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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 July-October periods from 2009 to 2013; one of the standard reference periods and referred to as “recent past.”
13YA	Thirteen-year average, the average for the July-October periods from 2001 to 2013; one of the standard reference periods and referred to as “last decade.”
BIOMSS	Agroclimatic indicator for biomass production potential
CALF	Cropped Arable Land Fraction
CAS	Chinese Academy of Sciences
CWSU	CropWatch Spatial Units
DM	Dry matter
EC/JRC	European Commission Joint Research Centre
ENSO	El Niño Southern Oscillation
FAO	Food and Agriculture Organization of the United Nations
GAUL	Global Administrative Units Layer
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
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 July 1 and October 31, 2014. It is the 95th 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), six regions that contribute most to global food production	As above, plus CALF, VCIX, and VHIn, and cropping intensity
Chapter 3	31 key countries (main producers and exporters)	As above plus NDVI
Chapter 4	China	As above
Chapter 5	<i>Special topics and outlook</i>	
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 present bulletin assesses the recent agroclimatic and agronomic factors up to October 2014 that determine crop development and the 2014 agricultural production. The analyses of environmental and satellite-based agronomic indicators focus on worldwide patterns and zoom into major production areas and countries. This bulletin also reports about disasters and El Niño perspectives and includes estimates of global cereal and soybean production prepared by CropWatch.

Overall agroclimatic conditions

During the reporting period, several regions were affected by a combination of unusual, and sometimes extreme, values of rainfall and temperature, usually accompanied by correlated changes in solar radiation.

Large areas of central and southern South America experienced a heat wave (temperatures between 2.0 and 2.4°C above average; +2.6°C in Paraguay), often accompanied by rainfall that exceeded averages by 15 to 25%. The phenomenon affected crops but did not severely reduce yields, in spite of the high temperatures. The high temperature was often brought about by abundant sunshine, for instance in Colombia (photosynthetically active radiation, +6%) and Ecuador (+8%). In North America, the largest temperature anomaly (+2.6°C) occurred on the West Coast and was associated with low radiation and rainfall that was 12% above average.

Some areas in Europe and Asia, from the Mediterranean to western Siberia across northeast Asia, suffered from a combination of mild drought (-5% to -25% precipitation) and low temperature, while more severe drought (-40% and below) affected many southern locations, including New Zealand, the Western Cape area in South Africa and adjacent areas (Botswana -56% and Swaziland -51%), and areas in southern and north Australia. Large positive rainfall departures affected the northern Great Plains in the United States (+61%), an area centered around the Mongolia region (+255%), and China's Gansu-Xinjiang (+198%), Uzbekistan (+175%), Kyrgyzstan (181%), and Tajikistan (+311%). While creating havoc in some places, the rainfall has replenished soil moisture, favored the development of rangelands—a welcome occurrence in most pastoralist economies, and created favorable conditions for the coming winter crop.

Agronomic indicators

High cropping intensities of over 150% prevail in South America and in South and South-east Asia. While for most winter crop land the cropping intensity values are close to 120%, the variable drops to 100% in areas (such as parts of Russia) that are too cold for winter crops. Modest increases in cropping intensity (+2%) are reported for South America and South Australia, but significant decreases occurred in western Europe (-6%) and South and South-east Asia (-7%). Most countries report little change in cropping intensity, with some exceptions (Cambodia -18%, the Philippines -14%, United Kingdom -13%), which can usually be accounted for by the occurrence of extreme events. In China, favorable conditions led to increased cropping intensity, with positive values in regions that did better than expected (Inner Mongolia +4% and Loess region +5%) and negative values in areas affected by drought and other unusual environmental conditions (Lower Yangtze -7%, Southwest China -11%, and Southern China -13%). The fraction of cropped arable land increased in the Americas (+8% in the north and +4% in the south) and in the south of Australia (+12%). In South America, the numbers above are part of the explanation for the

good performance of most crops in Argentina and Brazil: both countries underwent a record increase (+10% for both) in the fraction of cropped arable land.

Projected 2014 production

CropWatch puts the combined global estimate of 2014 maize, rice, and wheat output at 2,469 million tons: 994 million tons of maize, 756 million tons of rice, and 720 million tons of wheat. Soybean is estimated to reach 295 million tons. This amounts to no change for maize and rice, while wheat is up 2% compared with the last season. Soybean records a more significant increase of 6%.

When only major producers are considered, the situation is slightly less favorable for maize (-1% compared to last season), similar for rice (0%) and wheat (+2%), but significantly better for soybean (+9%), due to favorable weather but also because minor soybean producers keep losing ground compared with the big three producers: the United States, Brazil, and Argentina. The figures also confirm that maize and rice continue consolidating their global dominance among cereals (mostly at the expense of spring wheat).

As far as the major exporters are concerned, their production basically stagnates, except for soybean for which the offer may increase by as much as 7%. Maize production drops are estimated to occur in North America (United States -1%, but mostly in Canada: -16%), Poland (-12%), and in India (-13%); India this year ranks 6th in terms of production.

A major feature of the current season is that, after several poor seasons, favorable conditions returned to the main agricultural regions of South America: wheat production increased 15% in Brazil and as much as 22% in Argentina; for soybean, the increase amounts to 9% and 4%, respectively.

In China, the total production of the three main cereals amounts to 513 million tons. The figure reaches 564 million tons of food if minor cereals, tubers, and legumes (including 13 million tons of soybeans) are added. Compared with previous year's output, maize in China dropped 1%, rice remained stable, and wheat increased 1%. Most changes relate directly to weather conditions, except for soybean (-1%) where the drop is the continuation of a decade-long trend.

الملخص التنفيذي

تُقيّم النشرة الحالية العوامل المناخية الزراعية والهندسية الزراعية حتى أكتوبر 2014 والتي تُظهر تطور المحاصيل والإنتاج الزراعي في عام 2014. تركز تحليلات عوامل الهندسة الزراعية البيئية وتلك المستندة إلى الأقمار الصناعية على الأنماط العالمية وتُلقي مزيداً من الضوء على مناطق ودول الإنتاج الكبرى. تتحدث النشرة كذلك عن الكوارث ومنظور ظاهرة النينو كما تشمل تقديرات لإنتاج الحبوب وفول الصويا على مستوى العالم من إعداد CropWatch.

الظروف المناخية الزراعية العامة

تأثرت مناطق عدة أثناء الفترة التي يغطيها التقرير نتيجة مجموعة من العوامل غير المعتادة والقاسية في بعض الأحيان إلى جانب معدلات سقوط الأمطار ودرجات الحرارة، التي يرافقها عادة تغيرات مصاحبة في الإشعاع الشمسي.

وقد شهدت مناطق كبيرة من وسط وجنوب أمريكا الجنوبية موجة حرارة (تتراوح درجات الحرارة بين 2 و 2.4 مئوية فوق المعدل المتوسط، و+2.6 مئوية في باراغواي)، وغالباً ما يصاحب ذلك سقوط الأمطار الذي يتجاوز المعدلات الطبيعية بنسبة تتراوح من 15 إلى 25%. وقد أثرت الظاهرة على المحاصيل لكنها لم تخفض إنتاج المحاصيل بشكل حاد، رغم ارتفاع درجات الحرارة. وقد كانت درجات الحرارة المرتفعة تُعزى في الغالب إلى كثرة سطوع الشمس، في كولومبيا على سبيل المثال (معدل إشعاع التمثيل الضوئي النشط، +6%، والإكوادور (+8%). وفي أمريكا الشمالية، فإن أكبر انحراف لدرجات الحرارة (+2.6 مئوية) حدث في الساحل الغربي وكان مرتبطاً بانخفاض الإشعاع وسقوط الأمطار الذي تجاوز المعدل المتوسط بـ 12%.

وقد عانت بعض المناطق في أوروبا وآسيا، من البحر المتوسط إلى غرب سيبيريا عبر شمال شرق آسيا، من عدة عوامل منها الجفاف الطفيف (بمعدل هطول -5% إلى -25%) وانخفاض درجات الحرارة، بينما ضرب جفاف أكثر حدة (-40% أو أقل) العديد من الأجزاء الجنوبية، بما في ذلك نيوزيلندا ومنطقة الرأس الغربي في أمريكا الجنوبية والمناطق المجاورة (بتسوانا -56% وسوازيلاند -51%)، ومناطق في جنوب وشمال أستراليا. كما أثرت الانحرافات الموجبة الكبيرة في سقوط الأمطار على منطقة السهول الكبرى بالولايات المتحدة (+61%)، وهي منطقة تركز حول منطقة منغوليا (+255%)، ومنطقة جانسو-زينجيانج بالصين (+198%)، وأوزباكستان (+175%)، وكيرجستان (181%)، وطاجيكستان (+311%). وفي حين أن سقوط الأمطار تسبب في إشاعة الفوضى في بعض الأماكن، إلا أنه ساعد على إعادة رطوبة التربة، وعزز من ظهور المراعي الفسيحة - وهو حدث يلقي ترحيباً في معظم الاقتصاديات الرعوية، كما أنه خلق ظروفاً مواتية للمحصول الشتوي القادم.

العوامل الهندسية الزراعية

تسود الكثافة المرتفعة للمحاصيل بما يتجاوز 150% في أمريكا الجنوبية وفي الجنوب و جنوب شرق آسيا. وفي حين أن كثافة المحاصيل في معظم أراضي المحاصيل الشتوية تقترب من 120%، إلا أن هذا المعامل المتغير ينخفض إلى 100% في بعض المناطق (مثل أجزاء من روسيا) التي تتسم بالبرودة الشديدة بالنسبة للمحاصيل الشتوية. كما ترد تقارير عن زيادات متواضعة في كثافة المحاصيل (+2%) في أمريكا الجنوبية و جنوب أستراليا، لكن حدثت انخفاضات كبيرة في غرب أوروبا (-6%) و جنوب و جنوب شرق آسيا (-7%). تتحدث معظم الدول عن تغير طفيف في كثافة المحاصيل، مع بعض الاستثناءات (كمبوديا -18%، والفلبين -14%، والمملكة المتحدة -13%)، والتي يمكن أن تُعزى عادة إلى وقوع ظروف قاسية. أما في الصين فقد أدت الظروف المواتية إلى زيادة كثافة المحاصيل، حيث تحققت أرقام إيجابية في مناطق جاء أداؤها أفضل من المتوقع (البر الداخلي من منغوليا +4% ومنطقة لويس +5%) بينما جاءت الأرقام سلبية في المناطق التي تأثرت بالجفاف وغيره من الظروف البيئية غير المعتادة (المنطقة السفلى من يانجتسي -7%، و جنوب غرب الصين -11% و جنوب الصين -13%). وقد زادت حصة الأرض الصالحة للزراعة بالمحاصيل في الأمريكتين (+8% في الشمال و +4% في الجنوب) وفي جنوب أستراليا (+12%). وفي أمريكا الجنوبية، فإن الأرقام الواردة أعلاه جزء من بيان السبب وراء الأداء الجيد لمعظم المحاصيل في الأرجنتين والبرازيل: فقد شهد كلا البلدين زيادات قياسية (+10% لكليهما) في حصة الأرض الصالحة للزراعة بالمحاصيل.

الإنتاج المتوقع في عام 2014

تشير تقديرات CropWatch إلى أن الإجمالي العالمي لإنتاج الذرة الشامية والأرز والقمح في عام 2014 بلغ 2469 مليون طن: 994 مليون طن من الذرة الشامية، و756 مليون طن من الأرز، و720 مليون طن من القمح. وتشير التقديرات إلى أن إنتاج الفول الصويا سيصل إلى 295 مليون طن. وهذا لا يمثل تغييراً بالنسبة للذرة الشامية والأرز، بينما ارتفع القمح حتى 2% مقارنة بالموسم الماضي. ويسجل الفول الصويا زيادة أكبر كثيراً بواقع 6%.

عند النظر إلى كبار المنتجين فقط، فإن الوضع يكون أقل مواتية بعض الشيء بالنسبة للذرة الشامية (-1% مقارنة بالموسم الماضي)، وهو كذلك بالنسبة للأرز (0%) والقمح (+2%)، لكنه أفضل كثيراً بالنسبة للفول الصويا (+9%)، وذلك بسبب ظروف الطقس المواتية وأيضاً بسبب أن صغار منتجي الفول الصويا يتراجعون بانتظام أمام المنتجين الثلاث الكبار: الولايات المتحدة والبرازيل والأرجنتين. كما تؤكد الأرقام أن الذرة الشامية والأرز يواصلان تعزيز هيمنتها العالمية بين الحبوب (وذلك على حساب القمح الربيعي في أغلب الأحيان).

وبالنسبة لكبار المصدرين، فإن إنتاجهم ثابت، باستثناء الفول الصويا الذي قد يزداد المعروض منه بنسبة تصل إلى 7%. وتشير التقديرات إلى أن حدوث تراجع في إنتاج الذرة الشامية في أمريكا الشمالية (الولايات المتحدة -1%)، لكن معظمه سيكون في كندا: (-16%)، وبولندا (-12%)، والهند (-13%)؛ وتأتي الهند هذا العام في المرتبة السادسة من حيث الإنتاج.

ومن السمات الرئيسية للموسم الحالي أنه بعد عدة مواسم سيئة، فإن الظروف المواتية عادت إلى المناطق الزراعية الرئيسية في أمريكا الجنوبية: فقد زاد إنتاج القمح بنسبة 15% في البرازيل، وحتى 22% في الأرجنتين، أما بالنسبة للفول الصويا فقد بلغت الزيادة 9% و4% على التوالي.

أما في الصين فإن إجمالي إنتاج الحبوب الرئيسية الثلاثة 513 مليون طن. ويصل هذا الرقم إلى 564 مليون طن من الغذاء عند إضافة الحبوب غير الرئيسية مثل الدرنات والبقوليات (بما في ذلك 13 مليون طن من الفول الصويا). ومقارنة بإنتاج السنة الماضية، تراجع إنتاج الذرة الشامية في الصين بمقدار 1%، أما الأرز فظل مستقراً، بينما زاد القمح بمع 1%.

وترتبط معظم التغييرات مباشرة بظروف الطقس، باستثناء الفول الصويا (-1%)، حيث يأتي التراجع استمراراً لاتجاه ساد على مدار عقد من الزمان.

Résumé

Le présent bulletin analyse les récents facteurs agroclimatiques et agronomiques jusqu'à octobre 2014 qui déterminent l'évolution des céréales et la production agricole 2014. Les analyses des indicateurs environnementaux basés sur les observations par satellite sont axées sur des modèles au niveau mondial et focalisent sur les principaux pays et régions de production. Le présent bulletin fait également état des désastres et des perspectives El Niño et comprend des estimations de production globale de céréales et de soja préparées par CropWatch.

Conditions agroclimatiques générales

Au cours de la période qui fait objet de ce rapport, plusieurs régions ont été affectées par une combinaison de valeurs inhabituelles, voire extrêmes, des précipitations et des températures, généralement accompagnées par des modifications en termes de rayonnement solaire.

Des zones importantes d'Amérique Centrale et du Sud ont subi une vague de chaleur (températures entre 2 et 2,4°C au-dessus de la moyenne ; +2,6°C au Paraguay), souvent accompagnée de précipitations excédant les moyennes de 15 à 25%. Le phénomène a affecté les récoltes mais n'a pas gravement réduit les rendements en dépit des températures élevées. La température élevée a souvent été le résultat d'un ensoleillement important, comme par exemple en Colombie (rayonnement photosynthétiquement utilisable, +6%) et en Équateur (+8%). En Amérique du Nord, l'anomalie la plus importante en termes de températures (+2.6°C) s'est produite sur la côte ouest et a été associée à un rayonnement solaire faible et des précipitations de 12% au-dessus de la moyenne.

Certaines zones d'Europe et d'Asie, de la Méditerranée à la Sibérie occidentale en passant par l'Asie du Nord-est, ont souffert d'une combinaison de légère sécheresse (-5% à -25% de précipitations) et de faibles températures, tandis qu'une sécheresse plus sérieuse (-40% et moins) a affecté de nombreuses régions du sud, y compris la Nouvelle-Zélande, la région de Cap Occidental en Afrique du Sud et les zones voisines (Botswana -56% et Swaziland -51%), ainsi que des zones du nord et du sud de l'Australie. Des écarts de précipitation positifs importants ont affecté les Great Plains des États-Unis (+61%), une zone axée autour de la région de la Mongolie (+255%), et les provinces de Chine Gansu et Xinjiang (+198%), l'Ouzbékistan (+175%), le Kirghizstan (181%), et le Tadjikistan (+311%). Tandis qu'elles causaient des ravages en certains endroits, les sols ont été réhydratés, favorisant le développement de parcours —une aubaine pour la plupart des communautés nomades -- et créant des conditions favorables pour les cultures d'hiver à venir.

Indicateurs agronomiques

Des intensités culturales élevées de plus de 150% dominent en Amérique du Sud et en Asie du Sud et du Sud-est. Tandis que pour la plupart des terres cultivées l'intensité de culture atteint des valeurs proches de 120%, cette variable tombe à 100% dans certaines zones (comme dans certaines parties de la Russie) qui sont trop froides pour les cultures d'hiver. On rapporte de modestes augmentations de l'intensité de culture (+2%) pour l'Amérique du Sud et l'Australie du Sud, mais on a assisté à des baisses importantes en Europe occidentale (-6%) et en Asie du Sud et du Sud-est (-7%). La plupart des pays font état de peu de changements en termes d'intensité de culture, à quelques exceptions près (le Cambodge -18%, les Philippines -14%, le Royaume-Uni -13%), qui s'expliquent généralement par la survenance d'événements extrêmes. En Chine, des conditions favorables ont entraîné une augmentation de l'intensité de culture, avec des valeurs positives dans des régions qui ont obtenu des résultats au-delà des attentes (Mongolie

intérieure +4% et la région de Loess +5%) et des valeurs négatives dans des régions affectées par la sécheresse et autres conditions environnementales inhabituelles (le Bas-Yangtsé -7%, la Chine du Sud-ouest -11%, et la Chine du Sud -13%). La part de terre arable mise en culture a augmenté sur le continent américain (+8% dans le nord et +4% dans le sud) et dans le sud de l'Australie (+12%). En Amérique du sud, les chiffres ci-dessus font partie de l'explication des bonnes performances de la plupart des céréales en Argentine et au Brésil : ces deux pays ont connu une augmentation record (+10% dans les deux cas) dans la part de terre arable de culture.

Projections pour la production 2014

Les projections CropWatch pour les résultats agricoles globaux du maïs, du riz et du blé pour 2014 sont de 2 469 millions de tonnes : 994 millions de tonnes de maïs, 756 millions de tonnes de riz, et 720 millions de tonnes de blé. Le soja devrait atteindre 295 millions de tonnes. Ceci signifie « aucune changement » pour le maïs et le riz, tandis que le blé est en augmentation de 2% par rapport à la saison dernière. Le soja enregistre une augmentation de 6%.

Si l'on ne tient compte que des grands producteurs, la situation est légèrement moins favorable pour le maïs (-1% par rapport à la saison dernière), similaire pour le riz (0%) et le blé (+2%), mais nettement mieux pour le soja (+9%), du fait de conditions météorologiques favorables mais aussi parce que des plus petits producteurs de soja continuent de perdre du terrain par rapport aux trois grands producteurs : les États-Unis, le Brésil et l'Argentine. Les chiffres confirment également que le maïs et le riz continuent de consolider leur dominance globale parmi les céréales (principalement aux dépens de blé de printemps).

En ce qui concerne les grands exportateurs, leur production stagne fondamentalement, à l'exception du soja pour lequel l'offre pourrait augmenter de 7%. Des baisses de la production de maïs sont à attendre en Amérique du Nord (États-Unis -1%, mais surtout au Canada : -16%), Pologne (-12%), et en Inde (-13%) ; l'Inde se place cette année au 6ème rang en termes de production.

Après plusieurs mauvaises saisons, le retour de conditions favorables dans les régions agricoles principales d'Amérique du Sud constitue un fait majeur de la saison actuelle : la production de blé a augmenté de 15% au Brésil et pas moins de 22% en Argentine ; pour le soja, l'augmentation est respectivement de 9% et 4%.

En Chine, la production totale des trois principales céréales est de 513 millions de tonnes. Le chiffre atteint 564 millions de tonnes si l'on inclut les céréales mineures, les tubercules et les légumineuses (y compris 13 millions de tonnes de soja). Par rapport aux résultats de l'année précédente, le maïs en Chine a baissé de 1%, le riz est resté stable, et le blé a augmenté de 1%. Ces évolutions sont dans la plupart des cas directement liées aux conditions météorologiques, sauf pour le soja (-1%) dont la baisse est la poursuite d'une tendance qui dure depuis plus d'une décennie.

Краткий обзор

Настоящий бюллетень оценивает недавние агроклиматические и агрономические факторы по состоянию на октябрь 2014, определяющие развитие сельскохозяйственного производства в 2014 году. Анализ экологических и полученных со спутников агрономических данных фокусируется на мировой системе и акцентируется на крупнейших сельскохозяйственных площадях и странах. Также этот бюллетень описывает катастрофы и перспективы Эль-Ниньо и включает в себя оценки глобального урожая зерновых и бобовых, подготовленные CropWatch.

Общее агроклиматическое состояние

В течение отчётного периода в ряде регионов были отмечены нетипичные, а иногда и экстремальные, значения осадков и температур, что, как правило, сопровождалось коррелируемыми колебаниями уровня солнечной радиации.

Крупные площади Центральной и Южной Америки испытали тепловую волну (с температурами между 2.0 и 2.4°C выше среднего, +2.6°C в Парагвае), часто сопровождавшуюся осадками, интенсивность которых превысила среднюю норму на значения от 15 до 25%. Урожайность культур зависима от данного явления, но повышение температуры не обязательно снижает урожайность. Высокая температура часто была вызвана обилием солнечного света, например, в Колумбии (фотосинтетическая активность солнечного излучения +6) и Эквадоре (+8%). В Северной Америке наибольшие температурные аномалии (+2.6°C) имели место на Западном Побережье, и были связаны с низким солнечным излучением и интенсивными осадками, превысившими средние показатели на 12%.

Некоторые территории Европы и Азии, от Средиземноморья до Западной Сибири, через Северо-Восточную Азию, пострадали от сочетания мягкой засухи (от -5% до -25% среднегодовой нормы осадков) и низкой температуры, в то время как более интенсивная засуха (-40% и ниже) затронула многие южные местности, в том числе Новую Зеландию, Западно-Капскую провинцию ЮАР и соседние районы (Ботсвана -56% и Свазиленд -51%), и площади на юге и севере Австралии. Крупные позитивные отклонения в количестве осадков произошли на севере Великих Равнин в США (+61%), в регионе Монголии (+255%), китайских провинций Ганьсу и Синьцзян (+198%), Узбекистане (+175%), Киргизстане (+181%) и Таджикистане (+311%). Создав опустошения в некоторых местах, осадки увлажнили почву, способствуя развитию пастбищных угодий – что приветствуется в большинстве скотоводческих экономик, а также создали благоприятные условия для предстоящего зимнего урожая.

Агрономические показатели

Резкое повышение урожайности более чем на 150% преобладает в Южной Америке и Северной и Северо-Восточной Азии. В то время как для большинства озимых сельскохозяйственных угодий значения урожайности близки к 120%, падая до 100% в некоторых регионах (таких, как часть России), являющихся слишком холодными для озимых культур. Незначительные увеличения урожайности (+2%) отмечаются в Южной Америке и Южной Австралии, но значительное снижение произошло в Западной Европе (-6%) и Южной и Юго-Восточной Азии (-7%). Большинство стран сообщают о незначительном понижении урожайности, с некоторыми исключениями (Камбоджа -

18%, Филиппины -14%, Великобритания -13%), которые могут быть учтены в случае появления чрезвычайных ситуаций. В Китае благоприятные условия привели к улучшению урожайности, с положительными значениями в регионах, где урожайность превзошла ожидания (Внутренняя Монголия +4% и лёссовый регион +5%) и отрицательными значениями в регионах, пострадавших от засухи и других аномальных природных факторов (низовья Янцзы -7%, Северо-Западный Китай -11%, и Южный Китай -13%). Доля посевных пахотных земель увеличилась в обеих Америках (+8% в Северной и +4% в Южной) и на юге Австралии (+12%). Приведенные выше цифры по Южной Америке частично объясняют улучшившиеся показатели урожайности в Аргентине и Бразилии: обе страны осуществили рекордное увеличение (+10%) площади пахотных земель.

Прогнозируемое производство в 2014 году

CropWatch глобально оценивает в 2014 году производство кукурузы, риса и пшеницы в 2.469 миллионов тонн: 994 миллиона тонн кукурузы, 756 миллионов тонн риса, и 720 миллионов тонн пшеницы. Производство соевых бобов по оценкам достигнет 295 миллионов тонн. Это составляет прирост на 2% производства пшеницы по сравнению с прошлым сезоном, показатели же по кукурузе и рису не изменились. В производстве соевых бобов прирост более значителен и достигает 6%.

Если принимать во внимание только крупнейших производителей, то ситуация несколько менее благоприятна для кукурузы (-1% по сравнению с прошлым сезоном), для риса без изменений (0%), пшеницы (+2%), но значительно лучше для сои (+9%), не только благодаря благоприятным погодным условиям, но и потому, что мелкие производители сои не выдерживают конкуренции с «большой тройкой производителей»: США, Бразилией и Аргентиной. Цифры также подтверждают, что кукуруза и рис продолжают укреплять свое мировое господство среди зерновых культур (в основном за счет яровой пшеницы).

Что касается крупных экспортеров, то уровень их производства в основном застыл на определенных позициях, за исключением сои, по которой предложение может увеличиться на целых 7%. Снижение производства кукурузы, по оценкам, произойдет в Северной Америке (США -1%, но в основном в Канаде, до -16%), Польше (-12%), и в Индии (-13%); Индия в этом году занимает 6-е место в мире по объему производства этой культуры.

Главной особенностью нынешнего сезона является то, что после нескольких плохих сезонов благоприятные условия вернулись на большую часть территорий Южной Америки: производство пшеницы увеличилось на 15% в Бразилии и более чем на 22% в Аргентине; для сои увеличение составляет 9% и 4% соответственно.

В Китае общий объем производства трех основных зерновых культур составил до 513 миллионов тонн. С учетом менее значимых культур показатели производства продовольствия достигают 606 миллионов тонн, включая мелкие злаковые, клубневые и бобовые (в том числе 13 миллионов тонн соевых бобов). По сравнению с прошлым годом, производство кукурузы в Китае упало на 1%, производство риса не изменилось, а производство пшеницы увеличилось на 1%. Большинство изменений связаны непосредственно с погодными условиями, за исключением сои (-1%), падение производства которой является десятилетней тенденцией.

Resumen

El presente boletín informativo evalúa los factores agroclimáticos y agronómicos observados hasta octubre de 2014 que determinan el desarrollo de los cultivos y la producción agrícola de 2014. Los análisis de los indicadores ambientales y agronómicos derivados de información satelital se enfocan en patrones mundiales y analizan más en profundidad las áreas y países de mayor producción. Este boletín informativo también habla sobre desastres ocurridos y las perspectivas de El Niño e incluye estimaciones de producción mundial de cereales y soja realizadas por CropWatch.

Condiciones agroclimáticas generales

Durante el período del informe, varias regiones se vieron afectadas por una combinación de valores poco comunes y a veces extremos de precipitación y temperatura, por lo general acompañados por cambios en la radiación solar asociados a ellos.

Grandes zonas de la región sur de Sudamérica sufrieron una ola de calor (temperaturas de entre 2,0 y 2,4 °C por encima del promedio; + 2,6 °C en Paraguay), con frecuencia acompañada por precipitaciones entre 15 y 25 % por sobre los valores promedio. El fenómeno afectó los cultivos aunque, a pesar de las altas temperaturas, el rendimiento no se redujo sustancialmente. Las altas temperaturas con frecuencia fueron producto de una abundante radiación solar, por ejemplo en Colombia (+6 % de radiación fotosintéticamente activa) y Ecuador (+8 %). En Norteamérica, la anomalía térmica más importante (+2,6 °C) se produjo en la costa oeste y estuvo asociada con baja radiación y precipitaciones un 12 % por encima de los valores promedio.

Algunas zonas de Europa y Asia, desde el Mediterráneo hasta la región occidental de Siberia, al otro lado del noreste asiático, sufrieron una combinación de sequía leve (-5 % a -25 % de precipitaciones) y bajas temperaturas, mientras que muchas zonas meridionales se vieron afectadas por graves sequías (-40 % e inferiores), entre ellas Nueva Zelanda, la provincia del Cabo Occidental en Sudáfrica y zonas vecinas (Botsuana -56 % y Suazilandia -51 %) y zonas meridionales y del norte de Australia. Las Grandes Llanuras de los EE. UU. se vieron beneficiadas por importantes variaciones positivas del nivel de precipitaciones (+61 %), tal como sucedió en una zona centrada en torno a la región de Mongolia (+255 %) Uzbekistán (+175 %), Kirguistán (181%) , Tayikistán (+311%) y la regiones chinas de Gansu y Xinjiang (+198 %). Si bien generaron estragos en algunos lugares, las precipitaciones han repuesto la humedad del suelo, favorecieron el crecimiento en zonas de pastoreo, una buena noticia para la mayoría de las economías basadas en la ganadería trashumante, y generaron condiciones favorables para la próxima cosecha invernal.

Indicadores agronómicos

En Sudamérica y en el sur y sudeste de Asia prevalecen las intensidades de cosecha elevadas por encima del 150 %. Si bien en la mayoría de las tierras de cultivo invernales los valores de intensidad de cosecha están cerca del 120 %, en zonas demasiado frías para cultivos invernales (como ciertas partes de Rusia) la variable disminuye a 100 %. En Sudamérica y el sur de Australia se informaron modestos aumentos en la intensidad de cosecha (+2 %), pero se produjeron importantes disminuciones en Europa Occidental (-6 %) y en el sur y sudeste de Asia (-7 %). Los informes de la mayoría de los países muestran poco cambio en la intensidad de cosecha, salvo algunas excepciones (Camboya -18 %, las Filipinas - 14%, Reino Unido -13 %) que suelen poder explicarse por acontecimientos extremos. En China, las condiciones favorables

produjeron un aumento en la intensidad de cosecha, con valores positivos en regiones cuya producción fue mejor de lo esperada (Mongolia Interior +4 % y la región de Loess +5 %) y valores negativos en zonas afectadas por sequías y por otras condiciones ambientales menos frecuentes (Baja Yangtsé -7 %, sudoeste de China -11 % y China meridional -13 %). La fracción de tierra cultivable cosechada aumentó en el continente americano (+8 % en el norte y +4 % en el sur) y en el sur de Australia (+12 %). En el caso de Sudamérica, los números precedentes son parte de la explicación del buen desempeño de la mayoría de los cultivos de Argentina y Brasil: ambos países experimentaron un aumento record (+10 % ambos) de la fracción de tierra cultivable cosechada.

Proyección de producción para 2014

Según las estimaciones de CropWatch, la producción combinada mundial de maíz, arroz y trigo para 2014 rondará los 2.469 millones de toneladas: 994 millones de toneladas de maíz, 756 millones de toneladas de arroz y 720 millones de toneladas de trigo. Se calcula que la soja alcanzará los 295 millones de toneladas. Eso significa que la producción de maíz y de arroz no sufrirá cambio alguno, mientras que la de trigo aumentará un 2 % con respecto a la última campaña. La soja registrará un aumento más significativo del 6 %.

Si sólo se toma en consideración a los principales productores, la situación es levemente menos favorable para el maíz (-1 % en comparación con la última temporada), similar para el arroz (0 %) y el trigo (+2 %), pero mucho mejor para la soja (+9 %) debido a las condiciones meteorológicas favorables pero también a que los productores menores de soja siguen perdiendo terreno frente a los principales productores: los Estados Unidos, Brasil y Argentina. Las cifras además confirman que el maíz y el arroz siguen consolidando su dominio mundial entre los cereales (en su mayoría a expensas del trigo de primavera).

En lo que concierne a los principales exportadores, su producción básicamente se estancará, con excepción de la soja cuya oferta puede aumentar hasta un 7 %. Se estima que ocurrirán disminuciones en la producción de maíz de Norteamérica (Estados Unidos -1 %, pero sobre todo en Canadá: -16 %), Polonia (-12 %) e India (-13 %). Este año, en términos de producción, India ocupa el sexto lugar.

Un rasgo importante de la temporada actual es que, después de varias malas campañas, volvieron las condiciones favorables a las principales regiones agrícolas de Sudamérica: la producción de trigo aumentó un 15 % en Brasil e incluso un 22 % en Argentina; en el caso de la soja, el aumento equivale a un 9 % y un 4 % respectivamente.

En China, la producción total de los tres cereales principales equivale a 513 millones de toneladas. Si se agregan los cereales menores, los tubérculos y las legumbres (incluidas 13 millones de toneladas de soja), la cifra llega a los 564 millones de toneladas. En comparación con la producción del año anterior, en China se produjo un 1% menos de maíz, el arroz se mantuvo estable y la producción de trigo aumentó un 1%. La mayoría de los cambios están relacionados con las condiciones meteorológicas, excepto en el caso de la soja (-1%), en cuyo caso la caída es la continuación de la tendencia de la última década.

Chapter 1. Global agroclimatic patterns

Chapter 1 describes the CropWatch agroclimatic indicators for rainfall (RAIN), temperature (TEMP), and radiation (RADPAR), along with the agronomic indicator for potential biomass (BIOMSS) for sixty-five global Monitoring and Reporting Units (MRU). A complete list of values for the MRUs is included in Annex A, table A.1. A map of the MRUs and more detail about the indicators is included in Annex C.

1.1 Overview

During the reporting period, several large areas were affected by a combination of unusual, and sometimes extreme, values of rainfall and temperature, usually accompanied by correlated changes in radiation (RADPAR) and biomass (BIOMSS).

The largest temperature anomaly (TEMP, +2.6°C) occurred in the North American western coast (MRU-16) and was accompanied by rainfall (RAIN) 12% over average and low radiation.

Large areas of south America experienced a heat wave (temperatures between 2.0 and 2.4°C above average), including central-eastern Brazil (MRU-23; RAIN +10%, TEMP +2.0°C, RADPAR -1%), central north Argentina (MRU-25; +18%, -0.5, +3%), and south-east Brazil-Concepción-Bahia Blanca (MRU-26; +24%, +2.2°C, +1%) where high temperatures were accompanied by 15-25% above average rainfall. The adjacent area of the Brazilian Nordeste (MRU-22; -23%, +2.4°C, -1%) suffered from excess heat and drought (RAIN down 23% compared with average), while the central northern Andes (MRU-21; +1.6°C) experienced high temperature with close to average rainfall.

Some areas in Europe and Asia suffered from a combination of low rainfall and low temperature, especially Eastern central Asia (MRU-52; RAIN -4%, TEMP -0.7°C, RADPAR +3%), eastern Siberia (MRU-51; -17%, -0.5°C, +3%), the area from Ukraine to the Ural mountains (MRU-58; -28%, -0.4°C, -5%), and Mediterranean Europe and Turkey (MRU-59; -5%, -0.5°C, -4%).

The areas with the largest absolute negative rainfall departures include New Zealand (MRU-56; -65%), the Western Cape area in South Africa (MRU-10, -58%), areas in Australia (MRU-54, -43%, Queensland to Victoria; MRU-53, -56%, North Australia), and Taiwan (MRU-42, -36%). Large positive departures affected the Northern Great Plains (MRU-12, +61%) in North America, Gansu-Xinjiang in China (MRU-32, +198%) and the Mongolia region (MRU-47; +255%).

1.2 Rainfall

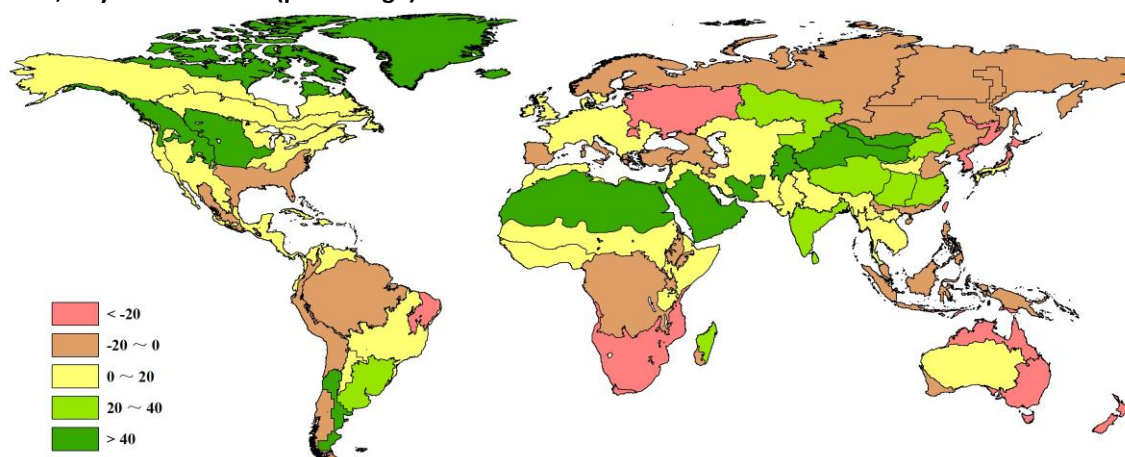
During the current July to October 2014 monitoring period, rainfall showed large variation across regions (figure 1.1). As an important maize growing zone of the United States, abundant rainfall fell over the northern great plains (MRU-12, +60.56%) and the major rice growing zones of China (lower Yangtze, MRU-37, +28.16%; southwest China, MRU-41, +21.39%). Excess rainfall also affected some dryer areas in Asia, where it favored rangeland development (Xinjiang region in Gansu, China, MRU-32, 198.43%; Mongolia region, MRU-47, +184%). Among the major soybean and wheat growing regions in the world, southeast Brazil and northeast Argentina (MRU-26, +23.64%) received abundant rainfall in this monitoring period as well. The drought in British Columbia to Colorado (MRU-11) eases with a rainfall increase of +44.51% over average. Some extreme climate zones received excesses rainfall, such as the

Sahara desert (basically the Nile valley as CropWatch only covers agricultural areas in the CWAs) and Arabian Peninsula (MRU-64, 60.14%) and the Pamir regions (MRU-30, +55.44%). Other areas are not relevant for crop agriculture and livestock, but may—marginally so—for forestry or as a source for river water (arctic region of North America, MRU-65, +194.58%).

Some important agricultural regions suffered insufficient rainfall during this monitoring period. Rainfall was below average (-28.21%) in the region from Ukraine to Ural Mountains (MRU-58), an important wheat cultivation area. Rainfall was low as well in parts of China (Taiwan, MRU-42, -36.05%) and maritime Southeast Asia (MRU-49, -14.85%), including Indonesia and the Philippines. Eastern Australia, Northeast Asia, and South Africa were all affected by droughts, including north Australia (MRU-53, -56.06%), Queensland to Victoria (MRU-54, -43.22%), New Zealand (MRU-56, -64.87%), southern Africa (MRU-9, -24.59%), and East Asia (MRU-43, -26.01%), especially affecting the Korean peninsula. Although the rainfall shortage was not so serious, it was nevertheless below average in two Chinese regions: Huanghuaihai plain (MRU-34, -6.16%) and northeast China (MRU-38, -3.12%)

Rainfall varied less in other agriculturally important regions: the American corn belt (MRU-13, +4.42%), American cotton belt and Mexican coastal plain (MRU-14, -2.3%), Western Europe (MRU-60, +7.03%), southern Himalayas (MRU-44, +14.9%), and continental south-east Asia (MRU-50, +0.5%).

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



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

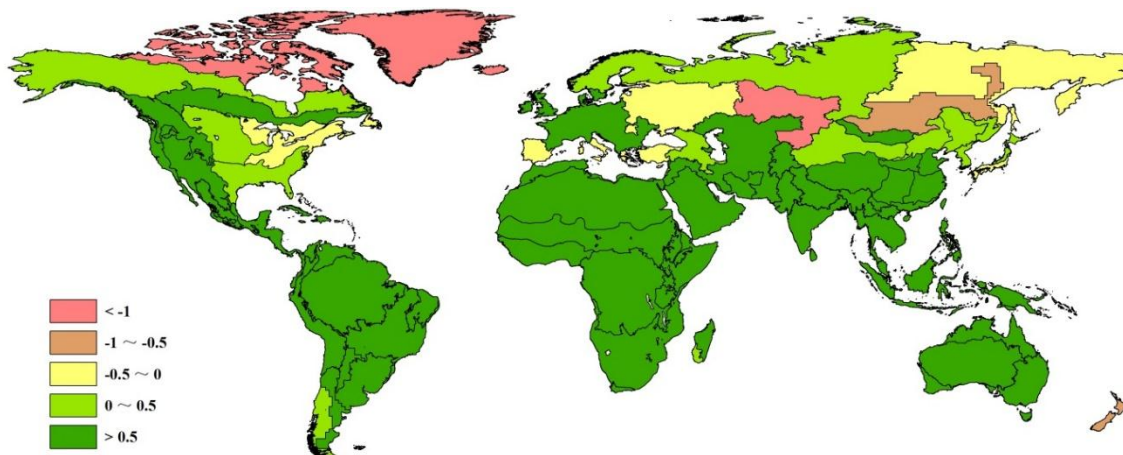
1.3 Temperature

Most parts of the world experienced warmer than average conditions compared with the recent thirteen years (figure 1.2). During this monitoring period, temperature in the whole southern hemisphere except New Zealand was higher than usual. This can be a favorable condition for crop cultivation during the cold season if sufficient water is available to cover increased demand, especially for the wheat growing areas in Australia (including North Australia (+0.5°C), Queensland to Victoria (+0.8°C), Nullarbor to Darling (+1.9°C)), Africa (including Southern Africa, +0.9°C and the Western Cape, +1.4°C), and South America (including Central Eastern Brazil (+2.0°C) and SE Brazil (Concepcion to Bahia Blanca, +2.2°C)). In North America, the temperature varies from above average in the west to average in the east. In the corn belt of the United States, the temperature was close to usual (-0.1°C).

