



CropWatch Cloud (<http://Cloud.cropwatch.com.cn>)

— Ownership and transparency

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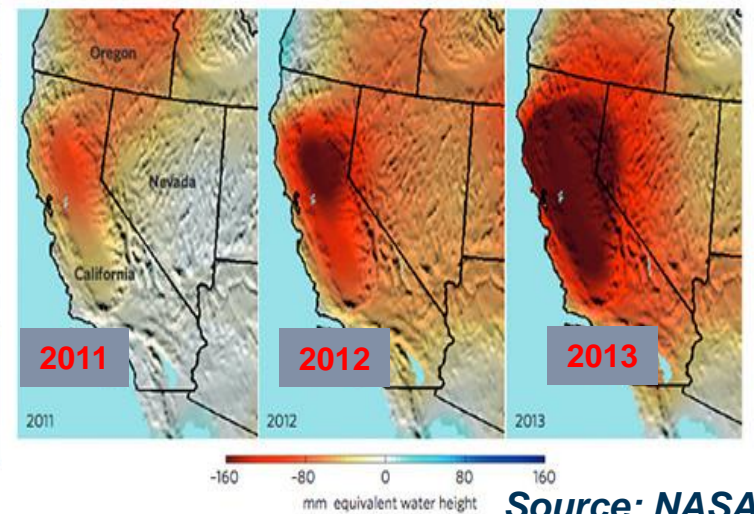
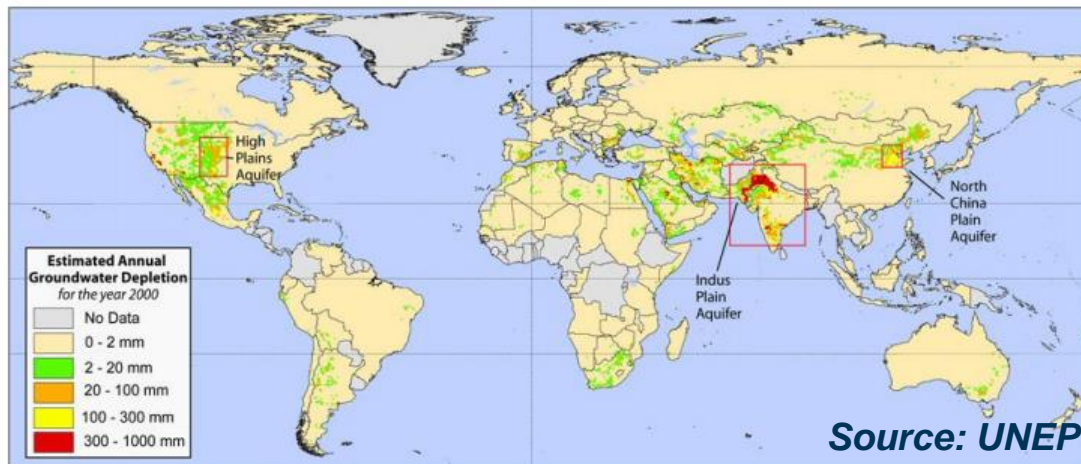
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Outline

- **Introduction**
- **CropWatch Cloud**
- **Implementation at countries**

Stress to food production

- Climate variability, especially extreme heat and frost events are inducing yield depressions by more than 10%
- To mitigate the impacts, irrigation is commonly applied causing serious groundwater depletion/transboundary issue
- Pest and diseases overall impact to 10-20% of global crop harvest



Crop Monitoring is essential

- Early production forecasts help policy makers to make evidence-based trade decisions
- In season warning (stress due to drought, pest & diseases) for better farm management
- Early warning information helps early response and actions on providing food aid to food shortage regions
- Many countries want use satellite data to improve food information availability and transparency

Gaps and challenges

- **Owners**

- Only big countries or int'l organizations have their own systems

- **Information**

- Crop condition is main output, lack of accurate production
- Lack of forecasting at early stage or even pre-sowing

- **Technical issues**

- No automatic processing, manual works mainly
- System are physical or technically difficult to access openly
- Unable to customize the system for local
- Rely on single or a few satellite data
- Methodology is not well documented and
- Difficult to participate in agriculture monitoring

Issues for developing countries

- The paucity of adequate capacity in obtain and accessing up-to-date staple crop production information, which is essential for a country economic governance and securing food supply.
- Over-dependence on information provided by third parties and often poses the danger of taking decisions based on delayed and on not easily verifiable information.
- Constraining developing countries to set-up, operate, and maintain crop monitoring facilities.
 - Big financial input and operational cost
 - Adequate technical skills

Outline

- Introduction
- **CropWatch Cloud**
- Implementation at countries

CropWatch Programme

- **Release first bulletin in August, 1998;**
- **Release first English bulletin in November, 2013**
- **CropWatch aims at improving food information availability, quality and transparency**
 - To provide additional, reliable information for developing countries to fight against hunger,
 - To provide cloud facility to enhance the capacity of developing countries on crop monitoring

CropWatch at Alibaba Cloud

cloud.cropwatch.com.cn



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CropWatch-Pro

- An online tool for people to produce crop monitoring products at any time and anywhere.

Cropwatch Pro

Enter



CropWatch-Explore

- An online interface for people to explore and analysis all the crop information data easily.

CropWatch Explorer

Enter



CropWatch-Project

- An online platform for people to create and write the crop bulletin.

Cropwatch Project

Enter



CropWatch-Bulletin

- An webpage for people to read CropWatch bulletin.

Cropwatch Bulletin

Enter



February 2019 CropWatch Bulletin

This bulletin features the latest production outlook for the major producers in the southern hemisphere and some isolated northern hemisphere countries where crop development is sufficiently advanced. Focusing on the months of October 2018 to January 2019, chapters cover global, national, and regional agro-climatic conditions and the condition of crops that were growing or harvested during this time. For China, the bulletin presents crop condition for each of seven key agro-ecological zones. The focus section reports on recent disaster events with an impact on agriculture and the possibility of an El Niño event.

[Bulletin](#) →

CropWatch Sub System



CropWatch Pro NEW

Enter →



CropWatch Explorer

Enter →



CropWatch Analysis

Enter →



CropWatch Bulletin

Enter →



About

CropWatch is China's leading crop monitoring system. Using remote sensing and ground-based indicators the system assesses



Bulletin

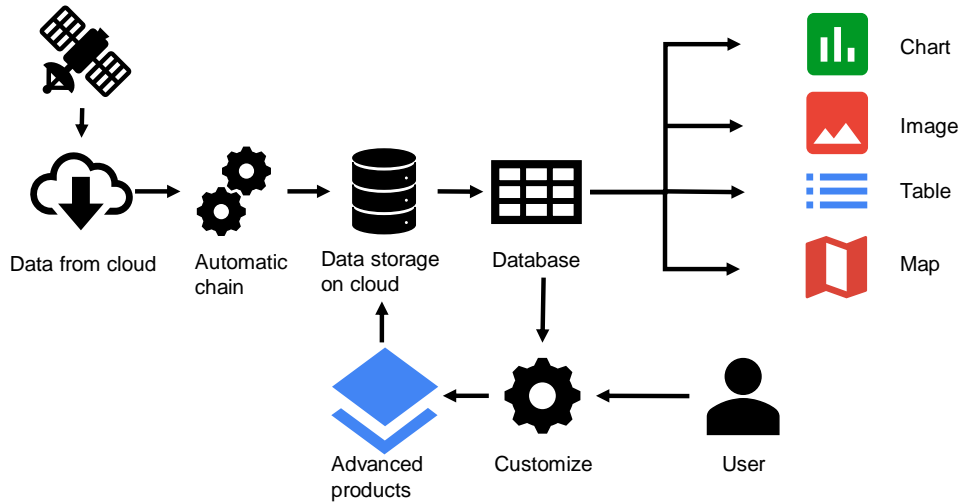
Each quarter, CropWatch findings are published in the CropWatch bulletin. The bulletin is issued in English and Chinese.



Publications

The CropWatch system and methodologies are described in various articles published in international and Chinese journals.

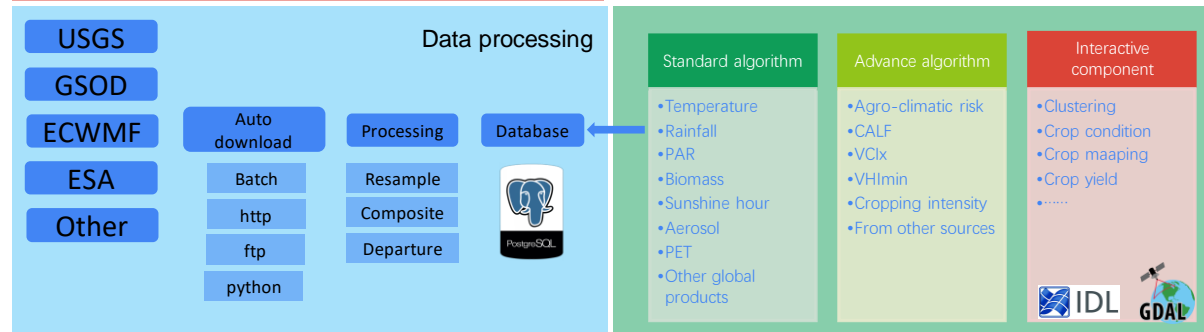
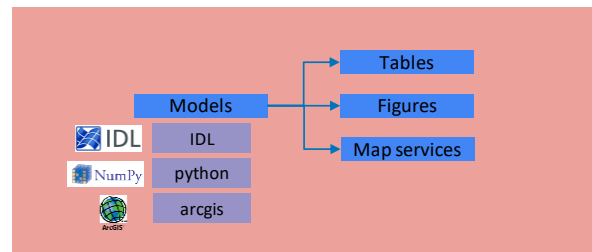
Data converging and preprocessing



