largest national increases in cropped arable land (9%).
- *Drought in selected temperate areas in Asia and Africa.* A number of mostly temperate areas (including some tropical highlands) in both hemispheres suffered drought, resulting in reduced biomass production. Areas involved are eastern and southern Africa, including the East African highlands and Madagascar. As a result, CropWatch puts the maize production of South Africa at -25% below last year's output and includes Ethiopia's among the countries that deserve close monitoring.
- *Rainfall deficit in East Asia.* In eastern Asia, a severe rainfall deficit affected the Republic of Korea (-51%) and Korea DPR (-63%), as well as the region including the China Loess and Huanghuaihai region, Northeast China, Taiwan Province, and eastern Central Asia where the average deficit was up to -50% for rainfall, while temperatures were average and radiation increased 2% above average.
- *Rainfall deficit and high temperature in Eurasia.* Western Eurasia, including much of Western Europe and Caucasus, experienced a reduction in rainfall with an average deficit of about -25% along with high temperature. CropWatch estimates that maize production will drop 2% in France,

8% in Romania (where the fraction of cropped arable land also fell 3 percentage points), and 10% in Ukraine, despite that country's increase in the fraction of cropped arable land.

- *Cyclones and storms in Asia.* In southern and eastern Asia, cyclones, storms, and intense monsoon precipitation created havoc through loss of life, flooding, damage to infrastructure, and crop loss. For instance, typhoon Chan-hom caused about US$1.5 billion in damage to agriculture and transportation in Zhejiang and Jiangsu provinces in China at the end of June. India, Bangladesh, and Myanmar were also the victims of severe floods during the same period and at the end of July. India rice production is projected by CropWatch to decrease 3%.
- *Drought and flood in North America.* In North America, losses due to drought in the west and center were compounded by floods in some areas. In Canada, rainfall was only half the expected amounts in Alberta and Saskatchewan. The cropped arable land fraction dropped by 6 percentage points in Canada. CropWatch estimates a national wheat output in Canada at 6% below last year's level.

Global production estimate

The latest CropWatch production estimate for the 2015 season puts global maize output at 987 million tons and rice production at 741 million tons (both are comparable to 2014), while the production of wheat and soybean are expected to increase by 1% to 725 million tons and 310 million tons, repectively. The global percentages of change are identical with those of the major producers for rice and wheat.

Among the major exporters, maize and soybeans stay at the same output level as for 2014, while rice output decreases by 2% and wheat output increases by the same percentage. In the United States, maize and soybean production also stay at their 2014 level, while wheat production increases 3%. This may result in some impact on the markets for maize, rice, and soybean.

China

CropWatch puts the total annual output at 567.7 million tons, 0.7% up from 2014 (3.9 million tons increase). Winter crops in China enjoyed favorable conditions while in their grain filling stage: CropWatch revised the total production of winter crops in China for 2015 to 125.7 million tons, an increase of 2.2 million tons or 2% compared to 2014. The total summer production is forecast at 406.9 million tons, 0.5% increase or 2 million tons increase from last drought year, slightly above 2013 summer crop production. Early rice production is at 35.1 million tons, 1% decrease from the previous year.

According to the updated summer crop estimates in this bulletin, 2015 maize production remains comparable to 2014, at 192.8 million tons. The largest increases were achieved in Chongqing, Gansu, Hebei, Henan, and Xinjiang (+3% each), while large decreases are observed in Inner Mongolia, Ningxia, Shaanxi, and Shanxi provinces. The factors behind the decreases vary from province to province and include drought and pests in Inner Mongolia and drought in Shaanxi.

Soybean continues its long-term negative production trend in China and reaches 12.7 million tons (a drop of 3% from 2014 levels), mostly because of a decrease in planted area compared to last year.

Rice production in China is projected to increase by 1% over 2014 to an output of 202.3 million tons, resulting from a 2% increase in single rice production and despite decreases in the production of early (-1%) and late (-2%) rice. The aggregated rice production shows a decrease in Guangdong, Hunan, Jiangxi, Yunnan, and Zhejiang provinces. Generally, areas that practice double cropping show a decrease, while single rice planting areas increased over recent years. As stressed in a new section describing phytosanitary conditions in China, about two thirds of all rice growing areas were affected by planthoppers (mostly in the Yangtze River Basin) and a third (mostly in the Lower Yangtze area) suffered from rice sheath blight. Maize was slightly affected by armyworms.

الملخص التنفيذي

التقرير الذي أعده معهد الاستشعار عن بعد والأرض الرقمية للأكاديمية الصينية للعلوم "RADI" إعتمادا على المؤشرات البيئية والزراعية النوعية والكمية المستقاة من الأقمار الاصطناعية، و ذلك لتقييم إنتاج الغذاء في جميع أنحاء العالم. بالإضافة إلى الصين، تغطي هذه التحليلات مناطق الإنتاج الرئيسية، وكذلك أهم الدول المصدرة. علاوة على ذلك، يركز هذا التقرير على الاتجاهات الحالية، والكوارث الطبيعية وغيرها من الظروف. كما يسلط الضوء على الأحداث الرئيسية ذات الصلة بالزراعة والأمن الغذائي العالمي، كاحتمال حدوث ظاهرة النينيو. وتشمل هذه النشرة أيضا قسما جديدا يهم الصحة النباتية للمحاصيل في الصين.
ويغطي هذا التقرير انتاج المحاصيل الشتوية ونمو المحاصيل الصيفية في نصف الكرة الشمالي، ونمو المحاصيل الشتوية في نصف الكرة الجنوبي للفترة بين أبريل و يوليو من 2015. بعد النظرة العامة حول الظروف المناخية الزراعية العالمية وآثارها على الزراعة في مناطق الإنتاج الرئيسية، فإن النشرة الإخبارية ل CropWatch تدرس بالتفصيل وضعية المنتجين الرئيسيين، بما في ذلك الصين، مع التركيز بالأساس على الذرة والأرز والقمح وفول الصويا.

الظروف الزراعية و البيئية العالمية بين أبريل و يوليو 2015

هطول الأمطار عموما (كما هو مبين في مؤشر "RAIN" ل CropWatch) تجاوز المعدل ب 4٪، في حين أن درجة حرارة "TEMP" قد سجلت قيما أكبر من المتوسط ب 0.4 درجة مئوية. وكان شهر يوليو الشهر الاكثر حرارة، وبلغ مستوى لم يتم تسجيله من قبل. وكما تجدر الإشارة إلى احتمال إنتاج كتلة حيوية أعلى من المتوسط للسنوات الخمس الماضية ب 1٪. كما أن مدة سطوع الشمس، التي تم قياسها ب RADPAR، ظلت في حدود المتوسط. بشكل عام، تميزت الفترة المشمولة بالتقرير وتيرة استثنائية من الظروف القاسية، وبعضها يرتبط بشكل واضح مع ظاهرة النينيو.

تشمل الظروف القاسية المختارة

- *ارتفاع درجة الحرارة وهطول الأمطار في عدد من مناطق آسيا الوسطى.* بعض مناطق آسيا الوسطى (جنوب منغوليا، قانسو، منطقة شينجيانغ في الصين، وجبال الأورال ثم جبال التاي والمناطق المجاورة) سجلت درجات حرارة عالية اضافة الى هطول أمطار غزيرة، والتي تتجاوز في بعض الأحيان ضعف الكميات المتوقعة. وقد استفادت بعض المناطق الرعوية الرئيسية من الظروف المواتية لا سيما للرفع من إنتاج الكتلة الحيوية للمراعي والمحاصيل. على سبيل المثال، تشير تقديرات CropWatch أن إنتاج القمح بكازاخستان سيزيد بنسبة 15٪، وذلك بفضل الظروف المواتية كما تعرف هذه المنطقة واحدة من المناطق التي تعرف زيادة مهمة في المساحات الصالحة للزراعة المزروعة بنسبة 9٪.

- *الجفاف في المناطق المعتدلة بآسيا و إفريقيا.* عرفت العديد من المناطق المعتدلة أساسا الجفاف (بما في ذلك بعض المرتفعات الاستوائية) في نصفي الكرة الأرضية، مما تسبب في انخفاض إنتاج الكتلة الحيوية. يتعلق الأمر بشرق وجنوب أفريقيا، بما في ذلك مرتفعات شرق إفريقيا و مدغشقر. ونتيجة لذلك، فإن CropWatch يتنبأ بانخفاض في إنتاج الذرة بنسبة 25٪ في جنوب أفريقيا مقارنة بإنتاج السنة الفارطة، و تبقى إثيوبيا من بين الدول التي تستحق تتبعا و رصدا دقيقا لحالتها.
- عجز *في التساقطات المطرية شرق آسيا*. في شرق آسيا، تم تسجيل عجز كبير في التساقطات المطرية بلغ 51٪ بكوريا الجنوبية و 63٪ بكوريا الشمالية. كما عرفت مناطق اللوس في الصين وهوانغ هوايهاي، و شمال شرق الصين، و مقاطعة تايوان ووسط شرق آسيا، عجزا فاق 50٪ مقارنة بمتوسط التساقطات المطرية المسجلة. وفيما يتعلق بدرجات الحرارة، فإنها ظلت على العموم مستقرة في جميع الأنحاء، في حين شهد الإشعاع زيادة طفيفة قدرها 2٪ فوق المتوسط.
- *نقص التساقطات المطرية وارتفاع درجات الحرارة في أوراسيا*. غرب أوراسيا، بما في ذلك معظم دول أوروبا الغربية والقوقاز، شهدت انخفاضا في معدلات *التساقطات المطرية*، حيث بلغ متوسط العجز حوالي 25٪ مع ارتفاع لافت في درجات الحرارة المسجلة. وتشير تقديرات CropWatch أن إنتاج الذرة سينخفض بنسبة 2٪ في فرنسا، 8٪ في رومانيا (حيث تم تسجيل انخفاض المساحة المزروعة بنسبة 3٪)، و 10٪ في أوكرانيا، على الرغم من أن هذه الأخيرة قد شهدت زيادة في المساحة المزروعة.

- *الأعاصير والعواصف في آسيا*. في جنوب وشرق آسيا، وتسببت العواصف والأعاصير والامطار الموسمية ثم الفيضانات أضرارا شديدة بالممتلكات وخسائر في الأرواح التي أثرت سلبا على البنى التحتية والمحاصيل. على سبيل المثال، تسبب الاعصار تشان هوم بأضرار في الممتلكات الزراعية والنقل قدرت بنحو 1.5 مليار دولار في كل من محافظات جيانغسو وتشجيانغ في الصين في نهاية يونيو. الهند وبنغلاديش وميانمار كانت أيضا من ضحايا فيضانات شديدة خلال الفترة نفسها وفي نهاية يوليو. إنتاج الأرز في الهند، سيعرف، وفقا لتوقعات CropWatch، انخفاضا بنسبة 3٪.

- *الجفاف والفيضانات في أمريكا الشمالية*. تفاقمت الخسائر الناجمة عن الجفاف في في بعض مناطق غرب ووسط أمريكا الشمالية بسبب الفيضانات. كما شهدت كندا انخفاضا كبيرا بلغ أكثر من نصف كميات الأمطار في كل من ألبرتا وساسكاتشوان. كما عرفت مساحة الأراضي المزروعة في كندا انخفاضا بنسبة 6٪. كما يتوقع CropWatch انخفاضا في إنتاج القمح بكندا بنسبة 6٪ مقارنة بإنتاج السنة الماضية.

توقعات الإنتاج العالمي

بالنسبة لموسم 2015، يتوقع CropWatch، على المستوى العالمي، إنتاجا للذرة يبلغ 987 مليون طن وإنتاجا من الأرز يقدر ب 741 مليون طن (الانتاجين متقاربين مقارنة بالإنتاج المسجل 2014). فيما يقدر إنتاج القمح ب 725 مليون طن، وأخيرا يتوقع تحقيق إنتاج من فول الصويا يقدر ب 310 مليون طن، وهذا يعني زيادة متوقعة بنسبة 1٪. تغيرات النسبة الإجمالية هي نفسها بالنسبة للمنتجين الأساسيين للأرز و القمح.
لا يزال المصدران الرئيسيان من الذرة وفول الصويا في نفس مستوى إنتاج سنة 2014، بينما انخفض إنتاج الأرز بنسبة 2٪ وإنتاج القمح زاد بنسبة 2٪. في الولايات المتحدة، يعرف إنتاج فول الصويا والذرة نفس مستوى انتاج السنة الفارطة، في حين زاد إنتاج القمح بنسبة 3٪. للإشارة فإن مستوى الإنتاج، لهذه السنة، قد يؤثر على سوق الذرة والأرز وفول الصويا.

الصين

يقدر CropWatch الإنتاج الكلي السنوي ب 567.7 مليون طن، وهو ما يعني زيادة بنسبة 0.7٪ مقارنة مع 2014 (3.9 مليون طن). وقد استفادت المحاصيل الشتوية في الصين من الظروف المواتية خلال مرحلة تعبئة الحبوب: حيث راجع CropWatch إجمالي إنتاج المحاصيل الشتوية في الصين لعام 2015 إلى 125.7 مليون طن، بزيادة 2٪ (2.2 مليون طن) مقارنة مع 2014.
كما قدر الإنتاج الكلي الصيفي ب 406.9 مليون طن، أي بزيادة قدرها 0.5٪ (2 مليون طن) مقارنة مع آخر موسم عرف الجفاف. الإنتاج المتوقع هو أعلى بقليل من المحاصيل الصيفية في عام 2013. إنتاج الأرز المبكر يقدر ب 35.1 مليون طن، بواقع انخفاض قدره 1٪ مقارنة بالسنة الفارطة.
وفقا لتوقعات المحاصيل التي تم تحديثها في هذه النشرة، فإن إنتاج الذرة في عام 2015، البالغ 192.8 مليون طن، مشابه للإنتاج المسجل سنة 2014. وتحققت أعلى الزيادات في تشونغتشينغ وقانسو وخبى وخنان ومنطقة شينجيانغ (بنسبة بلغت 3٪ لكل منهم)، بينما لوحظ أكبر تراجع في الانتاج في كل من محافظات منغوليا الداخلية ونينغشيا وشنشى وشانشى.
العوامل المسببة لتراجع الإنتاج تختلف من محافظة لأخرى وتشمل الجفاف والآفات في منطقة منغوليا الداخلية والجفاف فى شنشى.
كما يستمر تراجع إنتاج فول الصويا ،على المدى الطويل، في الصين، وبلغ الإنتاج 12.7 مليون طن (بتسجيل انخفاض بنسبة 3٪ مقارنة مع 2014)، ويرجع ذلك أساسا إلى الانخفاض الذي عرفته المساحة المزروعة في العام الماضي.
من المتوقع أن يزيد إنتاج الأرز بالصين بنسبة 1٪ مقارنة مع عام 2014 لتصل إلى إنتاج 202.3 مليون طن، مسجلا بذلك زيادة قدرها 2٪، على الرغم من الانخفاض في إنتاج الأرز المبكر والمتأخر بنسب تقدر ب1٪ و ب2٪ على التوالي. كما تميز الإنتاج العام للأرز بانخفاض في كل من مقاطعات قوانغدونغ وهونان وجيانغشى ويوننان وتشجيانغ. بصفة عامة، عرفت مناطق ممارسة الزراعة المزدوجة انخفاضا في إنتاجها، في حين شهدت مناطق زراعة الأرز فقط زيادة في الانتاج خلال السنوات الأخيرة.
كما تم التشديد، في القسم الجديد، على وصف الظروف الصحية للنباتات في الصين، وقد تأثر حوالي ثلثي المساحات المزروعة بالأرز بسبب حشرة النطاط النباتية (معظمها في حوض نهر اليانغتسى) وثلث المساحة (ومعظمها في منطقة اليانغتسى السفلى) تعاني من آفة غمد الأرز. كما تأثرت الذرة بآفة دودة الحشد بنسبة طفيفة.

المترجم: طارق بنعبدالوهاب

Résumé

Le bulletin CropWatch, préparé par l'Institut de la télédétection spatiale et de la terre numérique (RADI) de l'Académie Chinoise des Sciences, repose sur des indicateurs environnementaux et agronomiques basés sur les satellites pour évaluer qualitativement et quantitativement la production alimentaire dans le monde entier.

En plus de la Chine, les analyses portent sur toutes les principales zones de production, notamment les plus grands pays exportateurs. Par ailleurs, le bulletin se focalise sur les tendances actuelles, les catastrophes naturelles et d'autres circonstances. Il met en relief aussi les principaux événements liés à l'agriculture mondiale et la sécurité alimentaire, tels que la possibilité que le phénomène El Niño survienne. Ce bulletin présente également une nouvelle section sur l'état phytosanitaire des cultures en Chine.

Le rapport actuel couvre la récolte des cultures d'hiver et de la croissance des cultures d'été dans l'hémisphère nord, ainsi que la croissance des cultures d'hiver dans l'hémisphère sud pour la période Avril-Juillet 2015. Après un aperçu général sur les conditions agro-climatiques mondiales avec quelques impacts agronomiques typiques dans les principales zones de production, le bulletin examine en détail les principaux producteurs, dont la Chine, en se focalisant sur les cultures de maïs, riz, blé et soja.

Conditions agro-environnementales et agronomiques globales entre Avril et Juillet 2015

Globalement, les précipitations (comme indiqué par l'indicateur "RAIN" de CropWatch) ont dépassé la moyenne de 4%, tandis que la température (TEMP) a enregistré des valeurs supérieures à la moyenne de 0,4 °C; le mois de Juillet a été le mois le plus chaud, ce qui n'a jamais été enregistré auparavant. Le potentiel de la production de la biomasse a été supérieur à la moyenne des cinq dernières années de 1%. L'ensoleillement enregistré (mesurée par RADPAR) a été moyen. Dans l'ensemble, la période considérée a été marquée par une fréquence exceptionnelle des conditions extrêmes, certaines d'entre elles étant clairement associées au phénomène El Niño.

Les conditions extrêmes sélectionnées comprennent :

- Hautes températures et précipitations dans certaines parties de l'Asie centrale. Dans ces régions de l'Asie centrale (sud de la Mongolie, Gansu-Xinjiang en Chine, l'Oural aux montagnes de l'Altaï et les régions voisines) ont enregistré des températures élevées combinées à des précipitations abondantes, dont les quantités dépassent parfois le double de celles attendues. Certaines zones pastorales majeures ont bénéficié de conditions particulièrement favorables à la production de biomasse pour les pâturages et les cultures. A titre d'exemple, CropWatch estime que la production de blé au Kazakhstan va augmenter de 15%, grâce aux conditions favorables et à l'une des plus fortes hausses en terres arables cultivées (9%).

- *S*écheresse dans les régions tempérées de l'Asie et de l'Afrique. Un certain nombre de zones principalement tempérées (y compris certaines hautes terres tropicales) dans les deux hémisphères ont connu de la sécheresse, ce qui entraîne une baisse de la production de la biomasse. Les zones concernées sont l'Afrique orientale et australe, y compris les hautes terres d'Afrique orientale et de Madagascar. En conséquence, CropWatch prévoit une réduction de 25% de la production de maïs en Afrique du Sud par rapport à l'année dernière notamment pour l'Ethiopie qui est parmi les pays qui mérite une surveillance étroite.
- Déficit pluviométrique en Asie de l'Est. En Asie orientale, un déficit pluviométrique sévère a touché la Corée du sud (-51%) et la Corée du nord (-63%), ainsi que les régions des Lœss

en Chine et Huang Huaihai, le nord-est de la Chine, la province de Taiwan et le centre de l'Asie orientale, où le déficit moyen a enregistré une réduction de plus de 50% des précipitations. Concernant les températures, elles sont restées stable autour de la moyenne, alors que le rayonnement a connu une légère augmentation de 2% par rapport à la moyenne.

- Déficit en précipitations et températures élevées en Eurasie. L'Eurasie occidentale, notamment une grande partie de l'Europe occidentale et du Caucase, a connu une baisse de la pluviométrie avec un déficit moyen d'environ 25% et une température élevée. CropWatch estime que la production de maïs diminuera de 2% en France, 8% en Roumanie (où la fraction des terres arables cultivées a également reculé de 3%), et 10% en Ukraine, malgré que ce pays a connu une augmentation dans la fraction des terres arables cultivées.
- Cyclones et tempêtes en Asie. En Asie australe et orientale, les cyclones, les tempêtes et les précipitations intenses de mousson ont provoqués des dégâts humains, des inondations ainsi que des dommages matériels qui ont touchés les infrastructures et les récoltes. Par exemple, le typhon Chan-Hom a causé des dégâts matériels dans les secteurs de l'agriculture et du transport estimés à environ 1,5 milliard $ US dans les provinces du Jiangsu et du Zhejiang en Chine à la fin du mois de juin. L'Inde, le Bangladesh et le Myanmar ont également étaient victimes de graves inondations au cours de la même période et à la fin du mois de juillet. la production de riz en Inde, selon les prévisions de CropWatch, connaitra une réduction de 3%.
- *Sécheresse et inondations en Amérique du Nord.* En Amérique du Nord, les pertes dues à la sécheresse dans l'ouest et le centre ont été aggravées par les inondations dans certaines régions. Au Canada, une forte réduction, de plus de la moitié, des quantités prévues des précipitations a été observée à Alberta et à Saskatchewan. La fraction des terres arables cultivées a diminué de 6% au Canada. Parallèlement, CropWatch estime une réduction de 6% de la production nationale de blé au Canada par rapport celle de l'année dernière.

Estimation de la production mondiale

Pour la saison 2015, les dernières prévisions selon de CropWatch estiment la production mondiale de maïs à 987 millions de tonnes et la production de riz à 741 millions de tonnes (les productions estimées sont comparables à celles enregistrées en 2014). Concernant la production de blé, elle est estimée à 725 millions de tonnes et enfin une production de 310 millions de tonnes pour le soja, ce qui signifie une augmentation attendue de 1%. Les changements globaux en pourcentage sont identiques pour les grands producteurs de riz et de blé.
Les principaux exportateurs de maïs et de soja restent au même niveau de production qu'en 2014, tandis que la production de riz diminue de 2% et la production de blé augmente du même pourcentage. Aux États-Unis, la production de soja et de maïs est aussi comparable à celle de 2014, tandis que la production de blé augmente de 3%. Cela peut avoir certains impacts sur les marchés de maïs, de riz et de soja.

Chine

CropWatch estime la production annuelle totale à 567,7 millions de tonnes, ce qui signifie une augmentation de 0,7% comparée à 2014 (3,9 millions de tonnes). Les cultures d'hiver en Chine ont bénéficié de conditions favorables durant le stade de remplissage des grains: CropWatch a revu à la hausse la production totale des cultures d'hiver en Chine pour 2015 à 125,7 millions de tonnes, soit une augmentation de 2% (2,2 millions de tonnes) par rapport à 2014. La production totale d'été a été estimée à 406,9 millions de tonnes, soit une augmentation de 0,5% (2 millions de tonnes) comparée à la dernière année de sécheresse. Cette production est légèrement supérieure à celle des cultures d'été en 2013. La production de riz précoce est estimée à 35.1 millions de tonnes, soit une diminution de 1% par rapport à l'année précédente.

Selon les prévisions de récolte d'été mises à jour dans ce bulletin, la production de maïs en 2015 reste comparable à celle de 2014 avec 192,8 millions de tonnes. Les plus fortes hausses ont été atteintes à Chongqing, Gansu, Hebei, Henan et Xinjiang (+3% chacun), tandis que des baisses importantes ont été observées dans les provinces de Mongolie intérieure, Ningxia, Shaanxi, Shanxi.

Les facteurs qui ont causés la baisse de la production diffèrent d'une province à l'autre et ils comprennent la sécheresse et les ravageurs en Mongolie intérieure et la sécheresse dans le Shaanxi. Le soja poursuit sa tendance de production négative à long terme en Chine et elle atteint 12,7 millions de tonnes (une baisse de 3% par rapport à 2014), principalement en raison d'une diminution de la superficie cultivée l'année dernière.

La production de riz en Chine augmentera de 1% par rapport à 2014 pour atteindre une production de 202,3 millions de tonnes, enregistrant ainsi une augmentation de 2% et malgré les baisses de la production de riz précoce et tardif de 1% et de 2%, respectivement.

La production globale du riz est marquée par une diminution dans les provinces de Guangdong, Hunan, Jiangxi, Yunnan, et Zhejiang. En générale, les zones qui pratiquent la double culture montrent une diminution, tandis que les zones de plantation de riz uniquement ont connu une augmentation au cours des dernières années. Comme il a été souligné dans une nouvelle section décrivant les conditions phytosanitaires en Chine, environ les deux tiers des zones de culture de riz ont été affectés par la cicadelle brune (surtout dans le bassin du fleuve de Yangtze) et un tiers (principalement dans la zone basse de Yangtze) souffrait de la pourriture à sclérotes de la graine (riz). Le maïs a été légèrement affecté par les légionnaires d'automne.

Краткий обзор

Бюллетень « Наблюдение за состоянием посевов и насаждений» (Crop Watch), подготавливаемый Институтом дистанционного зондирования и цифровой Земли (RADI) Китайской Академии Наук, составляется на основе анализа показателей состояния окружающей среды и агрономических показателей по данным со спутников для качественной и количественной оценки мирового производства продуктов питания. Для Китая такие виды анализа фокусируются для всех основных производящих территорий и важнейших экспортирующих регионов. Кроме того, в бюллетене сообщается о наблюдаемых тенденциях, опасных явлениях и других событиях и происшествиях, значимых для мирового земледелия и продовольственной безопасности - таких, как перспектива появления Эль Ниньо. В этом бюллетене также представлен новый раздел, касающийся фитосанитарного состояния посевов и насаждений в Китае .

Текущий отчетный период с апреля по июль 2015 г. охватывает уборку урожая озимых культур и рост яровых культур в северном полушарии, также как и рост озимых культур в южном полушарии. После проведения обзора глобальных агроклиматических условий с некоторыми характерными агрономическими воздействиями в основных производящих зонах (MPZs), в бюллетене акцентируется внимание на основных странах - производителях, включая Китай, специализирующийся на выращивании кукурузы, риса, пшеницы и сои.

Агроэкологические и агрономические условия в целом в апреле- июле 2015 г.

В мировом масштабе, как показывает датчик дождевых осадков RAIN , используемый Crop Watch, количество осадков превысило норму на 4%, тогда как температура (по датчику TEMP) оказалась на 0.4°C выше средней; июль оказался к тому же самым теплым по длительным наблюдениям. Окончательный потенциал биопродуктивности оказался на 1% выше 5-летнего среднего. Солнечное сияние (измеренное устройством RADPAR) было на уровне среднего. В целом же, отчетный период охарактеризован необычной частотой экстремальных условий, некоторые из которых очевидно связаны с Эль Ниньо. Выбранные случаи возникновения экстремальных условий включают:

- *Высокие температуры и количество осадков в крупных регионах центральной Азии.* В крупных регионах центральной Азии (южная Монголия, Ганьсу - Синьцзян в Китае и пространство от Урала до Алтайских гор с прилегающими областями) зафиксированы высокие температуры в сочетании с обильными осадками, иногда превышающими более чем вдвое их ожидаемое количество. В некоторых основных пастбищных зонах сложились особенно благоприятные условия для биопродуктивности пастбищных угодий и культур. Например, CropWatch оценивает увеличение выхода валовой продукции пшеницы в Казахстане на 15% вследствие благоприятных условий и при одном из наибольших увеличений доли распаханных под культуры земель (9%).
- *Засуха в отдельных внетропических областях Азии и Африки.* Ряд областей главным образом с умеренным климатом (включая некоторые горные поднятия в тропиках) в обоих полушариях пострадал от засухи, приведшей к снижению биопродуктивности. Затрагиваемые засухой территории - восточная и южная Африка, включающие в себя Восточно- Африканскую горную страну и горные системы Мадагаскара. CropWatch оценивает валовой сбор кукурузы в Южной Африке на -25% ниже, чем в последние годы и относит Эфиопию к числу стран со сходным мониторингом.

- *Дефицит количества осадков на Востоке Азии.* В восточной Азии сильный дефицит осадков имел отрицательное проявление в Республике Корея (-51%) и КНДР (-63%), также как и в регионе Китая, включающем Лессовое плато и равнину вдоль р. Хуанхэ, в северо-восточном Китае, в провинции Тайвань и в восточном секторе центральной Азии, где средний дефицит осадков составлял до -50% нормы, в то время как температуры были на уровне средних значений, а радиация выше на 2%.
- *Дефицит осадков и высокие температуры в Евразии.* В западной части Евразии, включая почти всю территорию Западной Европы и Кавказский регион, ощущалось снижение количества осадков при среднем их дефиците около -25% наряду с высокими температурами. По оценкам CropWatch валовой сбор кукурузы во Франции сократится на 2%, в Румынии – на 8% (где доля распаханных под культуры земель также опустилась ниже 3- х процентной отметки) и на 10% на Украине, несмотря на увеличение доли распаханных под культуры земель.
- *Циклоны и бури в Азии.* В южной и восточной Азии циклоны, бури и сильные муссонные осадки привели к опустошению территорий вследствие гибели людей, наводнений, разрушений инфраструктуры и потерь урожая. Так например, тайфун Чань-Хом причинил ущерб сельскому хозяйству и транспорту в китайских провинциях Чжэцзян и Цзянсу в конце июня на сумму почти в 1.5 млрд. долларов. В тот же самый период времени, а также в конце июля, территории Индии, Бангладеш и Мьянмы подверглись воздействию сильных паводков. CropWatch предсказывается сокращение валового сбора риса в Индии на 3%.
- *Засуха и паводки в Северной Америке.* В Северной Америке ущербы от засухи на западе и в центре были усилены паводками в некоторых районах. Количество осадков, выпавших в канадских провинциях Альберта и Саскачеван, составило лишь половину ожидаемой их суммы. В Канаде доля распаханных под культуры земель упала ниже 6-ти процентной отметки. CropWatch оценивает выход валовой продукции пшеницы в Канаде на 6% ниже уровня последних лет.

Оценка глобального валового сбора

Самая последняя оценка валовых сборов, сделанная CropWatch для сельскохозяйственного сезона 2015 г., предсказывает мировой выход валовой продукции кукурузы в 987 млн. тонн, а валовой сбор риса в 741 млн. тонн (оба сравнимы с уровнями 2014 г.); в то время как валовые сборы пшеницы и сои ожидаются к увеличению на 1%: соответственно- 725 млн.тонн и 310 млн.тонн. Глобальное процентное отношение в изменении идентично таковому для основных производителей риса и пшеницы.

Среди основных экспортеров: кукуруза и соя стоят на одинаковом уровне по выходу валовой продукции в 2014 г., тогда как выход валовой продукции риса уменьшается на 2%, а выход валовой продукции пшеницы увеличивается на такой же процент. Для США валовые сборы кукурузы и сои также соответствуют их уровням в 2014 г., тогда как валовой сбор пшеницы увеличивается на 3%. Это может явиться некоторым толчком для рынков кукурузы, риса и сои.

Китай

По оценкам CropWatch суммарный годовой выход продукции растениеводства достигнет 567.7 млн. тонн, что на 0.7% выше уровня 2014 г. (увеличение составляет3.9 млн.тонн). В Китае для произрастания озимых культур сложились благоприятные условия во время фазы налива зерна: CropWatch производит коррекцию конечного валового сбора озимых культур в Китае для 2015 г. к уровню в 125.7 млн.тонн - т.е. увеличение на 2.2 млн. тонн или на 2% в сравнении с 2014 г. Конечный валовой сбор яровых культур прогнозируется в 406.9 млн.тонн - т.е. его 0.5% увеличение (или увеличение на 2 млн. тонн) относительно прошлого засушливого года и что немного выше валового сбора яровых культур в 2013 г. Валовой сбор раннего риса оценивается в 35.1 млн. тонн - т.е. его 1% -ное сокращение относительно предыдущего года.

Согласно последним оценкам для яровых культур, помещенным в этом бюллетене, в 2015 г.валовой сбор кукурузы остается сравнимым со сбором в 2014 г. - т.е. 192.8млн. тонн. Наибольшие его увеличения достигнуты в провинциях**?** Чуньцин **?** Ганьсу, Хэбей, Хэнань и Синьцзян (+3% в каждой), тогда как значительные снижения наблюдаются для провинций Внутренняя Монголия, Нинься, Шанси и Шэнси. Нижеприводимые факторы снижений варьируют от провинции к провинции и включают засуху и вредителей во Внутренней Монголии и засуху в Шанси.

Валовой сбор сои в Китае сохраняет долговременный отрицательный тренд и достигает 12.7 млн. тонн (спад 3% относительно уровня 2014 г.), главным образом из-за сокращения засеянной под культуру площади в сравнении с прошлым годом.

Валовой сбор риса в Китае предсказывается к увеличению на 1% по сравнению с 2014 г. при выходе валовой продукции риса в 202.3 млн.тонн как результат 2%- ного увеличения валового сбора риса, высаживаемого в обычные сроки, несмотря на сокращение валовых сборов раннего (-1%) и позднего (-2%) риса. Совокупный валовой сбор риса обнаруживает сокращение в провинциях Гуандун, Хунань, Цзянси, Юннань и Чжэцзян. Как правило, площади территорий, где практикуется выращивание двух культур в год в одном культурообороте, в последние годы сокращаются, тогда как площади под рис, высаживаемый в обычные сроки, расширяются. Как подчеркивается в новом разделе, описывающем фитосанитарные состояние посевов и насаждений в Китае, около двух третей всех отведенных под выращивание риса площадей подверглись нашествию дельфацидов (главным образом в бассейне р.Янцзы) и треть (главным образом в районах нижнего течения р.Янцзы) поражена ризоктониозом. Посевы кукурузы слегка пострадали от присутствия в них листогрызущей совки.

Resumen

El boletín de CropWatch, preparado por Institute of Remote Sensing and Digital Earth (RADI) de la Academia Nacional de Ciencias de China, considera indicadores ambientales y agronómicos basados en satélites para determinar en forma cualitativa y cuantitativa la producción mundial de alimentos. Además de China, el análisis se enfoca en las principales aéreas de producción y en los principales países exportadores. El boletín también genera reportes de tendencias actuales, desastres naturales, y otras circunstancias y eventos de interés para la agricultura global y la seguridad alimentaria, como la perspectiva de ocurrencia del fenómeno El Niño. Este boletín además presenta una nueva sección acerca de las condiciones fitosanitarias de los cultivos en China.

El presente período de reporte de abril a julio de 2015 cubre la cosecha de cultivos de invierno y el crecimiento de cultivos de verano en el hemisferio norte, así como también el crecimiento de cultivos de invierno en el hemisferio sur. Luego de proveer una visión general de las condiciones agroclimáticas globales junto con los impactos agronómicos en las principales zonas de producción (MPZs), el boletín analiza en detalle los principales países productores, incluyendo China, y enfocado en cultivos de maíz, arroz, trigo y soja.

Condiciones generales agro-ambientales y agronómicas entre abril y julio de 2015

A escala global, las precipitaciones- según el indicador de CropWatch RAIN -excedieron el promedio en un 4%, mientras que la temperatura (TEMP) estuvo 0,4°C por encima del promedio; julio mostró el valor más alto de temperatura registrado hasta el momento. La producción de biomasa potencial resultante estuvo 1 % por encima del promedio de los últimos cinco años. La radiación (medida por RADPAR) fue similar al promedio. En conjunto, el período reportado fue caracterizado por una inusual frecuencia de condiciones extremas, algunas de ellas asociadas con el fenómeno El Niño. Algunas de estas condiciones extremas incluyen:

- *Altas temperaturas y precipitaciones en parte de Asia Central.* Sectores de Asia Central (sur de Mongolia, Gansu-Xinjiang en China, montañas de Ural y Altái y zonas adyacentes) registraron altas temperaturas junto con abundantes precipitaciones, en algunos casos más del doble de las esperadas. Algunas de las principales áreas se beneficiaron con condiciones favorables para producción de biomasa de forrajes y cultivos. Por ejemplo, CropWatch estima un incremento en la cosecha de trigo en Kazajistán del 15 %, a partir de las condiciones favorables y uno de los mayores incrementos a nivel nacional en área cultivada (9%).
- *Sequía en áreas templadas de Asia y África.* Principalmente áreas templadas (incluyendo algunas zonas tropicales elevadas) de ambos hemisferios sufrieron sequía, resultando en menores producciones de biomasa. Las áreas en cuestión son el este y sur de África, incluyendo zonas elevadas del este de África y Madagascar. Como resultado, CropWatch ubica la producción de maíz en Sudáfrica un 25% por debajo de lo cosechado el año anterior, e incluye a Etiopía entre los países que requieren un seguimiento especial.
- *Déficit de precipitaciones en el Este Asiático.* En el este asiático, un déficit severo de precipitaciones afectó la República de Corea (-51%) y DPR Corea (-63%), así como también la región que incluye el Loess chino, región de Huanghuaihai, noreste de China, provincia de Taiwán y el este de Asia Central donde el déficit promedio fue hasta el 50% para las lluvias, mientras que las temperaturas fueron cercanas al promedio y la radiación se incrementó un 2% por encima del promedio.

- *Déficit de precipitaciones y temperaturas elevadas en Eurasia*. El oeste de Eurasia, incluyendo gran parte del Oeste de Europa y el Cáucaso, mostró una reducción en las precipitaciones promediando un déficit cercano al 25 % junto con elevadas temperaturas. CropWatch estima que la producción de maíz caerá un 2% en Francia, 8 % en Rumania (donde la fracción de área cultivada también disminuyó un 3 %), y 10 % en Ucrania, a pesar del incremento en la fracción de área cultivada en este país.
- *Ciclones y tormentas en Asia.* En el sur y este de Asia, ciclones, tormentas e intensas precipitaciones monzónicas produjeron estragos con pérdidas de vidas, inundaciones, daños en infraestructura y pérdida de cultivos. Por ejemplo, el tifón Chan-hom causó daños en agricultura y transporte por US$ 1.500 millones en las provincias chinas de Zhejiang y Jiangsu a finales de junio. India, Bangladesh y Myanmar fueron también víctimas de inundaciones severas durante el mismo período y al final de julio. CropWatch proyecta una disminución en la producción de arroz en India del 3 %.
- Sequía e inundaciones en América del Norte. En América del Norte, pérdidas por sequía en el oeste y centro fueron agravadas por inundaciones en algunas áreas. En Canadá, las precipitaciones fueron la mitad de las esperadas en Alberta y Saskatchewan. La fracción de área cultivada disminuyó 6 puntos porcentuales en Canadá. Las estimaciones de CropWatch para la producción de trigo en Canadá indican una disminución del 6% en relación al año anterior.

Estimaciones de Producción a Nivel Global

Las últimas estimaciones de producción de CropWatch para 2015 indican cosechas para maíz de 987 millones de toneladas, y de arroz de 741 millones de toneladas (ambos niveles comparables a 2014), mientras que la producción de trigo y soja muestra un incremento de 1% hasta 725 millones de toneladas y 310 millones de toneladas, respectivamente. Los porcentajes globales de cambio son idénticos a los de los principales productores de arroz y trigo.

Entre los principales exportadores, maíz y soja permanecen en valores similares de cosecha a 2014, mientras que el arroz disminuye su cosecha 2% y trigo incrementa ese porcentaje. En Estados Unidos, la producción de maíz y soja se mantiene al nivel de 2014, mientras que la producción de trigo se incrementa un 3%. Esto podría generar algún impacto en los mercados de maíz, arroz y soja.

China

CropWatch estima una cosecha total anual de alimentos de 567,7 millones de toneladas (excluyendo frutas, hortalizas y cultivos de azúcar), 0,7% por encima de 2014 (incremento de 3,9 millones de toneladas). Los cultivos de invierno aprovecharon las condiciones favorables en sus etapas de llenado de granos. La producción ajustada de CropWatch de cultivos de invierno de China en 2015 asciende a 135,7 millones de toneladas, un incremento de 2,2 millones de toneladas o 2 % en comparación con 2014. La predicción total para cultivos de verano es de 406,9 millones de toneladas, 0,5 % de incremento o 2 millones de toneladas con respecto al año anterior en que hubo sequía, levemente por encima de la producción de cultivos de verano de 2013. La producción de arroz temprano se ubica en 35,1 millones de toneladas, 1 % por debajo del año anterior.

De acuerdo a las estimaciones actualizadas para cultivos de verano de este boletín, la producción de maíz permanece comparable a la de 2014, en 192,8 millones de toneladas. Los mayores incrementos fueron logrados en Chongqing, Gansu, Hebei, Henan y Xinjiang (+3% cada uno), mientras que grandes caídas fueron observadas en las provincias Mongolia interior, Ningxia, Shaanxi y Shanxi. Las causas de esta disminución en producción varían de provincia en provincia, incluyendo sequías y adversidades en Mongolia interior y sequías en Shaanxi.

La soja continúa con su tendencia de producción negativa a largo plazo en China y alcanza los 12,7 millones de toneladas (una caída del 3% en comparación a 2014), principalmente por una disminución del área sembrada en comparación al año anterior.

La producción de arroz se incrementa un 1% con respecto a 2014 con una cosecha de 202,3 millones de toneladas, como resultado de un incremento del 2 % en la producción de arroz de una estación (single rice) y a pesar de la disminución en producción de arroz temprano (-1 %) y tardío (-2 %). La producción de arroz muestra disminución en las provincias de Guandong, Hunan, Jiangxi, Yunnan y Zhejiang. En general, áreas con doble cultivo muestran una disminución, mientras que áreas con una estación de cultivo se incrementaron durante los últimos años. Según se menciona en la nueva sección que describe condiciones fitosanitarias en China, cerca de dos tercios de las áreas de cultivo de arroz fueron afectadas por chicharrita (planthoppers - principalmente en la cuenca del rio Yangtze) y un tercio (principalmente en el área del bajo Yangtze) padecieron tizón de la vaina (rice sheath blight). El maíz fue afectado por oruga militar (armyworms).

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

Contrary to several previous reporting periods, monitoring results for the four-month period of April to July 2015 do not display very coherent spatial variations of abnormal weather conditions. Globally,[1] the RAIN indicator exceeds the recent average by 4%, while TEMP and BIOMSS were respectively 0.4°C and 1% above average; RADPAR was average.

Very abundant rainfall—more than double the expected amounts—was recorded in southern Mongolia (MRU-47, 195% excess) and adjacent Gansu-Xinjiang in China (MRU-32, +130%), as well as in agriculturally unimportant sub-arctic America (MRU-65, +183%). This last MRU also experienced the largest positive temperature departure (+1.5°C) among all MRUs. Sunshine conditions were about average in all the mentioned MRUs, but some biomass accumulation potential records are broken owing to both high temperature and abundant precipitation in southern Mongolia (MRU-47, +85%), sub-arctic America (MRU-65, +185%), and Gansu-Xinjiang (MRU-32, +69%). Both southern Mongolia and Gansu-Xinjiang are major livestock production areas and have benefited from exceptionally positive conditions.

Other areas with precipitation excesses above 30% during the reporting period include central eastern Brazil (MRU-23, +64), southwest United States and north Mexican highlands (MRU-18, +57%), Lower Yangtze (MRU-37, +41%), Ural to Altai mountains (MRU-62, +39%), the U.S. Cotton Belt to Mexican Noreste (MRU-14, +38%), and the northern Great Plains (MRU-12, +30%). Several are mentioned in section 5.2 on disasters, as precipitation was often concentrated in short and violent episodes. All mentioned areas had below average sunshine but temperatures close to average, with the exception of the Ural to Altai mountains (MRU-62) where radiation was average while temperature was higher than normal (+0.8°C). All also enjoyed above average biomass production potentials, varying from +3% in the northern Great Plains (MRU-12) to much higher values such as those in the southwest United States and north Mexican highlands (MRU-18, +64%).