In northern Eurasia, higher than average temperature (> +0.5°C) benefited crops. In the Ukraine to Ural Mountains region and in Mediterranean Europe and Turkey, the temperature was half a degree lower

than average, which would affect wheat and maize development. The Ural to Altai Mountains region experienced the most significant decrease in air temperature (-1.2°C).

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



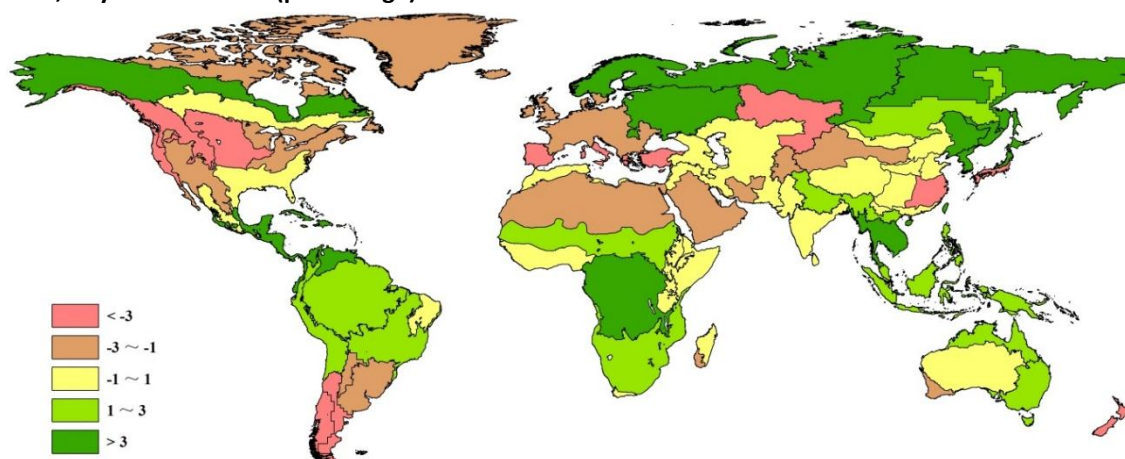
Note: Data for July-October 2014, compared with the thirteen-year average (13YA) for the same period 2001-2013.

1.4 Photosynthetically active radiation

Compared with the recent thirteen-year average, more than half of the 65 MRUs experienced above average photosynthetically active radiation (PAR), as measured with the RADPAR indicator. The highest departure from the recent reference period occurred in boreal North America (MRU-61), equatorial central Africa (MRU-01), and Ukraine to Ural mountains (MRU-58), with a +5% departure. Record low PAR departures were concentrated in several adjacent areas in north and south America, including (i) British Columbia to Colorado (MRU-11, -4%) and America's west coast (MRU-16, -4%) and (ii) the southwestern southern cone (MRU-27, -5%) and the semi-arid southern cone (MRU-28, -4%). The southern Japan and Korea (MRU-46) area is also one of the regions characterized by below average PAR, with a 6% decrease compared to average.

In China, the major paddy rice production area, the Lower Yangtze (MRU-37), shows a significant PAR decrease of 5% compared to average. The Xinjiang area in Gansu (MRU-32) also experienced a 2% below average PAR, paralleled by abundant rainfall in this region. Areas with positive PAR departures include North-east China (MRU-38, +3%), Taiwan (MRU-42, +4%), and Hainan, where the largest positive departure in China was recorded (MRU-33, +5%). The remaining areas generally show an average level of PAR.

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



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

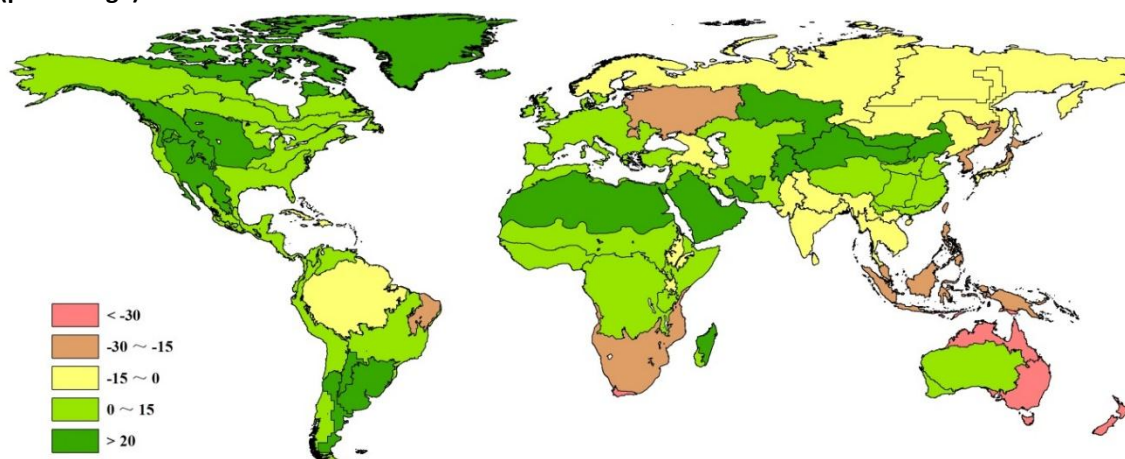
1.5 Biomass

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.

The potential biomass accumulation over the July to October monitoring period was higher than the five-year average for the same period in most of the world, usually due to the high temperature. The greatest positive biomass accumulations are found in the following MRUs: Mongolia (+142%), Gansu Xinjiang in China (+120%), the semi-arid southern cone in South America (+76%), British Columbia to Colorado (+34%), Madagascar (+33%), southwestern Mexico and North Mexico highlands (+32%), central north Argentina (+32%), America's northern great plains (+27%), and China's Inner Mongolia (+25%).

At the scale of the MRUs, unfavorable conditions for BIOMSS departures occurred mainly in the southern hemisphere, including North Australia (-51%), South Africa's Western Cape (-42%), Australia's Queensland to Victoria (-40%), Brazil's Nordeste (-28%), Taiwan (-20%), southern Africa (-17%), and East Asia (-16%). In the eastern hemisphere, areas with poor biomass condition are found in New Zealand (-59%) and Ukraine (-23%) due to insufficient rains.

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



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

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), maximum vegetation condition index (VCIx), cropping intensity, and minimum vegetation health index (VHIn)—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 the thirteen- and five-year averages.

Table 2.1. July to October 2014 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	876	7	26.8	0.7	1009	0
South America	403	20	21.1	2.2	1004	0
North America	419	18	20.3	0.2	1079	-2
South and Southeast Asia	1142	13	27.8	1.2	954	2
Western Europe	298	7	16.9	0.6	883	-3
Central Europe and Western Russia	184	-24	15.4	-0.2	876	4
Southern Australia	114	-36	13.6	0.9	963	1

Note: Departures are expressed in relative terms (percentage) for all variables, except for temperature, for which absolute departure in degrees Celsius is given. Zero means no change from the average value; Relative departures are calculated as $(C-R)/R*100$, with C=current value and R=reference value, which is the thirteen-year average (13YA) for the same period (July-October) for 2001-13.

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

	BIOMSS (gDM/m ²)		Cropped arable land fraction		Cropping Intensity		Maximum VCI
	Current	Departure from 5YA (%)	Current (% of pixels)	Departure from 5YA (%)	2014 (%)	Departure from 5YA (% points)	Current
West Africa	2007	5	84	-1	124	-4	0.81
South America	1103	12	90	4	169	2	0.71
North America	1224	13	93	8	121	-2	0.87
South and Southeast Asia	1875	-1	87	-1	157	-7	0.86
Western Europe	1152	12	93	1	120	-6	0.83
Central Europe/ Western Russia	786	-17	92	0	101	-2	0.75
Southern Australia	492	-31	80	12	123	2	0.79

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 (July-October) for 2009-13.

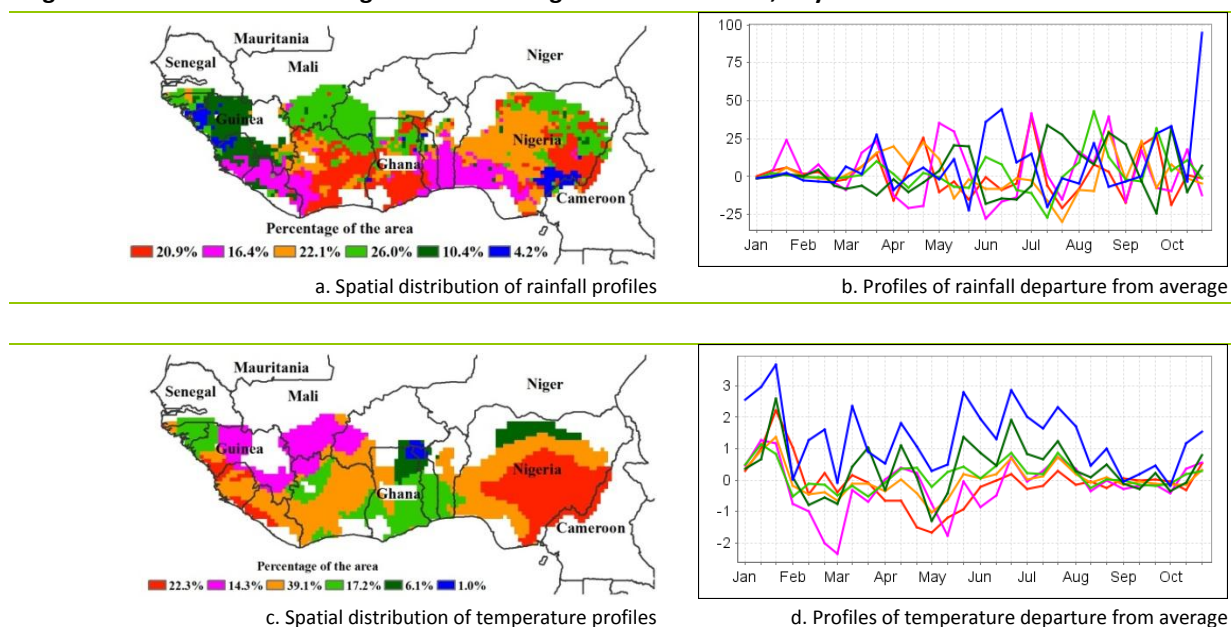
2.2 West Africa

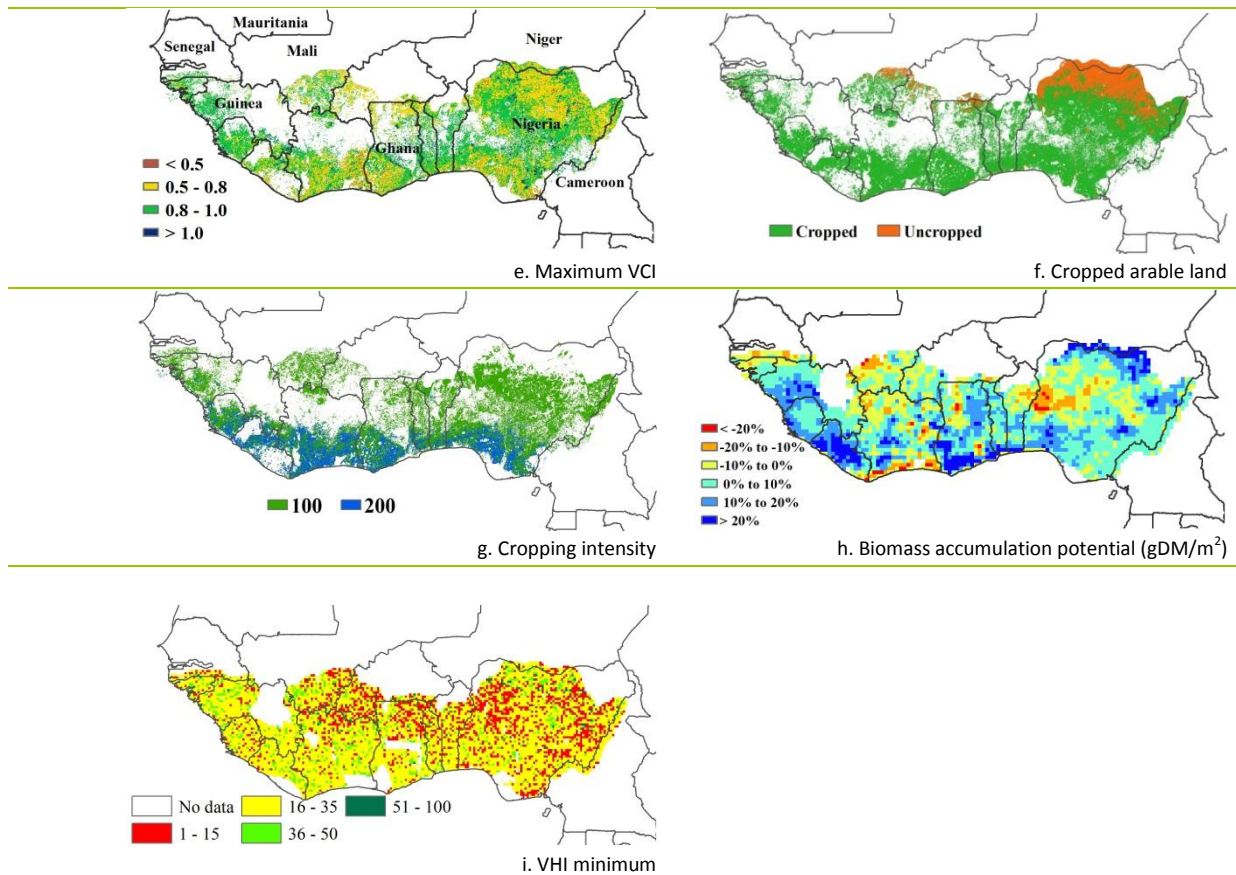
The whole African continent experienced above normal thermal conditions during the reporting period, with very few exceptions. One of those exceptions was in Sierra Leone, where temperature was slightly below average (-0.3°C). Across the MPZ, rainfall and BIOMSS were about average (+7% and 0%, respectively). RADPAR was also approximately average (0% departure), with the exceptions of Sierra Leone (RADPAR +1%), Côte d'Ivoire (+1%), Benin (+3%), and Guinea Bissau (-3%). As a result of increased precipitation, BIOMSS is up around 5% compared to the five-year average, with large differences among countries: from -1% in Guinea Bissau to +16% in Liberia, with most countries in the +6% to +7% range. The whole region is now completing harvest—or has already done so, with the exception of the south where the harvest of roots and tubers (yams and cassava) typically comes later in the year. The same areas also usually cultivate a second maize crop that is due to harvest later in the year, also visible on the cropping intensity map.

Most areas in the MPZ suffered a more or less synchronized rainfall reduction in July/August or August/September; at the end of September, precipitation fell -25% over most of Guinea and Sierra Leone, but this was compensated by high rainfall at the end of October. At the beginning of October, southern Ghana and Côte d'Ivoire as well as eastern central Nigeria suffered a slightly milder water stress (-20%). As indicated above, the region as a whole experienced a slight rainfall excess with no serious shortfalls. In the western Sahelian parts of the MPZ, high—but not excessively so—temperature departures of up to +2°C occurred in early July, coinciding with a somewhat delayed beginning of the Sahelian season, occurring mostly to the areas indicated as “uncropped” in the cropped and uncropped arable land map.

Despite a slightly decreased fraction of cropped arable land (-1%) and cropping intensity (-4%), high VCIx combined with roughly average weather indicate favorable conditions for the MPZ's first and second maize crops, roots and tubers, as well as rice.

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





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

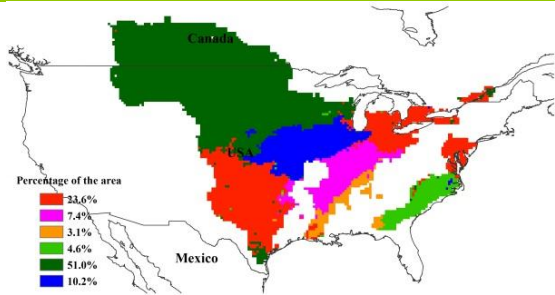
2.3 North America

In general, crops did well in the North American MPZ in 2014. Overall, rainfall (RAIN) increased by 16% over average, temperature (TEMP) increased by 0.4°C, and radiation (RADPAR) dropped 2%.

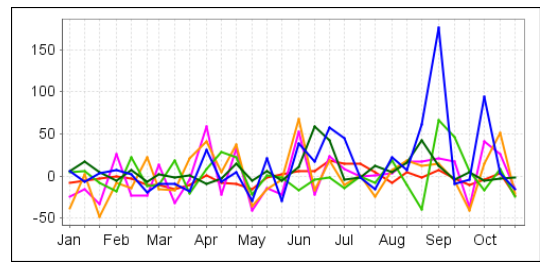
Between February and late May, Texas, Oklahoma, Kansas, and Ohio suffered a significant rainfall deficit. From mid-April to mid-May, the deficit extended to almost all areas of the North American MPZ, especially to Texas, Oklahoma, Kansas, Montana, Arkansas, and Indiana. The impact is confirmed by low VHI values in the MPZ (see figure 2.2). Late May witnessed above average temperature in almost all regions, contributing to worsening water deficits and stressing winter wheat. Fortunately, from the beginning of June to mid-July, rainfall recovered to above average while temperature dropped below average: abundant rainfall was recorded in northwestern and central regions, such as Alberta, Saskatchewan, Manitoba, Montana, North Dakota, South Dakota, Nebraska, Minnesota, and Wisconsin, especially in southern Iowa and in the northern Illinois. After mid-July, parts of the southwestern United States (Texas), northeast (Ohio), and in the central United States, rainfall was basically average, with minor departures. Abundant rainfall continued in the northwest, northern Great Plains and southwest of the Great Lakes, southern Iowa, and in the northern Illinois. These areas are part of the major soybeans and maize producers, so that good performance of soybeans and maize is to be expected.

The good performance is supported by agronomic indicators, including accumulated biomass (+13% over the recent five-year average) and VCI with a value of 0.85. The fraction of cropped arable land (CALF) increased 8% compared to the five-year average, while cropping intensity decreased 2%. The indicators concur and better than average summer crops production is to be expected. As to winter wheat (mostly harvested in June), below average production is to be expected due to serious water deficits in May.

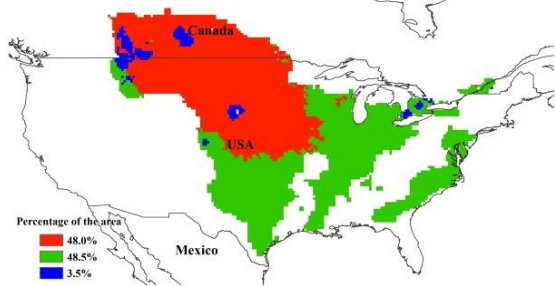
Figure 2.2. North America MPZ: Agroclimatic and agronomic indicators, July-October 2014



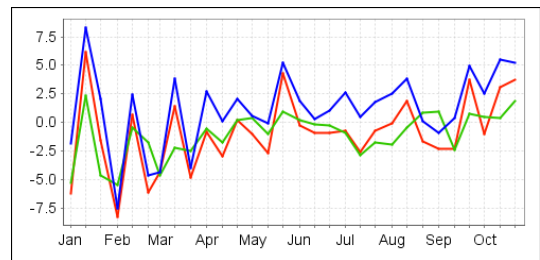
a. Spatial distribution of rainfall profiles



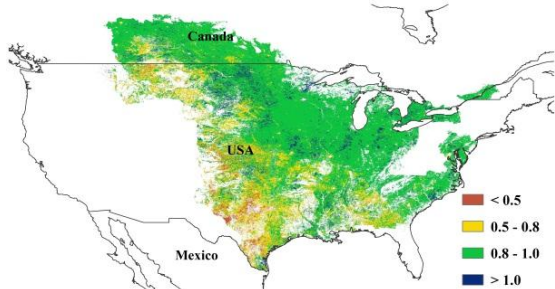
b. Profiles of rainfall departure from average



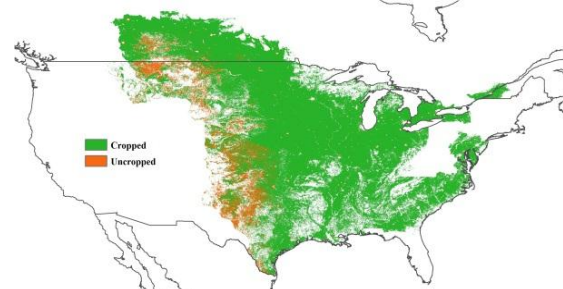
c. Spatial distribution of temperature profiles



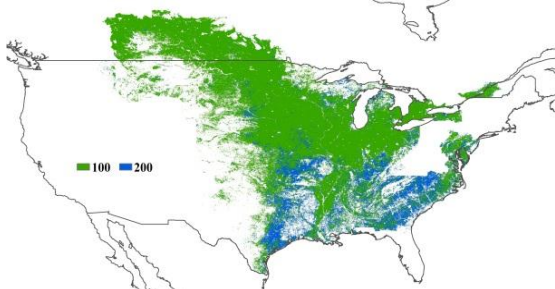
d. Profiles of temperature departure from average



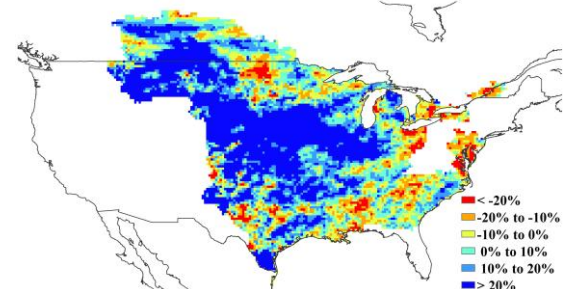
e. Maximum VCI



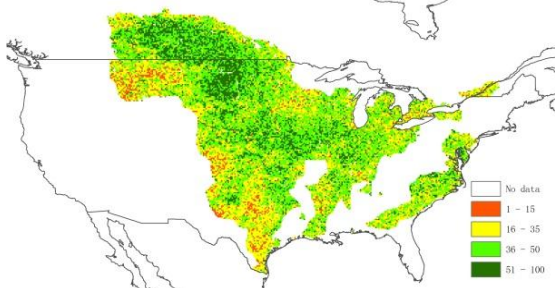
f. Cropped arable land



g. Cropping intensity



h. Biomass accumulation potential (gDM/m²)



i. VHI minimum

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

2.4 South America

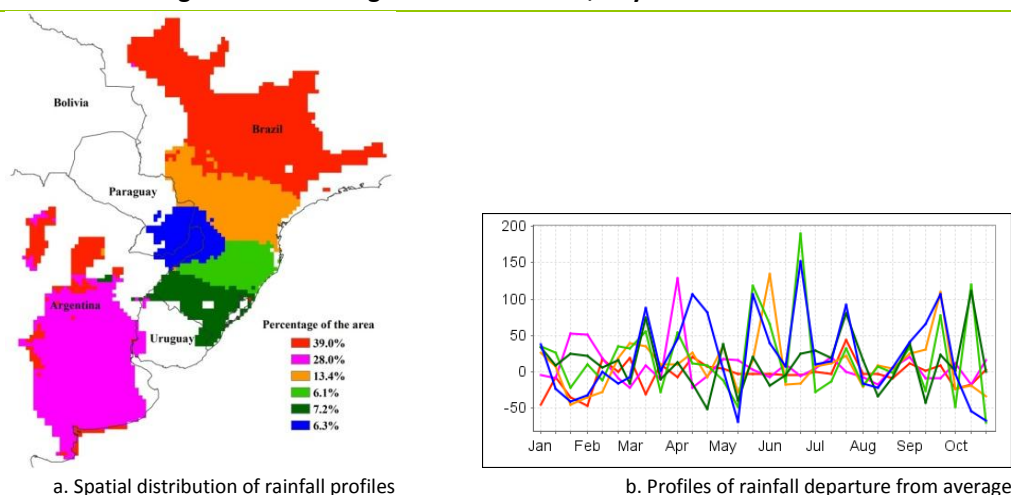
Generally, above average rainfall and air temperature in the MPZ advanced the harvesting of wheat and the emergence and development of early planted summer crops. Figure 2.3 summarizes the CropWatch indicators for the MPZ.

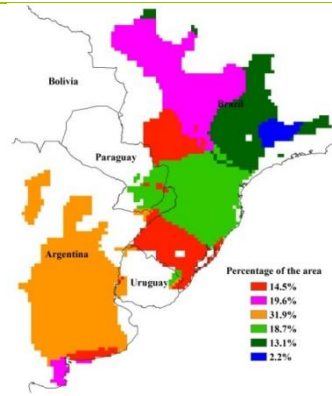
Rainfall (RAIN) and temperature (TEMP) were generally favorable between July to October 2014, with 20% above average rainfall and temperature up 2.0°C compared with the period's average. Average RADPAR provided adequate radiation for crops over the last four months. However, RAIN varied a lot from place to place. Average rainfall dominates Argentina and the northern Latin American MPZ (Sao Paulo and northern Mato Grosso Do Sul) while Parana, Santa Catarina, and Rio Grande do Sul experienced above average rainfall. Persistent high temperature from July to October together with average rainfall induced water deficit in the central Pampas, which is confirmed by the low VHI (below 35). Regions from northern Mato Grosso do Sul to Sao Paulo suffered from drought due to very warm weather (5.0°C degree above average) and normal rainfall in mid-October. Spatially, VCIx is well correlated with VHI_n, indicating that water deficit was indeed the key limiting factor for crop development in the MPZ for July to October. The average condition of crops was nevertheless above average, as confirmed by 12% above average biomass (BIOMSS). In Mato Grosso do Sul to Sao Paulo. The spatial patterns of maximum VCI and minimum VHI are paralleled by below average biomass (-20%).

From July to October 2014, 90% of the arable lands were cropped, which is 4% higher than the recent five-year average. Most uncropped arable land was scattered in the central Pampas, where harvest of soybeans of the previous season concluded in May and planting will take place in November to December. Average cropping intensity for the MPZ is estimated at 169%, 2% up from the recent five year average. A double cropping system dominates most of southern Paraguay and Brazil (Rio Grande do Sul, Santa Catarina, and Parana) and central Buenos Aires province.

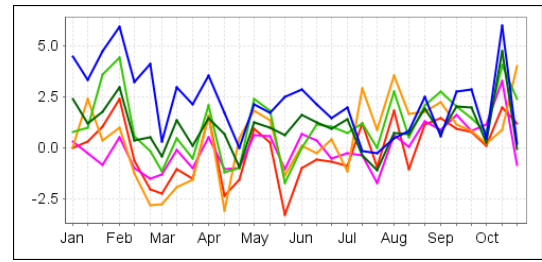
The persistent high temperature (>2.0°C) shortened the grain filling stage, accelerating wheat maturation and reducing yield accumulation in key wheat producing areas in the MPZ.

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

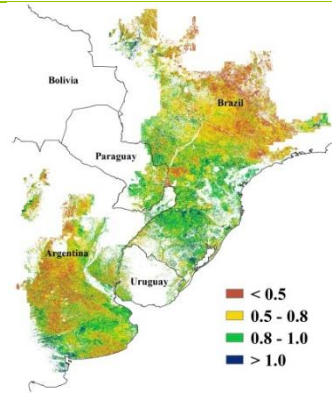




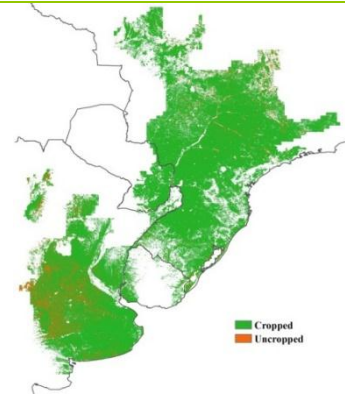
c. Spatial distribution of temperature profiles



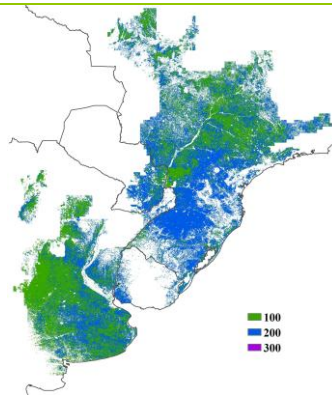
d. Profiles of temperature departure from average



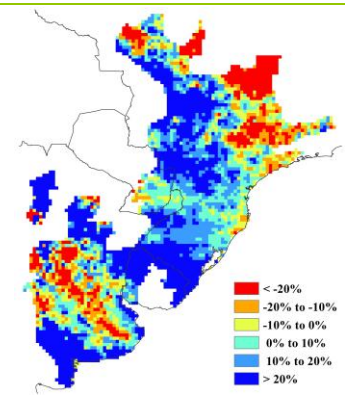
e. Maximum VCI



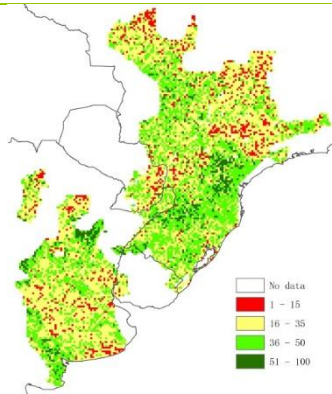
f. Cropped arable land



g. Cropping intensity



h. Biomass accumulation potential (gDM/m²)



i. VHI minimum

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

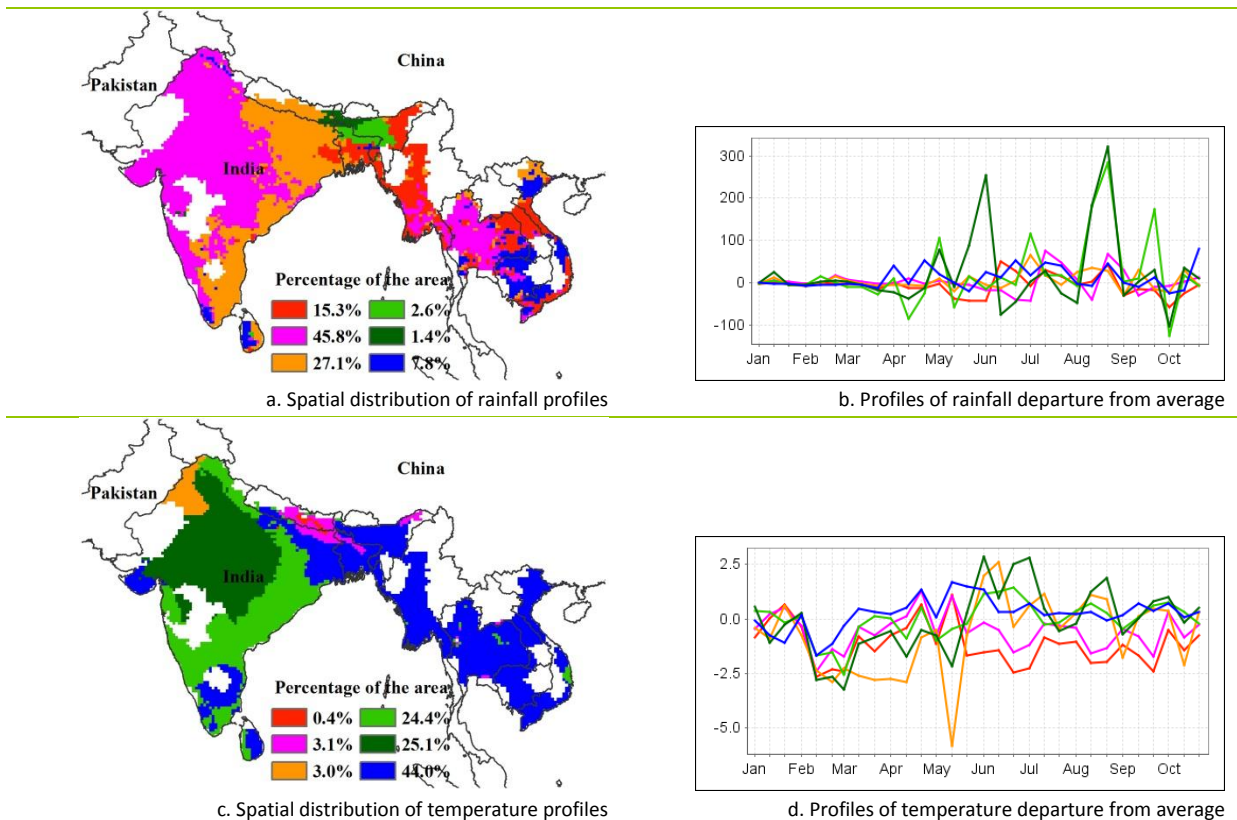
2.5 South and Southeast Asia

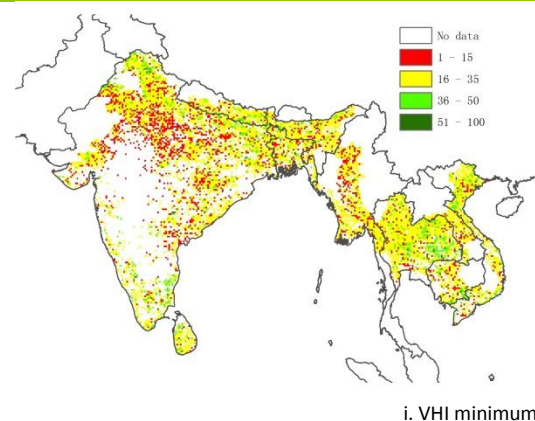
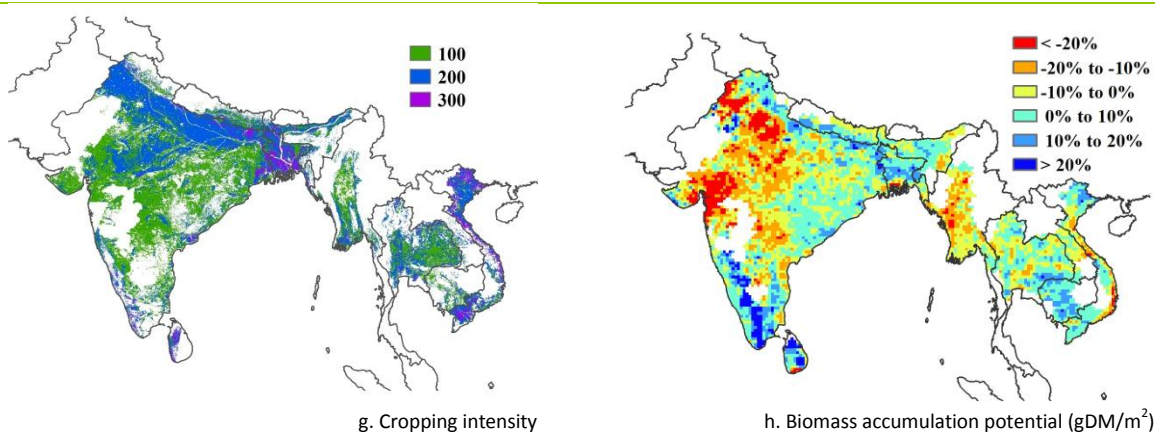
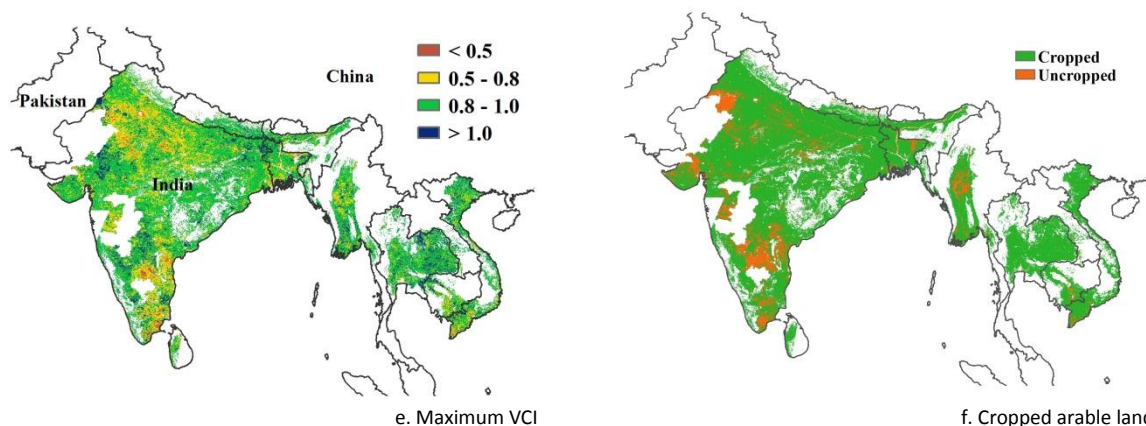
In the region as a whole, agro-climatic and agricultural indicators during July to October indicate increases of RAIN (+13%), TEMP (1.2°C), and RADPAR (2%) compared with average. High rainfall occurred mostly in mid-August in Meghalaya, the western part of Assam in India, and Rangpur, north Dhaka, and Sylhet in Bangladesh. Otherwise, rainfall was comparable to the average, and so was temperature with the exception of north Bihar in India. The biomass accumulation potential (BIOMSS) shows favorable conditions around Tonle Sap in Cambodia, the Red River delta of Vietnam, Tamil Nadu in India, and Central Dhaka in Bangladesh, which are the main rice plantation areas.

The VCIx map indicates good crop condition (+0.86), particularly in the northeastern region of Thailand, Banteay Meanchey, Battambang, and Siem Reap in Cambodia, and Madhya Pradesh in India. The fraction of cropped arable land (CALF) dropped by 1% compared with the last five-year average, affecting mostly Haryana, south Andhra Pradesh in India, and the central dry zone of Myanmar, which is related to the low maximum VCI and the low biomass accumulation potential. Low VHI_n occurs in Uttar Pradesh, Madhya Pradesh in India, and the central dry zone of Myanmar, consistent with the low biomass accumulation potential. Cropping intensity dropped by 7% compared with the five-year average. Triple-cropping occurs mostly in West Bengal in India, the Red River delta, and the Mekong delta of Vietnam.

Figure 2.4 presents an overview of CropWatch indicators for South and Southeast Asia.

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





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

2.6 Western Europe

Overall, when integrating the findings of the various agroclimatic and agronomic indicators, most parts of Western Europe presented favorable condition of summer crop and a large average VCIx value (0.83) over the monitoring period. (See also figure 2.5.)

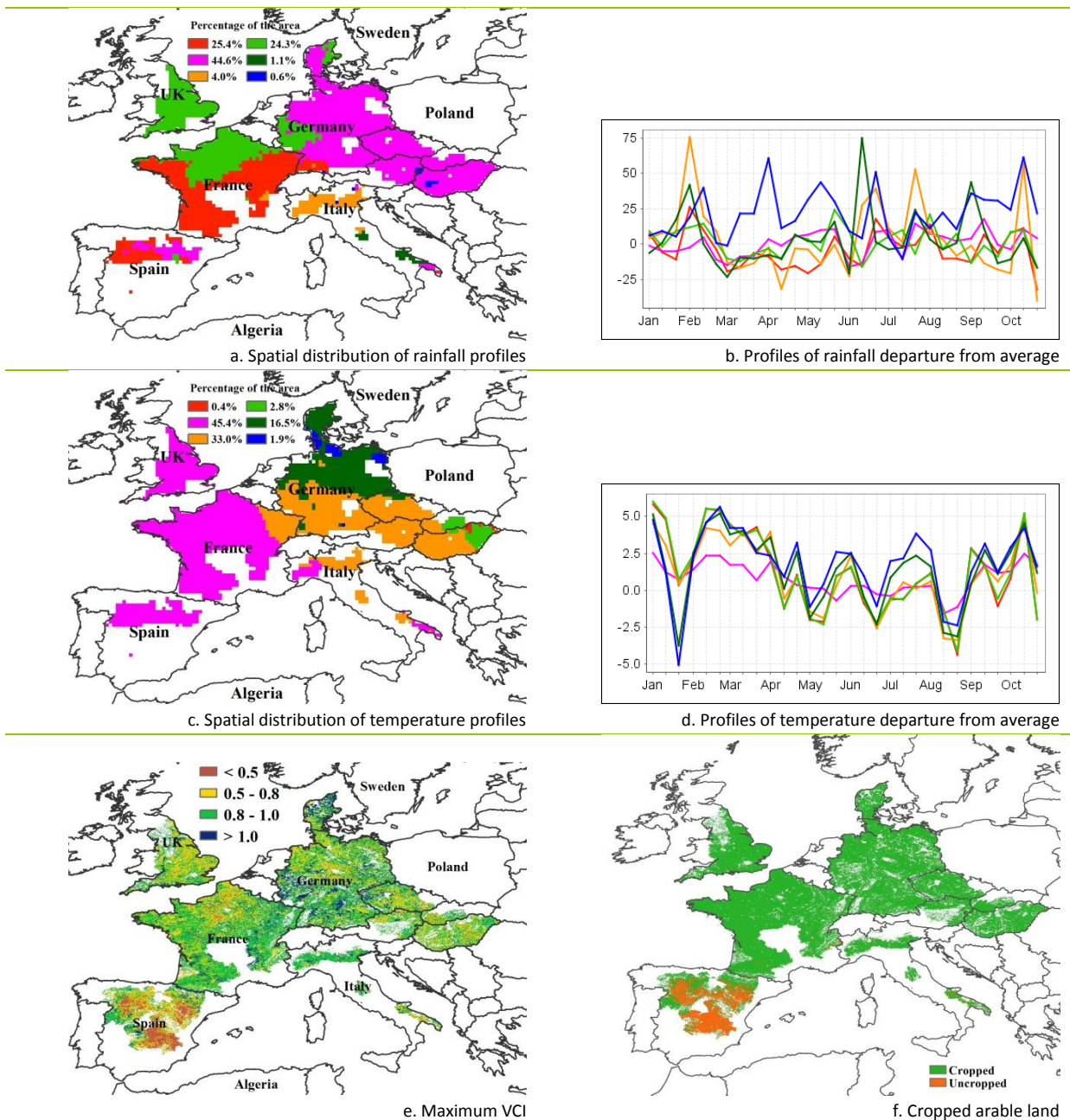
Rainfall (RAIN) and temperature (TEMP) were generally favorable from July to October 2014, with above average values for both rainfall (+7%) and temperature (+0.6°C). Three percent below average RADPAR was observed over the same period. The above average climatic conditions are beneficial for late crop development and maturation.

