GROUP ON EARTH OBSERVATIONS

GEOGLAM Global Agricultural Monitoring

Status of the GEOGLAM Initiative

Alyssa K. Whitcraft

CEOS SIT-31 Side Meeting - 21 April 2016

University of Maryland/GEOGLAM Secretariat

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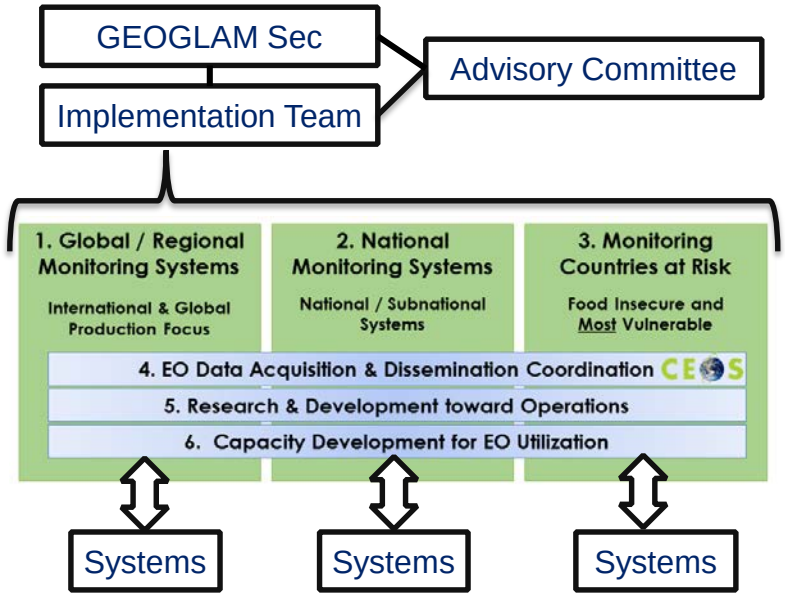
GEOGLAM Global Agricultural Monitoring

Topics – April 2016

- New Website – www.geoglam.org
- Organization Updates
- Advisory Committee – November 2015; Next: June 2016
  - Recommendations
  - Related actions
- CM for AMIS; EWCM Status Updates
- CEOS Ad Hoc WG:
  - Data Request Submission Tool
  - JECAM Update & Data Requests (Ian Jarvis)
  - Asia-RiCE Updates & Data Requests (Kei Ohyoshi)
  - RAPP Update (Alex Held/Flora Kerblatt)
- Linkages with CEOS WGCapD

GEOGLAM Organization

- GEOGLAM Sec:
  - Program Director = Michel Deshayes
  - Program Scientists = Alyssa Whitcraft & Inbal Reshef
- Implementation Team:
  - Component Leads
  - Major Project Leads
- Advisory Committee:
  - High-level officials from end-user organizations
- Recent change:
  - New C2 co-leads:
    - *Dave Johnson (USDA-NASS)*
    - *Carlos di Bella (INTA)*



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GEOGLAM Global Agricultural Monitoring

Some AC Recommendations…

- [C1] GEOGLAM to communicate more forcefully the successful contribution to AMIS in the countries presently covered.
  - Add new countries with rice, wheat, soybean, & corn production;

- [C4] The coordination of the remote sensing activities is of the highest priority. The coordination of the remote sensing data requirements with CEOS & related activities should be further supported.

- [C6] Better capacity development strategy + integration into other activities

Some AC Recommendations…

- The current mandate should be refreshed to cover both Trade and also Food Security.

- There is need for a more strategic communication and for increased engagement with other organizations; and

- The participation of more countries should be promoted, and the South-South cooperation should be enhanced.

The GEOGLAM Initiative:
Agricultural Monitoring in Support of Food Security and Market Stability

In order to contribute to SDG#2 – Zero hunger – GEOGLAM is seeking G20 endorsement for monitoring agricultural production in both main producer and food insecure countries, and for developing national capacity for agricultural monitoring.

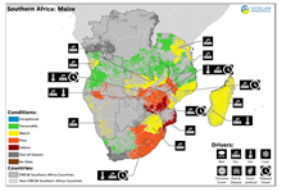
The Group on Earth Observations Global Agricultural Monitoring Initiative (GEOGLAM), adopted by the G20 in 2011, is providing transparent, timely, and actionable information on crop prospects through the use of Earth observations (EO). Since its launch, a major focus of GEOGLAM has been on monitoring the main grain producer and export countries, aligned with the Agricultural Market Information System's (AMIS) focus on global markets, trade, and reducing price volatility. The primary undertaking in this context has been the development of the GEOGLAM Crop Monitor, which is now providing AMIS with a monthly international consensus report on crop conditions in the G20+7+Spain countries, highlighting areas of concern for the four main commodity crops (wheat, maize, rice, and soybean).