A number of mostly temperate areas (including some tropical highlands) in both hemispheres suffered a significant rainfall deficit in excess of 20%. In several areas, the BIOMSS deficit was between -19% and -35%. Areas with significant rainfall deficits could be described as follows:

- Eastern and southern Africa, including East African highlands (MRU-02), Madagascar (MRU-05 and MRU-06), and Western Cape (MRU-10), with water deficits from -69% to -26% and an average deficit of -45%. Temperature in this area was above average and close to the overall

[1] Globally here refers to a planetary, non-weighted average.

planetary increase. Southern Africa as a whole (MRU-09) experienced a marked rainfall deficit of 17%.

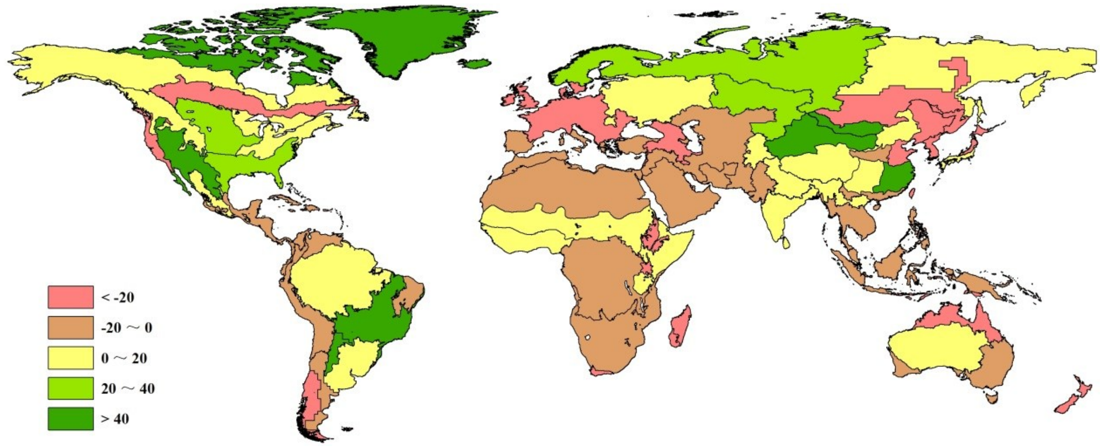
- Oceania, including northern Australia (MRU-53) and New Zealand (MRU-56), with an average deficit of -43% in both areas. Temperature was slightly above average (+0.2°C). The drought also affected the Queensland to Victoria (MRU-54; -18%).
- South America and in particular western Patagonia (MRU-27), which had a RAIN deficit of 43%, comparable with Oceania above. The temperature departure, however, was higher (+0.6°C), and it was accompanied by a 3% drop in RADPAR. Almost the entire western fringe of the American continent experienced below average rainfall (see also point (5) just below), even if less marked than in western Patagonia, covering northern South and Central America (MRU-19; -19%), the central-northern Andes (MRU-21, -17%), and the semi-arid Southern Cone (MRU-28, -15%).
- Eastern Asia, including the China Loess region (MRU-36), Northeast China (MRU-38), eastern Central Asia (MRU-52), Huanghuaihai (MRU-34), Taiwan (MRU-42), and East Asia (MRU-43), with an average deficit of -33% and deficits varying from -49% to -20%. Temperature was average and the areas experienced a positive sunshine departure of 2%.
- North America, including sub-boreal America (MRU-15) and the West Coast (MRU-16), with an average rainfall deficit of -28% in both MRUs, while temperature was above the seasonal averages by almost 1 degree (0.9°C), paralleled by a 3% increase in sunshine.
- Western Eurasia, including non-Mediterranean Western Europe (MRU-60) and the Caucasus (MRU-29), with an average RAIN deficit of -23% and deficits varying from -24% to -22%. Temperature in this area was above average and close to the overall global increase.

1.2 Rainfall

Over the reporting period, the CropWatch rainfall indicator (RAIN) showed large variations across regions. With the exception of the Gulf of Guinea (MRU-03, +1%) and Horn of Africa (MRU-04, +7%) where close to normal rainfall was recorded, below average rainfall prevailed in the African continent, including Southwest Madagascar (MRU-06, -69%), Madagascar (MRU-42, -44%), the Western Cape (MRU-10, -41%), East African highlands (MRU-02, -26%), Western Cape (MRU-10, -43%), southern Africa (MRU-09, -17%), equatorial central Africa (MRU-01, -10%), and North Africa-Mediterranean (MRU-07, -10%). Below average rainfall also occurred in Mediterranean Europe and Turkey (MRU-59, -7%), non-Mediterranean Western Europe (MRU-60, -22%), eastern Central Asia (MRU-52, -26%), East Asia (MRU-43, -49%), maritime Southeast Asia (MRU-49, -18%), Punjab to Gujarat (MRU-48, -11%), mainland Southeast Asia (MRU-50, -11%), North America's West Coast (MRU-16, -28%), New Zealand (MRU-56, -46%), northern Australia (MRU-53, -40%), and Queensland to Victoria (MRU-54, -18%). Some production zones of China also suffered below average rainfall, including Taiwan (MRU-42, -44%), Huanghuaihai (MRU-34, -36%), Northeast China (MRU-38, -25%), the Loess region (MRU-36, -20%), Hainan (MRU-33, -17%), and Southern China (MRU-40, -9%).

In contrast, the production zones of North America received abundant rainfall, including those recorded in the Northern Great Plains (MRU-12, +30%), Cotton Belt to Mexican Noreste (MRU-14, +38%), Southwest United States and North Mexican highlands (MRU-18, +57%), Corn Belt (MRU-13, +10%), and British Columbia to Colorado (MRU-11, +12%). As a main rice production zone for China, Lower Yangtze (MRU-37, +41%) received abundant rainfall. Abundant rainfall was also recorded in southern Asia, including the southern Himalayas (MRU-44, +17%), as well as in the Pampas (MRU-26, +20%) and central eastern Brazil (MRU-23, +64%) in South America.

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



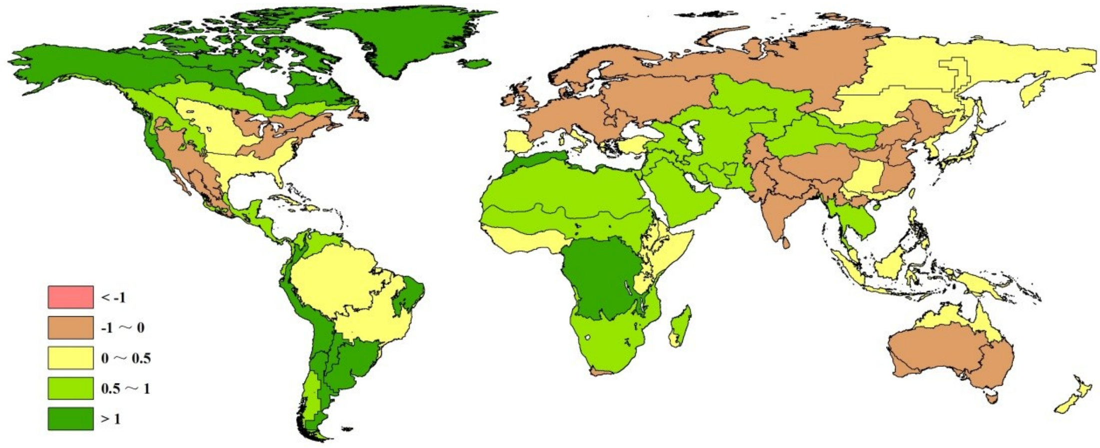
Note: Data for April-July 2015, compared with the fourteen-year average (14YA) for the same period 2001-2014.

1.3 Temperature

Temperature varied widely among regions. In 18 MRUs the temperature was lower than average by 0 to -0.6°C. Most of these MRUs are distributed in China, West Asia, Europe, and North America. In China, in the Lower Yangtze (MRU-37, -0.6°C), Loess region (MRU-36, -0.6°C), Huanghuaihai (MRU-34, -0.5°C), and Inner Mongolia (MRU-35, -0.5°C), temperature was significantly below average, which would affect the yield of spring crops. In Europe, temperature departure shows a decline in the area of the Ukraine to Ural mountains (MRU-58, -0.5 °C). In most parts of Australia, including Queensland to Victoria (MRU-54, -0.5°C), Nullarbor to Darling (MRU-55, 0.2°C), and Australian desert (MRU-63, -0.2°C), temperature was below average.

In most of South America, North America, and Africa, the temperature was above average between April and July. The greatest positive departure was found in North America, including Boreal America (MRU-61, +1.5°C) and sub-arctic America (MRU-65, +1.5°C), two areas of very limited agricultural importance. In South America, including in particular the Brazilian Nordeste (MRU-22, +1.4°C), Pampas (MRU-26, +1.3°C), central-northern Andes (MRU-21, +1.2°C), semi-arid Southern Cone (MRU-28, +1.2°C) and central-north Argentina (MRU-25, +1.1°C), the temperature anomaly significantly exceeded 1°C.

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



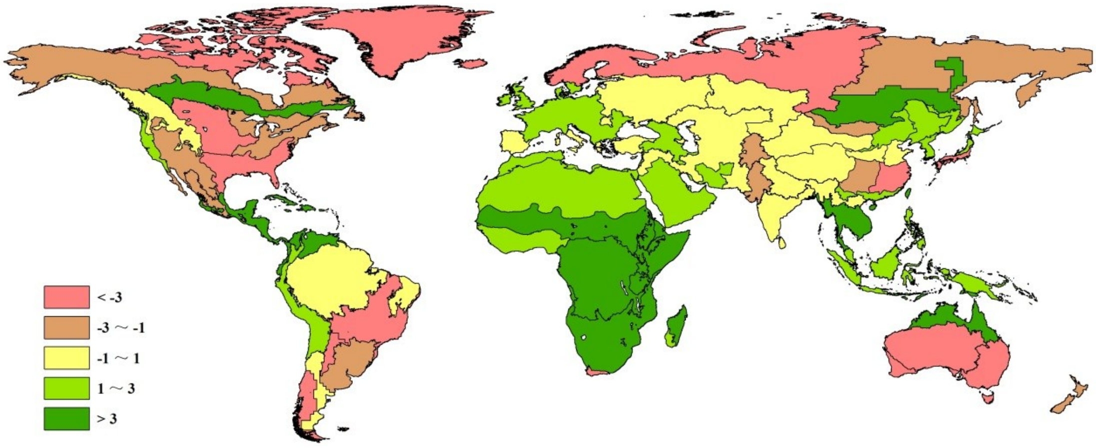
Note: Data for January-April 2015, compared with the fourteen-year average (14YA) for the same period 2001-2014.

1.4 Photosynthetically active radiation

As a key agroclimatic indicator, Photosynthetically Active Radiation (PAR) has an obvious relationship with temperature and rainfall patterns: abundant rainfall is associated with high cloudiness, which leads to low daytime temperatures, mostly in temperate areas. As shown in the figure, most MRUs in the African continent, Caribbean region, and the west shore of the Pacific show a significant increase in PAR compared with the recent average. The areas with marked positive departures include (i) equatorial central Africa (MRU-01, +7%) and the Horn of Africa (MRU-04, +4%); (ii) Southeast Asia mainland (MRU-50, +5%), eastern Central Asia (MRU-52, +4%), and northern Australia (MRU-53, +4%); (iii) sub-boreal North America (MRU-15, +4%), northern South and Central America (MRU-19, +4%) and Caribbean (MRU-20, 4%). In contrast, PAR decreases significantly in southern Australia, including Queensland to Victoria (MRU-54, -5%) and Australian desert (MRU-63, -6%). Elsewhere, PAR also shows a decrease in the northernmost area of Eurasia (not a major crop producing region) and sub-arctic America (MRU-65, -7%). The absolute highest PAR departure from the recent reference period occurred in China Lower Yangtze (MRU-37) with -8%.

In addition to the Lower Yangtze, another major grain producing region in China shows a decrease in PAR: Southwest China (MRU 41, -2%). Favorable PAR conditions benefited Taiwan (MRU-42, +5%) and Hainan Province (MRU-33, +7%). Remaining regions in China enjoyed average levels of PAR.

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



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

1.5 Biomass

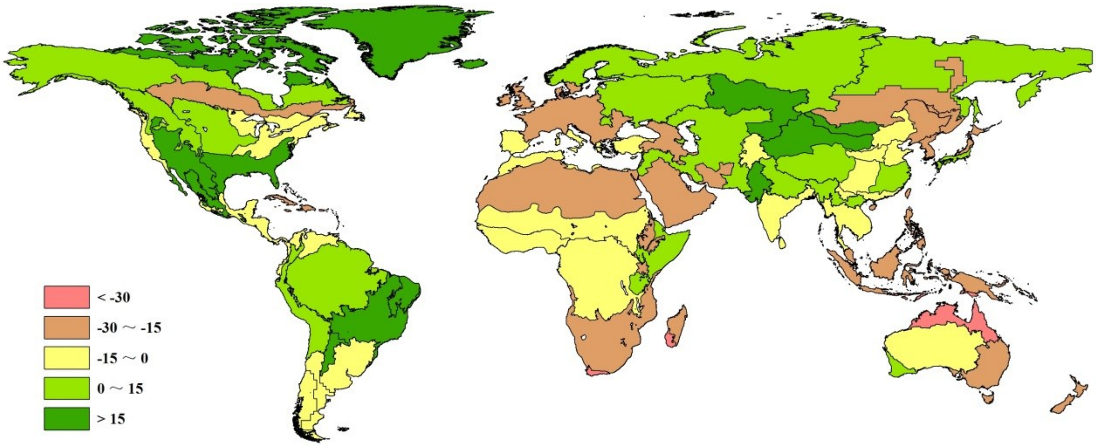
BIOMSS is a synthetic agroclimatic indicator that takes into account rainfall and temperature to estimate the potential biomass accumulation. During this monitoring period, due to the notable change in rainfall compared with average, BIOMSS is affected by the rainfall in almost all MRUs across the world. Over the reporting period, biomass variations are brought about more by RAIN anomalies than by TEMP (the R-squared between BIOMSS and RAIN is 0.79).

The greatest positive biomass departures are found in southern Mongolia (MRU-47, with BIOMSS +85% above average and RAIN +195%), Gansu-Xinjiang in China (MRU-32, +69% BIOMSS and +130% RAIN), Southwest United States and North Mexican highlands (MRU-18, +64% BIOMSS and +57% RAIN), central eastern Brazil (MRU-23, +46% BIOMSS and +64% RAIN), and Ural to Altai mountains (MRU-62, +37% BIOMSS and +39% RAIN).

Declines in BIOMSS (compared to average values for the same period) are similarly affected by decreased rainfall; the most negative biomass departures are found in Southwest Madagascar (MRU-06, -53% for

BIOMSS and -69% RAIN compared to average), Northern Australia (MRU-53, -42% BIOMSS and -40% RAIN), and South Africa's Western Cape (MRU-10, -40% BIOMSS and -41% RAIN).

Figure 1.4. Global map of biomass accumulation (BIOMSS) by MRU, departure from 5YA, April-July 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. April-July 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	628	1	29.2	0.6	1141	2
South America	439	40	19.9	0.9	775	-3
North America	526	31	19.8	0.3	1272	-4
South and SE Asia	849	11	29.6	0.1	1161	1
Western Europe	206	-26	14.9	0.1	1198	2
C. Europe and W. Russia	229	-7	15.7	-0.3	1157	1

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 (April-July) for 2001-14.

Table 2.2. April-July 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	1566	-6	83	-1	0.81
South America	1118	18	88	1	0.67
North America	1390	10	90	1	0.90
South and Southeast Asia	1453	-2	81	-4	0.85
Western Europe	846	-22	95	0	0.74
Central Europe and W. Russia	973	1	93	0	0.87

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 (April-July) for 2010-2014.

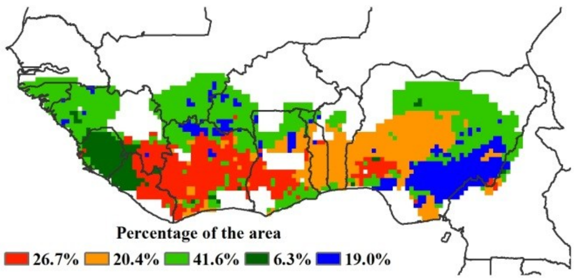
2.2 West Africa

In the West Africa MPZ, the planting of maize occurs from March or April in the south, but in May or later in the north and in the west, where countries are located at higher latitudes. Rice is a major crop in the west of the MPZ. Seasons may vary from very long to bimodal in the south, depending mostly on elevation. For the reporting period, rainfall was average in the region as a whole, resulting from above average rainfall in the west (Guinea Bissau, RAIN, +25%; Sierra Leone, +14%; and Guinea, +27%), average precipitation in Ghana and Nigeria, and a relative shortfall in Liberia (-18%), Côte d'Ivoire and Togo (both -19%), and Benin (-13%). As far as rainfall distribution over time is concerned, in April the MPZ experienced below average rainfall from southern Guinea to eastern Nigeria across the center of all the countries in-between, thus leaving mostly the west (Guinea Bissau, Sierra Leone, west Liberia, and west Guinea) as well as coastal areas and the north with average conditions. A second dry spell occurred mid-June throughout the area, but it is unlikely to have affected the global water balance significantly. Significant rainfall peaks (+100mm) occurred in Sierra Leone and west Liberia in May, and in southeast Nigeria in July.

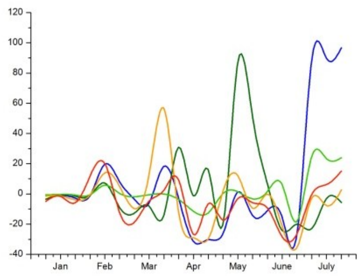
The region experienced a moderate warm spell (TEMP, +0.6°C on average) as well increased sunshine (RADPAR, +2%). Temperature peaks can be mentioned for limited areas, such as a cold spell in central northeastern Nigeria in April (-2.0°C) and a heat peak (+4.0°C) in Ghana in mid-April. Among all countries, Ghana, Togo, and Benin display the highest temperature anomalies (+0.8°C). The same countries also have the highest radiation departures (RADPAR, +4%, +3% and +6%, respectively) from average.

The biomass production potential (BIOMSS) in the region underwent a moderate drop of 6%, while the cropped arable land fraction at 83% (-1 percentage point compared to average) and VCIx (0.81) point at very close to average conditions in the west. Liberia, Côte d'Ivoire, Togo, Benin, and Nigeria underwent greater variability, with a BIOMSS drop between 10 and 14%. VHIn is very mixed, but with a tendency to low values in the north in relation with the late onset of the rainy seasons at higher latitude. Altogether, environmental conditions and vegetation indices create no particular concerns for the area. Figure 2.1 illustrates agroclimatic and agronomic indicators for the MPZ for the reporting period.

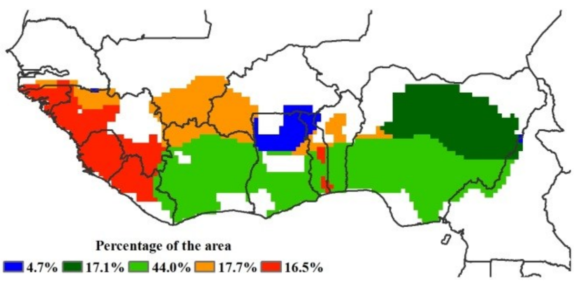
Figure 2.1. West Africa MPZ: Agroclimatic and agronomic indicators, April-July 2015



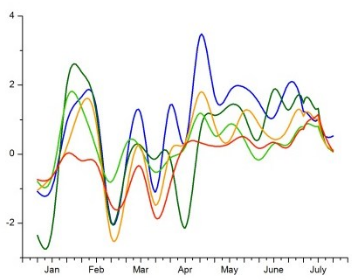
a. Spatial distribution of rainfall profiles



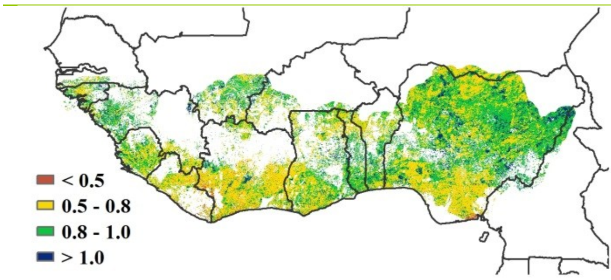
b. Profiles of rainfall departure from average (mm)



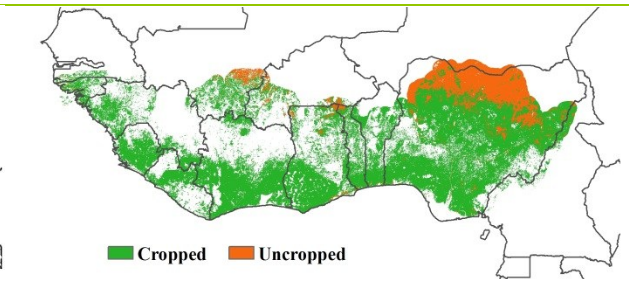
c. Spatial distribution of temperature profiles



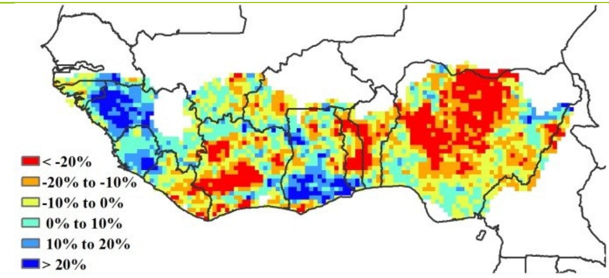
d. Profiles of temperature departure from average (°C)



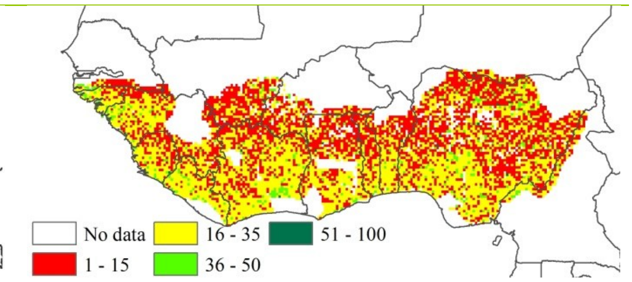
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

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

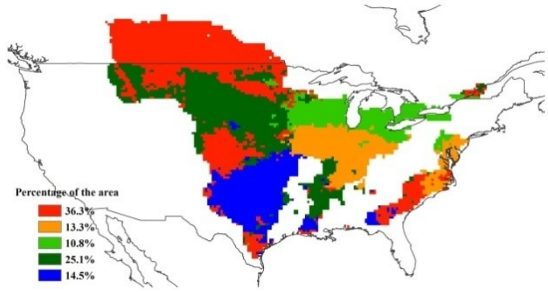
2.3 North America

In general, crop condition was above average in the North American MPZ (figure 2.2) over the reporting period. This monitoring period covered seeding, flowering, and heading stages of summer crops (maize, soybeans, barley, oats, spring wheat, and durum wheat) as well as heading and harvesting stages of winter wheat (hard red, soft red, soft white, and hard white wheat). Overall, the agroclimatic indicators show that rainfall (RAIN) was 31% above average and temperature (TEMP) average, while radiation (RADPAR) was 4% below average. Biomass (BIOMSS) shows a 10% positive departure, and the fraction of cropped arable land (CALF) was 1 percentage point above average. The maximum VCI for the MPZ was 0.9.

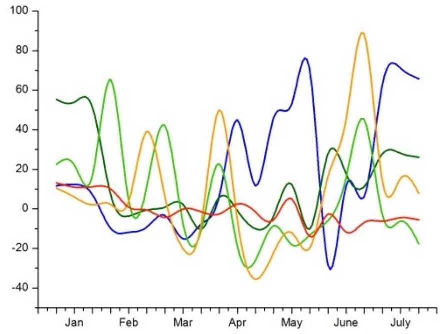
In June and July, abundant rainfall fell in the Corn Belt and major soybean production zones, providing enough soil water for maize and soybeans growth, especially in Iowa (RAIN +15%), Illinois (+59%), Nebraska (+67%), Indiana (+33%), Minnesota (+1%), Ohio (+7%), and Indiana (+33%). The good performance of crops is supported by high values for maximum VCI; VCI values in almost all regions were above 0.8 and in some states even greater than 1.0, indicating record crop condition. In the winter wheat zones, abundant rainfall occurred in Kansas (+36%), Oklahoma (+126%), Texas (+101%), and Arkansas (+56%), especially in May and July. It is reported by United States media that excessive rain caused record-breaking floods in Oklahoma and Texas; additional detail is provided in section 5.2. In the rice zones, abundant rainfall fell in Arkansas (+56%) and Louisiana (+43%), favoring the rice crop.

In Canada's main production zones, rainfall amounts were below average. In Alberta and Saskatchewan, rainfall sharply decreased by -49% compared to average. Considering rain-fed cropped land features in Canada, crop condition would be impacted by serious water stress.

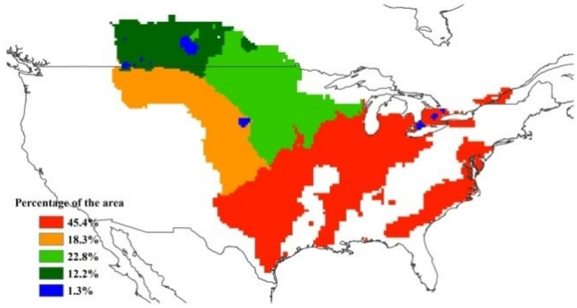
Figure 2.2. North America MPZ: Agroclimatic and agronomic indicators, April-July 2015



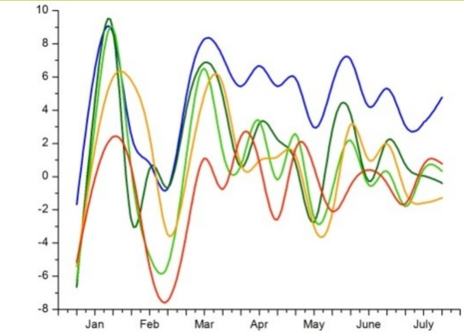
a. Spatial distribution of rainfall profiles



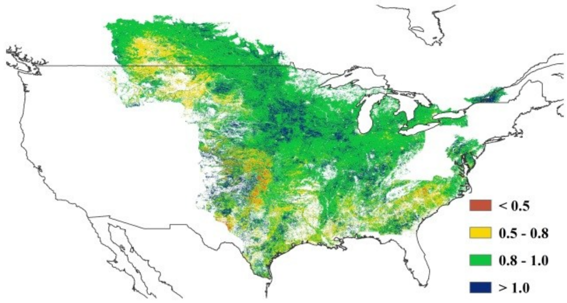
b. Profiles of rainfall departure from average (mm)



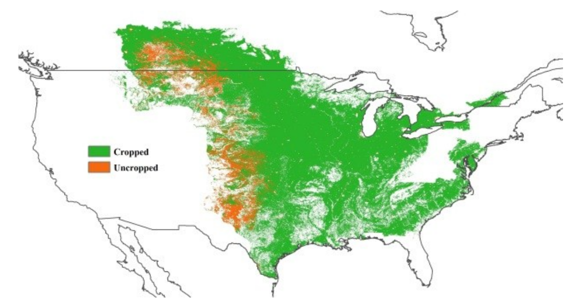
c. Spatial distribution of temperature profiles



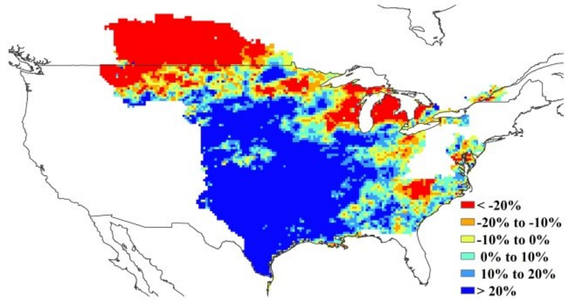
d. Profiles of temperature departure from average (°C)



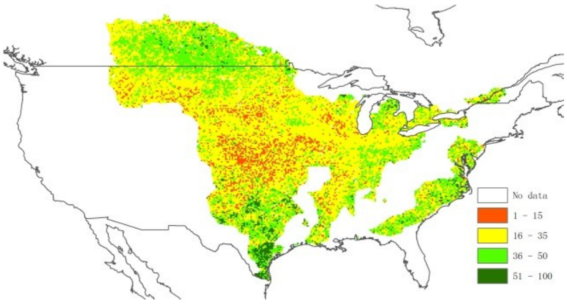
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

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

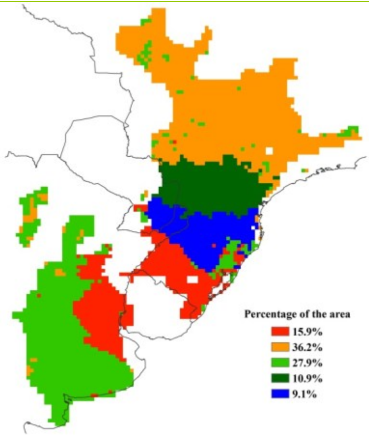
2.4 South America

The condition of crops was generally average in the South American MPZ during the monitoring period. Sufficient (40% above average) rainfall was observed over the whole area, which was beneficial for crops. High temperature (0.9°C above average), however, had negative effects on crops. Overall agroclimatic conditions were nevertheless beneficial to crops as shown by an 18% above average value for BIOMSS.

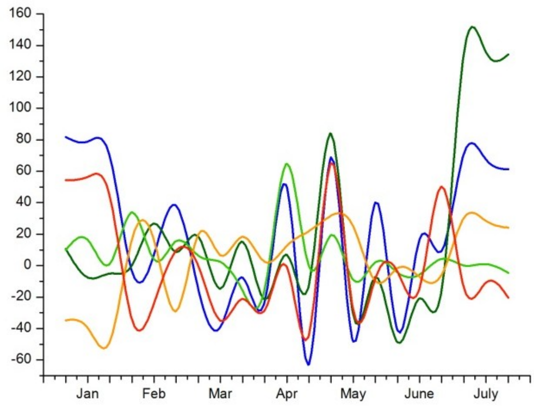
Figure 2.3 presents agroclimatic and agronomic indicators for the MPZ over the last four months. Spatially, significantly above average BIOMSS occurred in the central Pampas in Argentina and Mato Grosso do Sol and neighboring states in Brazil, where crops enjoyed adequate rainfall. Rainfall clusters and the corresponding profiles also confirm this. Below average BIOMSS is observed in adjacent regions of Paraguay resulting from both low rainfall and high temperature. According to the temperature departure clusters and profiles, the extreme high temperature in May and late July dominates the whole MPZ and had negative impacts on crops as confirmed by a low vegetation health index (VHI). Rainfall was more than double the normal precipitation in Goias and Mato Grosso and around 70% above average in Mato Grosso Do Sul and Parana from April to July (see also annex A, table A.5). The abundant rainfall mitigates the impacts of high temperature on crops as shown by high values indicated on the maximum vegetation index (VCIx) map.

The VCIx map further indicates crop conditions in Argentina are less favorable than those in Brazil. The low VCIx values in Argentina are mainly due to the unseasonably early harvest of summer crops concluded in April, which was already observed in the previous bulletin. Average VCIx for the MPZ is 0.67 over the reporting period. Meanwhile, CALF is 89%, which is 1 percentage point above the previous five-year average. Most of the uncropped arable land is in an area between Bahia Blanca and Santa Rosa. Other uncropped arable land is scattered in the northern part of the MPZ.

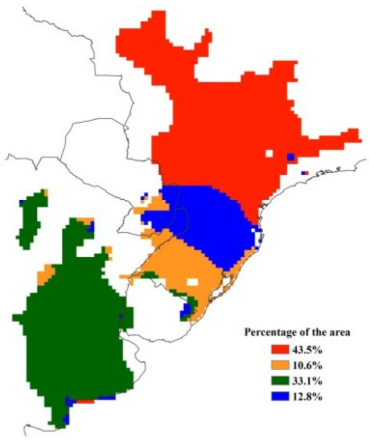
Figure 2.3. South America MPZ: Agroclimatic and agronomic indicators, April-July 2015



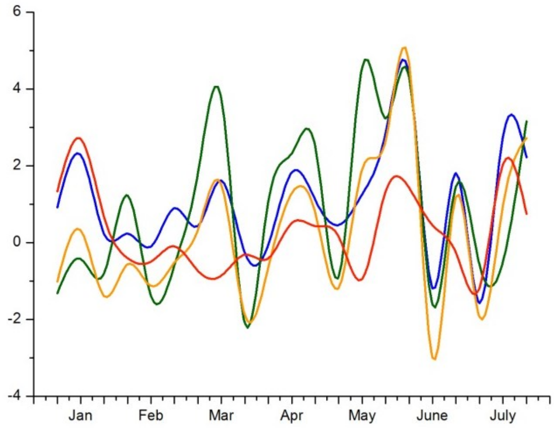
a. Spatial distribution of rainfall profiles



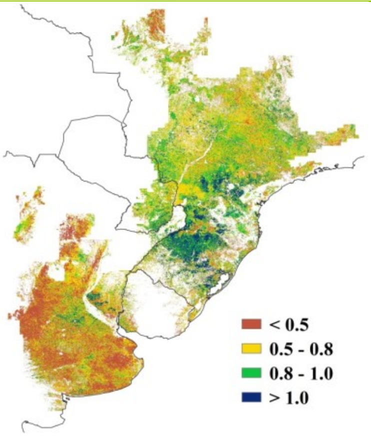
b. Profiles of rainfall departure from average (mm)



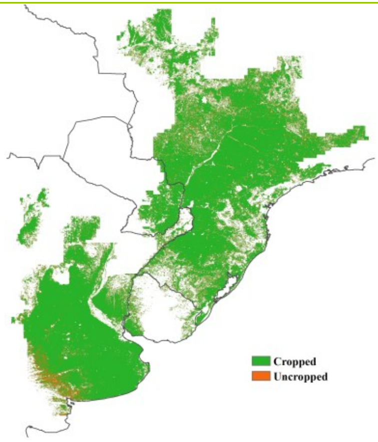
c. Spatial distribution of temperature profiles



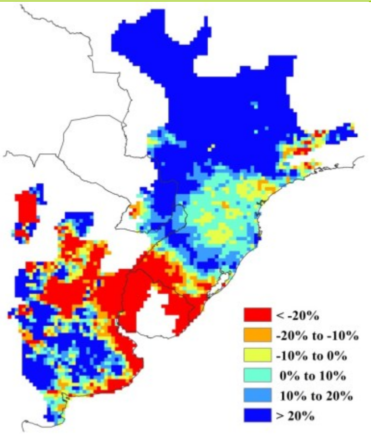
d. Profiles of temperature departure from average (°C)



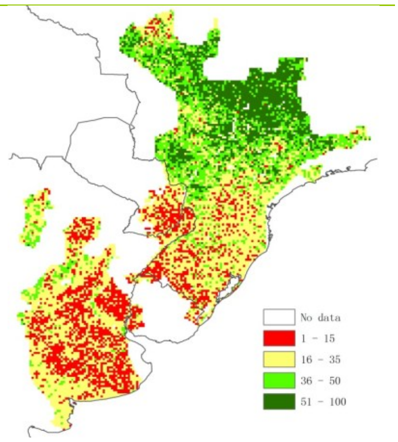
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

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

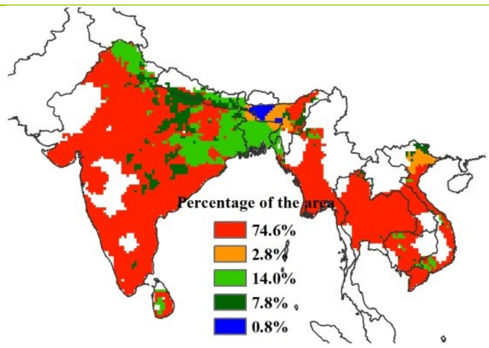
2.5 South and Southeast Asia

The reporting period is the planting and growing season of rice and maize in this MPZ. Overall, the CropWatch agroclimatic indicators show average crop condition. Rainfall for the entire zone was 11% above average, but low rainfall was recorded for Myanmar (-12%), Thailand (-24%), and Cambodia (-3%), while above average rainfall occurred in Bangladesh (+30%) and India (+11%). The spatial distribution of rainfall profiles indicate 74.6% of the MPZ experienced deficit rainfall after June. Temperature and radiation for the MPZ were about average.

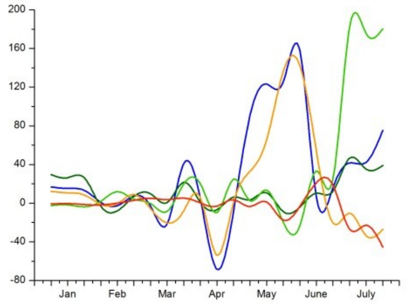
The maximum VCI values for the MPZ range from 0.5 to 1, pointing at average to favorable crop condition. However, VCIx values below 0.5 are recorded in some parts of southern and western India where they indicate poor crop condition. The fraction of crop arable land (CALF) was 81%. The uncropped areas were spatially distributed in the Indian state of Karnataka, Andhra Pradesh, Gujarat, Rajasthan, and the central part of Myanmar. The biomass accumulation potential for the MPZ was slightly below average (-2%). Its spatial distribution shows below average values in western India, most of Thailand, and some areas of Vietnam. Low values of VHI minimum were found over central India, Myanmar, Thailand, and Cambodia, indicating water stress linked with low rainfall.

Overall, crop condition is average in the MPZ, in spite of severe floods in northeastern India, Myanmar, and Bangladesh, and dry weather in western India, Thailand, Cambodia, and Vietnam.

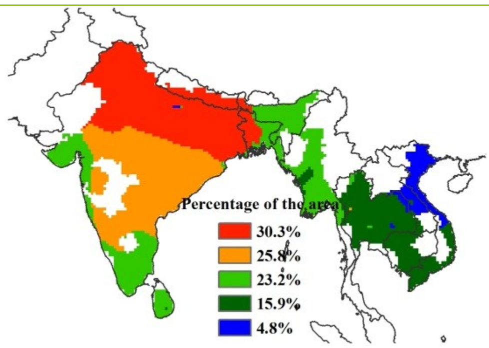
Figure 2.4. South and Southeast Asia MPZ: Agroclimatic and agronomic indicators, April-July 2015



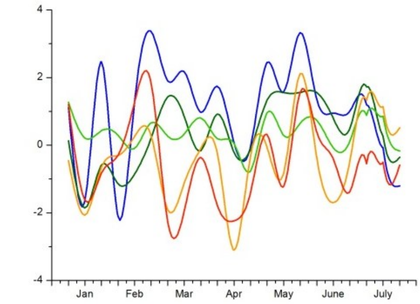
a. Spatial distribution of rainfall profiles



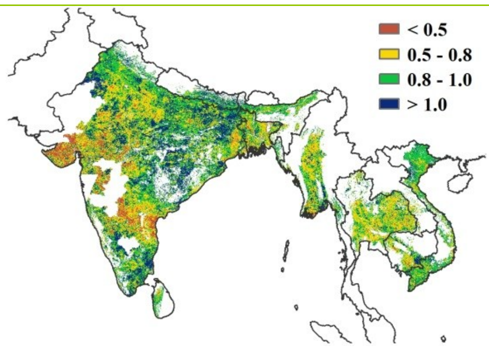
b. Profiles of rainfall departure from average (mm)



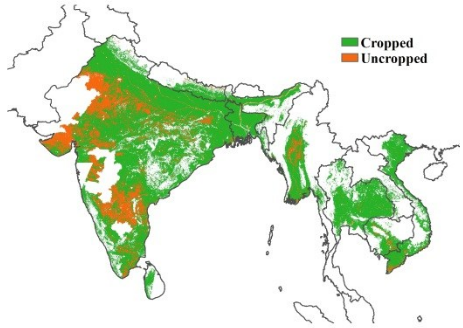
c. Spatial distribution of temperature profiles



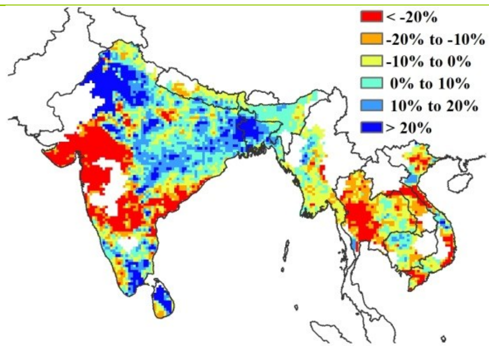
d. Profiles of temperature departure from average (°C)



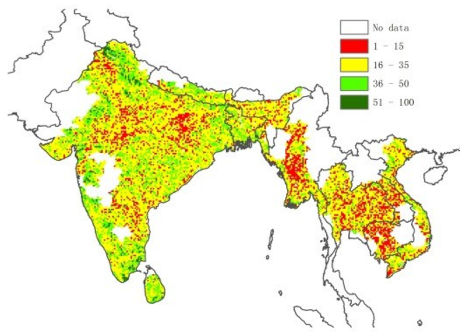
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

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

2.6 Western Europe

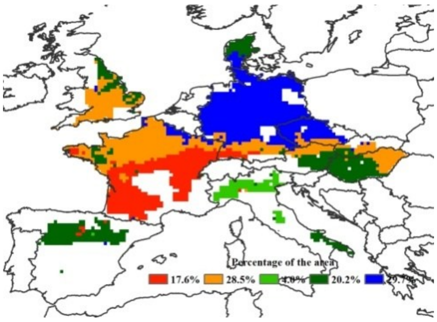
In general, crop condition was below average in most parts of Western Europe during this reporting period, with drought and high temperature conditions hitting spring and winter crops during grain filling and maize while flowering. Figure 2.5 presents an overview of CropWatch agroclimatic and agronomic indicators for this MPZ.

The total precipitation was 26% below average, with exceptional positive departures in RAIN over most of Spain, eastern Austria, western Hungary, most of Denmark, and also northern Italy from late May to early June. Meanwhile, overall TEMP showed an increase of 0.1°C while RADPAR for the MPZ was 2% above average. On a more detailed level, high temperatures occurred in most of Western Europe during this reporting period, with exceptional below average temperatures in the middle of May and early June. Due to the rainfall deficit and warm weather in most of Western Europe, overall BIOMSS for the MPZ was 22% below the recent five-year average. As shown in figure 2.5, the highest values for BIOMSS (20% and above) occurred over western Spain, eastern Austria, western Hungary, and most of Denmark where water stress was experienced in limited areas. In contrast, BIOMSS in most other regions (including most of France, western and northern Germany, southern United Kingdom, northern Hungary, southern Czechia, and southern Slovakia) was 10% below average with severe water stress and high temperature effects. The values for the minimum VHI confirm the water deficit in those regions over the last four months.

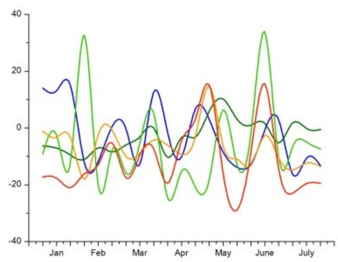
According to the VCIx map, crop condition was below average in most of Spain, France (with the exception of the north), and the eastern part of Italy. Average VCIx for the MPZ was 0.74. The CALF indicator for the fraction of cropped arable land was 95% across the MPZ, which is the same as the five-year average; most uncropped arable land is scattered in the south and northeast of Spain.

Generally, crop condition in Western Europe was unfavorable. The rainfall deficit and warmer-than-seasonal weather limited soil water storage and crop growth and reduced the yield potential of summer crops that are reaching the sensitive stages of flowering or the beginning of the grain-filling period.

