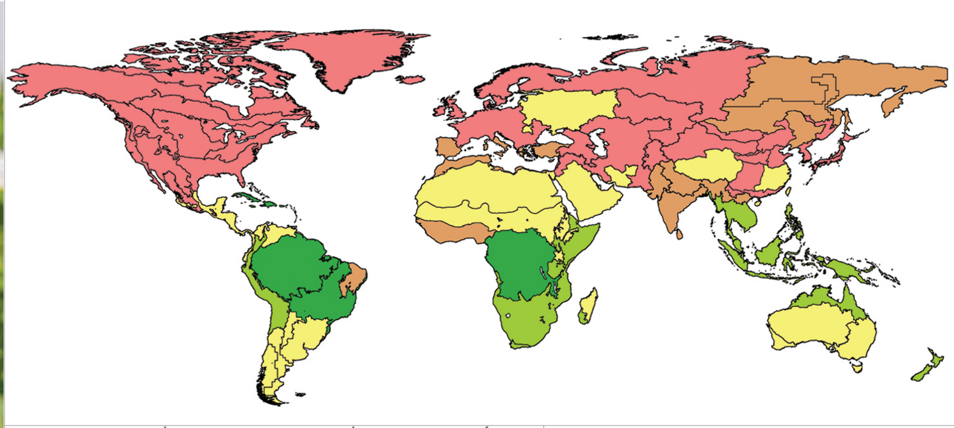

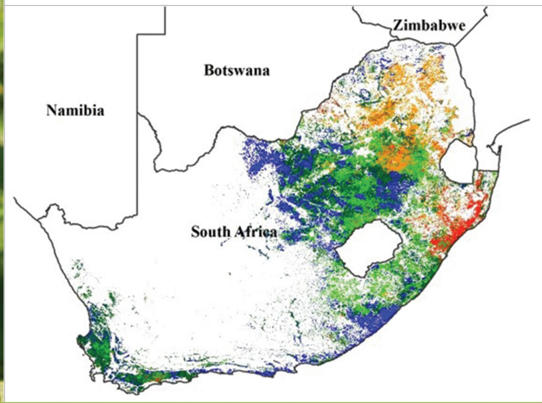

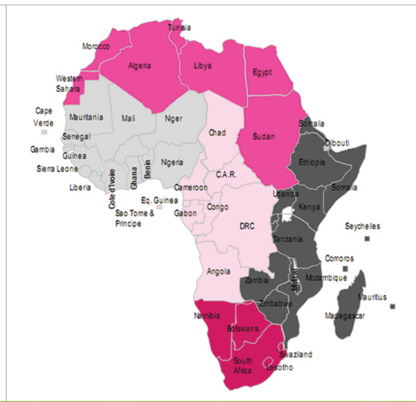

CropWatch bulletin

QUARTERLY REPORT ON GLOBAL CROP PRODUCTION

Monitoring Period: October 2014-January 2015

March 15, 2015
Volume 15, No. 1 (Total No. 96)

Institute of Remote Sensing and Digital Earth (RADI)
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Institute of Remote Sensing and Digital Earth
Chinese Academy of Sciences

March 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 October-January periods from 2009 to 2013; one of the standard reference periods.
13YA	Thirteen-year average, the average for the October-January periods from 2001 to 2013; one of the standard reference periods and typically referred to as "average."
BIOMSS	Agroclimatic indicator for biomass production potential
CALF	Cropped Arable Land Fraction
CAS	Chinese Academy of Sciences
CRED	Centre for Research on the Epidemiology of Disasters
CWSU	CropWatch Spatial Units
DM	Dry matter
EBV	Ebola Virus Disease
EC/JRC	European Commission Joint Research Centre
ENSO	El Niño Southern Oscillation
FAO	Food and Agriculture Organization of the United Nations
GAUL	Global Administrative Units Layer
GVG	GPS, Video, and GIS data
ha	hectare
MPZ	Major Production Zone
MRU	Monitoring and Reporting Unit (formerly CPSZ)
NCDC	U.S. National Climatic Data Center
NDVI	Normalized Difference Vegetation Index
NOAA	U.S. National Oceanic and Atmospheric Administration
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 (SOI)
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 October 1 2014 and January 31, 2015. It is the 96th 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, cropping intensity, 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), seven regions that contribute most to global food production	As above, plus CALF, VCIx, and VHIn
Chapter 3	30 key countries (main producers and exporters)	As above plus NDVI
Chapter 4	China	As above
Chapter 5	Special topics	
Online Resources	www.cropwatch.com.cn	

Newsletter and online resources

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

Executive summary

The current reporting period from October 2014 to January 2015 is a "quiet period" from an agricultural point of view. In the northern hemisphere, with the exception of equatorial areas with multiple crops a year, summer crops have been harvested, while winter crops were planted and are mostly dormant. In some tropical and equatorial countries—including the Philippines, Thailand, Vietnam, and Brazil—planting of the second maize and rice starts around January, while in the southern hemisphere summer crops are at advanced development stages and nearing flowering, for example maize and soybean in Argentina, Brazil, and South Africa.

Global production estimates for major crops were provided by country in the November 2014 CropWatch bulletin; they included no change over 2013 for the global production of rice and maize, a small increase for wheat (+2%) and a noteworthy increase for soybean (+6%). The current bulletin provides revised estimates for 2014-15 wheat production in Argentina (+14.8% compared to 2013), Brazil (+9%), and Australia (-9%, where crops were directly hit by unfavorable agroclimatic conditions.)

Global agroclimatic patterns from October to January were mainly characterized by a significant deficit of sunshine (exceeding a 3% decrease compared to average) in the northern hemisphere and India, next to the occurrence of spatially coherent patterns of rainfall anomalies and correlated temperature departures from average. In particular, above average temperature affected eastern South America, the western United States, and Western Europe, where drought occurred in the south and the Mediterranean Basin. Drought also affected northeast India and Bangladesh and especially Japan (-36% rainfall) and China (Taiwan, -84%; Jiangxi, -67%; and Zhejiang, -65%).

Abundant precipitation and severe cold conditions prevailed around the Caspian Sea and western Russia, and these conditions resulted in Vegetation Condition Indices among the lowest in all the major crop production zones (maximum VCI, or VCIx, of 0.63, particularly in the southeast of the region)—second only to Southern Australia (VCIx=0.62). The same areas also show the lowest fraction of cropped arable land (79% and 71%, respectively), representing, however, a 5% increase over the recent five agricultural seasons. Other major production zones all show VCIx values above 0.85 (except North America at 0.82) and stable fractions of cropped arable land.

In China, about 15% of agricultural land in the south and southeast suffered a water deficit and mostly above average temperature, especially during January. A reduction in cropped arable land fraction occurred in the Loess region, while the lowest vegetation condition indices are those of the Northeast. In spite of excess precipitation during January, the best Vegetation Condition Indices in China are those of the Southwest.

For several countries, CropWatch indicators point to possibly unfavorable conditions for crop growth. CropWatch will continue close monitoring of these countries over the next few months. They include:

- Australia, with increased cropped arable land values compared with the previous seasons (+5%) and low crop condition indices (VCIx=0.62).
- Egypt, with reduced cropped arable land (-6%), mostly fair crop condition (VCIx=0.82), but also with unusually low NDVI in the western Delta.
- Pakistan, characterized by a drop in cropped arable land (-8%) and unfavorable crop condition indices (VCIx=0.71). About 12% of the country experienced poor rainfall.
- Russia and adjacent areas in western Kazakhstan and Ukraine, with increased fractions of cropped arable land (+5%), low crop condition indices (VCIx=0.6), and unusual weather patterns this winter.

- South Africa, where a marked reduction in cropped arable land was recorded (-12%), national crop condition indices are just average, and vegetation indices in the eastern coastal areas indicate poor condition for the country's main staple: maize.
- Turkey, with a spectacular increase in cultivated land over the recent five-year average (+23%) and excellent crop condition indices (VCIx=0.90), but also poor vegetation indices in the east, west, and north-west.
- Ukraine, where cultivated cropland increased 9%, but vegetation condition is low (VCIx=0.61). The country also has mild drought conditions (-8% precipitation compared with average).

الملخص التنفيذي

فترة التقرير الحالية من أكتوبر 2014 إلى يناير 2015 هي "فترة هادئة" من وجهة النظر الزراعية. ففي نصف الكرة الشمالي، باستثناء المناطق الاستوائية التي تزرع محاصيل عديدة على مدار السنة، جرى حصاد المحاصيل الصيفية، في حين تم زراعة المحاصيل الشتوية وهي خاملة في الغالب. وفي بعض الدول المدارية والاستوائية – بما في ذلك الفلبين وتايلاند وفيتنام والبرازيل – فإن زراعة الذرة والأرز للمرة الثانية لا تبدأ إلا في يناير، أما في نصف الكرة الجنوبي فإن المحاصيل الصيفية في مرحلة تطور متقدمة وتقترب من الازدهار، وهذا يشمل على سبيل المثال الذرة وفول الصويا في الأرجنتين والبرازيل وجنوب أفريقيا.

وقد تم تقديم تقديرات الإنتاج العالمي للمحاصيل الرئيسية بحسب كل دولة في نشرة cropwatch الصادرة في نوفمبر2014 ، وهي لم تتضمن أي تغيير عن عام 2013 من حيث الإنتاج العالمي للأرز و الذرة، بينما شهد انتاج القمح انخفاضا بنسبة 2% في مقابل ارتفاع ملفت لانتاج الصويا بنسبة بلغت 6% .تُقدم النشرة الحالية تقديرات مراجعة لإنتاج القمح في عامي 2014 و2015 في الأرجنتين (+14.8% مقارنة بعام 2013)، والبرازيل (+9%)، وأستراليا (–9% حيث تأثرت المحاصيل بشكل مباشر بالظروف المناخية الزراعية غير المواتية).

وقد اتسمت الأنماط المناخية الزراعية العالمية خلال الفترة من أكتوبر وحتى يناير بالتراجع الكبير في سطوع الشمس (بمعدل تجاوز –3%) في نصف الكرة الأرضية الشمالي والهند، إلى جانب حدوث أنماط متسقة كثيراً لانحرافات سقوط الأمطار فضلاً عن ابتعاد درجات الحرارة المصاحبة عن المتوسط. وعلى وجه الخصوص، أثرت درجات الحرارة الزائدة عن المتوسط على شرق أمريكا اللاتينية، وغرب الولايات المتحدة، وغرب أوروبا، حيث وقع جفاف في الجنوب وفي حوض البحر الأبيض المتوسط. كما أثر الجفاف على شمال شرق الهند وبنغلاديش، والصين بصفة خاصة (تايوان، معدل سقوط أمطار –84% مقارنة بالمتوسط، وجيانكسي، –67%، وزيجيانج، 65%) واليابان، –36%).

كما تساقطت أمطار غزيرة وعم البرد محيط بحر قزوين وغرب روسيا، وقد ترتب على هذه الظروف جعل أرقام مؤشرات أحوال النبات من بين الأقل في جميع مناطق إنتاج المحاصيل الكبرى (أقصى رقم لمؤشرات أحوال النبات 0.63، لا سيما في جنوب شرق المنطقة) ولا يتقدم عليه سوى جنوب أستراليا (مؤشر أحوال النبات 0.62). كما تظهر المناطق ذاتها أدنى معدل من الأراضي الصالحة للزراعة بالمحاصيل (79% و71% على التوالي)، غير أن ذلك مثل زيادة 5% عن المواسم الزراعية الخمس الأخيرة. كما تُظهر جميع مناطق الإنتاج الرئيسية الأخرى قيماً قصوى على مؤشرات حالة النبات تتجاوز 0.85 (باستثناء أمريكا الشمالية عند 0.82) وأجزاء من الأراضي الصالحة للزراعة بالمحاصيل المستقرة في الغالب.

وفي الصين، واجه نحو 15% من الأراضي الزراعية في الجنوب والجنوب الشرقي جفافاً، فضلاً عن درجات حرارة فوق المتوسط في الغالب، لا سيما خلال يناير. وقد حدث الانخفاض في حصة الأجزاء القابلة للزراعة بالمحاصيل في منطقة لويس، في حين أن مؤشرات حالة النبات الأقل انخفاضاً هي تلك الخاصة بالأجزاء الشمالية الشرقية. ورغم تزايد سقوط الأمطار خلال يناير، إلا أن أفضل مؤشرات لحالة النبات في الصين هي تلك الخاصة بالجنوب الغربي.

وبالنسبة للعديد من البلدان، فإن مؤشرات CropWatch تشير إلى ظروف محتملة غير مواتية لنمو المحاصيل. سوف تواصل CropWatch مراقبتها الوثيقة لتلك الدول على مدار الشهور القليلة القادمة. تشمل هذه الدول:

- أستراليا، مع زيادة قيم الأراضي القابلة للزراعة بالمحاصيل مقارنة بالمواسم السابقة (5%) وانخفاض مؤشرات حالة النبات (مؤشر حالة النبات=0.62).
- مصر التي شهدت انخفاضاً في الأراضي الصالحة للزراعة بالمحاصيل (−6%)، وحالة جيدة في الغالب للمحاصيل (مؤشر حالة النبات=0.82)، لكن مع انخفاض غير متوقع في مؤشر الغطاء النباتي NDVI في غرب الدلتا.
- باكستان التي اتسمت بحدوث انخفاض في الأراضي الصالحة للزراعة بالمحاصيل (−8%) ومؤشرات حالة المحاصيل غير المواتية (مؤشر حالة النبات=0.71). شهد نحو 12% من الدولة ضعفاً في تساقط الأمطار.
- روسيا والمناطق المجاورة في غرب كازاخستان وأوكرانيا والتي شهدت زيادة في حصص الأراضي الصالحة للزراعة بالمحاصيل (+5%)، مع تراجع مؤشرات حالة المحاصيل (مؤشر حالة النبات=0.6)، وأنماط طقس غير معتادة هذا الشتاء. وكل من روسيا وكازاخستان مُنتِج رئيسي للقمح.
- جنوب أفريقيا، حيث تم تسجيل تراجع ملحوظ في الأراضي الصالحة للزراعة بالمحاصيل (−12%)، والمؤشرات الوطنية لحالة المحاصيل فوق المتوسط، كما أن مؤشرات النبات في المناطق الساحلية الشرقية تشير إلى حالة سيئة للمحصول الرئيسي للدولة، وهو الذرة.
- شهدت تركيا زيادة هائلة في الأراضي المنزرعة على مدار متوسط الخمس سنوات الأخيرة (+23%) ومؤشرات حالة المحاصيل الممتازة (0.90)، لكن مؤشرات النبات بها سيئة في الشرق والغرب والشمال الغربي.
- زادت الأراضي المنزرعة في أوكرانيا بنسبة 9%، لكن حالة النبات منخفضة (0.61). كما أن الدولة تعاني من ظروف جفاف معتدلة (بمعدل سقوط أمطار −8% مقارنة بالمتوسط).

Résumé

La période d'octobre 2014 à janvier 2015, qui fait l'objet du présent rapport est une « période calme » du point de vue de l'agriculture. Dans l'hémisphère nord, à l'exception des zones plus équatoriales qui pratiquent plusieurs récoltes dans une même année, les céréales d'été ont été récoltées tandis que les cultures d'hiver ont été plantées et sont pour la plupart au stade de dormance. Dans certains pays tropicaux et équatoriaux tels que les Philippines, la Thaïlande, le Vietnam et le Brésil, la campagne de semis de la deuxième culture de maïs et de riz ne débute qu'au mois de janvier, et dans l'hémisphère sud, les céréales d'été sont à des stades de développement avancés et bientôt prêtes à fleurir, comme par exemple le maïs et le soja en Argentine, au Brésil et en Afrique du sud.

Les estimations de production globale pour les principales céréales ont été fournies par pays dans le bulletin CropWatch de novembre 2014 ; elles ne comportaient pas de modification par rapport à 2013 pour ce qui est de la production de riz et de maïs, une légère augmentation pour le blé (+2%) et une augmentation notable pour le soja (+6%). Le présent bulletin fournit des estimations revues pour la production de blé 2014-15 en Argentine (+14,8% par rapport à 2013), au Brésil (+9%), et en Australie (-9%, où les céréales ont été directement affectées par des conditions agroclimatiques défavorables).

Les conditions agroclimatiques globales d'octobre à janvier ont été principalement caractérisées par un déficit important d'ensoleillement (supérieur à -3%) dans l'hémisphère nord et en Inde, doublé d'anomalies géographiquement cohérentes en termes de précipitations et des écarts de température corrélés par rapport à la moyenne. Des températures au-dessus de la moyenne ont notamment affecté l'est de l'Amérique latine, l'ouest des Etats-Unis et l'Europe de l'ouest, où la sécheresse a touché le sud et le bassin méditerranéen. La sécheresse a également affecté l'Inde du nord-est et le Bangladesh et, en particulier la Chine (Taiwan, -84% de précipitations par rapport à la moyenne ; Jiangxi, -67%; et Zhejiang, 65%) et le Japon, -36%.

Des précipitations abondantes ainsi que des conditions de froid extrême ont dominé autour de la mer Caspienne et la Russie occidentale, et ces conditions ont eu pour conséquence des indices d'état des cultures (VCIx) parmi les plus bas dans l'ensemble des zones majeures de production agricole (VCIx maximum de 0,63, en particulier dans le sud-est de la zone), et en Australie du sud (VCIx = 0,62). Ces mêmes zones présentent le pourcentage de terres arables cultivées le plus faible (respectivement 79% et 71%), représentant malgré tout une augmentation de 5% par rapport aux cinq récentes campagnes agricoles. Les autres zones de production majeures présentent toutes des indices maximum supérieurs à 0,85 (à l'exception de l'Amérique du nord avec un indice de 0,82) et un pourcentage de terres arables cultivées essentiellement stable.

En Chine, environ 15% des terres agricoles du sud et du sud-est ont souffert de la sécheresse et de températures en majorité au-dessus de la moyenne, notamment au cours du mois de janvier. On a assisté à une diminution du pourcentage de terres arables cultivées dans la région du Lœss tandis que les indices de végétation les plus bas sont ceux du nord-est. Malgré des précipitations excessives au cours de janvier, les meilleurs indices de végétation en Chine sont ceux du sud-est.

Pour plusieurs pays, les indicateurs CropWatch font ressortir les conditions éventuellement défavorables à la croissance des cultures. CropWatch va suivre de près l'évolution de ces pays au cours des prochains mois. Ces pays incluent :

- l'Australie, avec des valeurs de terres arables cultivées supérieures à celles des campagnes précédentes (+5%) et des indices d'état des cultures faibles (VCIx=0,62).
- l'Egypte, avec une diminution des terres arables cultivées (-6%), majoritairement des conditions céréalières correctes (VCIx=0,82), mais également des VCIx bas, contre toute attente, dans l'ouest du Delta.

- le Pakistan, caractérisé par la concomitance d'une diminution des terres arables cultivées (-8%) et des indices d'état des cultures défavorables (VCIx=0,71). Environ 12% du pays ont connu de faibles précipitations.
- la Russie et les zones voisines de l'ouest du Kazakhstan et de l'Ukraine, avec des pourcentages de terres arables cultivées en augmentation (+5%), des indices d'état des cultures bas (VCIx=0,6), et des conditions météorologiques inhabituelles cet hiver. La Russie et le Kazakhstan sont tous deux de grands producteurs de blé.
- l'Afrique du sud, où une chute marquée des terres arables cultivées a été enregistrée (-12%), les indices d'état des cultures nationaux sont tout juste moyens, et les indices de végétation des zones côtières de l'est indiquent de mauvaises conditions pour la culture principale du pays : le maïs.
- la Turquie, avec une augmentation spectaculaire des terres cultivées par rapport à la moyenne des cinq dernières années (+23%) et d'excellents indices d'état des cultures (0,90), mais également de mauvais indices de végétation dans l'est, l'ouest et le nord-ouest.
- l'Ukraine, où les terres de culture céréalière ont augmenté de 9%, mais où les indices de végétation sont bas (0,61). Le pays présente également des conditions de sécheresse modérée (-8% de précipitations par rapport à la moyenne).

Краткий обзор

Текущий отчетный период с октября 2014 года по январь 2015 года является «периодом затишья» с точки зрения сельского хозяйства. В северном полушарии, за исключением экваториальных областей, где собирается несколько урожаев в год, летний урожай был собран, а озимые высажены и пребывали в спящем состоянии. В некоторых тропических и экваториальных странах, включая Филиппины, Таиланд, Вьетнам и Бразилию, второй сев кукурузы и риса начинается только в январе, а в южном полушарии летние сельскохозяйственные культуры находятся на поздних стадиях развития и близятся к цветению, например кукуруза и соя в Аргентине, Бразилии и Южной Африке.

Глобальные оценки продуктивности основных сельскохозяйственных культур по странам были предоставлены в бюллетене “CropWatch” от ноября 2014 года, где не отмечено никаких изменений мировой производительности риса и кукурузы по сравнению с 2013 годом, а отмечается лишь небольшое увеличение производства пшеницы (+2%) и увеличение производства сои (+6%). Текущий выпуск бюллетеня содержит пересмотренные оценки за 2014-15 годы по производству пшеницы в Аргентине (+14.8% по сравнению с 2013 годом), Бразилии (+9%) и Австралии (-9%, посевы пострадали от неблагоприятных агроклиматических условий).

Глобальные агроклиматические условия с октября по январь характеризуются в основном значительным дефицитом солнечного света (превышающим -3%) в северном полушарии и в Индии, наряду с возникновением пространственно когергентных факторов аномалий осадков и коррелирующих температурных отклонений от средних значений. В частности, превышение средних значений температуры затронуло восточную часть Латинской Америки, запад США и запад Европы, где имела место засуха на юге и в бассейне Средиземного моря. Засуха также затронула северо-восток Индии и Бангладеш, в особенности Китай (Тайвань, -84% осадков по сравнению со средними показателями; Цзянси, -67%; Чжэцзян, -65%) и Японию (-36%).

Обильные осадки и сильные холода преобладали в регионе Каспийского моря и в западной части России; эти условия привели к низким показателям состояния растительности (VCIx) во всех крупных зонах сельскохозяйственного растениеводства (максимальные VCIx 0,63, в частности, на юго-востоке региона) – хуже показатели только в Австралии (VCIx составили 0,62). Эти же области также демонстрируют низкую долю посевных пахотных земель (79% и 71% соответственно), что, однако, на 5% больше показателей пяти предыдущих сельскохозяйственных сезонов. Другие крупные зоны сельскохозяйственного производства показывают максимальные значения VCIx выше 0,85 (кроме Северной Америки, где VCIx составляет 0,82), а площади посевных пахотных земель остаются в основном стабильными.

Около 15% сельскохозяйственных земель на юге и юго-востоке Китая подверглись засухе, кроме того, температура там превышала средние значения, особенно в январе. В регионе Лёссового плато отмечено сокращение площади посевных пахотных земель, в то время как низкие показатели состояния растительности отмечены на северо-востоке страны. Несмотря на избыток осадков в январе, лучшие показатели состояния растительности в Китае зафиксированы на юго-западе страны.

Для ряда стран показатели “CropWatch” указывают на неблагоприятные условия для растениеводства. “CropWatch” будет продолжать внимательно следить за ситуацией в этих странах в ближайшие несколько месяцев. В число этих стран входят:

- Австралия, с увеличением доли посевных пахотных земель по сравнению с предыдущими сезонами (+5%) и низкими показателями урожайности (VCIx = 0,62).
- Египет, с уменьшением доли посевных пахотных земель (-6%), преимущественно удовлетворительным состоянием сельскохозяйственных культур (VCIx = 0,82), но неожиданно низким стандартизированным индексом различий растительного покрова (NDVI) в западной Дельте.

- Пакистан, характеризующийся комбинированным уменьшением площадей посевных пахотных земель (-8%) и неблагоприятных показателей состояния посевов (VCIx = 0,71). Около 12% территории страны испытывает дефицит осадков.
- Россия и прилегающие регионы Украины и Западного Казахстана, с повышением доли посевных пахотных земель (+5%), низкими показателями урожайности (VCIx=0,6) и нетипичными погодными условиями прошедшей зимой. Россия и Казахстан являются крупными производителями пшеницы.
- Южная Африка, где отмечается снижение доли посевных пахотных земель (-12%), показатели состояния национальных сельскохозяйственных культур на средних значениях, а показатели растительности в восточных прибрежных районах говорят о плохом состоянии основной культуры страны – кукурузы.
- Турция, с потрясающим ростом посевных площадей за последние пять лет (+23%) и отличными показателями состояния посевов (0,90), но бедными показателями растительности на востоке, западе и северо-западе страны.
- Украина, где доля пахотных земель увеличилась на 9%, но состояние растительности низкое (0,6). В стране также отмечена мягкая засуха (-8% осадков по сравнению со средними показателями).

Resumen

El período comprendido entre octubre de 2014 y enero de 2015 no ha presentado mayores contratiempos desde el punto de vista agrícola. En el hemisferio norte, salvo aquellas regiones más cercanas al Ecuador con múltiples cultivos al año, los cultivos de verano ya han sido cosechados y los de invierno ya fueron plantados y se encuentran mayoritariamente en letargo. En algunos países tropicales y ecuatoriales -como Filipinas, Tailandia, Vietnam y Brasil-, la siembra del segundo ciclo de maíz y arroz comienza recién en enero y en el hemisferio sur los cultivos de verano se encuentran en etapas avanzadas de desarrollo y cercanos a la floración (por ejemplo: maíz y soja en Argentina, Brasil y Sudáfrica).

Las estimaciones globales de producción por país para los principales cultivos fueron proporcionadas en el boletín informativo de CropWatch de noviembre de 2014; estas consideraban una situación estable durante 2013 para la producción mundial de arroz y maiz, un pequeño aumento del trigo (+2%) y un aumento notable en la soja (+6%). El presente boletín informativo brinda una versión actualizada de las estimaciones para el período 2014-2015 en cuanto a la producción de trigo en Argentina (+14,8% en comparación con 2013), en Brasil (+9%) y en Australia, donde los cultivos se vieron directamente afectados por condiciones agroclimáticas desfavorables (-9%).

Entre octubre y enero, los patrones agroclimáticos globales se caracterizaron principalmente por un significativo déficit de radiación solar (mayor al 3%) en el hemisferio norte y en India donde se observaron patrones espacialmente coherentes de anomalías en la pluviosidad y temperaturas alejadas del promedio. Las temperaturas por encima del promedio afectaron particularmente a la región oriental de América Latina, a la región occidental de Estados Unidos y a Europa oriental con sequías en la zona sur y en la cuenca del Mediterráneo. La sequía también afectó al noreste de India, a Bangladesh y muy especialmente a China (Taiwán presentó un 84% menos de lluvias en comparación con el promedio, Jiangxi 67% menos y Zhejiang 65% menos) y a Japón con 36% menos.

Abundantes precipitaciones y condiciones de frío severo prevalecieron en los alrededores del mar Caspio y en Rusia occidental, las que provocaron que el Índice de Condición de la Vegetación (VCI, por sus siglas en inglés) se encontrara entre el más bajo de las principales zonas de producción de cultivos (VCI máximo de 0,63 particularmente en el sudeste de la región), segundo después del Sur de Australia, donde el VCI máximo fue de 0,62. Estas áreas también mostraron las menores porciones de área cultivada segundo después del Sur de Australia (79% y 71% respectivamente), lo que, sin embargo, representa un aumento de 5% con respecto a las últimas recientes cinco temporadas agrícolas. Otras zonas importantes de producción presentan valores máximos de VCI por encima de 0,85 (salvo América del Norte con 0,82) y proporciones de terreno cultivado se muestran básicamente estables.

En China, cerca del 15% del área agrícola de las regiones sur y sureste enfrentaron sequías y temperaturas sobre el promedio, especialmente en enero. Se produjo una disminución de la porción de terreno cultivado en la región de Loess y el noreste presentó los más bajos Índices de Condición de la Vegetación. A pesar del superávit de lluvias en enero, los mejores Índices de Condición de la Vegetación en China son aquellos de la región suroeste.

En el caso de ciertos países específicos, los indicadores de CropWatch señalan posibles condiciones desfavorables para el crecimiento de los cultivos. CropWatch continuará monitoreando dichos países durante los próximos meses. Entre ellos se incluyen:

- Australia: aumento en el valor de área cultivada en comparación con temporadas anteriores (+5%) y bajos índices de condición del cultivo (VCI máximo de 0,62).
- Egipto: disminución de área cultivada (-6%) y condiciones mayoritariamente favorables para los cultivos (VCI máximo de 0,82), pero un inesperadamente bajo Índice de Vegetación Normalizado (NDVI, por sus siglas en inglés) en el delta occidental.

- Paquistán: ha primado una disminución de área cultivada (-8%) junto a desfavorables índices de condición del cultivo (VCI máximo de 0,71). Alrededor del 12% del país presentó un nivel muy bajo de precipitaciones.
- Rusia y áreas adyacentes a la zona occidental de Kazajistán y Ucrania: aumento de las porciones de área cultivada (+5%), bajos índices de condición del cultivo (VCI máximo de 0,6) e inusuales patrones climáticos observados este último invierno. Tanto Rusia como Kazajistán son importantes productores de trigo.
- Sudáfrica: se registró una fuerte caída de las áreas cultivadas (-12%), los índices de condición del cultivo del país no superaron el promedio y los índices de vegetación en las regiones costeras orientales sugieren pobres condiciones para el principal producto del país: el maíz.
- Turquía: notable aumento de las áreas cultivadas (23% sobre el promedio de los últimos cinco años) y excelentes índices de condiciones de cultivo (0,90) pero, a la vez, bajísimos índices de vegetación en las regiones este, oeste y noroeste del país.
- Ucrania: aumento de 9% en las áreas cultivadas pero bajos índices de condiciones de vegetación (0,61). El país también presenta condiciones de sequía moderada (8% menos de lluvias en comparación con el promedio).

Chapter 1. Global agroclimatic patterns

Chapter 1 describes the CropWatch agroclimatic indicators for rainfall (RAIN, figure 1.1), temperature (TEMP, figure 1.2), and radiation (RADPAR, figure 1.3), along with the agronomic indicator for potential biomass (BIOMSS, figure 1.4) 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 thirteen 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

Over the current reporting period—October 1 2014 to January 31 2015, global agroclimatic patterns are characterized by a significant deficit of sunshine in the northern hemisphere and India, along with an occurrence of coherent rainfall patterns in several regions.

The northern hemisphere sunshine deficit consisted of a more than 3% drop below average for radiation in most areas above 20 degrees northern latitude and in India; only an area from the Ukraine to the Ural mountains (MRU-58) and the Lower Yangtze (MRU-37) were excepted, with both areas showing normal conditions. With the exception of the Brazilian Nordeste (MRU-22) and the Gulf of Guinea region (MRU-03), radiation was higher than expected in equatorial regions and southern Africa, including all of Southeast Asia and southern Africa.

The largest radiation deficits occurred in the Ural to Altai mountains (MRU-62, -10%) and—among the major crop producing areas—in non-Mediterranean Western Europe (MRU-60, -8%) andCorn Belt (MRU-13, -6%). The highest positive departures for radiation are those of Equatorial central Africa (MRU-01) and Central-eastern Brazil (MRU-23), both showing 7% above average sunshine.

The typical rainfall patterns include deficits on the eastern margin of Asia and Oceania, Africa, and South America. In Asia and Oceania, rainfall extremes occurred in southern Japan and Korea (MRU-46,-33%), Hainan (MRU-33, -55%), Taiwan (MRU-42, -84%), and New Zealand (MRU-56, -69%), but also affected other Chinese regions (Lower Yangtze MRU-37, -28%) and maritime Southeast Asia (MRU-49, -5%). In Africa, the effect is most marked in the Horn of Africa (MRU-04,-23%) and southwest Madagascar (MRU-06,-31%), but less so in the east African highlands (MRU-02, -8%) and southern Africa (MRU-09, -5%). Finally, in South America, the Nordeste (MRU-22, -27%) and the extreme south (MRUs 27 and 28) stand out with values between -28% and -60%. In contrast, the Pampas MRU (MRU-26), a major agricultural area, benefited from above-average rainfall (+26%).

Finally, favorable conditions for rainfall existed in a large area in Asia stretching from Huanghuaihai (MRU-34, +44%) and Southwest China (MRU-41, +81%) across much of central Asia to the Ural to Altai mountains (MRU-62, +52%), showing large rainfall departures of above 50%, including the record for the current reporting period: +413% in southern Mongolia (MRU-47).

1.2 Rainfall

Over the monitoring period, almost all summer crops were harvested, and winter crops were planted in the northern hemisphere. In the southern hemisphere, the harvest season is either nearing completion or already finished. Rainfall showed a large variation across regions (figure 1.1).

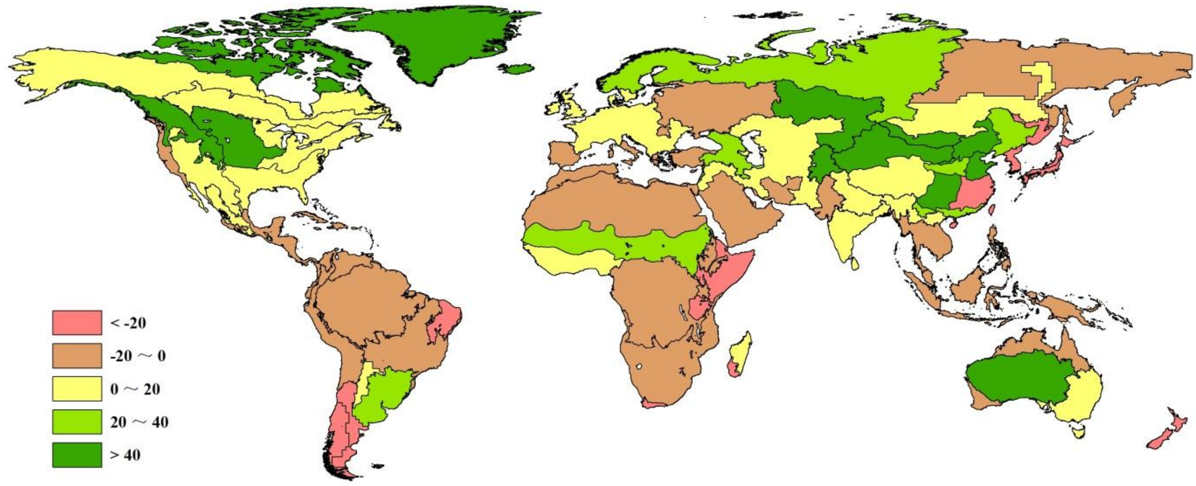
Overall, the southern hemisphere suffered insufficient rainfall, including the Western Cape (MRU-10, -60%), southwest Madagascar (MRU-06, -31%), Horn of Africa (MRU-04,-23%), Nordeste (MRU-22, -27%), Amazon (MRU-24, -19%), central-eastern Brazil (MRU-23, -17%), New Zealand (MRU-56, -69%), and northern Australia (MRU-53, -13%). Fortunately, the rainfall amounts in the main production zones in the southern hemisphere were close to normal or above average, including in the Pampas (MRU-26, +30%), Queensland to Victoria (MRU-54, +6%), and the Gulf of Guinea (MRU-03, +5%). Most other regions had close to average rainfall, such as North African-Mediterranean (MRU-07, -5%).

The variation of rainfall in the northern hemisphere is complicated. In North America, except for the West Coast (MRU-16, -18%), abundant or average rainfall occurred in the Corn Belt (MRU-13, +4%), British Columbia to Colorado (MRU-11, +44%), northern Great Plains (MRU-12, +54%), and the area extending from the Cotton Belt to Mexican Noreste (MRU-14, +17%). In China, although rainfall in the Lower Yangtze (MRU-37) was 28% below average, abundant rainfall fell over Huanghuaihai (MRU-34, +44%), the Loess region (MRU-36, +34%), Northeast China (MRU-38, +28%), and Southern China (MRU-40, +20%). Insufficient rainfall was recorded in the MRUs of East Asia (MRU-43, -25%) and southern Japan and Korea (MRU-C46, -33%).

In the main rice production zones, rainfall was close to average in Southeast Asia and South Asia, including mainland Southeast Asia (MRU-50, +0%), southern Himalayas (MRU-44, +9%), southern Asia (MRU-45, +6%), Punjab to Gujarat (MRU-48, -9%), and maritime Southeast Asia (MRU-49, -5%).

Rainfall was normal in Western Europe (MRU-60, +4%) and the Ukraine to Ural mountains (MRU-58, -6%), but insufficient rainfall fell over Mediterranean Europe and Turkey (MRU-59, -18%). In central Asia, abundant rainfall fell over the Ural to Altai mountains area (MRU-62, +51%).