Auto converging

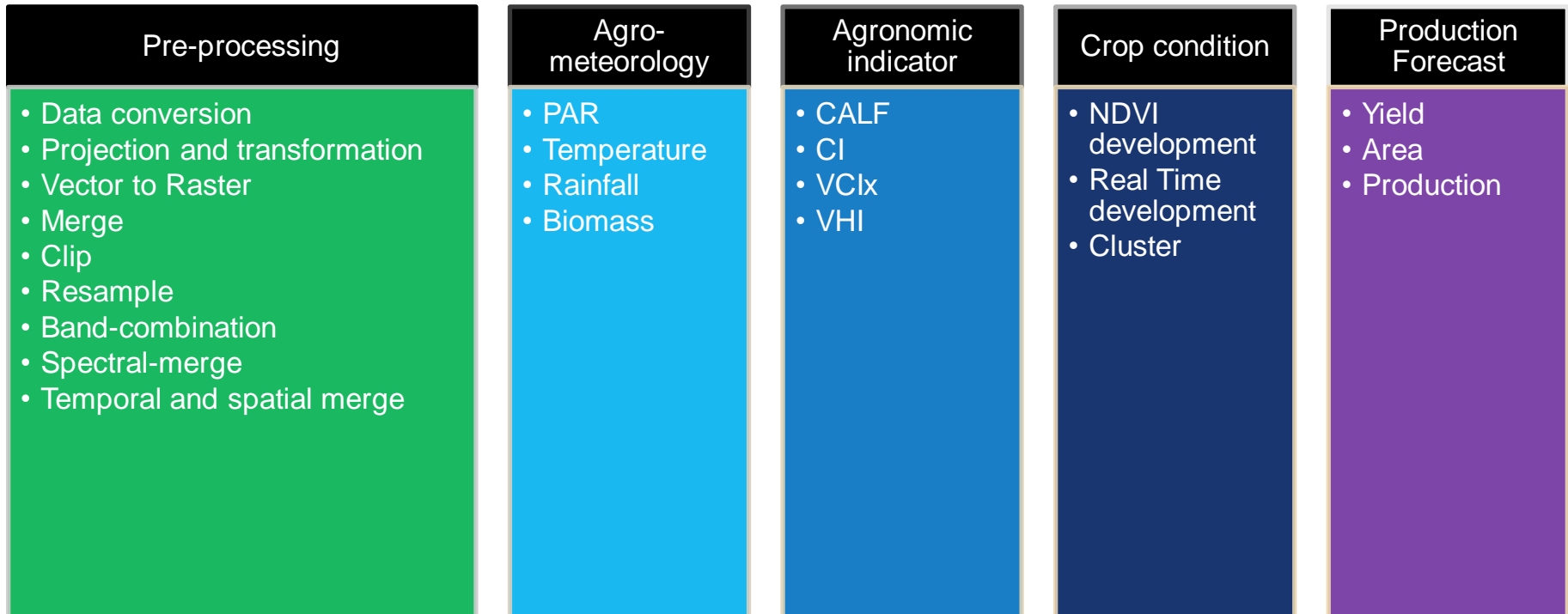


Auto preprocessing



Component 1: CropWatch Processing

CropWatch Processing offers an auto-processing chain from pre-processing of raw data to production outlook



32 Indicators

CropWatch generates 32 agro-climatic, agronomic, early warning indicators, and crop production (area, yield)

1. Agro-climatic																										
农情遥感监测系统	Temp			Rain					Agro-suitability	Wind	Wind direction	Humidity	Radiation	Sun hours	Cold spell	Potential	ET		Surface temperature	Water balance	Soil Moisture	Snow cover	Sea surface temperature	Fire	Flood	
	最高	最低	平均	日	周	旬	月	SPI									潜在	实际								
India					x			x														x				
Pakistan	x	x	x									x	x													
Pakistan (Provincial)	x	x	x																							
South Africa								x				x				x					x					
Australia								x													x					
Argentina														x				x						x	x	
Brazil																										
Canada																										
USA	x	x	x					x																		
Caribbean	x	x	x	x				x	x	x											x	x			x	
JRC MARS	x	x	x					x			x	x							x		x					
FAO GIEWS																										
CropWatch			x					x				x			x											
	通用	通用	通用					通用				通用									通用					
	不是每个地方都一样 极端阈值不一样																									

2. Agronomic												
农情遥感监测系统	NDVI	PASG	SDVI	NDWI	FAPAR	VCI	SASI	phenology	Sowing date	ASI	VIII	Fire Watch
India	x			x		x	x					
Pakistan	x					x						
Pakistan	x											
South Africa	x	x	x			x					x	
Australia												
Argentina	x											
Brazil	x											
Canada												
USA	x											
Caribbean												
JRC MARS				x				x	x		x	
FAO GIEWS						x				x	x	
CropWatch	x					x					x	
	通用				有特色	通用	有特色	有特色			通用	

SPI	Standardized Precipitation Index (SPI) expresses the actual rainfall as a standardized departure with respect to rainfall probability distribution function and hence the index has gained importance in recent years as a potential drought indicator permitting comparisons across space and time.
NDVI	$NDVI = (NIR - Red) / (NIR + Red)$
NDWI	$NDWI = (NIR - SWIR) / (NIR + SWIR)$
PASG	Percentage of Average Seasonal Greenness
FAPAR	Fraction of absorbed photosynthetically active radiation
SDVI	SDVI is the standardized anomaly of the NDVI-表示受旱程度
VCI	$VCI = 100 * (NDVI - NDVI_{min}) / (NDVI_{max} - NDVI_{min})$, $VCI = 100 * (NDWI - NDWI_{min}) / (NDWI_{max} - NDWI_{min})$
SASI	Shortwave Angle Slope Index (SASI).SASI sensitive to surface wetness, has been found to be strongly correlated with
物候期	物候期预测: heading, flowering, grain filling, ripening, maturity
VHI	VHI: 植被健康度指数 (VHI) 是一项综合指数, 是用于计算ASI的基础指标。它结合了VCI指数和温度状况指数(TCI)。TCI是采用与VCI类似的方程计算得出的, 但反映的是当前温度与长期最高值之间的关系, 它假定温度较高倾向造成植被状况的恶化。例如当VCI值下降(绿色植被状况相对较差)和TCI值提高(温度提高)时出现VIII值下降的情况, 则可能意味着植被状况受到应力影响, 而且从较长期来看可能是旱灾的指征。在计算该指数时VHI成分(VCI和TCI)被给予同样权重, VHI图按两个季节和三种模式(旬、月、年)计算得出。

CropWatch-Pro

123.56.89.7:9087/CropWatch/SysUser/SysPerCen

CropWatch

User's self-defined CropWatch Cloud

English mohsen

个人中心

Settings

默认语言 English

感兴趣区域类型 Key Countries

感兴趣区域名称 Egypt

系统名称 Mohsen's self-defined CropWatch Cloud

备注 备注

菜单

- 菜单列表
 - 农气指数
 - 降水因子
 - 气温因子
 - 辐射因子
 - 潜在生物量
 - 标准化降水指数
 - 土壤湿度
 - 农气指数合成
 - 农情指标
 - 最佳植被状况指数
 - 植被健康状况指数
 - 复种指数
 - 植被健康状况指数 (中国)
 - 耕地种植状况

Model description

1. Define the language

2. Define the region of interest

3. Define the name of region of interest

4. Give a name for your system

5. For writing any remarks

6. For selecting which components the user want to be keep.

Save Reset

http://123.56.89.7:9087/CropWatch/SysUser/SysPerCen

NDVI Anomaly



CropCondition

Crop Condition based on NDVI anomaly

Settings

Region Type: Key Countries

Region Name: SouthAfrica

Starting time: 2017

End Time: 2017

Reference Year: Previous 5 year 1 average

Run Abort

Model description

Parameter Setting

Task Center

Key Words: Task Status/Starting Time/Model

No.	User	Model	Creating Time	Starting Time	Progress	Status	Operation	Logs
1	zenghongwei	Crop Condition based on NDVI anomaly	2017-05-11 08:58:41			To be processed	Pause Cancel	Task Logs
2	zenghongwei	Crop Condition based on NDVI anomaly	2017-05-11 08:55:50	2017-05-11 08:55:40	100%	Finished		Task Logs
3	zenghongwei	Rabi/Rabi Index	2017-05-11 08:30:39	2017-05-11 08:30:40	100%	Finished		Task Logs
4	zenghongwei	Cropped Arable Land Fraction(16day)	2017-05-11 07:56:15	2017-05-11 07:56:20	100%	Finished		Task Logs
5	miao	Index Statistics	2017-05-10 18:52:44	2017-05-10 19:47:40	100%	Finished		Task Logs
6	miao	Index Statistics	2017-05-10 18:52:17	2017-05-10 19:47:30	100%	Finished		Task Logs
7	miao	Index Statistics	2017-05-10 18:51:47			Cancelled		Task Logs
8	miao	Index Statistics	2017-05-10 18:33:21	2017-05-10 19:47:20	100%	Finished		Task Logs
9	miao	Index Statistics	2017-05-10 18:32:51	2017-05-10 19:47:10	100%	Finished		Task Logs
10	miao	Index Statistics	2017-05-10 17:50:52	2017-05-10 19:10:20	100%	Finished		Task Logs

Queue in task list

Task Center

Key Words: Task Status/Starting Time/Model

No.	User	Model	Creating Time	Starting Time	Progress	Status	Operation	Logs
1	zenghongwei	Crop Condition based on NDVI anomaly	2017-05-11 08:58:41	2017-05-11 08:58:30	100%	Finished		Task Logs
2	zenghongwei	Crop Condition based on NDVI anomaly	2017-05-11 08:55:50	2017-05-11 08:55:40	100%	Finished		Task Logs
3	zenghongwei	Rabi/Rabi Index	2017-05-11 08:30:39	2017-05-11 08:30:40	100%	Finished		Task Logs
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6	miao	Index Statistics	2017-05-10 18:52:17	2017-05-10 19:47:30	100%	Finished		Task Logs
7	miao	Index Statistics	2017-05-10 18:51:47			Cancelled		Task Logs
8	miao	Index Statistics	2017-05-10 18:33:21	2017-05-10 19:47:20	100%	Finished		Task Logs
9	miao	Index Statistics	2017-05-10 18:32:51	2017-05-10 19:47:10	100%	Finished		Task Logs
10	miao	Index Statistics	2017-05-10 17:50:52	2017-05-10 19:10:20	100%	Finished		Task Logs

Task status updating/finished

专题图生产

Preview Thematic Map

Model Name: Crop Condition based on NDVI anomaly

Region Type: Country

Region Name: ZW

Start Year: 2017

Start day: 1

End year: 2017

End day: 1

Reference Year[1]: 1

Preview thematic product and output to database

Component 2: CropWatch Explore

CropWatch-Explore provide a web service for users to conveniently explore and visualize our data.