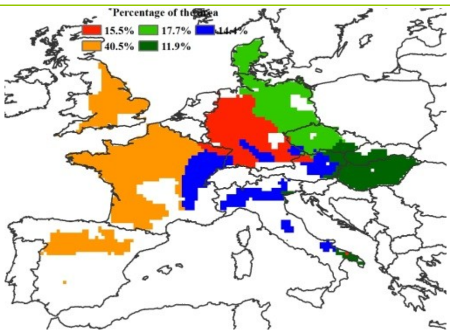
Figure 2.5. Western Europe MPZ: Agroclimatic and agronomic indicators, April-July 2015



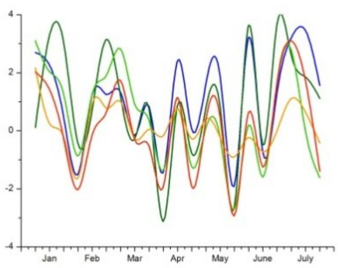
a. Spatial distribution of rainfall profiles



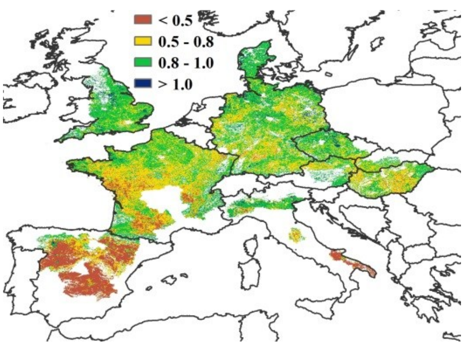
b. Profiles of rainfall departure from average (mm)



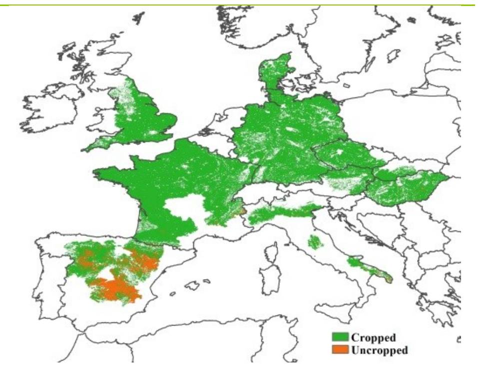
c. Spatial distribution of temperature profiles



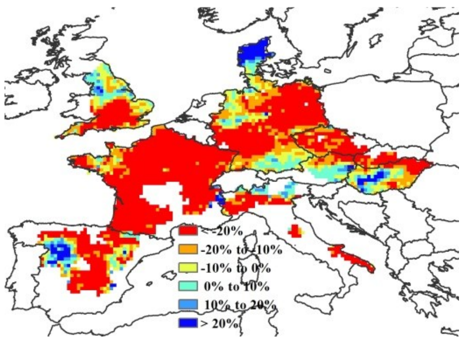
d. Profiles of temperature departure from average (°C)



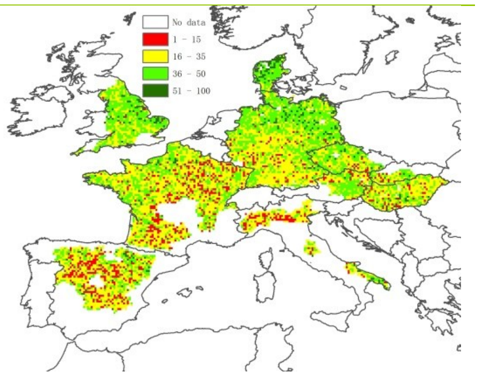
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

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

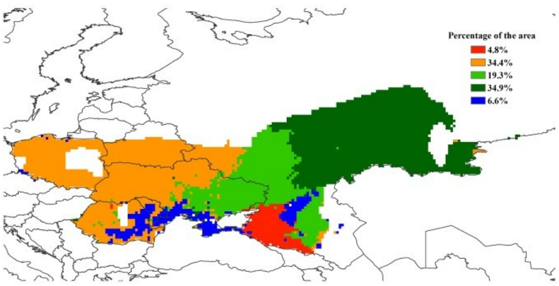
2.7 Central Europe to Western Russia

During the current monitoring period, most parts of the Central Europe to Western Russia MPZ presented favorable conditions of winter and summer crop (average VCIx=0.87). Colder and drier than usual weather has been experienced across the MPZ, with decreased rainfall (RAIN, -7%) and slightly decreased temperature (TEMP, -0.3°C). Radiation (RADPAR) increased 1% over the recent average. (See figure 2.6.)

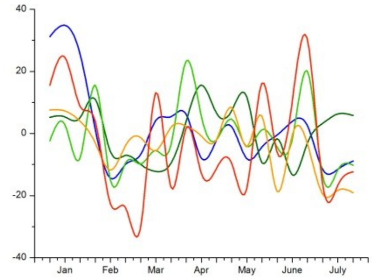
As indicated by the rainfall profile analysis, the west and south of Russia and eastern Ukraine received well above average rainfall since May, with significant rainfall peaks in mid-June, especially in the Krais of Krasnodar and Stavropol and the Oblast of Rostov, which received almost 30% more rainfall than average. Most regions of the MPZ presented below average moisture conditions in late-June and July except the eastern part of the MPZ in Russia. Temperature profiles show that the western part of the MPZ experienced low temperatures over the monitoring period, including Romania, Poland, Belarus, and western Ukraine. Most arable land in Russia shows low temperature in July.

Most arable land was actually cropped during this period, with a CALF of 93%. Due to the low temperature in the western part of the MPZ, the accumulated potential biomass (BIOMSS) is below the five-year average in Romania, Poland, Belarus (<-20%), while as a result of the BIOMSS increase in the eastern part, the biomass accumulation of the whole MPZ shows a slight increase of 1%. The average maximum VCI values reach a high of 0.87.

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

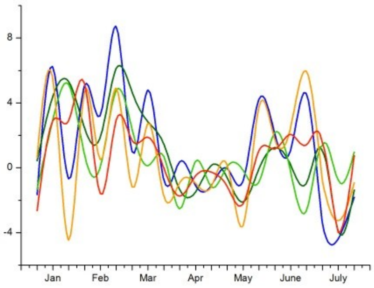


a. Spatial distribution of rainfall profiles

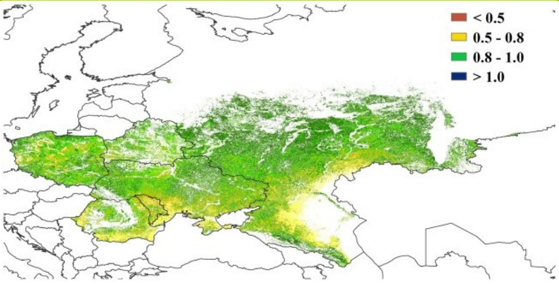


b. Profiles of rainfall departure from average (mm)

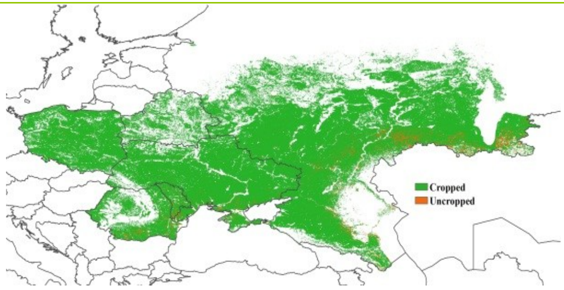
c. Spatial distribution of temperature profiles



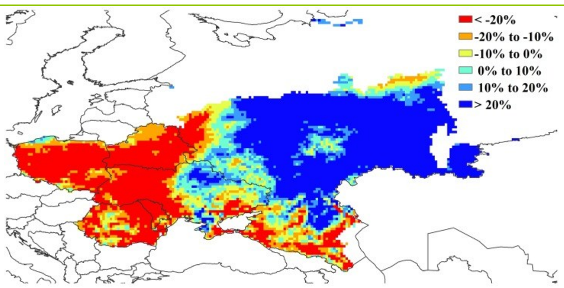
d. Profiles of temperature departure from average (°C)



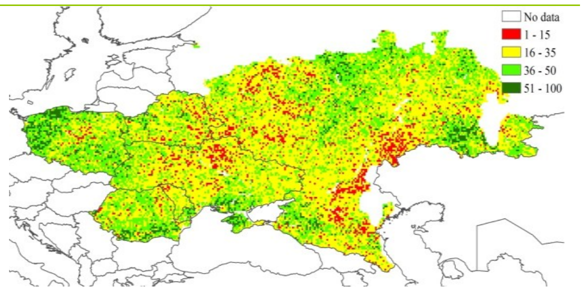
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential departure



h. VHI minimum

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

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) 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 2015 production estimates for Argentina, Brazil, Canada, 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 April-July period. Details by country are presented in table 3.1.

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

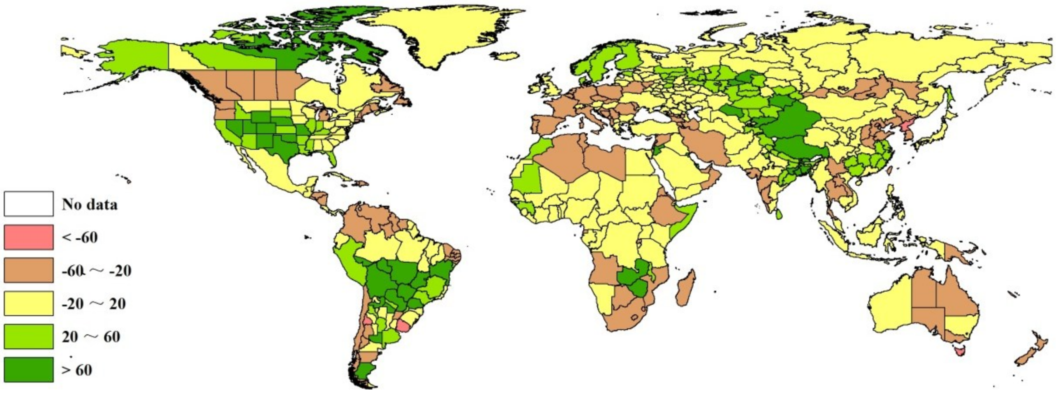


Figure 3.2. Global map of temperature (TEMP) by country and sub-national areas, departure from 14YA (degrees), April-July 2015

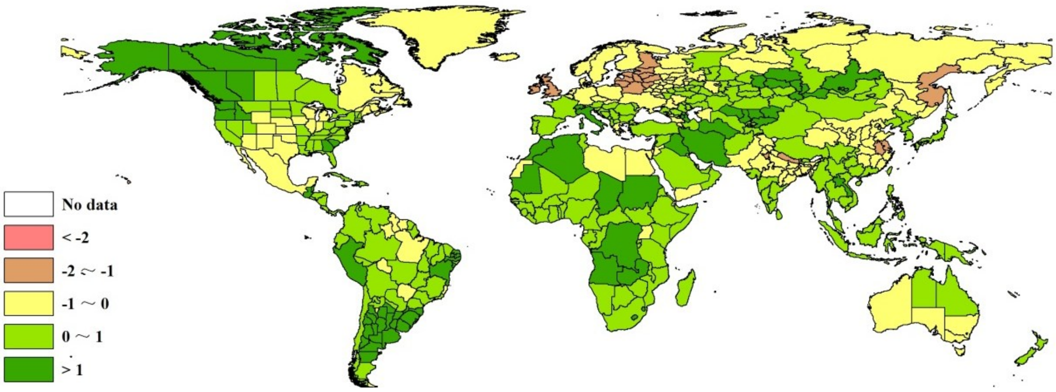


Figure 3.3. Global map of PAR (RADPAR) by country and sub-national areas, departure from 14YA (percentage), April-July 2015

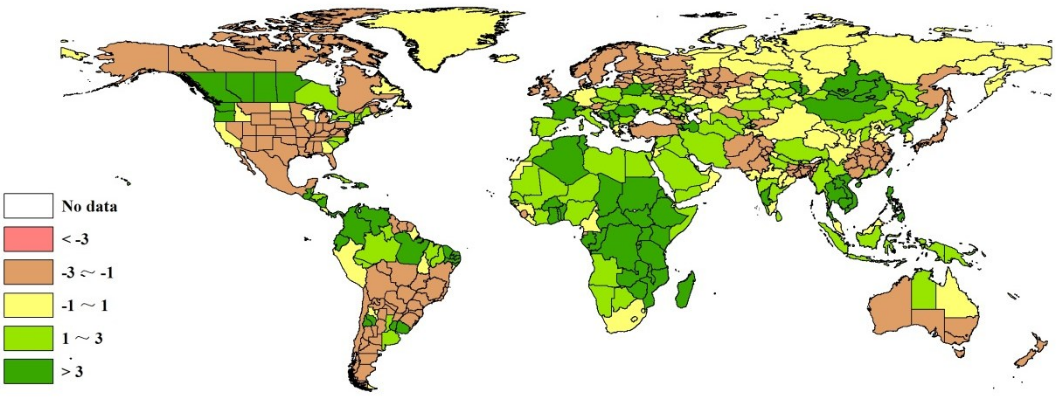
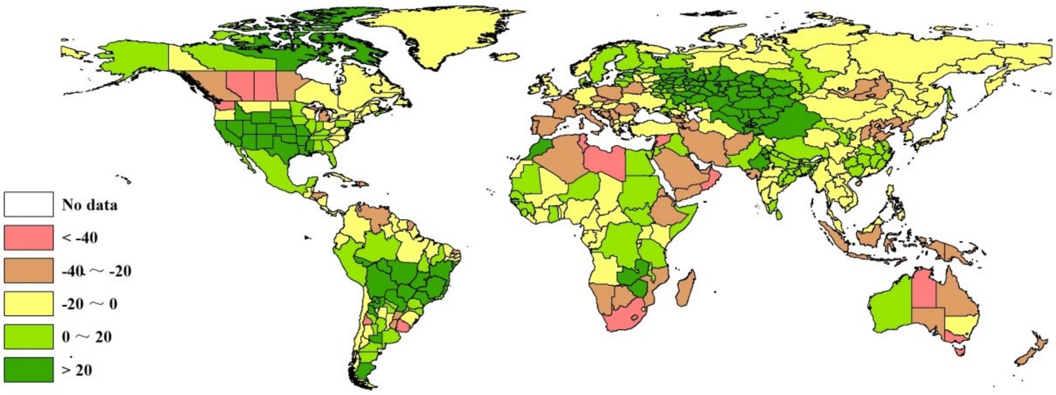


Figure 3.4. Global map of biomass (BIOMSS) by country and sub-national areas, departure from 14YA (percentage), April-July 2015



Among the 31 countries monitored by CropWatch (see the detailed analyses in section 3.2), several countries experienced nationwide favorable or unfavorable conditions, starting with a group of western European countries (France, Poland, Romania, Germany, and Ukraine; figure 3.1) where spring and early summer rainfall (RAIN) was about 26% below average (-38% in France to -20% in Ukraine) with slightly below average temperature (TEMP, -0.1°C), average sunshine as indicated by RADPAR, and a biomass production potential (BIOMSS) decrease of 24% compared to average. In Romania, cropped arable land fraction (CALF) fell 3 percentage point compared with the recent five-year average while the maximum Vegetation Condition Index (VCIx) was just fair (0.76), indicating that, among the listed countries, Romania is likely to be one of the most affected by the adverse conditions. In Ukraine, on the other hand, CALF increased 2%, and the fair crop condition (VCIx=0.86) points to a more limited impact.

Below average water supply affected two Asian countries: Iran (-41%) and Thailand (-24%), both with above average temperature (+1.4°C and +0.8°C, respectively) and above average sunshine (+2% and +8%), resulting in decreased production potentials of -13% (Thailand) and -33% (Iran). In Thailand, however, CALF was identical to the average of the last five seasons, accompanied by “good” VCIx (0.81), which is not compatible with a serious impact. In contrast, Cambodia, with a slight rainfall deficit (RAIN, -3%) and abundant sunshine (RADPAR, +5%), displays a low CALF value of 5 percentage points below average and a VCIx of 0.83; in this case non-weather factors may have played a part.

Table 3.1. CropWatch agroclimatic and agronomic indicators for April-July 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	18	1.4	-1	-2	2	0.55
Australia	-22	-0.3	-3	-17	-1	0.82
Bangladesh	71	-0.5	-9	15	0	0.79
Brazil	22	0.5	-2	24	1	0.73
Cambodia	-3	0.8	5	-5	-4	0.83
Canada	-30	0.7	4	-23	-6	0.91
China	11	-0.2	-2	0	-2	0.90
Egypt	13	-0.7	2	13	0	0.89
Ethiopia	-25	0.6	4	-22	-2	0.88
France	-38	0.5	4	-36	0	0.74
Germany	-24	-0.2	1	-19	0	0.81
India	11	-0.2	0	0	-6	0.84
Indonesia	-19	0.3	3	-23	0	0.83
Iran	-41	1.4	2	-33	1	0.41
Kazakhstan	41	0.7	1	42	9	0.89
Mexico	-4	-0.1	-2	14	5	0.89
Myanmar	-12	0.5	1	-6	0	0.84
Nigeria	0	0.5	3	-10	-3	0.83
Pakistan	17	-0.8	-3	19	1	0.85
Philippines	-5	0.4	5	-15	0	0.85
Poland	-26	-0.7	1	-24	0	0.86
Romania	-25	0.2	3	-23	-3	0.76
Russia	8	0.1	0	14	1	0.91
S. Africa	-50	0.8	0	-42	-10	0.35
Thailand	-24	0.8	8	-13	0	0.81
Turkey	14	0.1	-1	-5	6	0.68
United Kingdom	0	-1.1	-2	-7	0	0.89
Ukraine	-20	-0.5	2	-15	2	0.86
United States	33	0.2	-4	19	2	0.88
Uzbekistan	12	0.9	2	28	3	0.76
Vietnam	-2	1.0	4	-10	0	0.89

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 (April-July).

Two African countries were also affected by poor water availability: Ethiopia and South Africa. The first recorded a water deficit of 25%, with above average sunshine (+4%) and a drop in BIOMSS of 22%. The impact on cultivated land fraction is slight (-2%) and condition is generally rather satisfactory (VCIx=0.88). In the second country, the precipitation deficit in the late months of the growing season was severe (reaching -50%) with a resulting biomass production potential deficit of 42% but nevertheless close to normal sunshine and temperature. South Africa is the only country among those monitored by CropWatch that shows both a marked drop in cultivated land fraction (-10%) and poor crop condition (VCIx=0.35), leaving little doubt that crops suffered seriously from the drought.

In Australia and Canada, the rainfall deficit reached 22% and 30%, respectively. In Australia this was combined with above average temperature (+0.7°C) and sunshine (+4%), while Canada experienced relatively cool weather and a correlated sunshine drop of 3%. CALF dropped by 6% in Canada, which is one of the largest drops among all CropWatch monitored countries, although VCIx seems to be rather favorable, indicating a decrease in cropped area but satisfactory condition in planted areas.

At the national scale, significant above-average precipitation is reported from the United States, where it affected mostly southern and central western states (RAIN, +33%) with about average temperature and low RADPAR, resulting in a BIOMSS increase estimate of 19%. CALF rose 2% of the average of the recent five years, and VCIx was rather favorable (0.88), indicating at least fair conditions globally in spite of local floods and drought.

Kazakhstan also recorded excess rainfall (+41%) but otherwise average conditions, with a positive impact on BIOMSS (+42%). Considering that CALF markedly increased (+9%) and that VCIx shows good conditions (0.89), the condition of the country's crop and rangeland can be assessed as favorable. Finally, Bangladesh received large excesses of precipitation compared to average (+71%), which led to floods and also affected neighboring areas in India, Myanmar, and Nepal, as discussed in more detail in the respective country sections in this chapter and in section 5.2 on disaster events. Bangladesh suffered a very significant drop in RADPAR (-9%) but apparently no drop in cropland (as assessed by CALF and indicated by good VCIx)

When considering all countries worldwide (see also figures 3.1 to 3.4), additional detail emerges in terms of global patterns, as already indicated at a coarser spatial resolution in Chapter 1 as well as on a sub-national scale for the largest countries. Drought affected several countries in the Middle East and North Africa with negative RAIN departures in Oman (-53%), Cyprus (-68%), Lebanon (-63%), Israel (-53%) and Tunisia[2] (-60%). Drought also affected the Caribbean islands (Dominica -90%, Jamaica -54%, and Trinidad and Tobago -52%) as well as Uruguay (-61%), although the country is mostly surrounded by areas with average or above average rainfall, sometimes significantly so especially in southern Brazil and northern Argentina. Poor water supply also affected Lesotho[3] (-50%, similar to the deficit in South Africa), Eritrea (also -50%), and Comoro Island (-58%), an Indian Ocean nation that is part of the same climatic belt as Madagascar and southern Africa.

Finally, the Republic of Korea (RAIN, -51%) and the Democratic People’s Republic of Korea (-63%) also experienced water deficits. The two countries are part of a cluster also involving adjacent areas in China, in particular parts of north-east and east China (Shanxi, Henan, Hebei, Tianjin, Shandong, Taiwan, Liaoning, and Jilin) where the deficit typically ranged from 44% to 26%, with the largest value recorded in Hebei (-55%). Unconnected spatially to the previous provinces, Yunnan also suffered a deficit of 36% in a rainfall deficit area that extended into Laos (RAIN -25%) and the already mentioned Thailand.

Areas where excess precipitation occurred include mostly coastal areas in south-east China (refer to section 5.1), with excess RAIN values in the range from 32% to 54% (Hunan, Guangxi, Anhui, Jiangxi, and Shanghai), as well as the western regions of Tibet (+78%) and in Xinjiang-Uygur. The latter experienced a spectacular in RAIN of +165% compared to average. The combination of favorable and unfavorable conditions in areas in China results in a slight drop in the fraction of cropped arable land (-2 percentage points) but altogether rather favorable crop condition as assessed by VCIx (0.9).

The areas of Tibet and Xinjiang-Uygur are part of a contiguous region of excess precipitation starting in north-east India with excesses between 27% in Assam and reaching 55% in Uttarakhand over Bihar, Meghalaya, Himachal Pradesh, Chhattisgarh, and Haryana. The largest rainfall excesses were recorded in Uttarakhand (+55%), Jharkhand (+60%), Sikkim (+64%), West Bengal (+75%), and Tripura (+93%). West India, on the other hand, suffered poor rainfall, especially Goa (-70%) and Gujarat (-51%), but also Maharashtra, Kerala, Puducherry, and Karnataka (-27%). Although biomass is average, based on a low value for CALF (-6%) and a fair VCIx (0.84), slightly below average condition is expected.

North of the Xinjiang-Uygur region, precipitation excesses have benefited the mostly pastoral economies in Kyrgyzstan (RAIN, +63%) and Kazakhstan (Oblasts of Vostok (+80%) and Kyzylorda (+118%)), with

[2] Neighboring Algeria and Libya also suffered; the three countries (Algeria, Libya and Tunisia) can be considered as part of the same set of countries experiencing a rainfall deficit as the European countries for which only the most severely affected were listed. Mediterranean Europe also recorded a rainfall deficit.

[3] In contrast, both Zimbabwe (RAIN, +94%) and Zambia (RAIN, +122%) enjoyed unusually good late cropping season conditions.

rainfall excesses extending into Russia (Kurgan +68% and Tyumen +68%) as well as most areas in between and extending west up to—but not including—Finland. Conditions were generally unfavorable in southeast Siberia, including the Amur (-22%) and Chita (-35%) Oblasts as well as the Buryatia (-35%) and Tyva (-26) Republics.

3.2 Country analysis

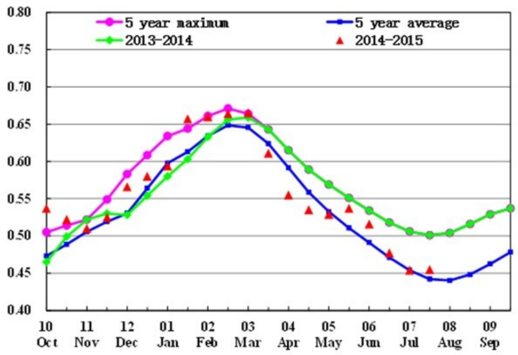
This section presents CropWatch results for each of thirty key countries (China is addressed in Chapter 4). The maps refer to crop growing areas only and include (a) Crop condition development graph based on NDVI average over crop areas, comparing the April-July 2015 period to the previous season and the five-year average (5YA) and maximum. (b) Maximum VCI (over arable land mask) for April 1 – July 31 2015 by pixel; (c) Spatial NDVI patterns up to July 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.4, 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 April-July 2015

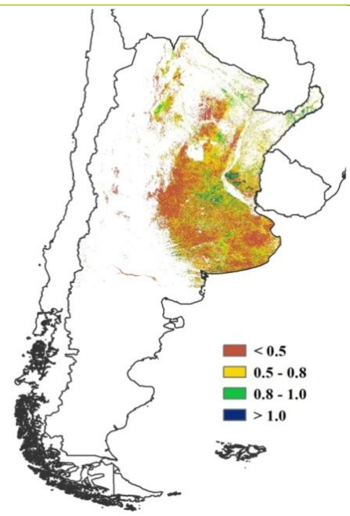
[ARG] Argentina

In general, crops in Argentina underwent below average conditions from April to July. Harvest of summer crops (mainly maize and soybean) was concluded by April. The planting of winter wheat was completed by late July and is currently in the tillering stage. At the national level, overall agroclimatic conditions were favorable as crops enjoyed sufficient rainfall (RAIN, +18% above average), warm temperature (TEMP, +1.4°C), and average radiation (RADPAR, -1%), which resulted in an average value for BIOMSS compared to the recent five years. As mentioned in the previous bulletin, high temperature and adequate rainfall advanced the maturity and harvest of maize and soybean; the NDVI peak is above the recent five-year average and that of last year. The rapid decrease of the NDVI value from March to late April indicates that the harvest of the summer crops progresses well. CropWatch puts the final production of maize and soybean at the same level as in the previous CropWatch forecast (see Annex B, table B.1). Since April, farming practices were dominated by the planting of winter wheat. Favorable agroclimatic conditions were observed in most of the major agricultural provinces with the exception of Santa Fe and Entre Rios where crops suffered 15% below average rainfall conditions. However, winter wheat condition is slightly below average in most regions according to the crop condition maps and graphs. The main reason is excess moisture during wintering, as a series of storms since August 1 has resulted in floods in major wheat producing regions, which may negatively impact wheat outputs.

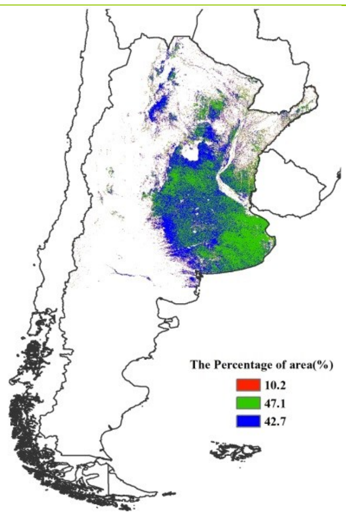
Figure 3.5. Argentina crop condition, April-July 2015



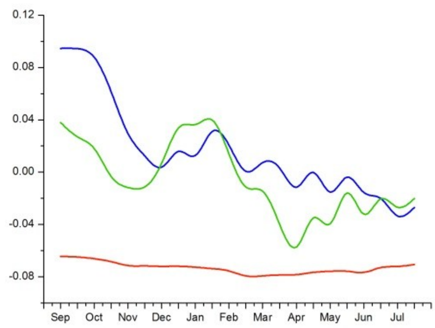
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



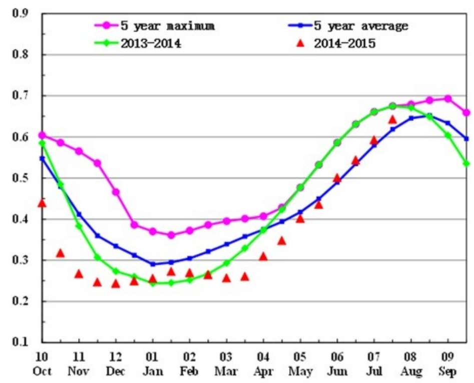
(d) NDVI profiles

[AUS] Australia

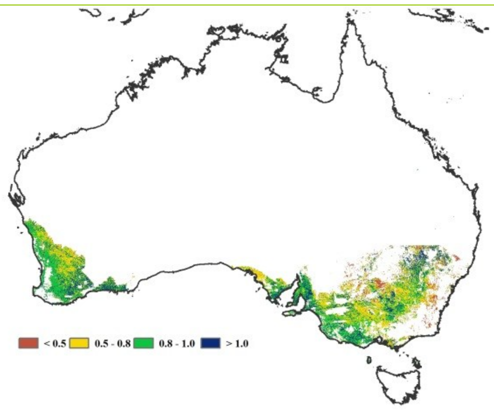
Compared to the five-year average, crop condition in Australia was generally average over the reporting period, as illustrated by the crop condition development graph. Crop condition, however, was below average in April. The total maximum VCI reached 0.82 with a stable value for the area of cropped arable land (CALF, -1%).

Although the precipitation in Australia shows a decrease of 22% compared to average (with TEMP at -0.3°C and RADPAR -3% compared to average), the planted winter wheat was in the dormant period so that the drop in precipitation will not so significantly impact its growth. However, parts of north and western Victoria show below-average NDVI values (clearly shown in the spatial NDVI patterns), which should be paid attention to; these areas account for about 41.6% of the cropped regions. Victoria also experienced a precipitation drop of 50%, possibly due to the influence of EI Niño (TEMP, -0.7°C and RADPAR, -4%), leading to a 43% drop in accumulated potential biomass (BIOMSS). Crop condition in southeastern New South Wales was below average from April to June, but improved to above average in July. Southwestern Western Australia, south-eastern South Australia, and southern Victoria all show generally average crops. In general, crop condition in Australia is favorable.

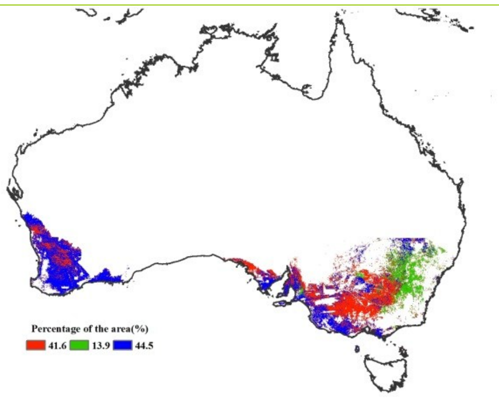
Figure 3.6. Australia crop condition, April-July 2015



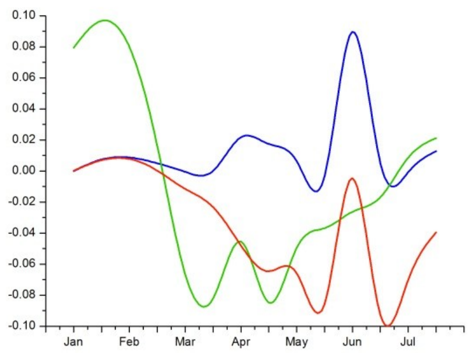
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

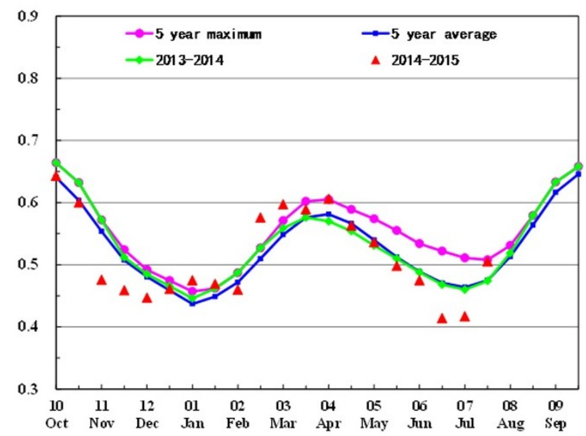


(d) NDVI profiles

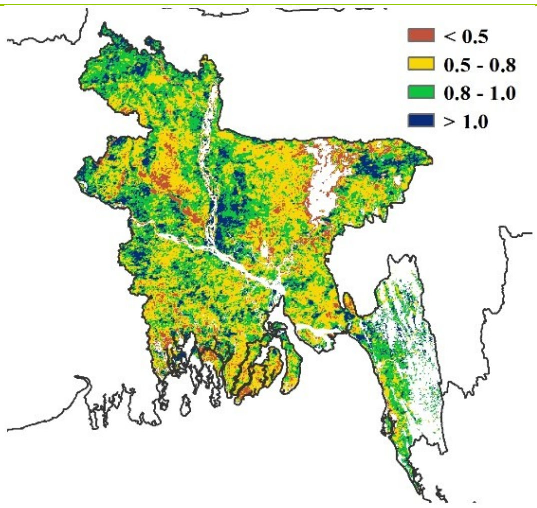
[BGD] Bangladesh

The reporting period corresponds to the growing of Aus rice and planting of Aman. Overall, the CropWatch indicators show poor crop condition at the end of the reporting period. Cyclone Komen and excess rainfall (RAIN, +71%) caused flooding in Chittagong, Rajshahi, Dhaka, Khulna, and Barisal and damaged rice crops. The overall biomass accumulation potential (BIOMSS) was 15% above average; temperature (TEMP) were average, while radiation was low (RADPAR, -9%), a very negative factor in a country where sunshine is a dominant limiting factor. Considering the previous five-year average, there were no changes in the fraction of cropped arable land. The national NDVI profile was below the average of the previous five years. In some regions of Sylhet, Dhaka, and Rajshahi. The maximum VCI recorded was below 0.5, indicating below average crop condition. However, maximum VCI values in other states ranged from 0.5 to 1, pointing to average crop condition. Spatial NDVI profiles for the whole country dropped during May to early June; however, profiles started to recover in the end of June except for the areas of Khulna, Barisal, Chittagong, and the region south of Dhaka, where profiles started to improve only in mid-July.

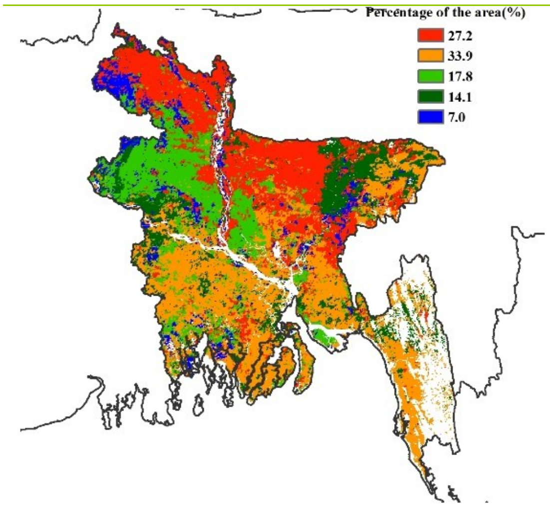
Figure 3.7. Bangladesh crop condition, April-July 2015



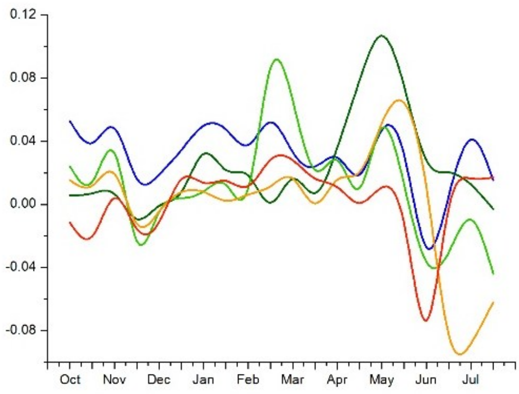
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

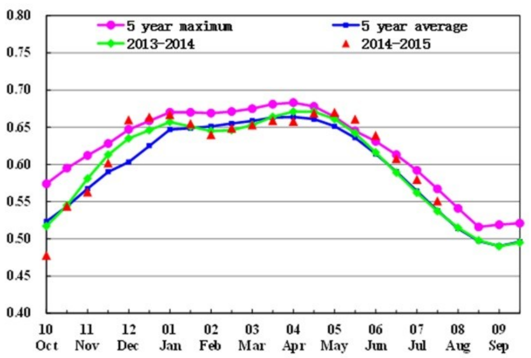


(d) NDVI profiles

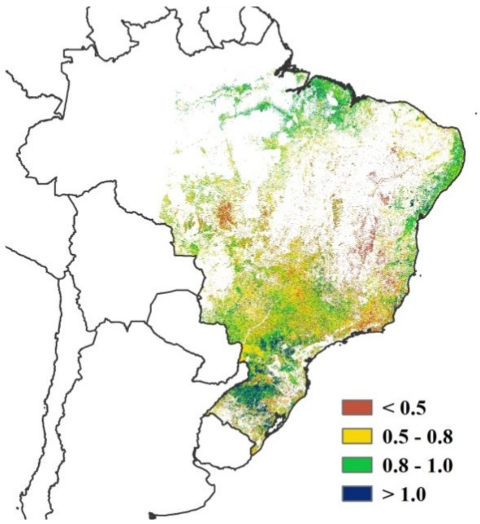
[BRA] Brazil

Overall crop condition was above average in Brazil during the reporting period. The harvest of the second maize is ongoing and wheat is currently in the heading stage. Agroclimatic conditions were beneficial for the development of wheat, which overall resulted in significant above average BIOMSS. Rainfall was 443 mm from April to July (or 22% above average), which replenished the soil moisture for crops. Air temperature and radiation were close to average. Rainfall was above average for most of the states in southern Brazil especially in Goias, Mato Grosso, Mato Grosso Do Sul, and Parana, with increases of respectively 138%, 107%, 74%, and 70% above average rainfall. Spatial patterns and NDVI departure profiles compared to the five-year average clearly indicate above average conditions in southern Brazil; this coincided with high VCIx values in Rio Grande Do Sul, Santa Catarina, Goias, Mato Grosso, Mato Grosso Do Sul, and Parana, among others. In central Brazil, crop condition was below the five-year average as shown in the VCIx map and NDVI departure clustering map, mainly due to the shortage of rainfall. Nationally, crop condition was above the five-year average and the previous year as shown in the NDVI based crop development profile, indicating an increased yield compared with the previous year. Cropped arable land fraction at national scale is estimated at 82%, 1 percentage point above average. Table B.2 in Annex B presents the estimated production outputs for the country in 2015.

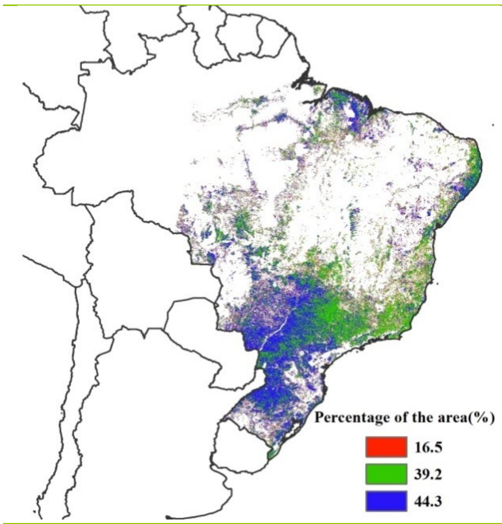
Figure 3.8. Brazil crop condition, April-July 2015



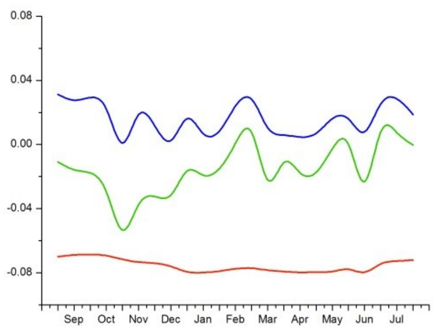
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

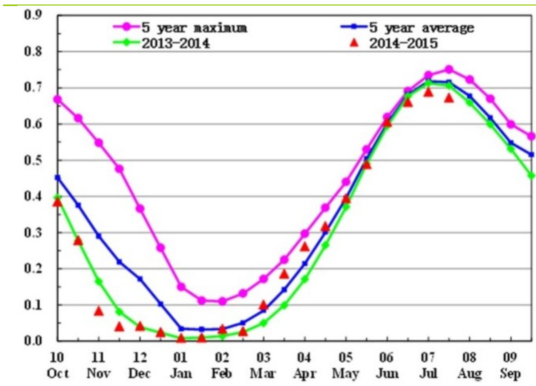
[CAN] Canada

In general, crop condition as assessed by NDVI is below average in the current monitoring period. This reporting period covered the seeding and flowering stages of summer crops, including barley, maize, oats, spring wheat, and soybeans. In terms of the CropWatch agroclimatic indicators, RAIN was 30% below average; TEMP was close to average (+0.7° C), and RADPAR was 4% above average.

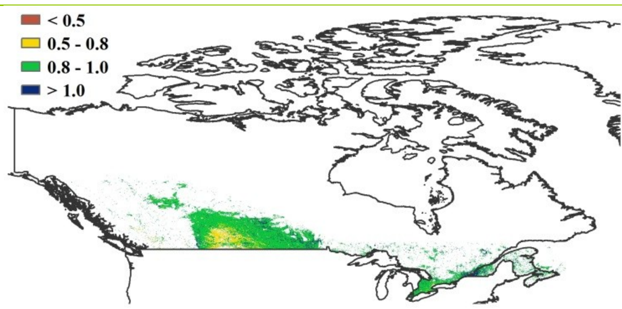
In the previous monitoring period (up to and including April), abundant rainfall (+38%) was available in Canada according to the CropWatch agroclimatic indicators. Unfortunately, over the recent period most regions were affected by drought. This in particular was the case in Alberta and Saskatchewan, where rainfall sharply decreased (-49%) and temperature increased by 1.3ºC and 1.0ºC, respectively. The dry and warm weather caused the biomass production potential (BIOMSS) in both provinces to drop 45% below the five-year average. According to media reports, Alberta was hit by the worst drought in 50 years, which could eventually cause a 20-30% drop in grain production. CropWatch forecasted a 11.3% drop in wheat output for Alberta. In Saskatchewan, the bad crop situation is confirmed by low maximum VCI values, and the decrease in output is estimated to be 7.3%. In other provinces, below average rainfall occurred in Manitoba (-27%), Ontario (-11%), and Quebec (-13%). NDVI profiles also indicated gradually worsening crop condition, with NDVI close to average in Ontario, Quebec, and some scattered regions of Alberta and Saskatchewan and below average elsewhere.

Due to the drought condition, the overall drop in BIOMSS for Canada was 23% over the reporting period. Some crops were destroyed as a result of the drought, which in turn resulted in a decrease in the fraction of cropped arable land of 6 percentage points. If dry weather conditions continue into the next monitoring period, below average grain production can be expected. Table B.3 in Annex B presents the estimated production outputs for the country in 2015.