Figure 1.1. Global map of rainfall anomaly (as indicated by the RAIN indicator) by MRU, departure from 13YA, October 2014-January 2015 (percentage)



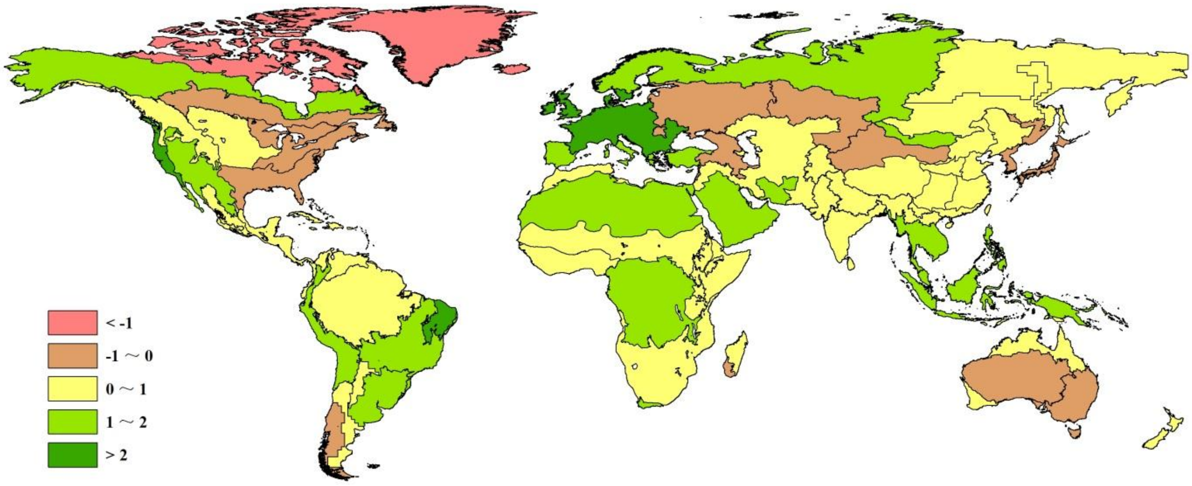
Note: Data for October 2014-January 2015, compared with the thirteen-year average (13YA) for the same period 2001-2013.

1.3 Temperature

Over the reporting period, most parts of the world experienced average temperature (TEMP) conditions compared to average (figure 1.2). In North America, temperature was above average in the west and below average in the east. The greatest positive temperature departures are found on the West Coast (MRU-16, +2.2°C) and in an area from British Columbia to Colorado (MRU-11, +1.7°C). In the non-agricultural sub-boreal America (MRU-15, -0.8°C) average temperature was -7.9°C, while precipitation was abundant (RAIN, +9%). In South America and Africa, most MRUs were warmer than usual, with the exception of western Patagonia (MRU-27, -0.4°C). In Oceania, below average temperatures were found in the Australian desert (MRU-63, -0.7) and Queensland to Victoria (MRU-54, -0.5°C).

Among the areas that were warmer than average, many are found in Eurasia, with the largest positive departure in non-Mediterranean Western Europe (MRU-60, +2.1°C). In Ukraine to Ural Mountains (MRU-58, -0.3°C) and Ural to Altai mountains (MRU-62, -0.5), the temperature was below the average and lower than 0°C.

Figure 1.2. Global map of air temperature anomaly (as indicated by the TEMP indicator) by MRU, departure from 13YA, October 2014-January 2015 (degrees Celsius)



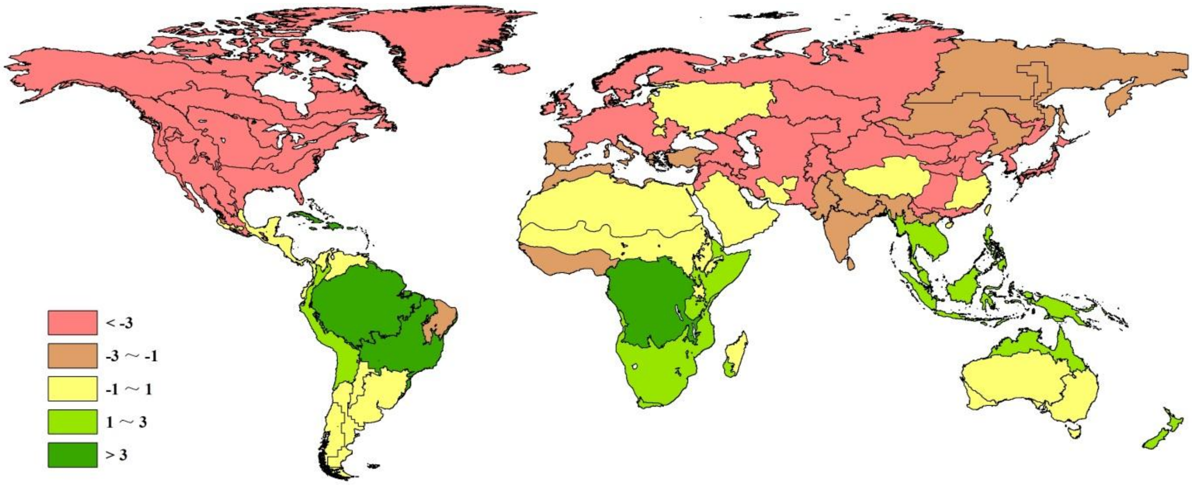
Note: Data for October 2014-January 2015, compared with the thirteen-year average (13YA) for the same period 2001-2013.

1.4 Photosynthetically active radiation

The observed photosynthetically active radiation assessed by the RADPAR CropWatch agroclimatic indicator was mostly consistent with rainfall and temperature mentioned above (see figure 1.3). Compared to average, most MRUs in the northern hemisphere showed below average values, while in the southern hemisphere most were above average. The highest increases compared to average (+7%) occurred in both equatorial central Africa (MRU-01) and central eastern Brazil (MRU-23). The Amazon region also experienced above average PAR (+5%). Record low radiation departures were concentrated in the North American continent and mainland Europe, including (i) Corn Belt (MRU-13, -6%), sub-boreal America (MRU-15, -6%), and boreal America (MRU-61, -5%); (ii) Western Europe (MRU-60, -8%) and Ural to Altai mountains (MRU-62, -10%); and (iii) boreal Eurasia (MRU-57) where the absolute highest PAR departure from the recent reference period occurred (-14%). While the mentioned northernmost areas do not play a significant role in agricultural production, their PAR values underscore the spatial coherence of PAR variations.

Most regions of China show a decrease in radiation. The major winter wheat production area in Huanghuaihai (MRU-34, -3%) and the Loess region (MRU-36, -4%) show a significant decrease in RADPAR, which may have negative effects on the growth of winter wheat. The largest negative departure in China was recorded in Gansu-Xinjiang (MRU-32, -5%), which resulted from abundant rainfall in this region.

Figure 1.3. Global map of PAR anomaly (as indicated by the RADPAR indicator) by MRU, departure from 13YA, October 2014-January 2015 (percentage)

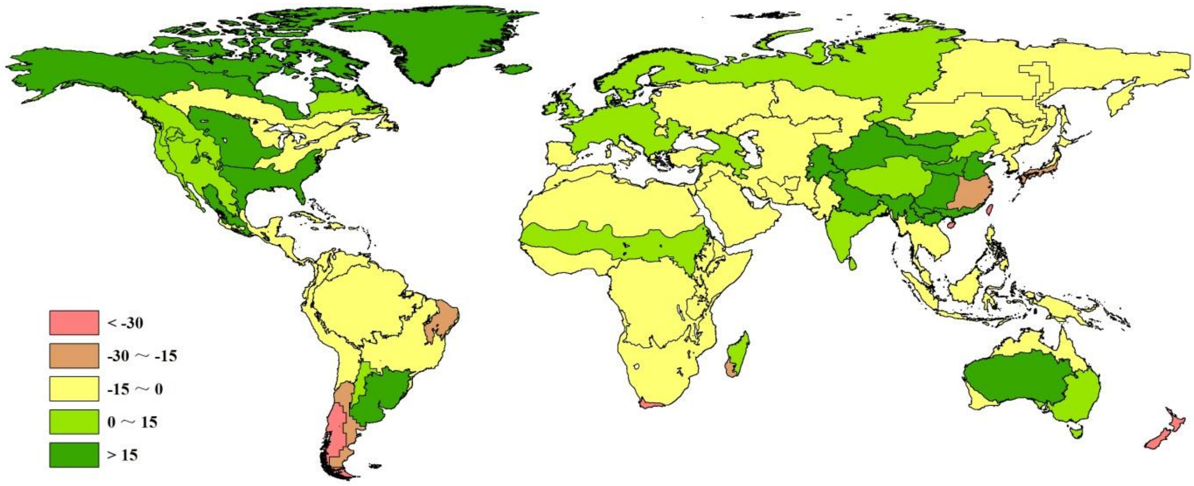


Note: Data for October 2014-January 2015, compared with the thirteen-year average (13YA) for the same period 2001-2013.

1.5 Biomass

BIOMSS is a synthetic agro-climatic indicator that takes into account rainfall and temperature to estimate the potential biomass accumulation. Recent departures from average for the 65 global MRUs are shown in figure 1.4.

Figure 1.4. Global map of biomass accumulation (BIOMSS) by MRU, departure from 5YA, October 2014-January 2015 (percentage)



Note: Data for October 2014-January 2015, compared with the five-year average (5YA) for the same period 2009-2013.

Overall, 27 MRUs display a potential biomass accumulation during the October 2014 to January 2015 monitoring period that is higher than in other areas for the same period, usually due to high temperatures and abundant precipitation. The greatest positive biomass accumulation departures are found in the Australian desert (MRU-63, +23%), boreal America (MRU-61, +24%), southern Himalayas (MRU-44, +26%), northern Great Plains (MRU-12, +37%), Gansu-Xinjiang (MRU-32, +42%), Southwest China (MRU-41, +59%), southern Mongolia (MRU-47, +167%), and sub-arctic America (C65, +226%). At the scale of the MRUs, large negative BIOMSS departures occur in the Nordeste (MRU-22, -23%), lower Yangtze (MRU-37, -24%), southwest Madagascar (MRU-6, -29%), western Patagonia (MRU-27,-47%), Hainan (MRU-33,-51%), Western Cape (MRU-10,-52%), New Zealand (MRU-56,-57%), and Taiwan (MRU-42,-77).

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 seven 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 seven MPZs, comparing the indicators to their thirteen- and five-year averages.

Table 2.1. October 2014 to January 2015 agroclimatic indicators by Major Production Zone, current value and departure from 13YA

	RAIN		TEMP		RADPAR	
	Current (mm)	Departure from 13YA (%)	Current (°C)	Departure from 13YA (°C)	Current (MJ/m^2)	Departure from 13YA (%)
West Africa	225	6	27.2	0.5	1150	-1
South America	734	4	25.0	1.5	1344	3
North America	347	22	4.7	-0.4	534	-4
South and Southeast Asia	205	1	22.4	0.6	958	-1
Western Europe	264	-4	8.4	2.6	298	-7
Central Europe and Western Russia	199	0	-0.4	-0.2	237	-1
Southern Australia	237	5	19.6	-0.4	1494	0

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 thirteen-year average (13YA) for the same period (October-January) for 2001-13.

Table 2.2. October 2014 to January 2015 agronomic indicators by Major Production Zone, current season values and departure from 5YA

	BIOMSS		Cropped arable land fraction		Maximum VCI
	Current (gDM/m^2)	Departure from 5YA (%)	Current (% of pixels)	Departure from 5YA (%)	Current
West Africa	638	-4	90	1	0.85
South America	1855	4	82	-1	0.86
North America	823	17	82	4	0.82
South and Southeast Asia	543	9	87	-1	0.85
Western Europe	936	1	93	3	0.90
Central Europe & Western Russia	638	-4	79	5	0.63
Southern Australia	824	2	71	5	0.62

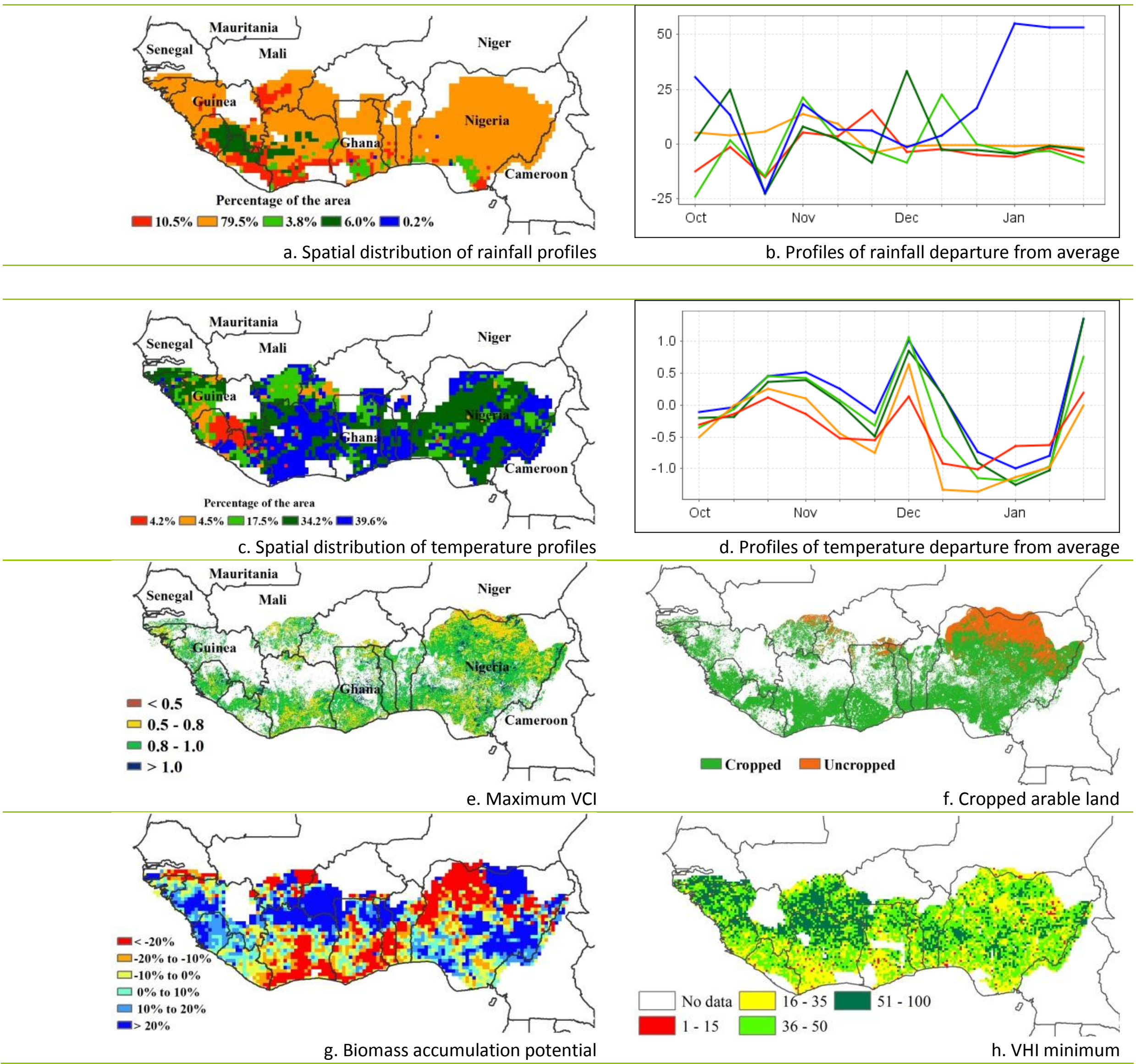
Note: Departures are expressed in relative terms (percentage) for all variables. Zero means no change from the average value; Relative departures are calculated as (C-R)/R*100, with C=current value and R=reference value, which is the five-year (5YA) average for the same period (October-January) for 2009-13.

2.2 West Africa

Over the reporting period, cereals and tubers were harvested throughout the West Africa MPZ, with small spatial differences in harvest times conditioned by latitude and elevation (such as in the case of Guinea). The MPZ as a whole underwent close to average conditions (see figure 2.1), with rainfall exceeding average by 6% and a drop in radiation of 1%, resulting in an overall drop in biomass potential of 6%. Few countries experienced extreme conditions: the largest rainfall deficit occurred in Côte d'Ivoire (-17%, leading to a BIOMSS drop of 18%), while Sierra Leone and Guinea both recorded rainfall excesses just above 20%, which were associated with drops in sunshine between 3 and 4%.

Not only were total rainfall amounts close to average, but their distribution over time was according to expectation too in about 80% of the region, with some local exceptions in October. At the beginning of the month, about 15% of the MPZ (in the very south of all countries and especially in Ghana and Nigeria) experienced a rainfall shortfall between 10 and 25%. At the end of October, the same areas experienced a weaker deficit of about 10%. The area including northeast Sierra Leone, northern Liberia, southeast Guinea, and parts of central Côte d'Ivoire did experience the late October deficit, but also benefited from abundant rain during mid-October and at the beginning of December. This is also the area where the highest VCIx values were recorded.

Figure 2.1. West Africa MPZ: Agroclimatic and agronomic indicators, October 2014-January 2015



a. Spatial distribution of rainfall profiles
b. Profiles of rainfall departure from average
c. Spatial distribution of temperature profiles
d. Profiles of temperature departure from average
e. Maximum VCI
f. Cropped arable land
g. Biomass accumulation potential
h. VHI minimum

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

Other than this area with high VCIx values, no clear VCIx pattern existed; the current regional average of 0.85 points at rather satisfactory conditions except in the northernmost areas where planting is still several dekads off. Those areas are identified in the Cropped/uncropped land map.

Temperature followed a consistent pattern of slightly above average values from October to early December followed by a weak negative departure between mid-December and mid-January. The decrease in regional biomass production potential over the average of the last five years (-6%) can be ascribed to this relative cold spell. Spatially, it affects about 50% of the MPZ with drops in BIOMSS exceeding 10% in the southern halves of Côte d'Ivoire, Ghana, Togo, and Benin, as well as the northwestern quadrant of Nigeria. However, because the crops were all in their late phenological stages, the effect on yield was low.

Aside from environmental conditions, the region has suffered from a combination of ongoing and new emergencies, starting with the Ebola Virus Disease (EBV) outbreak from May in Sierra Leone, Guinea and Liberia. The EBV emergency affected agriculture in several ways, as it interfered with farm operations, the availability and use of inputs, as well as movement of people and goods across borders. In general, rainfed cereals have been more seriously affected than roots, tubers (cassava and yams), and rice, which predominate in the south and west and are harvested later than cereals. EBV also affected the return of refugees to Côte d'Ivoire after the situations normalized in the country. In Nigeria, Boko Haram have created an insecure situation in the northeast (especially in the states of Borno, Adamawa, and Yobe), with a resulting drop in farm output.

FAO and the World Food Program have recently assessed the situation and put the production drop as a result of EBV at 1% to 5% (affecting cassava and cereals (including rice) in the three affected countries) and 12% (rice in Liberia).

Altogether, the indicators assessed by CropWatch, especially VCIx, concur to qualifying the season in the MPZ as fair to good, due to the absence of extreme conditions.

2.3 North America

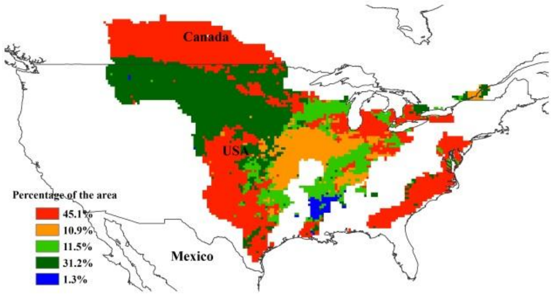
In general, crop condition is above average in the North America MPZ (figure 2.2). The summer crops (maize, soybean, and spring wheat) were completely harvested; winter crops were planted and stayed in over-wintering stages.

The agroclimatic indicators show that rainfall was 22% above average while temperature was slightly below. Abundant rainfall recharged soil water reserves for winter crop planting and the coming growth, especially in Kansas (RAIN, +62%), Oklahoma (+49%), northern Texas (+20%), and Arkansas (+42%). The maximum VCI (VCIx) and BIOMSS also indicate a good performance of crops.

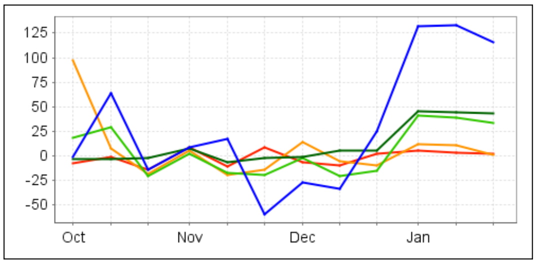
Other regions that also received abundant rainfall include Alberta (+29%), Idaho (+49%), Iowa (+45%), Minnesota (+33%), Missouri (+53%), Montana (+152%), Nebraska (+71%), North Dakota (+95%) and South Dakota (+139%). This will benefit summer crops (spring wheat, maize, and soybeans) in 2015. The development of rainfall and especially temperature profiles showed significant variations in this monitoring period. Generally from early January on forward, both temperature and rainfall increased to values above average; in some areas, temperature exceeded averages by 5°C or more.

The accumulated biomass (BIOMSS) showed a positive departure of 17%, and good crop performance was recorded (according to VCIx). The fraction of cropped arable land increased by 4%. Most indicators for this MPZ concur to forecast above average crop condition.

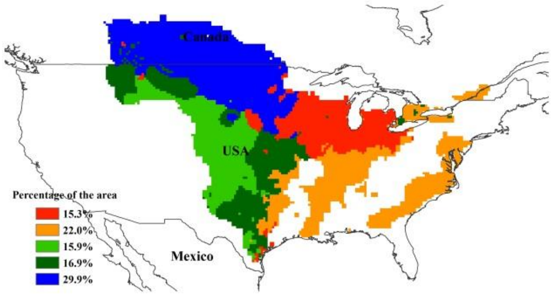
Figure 2.2. North America MPZ: Agroclimatic and agronomic indicators, October 2014-January 2015



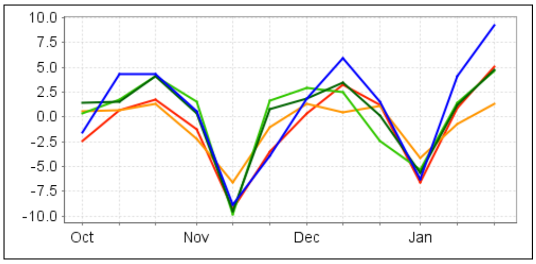
a. Spatial distribution of rainfall profiles



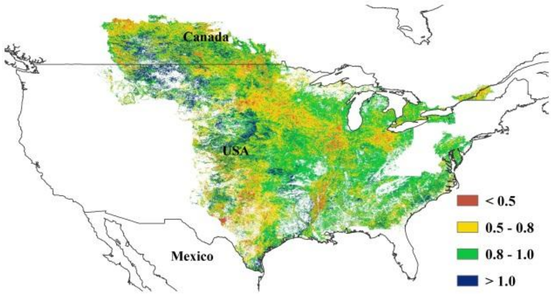
b. Profiles of rainfall departure from average



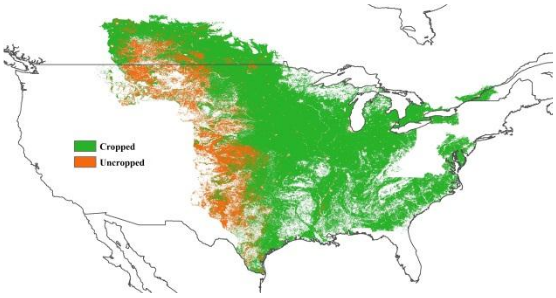
c. Spatial distribution of temperature profiles



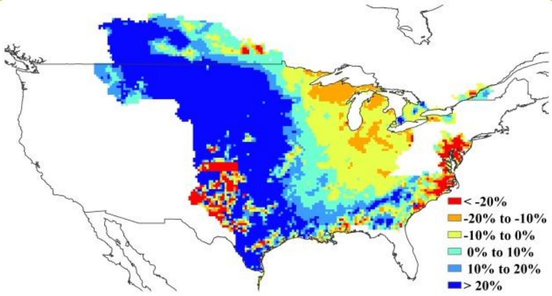
d. Profiles of temperature departure from average



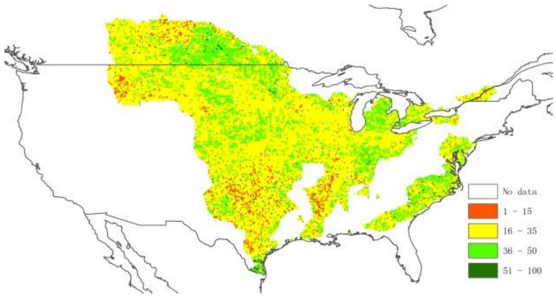
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential



h. VHI minimum

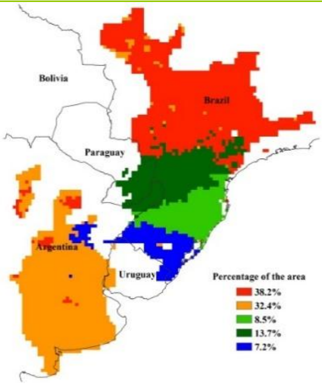
Note: For more information about the indicators, see Annex C.

2.4 South America

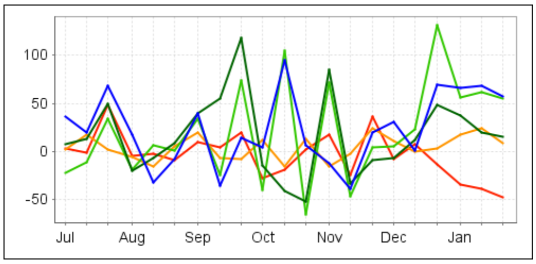
Generally, favorable climatic conditions predominate over South America this reporting period, with above average crop growth condition. Slightly above average rainfall and air temperature promoted the progress of summer crops. Figure 2.3 presents an overview.

Environmental conditions were generally favorable, with rainfall 4% above average and temperature up 1.5°C. Rainfall, however, varied a lot from place to place. Argentina experienced average rainfall conditions; southern Brazil, including Rio Grande do Sul and Santa Catarina, suffered from excessive rainfall, while northern parts of the MPZ (Parana, Mato Grosso do Sul, and Sao Paulo) had a shortage of precipitation. High temperature from October to January together with average rainfall induced a water deficit in the central Pampas, which is confirmed by the low VHI (below 0.35) and below average BIOMSS. The excessive rainfall offset the impacts of consistently high temperature in Rio Grande do Sul where 20% or more above average biomass estimates and high VCIx can be observed. Spatially, VCIx in Brazil is well correlated with VHIn, indicating that water deficit was indeed the key limiting factor for crop development. In contrast, VCIx is not consistent with VHIn in Argentina, which means that water deficit is insignificant. Over the monitoring period, 82% of arable lands were cropped, which is 1% below average. Most uncropped arable land was scattered in the central Pampas.

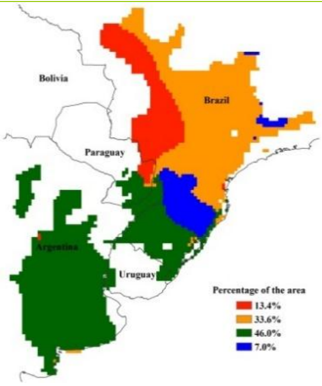
Figure 2.3. South America MPZ: Agroclimatic and agronomic indicators, October 2014-January 2015



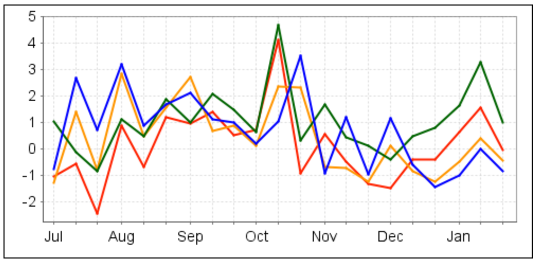
a. Spatial distribution of rainfall profiles



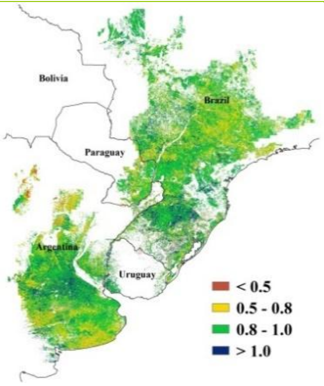
b. Profiles of rainfall departure from average



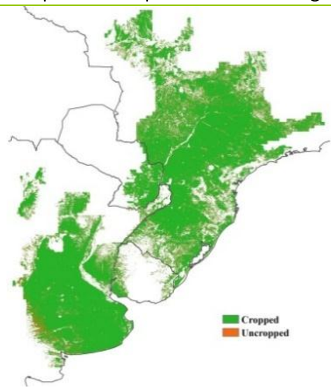
c. Spatial distribution of temperature profiles



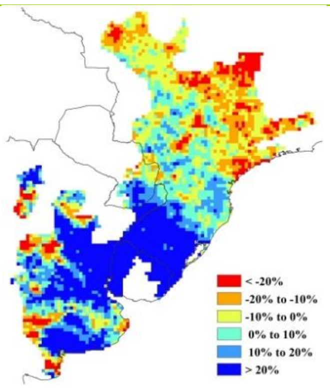
d. Profiles of temperature departure from average



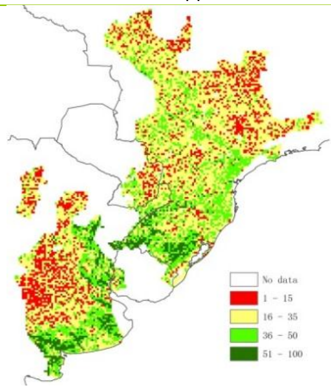
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential



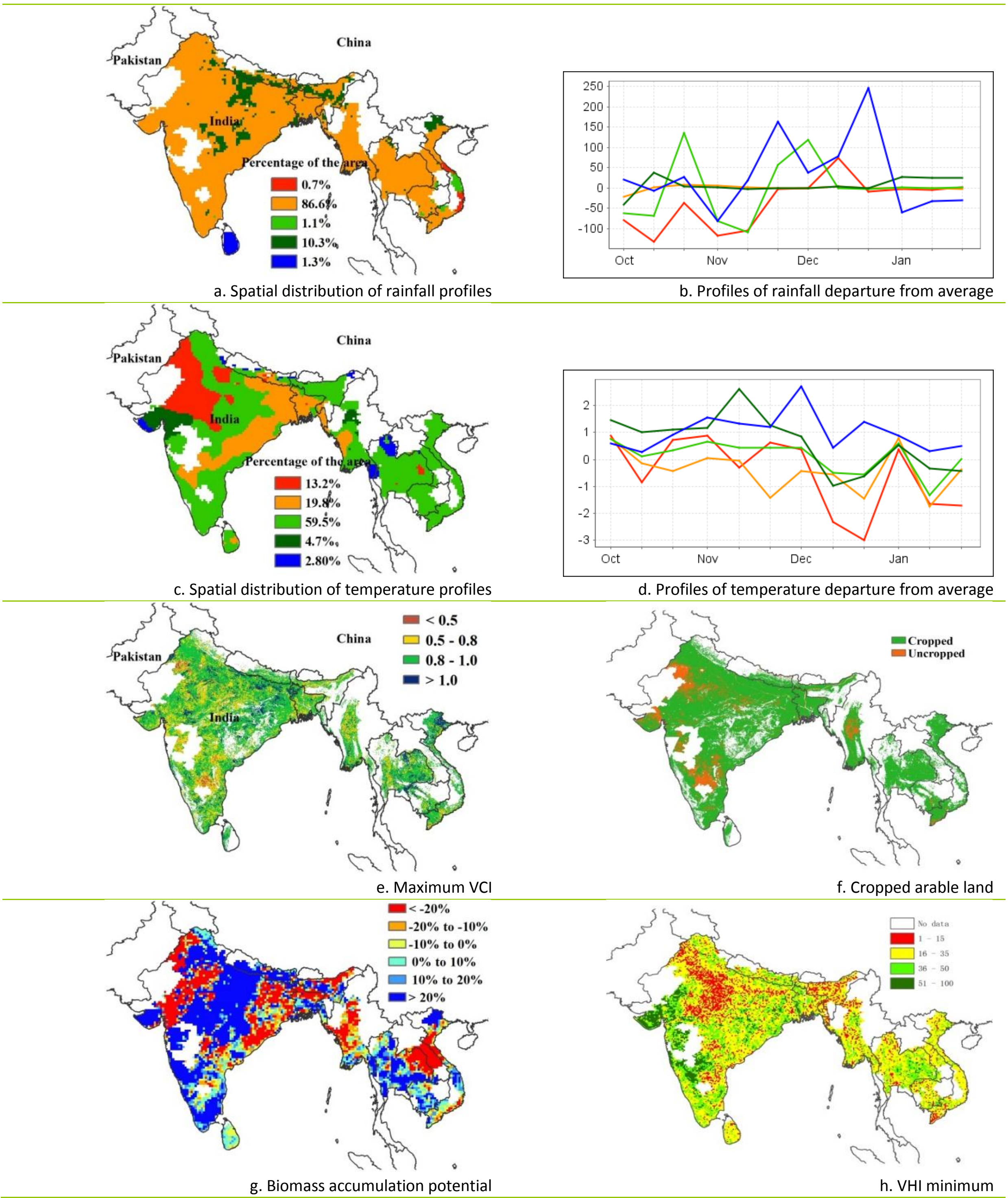
h. VHI minimum

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

2.5 South and Southeast Asia

The reporting period was the season for the growing and harvesting of rice and cereal crops in this MPZ. The zone experienced a 1% increase in rainfall compared to average, although a rainfall deficit was recorded for Bangladesh (-43%) and Vietnam (-18%), leading to low biomass accumulation in Vietnam (-15%) compared with the previous five years. The TEMP (+0.6°C) and RADPAR (-1%) indicators were close to average. The cropped arable land fraction underwent a slight decrease (-1%), also compared to the average, although biomass accumulation was at +9% over the region. Figure 2.4 summarizes CropWatch findings.

Figure 2.4. South and Southeast Asia MPZ: Agroclimatic and agronomic indicators, October 2014-January 2015



a. Spatial distribution of rainfall profiles
b. Profiles of rainfall departure from average
c. Spatial distribution of temperature profiles
d. Profiles of temperature departure from average
e. Maximum VCI
f. Cropped arable land
g. Biomass accumulation potential
h. VHI minimum

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

The rainfall amount was close to average over 86% of the area, although a drop was noticed in areas of northern India and eastern Vietnam during November and December. Temperature followed an average pattern from October to early December, with a slight drop during mid-December. In eastern India and Gujarat, negative departures of temperature were recorded.

The current maximum VCI was 0.85 while the VCI ranges between 0.5 and 0.8, indicating favorable crop condition over the region. Most parts of the region had cropped land and a positive biomass accumulation potential compared with recent years. Overall, CropWatch indicators forecast good crop condition without any concerns of major extreme conditions.

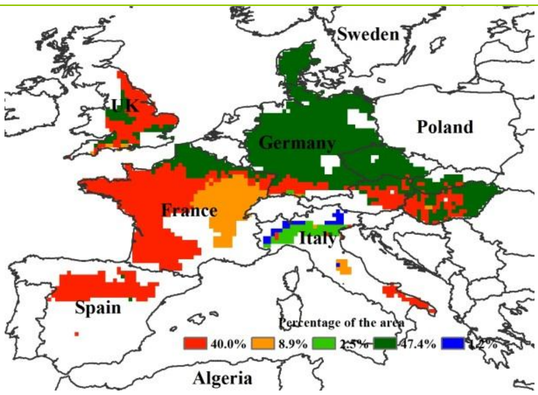
2.6 Western Europe

Overall, agroclimatic and agricultural indicators for October 2014 to January 2015 indicate most parts of Western Europe presented favorable condition of winter crop and a large average VCIx value (0.9). Figure 2.5 presents an overview of CropWatch agroclimatic and agronomic indicators.

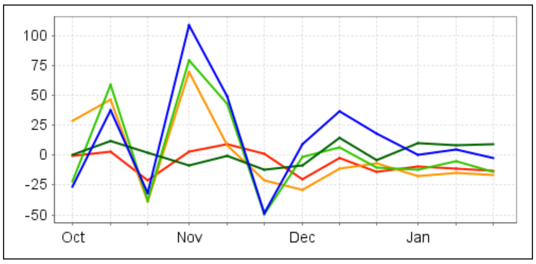
Temperature was generally favorable (2.6°C above average), while below average rainfall (-4%) and radiation (-7%) were observed. The condition of crops was about average according to the BIOMSS indicator. Biomass accumulation potential, however, was well below the recent five year average (-20% and below) in central and western France, northwestern and southern Spain, southeastern Italy, and Hungary. In contrast, BIOMSS in most other regions was 10% above average. The rainfall deficit in late October and the continuously below average temperature from December to January are the main reasons behind the low BIOMSS indicator.

More than 93% of the arable lands were cropped, which is 3% above the recent five-year average. Most uncropped arable land is concentrated in Spain. Accordingly, maximum VCI was lower as well, compared with other regions in the MPZ. Generally, crop condition in Western Europe was above average relative to both the thirteen-year and the five-year averages. Areas with low minimum VHI are found mainly in central Spain and the United Kingdom.