Apart from these main food producers and exporters, a number of countries import a significant amount of their food and are impacted by global price volatility and the associated export restrictions. Countries prone to food insecurity are often the victim of domestic production shortfalls, and they tend to be disproportionately affected by extreme weather and climate events. In terms of global production these disruptions may seem insignificant, but within food insecure nations the impact can be devastating.

Earth observations can be a critical tool to help food insecure nations monitor the current state of food production, forecast and project production changes, and more effectively respond to emerging food scarcity. The goal is for EO to provide information to help governments and farmers make informed decisions in support of food security.

Looking beyond recent short-term production shortfalls, the FAO predicts that food production must increase by 60% to feed 2.3 billion more

In January 2016, GEOGLAM launched its **Early Warning Crop Monitor** (EWCM). An analog to the Crop Monitor for AMIS, the EWCM focuses on countries at risk for food insecurity, providing consensus reports on the conditions of regionally relevant crops and drivers. Below, the EWCM January 2016 report shows watch, poor, and failure conditions in many maize areas in Southern Africa., due to hot and dry conditions.



Next AC Meeting:
24 June 2016

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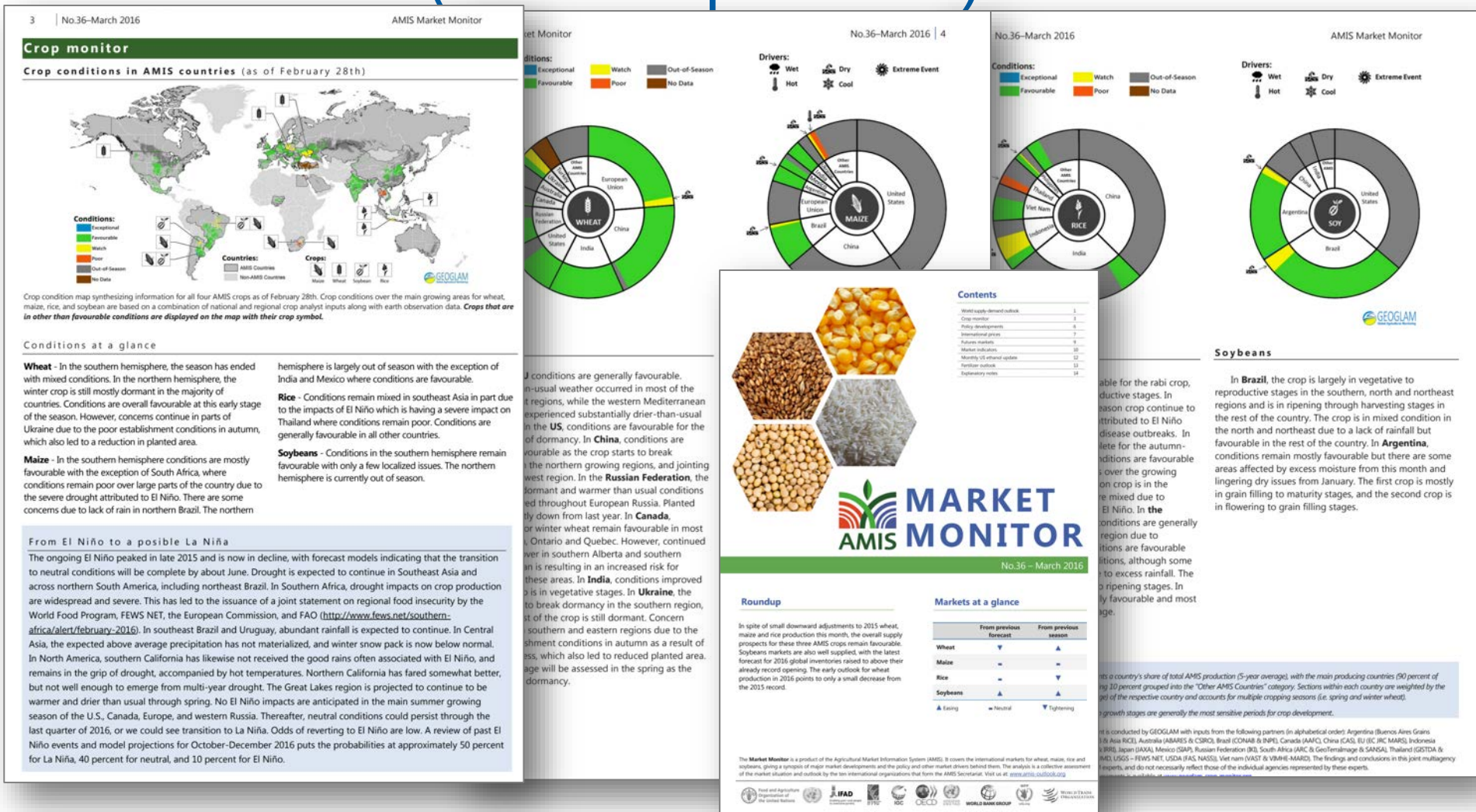
GEOGLAM Global Agricultural Monitoring