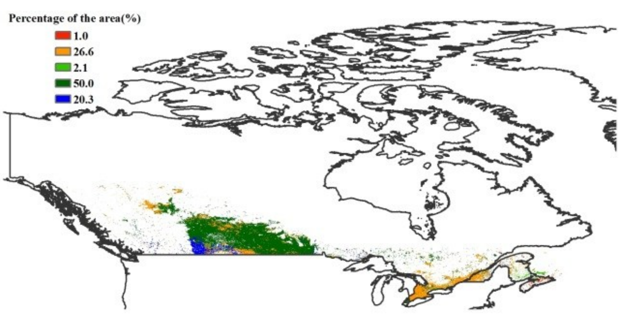
Figure 3.9. Canada crop condition, April-July 2015



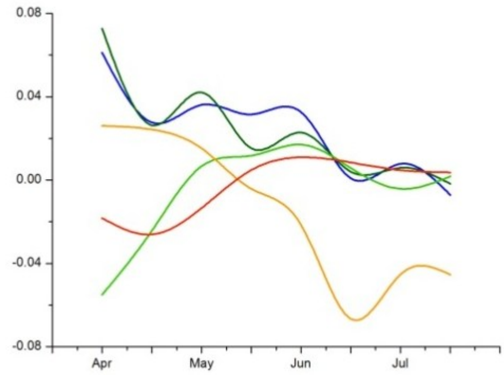
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

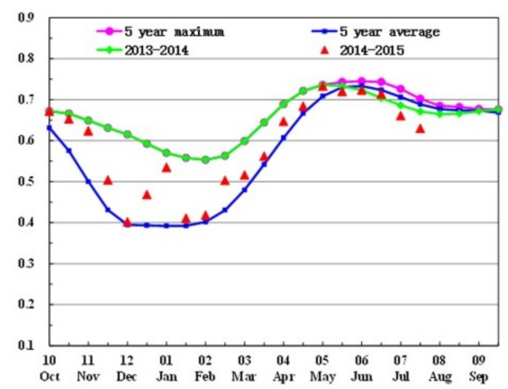


(d) NDVI profiles

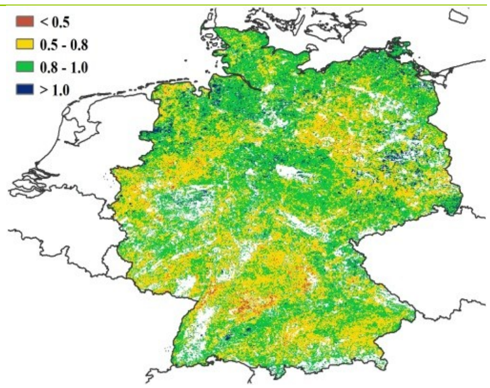
[DEU] Germany

Overall, crop condition in Germany over the monitoring period is average to below-average, and below last year's condition. Winter wheat, spring barley, and maize are the main grain crops of Germany; currently, winter wheat has been harvested, while spring barley and maize are in the vegetative stage. The country's spatial NDVI indicates a situation that on the whole is below average, except for 18% of crop areas scattered across the west of Baden-Wuerttemberg, northwest Bayern, western Sachsen, northern Schleswig-Holstein, and Mecklenburg-Vorpommern. This spatial pattern is also reflected by the maximum VCI in the different areas, with a VCIx of 0.81 for Germany overall. According to the crop condition map based on NDVI, Germany enjoyed a better situation than the five-year average from April to May due to sufficient rainfall, but this period was followed by severe water stress and high temperature, which lead to a worsening of the situation. The cropped arable land fraction was average compared to the five-year average. The CropWatch agroclimatic indicators show that the reporting period recorded a 24% drop in RAIN compared to average, a 0.2°C decrease in TEMP, and 1% above average RADPAR at the national level. With the rainfall deficit and high temperatures, BIOMSS on the national level is expected to decrease by 19% compared to the five-year average.

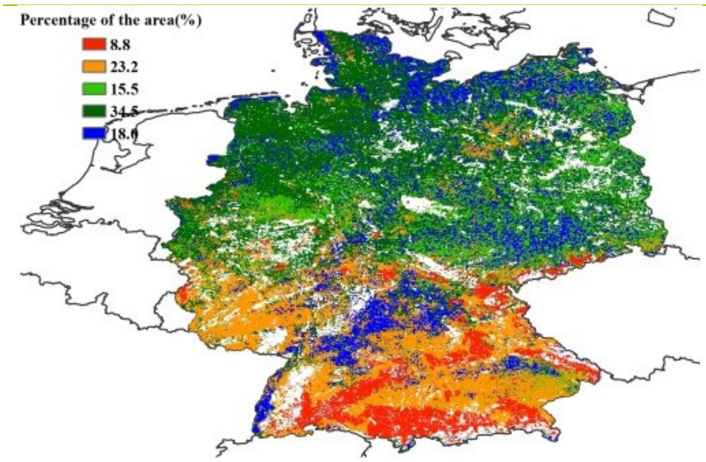
Figure 3.10. Germany crop condition, April-July 2015



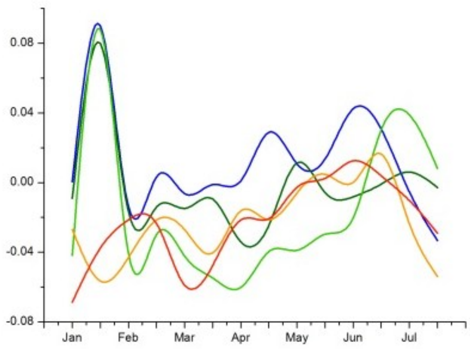
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

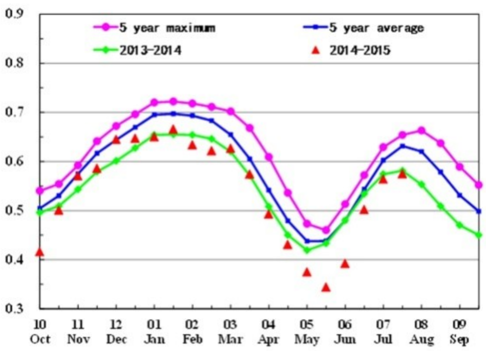


(d) NDVI profiles

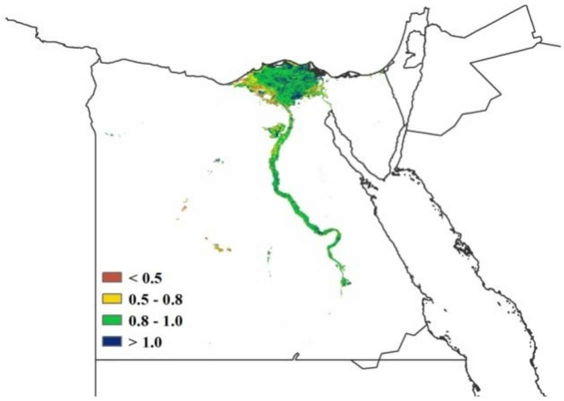
[EGY] Egypt

Crop condition was below the past five years' average during the whole monitoring period (April-July 2015), but close to last year's level from early July on forward. Currently, the winter wheat harvest has been completed and summer crops (maize and rice) are in the field. The CropWatch agroclimatic indicators show that rainfall (RAIN) and radiation (RADPAR) increased (+13% and +2%, respectively), but temperature dropped (-0.7°C) compared to average. Because of the favorable climatic condition, the NDVI values for summer crops at the national scale displayed a sharp increase that started late May, which is consistent with the relative high values for the biomass accumulation potential (BIOMSS, +13%) and the maximum VCI (0.89). The cropped arable land fraction (CALF) was equal to average. According to the spatial NDVI patterns, good crops (about half the crop areas) are distributed in the northern and eastern Delta. In the western and southwestern Delta, however, the crop condition was below average, even with a maximum VCI below 0.5 in some areas. Overall, the outcome of summer crops in Egypt is expected to be below the five-year average level but about similar to the output last year.

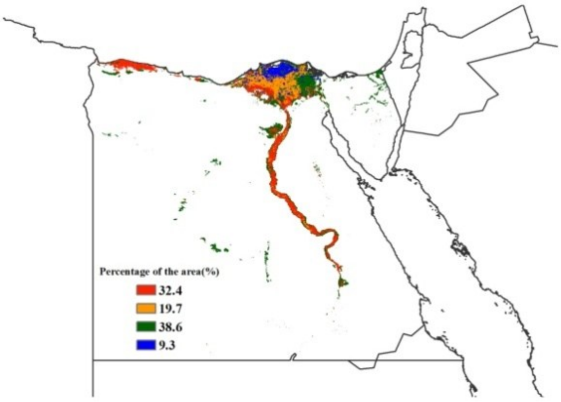
Figure 3.11. Egypt crop condition, April-July 2015



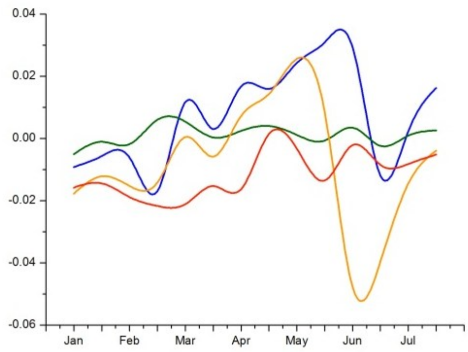
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

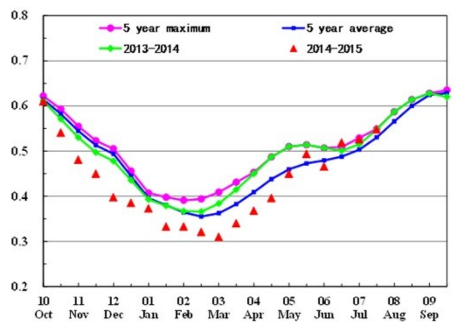


(d) NDVI profiles

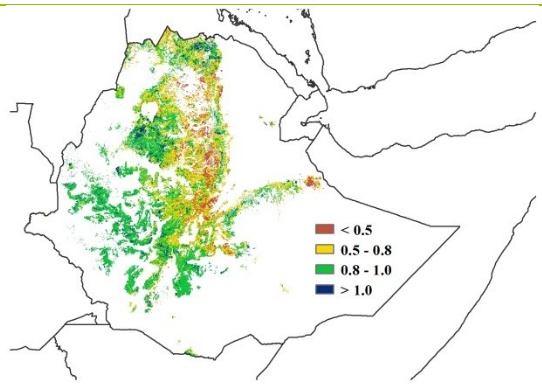
[ETH] Ethiopia

The Ethiopian Belg is a generally unreliable season during which short-cycled cereals are grown for which harvesting takes place early, usually before August. Crops of the "main" Meher season are planted between May and August and subsequently harvested in August or even significantly later in the season (this can be as late as December.) The current reporting period, which largely coincides with the planting of Meher and harvest of Belg crops suffered below average rainfall (-25%), slightly above average temperature (+0.4°C), and a more significant increase in sunshine. The resulting biomass production potential (BIOMSS, -22%) essentially regards Belg crops. National crop development profiles show below average crop condition until the end of May, which is an indicator for below average Belg crops due to drought. From June on forward, however, coinciding with Meher planting, the situation turned close to average. Considering the slight reduction in CALF (-2%) and fair VCIx values (0.88), it is likely that the Meher season was delayed due to insufficient soil moisture, but that the current situation, with NDVI close to the recent five-year maximum, shows globally favorable conditions for the Meher season. It is also stressed that there is good agreement between the average NDVI and the profile clusters, which converge at 0 (i.e., average) at the end of July. Altogether, after a reduced Belg output, current prospects are good for the ongoing Meher, especially in the southern half of the country.

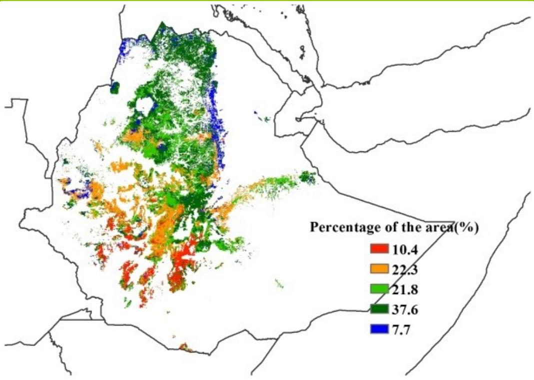
Figure 3.12. Ethiopia crop condition, April-July 2015



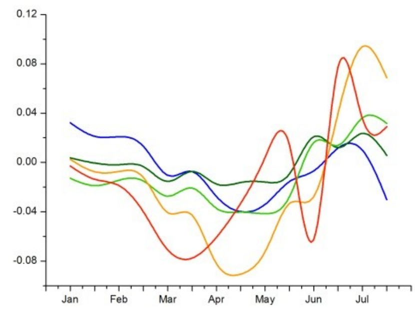
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



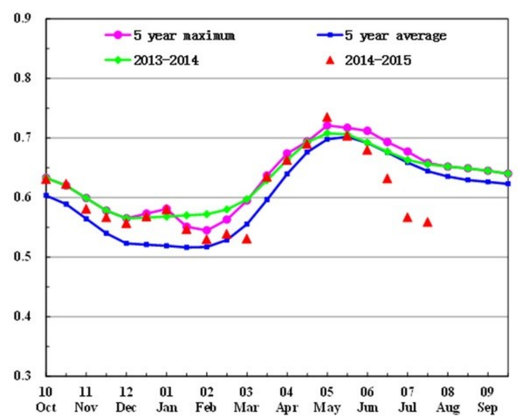
(d) NDVI profiles

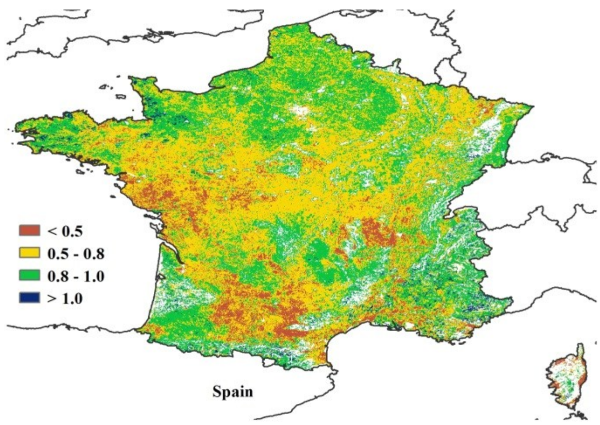
ARG AUS BGD BRA CAN DEU EGY ETH **FRA** GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[FRA] France

Crops in France show above-average to below-average condition over the reporting period. Currently, soft wheat and spring barley have been harvested, while maize is in the vegetative stage. Compared to average, CropWatch agroclimatic indicators show that the reporting period recorded a 38% drop in RAIN, a 0.5°C increase in TEMP, and 4% above average RADPAR at the national level. BIOMSS presents a 36% decrease compared to the five-year average due to scarcity of rainfall. As shown by the crop condition development graph, national NDVI values were well above average and even close to the five year maximum from April to May due to sufficient rainfall at the end of April. National NDVI values began to drop below average from June—dropping even below last year's values, which is consistent with the lack of rainfall and high temperature during this period. The spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles also indicate that NDVI is above average in only 17.8% of arable land, namely in the northeast of Provence-Alpes-Côte-d'Azur, the south of Languedoc-Roussillon, the northwest of Midi-Pyrenées, the south and north of Poitou-Charentes, and middle of Champagne-Ardenne. In contrast, in the other regions the NDVI is below average. This spatial pattern is also reflected by the maximum VCI in the different areas, with a VCIx of 0.74 for France overall. Generally, due to rainfall deficit and high temperature, the agronomic indicators mentioned above show unfavorable condition for most crop areas of France. More rain for rainfed arable land regions is needed in the next few months.

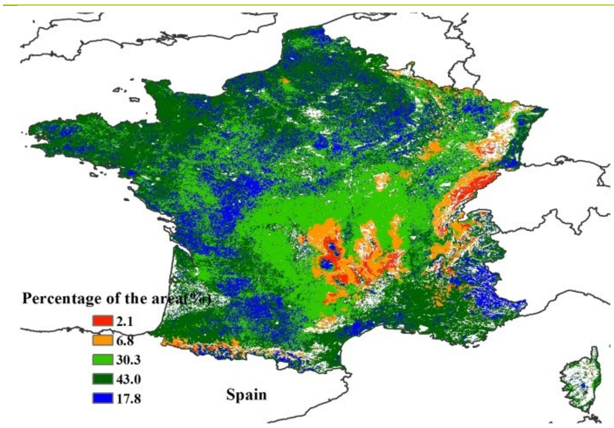
Figure 3.13. France crop condition, April-July 2015

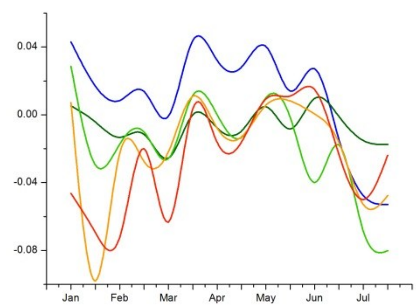




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

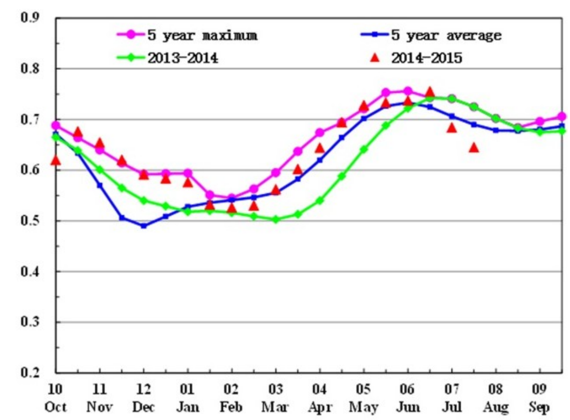
(d) NDVI profiles

ARG AUS BGD BRA CAN DEU EGY ETH FRA **GBR** IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

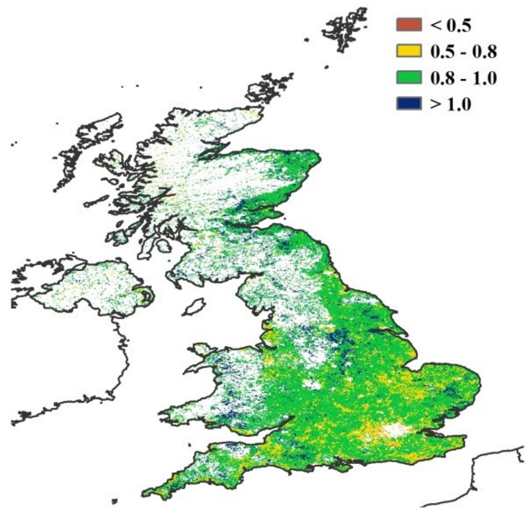
[GBR] United Kingdom

Generally, crops in the United Kingdom showed favorable condition over the reporting period. Currently, most of the winter wheat and oats and all the winter barley and winter rape have been harvested, while spring barley is in the vegetative stages. Compared to average, the CropWatch agroclimatic indicators show that rainfall over the reporting period was average, with slightly below average radiation (RADPAR, -2%) and temperature (TEMP, -1.1°C). With water stress in May and high temperature in June, BIOMSS decreased by 7% compared to the five-year average at the national scale. As a result of adequate rainfall in April and the appropriate temperature conditions from April to June, the national NDVI values were well above average and even close to the five-year maximum from April to June according to the crop condition development graph. From late June to July, due to reduced rainfall and warmer-than-seasonal weather, the national NDVI values dropped to below average. The spatial NDVI patterns, when compared to the five-year average, and corresponding NDVI departure cluster profiles indicate above average NDVI values over the country for more than 51.2% of arable land (including south of Lincoln-shire, most of Cambridge-shire and Suffolk, Bucks, and the shires of Gloucester, Oxford, Warwick, Hereford, Worcester, Northampton, and Perth and Kinross, as well as the west of Cornwall, middle of Durham, and the north of Northumberland. The spatial pattern is also reflected by the maximum VCI in the different areas, with a VCIx of 0.89 for the country overall.

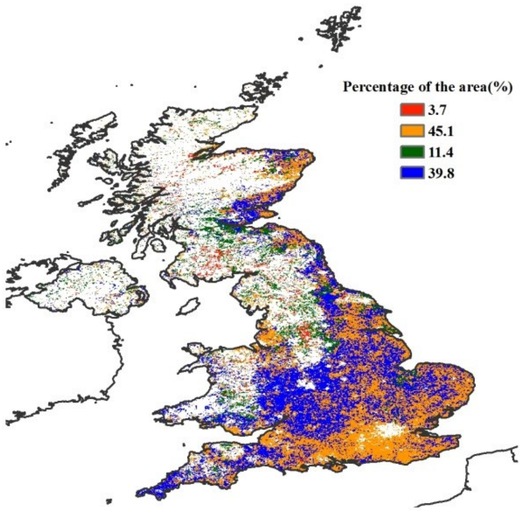
Figure 3.14. United Kingdom crop condition, April-July 2015



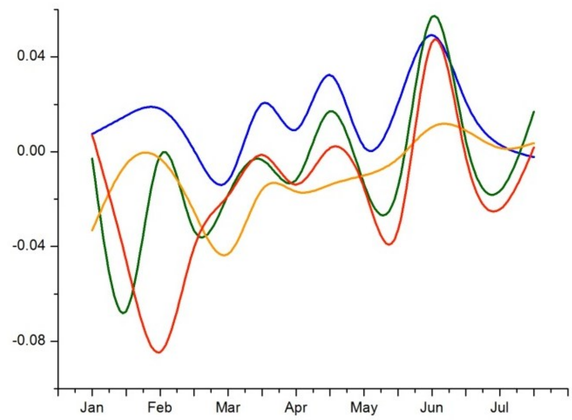
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



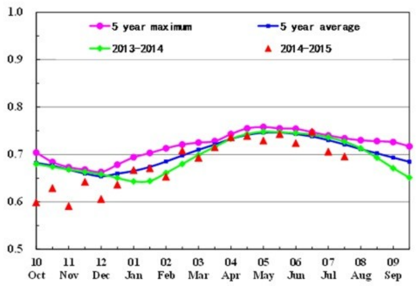
(d) NDVI profiles

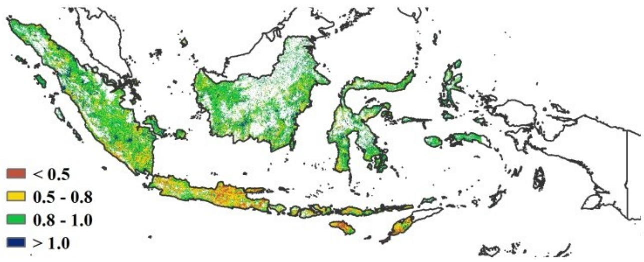
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR **IDN** IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[IDN] Indonesia

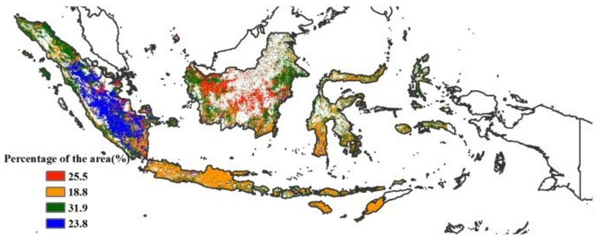
The crops in Indonesia generally show poor condition between May and July. The monitoring period covers the whole harvest of the main rice and rainy season maize, as well as secondary rice. Compared with the recent average, RADPAR and TEMP were slightly above average (+3% and +0.3◦C, respectively). As a result of El Niño conditions (see also section 5.4), a significant rainfall (RAIN) deficit of 19% was recorded; consequently, biomass production expectations (BIOMSS) were far below average (-23%). According to the NDVI clusters, crop condition in Sumatra Selatan, Jambi, and Riau was above average from May to July, while the rest of the country experienced unfavorable conditions (low precipitation and high temperature). The maximum VCI map confirms that crop condition was bad in Nusatenggara Timur, Jawa Tengah, Jawa Timur, and other islands in the southern part of the country. National NDVI profiles also show poor crop condition in the monitoring period. Altogether, CropWatch estimates that dry conditions have caused yield reduction in this season's crops.

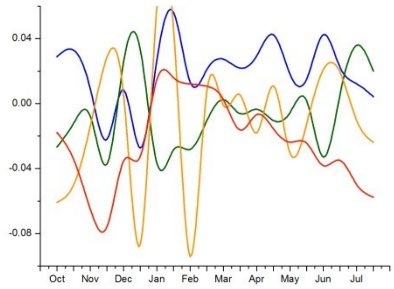
Figure 3.15. Indonesia crop condition, April-July 2015





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





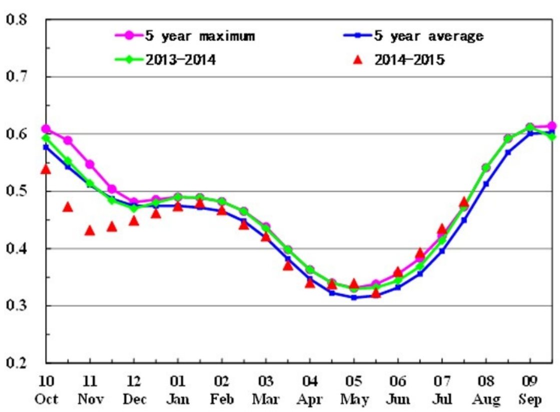
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN **IND** IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

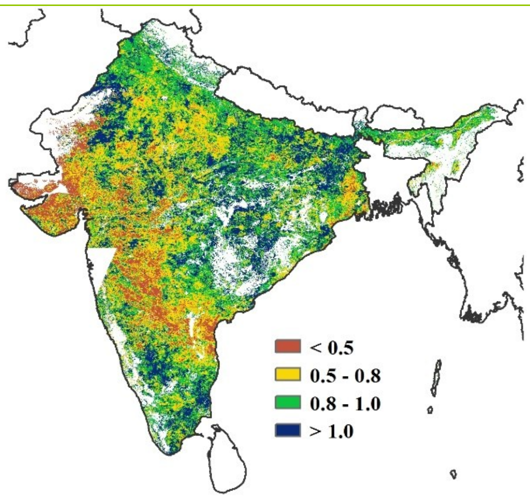
[IND] India

The reporting period corresponds mainly to the harvesting of Rabi and planting of Kharif crops. Heavy monsoon rain and cyclone Komen caused severe floods in several states. Mostly affected regions were Assam, Meghalaya, Manipur, Telangana, Maharashtra, Gujarat, Haryana, Uttarakhand, and Orissa. Flooding damaged the standing Kharif crop in these regions. However, over the reporting period crop development was above average and reached a record maximum. The maximum VCI values were never below 0.5, which confirms average crop condition over the country. The NDVI values were favorable until the end of June, but a drop started in early July. Several states experienced above average rainfall (RAIN), including Assam (+27%), Bihar (+35%), Chhattisgarh (+36%), Haryana (+36%), Jharkhand (+60%), Tripura (+93%), Uttar Pradesh (+18), Punjab (+6%), Orissa (+20%), and West Bengal (+75%). High rainfall led to positive biomass accumulation (BIOMSS) and good Kharif crop condition, but also to the mentioned floods in much of the country's northeast. Low rainfall was experienced in some states like Gujarat (-51%), Goa (-70%), Kerala (-31%), Karnataka (-27%), and Maharashtra (-37%). Low rainfall triggered average NDVI for the region, indicating average crop condition in those places. Temperature (TEMP) was average, while radiation (RADPAR) was below average in several states including Assam (-3%), Himachal Pradesh (-5%), Haryana (-2%), Jharkhand (-4%), Tripura (-7%), Sikkim (-4%), and west Bengal (-6%). The crop arable land fraction (CALF) dropped by 6 percentage points compared to the previous five-year average. Overall, adverse weather condition including excess rainfall and floods in some places as well as droughts in others have resulted in the reduction of cultivated land and likely reduced outputs, especially for rainfed crops.

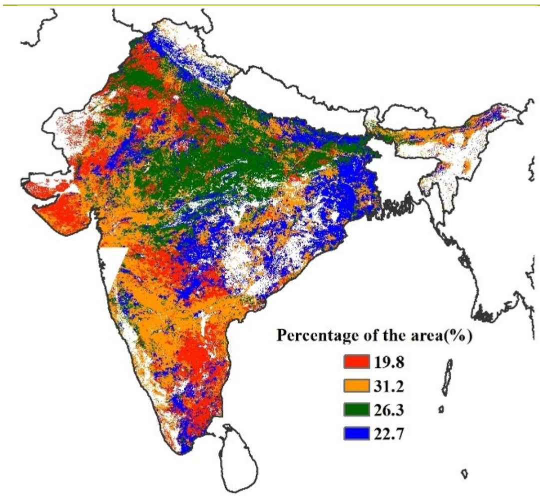
Figure 3.16. India crop condition, April-July 2015



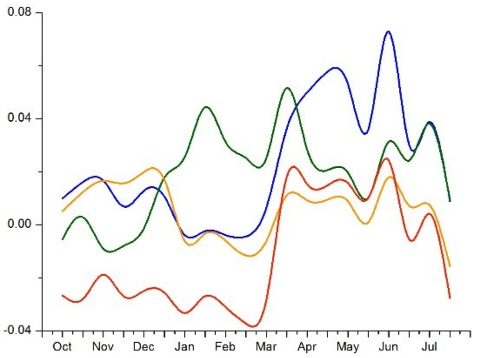
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

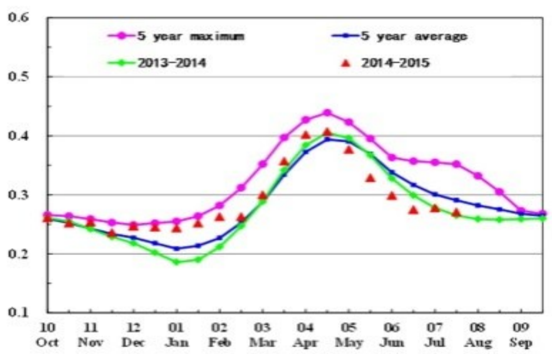
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND **IRN** KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

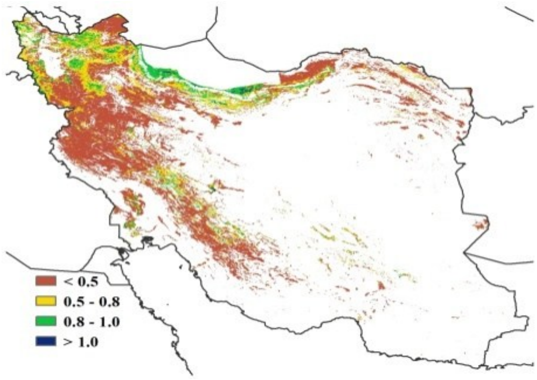
[IRN] Iran

In Iran, crop condition was generally below average for the reporting period. Winter wheat was harvested from June to July, while the sowing of summer crops (potato and rice) began in May. Rainfall (RAIN) was far below average in the monitoring period, while temperature (TEMP) and radiation (RAIN) were above. CropWatch agroclimatic indices for the current season show significantly unfavorable conditions for crop growth, which is confirmed by the decrease of the BIOMSS index by 33% and low average VCIx (0.41).

Crop condition in the most of north-western region was above or close to the five-year average from April to May, while it was below average from June to July. Khuzestan and Fars provinces in the southwest region, Razavi Khorasan province of the northeast region, and the Mazandaran and Gilan provinces of the central north region generally experienced below average crop condition from April to July. Overall, the outcome of winter crops is average while crop condition of summer crops is poor.

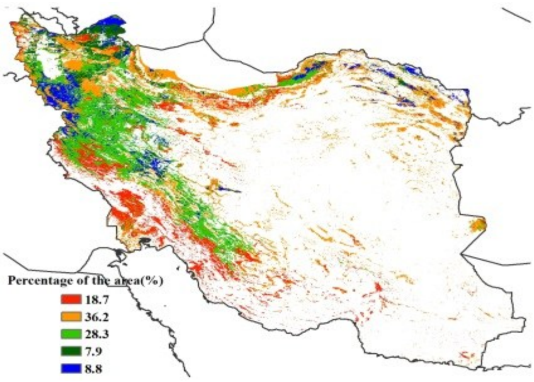
Figure 3.17. Iran crop condition, April-July 2015

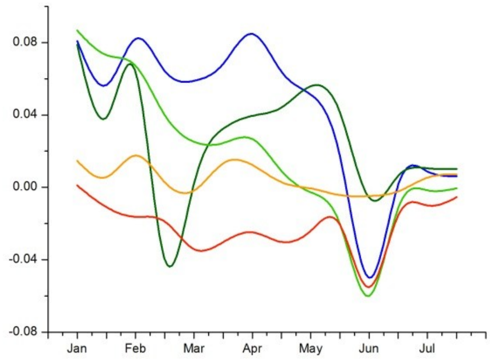




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





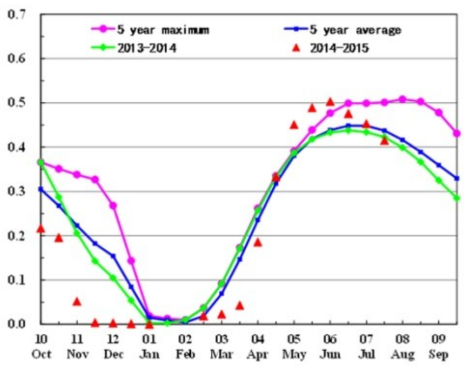
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

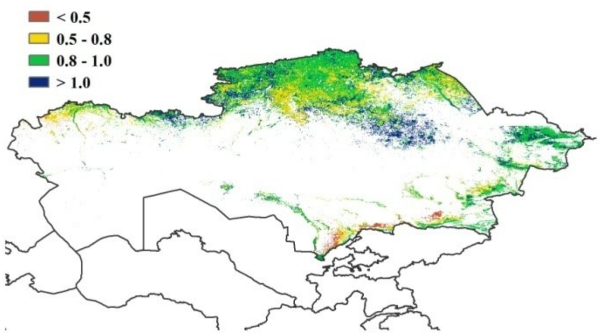
[KAZ] Kazakhstan

In Kazakhstan spring wheat, barley, and other cereals currently in the field were sowed before June; they are now in the vegetative stage. Rainfall (RAIN) and temperature (TEMP) were above average (+41% and +0.7°C), with also BIOMSS sharply above average (+42%). From March to April, floods occurred in parts of Kazakhstan and negatively affected crops for some time. However, stored moisture led to fast growth, to the extent that in May and June crop condition was far above the maximum of the last five years. Considering the NDVI profiles and spatial NDVI patterns (compared to the last five years), most areas in Kazakhstan were above average after April, except for the south of Yujno-kazachstanskaya, Jambylslkaya, and Almatinskaya Oblasts, where maximum VCI did not exceed 0.5. Since late June, national NDVI gradually decreased, but nevertheless stayed close to average. Thanks to abundant rainfall, crop and rangeland prospects are favorable in the country.

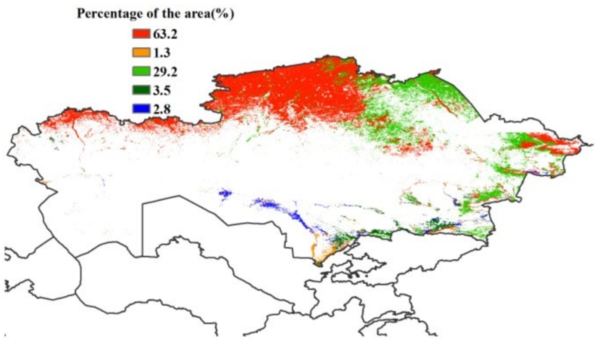
Figure 3.18. Kazakhstan crop condition, April-July 2015



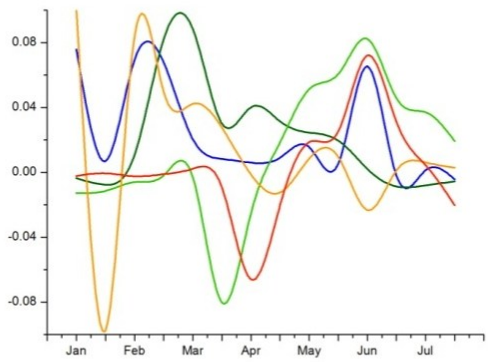
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

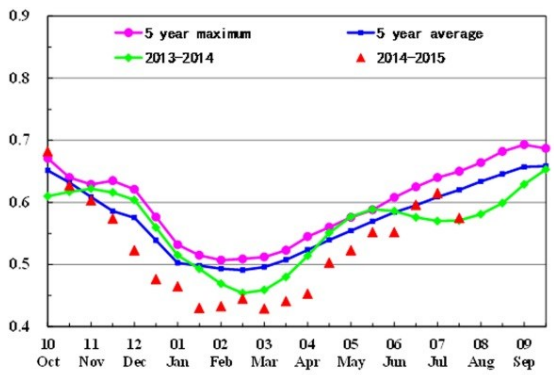


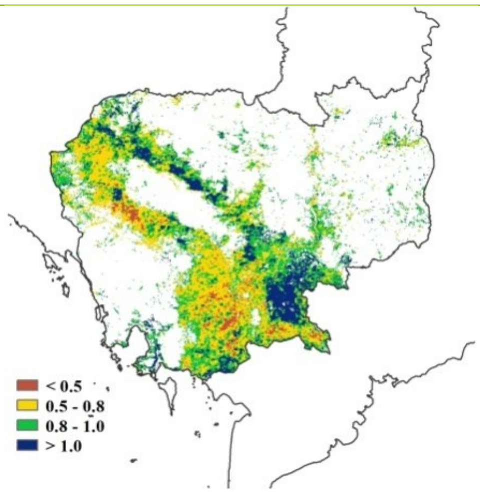
(d) NDVI profiles

[KHM] Cambodia

The period from April to July 2015 covers the harvest of the second (dry season) rice, the early stage of the main (wet season) rice, and the growing period of maize. Compared to the five-year average, crop condition before July was below average. The CropWatch agroclimatic and agronomic indicators show that Cambodia suffered a minor drop in precipitation compared to average (RAIN, -3%), which decreased the biomass accumulation expectations (expressed by BIOMSS) by 5% compared to the recent five-year average, while TEMP (+0.8°C) and especially RADPAR (+5%) were higher than average. At the same time, the fraction of cropped arable land (CALF) decreased 6 percentage points compared to average. Low vegetation condition indices (VCIx) occur in a scattered way south of Tonle Sap, which is attributed to shortage of rain in Kampong Seu, Kampong Chhnang, and Pursat. Overall crop prospects for the country are not optimistic.

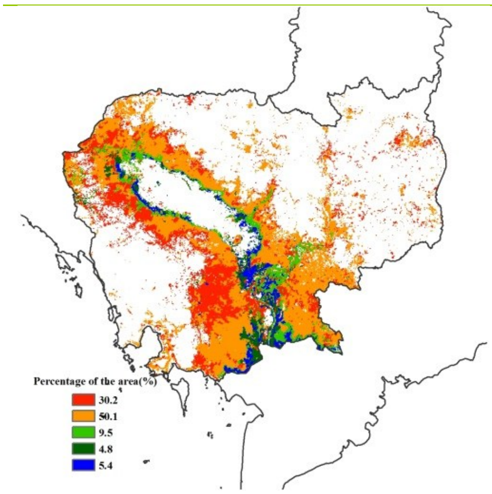
Figure 3.19. Cambodia crop condition, April-July 2015

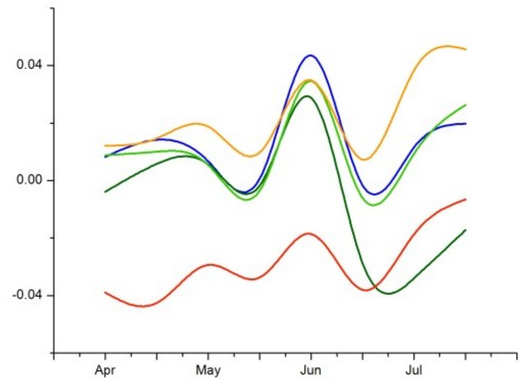




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





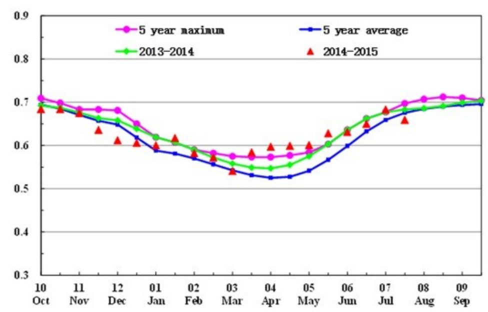
(c) Spatial NDVI patterns compared to 5YA

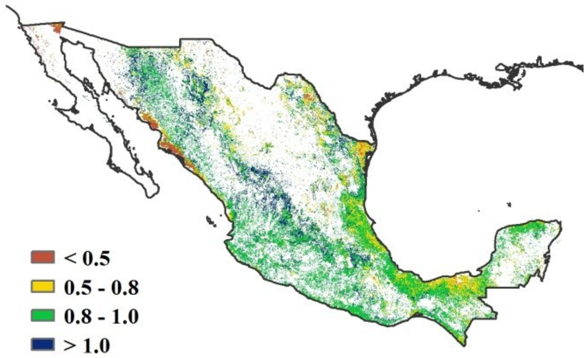
(d) NDVI profiles

[MEX] Mexico

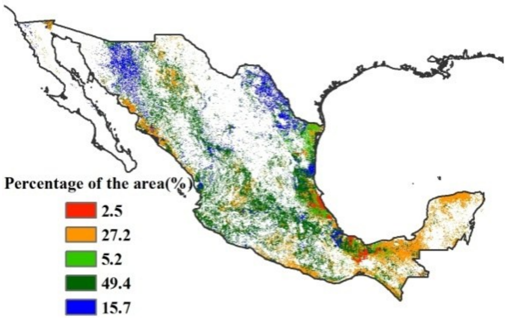
Overall, crop condition in Mexico was above the five-year average between April and early July. During the monitoring period, last year's winter wheat and secondary maize were harvested; this year's maize is still growing. The CropWatch agroclimatic indices show that rainfall, radiation, and temperature were close to average (only deviating by -4%, -2% and -0.1°C, respectively). According to the crop condition development graph based on NDVI, the NDVI values at the national scale exceeded the past five-year maximum from April to May; since June, the values were close to or below the maximum. Finally, in late July, the value was again below the last five year average. Over the reporting period, the biomass accumulation potential (BIOMSS) was significantly above average (+14%). Moreover, the cropped arable land fraction (CALF) increased slightly compared to average (+5%). Considering both favorable condition of growth and increased CALF, the yields of summer crops in Mexico are expected to be above the five-year average.

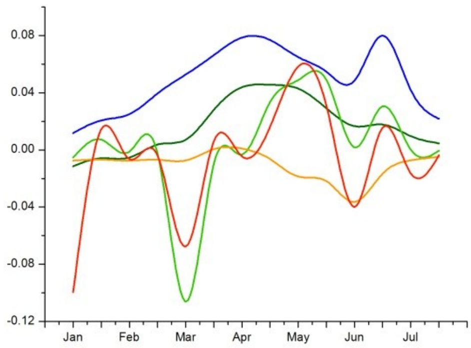
Figure 3.20. Mexico crop condition, April-July 2015





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





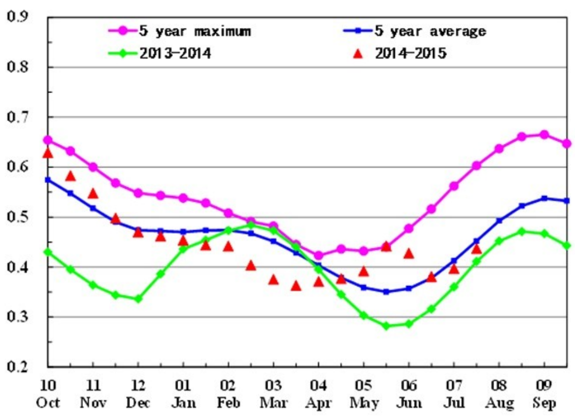
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

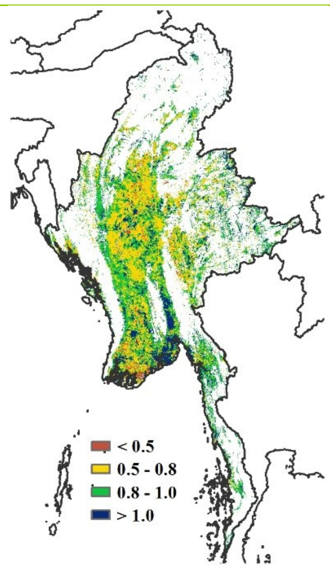
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX **MMR** NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[MMR] Myanmar

The reporting period is the main rice season in Myanmar. In late July, cyclone Komen hit the country and caused severe floods that damaged the standing rice crop, especially in Sagaing, Magway, Chin, and Rakhine regions. Overall, however, crop condition is average according to the CropWatch indicators, in spite of rainfall for the country overall decreasing by 12% and the biomass accumulation potential dropping 6% below average. Temperature and radiation over the monitoring period were average. Crop condition development was above the previous five-year average from May to June, while below average values prevailed from early June to July. The maximum VCI values ranged from 0.5 to 1, indicating favorable crop condition. The spatial NDVI profile values were average from April to June, but dropped in early July to recover again in mid-July for the whole country except Yangon and eastern Kengtuang region, which experienced a gradual decrease of NDVI values from late June on forward. No changes were noted in the cropped arable land fraction when compared to the five-year average. Overall, the CropWatch indicators point to average production prospects for the country.