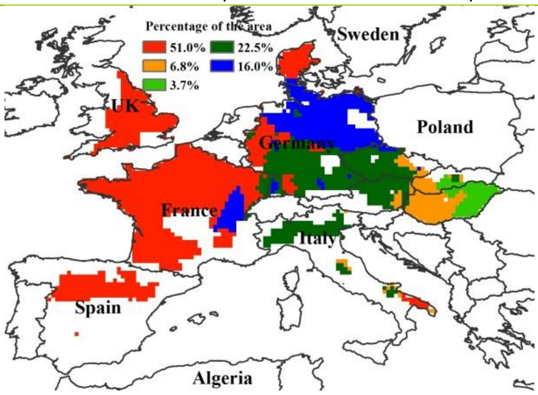
Figure 2.5. Western Europe MPZ: Agroclimatic and agronomic indicators, October 2014-January 2015



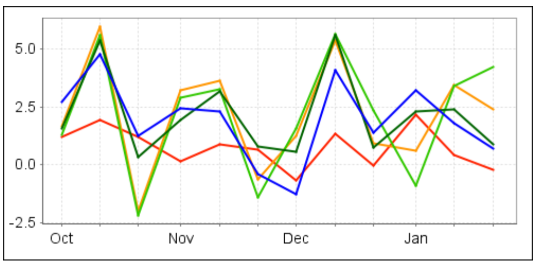
a. Spatial distribution of rainfall profiles



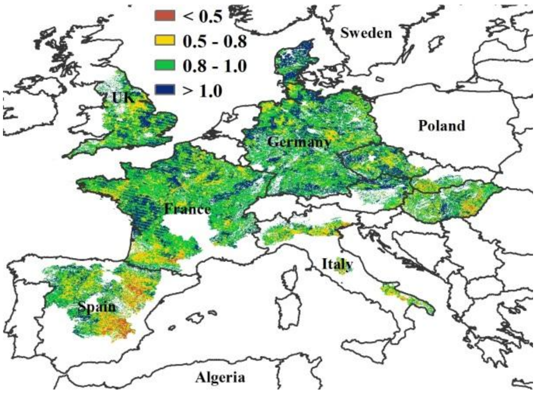
b. Profiles of rainfall departure from average



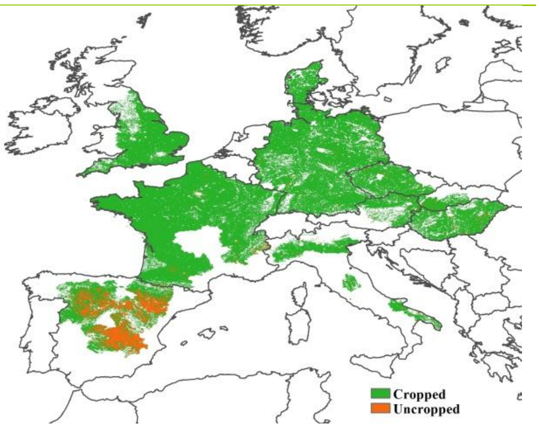
c. Spatial distribution of temperature profiles



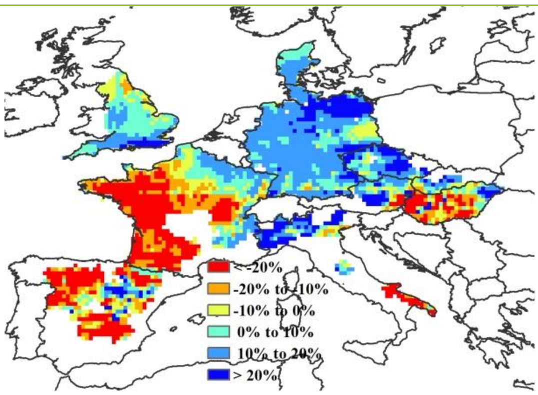
d. Profiles of temperature departure from average



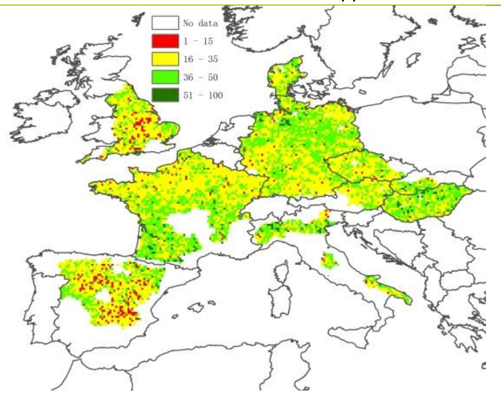
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential



h. VHI minimum

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

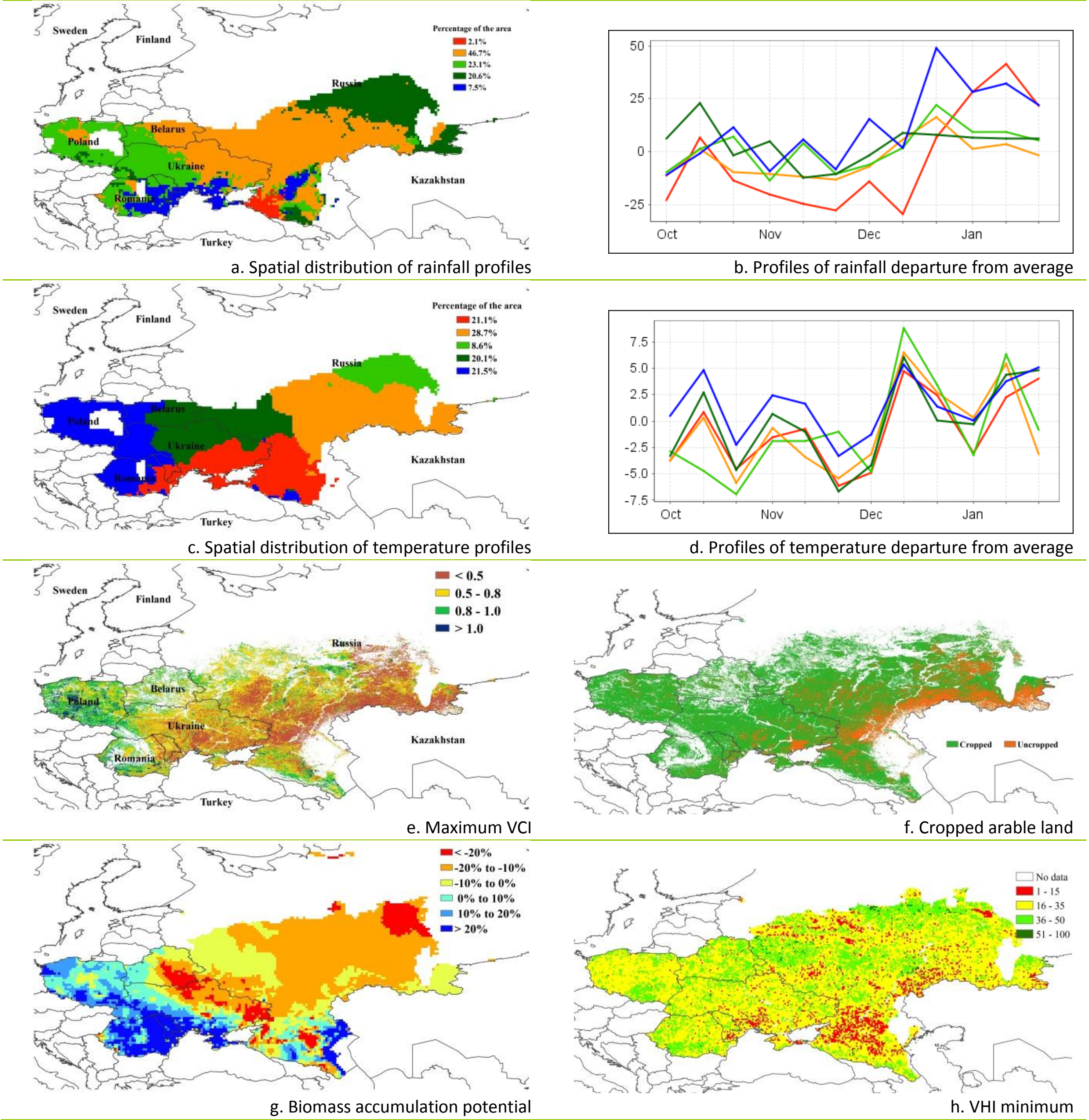
2.7 Central Europe to Western Russia

The reporting period covers the harvest of summer crops and the early vegetative stages of winter crops for the MPZ. The region experienced slightly below normal thermal conditions; rainfall and radiation were approximately average as well. Temperature profiles show similar variations in Romania, Poland, Ukraine, and Belarus. Between October and December, almost all areas of central Europe to western Russia suffered a significant rainfall deficit, especially in Krasnodarskiy Kray in the south of western Russia, where rainfall was more than 25mm below average in mid-December. The negative impact is confirmed by low VHIn values in the MPZ. From the end of December to January, rainfall recovered to above average: abundant rainfall was recorded in the southern part of Romania, Ukraine, and western Russia. In the second and third dekad of January, above average temperature prevailed over central Europe, which benefited the development of hardened winter crops. However, as a result of decreased precipitation and low temperature from October to December, BIOMSS is down 4% compared to its five-year average. The biomass accumulation potential deteriorates from west to east, with about a 20% decrease in the eastern Ukraine and southeastern Belarus.

Overall, 79% of the arable lands were cropped in October to January in 2015, which is 5% above the recent five-year average. Most uncropped arable land was scattered in the south of western Russia (including the Oblasts of Volgogradskaya, Saratovskaya and Samarskaya).The maximum VCI (0.63) is lower compared with other regions; below average production is to be expected due to poor agrometeorological conditions for winter.

Figure 2.6 illustrates the CropWatch agroclimatic and agronomic indicators for the MPZ.

Figure 2.6. Central Europe-Western Russia MPZ: Agroclimatic and agronomic indicators, October 2014-January 2015



a. Spatial distribution of rainfall profiles
b. Profiles of rainfall departure from average
c. Spatial distribution of temperature profiles
d. Profiles of temperature departure from average
e. Maximum VCI
f. Cropped arable land
g. Biomass accumulation potential
h. VHI minimum

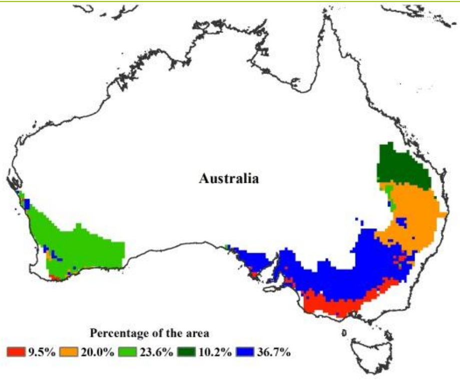
Note: For more information about the indicators, see Annex C.

2.8 Southern Australia

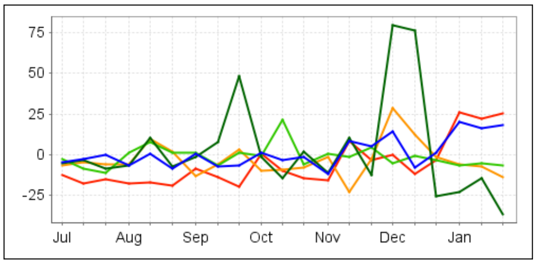
October to January is the harvest season for the main crops of wheat and barley in Southern Australia. As a result, the average agroclimatic conditions have no marked direct influences on these crops. Conditions were favorable for the early growth stages for the limited areas cultivated in maize, late potatoes, and sorghum, which are planted during this period. Rainfall was average with a total amount of 237 mm (a 5% increase compared to average). Temperature was between 16.8 and 19.8°C, a little higher than average, except for New South Wales, which showed a 1°C drop.

The maximum VCI of 0.62 indicates below average condition of wheat and barley for Australia this year, which is confirmed by the low minimum VHI, mainly in the low ranges of 1-15 and 16-35. Although area of cropped arable land has increased by 5%, CropWatch foresees a reduction in production for wheat and barley for 2014. Figure 2.7 presents an overview of the agroclimatic and agronomic indicators for Southern Australia.

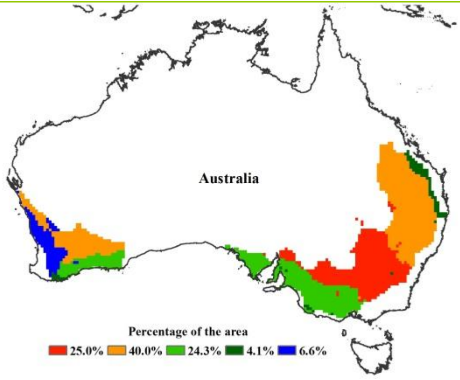
Figure 2.7. Southern Australia MPZ: Agroclimatic and agronomic indicators, October 2014-January 2015



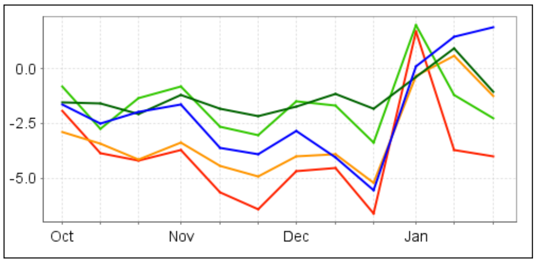
a. Spatial distribution of rainfall profiles



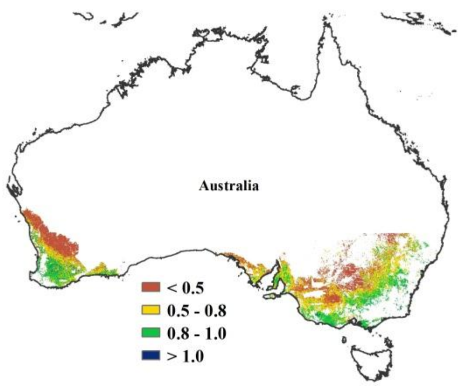
b. Profiles of rainfall departure from average



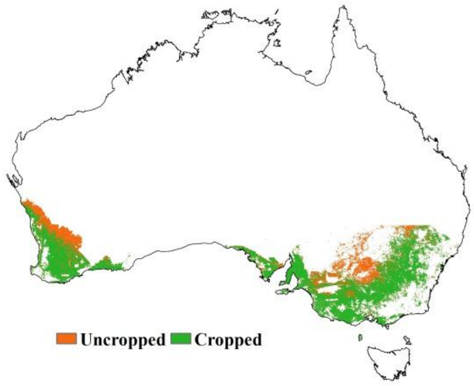
c. Spatial distribution of temperature profiles



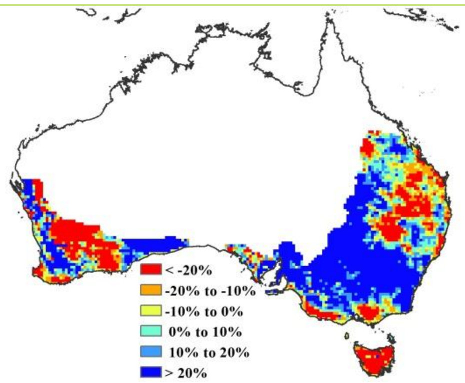
d. Profiles of temperature departure from average



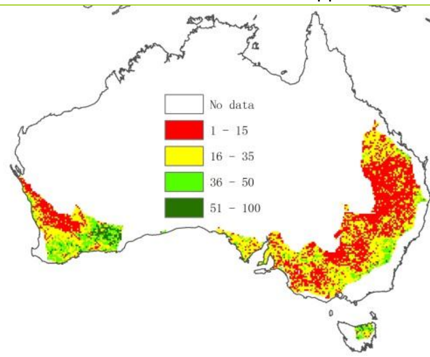
e. Maximum VCI



f. Cropped arable land



g. Biomass accumulation potential



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. For each country, maps present an NDVI-based crop condition development graph, maximum VCI, and spatial NDVI patterns with associated NDVI profiles. Additional detail on the agroclimatic and BIOMSS indicators, in particular for some of the larger countries, is included in Annex A, tables A.2-A.11. Annex B includes 2014 production estimates for Argentina, Australia, and Brazil.

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 the average October-January period. Details by country are presented in table 3.1.

During the reporting period, above average temperature was recorded in:

- Most of Europe, with values increasing from the east (Poland, +1.6°C; Slovakia, +2.2°C; Hungary, +2.1°C; and Bosnia, +2.0°C) to west, with the highest departures in agriculturally important countries being those of France (+3.6°C) and Hungary (+2.1°C). Other high values include Switzerland (+2.5°C) and Norway (+2.8°C). The same area had above average rainfall in the north but a deficit in the south. High temperatures were mostly associated with above average sunshine often exceeding +10%.
- Western United States, with temperature departures between +1.7°C (Oregon) and +2.4°C (Utah and California) but also a shortage of rainfall in Nevada (-31%) and Oregon (-26%).
- Eastern South America from Ceara to Rio Grande do Sul, with highest temperature departures in Rio (+2.7°C, with a -27% drop in rainfall), Sao Paolo (+2.6°C and -21%), and Minas Gerais (+2.6°C and -32%).

Other areas with abnormally warm conditions included Afghanistan (+2.8 ℃) and Guatemala (+2.0 ℃); rainfall in these countries, however was in excess and close to +25%.

Very cold departure conditions—with temperatures much below average—were concentrated around the Caspian sea, encompassing an area including the republics of Dagestan (-2.7 ℃), Ingushetia (-2.0 ℃), and Northern Ossetia (-1.6 ℃) to the Oblasts of Rostov (-1.7 ℃), Saratov (-1.6 ℃), and all the way east to Jamblynsk (-2.2 ℃). The same area usually experienced excess rainfall in the south and east (+119% in Dagestan and +53% in the Jamblynsk Oblast) and close to average in the east and north.

Drought conditions occurred in the already mentioned areas around the Mediterranean: Portugal (RAIN -53%); Bosnia-Herzegovina (-46%); Albania (-45%); Spain (-38%); Croatia (-36%); Algeria (-35%), as well as in Brazil (Rio Grande do Norte, -66%); Amapa (-54%), and the United States (Arizona, -36% and Nevada, -31%). In addition, droughts occurred in:

- Southern South America, in Chile (-59% at the national level) and west to south Argentina (Catamarca, -35% to San Juan, Neuquen, and Santa Cruz, San Juan, which are all at or close to -70%).

- Eastern United States (Delaware, -53%; Maryland, -48%; Pennsylvania, -47%; and -45% in New Jersey).
- Northeast India (Assam and Meghalaya, both at -50%; West Bengal, Jharkhand, and Arunachal Pradesh at about -40%; and Odisha, -32%) and Bangladesh (-43%).
- Eastern Asia in Japan (-36%) and China (Taiwan, -84%; Jiangxi, -67%; Zhejiang, -65%; and Hainan, Guangdong, and Fujian, all around -55%; and Tianjin and Beijing with -30%).

Very wet conditions, with precipitation at least double of expected amounts (expressed as rainfall values above 100%) concentrate in four areas:

- Northern central United States (South Dakota, with a record +260%, followed by Montana and Wyoming, both close to +150%, and Colorado, 109%).
- Western Caspian, partly overlapping with very cold conditions: Astrakhan Oblast, +135%; Dagestan Republic, +120%; Armenia, +127%; and Azerbaijan, 106%.
- Northern Indian sub-continent with Uttarkhand, +186%; Nepal, +170%; and Uttar Pradesh, +100%.
- A large central Asian area stretching from Kyrgyzstan (300%) to China (Qinghai, 280%; Ningxia, 173%; Gansu, +129%; and Xinjiang, +108%).

Low sunshine has affected several isolated or high latitude areas of limited agricultural relevance, but also a large east-west stretch in southern Russia and Kazakhstan, mostly from the Tatarstan republic (RADPAR -16%) to the Kemerovo Oblast (-14%) and including the Oblast of Kurgan, North Kazakhstan, East Kazakhstan, Novosibirsk, and the Altay Krai, at -13%. This is unlikely to have had any significant impact of agriculture, except through the association of low sunshine with higher than expected precipitation, which has improved soil moisture storage and will benefit currently dormant winter crops and future spring crops.

Figure 3.1. Global map of rainfall (RAIN) by country and sub-national areas, departure from 13YA (percentage), October 2014-January 2015

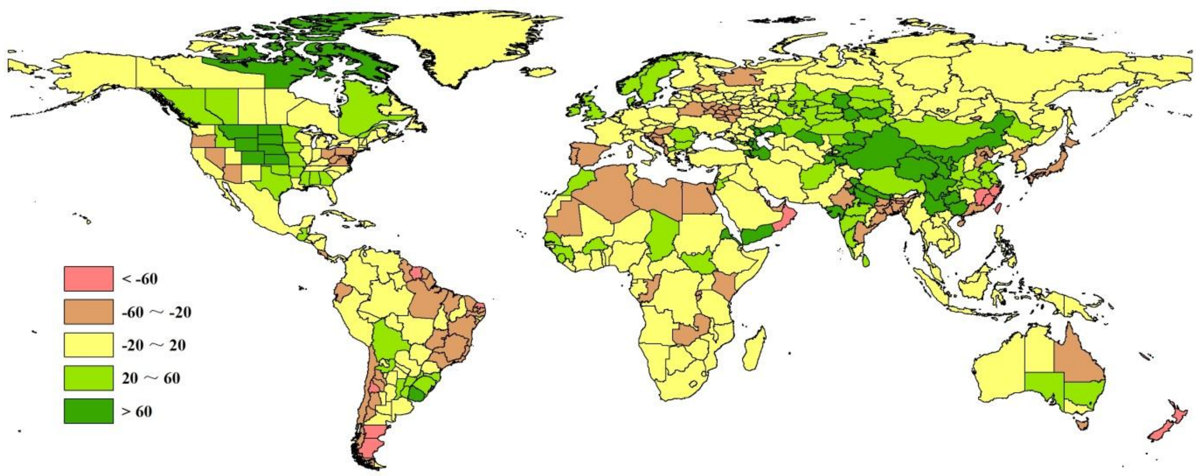


Figure 3.2. Global map of temperature (TEMP) by country and sub-national areas, departure from 13YA (degrees), October 2014-January 2015

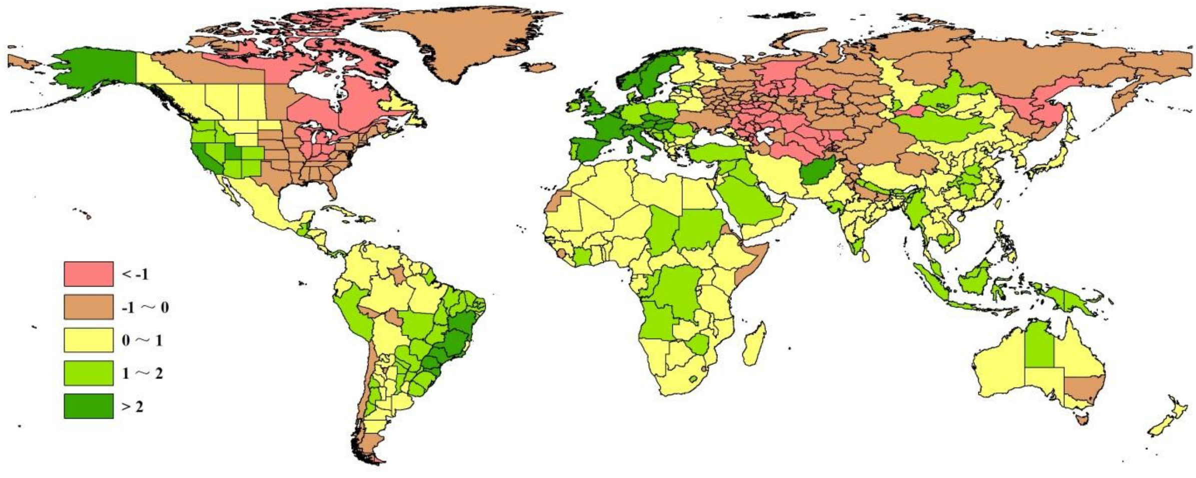


Figure 3.3. Global map of PAR (RADPAR) by country and sub-national areas, departure from 13YA (percentage), October 2014-January 2015

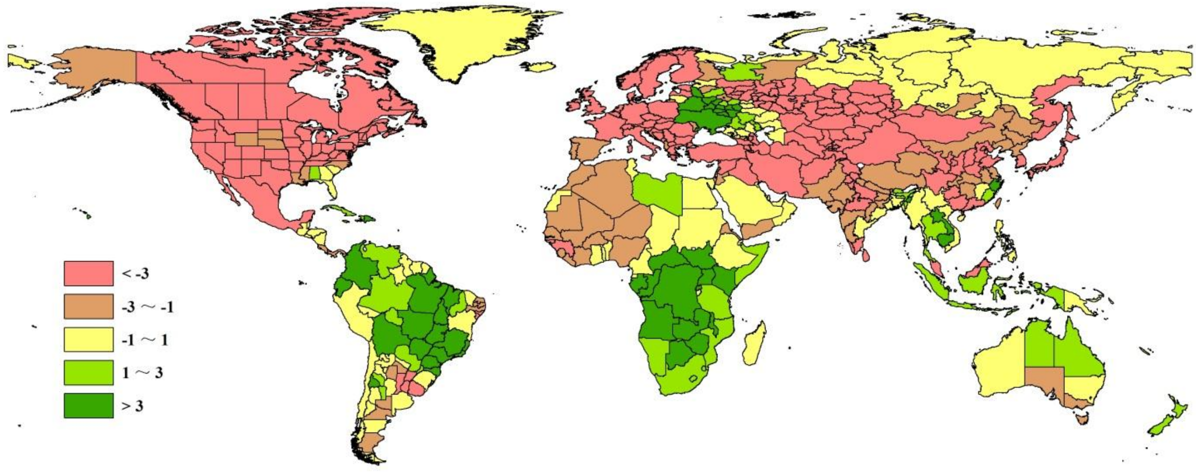


Figure 3.4. Global map of biomass (BIOMSS) by country and sub-national areas, departure from 5YA (percentage), October 2014-January 2015

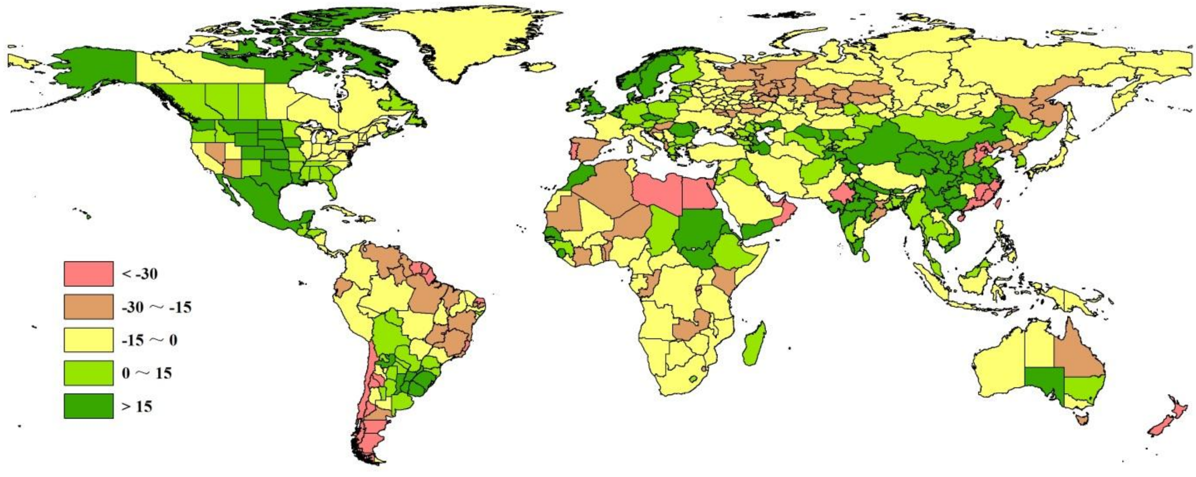


Table 3.1. CropWatch agroclimatic and agronomic indicators for October 2014-January 2015, departure from 5YA or 13YA

Country	Agroclimatic indicators			Agronomic indicators		
	Departure from 13YA (2001-13)			Departure from 5YA (2009-13)		Current
	RAIN (%)	TEMP (°C)	RADPAR (%)	BIOMSS (%)	CALF (%)	Maximum VCI
Argentina	22	0.7	-1	14	3	0.84
Australia	1	-0.3	0	0	5	0.62
Bangladesh	-43	0.6	0	8	1	0.83
Brazil	-14	1.5	5	-10	0	0.84
Cambodia	20	1.3	3	5	3	0.89
Canada	15	0.0	-7	5	4	0.81
China	14	0.8	-2	10	0	0.85
Egypt	-41	0.3	1	-31	-6	0.82
Ethiopia	15	0.0	1	0	3	0.88
France	-15	3.6	-7	-10	1	0.91
Germany	10	1.8	-8	13	3	0.93
India	5	0.5	-2	13	-2	0.83
Indonesia	-10	1.1	3	-8	0	0.87
Iran	3	0.3	-4	-7	5	0.76
Kazakhstan	41	-0.8	-8	-1	-1	0.59
Mexico	9	0.4	-5	20	5	0.87
Myanmar	25	0.8	-2	29	1	0.85
Nigeria	12	0.4	-1	-7	-1	0.82
Pakistan	-16	0.3	-3	-8	-8	0.71
Philippines	-5	0.3	0	-9	0	0.89
Poland	8	1.6	-5	13	4	0.87
Romania	42	1.1	-10	17	7	0.77
Russia	7	-0.6	-4	-11	5	0.60
S. Africa	-9	0.7	2	-9	-12	0.78
Thailand	17	0.8	1	2	1	0.89
Turkey	18	1.0	-5	-2	23	0.90
United Kingdom	36	2.1	-8	16	0	0.90
Ukraine	-8	-0.1	5	-3	9	0.61
United States	17	-0.2	-4	14	3	0.82
Uzbekistan	4	-1.1	-6	10	-3	0.76
Vietnam	-18	0.8	3	-15	1	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 thirteen-year average (13YA) for the same period (October-January).

3.2 Country analysis

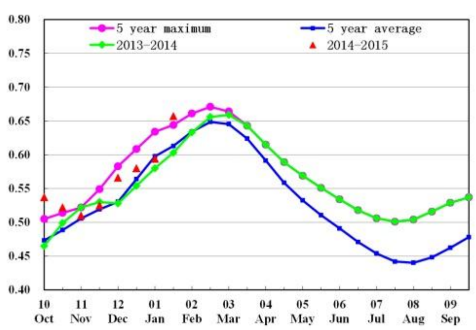
This section presents CropWatch results for each of thirty key countries (China is addressed in Chapter 4). The maps refer to crop growing areas only and include (a) Crop condition development graph based on NDVI average over crop areas, comparing the January-October 2014 period to the previous season and the five-year average (5YA) and maximum. (b) Maximum VCI (over arable land mask) for October 1 2014-January 31 2015 by pixel; (c) Spatial NDVI patterns from July or October (according to local cropping patterns) up to February 2015 (compared to the 5YA); and (d) NDVI profiles associated with the spatial pattern under (c). See also Annex A, tables A.2-A.10, and Annex B, tables B.1-B.3, for additional information about indicator values and production estimates by country. Country agricultural profiles are posted on www.cropwatch.com.cn.

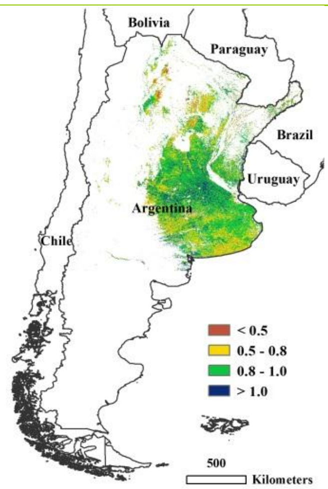
Figures 3.5-3.34. Crop condition for individual countries ([ARG] Argentina- [ZAF] South Africa) for October 2014-January 2015

[ARG] Argentina

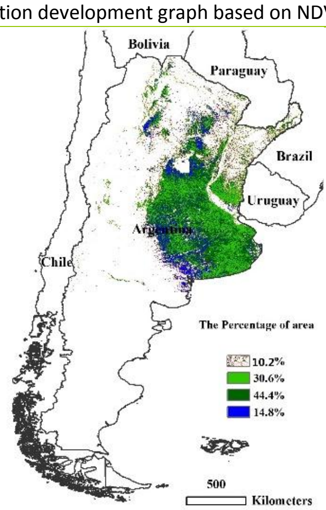
Crop condition in Argentina was generally favorable over the reporting period. Currently, the harvesting of winter wheat is almost completed, and maize and soybean are at flowering to grain filling stages. Argentina experienced sufficient rainfall and favorable temperatures, which promoted the development of maize and soybean. Compared to the average, Argentina experienced 22% more rainfall, 0.7°C higher temperature, and average PAR. The overall crop condition based on NDVI development shows above average crop condition. Spatial NDVI patterns compared to the five-year average and corresponding NDVI departure cluster profiles confirm that NDVI is above average for most arable land in Argentina. Only 10% of crop areas scattered across north Argentina showed below average condition since September 2014. Rainfall in late January promoted the summer crops' progress. High maximum VCI values in central and northern Buenos Aires, Santa Fe, and Cordoba indicate positive prospects for maize and soybean. CropWatch estimates winter wheat production for the 2014-2015 season at 12.1 million tons, 15% up from the previous season (see table B.1 in Annex B.)

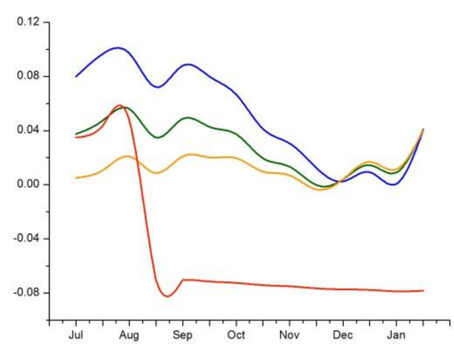
Figure 3.5. Argentina crop condition, October 2014-January 2015





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



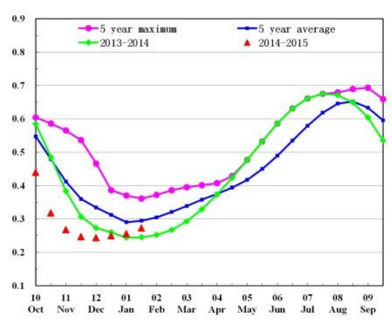


(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

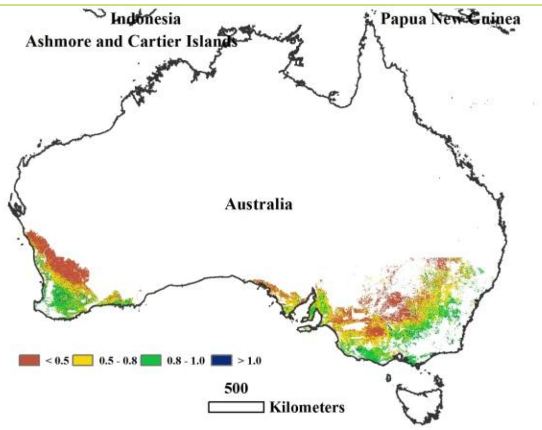
[AUS] Australia

The crops in Australia show below average condition from October 2014 to January 2015. The maximum VCI was between 0.5 and 0.8 for the central and southeastern regions of New South Wales, between 0.8 and 1.0 for the central area of Victoria, and at an overall value of 0.62 for Australia's cropped land. Compared to the last five years, the cropped regions show below average crop conditions for the entire monitored period, as shown by the spatial NDVI patterns. Regions with VCIx lower than 0.5 were not planted over the monitoring period. The NDVI-based crop condition development graph also displays below average crop condition from October 2014 to January 2015 compared to the last five-years. Even when compared with the situation of 2013, crop condition was not favorable before January 2015; following January, however, some degree of recovery can be seen. As it is harvest season for wheat and barley, some fears exist that production will be reduced this year, a result from the reduced precipitation during the main growing season from July to October, 2014. (See also table B.2 in Annex B.)