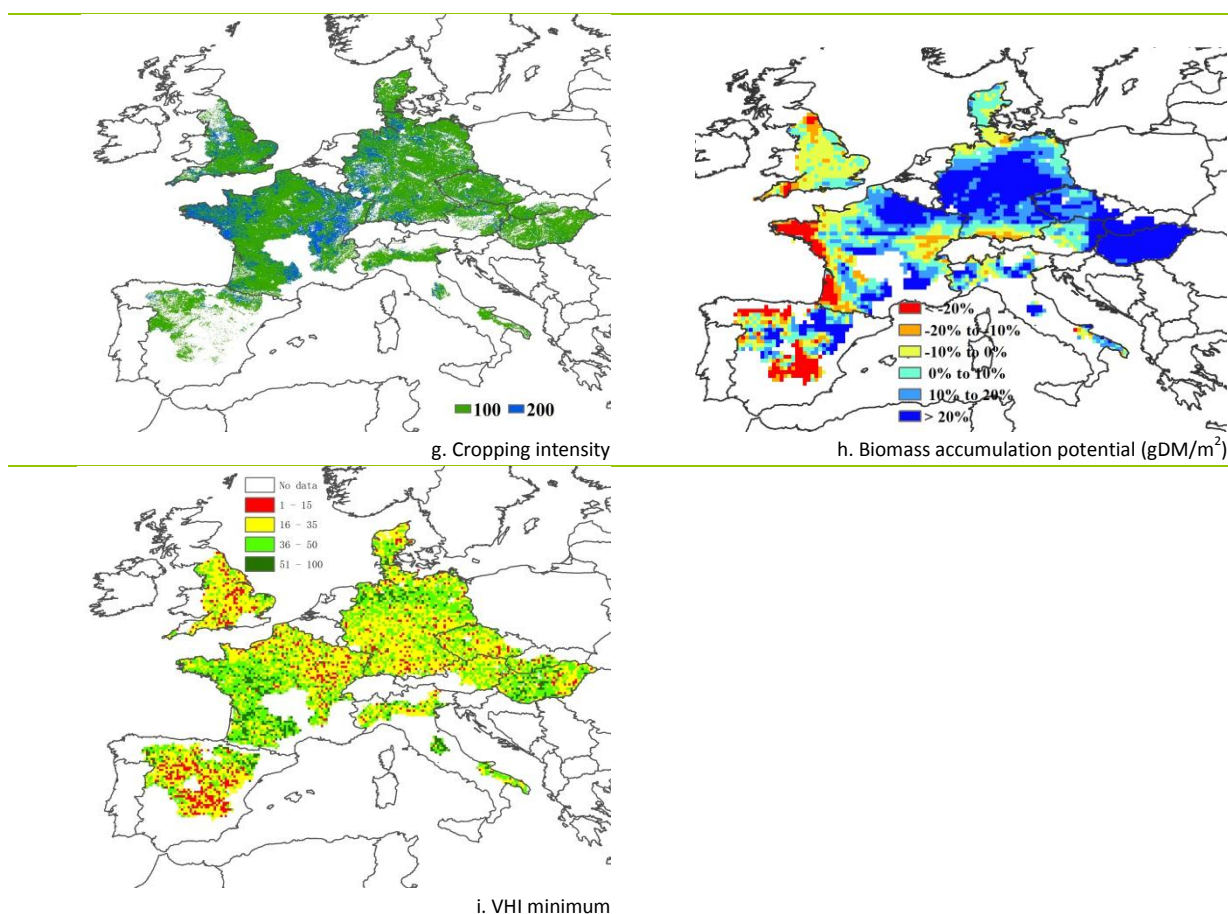
The condition of crops was above average, as suggested by 12% above average biomass (BIOMSS). Biomass accumulation in west and southwest France and northern and south-central Spain, however,

was well below average (20% lower), while in contrast, biomass in most other regions was 10% above average. The rainfall deficit from early August to September and the continuously below average temperature in mid-August in west and southwest France and northern and south-central Spain was the main reason for the low biomass, which is confirmed by the low values of the VHI minimum map and below average values of VCIx.

Although cropping Intensity (120%) was down 6% compared with the five-year-average, more than 93% of the arable lands were cropped in July to October 2014, 1% higher than the recent five-year average. Only central Spanish regions show uncropped land from July to October. 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. Pixels with low minimum VHI (below 15) are found sporadically in northeastern France, southern Germany, and south-central Britain, but especially in central Spain.

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





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

2.7 Central Europe to Western Russia

During the current monitoring period, sowing of winter crops was completed under generally favorable weather conditions, although drier conditions than usual has been experienced for the MPZ (24% drop in rainfall compared to average and a PAR increase of 4%). The crop condition deteriorates from north to south, with poor conditions in the southern Ukraine and southern part of western Russia.

As indicated by the rainfall profiles, the extreme south of western Russia (including the republics of Karachayevo-cherkesiya, Kabardino-balkariya and Severnaya Osetiya-alaniya) shows two peaks in rainfall: one well marked in mid-October, one diffuse in southern Poland and southwest Romania in September. Temperature profiles show correlated variations in Romania, Poland, Ukraine, Belarus, and western Russia. From August to October the temperature fluctuated but was generally low at the end of the period.

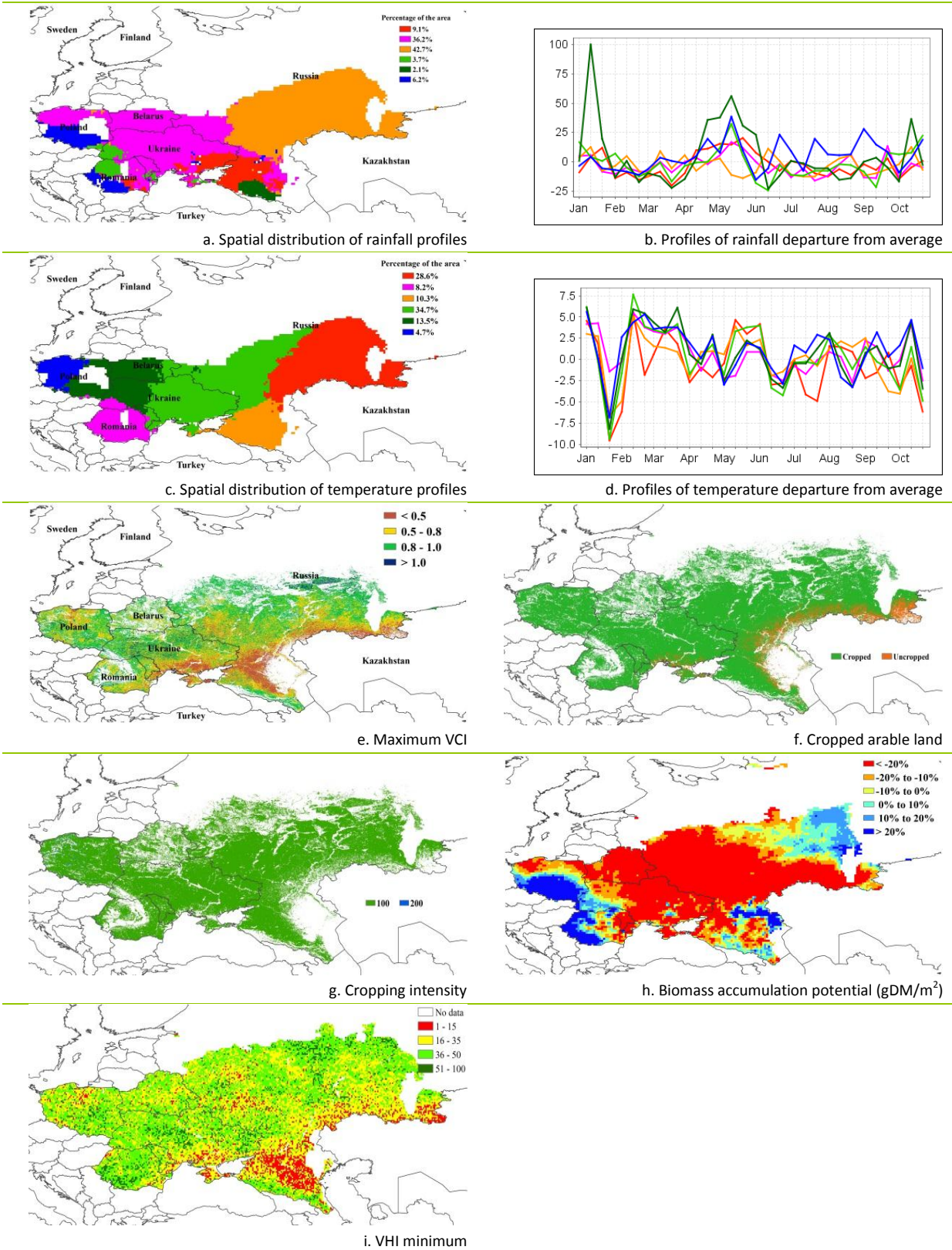
The scarce rainfall led to a significant drop in potential biomass for the whole MPZ (17% compared to the five-year average). On the distribution map of the potential biomass, a large positive biomass departure would be expected for the central part of the MPZ (including most parts of Belarus, Ukraine, and western Russia), while a positive biomass production pattern is observed in southern Poland, western Romania, and adjacent areas in Ukraine.

Accordingly, VHI-based drought profiles show worse moisture condition compared with the previous monitoring period. Ninety-two percent of the arable lands in August to November 2014 are cropped, at

the same level as the five-year average, maximum VCI (0.75) is lower compared with other regions. Generally, crop condition is favorable but slightly below expectations in the southern part of the MPZ.

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, July-October 2014



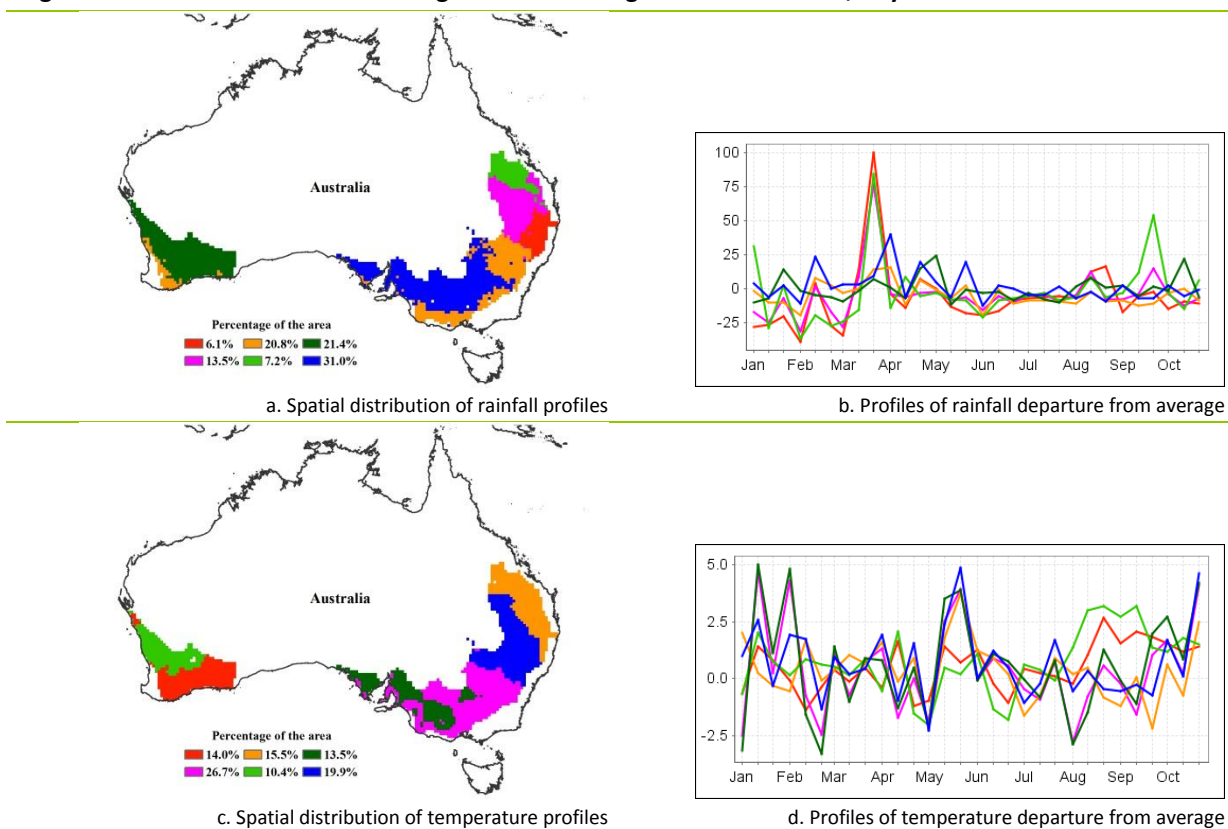
Note: For more information about the indicators, see Annex C.

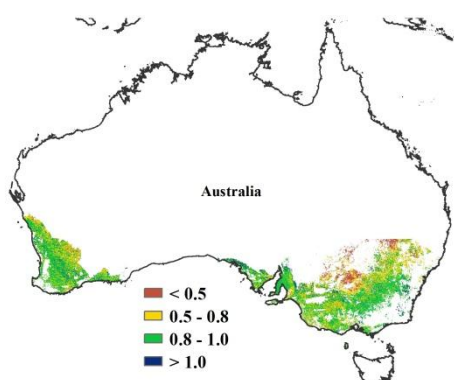
2.8 Southern Australia

Crop condition in Southern Australia was a bit below average during the reporting period. The temperature (TEMP) increased by 0.9°C and radiation (RADPAR) increased by 1%, compared to average. Rainfall (RAIN) decreased by 36%, although current rainfall was only 114 mm. As a result, potential biomass (BIOMSS) decreased by 31%. The cropped arable land fraction (CALF) increased by 12% over the Southern Australia region compared to the recent five-year average, while cropping intensity at 123% remains at an average level, 2% above the five-year average. The maximum VCI correlated well with cropped arable land, with an average value of 0.79. The maximum VCI in southwestern and central New South Wales was less than 0.5, as the area had uncropped land this year. Based on both the agroclimatic and agronomic indicators, CropWatch estimates that the growing of wheat and barley would be negatively influenced in Southern Australia, which was confirmed by the decreasing potential biomass due to reduced rainfall. In some regions, however, rainfall showed an increase. For example, in September, rainfall exceeded average values by over 50% in southeastern Queensland and in October, by nearly 25%, in southwestern Western Australia, where temperature also rose above average (+2°C). CropWatch estimates that winter wheat and barley in both these regions would probably still have average productions.

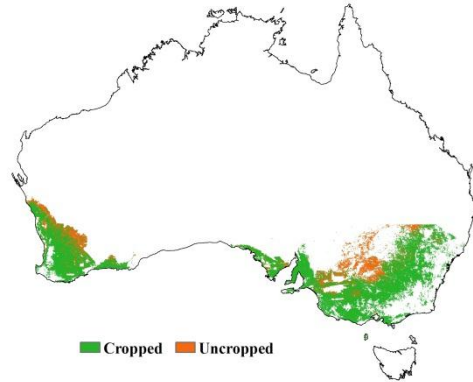
Figure 2.7 presents an overview of the agroclimatic and agronomic indicators for Southern Australia.

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

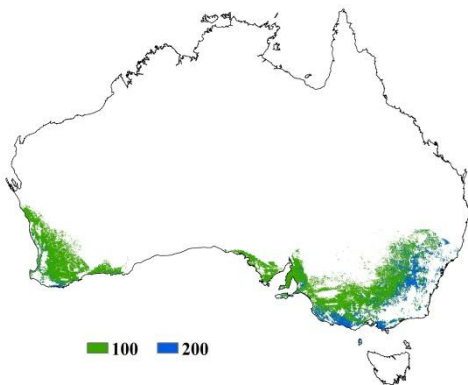




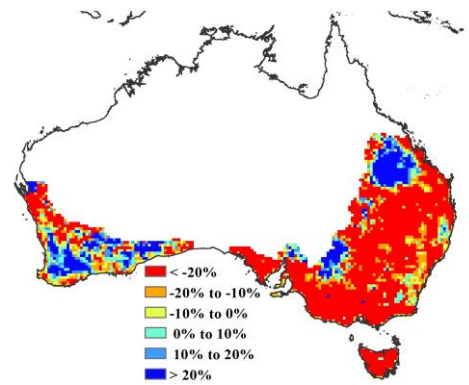
e. Maximum VCI



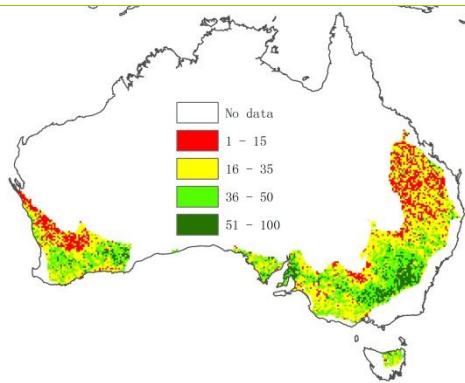
f. Cropped arable land



g. Cropping intensity



h. Biomass accumulation potential (gDM/m²)



i. 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, Brazil, Canada, and the United States.

3.1 Overview

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

Two countries—Iraq and New Zealand—underwent extreme conditions during the reporting period; Iraq experienced rainfall at a level of 178% of average and a TEMP increase of +2.6°C (RAIN +178%, TEMP +2.6°C), while New Zealand experienced a decrease in both (-85%, -0.6°C). Negative effects on crops are unlikely in Iraq, but in New Zealand the period coincides with the end of the winter crop season and negative impacts are likely on wheat and barley. Less extreme conditions are reported for French Guyana (-31%, -1.8°C) and Portugal (-33%, -0.7°C, with a drop in RADPAR of 5%), where both rainfall and temperature were below average. In Spain, temperature was low as well (-1.7°C), but rainfall was closer to average than in neighboring Portugal.

The following countries all experienced varying degrees of excess rainfall: Macedonia (+55%, -0.4°C, -5% RADPAR), Mauritania (+58%, +1.7°C), Lebanon (+60%, -1.6°C, +11% RADPAR), neighboring Syria (+105%, +2.1°C), and Uzbekistan with a record +175% of rainfall and -0.2°C temperature departure. For Uzbekistan, CropWatch indices also list a biomass potential (BIOMSS) increase of 175%. For all countries, the extra rainfall constitutes a positive factor, either for the end of the summer season (for example in Mauritania), or to replenish soil moisture before the winter crop season in Europe and Asia.

Countries with below average precipitation but otherwise average conditions are mostly located in southern Africa and include Botswana (RAIN -56%), Swaziland (-51%), and South Africa (-39%). The reduced rainfall may point at a late onset of the main growing season (October-March/May). It is compatible with El Niño patterns and may negatively affect the growing season through low initial soil moisture storage. Other countries that deserve mentioning are Suriname (RAIN -41%) and, among the major producers, Ukraine with a drop in rainfall of -29%.

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

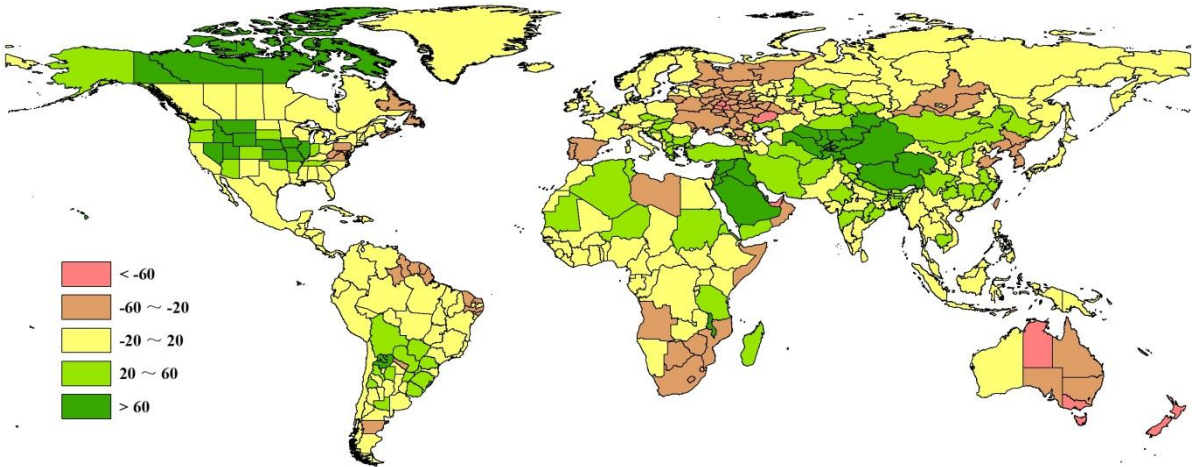


Figure 3.2. Global map of temperature (TEMP) by country and sub-national areas, departure from 13YA (degrees), July-October 2014

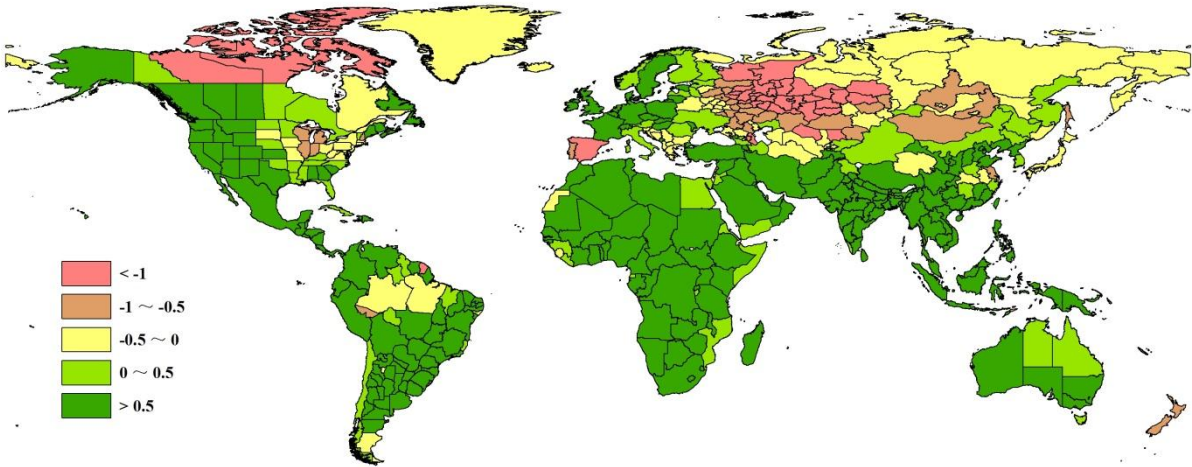


Figure 3.3. Global map of PAR (RADPAR) by country and sub-national areas, departure from 13YA (percentage), July-October 2014

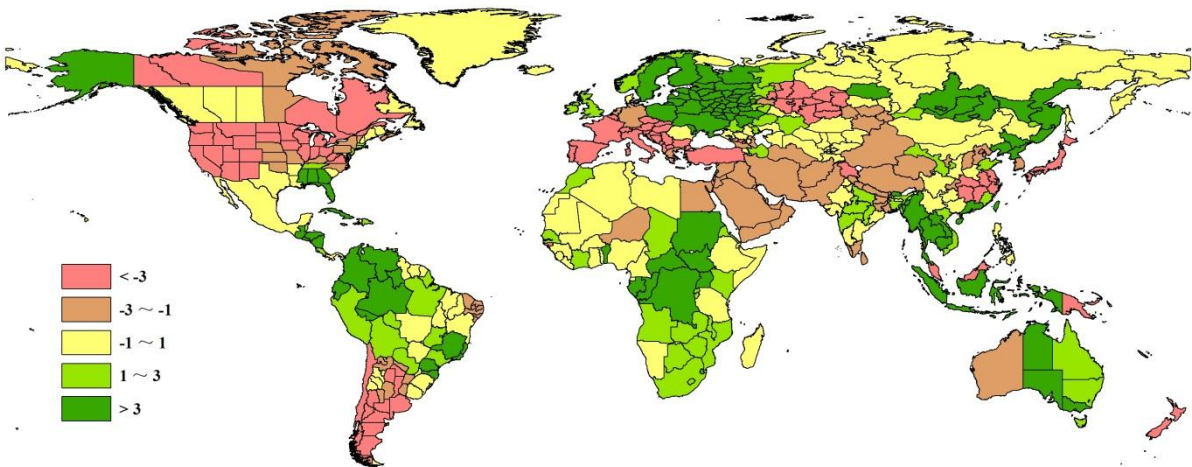
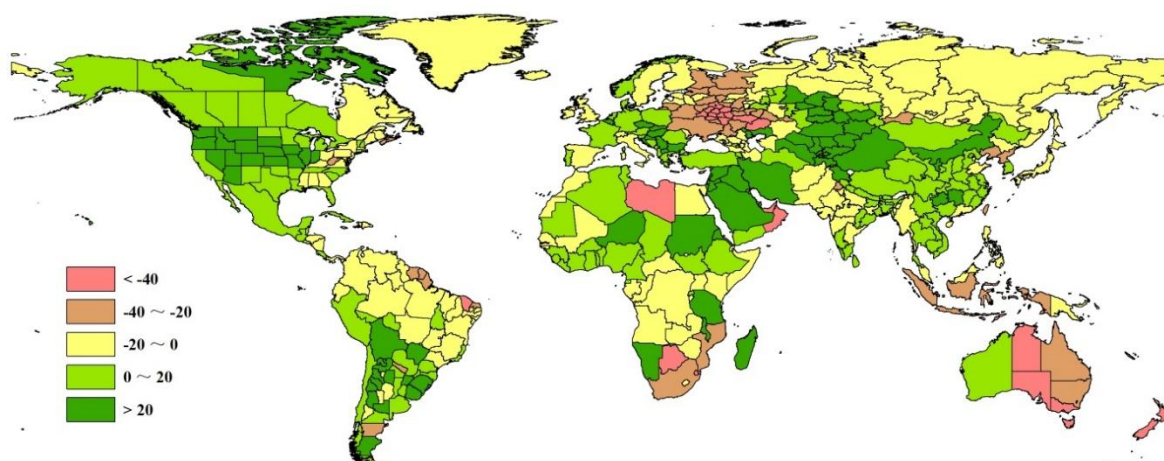


Figure 3.4. Global map of biomass (BIOMSS) by country and sub-national areas, departure from 13YA (percentage), July-October 2014**Table 3.1. CropWatch agroclimatic and agronomic indicators for July-October 2014, departure from 5YA and 13YA**

Country	Agroclimatic indicators			Agronomic indicators			Current Maximum VCI
	Departure from 13YA (2001-13)			Departure from 5YA (2009-13)		Cropping Intensity (% points)	
	RAIN (%)	TEMP (°C)	RADPAR (%)	BIOMSS (%)	CALF (%)		
Argentina	12	1.9	-4	14	10	2	0.72
Australia	-37	0.9	1	-31	12	2	0.79
Bangladesh	23	1.1	2	4	-1	-5	0.86
Brazil	4	1.7	1	1	12	5	0.71
Cambodia	26	1.3	4	8	2	-18	0.87
Canada	6	1.0	-2	6	2	-2	0.91
China	14	0.7	-1	12	0	-6	0.86
Egypt	-17	0.0	-1	0	5	0	0.82
Ethiopia	-2	0.7	0	2	2	0	0.87
France	-3	1.1	-5	6	0	-4	0.85
Germany	18	1.1	-2	17	0	-8	0.88
India	18	1.2	0	-3	-1	0	0.84
Indonesia	-20	0.8	4	-21	0	-12	0.87
Iran	37	1.0	-1	30	0	-3	0.65
Kazakhstan	40	-0.7	-2	33	2	0	0.67
Mexico	-1	0.8	1	8	5	5	0.86
Myanmar	-8	1.2	5	-5	0	-15	0.90
Nigeria	8	0.7	0	6	0	-4	0.81
Pakistan	1	1.3	-1	-15	-2	-1	0.66
Philippines	5	0.6	0	-3	0	-14	0.89
Poland	10	1.0	4	10	0	5	0.80
Romania	-9	0.4	0	13	1	5	0.78
Russia	-17	-0.8	2	-10	1	-1	0.78
S. Africa	-39	0.9	2	-24	-18	6	0.44
Thailand	7	0.9	5	1	0	-16	0.93
Turkey	35	1.1	-3	19	2	-3	0.78
U.K.	4	0.9	3	-6	0	-13	0.81
Ukraine	-29	0.1	7	-22	0	-2	0.75
U.S.A.	16	0.4	-2	14	3	-1	0.83
Uzbekistan	175	-0.2	-1	175	-2	0	0.67
Vietnam	1	1.1	1	2	0	-15	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 (July-October).

Large excess of water affected Malawi (+159%) and a group of countries in Central Asia (Uzbekistan was already mentioned; Kyrgyzstan, +181%; and Tajikistan, +311%), where it will benefit winter crops and especially rangelands.

The South-American heat wave was already mentioned in chapter 1 in relation to Brazil and Argentina. This heatwave also affected other countries in the region, such as Uruguay (+2.3°C), Paraguay (+2.6°C) and, further north, Guatemala (+2.6°C) and Belize (+3.9°), the record among all countries monitored by CropWatch. The heat wave was often accompanied by a lot of sunshine, for instance in Colombia (+6% RADPAR) and Ecuador (RADPAR +8%).

Larger than average sunshine is also mentioned for central Africa (the Democratic Republic of Congo, Uganda, Gabon, Sudan, South Sudan, and the Central African Republic), with values between 6 and 11% excess RADPAR. This can only benefit crop production and food security in countries where water is rarely limiting but cloud cover limits available sunshine. A group of countries in Europe were exposed to record low sunshine between -7% and -10% RADPAR, including Slovenia, Croatia, Switzerland, Austria, and Bosnia and Herzegovina, among others. With the low sunshine values often correlated with high rainfall, low RADPAR is not necessarily negative at this time of the year. However, water logging has certainly interfered with late harvest operations as well as with the land preparation for the coming winter season.

3.2 Country analysis

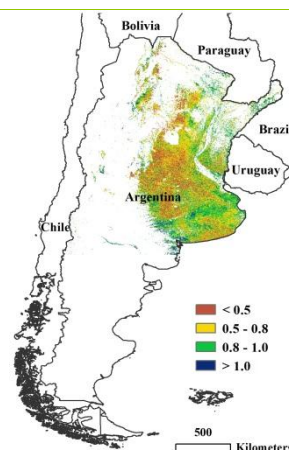
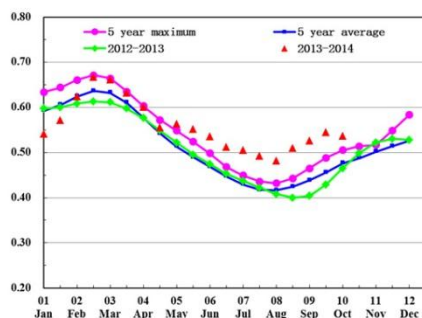
Subsequent pages present CropWatch results for each of the thirty key countries (China is addressed in Chapter 4). The maps refer to crop growing areas only and include (a) Crop condition development graph based on NDVI average over crop areas, comparing the January-October 2014 period to the previous season, to the five-year average (5YA), and the five-year maximum. (b) Maximum VCI (over arable land mask) for July 1-October 31, 2014 by pixel; (c) Spatial NDVI patterns from January or April (according to local cropping patterns) up to October 2014 (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.5, 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 July-October 2014

[ARG] Argentina

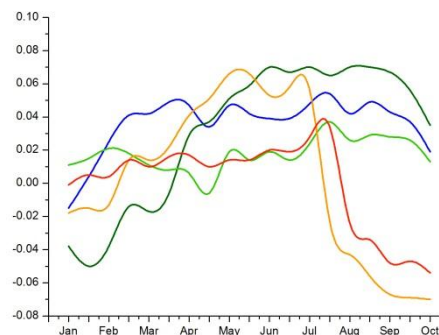
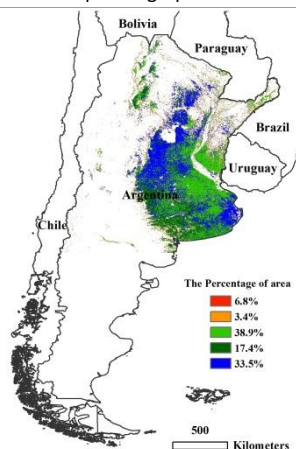
Crop condition in Argentina was generally favorable in 2014. Currently, the harvesting of winter wheat is ongoing. The planting of maize is virtually over, while the planting of soybean is still ongoing. From July to October, Argentina experienced wet and warm climatic conditions which are beneficial for the emergence and development of maize and 1st season soybean. Compared with the average, Argentina experienced 12% more rainfall, 1.9°C degree higher temperature, and average PAR. Spatial NDVI patterns compared to the 5-year average and the corresponding NDVI departure cluster profiles reveal that NDVI of most arable land in Argentina is above average. Major wheat producing regions (including southern Buenos Aires, Cordoba, and Santa Fe) are even better off. Crop condition development graphs based on NDVI present the evolution of winter crops since August. The higher than the previous five years' maximum NDVI series confirms above average winter crop condition. However, the 1.5°C degree and 2.2°C degree higher air temperature in the two top wheat producing states (see also figure 2.3(c, d)) shortens the grain filling stage and accelerates wheat maturity, thus hampering yield formation. Compared with the assessment carried out in August, CropWatch revised down the winter wheat production to 13 million tons, still 22% up over last year but 4% down from the August estimates. The increased production is due to the expanded planting area because of high domestic prices. (See also table B.1 in Annex B.)

Figure 3.5. Argentina crop condition, July-October 2014



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

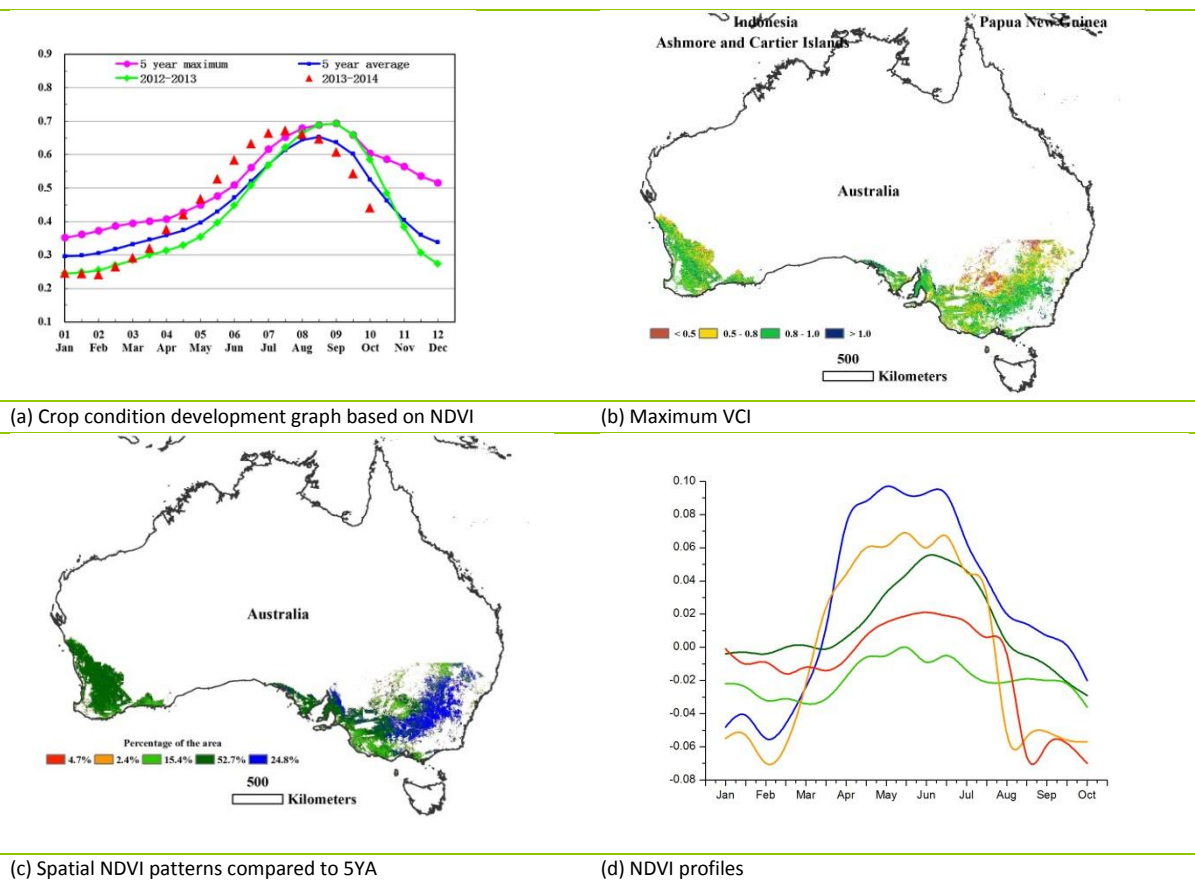
(d) NDVI profiles

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

[AUS] Australia

In general, crop condition was slightly below average in Australia from July to October, which was the main growing season for winter wheat and barley. The spatial NDVI patterns showed that in southeastern New South Wales (24.8% of the arable land), winter wheat and barley enjoyed above average condition until the middle of September, while in southwestern Western Australia, southern South Australia, and northwestern Victoria (52.7% of arable land), condition was a little below average from August. In the southeast of South Australia, South Victoria, west of the border area between New South Wales and Victoria (15.4% of the arable land), crop condition was slightly below average throughout the monitoring period. This analysis was further confirmed by the crop condition development graph based on NDVI, which shows that wheat and barley were, on the whole, above average in July, but that both deteriorated gradually from August, although crop condition was above average during the planting and early growing season from May to June. The below average condition was due to a general 37% decrease of precipitation compared with average, as mentioned in the MPZ analysis (section 2.6), confirming that irrigation could not compensate the decreased rainfall from July to October. In summary, CropWatch estimates that the production of wheat in Australia will decrease by 4%, but that wheat production in Western Australia would increase by 3%. (See also table B.2 in Annex B.)

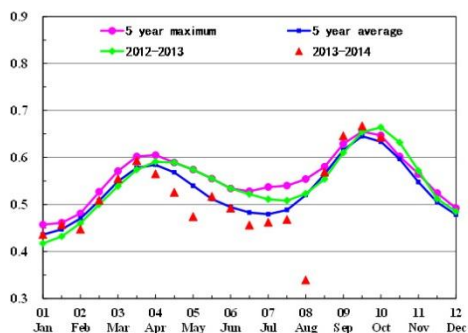
Figure 3.6. Australia crop condition, July-October 2014



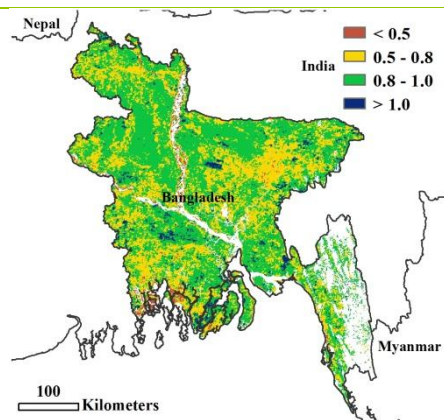
[BGD] Bangladesh

CropWatch indicators show average crop condition in the northeastern and southern regions (including Sylhet and Khulna), but above average conditions elsewhere. The maximum VCI values observed were above 0.8 in most areas, except in the two mentioned regions of Sylhet and Khulna where VCIx was between 0.5 and 0.8. The low NDVI values around July indicate the completion of Aus harvesting and the sowing of Aman rice and sorghum. Crop condition development was similar to the previous five years' maximum. Rainfall (RAIN) was 23% higher than average, which benefited the sowing and growing of Aman rice. Temperature (TEMP) and PAR (RADPAR) were average, but biomass (BIOMSS) was 4% higher than the recent five-year average.