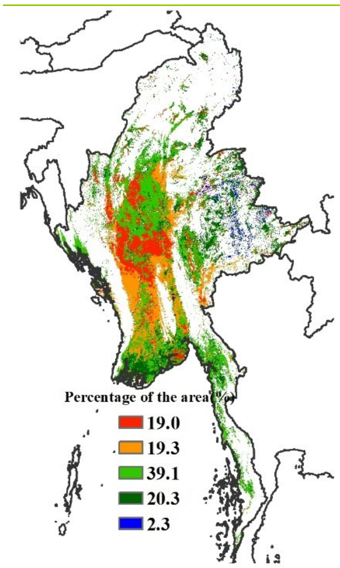
Figure 3.21. Myanmar crop condition, April-July 2015

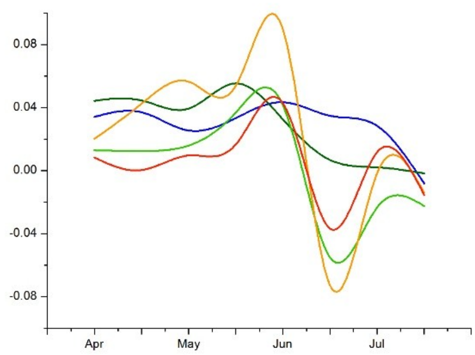




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





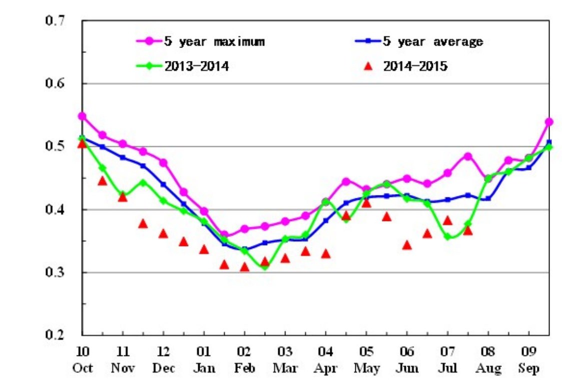
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

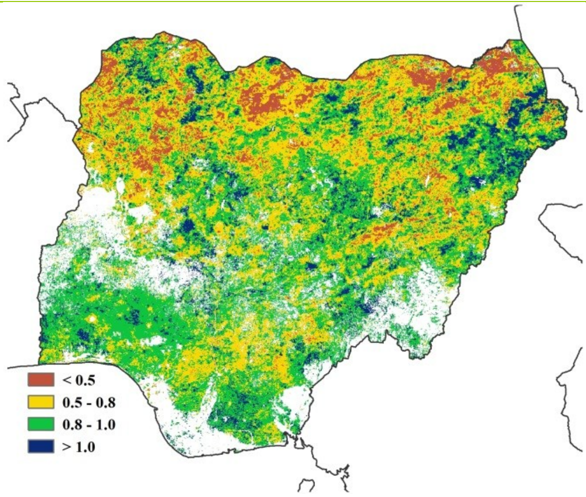
[NGA] Nigeria

Climatic conditions vary greatly in Nigeria, with the south of the country enjoying a very long rainy season between April and November, while the northernmost areas usually plant maize in July for a harvest in September. The major maize producing areas in the country cover an east-west oriented area roughly between the latitudes of 7 and 11 degrees north, with planting varying from March-April (in the south of the area) to May (in the north). Altogether, cereals account for about 10% of food production in Nigeria, with cassava and yams being the major food crops, especially in the more humid south. National CropWatch agroclimatic indicators have been close to average during most of the reporting period, listing average rainfall and slightly above average temperature and sunshine, which nevertheless are resulting in a 6% drop in biomass production potential due to some spatial differences not taken into account by the national agroclimatic indices. NDVI profiles have fluctuated over the reporting period, but they were generally close to average in July. The combined effect of NDVI profiles, VCIx (0.83 average, with low values concentrated in the northern half of the country) and CALF (-10%) indicates generally average conditions, with the possibility of a somewhat late season in the north.

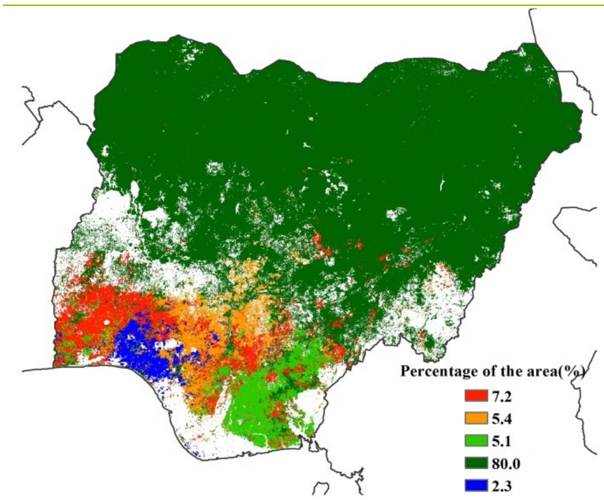
Figure 3.22. Nigeria crop condition, April-July 2015



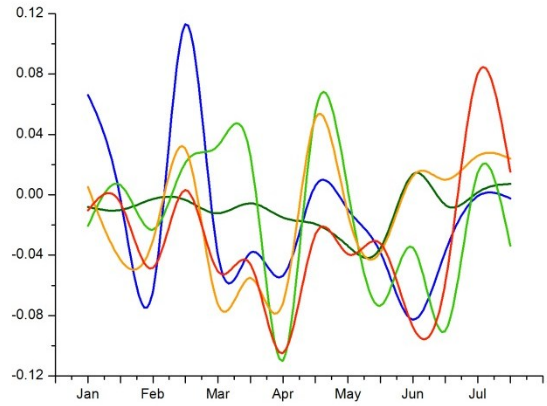
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

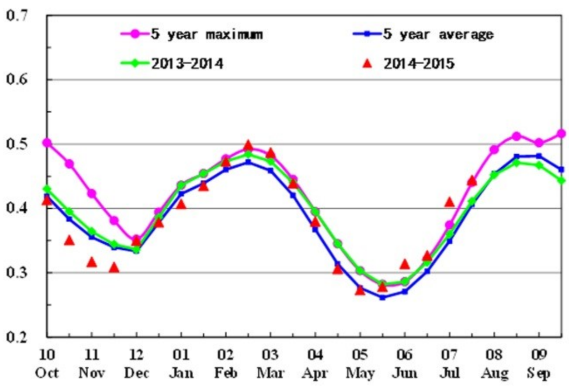


(d) NDVI profiles

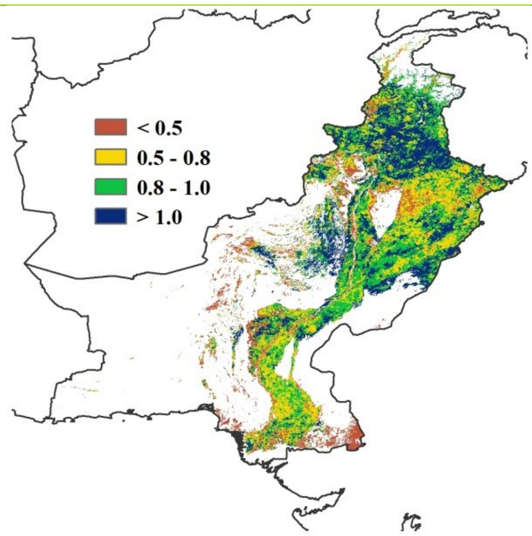
[PAK] Pakistan

The reporting period coincides with the harvest of winter wheat and barley, the sowing and growing stage of summer crops (cotton and rice), and the sowing of summer maize. Agroclimatic indicators show an increase of rainfall (RAIN, +17%) and decrease of radiation (RADPAR, -3%), compared to average. Temperature was below average (TEMP, -0.8°C), while biomass production potential is above (BIOMSS, +19%). CALF slightly increased (+1 percentage point) over its five-year average. The national NDVI development graph indicates that crop condition was unfavorable in April, but later gradually improved and peaked at the beginning of July, reaching values comparable to the maximum of the past five years. The lowest maximum VCI values (0.5) occur in North Balochistan, the south of Khyber Pakhtunkhwa, and south Sindh. According to the NDVI profiles, 44% of the cropped areas display above average conditions from the beginning of April, much of it in Punjab, especially in the north. Remaining areas (56%) show average conditions. Altogether, crop condition is estimated to be above average.

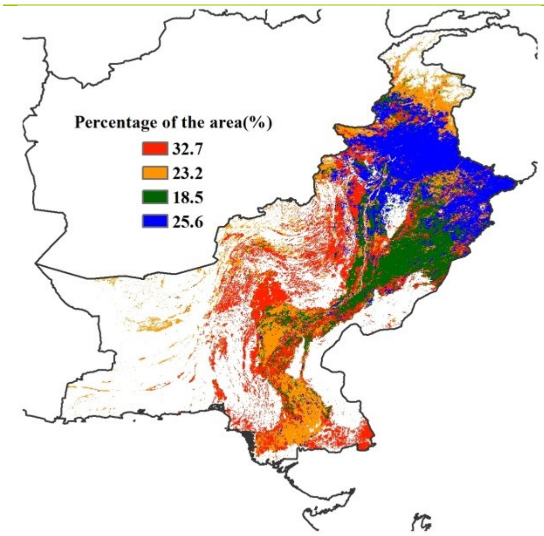
Figure 3.23. Pakistan crop condition, April-July 2015



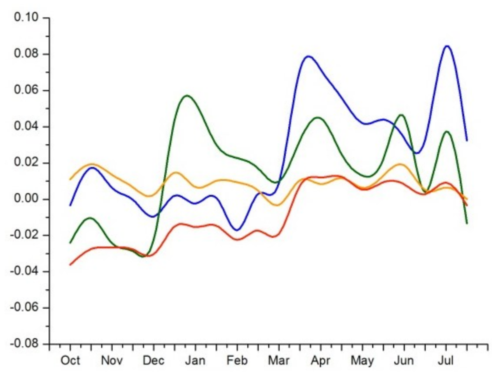
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

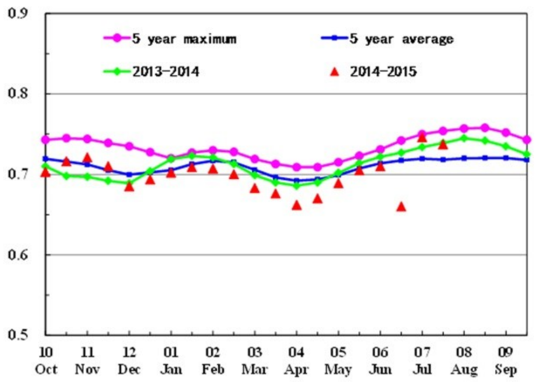


(d) NDVI profiles

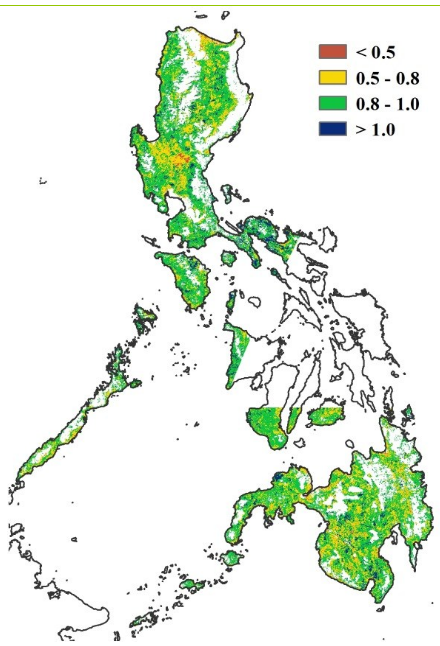
[PHL] The Philippines

In the Philippines, the main rice crop is currently growing, while maize has reached maturity and is about to be harvested. Nationwide, temperature (TEMP) and radiation (RADPAR) were slightly above average (+0.4°C and +5%), while rainfall (RAIN) decreased by 5%, mainly resulting from El Niño conditions; the biomass accumulation potential (BIOMSS) for the country shows a significant decrease of 15%. Considering the spatial patterns of NDVI profiles, crop condition in Luzon was above average in May, while after early June it declined sharply. In the southern part of Philippine islands, including Caraga, Davao, and Soccsksargen in southern Mindanao, crop condition was below average due to seasonal rainfall deficits from May to July. NDVI in late June was significantly below average but it recovered in July. Altogether, the output of the main season rice is expected to be below average.

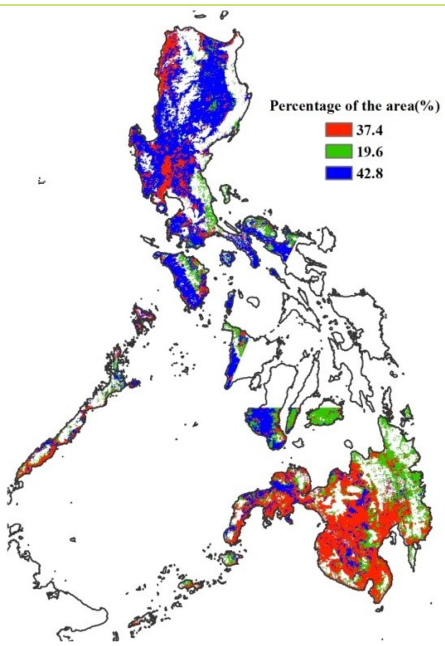
Figure 3.24. Philippines crop condition, April-July 2015



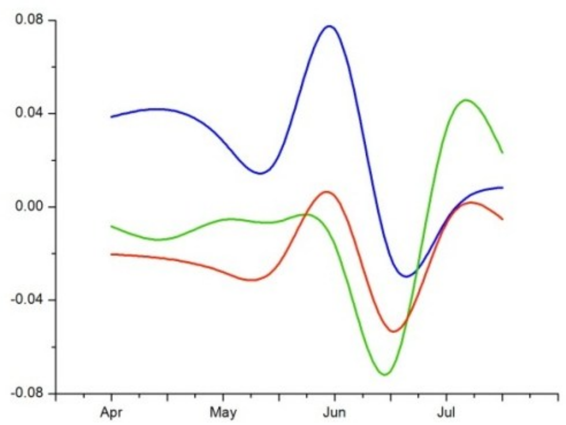
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



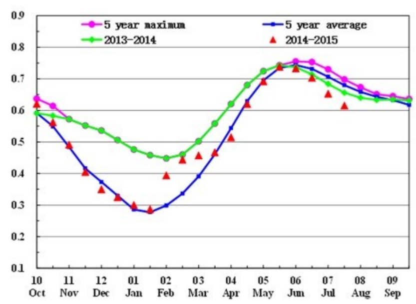
(d) NDVI profiles

[POL] Poland

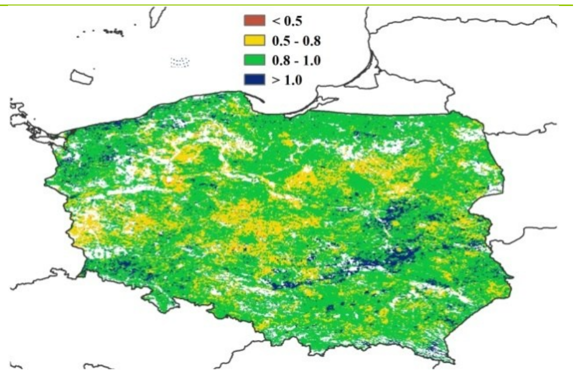
In Poland, maize planting begins in May, while winter wheat harvesting starts in July. The cropped arable land fraction (CALF) is same as the average of the last five years. During April to July, rainfall (RAIN) was -26% compared to average, and temperature (TEMP) dropped 0.7°C. RADPAR is near average (+1%), while the potential biomass (BIOMSS) is significantly decreased due to the insufficient rainfall.

As shown in the NDVI crop condition development graph, the NDVI in Poland is lower than usual from June on forward, particularly in the south and east of the country (including Warsaw, Lodz, and Radom). The maximum VCI shows that in more than 85% of the country crop condition is favorable. In the west and center, including Lubuskie, Wielkopolskie, Kujawsko-Pomorskie, and Lodskie, the crop condition is lower than usual due to the drought. Considering the average VCIx of 0.86, the final assessment for Poland is that crop condition is mixed but fair.

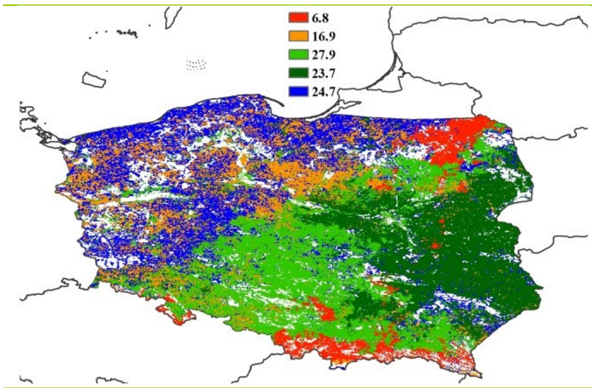
Figure 3.25. Poland crop condition, April-July 2015



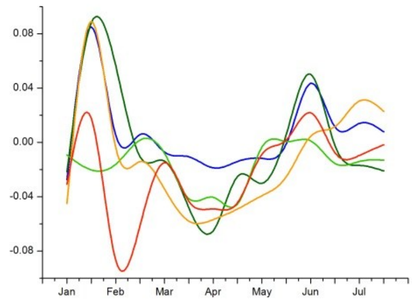
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

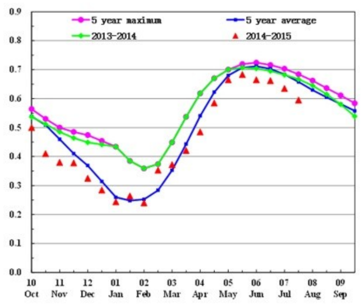
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL **ROU** RUS THA TUR UKR USA UZB VNM ZAF

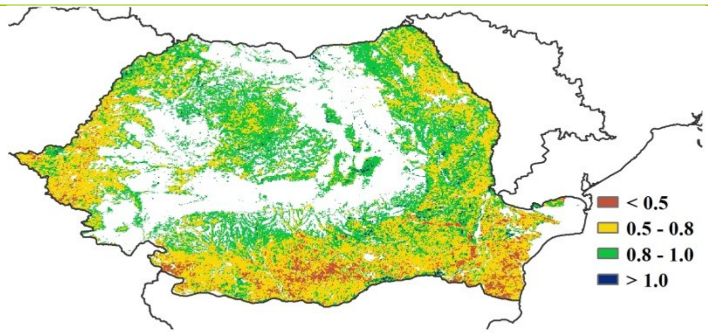
[ROU] Romania

Romania presented average crop conditions during January to April (VCIx=0.76), a period that covers the harvest of winter wheat (starting in July) and the planting of summer crops, especially maize (planted before May). During this monitoring period, the fraction of cropped arable land dropped 3 percentage point compared with the recent five-year average. Overall, temperature (TEMP) was just above average while rainfall (RAIN) dropped 25%. Due to the dry weather, the potential biomass (BIOMSS) decreased 23% compared with the average.

As shown in the NDVI crop condition development graph, NDVI over the monitoring period was below the recent five-year average from April on forwards. In most parts of southern Romania, including Craiova, Bucharest, and Bacau, the crop condition is near or below average (VCIx < 0.8). In these areas, the NDVI is significantly lower than the five-year average. Especially in the south of the country, the crop outlook is poor.

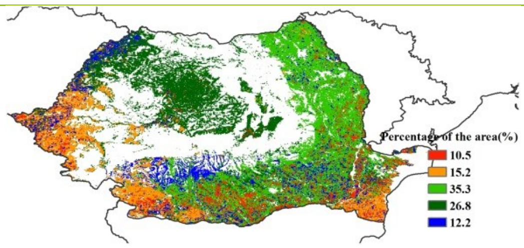
Figure 3.26. Romania crop condition, April-July 2015

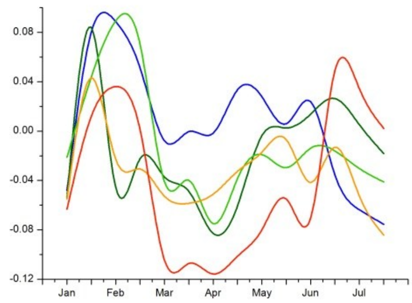




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

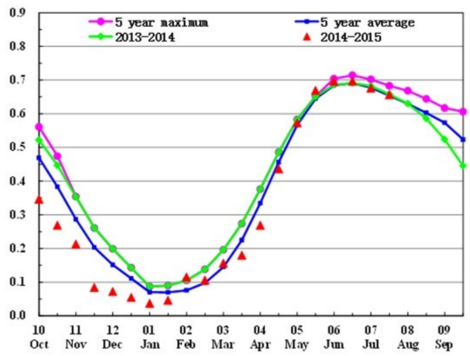
(d) NDVI profiles

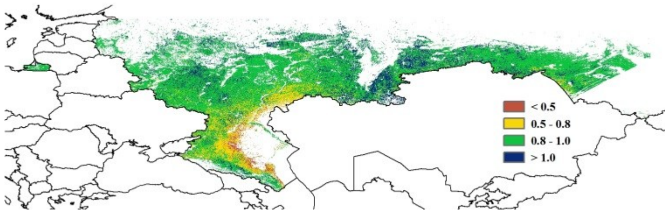
[RUS] Russia

Russia experienced very favorable environmental conditions from April to July (VCIx=0.91).The winter wheat harvest in the country began in mid-June, while the planting of maize and spring wheat started in April. The fraction of cropped arable land was 1 percentage point above the five-year average. In general, Russia experienced warm and wet conditions over the recent four months. Precipitation exceeds the recent average (RAIN, +8%) and the temperature was just slightly above average (+0.1°C). Mainly due to weather, the BIOMSS indicator rose 14% over the last five-year average.

As shown in the NDVI crop condition development graph, the NDVI is close to average in this monitoring period. The crop condition is favorable in most parts of Russia's cropland (VCIx>0.8). The spatial NDVI patterns show that in some parts of southern Russia, including in Volgograd and Rostov, the NDVI is significantly below the five-year average before June and above average after. In Russia's eastern cropland areas, from Orenburg to Novosibirsk, the NDVI is above average from April to July. Due to the abundant water supply, the harvest of winter wheat in these areas has been advanced. Overall crop condition is favorable.

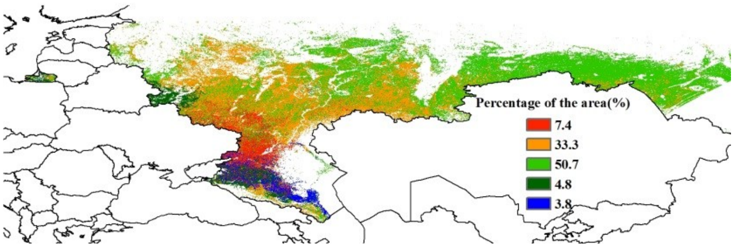
Figure 3.27. Russia crop condition, April-July 2015

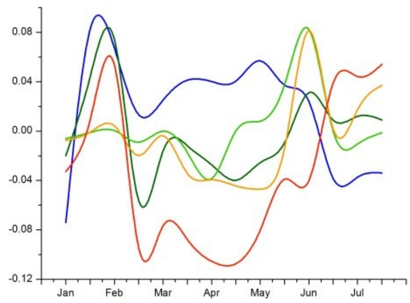




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

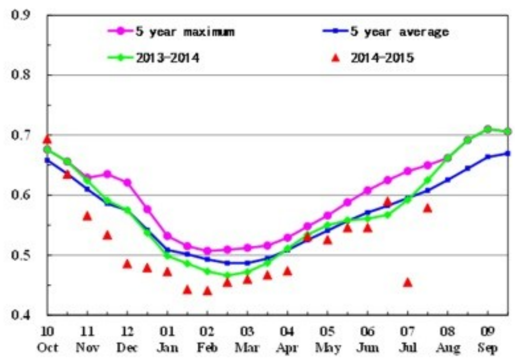
(d) NDVI profiles

[THA] Thailand

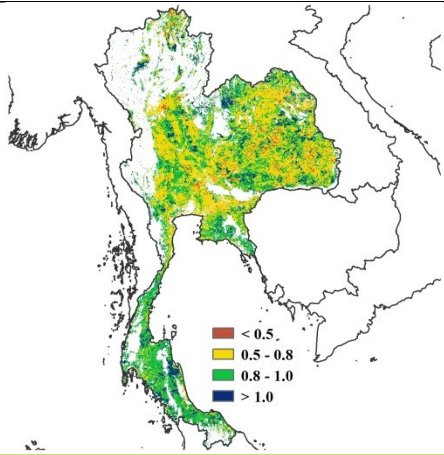
Crop condition from April to July 2015 was below average in Thailand. In most areas, the main rice is in the sowing stage (particularly in the northeastern region), while the harvest of the country's second rice crop was completed in June. Accumulated rainfall was below average during the monitoring period, while the temperature and radiation were above. The agroclimatic indices show poor growing condition, which is confirmed by the decrease of the BIOMSS index by 13%. The VCIx map presents a consistent spatial pattern with the NDVI cluster map in the central and northeastern regions.

Crop condition was below average from April to June in the southeast region and the south of the central region. Favorable crop condition is found in the areas from the Ang-Thong to Singburi provinces, extending north to Phitsanulok province. In Lopburi and Chaiyaphum provinces in the central region, as well as in the northwest region, crops developed under favorable conditions from April to May, but then deteriorated from June and recovered to an average level at the end of July. Overall, the outcome for the second season rice is unfavorable; the crop condition of main rice for Thailand can be assessed as poor or mixed.

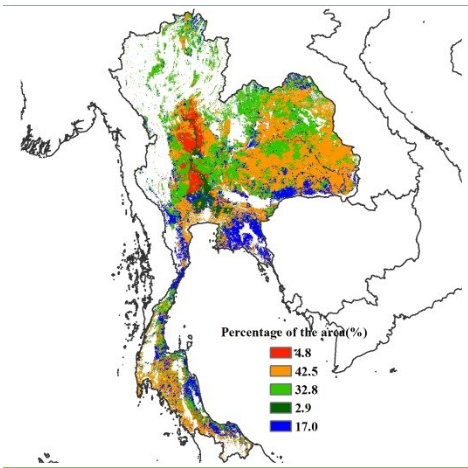
Figure 3.28. Thailand crop condition, April-July 2015



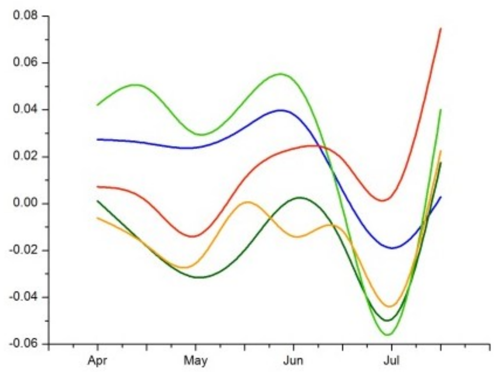
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

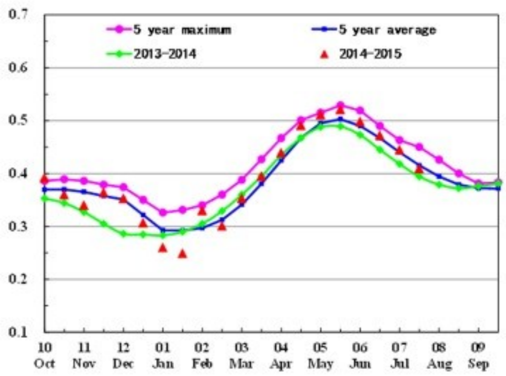
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA **TUR** UKR USA UZB VNM ZAF

[TUR] Turkey

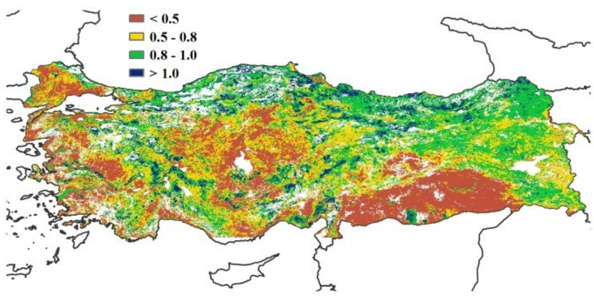
The crop condition from April to July 2015 was generally above average in Turkey. Winter wheat harvest was completed during the monitoring period, and summer crops (maize, rice, and potato) were sown from April on forward and are still growing. Accumulated rainfall (RAIN) and temperature (TEMP) were above average (although less so for temperature), while RADPAR was slightly below average. The agroclimatic conditions resulted in a BIOMSS decrease of 5% below the average of the previous five years. The maximum VCI (0.68) was above average, and the fraction of cropped arable land (CALF) significantly increased by 6% compared to the recent five-year average. Production of winter crops is expected to be comparable to the average of the previous five years.

Crop condition above the recent five-year average prevailed over most of Central Anatolia. In the province of Uşak, the surrounding areas of the Aegean region, and in south-eastern Anatolia crop condition changed from favorable to unfavorable during the middle of May and recovered to average in the middle of June. Poor growth conditions concentrated in the Eastern Anatolia and the Marmara regions over the whole monitoring period. Overall, the outcome for the winter crop season is favorable, while the outlook for the summer crops is mixed.

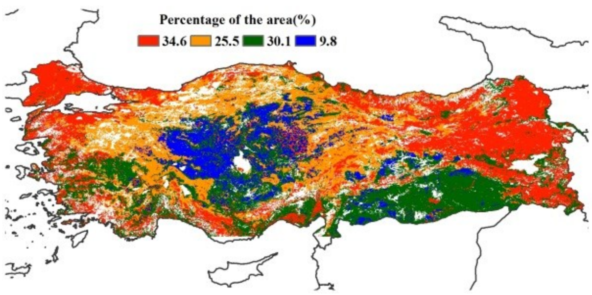
Figure 3.29. Turkey crop condition, April-July 2015



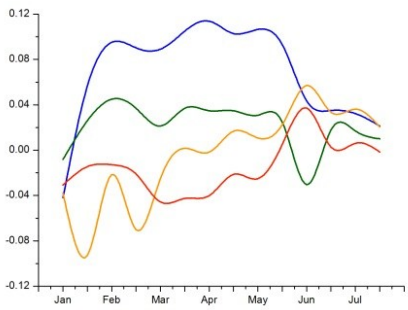
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

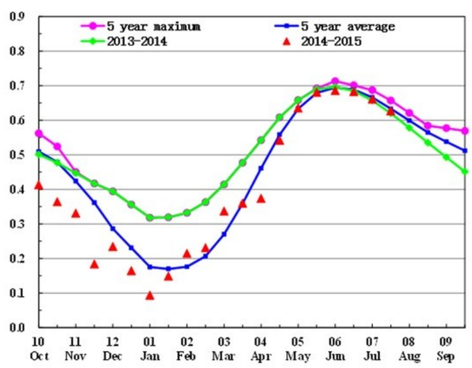


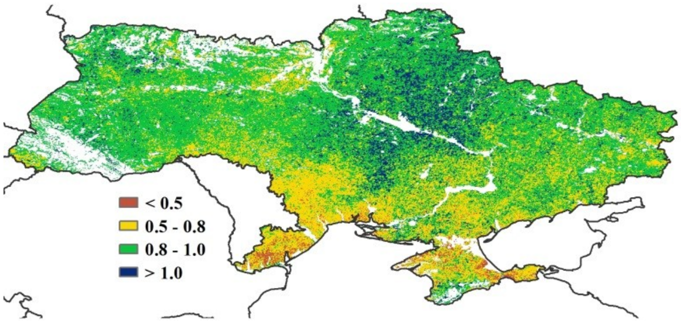
(d) NDVI profiles

[UKR] Ukraine

The harvest of winter wheat in Ukraine started in July and is currently still underway; spring cereals and maize are still growing. Rainfall was well below average (-20%), while radiation slight increased (+1.0%). As illustrated in the section on the Central Europe to Western Russia MPZ (section 2.7), the decrease in potential biomass production potential (as described by BIOMSS) is large in the west of the country (-20%), while the east had favorable conditions with at least average BIOMSS; At the national level, a BIOMSS decrease of 15% is expected. According to the NDVI profiles, crop condition in Ukraine is close to the reference five-year average with a maximum VCI index of 0.86. According to the spatial NDVI patterns and compared to the last five years, central and eastern areas underwent favorable conditions in June (including Poltavs'ka, Chernihivs'ka, Sums'ka, and Kharkivs'ka), which is confirmed in the maximum VCI map. The many pixels with values >1.0 in the VCI map indicate exceptionally good crops in those areas. Altogether, the situation of both winter and summer crops has recovered from the poor conditions before; the current expectation is that crop production will be close to but below average.

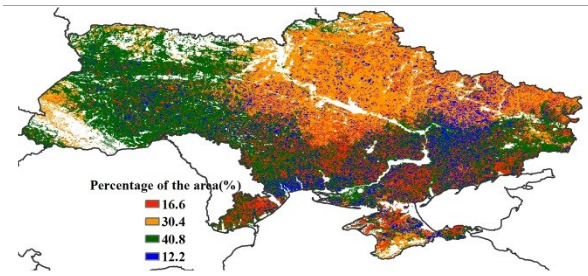
Figure 3.30. Ukraine crop condition, April-July 2015

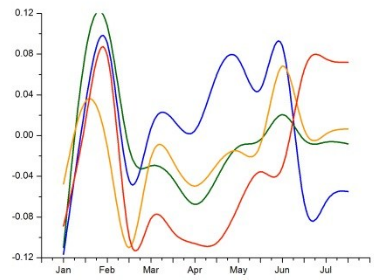




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

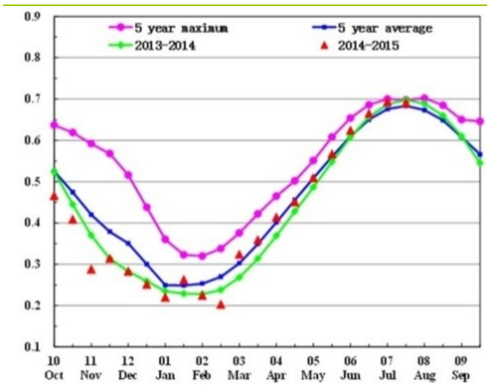
[USA] United States

In general, CropWatch indicators indicate that crop condition was above average in the United States over the monitoring period, which covers the heading and harvesting season of winter crops and seeding and heading season of summer crops. Overall, the rainfall indicator (RAIN) shows a 33% departure above average, with average temperature (TEMP, +0.2°C) and a 4% decrease in radiation (RADPAR).

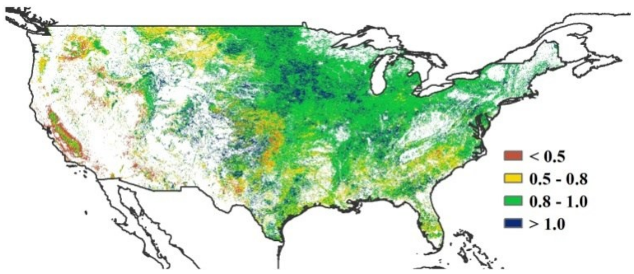
Excessive rainfall was recorded in the main winter wheat states, including Oklahoma (+126%), Texas (+101%), and Kansas (+36%). U.S. media reported strong rain causing record-breaking floods in May in Oklahoma and Texas, especially in Dallas-Fort Worth in Texas. Temperature was close to but below average in Oklahoma (-0.5°C), Texas (-0.4°C), and Kansas (-0.2°C). RADPAR was far below average in Texas (-8%), Oklahoma (-8%), and Kansas (-7%). Some winter crops were damaged by floods, but abundant rainfall also provided enough soil water for crop growth. As a result, the BIOMSS indicator shows a significant positive departure in Texas (+74%), Oklahoma (+69%), and Kansas (+31%) in general, but low values of VCIx in northern Texas and in Oklahoma, indicating the negative influence of excess water. As mentioned in the description of the North American MPZ (section 2.3), maize and soybeans received abundant rainfall, including in Iowa (RAIN, +15%), Illinois (+59%), Nebraska (+67%), Indiana (+33%), Ohio (+7%), and Minnesota (+1%). This is confirmed by record-breaking VCIx values (>1.0) in major maize and soybean producing areas. If favorable weather continues into the next monitoring period, good production of maize and soybeans can be expected. In Montana and North Dakota, rainfall was below or close to average (-6% and 0%, respectively). A negative NDVI departure after mid-May in the main barley producing states indicates a below average output for this crop. As mentioned in the previous bulletin, severe drought affected western states. This continued in this monitoring period in Washington (RAIN, -50%), Oregon (-24%), Montana (-6%), and the West Coast (-28%). Groundwater depletion in this region is a serious long-term risk.

Overall, the biomass accumulation potential (BIOMSS) shows a 19% positive departure compared to the recent five-year average; CALF increased by 1%; and VCIx was 0.88. The NDVI development profile showed above average crop condition, at the same level as same as last year, indicating a similar output can be expected. Table B.4 in Annex B presents the estimated production of maize, rice, wheat, and soybean in the United States in 2015.

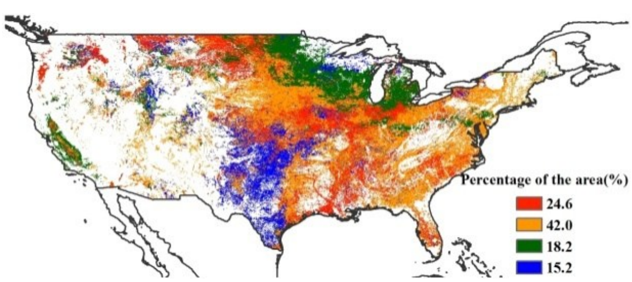
Figure 3.31. United States crop condition, April-July 2015



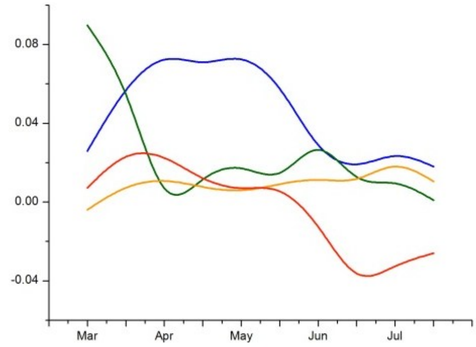
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

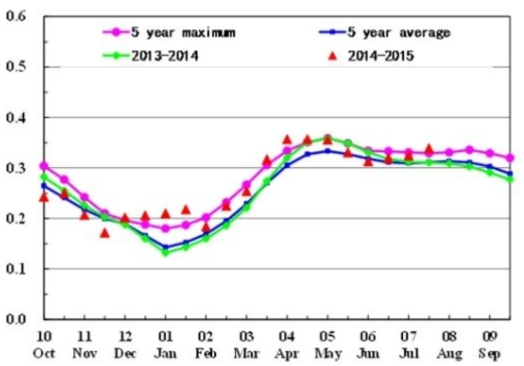
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA **UZB** VNM ZAF

[UZB] Uzbekistan

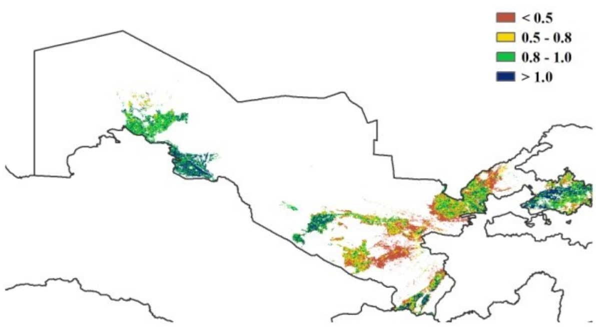
The reporting period covers the growing and harvesting stage of winter cereals, along with the sowing and growing stages of coarse grains and maize in Uzbekistan. The crop condition was generally favorable. The country as a whole showed an increase of RAIN, TEMP, and RADPAR (respectively+12%, +0.9°C, and +2%), and their combined effect was led to increase in BIOMSS of the order of 28% over the previous five-year average.

The national NDVI development graph shows that crop condition in early April was above the maximum of the past five years, but later deteriorated (in early June, it was below the average of past five years), and then gradually improved again up to a value above the maximum of the past five years. A closer look at the indicators shows that maximum VCI was below 0.5 in central and northern areas (Navoiy, Kagan, Jizzakh, Samarkand, Qarshi, Shakhriabz, Denow, Guliston, and Tashkent). NDVI profiles and spatial NDVI patterns show that in early June crops in most areas were in poor condition, except for the west and east (including the cotton growing areas of Karakalpakstan and Namangan, Andijon, and Quqon). The observation may be due to low rainfall and high temperature in this period. Generally rangeland and crop condition were satisfactory from April to July.