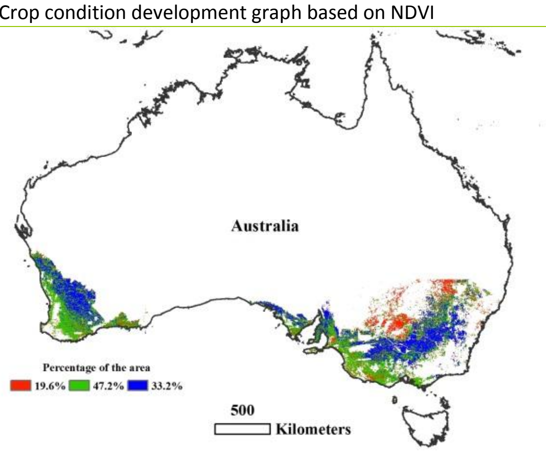
Figure 3.6. Australia crop condition, October 2014-January 2015



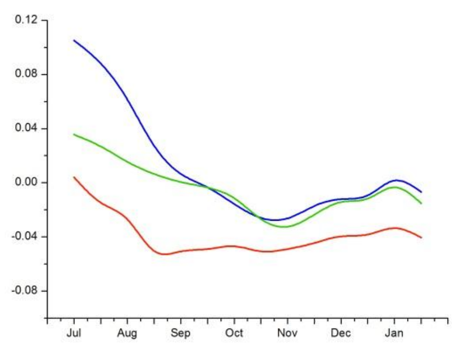
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

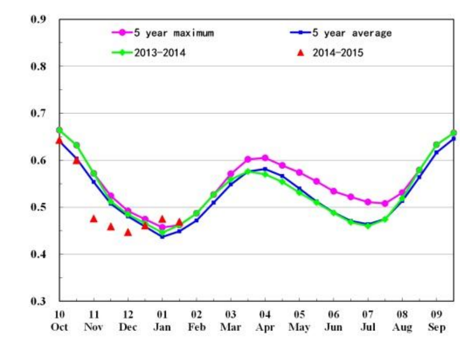


(d) NDVI profiles

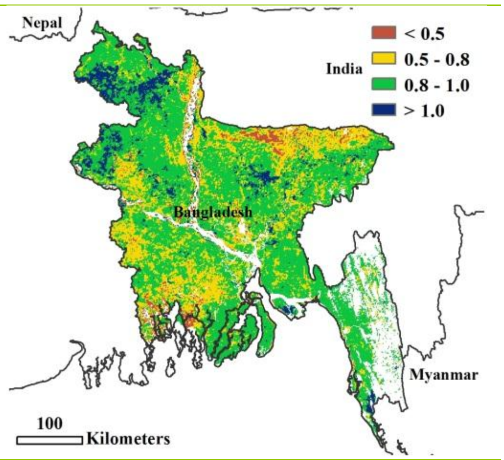
[BGD] Bangladesh

The monitoring period is the growing and harvesting season of Aman rice. The crop condition was favorable with maximum VCI ranges between 0.5 and 1 for most of the regions. Very favorable crop condition was observed in the northwestern part of Bangladesh with a maximum VCI value larger than 1. The NDVI values for crop growing regions dropped in mid-November but gradually started increasing in early December, indicating good crop progress. The NDVI values of the northern part of Dhaka and Sylhet increased between October and early December. The crop condition was below the previous year and the five-year average during the October to December period. However, it returned to normal in early January and crop condition development reached values above the previous five years maximum. Rainfall was 43% below average, while temperature and radiation were average. The cropped arable land fraction was about the five-year average. Biomass accumulation was 8% above. Overall, CropWatch indicators forecast good crop condition due to adequate average rainfall during the key seasons over the rice growing areas.

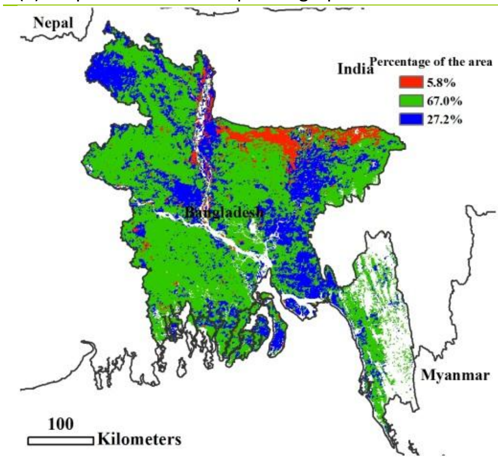
Figure 3.7. Bangladesh crop condition, October 2014-January 2015



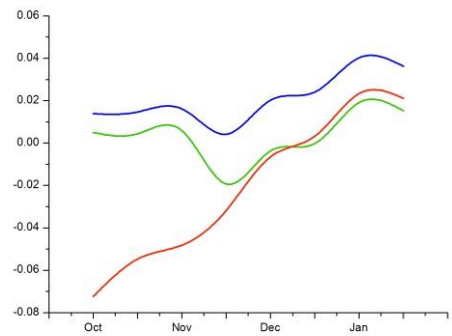
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

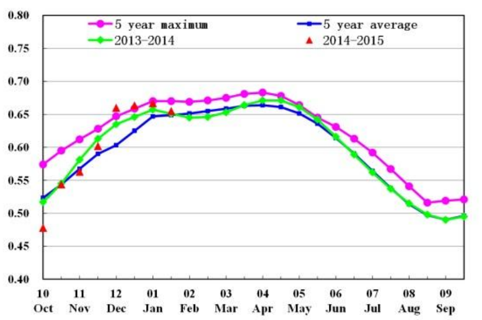


(d) NDVI profiles

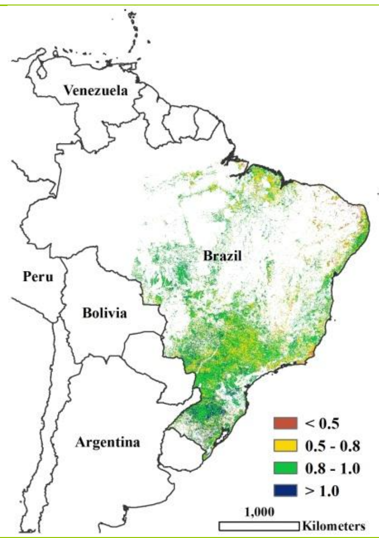
[BRA] Brazil

Crop condition was generally average in Brazil from October 2014 to January 2015. The harvest of wheat was completed in early January. Currently, soybean and first season maize are at grain filling stage while the planting of the second season maize is still ongoing. The reporting period recorded a 14% drop in rainfall compared to average and a 1.5°C increase in temperature at the national level. The unfavorable climatic conditions induced overall low biomass in Brazil. However, conditions varied from place to place. In the southernmost areas, including Rio Grande Do Sul and Santa Catarina, sufficient rainfall benefited crop development and yield accumulation. In contrast, below average rainfall hampered the crops in the central-west, the southeast region, and the northeast region. Spatial NDVI patterns together with NDVI cluster profiles also illustrate the above average condition in the south region, and average to below average condition in central and north Brazil. The observations are consistent with high maximum VCI mainly in southern Brazil, including the key grain producing state of Rio Grande Do Sul. Overall, crop condition for the whole of Brazil is slightly above both the average and the previous year according to the NDVI development graph. CropWatch puts wheat production for 2014-2015 at 6.7 million tons, an increase of 9% compared with the previous year (see also table B.3 in Annex B.)

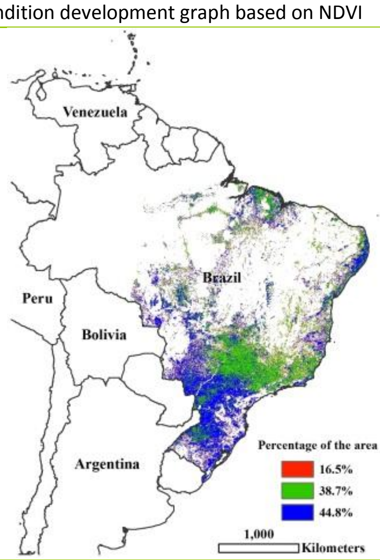
Figure 3.8. Brazil crop condition, October 2014-January 2015



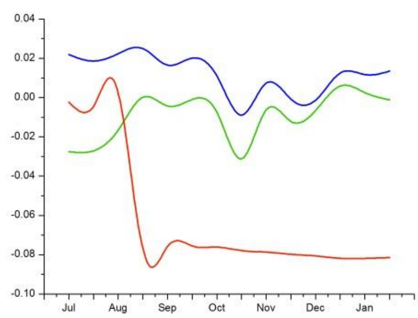
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

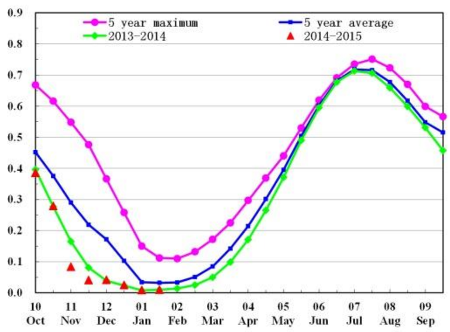


(d) NDVI profiles

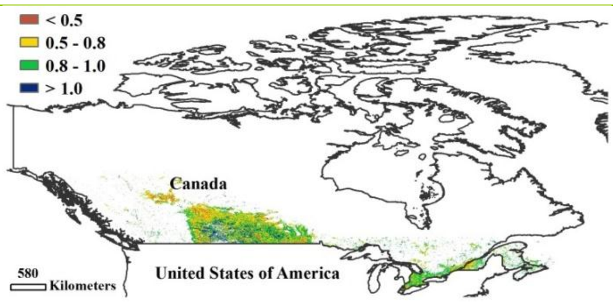
[CAN] Canada

In general, the crop condition as assessed by NDVI is below average in this monitoring period. This period is the harvesting season of spring-summer crops in Canada, and all crops had been harvested before the end of November. As mentioned in the previous CropWatch bulletin, some crops were damaged by floods and water logging in Alberta, Saskatchewan, and Manitoba, resulting in the low average crop condition indicated by VCIx and NDVI profiles. For the agroclimatic indicators in this monitoring stage, rainfall over agricultural areas was 17% above average, with a particularly high increase in Alberta (+29%); temperature was close to average, and PAR decreased by -7% compared to average at the national scale. The NDVI development profile is below average from early October to the end of January, while accumulated biomass (BIOMSS) showed a positive departure of 5%. The cropped arable land fraction (CALF) increased by 4% compared to last five-year average, while the maximum VCI was 0.81. The increase of CALF may have resulted from the delayed harvest of summer crops in 2014.

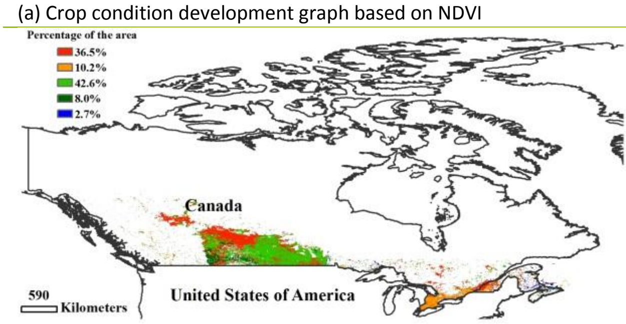
Figure 3.9. Canada crop condition, October 2014-January 2015



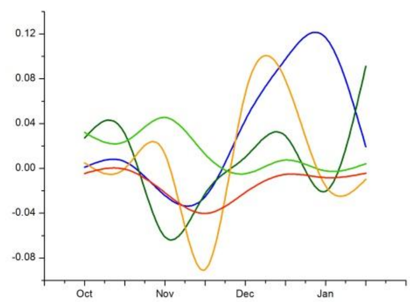
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

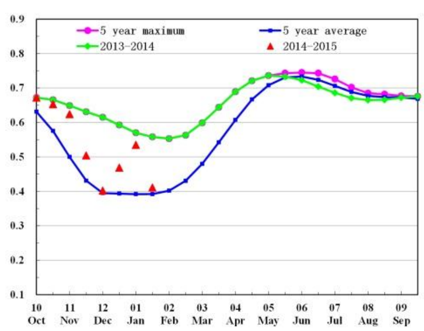


(d) NDVI profiles

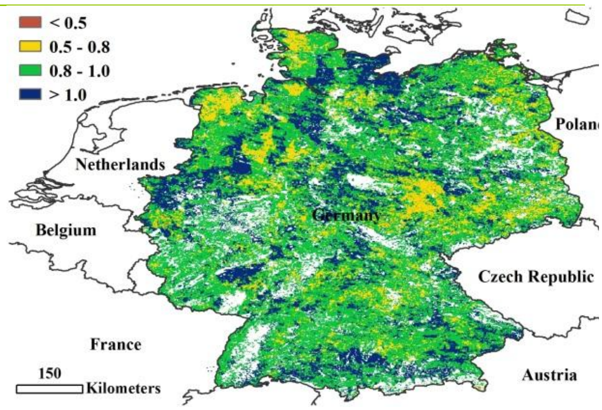
[DEU] Germany

The reporting period covered the late states of sugar beets (October harvest) and early vegetative stages of winter wheat and winter barley (planted in October) in Germany. The CropWatch agroclimatic indicators indicate above average rainfall and temperature (+10% and +1.8°C), while radiation decreased by 8%. With the positive moisture and thermal anomalies, biomass is expected to increase by 13% compared to the five-year average at the national scale. This observation is confirmed by the NDVI profiles, with the national NDVI values well above average and even close to the five-year maximum, except for a sharp drop at the beginning of December and another sharp drop at the end of January. The NDVI clusters indicate that NDVI values over the country were above average from the end of October to early December; a sharp drop of NDVI in December mostly affected central and southern Germany. The maximum VCI map also presents overall good crop condition. Generally, due to the suitable temperature and moisture conditions, the agronomic indicators mentioned above indicate a favorable condition for most winter crop areas of Germany.

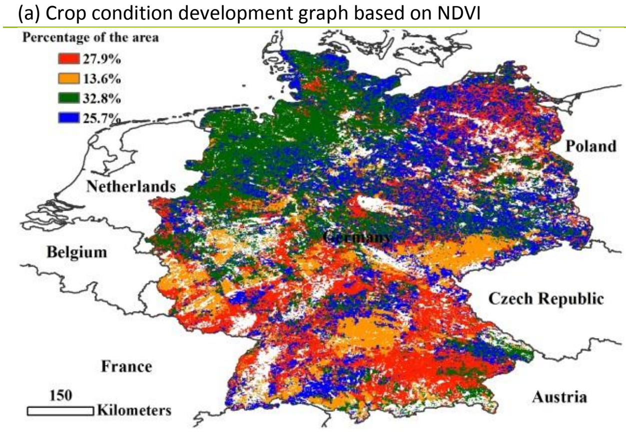
Figure 3.10. Germany crop condition, October 2014-January 2015



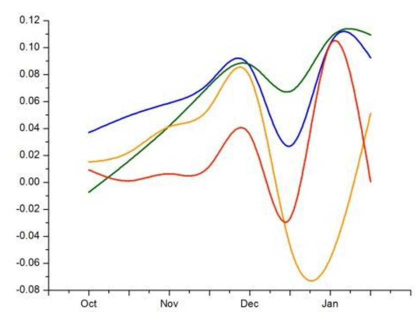
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



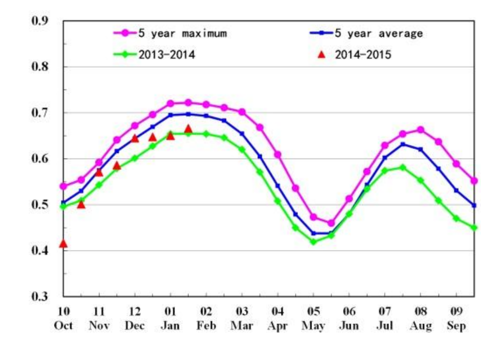
(d) NDVI profiles

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

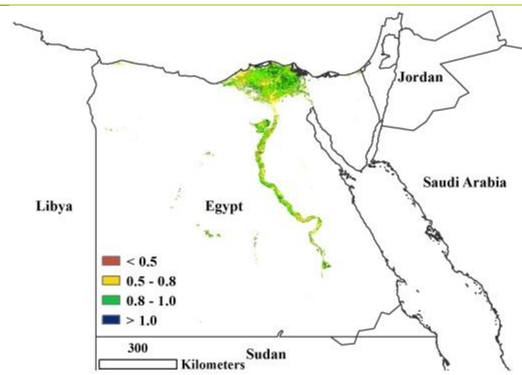
[EGY] Egypt

The harvest of summer crops was completed at the end of 2014; current winter crops were planted in November and December and are due to be harvested in May and June. Although almost all crops are irrigated, occasional rainfall does contribute to creating favorable growing conditions. The rainfall indicator for the reporting period was significantly below average (-41%), while radiation and temperature were about average. Cropped arable land fraction (CALF) also dropped (-6% compared to average), although this is unlikely to be due to reduced precipitation. Overall, 17.3% of the agricultural areas, located in the western half of the Delta (east Al Buhayrah), show a very significant NDVI drop at the beginning of November, which together with the decrease in CALF indicate poor or late planted crops, both situations leading to below average conditions in the areas concerned. The national NDVI profile started slowing down at the end of December. Although the winter crops are still three to four months from being harvested, current conditions point at just fair conditions.

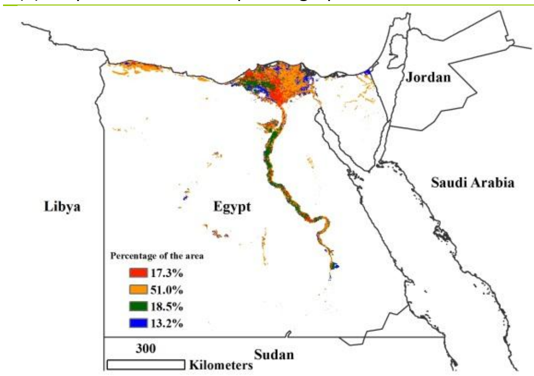
Figure 3.11. Egypt crop condition, October 2014-January 2015



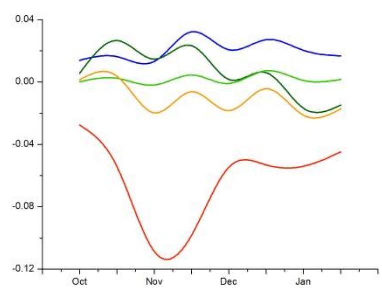
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

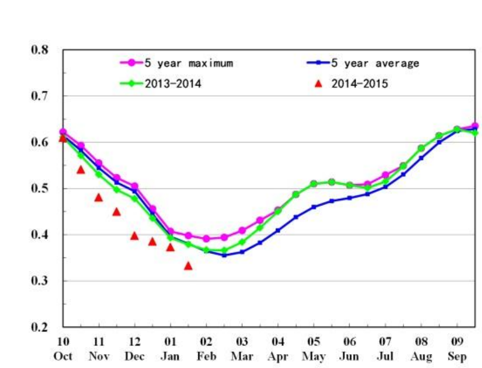


(d) NDVI profiles

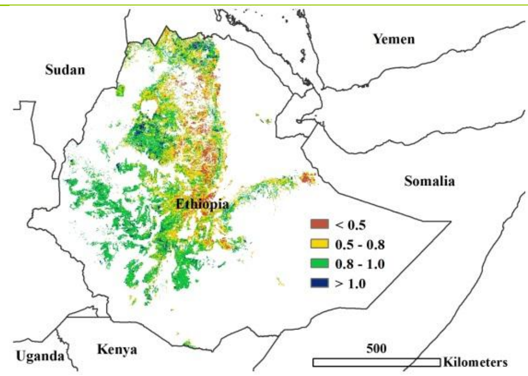
[ETH] Ethiopia

Main season (Meher) crops were harvested at the end of 2014, while some "minor" coarse grains (such as oats and millets) will be mostly harvested in January. The condition of these main season crops was generally slightly below the average of the previous five years. Based on the NDVI profiles, the areas where conditions were unfavorable are identified as the southeastern SNPP and southwest Oromyia, together representing about 15% of Ethiopia's cropland. Maximum VCI values are low in central Oromyia and in east Amhara, where NDVI values have been at least average throughout the reporting period. The discrepancy is not explained by rainfall (+15% compared with the recent reference period) nor temperature, PAR, or biomass accumulation potential, which were all average. On the other hand, the fraction of cropped arable land increased by 3%, while the average national VCIx amounts to 0.88, showing that the combination of cultivated area and slightly above-average yields has resulted in favorable crop condition.

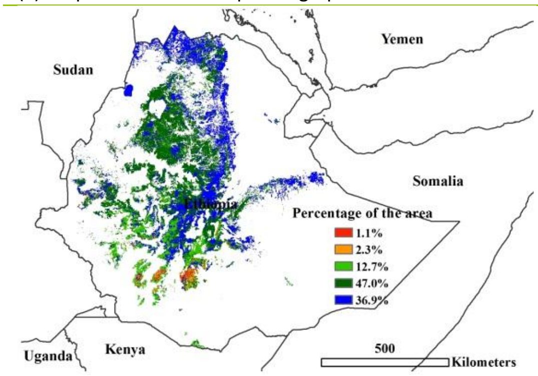
Figure 3.12. Ethiopia crop condition, October 2014-January 2015



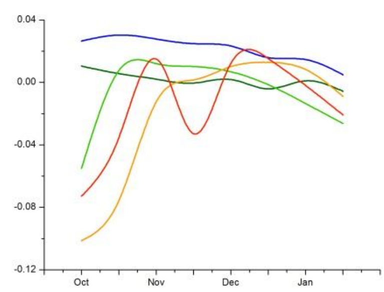
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



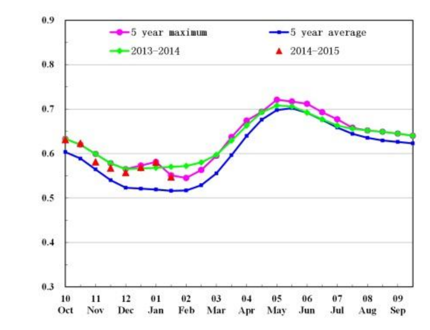
(d) NDVI profiles

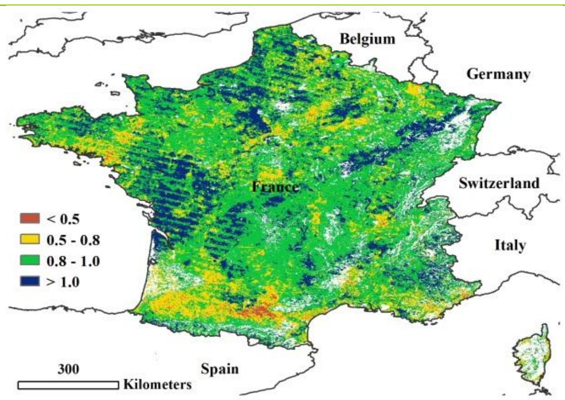
ARG AUS BGD BRA CAN DEU EGY ETH **FRA** GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[FRA] France

This report’s monitoring period covers the late stages of sugar beets (October harvest) and the early vegetative stages of soft wheat and winter barley (planted in October). On the national scale, the CropWatch TEMP indicator shows warmer than average weather. Also at the national level, biomass presents a 10% decrease compared to average due to low rains (-15%) and radiation (-7%). As shown by the NDVI profiles, national NDVI values were well above average and even close to the five-year maximum, consistent with a maximum VCI of 0.85 for France overall. According to the crop condition map based on NDVI, the country's spatial NDVI indicates a situation that on the whole is better than the five-year average, with the exception of (i) the east of Bourgogne, the south of Franche-comte, and the east of Rhone-Alpes region, with NDVI values below average from mid-November to early December; and (ii) the Lorraine and Champagne-Ardenne region, where NDVI values were below average from early November to mid-November. Generally, due to the suitable temperatures, the agronomic indicators mentioned above indicate a favorable condition for most winter crop areas of France.

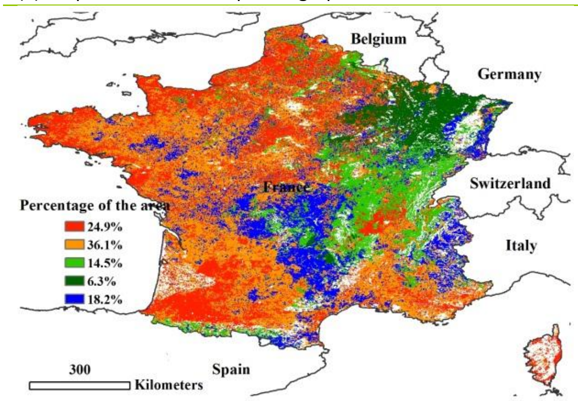
Figure 3.13. France crop condition, October 2014-January 2015

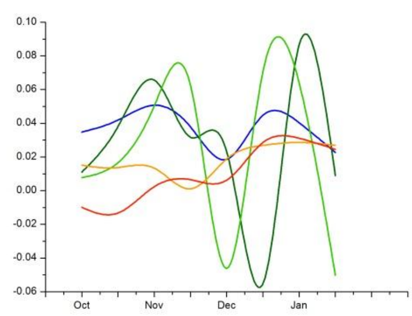




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





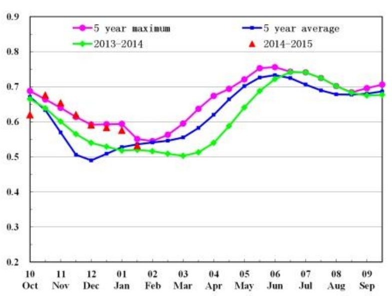
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

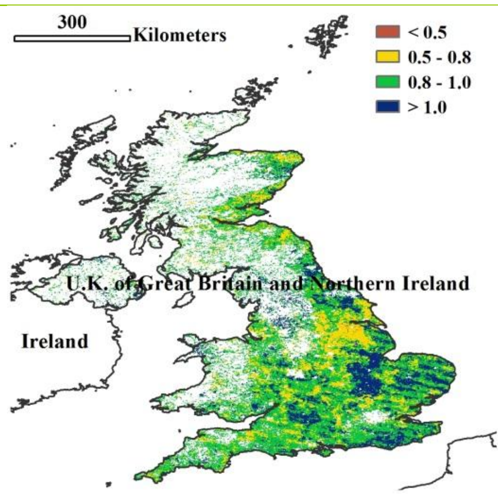
[GBR] United Kingdom

This reporting period from October 2014 to January 2015 covers the late states of sugar beets (December harvest) and the early vegetative stages of winter wheat, winter barley, and rapeseed. The country experienced unusually favorable weather conditions with an increase of the CropWatch agroclimatic indicators, especially rainfall (up 36% compared to average). As shown by the NDVI profiles, national NDVI values were well above average and even above the five-year maximum (except for a sharp drop at the beginning of October). According to the crop condition map based on NDVI, more than 90% of the country recorded higher than average NDVI from October to January. The eastern and southeast regions presented a NDVI decrease from November to December due to excess water, but have since recovered. This spatial pattern is also reflected by the maximum VCI in the different areas, with a VCIx of 0.9 for the country overall. The CropWatch agroclimatic and agronomic indices indicate above average temperature (TEMP, +2.1°C), while radiation (RADPAR, -8%) was below average. Due to adequate rainfall and suitable temperatures, biomass at the national scale is expected to increase by 16% compared with the last five-year average, reflecting the above-mentioned crop conditions. Overall, the agronomic indicators all indicate rather favorable conditions for the winter crop areas of the United Kingdom.

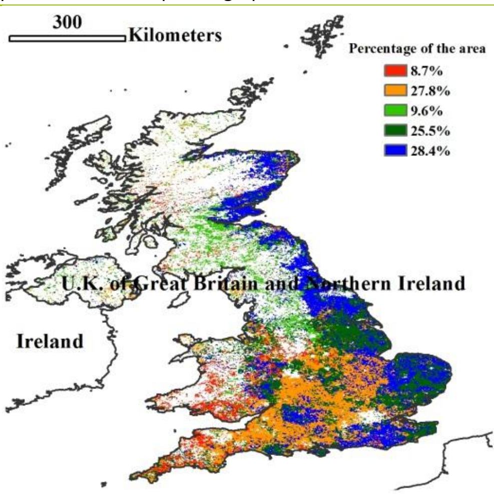
Figure 3.14. United Kingdom crop condition, October 2014-January 2015



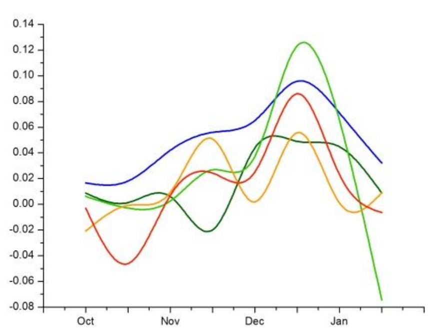
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

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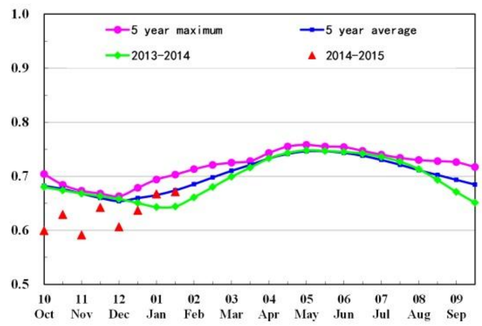
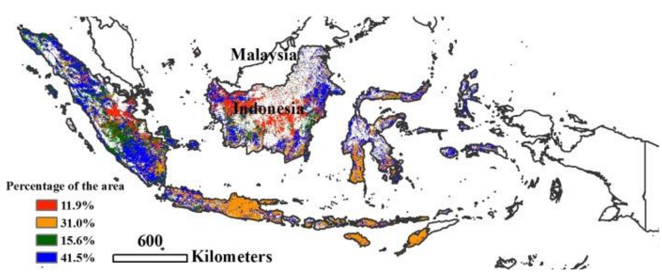
[IDN] Indonesia

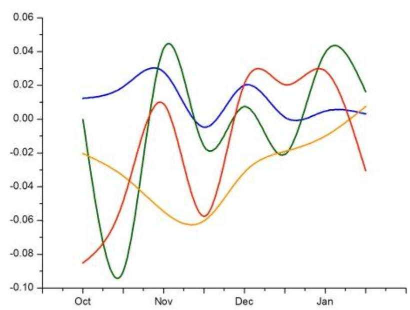
Indonesian crops generally showed satisfactory condition between October and January (VCIx=0.87). The monitoring period covers the harvesting stage of the dry season maize and rice; wet season crops are currently in the field. Compared with the average for the same period, precipitation was below average (-10%) and, correspondingly, the country enjoyed favorable radiation with values about 3% above average, as well as a 1.1°C increase of temperature. As the onset of the rainy season was late, dry and warm condition had negative effects on the seeding stage of rice, resulting in a decrease of 8% in biomass compared with the recent five-year average. According to the spatial patterns of NDVI profiles, in central and eastern Java, rice was below average condition until late December. In January, a well-established monsoon maintained abundant moisture supplies for rice, which benefited the growing rice and, based on NDVI, crop condition reached an average level.

Figure 3.15. Indonesia crop condition, October 2014-January 2015



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



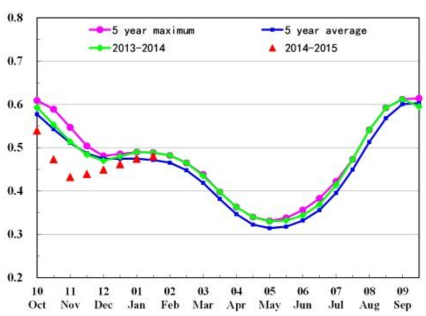


(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

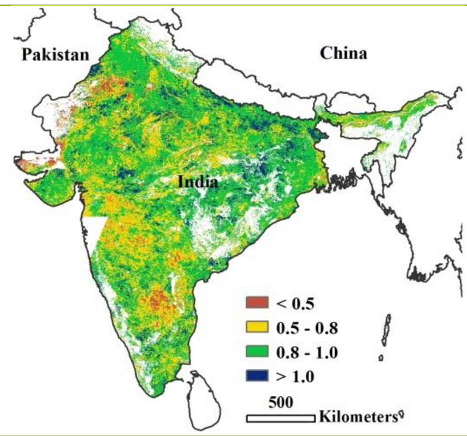
[IND] India

The reporting period corresponds to the planting and growing season of rabi crops. Several key rabi crop producing states experienced below average rainfall, such as Andhra Pradesh (RAIN, -25%), Assam (-49%), Bihar (-24%), Jharkhand (-38%), Odisha (-32%), Punjab (-29%), West Bengal (-41%), and Rajasthan (-8%), which may lead to poor crop condition. Low rainfall in these region also triggered low biomass accumulation, especially in Rajasthan (BIOMSS, -47%) followed by Odisha (-21%), Jharkhand (-20%), Bihar (-7%), and Assam (-4%). However, for the entire region, crop condition was average with maximum VCI values between 0.5 and 0.8. The lowest VCI was observed in the below average crop condition areas in Rajasthan and Andhra Pradesh with reported low rainfall. During the monitoring period the NDVI values increased gradually in Uttar Pradesh, Bihar, Punjab, Haryana, Karnataka, and Tamil Nadu, indicating good development of rabi crops. Starting in early December, NDVI values increased in Madhya Pradesh, Uttar Pradesh, and Maharashtra. In the states of Maharashtra, Andhra Pradesh, and the central part of Uttar Pradesh, crop development progress was favorable with increasing NDVI values starting in mid-December. NDVI values suddenly dropped to negative in early November in the coastal part of Tamil Nadu indicating poor crop condition, which, however, improved to average condition after mid-December. From October to January, crop condition was below last years', but starting in early January it reach last year's level. The fraction of cropped arable land decreased by 2%. Overall, as per the CropWatch indicators, the crop condition is average during the reporting period.

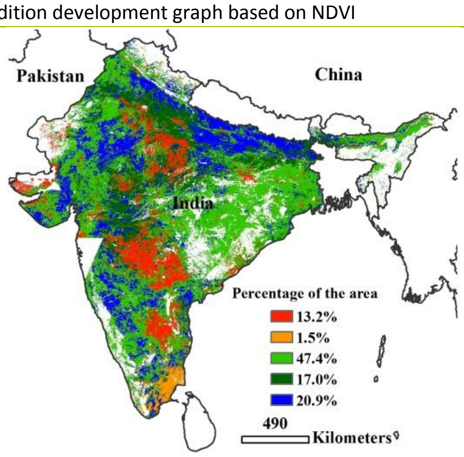
Figure 3.16. India crop condition, October 2014-January 2015



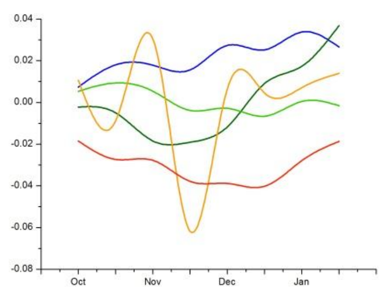
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

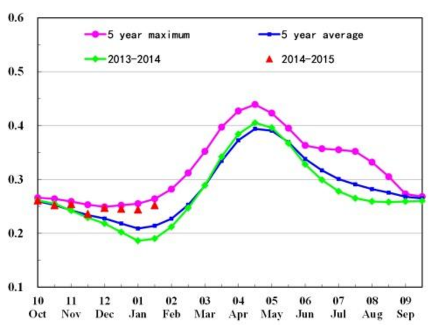


(d) NDVI profiles

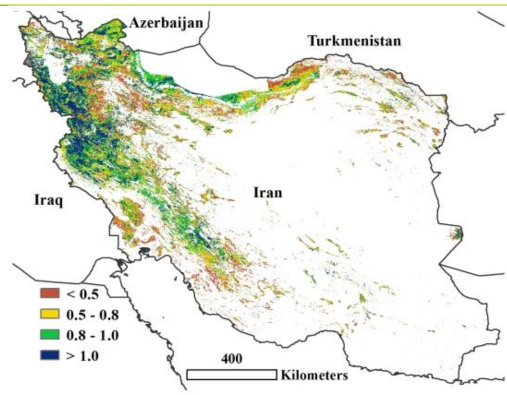
[IRN] Iran

During the period from October 2014 to January 2015, the planting of winter wheat has been completed, while at the end of January planting of barley was still underway. Rainfall and temperature were above and radiation below average. The CropWatch agroclimatic indices for the current season indicate unfavorable conditions for winter crop growth, which are confirmed by the decrease of the BIOMSS index by 7%. The national maximum VCI (0.76) was just above average conditions, while the fraction of cropped arable land increased by 5% compared to the five-year average. This information indicates that the initial conditions for winter crops in the country were favorable. Conditions were close to or above the five-year average in the Razavi Khorasan and North Khorasan province of the northeast region, in the western regions from Ardabil to Zanjan, and extending south and southwest as far as Khuzestan province. The crop conditions in the central-north region, particularly Mazandaran and Golestan province, were below the five-year average during the period of October to December. Most regions experienced close average crop condition from October to November and above average crop condition through December and January. Iran's latest 2014-15 winter crop generally underwent favorable conditions.