GEOGLAM Crop Monitor Progress

- Political mandate with well defined, active user community
- Effective mechanism for coordination, and communication of science based, international assessments
- Two operational global systems and 2 national systems in development
  - Crop Monitor for AMIS- focus on main production export countries (>35 participating partners)
  - Early Warning Crop Monitor- focus on countries at risk of food insecurity
  - Crop Monitor Tanzania- in development in partnership with Min of Ag
- Continued strong, high level support for GEOGLAM Crop Monitor Initiative
  - Including at recent AMIS Rapid Response Forum, March 2016, DC
    - *Interest to expand collaboration with AMIS*
    - *Interest from Ukraine for collaboration*
    - *UK uses the GEOGLAM products for ministry briefings*
- GEOGLAM-AMIS joint session to be held at AMIS meeting- 23rd June in the afternoon

Crop Monitor for AMIS

Published monthly within the Market Monitor (26 issues published)



The Early Warning Crop Monitor

- Grew out of successful AMIS Crop Monitor
- Context: need for more timely, reliable, vetted information on crop conditions within countries at risk
- Objective: Exchange information and reduce uncertainty to strengthen agricultural decision making
  - Focus on discussion and consensus building
- Current partners: USAID FEWS NET, WFP, JRC, ARC, ASIA RiCE, UMD
  - Expanding to include regional networks, and national sources
  - Discussions with SADC, FAO GIEWS, SERVIR Hubs, MESA, Tanzania MoA
- Coordinated by UMD/GEOGLAM Secretariat (I. Becker-Reshef)
- First bulletin published in Feb 2016
- Already informing agricultural decisions
  - included in news, press releases and official reports including joint press release by FEWS NET, JRC, WFP and FAO on current crisis in southern Africa