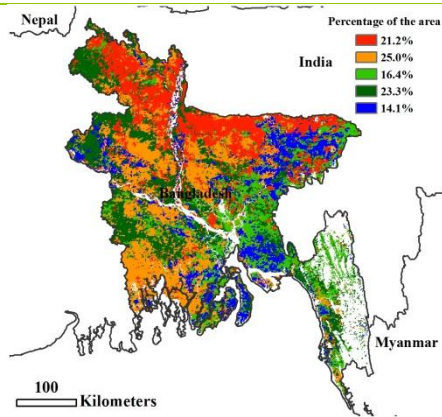
Figure 3.7. Bangladesh crop condition, July-October 2014



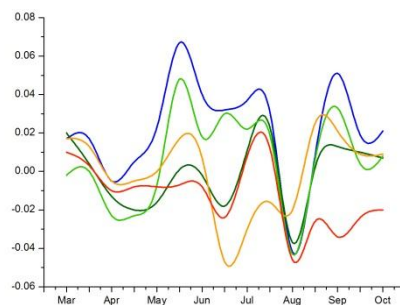
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



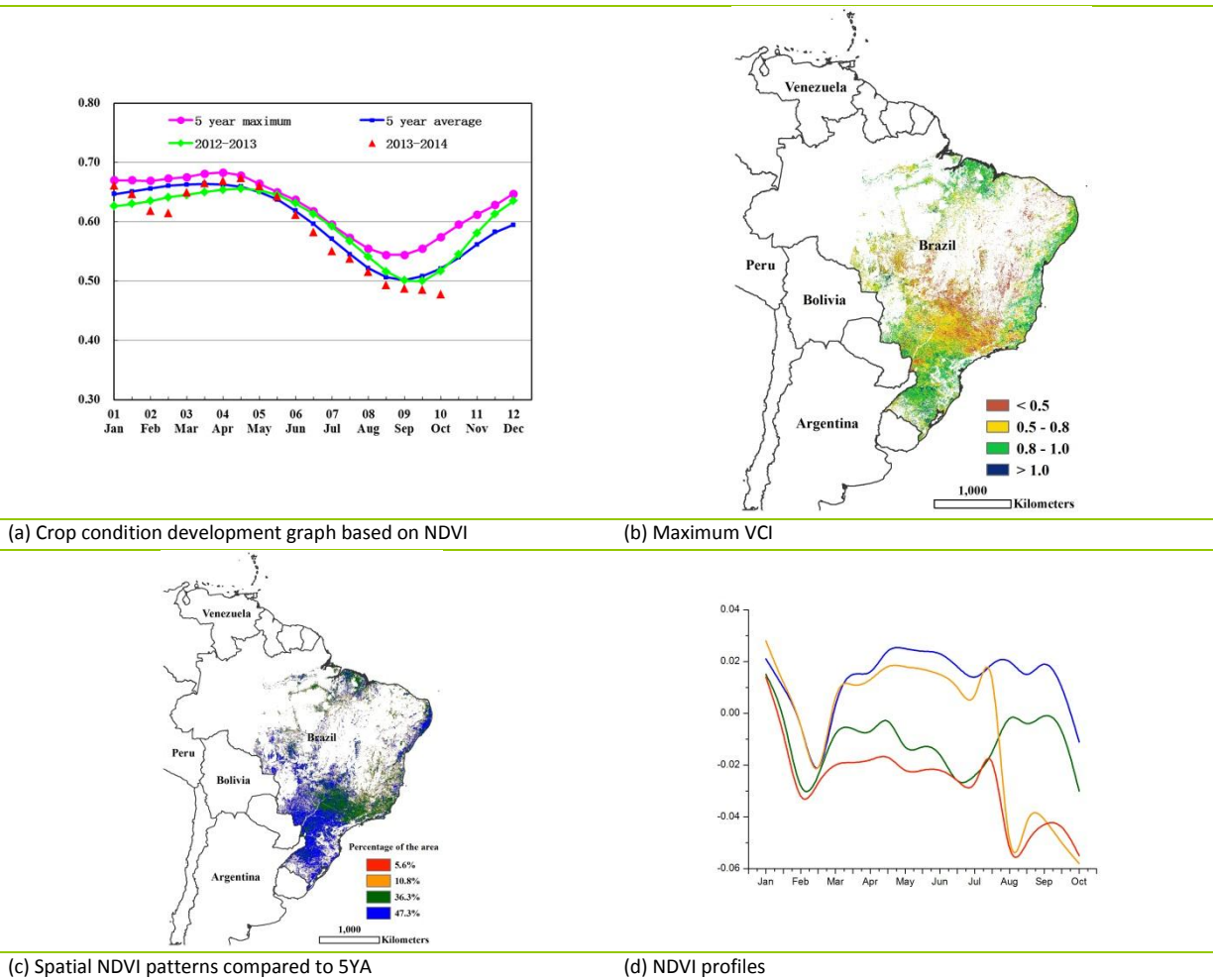
(d) NDVI profiles

ARGAUS 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

[BRA] Brazil

Crop condition in Brazil was generally average from July to October. Currently, the harvest of wheat and second maize (mostly in central and southern Brazil) is almost completed. The planting of rice, soybean, and first maize are ongoing. From July to October 2014, above average TEMP dominated in Brazil and altogether average (13YA) precipitation was observed at national level, even if conditions sometimes varied from place to place. Southern Brazil, including Rio Grande Do Sul, Paraná and Mato Grosso Do Sul experienced 20% more rainfall than average while central Brazil (Mato Grosso to Minas Gerais) suffered from a water deficit. Water was the key limiting factor for crops over the July to October period as confirmed by the maximum VCI map. Crop condition in central Brazil including Mato Grosso, Goiás, and Minas Gerais is either at or below average due to shortage of rainfall. The top two wheat producing states (Rio Grande Do Sul and Paraná) show above average vegetation condition and BIOMSS (see also figure 2.3(f)). However, the persistent high temperature (2°C degree above average) shortens the grain filling stage and hampers yield accumulation. The harvest of wheat was well advanced due to high temperature, which can be confirmed by the rapid decrease of the NDVI profile in the crop condition development graph. Overall, wheat production has been revised downwards to 6.6 million tons, 6% down from the CropWatch August forecast, but still 16% above last year’s production due to expanded area supported by high domestic and regional prices. Wheat yield is revised from average to 6% below last year’s harvest (see also table B.3 in Annex B).

Figure 3.8. Brazil crop condition, July-October 2014



[CAN] Canada

In general, crop condition was below average in Canada from July to October 2014. This monitoring period is the key growing and harvesting season of spring wheat and soybean. Overall weather conditions were close to average with rainfall rising 6% above average, temperature increasing 1°C, and RADPAR 2%. In the major production provinces, abundant rainfall fell over Alberta (+19%), Manitoba (+8%), and Saskatchewan (+15%) and provided sufficient water for crop growth, generally making up for increased water requirements deriving from above average temperature in Manitoba (+1.4°C) as well as Alberta and Saskatchewan (both 1.1°C). RADPAR was close to average.

Conditions were favorable to crop growth and development, as confirmed by NDVI clusters and profiles. Biomass (BIOMSS) increased by 6%, CALF increased by 2%, and cropping intensity decreased by 2% compared to the five-year average. Unfortunately, serious floods were recorded in Southern Alberta, Manitoba, and Saskatchewan during the monitoring period (especially in Southern Alberta), resulting in crop damage. The national NDVI average of croplands indicates that crop condition is below the average of the last five years and far below conditions in 2013. Below average production can be expected for this year. (See also table B.4 in Annex B.)

Figure 3.9. Canada crop condition, July-October 2014

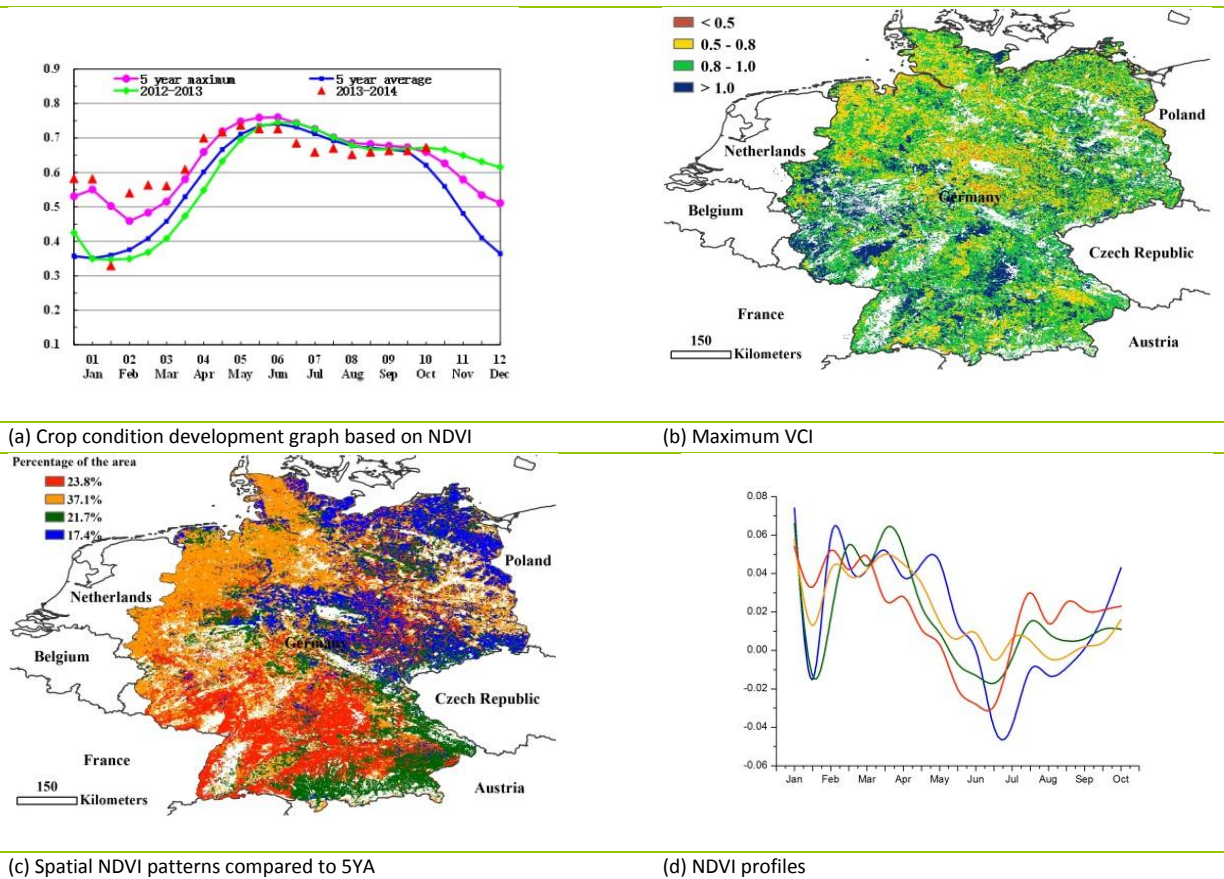


ARG AUS BGD BRA CAN **DEU** EGY ETH FRA GBR IDN IND IRN KAZ KHM MEX MMR NGA PAK PHL POL ROU RUS THA TUR UKR USA UZB VNM ZAF

[DEU] Germany

The crops in Germany showed generally average conditions during the reporting period from July to October. The country's spatial NDVI indicates a situation that on the whole is better than the five-year average, except for limited patches in the Central-East and Northern Germany (Saxony, Lower Saxony, Sachsen-Anhalt and Mecklenburg-Vorpommern). This spatial pattern is also reflected by the maximum VCI in Lower Saxony and Sachsen-Anhalt, with a VCIx of 0.88 for Germany overall. According to the crop condition map based on NDVI, Germany enjoyed an average season compared with the five-year average throughout the reporting period, but less favorable than the five-year maximum. The CropWatch TEMP indicator exceeded average by 1.1°C and RAIN increased by 18%. Although RADPAR decreased by 2% compared with the previous thirteen-year average, BIOMSS increased by 17% (over the five-year average). Cropping intensity decreased by 8%, compared to the five-year average. Due to the suitable temperature and adequate rainfall, the agronomic indicators mentioned above all indicate an average condition for most summer crop areas of Germany.

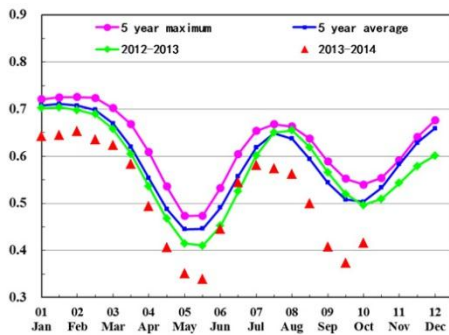
Figure 3.10. Germany crop condition, July-October 2014



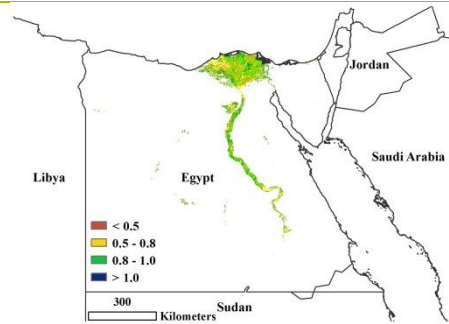
[EGY] Egypt

Agroclimatic indicators were somewhat unfavorable for Egypt, with RAIN at -17% and RADPAR at -1% (TEMP and BIOMSS are both average). However, because virtually all crops are irrigated, this situation is no cause for concern. The fraction of cropped arable land (CALF) increased by 5%, but cropping intensity was average; average VCIx stands at 0.82. According to NDVI profiles and clusters, the Nile valley experienced almost perfectly average conditions throughout the summer crop and early winter crop season, the latter of which just started. Conditions in the Nile delta are more contrasted, but average NDVI is now just above average, indicating a favorable condition of the early winter crop.

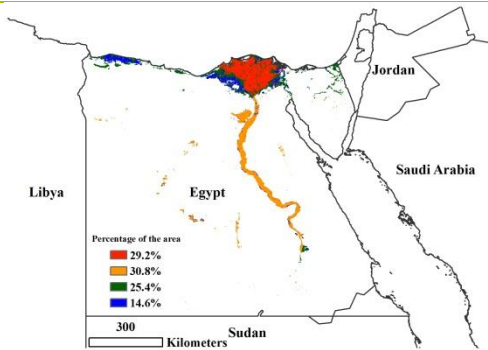
Figure 3.11. Egypt crop condition, July-October 2014



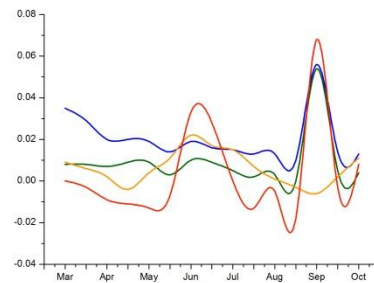
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



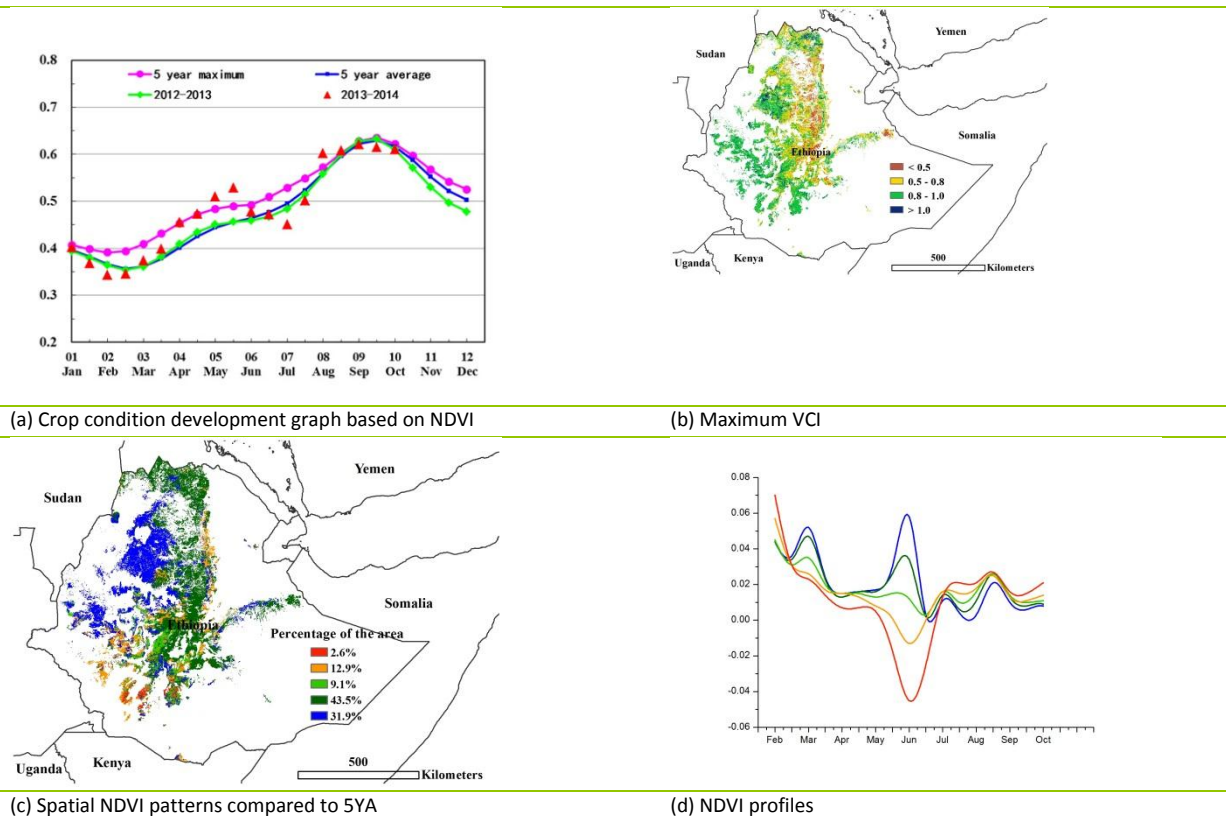
(d) NDVI profiles

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[ETH] Ethiopia

During the Belg season—Belg crops are harvested before August—NDVI fluctuated around the level of the reference values with departures close to 0.1. The Meher crops appear to be generally average, as the late stages occurred in conditions that were average as well (RAIN -2% RAIN, TEMP +0.7°C, RADPAR +0%, and BIOMSS +2%). The NDVI profiles illustrate that the current season was rather similar throughout the country, with differences between areas related to the behavior of NDVI between May and July (with a positive or negative peak in June). In about 20% of the agricultural areas, located in the eastern fringe of agricultural areas bordering Afar and in the central south-west (SNPP), NDVI behavior was average. In about 2.6% of croplands, in the south of SNPP, behavior was very poor. Finally, NDVI behavior in about 75% of the country, particularly in central Amhara and west Oromyia, can be considered favorable to very favorable. The fraction of cropped arable land (CALF) increased by 2%. VCIx values in large part confirm the analysis above based on the NDVI profiles, which means that most Belg and Meher season crops can be ranked as average to above average.

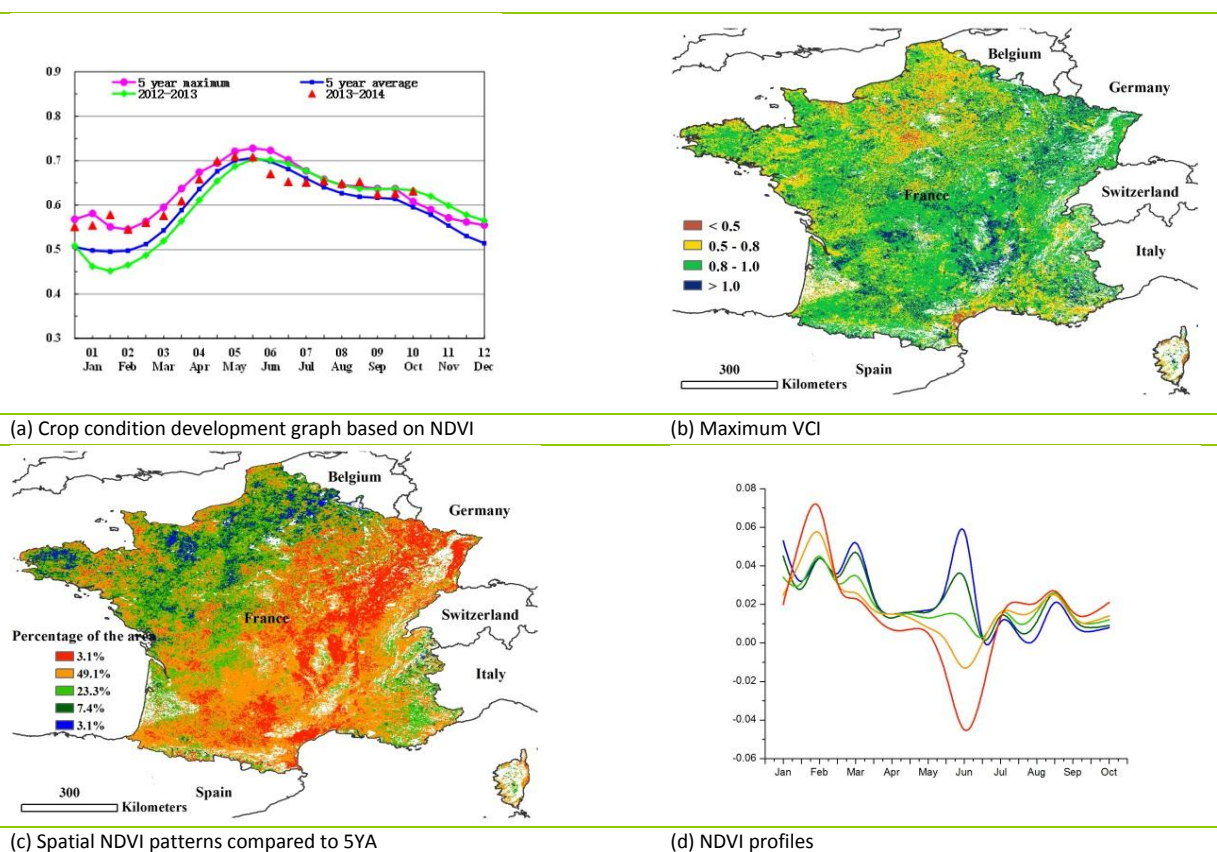
Figure 3.12. Ethiopia crop condition, July-October 2014



[FRA] France

Crops in France showed generally favorable conditions during the reporting period from July to October. Currently, summer crops have been harvested. As shown by the NDVI profiles, national NDVI values were well above average and even higher than the five-year maximum in July and August, after which they were close to maximum from September to October. 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. This spatial pattern was also reflected by the maximum VCI in the different areas, with a VCIx of 0.85 for France overall. The CropWatch TEMP indicator exceeded average by 1.1°C, RADPAR and rainfall decreased by 5% and 3%, respectively, below the thirteen-year average, while BIOMSS increased 6% compared to the five-year average. Cropping intensity decreased by 4%, compared to the five-year average. Generally, due to the suitable temperatures, the agronomic indicators mentioned above indicate a favorable condition for most summer crop areas of France.

Figure 3.13. France crop condition, July-October 2014

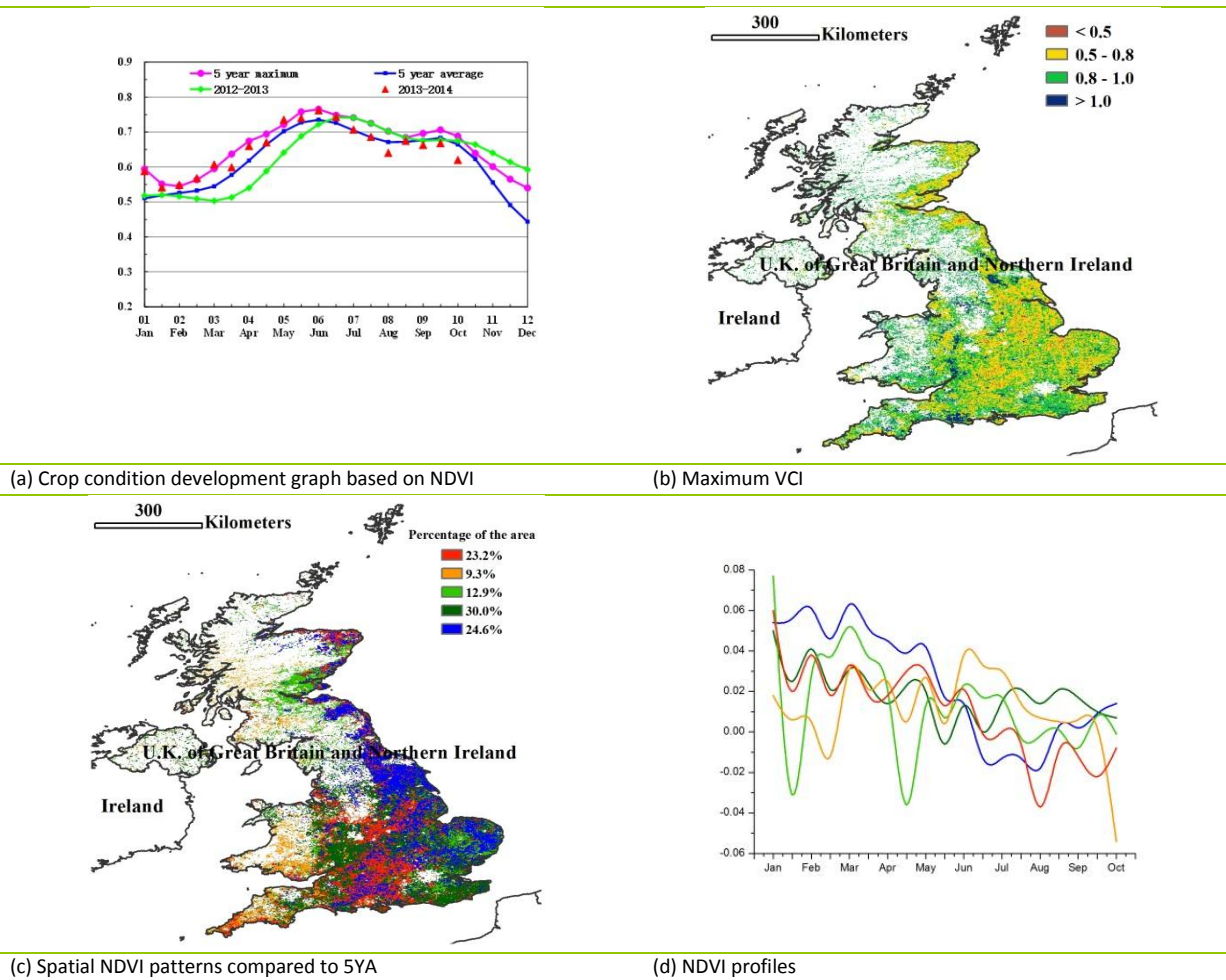


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[GBR] United Kingdom

The crops showed generally unfavorable conditions during the reporting period from July to October. Currently, summer crops have been harvested. As shown by the NDVI profiles, national NDVI values were close to average in early July, after which they were all below average from mid-July to October. According to the crop condition map based on NDVI, more than 50% of the country's spatial NDVI was lower than average from July to September, especially in southern and eastern England (Oxford, Cambridge, York, Birmingham, Edinburgh). This spatial pattern is also reflected by the maximum VCI in the different areas, with a VCIx of 0.81 for the country overall. The CropWatch agroclimatic and agronomic indices indicate total precipitation (RAIN, +4%), average temperature (TEMP, +0.9), and PAR (RADPAR, +3%) were above average, while BIOMSS decreased by 6%, reflecting the above-mentioned crop conditions in the country. Cropping intensity decreased by 13% compared to the five-year average. Overall, the agronomic indicators all indicate an unfavorable condition for most summer crop areas of the United Kingdom.

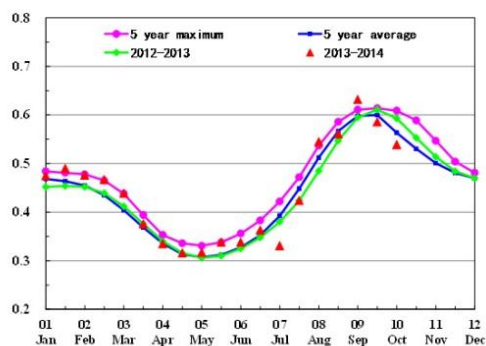
Figure 3.14. United Kingdom crop condition, July-October 2014



[IDN] Indonesia

Indonesia underwent close to average conditions between August and October, while the dry season maize and rice is entering generative or early ripening stage. Compared with the recent thirteen-year average for the same period, precipitation was significantly (20%) below average--the possible result of El Niño conditions building up. The CropWatch agroclimatic indices also indicate warmer than average weather and a RADPAR increase of 4%. Nevertheless, influenced by the lack of rain, biomass accumulation was still much below average (-21%). This is consistent with the NDVI profile, which stayed slightly below the five-year average for the recent two months. Additional spatial information provided by NDVI clusters shows mostly below average conditions in Nangroe, Aceh, Darussalam, and Nusatenggara Timur, but generally average for most of the country's islands.

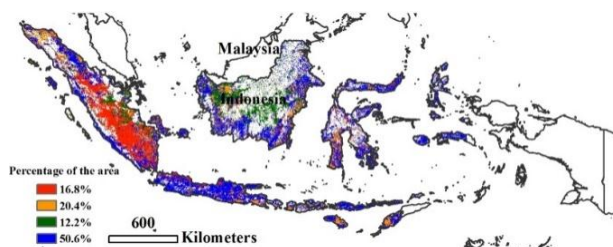
Figure 3.15. Indonesia crop condition, July-October 2014



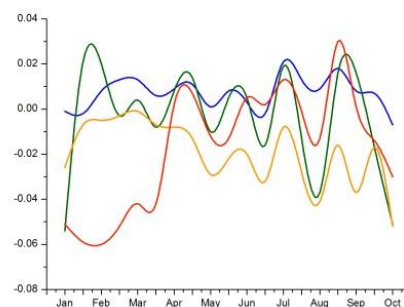
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



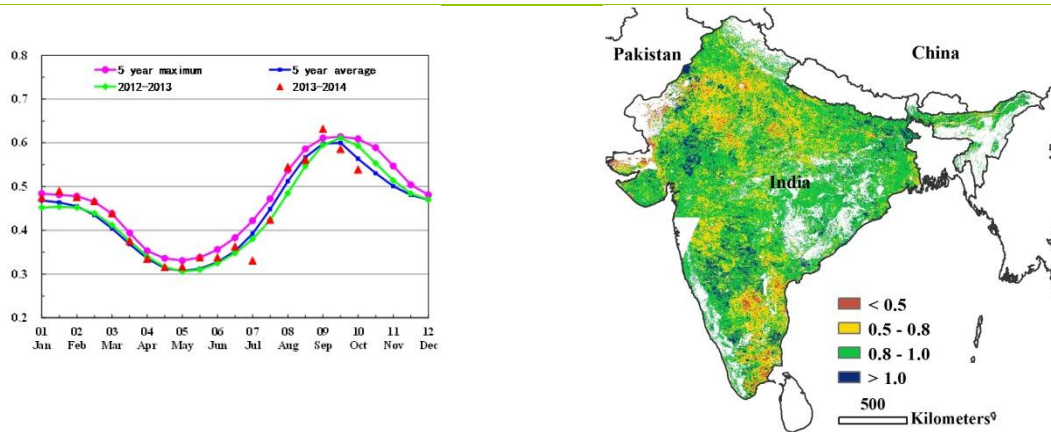
(d) NDVI profiles

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[IND] India

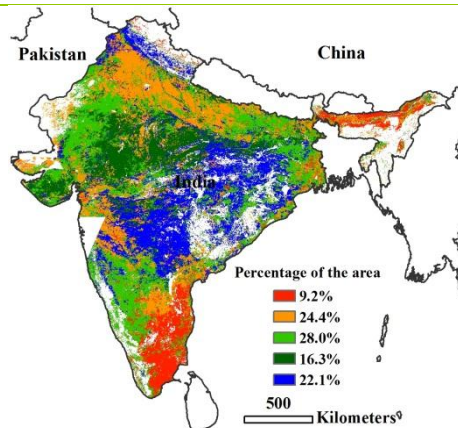
CropWatch indicators show overall above average crop condition for the entire country. The monitoring period was the main growing season of kharif crops, including rice and maize. India’s maximum VCI value never dropped below 0.5, except in some isolated areas in southern and northern India; in most states VCIx ranged between 0.8 and 1.0, indicating above average crop condition. Considering the spatial patterns of NDVI profiles, most areas experienced below average condition in July, but recovered around mid-August. Crop condition then declined again in parts of Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh, and Odhisa, and improved by the end of September. This probably happened due to erratic rainfall and increases in temperature as both rainfall and temperature were higher than average in central and East India, while lower than average rainfall was recorded in Punjab, Haryana, Kerala, and Uttar Pradesh. The low NDVI values from May to June are a result of the completion of the rabi crop harvest (by June), followed by the cultivation of kharif crops. Crop condition development was generally above average with crops at an advanced stage of maturity. Rainfall was 18% above average for the country, which led to localized floods in July and September in places such as Assam and Bihar, hampering the development of crops. However, main rice growing states like Andhra Pradesh, Odisha, Madhya Pradesh, Tripura, and West Bengal received slightly higher than average precipitation, which increased the yield potential. RADPAR values were average, while temperature was 1.2°C higher than average for the country. BIOMSS was slightly below (-3%) the previous five-year average. In October, cyclone Hudhud seriously damaged agriculture in Andhra Pradesh and Odisha, among other states, the exact costs of which are still being assessed (see section 5.2).

Figure 3.16. India crop condition, July –October 2014

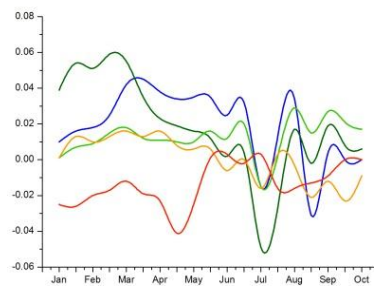


(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

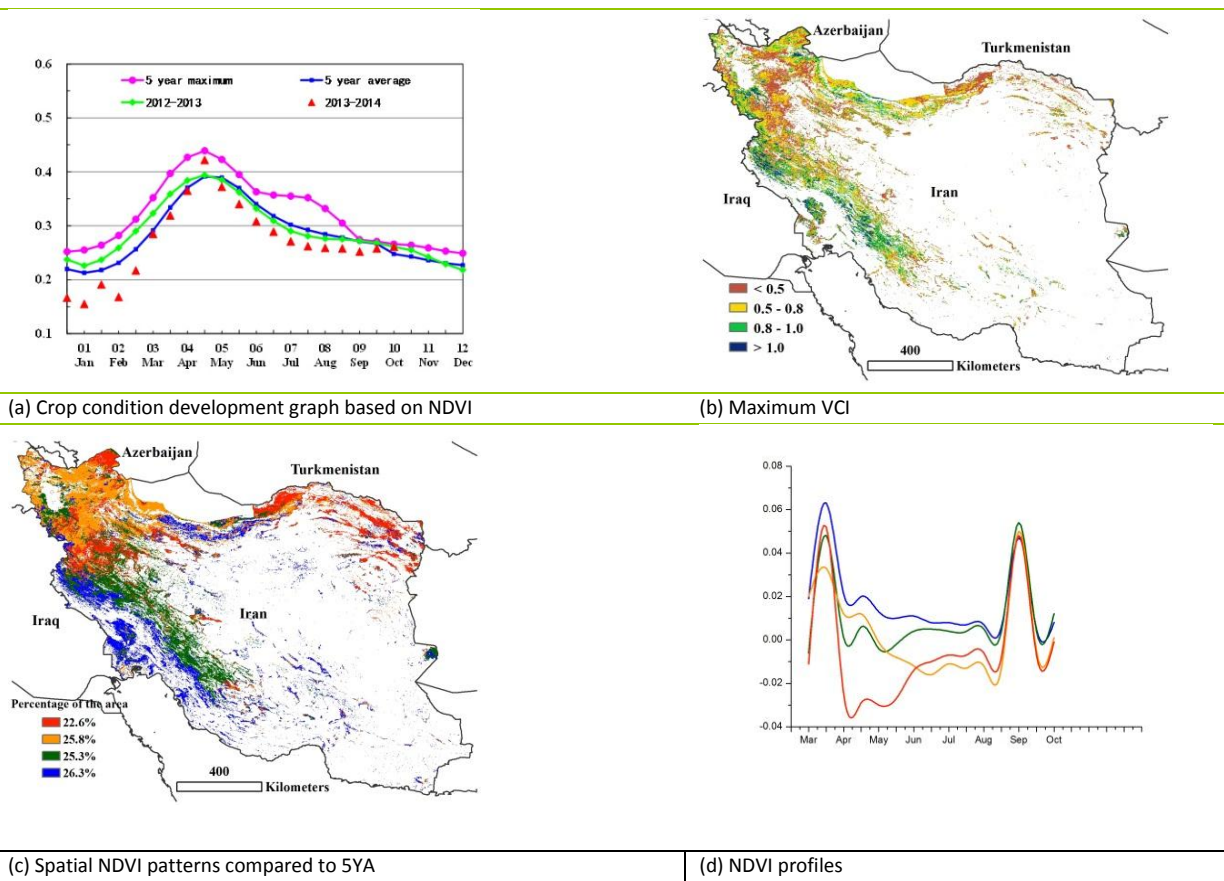


(d) NDVI profiles

[IRN] Iran

For July to October 2014, accumulated rainfall in Iran was above the thirteen-year average, while temperature and RADPAR were close to average. The harvest of summer crops (potato and rice) was completed before October; winter wheat and barley were planted from September. The CropWatch agroclimatic indices for the current season indicate favorable conditions for summer crops, which is confirmed by the increase of the BIOMSS index by 30%. The national average of VCIx (0.65) indicates just above average conditions. Poor growth conditions occurred in the Razavi Khorasan, north Khorasan, and the center of Golestan provinces in the northeast region, and the Ardabil, Zanjan, and Hamadan provinces of the northwest region. Conditions close to or above the five-year average are mainly distributed in the Khuzestan, Kermanshah, and Fars provinces in the southwest and in Mazandaran province in the central-north. Overall, the situation of most summer crops is poor and the outcome is below last year and the five-year's average. The outcome of the rice crop, however, is favorable in Mazandaran province, a province accounting for about half of the rice producing areas in the country.

Figure 3.17. Iran crop condition, July-October 2014

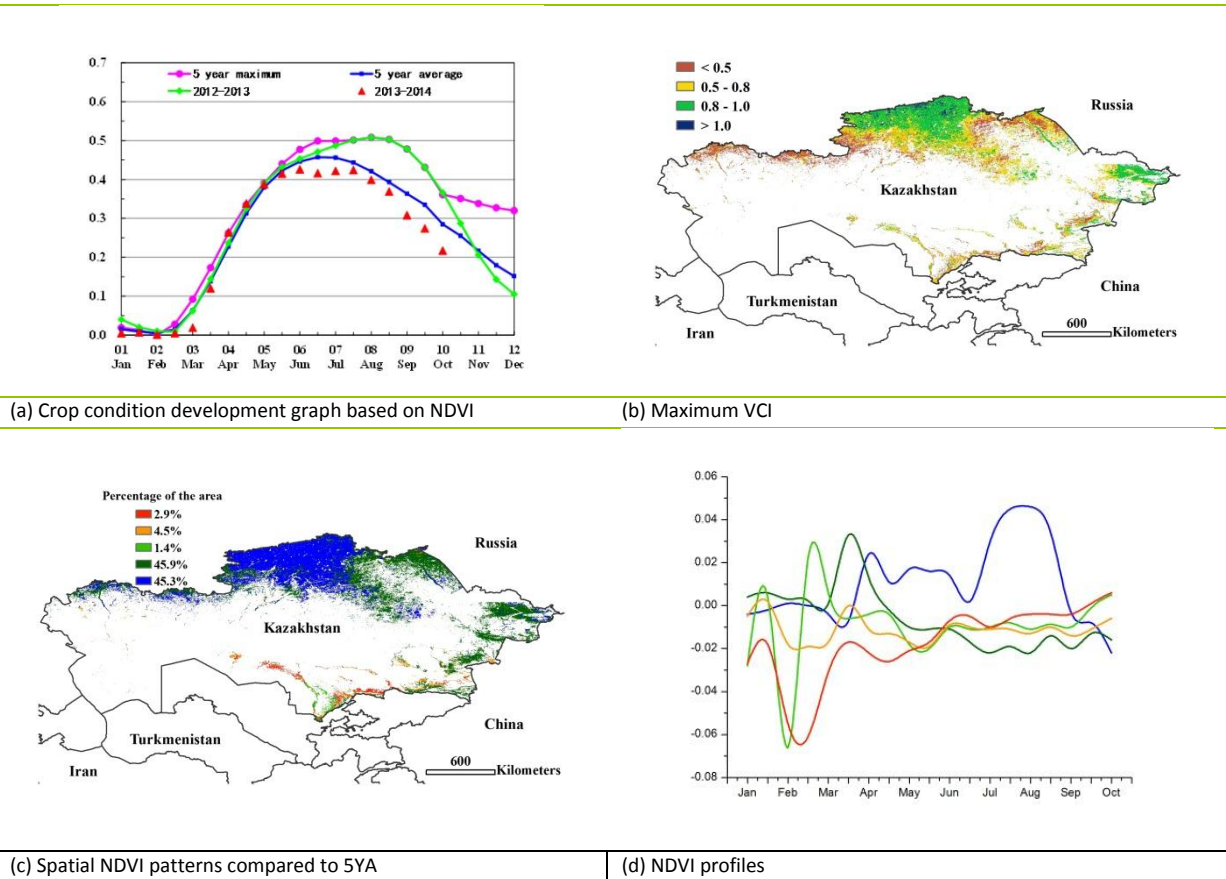


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[KAZ] Kazakhstan

For this monitoring period, crop condition was generally unfavorable during the growing and harvesting stage of spring barley and wheat. Among the CropWatch agroclimatic indicators, RAIN was above average (40%), and TEMP and RADPAR below (-0.7% and 2%, respectively). The maximum VCI indicates that crop condition of most arable land in Kazakhstan was below average (pixel value below 0.5) except for the north and east. Excessive rains affected almost the entire country, except for Zapadno-kazachstanskaya. Spatial NDVI patterns and profiles show that crop condition in 55% of the agricultural areas was below average, mainly in Akmolinskaya, Karagandinskaya, Kustanayskaya, Pavlodarskaya, Severo kazachstanskaya, and Vostochno kazachstanskaya. The low maximum VCI in the same regions also confirms the impact of excessive rains on crop development. Other areas, such as the north and east, enjoyed good crop condition. According to the crop condition development graph, however, overall crop condition is both below last year's and the five-year average. CropWatch puts the wheat production at 1% below last year's.