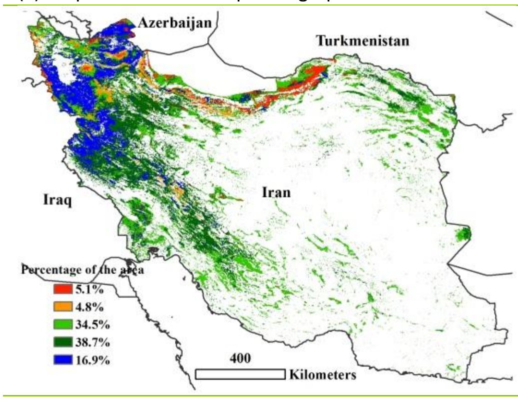
Figure 3.17. Iran crop condition, October 2014-January 2015



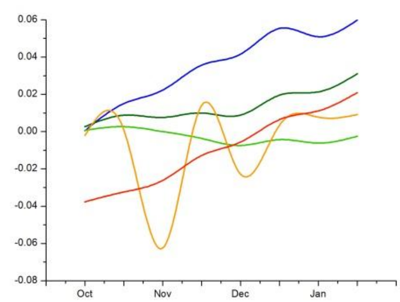
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

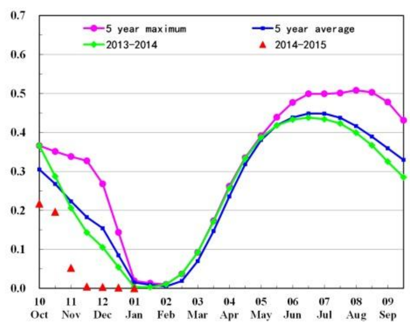


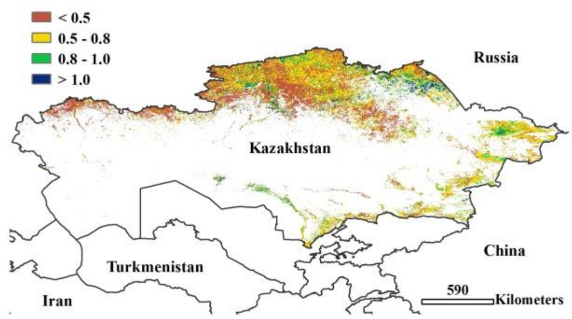
(d) NDVI profiles

[KAZ] Kazakhstan

This analysis covers the harvesting period of last year's summer crops (cereals, spring barley, and wheat) from October 2014 to late January of this year. Among the CropWatch agro-climatic indicators, compared with average, rainfall over agricultural areas showed a sharp increase (+41%) (with the exception of the Zapadno kazachstanskaya oblast where rainfall decreases by 10%), while temperature and radiation undergo slight (-0.8°C for TEMP) and sharp (-8% for PAR) decreases. The NDVI clusters indicate that crops were in poor condition from October to early November in the areas of Severo kazachstanskaya and Akmolinskaya. The maximum VCI indicates that crop condition of most arable land in Kazakhstan was below average (pixel values below 0.5), except for some areas of the north and east. No crop was planted since November, and from December the NDVI index has been close to zero. The crop condition development graph also shows that crops are clearly worse off than last year and the average of the past five years, but favorable rainfall has provided the soil moisture for the initial stages of the forthcoming crops.

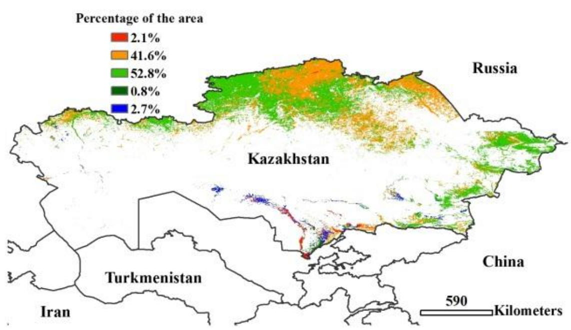
Figure 3.18. Kazakhstan crop condition, October 2014-January 2015

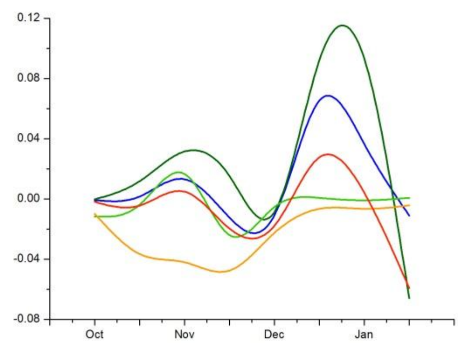




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





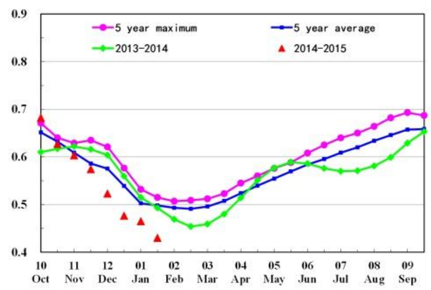
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

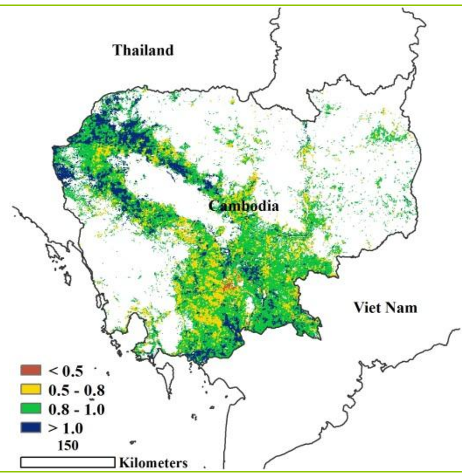
[KHM] Cambodia

October to January covers the growing period of the main (wet season) rice crop, and the early stage of the second (dry season) rice in Cambodia. The fraction of cropped arable land was consistent with the average of the previous five years. For the period under consideration, the CropWatch agroclimatic indicators show markedly above average rainfall and a slight increase in PAR, and temperature increased by 1.3°C compared to average. Favorable conditions increased the biomass accumulation expectations by 5% in comparison with the last five years. Sufficient rainfall is beneficial for the sowing and emergence of the second rice. Vegetation condition indices (VCIx) are very high (>1.0) in Banteay Meanchey and Battambang in the northwestern part of the country, the major rice cultivation area in the Tonle Sap basin.

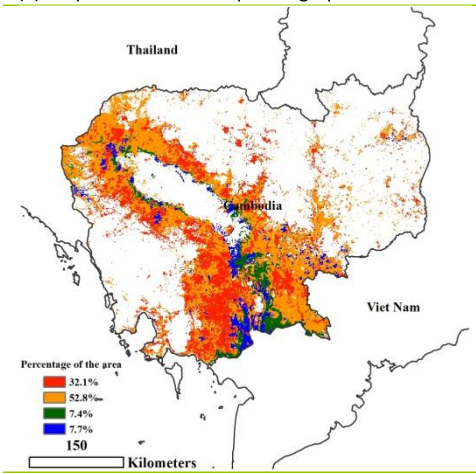
Figure 3.19. Cambodia crop condition, October 2014-January 2015



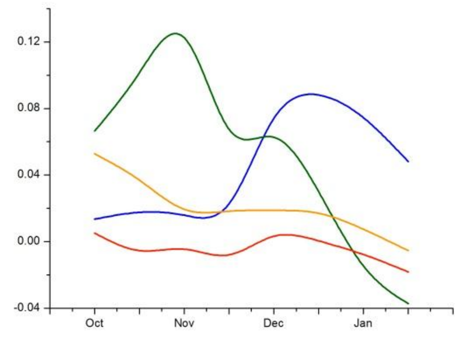
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

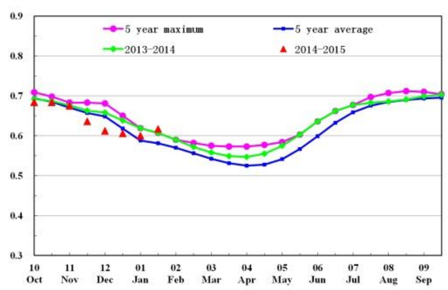


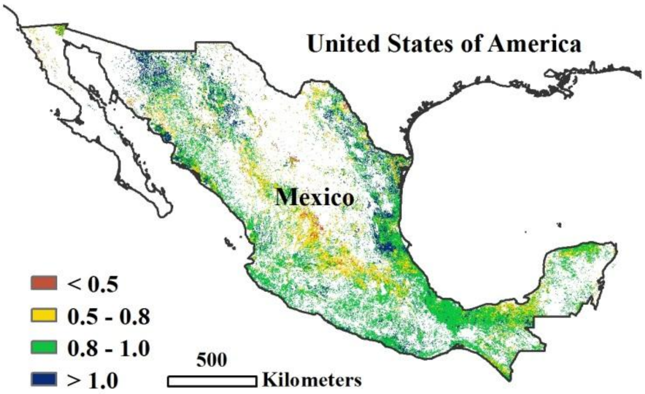
(d) NDVI profiles

[MEX] Mexico

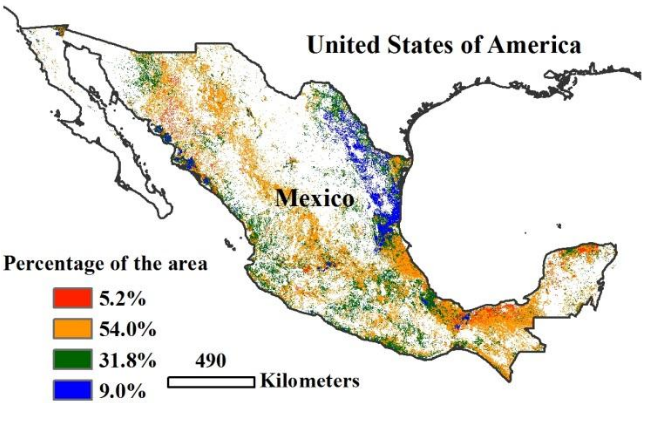
In general, crop condition was above average in this monitoring period (October 2014 to January 2015). This is the harvesting season of Mexico's 2014 main maize and the planting season of secondary maize and winter wheat. During the monitoring period, rainfall showed a positive departure (+9%) compared to average; temperature was slightly above average (+0.4°C), and photosynthetically active radiation decreased by 5%. The NDVI development profile indicates the average performance during the 2014 harvesting season and the favorable crop condition in January 2015. Maximum VCI in the north and northeastern regions of the country was much above the five-year average, which indicates the good performance of crops in those regions, as supported by the cluster of NDVI profiles (more than 40% of arable land shows good crop condition) and accumulation of biomass (+20%). On the contrary, crop condition is only average in some part of central Mexico, according to the average value of maximum VCI. The cropped arable land fraction showed a positive departure of 5%.

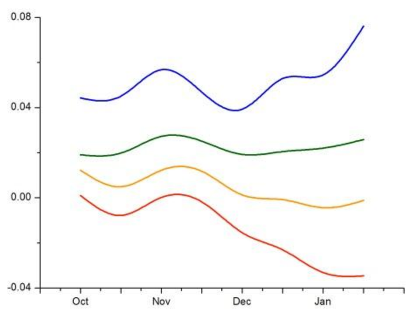
Figure 3.20. Mexico crop condition, October 2014-January 2015





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





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

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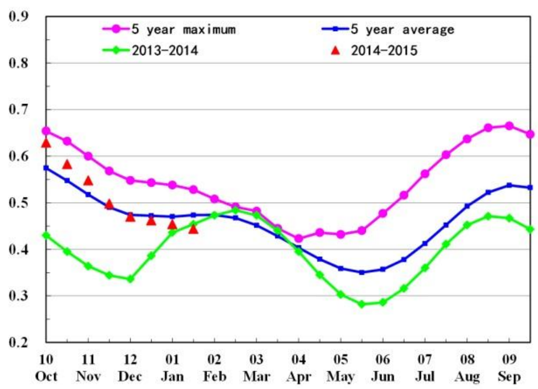
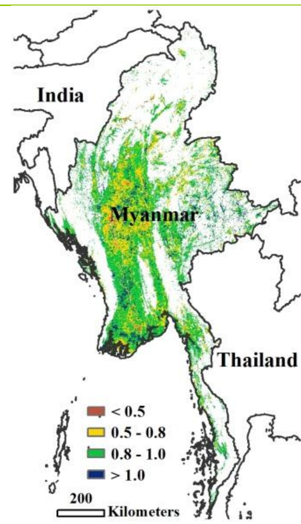
[MMR] Myanmar

Based on CropWatch indicators, the crop condition was favorable in Myanmar from October to January. The harvesting period of the main rice crop was completed in mid-November, with second rice crop starting to grow in early January. The growing period of maize and wheat begun around December. The CropWatch agroclimatic and agronomic indicators showed a decrease in radiation (-2%) but increases in rainfall (+25%) and temperature (+0.8°C. Biomass, expressed with the CropWatch BIOMSS indicator, increased by 29%. Crop growing condition showed values above average compared to the previous year because of the favorable weather condition of the main rice crop. The profiles of NDVI clusters were above average in all areas except Magway region, which is consistent with the maximum VCI map. The maximum VCI index increased to 0.85. The VCI map presents a very good crop condition in Ayeyarwady and Bago regions.

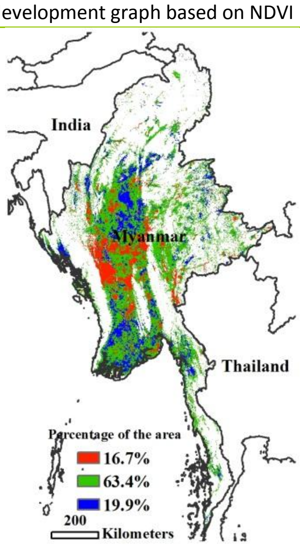
Figure 3.21. Myanmar crop condition, October 2014-January 2015



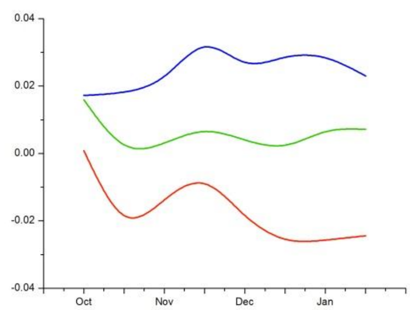
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

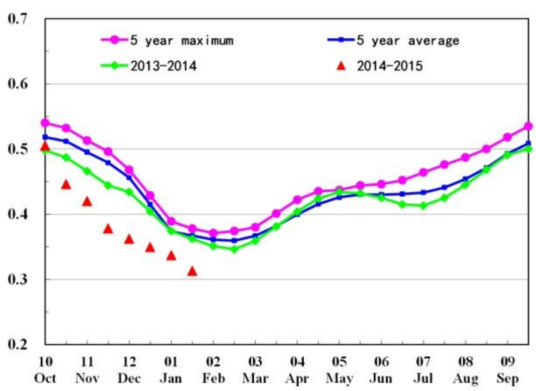


(d) NDVI profiles

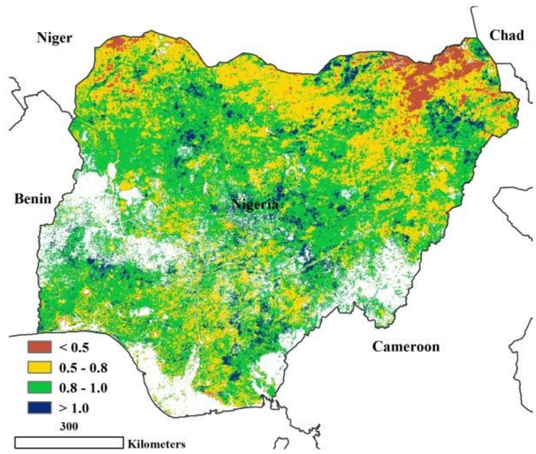
[NGA] Nigeria

The reporting period coincides with the harvesting of all crops, as indicated by the decreasing national NDVI profiles, which reach their minimum around February. Rainfall is above average (+12%), while radiation and temperature were globally average. Compared with the average of the recent five years, the biomass accumulation potential dropped 7%, which is contradicted by a rather favorable average value for maximum VCI (0.82). In fact, the VCI maps show favorable conditions everywhere but in the Sahelian northernmost areas, with especially favorable conditions in the northeast. The differences between indicators result from contrasting conditions in the southern third of the country. NDVI profiles were close to average in about 90% of the country, and they departed little from the reference value throughout the October to January period. In contrast, while globally average, they fluctuated a lot in the south, with low values in mid-October and early December in Kogi, Edo, and Ondo States, due to reduced precipitation, as mentioned in Chapter 1. Altogether, crop condition at harvest is favorable, but less so in some southern areas.

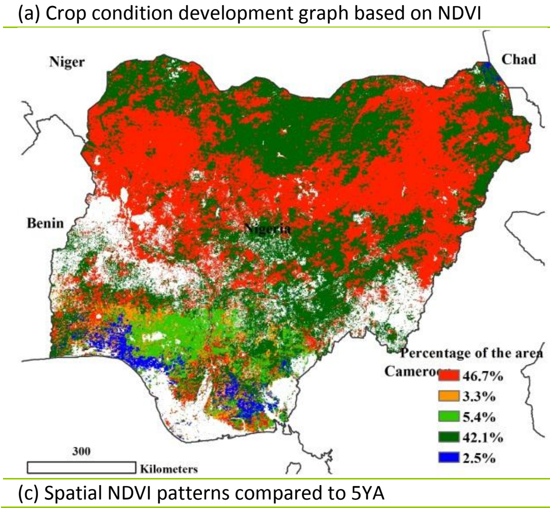
Figure 3.22. Nigeria crop condition, October 2014-January 2015



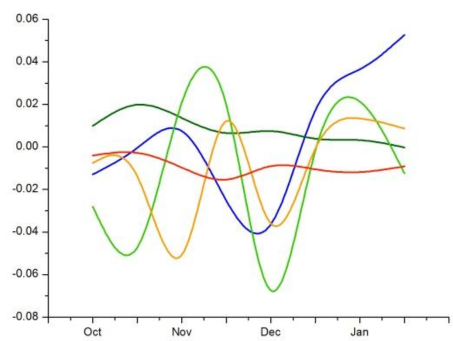
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

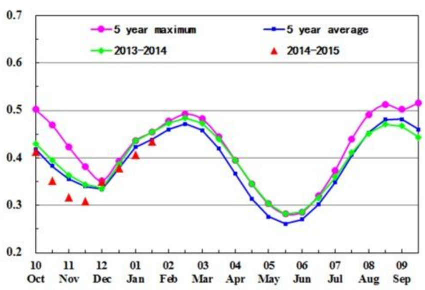


(d) NDVI profiles

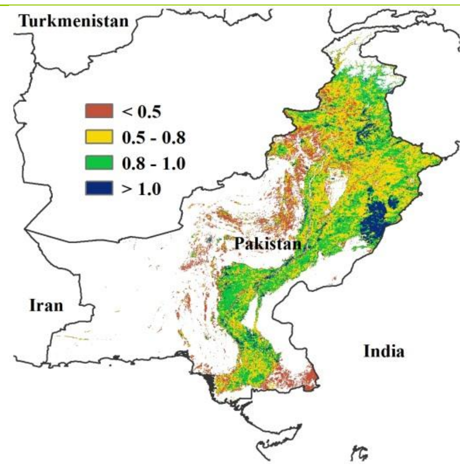
[PAK] Pakistan

This monitoring period covers the harvesting stage of last year's summer crops (maize, rice, and sorghum), as well as the sowing and growing stage of winter wheat and winter barley. Agroclimatic indicators show a decrease of rainfall (-16%) and radiation (-3%), and little above average temperature, while biomass is below the five-year average (-8%). Since October, the average NDVI development profiles indicate that crop condition was less favorable than during the five-year average from October to November; in early December, however, crop condition suddenly increased to close to and above this average, due to an increase in rainfall, as reported from other sources. Later periods experienced below average rainfall. Actually, spatial NDVI patterns and profiles show that crop condition in about 58% of arable agricultural areas in the country has been below average starting in October. All available indicators concur to rank Pakistan's crops as below average throughout the country, with the exception of areas in north and eastern Punjab and north Sindh.

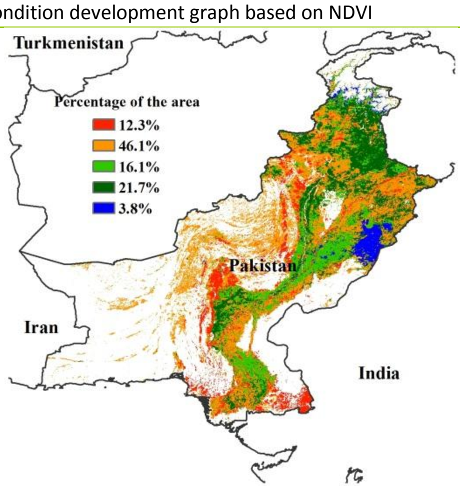
Figure 3.23. Pakistan crop condition, October 2014-January 2015



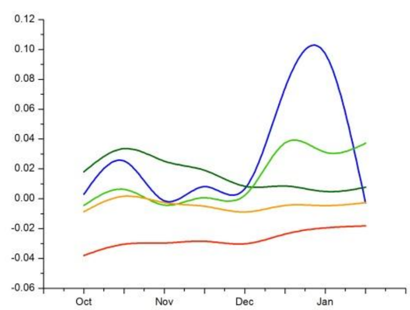
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



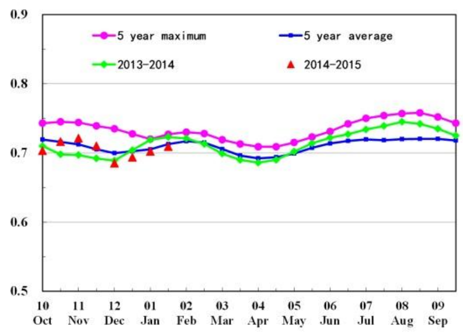
(d) NDVI profiles

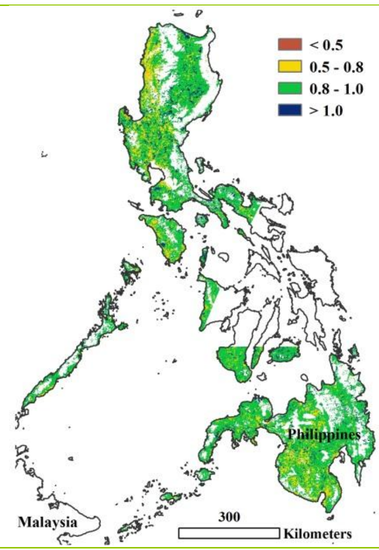
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK **PHL** POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[PHL] The Philippines

Crop condition in the Philippines was generally average from October to January. The monitoring period covers the harvesting stage of last year's main rice, as well as the sowing and growing stage of secondary rice and maize. Environment indices show decreased rainfall (-5%) and slightly increased temperature (0.3°C) compared to average. As a result of rainfall deficit, the biomass accumulation shows a significant 9% decrease compared to that same average, which is also shown in the NDVI development graph: crop condition was the lowest among the curves in December. The overall maximum VCI index is 0.89, therefore, average to good yields can be expected for secondary rice.

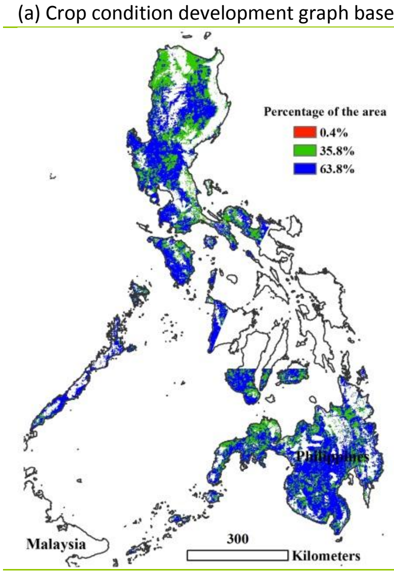
Figure 3.24. Philippines crop condition, October 2014-January 2015

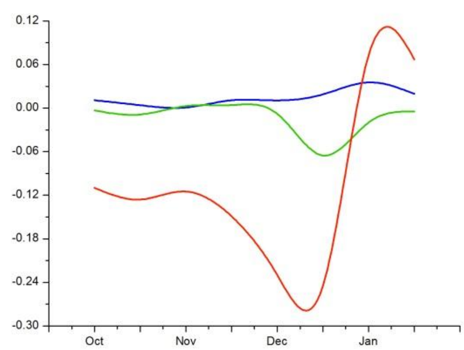




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

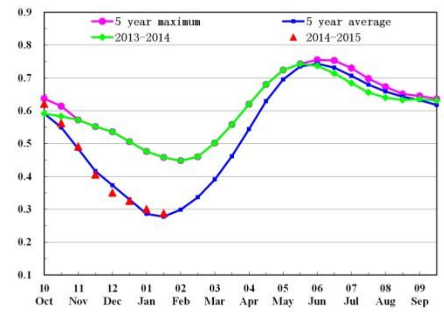
(d) NDVI profiles

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

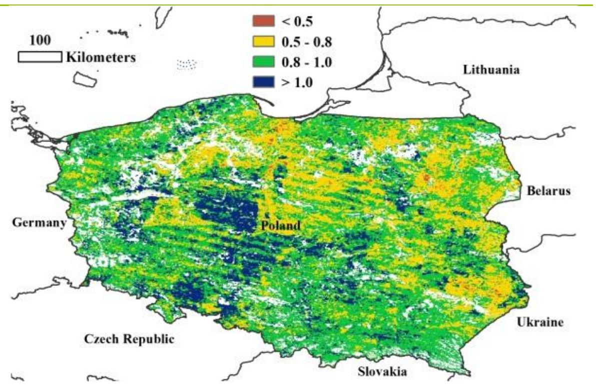
[POL] Poland

Poland enjoyed favorable conditions during this monitoring period, as indicated in part by a maximum VCI value (0.87). The country this period witnessed the harvest of maize (before October) and the sowing of winter wheat. The cropped arable land fraction was 4% above the five-year average. Weather during October to January was wetter and warmer than average, with rainfall up 8% and temperature up 1.6°C. Radiation was 5% below average, and the potential biomass increased 13% due to the abundant precipitation and mild weather. As shown by the spatial NDVI patterns, NDVI was above average in October and close to average in the next three months in most parts of Poland except the Northeast, including Poznan, Warsaw, and Cracow. Due to the warm condition in winter, Poland's winter crop was probably only slightly hardened but freezing risk was low.

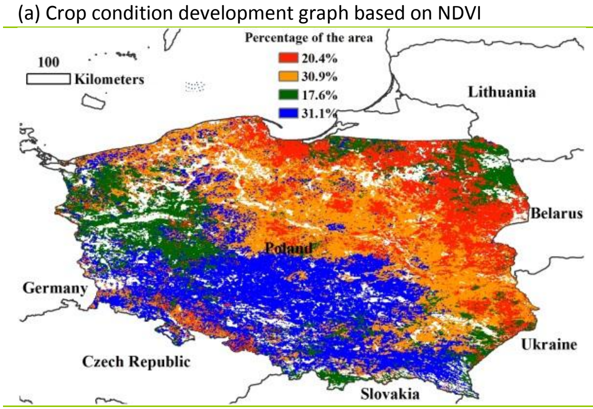
Figure 3.25. Poland crop condition, October 2014-January 2015



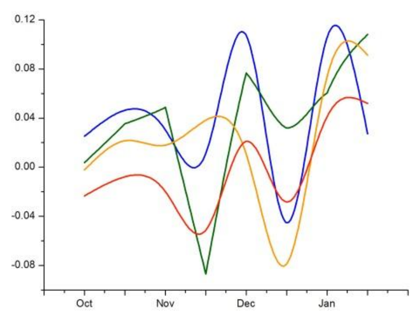
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

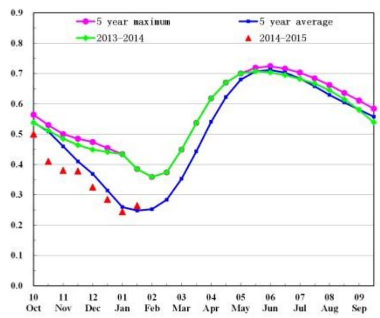


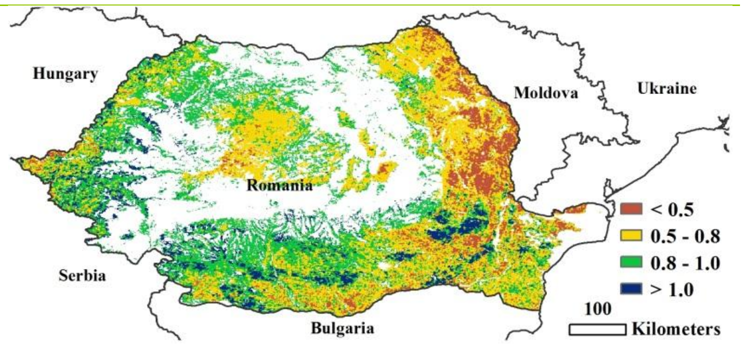
(d) NDVI profiles

[ROU] Romania

Romania presented average crop conditions during October to January (VCIx=0.77). The winter wheat and maize harvest was completed before October; the next three months were the planting season for winter wheat. Cropped arable land was 7% above the five-year average. Overall, weather was warm with temperature up 0.4°C compared to average. Precipitation was abundant (42% above average), while the potential biomass was up to 17% higher than average due to the heavy rainfall. As a result of the cold weather over eastern Romania, including Chisinau and Bucharest, NDVI was significantly below the recent five-year average. In the west and southwest, including Oradea, Arad, Timisoara and Craiova, croplands benefited from warm conditions. Overall, the winter crops in Romania display very different conditions between west (favorable) and east (unfavorable).

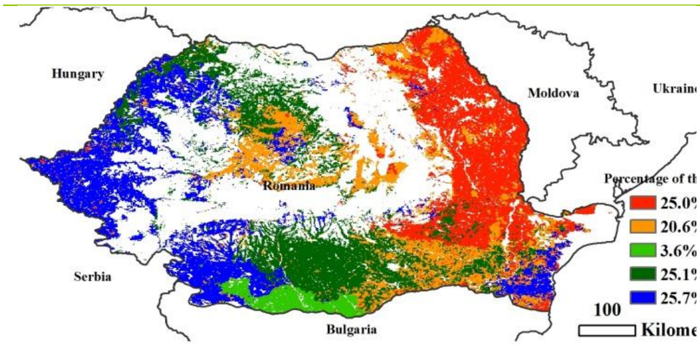
Figure 3.26. Romania crop condition, October 2014-January 2015

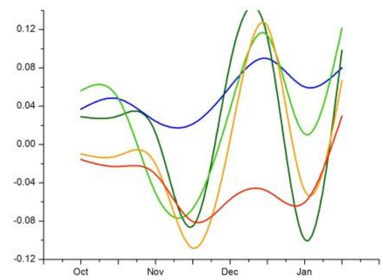




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





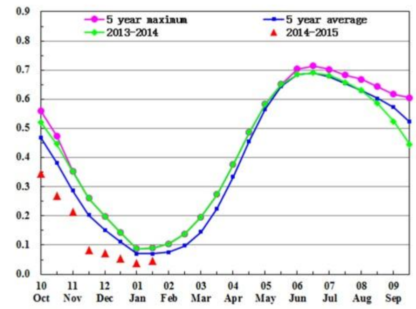
(c) Spatial NDVI patterns compared to 5YA

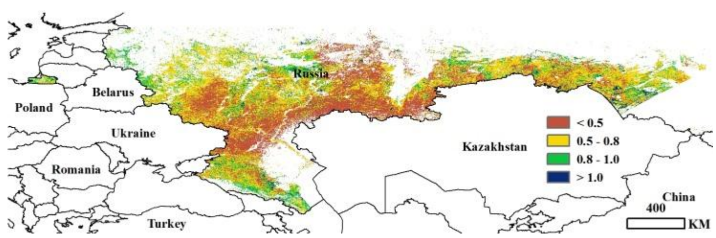
(d) NDVI profiles

[RUS] Russia

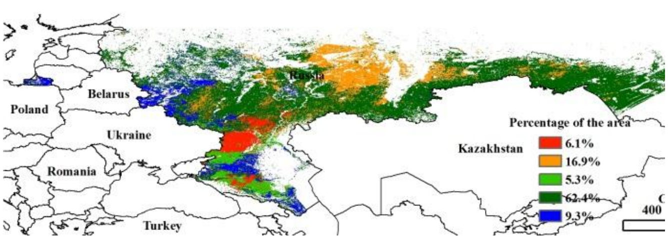
Russia presented poor crop condition from October 2014 to January 2015 (VCIx=0.60). This reporting period covered the sowing of winter wheat, while maize and spring wheat were harvested before October. Compared with average conditions, Russia experienced slightly below average temperature (-0.6°C) and freezing weather conditions, but considerably above average precipitation (+7%). Mainly due to low temperature, a biomass drop of 11% below average is currently projected. As for the NDVI patterns, significantly below average values occurred in more than 85% of Russia's agricultural area between October and January. Only few areas concentrated in the southwest of Russia had favorable NDVI values after December (including Krasnodar and Stavropol). In most parts of southern Russia, including Volgograd, Saratov, and Orenburg, the crop condition is very poor, with a maximum VCI below 0.5. During this monitoring period, as shown by the crop condition development graph, NDVI was significantly below values for the recent five-year average. The low NDVI values result from freezing weather conditions, which affected the sowing of winter wheat.

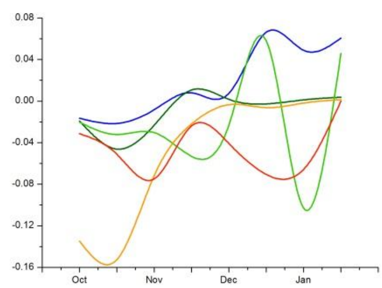
Figure 3.27. Russia crop condition, October 2014-January 2015





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



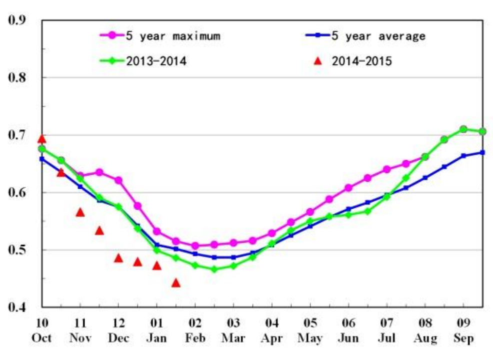


(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

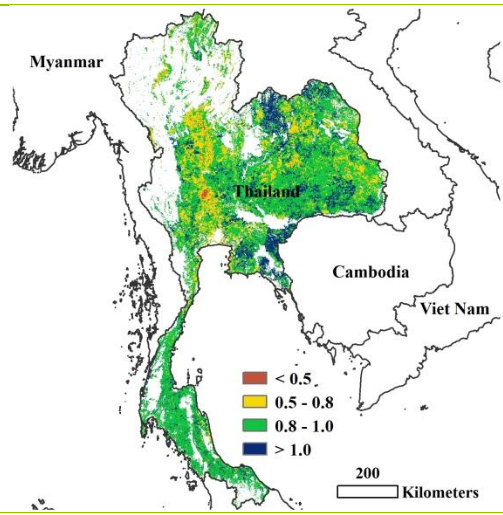
[THA] Thailand

The harvesting period of the main rice crop was completed in January, while planting of the second rice crop started in early January. Based on CropWatch indicators, the situation of crops during November to January in Thailand was average to above average compared the previous five years. The CropWatch agroclimatic and agronomic indicators showed an increase of radiation (+1%), rainfall (+17%), and temperature (+0.8°C) compared to average. Additionally, biomass showed a 2% increase compared with the recent five-year average. In early October, the crop condition was better than the previous year. From November to mid-January, the crop condition showed values below average compared to those of the recent five years and the previous year due to the erratic monsoon rains and unfavorable weather conditions during the main rice crop period. The NDVI profiles in the area around the Chao Phraya river basin gradually decreased to values below average, while the crop condition was mostly above average in the northeastern and eastern region. The maximum VCI index was very high (0.89), due to good crop condition throughout the country. Crop condition was favorable in Loei, Buengkan, Sisaket, Chonburi, Chanthaburi, and Sakaeo provinces, with the maximum VCI above 1.0. Low VCIx values occurred in the central part of Thailand, particularly in the province of Chainat, which was affected by severe drought.

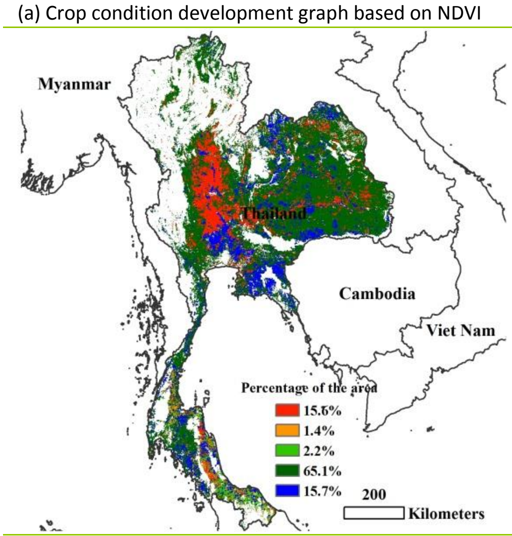
Figure 3.28. Thailand crop condition, October 2014-January 2015



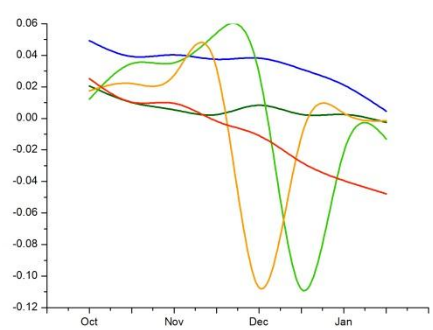
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

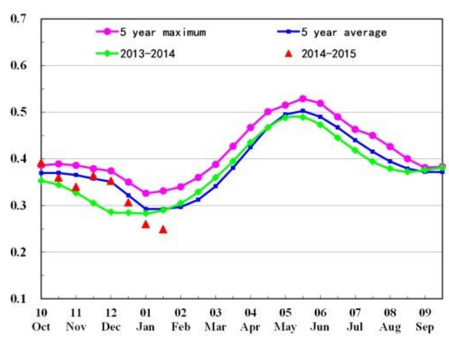


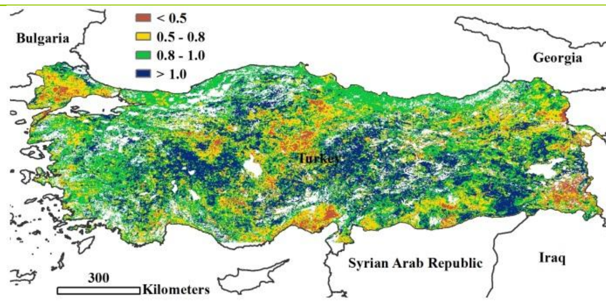
(d) NDVI profiles

[TUR] Turkey

During the monitoring period for this bulletin, planting of winter grains was completed in Turkey. Rainfall and temperature were average, while radiation, as measured by the CropWatch RADPAR indicator, was below average. The agroclimatic indicators indicate poor growing conditions for winter crops, which are confirmed by the decrease of the biomass indicator by 2%. The maximum VCI (0.9) points to above average conditions, while the fraction of cropped arable land also showed a spectacular increase of 23% compared to the recent five-year average. These changes indicated a good start for winter crops. Below average conditions, however, occur in some areas of the western Marmara Region and Aegean Region, and the east of Eastern Anatolia. Most areas across Turkey experienced an above or a close to average crop condition from October to December 2014 and significant unfavorable conditions in January 2015. Altogether, Turkey’s current winter crop so far underwent unfavorable conditions. The final outcome of the season will be largely determined by soil moisture in March, when vegetative grow will resume, and in the months that follow.