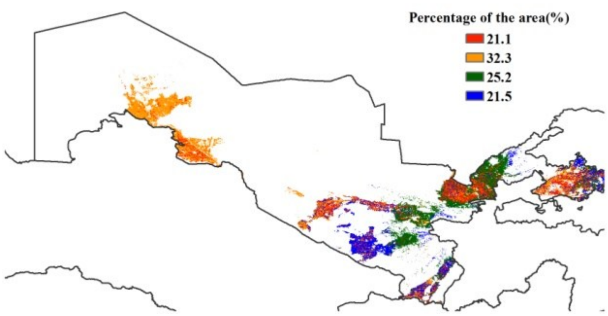
Figure 3.32. Uzbekistan crop condition, April-July 2015



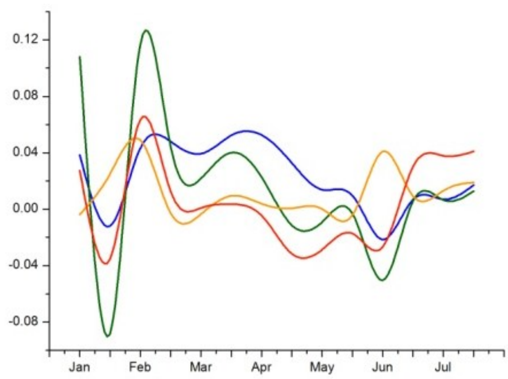
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

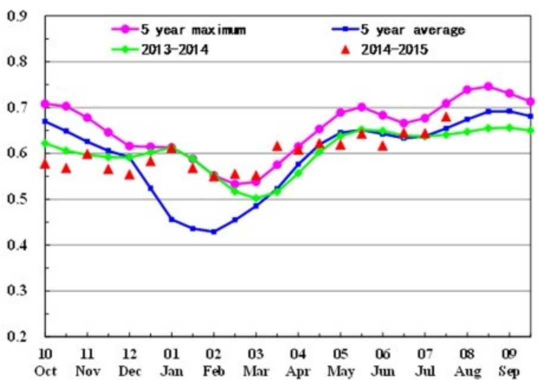


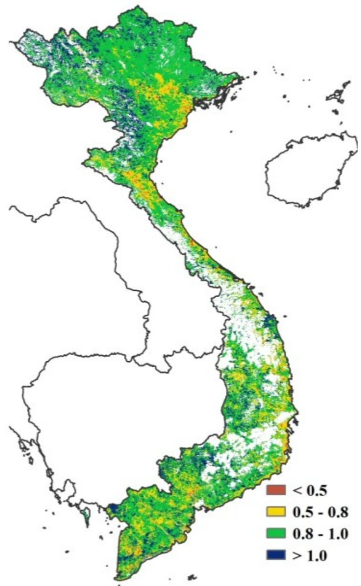
(d) NDVI profiles

[VNM] Vietnam

The period from April to July 2015 mainly covers the harvesting period of winter/spring rice and also the sowing of the 10th month or North rice in Vietnam. Crop condition in April was slightly better than the average of the previous five years, then reverted to close to average or even below average in July, before returning to above average again at the end of the month. This is also confirmed by the profiles of NDVI: All five profiles show above average conditions from July on forward. More than 85% of the crops are in favorable condition. Only about 10% of the crops show fair conditions, including those in the northeast provinces of Lang son, Bac Giang and Quang Ninh. The maximum VCI of the current period is 0.89, indicating acceptable overall conditions. Among the CropWatch agroclimatic and agronomic indicators, both RAIN (-2%) and TEMP (+1°C) were about average. In contrast, RADPAR (+4%) was slightly above average. Since the rainfall and temperature were favorable, the -10% decrease in biomass accumulation (BIOMSS) and the sharp drop of NDVI in early July may be attributed to the Typhoon Kujira (see also section 5.2). Overall crop condition in the country is satisfactory.

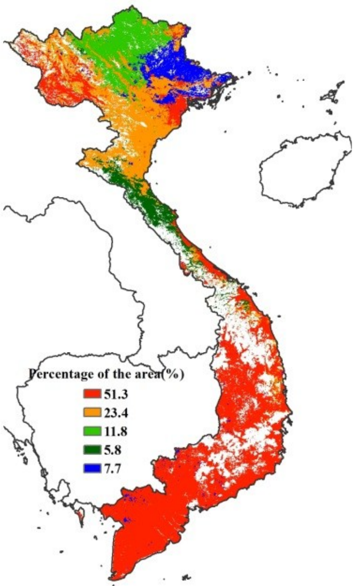
Figure 3.33. Vietnam crop condition, April-July 2015

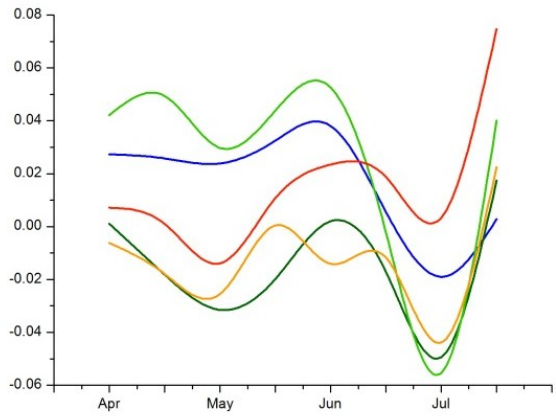




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

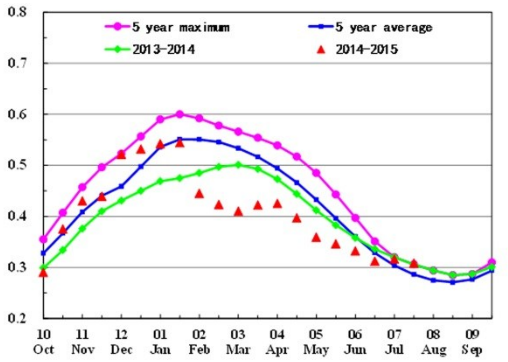
(d) NDVI profiles

ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM **ZAF**

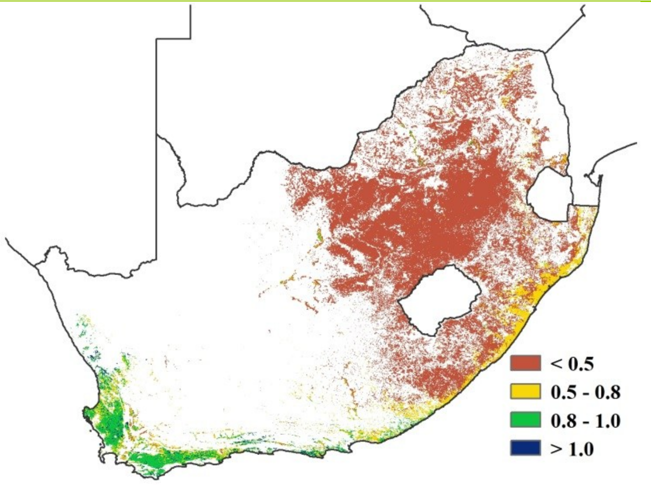
[ZAF] South Africa

The monitoring period covers the sowing of winter wheat and the harvesting of maize. Maize, which is widely cultivated in the country's northwest and in Mpumalanga, Free state, and KwaZulu-Natal, is the most important crop for South Africa. Crop condition is well below the average of the recent five years, which indicates a reduced production that is confirmed by the very low maximum VCI of 0.35. The CropWatch agroclimatic indicators all point to a decrease in production. Rainfall was well below average (RAIN, -50%), while temperature (TEMP) was slightly above average (+0.8°C) and radiation (RADPAR) mostly unchanged; all this led to a 42% reduction in biomass production potential compared to the average. Cropped arable land was 10 percentage points below the average of the last five years. As is shown in the NDVI clusters, more than 70% of the agricultural region does not reach average conditions.

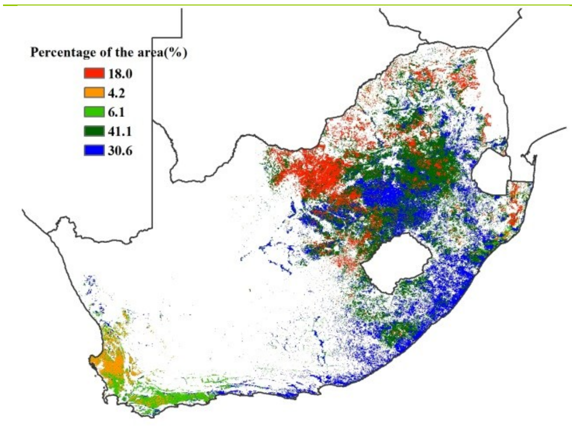
Figure 3.34. South Africa crop condition, April-July 2015



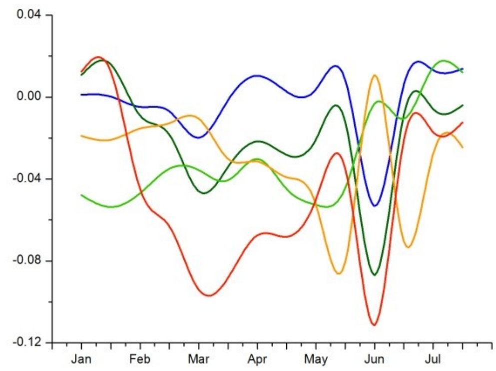
(a) Crop condition development graph based on NDVI



(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 agroclimatic and agronomic conditions over the monitoring period (section 4.1), a new bulletin section (4.2) describes the situation with pests and diseases that are affecting agricultural crops in China. Section 4.3 then presents an outlook for 2015 production of maize, rice, wheat, and soybean, while section 4.4 presents analyses by region. Additional information on the agroclimatic indicators for agriculturally important Chinese provinces are listed in table A.11 in Annex A.

4.1 Overview

During the monitoring period, winter wheat was harvested and summer crops (maize and soybean) were planted in the north of China. 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). Table 4.1 presents an overview of CropWatch indicators for the monitoring period.

Table 4.1. CropWatch agroclimatic and agronomic indicators for China, April-July 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	-36	-0.5	0	-14	1	0.89
Inner Mongolia	3	-0.5	1	0	-5	0.74
Loess region	-20	-0.6	1	-10	-3	0.87
Lower Yangtze	41	-0.6	-8	13	0	0.90
Northeast China	-25	-0.1	2	-17	-1	0.91
Southern China	-9	0.4	2	-9	-1	0.89
Southwest China	9	0.1	-2	0	-2	0.93

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 (April-July).

Rainfall (RAIN) increased by 11%, while temperature (TEMP) and radiation (RADPAR) decreased by 0.2°C and 2%, respectively, when compared with average. The prevailing agroclimatic conditions lead to average biomass. In more than 70% of the country, mostly in central and northern China, rainfall in the past seven months was average up to July, while it was above average in the west of Guangxi and east of Guizhou provinces. Temperature fluctuated widely.

In Huanghuaihai, Loess region, and Northeast China, below average RAIN and TEMP resulted in lower BIOMSS. In the Lower Yangtze region, abundant rainfall lead to a potential BIOMSS increase of 13% over the recent five-year average. High VCIx values mostly occur in Southwest China and in the Northeast. Low VCIx values are mainly located in Northwest China and Huanghuaihai regions, in particular the south of Jiangsu and north of Shanxi and Shaanxi provinces. Crop condition in the Southwest China is above average (VCIx is 0.93), as temperature and PAR are higher than average and rainfall is just slightly below.

During the monitoring period, the cropped arable land fraction (CALF) dropped below the recent five-year average in all regions except Huanghuaihai where CALF increased by 1 percentage point. In Inner Mongolia, Loess Region, and Lower Yangtze, the drop in CALF may be the result of the low temperature, while in Northeast and Southern China below average rainfall is the most likely factor. The results for minimum VHI indicate that most areas did not experience water stress. Some major production zones, however, suffered from drought, including southern Liaoning, western Shandong, and the east of Jiangsu province (figure 4.5).

Figure 4.1. China spatial distribution of rainfall profiles

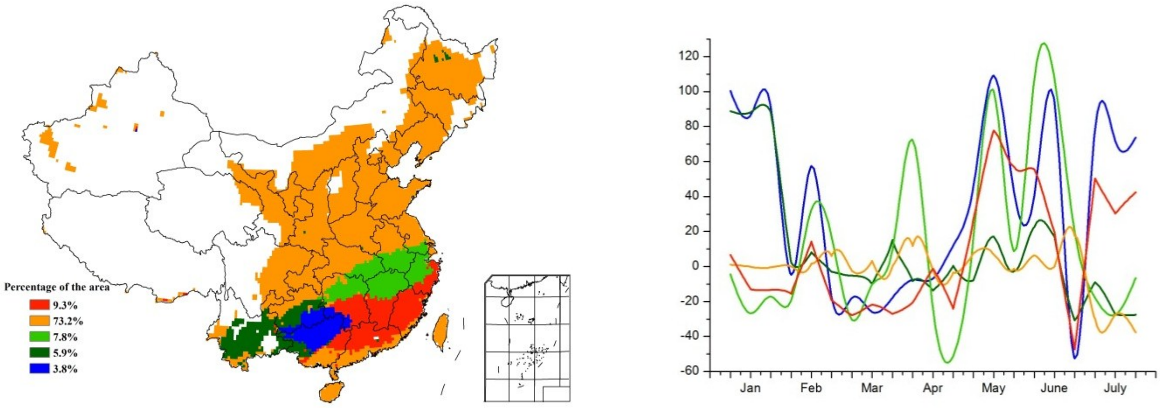


Figure 4.2. China spatial distribution of temperature profiles

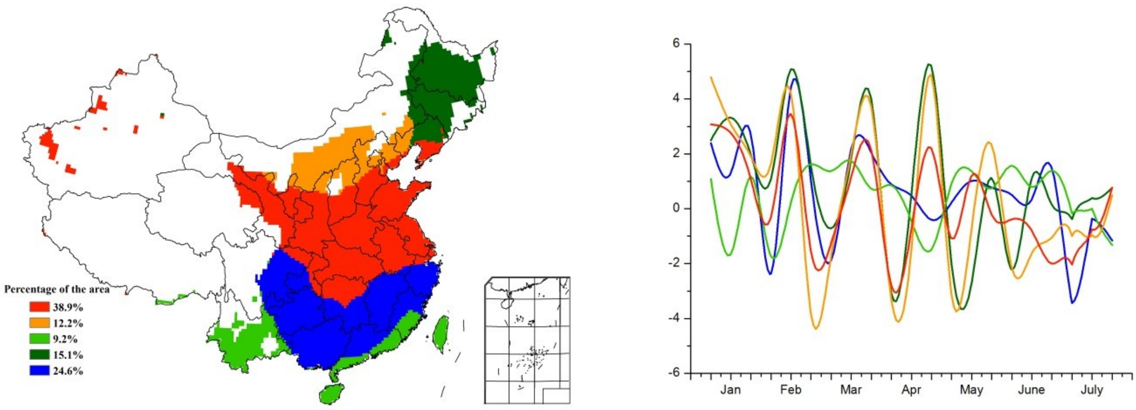


Figure 4.3. China cropped and uncropped arable land, by pixel

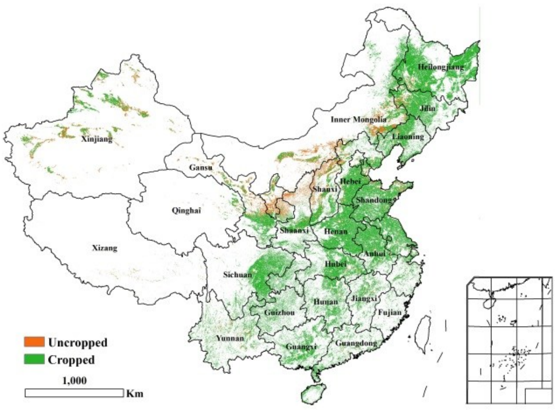


Figure 4.4. China maximum Vegetation Condition Index (VCIx), by pixel

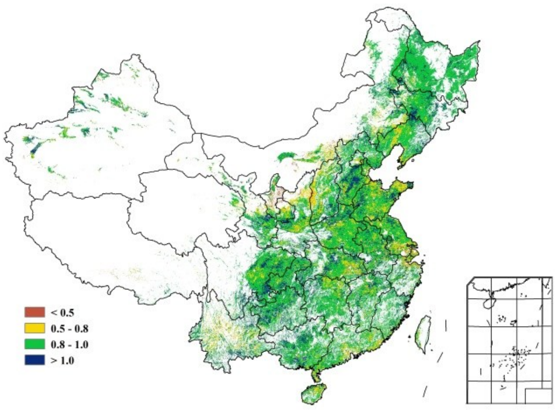
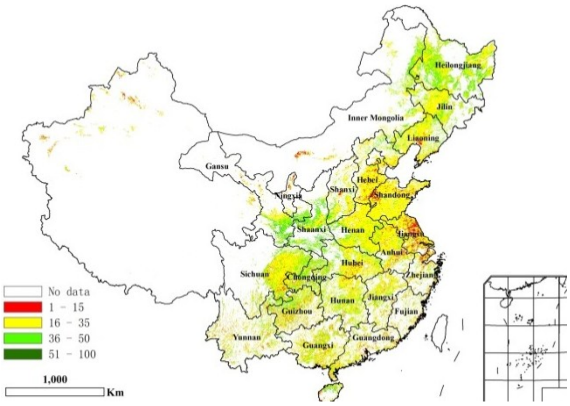


Figure 4.5. China VHI minimum, by pixel



4.2 Impact of pests and diseases

The impact of pests and diseases was relatively severe during August 2015 in the main rice regions of China. Maize areas were much less seriously affected.

Rice

For Southern China, south of the Yangtze River and in the middle reaches of the Yangtze River, due to large areas being cultivated either as single cropping rice or double cropping rice, a variety of different phenological stages coexist, which provide favorable conditions for the planthopper. The above average rainfall and normal temperature in eastern Southwest China, south of the Yangtze River, and in the Yangtze River basin has been conducive to both planthopper reproduction and sheath blight dispersal.

The distribution of the rice planthopper during August 2015 is shown in figure 4.6(a) and table 4.2. Across China, the total area affected with by the insect has reached 20 million ha, with the pest mostly occurring in the northern part of Southern China and the middle and lower reaches of the Yangtze River. The most severely affected areas include eastern Sichuan, most of Guizhou, central Hubei, most of Hunan, southern Jiangsu, central Anhui and northern Guangdong, where in total 10 million ha were damaged.

Rice sheath blight (figure 4.6(b) and table 4.3) has damaged around 15 million ha across China, with the disease mostly found along the middle and lower reaches of the Yangtze River and in most areas of Southern China and the east of Southwest China. Damage was most severe on 6.7 million ha in central Anhui, southern Jiangsu, most of Jiangxi, and in the east of Sichuan province.

Figure 4.6. Distribution of the rice planthopper (a) and rice sheath blight (b) in China, August 2015

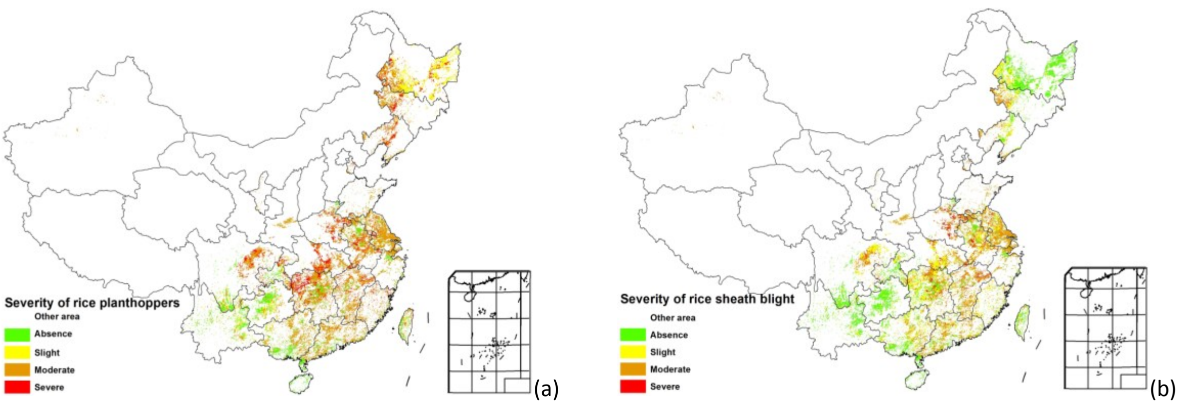


Table 4.2. Areas in China affected by rice planthopper, August 2015

Region	Area (thousand hectares)					
	Absence	Slight	Moderate	Severe	Total	Occurrence ratio
Huanghuaihai	232	2	1066	317	1617	85.6%
Inner Mongolia	5	3	247	37	292	98.4%
Loess region	3	7	127	6	143	97.7%
Lower Yangtze	879	79	6816	1701	9475	90.7%
Northeast China	30	1905	1443	880	4258	99.3%
Southern China	740	39	1431	45	2255	67.2%
Southwest China	1370	737	1757	954	4818	71.6%

Table 4.3. Areas in China affected by rice sheath blight, August 2015

Region	Area (thousand hectares)					
	Absence	Slight	Moderate	Severe	Total	Occurrence ratio
Huanghuaihai	237	129	961	290	1617	85.3%
Inner Mongolia	10	35	229	18	292	96.8%
Loess region	3	10	125	5	143	98.1%
Lower Yangtze	1121	2544	4933	877	9475	88.2%
Northeast China	2704	1165	354	35	4258	36.5%
Southern China	830	440	961	24	2255	63.2%
Southwest China	2505	1497	603	213	4818	48.0%

Maize

In general, during August 2015, the situation of maize diseases and pests in the main maize producing regions of China was relatively uneventful. In August, northern leaf blight only occurred in Northeast and Southwest China. Meanwhile, the temperature and precipitation in Northeast, Huanghuaihai and Inner Mongolia provided a proper environment for armyworm reproduction.

As shown in figure 4.7(a), only some parts of Heilongjiang, Jilin, Liaoning, Yunnan, Sichuan, and Guizhou provinces were affected by northern leaf blight. Within the diseased regions, the total damaged area is around 560 thousand ha.

For armyworms, the total area affected in China is around 1.5 million ha, with the pest mostly observed in Northeast, Inner Mongolia, and Huanghuaihai (figure 4.7(b) and table 4.4). Especially severe attacks are reported from eastern Inner Mongolia, southern Heilongjiang, Jilin, Liaoning, northern Hebei, Beijing, Tianjin, and some parts in Henan and Shandong, totaling 1.3 million ha.

Figure 4.7. Distribution of maize northern leaf blight (a) and armyworm (b) in China, August 2015

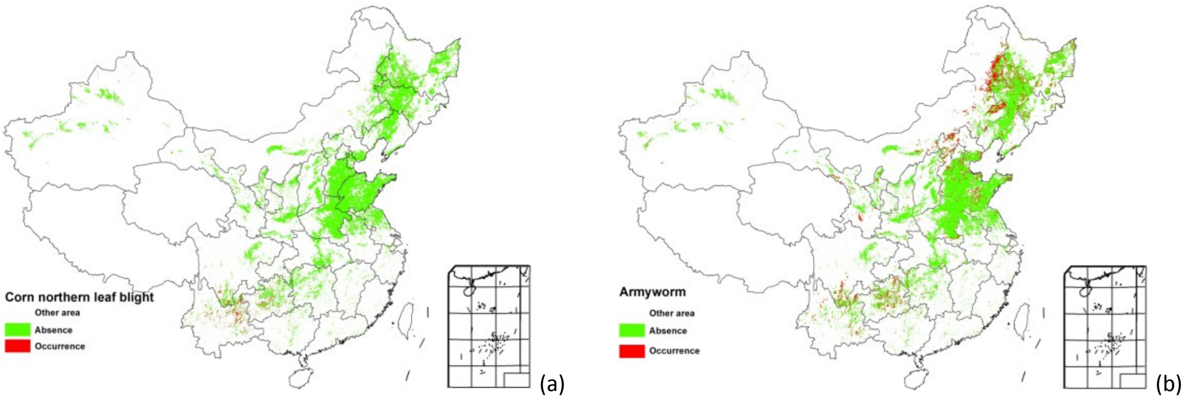


Table 4.4. Occurrence of armyworm in China, August 2015

Region	Maize area (thousand hectares)	Armyworm occurrence area (thousand hectares)	Occurrence ratio
Huanghuaihai	16385	309	1.9%
Inner Mongolia	2683	348	13.0%
Loess region	2483	7	0.3%
Lower Yangtze	2289	19	0.8%
Northeast China	10318	631	6.1%
Southern China	145	4	2.8%
Southwest China	2601	125	4.8%
Huanghuaihai	16385	309	1.9%

4.3 Crop production

CropWatch indicators point to favorable conditions for winter crops at the grain filling stage. As a result, the total production of winter crops in China is revised to 125.7 million tons, an increase of 2.16 million tons (or 1.7%) compared to 2014 and 0.3 percentage points (equivalent to 317 thousand tons) up from the previous estimates. Table 4.5 presents an overview of the estimated production levels by province. Only Anhui, Hubei, and Gansu show decreased production compared to the previous year.

Table 4.5. China, 2015 winter crop production (thousand tons) and percentage difference with 2014, by province

	2014 (thousand ton)	2015			
		Area change	Yield change	Production change	Production (thousand ton)
Hebei	10783	0.9%	0.2%	1.1%	10904
Shanxi	2170	-0.5%	1.2%	0.7%	2184
Jiangsu	9995	1.7%	-1.0%	0.7%	10069
Anhui	12122	-1.2%	-0.6%	-1.8%	11908
Shandong	22107	2.4%	1.7%	4.2%	23037
Henan	25862	0.2%	0.8%	1.1%	26134
Hubei	6120	-0.6%	-3.4%	-4.0%	5877
Chongqing	2297	-0.8%	1.3%	0.5%	2308
Sichuan	5495	0.9%	1.4%	2.3%	5621
Shaanxi	4389	-0.4%	1.3%	0.8%	4426
Gansu	3108	-6.3%	5.7%	-0.9%	3080
Sub total	**104448**	**-**	**-**	**1.1%**	**105548**
Other provinces	19093	-	-	5.6%	20155
National total*	**123541**	**0.9%**	**0.8%**	**1.7%**	**125703**

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

Table 4.6 lists the estimated 2015 production for maize, rice, wheat, and soybean in China; table 4.7 provides additional detail about different rice crop types. The production of maize is at the same level as during 2014 (an increase just under +0.5%), but rice and wheat are estimated to respectively increase their production by 1% and 2% compared with the previous season. Soybean decreases 3%—in line with its downward trend—because of a drop in planting area; soybean production will reach 12.69 million tons. For rice, single rice production increases by 2%, while the production of early rice and late rice decrease by 1% and 2%, respectively.

Chongqing, Gansu, Hebei, Henan, and Xinjiang all have an estimated increase in maize production above 3%. On the contrary, a large decrease in the production of this crop is observed in Inner Mongolia, Ningxia, Shaanxi, and Shanxi. The factors behind the decrease vary from province to province and include drought and pests in Inner Mongolia. Yield in Shaanxi province drops mainly due to the severe drought. Soybean in Heilongjiang province—the top soybean producing province in China (representing nearly one third of the national soybean production)—decreases by 4% due to the reduced planted area. Inner Mongolia and Shanxi show the largest drop in soybean production, as both area and yield are low.

The aggregated rice production shows a decrease in Guangdong, Hunan, Jiangxi, Yunnan, and Zhejiang, while all other provinces show an estimated increase by 1% to 3%. Generally, areas that practice double cropping show a decreasing trend while the area for single rice planting increased in recent years.

Table 4.6. China, 2015 maize, rice, wheat and soybean production and percentage difference with 2014, by province

	Maize		Rice		Wheat		Soybean	
	2015	**Δ(%)**	**2015**	**Δ(%)**	**2015**	**Δ(%)**	**2015**	**Δ(%)**
Anhui	3626	0	17410	2	11245	-1	1113	1
Chongqing	2165	3	4892	2	1118	0		
Fujian			2855	2				
Gansu	4892	6			1607	-1		
Guangdong			10918	-1				
Guangxi			11247	2				
Guizhou	4935	-1	5213	1				
Hebei	17163	6			10730	1	175	2
Heilongjiang	25767	-2	20259	0			4413	-4
Henan	16625	4	3937	1	25992	1	752	2
Hubei			15903	0	4328	-3		
Hunan			25242	-1				
Inner Mongolia	13636	-5					784	-6
Jiangsu	2275	2	17111	3	9606	1	777	-1
Jiangxi			17133	-1				
Jilin	23944	0	5063	1			643	-3
Liaoning	12802	-1	4703	0			506	-1
Ningxia	1733	-4	542	0				
Shaanxi	3735	-3	1053	1	3997	1		
Shandong	18568	1			22881	5	667	1
Shanxi	9084	-5			2109	1	179	-5
Sichuan	7160	1	14834	1	4673	2		
Xinjiang	6832	6						
Yunnan	5730	2	5147	-3				
Zhejiang			6367	-2				
Sub total	**180671**	**0**	**189915**	**0**	**98286**	**1**	**10008**	**-2**
Other provinces	12151	3	12408	3	15639	2	2683	-6
National total*	**192822**	**0**	**202323**	**1**	**121613**	**2**	**12691**	**-3**

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

Table 4.7. China, 2015 single rice, early rice, and late rice production and percentage difference with 2014, by province

	Early Rice		Single Rice		Late Rice	
	2015	**Δ(%)**	**2015**	**Δ(%)**	**2015**	**Δ(%)**
Anhui	1844	-3	13775	2	1791	0
Chongqing			4892	2		
Fujian	1717	2			1137	0
Guangdong	5247	1			5671	-3
Guangxi	5581	3			5666	2
Guizhou			5213	1		
Hebei						
Heilongjiang			20259	0		
Henan			3937	1		
Hubei	2306	-4	10813	1	2784	-1
Hunan	8199	-1	8524	2	8606	-2
Jiangsu			17111	3		
Jiangxi	7336	1	2861	-1	6936	-4
Jilin			5063	1		
Liaoning			4703	0		
Ningxia			542	0		
Shaanxi			1053	1		
Sichuan			14834	1		
Yunnan			5147	-3		
Zhejiang	817	-4	4668	-1	882	-4
Sub total	**33047**	**0**	**123396**	**1**	**33472**	**-2**
Other provinces	2077	-11	8826	8	1505	-3
National total *	**35123**	**-1**	**132221**	**2**	**34978**	**-2**

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

CropWatch puts the total annual output (including cereals, legumes, and tubers) at 567.7 million tons, 0.7% up from 2014 (3.9 million tons increase). The total summer production is forecast at 406.9 million tons, 0.5% increase or 2 million tons increase from last drought year, slightly above 2013 summer crop production. Early rice production is at 35.1 million tons, 1% decrease from the previous year.

Since late rice is still at early growing stage, and maize and single rice are at grain filling stage, the production for each crop type as well as total summer crops production and annual outputs will be revised using new updated remote sensing data in the next bulletin.

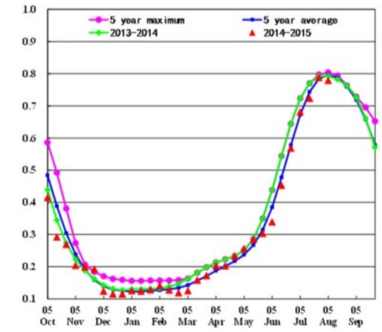
4.4 Regional analysis

Figures 4.8 through 4.14 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 July 2015 to the previous season, to the five-year average (5YA), the five-year maximum; (b) Spatial NDVI patterns from April to July 2015 (compared to the (5YA); (c) NDVI profiles associated with the spatial patterns under (b); (d) maximum VCI (over arable land mask); and (e) biomass for April-July 2015. Additional information about agroclimatic indicators and BIOMSS for China is provided in Annex A, table A.11.

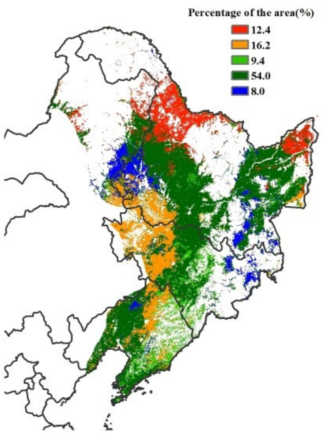
Northeast region

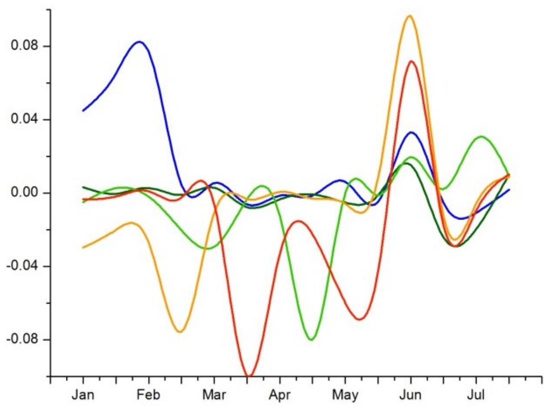
In China's Northeast, the monitoring period from April to July mainly covered the growing of spring maize, spring wheat, one-season rice, and soybean. Overall and across the monitoring period, crop condition was comparable with the recent five-year average. The NDVI clusters and profiles also illustrate this: crop condition is average in about 70% of the area and below average in parts of north Heilongjiang and west Jilin provinces before July because of the shortage of rain that affected the maturity phase. VCIx values were between 0.5 and 0.8 in nearly the entire region. Over the reporting period, only 1% of arable land was uncropped. The CropWatch agroclimatic and agronomic indicators show that the region suffered a 25% drop in rainfall (RAIN) compared to average, while temperature (TEMP) and PAR (RADPAR) accumulation were just average. Biomass accumulation (BIOMSS) was 17% below the five-year average, resulting in poor crops in the area.

Figure 4.8. Crop condition China Northeast region, April-July 2015

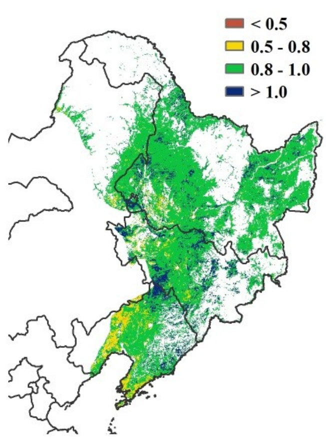


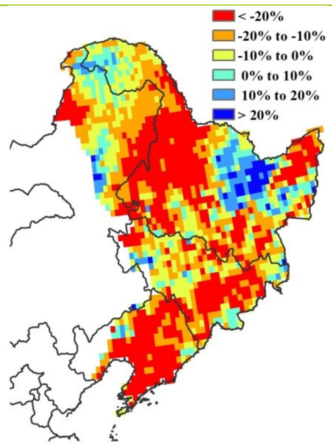
(a) Crop condition development graph based on NDVI





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



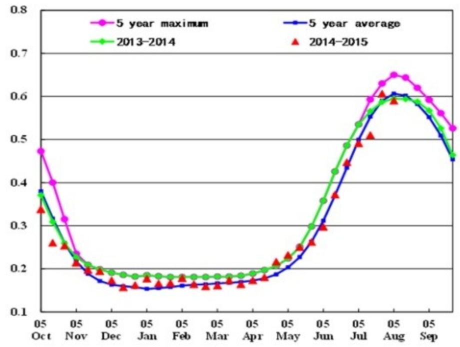


(d) Maximum VCI (e) Biomass

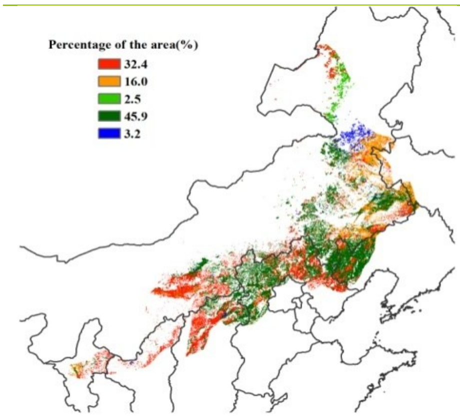
Inner Mongolia

The condition of spring crops was generally unfavorable in Inner Mongolia for the current reporting period. Among the CropWatch agroclimatic indicators, RAIN was somewhat above average (+3%); TEMP was below (-0.5°C), and there was no change in the biomass production potential BIOMSS. Conditions were favorable for the sowing and early growth of spring crops, as illustrated in the crop development graph from April to late May. In June, however, dry weather affected crop growth. Crops recovered gradually, and by late July crop condition was above average. West Liaoning, central and southeast Inner Mongolia, northern Ningxia, Shaanxi, and Shanxi all suffered unfavorable vegetation condition according to the VCIx map. This is further confirmed by the presence of uncropped areas as in partly cropped arable land, the potential biomass is poor as well. Generally crop condition was unfavorable from April to July. If unfavorable conditions are maintained over the whole cycle, crop growth will be restricted and the outcome may altogether be a poor season.

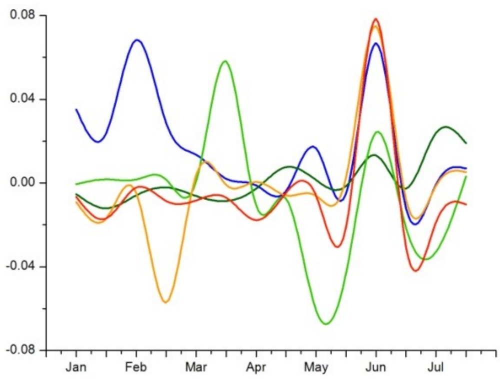
Figure 4.9. Crop condition China Inner Mongolia, April-July 2015



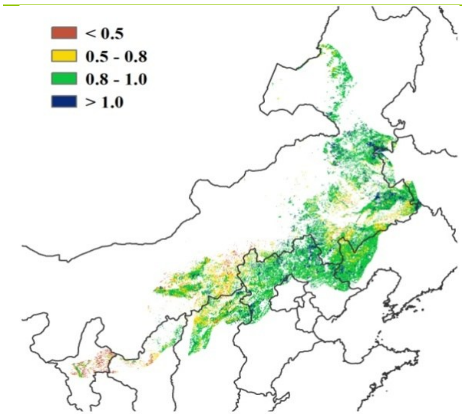
(a) Crop condition development graph based on NDVI



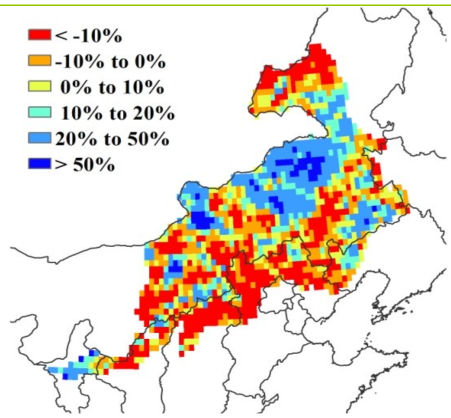
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI

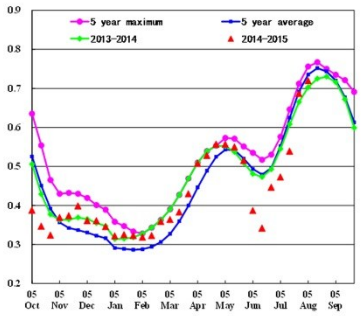


(e) Biomass

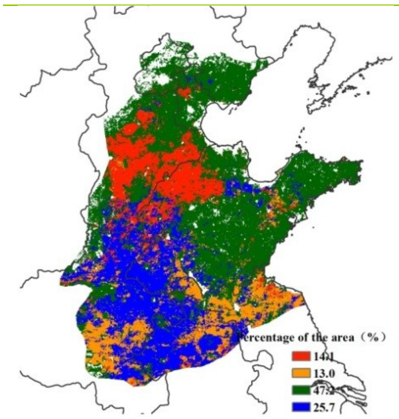
Huanghuaihai

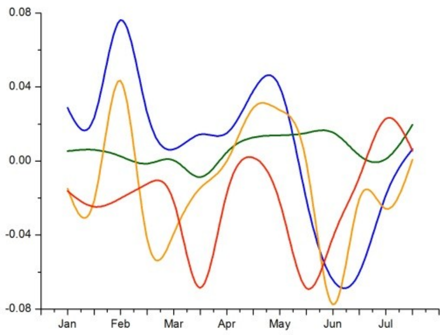
Generally, crop condition in Huanghuaihai is not very satisfactory. The main crop for the reporting period was winter wheat, which is harvested in June, while maize is being planted. As shown by the NDVI development graph, crop condition was above the five-year average during April and May, while it was well below last year's condition and the five-year average most of the time, suggesting a decline in crop production. Agroclimatic conditions were unfavorable: 36% below average rainfall and 0.5°C below average temperature resulted in a 14% reduction in biomass, especially in Beijing, Tianjin, Hebei, northern Jiangsu, and northern Shandong. According to the NDVI clusters, crop condition in part of Hebei and Shandong was below normal, while other regions were at the average level. In addition, the fraction of cropped arable land was 1 percentage point below average. Low values for the vegetation condition index (VCIx) are distributed in the west and south of Bohai bay, which is corresponding with reduced values for BIOMSS.

Figure 4.10. Crop condition China Huanghuaihai, April-July 2015



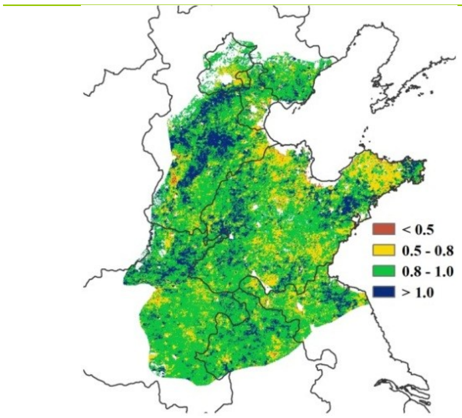
(a) Crop condition development graph based on NDVI

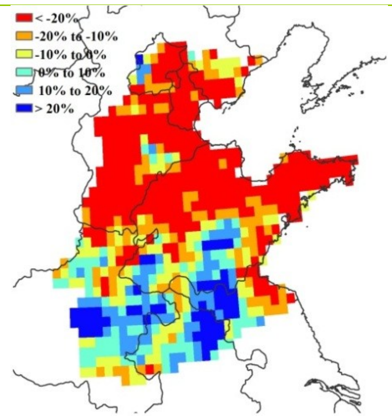




(b) Spatial NDVI patterns compared to 5YA

(c) NDVI profiles





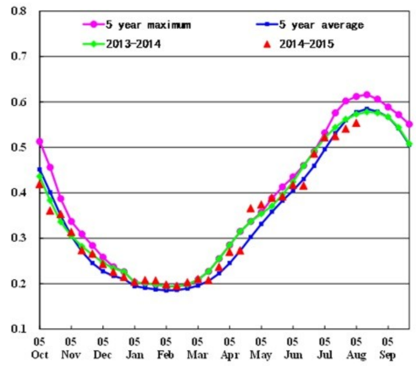
(d) Maximum VCI

(e) Biomass

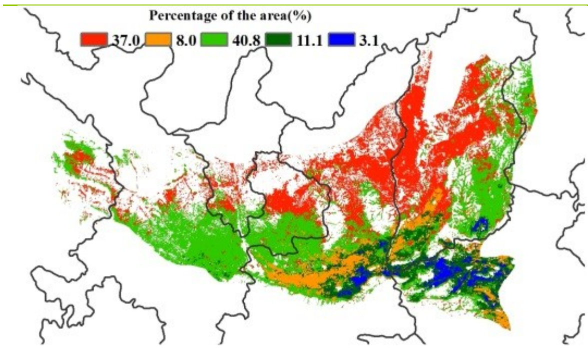
Loess region

In the Loess region, winter wheat was harvested from early to mid-June, and summer maize has been planted during the monitoring period. When compared to average, PAR accumulation (RADPAR) increased 1%, while temperature dropped by 0.6°C and rainfall by 20%. Up to June, condition of crops was only below the five-year average, but by the end of July it was below both that average and last year's level, with a VCIx value of 0.87. The spatial NDVI clusters and profiles indicate that crop condition fluctuated in almost all the seven months covered in the graphs; condition was favorable in the northwest of Henan and central Shaanxi provinces during the monitoring period, with the exception of the period in early June. On the contrary—and mostly because of the below average precipitation (which is confirmed by the maps of potential biomass), crops were in poor condition (compared to the five-year average) in the northeast of Gansu and north of Shaanxi and Shanxi provinces. The fraction of arable land actually cropped decreased 4 percentage points, possibly as a result of lower temperature and below average rainfall.