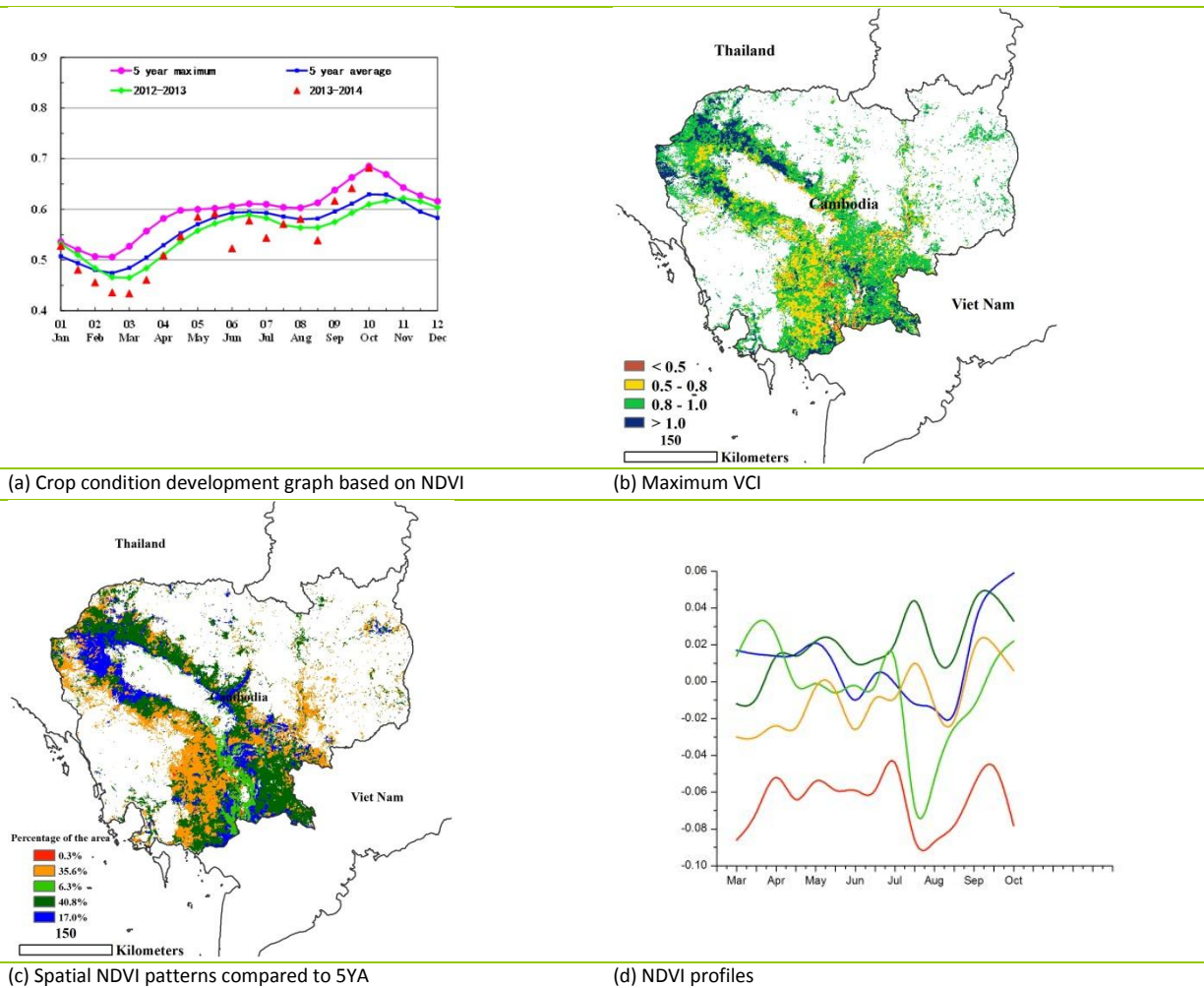
Figure 3.18. Kazakhstan crop condition, July-October 2014



[KHM] Cambodia

Crops in Cambodia displayed slightly above average condition over the reporting period, which coincides with the planting season of main paddy crop. Overall, persistent rainfall in the period has been above average (26%) over much of the country, benefiting sowing activities and crop development. Climatic indicators and biomass monitoring by CropWatch indicate that the country enjoyed favorable PAR with values about 4% higher than the five-year average, as well as an 8% increase of biomass accumulation. Crop condition, which was worse than average during mid-August, soon recovered in the following two months. The maximum VCI reached 0.87 in the recent period. NDVI profiles show that crop condition was much below average in August in 6.3% of the cropped area (mainly Kandal, Kampong Chhnang, and Phnom Penh)—possibly a result of drought. Generally, the presence of favorable conditions during the early stages of rice suggests a good production of main wet season rice, which accounts for about 80 percent of annual production in Cambodia.

Figure 3.19. Cambodia crop condition, July-October 2014

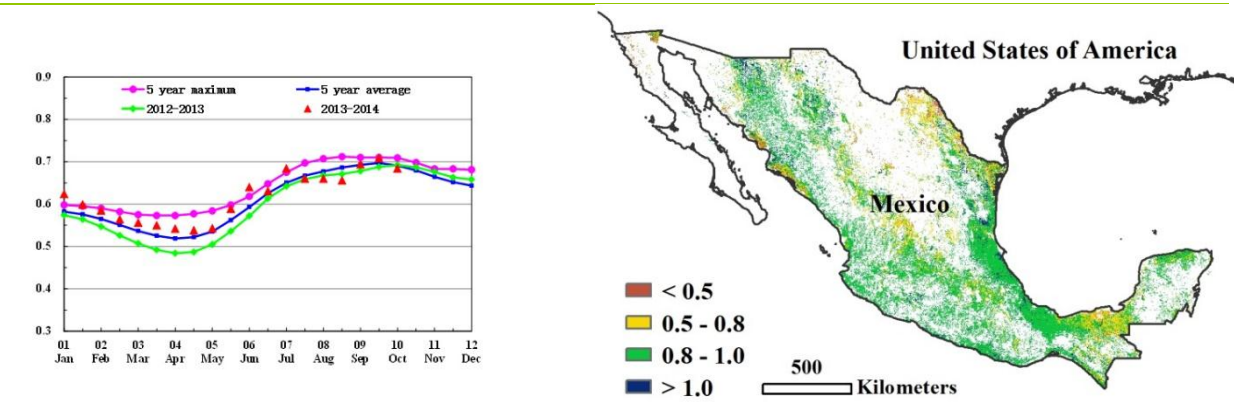


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[MEX] Mexico

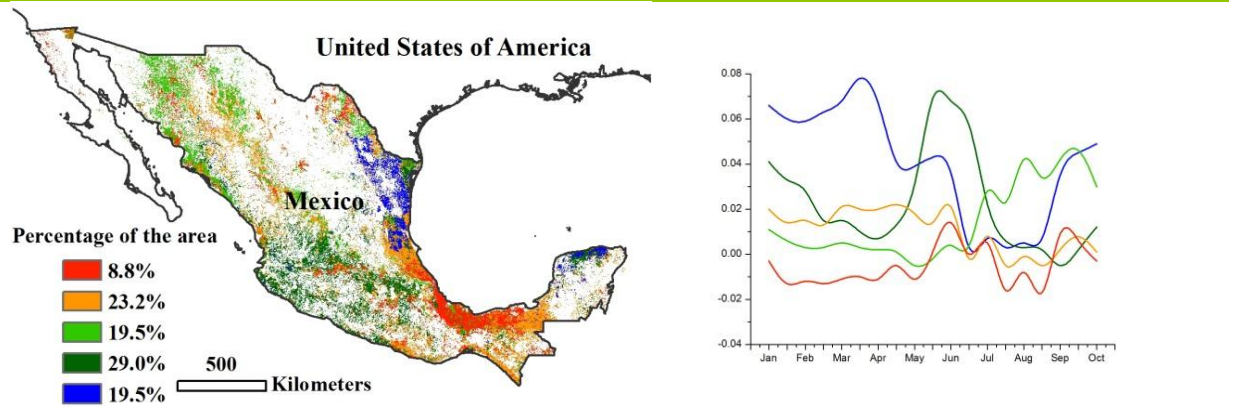
In general, crop condition was close to average in Mexico during the current monitoring period. Overall, and with the exception of Veracruz, the weather was average: rainfall decreased by 1%, temperature increased 0.8°C and PAR increased by 1%. CropWatch indicators also show that biomass accumulation (BIOMSS) increased by 8% and that the fraction of cropped arable land (CALF) and cropping intensity both increased by 5% compared to the five-year average. Thanks to the increase of CALF and cropping intensity, above average production can be expected in Mexico.

Figure 3.20. Mexico crop condition, July-October 2014



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



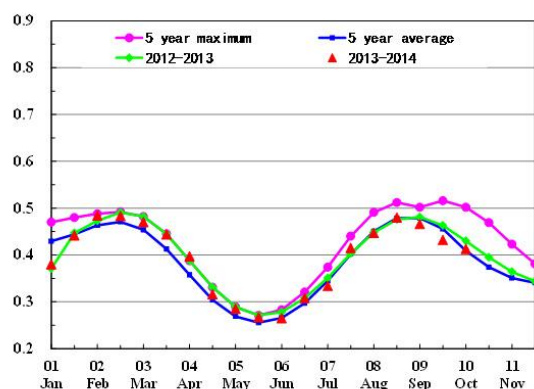
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

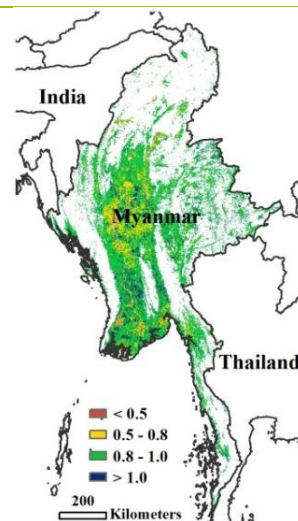
[MMR] Myanmar

Crop condition in Myanmar from July to October was comparable to the situation in 2012-2013. During the reporting period, the harvesting of main season rice started in October, while the sowing of wheat and maize occurs around mid-September. The NDVI profile sharply increased to near and above average values in most agricultural areas from July to August during the growing period of the main season rice crop, particularly in the central dry zone and Yangon region. Due to torrential rains at the beginning of August, the NDVI profile sharply decreased to below average values in almost 20% of the cropland area; the most affected areas are Bago region, Mon state, and Kayin state. For the period under consideration, the CropWatch agroclimatic and agronomic indicators show an increase in RADPAR (+5%), accompanied by an increase in TEMP (1.2°C) compared to average conditions. BIOMSS decreased by 5% compared to the same average as a result of the 8% below average precipitation (RAIN). The maximum VCI index increased to 0.90. VCI presents very good crop condition in Bago and Ayeyarwady regions. Based on CropWatch indicators, the crop situation of most arable land in Myanmar is rated as above average.

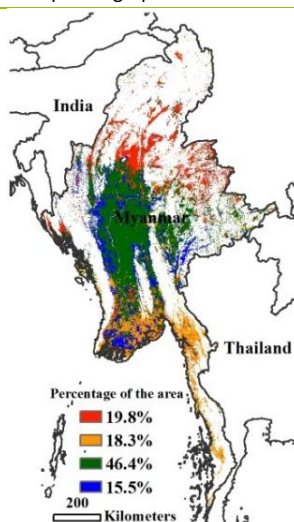
Figure 3.21. Myanmar crop condition, July-October 2014



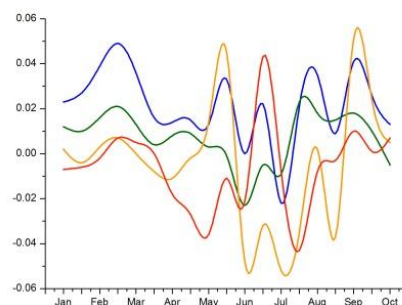
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



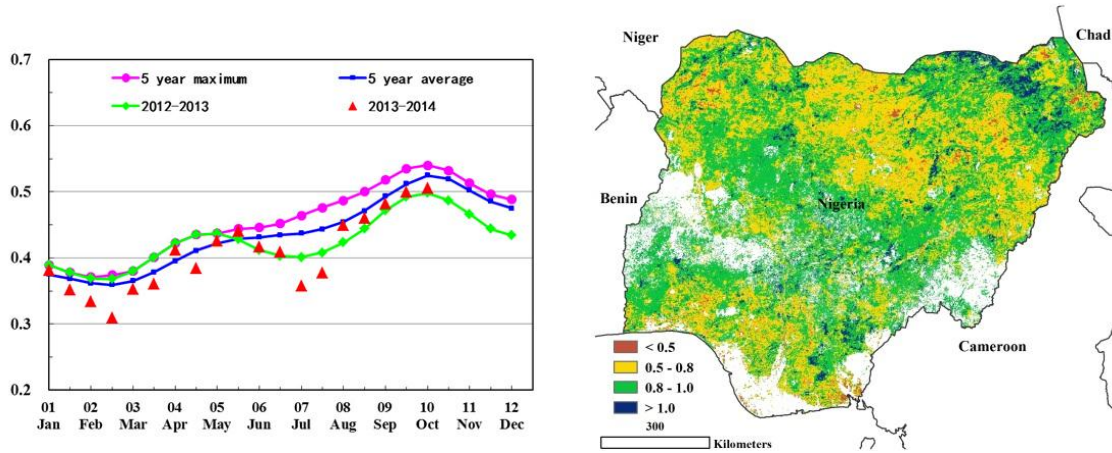
(d) NDVI profiles

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[NGA] Nigeria

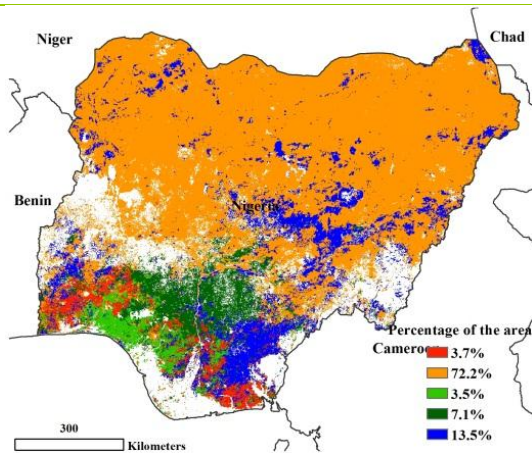
In spite of the somewhat erratic behavior of average NDVI between May and July (due to a low NDVI peak in the south around Imo and Oyo in July and a high peak at the end of August in and around Kogi State), VCIx values in Nigeria are usually above 0.5, with an average VCIx of 0.81. VCIx values increase to above 1 in the north-east (Yobe and Borno states) and drop below 0.5 only in very limited patches. Altogether, conditions in more than 72% of the country are average, resulting also from average agroclimatic conditions (RAIN +8%, TEMP +0.7°C, RADPAR 0%, and BIOMSS +6%). While the fraction of cropped arable land (CALF) remained the same (0%), cropping intensity dropped by 4%, which may be linked to a somewhat late onset of the season in the north. The condition of the first maize crop and the condition of the crops still to be harvested (for example the second maize crop in the south) do not raise reasons for concern.

Figure 3.22. Nigeria crop condition, July-October 2014

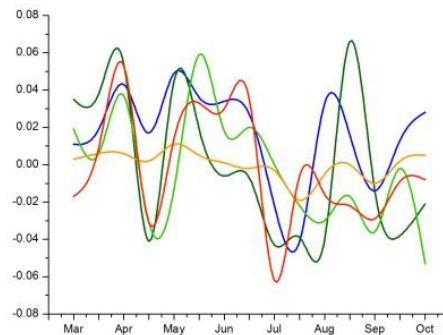


(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

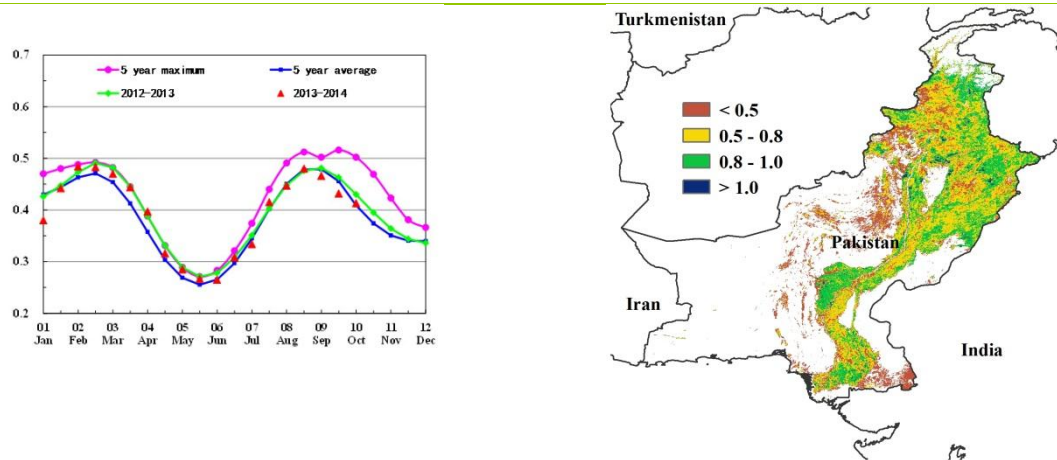


(d) NDVI profiles

[PAK] Pakistan

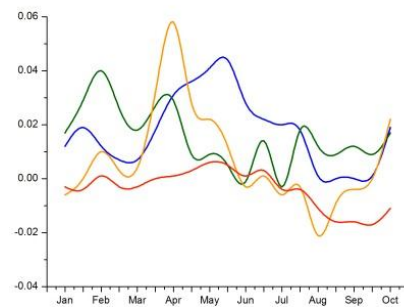
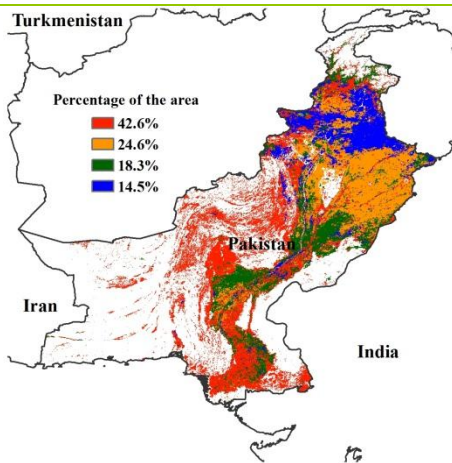
Crop condition was generally unfavorable from July to October, which covered the growing and harvesting stage of maize and rice, as well as the sowing of barley and winter wheat. Compared with average, RAIN and TEMP showed a slight increase (1% and 1.3°C respectively), while RADPAR decreased (-1°C). The maximum VCI map indicates the areas where crop condition was below average (lower than 0.5), which mostly resulted from higher TEMP and low RADPAR. Unfavorable conditions resulted in low average BIOMSS (-15%) at the national scale. The fraction of cropped arable land (CALF) and cropping intensity slightly decreased (-2% and -1%, respectively), which may impact production. As shown by the crop condition development graph, crops were below the average of the last five-years from late August. Actually, spatial NDVI patterns and profiles showed that crop condition in about 67% of arable agricultural areas was below average from June. All available indicators concur to rank Pakistan's crops as below average throughout the country and CropWatch has put production below last year's levels (-2% for maize and -3% for rice).

Figure 3.23. Pakistan crop condition, July-October 2014



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

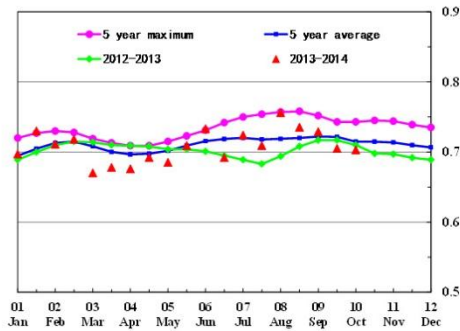
(d) NDVI profiles

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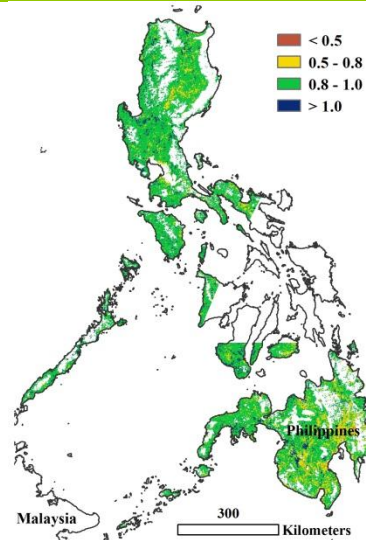
[PHL] The Philippines

The crops in the Philippines generally showed average condition between August and October. Harvesting of the main season paddy crop is currently underway, while seasonable showers are conducive to the planting of the secondary season crop. As illustrated by above average indices for temperature and rainfall, crops planted from October enjoyed favorable initial growing conditions. NDVI profiles indicate that throughout the season, especially in October, the country underwent mixed conditions roughly comparable with the recent five-year average level. According to the NDVI clusters, somewhat contrasted crop conditions characterized north and south in August, with favorable conditions in Luzon and poor conditions in Mindanao.

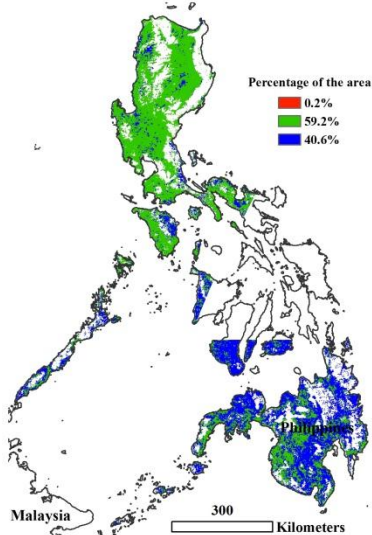
Figure 3.24. Philippines crop condition, July-October 2014



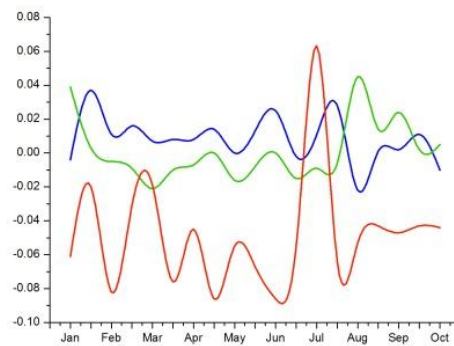
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA

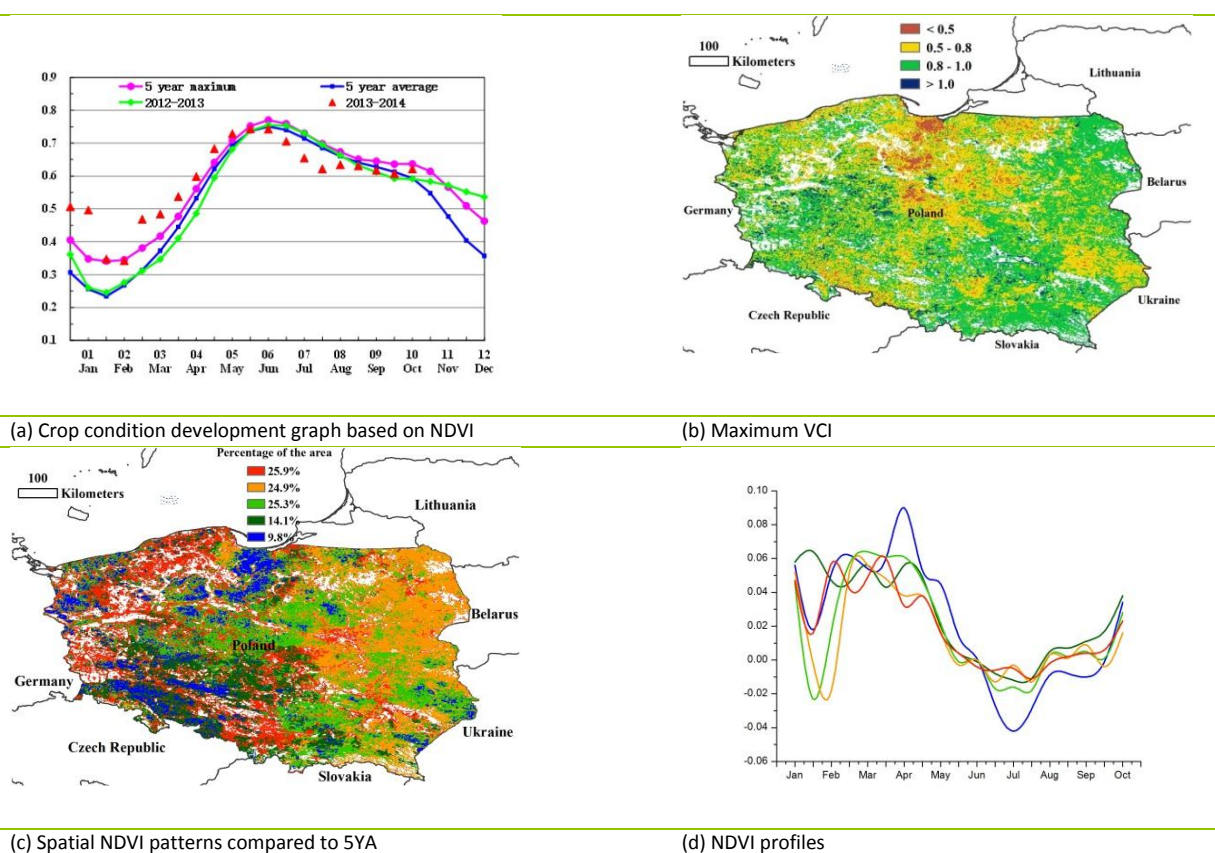


(d) NDVI profiles

[POL] Poland

Poland enjoyed favorable conditions during this monitoring period ($VCI_x=0.8$), which witnessed the harvest of winter wheat and maize. The cropped arable land fraction (CALF) was the same as during the last five years. The weather during July to October was wetter and warmer than the last thirteen years average with rainfall up 10%, temperature up 1.0°C, and PAR up 4%. Due to the impact of rainfall, the potential biomass was 10% higher than usual. As shown in the spatial NDVI patterns figure, in southwest Poland (including Wroclaw and Opole), the NDVI underwent a marked drop in July, which was caused by the harvest of wheat. Meanwhile, for the current monitoring period, most parts of the wheat planting area (including Poznan and Bydgoszcz) recorded NDVI values close to the recent five-year average. Because of the good climate condition from January to June, yields are forecast to be above average for wheat.

Figure 3.25. Poland crop condition, July-October 2014

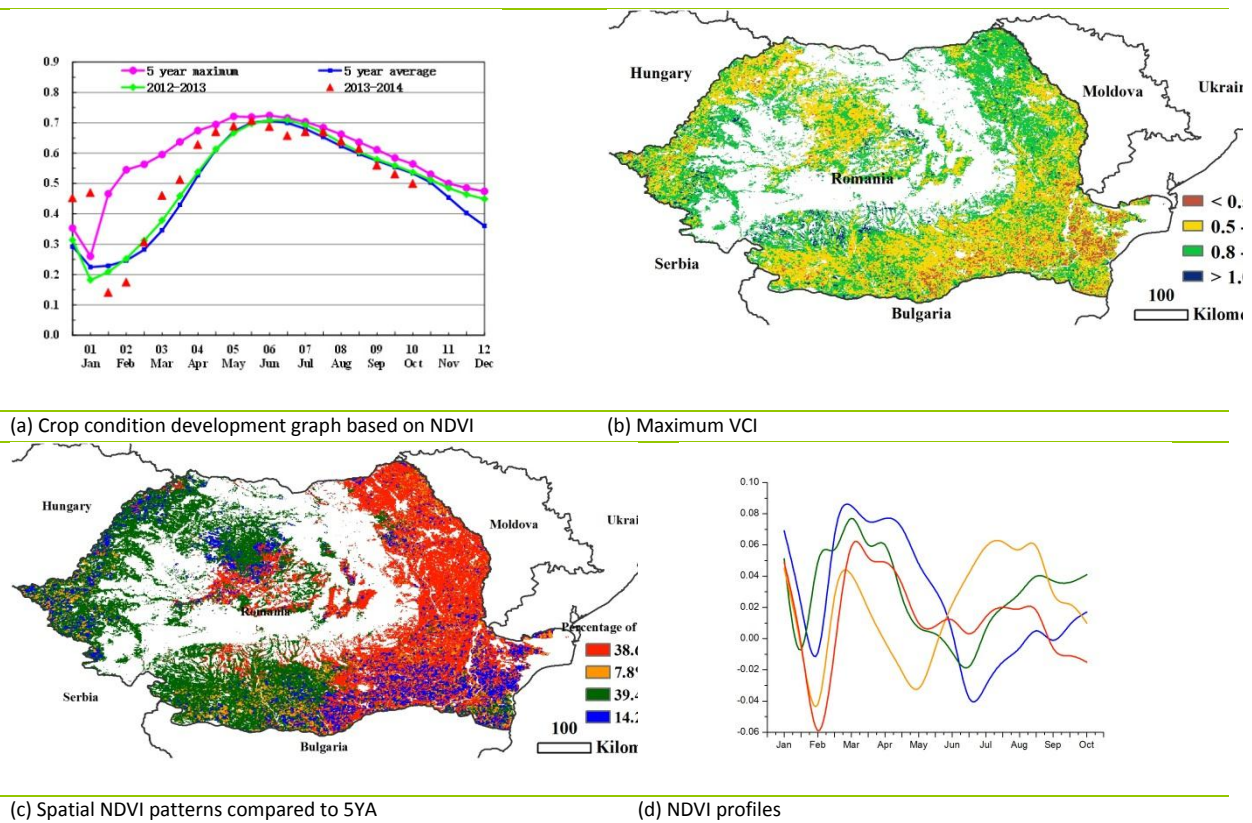


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[ROU] Romania

Romania presented average crop conditions during July to October (VCIx=0.78). The winter wheat harvest was completed before July and planting took place in September and October. As to maize, the bulk of the harvest occurred from August to October. Cropped arable land was close to the last five years' average. Overall, weather was warm and dry in this period, with rainfall down 9% and temperature up 0.4°C compared with the average, conditions mostly favorable for the harvesting period. Crop development was normal, with biomass accumulation values 13% above the average of the recent five years. As illustrated, NDVI exceeded average values over most of Romania's cropland during spring, which led to an increase in winter wheat yields. During the reporting period, the whole country (except the southeast) enjoyed above average NDVI. In the west of Romania, near Hungary, the NDVI was significantly lower than usual due to insufficient rainfall in July. However, some parts of southern Romania (including Bucharest and Slobozia), recorded excess of rainfall in June and July, resulting in lower than usual NDVI and VCIx (<0.8). This is expected to negatively affect the yield of maize in Romania.

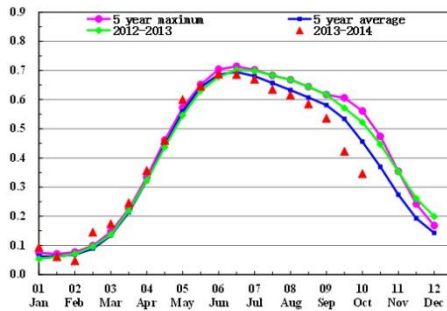
Figure 3.26. Romania crop condition, July-October 2014



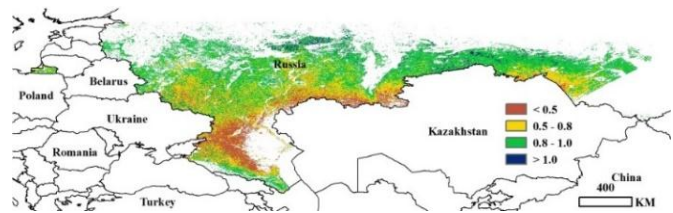
[RUS] Russia

Russia presented unfavorable crop and environmental conditions from July to October (VCI=0.78), the time (July and August) when winter and spring wheat are harvested. The maize harvest was also completed before October. Compared with average conditions, rainfall decreased 17% and temperature decreased 0.9°C. Both changes concur to account for a 10% drop in potential biomass compared with the last five-year average. As for the NDVI patterns, significantly above average values occurred in most parts of Russia’s cultivation area (more than 70% of the area, mostly in the west including Moscow and Volgograd, and east including Novosibirsk) from February to June. Good crop condition indicators point at satisfactory crops. During this monitoring period, as shown by the crop condition development graph, NDVI was below values for the recent five-year average. Above average NDVI occurred in the center and south of Russia’s cultivation areas, including Yekaterinburg; other regions were characterized by close to or slightly below average NDVI. The low NDVI values for the monitoring period describes dry conditions, which could lead to early harvesting. Overall, CropWatch estimates a positive outcome of the growing season.

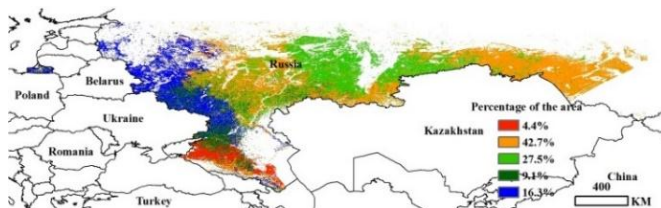
Figure 3.27. Russia crop condition, July-October 2014



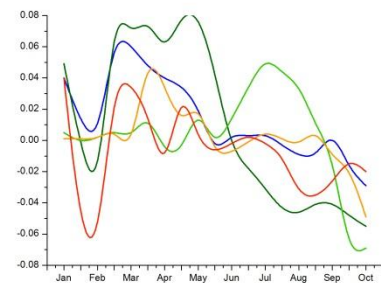
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



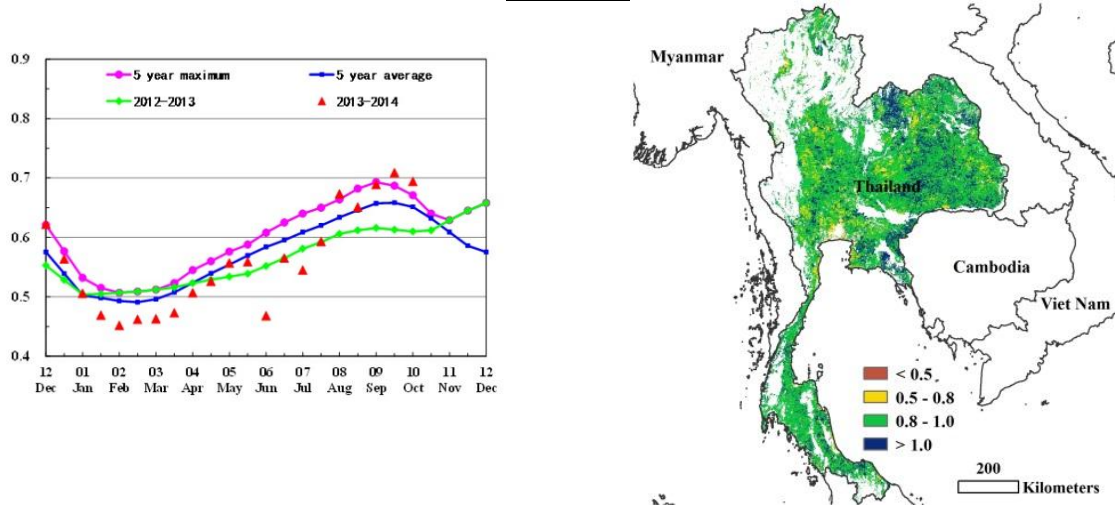
(d) NDVI profiles

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

[THA] Thailand

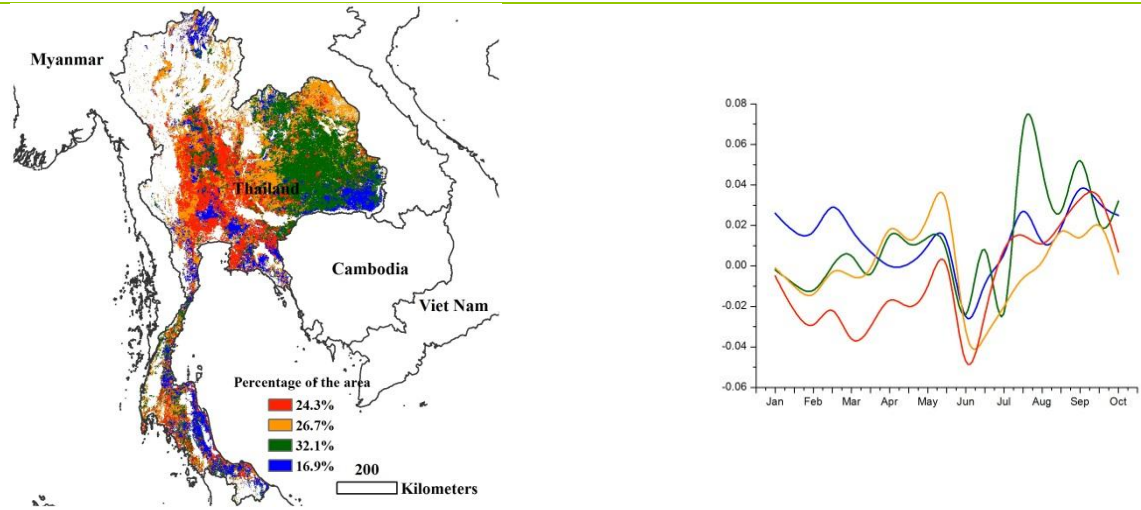
The harvesting period of maize has been completed, while main rice harvest started in October. For the period under consideration, crops show above average condition compared to the previous year as well as the recent five-year average. The NDVI profile sharply increased to above average values in the area around the Chao Phraya river basin and in the Tung Kula RongHai region (a large plateau in Northeastern area) from July to August because of the adequate rainfall for rice crops. The NDVI profile sharply decreased to almost average values in most regions of cropped arable land from September to October due to the dry weather during harvesting. The CropWatch agroclimatic and agronomic indicators show an increased PAR accumulation (RADPAR, +5%), rainfall (RAIN, +7), biomass (BIOMSS, +1%), and temperature (TEMP, +0.9°C) compared to average. Compared with the other countries monitored by CropWatch, Thailand enjoyed very favorable conditions (VCIx=0.93). The VCIx values indicate that good crops occur throughout the country, particularly in the northeastern region. Based on CropWatch indicators, the situation of crops in Thailand is ranked as very favorable.