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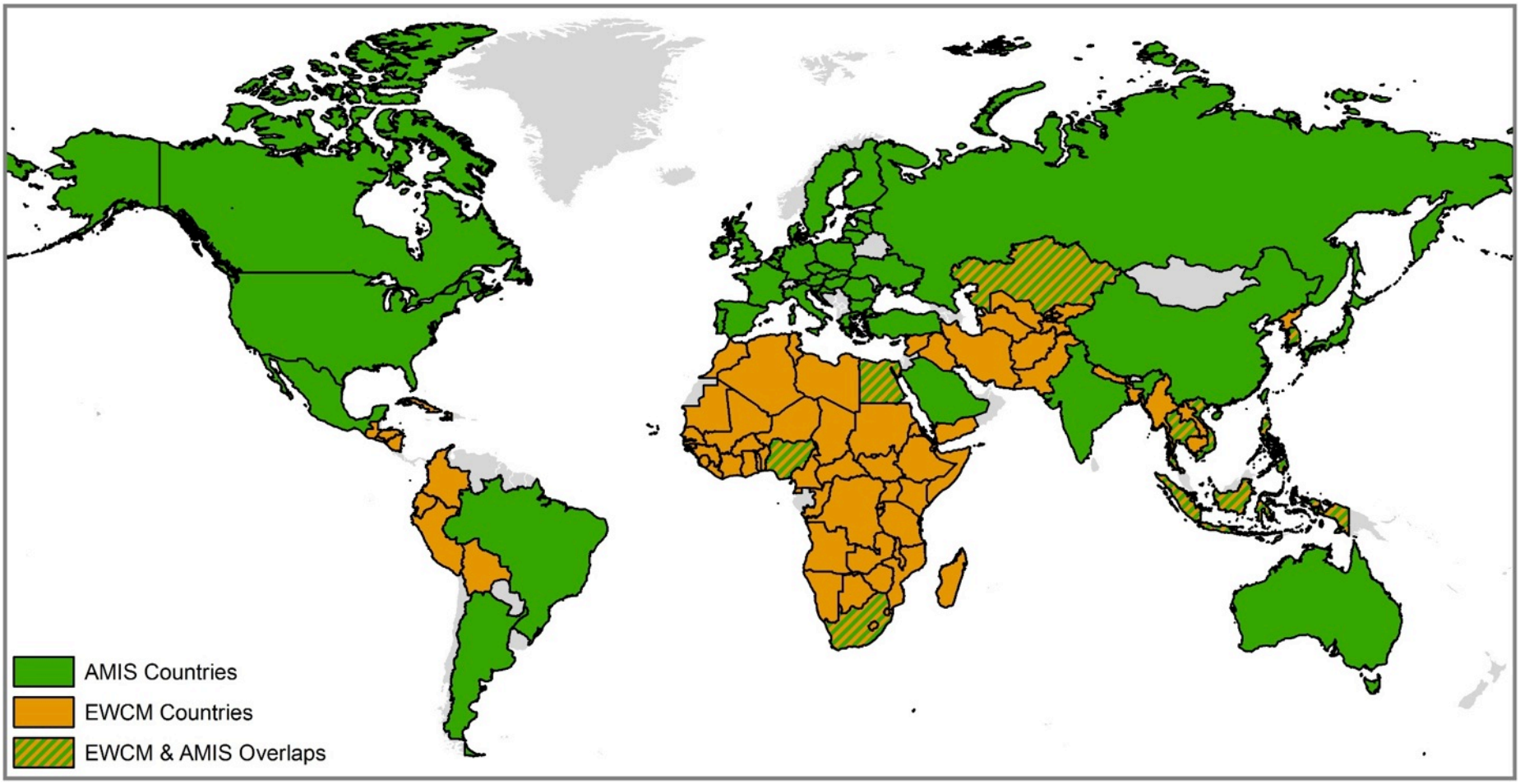
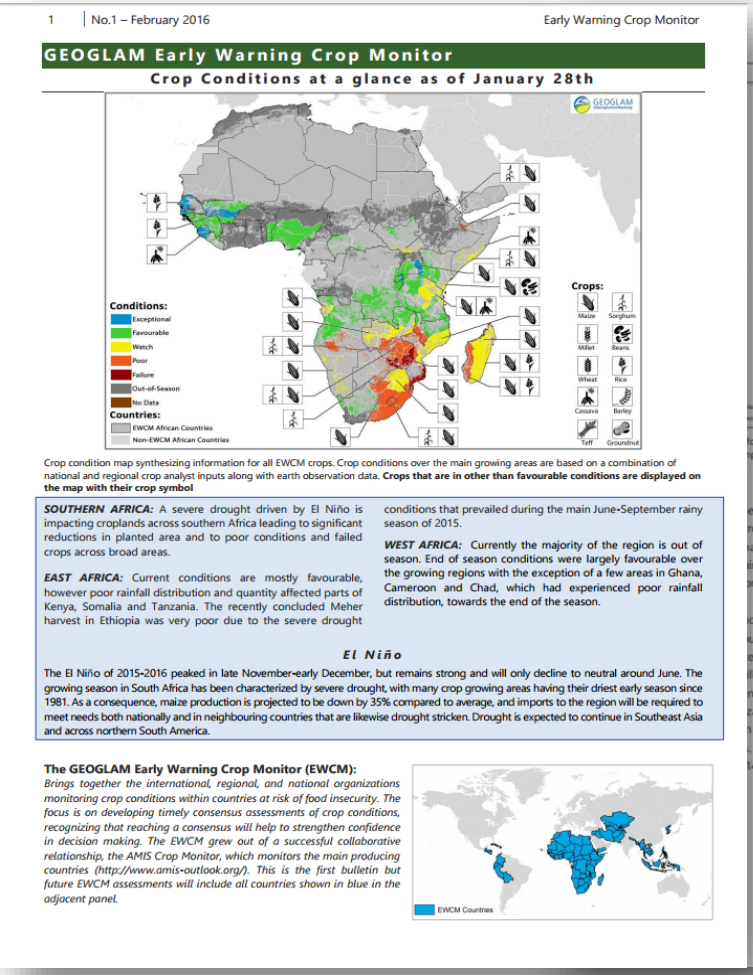
GEOGLAM Global Agricultural Monitoring

EWCM Vs. AMIS Countries



The First EWCM Bulletin Released February 2016 3 published to date



1 | No.1 – February 2016 Early Warning Crop Monitor

GEOGLAM Early Warning Crop Monitor

Crop Conditions at a glance as of January 28th

Crop condition map synthesizing information for all EWCM crops. Crop conditions over the main growing areas are based on a combination of national and regional crop analyst inputs along with earth observation data. **Crops that are in other than favourable conditions are displayed on the map with their crop symbol**

SOUTHERN AFRICA: A severe drought driven by El Niño is impacting croplands across southern Africa leading to significant reductions in planted area and to poor conditions and failed crops across broad areas.

EAST AFRICA: Current conditions are mostly favourable, however poor rainfall distribution and quantity affected parts of Kenya, Somalia and Tanzania. The recently concluded Meher harvest in Ethiopia was very poor due to the severe drought conditions that prevailed during the main June-September rainy season of 2015.

WEST AFRICA: Currently the majority of the region is out of season. End of season conditions were largely favourable over the growing regions with the exception of a few areas in Ghana, Cameroon and Chad, which had experienced poor rainfall distribution, towards the end of the season.