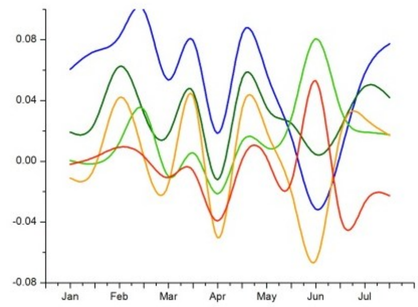
Figure 4.11. Crop condition China Loess region, April-July 2015



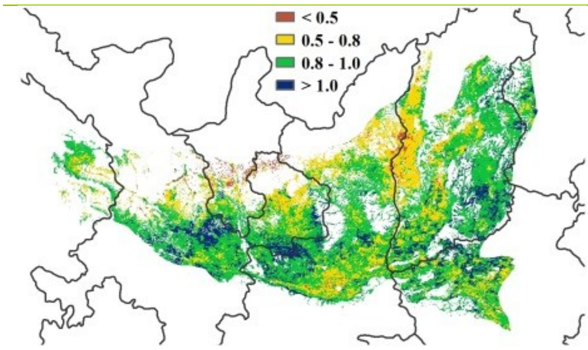
(a) Crop condition development graph based on NDVI



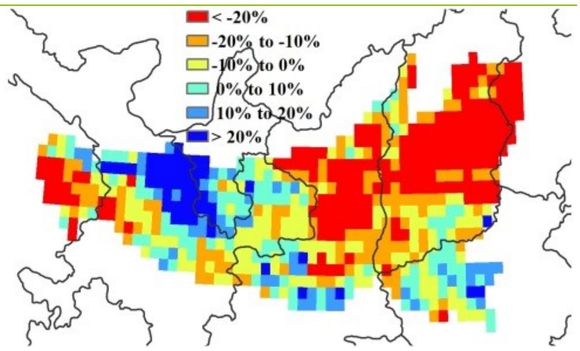
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI

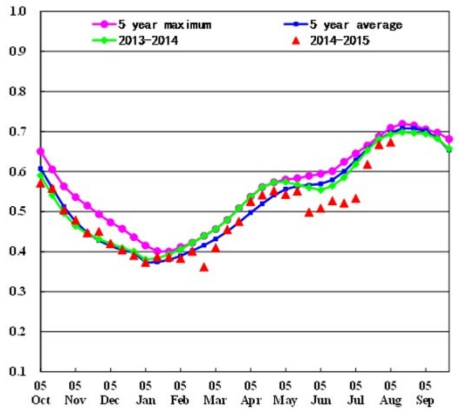


(e) Biomass

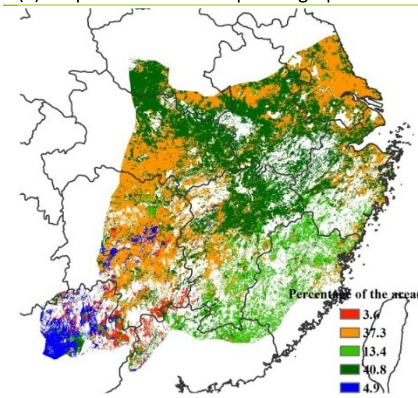
Lower Yangtze region

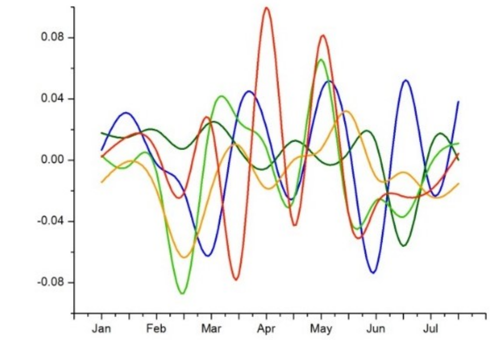
During the monitoring period, the winter wheat harvest was completed in the north of the Lower Yangtze region (Henan, Jiangsu, and Anhui provinces). In the south and center (including Fujian, Jiangxi, Hunan, and Hubei provinces), early rice was harvested while semi-late and late rice is still growing. Between April and July crop condition varied from below to close to the average of the past five years. The agroclimatic indicators show that rainfall was significantly above average (+41%), but radiation and temperature were below (-8% and -0.6°C, respectively). Due to heavy precipitation, Guangdong, Guangxi, Fujian, Jiangxi, Hunan, Hubei, and Zhejiang provinces, which together cover most of the Lower Yangtze region, suffered from serious floods between May and June. However, this did not lead to significant crop loss. The biomass production potential (BIOMSS) was above the past five-year average (+13%), and the cropped arable land fraction was average. In addition, the maximum VCI reached 0.90. Based on the above analysis, the yield of crops in the region is expected to be close to the recent five-year average.

Figure 4.12. Crop condition Lower Yangtze region, April-July 2015



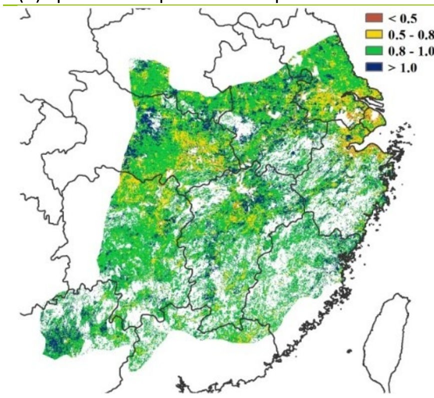
(a) Crop condition development graph based on NDVI

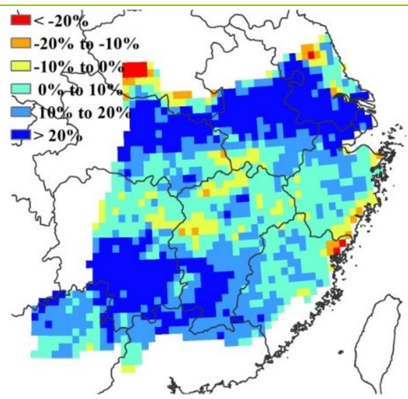




(b) Spatial NDVI patterns compared to 5YA

(c) NDVI profiles





(d) Maximum VCI

(e) Biomass

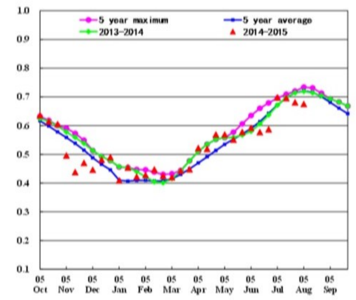
Southwest China

The ongoing season in Southwest China shows overall fair conditions. Compared with average, the precipitation increased by 9%, temperature was average (+0.1°C) and radiation decreased by 2%. This led to a stable potential accumulated biomass (0%) on the whole, compared to the five-year average. Nearly all arable land was actually cropped over the region, with the CALF decreasing by just 2 percentage points compared to average. The maximum VCI reached 0.93.

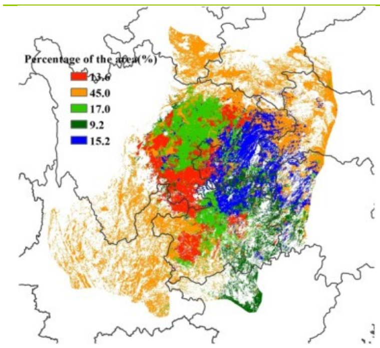
According to the crop condition development graph based on NDVI, in April crop condition in the region reached the five-year maximum level, but condition was just average in May. At the beginning of June and July, the crop condition was below average in southern Chongqing, southwestern Hunan, middle and northern Guangxi, southeastern Sichuan, and western Guizhou, accounting for about 22.8% of the cropped region, which was also reflected by the spatial NDVI pattern and profiles.

The CropWatch agroclimatic indicators for Yunnan are as follows: precipitation, -36%; temperature, +0.5°C, and radiation, +2%. As a result, potential accumulated biomass decreased by 18%. Northwestern and northeastern Yunnan suffered from severe drought, which will have a negative influence on rice output. The same situation occurred in southwestern Chongqing and small parts of south-eastern Sichuan, areas that will need close monitoring in the coming months.

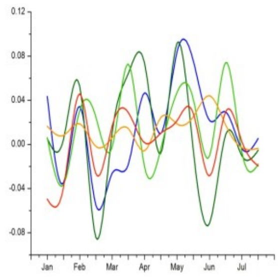
Figure 4.13. Crop condition Southwest China region, April-July 2015



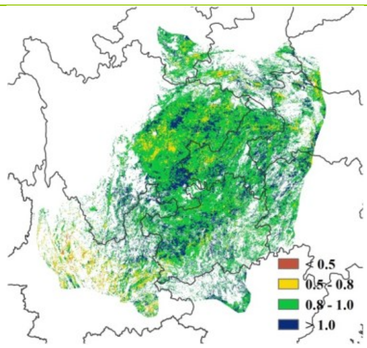
(a) Crop condition development graph based on NDVI



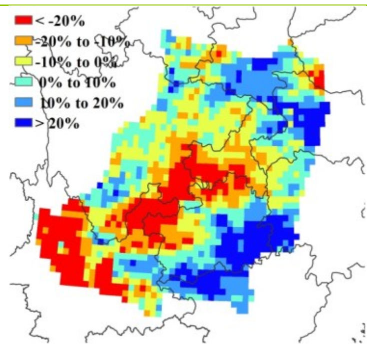
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI



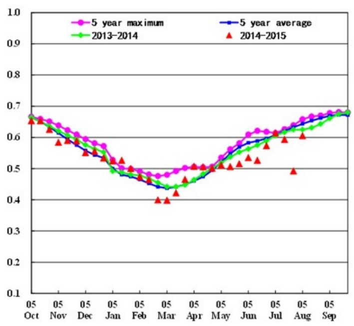
(e) Biomass

Southern China

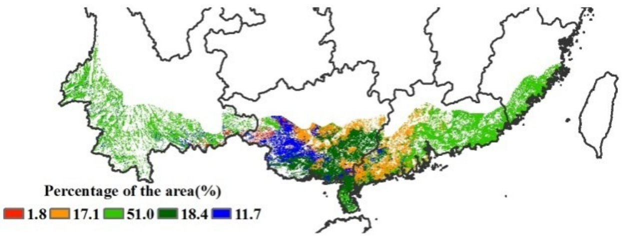
The period from April to July 2015 covers the growing and harvest period of early rice, the planting of late rice, and harvest of winter wheat. Crop condition was generally somewhat below average during the entire period. The precipitation (RAIN) dropped by 9%, temperature (TEMP) increased by 0.4°C, while radiation (RADPAR) increased by 2%. As a result, potential accumulated biomass decreased by 9% on the whole, compared to the five-year average. Nearly all arable land was actually cropped over the region, with the CALF decreasing by only 1 percentage point.

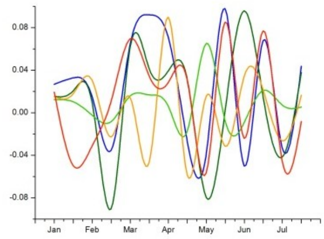
From the crop condition development graph based on NDVI, it can be seen that in April crop condition in the region reached the five-year maximum. However, condition dropped sharply to below average in May and the beginning of June. After June it showed some recovery and returned to average at the end of June. Subsequently, it dropped below average condition again, resulting from frequent rainstorms and floods (see section 5.2 for details). The overall below average condition in May and July was also reflected by the spatial NDVI pattern and profiles, covering southern Guangxi and southwestern Guangdong regions. According to CropWatch monitoring, close to average temperature (+0.5°C) and low rainfall (-36%) with stable radiation (+2%) in Yunnan led to the decrease in potential accumulated biomass (BIOMSS) by 18% compared to average. Yunnan has suffered from severe drought, including in the southern Yunnan region also mentioned in the analysis of China's Southwest region. CropWatch will closely monitor the situation in this area in the coming months.

Figure 4.14. Crop condition Southern China region, April-July 2015



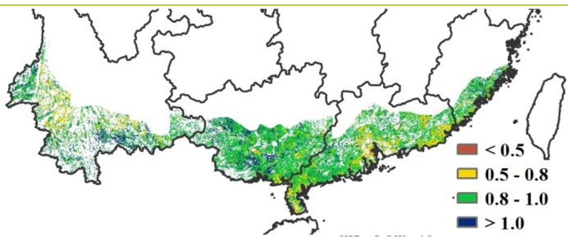
(a) Crop condition development graph based on NDVI



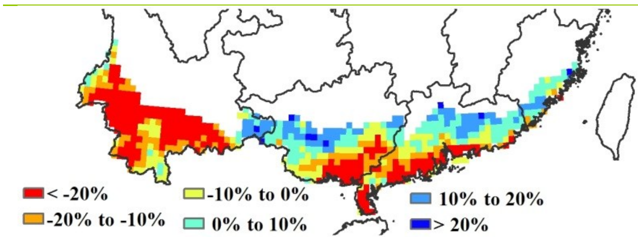


(b) Spatial NDVI patterns compared to 5YA

(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 presenting additional information about topics of interest to global agriculture. Section 5.1 presents a production outlook for 2015, while the other three sections focus on disaster events (5.2), agricultural developments in North America (section 5.3), and an update on El Niño (5.4).

5.1 Production outlook for 2015

The latest global CropWatch forecasts of maize, rice, wheat, and soybeans production for 2015 are presented in tables 5.1 and 5.2, providing both a quick overview (table 5.1) and detailed production estimates for each of the 31 countries monitored by CropWatch (table 5.2).

Table 5.1. Overview of 2015 production estimates and forecasts for maize, rice, wheat, and soybean (thousand tons) for major and minor producers and exporters

	Maize		Rice		Wheat		Soybean	
	2015	Δ%	2015	Δ%	2015	Δ%	2015	Δ%
Major producers	874321	-1	660265	0	626630	1	284619	0
Minor producers	112255	3	80786	2	98212	2	25731	10
Total	**986576**	**0**	**741051**	**0**	**724842**	**1**	**310350**	**1**
Major exporters	479413	0	254646	-2	290126	2	250529	0

Note: Major exporters are those that normally account for 80% of world exports

As shown in table 5.1, the total production of maize and rice is stable with a global production of 987 million tons and 741 million tons, respectively, close to that of 2014. With a production of 725 million tons, wheat production has increased 1% over 2014. Soybean global production increases by 1% at 310 million tons. The global percentages of change are identical with those of the major producers for rice and wheat; the additional 140 minor producers for maize, 96 for rice, 98 for wheat, and 75 for soybeans do not alter the overall picture. However, the largest increases among the minor producers are those for maize (+3%) and soybean (+10%), confirming the appeal of both crops to a number of countries that may eventually become exporters of the commodities (see table 5.2).

Among the major exporters (listed in table 5.2), maize and soybeans stay at the same level as during 2014, while rice drops 2% and wheat increases by the same percentage. This may result in some strain on the markets for maize, rice and soybean.

The production estimates in table 5.2 directly reflect marked conditions of drought and water excess that have affected several countries and groups of countries, including China. In China, however, the size of the country and the large climatic diversity has helped to efficiently spread the risk. In China, maize production stagnates compared with 2014, while rice and wheat increase (+1% and +2%, respectively). Soybean continues the negative production trend (-3%), albeit at a reduced rate compared with the last ten years.

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	1805	4	12053	15	52230	0
Australia	1052	2	1779	20	24581	-9	89	6
Bangladesh	2325	5	51785	2	1340	4	64	1
Brazil	79655	1	11975	1	6764	1	90230	1
Cambodia	932	-10	8824	-7			103	-6
Canada	12123	2			31141	-6	5415	0
China	**192822**	**0**	**202323**	**1**	**121613**	**2**	**12691**	**-3**
Egypt	5837	-2	6424	-1	9858	4	22	-5
Ethiopia	6425	-5	195	7	4243	-3	87	20
France	14768	-2	76	-7	39077	-2	105	-2
Germany	4513	-3			27175	-2	3	5
India	21067	4	151495	-3	91396	-4	12273	6
Indonesia	18415	0	69797	1			690	-11
Iran	2613	4	2534	0	14179	6		
Kazakhstan	603	4	365	2	15913	15	252	12
Mexico	24327	2	121	-33	3693	1	323	11
Myanmar	1723	0	27965	-2	188	1	177	-7
Nigeria	10164	-4	4562	-2	103	-14	760	9
Pakistan	5010	6	9961	5	25336	4		
Philippines	7524	0	19430	0				
Poland	3681	4			10465	-1		
Romania	10287	-8	42	-9	6852	-8	161	5
Russia	11959	2	1017	5	54296	2	2035	35
South Africa	11324	-24			1704	-2	894	33
Thailand	4979	-2	38401	-2			192	-6
Turkey	5766	-2	986	6	24471	18	229	16
United Kingdom					14590	0		
Ukraine	26889	-10	160	1	22739	-2	3711	-4
United States	359658	0	9908	-1	56578	3	108069	0
Uzbekistan	423	9	401	12	6573	5		
Vietnam	5135	1	44881	2				
Sub total	**877331**	**-1**	**667212**	**0**	**626921**	**1**	**290805**	**1**
Other countries	109245	3	73839	2	97921	2	19545	8
Global	**986576**	**0**	**741051**	**0**	**724842**	**1**	**310350**	**1**

Note: The production values in this table were estimated based on satellite indices over the respective cultivation areas, except for the minor producers for which the values were extrapolated to 2015 based on FAO statistics. For maize, satellite-based estimates cover all countries with productions starting at 1,723 thousand tons for maize (Myanmar and above); 2,534 thousand tons for rice (Iran and above); 1,340 ton for wheat (Bangladesh and above), and 3,617 thousand tons for soybean (Ukraine and above).

Maize. The largest national decreases for maize occurred in South Africa (-24%) as the direct result of drought over much of the area, followed by Ukraine (-10%) due to the combination of weather and the political situation. In Cambodia, also with a production decrease (-10%), satellite indices clearly show unfavorable conditions south of Tonle Sap, but it is not clear what exactly created the situation. Romania displays a drop of 8% due to summer drought, especially in the south. The 5% drop conjectured for Ethiopia may be modified if favorable conditions prevail for the Meher season crop, which is still growing. Significant production increases of 5% occur in Pakistan and Bangladesh, where figures may be revised down once the full extent of excess water can be assessed with greater accuracy. Among the major exporters, Thailand and France both suffered drought which resulted in a 2% decrease in maize production.

Rice. Among the countries where rice constitutes a major staple, it is worth mentioning the estimated production decreases in Cambodia (-7%) and India (-3%), while the other significant drops affect countries where the crop is of lesser importance. Estimates for Indonesia, the Philippines, and Vietnam are in the range of 0 to +2%. Major rises are listed for several countries. Pakistan (+5%) is one of those where the crop plays an important part both for local consumption and as an export commodity.

Wheat. Wheat presents a very asymmetrical situation with a large number of countries having increased their production and only a few having suffered a drop. Argentina and Turkey come first, with increases of 15% and 18%, respectively, brought about by favorable weather but also increased areas, as assessed by the CropWatch cropped arable land fraction indicator. In Turkey, the fraction of cropped arable land was 6 percentage points over average. Significant wheat production increases are also seen in Egypt (+4%) and Kazakhstan (+15).

Soybean. CropWatch puts the U.S. soybean production at the same level as the previous season's production. Production is up 6% in India and as much as 35% in Russia, while a marked drop was noted for Ukraine (-4%).

5.2 Disaster events

A report issued in July 2015 by Munich Re indicated that economic losses due to natural disasters in the first half of the year (totaling US$46 billion) were down 58% compared with the recent ten-year average for economic losses over the same time period, which was US$107 billion. Insured losses were estimated to be close to US$15 billion, down 47% from an average of US$28 billion. However, even if the economic damage is down, 2015 is expected to experience a record impact in terms of numbers of people affected by disasters.

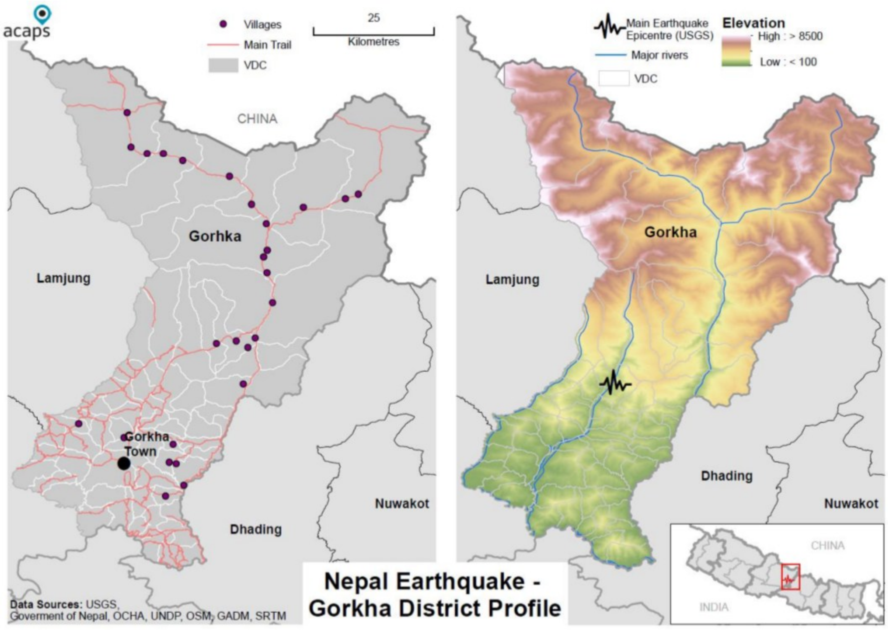
As discussed in previous CropWatch Bulletins, only a fraction of risk is insured in the developing countries. A typical example is the Dolakha earthquake of Nepal on 25 April (see also figure 5.1), in which only US$140 million in damages was insured while the total loss has been estimated to have reached US$4.5 billion—making the insured proportion about 3% of the total damages. When insured losses (payouts to beneficiaries) are split geographically, for the first half of 2015 most of them occurred in the United States (73%) due to its adverse winter and spring conditions, followed by the Asia-Pacific area (14%) and then the rest of the world, including the Middle-east and Africa.

The current reporting period is dominated by three groups of adverse conditions that have affected agriculture both directly and indirectly, even if quantitative estimates are still mostly missing. They include (i) drought in the western-central United States and adjacent areas, (ii) a heat wave affecting India and Pakistan, and (ii) floods in Asia, particularly affecting India, Myanmar and China. The following sections describe these and other global events.

Earthquakes and volcanic eruptions

The Nepal earthquake "started" on April 25 when an earthquake with a magnitude of 7.9 occurred in the Gorkha district in Nepal. Following the initial event, aftershocks—some severe, such as the one on May 12—were recorded well into August in different parts of the country, also affecting Bihar and Uttar Pradesh in India and Tibet in China. The death toll from the Gorkha earthquake has crossed 8,600.

Figure 5.1. Location and topography of Gorkha district, Nepal



Source: http://acaps.org/img/documents/d-acaps_district_profile_gorkha_nepal_earthquake_1_may_2015.pdf.

The earthquake coincided with the beginning of the maize planting season, with rice due to be planted about a month later in the six most affected districts; the disruption of society and the destruction of the infrastructure (drainage and irrigation canals, roads, loss of tools) has affected production in the affected areas. FAO estimates that crops currently in the field suffered less (losses of 20% for maize and less for other crops) than stored grain, especially rice, millet, and maize (losses exceeding 80%) and potatoes (60% loss) and wheat (40%). Crop recovered from the rubble are mostly unsuitable for human consumption and inadequate for seeds. About 16% of cattle and 36% of poultry was lost and part of the surviving population is in urgent need of veterinary assistance.

While minor in comparison with the Nepal earthquake, the earthquake that shook the Sabah region of Malaysia on June 7 also deserves mentioning as it was the strongest earthquake in Malaysia in about 40 years and claimed about 20 lives.

The monitoring period was also characterized by a number of volcanic eruptions. These typically forced people to leave their villages and crops and often significantly increased life and crop threatening mudslides. One such eruption involved Calbuco, which erupted in southern Chile on the 17th of May, affecting an area where livestock, forestry and fisheries dominate agriculture. Elsewhere, the Piton de la Fournaise on Reunion Island became active on June 3. At the end of June, more than 6,000 residents living near Mount Sinabung (Sumatra) had to evacuate, sometimes at larges distances from the eruption itself. Also in Indonesia, Mount Raung erupted on June 29 in eastern Java, an event then followed by the eruption of Mt. Colima in western Mexico on July 11.

Drought and heat waves

Drought is often associated with other extreme conditions such as fires and heat waves, which all occurred during the reporting period in various locations worldwide.

Due to prolonged drought and reduced snowfall this year, water availability constraints continued to be severe in the western and south-western United States. Several states restricted water use in urban areas, for example in about half of Washington State (starting in March) and California (in April). In California, farmers were usually not held to the mandated 25% reduction as they were already affected by the reduced release of water from reservoirs and from creeks, which started three years ago. As a result of the drought, the USDA in the end of April declared parts of several states as natural disaster areas, including Nevada (Lincoln, Nye, and White Pine counties), Mohave County in Arizona, and Box, Elder, and Tooele counties in Utah, where farmers could apply for assistance to the crops and livestock sectors. On May 14th, Wheeler County in Oregon was added to the list of disaster areas, as were Coryell County in Texas, Duchesne and Uintah counties in Utah, and Elmore County in Idaho. By June 13th, more than half of Oregon was affected.

In May, large fires developed in western Canada, starting with Alberta, which is the major spring wheat producing area in the country. The fires caused significant losses to the natural vegetation and about 7,000 people had to be evacuated. By the beginning of July, wild fires were also reported from British Columbia. In mid-July, Parkland County—at the very center of Alberta—was declared an agricultural disaster area, with rainfall often 25% below expectations.

In Asia, Korea DPR (North and South Hwanghae provinces) was affected by extremely dry conditions. By mid-June, the drought was said to be the worst in a hundred years. In the country as a whole, about one third of the rice areas is estimated to have suffered drought.

Heat waves are reported from Europe and Asia. The highest daytime temperature in the world (50.5°C) was recorded at Sweihan, Abu Dhabi on the third of June. In India, a new temperature record occurred at Angul (Odisha), where 47 degrees were recorded on May 25th.

Both India and Pakistan suffered a deadly heat wave at the end of May and in June, mostly in Andhra Pradesh, the neighboring state of Telanga, and the eastern states of West Bengal and Orissa. The heat wave was also characterized by the abrupt end of pre-monsoon showers and several thousands of excess deaths are deemed to have been caused by the heat. In Pakistan, the heat affected mostly the south (Sindh province) starting around the 20th of June and aggravated by electricity shortages, Ramadan, and the urban setting. Temperatures reached up to 49°C.

Early July, other heat waves were reported from Italy and from Germany. In Germany, a temperature of 40.3°C was recorded in Kitzingen, northern Bavaria, on July 5, which was the highest temperature recorded in the country since 1881, the beginning of the instrumental record. Wildfires occurred in Spain and Portugal.

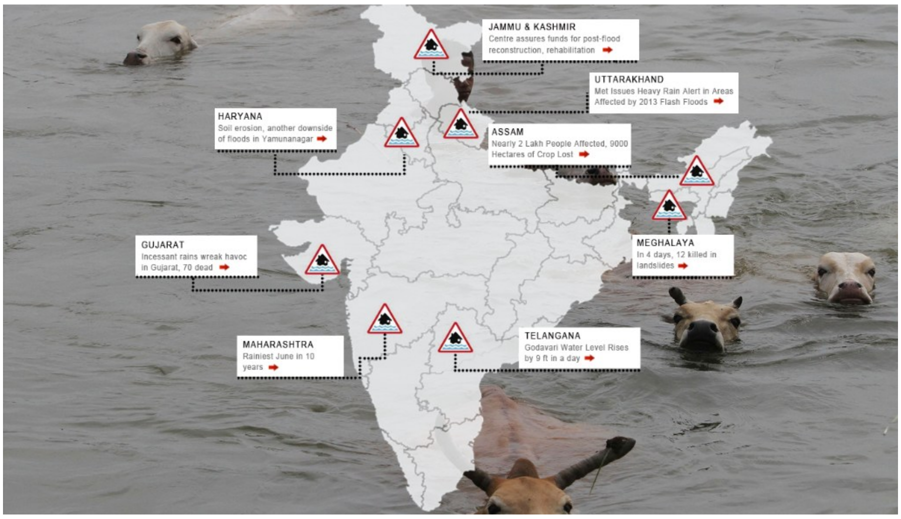
Heavy rain, floods, storms

Excess rainfall and related and secondary disasters have occurred with high frequency throughout the reporting period across the globe. Among all countries, India, China, and Myanmar seem to have suffered the most from these events in several repeated episodes. The text below does not include the five cyclones that have affected India, Bangladesh, Myanmar, and China, which are described in a separate section below.

In Kashmir, landslides and flooding on the first days of April claiming hundreds of lives. In the same period, a severe storm affected Bangladesh and took the lives of at least 33, injuring 200 others; Bogra was the worst affected district. In the last dekad of April, heavy storms hit Bihar, killing 30 people and seriously injuring around 100. Next, on May 18, flash floods washed away about 10 people in Tamil Nadu. Again, on 7 June, nearly 33,000 people were affected by floods in Assam, according to the State Disaster Management Authority (ASDMA). The floods have affected 108 villages in six districts of Assam and also damaging 1,000 hectares of crops. In the last days of June, most of India was affected by the monsoon floods, which are deemed to be the worst in 200 years. Affected areas included Gujarat, Haryana, Meghalaya, Assam, Telanga and Maharashtra. In Assam, 367,000 ha of cropland were affected and 9,000 cattle drowned. In Jammu and Kashmir, 648,000 ha of cropland were flooded and 61,000 cattle lost. In

Meghalaya, 16,000 ha were damaged and 8,800 cattle perished. Altogether, about 400,000 houses were damaged or lost and 1,000 people died.

Figure 5.2. States in India affected by floods, June 26 2015



Source: http://www.indiaenvironmentportal.org.in/media/iep/infographics/flood%20map/floods.html

In China on April 6, a severe storm with wind speeds reaching 150 km/hour occurred in China's Sichuan Province, claiming lives, injuring people, and causing direct economic losses of about US$120 million to infrastructure and houses. On May 16, thunderstorms and resulting mudslides and lightning in Guangxi Zhuang Autonomous Region in southern China claimed the lives of at least four people, while 60,500 were affected around Guilin and Liuzhou. A week later, four times more people were the victims of the floods that hit Hunan and Fujian Provinces (eastern China), destroying 2,500 houses, damaging 21,000 ha of farmland, and causing an economic loss of US$337 million. Continuing rains until early June claimed the additional lives of 16 people and affected Fujian, Jiangxi, Hubei, Hunan, Guangdong, Chongqing, Sichuan, Guizhou, Yunnan, and other provincial regions, as reported by Xinhua.

Less severe floods were reported from various areas, including the United States (Oklahoma and Texas at the end of May, and again Oklahoma, Missouri, and Texas during mid-June), Haiti (early April), Finland (mid-May), Kazakhstan (Karaganda Oblast in mid-April due to accelerated snowmelt brought about by high temperature), Iran (July 20), and the Philippines (July 22). In the Philippines heavy rain and floods in Luzon caused 19 people to die.

Landslides and flashfloods

At least 3,000 landslides have been reported in association with the Dolakha earthquake in Nepal, along with 14 minor earthquakes and torrential rains. Six huge landslides have blocked river flow, thus creating conditions for flashflood disasters well after the seismic activity will have returned to normal.

The reporting period also recorded several curious accidents where landslides have buried mines, for instance in Phakant in Myanmar where close to 70 people went missing on April 9 due to a landslide in a jade mining area. In northeast Tanzania, at least 19 gold miners died in a similar incident in Kahama district on April 18. Four days later, on April 22, 19 people died when a coalmine was flooded in Shanxi Province, China.

In other parts of the world, about 85 people died in two landslides in Colombia on May 19 (Liboriana River) and June 12 (Cauca Department). In Georgia, 500 sheep and 40 cows were buried by a landslide on June 3.

Cyclones and storms

Over the reporting period, five significant cyclones—Maysak, Noul, Kujira, Chan-hom, and Kromen—reached land and caused large damages. All five cyclones were in Asia, with cyclonic storm Kromen probably the most damaging.

Cyclone Maysak (also known as Chedeng) was active between March 26 and April 7 and affected the Federated States of Micronesia and the Philippines. In Micronesia, the agricultural impact was extensive, with 90% of the banana, breadfruit, and taro crops destroyed in Chuuk and Yap states. Three hundred houses were destroyed and an equal number was damaged, affecting about 30,000 people (close to 30% of the population) and leading to damages amounting to US$8.5 million. The impact was minimal in the Philippines.

The Philippines were also affected, on May 10, by typhoon Noul, which followed a trajectory that had also previously touched the Caroline Islands. The typhoon then continued to China (Taiwan) and Japan. Most agricultural damage (an estimated US$23.2 million) occurred on Okinawa.

Tropical storm Kujira, which was active between June 19 and 25, destroyed 7,400 hectares of crops in Hainan, China, on June 20 and caused US$14.4 million in economic losses. In Vietnam, the storm killed nine people as a result of flooding in northern Sơn La Province.

Figure 5.3. Maize field flooded by Chan-hom in Zhoushan village Zhejiang province, July 11

Source: http://www.chinadaily.com.cn/m/ningbo/2015-07/11/content_21290377.htm.

Typhoon Chan-hom (June 30 to July 15) visited the Caroline Islands, Guam, northern Mariana Islands, Japan, China, the Korean peninsula, and the Russian far east. On July 7, the typhoon hit the central Philippines (Visayas), resulting in agricultural losses up to US$90,000. In Japan, Okinawa was hit again, but with impacts less severe than for Noul in the previous month, mostly affecting mangoes. This time the damages in Okinawa amounted to an estimated US$4.2 million. In China, more than 1 million people were evacuated in Zhejiang as rainfall locally reached 400 mm. In Zhejiang and neighboring Jiangsu alone, losses were between US$300 and 400 million, but the total economic loss amounted to US$1.43 billion. Agriculture and transportation make up the largest share of the total national loss estimated at US$1.5 billion. In Russia, heavy rains occurred in Khabarovsk Krai as the typhoon was reaching the end of its life.

Finally, the north Indian Ocean cyclonic storm Komen had a severe impact on India, Bangladesh, and Myanmar between July 26 and August 2, causing 170 deaths due to widespread flooding brought about by exceptional rain. For instance, the Chittagong hills in southeast Bangladesh recorded more than one meter of rainfall over the event. In total, about 130,400 people were affected, and many were killed by the floods and landslides. In India, about half a million suffered from the direct and indirect impacts of Komen. About 300,000 houses were destroyed or damaged. In Myanmar, 12 out of the 14 states suffered badly through displacement (200,000 people) and other impacts (an additional 150,000 affected). The World Food Program indicated that beans and pulses (some of Myanmar's biggest agricultural exports) as well as other crops could be delayed by two months.

5.3 Crop production and trends in North America

Overview

Canada, Mexico, and the United States are among the major producers and—to varying degrees—exporters of maize, wheat, and soybeans. Table 5.3 illustrates some background information about population levels, land use, and production in the three countries, comparing it to China.

With the exception of Canada, 45-55% of the land area in the countries is used for agriculture, which thus dominates the landscapes in Mexico and the United States. The North American countries are in the upper quartile of the most urbanized countries, while China ranks just below median.

Mexico and China share several features due to their climate and level of development, such as the relatively large contribution of agriculture to GDP (3.5% and 9.2%, respectively, which compares with a level close to 1.5% for both Canada and the United States) and the larger share of the population active in agriculture. China and Mexico also practice irrigation at a larger scale than the United States and in particular Canada, where irrigation reaches just 2% of the cropland.

Table 5.3. Socio-economic and agricultural variables in North America and China

	Canada	Mexico	U.S.	China	Period	Source
Population total (millions)	36	125	325	1402	[g]	[10]
Population urban (%) 2015/2030	81/83	79/83	83/86	56/69	[g], [h]	[10]
Agriculture, value added (% of GDP)	1.5 [a]	3.5	1.4 [d]	9.2	[e]	[9]
Agricultural land as % of land area	7.2	54.9	44.7	54.8	[e]	[1]
Permanent cropland (% of land area)	0.5	1.4	0.3	1.7	[e]	[8]
Agriculture value added/worker (constant 2005 US$)		4416	68457 [d]	754 [d]	[e]	[2]
% of water withdrawal used for agriculture	12	77	40	65	[h]	[12]
% of arable land equipped for irrigation	2	25	16	51	[h]	[12]
Arable land (hectares per person)	1.32	0.19	0.49	0.08	[e]	[4]
Employment in agriculture (% of total employment)	2 [e]	13	2 [a]	35	[b]	[5][11]
Fertilizer consumption (kilograms per hectare of arable land)	74.4	72	131.1	647.6	[e]	[7]
% contribution of agriculture to GDP	1.9	3.8	1.2	10.1	[b]	[3]
Million ha with GMO crops	10.8 MS	0.2 CS	70.1 MCS	4.2 C	[d]	[6]
Wheat production (million tons)	27	3	62	122 [g]	[c]	[10][13]
Wheat imports (<) and exports (>) (million tons)	>16	>1 ,<4	>32, <2	<3 [e]	[b]	[10][14]
Maize production (million tons)	13	22	274	193 [g]	[c]	[10] [13]
Maize imports (<) and exports (>) (million tons)	>1	<9	>46	<3 >2[e]	[b]	[10] [14]
Soybean production (million tons)	5	0	82	13 [g]	[c]	[10] [13]
Soybean imports (<) and exports (>) (million tons)	>3, <1	<3	>34	<71 [e]	[b]	[10] [14]

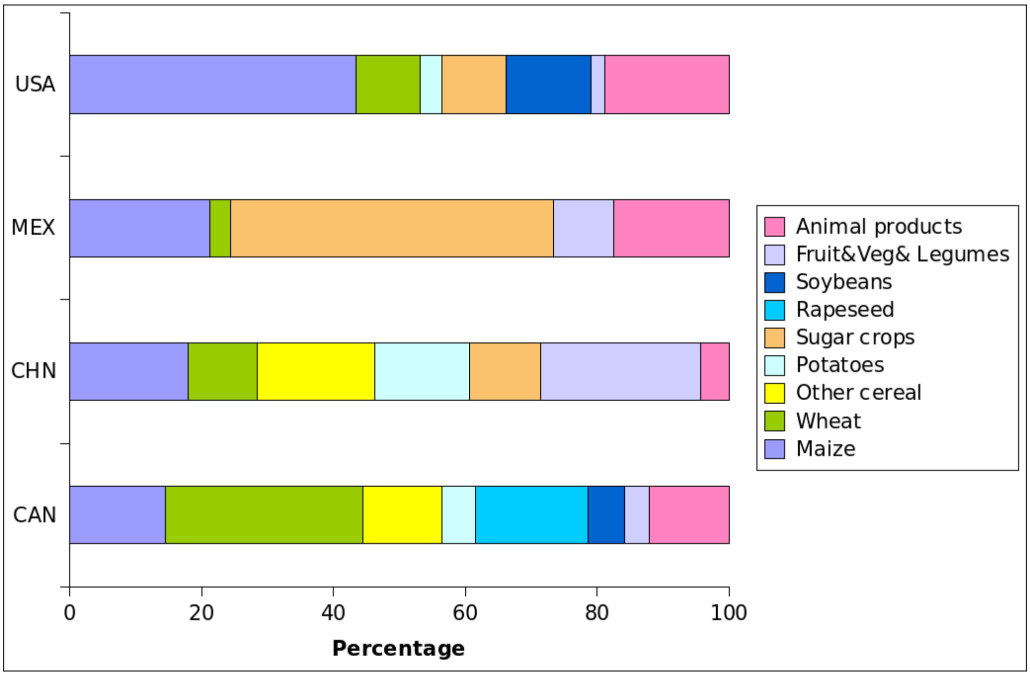
Note: M=Maize; C=Cotton; S= Soybean; [a] 2010; [b] 2011; [c] 2012; [d] 2013; [e] 2014; [f] 2006; [g] 2015; [h] various years between 2005 and 2011

Source: [1] World Bank data, http://data.worldbank.org/indicator/AG.LND.AGRI.ZS/countries; [2] http://data.worldbank.org/indicator/EA.PRD.AGRI.KD/countries; [3] https://en.wikipedia.org/wiki/List_of_countries_by_GDP_sector_composition; [4] http://data.worldbank.org/indicator/AG.LND.ARBL.HA.PC/countries; [5] http://data.worldbank.org/indicator/SL.AGR.EMPL.ZS/countries; [6] http://www.gmo-compass.org/eng/agri_biotechnology/gmo_planting/257.global_gm_planting_2013.html; [7] http://data.worldbank.org/indicator/AG.CON.FERT.ZS/countries; [8] http://data.worldbank.org/indicator/AG.LND.CROP.ZS/countries; [9] http://data.worldbank.org/indicator/NV.AGR.TOTL.ZS/countries; [10] http://faostat3.fao.org/faostat-gateway/go/to/home/E; [11] http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/econ40-eng.htm; [12] http://www.fao.org/nr/water/aquastat/main/index.stm; [13] http://www.cropwatch.com.cn/htm/en/bulletin32.shtml; [14] http://www.customs.gov.cn/publish/portal0/tab49667/info730492.htm.

Relative share of major agricultural product categories

The four countries differ markedly in the relative importance of their crops and animal production (figure 5.4). For the purpose of this graph, all animal products were grouped, including meat (poultry, cattle, and pork), milk, and eggs. Sugar beet (only in the United States) and sugar cane (all countries except Canada) were grouped as sugar crops; the United States produces about equal amounts of both. Other cereals include oats and barley in Canada and rice in China. Potatoes include both white (Irish) potatoes and sweet potatoes, which constitute a major crop only in China.

Figure 5.4. Relative importance of major agricultural products in terms of quantity



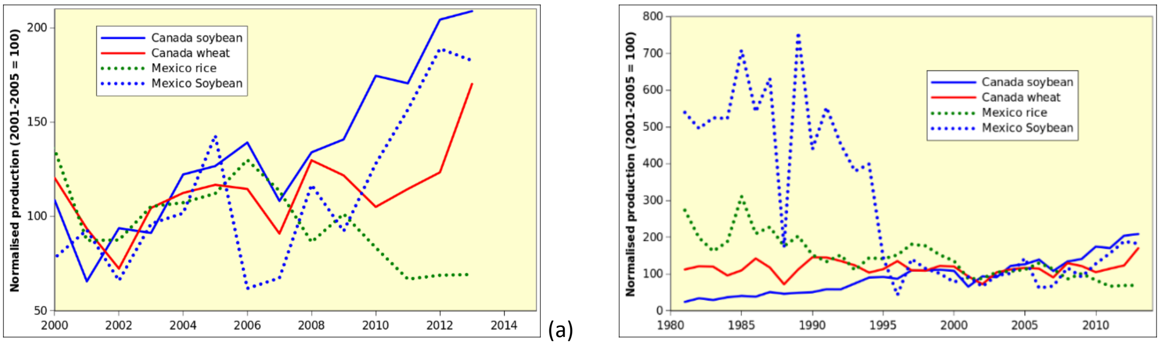
Note: The figure is based on the 10 major products for each country, with products organized in 9 categories.
Source: Based on FAOSTAT data.

The most balanced and probably least vulnerable situation as far as domestic production is concerned occurs in China, where the relative importance of different product categories is comparable. In the United States and particularly in Mexico, one crop—either maize (in the United States) or sugar cane (Mexico) dominates the scene. Other remarkable features include (i) the large and growing importance of soybean in Canada and the United States, much of which (40%) is exported to China (table 5.3); and (ii) the importance of rapeseed, oats, and barley in Canada. Rapeseed in particular is better adapted to local environmental conditions than soybeans.

Trends

Several noteworthy trends have affected North American crop production during the first years of the 21st century, including (i) a decrease in rice production in Mexico (-21%) and the United States (-4%) and (ii) an overall systematic increase of maize, wheat, and soybean production usually exceeding 20%. Examples of the latter are maize production in the United States (21%) and Canada (29%), wheat in Mexico (26%) and Canada (27%), and—with the most spectacular increases—soybeans in Mexico (44%) and Canada (72%), to feed an apparently insatiable regional and international market. Figure 5.5b further compares the recent trend against longer trends, confirming that the drop in rice in Mexico has been ongoing for thirty years, but that the increase in soybeans is just a recovery from a 1980-95 soybean crash.