Figure 3.28. Thailand crop condition, July-October 2014



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



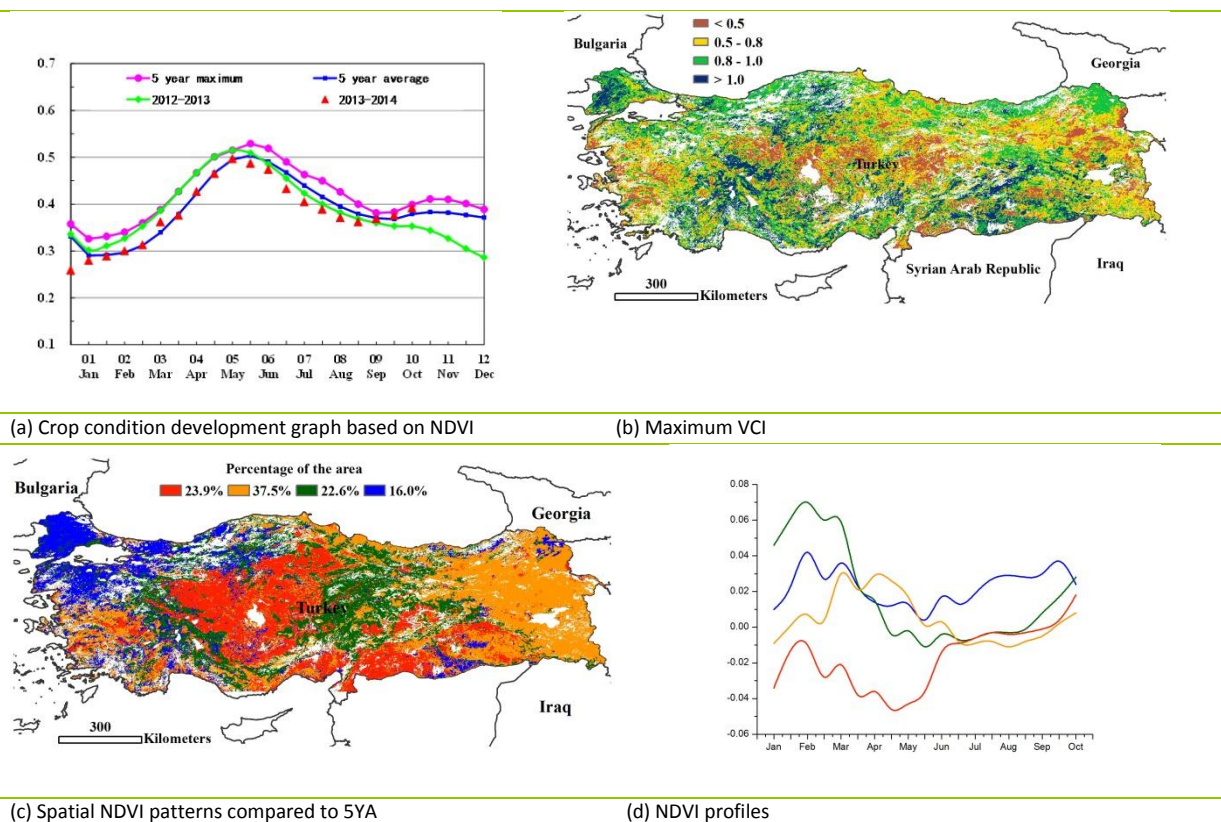
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

[TUR] Turkey

During the monitoring period from July to October 2014, accumulated rainfall was above the thirteen-year average. Temperature and RADPAR were close to their average values, which resulted in above average BIOMSS in Turkey. During the monitoring period, the summer crops (maize, rice, and potato) harvest was completed, and winter wheat and barley was sown from the middle of September. The agroclimatic indices indicate favorable growing conditions, which is confirmed by the BIOMSS increase of 19 percentage points. The national VCIx (0.78) was above average conditions. Except for western Anatolia and the south of Central-Eastern Anatolia, the VCIx map presents a spatial pattern that is consistent with the NDVI cluster map comparing to the five-year average. Crop condition below average for July to September is found in most regions of Anatolia, covering approximately 70% of the national territory. Other areas located in the Istanbul, Marmara, and Western Black Sea regions underwent favorable conditions for the monitoring period. Overall, the outcome of the summer crops is poor, while prospects for the winter crops are normal.

Figure 3.29. Turkey crop condition, July-October 2014



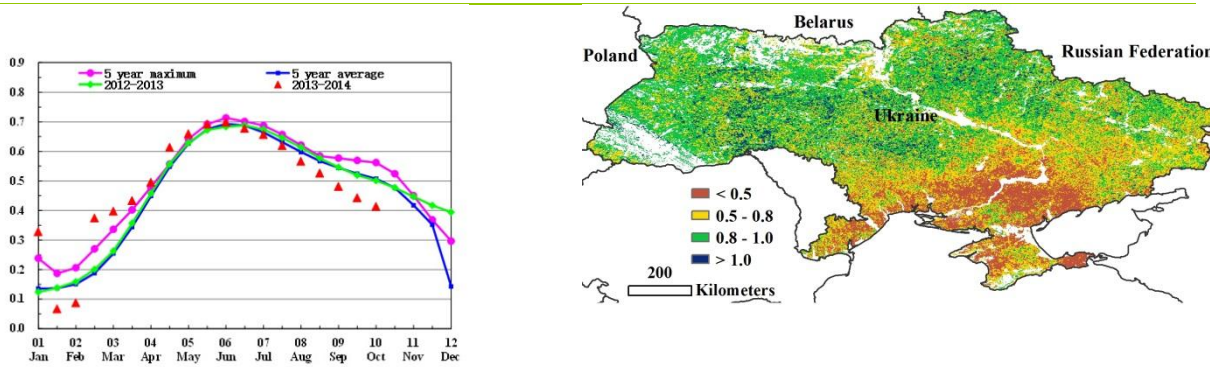
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[UKR] Ukraine

Ukraine presented unfavorable crop condition during this monitoring period (VCIx=0.75) and phenology was normal. The winter wheat's harvest was completed before August and seeding began in September. The maize harvest started in August. The climate conditions are characterized by poor rainfall from July to October (down 29% compared with the last thirteen years), while TEMP and RADPAR were close to average. The resulting potential biomass drop is 22%.

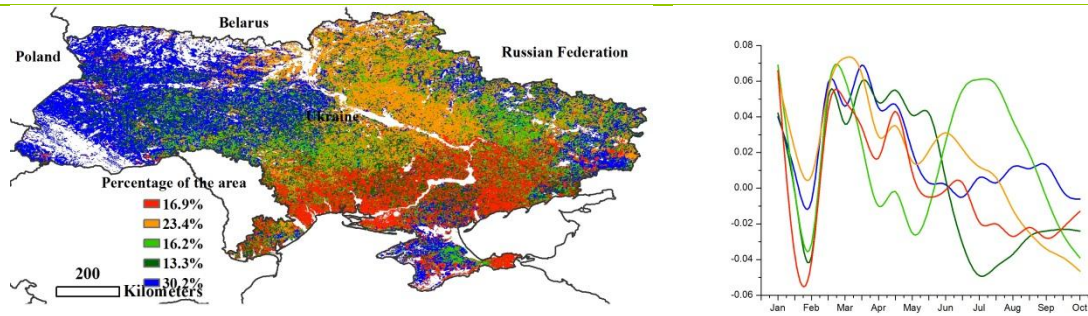
As shown in the crop condition development graph, the July-October NDVI was lower than during the last five years. The decrease mainly affects southern and eastern Ukraine. In most parts of western Ukraine, the NDVI is average compared to the previous five years. As most of the winter wheat has been harvested before August, the yield of wheat wouldn't be affected. The maize yield is expected to drop in eastern Ukraine (including Donetsk and part of Dnipropetrovsk).

Figure 3.30. Ukraine crop condition, July-October 2014



(a) Crop condition development graph based on NDVI

(b) Maximum VCI



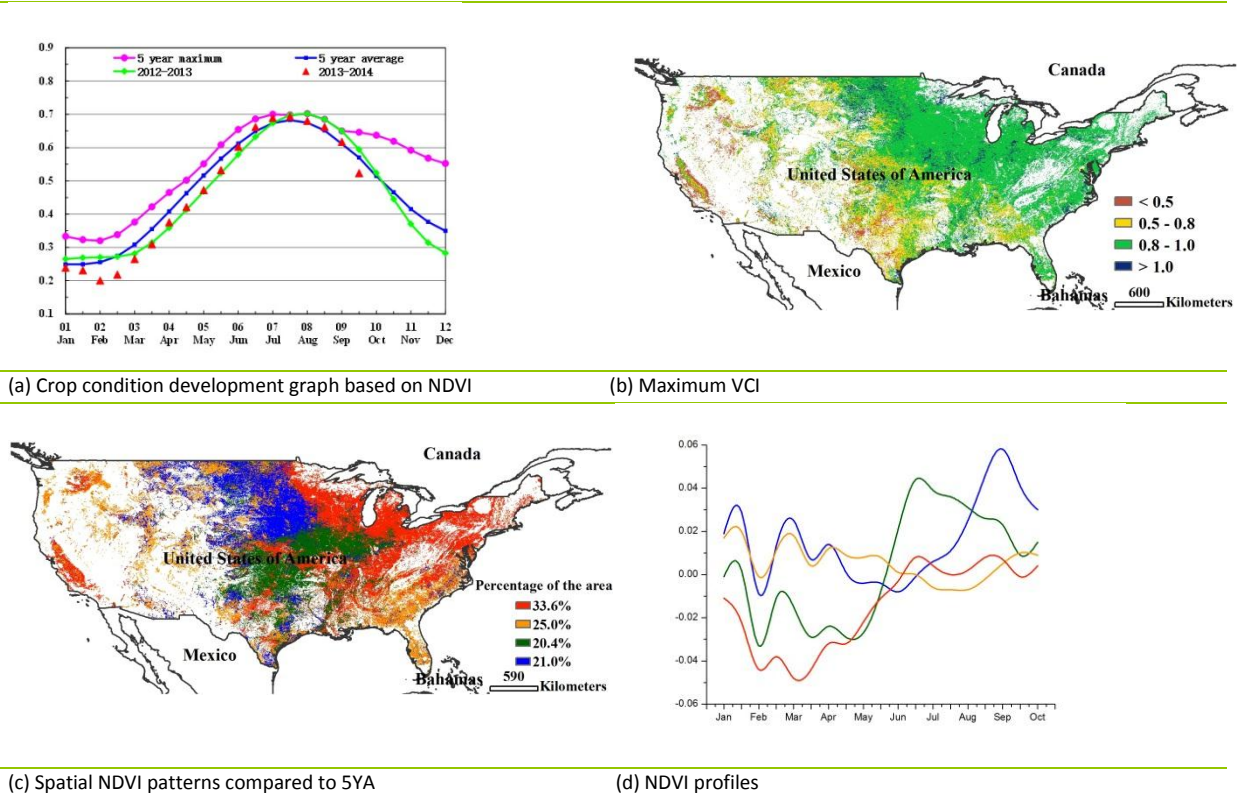
(c) Spatial NDVI patterns compared to 5YA

(d) NDVI profiles

[USA] United States

Crops were slightly above average in the United States from July to October 2014, during which the winter wheat harvest was completed and other crops started being harvested. During the previous monitoring period (April to July), drought conditions caused the decrease of winter wheat production; the water shortage eased during the current period in the west of the country due to significant increase of rainfall, especially benefiting California (+17% or average), Oregon (+38%), and Washington (+28%). The drought continued in Texas (-5%). In soybean growing areas and the corn belt, abundant rainfall continued this monitoring period: Illinois (+68%), Iowa (+91%), Missouri (+77%), Nebraska (+90%), Indiana (+27%), Wisconsin (+13%), and Minnesota (+7%). Ample moisture was available for maize and soybean growth. RADPAR typically decreased when rainfall increased in temperate countries and the following RADPAR values were recorded in Illinois (-4%), Iowa (-7%), Missouri (-3%), Indiana (-4%), and Minnesota (-7%). As a result of reduced sunshine, soybean and maize were only slightly above average in the major production regions. However, in the major production states, in central Illinois, Iowa, and Nebraska, the crop condition is above average. CropWatch results indicate that, over the reporting period) the accumulation of biomass (BIOMSS) exceeded the average by 14% while the fraction of cropped arable land was increased by 3%. Cropping intensity, however, decreased (-1%) compared to the recent five-year average. Although winter wheat condition was below average for the United States, the analysis of the CropWatch indicators points at above average production of soybean and maize. (See also table B.5 in Annex B.)

Figure 3.31. United States crop condition, July-October 2014

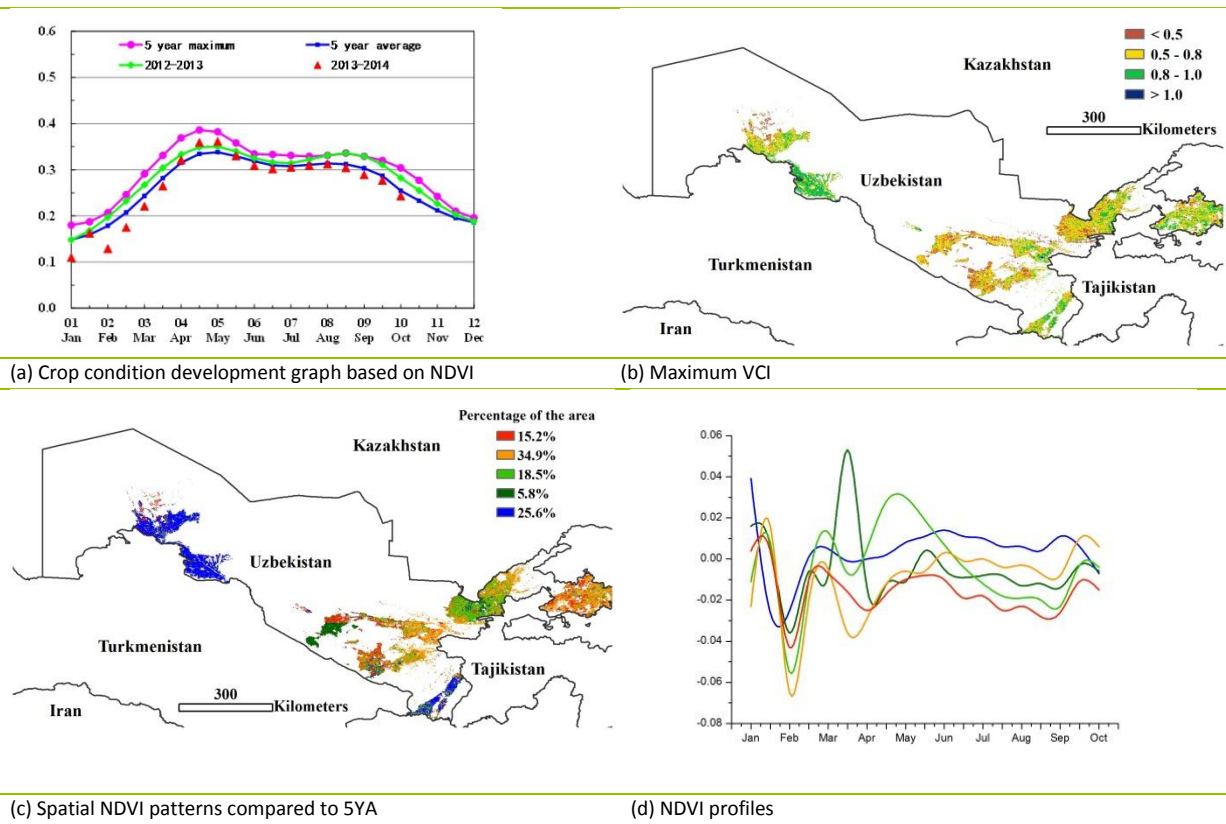


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[UZB] Uzbekistan

This reporting period covers the harvesting and sowing stages of winter wheat, as well as the growing and harvesting stages of coarse grains and maize. Crop condition was general unfavorable. Among the CropWatch agroclimatic indicators, RAIN was well above average (175%). The country also experienced excessive rains and low TEMP, but these events were poorly distributed as confirmed by the spatial NDVI patterns and profiles. Throughout the growing season, crop condition was close to average or below in most areas (Navoiy, Bukhara, Kashkadarya, Jizzakh, Namangan, Andijan, and Fergana). Good crop conditions appear in the west—in an area with mostly cotton crops—and south. Winter wheat, which is the most important crop in Uzbekistan, was harvested in June; the next season crop is currently being planted. Unfavorable conditions during June severely affected crops. CropWatch estimates that the wheat production dropped 8% compared with the previous season.

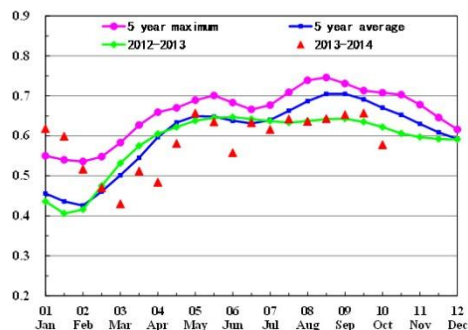
Figure 3.32. Uzbekistan crop condition, July-October 2014



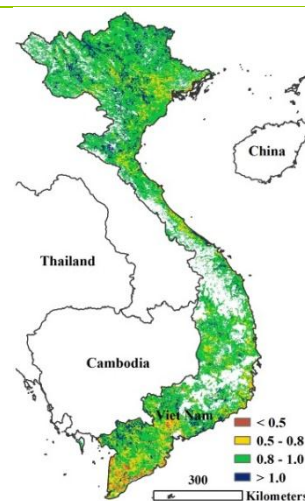
[VNM] Vietnam

The harvesting period of summer/autumn rice has been completed, while the 10th month rice was still growing in mid-October. The crop condition from July to October was generally comparable to the situation in 2012-2013 but below average in October. For the period under consideration, the CropWatch agroclimatic and agronomic indicators all show an increase over the average: RADPAR (+1%), TEMP (1.1°C), BIOMSS (+2%), and RAIN (+1%). Spatial NDVI profiles show that the crop condition in Tuyen Quang, Bac Kan, and Thai Nguyen provinces sharply decreased to below average values from July to August, followed by a rapid increase in September due to the precipitation that fell in the wake of typhoon Kalmaegi. The other record above average NDVI values, especially in the south, are probably due to favorable weather conditions. NDVI profiles show that crop condition was below average in 16.2% of the major rice plantation area, mainly the Red River delta from September to October. Crop condition was average in the Mekong River delta region, with VCI ranging between 0.5 and 0.8. Based on CropWatch indicators, the crop situation in Vietnam is considered to be close to average.

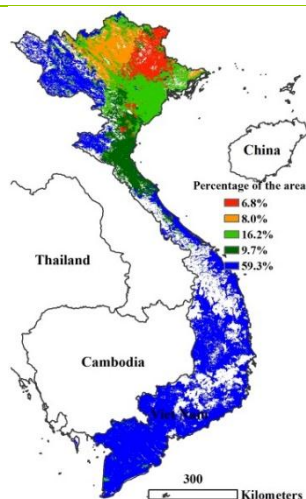
Figure 3.33. Vietnam crop condition, July-October 2014



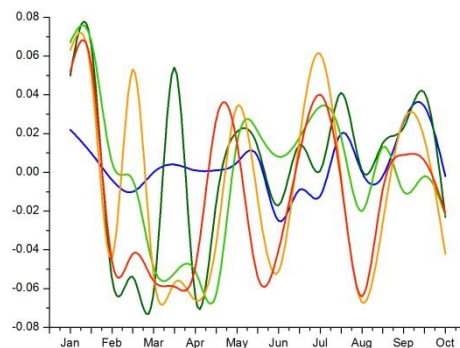
(a) Crop condition development graph based on NDVI



(b) Maximum VCI



(c) Spatial NDVI patterns compared to 5YA



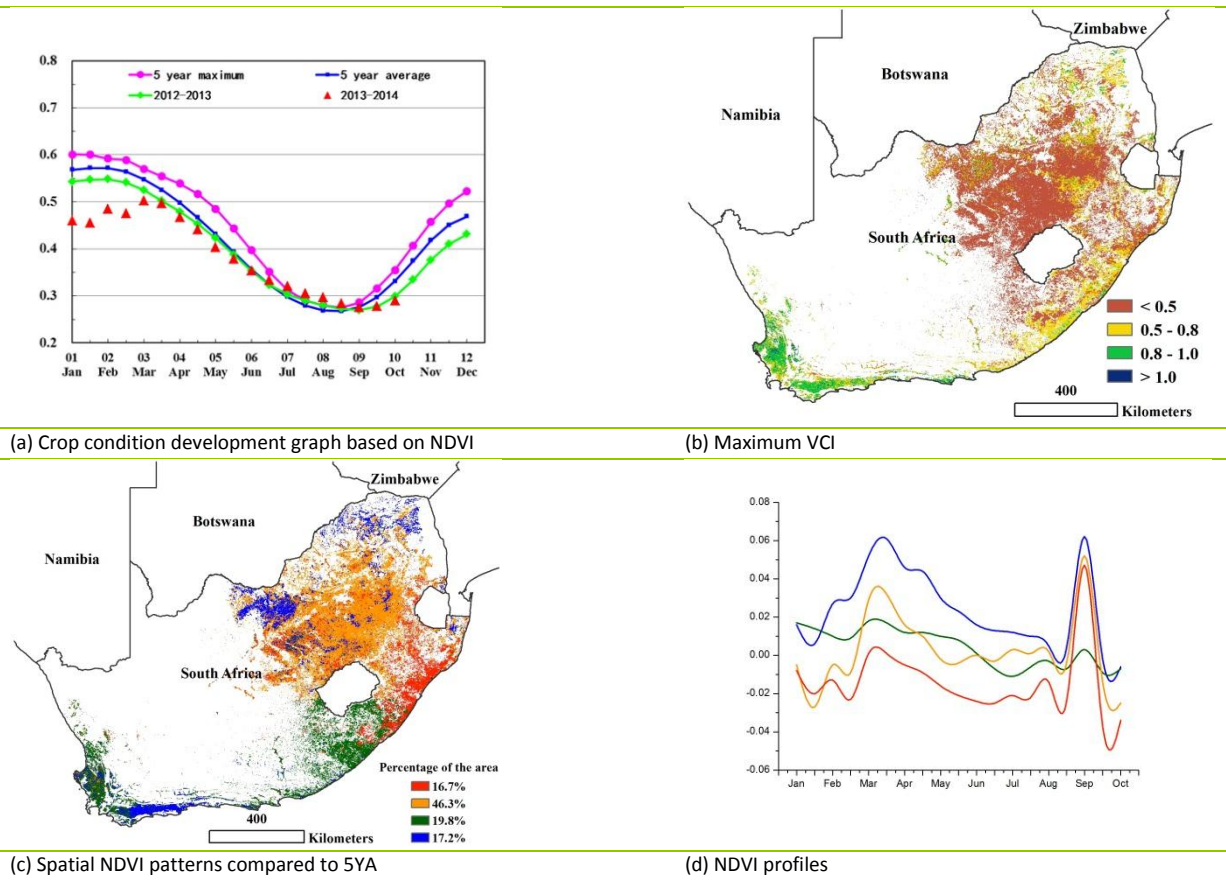
(d) NDVI profiles

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[ZAF] South Africa

The overall NDVI profile for South Africa shows conditions in September and October that are comparable to the 2012-2013 season and well below the recent five-year average. VCI is low over the north-western areas, which includes the bulk of South African maize production. NDVI values are currently close to average after a marked peak at the beginning of September, probably due to some isolated early rain showers. At the end of October, NDVI is well below average in KwaZulu-Natal and—though less severely—in Gauteng and surrounding areas. In combination with the agroclimatic data (-39% RAIN, +0.9°C TEMP, +2% RADPAR, and -24% for BIOMSS), all indices concur in assessing the current conditions for the 2014-15 maize crop in South Africa as mixed at best.

Figure 3.34. South Africa crop condition, July-October 2014



Chapter 4. China

Chapter 4 presents a detailed CropWatch analysis for China, focusing on the seven most productive agro-ecological regions of the east and south. After a brief overview including a production outlook for 2014, detailed analysis including maps and profiles for NDVI, VCIX, CALF, and BIOMSS are provided for the individual regions. Additional information on the agroclimatic indicators for agriculturally important Chinese province are provided in table A.11 in Annex A.

4.1 Overview

Figures 4.1-4.6 illustrate the distribution and profiles of rainfall (RAIN) and temperature (TEMP) indicators, as well as the fraction of cropped arable land (CALF), maximum Vegetation Condition Index (VCIX), cropping intensity, and minimum Vegetation Health Index (VHI). Indicator values are provided in table 4.1.

Generally favorable conditions prevailed over the monitoring period with 14% above average RAIN, 0.7°C degree above average TEMP, and average radiation (RADPAR), resulting in a 12% rise over average biomass (BIOMSS). Without exception, TEMP increased in all seven regions in China, with the lowest increase (0.1°C) in the North-east region) and the most significant increase in Southwest China (1.2°C degree). RAIN in Huanghuaihai, Northeast, and Southwest China slightly decreased (6%, 3%, and 3%, respectively). RAIN remained average throughout the year for most regions north of Yangtze River (58% of the country), while it was above average in Guangdong and the east of Guangxi province. Temperature fluctuated widely from January to June; it was below average in mid-February and May and above average in late October.

High VCIX values occurred mostly in Southern China and in the Northeast region. Low VCIX values are mainly located in central and eastern China, particularly in southern Jiangsu and western Henan provinces. Crop condition in the northeast is above the thirteen-year average (VCIX is 0.92), though agro-climatic conditions are at an average level. At the regional and provincial scale, BIOMSS is above average, except for the Southwest regions and corresponding provinces.

During the monitoring period the cropped arable land fraction (CALF) did not change; for all seven monitored regions, CALF is about the five-year average; only slightly decreased values are recorded for the Loess and Huanghuaihai regions (-1% and -3%, respectively). Cropping intensity increased by 4% and 5% in the Inner Mongolia and Loess region and is at average levels in the Northeast; it decreased in the other four regions.

Minimum VHI indicates that almost all regions in central and eastern China suffered from water stress, including the east of Sichuan, western and southern Henan, south of Jiangsu, and south of Hubei provinces (figure 4.6).

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

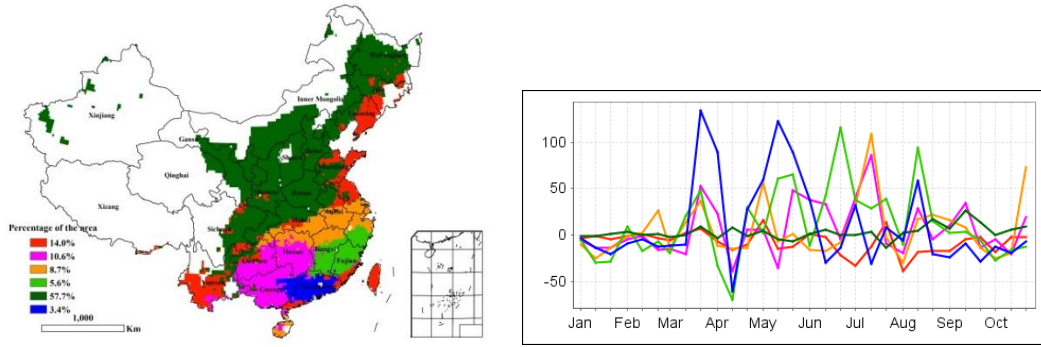


Figure 4.2. China spatial distribution of temperature profiles, July-October 2014

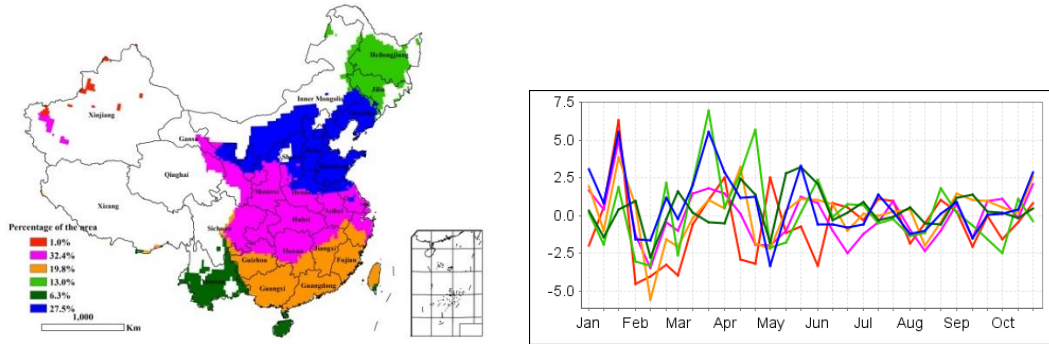


Figure 4.3. China cropped and uncropped arable land, by pixel, July-October 2014

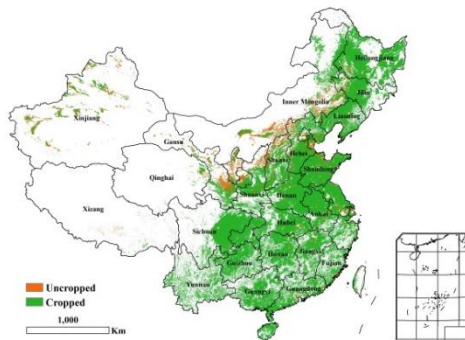


Figure 4.4. China maximum Vegetation Condition Index (VCIx), by pixel, July-October 2014

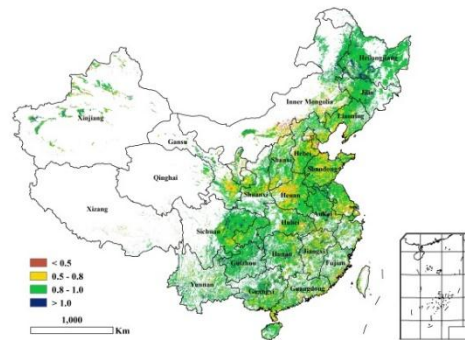


Figure 4.5. China Cropping Intensity, by pixel, July-October 2014

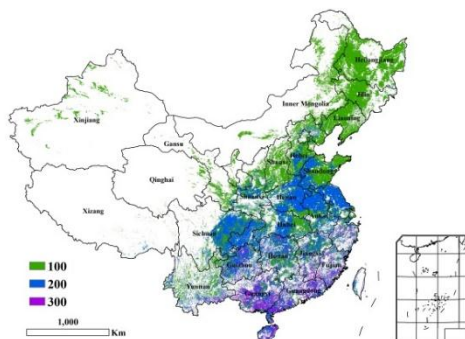


Figure 4.6. China minimum Vegetation Health Condition Index (VHI_{in}), by pixel, July-October 2014

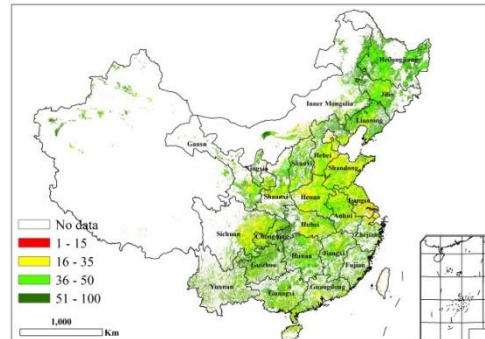


Table 4.1. CropWatch agroclimatic and agronomic indicators for China, July-October 2014, departure from 5YA and 13YA

Region	Agroclimatic indicators				Agronomic indicators		
	departure from 13YA (2001-2013)			departure from 5YA (2009-2013)		Current	
	RAIN (%)	TEMP (°C)	RADPAR (%)	BIOMSS (%)	CALF (%)	Cropping Intensity (% points)	Maximum VCI
Huanghuaihai	-6	0.5	0	8	-3	-2	0.83
Inner Mongolia	39	0.3	-1	25	0	4	0.79
Loess region	10	0.6	0	10	-1	5	0.81
Lower Yangtze	28	0.5	-5	13	0	-7	0.86
North-East	-3	0.1	3	-3	0	0	0.92
Southern China	-3	1.2	1	0	0	-13	0.87
South West	21	0.8	-1	14	0	-11	0.90

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 (July-October). VCI=Vegetation condition index.

China production outlook

At the time of reporting, the bulk of the maize, rice, wheat, and soybean harvest is over. Table 4.2 lists the estimated production numbers for maize, rice, wheat, and soybean in China for 2014, with estimates based on remote sensing, agricultural statistics, and other ground data. Details for China's rice production—distinguishing single, early, and late rice—are provided in table 4.3. Single-crop rice (one crop per year) is mainly located in the Northeast, Central, and Eastern China and Sichuan province, while double-crop rice is found in Southern China. Areas with three crops occur in the south of China, such as Guangdong and Guangxi provinces.

The production of maize and soybean in China is estimated to decrease in 2014 compared with the previous season, while wheat production (including winter wheat and spring wheat) is estimated to increase by 1%. Maize production is expected to reach 201 million tons, which represents a decrease of 1% when compared to 2013, mainly due to a decrease in yield. Soybean production will reach 13.1 million tons, with a drop of 1% because of the decrease in harvested area compared to last year's. Rice production is stable: the production of single rice increases, while the production of early rice falls (table 4.3).

Out of seventeen monitored provinces, only Chongqing, Guizhou, Heilongjiang, Jiangsu, and Ningxia have an estimated increase in maize production above 2%. On the contrary, Gansu, Yunnan, and Inner Mongolia record the largest decreases in maize production because of a combination of reduced area and decreased yield due to drought. Liaoning and Henan are the two provinces with the largest decreases (-4%) in maize yield due to the severe drought in August.

Soybeans in Henan show the largest drop in production, as both area and yield are low. Due to an increase in area, soybean production in Jilin rises by an estimated 2%.

Table 4.2. China, 2014 production (thousand tons) and difference with 2013 (percentage)

	Maize		Rice (paddy)		Wheat		Soybean	
	2014	Δ%	2014	Δ%	2014	Δ%	2014	Δ%
Anhui	3632	-4	17151	3	11375	-2	1098	0
Chongqing	2099	3	4785	1	1119	-2		
Fujian			2812	1				
Gansu	4604	-7			4490	-4		
Guangdong			11073	2				
Guangxi			10983	2				
Guizhou	5004	6	5148	1				
Hebei	16237	-2			10609	-2	172	-1
Heilongjiang	26303	3	20231	4	1460	-7	4586	-1
Henan	16008	-4	3895	1	25747	-1	737	-5
Hubei			15912	3	4450	-3		
Hunan			25394	5				
Inner Mongolia	14360	-5			5762	-2	836	-1
Jiangsu	2227	3	16569	3	9501	1	781	-2
Jiangxi			17365	4				
Jilin	24032	0	5022	1			660	2
Liaoning	12889	-3	4709	1			511	-2
Ningxia	1797	7	545	0	2315	5		
Shaanxi	3870	-3	1040	0	3953	-8		
Shandong	18356	-1			21886	1	659	-5
Shanxi	9593	-2			2095	-5	187	-3
Sichuan	7101	1	14676	3	4596	2		
Yunnan	5613	-5	5332	1				
Zhejiang			2786	1				
Sub-total	173725	-1	185430	0	96393	1	10227	-1
Other 12 provinces	18226	0	15740	1	19140	3	2852	-1
China total	191952	-1	201167	1	119735	1	13079	-1

Note: Δ%=percentage difference with 2013.

As shown in table 4.3, the single-crop rice production decreases in Shaanxi (-1%) and Henan province (-5%) due to drought. Yield dropped in both provinces due to drought, while in Henan, areas were affected as well. In Ningxia, the single rice production increases by 18% due to an increase in cultivated area and yield.

Overall, CropWatch puts the combined production of the main cereals (wheat, rice, and maize) in China for 2014 at 513 million tons. Combined with an estimated 51 million tons of other crops including tubers, legumes (including 13 million tons of soybean), and other minor cereals such as millet, the total estimated production for China is 564 tons—a modest decrease compared to 2013 (-0.1%). The total output for summer crops is projected at 405 million tons, a decrease of 1.8 million tons (-0.5%) compared with 2013. The main decrease comes from the decreased yield of maize due to the severe drought developed in July and August, particularly in Liaoning, Henan, and Inner Mongolia.

Table 4.3. China, 2014 single rice, early rice, and late rice production and difference with 2013, by province (thousand tons).

	Single rice		Early rice		Late rice	
	2014	Δ%	2014	Δ%	2014	Δ%
Anhui	13448	3	1910	-1	1792	1
Chongqing	4785	-2				
Fujian			1680	0	1132	-1
Gansu						
Guangdong			5207	-1	5866	1
Guangxi			5428	-1	5556	2
Guizhou	5148	0				
Hebei						
Heilongjiang	20231	1				
Henan	3895	-5				
Hubei	10688	1	2399	-2	2826	-1
Hunan	8338	3	8278	-3	8777	-1
Inner Mongolia						
Jiangsu	16569	-1				
Jiangxi	2876	3	7297	2	7192	-1
Jilin	5022	-1				
Liaoning	4709	0				
Ningxia	545	18				
Shaanxi	1040	-1				
Shandong						
Shanxi						
Sichuan	14676	1				
Yunnan	5332	5				
Zhejiang			1509	-1	1277	-1
Sub total	117302	1	33708	-1	34418	0
Other provinces	12865	3	1679	-1	1196	8
China	130167	1	35387	-1	35614	0

Note: Δ%=percentage difference with 2013.

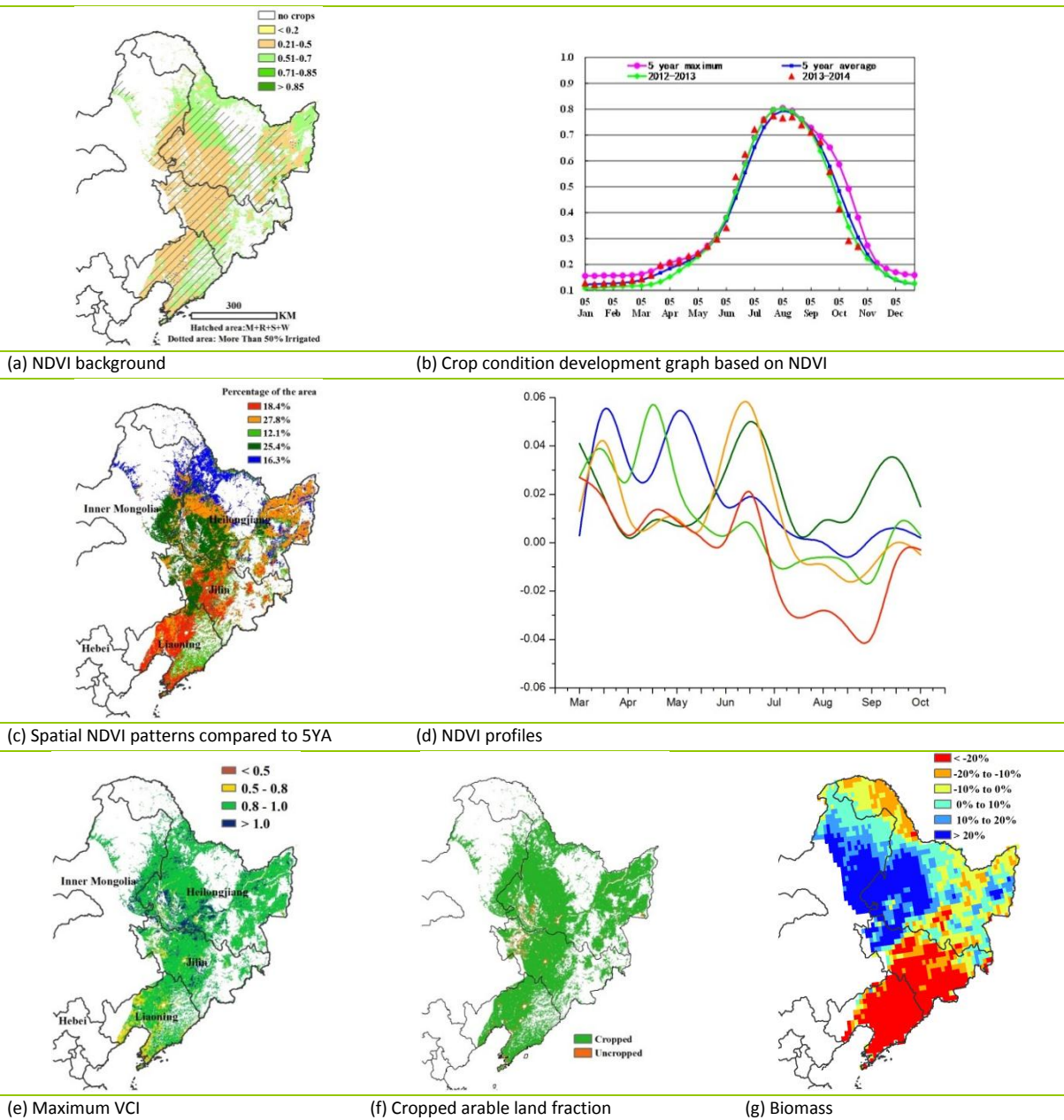
4.2 Regional analysis

Figures 4.7 through 4.13 present crop condition information for each of China's seven regions. The provided information is as follows: (a) General setting: NDVI background; combined maize, rice, soybean and wheat cultivation area, and areas where more than 50 percent of the land is irrigated; (b) 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; (c) Spatial NDVI patterns from July to October 2014 (compared to the (5YA)); (d) NDVI profiles associated with the spatial patterns under (c); (e) maximum VCI (over arable land mask); (f) Cropped arable land fraction (CALF); and (g) biomass for July-October. Additional information about agroclimatic indicators and BIOMSS for China is provided in Annex A, table A.11.