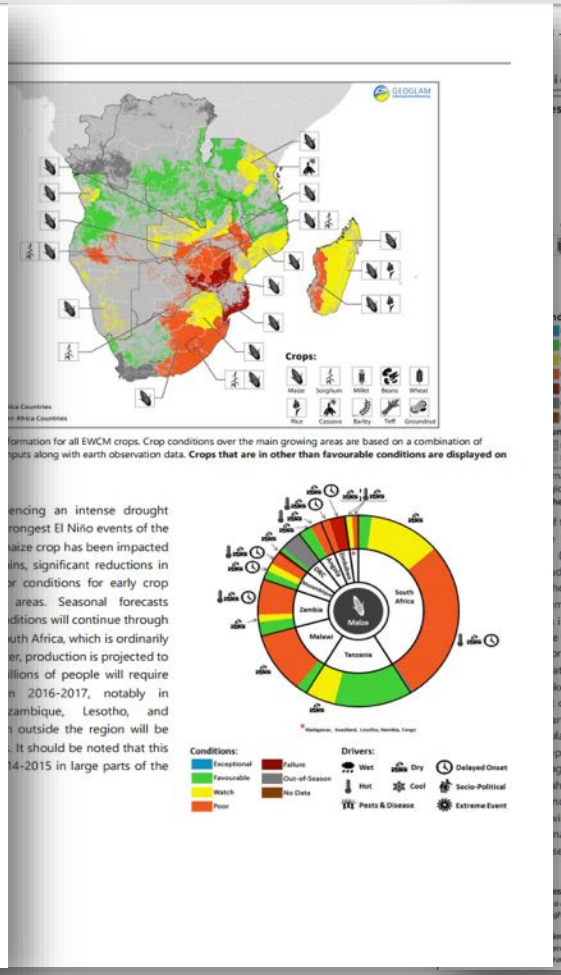
El Niño

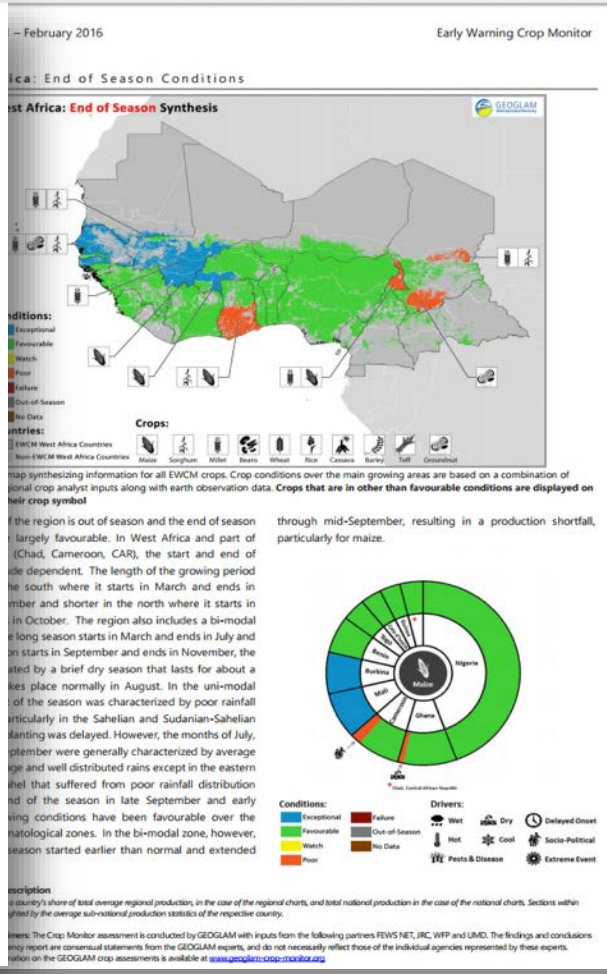
The El Niño of 2015-2016 peaked in late November-early December, but remains strong and will only decline to neutral around June. The growing season in South Africa has been characterized by severe drought, with many crop growing areas having their driest early season since 1981. As a consequence, maize production is projected to be down by 35% compared to average, and imports to the region will be required to meet needs both nationally and in neighbouring countries that are likewise drought stricken. Drought is expected to continue in Southeast Asia and across northern South America.

The GEOGLAM Early Warning Crop Monitor (EWCM):

Brings together the international, regional, and national organizations monitoring crop conditions within countries at risk of food insecurity. The focus is on developing timely consensus assessments of crop conditions, recognizing that reaching a consensus will help to strengthen confidence in decision making. The EWCM grew out of a successful collaborative relationship, the AMIS Crop Monitor, which monitors the main producing countries (http://www.amis-outlook.org/). This is the first bulletin but future EWCM assessments will include all countries shown in blue in the adjacent panel.