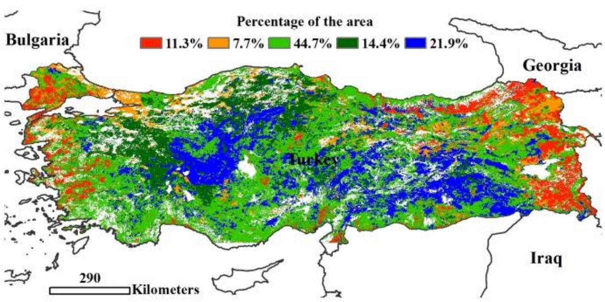
Figure 3.29. Turkey crop condition, October 2014-January 2015

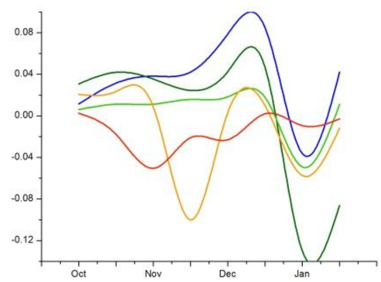




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





(c) Spatial NDVI patterns compared to 5YA

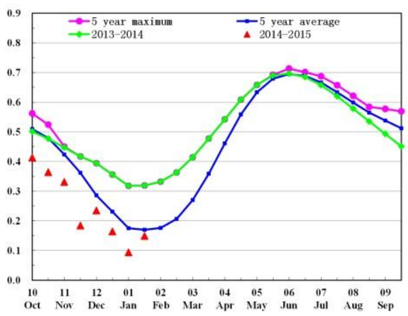
(d) NDVI profiles

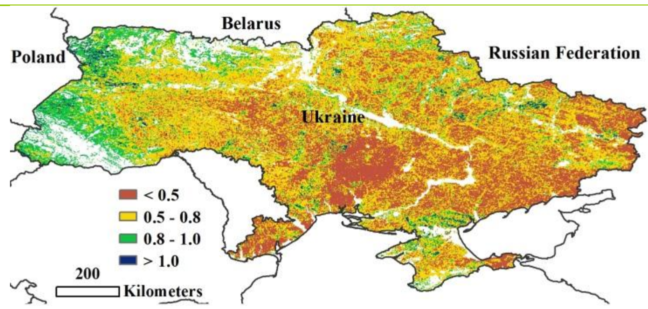
ARG AUS BGD BRA CAN DEU EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR **UKR** USA UZB VNM ZAF

[UKR] Ukraine

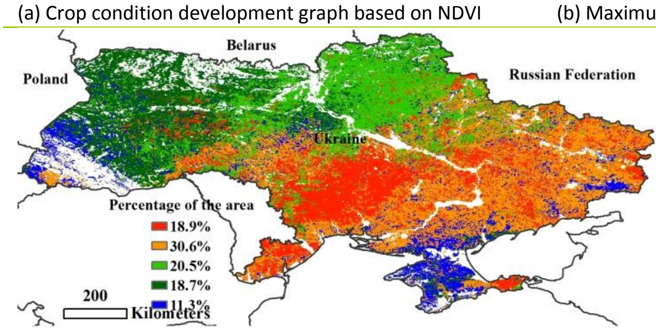
Ukraine presents poor crop condition from October to January (VCIx=0.61). This analysis covers the late stages of maize (harvest completed in November) and the early vegetative stages of winter wheat and other winter cereals. In Ukraine most crops were into winter dormancy by mid-January, and cold weather has substantially affected crop establishment. Overall, October to January weather was cold and dry with rainfall down 8%, temperature about average (-0.1°C), and radiation up 5% compared to average. A significant drop in air temperature was recorded in the country from October to December. The central and northeastern regions of Ukraine were affected by frost kill, negatively impacting the emergence of winter crops (including Kirovohrads'ka, Mykolayivs'ka, Kharkivs'ka and Luhans'ka). The national NDVI profile also suggests that crop condition was below average during the winter months. From January on forward, crops in western Ukraine have gradually recovered. However, it is likely that the production of winter crops in Ukraine will suffer a loss this season.

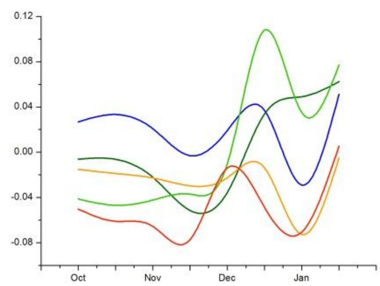
Figure 3.30. Ukraine crop condition, October 2014-January 2015





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



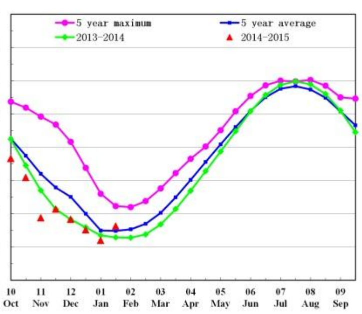


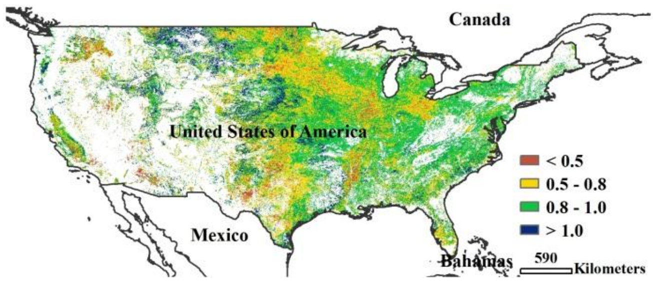
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

[USA] United States

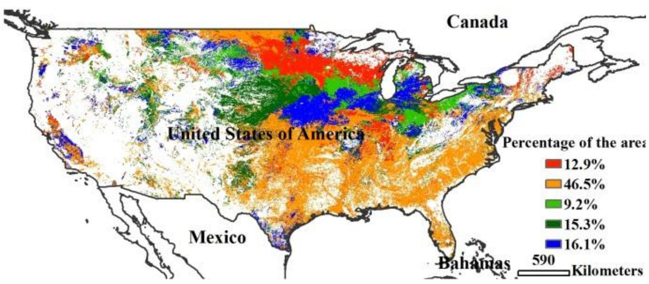
In general, crop condition in the United States over the CropWatch monitoring period is abovebelow average. This monitoring period covered the harvesting season of 2014 summer crops and the planting season for 2015 winter crops. The agroclimatic indicators include a positive departure (17%) of rainfall (compared to average), average temperature (-0.4°C), and a 4% decrease in radiation. During this monitoring season, summer crops were completely harvested and winter crops were planted and stepped into wintering period. The main zone for winter crops, the south of the Great Plains, enjoyed abundant rainfall, including in Kansas (+62%), Oklahoma (+49%), northern Texas (+20%), and Arkansas (+42%). This replenished soil water for the growth of winter crops in the next monitoring period. In other regions, abundant rain also fell over Idaho (+49%), Iowa (+45%), Missouri (+53%), Montana (+152%), Nebraska (+71%), North Dakota (+95%), and South Dakota (+139%), which will benefit the planting of summer crops (Spring wheat, maize, and soybeans) in 2015. At the same time, the cluster of NDVI profiles indicates more than 62.6% of arable land shows slightly above average crops, these region is conherent with the main winter crop zones, as also indicated by the maximum VCI (0.82) and the increased accumulation of biomass (14%) compared to the recent five-year average. The cropped arable land fraction showed a positive departure of 3%. Altogether, prospects are favorable.

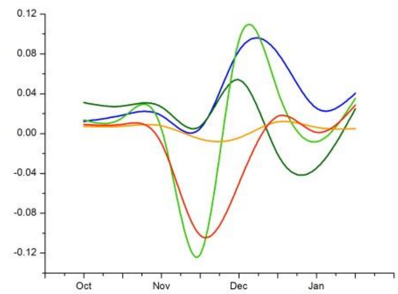
Figure 3.31. United States crop condition, October 2014-January 2015





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



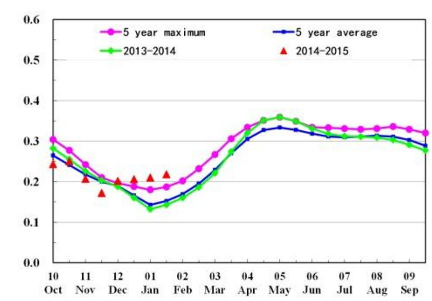


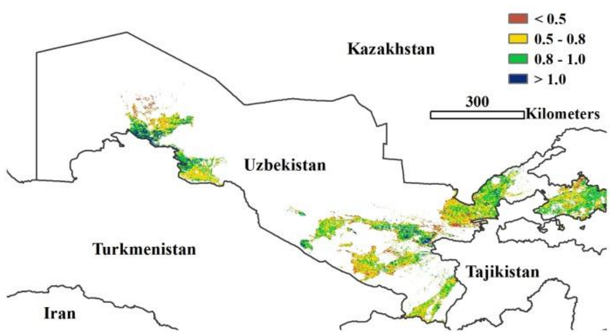
(c) Spatial NDVI patterns compared to 5YA (d) NDVI profiles

[UZB] Uzbekistan

This analysis covers the sowing and growing stage of winter cereals in Uzbekistan from October 2014 to late January 2015. Currently in the field are mostly winter wheat and barley. The country as a whole enjoyed a small increase of rainfall (+4%) and biomass (+10%), while temperature and radiation were below average. A detailed look at the indicators shows favorable conditions in most parts (such as in Ferghana, Andijan, Tashkent, Samarkhand, Nawoly, and Bukhara), with maximum VCI mostly above 0.5. In November, the national NDVI development graph indicates that crop condition was unfavorable, consistent with the lack of rainfall. More precise spatial information is provided by the NDVI clusters, which show a sharp drop in late November and a recovery thereafter in eastern and central areas (Ferghana, Andijan, Tashkent, Samarkhand, and Denow). From December to January, abundant rainfall benefited crops, the condition of which is now above the last five-year average level according to the NDVI development graph as well as the NDVI cluster profiles.

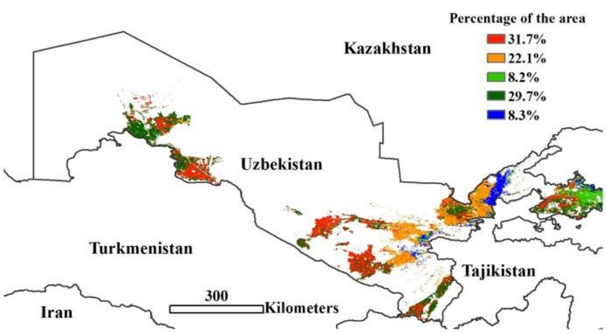
Figure 3.32. Uzbekistan crop condition, October 2014-January 2015

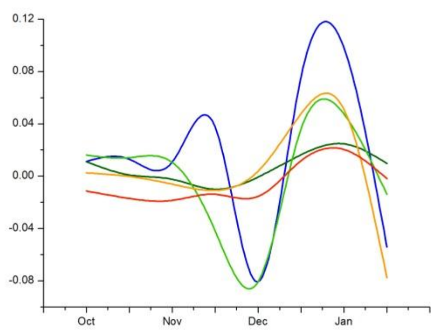




(a) Crop condition development graph based on NDVI

(b) Maximum VCI





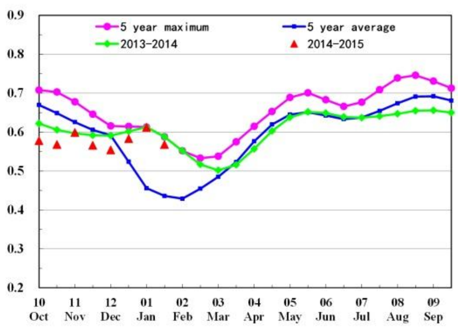
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

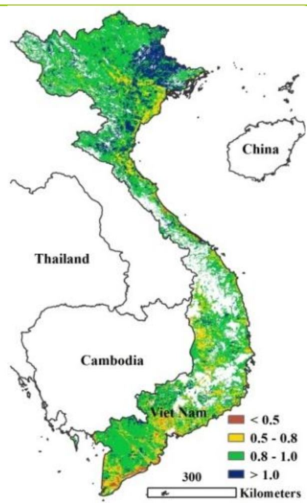
[VNM] Vietnam

The period from October to January covers the growing stages of the "10th month rice" and the sowing of the winter/spring rice in Vietnam. Most of the rice cultivation regions are distributed in the Red River delta in northern Vietnam and the Mekong River delta in southern Vietnam. The fraction of cropped arable land was similar to the average of the previous five years. Vegetation condition indices (maximum VCI) were seasonally low (<0.8). On the contrary, vegetation condition indices are very high (>1.0) in the northeastern tip of the country including in Lang Son and Thái Nguyênand Bắc Giang. For the period under consideration, the CropWatch agroclimatic indicators show clearly below average rainfall (-18%) and a correlated slight increase in radiation (+3%) and temperature (+0.8°C). The insufficient rainfall limited the biomass accumulation and resulted in a 15% decrease in BIOMSS compared with the recent five-year average. Crop condition was also below the five-year average until late November, after which it improved to above average. Correspondingly, the profiles of NDVI clusters also show late November as a turning point after which crop conditions in most of Vietnam are better than the average of the previous five years.

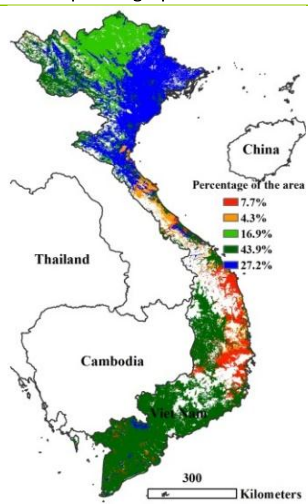
Figure 3.33. Vietnam crop condition, October 2014-January 2015



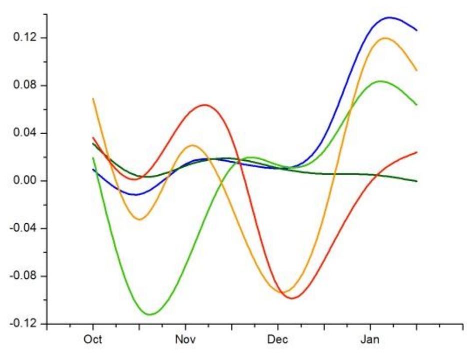
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

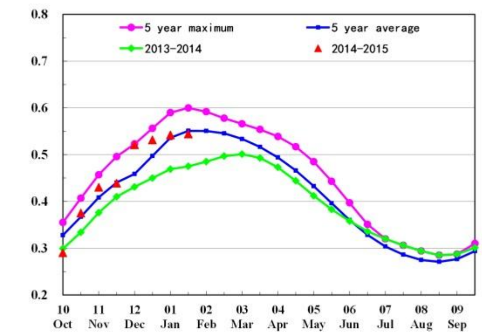


(d) NDVI profiles

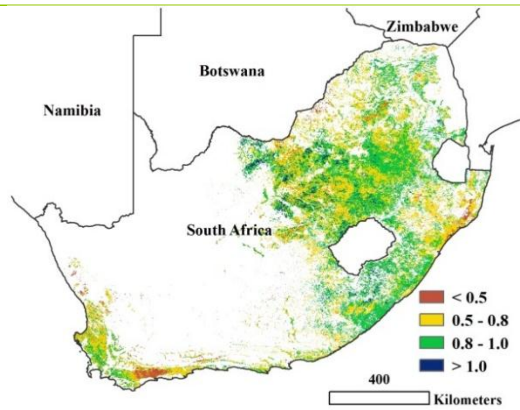
[ZAF] South Africa

Winter crops, essentially barley and wheat, were harvested in November and December, and the summer crops have reached mid-season stages. Rainfall was below average (-9%), with slightly above-average temperature and increased radiation. The biomass accumulation potential dropped 9% compared to the recent five-year average, while the area of cropped arable land underwent a significant plunge of 12% compared to average, with maximum VCI staying below 0.8. Altogether, summer crop condition, of which maize is the main one in South Africa, can only be qualified as below average. Although nationwide NDVI is still close to the recent five-year average, much still depends on rain at the time of flowering in February. As shown by the NDVI clusters, NDVI was consistently poor and particularly so in coastal Kwa-zulu Natal, but apparently recovering in the Northern province and north Mpumalanga.

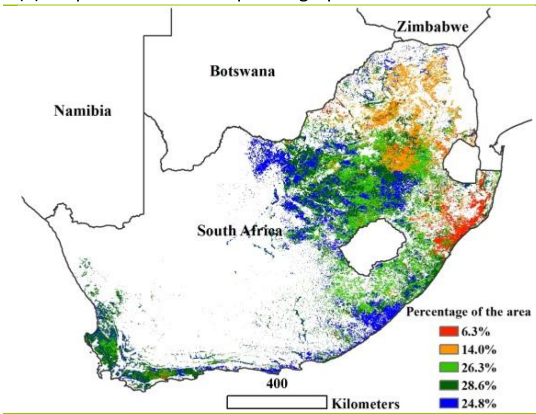
Figure 3.34. South Africa crop condition, October 2014-January 2015



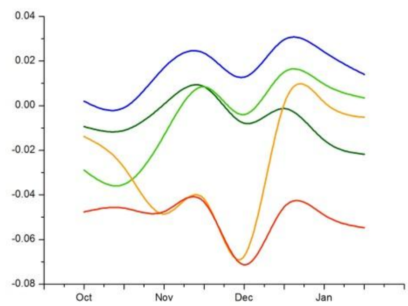
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



(d) NDVI profiles

Chapter 4. China

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

4.1 Overview

In China, the beginning of the reporting period for this bulletin—early October—is the major planting time of most winter crops including winter wheat and rapeseed, right after the harvesting of the autumn crops.

From October 2014 to January 2015, agro-climatic conditions in China were generally favorable (see figures 4.1 and 4.2). Specifically, average temperature was only 0.5°C above average, which is beneficial for winter wheat survival during winter. It should be highlighted that 14% above average rainfall combined with average PAR contributed a 10% above average potential biomass estimate. As indicated in table 4.1, the 2014-2015 winter was generally warm with temperature above average in all seven regions; the lowest increase (0.1°C) occurred in the Northeast region and the most significant one in Huanghuaihai (0.9°C). The Lower Yangtze region was the only area suffering from below average rainfall among the seven regions (RAIN, -28%). Frequent showers occurred in January in the center of Yunnan and northwest of Guangxi provinces, while in Jiangxi, Fujian, Zhejiang, and the north of Guangdong province, rainfall was always below average. Temperature dramatically fluctuated from October to January throughout China; it was below average in mid-December and early November and average or above average at other times during the monitoring period.

Cropped arable land fraction (CALF, figure 4.3) was near the recent five-year average. Huanghuaihai and the Loess region are the only two regions where CALF was below the last five years' average. In Inner Mongolia and the Northeast region, the indicator was 1% above average, while for the Lower Yangtze region, South China, and Southwest China, cropped arable land was at the five-year average level. As for major wheat producing provinces (12 provinces covering 85% of total wheat production in China), CALF was 1.5% above the previous year, indicating that the total cropped area of winter crops increased from the 2013-2014 winter season. Most of the uncropped arable land during this reporting period is located in northern and central Gansu, northern Shanxi and Shaanxi, eastern Shandong, southern Jiangsu, and Anhui provinces. Uncultivated farmlands were either reserved for other crops to be planted later or unsuitable for winter crops due to the low temperature.

Maximum VCI (VCIx, figure 4.4) was distributed unevenly, resulting from complex climatic situations. High VCIx values occurred mostly in Southwest China and eastern Shandong province. Low VCIx values were mainly located in the North China Plain. The low VCIx in those regions results from the dry weather from July to October 2014. At the regional scale, BIOMSS is above average, except for the Lower Yangtze and Northeast regions and corresponding provinces.

Figure 4.1. China spatial distribution of rainfall profiles, October 2014-January 2015

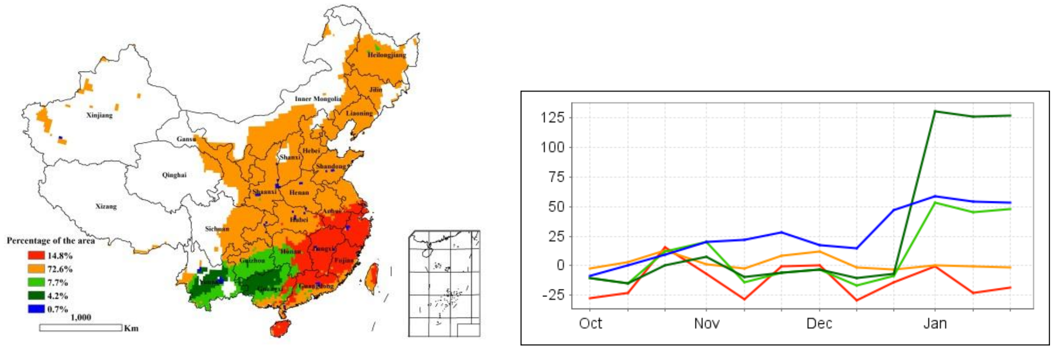


Figure 4.2. China spatial distribution of temperature profiles, October 2014-January 2015

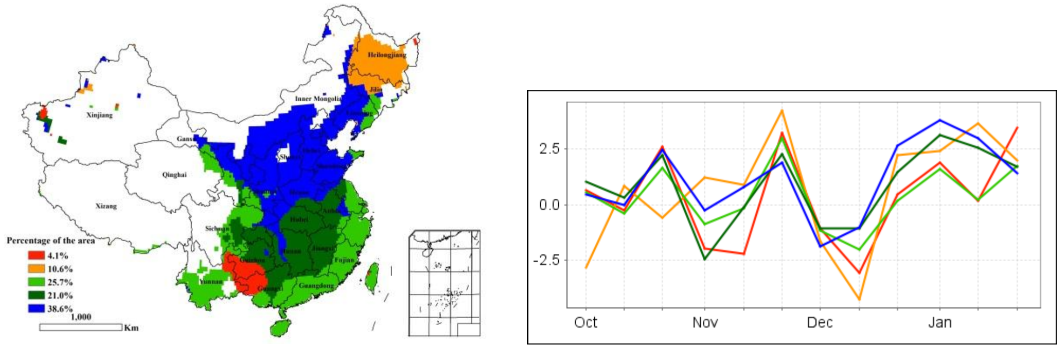


Figure 4.3. China cropped and uncropped arable land, by pixel, October 2014-January 2015

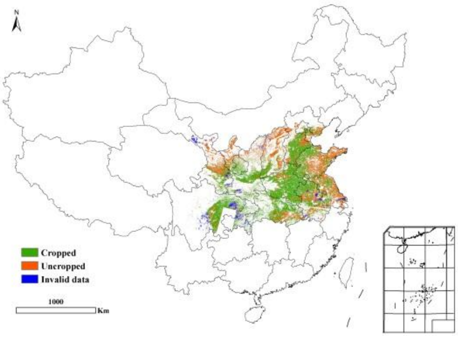


Figure 4.4. China maximum Vegetation Condition Index (VCIx), by pixel, October 2014-January 2015

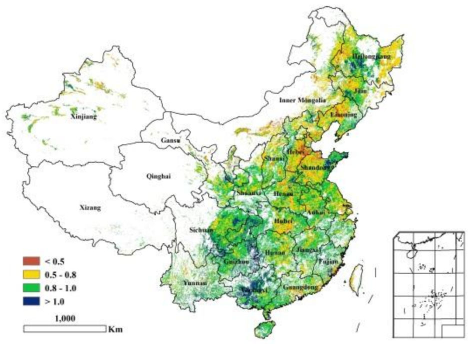


Table 4.1. CropWatch agroclimatic and agronomic indicators for China, October 2014-January 2015, departure from 5YA and 13YA

Region	Agroclimatic indicators			Agronomic indicators		
	Departure from 13YA (2001-13)			Departure from 5YA (2009-13)		Current
	RAIN (%)	TEMP (°C)	RADPAR (%)	BIOMSS (%)	CALF (%)	Maximum VCI
Huanghuaihai	44	0.9	-3	16	-3	0.78
Inner Mongolia	52	0.8	-3	4	1	0.78
Loess region	34	0.7	-4	18	-4	0.83
Lower Yangtze	-28	0.8	0	-24	0	0.83
Northeast China	28	0.1	-2	-1	1	0.75
Southern China	20	0.5	-3	16	0	0.88
Southwest China	81	0.8	-3	59	0	0.91

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 thirteen-year average (13YA) for the same period (October-January). VCI=Vegetation condition index.

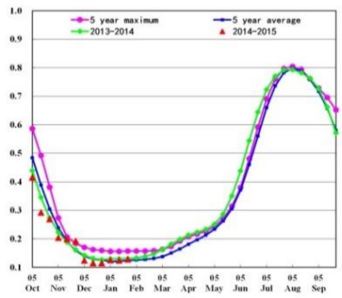
4.2 Regional analysis

Figures 4.5 through 4.11 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 January-October 2014 period to the previous season, to the five-year average (5YA), the five-year maximum; (b) Spatial NDVI patterns from October 2014 to January 2015 (compared to the (5YA); (c) NDVI profiles associated with the spatial patterns under (b); (d) maximum VCI (over arable land mask); (e) biomass for October-January. Additional information about agroclimatic indicators and BIOMSS for China is provided in Annex A, table A.11.

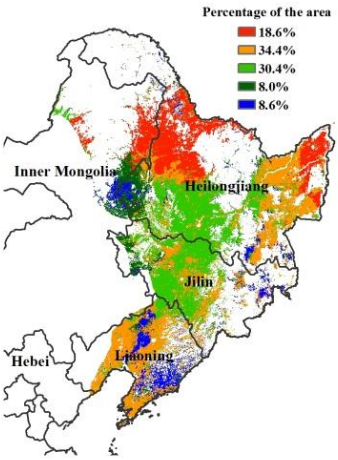
Northeast region

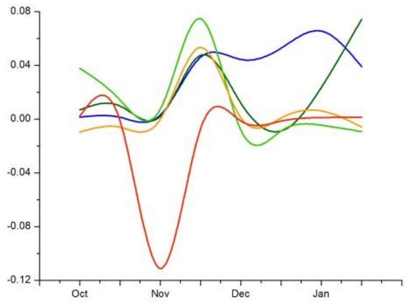
No crops are grown between late October and January in Northeast China due to the low temperatures. For the period under consideration, the CropWatch agroclimatic indicators show markedly above average rainfall (+28%) and a slight decrease in PAR (-2%). Temperature was about average. Abundant snow will ensure good soil moisture, which will benefit spring crops in 2015.

Figure 4.5. Crop condition China Northeast region, October 2014-January 2015

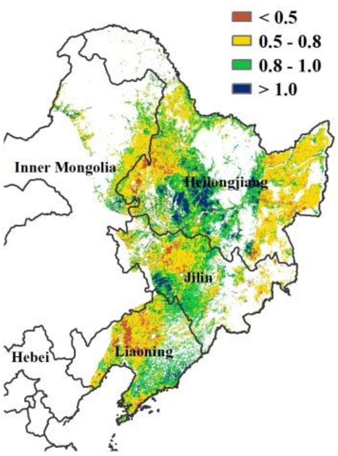


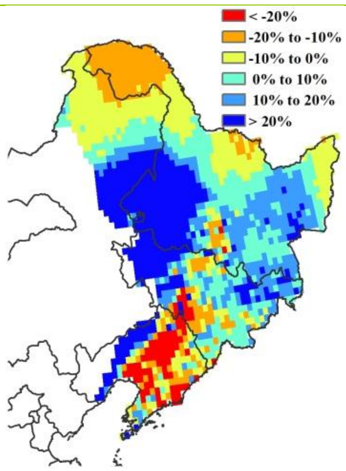
(a) Crop condition development graph based on NDVI





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



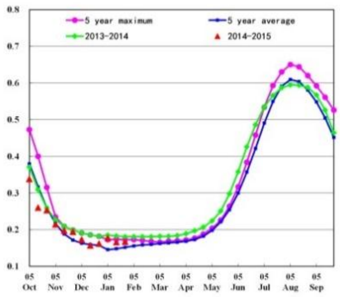


(d) Maximum VCI (e) Biomass

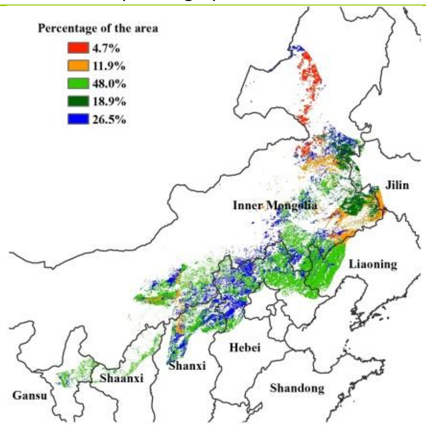
Inner Mongolia

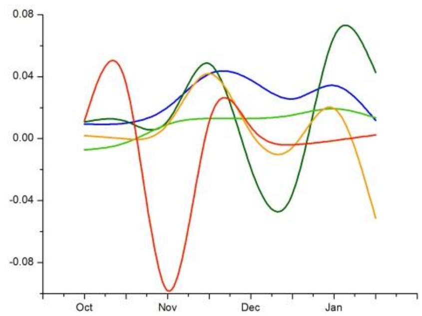
2014 Crops have already been harvested by October 2014. Inner Mongolia does not grow any winter crops due to low temperature between October and January. Compared with average conditions, CropWatch agroclimatic indices indicate a sharp increase of rainfall (+52%) and decrease of radiation (-3%); temperature was slightly above average. Biomass (expressed with the CropWatch BIOMSS indicator), however, was above the last five-year average for the same period (+4%). Abundant snow since December and above rainfall will be favorable for the sowing of upcoming spring crops. However, temperature was higher than average in most areas in Inner Mongolia, which may have some influence on spring crops by prematurely depleting soil moisture reserves.

Figure 4.6. Crop condition China Inner Mongolia, October 2014-January 2015



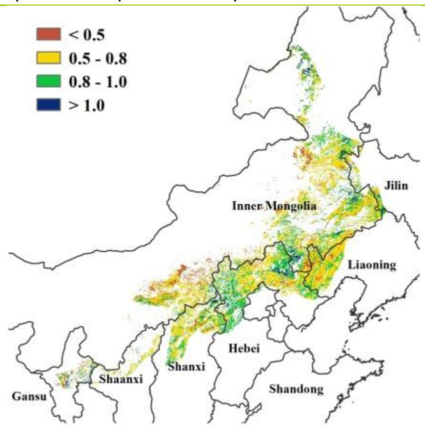
(a) Crop condition development graph based on NDVI

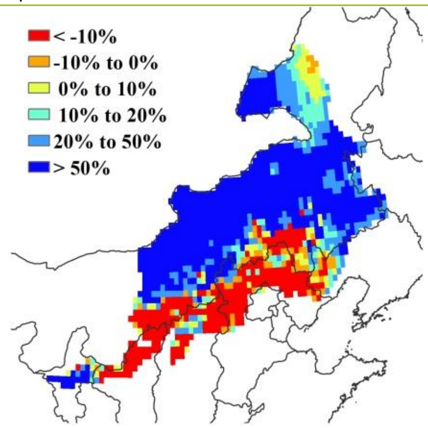




(b) Spatial NDVI patterns compared to 5YA

(c) NDVI profiles





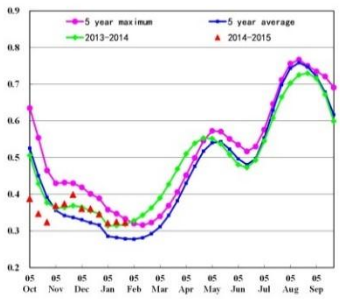
(d) Maximum VCI

(e) Biomass

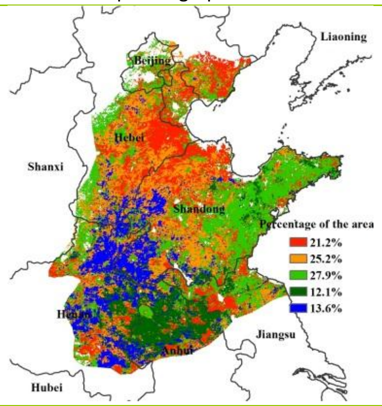
Huanghuaihai

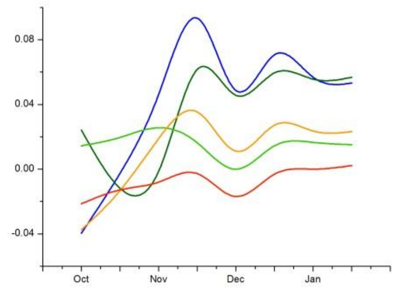
Crop condition in Huanghuaihai was generally above the recent five-year average and at the same level as the previous year. Currently, crops in the region are mainly winter wheat, which is at wintering stage. Winter wheat will green up starting in mid-March. Dry weather conditions from July to October in the regions hampered the emergence of winter wheat as confirmed by the below average NDVI in October shown in the NDVI development graph. Starting in November, above average rainfall promoted winter wheat development before dormancy, allowing crop conditions to recover to average. Overall, favorable climatic conditions with 44% above average precipitation will provide adequate soil moisture for winter crops after dormancy. Over the last four months, crop conditions were below average only in Cangzhou, Hebei Province, and other scattered regions (as shown in the spatial NDVI pattern map) where VCIx values consistently below 0.5 were observed.

Figure 4.7. Crop condition China Huanghuaihai, October 2014-January 2015



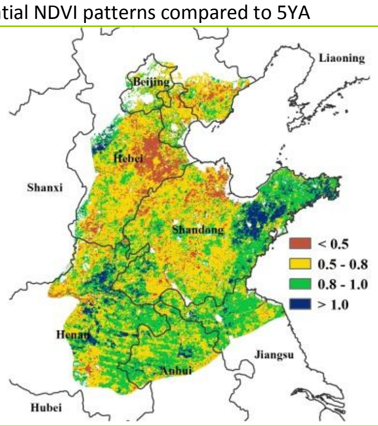
(a) Crop condition development graph based on NDVI

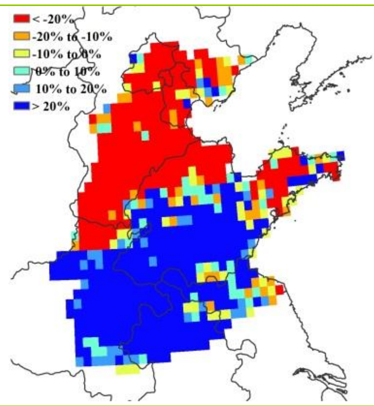




(b) Spatial NDVI patterns compared to 5YA

(c) NDVI profiles





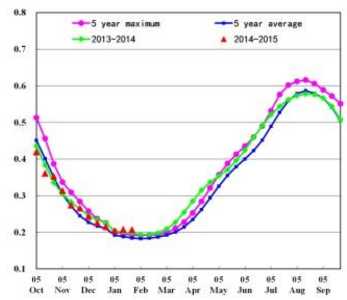
(d) Maximum VCI

(e) Biomass

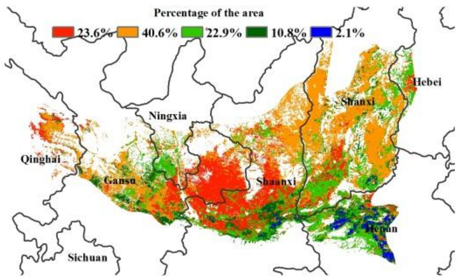
Loess region

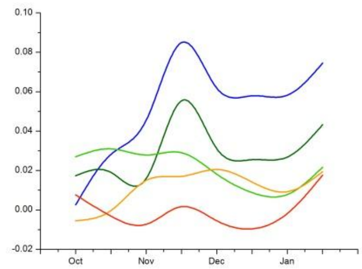
Crop condition in the Loess region was better than the five-year average and the last year during the monitoring period. When compared with the average, precipitation and temperature increased by 34% and 0.7°C, respectively, while radiation decreased 4%, as expected from the above average rainfall. The potential biomass increased by 18% when compared with the five-year average as a result of both favorable rainfall and temperature. Winter wheat was sowed in October, and it is currently dormant. The NDVI clusters and profiles confirm that crop condition was above average in more than 75% of the areas, especially in northwest of Henan and Fen-Wei Plains in Shaanxi and Shanxi Provinces. In the most east of Gansu and the adjacent regions in Shaanxi, province, crop condition was below average when compared with the recent five years due to droughts. The value of the maximum VCI was 0.83 and and the highest maximum VCI is observed in southern Ningxia. The cropped arable land fraction was below average (-4%), which indicate that crop condition is good but that the cultivated area decreased.