CropWatch-Explore

Visual Type

Scale Type

Crop Type

Vector

Raster

Cluster

MPZ

MRU

Country

Sub-Country

Wheat

Maize

Rice

Soybean

RAIN

TEMP

PAR

BIOMASS

NDVI

VCix

VHI

CALF

CI

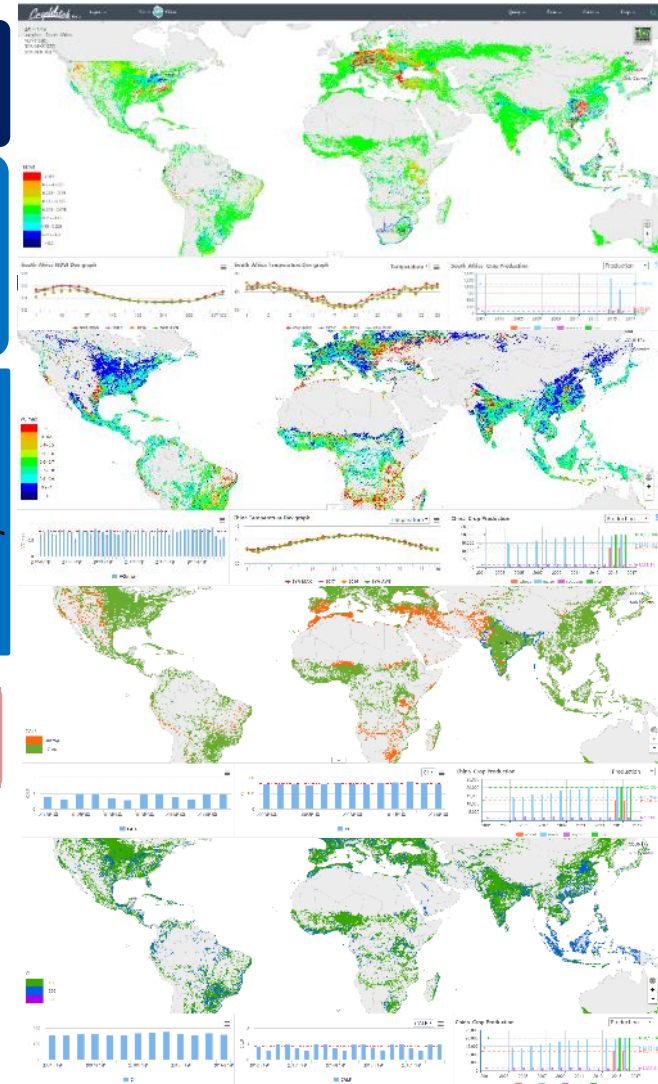
Area

Yield

Production

Early warning

Price



Component 3: CropWatch Analysis

CropWatch Analysis is **cloud based participatory tool** for the CropWatch teams or invited people from over the world analyzing their CropWatch indicators anywhere. It provides create document, allocate and manage tasks, monitor schedule and publish the document online functions which let people over the world finish their documents together on the cloud platform.



CropWatch Team



Experts across the world

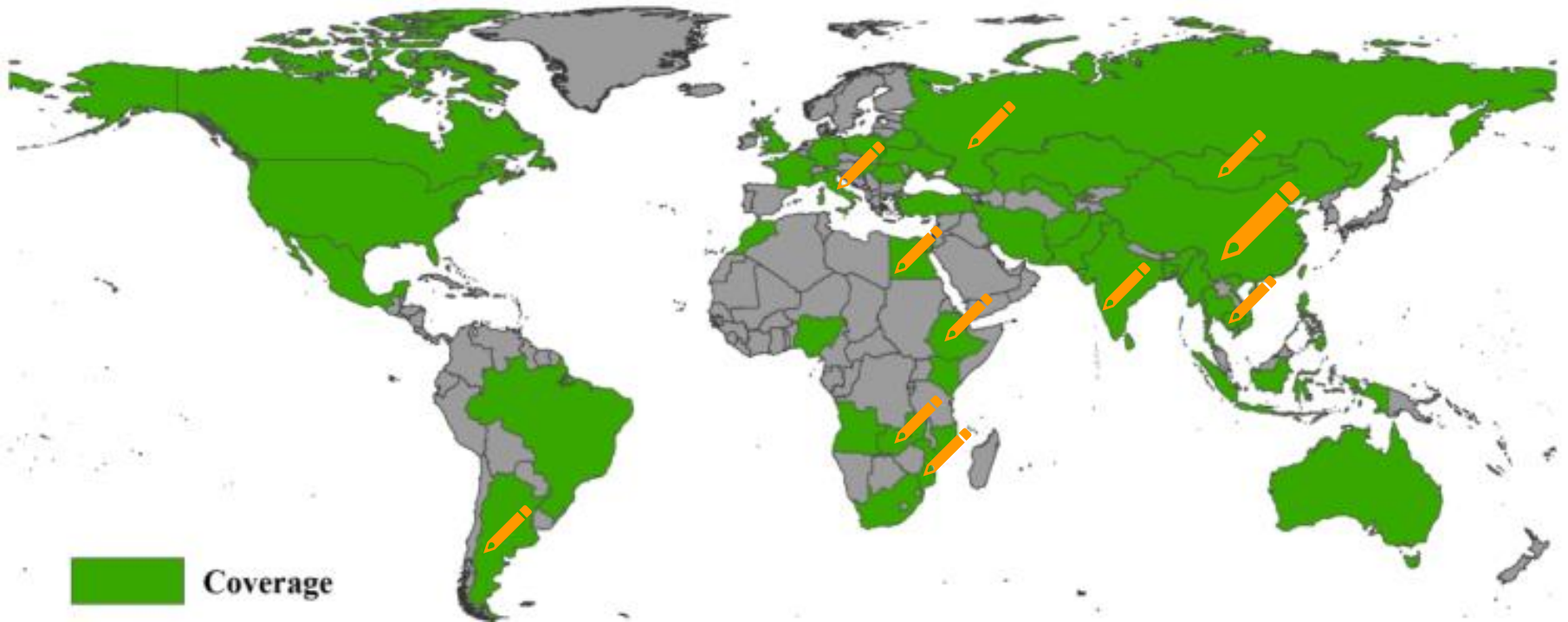
Author assignment

The screenshot displays the CropWatch web application interface. On the left is a dark sidebar with navigation options: Reports, Report, Work, Settings, Auth, and Tag. The main content area shows the 'August 2018 CropWatch bulletin' with a notification badge '6'. Below the title are action buttons: Publish, View, Update, and Create Chapter. A metadata line indicates 'Changsheng' created the report on 2018-08-06 15:48:43 with a status of 'Created'. The report is divided into four sections, each with a table of assignments:

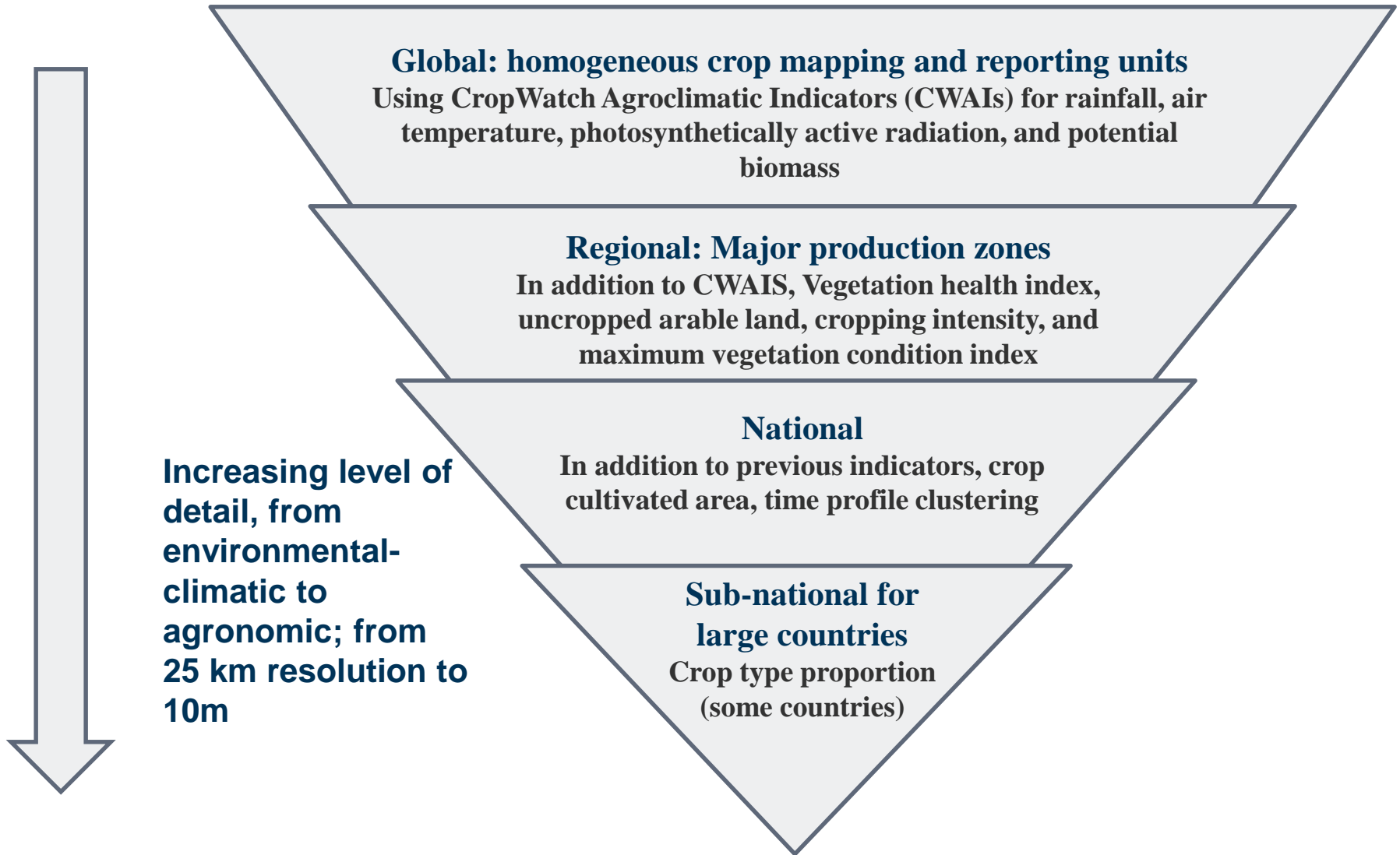
- Executive summary**: 1 row with author 'zenghongwei rene', status 'Published'.
- Global agroclimatic patterns**: 1 row with authors 'rene mshirbeny', status 'Published'.
- Crop and environmental conditions in major production zones**: 7 rows with authors 'yann', 'ephin', 'zenghongwei', 'deabelle', 'mshirbeny', 'zhuweiwei', and 'xingqiang', all with status 'Published'.
- Main producing and exporting countries**: 9 rows with authors 'rene', 'Changsheng', 'deabelle', 'xingqiang', 'mshirbeny', 'Miao', 'zhaodan', 'zhuweiwei', and 'Mohsen', all with status 'Published'.