EWCM Countries





– February 2016 Early Warning Crop Monitor

ica: End of Season Conditions

st Africa: End of Season Synthesis

map synthesizing information for all EWCM crops. Crop conditions over the main growing areas are based on a combination of ional crop analyst inputs along with earth observation data. **Crops that are in other than favourable conditions are displayed on heir crop symbol**

f the region is out of season and the end of season largely favourable. In West Africa and part of (Chad, Cameroon, CAR), the start and end of de dependent. The length of the growing period he south where it starts in March and ends in mber and shorter in the north where it starts in in October. The region also includes a bi-modal long season starts in March and ends in July and n starts in September and ends in November, the ated by a brief dry season that lasts for about a kes place normally in August. In the uni-modal of the season was characterized by poor rainfall rticularly in the Sahelian and Sudanian-Sahelian lanting was delayed. However, the months of July, ptember were generally characterized by average ge and well distributed rains except in the eastern hel that suffered from poor rainfall distribution nd of the season in late September and early ving conditions have been favourable over the natological zones. In the bi-modal zone, however, season started earlier than normal and extended through mid-September, resulting in a production shortfall, particularly for maize.

escription

country's share of total average regional production, in the case of the regional charts, and total national production in the case of the national charts. Sections within ghted by the average sub-national production statistics of the respective country.

mers: The Crop Monitor assessment is conducted by GEOGLAM with inputs from the following partners FEWS NET, JRC, WFP and UMD. The findings and conclusions ency report are consensual statements from the GEOGLAM experts, and do not necessarily reflect those of the individual agencies represented by these experts. ation on the GEOGLAM crop assessments is available at www.geoglam-crop-monitor.org

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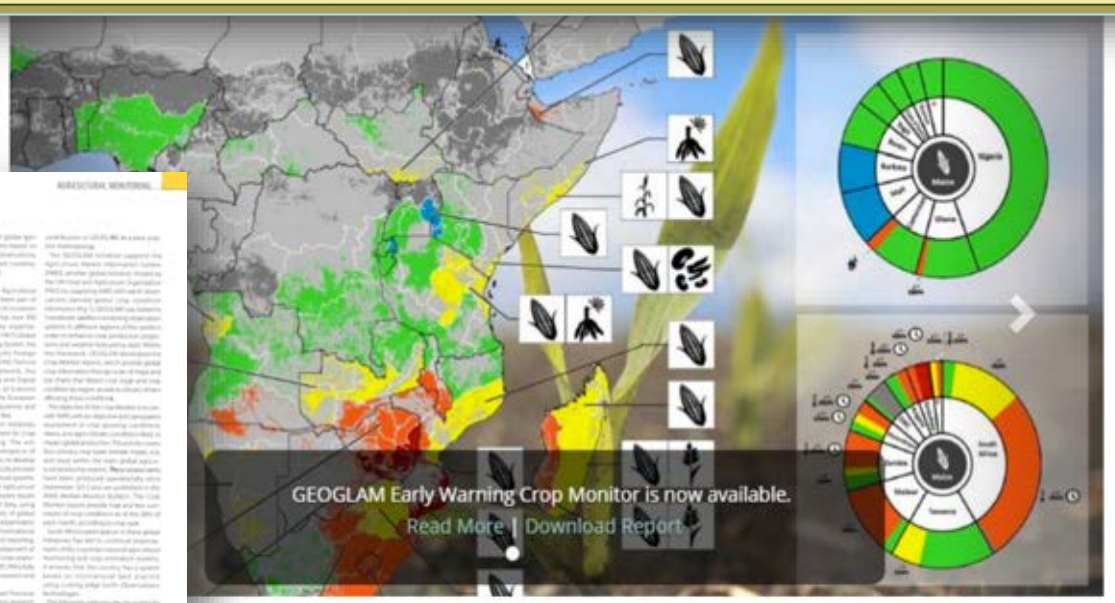
In the Media

GEO Announces Launch of Early Warning Crop Monitor: A New Tool to Fight Food Insecurity

GEO's US Co-Chair, Dr Kathryn Sullivan, Administrator of the US National Oceanic and Atmospheric Administration (NOAA), stated, "Concerns over food and water security are rising globally. Ensuring that agricultural industries around the world have access to the best science, data, tools and resources is essential as we work to increase food security and mitigate the effects of droughts and floods. The GEOGLAM Early Warning Crop Monitor provides decision-makers with essential information, gathered from satellites, buoys and other observational tools, to be ready, responsive and resilient against extreme weather and water events."



...he GEO Global Agricultural Monitoring Initiative (GEOGLAM), initiated by the G-...Ministers, the Early Warning Crop Monitor (ECWM) provides consensus reports ...on crop conditions in countries at risk of food insecurity in Central and South America, Africa,

ARC Article South Africa

Business / Land & Agriculture

Dry and brown Southern Africa will need food aid

BY EMIKO TERAZONO AND ANDREW ENGLAND, FEBRUARY 15 2016, 05:52

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FEWS NET

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SOUTHERN AFRICA Special Report March 18, 2016

Illustrating the extent and severity of the 2015-16 drought

A severe drought, related to El Niño, is ongoing across the Southern Africa region. This drought has limited crop production and exacerbated the current lean season. While April/May harvests will provide some temporary relief, food insecurity during the 2016/17 consumption year is expected to be severe. This report presents a series of maps which illustrate the extent and the severity of the drought as well as its impacts on water availability, crop and rangeland conditions, food prices, and food security. For a more detailed narrative and analysis of the drought's current and expected impacts on food security, please visit www.fews.net/south.