North-east region

CropWatch agro-climatic and agronomic indicators indicate generally average conditions over most of the north-east region during the reporting period. Harvest of spring crops was concluded in October. “Single crops” including maize, rice, and soybean reach the grain-filling to maturity stages in August to late September. As shown in the spatial NDVI patterns, compared to their recent five-year average and the corresponding cluster profiles, crop condition was above average from May (early growing stage) up to mid-July. However, significant below average rainfall in August stressed crops in western Liaoning province where NDVI was well below the five-year average. Below average BIOMSS confirms the unfavorable conditions in Liaoning. The maximum VCI map still shows above average conditions, but not as good as other places in the region. In the south of Heilongjiang, NDVI was continuously above the five-year average and actually exceeded the recent thirteen-year record ($VCI > 1$). Overall, the increased maize production in Heilongjiang is due to farmers switching from less profitable crops such as spring wheat and soybean to maize; this offsets the decreased production brought about by the Liaoning drought: the global outputs from the region are slightly above those of the previous year.

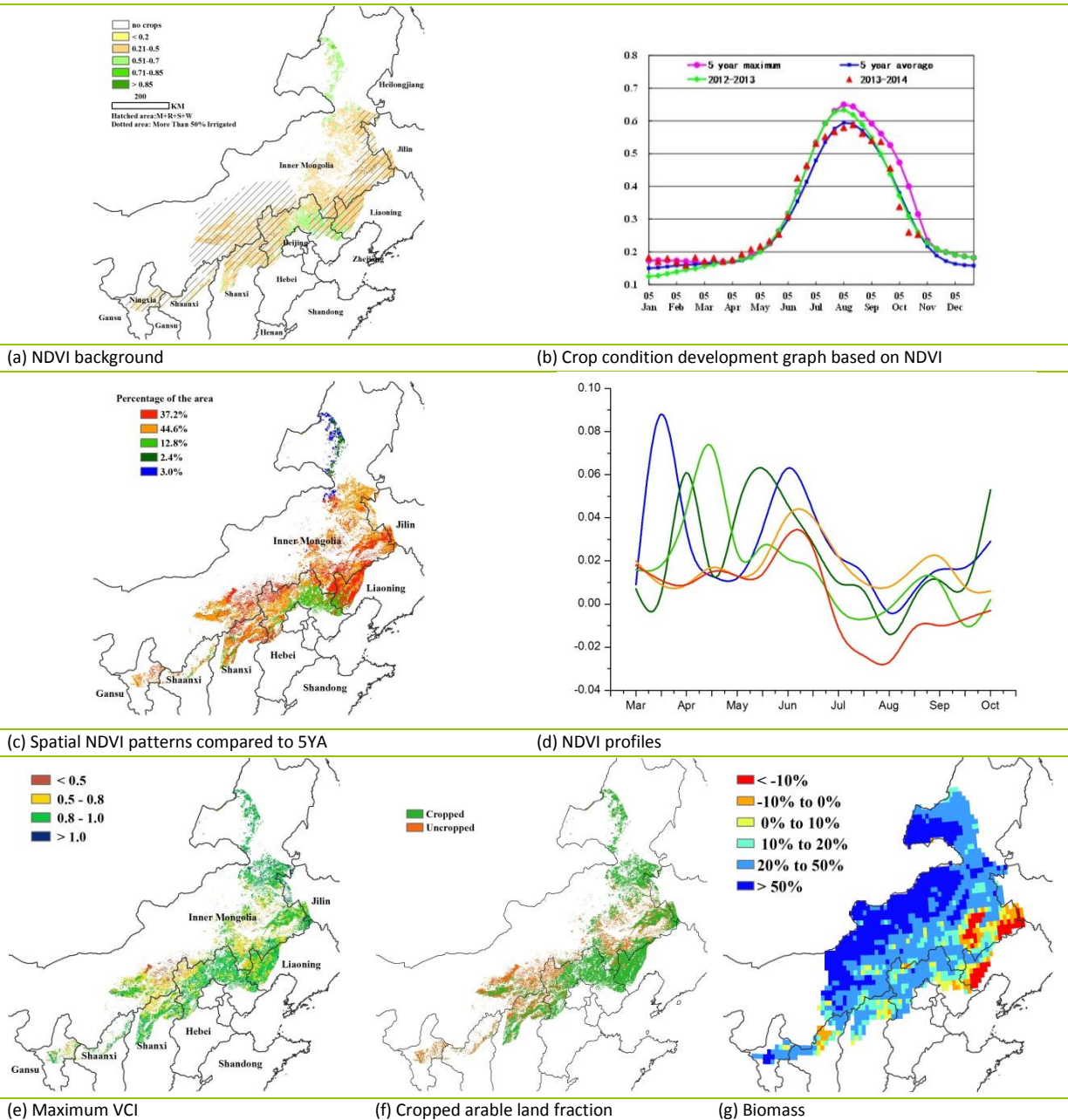
Figure 4.7. Crop condition China North-east region, July-October 2014



Inner Mongolia

The condition of maize and soybean, the main summer crops in Inner Mongolia, was generally unfavorable during the reporting period. Rainfall for the region was above average (+39%). The crop condition development graph shows slightly below average condition from August. In late July and August, dry weather in the center and hail in the north and west have affected crop growth, with sharp drops in the NDVI profiles starting in July in about 33% of the region. Western Liaoning, western Hebei, northern Shanxi, and central and southeastern Inner all have poor vegetation condition according to the VCIx map, including some areas that have uncropped land. In partly cropped land, the potential biomass was poor due to drought. According to the CropWatch indicators, maize and soybean production decreased in varying degrees compared with the previous season (see also table 4.2).

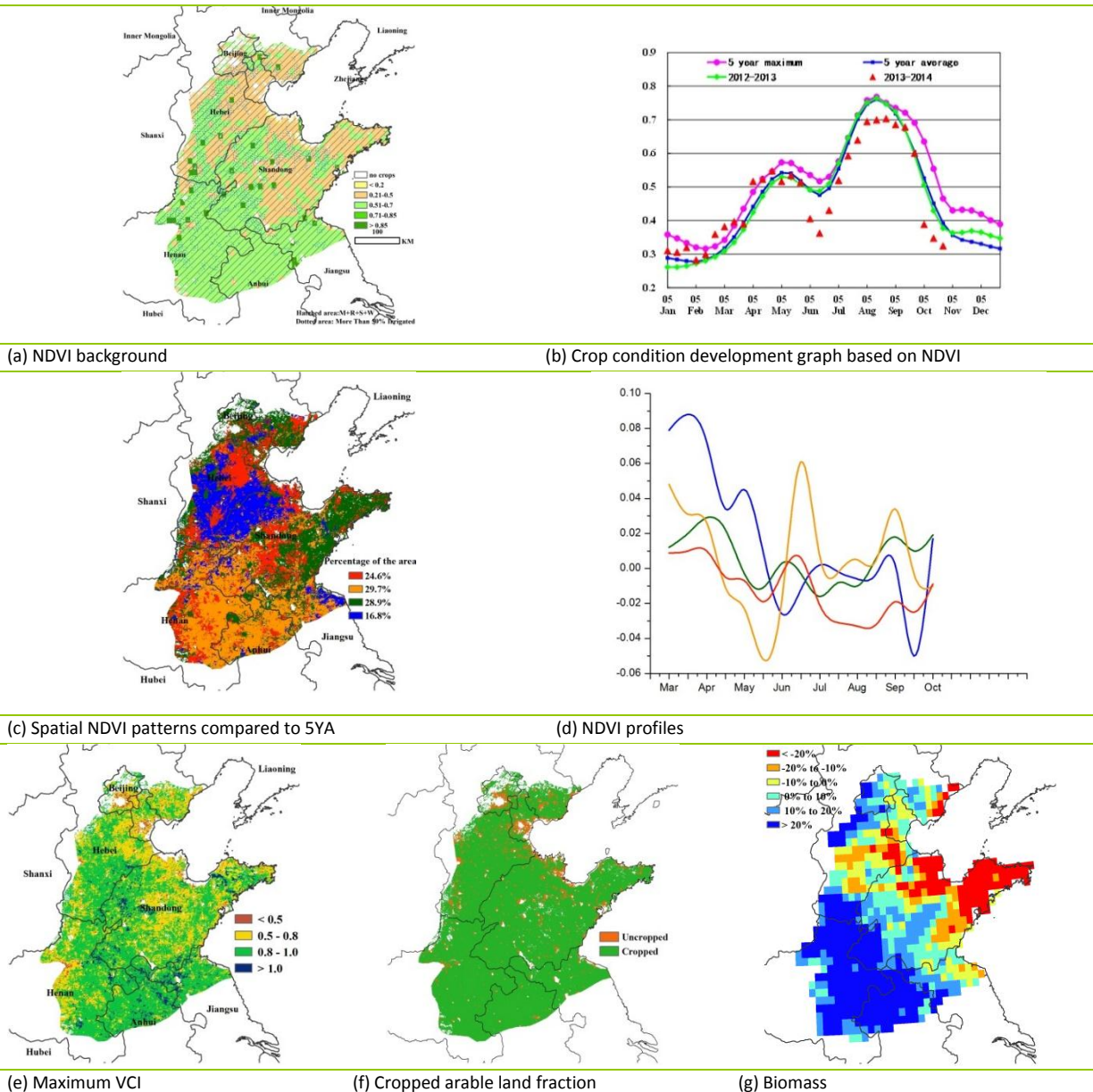
Figure 4.8. Crop condition China Inner Mongolia region, July-October 2014



Huanghuaihai

Crop condition was generally average from July to October with unfavorable conditions in August and favorable condition from September on forward. The harvesting of summer crops (mainly maize, rice, and soybean) concluded in early October. Currently, winter wheat is in tillering to wintering stage. Huanghuaihai experienced generally below average precipitation and above average temperature, but an 8% increase in BIOMSS. The most severe decline in BIOMSS was observed in eastern Shandong province due to the below normal rainfall (figure 4.1), while maximum VCI shows above average crop condition in the area. According to the spatial NDVI patterns (compared to the recent five-year average) and the corresponding NDVI profiles, NDVI was continuously below average for Bohai Bay west coastal regions as well as central Shandong. Overall, the spatial average NDVI development graph reveals that summer crops condition is below both average and the previous years' condition. The below average CALF and cropping intensity is the combined effect of poor weather conditions and low earnings from farming.

Figure 4.9. Crop condition China Huanghuaihai region, July-October 2014

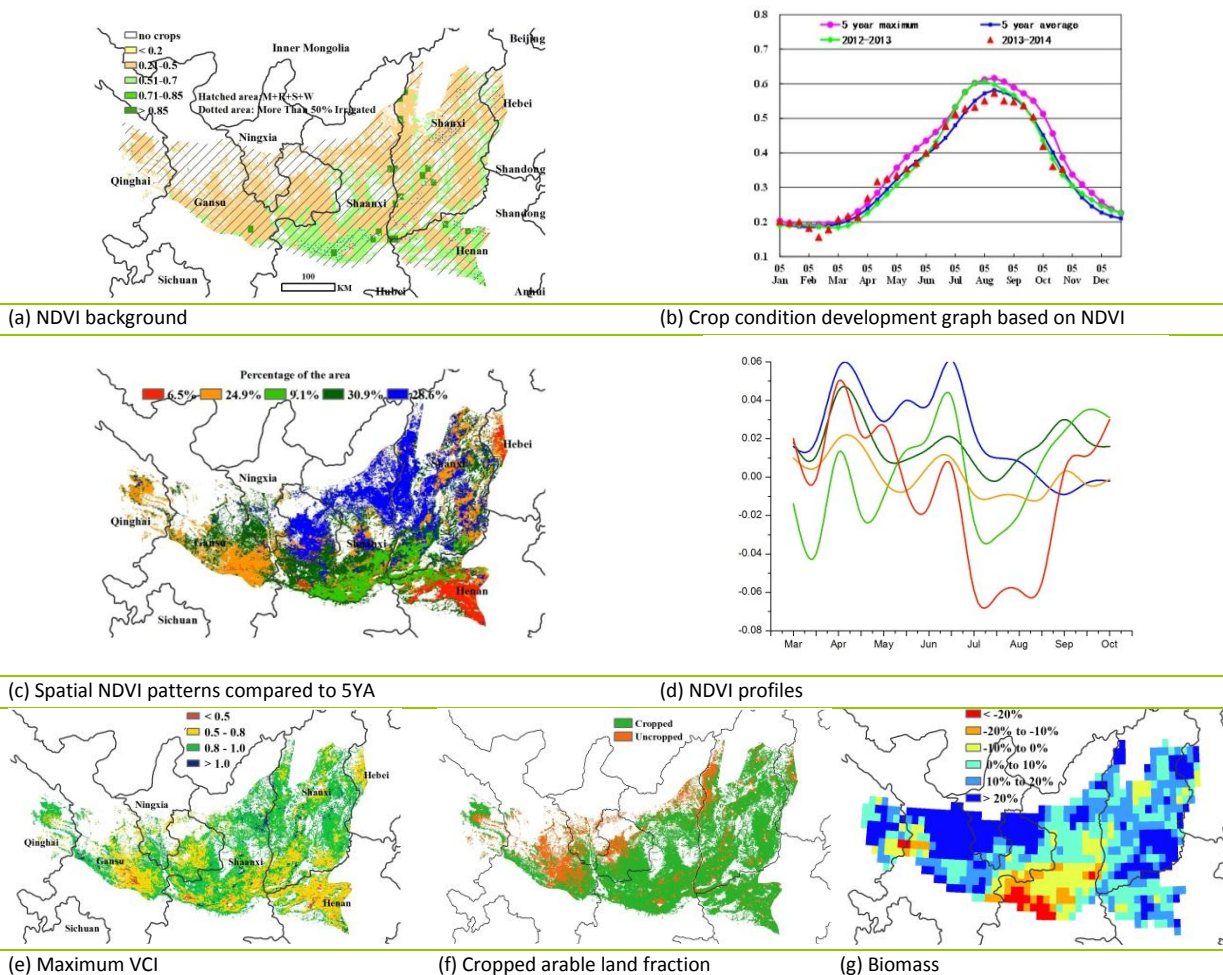


Loess region

In spite of crop condition being below last year's in the Loess region from June to September, at the time of harvest the maize crop condition was slightly better than last year's and as good as the five-year average. When compared to the thirteen-year average, temperature and precipitation increased by 0.6°C and 10%, resulting in a potential biomass of 10% above average.

The analysis of spatial NDVI clusters and profiles indicates that crop condition is favorable in the east of Gansu, north of Shaanxi, and in most parts of Shanxi, due to the abundant rainfall and suitable temperature and sunlight. That crops are better than the historical average is also confirmed by VCI in central Anhui province. On the contrary—and mostly because of drought in August (as confirmed by the maps of potential biomass), crops are in poor condition (compared to the five-year average) in the northwest of Henan and west of Hebei. At the beginning of September, however, crop condition had recovered (it was better than the five-year average) because of the suitable temperature and rainfall. The fraction of arable land actually cropped increased 4% due to suitable temperature and PAR; uncropped arable land is mainly located in Gansu, north of Shaanxi, and scattered areas of Henan, Shanxi, and Henan provinces.

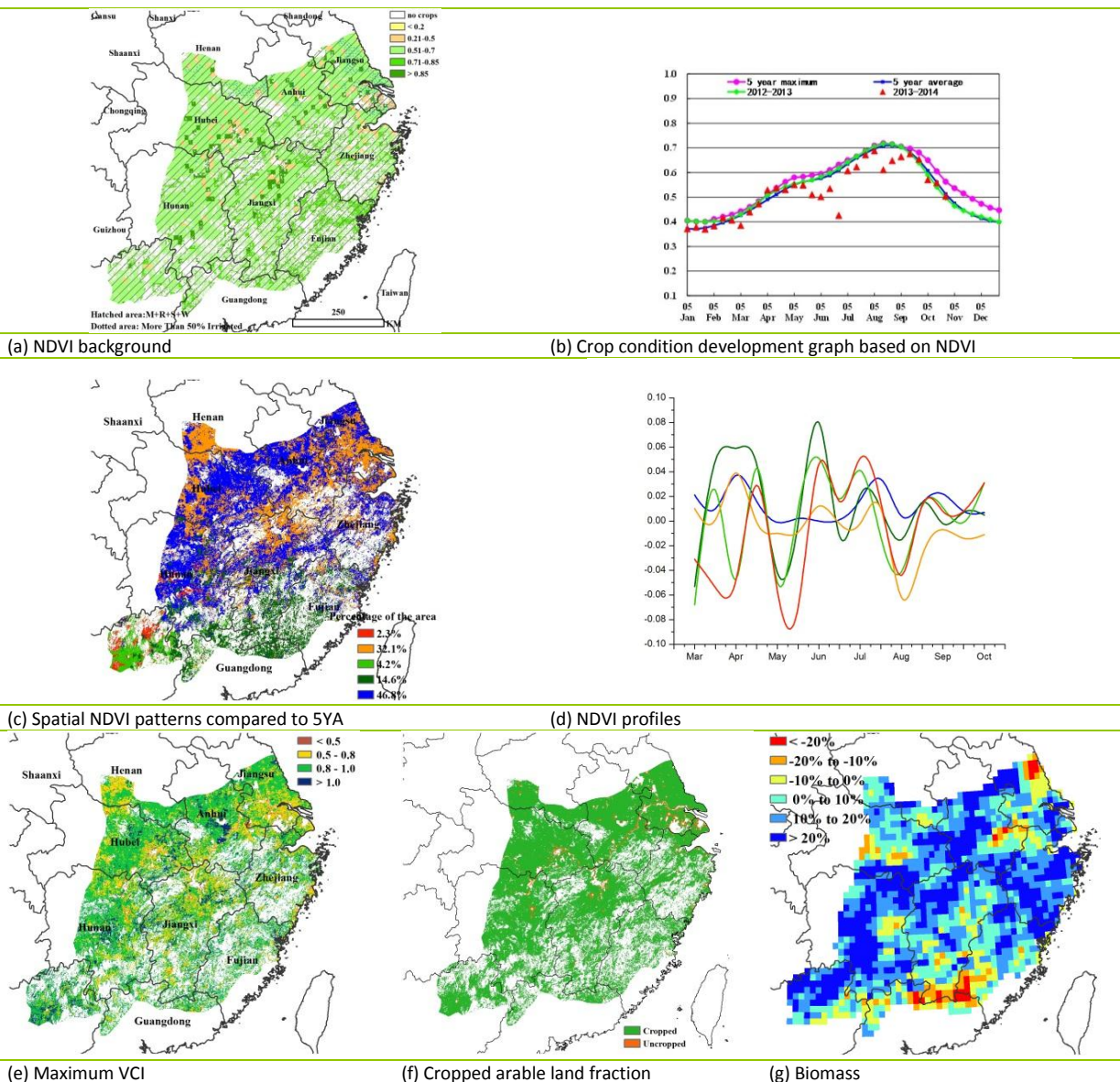
Figure 4.10. Crop condition China Loess region, July-October 2014



Lower Yangtze region

Although the crop condition has fluctuated over the growing cycle, by October it was comparable to last year's condition and the average of the last five years. The main crops in this region (single rice and late rice) have already been harvested between late-August and mid-October. The analysis shows that TEMP and RAIN are above average, while RADPAR is below average by 5%. Potential biomass (BIOMSS) shows an increase of 13% when compared to the five-year average. Although NDVI fluctuated widely, crop condition in the central and north of the region remained above average, which is confirmed by the average VCIx value of 0.89 and the VCIx map. In late May and June, crop condition in the south of the region (in particular in northeast Guangxi, northern Guangdong, and most parts of Fujian province) dropped sharply because of heavy rainfall. As the Lower Yangtze region is the main producer of rice in China, almost all the arable land in this region is cropped except for some areas scattered along the Yangtze River; the fraction of cropped arable land (CALF) in this region is similar to its five-year average. The map of the potential biomass also shows that crop condition in most parts is better than the five-year average, with a spectacular BIOMSS increase of 10 percent when compared to the five-year average.

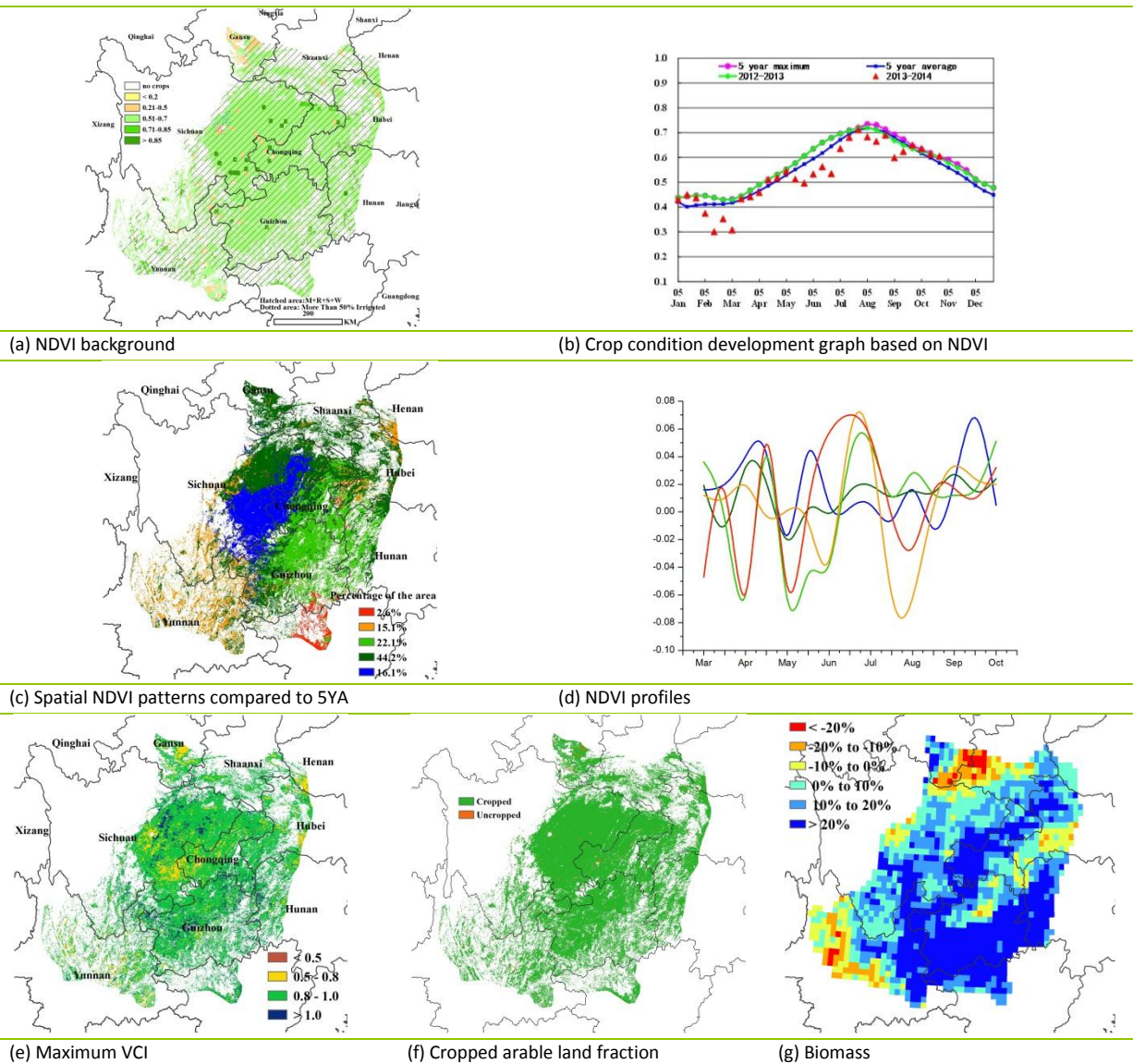
Figure 4.11. Crop condition Lower Yangtze region, July-October 2014



South-west China

The overall condition of crops was close to average in South-west China between July and October. The period coincides with the region’s harvest season for maize and single cropping rice and its planting season for winter wheat. The spatial NDVI patterns and profiles, as well as a VCIx in the range of 0.8 to 1.0, indicate favorable harvest prospects; crops in most of the region (82% of the area) were at an above average level. However, the NDVI profiles were below average in northern Yunnan and northwestern Guangxi, indicating a less favorable condition of maize in Yunnan and rice in Guangxi (as it is the harvest season there). Nearly all arable land was cropped, although the cropping intensity decreased by 11%, compared to the five-year average.

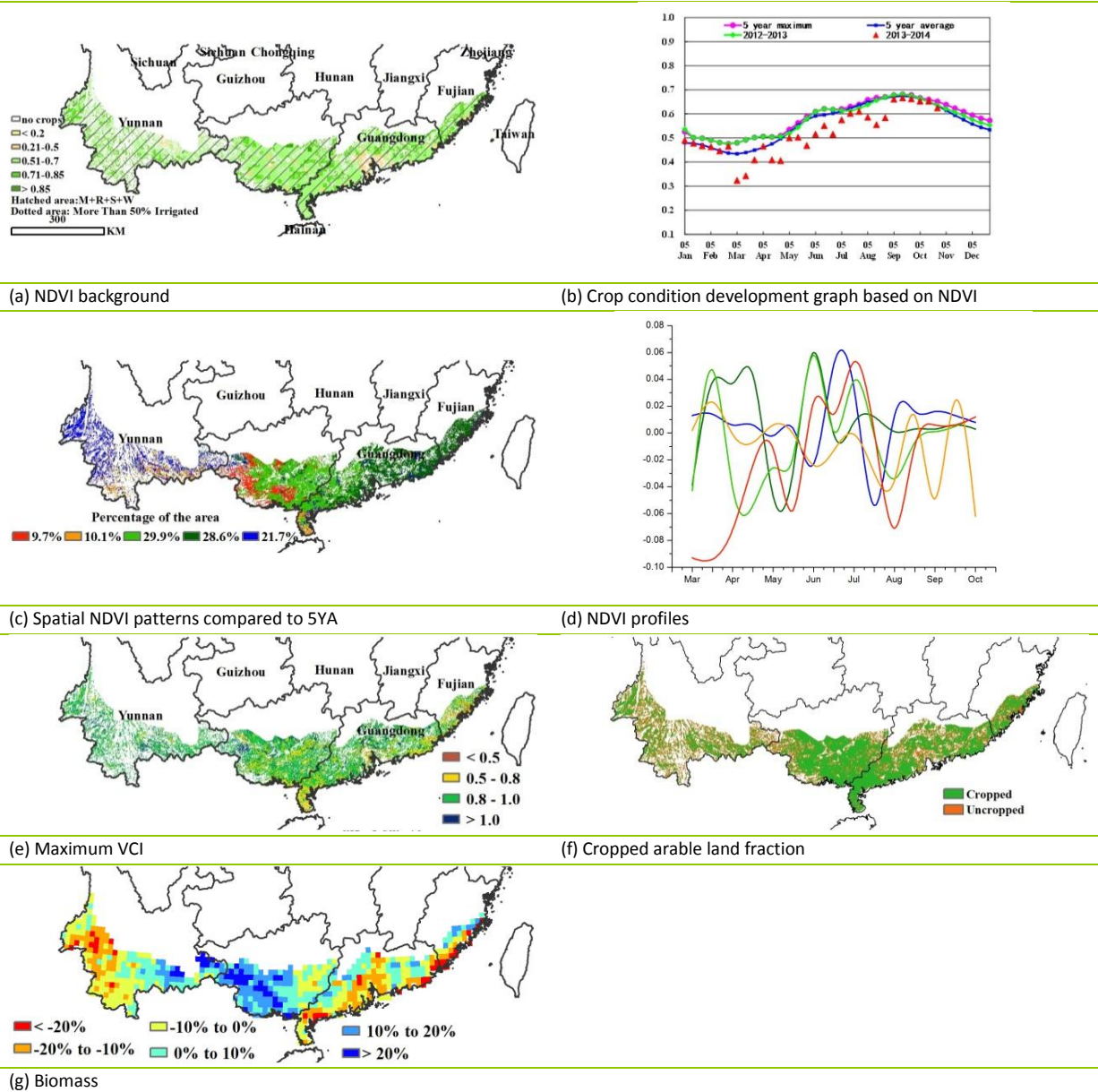
Figure 4.12. Crop condition Southwest China region, July-October 2014



Southern China

Average crop conditions prevailed in southern China during most of the reporting period, which covered the end of the early rice harvest and the planting and harvest period of late rice. Overall, the region's maximum VCI was between 0.5 and 0.8 with no change in the cropped arable land fraction; cropping intensity decreased by 13%, compared to the five-year average. In southern Fujian and central and southern Guangdong, NDVI was slightly above average during the growing and harvesting of rice, indicating favorable crop condition brought about by increased precipitation (RAIN +21% for Fujian and +12% for Guangdong). The double-crop late rice was below average in south Guangxi in August, especially in southwestern Guangxi, but recovered after September. In southern Yunnan, the spring maize and early rice were below average at the time of harvest; however, late rice improved to slightly above average, rising the prospects for a fair rice crop.

Figure 4.13. Crop condition Southern China region, July-October 2014



Chapter 5. Focus and perspectives

This focus section complements CropWatch analyses presented in chapters 1 through 4 by presenting a global outlook for 2014 production and other topics of relevance to global agriculture. Section 5.1 summarizes the provisional CropWatch estimates for 2014 production, while section 5.2 presents the standard CropWatch section on extreme atmospheric factors—disaster events—that have interfered with crop production in recent months. Sections 5.3 and 5.4 focus on El Niño and rice, respectively.

5.1 Production outlook for 2014

The latest CropWatch production estimate for the 2014 season puts the production of maize and rice (as paddy) at 993,783 and 755,513 thousand tons, respectively, both at about the same level as 2013; wheat is up 2% (compared to last year) with 719,718 thousand tons, while soybean reaches 294,822 thousand ton, a significant increase (+6%) over the previous harvest (table 5.1).

When only major producers are considered, the situation is slightly less favorable for maize (-1% compared to last year), similar for rice (0%) and wheat (+2%), but significantly better for soybean (+9%), indicating that minor soybean producers keep losing ground compared with the big three: United States, Brazil, and Argentina. The figures also confirm that maize and rice continue consolidating their global dominant role in cereal production (mostly at the expense of spring wheat).

For the major exporters, production has basically stagnated, except for soybean for which their offer may increase.

Table 5.1. Global 2014 production of maize, rice, wheat, and soybean (thousand tons) and departure from 2013 production

	Maize	Rice	Wheat	Soybean
Total production (thousand tons)	993,783	755,513	719,718	294,822
World (%)	0	0	+2	+6
Top 80% producers (%)	-1	0	+2	+9
Rest of the world (%)	+9	+6	-23	-26
Major exporters (%)	-1	0	0	+7

Note: Departures expressed as percentage compared to 2013 production.

On a more detailed scale (see table 5.2), decreases in maize production are estimated to occur in North America, both in the United States (-1%) and Canada (-16%). (In the United States, this production decrease is happening despite an estimated yield increase of +2.34% due to an area decrease of -3.6%.) Other maize production decreases are happening in Poland (-12%) and India (-13%), with India ranking 6th this year in terms of maize production. According to CropWatch estimates, China underwent an estimated 1% production drop in maize.

As expected for a crop that is mostly irrigated, the variability in rice (paddy) production remains rather limited, with extremes between -4% (Egypt) and the +16% (United States). Wheat, on the other hand, is much more prone to weather induced yield fluctuations and shows large differences over 2013 estimates. South America, for example, witnessed the return of favorable conditions of water supply and temperatures after several poor seasons and wheat production increased 15% in Brazil and as much as 22% in Argentina. Favorable conditions prevailed in Europe as well, with significant wheat production increases in Germany, Poland, and the United Kingdom (+11%, +12% and +23%, respectively). The largest

estimated drop in wheat production occurs in Canada (-11%). Although estimated production losses are less severe, most countries from the western Mediterranean to central Asia have suffered poor winter wheat weather (especially a shortage of rainfall, as reported in the previous issues of the CropWatch bulletin), resulting in reduced production in Iran, Turkey, Kazakhstan, and Uzbekistan (-8% to -1%).

China experienced an average wheat season with an expected production increase of just 1%, while the long-term downward trend of soybean production continues (-2%). Also for soybean, India (-3%), Indonesia (-1%), Russia (-8%), and especially South Africa (-14%) performed poorly due to poor water supply. As mentioned above, positive soybean results occur among the major producers (Argentina, +4%; United States, +7%; and Brazil +9%). However, two minor producers of soybean also do rather well this year: Thailand (7th producer, +16%) and Ukraine (11th producer, +39%).

Table 5.2. Estimated rates of change of production compared with 2013 for maize, rice, wheat, and soybean (thousand tons) and derived 2014 production in selected countries

	Maize		Rice (paddy)		Wheat		Soybean	
	2014	Δ%	2014	Δ%	2014	Δ%	2014	Δ%
Argentina (A)	25078	1			12786	22	52445	4
Australia (A)					27698	-4		
Bangladesh	2219	-1	50871	-1	1292	3		
Brazil	78669	-2	11847	1	6603	15	89036	9
Cambodia			9467	1				
Canada (A)	11909	-16			33287	-11	5420	4
China (B)	191952	-1	201167	0	119735	1	13079	-1
Egypt	5951	-8	6506	-4	9506	0		
Ethiopia	6739	1	182	-1	4390	9		
France	15050	0	81	-1	39754	3		
Germany	4652	6			27677	11		
India	20172	-13	156960	-1	95663	2	11627	-3
Indonesia	18362	-1	69281	-3			775	-1
Iran	2508	-1	2546	0	13349	-5		
Kazakhstan	574	1	345	0	13840	-1		
Mexico	23953	6	181	0	3657	9		
Myanmar	1716	1	28464	2	191	2		
Nigeria	10627	2	4678	0				
Pakistan	4711	-2	9488	-3	24390	1		
Philippines	7511	2	19362	5				
Poland	3543	-12			10614	12		
Romania	11149	-2			7437	2		
Russia	11755	1	970	4	53266	2	1509	-8
South Africa	12528	1			1865	6	673	-14
Thailand	5079	0	39142	1			220	16
Turkey	5859	-1	906	1	20736	-6		
United Kingdom					14617	23		
Ukraine	29976	-3			23095	1	3854	39
United States (A)	348948	-1	10095	16	56728	-2	96034	7
Uzbekistan					6273	-8		
Vietnam	5094	-2	43994	0				
Sub total	866284	-1	666533	0	628459	2	274673	9
Others	127499	9	88980	6	91269	-3	20149	-26
World	993783	0	755513	0	719718	2	294822	6

Note: Rates of change of production were computed as the product of the rates of change of yield and area: Refer to Annex C for additional details about the method; this method was applied for most countries, except those marked (A) and (B). (A) indicates that the areas are pure remote-sensing estimates (neither FAOSTAT nor national data were used for calibration); (B) indicates that no FAOSTAT or national data were used for area and yield estimates. Wheat productions for Argentina, Australia, and Brazil refer to the crop planted in 2014 and to be harvested in late 2014 to early 2015. Cells are left empty for crops not grown in a country or when the crops are a minor production; in that case, the country was included in the "others" category, as for instance maize and rice in Australia, wheat in Nigeria, and soybean in France, Mexico, Kazakhstan, and Nigeria.

5.2 Disaster events

With the exception of cyclone Hudhud, the current reporting period witnessed fewer and less severe extreme events than the previous ones. While in several areas human lives were lost as a result of disaster events, no detailed agricultural impacts have been mentioned in the leading disaster databases and compilations.

Cyclones

The most notable disasters this reporting period included several cyclones, as summarized in table 5.3.

Table 5.3. Major cyclones and related damage (in million U.S. dollars) in July-October 2014

Name	Local name	Date	Countries affected	Total damage (damage to agriculture) (million U.S. dollars)
Rammasun	Glenda	Jul 9-20	Philippines (Luzon, Visayas), China (Hainan), Vietnam	871(762)
Kalmaegi	Luis	Sep 11-18	Caroline Islands, Philippines, China (Hainan), Vietnam, Lao PDR, Thailand, Myanmar, India	75
Fung-Wong	Mario	Sep 17-25	Philippines, Japan, China (Hainan), Republic of Korea	75(62)
Hudhud		Oct 7-14	India (Andhra Pradesh, Odisha, Chhattisgarh, Madhya Pradesh, Uttar Pradesh), Nepal	11000
Gonzalo		Oct 12-25	Puerto Rico, Bermuda, Canada, and Europe (Figure 5.1)	200
Nilofar		Oct 25-31	India, Pakistan	n.a.

Source: Based on Wikipedia.

Hudhud was the most destructive cyclone that has ever affected India. Most damage occurred in Andhra Pradesh and Odisha. Crops that suffered most include kharif sugarcane, rice, and pulses (that were still growing at the time). The estimated total damage stands at US\$11 billion; this compares with just under US\$3 billion for cyclone Haiyan in the Philippines, which was the major agricultural disaster of 2013 and reported on in the February 2014 CropWatch Bulletin.

At the time of writing, official estimates are not available yet for the damage to India's agricultural sector; these numbers are expected at the end of November 2014. Insurance claims are likely to reach 1,500 crore rupees (about US\$300 million) for the agricultural sector. Preliminary damage assessments list the following estimates: field crops, US\$189 million; horticulture, US\$267 million; farm animals and poultry, US\$6.4 million; fisheries, US\$13.4 million; and sericulture (silk farming) US\$0.3 million. The estimates exclude damage to agricultural infrastructure.

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. In Odisha, for example, it is estimated that 250,000 hectares were directly affected while 50,000 hectares lost most than 50% of yield. Table 5.4 lists the CropWatch rainfall indicator, RAIN, for four states in India affected by the cyclone.

Early impact assessments carried out at the end of October also found that loss of poultry and domestic food stocks were perceived as one of the major losses incurred by villagers. Little doubt exists that Hudhud has severely impacted food security in north-east and east India and that the long-term effects (for example on coconuts) will last several years.

Although less severe, other cyclones also had local impacts on agriculture, as shown in figure 5.1.

Table 5.4. Increase in rainfall for the July-October period and state shares in national maize and rice production, for states in India affected by cyclone Hudhud

State	Increase in rainfall (CropWatch RAIN indicator) in July-October 2014 compared to the same period in 2013 (%)	Share in national rice production (%)	Share in national maize production (%)
Andhra Pradesh	+11	11	17
Odisha (Orissa)	+28	7	-
Chhattisgarh	+32	7	-
Madhya Pradesh	+5	2	6
Uttar Pradesh	-2	15	6

Figure 5.1. A Hungarian farmer with his tractor stranded in mud during land preparation for the 2014-15 winter crop

The rainfall was brought about by the tail of Caribbean hurricane Gonzalo, which reached deep into southern-central Europe at the end of October, causing widespread water logging and floods, for instance in Slovenia from 23rd October.

Source of photograph:
<http://www.agroinform.com/szantofold/elakadasok-20227>



Other disasters

In addition to floods from the cyclones mentioned above, more floods, resulting in landslides, and droughts are reported from several areas worldwide. They often coincide with the extremes of the CropWatch agroclimatic indicators that were mentioned in previous chapters.

The most significant impacts associated with excess water occurred in Niger in mid-August and in seventeen provinces of Thailand at the end of August and early September. Other African floods are reported from Cameroon in August and from Somalia and Ethiopia in October. Starting in early September, both India and Pakistan were in the news when several thousands of villages were hit by floods and landslides in Kashmir, resulting in hundreds of deaths; India declared a national calamity. In China a landslide in Yunnan on October 28 caused nine deaths. The next day, a landslide in Sri Lanka killed ten.

Drought occurred in South America—for example in Bolivia in October. Honduras declared a drought on July 9, referring to a shortage of rain that occurred earlier in the season. Similarly, Namibia experienced dry conditions between May and July. This drought is said to have been the worst in 30 years, and possibly constitutes the first sign of the ongoing shortage of rainfall over the Western Cape Province and south-eastern African countries, which was reported on in other sections of the bulletin.

5.3 El Niño

El Niño monitoring is one of the recurring topics in this bulletin. The Southern Oscillation Index (SOI) of the Australian Bureau of Meteorology (BOM) normally fluctuates between -8.0 and +8.0. During recent months, it exceeded +8.0 in November 2013 and January 2014, while it dropped below -8.0 in March,

August, and October in 2014. Figure 5.2 illustrates that El Niño remained neutral from October 2013 to October 2014, even if a warming of the tropical Pacific Ocean was observed.

Figure 5.2. Monthly BOM SOI time series from October 2013 to October 2014



Note: The dashed blue lines are the El Niño thresholds used by BOM; sustained negative values of SOI below -8 may indicate an El Niño event, while sustained positive values above +8 are typical of a La Niña event. Values within the range (-8 to +8) indicate neutral conditions. The data and methodology description can be found at: <http://www.bom.gov.au/climate/glossary/soi.shtml>.

Information from other sources also indicates neutral conditions for El Niño until October 2014. The International Research Institute for Climate and Society, Columbia University, reported that during September through early October the observed El Niño Southern Oscillation (ENSO) conditions had retreated from those of a *borderline El Niño* back to a *warmish ENSO-neutral* state. The diagnostic discussion on November 6, 2014, released by the NOAA's Climate Prediction Center, indicates that overall, several features across the tropical Pacific are characteristic of borderline El Niño conditions, but collectively, the combined atmosphere and oceanic state remains ENSO-neutral. The typical climate anomalies associated with El Niño events are also presented in CropWatch global maps of rainfall and temperature departures (figures 3.1 and 3.2), such as the dryness in the middle and eastern parts of Australia, and the temperature increase in western and eastern parts of South America and the northern parts of Latin America. In the next few months, CropWatch will keep a close eye on the developments of El Niño and report about the regions that shown sensitivity to this event.