Joint Analysis from over the world

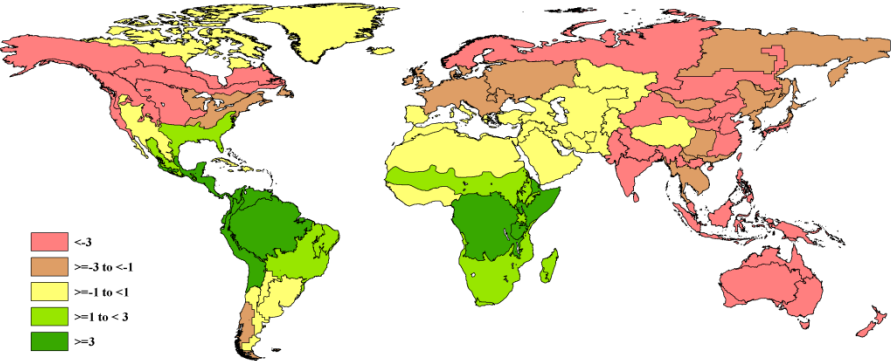
Joint analysis by 37 experts from 11 countries



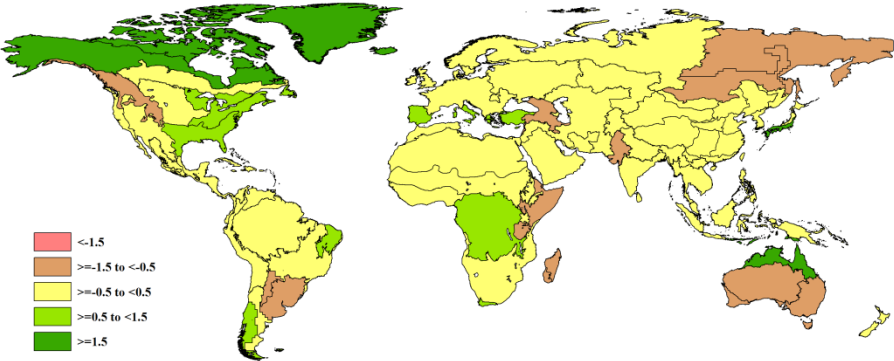
CropWatch Hierarchical approach



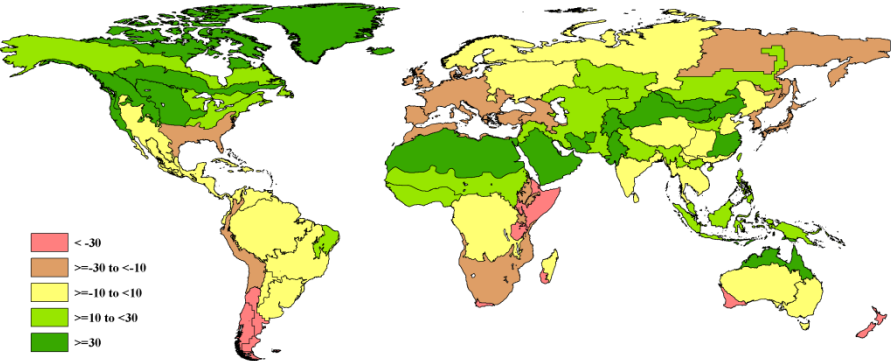
Global: 65 MRUs



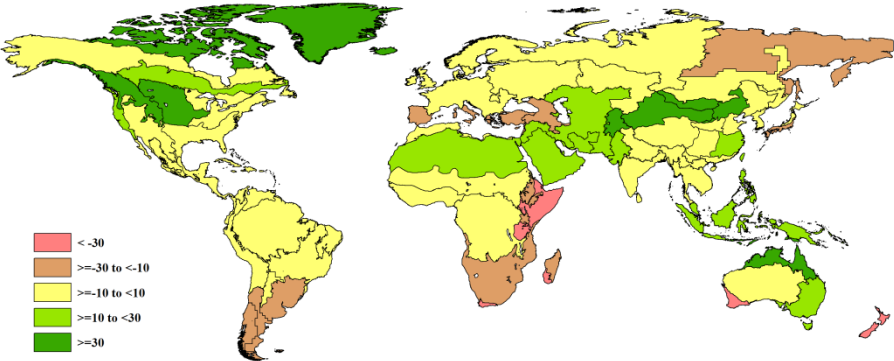
PAR departure



Temperature departure



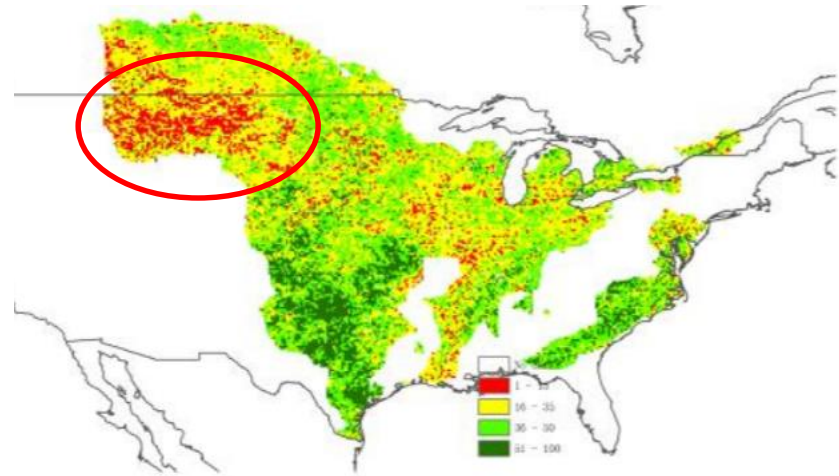
Precipitation departure



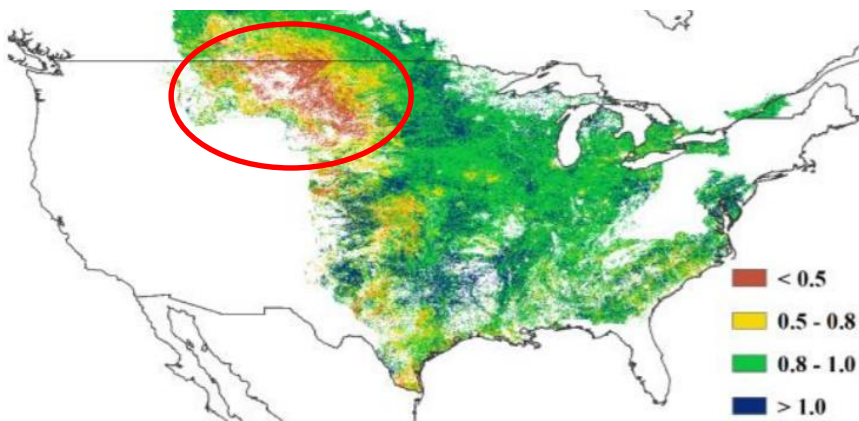
Biomass departure

Hotspots for MPZs

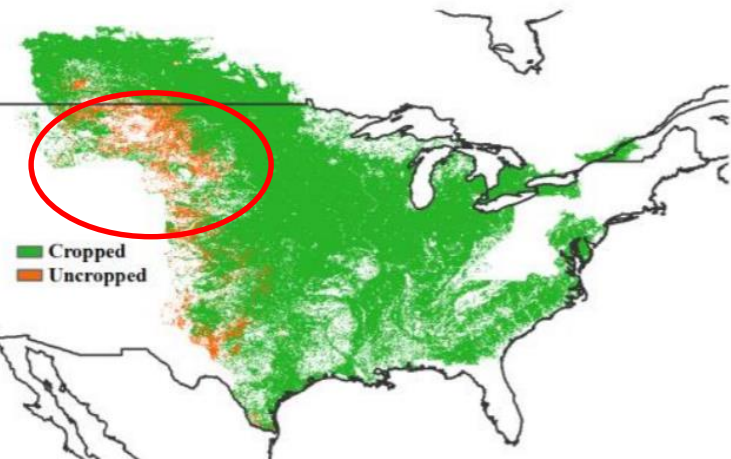
- North America: shortage of rainfall and above average temperature resulted in drought.
- Drought was confined to Manitoba (RAIN, -20%) and Saskatchewan (RAIN, -23%). The temperature was 2 to 3° above average July to late August