Figure 4.8. Crop condition China Loess region, October 2014-January 2015



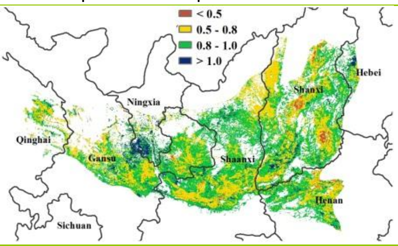
(a) Crop condition development graph based on NDVI

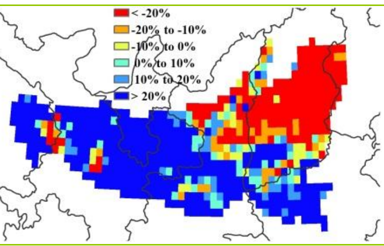




(b) Spatial NDVI patterns compared to 5YA

(c) NDVI profiles





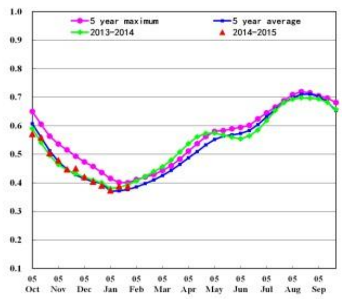
(d) Maximum VCI

(e) Biomass

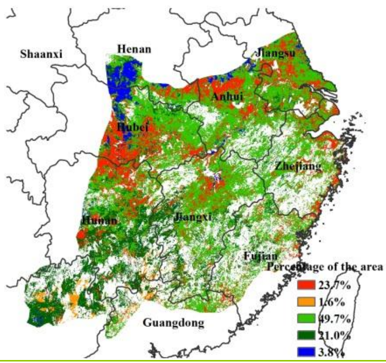
Lower Yangtze region

Crop condition was above the five-year average in the Lower Yangtze region. The CropWatch agroclimatic indicators indicate that temperature was above average, while rainfall was lower than average in this region. The potential biomass decreased by 24% over the five-year average, probably resulting from unfavorable rainfall. During the past four months, crop condition was above average in almost 75% of the region; drought and below average rainfall constrained the growth of crops in the south of Hubei and north of Hunan provinces starting in October 2014. In the south of Henan, northeast of Guangxi, and east of Hunan province, crop condition was above average due to adequate temperature and precipitation, which is confirmed by the distribution of maximum VCI. The value of the maximum VCI was 0.83, while the fraction of cropped arable land did not change compared to its average value.

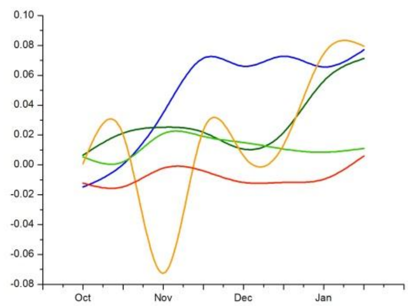
Figure 4.9. Crop condition Lower Yangtze region, October 2014-January 2015



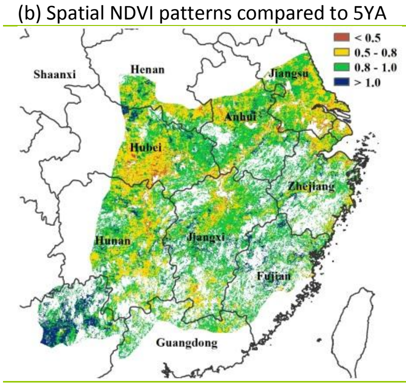
(a) Crop condition development graph based on NDVI



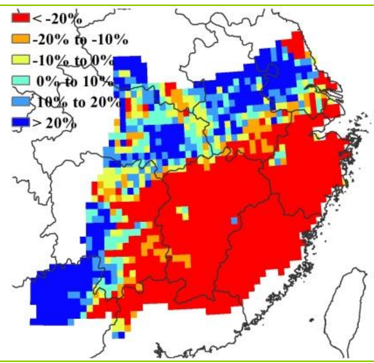
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI



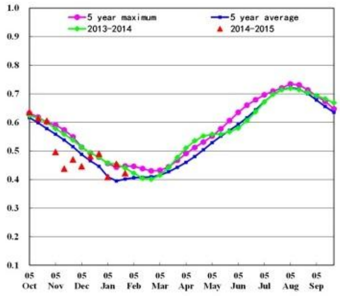
(e) Biomass

Southwest China

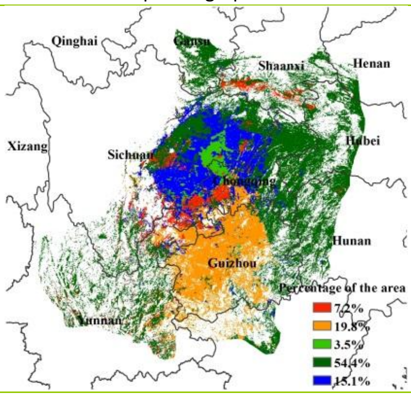
The monitoring period covers planting of winter wheat and rapeseed in Southwest China. Overall, crop conditions shows an above average level, compared to the average of the recent five years. Rain has increased by 81%, accompanied by a temperature rise of 0.8°C and a 3% decrease of RADPAR, resulting in an estimated 59% increase of the potential biomass accumulation. Potential biomass accumulation map also showed above average in most of the region. The cropped arable land fraction stayed the same as the recent five-year average.

According to the spatial NDVI patterns and profiles, winter wheat in the eastern part of Sichuan province experienced below average condition in November 2014, which is confirmed by the NDVI based crop condition development graph, probably due to decreased precipitation (a 19% decrease of precipitation from October to January, which may affect the outcome of the season). A small fraction (7.2% of the region) of land in this region showed below average conditions in December, including southern Shaanxi, southwestern Chongqing, and southeastern Sichuan. Altogether, most of southwestern China displays above average conditions, including Chongqing, Guizhou, northern Yunnan, western Hunan, western Hubei, southern Gansu, and northwestern Guangxi. The overall maximum VCI of 0.91 confirms this positive outlook.

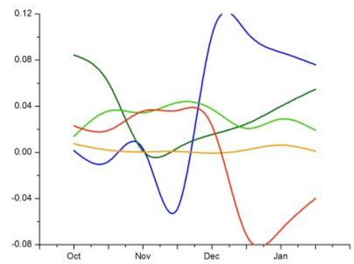
Figure 4.10. Crop condition Southwest China region, October 2014-January 2015



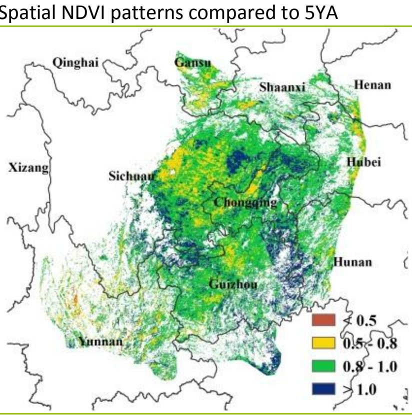
(a) Crop condition development graph based on NDVI



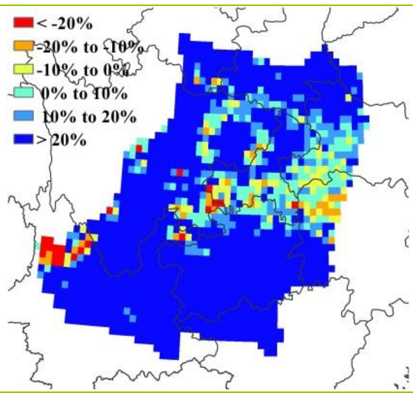
(b) Spatial NDVI patterns compared to 5YA



(c) NDVI profiles



(d) Maximum VCI

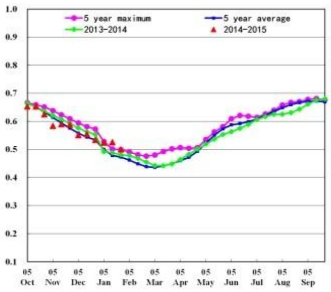


(e) Biomass

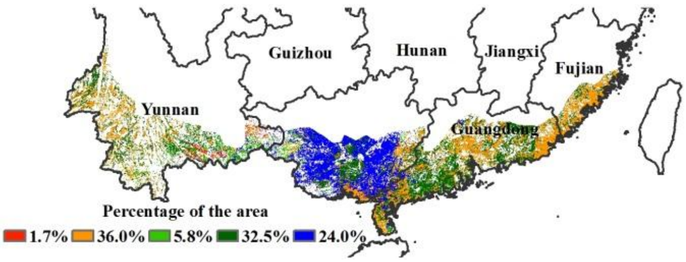
Southern China

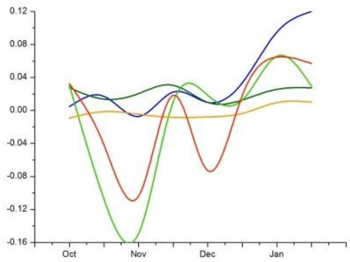
In southern China, the monitoring period corresponds to the harvest season for late rice and the planting season for winter wheat. The overall crop condition currently is average compared to the last five years, which is clearly illustrated by the NDVI-based crop condition development graph. Precipitation increased 20% and temperature was about average (+ 0.5°C), while RADPAR decreased by 3% compared to average. The precipitation in Fujian dropped very significantly (-76%), compared to average, with an absolute value of 57mm, which is bound to negatively impact the growth of winter wheat. The precipitation in Guangdong (+129%), Guangxi (+83%), and Yunnan (+94%) all show an increase over expected values. Maximum VCI reached 0.88, with the cropped arable land fraction staying at the same level as the five-year average. The best crop condition occurs in southern Guangxi and southern Yunnan, with the maximum VCI of most regions attaining to 0.8-1.0 or even above 1.0, indicating an increased production of late rice and winter wheat. For southern Guangdong, the NDVI profile graph shows an overall average level. In general, the indicators show average crop condition in southern China for the monitoring period.

Figure 4.11. Crop condition Southern China region, October 2014-January 2015



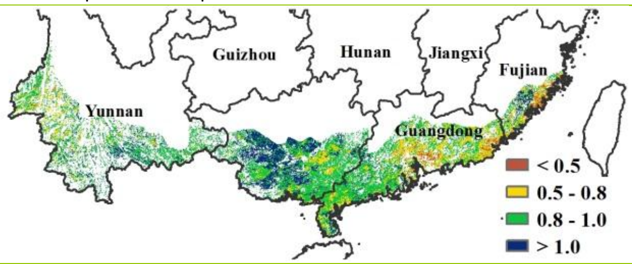
(a) Crop condition development graph based on NDVI



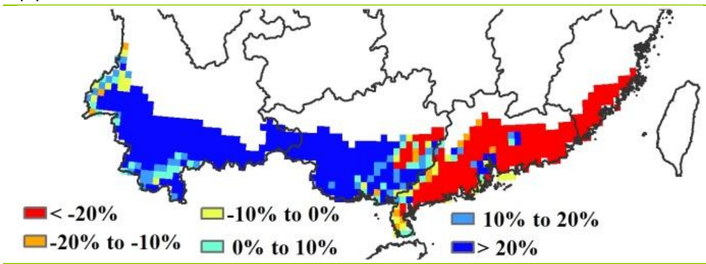


(b) Spatial NDVI patterns compared to 5YA

(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 summarizes disaster events that took place during the reporting period for this bulletin. Sections 5.2 and 5.3 respectively focus on agricultural developments in Africa (Section 5.2) and provide an update on El Nino (5.3).

5.1 Disasters

The price of disasters

Globally, more than 90% of disasters are due to natural geophysical causes. According to Swiss Re, one of the major global reinsurance companies, the total worldwide economic loss from disasters amounted to US$113 billion in 2014, including US$34 billion of insured losses. About eleven thousand people lost their lives.

Although the numbers are large, 2014 actually witnessed a 25% decrease in insured disaster losses compared with 2013, and a 50% reduction in terms of loss of life. 2014 was also an improvement over the average of the previous ten years.

Insured losses are losses covered by insurance, which is to say that only one third of losses due to disasters are actually compensated. It also happens that the sum of all micro-disasters in all sectors by far exceeds the losses due to the large, spectacular disasters. As a result, losses due to unfavorable natural conditions are much larger than losses estimated by insurers. In the area of agriculture, micro-disasters include, among others, isolated pockets of drought, mild pest and disease attacks, hail, and frost. Floods, which typically affect valley bottoms, are associated with water logging and root asphyxiation in much of the catchment basins. While floods get the attention of the media, it is the inconspicuous water logging that causes volumes of production losses far larger than the losses due to actual submersion of fields.

According to the databases maintained by CRED (Centre for Research on the Epidemiology of Disasters) the largest loss due to a disaster in 2014 was caused by the floods that affected Jammu and Kashmir, Azad Kashmir, Gilgit-Baltistan, and Punjab in India and Pakistan in September, with effects extending well into the current CropWatch reporting period. CRED and other sources estimate the damage at US$16 billion, with 300,000 people affected in about 3000 villages.

The second most costly disaster resulted from the impact of cyclone Hudhud in east India in October. CRED puts the total loss at US$7 billion, with 920,000 people affected. According to the Financial Express of India, the combined “loss” to insurance companies due to Jammu and Kashmir floods and Hudhud reaches 40,000 million rupees, which is equivalent to approximately US$650 million. The “insured loss” for these event appears to be only 3% of the total loss, suggesting that the losses of this disaster are mostly carried by poor people, who suffer the largest relative losses and are generally uninsured, with only access to some temporary assistance to support them.

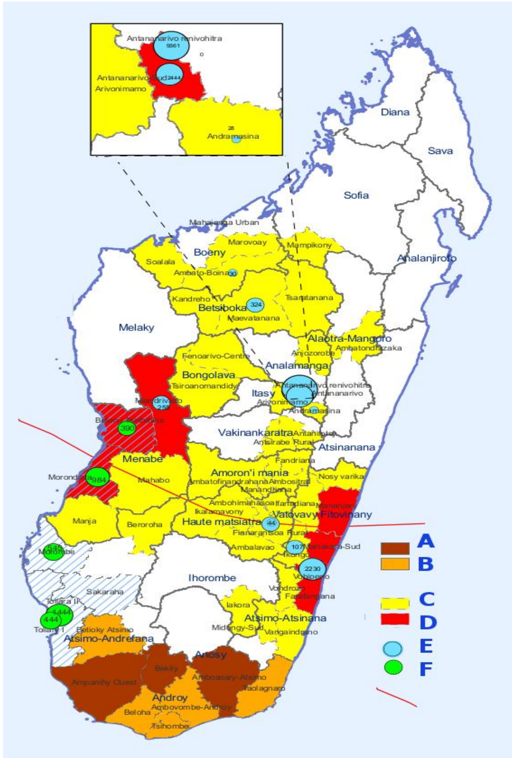
In addition to cyclone Hudhud in October, other major disasters during the current CropWatch reporting period include floods in east and southeast Africa, more cyclones, droughts, floods and landslides, and severe winter conditions. Many of these so called “minor” disasters can only be called as such in terms of global economic loss, not in terms of local human suffering.

Cyclones

As already reported in the recent November 2014 bulletin, cyclone Hudhud was the most destructive cyclone that has ever affected India. Most damage occurred in coastal Andhra Pradesh and Odisha, and crops that suffered most include kharif sugarcane, rice, and pulses still growing at the time of the event. The latest official Indian estimates of total losses due to Hudhud amount to US$3.5 billion, which is only half of the amount listed by CRED[1]. These Indian estimates include losses of US$150 million in agriculture (238,000 hectares lost) and US$220 million in horticulture (from 88,000 hectares damaged to varying degrees). Altogether, the loss to the sector is 10% of the total loss. Indian sources list Hudhud as the main factor behind the country's drop in national rice production this season and as a significant contributing factor for the drop in maize output[2]. In Odisha, for example, it is estimated that 250,000 hectares were directly affected while 50,000 hectares lost most than 50% of yield.

Three additional cyclones deserve mentioning, two for the Philippines and one for Madagascar (see also floods and landslides below). In the Philippines, typhoon Hagupit (known locally as Ruby) first made landfall in Eastern Samar province on 6 December 2014 and again on 7 December in Masbate province. Impacts included 18 casualties and US$114 million in losses, most of it in agriculture (US$82 million). The second tropical storm, known as either Jangmi or Seniang, crossed the center of the country on the very last days of December, causing 66 deaths but relatively little damage to infrastructure. In Madagascar, cyclone Chedza affected large areas (figure 5.1).

Figure 5.1.
Situation in Madagascar on 15 February 2015.



Source: OCHA and Reliefweb.int.
Note: A and B: Districts affected by drought, with highest risk in A; C and D: Districts affected by Chedza ,with D indicating the most affected districts; and E and F: Displaced people due to storm Chedza (E, blue) and Fundi (F, green). The red line indicates the track of Chedza. Hatched areas are those affected by Fundi. Fundi was a moderate tropical storm that occurred from 5 to 9 February 2015.

Drought

Significant drought was reported from the eastern Santa Cruz department in Bolivia at the end of October; according to early estimates about 20,000 hectares were affected. Australia reported wildfires resulting from drought at the beginning of January.

Floods and landslides

Heavy rains started in September in eastern Africa, causing floods in September and October in Ethiopia, in particular in its Afar, SNNP and Somali regions. According to the UN Office for the Coordination of Humanitarian Affairs (OCHA), by the end of 2014, 320,000 people had been displaced by flooding. In Somalia, heavy rains in the south-central region, upper parts of the Shabelle basin, and on the Somali-Ethiopian border caused floods of the Shabelle and Juba rivers. According to ReliefWeb, "many" people were in need of humanitarian assistance.

Floods and landslides were also reported from a number of locations on all continents. In Europe, Switzerland (in November) and especially Slovenia (in October) were affected, as were France, Greece, Italy, and Albania. The European parliament has approved an aid packet in the amount of 127 million Euros.

[1] The different estimates result from methodological differences, for example whether or not loss of life and medical expenses are included and whether or not "agriculture" covers such items as livestock, inland fisheries, and marine fisheries. The mentioning of the affected area in the Indian estimates confirms that the losses are only those that occurred in field crops. Indeed, preliminary damage assessments list losses of US$189 million in field crops; US$267 million in horticulture; US$6.4 million in farm animals and poultry; US$13.4 million in fisheries; and US$0.3 million in silk farming. The estimates excluded damage to agricultural infrastructure.
[2] Estimated at -13% for maize and -1% for rice by CropWatch; refer to November 2014 bulletin.

The Caribbean and neighboring areas (Haiti, the Dominican Republic, Puerto Rico, and Colombia) suffered from rainfall at the beginning of October. In Colombia, the intense precipitation continued into 2015, making thousands of people homeless and killing 38, especially in Antioquia, Valle de Cauca, and Cauca states.

In Asia, floods and landslides took place in China's Yunnan province in October. In November and December excess precipitation created havoc in Indonesia (Nanggroe, Aceh, Darussalam) where more than 120,000 people were temporarily displaced and 40,000 hectares of fish-ponds and 6,000 hectares of agricultural land were damaged. According to OCHA, accompanying landslides on the islands of Sumatra and Java killed at least 171 people between October and December. During the last dekad of December, floods were also reported from Malaysia (Kelantan) and Sri Lanka. In Sri Lanka, by early January, more than 1 million people had been affected in 22 districts, with 39 deaths reported.

The most serious floods in terms of casualties and other impacts during the reporting period were those that affected southeast and southern Africa in January 2015. Several hundreds of people lost their lives, and hundreds of thousands were rendered homeless in Malawi alone where the worst affected districts were Nsanje and Chikwawa in the southern area of the Lower Shire, Phalombe, and Zomba. Rains actually started in December and affected the countries between and including Zimbabwe and Madagascar across the Mozambique Channel. Crops, livestock and agricultural infrastructure were badly damaged. In Mozambique, flooding surpassed the government's capacity to respond to the emergency, according to Reliefweb. A total of 65,000 hectares of crops were destroyed, putting the food security of half a million people at risk in the coming months. In Zimbabwe, flooding affected mostly the provinces of Manicaland, Mashonaland Central, Mashonaland East, Mashonaland West, and Midlands. Finally, in Madagascar, the situation was exacerbated by tropical storm Chedza, which hit the country on 16 January.

Severe winter conditions

Cold spells with typical associated phenomena are reported from various parts of North America (in November) but mostly from several locations in Asia. In Nepal, blizzards and avalanches killed 32 people in October, while in Japan, in December, a heavy snowstorm killed six.

In north India, a cold wave on 25th December did not reach the freezing point, but with temperatures around 3°C nevertheless claimed 12 lives in an area where cold weather rarely occurs (the previous time was in 1991). In the Middle East—in Turkey, Lebanon, Syria, Jordan, and north Egypt—snowstorm Huda (also called Zeina) brought severe winter conditions with cold and snow, adding to the hardship of thousands and freezing several refugees to death in December. In Lebanon alone, one million people were affected, but many more suffered due to their precarious living conditions in refugee camps across the region.

5.2 New optimism for African agriculture?

Recent trends

Many African countries have recently achieved sizeable GDP improvements, with growth rates above 3% for 41 of Africa's 53 countries; Moreover, growth rates are even above 5% for 25 countries and above 7% for 9 countries (2010 data[3]). In few countries, however, did improving agricultural production significantly contribute to this growth. Among the countries with a GDP increase above 5%, the largest contribution of agriculture was achieved by Liberia (77%), followed by Chad (50%), Sierra Leone (49%), Tanzania (42%) and the Democratic Republic of Congo (37%). For most countries, the major contributor to GDP growth was the service sector.

Despite this relatively minor contribution of agriculture and partially driven by high prices after the 2008 crisis, some analysts have declared an "end to the pessimism" about African agriculture. This perspective

[3] http://en.wikipedia.org/wiki/List_of_African_countries_by_GDP_%28PPP%29_per_capita

was voiced in particular by the World Bank (2009) in a joint report with FAO about the "awakening of the sleeping giant" and in a report by Ferguson et al. (2011), in which Africa is dubbed "the other Eden."

These observations are in line with some recent successes with African agriculture in terms of production. As shown in table 5.1, since 2001 per capita productions of maize and rice (as paddy) in East and West Africa have increased by values comparable or larger than the world average. Wheat production per capita also grew significantly in these two regions, as well as in middle Africa. The most typical example is wheat in Nigeria, where wheat is grown as an irrigated dry season crop in the north between November and March. Even here, however, production remains low in absolute terms (about 60,000 tons), while the estimated national demand is at least 50 times larger (Magaji, 2012). Table 5.1 also illustrates that per capita potato output more than doubled in north and middle Africa, while cassava production rose 56% in North Africa, where the crop is used as animal feed and often compensates barley production deficits during unfavorable years.

Table 5.1. Percent change in per capita production of major food crops between 2001 and 2013.

		Africa					
	World	Total	North	East	West	Middle	South
Barley	−18	24	38	20	9	38	42
Maize	38	31	−4	41	51	32	21
Paddy	13	31	−18	43	69	29	−26
Wheat	7	6	18	53	100	92	−29
Other Cereals	−15	−13	−21	40	−30	31	−40
Total Cereal	14	12	3	41	3	32	10
Cassava	32	16	56	8	14	10	n.a.
Potatoes	4	69	114	61	54	122	21
Other R&T	−23	2	25	10	−6	22	3
Total R&T	3	15	103	16	4	13	17
Soybeans	30	63	−4	64	−11	72	436

Note: Data based on FAOSTAT data. "Other cereals" are based on the difference between "total cereals" and the sum of barley, maize, paddy, and wheat; similarly, other roots and tubers (R&T) were calculated by subtracting cassava and potato production amounts from total R&T. Percentages were obtained based on the linear trend of per capita production between 2001 and 2013. Refer to figure 5.2 for the definition of the regions.

Soybeans production increases are among the largest in the world, with a 64% increase in east Africa, 72% in middle Africa, and a more than fourfold increase in southern Africa, in particular South Africa. Per capita production drops affect mostly traditional drought staples (millets and sorghum), rice, and especially wheat in South Africa, where the low demand for wheat compared to maize and soybean has negatively affected production.

Despite these considerable increases in production for some crops, the continent is still very dependent on cereal imports. On the level of the continent, the dependency rate[4]is 30%, with the highest values of this rate in northern Africa (48%), followed by middle Africa (28%), and values close to 20% in southern Africa, western Africa and eastern Africa (20, 19 and 16 percent, respectively).

Could Africa join the major exporters?

For a few crops, world agriculture has been dominated by a limited number of major producers. This is in particular the case for maize (80% of exports from four major producers and 90% from eight) and soybean (80% from three countries; 90% from four). For rice (80% from five countries and 90% from ten) the situation is somewhat different because the major producers (China and India) are not the major exporters, but rather the major consumers. No African country plays any part as a top exporter of maize, or even as a top producer, with the exception of South Africa (11th producer, with about 1% of global production). In terms of production, South Africa is followed by Nigeria (13th), Egypt (17th), Ethiopia (20th), and Tanzania (24th), all with a share in global production well below 1%. Little doubt, however, exists that the situation is bound to change, though the change will likely take decades rather than years.

[4] Computed based on FAOSTAT data as the ratio in percent between imports/(imports + production).

Whether or not African countries can become major exporters, also depends on their own national consumption. The recent upward revision of African population projections (UN, 2013) foresees a fourfold population increase by 2100 compared with 2010, to reach 4.2 billion people (with 1.6 billion each in East and West Africa)—most earlier projections had the 2100 African population at just under two billions. Major increases are projected to take place in Nigeria, Tanzania, Niger, and the Congo, of which only Nigeria and Tanzania are significant producers for maize. This raises the risk of production increases being absorbed by national consumption, leading to situations not unlike the current case of rice in China and India characterized by local consumption and little exportable surplus. Indeed, the data reviewed by Alexandratos (2011) projects that 5.8 to 12.6% of people in Africa will still be undernourished by 2050.

Compared to other continents, ample room exists for the expansion of agriculture in Africa. Table 5.2 compares current land use with areas potentially available for agriculture according to the IIASA/FAO Global Agroecological Zones study (Fischer et al., 2002); it also compares the potential for growth of agricultural areas with projected increases in population.

Table 5.2. Comparison of current agricultural land use with available land by regions in Africa (million hectares)

	Current area with annual and perennial crops (A)	Area suitable for rainfed cereals (B)	Potential increase in cereal area (%) (C)	Area suitable for rainfed cultivation all crops (D)	Potential increase in area for all crops (%) (E)	Projected population increase (percentage)	
						By 2030	By 2050
North	48	75	56%	104	117%	29%	55%
East	75	199	165%	286	281%	71%	159%
West	101	126	25%	194	92%	69%	167%
Middle	28	185	561%	311	1011%	67%	153%
South	14	16	14%	41	193%	15%	27%
Africa	265	601	127%	936	253%	58%	132%
World	1548	2487	61%	3560	130%	22%	38%

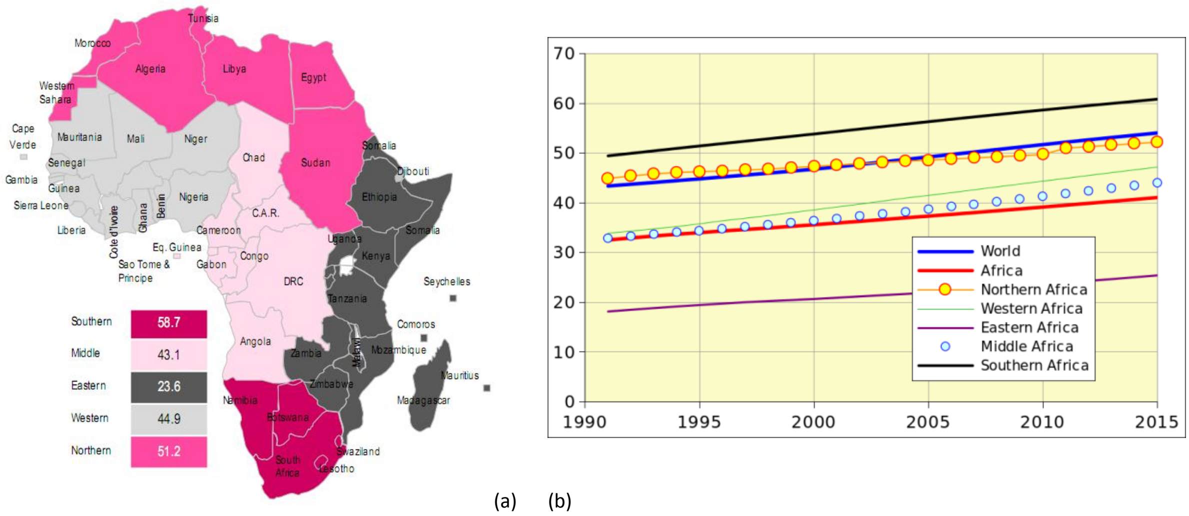
Note: (A) Current areas of arable land with annual and perennial crops, 2010-2012 data from FAOSTAT; (B) Area suitable for rainfed cereals; (C) Potential increase in cereal area is calculated as ((B-A)/A)*100%; (D) Area suitable for rainfed cultivation if all crops are included, calculated as ((D-A)/A)*100%. Columns (B) and (D) are from tables 5.14 and 5.15 in Fischer et al. (2002). Projected percent population increases to 2030 and 2050 are based on data from FAOSTAT. The area of "available land" is a gross number, in the sense that uses other than agriculture (such as settlements, infrastructure, or protected areas) have not been considered. In some countries, actual available land areas may be lower by 10 to 30% compared with the listed values.

The table, of course, only shows a very crude comparison, as area change is only one of several components of production increase; other aspects, in particular yields, irrigation potential, and climate change impacts, have also been extensively studied (IAC 2004, 2006; You et al., 2010; Asenso-Okyere and Jemaneh, 2012). According to FAO data, from 1961 to 1999, production increases in sub-Saharan Africa were achieved by area increases, better yields, and cropping intensities exceeding 100%,with each of these three factors contributing about one third. It is foreseen that, during the period leading up to 2030, the share of yield for increasing production will rise to about 60% while the share of cropping intensity will drop to just 10%. This also shows that hypothetical production rises based on area increase alone are bound to be pessimistic.

Many regions in Africa do have a significant potential to increase their agricultural production for cereals and other crops. This includes maize in the whole continent, rice in middle and western Africa, and "other" cereals (including drought staples) in southern Africa (Fischer et al., 2002). The potential for increasing crop area and production is present in most of the continent (with the exception of the north), in particular in the middle.

Labor, "superfarms," and development corridors

The availability of labor is also important for agricultural growth. Africa is currently the least urbanized continent, although with marked differences between the regions (figure 5.2a). The likely shortage of agricultural labor in rural areas that will follow increased urbanization (figure 5.2b) has been interpreted in contrasting ways by different authors. Collier and Dercon (2009) and Drechsler (2011) tend to see the trend as an opportunity to move away from traditional smallholder agriculture and, perhaps paradoxically, thus reduce poverty in the continent. Migration to cities will stimulate the improvement of farm productivity, mostly through mechanization and modern techniques. It is open to debate, however, to what extent this will eventually benefit the people of Africa. Extreme options for a modernization of agriculture include the setup of large cooperatives or “superfarms,” an option seen as inevitable by Ferguson et al. (2011). Superfarms resulted essentially from “superinvestments.” These superinvestments are often perceived as a geopolitical as much as an agricultural development issue.



(a) (b)

Figure 5.2. Urbanized population for regions in Africa, map (a) and trends (b).

Note: (a) Percentage of urbanized population in 2010 (slightly modified from Ferguson et al., 2011); (b) Recent trends (data based on FAOSTAT).

It is clear that African agriculture needs large investments, but investments are needed as well in a number of supporting and related sectors directly aimed at "people", which may be much less appealing to “superinvestors.” For instance, in East Africa, where the population is projected to reach 1.6 billion in 2100, smallholders currently produce 75% of farm output—while also providing 75% of employment. While Benin (2012) concludes that, overall, many African governments are “serious about agriculture,” it is obvious that the challenges are huge.

A recent report by the African Development Bank (Salami et al., 2010) lists many bottlenecks to the development of commercial agriculture, including inadequate infrastructure and difficult access to credit and markets, not to mention severe land tenure constraints. Experiences from other parts of the world (such as from northeast Thailand and the Brazilian Cerrado) have shown that investment in “general” infrastructure (transports, harbors, and energy supply) is a prerequisite for creating favorable conditions for agricultural development (World Bank, 2009). Moreover, those experiences have shown that the results can be very spectacular, but that increasing food production for national consumption and export is a long-term project. It took about thirty years to multiply soybean production by hundred in Brazil, while cassava production (to be followed by other crops) grew tenfold in Thailand over a similar period.

Africa’s agricultural (and other) development will likely be best achieved in its limited and spatially organized areas dubbed “development corridors.” Two such corridors have received a fair amount of positive and negative media attention (Paul and Steinbrecher, 2013): the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) and the Beira corridor in Mozambique. Both were established in 2010 and constitute attempts at developing infrastructure and people's capacity in whole regions, basically reproducing the Thai and Brazilian success stories.

Conclusion

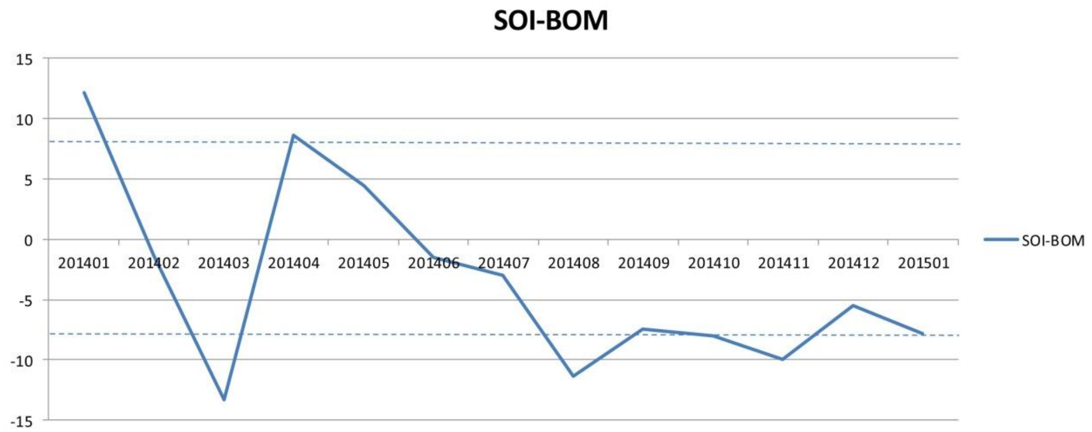
In the wake of the 2008 high food price crisis and some substantial successes achieved in terms of GDP growth by several African countries (mostly in the services sector), the prospects of improved earnings from agriculture have resulted in renewed attention being devoted to the continent by businesses and development agencies alike. It appears that the potential for improved agricultural production is really due to land availability and the low current level of development of agriculture in large areas of the continent, especially in the east, west and middle parts of the continent. But poverty and small-scale agriculture still dominate the landscape, and significant efforts will be needed to create the conditions (including the infrastructure) that will make African agriculture take off and contribute to feeding growing international demand, in addition to feeding itself.

The current "development corridors" that have been established in east and southeast Africa in 2010 are reminiscent of the mechanism which turned the Brazilian Cerrado and northeast Thailand into major food exporters, which took about thirty years. The very broad basis of partners in the initiatives can possibly ensure that the process does permanently lift farmers out of the poverty cycle, even if financial, institutional and societal constraints are severe.

5.3 El Nino

El Niño reports have turned to reporting a “neutral” condition during this monitored season. Figure 5.3 illustrates the behavior of the Southern Oscillation Index (SOI) of the Australian Bureau of Meteorology (BOM) from January 2014 to January 2015. Sustained negative values of SOI below -8 may indicate an EI Niño event, while sustained positive values above +8 are typical of La Niña. Values within the range (-8 to +8) indicate neutral conditions. During the current season, SOI fluctuated between -13.3 and +12.2 from January 2014 to April 2014. The index then dropped gradually until August and reached a value of -11.4. From August 2014 to January 2015, SOI fluctuated around the "inconclusive" value of -8.0 (in January 2015, SOI was at -7.8). Although the SOI was continuously low in the later half year of 2014 and beginning of January 2015, the ENSO tracker status of BOM is “Neutral” as of January 2015, as the SOI does not show sustained negative values below -8.

Figure 5.3. Monthly SOI time series from January 2014 to January 2015



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

Annex A. Agroclimatic indicators and BIOMSS

Tables in this Annex provide additional information about the agroclimatic indicators—RAIN, TEMP, and RADPAR—and BIOMSS for the Monitoring and Reporting Units (MRU) (table A.1), thirty-one main producing and exporting countries (A.2), regions or provinces within large countries—Argentina, Australia, Brazil, Canada, India, Kazakhstan, Russia, and the United States (tables A.3 through A.10), and China (table A.11).