5.4 Rice in diets and politics

Rice is an Asian crop par excellence: it is the staple food of about half the world population and 90% of it is consumed in Asia. Contrary to some other major commodities, the major producers are also the main consumers as only 7% of the production is traded.

There exist, however, large differences in the per capita consumption of rice among the largest rice consuming countries in Asia. For instance, Indonesians—population 0.25 billion—consume 160 kg/capita per annum, while the Chinese (population 1.4 billion) consume only 100 kg/capita and people in India only 70 kg/capita with a population of 1.3 billion. As countries develop and urbanize, diets change and the importance of rice tends to decrease, a process sometimes captured in the phrase, “countries diversify out of rice.” Africa is the continent where rice consumption grows fastest; it currently stands at only 25 kg/capita per annum. Highest levels of rice consumption in Africa of 100 kg/capita occur in Madagascar, possibly a direct consequence of the Malayo-Indonesian component in the Malagasy population. The main rice producing countries on the continent are, however, located in West Africa, especially along the Niger river and including in particular the Inner Delta in Mali. Many African countries are more than 80% self-sufficient in rice. They are located in a “belt” from Guinea—the source of the Niger river—to Niger across Mali, then Chad, Tanzania, and Madagascar, along with adjacent areas.

A major issue in West Africa has been the “unfair” competition of imported rice with the locally produced crop, which basically boils down to a transportation issue. It is, indeed, easier to import rice to the Gulf of Guinea ports, especially Abidjan in Côte d'Ivoire, and then ship it by rail to the Sahelian countries, rather than to collect it from local producers and transport it to the cities. In addition, local rice is of very variable quality, to the extent that city residents usually prefer rice imported from Thailand or elsewhere. It remains, however, that imports deprive local small rice producers of their market. Governments have occasionally implemented import restrictions or outright bans as a result of local and international pressures, in particular from traditional food donors.

Another key area for rice production and consumption in Africa is Egypt. The country has a complex love-hate relationship with rice. The member countries of the Nile Basin Initiative are entitled to a fixed share of the Nile waters and Egypt has at times consumed more than its share. Countries in the basin, among which Ethiopia is one of the most vocal, put pressure on Egypt to reduce its consumption. One of the ways to achieve this is to limit cultivation of the most water demanding crops such as sugarcane and rice. Egypt has thus issued legislation to restrict the cultivation of rice. As a result, discontent has been rising among both producers (who lost their income) and those involved in rice processing and transportation, as well as among consumers (who have to pay a higher price for imported rice). It also deprives the country of valuable export earnings. As a result, the actual situation of rice in Egypt keeps fluctuating.

More than any other major crop, rice is the frequent source or component of national and international tension. In Asia, for example, many countries consider rice self-sufficiency a key objective for the country. When in 2011 South Korea's self-sufficiency rate for rice dropped to 83%, this was perceived as a serious threat to national security. Meanwhile, the Philippines has set itself the goal of achieving rice self-sufficiency by 2013, which is a difficult objective in the face of limited land and limited water availability when other crops, such as sugarcane, are efficiently competing with rice every time international sugar prices are high.

As became very clear during the high food price crisis in 2008, many countries—including major producers—have imposed restrictions and bans on rice imports or exports, for example Vietnam, India, Cambodia, and Egypt. Some of the measures can be interpreted as a government-supported form of speculation, but in most cases they stem from a genuine desire to ensure national rice security.

Production variability

Even a superficial look at time series of rice statistics shows that the crop is much less variable than most other major cereals, in particular maize. Stability of supply is indeed one of the comparative advantages of rice, even if yields are outperformed by maize and the crop also consumes less water.

The reason for the low variability in rice production is that rice can be grown in a very large spectrum of environments under conditions of water control that go from pure rainfed to 100% irrigation in many desert areas along major rivers¹. Rice thus often grows under conditions with abundant sunshine and in dry climates that are not conducive to the development of pest and diseases; it often grows in tropical or other warm climate areas with cropping intensities up to 300% (for example close to 190% on average in Bangladesh), under various scenarios of water control (such as two monsoon crops and one irrigated dry season crop in Bangladesh). As a result, yields are both high and stable².

1. Rice is a very versatile crop, grown under diverse conditions of water supply, including upland rainfed, lowland rainfed, irrigated (lowland and upland), mangrove swamp, flood recession, floating, and “aerobic.”

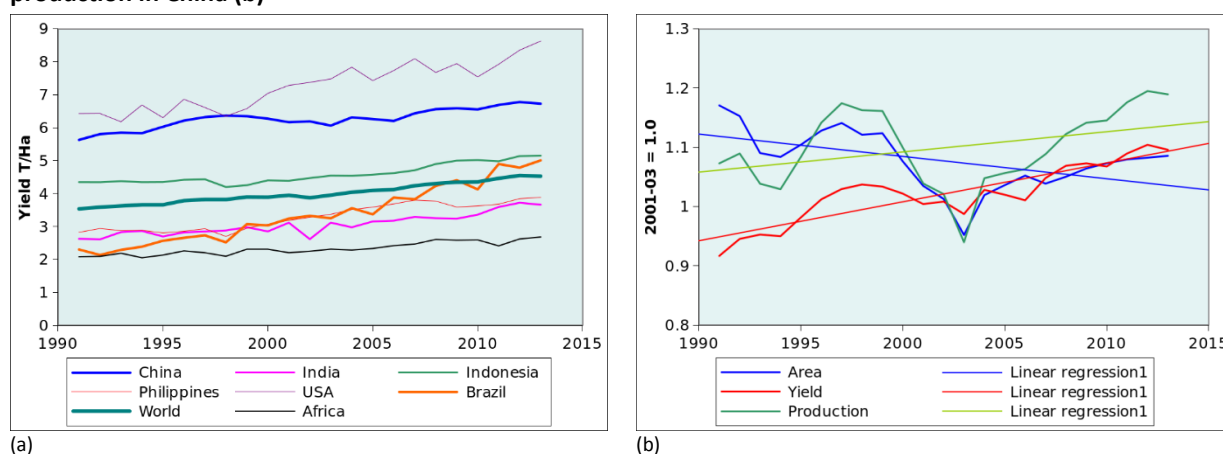
2. Another stabilizing factor is the fact that rice cultivation depends on dedicated irrigation infrastructure, which provides additional income (labor). For most other crops in developing countries, the production costs include little more than labor. In addition, the

Unfortunately, after the initial boom of the green revolution, rice and wheat yields started stagnating in many countries during the early or mid-1990s, which no doubt is one of the factors for maize becoming so popular. Reasons for the stagnation include soil degradation, a slower pace of varietal innovation, and shortage of land and water; moreover, when yields—already close to their climatic maximum—could sometimes be increased, this would be at an unacceptably high economic and environmental cost.

Figure 5.3 illustrates that by world standards China achieves high rice yields (figure 5.3a), but its interannual yield increases are low (figure 5.3b). Agricultural statistics show that the annual global rice yield increase, which had been about 10 kg per hectare per annum, dropped to 8 kg per hectare per annum around 1990, at the time when maize increased from 10 to 17 kg per hectare per annum.

Because of its stagnating yield, rice appeals less and less to many farmers, which increases the gap between rice demand and production. As mentioned above, as the major Asian economies continue to grow, diets will change and, as was observed in urban Africa, it is like that the traditional staples including rice will undergo a demand reduction that may bring some relief and help bridge the gap.

Figure 5.3. Recent trends of rice yield among some typical producers (a) and trends of area, yield and production in China (b)



Recent changes in rice markets

The main rice producers and the main exporters (table 5.5) only partly overlap: 81% of world production comes from seven countries (China, India, Indonesia, Bangladesh, Vietnam, Thailand, and Myanmar), while seven more are needed to reach 90% (Philippines, Brazil, Cambodia, Japan, the United States, the Republic of Korea, and Pakistan).

Of those seven, only Brazil and the United States are not located in Asia. Contrary to the major Asian producers, both enjoy significantly faster yield increases than their Asian counterparts (see also figure 5.2(a)). Although it is difficult to foresee how long both countries will be able to sustain the same yield growth rate—and at which human, environmental, and economic cost—they are bound to keep climbing or, at least, maintain their position among the rice exporters. Between 1999-2001 and 2009-2011, Pakistan has been climbing from a 5th position to a 3rd, while China dropped from the 3rd to the 9th. Brazil and Argentina were not even listed in FAO statistics as rice exporters 15 years ago. Obviously, this is a very dynamic situation that will continue changing, with Brazil continuing the climb at a fast pace. When comparing the per capita production rates with per capita consumption (which, as mentioned above, among the main producers varies between 70 and 160 kg/person per annum), table 5.3 also points to

complexity of many rice farming systems (for example the rice-fish farming systems in Sichuan, Hunan, and Guizhou provinces in China) also contributes to stabilizing food production from rice farming.

some countries with extreme high production rates per capita. The high numbers, three or four times larger than national consumption requirements, such as in Vietnam and Uruguay, are a clean indicator of those countries' sustained and successful efforts to become a major exporter.

Table 5.5. Main rice importing and exporting countries

Main rice exporting countries					Main rice importing countries				
Rank		Volume	PCP	Rank	Rank		Volume	PCP	Rank
2009-2011	Country	2009-2011	2009-2013	1999-2001	2009-2011	Country	2009-2011	2009-2013	1999-2001
		Mtons	kg/person				Mtons	kg/person	
1	Thailand	9.39	37	1	1	Nigeria	1.74	27	2
2	Vietnam	6.66	464	2	2	Philippines	1.62	179	6
3	Pakistan	3.45	52	5	3	Saudi Arabia	1.23	0	4
4	United States	3.28	30	4	4	Indonesia	1.23	276	1
5	India	3.13	123	6	5	Iraq	1.02	6	3
6	Brazil	0.77	62	?	6	Iran	1.02	34	5
7	Italy	0.75	25	9	7	Malaysia	1.02	89	10
8	Uruguay	0.72	405	7	8	UAE	1.02	0	15
9	China	0.63	146	3	9	Côte d'Ivoire	0.98	62	16
10	Argentina	0.60	36	?	10	China	0.91	146	10

Note: PCP=annual per capita production; UAE=United Arab Emirates.

Source: FAO statistics.

In terms of rice importing countries, Nigeria and the Philippines are at the top, underscoring the difficulties of the latter country to achieve rice self-sufficiency. Malaysia also now ranks higher in rice import compared to ten years ago (from 10 to 7), while Indonesia is doing better, as the country dropped from being the first importer to number 4. Finally, note that imports by Côte d'Ivoire do not supply the country itself only, but also the Sahelian hinterland.

Conclusion

Rice differs from other major cereals in many respects; it plays a dominating role not only in the economy of major Asian producers, but also in the life of the people. Little is traded and industrial uses are few, compared with maize. While some countries—the Philippines and Korea—almost desperately try to maintain or reach rice self-sufficiency, other countries, such as Malaysia and China, are more pragmatic and focus on income from industry and services to cover imports, rather than on local production.

The widening difference between national rice production and demand that international organizations have paid a lot of attention to in the mid-1990s does not seem to have led to any major crisis, although it certainly contributed as one factor among others to the high price crisis of 2008. There are also signs that the rapidly developing economies in Asia are relaxing their objective of rice self-sufficiency. If that is the case, it can be achieved, among others, thanks to some relative newcomers on the rice markets, such as Brazil, Argentina, and Pakistan.

Altogether, rice production is more a geopolitical issue than the production of other cereals. Combined with soybean, rice is bound to play a role of increasing importance—directly but perhaps mostly indirectly—in world food security and stability.

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. July to October 2014 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/m ²)	13YA dep. (%)	Current (gDM/m ²)	5YA dep. (%)
Equatorial Central Africa	439	-3	25.3	1.3	1152	5	1208	0
East African Highlands	585	-5	19.7	0.6	1127	0	1560	-1
Gulf of Guinea	893	6	26.6	0.6	981	1	2034	4
Horn of Africa	137	2	24.1	0.9	1245	0	448	6
Madagascar(main)	162	37	22.3	0.8	1110	0	494	33
SW Madagascar	52	-17	22.3	0.1	1173	-2	222	3
North Africa Mediterranean	108	16	24.8	1.1	1298	0	398	6
Sahel	636	20	29.5	1.3	1251	2	1665	13
Southern Africa	48	-25	21.9	0.9	1193	2	191	-17
S. Africa Western Cape	70	-58	13.4	1.4	942	0	319	-42
British Columbia To Colorado	264	45	12.9	1.4	1100	-4	914	34
America northern great plains	422	61	17.9	0.4	1065	-3	1151	27
America corn belt	423	4	17.5	-0.1	982	-3	1357	0
America cotton belt Mexican coastal plain	431	-2	24.4	0.5	1134	1	1293	5
Sub boreal north America	310	14	12.7	0.8	857	-1	1122	3
America West Coast	95	12	18.7	2.6	1233	-4	321	14
Sierra Madre	613	-4	20.3	0.7	1213	1	1607	3
SW Mexico and N. Mexico highlands	211	18	22.1	1.4	1259	-3	788	32
Northern South and Central America	955	1	27.5	0.9	1083	3	2080	1
Caribbean	856	10	27.6	0.5	1256	3	1994	0
Central Northern Andes	324	-13	16.6	1.6	1122	3	836	5
Brazil Nordeste	44	-23	27.4	2.4	1217	-1	184	-28
Central Eastern Brazil	221	10	26.0	2.0	1134	1	718	3
Amazon	355	-11	28.6	0.8	1146	2	1124	-5
Central north Argentina	109	18	20.9	2.1	963	-2	437	32
SE Brazil Concepcion Bahia Blanca	522	24	18.2	2.2	899	-1	1311	15
SW southern cone	329	-16	7.6	0.2	713	-5	826	5
Semi-arid southern cone	95	45	11.7	1.2	918	-4	376	76
Caucasus	162	-7	19.5	0.3	1115	-1	623	-1
Central Asia Pamir mountains	235	55	18.5	1.1	1221	-2	712	41
Western Asia	66	17	23.9	1.0	1228	-1	255	8
China Gansu Xinjiang	317	198	16.7	0.3	1106	-2	922	120
China Hainan	1135	-3	28.0	1.3	1102	5	1900	-12
China Huanghuaihai	439	-6	23.0	0.5	1009	0	1398	8
China Inner Mongolia	365	39	15.9	0.3	1050	-1	1279	25
China Loess region	397	10	18.0	0.6	1017	0	1378	10
China Lower Yangtze	626	28	25.1	0.5	988	-5	1559	13
North East China	369	-3	16.2	0.1	980	3	1248	-3
China Qinghai Tibet	850	29	12.2	0.9	1008	0	1299	8
Southern China	704	-3	25.0	1.2	1014	1	1703	0
South West China	658	21	21.2	0.8	905	-1	1732	14
Taiwan	641	-36	26.2	1.5	1128	4	1325	-20
East Asia	470	-26	17.5	0.3	927	3	1337	-16
Southern Himalayas	1145	15	25.8	1.1	944	1	1853	0

65 Global MRUs	RAIN		TEMP		RADPAR		BIOMSS	
	Current	13YA	Current	13YA	Current	13YA	Current	5YA dep.
	(mm)	dep. (%)	(°C)	dep. (°C)	(MJ/m ²)	dep. (%)	(gDM/m ²)	(%)
Southern Asia	1141	20	27.8	1.2	926	0	1839	0
Southern Japan and Korea	787	1	22.2	-0.4	900	-6	1759	-1
Mongolia region	417	255	15.7	0.8	1121	0	1179	142
S. Asia Punjab to Gujarat	598	14	30.3	1.3	1055	0	1063	-10
SE Asia islands	728	-15	26.3	0.9	1057	2	1694	-15
SE Asia mainland	1212	0	27.8	1.1	976	4	2262	0
Eastern Siberia	245	-17	10.9	-0.5	836	3	1030	-12
Eastern Central Asia	233	-4	9.4	-0.7	943	3	943	-5
North Australia	45	-56	24.2	0.5	1226	2	212	-51
Australia Queensland to Victoria	98	-43	13.3	0.8	971	2	433	-40
Australia Nullarbor Darling	198	-8	14.3	1.9	900	-2	749	2
New Zealand	113	-65	8.0	-0.6	719	-3	425	-59
Boreal Eurasia	312	-5	11.0	0.2	724	3	1099	-7
Ukraine to URAL Mountains	177	-28	14.5	-0.4	847	5	764	-23
Mediterranean Europe and Turkey	157	-5	19.5	-0.5	1147	-4	588	4
W. Europe (non Mediterranean)	319	7	16.8	0.8	868	-3	1193	11
Boreal north America	419	15	7.9	0.5	660	5	1165	6
URAL to Altai Mountains	253	33	12.2	-1.2	828	-4	998	29
Australian Desert	86	1	15.3	1.4	1015	1	399	1
Old World Deserts	42	60	30.4	1.1	1357	-1	159	19
Sub-Arctic America	230	195	-3.2	-4.3	275	-1	849	374

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 July and October.

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

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 (%)
Argentina	263	12	17.0	1.9	893	-4	796	14
Australia	107	-37	14.3	0.9	984	1	476	-31
Bangladesh	1717	23	29.1	1.1	908	2	2263	4
Brazil	272	4	26.1	1.7	1132	1	798	1
Cambodia	1429	26	28.8	1.3	1030	4	2520	8
Canada	306	6	13.3	1.0	896	-2	1099	6
China	578	14	21.5	0.7	984	-1	1429	12
Egypt	4	-17	26.7	0.0	1324	-1	18	0
Ethiopia	689	-2	20.7	0.7	1117	0	1762	2
France	285	-3	17.7	1.1	911	-5	1099	6
Germany	347	18	16.5	1.1	802	-2	1370	17
India	1077	18	27.8	1.2	950	0	1681	-3
Indonesia	647	-20	26.3	0.8	1079	4	1493	-21
Iran	51	37	24.0	1.0	1285	-1	170	30
Kazakhstan	194	40	14.3	-0.7	919	-2	778	33
Mexico	705	-1	24.4	0.8	1195	1	1574	8
Myanmar	1155	-8	26.7	1.2	880	5	2169	-5
Nigeria	853	8	27.3	0.7	1055	0	1997	6
Pakistan	263	1	27.5	1.3	1188	-1	601	-15
Philippines	1215	5	26.6	0.6	1031	0	2250	-3
Poland	280	10	16.3	1.0	830	4	1154	10
Romania	266	-9	17.3	0.4	957	0	1040	13
Russia	204	-17	13.1	-0.8	839	2	884	-10
South Africa	77	-39	15.7	0.9	1091	2	324	-24
Thailand	1046	7	27.7	0.9	1004	5	2210	1
Turkey	168	35	20.3	1.1	1177	-3	597	19
United Kingdom	342	4	14.3	0.9	742	3	1228	-6

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 (%)
Ukraine	164	-29	16.8	0.1	939	7	698	-22
United States	402	16	20.1	0.4	1094	-2	1137	14
Uzbekistan	74	175	21.4	-0.2	1237	-1	292	175
Vietnam	1122	1	26.9	1.1	999	1	2159	2

See note table A.1.

Table A.3. Argentina, July-October 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	323	16	13.4	1.4	817	-5	1010	13
Chaco	159	-19	21.6	2.7	905	-6	630	1
Cordoba	128	-15	16.1	2.1	941	-3	506	-10
Corrientes	491	20	19.9	2.5	898	-3	1378	20
Entre Rios	370	8	16.9	2.3	882	-3	1211	16
La Pampa	262	30	13.6	1.3	838	-7	913	41
Misiones	906	41	20.6	2.7	927	1	1913	13
Santiago Del Estero	117	20	20.2	2.4	949	-5	471	44
San Luis	114	-13	15.1	2.8	947	-2	464	-13
Salta	129	156	20.3	1.0	1010	-3	456	224
Santa Fe	224	0	18.1	2.6	907	-4	804	8
Tucuman	-	-	-	-	-	-	-	-

See note table A.1.

Table A.4. Australia, July-October 2014 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	110	-29	13.0	0.9	991	1	463	-28
South Australia	91	-48	12.9	0.8	906	5	424	-45
Victoria	84	-65	11.1	0.8	834	4	405	-58
Western Australia	188	-8	15.0	1.5	928	-2	721	2

See note table A.1.

Table A.5. Brazil, July-October 2014 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	22	-26	28.6	1.9	1341	-1	112	-41
Goias	162	-8	26.6	2.0	1191	1	556	-14
Mato Grosso Do Sul	398	50	25.7	2.7	1087	1	1175	25
Mato Grosso	213	-12	28.9	1.8	1162	0	761	-1
Minas Gerais	137	-12	23.9	2.0	1157	3	473	-17
Parana	663	28	21.5	2.8	1015	4	1708	18
Rio Grande Do Sul	845	27	17.9	2.2	870	-1	1952	21
Santa Catarina	672	2	17.8	2.5	904	4	1698	7
Sao Paulo	285	3	23.2	2.0	1092	2	935	-4

See note table A.1.

Table A.6. Canada, July-October 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 (%)
Alberta	234	19	13.2	1.4	935	1	904	4
Manitoba	265	8	14.3	0.0	918	-2	1072	-3
Saskatchewan	230	15	13.7	1.1	939	-1	933	8

See note table A.1.

Table A.7. India, July-October 2014 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 (%)
Arunachal Pradesh	1567	6	23.4	0.6	818	1	2067	-4
Andhra Pradesh	834	11	28.9	1.5	957	0	1720	-4
Assam	1749	29	29.4	1.0	873	3	2325	1
Bihar	1200	29	29.9	0.7	918	-3	1938	4
Chandigarh	-	-	-	-	-	-	-	-
Chhattisgarh	1428	32	27.4	1.1	901	1	2126	2
Daman and Diu	510	-17	29.4	1.6	936	-1	1187	-2
Delhi	320	-34	30.7	1.8	1091	2	1099	-23
Dadra and Nagar Haveli	1635	10	27.7	1.1	828	0	1487	-26
Gujarat	794	2	30.1	1.5	975	0	1165	-18
Goa	1559	-5	27.0	0.4	795	-3	2268	4
Himachal Pradesh	1066	36	15.9	1.4	1076	-2	1518	7
Haryana	397	-14	30.0	1.5	1104	1	1171	-11
Jharkhand	1067	9	28.1	1.2	922	-2	2044	-1
Kerala	1357	-2	26.1	0.4	873	-1	2341	2
Karnataka	1028	19	25.4	1.0	909	1	1801	8
Meghalaya	3074	53	25.5	0.9	846	0	2399	4
Maharashtra	1252	25	27.1	1.3	899	2	1715	-7
Manipur	837	-17	23.9	1.4	906	9	2041	-8
Madhya Pradesh	918	5	28.1	1.4	950	2	1582	-10
Mizoram	1531	8	25.3	1.0	960	9	2388	0
Nagaland	1420	14	24.0	0.5	891	3	2282	0
Orissa	1457	28	27.8	0.9	877	0	2224	3
Puducherry	2013	6	25.7	0.0	853	-5	2548	2
Punjab	407	-11	29.6	0.8	1098	0	986	-22
Rajasthan	580	33	30.5	1.7	1081	0	1111	-7
Sikkim	1560	13	15.8	1.5	915	-7	1640	7
Tamil Nadu	698	17	29.1	1.8	1044	-2	1713	11
Tripura	1988	52	28.3	0.7	938	6	2588	12
Uttarakhand	1414	44	19.1	1.1	999	-1	1727	10
Uttar Pradesh	760	-2	30.1	1.2	1012	2	1596	-8
West Bengal	1265	6	29.4	1.1	896	-2	2128	2

See note table A.1.

Table A.8. Kazakhstan, July-October 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 (%)
Akmolinskaya	169	16	12.8	-1.1	831	-5	783	24
Karagandinskaya	183	33	12.8	-0.7	918	0	833	45
Kustanayskaya	161	11	13.5	-1.2	818	-5	687	13
Pavlodarskaya	189	20	13.4	-0.4	833	-2	871	34
Severo kazachstanskaya	221	20	11.8	-2.0	746	-7	948	28
Vostochno kazachstanskaya	300	85	12.7	0.0	964	-2	1111	57
Zapadno kazachstanskaya	41	-62	17.1	-0.7	958	3	222	-52

See note table A.1.

Table A.9. Russia, July-October 2014 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.	213	-3	11.7	-2.2	768	-6	913	-3
Chelyabinskaya Oblast	257	19	11.2	-2.3	742	-7	1003	14
Gorodovikovsk	-	-	-	-	-	-	-	-
Krasnodarskiy Krai	230	-14	15.0	-0.3	895	1	1014	-3
Kurganskaya Oblast	288	42	10.9	-2.8	703	-10	1140	49
Kirovskaya Oblast	246	-11	11.3	-2.0	740	2	1081	-5
Kurskaya Oblast	116	-50	15.6	-0.3	904	10	529	-44
Lipetskaya Oblast	88	-62	15.5	-0.1	890	9	433	-53
Mordoviya Rep.	158	-38	13.6	-1.3	841	7	736	-29
Novosibirskaya Oblast	215	-3	11.0	-1.4	786	0	965	2
Nizhegorodskaya Oblast	186	-31	13.1	-1.2	810	7	854	-23
Orenburgskaya Oblast	90	-42	14.1	-1.6	875	0	452	-33
Omskaya Oblast	266	28	10.6	-2.2	726	-5	1099	38
Permskaya Oblast	292	6	9.8	-2.9	695	-5	1237	9
Penzenskaya Oblast	136	-40	14.3	-1.0	870	7	646	-32
Rostovskaya Oblast	111	-37	18.6	-0.7	975	2	528	-22
Ryazanskaya Oblast	107	-59	14.1	-0.9	862	10	512	-52
Stavropolskiy Krai	167	-22	19.9	-0.4	975	0	754	-12
Sverdlovskaya Oblast	299	21	9.5	-3.1	658	-10	1212	30
Samarskaya Oblast	114	-39	14.1	-1.6	868	3	561	-29
Saratovskaya Oblast	75	-52	16.1	-0.9	924	6	377	-43
Tambovskaya Oblast	96	-56	15.2	-0.6	896	9	472	-49
Tyumenskaya Oblast	274	27	10.1	-2.9	695	-7	1166	41
Tatarstan Rep.	207	-9	13.0	-1.8	782	-1	915	0
Ulyanovskaya Oblast	168	-24	13.7	-1.6	838	3	741	-20
Udmurtiya Rep.	262	1	11.1	-2.4	717	-4	1116	5
Volgogradskaya Oblast	90	-35	17.6	-0.7	957	5	432	-26
Voronezhskaya Oblast	90	-50	16.3	-0.5	927	7	444	-42

See note table A.1.

Table A.10. United States, July-October 2014 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	545	33	23.4	0.1	1149	1	1540	17
California	52	17	19.9	2.8	1312	-5	204	15
Idaho	188	97	15.2	1.1	1183	-5	785	80
Indiana	517	27	18.9	-0.8	1038	-4	1574	23
Illinois	628	68	19.4	-0.6	1055	-4	1597	33
Iowa	712	91	18.2	-0.4	1022	-7	1759	55
Kansas	536	60	21.9	0.6	1166	-1	1414	32
Michigan	380	11	15.6	-0.9	968	-5	1282	6
Minnesota	358	7	16.1	0.0	950	-7	1215	9
Missouri	710	77	21.1	0.0	1102	-3	1517	21
Montana	209	60	15.6	1.1	1088	-5	856	33
Nebraska	509	90	19.1	0.4	1146	-1	1475	51
North Dakota	254	18	15.7	0.2	1001	-4	934	1
Ohio	337	-15	18.6	-0.3	1006	-3	1220	-10
Oklahoma	429	27	24.0	0.1	1171	-2	1305	20
Oregon	145	38	17.3	2.3	1167	-3	594	45
South Dakota	315	37	17.8	0.0	1067	-5	1130	23
Texas	306	-5	26.3	0.7	1196	-1	984	10
Washington	167	28	17.2	2.3	1084	-3	616	27
Wisconsin	433	13	16.0	-0.5	947	-7	1348	7

See note table A.1.

Table A.11. China, July-October 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 (%)
Anhui	676	24	24.1	-0.3	923	-8	1762	19
Chongqing	748	36	22.5	0.8	895	-2	1845	19
Fujian	631	21	25.2	1.2	1074	1	1464	4
Gansu	589	-15	27.4	1.4	1101	4	1486	-6
Guangdong	350	12	15.8	0.6	1012	1	1205	18
Guangxi	701	16	26.3	1.1	1029	-1	1733	15
Guizhou	647	40	22.3	1.0	934	1	1707	30
Hebei	404	16	20.1	0.8	1031	-1	1364	12
Heilongjiang	490	4	22.8	0.1	989	0	1583	18
Henan	421	24	15.3	0.0	937	1	1350	8
Hubei	584	15	23.1	0.0	938	-5	1634	10
Hunan	647	46	24.7	0.3	959	-6	1532	21
Jiangsu	316	-20	16.8	0.3	1020	5	1115	-14
Jiangxi	566	3	23.9	-0.6	907	-9	1582	10
Jilin	614	38	26.3	0.8	1033	-4	1451	10
Liaoning	277	-39	19.2	0.7	1064	6	1004	-29
Inner Mongolia	373	49	15.0	0.2	1027	0	1267	29
Ningxia	309	42	17.1	0.8	1067	-2	1127	35
Shaanxi	740	25	20.0	0.6	861	-1	1746	11
Shandong	360	-25	23.0	0.6	1027	2	1233	-5
Shanxi	453	-3	19.3	0.5	966	0	1457	2
Sichuan	439	25	17.3	0.6	1027	-2	1460	15
Yunnan	660	-1	19.8	0.9	923	0	1720	2
Zhejiang	773	38	24.6	0.4	927	-10	1793	18

See note table A.1.

Annex B. 2014 production estimates

Tables B.1 through B.5 present 2014 CropWatch production estimates for Argentina, Australia, Brazil, Canada, and the United States.

Table B.1. Argentina, 2014 maize, wheat, and soybean production, by province (thousand tons)

	Maize		Wheat		Soybean	
	2014	Δ%	2014	Δ%	2014	Δ%
Buenos Aires	7118	-2	6524	16	15263	-8
Chaco					567	14
Córdoba	6959	7	1216	18	11963	5
Corrientes						
Entre Rios	1142	-3	990	19	3332	5
La Pampa	333	-1			676	-2
Salta					255	6
San Luis	1049	3			619	1
Santa Fe	4164	7	1352	1	10462	12
Santiago Del Estero	1203	0			1768	11
Tucuman	175	6			251	2
Sub total	22142	3	10082	14	45155	2
Other provinces	2936	-10	2704	60	7290	27
Argentina	25078	1	12786	22	52445	4

Δ% indicates percentage difference with 2013.

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

	Wheat	
	2014	Δ%
New South Wales	8866	-7
South Australia	4997	-5
Victoria	3785	-9
Western Australia	8300	3
Sub total	25948	-4
Other states	1750	-14
Australia	27698	-4

Δ% indicates percentage difference with 2013.

Table B.3. Brazil, 2014 maize, rice, wheat, and soybean production, by state (thousand tons)

	Maize		Rice(paddy)		Wheat		Soybean	
	2014	Δ%	2014	Δ%	2014	Δ%	2014	Δ%
Ceara	159	41	52	6				
Goias	8445	10	137	-8			9954	12
Mato Grosso	19613	-3	584	17			25933	11
MG Do Sul	7520	-1	96	0	11	20	6291	9
Minas Gerais	7336	-1	38	-10	171	43	3632	8
Parana	15027	-14	161	-8	2406	28	17134	8
Rio Gr. Do Sul	4870	-9	8497	5	3578	7	13461	6
Santa Catarina	3057	-8	1033	1	287	17	1717	8
Sao Paulo	3769	-21	75	-19	100	7	2180	13
Sub total	69796	-6	10673	4	6553	15	80302	9
Other states	8872	34	1175	-24	50	105	8733	9
Brazil	78669	-2	11847	1	6603	15	89036	9

Δ% indicates percentage difference with 2013.

Table B.4. Canada, 2014 maize and wheat production, by state (thousand tons)

	Maize		Wheat	
	2014	Δ%	2014	Δ%
Alberta			10446	-5
British Columbia			147	-3
Manitoba			3651	-17
Ontario	7628	-15	2351	-2
Quebec	3104	-18		
Saskatchewan			15708	-14
Sub total	10731	-16	32303	-11
Other states	1177	-17	984	-21
Canada	11909	-16	33287	-11

Δ% indicates percentage difference with 2013.

Table B.5. United States, 2014 maize, rice, wheat, and soybean production, by state (thousand tons)

	Maize		Rice (paddy)		Wheat		Soybean	
	2014	Δ%	2014	Δ%	2014	Δ%	2014	Δ%
Alabama	1079	-3					600	21
Arkansas	3538	-14	4398	20	862	-17	4226	11
California	828	-7	2000	-7	890	-4		
Colorado	3521	7			2105	75		
Delaware	702	-4					169	-5
Georgia	1336	-35			607	6	225	-8
Idaho					1623	-41		
Illinois	51917	-3			1300	-14	13323	6
Indiana	26361	0			662	-24	7412	3
Iowa	56202	2			0		10510	3
Kansas	14164	10			8456	-3	3876	12
Kentucky	5945	-4			1009	-19	2165	-2
Louisiana	2333	-21	1577	15			1705	18
Maryland	1699	1			495	4	521	3
Michigan	8106	-8			954	-22	2421	7
Minnesota	31993	-3			1774	-1	7961	8
Mississippi	2644	-29	561	35	434	-29	2286	-6
Missouri	12247	11	769	55	1386	-9	5938	11
Montana					5506	0		
Nebraska	41239	0			1413	31	7225	5
New Jersey	246	-13					95	3
New York	2124	-12			203	-4	312	-14
North Carolina	2989	-5			1272	-11	1302	2
North Dakota	8163	-19			8809	18	4672	24
Ohio	16084	-4			1100	-13	6562	11
Oklahoma	1253	10			2353	-18	240	-12
Oregon					1348	-8		
Pennsylvania	4018	-1			279	-6	866	21
South Carolina	1114	1			379	1	232	-2
South Dakota	19851	-3			3094	47	5315	7
Tennessee	3413	5			928	-11	1943	2
Texas	7302	4	509	1	1805	2	76	17
Virginia	1398	-1			533	15	605	-1
Washington	602	5			3578	-9		

	Maize		Rice (paddy)		Wheat		Soybean	
	2014	Δ%	2014	Δ%	2014	Δ%	2014	Δ%
Wisconsin	11558	2			417	0	1625	1
Sub total	345969	-2	9814	14	55577	-1	94408	7
Other states	2979	42	281	166	1151	-41	1626	57
United States	348948	-1	10095	16	56728	-2	96034	7

Note: Δ% indicates percentage difference with 2013. The wheat production of "other states" was calculated by total wheat production minus "subtotal" winter wheat production. Δ% indicates percentage difference with 2013.

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 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			
Type/ source	Unit, spatial scale	Description	Presentation and legend
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.
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 year." Values can exceed the range if the current year is the best or the worst.	VCIx is based on NDVI and two VCI values are computed every month. VCIx is the highest VCI value recorded for every pixel over the reporting period. A low value of VCIx means that no VCI value was high over the reporting period. A high value means that at least one VCI value was high. VCI is shown as pixel-based maps and as average value by CWSU.
VHI			
Vegetation health index			
Crop/ Satellite	Number, pixel to CWSU	The average of VCI and the temperature condition index (TCI), with TCI defined like VCI but for 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 UNITS

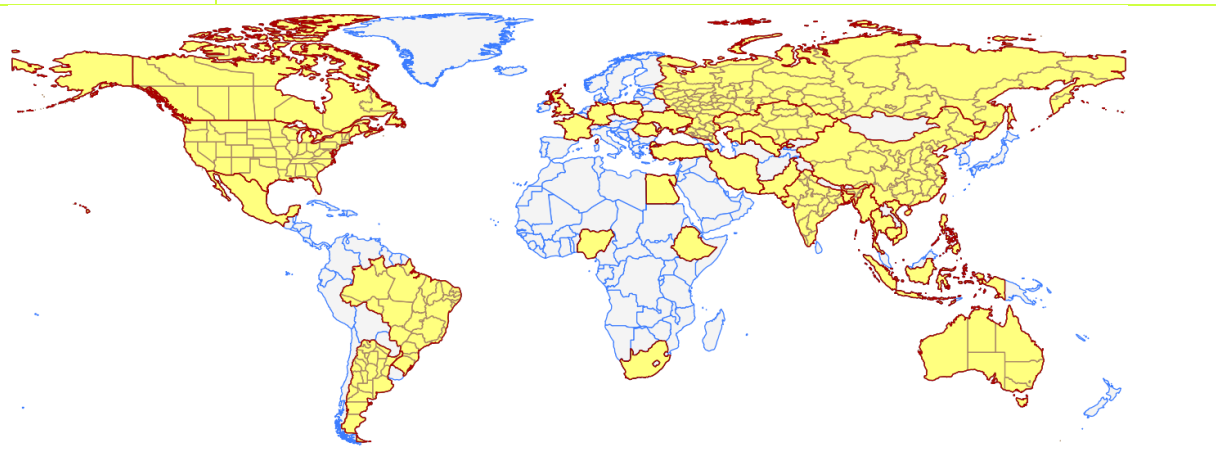
CHINA

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



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

Overview	Description
"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 .



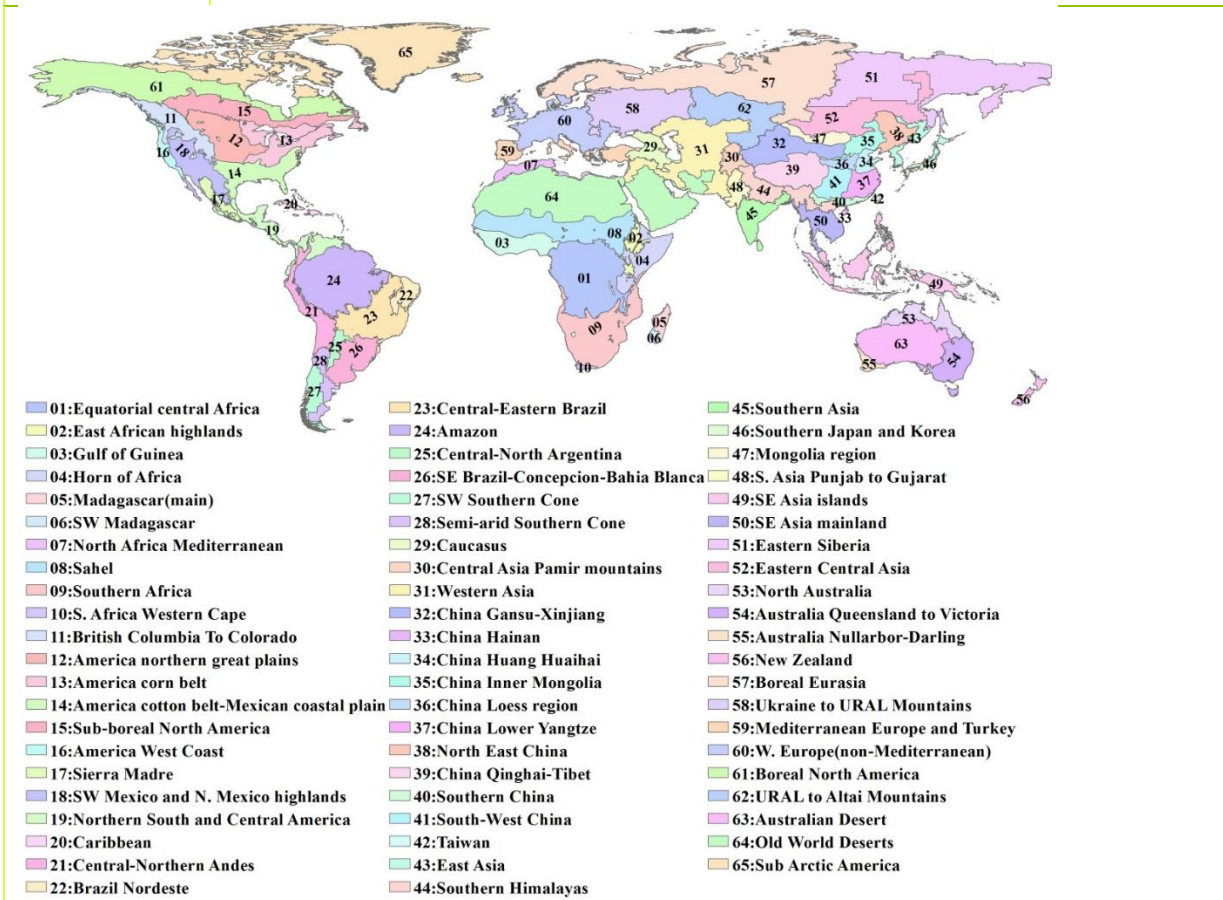
Major Production Zones (MPZ)

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

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

$$Area_i = a + b * CALF_i$$

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

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

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Online resources



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

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

- ✓ **Definition of spatial units**
A description of the four spatial levels of analysis: Monitoring and Reporting Units (MRU), Major Production Zones (MPZ), selected countries, and the use of sub-national administrative areas.
- ✓ **Methodology**
Overview of CropWatch data sources and methods.
- ✓ **Time series of indicators**
Background data on environmental 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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