h. VHI minimum

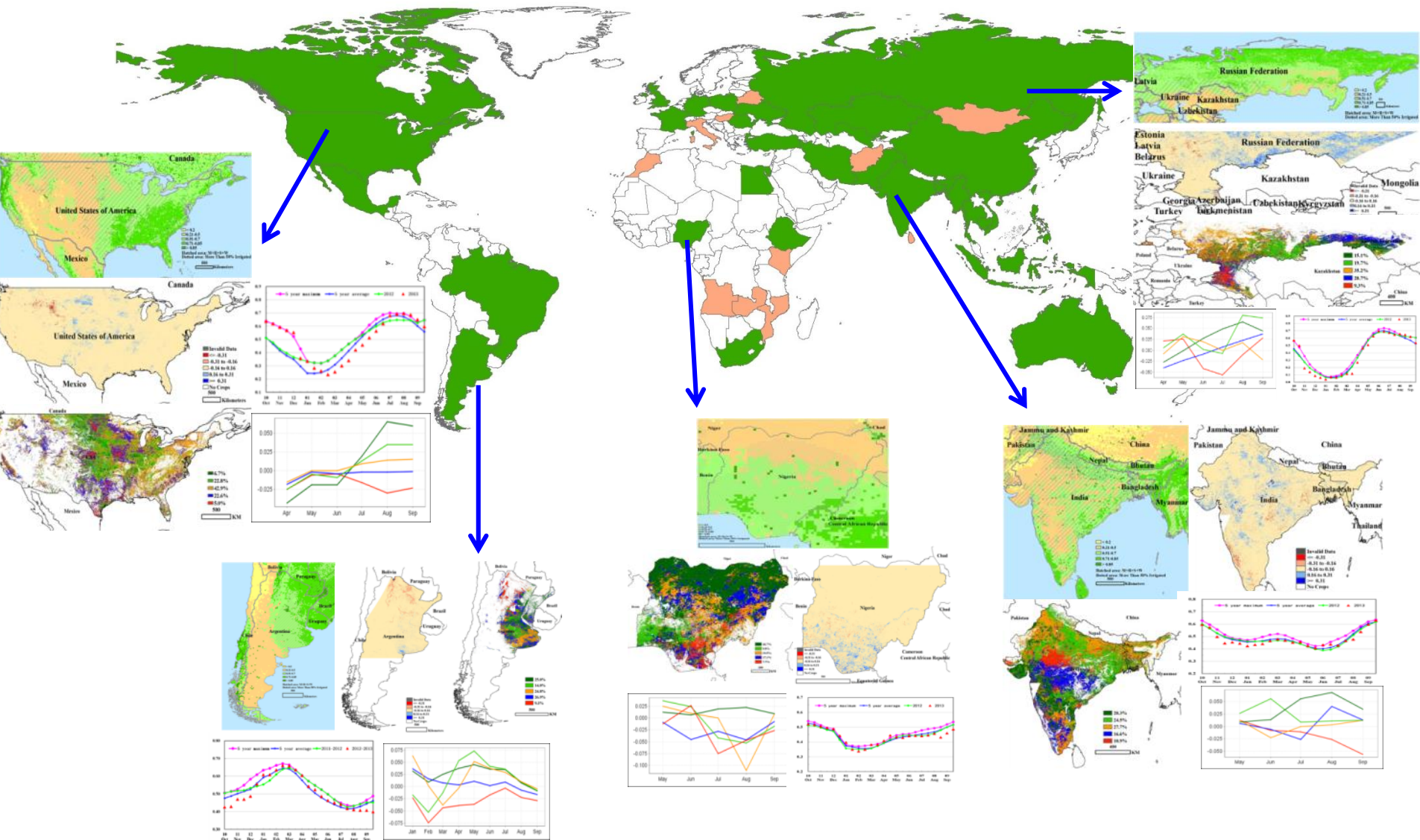


e. Maximum VCI



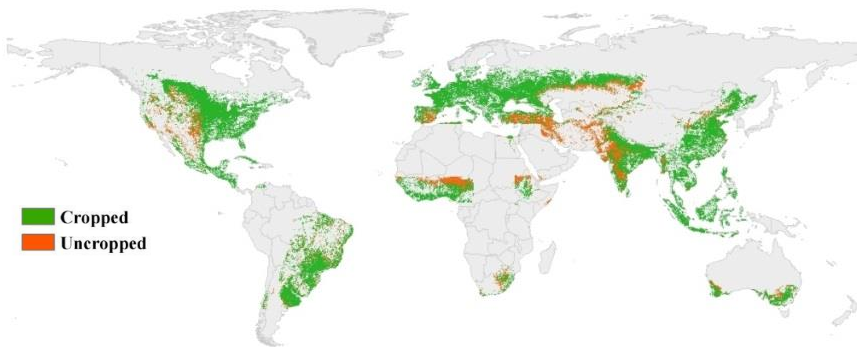
f. Cropped arable land

Countries: 42

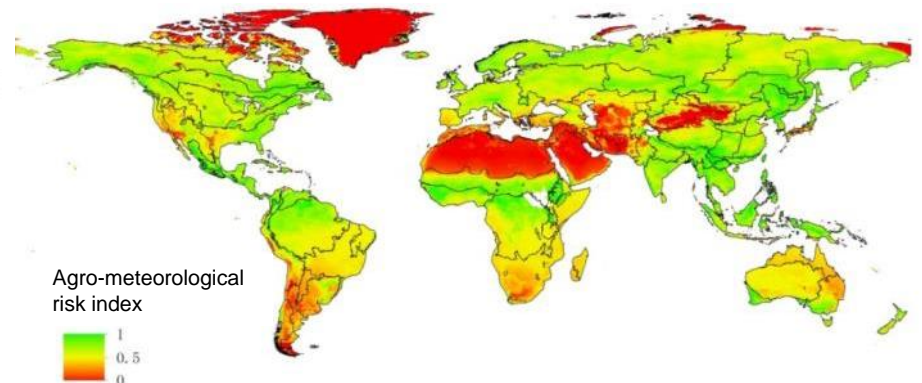


Food security early warning

- **Cropped arable land fraction (CALF)** represents the total cropping proportion at early growing stage
- **Agro-meteorological risk index (AMRI)** considering meteorological suitability for crops at different growing stage is used for yield alarming



July to October 2015

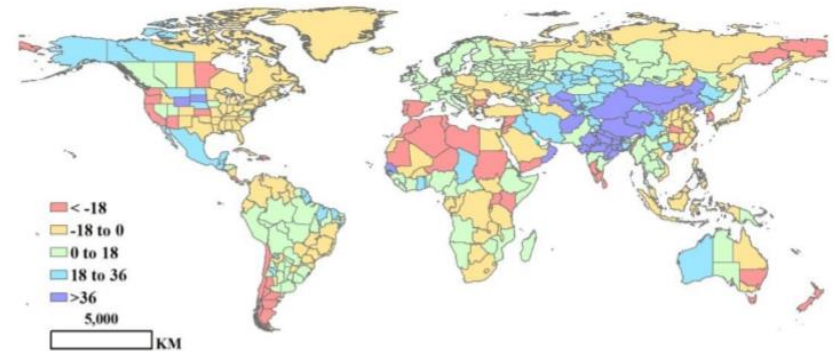


August 2013

Early outlook

	Environmental indices departure from 12YA (2001-2013)				Crop indicators departure from 5YA (2008-2013)		
	Rainfall total (%)	Temperature average (°C)	PAR accumulation (%)	Biomass accumulation (%)	Uncropped arable land in % of pixels (Absolute difference in % points)	Maximum VCI (absolute difference)	
Argentina	5	1.0	0.1	-1	0.7	-0.05	
Australia	-27	0.3	3	3	9.2	0.01	
Bangladesh	11	-0.5	-0.5	33	-0.2	0.06	
Brazil	-1	0.2	-0.4	2	-0.4	0.01	
Cambodia	5	-0.8	5	8	0.5	-0.01	
Canada	8	-1.3	6	-2	10.7	0.01	
China	19	0.5	8	21	-3.3	0.03	
Egypt	-24	0.2	3	26	-1.0	0.05	
Ethiopia	28	0.3	0.2	16	-4.3	0.01	
France	-3	0.8	0.1	4	-2.0	0.07	
Germany	5	1.2	-0.4	8	-10.7	0.11	
India	52	-0.3	1	33	-3.0	0.11	
Indonesia	-2	-0.2	-2	-2	0.4	-0.01	

Figure 3.1. Global map of biomass accumulation by country and sub-national areas, departure from twelve-year average (2001-13) average (percentage)



Overall, CropWatch tentatively summarizes the ongoing season as follows:

Mostly unfavorable: Armenia, Azerbaijan, Canada, Georgia, Philippines, Poland, Spain, Turkey, Ukraine, Moldova, Morocco, United States, and Vietnam.

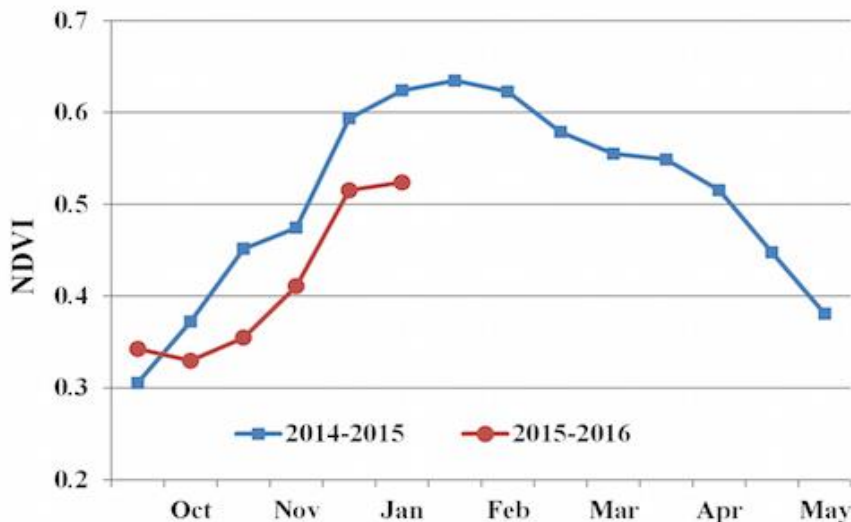
Mixed: Argentina, Brazil, China, Denmark, Egypt, France, Hungary, Indonesia, Iran, Italy, Nigeria, Romania, Russia, South Africa, United Kingdom, and Uzbekistan.