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THE United Nations' World Food Programm announced that it would this year -- for the f suspend food aid in March but continue to a Zimbabweans until next year.

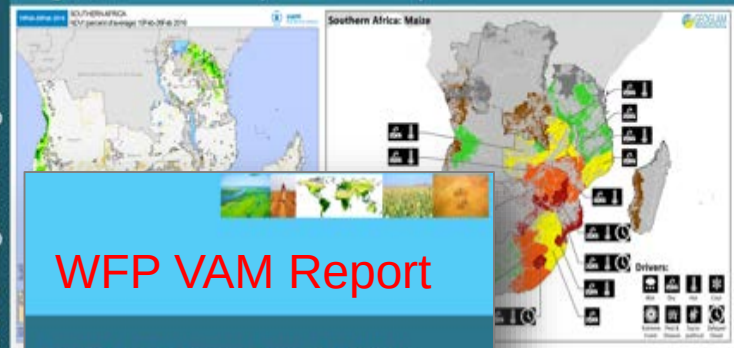
In a statement released yesterday, WFP sa "period of bounty" and will continue offering the year into next year.

Pawn On African Waters

Africa: Africa Development Week Kicks Off in Addis

Vegetation Status and Crop Production Perspectives

Southern Africa: A Season of Regional Drought



Left: NDVI in late February 2016, as a percentage of a 12-year average. Orange shades indicate below-average vegetation; green shades indicate above-average vegetation. Right: Maize production perspectives from a multi-agency assessment (GEOGLAM)

WFP VAM Report

Southern Africa Growing Season 2015-2016:

A Season of Regional Drought

vam food security analysis

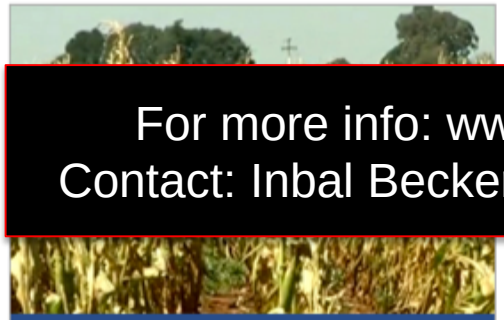
spread drought. A joint assessment of crop production perspectives carried out by D) confirms a very pessimistic picture across most of the region: the situation is nerally poor production in the rest of the country. Similar outcomes extend to the mbique can also expect crop failures in its southern regions. Only regions such as northern Mozambique, Tanzania, northeast Zambia, northern Malawi and parts of Angola face normal production scenarios, as they benefit from El Nino induced rainfall enhancements typical of East Africa.

South Africa's maize production estimates for this season have been revised downwards slightly in February, to about 7.2 million tons, 27 percent below last year's and 38 percent below the 5 year average. The USDA Foreign Agriculture Service is more pessimistic, estimating production at 6.5 million tons. Similar variations may be expected for Zimbabwe, possibly Mozambique and Malawi, with more moderate losses in Zambia.

Southern Africa to face severe food crisis

Friday 25 March 2016 09:40

ANA



Two years of consecutive drought has limited crop production.(SABC)

The Famin

FEWSNET expected fr April/May, Monitor (E 28, crop fa Swaziland, Zimbabwe

Crop condi western Ma Malawi, no producing Mozambiqu

TAGS:

Famine Early Warning System Network Drought GEOGLAM Early Warning Crop Monitor EWCM Botswana FEWSNET Food insecurity Zimbabwe Malawi Mozambique Zambia Lesotho Madagascar

International Edition

FINANCIAL TIMES

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Comment Now

Southern Africa warned of severe food crisis

AFRICA Thursday 24 March 2016 - 4:04pm

ar, southern Zambia, southern th Africa, Zimbabwe and

(FEWSNET) has warned in 2016-2017 after two years of consecutive drought which have limited crop production.

In a new special report entitled "Illustrating the extent and severity of the 2015-2016 drought," FEWSNET said although temporary relief was expected from the harvests expected in April/May, the GEOGLAM Early Warning Crop Monitor (EWCM) had shown that as of February 28, crop failure had been confirmed in Lesotho, Swaziland, southern Mozambique, southern Zimbabwe and eastern Botswana.

For more info: www.geoglam-cropmonitor.org
Contact: Inbal Becker-Reshef, ireshef@geoglam.org

World Food Programme FEWS NET Food and Agriculture Organization of the United Nations

Joint Statement

El Niño Set to Have a Devastating Impact on Southern Africa's Harvests and Food Security

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CEOS Ad Hoc WG for GEOGLAM

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GEOGLAM Data Requirements & Requests

- JECAM
- Asia-RiCE
- RAPP
- Additional Requests (via DRST)

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Evolution of GEOGLAM Data Requirements

- Cookbook and Grocery List analogy
  - One step further: Remote Sensing analysts are the cooks; End-users are the eaters/consumers ☺
- We are now talking about collecting the “grocery list” from different “cooks”
  - Data Request Submission Tool (DRST)
- Cookbook will also evolve – with R&D progress
  - Training an important component of transitioning R&D into operational context
  - How to incorporate growing activities (e.g. RAPP) requirements, for the CEOS audience?