Figure 5.5. Recent (a) and long-term (b) trends in soybean, rice, and wheat production in North America

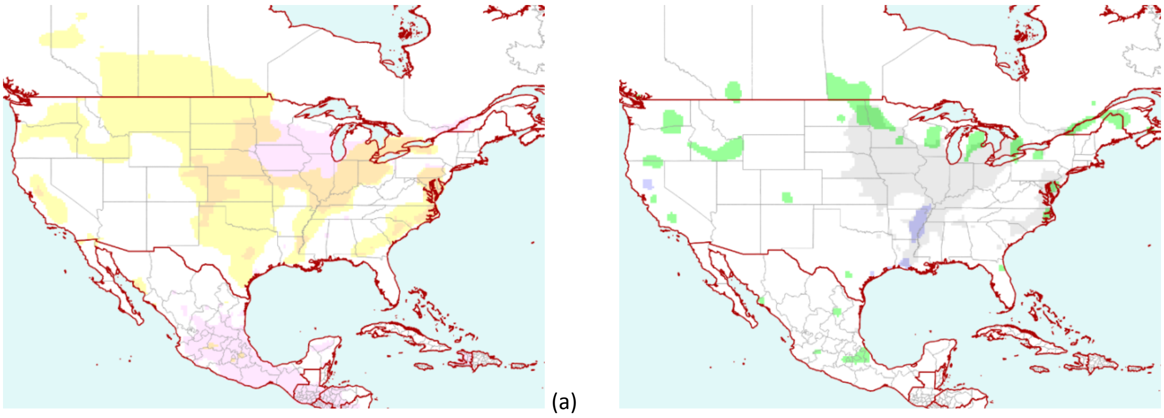


Note: Trends are normalized against 2001-2005 production averages.
Source: Based on FAOSTAT data.

Country overviews

Figure 5.6 illustrates the distribution of crops production areas in North America. Canada is particularly interesting because the current distribution results from the interaction of severe winter conditions and generally cool temperatures (compared with the United States and Mexico), but also from the fact that the development of early varieties has allowed the expansion of soybean at higher latitudes. This was paralleled by a reduction of farmland (about 6% since the 1980s), a reduction in the number of farms, and an increase in farm size, which reached an average of 315 ha per farm in 2011.

Figure 5.6. Approximate distribution of main cereal, soybean, and potato production areas in North America



Note: Figure a (left) illustrates wheat (yellow) and maize (red) production areas; figure b shows soybean (grey), potatoes (green), and rice (blue).
Source: Maps based on JRC crop masks.

Canada

In Canada, the south of Ontario is the country's largest maize production area (62% of maize land in 2011 with an average farm size of 51 ha), although its relative share in total maize land is decreasing. South Quebec (30% of maize land and 65 ha per farm) represents the second largest area, which an increasing share in maize land. Due to the cooler climate, Manitoba has only 6% of the national maize areas (average farm size is 120 ha), but its maize area is expanding. Under normal climatic conditions, only 2% of crop water requirements are supplied by irrigation; maize irrigation is concentrated in the prairies in western Canada (South Alberta, Saskatchewan, and west Manitoba) where the water is provided by many small dams.

The prairies also account for 80% of wheat areas and constitute the major production centers for rapeseed (canola) and cattle. Soybeans are grown in Prince Edward Island, Quebec, Ontario, Manitoba, and Alberta. The crop has been permanently expanding since the 1980s—when it was still largely confined to southern Ontario (figure 5.6(b))—and it seems to be exploding now; the largest share of production comes from Ontario, and more than half of the production is being exported. Most soybeans are still cultivated in eastern Canada (sometimes occupying more than half of the cropland), but the crop is gaining ground in the Prairies where its share of farmland still stays below 10%. The ratio of GMO to non-GM is about 60/40, with organic soybean for export making up about 1%.

About 50% of Canadian wheat is produced in Saskatchewan, followed by Alberta and Manitoba. Winter wheat (mostly grown in western Canada) represents only a very small fraction (1%) of the total wheat area.

United States

Crop distribution in the United States is mostly contiguous with the pattern noted for Canada, but relatively fewer changes have taken place. The main maize producing areas in the country belong to the Corn Belt, where a flat landscape and favorable maize climate prevail south and east of the Great Lakes area. The main maize producing states include Iowa, Illinois, Nebraska, and Minnesota, together accounting for about half the country's production. Other important states include Indiana, Ohio, southern Michigan, Kansas, and Missouri, and, to a lesser extent, South Dakota, North Dakota, Wisconsin, and Kentucky. Powerful farmers' organizations are a main feature of maize farming in the United States.

The production areas of soybean in the United States largely overlap with those of maize, maybe with a slightly more southern distribution because of climatic reasons. The major producers are Illinois, Iowa, Minnesota, Indiana, and Ohio.

Of wheat, 75% is winter wheat, which usually comes under the names of hard or soft and red or white wheat, with hard red winter wheat being the most common type (constituting about 45% of all wheat produced in the country). This wheat is mostly cultivated in Kansas, Colorado, Oklahoma, and Texas. Other winter wheat types come from Arkansas, Illinois, Indiana, North Carolina, Ohio, Oregon, southern Idaho, Tennessee, and Washington. Spring wheat (hard red spring wheat and durum) mostly come from South Dakota, Montana, Wisconsin, North and South Dakota, and Montana (figure 5.6(a)).

Most trends affecting Canadian farming also occur in the United States, including the very low share of agricultural population, the explosion of soybeans, and the general growth of yields and exports. In 2010, the United States had 1.2 million farmers and 0.8 million farm workers (compare with table 5.3). Much land that used to run as small family farms has now been leased to large companies (such as for example Archer-Daniels Midland, ADM) that have come to run much of American agriculture on leased and rented land, a trend that was very marked between 2002 and 2007, but has slowed down since then. As a result of this trend, four companies for example are operating four-fifths of the U.S. beef market.

The explosion in soybean production started during the first half of the 20th century. The United States has been the world's largest soybean producer since 1942, after representing just 3% of production in 1930. By the mid-1970s, the value of exported soybean exceeded that of maize and wheat. Globally, about 80% of soybean is genetically modified; for maize this number is 32%.

Maize plays a central role in a U.S. Department of Energy strategy to use the crop to provide 5% of the U.S. energy supply by 2020, compared to its 1% contribution today. In 2013, U.S. maize is used in about equal proportions for feed (38%) and ethanol and by-products (35%). In addition, 7% of the production goes to stocks, 10% to exports, and 10% to food (including starch and popcorn). Only 1% is used for direct human consumption, mostly as breakfast cereals. This figure is almost identical with maize consumption in Canada, which is currently about 3 kg/person per year, down from about 4 kg/person per year in 1970. The use of 35% of maize for methanol represents a steep increase over the share of 3% in the 1990s.

Mexico

The bulk (80%) of Mexican wheat production originates in four states (Sonora, Baja California, Guanajuato, and Sinaloa), while just three more (Michoacán, Chihuahua, and Jalisco) account for 90%. In these states, 92% of production is irrigated, and all states are located in west and north-west Mexico. For soybean, 80% of the crop comes from the three states of Tamaulipas, San Luis Potosí, and Campeche in eastern Mexico, bordering the Gulf of Mexico near the U.S. border and western Yucatan.

Soybean has an interesting history in Mexico (Figure 5.5(b)); cultivated area fell from just under 500,000 ha in the mid and late 1980s to 50,000 in 2006, after which it increased again to reach about 160,000 ha today. This is because soybeans, cultivated as a spring-summer crop, constituted a reservoir of silverleaf whitefly, which would then damage the vegetables that were widely cultivated as fall-winter crops to supply the North American market during winter. As vegetables constitute a major source of income, soybean, as well as cotton, were banned.

Maize is cultivated on about 60% of Mexico's cropland. The major maize producing area (Sinaloa, 15% of production and located on the southeastern Bay of California) is mostly irrigated. Virtually all other states grow the crop under rainfed conditions. In fact, in the ten states that produce 80% of the national maize output the average irrigation density is 16%. These states include, in order of decreasing output: Jalisco, Michoacán, México, Guanajuato, and Chihuahua, which borders Texas and New Mexico and has the second highest level of irrigation (50%) after Sinaloa, Guerrero, Veracruz, Chiapas and Puebla. Most states (except Chihuahua) are located in the south of Mexico (see figure 5.6(a)) and grow maize as a summer crop from June to October.

Interestingly, Mexico is the place of origin of maize, but it has become, over the years, one of the main maize importers. Maize provides about 10% of human calorie and protein intake and the country is self-sufficient for maize as far as human consumption is concerned. About half of maize imports are used for animal feeds.

NAFTA, the North American Free Trade Agreement, provides Mexico an easy access to the U.S. and Canadian markets for some products such as vegetables, fruits (mostly tomatoes and avocados[4]), fruit juices, and flowers, especially in winter.

5.4 El Niño

El Niño continued to strengthen during this monitoring season. Figure 5.7 illustrates the behavior of the Southern Oscillation Index (SOI) of the Australian Bureau of Meteorology (BOM) from July 2014 to July 2015. Sustained negative values of SOI below -7 may indicate an 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 value remained negative throughout the past 12 months, except for a positive value of +0.6 in February 2015; this positive value, however, was immediately followed by a decrease in the SOI, with a large negative value of -14.7 in July. Considering the consistently strong negative values of the SOI and tropical Pacific Ocean temperatures over El Niño thresholds, the status of the ENSO Tracker at the BOM is raised to “Continue to Strengthen” as of July 2015. The BOM also reported that it may not even weaken until the end of this year.

Over the reporting period, El Niño-induced extreme weather conditions happened worldwide. In April, rainfall in Australia decreased by 50%-80%, compared to the same period of past year. In May, 8 provinces in the Philippines and California suffered from severe drought. The heat wave in India has led

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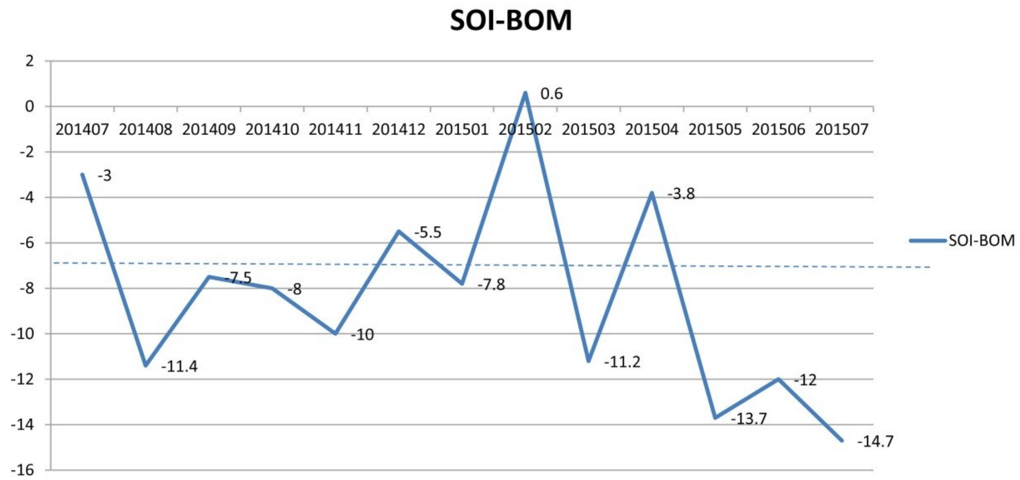
[4] After the U.S. lifted an 80-year ban on the import of Mexican avocadoes in 1997.

to 2000 deaths. In June to August, Thailand experienced its most severe drought in 10 years, while in July the middle and western parts of America suffered from heavy rainstorms. Section 5.2 includes a more comprehensive list of abnormal conditions across the world, and CropWatch will keep a close look at EI Niño conditions in the coming months.

Figure 5.7. Monthly SOI time series from July 2014 to July 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. April-July 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	345	-10	25.7	1.0	1140	7	1059	-1
2	East African highlands	408	-26	21.4	0.5	1191	3	1145	-23
3	Gulf of Guinea	650	1	28.9	0.5	1107	2	1637	-5
4	Horn of Africa	211	7	24.4	0.3	1188	4	671	10
5	Madagascar (main)	123	-43	23.0	0.6	957	4	412	-23
6	Southwest Madagascar	23	-69	22.5	0.2	995	3	103	-53
7	North Africa-Mediterranean	83	-10	22.6	1.0	1549	2	332	-12
8	Sahel	331	1	33.0	1.0	1407	3	953	-1
9	Southern Africa	80	-17	20.8	0.8	1004	3	255	-17
10	Western Cape (South Africa)	106	-41	12.6	-0.4	665	-3	342	-40
11	British Columbia to Colorado	318	18	7.6	1.5	1028	-2	1013	7
12	Northern Great Plains	454	30	17.0	0.3	1297	-3	1241	3
13	Corn Belt	472	10	16.6	0.0	1211	-2	1376	-1
14	Cotton Belt to Mexican Nordeste	599	38	24.2	0.3	1274	-4	1624	29
15	Sub-boreal America	211	-28	11.4	0.7	1252	5	900	-25
16	West Coast (North America)	82	-28	16.3	1.1	1515	1	351	-13
17	Sierra Madre	401	2	20.9	-0.3	1410	-3	1181	18
18	SW U.S. and N. Mexican highlands	182	57	20.8	-0.1	1540	-2	706	64
19	Northern South and Central America	624	-19	28.3	0.6	1167	4	1506	-14
20	Caribbean	582	-15	27.7	0.5	1377	4	1430	-19
21	Central-northern Andes	353	-17	16.7	1.2	983	2	881	3
22	Nordeste (Brazil)	203	-8	27.4	1.4	1028	1	701	18
23	Central eastern Brazil	393	64	24.6	0.4	908	-3	1126	46
24	Amazon	681	4	27.8	0.1	954	1	1659	10
25	Central-north Argentina	194	87	18.7	1.1	675	-5	492	21
26	Pampas	478	20	17.3	1.3	670	-2	1081	-3
27	Western Patagonia	292	-43	7.6	0.6	474	-3	860	-6
28	Semi-arid Southern Cone	62	-15	10.8	1.2	676	0	240	-8
29	Caucasus	183	-24	17.5	0.6	1362	1	691	-23
30	Pamir area	236	18	17.9	-0.1	1446	-3	732	0
31	Western Asia	87	-1	24.2	0.9	1479	1	356	4
32	Gansu-Xinjiang (China)	278	130	18.2	0.6	1395	-1	885	69
33	Hainan (China)	614	-17	28.7	0.6	1245	7	1309	-29
34	Huanghuaihai (China)	255	-36	22.1	-0.5	1255	0	918	-14
35	Inner Mongolia (China)	267	3	15.9	-0.5	1294	1	1038	0
36	Loess region (China)	217	-20	18.0	-0.6	1295	1	920	-10

	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. (%)
37	Lower Yangtze (China)	1148	41	23.3	-0.6	989	-8	2109	13
38	Northeast China	268	-25	16.2	-0.1	1213	2	1015	-17
39	Qinghai-Tibet (China)	760	15	11.6	-0.1	1209	1	1191	1
40	Southern China	817	-9	24.7	0.4	1039	2	1747	-9
41	Southwest China	645	9	20.8	0.1	1016	-2	1559	0
42	Taiwan (China)	526	-44	25.1	0.4	1195	5	1402	-18
43	East Asia	250	-49	15.5	0.3	1172	3	974	-27
44	Southern Himalayas	986	17	26.9	-0.1	1144	0	1578	1
45	Southern Asia	748	13	30.1	-0.1	1155	0	1318	-4
46	Southern Japan and Korea	827	11	19.7	0.4	1063	-5	1781	2
47	Southern Mongolia	417	195	17.0	0.6	1424	-2	1156	85
48	Punjab to Gujarat	286	-11	32.2	-0.4	1341	-1	858	19
49	Maritime Southeast Asia	761	-18	26.7	0.3	1026	2	1684	-21
50	Mainland Southeast Asia	834	-11	29.5	0.7	1128	5	1774	-9
51	Eastern Siberia	238	0	10.0	0.2	1131	-2	1013	0
52	Eastern Central Asia	175	-26	11.3	0.4	1293	4	799	-18
53	Northern Australia	142	-40	24.7	0.3	1034	4	407	-42
54	Queensland to Victoria	133	-18	12.2	-0.5	656	-5	521	-21
55	Nullarbor to Darling	192	-14	13.9	-0.2	652	-4	758	10
56	New Zealand	183	-46	9.2	0.1	464	-2	729	-28
57	Boreal Eurasia	354	27	9.1	-0.1	1014	-6	1149	7
58	Ukraine to Ural mountains	242	2	14.9	-0.5	1129	0	1034	11
59	Mediterranean Europe and Turkey	153	-7	17.0	0.3	1419	0	610	-14
60	W. Europe (non Mediterranean)	230	-22	15.1	0.0	1179	2	925	-20
61	Boreal America	318	18	7.6	1.5	1028	-2	1013	7
62	Ural to Altai mountains	284	39	15.2	0.8	1214	0	1087	37
63	Australian desert	97	4	14.5	-0.2	690	-6	418	-4
64	Sahara to Afghan deserts	41	-1	30.1	0.6	1566	1	148	-24
65	Sub-arctic America	182	183	-5.2	1.5	489	-7	633	185

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 April and July.

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

	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 (%)
[ARG]	Argentina	252	18	16.0	1.4	658	-1	663	-2
[AUS]	Australia	133	-22	13.5	-0.3	688	-3	539	-17
[BGD]	Bangladesh	2350	71	29.0	-0.5	932	-9	2408	15
[BRA]	Brazil	443	22	25.1	0.5	921	-2	1181	24
[CAN]	Canada	216	-30	11.6	0.7	1250	4	894	-23
[CHN]	China	671	11	20.8	-0.2	1104	-2	1341	0
[DEU]	Germany	218	-24	14.9	-0.2	1107	1	935	-19
[EGY]	Egypt	7	13	23.4	-0.7	1594	2	42	13
[ETH]	Ethiopia	449	-25	22.8	0.6	1209	4	1230	-22
[FRA]	France	179	-38	15.0	0.5	1249	4	699	-36
[GBR]	U. Kingdom	289	0	10.4	-1.1	1000	-2	1067	-7
[IDN]	Indonesia	768	-19	26.7	0.3	1002	3	1632	-23
[IND]	India	732	11	29.9	-0.2	1195	0	1251	0

	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	53	-41	23.3	1.4	1524	2	215	-33
[KAZ]	Kazakhstan	230	41	16.9	0.7	1276	1	907	42
[KHM]	Cambodia	815	-3	30.6	0.8	1168	5	2006	-5
[MEX]	Mexico	423	-4	24.9	-0.1	1377	-2	1133	14
[MMR]	Myanmar	909	-12	27.9	0.5	1049	1	1750	-6
[NGA]	Nigeria	608	0	30.0	0.5	1197	3	1423	-10
[PAK]	Pakistan	241	17	27.5	-0.8	1430	-3	669	19
[PHL]	Philippines	879	-5	27.6	0.4	1203	5	1737	-15
[POL]	Poland	202	-26	14.4	-0.7	1100	1	920	-24
[ROU]	Romania	246	-25	17.0	0.2	1248	3	970	-23
[RUS]	Russia	255	8	14.5	0.1	1158	0	1040	14
[THA]	Thailand	584	-24	29.5	0.8	1165	8	1658	-13
[TUR]	Turkey	214	14	17.1	0.1	1411	-1	788	-5
[UKR]	Ukraine	206	-20	16.7	-0.5	1190	2	886	-15
[USA]	U.S.A.	495	33	19.4	0.2	1293	-4	1295	19
[UZB]	Uzbekistan	110	12	23.5	0.9	1470	2	432	28
[VNM]	Vietnam	814	-2	28.1	1.0	1138	4	1769	-10
[ZAF]	South Africa	48	-50	14.6	0.8	843	0	214	-42

See note table A.1.

Table A.3. Argentina, April-July 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	290	40	13.1	1.5	605	1	807	3
Chaco	396	71	19.7	1.4	670	-4	989	17
Cordoba	151	30	15.2	1.7	678	-1	464	5
Corrientes	286	-27	18.9	1.1	676	-2	939	-22
Entre Rios	260	-16	16.6	1.5	685	5	669	-29
La Pampa	213	78	13.0	1.6	604	-3	623	36
Misiones	980	51	19.3	1.2	690	-4	1980	15
Santiago Del Estero	116	19	18.4	1.6	682	-3	399	-4
San Luis	109	19	13.7	1.6	674	-2	351	10
Salta	112	92	17.9	0.9	722	-5	286	23
Santa Fe	180	-15	17.4	1.9	687	2	624	-17
Tucuman	-1	0	-1.0	0.0	-1	0	-1	0

See note table A.1.

Table A.4. Australia, April-July 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	164	5	11.7	-0.5	664	-6	602	-5
South Australia	111	-36	12.4	-0.5	569	-6	475	-34
Victoria	107	-50	10.2	-0.7	528	-4	462	-43
W. Australia	182	-15	14.8	-0.1	684	-3	730	8

See note table A.1.

Table A.5. Brazil, April-July 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	226	-36	28.2	1.0	1112	3	853	-5
Goias	343	138	24.6	0.3	997	-3	1069	114
Mato Grosso Do Sul	519	74	23.9	0.0	839	-7	1517	41
Mato Grosso	419	107	27.4	0.5	989	-3	1239	79
Minas Gerais	170	28	22.7	0.7	898	-4	668	37
Parana	896	70	20.1	0.9	753	-4	1631	8
Rio Grande Do Sul	590	-1	17.5	1.1	648	-4	1554	-1
Santa Catarina	668	14	17.3	1.2	654	-6	1666	5
Sao Paulo	386	45	21.9	0.7	833	-5	1228	30

See note table A.1.

Table A.6. Canada, April-July 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	136	-49	12.2	1.3	1333	6	650	-45
Manitoba	224	-27	13.0	0.9	1288	5	983	-22
Saskatchewan	136	-49	12.5	1.0	1330	7	659	-45

See note table A.1.

Table A.7. India, April-July 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	1417	-10	22.6	0.2	889	3	2201	2
Andhra Pradesh	404	-3	31.7	0.0	1216	2	1061	-14
Assam	1898	27	28.4	-0.1	887	-3	2551	4
Bihar	897	35	31.5	-0.7	1206	-1	1503	8
Chandigarh	-1	0	-1.0	0.0	-1	0	-1	0
Chhattisgarh	898	36	30.6	-0.4	1168	0	1560	6
Daman and Diu	396	-6	31.1	1.6	1236	-1	411	-46
Delhi	337	20	32.0	-0.9	1351	-1	1158	38
Dadra and Nagar Haveli	271	-74	29.2	0.5	1199	3	653	-43
Gujarat	224	-51	32.5	0.7	1298	0	477	-37
Goa	411	-70	28.8	0.5	1116	7	1247	-21
Himachal Pradesh	769	35	16.0	-0.6	1340	-5	1260	0
Haryana	400	36	31.1	-1.1	1354	-2	1259	44
Jharkhand	1022	60	30.3	-0.4	1167	-4	1635	12
Kerala	902	-31	27.7	0.5	972	2	2020	-9
Karnataka	491	-27	27.7	0.2	1144	4	1203	-12
Meghalaya	3093	35	24.6	-0.4	865	-8	2467	5
Maharashtra	416	-37	30.3	0.1	1202	3	991	-18
Manipur	1013	-8	23.1	-0.2	937	-4	2247	3
Madhya Pradesh	537	-2	31.6	-0.3	1224	-1	1080	-5
Mizoram	1697	16	25.1	-0.4	983	-5	2349	3

	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	932	-23	23.3	0.1	980	-1	2160	-4
Orissa	904	20	30.2	-0.3	1142	0	1716	0
Puducherry	1232	-30	28.3	1.3	1021	3	2275	5
Punjab	327	6	30.6	-0.9	1354	-2	1086	25
Rajasthan	301	14	32.9	-0.6	1356	-1	941	34
Sikkim	1993	64	15.2	-0.7	1123	-4	1567	3
Tamil Nadu	350	4	30.3	0.3	1221	0	1138	8
Tripura	2971	93	28.0	-0.4	912	-7	2621	12
Uttarakhand	1034	55	19.9	-0.6	1305	-1	1385	7
Uttar Pradesh	573	18	32.3	-0.2	1313	1	1174	7
West Bengal	1665	75	30.2	-0.5	1078	-6	2115	14

See note table A.1.

Table A.8. Kazakhstan, April-July 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	213	32	15.4	0.2	1222	0	952	39
Karagandinskaya	224	33	15.4	0.6	1279	2	993	38
Kustanayskaya	187	24	16.2	0.2	1217	0	848	41
Pavlodarskaya	188	17	16.4	0.7	1234	1	850	40
Severo kazachstanskaya	281	44	15.2	0.6	1167	-1	1148	44
Vostochno kazachstanskaya	347	80	14.6	0.9	1329	1	1124	44
Zapadno kazachstanskaya	99	-12	19.1	0.6	1252	0	486	27

See note table A.1.

Table A.9. Russia, April-July 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.	298	37	14.2	0.0	1121	-4	1205	54
Chelyabinskaya Oblast	299	37	14.2	0.1	1130	-2	1202	49
Gorodovikovsk	-1	0	-1.0	0.0	-1	0	-1	0
Krasnodarskiy Kray	265	-2	15.8	0.4	1209	1	1077	1
Kurganskaya Oblast	344	68	14.7	0.4	1127	-3	1295	61
Kirovskaya Oblast	310	31	13.4	0.0	1096	0	1252	40
Kurskaya Oblast	201	-13	15.7	-0.7	1165	2	906	3
Lipetskaya Oblast	226	7	15.7	-0.4	1134	-1	938	20
Mordoviya Rep.	202	-9	15.1	-0.1	1134	-1	944	18
Novosibirskaya Oblast	246	15	14.5	1.3	1180	1	1038	22
Nizhegorodskaya O.	270	16	14.4	-0.3	1098	-2	1171	38
Orenburgskaya Oblast	178	10	16.1	0.1	1195	-2	802	52
Omskaya Oblast	290	33	14.5	1.3	1149	-1	1167	31
Permskaya Oblast	324	26	13.0	0.2	1043	-5	1332	31
Penzenskaya Oblast	168	-19	15.7	0.1	1167	0	820	16
Rostovskaya Oblast	205	2	18.9	0.0	1230	1	880	6

	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	281	24	15.1	-0.2	1093	-4	1139	37
Stavropolskiy Kray	261	0	19.9	0.6	1241	2	995	-8
Sverdlovskaya Oblast	351	43	13.5	0.5	1068	-3	1327	41
Samarskaya Oblast	202	12	16.2	0.4	1176	-1	935	63
Saratovskaya Oblast	148	-4	17.8	0.5	1214	1	702	37
Tambovskaya Oblast	226	12	16.0	0.0	1144	-2	962	32
Tyumenskaya Oblast	373	65	14.2	0.9	1113	-2	1325	43
Tatarstan Rep.	259	27	15.1	0.1	1133	-3	1101	62
Ulyanovskaya Oblast	183	-11	15.8	0.4	1165	0	868	33
Udmurtiya Rep.	307	32	13.5	0.0	1089	-3	1248	45
Volgogradskaya O.	171	17	18.6	0.0	1242	2	769	35
Voronezhskaya Oblast	204	8	17.1	0.3	1191	2	862	17

See note table A.1.

Table A.10. United States, April-July 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	726	56	23.7	0.4	1240	-6	1997	48
California	98	29	17.2	0.6	1589	-1	383	39
Idaho	188	28	13.4	1.2	1485	0	830	32
Indiana	640	33	19.2	-0.3	1183	-8	1640	11
Illinois	730	59	19.7	-0.1	1219	-7	1731	18
Iowa	574	15	18.1	-0.3	1227	-6	1632	7
Kansas	560	36	20.9	-0.2	1306	-7	1554	31
Michigan	273	-26	14.4	-0.4	1244	-2	1021	-23
Minnesota	391	1	15.4	0.2	1244	-1	1370	1
Missouri	944	91	21.2	0.1	1215	-9	2073	42
Montana	211	-6	13.8	0.7	1367	-2	877	-10
Nebraska	615	67	18.0	-0.2	1268	-9	1730	37
North Dakota	291	0	14.9	0.5	1297	0	1121	-2
Ohio	473	7	18.6	0.2	1192	-6	1435	-5
Oklahoma	955	126	22.9	-0.5	1270	-8	2099	69
Oregon	114	-24	15.0	1.6	1458	3	556	-9
South Dakota	496	59	16.9	0.3	1303	-3	1496	23
Texas	607	101	25.0	-0.4	1289	-8	1512	74
Washington	76	-50	15.9	2.2	1441	7	373	-45
Wisconsin	375	-15	15.5	-0.1	1242	-1	1297	-12

See note table A.1.

Table A.11. China, April-July 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	905	39	22.7	-1.2	1092	-7	1833	18
Chongqing	596	-8	21.4	0.1	953	-5	1578	-9
Fujian	1125	20	23.1	-0.1	971	-6	2200	7
Gansu	264	3	15.5	-0.3	1257	-1	1024	8
Guangdong	1110	5	26.1	0.4	1016	2	2055	-3
Guangxi	1286	34	25.6	0.4	955	-2	2134	6
Guizhou	839	25	21.4	0.3	923	-4	1709	4
Hebei	219	-29	19.7	-0.5	1278	0	864	-20
Heilongjiang	266	-18	15.5	-0.3	1195	2	1001	-15
Henan	307	-26	22.1	-0.9	1223	-1	1120	-1
Hubei	772	20	21.8	-0.9	1054	-6	1885	14
Hunan	1025	32	23.1	-0.7	940	-9	2100	14
Jiangsu	681	27	21.9	-1.1	1127	-5	1583	17
Jiangxi	1392	50	24.3	-0.4	954	-11	2283	11
Jilin	275	-27	16.9	0.2	1239	4	1077	-14
Liaoning	275	-31	18.5	0.1	1245	2	1009	-20
Inner Mongolia	269	5	15.2	-0.4	1279	1	1025	-1
Ningxia	195	19	17.2	-0.4	1355	0	839	14
Shaanxi	345	-2	18.9	-0.6	1222	1	1151	-3
Shandong	219	-44	21.9	-0.2	1277	0	832	-21
Shanxi	198	-26	17.6	-0.5	1318	1	824	-21
Sichuan	585	6	19.7	0.3	1041	0	1475	-3
Yunnan	388	-36	20.5	0.5	1104	2	1220	-18
Zhejiang	1061	39	22.2	-0.6	968	-11	2078	7

See note table A.1.

Annex B. 2015 production estimates

Tables B.1-B.4 present 2015 CropWatch production estimates for Argentina, Brazil, Canada, and the 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, wheat, and soybean production, by state (thousand tons)

	Maize		Rice		Wheat		Soybean	
	2015	Δ%	2015	Δ%	2015	Δ%	2015	Δ%
Ceara	166	3						
Goias	8511	1					9988	0
Mato Grosso	19651	0					26096	1
Mato Grosso Do Sul	7658	2					6331	1
Minas Gerais	7389	1					3629	0
Parana	15022	0			2542	0	17154	0
Rio Grande Do Sul	4864	0	8595	1	3648	2	13608	1
Santa Catarina	3038	-1	1028	0			1708	-1
Sao Paulo	3822	1					2172	0
Sub total	**70121**	**0**	**9623**	**1**	**6191**	**1**	**80686**	**0**
Others	9534	7	2352	2	573	-3	9544	9
Brazil	**79655**	**1**	**11975**	**1**	**6764**	**1**	**90230**	**1**

Δ% indicates percentage difference with 2014.

Table B.3. Canada, 2015 maize and wheat production, by province (thousand tons)

	Maize		Wheat	
	2015	Δ%	2015	Δ%
Alberta			8290	-11.3
Manitoba			3654	-0.1
Ontario	2979	-1.6	1714	-2.1
Quebec	7714	1.5		
Saskatchewan			13055	-7.8
Sub total	**10693**	**0.6**	**26713**	**-7.6**
others	1430	11.5	4428	1.3
Canada	**12123**	**1.8**	**31141**	**-6.4**

Δ% indicates percentage difference with 2014.

Table B.4. United States, 2015 maize, rice, wheat, and soybean production, by state (thousand tons)

States	Maize		Rice		Wheat		Soybean	
	2015	Δ%	2015	Δ%	2015	Δ%	2015	Δ%
Alabama	1138	-1					524	1
Arkansas	2476	-2	5045	-1	686	1	4401	1
California			1669	-1	585	26		
Colorado	3657	-2			2461	1		
Georgia	1396	4			311	1		
Idaho					2692	6		
Illinois	56608	-5			1231	1	14784	-1
Indiana	24504	-11			694	0	8128	-3
Iowa	61796	3					13949	1
Kansas	14260	-1			7795	16	3717	-4
Kentucky	5866	2			1004	2	2401	5
Louisiana	1783	-2	1419	-4			2064	-5
Maryland					477	0	632	0
Michigan	9087	1			988	1	2533	1
Minnesota	31951	7			1833	4	8720	5
Mississippi	2291	1	622	-3	343	1	3048	-2
Missouri	15280	-4	664	1	1184	1	6566	-7
Montana					5565	-2		
Nebraska	42647	5			2072	7	7979	1
New York	2526	-1			165	1		
North Carolina	2532	-3			1220	0	1854	-2
North Dakota	8055	1			9343	-1	5663	3
Ohio	15119	-3			1109	1	6822	-1
Oklahoma	1117	3			1449	12		
Oregon					1155	-5		
Pennsylvania	3966	-2			268	1	812	1
South Carolina					314	1		
South Dakota	20214	1			3251	-9	6347	1
Tennessee	3625	1			865	1	2084	3
Texas	7467	0	489	0	2077	13		
Virginia	1299	1			486	1	702	0
Washington					2884	-2		
Wisconsin	12646	3			448	1	2220	4
Sub total	**353305**	**0**	**9908**	**-1**	**54954**	**3**	**105950**	**0**
Others	6353	-5			1624	16	2118	6
United States	**359658**	**0**	**9908**	**-1**	**56578**	**3**	**108069**	**0**

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.
VHIn			
Minimum Vegetation health index			
Crop/ Satellite	Number, pixel to CWSU	VHIn 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 VHIn values indicate the occurrence of water stress in the monitoring period, often combined with lower than average rainfall. The spatial/time resolution of CropWatch VHIn is 16km/week for MPZs and 1km/dekad for China.

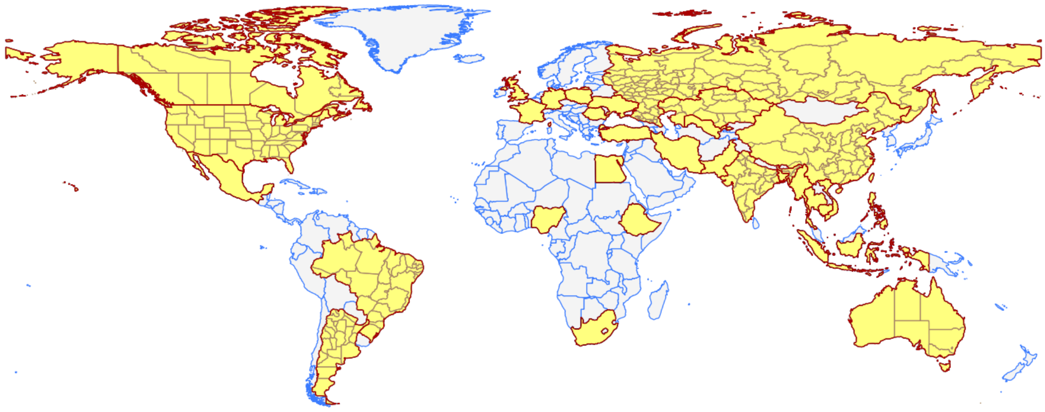
Note: Type is either "Weather" or "Crop"; source specifies if the indicator is obtained from ground data, satellite readings, or a combination; units: in the case of ratios, no unit is used; scale is either pixels or large scale CropWatch spatial units (CWSU). Many indicators are computed for pixels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

CropWatch spatial units (CWSU)

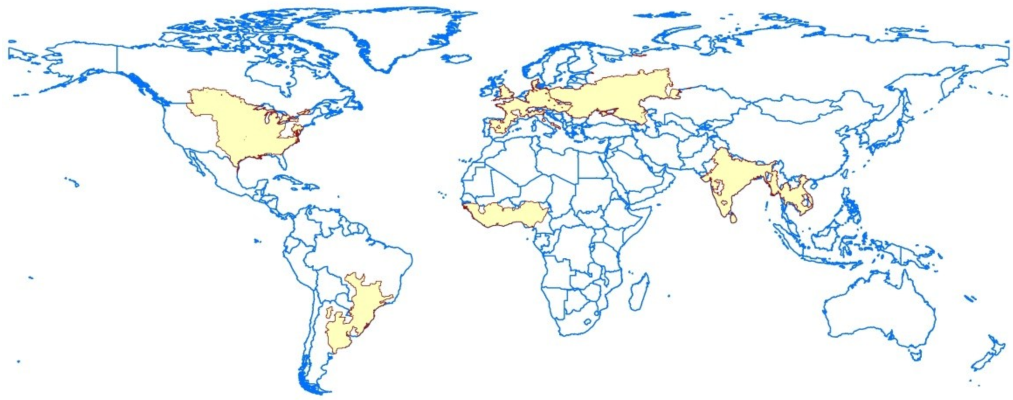
CropWatch analyses are applied to four kinds of CropWatch spatial units (CWSU): Countries, China, Major Production Zones (MPZ), and global crop Monitoring and Reporting Units (MRU). The tables below summarize the key aspects of each spatial unit and show their relation to each other. For more details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

SPATIAL LUNITS	
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.

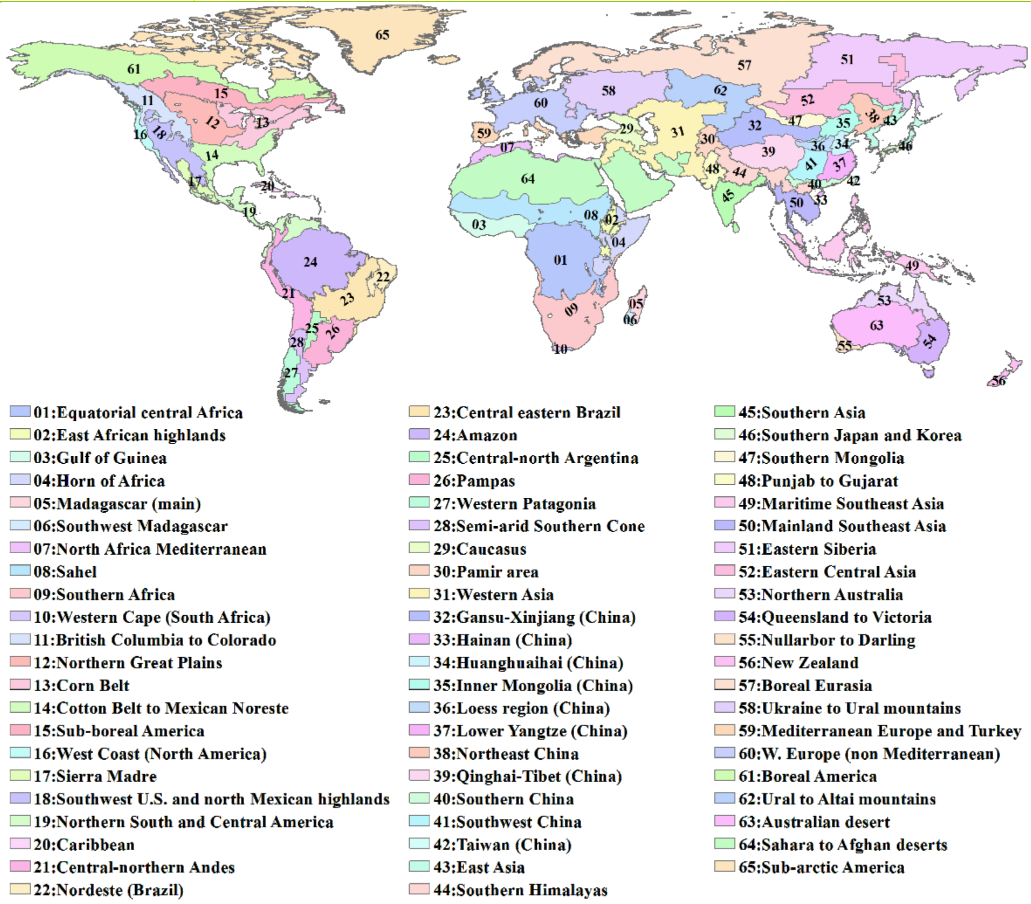
Countries (and first-level administrative districts, e.g., states and provinces)	
Overview	*Description*
"Thirty plus one" countries to represent main producers/exporters and other key countries.	CropWatch monitored countries together represent more than 80% of the production of maize, rice, wheat and 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.



Major Production Zones (MPZ)	
Overview	*Description*
Six globally important areas of agricultural production	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 six zones were identified based mainly on production statistics and distribution of the combined cultivation area of maize, rice, wheat and soybean.



Global Monitoring and Reporting Unit (MRU)	
Overview	*Description*
65 agro-ecological/agro-economic units across the world	MRUs are reasonably homogeneous agro-ecological/agro-economic units spanning the globe, selected to capture major variations in worldwide farming and crops patterns while at the same time providing a manageable (limited) number of spatial units to be used as the basis for the analysis of environmental factors affecting crops. Unit numbers and names are shown in the figure below. A limited number of units (e.g., MRU-63 to 65) are not relevant for the crops currently monitored by CropWatch but are included to allow for more complete coverage of global production. Additional information about the MRUs is provided online under www.cropwatch.com.cn .



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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Acknowledgments

This bulletin is produced by the CropWatch research team at the Institute of Remote Sensing and Digital Earth (RADI), at the Chinese Academy of Sciences in Beijing, China. The team gratefully acknowledges the active support of a range of organizations and individuals, both in China and elsewhere.

Financial and programmatic support is provided by the Ministry of Science and Technology of the People's Republic of China, National Natural Science Foundation of China, State Administration of Grain, and the Chinese Academy of Sciences. We specifically would like to acknowledge the financial support through the National High Technology Research and Development Program of China (863 program), Grant No. 2012AA12A307; the International Science & Technology Cooperation Program of China, Grant No. 2011DFG72280; National Natural Scientific Foundations of China, Grant No. 91025007; China Grains Administration Special Fund for Public Interest, Grant No. 201313009-02, 201413003-7; CAS global food production monitoring and customization service, Grant No. KFJ-EW-STS-017; Visiting Professorships for Senior International Scientists, Grant No. 2013T1Z0016; and RADI funding in the form of the "Global Spatial Information System for Environment and Resources" project.

The following contributions by national organizations and individuals are greatly appreciated: China Center for Resources Satellite Data and Application for providing the HJ-1 CCD data; China Meteorological Satellite Center for providing FY-2/3 data; China Meteorological Data Sharing Service System for providing the agro-meteorological data; and Chia Tai Group (China) for providing GVG (GPS, Video, and GIS) field sampling data.

The following contributions by international organizations and individuals are also recognized: Andres Ravelo (Cordoba, Argentina) for his contributions to the focus section of this bulletin; François Kayitakire at FOODSEC/JRC for making available and allowing use of their crop masks; Ferdinando Urbano also at FOODSEC/JRC for his help with data; Herman Eerens, Dominique Haesen, and Antoine Royer at VITO, for providing the JRC/MARS SPIRITS software, Spot Vegetation imagery and growing season masks, together with generous advice; Patrizia Monteduro and Pasquale Steduto for providing technical details on GeoNetwork products; and IIASA and Steffen Fritz for their land use map.

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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