Mostly favorable: Bangladesh, Czechia, Germany, India, Kazakhstan, Mexico, Myanmar, Pakistan, and Thailand.

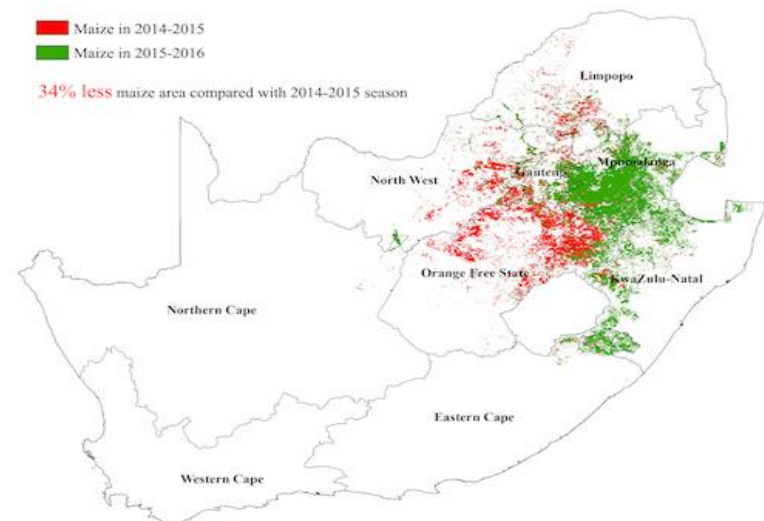
Server drought in South Africa

- **Large production drop alert** given in November 2015 Bulletin
- **January 2016 Bulletin:** Maize production was **projected at 44.6% drop**: Server drought prevented farms sowing maize, with a reduction of 34% of maize area; yield was 16% lower than 2015
- **April 2016 Bulletin:** Maize production is **revised to 32% drop**, since Feb 2016, rainfall benefited the maize in fields.

Development of NDVI profiles over maize growing areas in 2014-15 and 2015-16



Relative distribution of maize in 2014-15 and 2015-16



Component 4: CropWatch Bulletin

Provide global crop report as pdf or html format



This is a screenshot of the CropWatch Bulletin page for February 2019. The page has a white background with a blue header. The main title is 'FEBRUARY 2019 CROPWATCH BULLETIN'. Below the title, there are tabs for 'All', 'Summary', and 'cropwatch'. The main content area is titled 'South and Southeast Asia Crop and environmental conditions in major production zones'. The author is listed as zhaofei, maltrabany, and rana. There is a 'sign up for the mailing list' button. On the right side, there is a detailed text report. On the left side, there is a 'Menu' section with various categories like EXECUTIVE SUMMARY, GLOBAL AGROCLIMATIC PATTERNS, CROP AND ENVIRONMENTAL CONDITIONS IN MAJOR PRODUCTION ZONES, and MAIN PRODUCING AND EXPORTING COUNTRIES. Each category has a list of sub-items.

Home >> Bulletin >> February 2019 CropWatch Bulletin (Vol. 19, No. 1)

February 2019 CropWatch Bulletin (Vol. 19, No. 1)

All bulletins >>



This bulletin features the latest production outlook for the major producers in the southern hemisphere and some isolated northern hemisphere countries where crop development is sufficiently advanced. Focusing on the months of October 2018 to January 2019, chapters cover global, national, and regional-level agroclimatic conditions and the condition of crops that were growing or harvested during this time. For China, the bulletin presents crop conditions for each of seven key agro-ecological zones. The focus section reports on recent disaster events with an impact on agriculture, the possibility of an El Niño event.

Full report

报告中文

sign up for the mailing list

Key messages from the report

- > Agro-climatic patterns over agricultural areas: global rainfall was above average (4%), temperature was below average (-0.1°C), and sunshine was 1% above average. Most below average rainfall areas with deficits more severe than 20% are consistent with El Niño patterns.
- > Agronomic Indicators: Unfavorable conditions were observed in Romania (significantly below average Cropped Arable Land Fraction, CALF), Turkey, Ukraine, Kazakhstan, Pakistan, Mongolia, Morocco, Zambia and Mozambique show large increases in CALF. High Maximum Vegetation Condition Index (VCI) values, indicating favorable crops, occur mostly in Asia. The situation is mixed in Afghanistan (with lowest VCI at 0.45 among 42 key countries, but 25% above average CALF).
- > China: agro-climatic conditions were generally below average with deficits of rainfall (7%) and sunshine (8%). Temperature was average but the nationwide CALF fell 2% below the average value of the previous five years.
- > Production outlook: the reporting period saw the harvest of wheat in the Southern Hemisphere. Production of maize in Argentina and Mexico is above last year's output (8% and 21%, respectively) while South Africa suffered a marked drop (-14%); production of wheat in Australia suffered a marked drop as well (-13%), and so did Argentina (-3%).

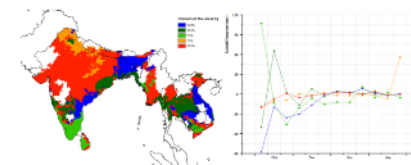
Introduction

This CropWatch bulletin summarizes global crop condition developments and agroclimatic factors from October 1, 2018 to January 31, 2019 through a zoom in from a global overview of agroclimatic indicators (Chapter 1) to detailed descriptions of crop and environmental conditions in large production zones (Chapter 2), to individual country analyses covering 42 major producers and exporters including agro-ecological zones (Chapter 3) and China (Chapter 4). A special focus section is included in Chapter 5, covering crop production for 2018-2019 for countries in Southern Hemisphere, disaster events, and an update on El Niño. This first part of the report includes the cover, table of contents, abbreviations, a short overview of the different sections of the bulletin and executive summary.

Download

Introduction

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



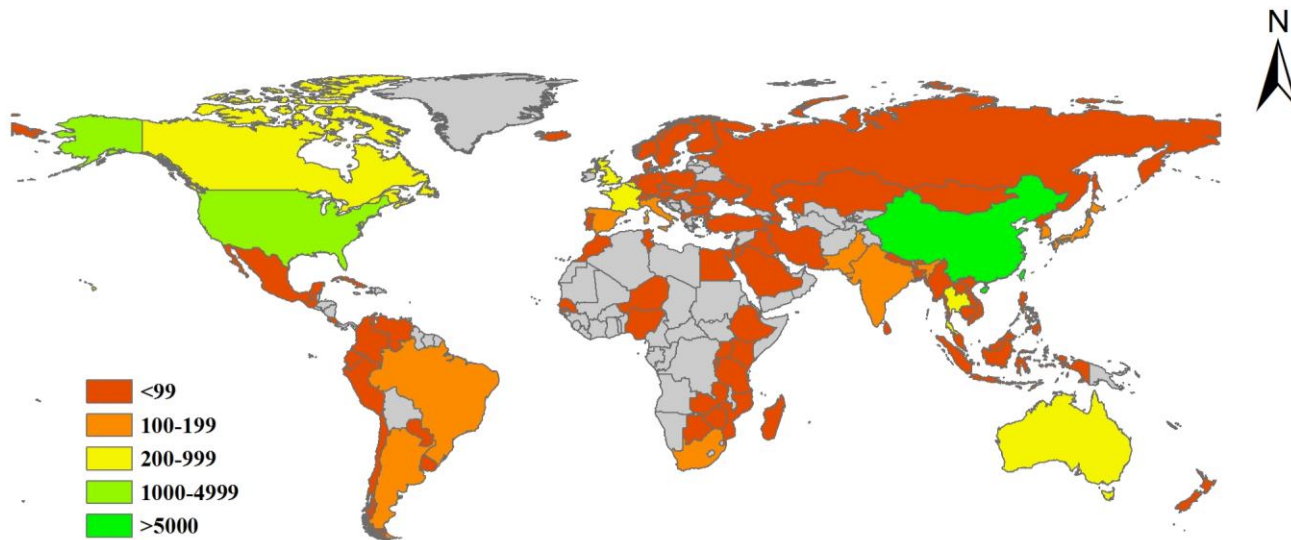
Component 4: CropWatch Bulletin

- Four Quarterly CropWatch Bulletins
- One annual report



Component 4: CropWatch Bulletin

- already provided information services for 149 countries, and obvious enhance the transparency of global agricultural monitoring.



- **Analysis-ready products**

- 32 Indicators ready in CropWatch Cloud considering most indicators used in existing system
- Indicators customizable, easy to include new national or regional specific indicators

- **Cloud computing improves efficiency of data processing**

- **Customized for local condition**

- **Joint work promotes confident and transparency**

Outline

- **Introduction**
- **CropWatch Cloud**
- **Implementation at countries**
 - **Monitoring on Cloud**
 - **Cloud services**
 - **Handover**

CropWatch for Mozambique

- **Customize CropWatch for Mozambique**
 - Portuguese Interface
 - Including all provinces and districts
 - Crop phenology
 - Portuguese version of GVG tools