Table A.1. October 2014 to January 2015 agroclimatic indicators and biomass by global Monitoring and Reporting Unit, current value and departure from average

	65 Global MRUs	RAIN		TEMP		RADPAR		BIOMSS	
		Current (mm)	13YA dep. (%)	Current (°C)	13YA dep. (°C)	Current (MJ/m²)	13YA dep. (%)	Current (gDM/m²)	5YA dep. (%)
1	Equatorial central Africa	465	-18	26.0	1.0	1208	7	1399	-11
2	East African highlands	185	-8	19.5	0.1	1237	1	607	-8
3	Gulf of Guinea	245	5	27.3	0.5	1131	-1	680	-5
4	Horn of Africa	262	-23	24.8	0.6	1303	1	858	-11
5	Madagascar (main)	898	18	25.4	0.9	1274	0	1765	7
6	Southwest Madagascar	328	-31	25.6	-0.1	1458	2	848	-29
7	North Africa-Mediterranean	172	-5	14.0	0.8	688	-2	529	-3
8	Sahel	59	26	28.0	0.6	1252	-1	190	6
9	Southern Africa	429	-5	25.4	0.6	1374	3	1173	-10
10	Western Cape (South Africa)	55	-60	19.2	1.7	1567	1	243	-52
11	British Columbia to Colorado	306	8	-6.6	1.7	138	-4	387	11
12	Northern Great Plains	224	54	0.2	0.1	478	-4	667	37
13	Corn Belt	376	4	1.3	-1.0	426	-6	764	-4
14	Cotton Belt to Mexican Noreste	418	17	11.5	-0.4	660	-3	1061	15
15	Sub-boreal America	165	9	-7.9	-0.8	247	-6	394	-6
16	West Coast (North America)	284	-18	9.2	2.2	527	-4	685	1
17	Sierra Madre	148	17	15.3	0.6	982	-5	479	18
18	Southwest U.S. and north Mexican highlands	91	1	9.2	1.3	748	-5	355	0
19	Northern South and Central America	428	-8	26.1	0.7	940	0	1032	-5
20	Caribbean	299	-11	25.2	0.7	943	3	784	-12
21	Central-northern Andes	556	-6	18	1	1149	3	1230	-4
22	Nordeste (Brazil)	203	-27	28.8	2.3	1352	-1	632	-23
23	Central eastern Brazil	630	-17	27.4	1.7	1296	7	1674	-12
24	Amazon	670	-19	28.2	0.7	1132	5	1787	-10
25	Central-north Argentina	465	9	26.3	0.8	1298	0	1436	13
26	Pampas	787	30	23.8	1.2	1366	0	1865	18
27	Western Patagonia	66	-60	13.5	-0.4	1457	1	280	-47
28	Semi-arid Southern Cone	87	-28	18.7	0.0	1482	-1	340	-16
29	Caucasus	345	27	3.7	-0.2	516	-5	810	6
30	Pamir area	186	48	3.1	0.3	684	-6	476	19
31	Western Asia	136	2	7.3	0.4	632	-4	422	-5
32	Gansu-Xinjiang (China)	94	95	-3.8	0.0	556	-5	286	42
33	Hainan (China)	166	-55	21.8	1.0	793	0	384	-51
34	Huanghuaihai (China)	105	44	6.8	0.9	634	-3	376	16
35	Inner Mongolia (China)	66	52	-4.8	0.8	555	-3	259	4
36	Loess region (China)	87	34	2.1	0.7	651	-4	347	18
37	Lower Yangtze (China)	171	-28	12.2	0.8	707	0	592	-24
38	Northeast China	108	28	-7.4	0.1	479	-2	354	-1
39	Qinghai-Tibet (China)	113	16	1.5	0.7	841	-1	336	13
40	Southern China	201	20	16.2	0.5	776	-3	659	16
41	Southwest China	252	81	9.8	0.8	587	-3	762	59
42	Taiwan (China)	32	-84	18.3	0.3	775	-1	168	-77

65 Global MRUs		RAIN Current (mm)	RAIN 13YA dep. (%)	TEMP Current (°C)	TEMP 13YA dep. (°C)	RADPAR Current (MJ/m^2)	RADPAR 13YA dep. (%)	BIOMSS Current (gDM/ m^2)	BIOMSS 5YA dep. (%)
43	East Asia	164	-25	-1.4	-0.3	500	-4	515	-8
44	Southern Himalayas	152	9	17.8	0.6	873	-1	490	26
45	Southern Asia	239	6	23.7	0.6	1006	-2	637	11
46	Southern Japan and Korea	280	-33	8.9	-0.1	565	-5	948	-18
47	Southern Mongolia	102	413	-8.0	1.1	467	-3	375	167
48	Punjab to Gujarat	26	-9	21.2	0.6	940	-3	99	-11
49	Maritime Southeast Asia	1073	-5	26.4	1.0	989	1	2109	-7
50	Mainland Southeast Asia	332	0	25.6	1.1	1000	1	807	0
51	Eastern Siberia	159	-5	-9.7	0.4	271	-2	306	-12
52	Eastern Central Asia	59	13	-14.6	0.6	350	-2	199	0
53	Northern Australia	539	-13	27.5	0.7	1320	3	1331	-14
54	Queensland to Victoria	258	6	19.5	-0.5	1482	0	908	3
55	Nullarbor to Darling	97	-3	19.0	0.1	1591	1	428	-5
56	New Zealand	101	-69	14.0	0.8	1313	1	453	-57
57	Boreal Eurasia	323	28	-2.8	1.7	115	-14	526	13
58	Ukraine to Ural mountains	190	-6	-1.4	-0.3	202	0	588	-8
59	Mediterranean Europe and Turkey	273	-18	10.0	1.4	524	-2	848	-13
60	W. Europe (non Mediterranean)	296	4	7.0	2.1	287	-8	958	6
61	Boreal America	343	44	-2.5	1	441	-5	549	24
62	Ural to Altai mountains	191	53	-7.9	-0.5	238	-10	372	-8
63	Australian desert	136	48	20.8	-0.7	1598	0	574	23
64	Sahara to Afghan deserts	57	-12	18.3	1.1	943	-1	184	-10
65	Sub-arctic America	106	129	-21.4	-2.5	25	-5	146	226

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 thirteen-year average (13YA) for the same period between October and January.

Table A.2. October 2014-January 2015 agroclimatic indicators and biomass by country, current value and departure from average

31 Countries		RAIN Current (mm)	RAIN 13YA Departure (%)	TEMP Current (°C)	TEMP 13YA Departure (°C)	RADPAR Current (MJ/m^2)	RADPAR 13YA Departure (%)	BIOMSS Current (gDM/m^2)	BIOMSS 5YA Departure (%)
[ARG]	Argentina	591	22	23.2	0.7	1384	-1	1539	14
[AUS]	Australia	254	1	20.2	-0.3	1487	0	832	0
[BGD]	Bangladesh	134	-43	22.2	0.6	926	0	508	8
[BRA]	Brazil	634	-14	27.3	1.5	1268	5	1618	-10
[CAN]	Canada	264	15	-5.2	0.0	291	-7	476	5
[CHN]	China	166	14	7.4	0.8	647	-2	478	10
[DEU]	Germany	281	10	6.3	1.8	230	-8	1057	13
[EGY]	Egypt	38	-41	18.1	0.3	784	1	127	-31
[ETH]	Ethiopia	174	15	20.0	0.0	1223	1	544	0
[FRA]	France	275	-15	10.2	3.6	325	-7	916	-10
[GBR]	U. Kingdom	481	36	8.4	2.1	189	-8	1192	16
[IDN]	Indonesia	1042	-10	26.7	1.1	1018	3	2115	-8
[IND]	India	149	5	21.5	0.5	968	-2	436	13
[IRN]	Iran	193	3	8.0	0.3	720	-4	517	-7
[KAZ]	Kazakhstan	160	41	-6.5	-0.8	299	-8	423	-1
[KHM]	Cambodia	402	20	27.6	1.3	1068	3	976	5
[MEX]	Mexico	211	9	19.1	0.4	914	-5	555	20
[MMR]	Myanmar	248	25	13.6	0.8	725	-2	710	29
[NGA]	Nigeria	189	12	27.2	0.4	1207	-1	447	-7
[PAK]	Pakistan	56	-16	14.4	0.3	841	-3	129	-8
[PHL]	Philippines	872	-5	25.5	0.3	897	0	1667	-9

	31 Countries	RAIN		TEMP		RADPAR		BIOMSS	
		Current (mm)	13YA Departure (%)	Current (°C)	13YA Departure (°C)	Current (MJ/m^2)	13YA Departure (%)	Current (gDM/m^2)	5YA Departure (%)
[POL]	Poland	206	8	4.5	1.6	221	-5	887	13
[ROM]	Romania	298	42	4.1	1.1	334	-10	911	17
[RUS]	Russia	187	7	-5.6	-0.6	220	-4	422	-11
[THA]	Thailand	340	17	25.4	0.8	1013	1	793	2
[TUR]	Turkey	376	18	6.1	1.0	555	-5	917	-2
[UKR]	Ukraine	172	-8	1.8	-0.1	287	5	722	-3
[USA]	United States	340	17	5.3	-0.2	550	-4	769	14
[UZB]	Uzbekistan	148	4	4.1	-1.1	534	-6	501	10
[VNM]	Vietnam	289	-18	27.9	0.8	1057	3	932	-15
[ZAF]	South Africa	345	-9	20.8	0.7	1431	2	1132	-9

See note table A.1.

Table A.3. Argentina, October 2014-January 2015 2014 agroclimatic indicators and biomass (by province), current value and departure from average

	RAIN		TEMP		RADPAR		BIOMSS	
	Current (mm)	13YA Departure (%)	Current (°C)	13YA Departure (°C)	Current (MJ/m^2)	13YA Departure (%)	Current (gDM/m^2)	5YA Departure (%)
Buenos Aires	510	17	20.4	0.3	1476	-1	1562	15
Chaco	518	-4	26.8	1.3	1314	-3	1536	3
Cordoba	463	6	22.9	0.6	1431	0	1512	9
Corrientes	1094	57	25.4	1.1	1331	-3	2129	27
Entre Rios	822	49	23.2	0.5	1381	-4	2106	36
La Pampa	340	-9	21.7	0.6	1502	-2	1196	-4
Misiones	1255	50	25.3	1.4	1324	2	2269	19
Santiago Del Estero	432	0	26.2	0.9	1291	-3	1443	11
San Luis	404	4	22.4	0.9	1485	2	1376	9
Salta	631	43	25.1	0.2	1222	1	1618	34
Santa Fe	679	29	24.3	1.1	1368	-3	1879	20
Tucuman	-	-	-	-	-	-	-	-

See note table A.1.

Table A.4. Australia, October 2014-January 2015 agroclimatic indicators and biomass (by state), current value and departure from average

	RAIN		TEMP		RADPAR		BIOMSS	
	Current (mm)	13YA Departure (%)	Current (°C)	13YA Departure (°C)	Current (MJ/m^2)	13YA Departure (%)	Current (gDM/m^2)	5YA Departure (%)
New South Wales	287	20	19.6	-1.0	1508	0	996	14
South Australia	136	23	18.5	0.3	1506	-1	620	24
Victoria	200	-1	16.8	0.0	1449	-2	827	0
Western Australia	138	15	19.8	0.1	1577	1	458	-4

See note table A.1.

Table A.5. Brazil, October 2014-January 2015 agroclimatic indicators and biomass (by state), current value and departure from average

	RAIN		TEMP		RADPAR		BIOMSS	
	Current (mm)	13YA Departure (%)	Current (°C)	13YA Departure (°C)	Current (MJ/m^2)	13YA Departure (%)	Current (gDM/m^2)	5YA Departure (%)
Ceara	119	-38	29.1	1.6	1387	0	489	-11
Goias	654	-25	27.0	1.9	1315	8	1818	-18
Mato Grosso Do Sul	627	-8	27.9	1.3	1324	4	1835	-3
Mato Grosso	876	-14	28.4	1.3	1218	7	2184	-7
Minas Gerais	566	-33	26.0	2.6	1355	10	1537	-21
Parana	761	2	25.2	2.4	1328	9	1960	2
Rio Grande Do Sul	1082	55	23.5	1.2	1318	-1	2211	30
Santa Catarina	1071	38	22.7	2.2	1278	6	2108	9
Sao Paulo	629	-21	26.2	2.6	1349	10	1771	-11

See note table A.1.

Table A.6. Canada, October 2014-January 2015 agroclimatic indicators and biomass (by province), current value and departure from average

	RAIN		TEMP		RADPAR		BIOMSS	
	Current (mm)	13YA Departure (%)	Current (°C)	13YA Departure (°C)	Current (MJ/m^2)	13YA Departure (%)	Current (gDM/m^2)	5YA Departure (%)
Alberta	136	29	-5.4	0.7	271	-4	481	15
Manitoba	101	-17	-7.2	-0.3	302	-6	418	-3
Saskatchewan	89	-11	-6.5	0.8	292	-7	431	8

See note table A.1.

Table A.7. India, October 2014-January 2015 agroclimatic indicators and biomass (by state), current value and departure from average

	RAIN		TEMP		RADPAR		BIOMSS	
	Current (mm)	13YA Departure (%)	Current (°C)	13YA Departure (°C)	Current (MJ/m²)	13YA Departure (%)	Current (gDM/m²)	5YA Departure (%)
Arunachal Pradesh	126	-43	16.5	1.4	811	1	548	-12
Andhra Pradesh	168	-25	25.2	0.6	1048	0	562	-1
Assam	95	-49	22.3	1.3	854	3	416	-4
Bihar	70	-24	21.0	-0.2	908	-3	272	-7
Chandigarh	-	-	-	-	-	-	-	-
Chhattisgarh	117	8	21.7	0.3	1006	-2	475	25
Daman and Diu	18	-23	27.1	2.7	1062	-2	95	-38
Delhi	68	77	18.6	-0.4	881	-3	324	101
Dadra and Nagar Haveli	154	72	25.2	1.2	1041	-2	407	-6
Gujarat	40	76	25.1	1.4	1035	-2	170	27
Goa	343	88	26.5	0.6	1096	-2	762	33
Himachal Pradesh	200	70	3.0	0.0	836	-4	362	-1
Haryana	79	98	17.7	-0.4	869	-3	293	94
Jharkhand	76	-38	20.5	0.3	962	-2	347	-20
Kerala	710	31	26.9	1.6	1021	-7	1443	23
Karnataka	243	26	24.4	0.9	1091	-1	671	14
Meghalaya	135	-51	18.7	1.0	896	2	520	30
Maharashtra	137	38	23.7	0.5	1045	-2	476	23
Manipur	167	-16	17.2	1.1	915	4	651	31
Madhya Pradesh	79	35	20.9	0.1	965	-5	339	16
Mizoram	242	-5	19.6	0.7	948	2	785	31
Nagaland	149	-14	17.7	1.1	860	3	635	39
Orissa	129	-32	22.6	0.5	1000	-1	418	-21
Puducherry	655	54	26.8	1.3	981	-8	1356	26
Punjab	43	-29	16.9	-0.4	824	-3	174	-4
Rajasthan	13	-28	21.0	0.5	948	-3	50	-47
Sikkim	257	79	7.2	1.5	799	-7	556	49
Tamil Nadu	582	14	27.0	1.4	947	-6	1384	28
Tripura	192	-24	21.8	0.4	933	1	677	26
Uttarakhand	274	186	8.6	1.0	874	-2	540	59
Uttar Pradesh	122	100	19.5	-0.4	896	-4	422	56
West Bengal	109	-41	22.0	0.7	931	0	446	2

See note table A.1.

Table A.8. Kazakhstan, October 2014-January 2015 agroclimatic indicators and biomass (by province), current value and departure from average

	RAIN		TEMP		RADPAR		BIOMSS	
	Current (mm)	13YA Departure (%)	Current (°C)	13YA Departure (°C)	Current (MJ/m²)	13YA Departure (%)	Current (gDM/m²)	5YA Departure (%)
Akmolinskaya	140	44	-8.4	-0.8	246	-9	371	-7
Karagandinskaya	135	48	-8.2	-0.7	311	-7	381	-2
Kustanayskaya	142	37	-7.4	-0.7	231	-10	392	-11
Pavlodarskaya	125	63	-8.1	-0.2	239	-10	374	5
Severo kazachstanskaya	155	54	-8.3	-0.7	192	-13	347	-16
Vostochno kazachstanskaya	212	48	-8.7	0.0	330	-12	377	4
Zapadno kazachstanskaya	115	-10	-4.3	-1.7	280	0	503	-11

See note table A.1.

Table A.9. Russia, October 2014-January 2015 agroclimatic indicators and biomass (by oblast), current value and departure from average

	RAIN		TEMP		RADPAR		BIOMSS	
	Current (mm)	13YA Departure (%)	Current (°C)	13YA Departure (°C)	Current (MJ/m^2)	13YA Departure (%)	Current (gDM/m^2)	5YA Departure (%)
Bashkortostan Rep.	220	23	-6.5	-0.6	168	-17	396	-14
Chelyabinskaya Oblast	144	27	-6.9	-0.2	188	-13	376	-12
Gorodovikovsk	-	-	-	-	-	-	-	-
Krasnodarskiy Kray	198	-18	-2.3	0.5	282	0	507	-5
Kurganskaya Oblast	172	55	-7.9	-0.7	171	-13	341	-19
Kirovskaya Oblast	253	11	-6.1	-1.2	118	-9	391	-19
Kurskaya Oblast	121	-36	-0.7	-0.4	241	9	587	-17
Lipetskaya Oblast	128	-33	-1.6	-0.5	227	6	591	-12
Mordoviya Rep.	180	-11	-3.8	-1.0	179	0	494	-15
Novosibirskaya Oblast	207	51	-9.5	-0.4	171	-13	306	-19
Nizhegorodskaya Oblast	220	3	-3.7	-0.6	144	-6	489	-13
Orenburgskaya Oblast	158	5	-5.8	-0.9	228	-8	442	-13
Omskaya Oblast	199	63	-9.3	-0.5	167	-9	304	-22
Permskaya Oblast	249	20	-7.9	-1.3	119	-15	340	-21
Penzenskaya Oblast	173	-13	-4.0	-1.3	205	1	498	-15
Rostovskaya Oblast	215	-5	0.6	-1.7	306	2	689	-8
Ryazanskaya Oblast	152	-24	-2.5	-0.7	183	2	554	-11
Stavropolskiy Kray	192	-3	3.1	-1.6	352	-1	740	4
Sverdlovskaya Oblast	185	37	-8.3	-1.2	143	-10	326	-20
Samarskaya Oblast	161	-2	-4.7	-1.1	202	-6	476	-14
Saratovskaya Oblast	139	-12	-3.7	-1.6	249	1	522	-16
Tambovskaya Oblast	151	-25	-2.6	-1.1	224	5	557	-14
Tyumenskaya Oblast	189	52	-9.2	-1.1	160	-7	303	-24
Tatarstan Rep.	206	10	-5.0	-0.9	151	-16	445	-16
Ulyanovskaya Oblast	150	-14	-4.4	-1.1	185	-7	478	-15
Udmurtiya Rep.	256	23	-6.5	-1.1	122	-17	385	-18
Volgogradskaya Oblast	184	11	-1.9	-1.9	281	3	589	-15
Voronezhskaya Oblast	137	-26	-1.3	-1.0	259	7	601	-17

See note table A.1.

Table A.10. United States, October 2014-January 2015 agroclimatic indicators and biomass (by state), current value and departure from average

	RAIN		TEMP		RADPAR		BIOMSS	
	Current (mm)	13YA Departure (%)	Current (°C)	13YA Departure (°C)	Current (MJ/m^2)	13YA Departure (%)	Current (gDM/m^2)	5YA Departure (%)
Arkansas	687	42	9.2	-0.5	602	-4	1346	11
California	222	-9	10.2	2.3	626	-4	543	-6
Idaho	281	49	-0.5	1.2	473	-4	574	8
Indiana	346	-12	3.2	-1.5	479	-7	908	-5
Illinois	374	8	3.3	-1.2	485	-8	912	-1
Iowa	292	45	0.7	-0.8	494	-5	774	16
Kansas	261	62	5.1	0.0	606	-4	821	56
Michigan	296	-6	-0.2	-1.5	370	-8	694	-10
Minnesota	223	33	-3.2	-0.6	402	-4	573	13
Missouri	497	53	5.5	-0.6	542	-5	1039	13
Montana	256	152	-1.4	0.4	434	-3	658	47
Nebraska	206	71	1.9	-0.1	569	-1	758	55
North Dakota	196	95	-3.7	0.0	405	-4	560	37
Ohio	249	-30	3.2	-1.2	456	-6	893	-6
Oklahoma	367	49	8.7	-0.2	628	-7	1086	46
Oregon	255	-27	5.1	1.7	417	-6	794	12
South Dakota	260	139	-0.2	-0.1	491	-2	738	64
Texas	294	20	12.8	-0.1	700	-6	829	31
Washington	407	14	3.8	1.4	342	-6	873	24
Wisconsin	261	5	-1.8	-1.3	391	-9	624	-7

See note table A.1.

Table A.11. China, October 2014-January 2015 agroclimatic indicators and biomass (by province), current value and departure from average

	RAIN		TEMP		RADPAR		BIOMSS	
	Current (mm)	13YA Departure (%)	Current (°C)	13YA Departure (°C)	Current (MJ/m^2)	13YA Departure (%)	Current (gDM/m^2)	5YA Departure (%)
Anhui	228	21	10.1	0.5	674	-1	784	23
Chongqing	206	24	9.8	1.1	498	-3	703	17
Fujian	57	-76	13.5	0.7	782	2	277	-65
Gansu	67	-57	17.4	0.7	781	-6	291	-50
Guangdong	113	129	0.7	0.4	665	-4	388	92
Guangxi	349	83	16.0	0.8	698	-5	930	43
Guizhou	307	85	10.7	0.9	529	-4	967	77
Hebei	32	-35	1.8	0.9	601	-3	152	-38
Heilongjiang	142	42	8.2	1.1	651	-4	555	36
Henan	123	52	-9.7	-0.3	443	-1	353	7
Hubei	233	33	9.8	1.0	635	-3	750	19
Hunan	252	4	12.1	1.1	647	-2	800	-1
Jiangsu	104	15	-5.9	0.0	511	-2	391	-4
Jiangxi	194	34	9.6	0.3	665	-1	628	19
Jilin	95	-67	13.1	0.9	735	1	406	-56
Liaoning	87	-7	-1.1	0.7	560	-3	364	-18
Inner Mongolia	78	87	-7.2	0.8	512	-2	276	18
Ningxia	95	173	0.0	0.5	661	-5	341	79
Shaanxi	159	64	8.5	0.6	580	-4	549	52
Shandong	103	55	6.7	0.9	628	-3	393	15
Shanxi	129	33	3.9	0.5	609	-5	470	21
Sichuan	48	-19	0.2	0.8	638	-4	222	-26
Yunnan	292	94	12.2	0.5	776	0	823	83
Zhejiang	101	-65	11.5	0.7	716	4	389	-58

See note table A.1.

Annex B. 2014-2015 production estimates

Tables B.1 –B.3 present 2014-2015 CropWatch production estimates for Argentina, Australia, and Brazil.

Table B.1. Argentina, 2014-2015 wheat production, by province (thousand tons)

	Wheat	
	2014-2015	Δ%
Buenos Aires	6290	12.0
Córdoba	1089	5.9
Entre Rios	867	4.4
Santa Fe	1398	4.9
Sub total	9644	9.5
Other provinces	2409	42.4
Argentina	12053	14.8

Δ% indicates percentage difference with 2013-2014.

Table B.2. Australia, 2014-2015 wheat production, by state (thousand tons)

	Wheat	
	2014-2015	Δ%
New South Wales	6180	-7
South Australia	4241	-18
Victoria	3029	-14
Western Australia	10305	-2
Sub total	23755	-8
Other states	826	-31
Australia	24581	-9

Δ% indicates percentage difference with 2013-2014.

Table B.3. Brazil, 2014-2015 wheat production, by state (thousand tons)

	Wheat	
	2014-2015	Δ%
MG Do Sul	25	6
Minas Gerais	191	0
Parana	2174	10
Rio Gr. Do Sul	3643	3
Santa Catarina	241	-7
Sao Paulo	211	-4
Sub total	6485	5
Other states	225	-33
Brazil	6710	9

Δ% indicates percentage difference with 2013-2014.

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 (2009-13), 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 (2009-13), 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 (2009-2013), 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 thirteen-year average (2001-13), 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 thirteen-year average (2001-13), 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 13 years (2001-13), 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	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

INDICATOR			
		year." Values can exceed the range if the current year is the best or the worst.	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 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).	Low VHI values indicate unusually poor crop condition, but high values, when due to low temperature, may be difficult to interpret. VHI is 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.

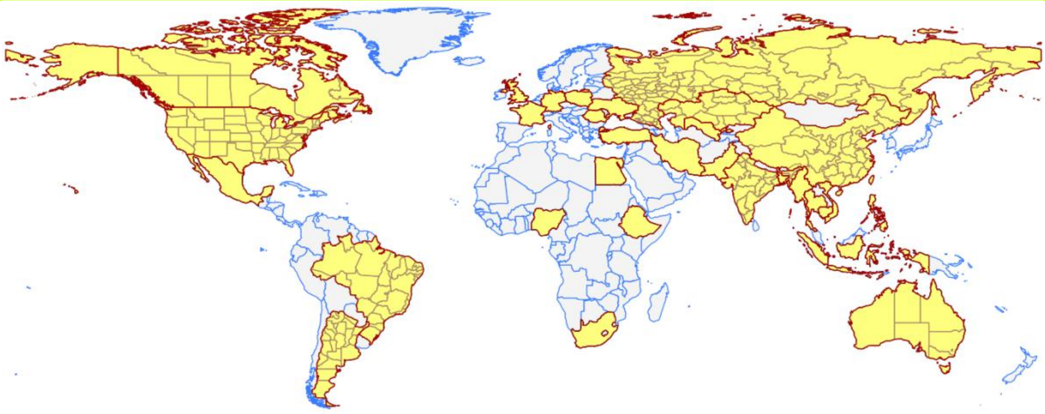
CropWatch spatial units (CWSU)

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.

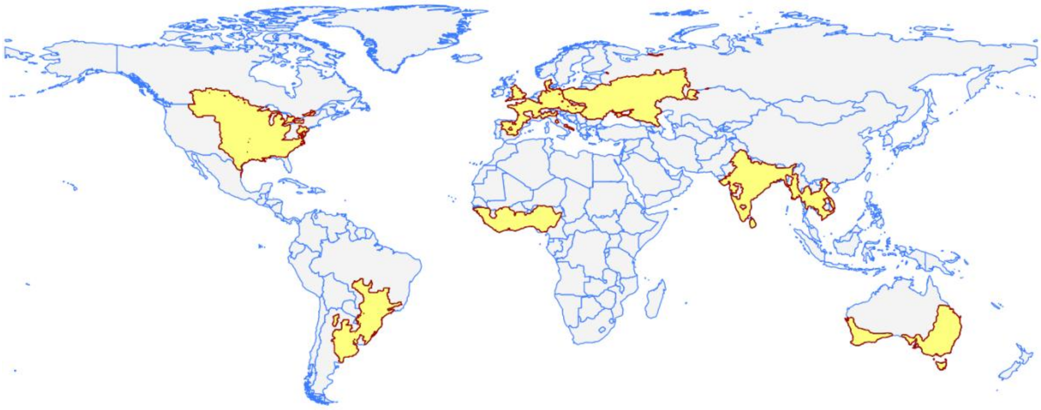
Countries (and first-level administrative districts, e.g., states and provinces)

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.

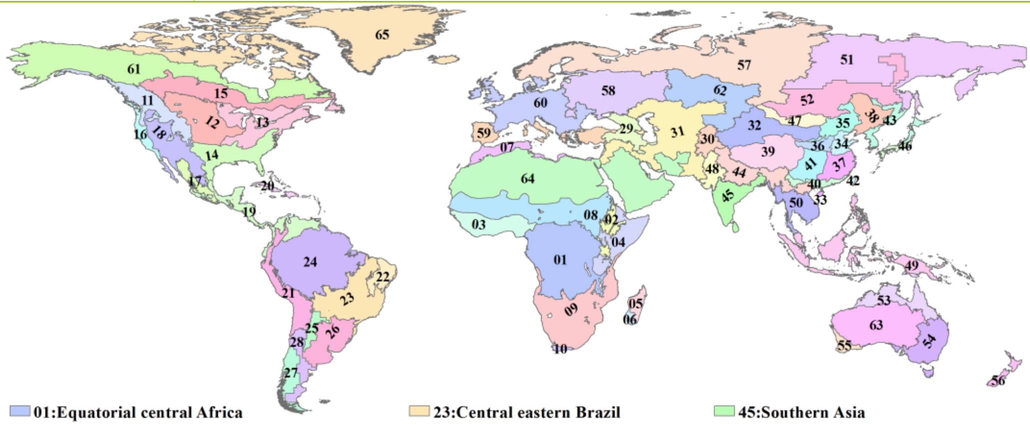


Major Production Zones (MPZ)

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



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, Australia, USA, and Canada, 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 for other 27 countries, 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).

Data notes and bibliography

Alexandratos, N. 2011. Critical evaluation of selected projections, pp. 465-506 in: Conforti, P. (Ed) 2011. Looking ahead in world food and agriculture: Perspectives to 2050. FAO, Rome. 539 pp.

Asenso-Okyere K. and S. Jemaneh. 2012. Increasing agricultural productivity & enhancing food security in Africa. New Challenges & Opportunities, Synopsis of an international conference. IFPRI, Washington. 25 pp. http://www.ifpri.org/sites/default/files/publications/oc71.pdf

Australian Bureau of Meteorology (BOM), http://www.bom.gov.au/climate/enso/

BBC, 2015. Malawi floods kill 170 and leave thousands homeless, http://www.bbc.com/news/world-africa-30854140

BBC, 2015. Mozambique and Malawi floods cause havoc, http://www.bbc.com/news/world-africa-30821256

Benin, S. 2012. Are African Governments serious about agriculture. Discussion note N. 4, Transforming Agriculture Conference, IFPRI, Washington. 8pp.

Collier, P and S Dercon. 2009. African Agriculture in 50 years: Smallholders in a Rapidly Changing World? Expert Paper for the FAO Conference on “How to Feed the World in 2050?”, FAO, Rome, 12-13 October. 13 pp. ftp://ftp.fao.org/docrep/fao/012/ak983e/ak983e00.pdf

Deccan Chronicle, 2015. Hudhud caused Rs 21,908 crore loss, agriculture sector worst hit: AP government. http://www.deccanchronicle.com/141219/nation-current-affairs/article/hudhud-caused-rs-21908-crore-loss-agriculture-sector-worst-hit

Disaster Report, 2015. http://www.disaster-report.com/

DNA India, 2014. Cyclone Hudhud caused Rs 21,908 crore loss, agriculture sector worst hit: Andhra government. http://www.dnaindia.com/india/report-cyclone-hudhud-caused-rs-21908-crore-loss-agriculture-sector-worst-hit-andhra-government-2045435

Drechsler, D. 2011. The future of African agriculture: Can smallholders be the answer? http://www.voxeu.org/article/future-african-agriculture-can-smallholders-be-answer

EM-DAT The International Disaster Database (Centre for Research on the Epidemiology of Disasters (CRED), www.emdat.be/database

FAO, 2014. Crop Prospects and Food Situation. No. 4. December 2014. http://www.fao.org/3/a-i4256e.pdf

FAO, 2015. FAO/WFP Crop and Food Security Assessment - Liberia, Sierra Leone and Guinea. 5 January 2015. http://www.fao.org/3/a-i4311e.pdf

FAO, FAOStat, http://faostat.fao.org/

FAO, GIEWS, country briefs Thailand and Myanmar, http://www.fao.org/giews/countrybrief/
Times of India, 2014. Hudhud caused Rs 21,908 cr loss, agriculture sector worst hit: Andhra Pradesh govt, http://timesofindia.indiatimes.com/india/Hudhud-caused-Rs-21908-cr-loss-agriculture-sector-worst-hit-Andhra-Pradesh-govt/articleshow/45576611.cms

Ferguson, R., D. Krishna, Y. Mhango, A. Alexander, R. Kuzviwanza, A. Oliver, O. Mfune, I. Pretorius & J. Lutzweiler. 2011. African agriculture, this other Eden. Renaissance Capital, Moscow, Russia. 220 pp. http://www.fastestbillion.com/res/Research/This_other_Eden-211111.pdf

FEWS NET (Famine Early Warning Systems Network), 2015. Nigeria Food Security Alert: Boko Haram violence limits farming and market activity in northeast Nigeria. January 7. http://www.fews.net/sites/default/files/documents/reports/Nigeria_Alert_201501_0.pdf

Financial Express, 2015. http://www.financialexpress.com/

Fischer, G., H. van Velthuizen, M. Shah, F. Nachtergaele. 2002. Global Agro-ecological Assessment for Agriculture in the 21st Century: Methodology and Results. IIASA, Laxenburg, Austria and FAO, Rome, Italy. 119 pp.

Global Drought Information System, http://www.drought.gov/gdm/current-conditions

IAC 2004. Realizing the Promise and Potential of African Agriculture. IAC, Amsterdam. 233 pp. http://www.interacademycouncil.net/24026/AfricanAgriculture.aspx

IAC 2006. Realizing the promise and potential of African agriculture Implementation of recommendations and action agenda. Report of the Ad-Hoc Follow-up Committee. InterAcademy Council, Amsterdam. 19 pp. http://www.interacademycouncil.net/File.aspx?id=27838

IFRC (International Federation of Red Cross and Red Crescent Societies), 2015. http://www.ifrc.org/

Magaji, M.D. 2012. Presentation at Wheat for Food Security in Africa conference, Oct 8, 2012, Addis Ababa, Ethiopia. http://www.slideshare.net/CIMMYT/09-magajiabubakarolabanjicurrent-statusofwheatinnigeria.

NOAA Climate Prediction Center, http://www.cpc.ncep.noaa.gov/data/indices/

NOAA National Climatic Data Center, http://www.ncdc.noaa.gov/sotc/global/2014

Paul, H. and R. Steinbrecher. 2013. African Agricultural Growth Corridors and the New Alliance for Food Security and Nutrition. Who benefits, who loses? EcoNexus Report. 17 pp. http://www.econexus.info/sites/econexus/files/African_Agricultural_Growth_Corridors_&_New_Alliance_-_EcoNexus_June_2013.pdf

Reliefweb.Int, 2014, http://reliefweb.int
http://reliefweb.int/sites/reliefweb.int/files/resources/Avis_spet%202014_%20ENGLISH%20VERSION.pdf;
http://reliefweb.int/report/madagascar/madagascar-situation-humanitaire-madagascar-saison-cyclonique-et-s-cheresse.

Salami, A., A. B. Kamara and Z. Brixiova. 2010. Smallholder Agriculture in East Africa: Trends, Constraints and Opportunities. Working Papers Series N° 105 African Development Bank, Tunis, Tunisia. 52 pp.

Sasson, A. 2012. Food security for Africa: an urgent global challenge. Agriculture & Food Security, 1:2. http://www.agricultureandfoodsecurity.com/content/pdf/2048-7010-1-2.pdf

Swiss RE, 2014. Preliminary sigma estimates: global disaster events cost insurers USD 34 billion in 2014. http://www.swissre.com/media/news_releases/Preliminary_sigma_estimates_global_disaster_events_cost_insurers_USD_34_billion_in_2014.html

UN 2013. Demographic Components of Future Population Growth. United Nations Department of Economic and Social Affairs, Population Division, Technical Paper No. 2013/3. 19 pp.

UNHCR (The UN Refugree Agency). 2015 UNHCR regional operations profile – Africa. http://www.unhcr.org/pages/4a02d7fd6.html

USDA, Weekly Weather and Crop Bulletin, http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1393

WAMIS, http://www.wamis.org/index.php

Wikipedia, 2015. "North American cold wave", http://en.wikipedia.org/wiki/November_2014_North_American_cold_wave.

Wikipedia, 2015. "Typhoon Hagupit", http://en.wikipedia.org/wiki/Typhoon_Hagupit_%282014%29.

Wikipedia, 2015. "Typhoon Haiyan", http://en.wikipedia.org/wiki/Typhoon_Haiyan.

World Bank 2009. Awakening Africa's Sleeping Giant. Prospects for Commercial Agriculture in the Guinea Savannah Zone and Beyond. Directions in development, Agriculture and Rural Development. World Bank, Italian Ministry of Foreign Affairs and FAO, Rome. 219 pp

You, L., C. Ringler, G. Nelson, U. Wood-Sichra, R. Robertson, S. Wood, Z. Guo, T. Zhu, Y. Sun. 2010. What is the irrigation potential for Africa? A combined biophysical and socioeconomic approach. IFPRI discussion paper 993, IFPRI, Washington. 30 pp. http://www.ifpri.org/sites/default/files/publications/ifpridp00993.pdf)

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Online resources

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

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

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

The latest 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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