CropWatch Pro Produce Thematic Map

Iniciar a sessão

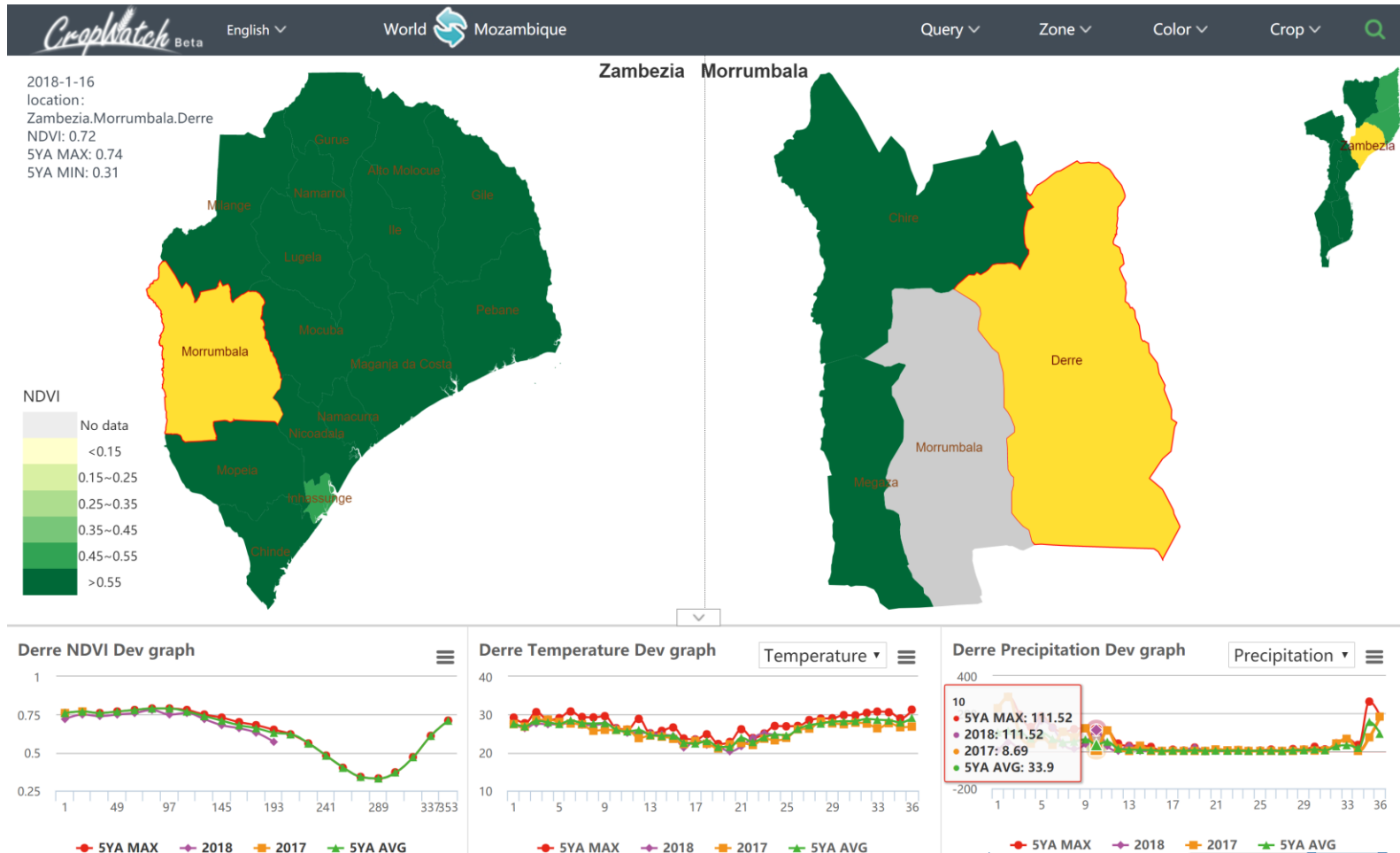
Índices Agro-climáticos	Indicadores Agronómicos
 Índice de Precipitação	 VCI máximo
 Índice de Temperatura	 Índice Mínimo de sanidade Vegetal
 Índice de PAR	 Classificação das terras aráveis cultivadas
 Biomassa	 Intensidade de Cultivo

Settings

Types of map to be produced	NDVI profiles
Type	NDVI
Region Type	Key Countries
Region Name	Mozambique
Sub Regions of Key Countries	Whole country
Starting time	Whole country Maputo Gaza Inhambane Sofala Manica Tete Zambezia Nampula Cabo Delegado
End Time	
Crop Type	

CropWatch for Mozambique

Monitoring units: every districts and provinces



Mozambique National Meteorological Bulletin

■ National Meteorological Bulletin powered by CropWatch

DIRECÇÃO NACIONAL DE AGRICULTURA E SILVICULTURA—MASA
DEPARTAMENTO DE CULTURAS E AVISO PRÉVIO



Edição Nº 08
Campanha Agrícola 2017/18
Publicado em: 15/06/2018

BOLETIM AGROMETEOROLÓGICO

Em Foco

- *Registo de precipitação muito abaixo da normal, na região Sul do país e acima da normal nas regiões Centro e Norte, no período de Outubro de 2017 à Março de 2018.*
- *Registo de perda de cerca de 275 mil hectares de culturas diversas devido aos efeitos combinados de inundações, estagem e lagarta do funil ao nível do país.*
- *Boas Perspectivas de Produção das principais culturas alimentares na Campanha Agrícola 2017/18.*
- *Preços de principais produtos agrícolas, com tendências de redução ao nível dos principais mercados do país.*

PRECIPITAÇÃO REGISTRADA E ACUMULADA DE OUTUBRO DE 2017 À MARÇO DE 2018

O período entre Outubro e Dezembro de 2017 foi caracterizado por precipitação irregular e escassa nas regiões Sul e partes do Centro do País. Na região Norte, incluindo as províncias de Sofala e Zambézia (região Centro), a precipitação registada no mês de Dezembro, mostrou-se regular, com valores entre 300 e 500 mm, tendo atingido valores superiores a 500 mm em alguns distritos isolados, no mês de Dezembro.

De Janeiro a Março de 2018, houve queda regular e excessiva de precipitação em quase todo o país, sobretudo no mês de Janeiro. Na região Sul, a precipitação registada não foi suficiente para as culturas, o que causou stress hídrico e falhas no desenvolvimento das culturas.

Na região Centro, as chuvas foram intensas sobretudo nas províncias de Sofala, Manica e Zambézia, com registo acumulado entre 500 e 1000 mm, causando igualmente inundações. Na província de Tete, a precipitação foi inferior a 500 mm, excepto nos distritos situados no planalto, onde tiveram registo entre 500 e 1000 mm.

Na região Norte do País, as chuvas foram intensas com valores superiores a 500 mm, verificando níveis aceitáveis para um bom desenvolvimento das culturas nesta região, não obstante o registo de inundações ocorridas no mês de Janeiro. (Fig. 1).

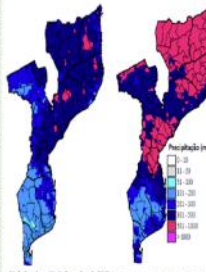


Fig. 1. Precipitação registada durante o Época Chuvosa 2017/18

DESVIO DE PRECIPITAÇÃO REGISTRADO DE OUTUBRO DE 2017 À MARÇO DE 2018

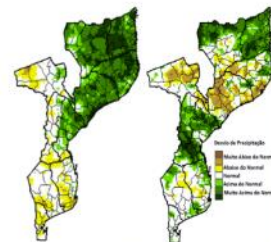


Fig. 2. Desvio padrão da precipitação durante o Época Chuvosa 2017/18

Em geral, a precipitação registada entre os meses de **Outubro e Dezembro de 2017** no país, foi irregular e esteve **abaixo do normal**, nas regiões Sul (Maputo, Gaza e Inhambane) e partes da região Centro (Manica, Tete e distritos a Sul de Sofala). Nas restantes províncias de Centro e Norte, a precipitação foi regular e **acima do normal**. (Fig.2)

Entre os meses de **Janeiro e Março de 2018**, a precipitação esteve **muito acima do normal** nas províncias de Manica, Sofala (região Centro), Cabo Delgado e Niassa (região Norte) e **abaixo do normal** nas regiões Centro (Tete e Zambézia) e Norte (Nampula e Sul de Niassa).

Na região Sul, em geral, registou-se precipitação **normal e abaixo do normal** em alguns distritos do interior de Gaza e Inhambane.

1

ÍNDICE DE SATISFAÇÃO HÍDRICA DAS CULTURAS

O Índice de Satisfação Hídrica (WRSI) das culturas da 1ª época em geral foi **considerado bom** para região Norte, médio à mediocre para a região Centro e pobre para a região Sul do país. (fig. 3)

Na **Regiões Sul**, as culturas da 1ª época foram colhidas até o mês de Março. O índice de satisfação hídrica (WRSI) foi pobre, o que pressupõe produtividade das culturas baixa e consequentemente produção não satisfatória.

Na **Região Centro**, as culturas da 1ª época foram colhidas até o mês de Abril. Em geral, o WRSI nesta região é considerado de médio, pese embora em alguns distritos da província de Tete, Manica, Sofala e Zambézia, o índice ter sido afectado pela irregularidade da precipitação.

Na **Região Norte**, as culturas foram colhidas até finais do mês de Maio. O WRSI foi considerado bom a muito bom, o que pressupõe boa produtividade e produção nas principais culturas da 1ª época.

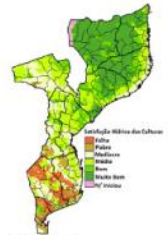


Fig. 3. WRSI até finais de Março de 2018

ANÁLISE DE NDMI

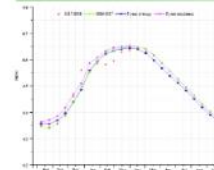


Fig. 4. NDMI Perfil ao nível do País

A análise de desenvolvimento das culturas baseado no NDMI a nível nacional (Fig. 4), demonstram que as condições para desenvolvimento das culturas foram desfavoráveis desde o início do mês de Março, estas condições foram recuperando, chegando a situar-se próximo da média dos últimos 5 anos.

O gráfico abaixo (fig 5), mostra que os padrões de partida de NDMI associados aos perfis de NDMI, indicam diversidade de comportamento antes do mês de Fevereiro, com partes das províncias de Cabo Delgado, Nampula, Tete e Gaza acima da média e outras abaixo (5,6%). A partir de Fevereiro, os padrões de NDMI estiveram situados notavelmente perto da média. Em resum, entre os meses de Janeiro a Abril de 2018, a maior parte das áreas cultivadas (43%), estavam em condições abaixo da média dos últimos cinco anos.

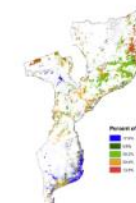
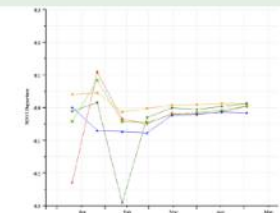


Fig. 5. Padrões de partida do NDMI espacial



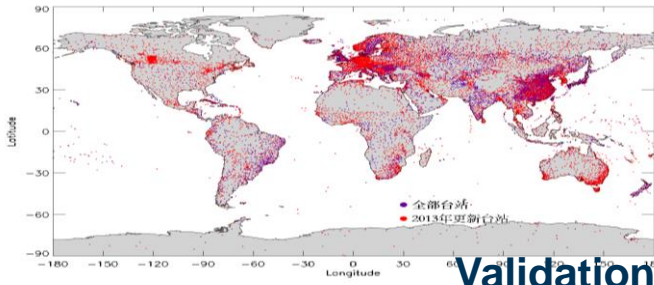
3

Independent evaluation

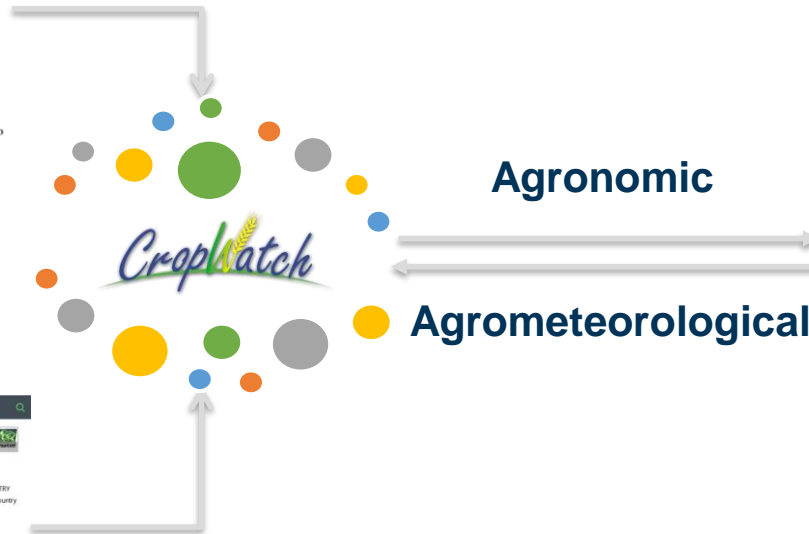
- CropWatch's yield estimation result is quite accurate when compared to real ground data collected from their district and provincial level staff.
- It is also relatively more accurate and has higher resolution than other similar technologies they used before
- CropWatch is easy to learn and operate after several trainings.
- able to get in-time response from CropWatch team whenever he needs any troubleshooting.
- applying the tool to generate monthly agriculture bulletin during the rainy season, which informs policy making at national and provincial-level agriculture departments.
- Stressed the importance of building long-term internal capacity to understand the algorithm and the technology deeper so that maybe they can also build similar technology by themselves one day.

CropWatch for Thailand

- Using CropWatch to process the data for required indicators
- CropWatch provides API for Thailand to feed ago-climate and agronomic information to Agri-Map, which provides services to local with own data



Validation

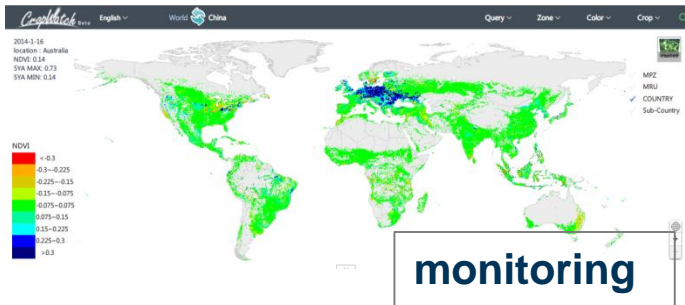


Agronomic

Agrometeorological



อินดีด็อนร็บเช้าสู้ระบบ Agri-Map Online



monitoring

DroughtWatch for Mongolia

DroughtWatch 3.1


Modules Help



User Login

User Name:

Password:



Modules

DroughtWatch 3.1 - Indices

VCI TCI VHI WDI NSVI SPI AI

Resolution: 120M

Frequency: Dekad

Date: 2000 7 1

< Input Data ->

NDVI: E:\DrounS\UrounS\DataDir\Parameter\dekad\2\ Load Preview

Max_NDVI: E:\DrounS\UrounS\DataDir\Reference\0701D_m\ Load Preview

Min_NDVI: E:\DrounS\UrounS\DataDir\Reference\0701D_m\ Load Preview

Output Folder: E:\DrounS\UrounS\DataDir\Index\ Browse Preview

Batch

Sensor/Satellite: MODIS/TERRA Resolution: 120M

ST: 2000 1 1 ET: 2000 1 1

Frequency: Month Dekad Week Pentad

< Parameters Configuration ->

Atmos. Correction: No Yes

Aggregation: Maximum Average

Single Index: VCI TCI VHI WDI NSVI

Combination Index: S2_12345 (VCI@TCI@VHI@WDI@NSVI)

Combination Method: Max Min Mean Median Majority

----- PROGRESS -----

DroughtWatch 3.1 - Database

Import Edit Table Window

Device Observation Data (Selected) Grids Data

Station ID	Year	Month	Index (Air Temperature)
750101	2000	1	10.120000
750101	2000	2	13.340000
750101	2000	3	15.160000
750101	2000	4	17.160000
750101	2000	5	18.110000
750101	2000	6	14.760000
750101	2000	7	12.440000
750101	2000	8	12.000000
750101	2000	9	12.150000
750101	2000	10	12.410000
750101	2000	11	12.000000
750101	2000	12	10.000000
490501	2000	1	12.410000
490501	2000	2	12.410000
490501	2000	3	12.410000
490501	2000	4	12.410000
490501	2000	5	12.410000
490501	2000	6	12.410000
490501	2000	7	12.410000
490501	2000	8	12.410000
490501	2000	9	12.410000
490501	2000	10	12.410000
490501	2000	11	12.410000
490501	2000	12	12.410000

Query

Start Time: 2000-1-1

End Time: 2000-12-31

Category: GetGrid/Dekad

Preprocess: Batch

Group: GetGrid/Dekad

View: All

DroughtWatch 3.1 - Preprocessing

Preprocessing Aggregation

Resolution: 120M

Start Time: 2000 1 1

End Time: 2004 6 1

Metadata Folder: E:\DrounS\UrounS\DataDir\Metadata\ Browse Search

Category: GetGrid/Dekad

Output Folder: E:\DrounS\UrounS\DataDir\Preprocess\ Browse

20000701_NDVI_120M.tif
XX:1542 YY:964 Value:0.056219

< Processing Procedure ->

Time (GMT)	QD	WDI	WDI	WDI	WDI	WDI	WDI
2000-05-01							

DroughtWatch 3.1 - Drought

Single Combination Dashboard

Resolution: 120M

Frequency: Dekad

Date: 2000 7 3

IndexType: TCI

Input File: E:\DrounS\UrounS\DataDir\Index\dekad\20000703D_TCI Loading

Input Information:

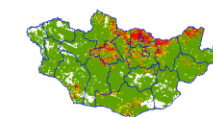
Max:	1.000000
Min:	0.000000
StdDev:	0.282510
Accumulative Frequency (95%):	1.000000

Classification:

Extreme:	0	0.095
Serious:	0.095	0.167
Moderate:	0.167	0.255
Slight:	0.255	0.343
Normal:	0.343	1

Output Folder: E:\DrounS\UrounS\DataDir\Droughtstat\ Browse

TCI, 20000703D



DroughtWatch 3.1 - Analysis

Over Spatial Unit Over Time Interval

Frequency: Dekad IndexType: TCI

Date: 2000 7 3

Admin Unit: Province

Province	Max	Extreme	Serious	Moderate	Slight	Normal
Bayankhongor	0.212525	0.074111	0.336388	0.125420	0.625715	0.000000
Bovdun	0.306508	0.127580	0.121142	0.099616	0.346854	0.000000
Darkhan	0.287190	0.211394	0.216050	0.148155	0.157210	0.000000
Dundgovi	0.251263	0.108370	0.145397	0.153190	0.341760	0.000000
Govisumber	0.221179	0.098068	0.117697	0.090180	0.453876	0.000000
Govisumber	0.582696	0.194094	0.146796	0.054044	0.021190	0.000000
Salween	0.011062	0.017020	0.014941	0.011964	0.945911	0.000000
Uvsumkh	0.671661	0.220797	0.085353	0.018616	0.026313	0.000000
Darkhan	0.000000	0.000000	0.000000	0.001577	0.998423	0.000000
Dundgovi	0.430794	0.150298	0.172463	0.128410	0.024675	0.000000
Omnogovi	0.548431	0.247594	0.131896	0.047315	0.024674	0.000000
Orkhon	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000
Ovorkhangai	0.496539	0.127462	0.120737	0.050983	0.248279	0.000000
Bayan	0.051421	0.026871	0.026293	0.071865	0.791732	0.000000
Bayankhangai	1.096483	0.146786	0.153840	0.110290	0.483341	0.000000
Arkhangai	0.022291	0.022550	0.051597	0.065508	0.811824	0.000000
Dundgovi	0.054812	0.027114	0.044170	0.065468	0.828407	0.000000
Darkhan	0.121094	0.085071	0.088934	0.119593	0.595338	0.000000

Drought Data: E:\DrounS\UrounS\DataDir\Droughtstat\ Load

Administrative File: E:\DrounS\UrounS\DataDir\province_code\ Select

Output Folder: E:\DrounS\UrounS\DataDir\Droughtstat\ Browse

DroughtWatch Handover to Mongolia

On September 17, 2018, the DroughtWatch-Mongolia was officially handed over to the Mongolian National Remote Sensing Center (NRSC)

<http://irimhe.namem.gov.mn>



www.icc.mn



www.eic.mn



Drought product dissemination to local meteorological departments by internal network

Servicing to organizations



■ **Promote ownership for developing countries**

- Customized according to the specific demand for each country and work as a national/regional system
- After customization and training, countries will strengthen the agricultural monitoring capacity on your own
- Promote developing countries leap-frag development

■ **Cloud services for crop monitoring**

- Cloud based system assessible from internet everywhere without investment on computing infrastructure, storage, etc

**Thank you for your
attention!**