GEOGLAM's Data Requirements Submission Tool (1)

What? A mechanism for GEOGLAM community members to communicate their space-based EO data needs

- Forward looking (new) data needs
- Backward looking (archival) data needs
- …so that GEOGLAM can work with CEOS and space agencies to meet GEOGLAM's needs

Why?

- The first step in a pipeline to request and obtain space-based EO data for agricultural monitoring applications (e.g. crop conditions, crop yield forecasting & estimation, cropland & crop type mask, crop calendars) – coordinated data for GEOGLAM.
  - A request ≠ a guarantee of fulfillment

Who?

- Requests *from*: Remote sensing analysts who participate in GEOGLAM who need support in discovering, requesting, and/or obtaining space-based EO data
- Requests *to:* CEOS, the CEOS Ad Hoc Working Group for GEOGLAM, and the space agencies

Which Data?

- New Acquisitions: any mission currently operational from a civil space agency
- Archival Data: a few missions currently available, working to expand

Submit requests here: https://goo.gl/dmV87v

GEOGLAM's Data Requirements Submission Tool (2)

How?

- **Step 1: Submit requests here:** https://goo.gl/dmV87v
  - *Which data (spectral/spatial resolution), when, where, how frequently?*
  - *For what purpose?*
  - *Do you need help with downloading, storing, or pre-processing data?*
- **Step 2: GEOGLAM Secretariat & CEOS Ad Hoc WG evaluate submissions**
  - *For archival data requests – we search the metadata archives to see what exists, then submit requests to agencies*
  - *For new acquisition requests – we evaluate capabilities to meet requirements, and request acquisition plan modifications to accommodate them*

When to submit requests?

- **Starting now, only when you are ready and willing to use the data**
- **Data readiness definitions:**
  - *Level 1: You have the desire and capacity to analyze the satellite data, but lack the capacity to download, store, and/or preprocess data for use. Therefore, a data services solution is desired to manage any data.*
  - *Level 2: You have the desire and capacity to download, store, preprocess, and analyze satellite data, but require CEOS intervention to do so (including: mode selection, coverage expansion, license assistance, etc.).*
  - *Level 3: You have the desire and capacity to download, store, preprocess, and analyze satellite data, but you require NO intervention on the part of CEOS (no new acquisition requests or aid in securing archival datasets).*

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GEOGLAM Global Agricultural Monitoring

Points of Contact for Data Requests

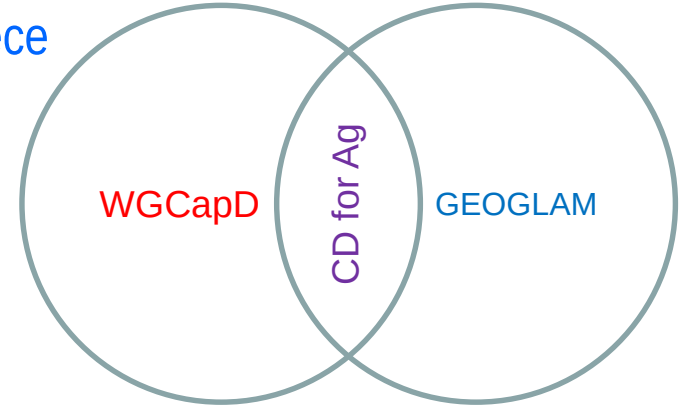
Mission	Instrument	Agency	Policy	Data Issue	Points of Contact
Terra/Aqua	MODIS	NASA	Open	None	
Suomi-NPP	VIIRS	NASA	Open	None	
Landsat-7/8	ETM+	NASA/USGS	Open	None	
Sentinel-2A	MSI	ESA	Open	Routine ARD	Ben Koetz
HJ-1A	HSI	CRESDA/CAST	Open	Access / Coverage	Wu Bingfang (?)
ResourceSat-2	AWiFS/LISS	ISRO	Restricted	Access / Coverage	Rajeev Jaiswal
CBERS-4	Imagers	INPE/CAST	TBD	Access / Coverage	Julio D'Álge
Pleiades-1A/1B	HiRI	CNES	Restricted	Access / Coverage	Steven Hosford
Radarsat-2	SAR C-band	CSA	Restricted	Access / Coverage	Yves Crevier
Sentinel-1A/1B	SAR C-band	ESA	Open	Routine ARD, Coverage	Ben Koetz
RISAT-1	SAR C-band	ISRO	Restricted	Access / Coverage	Rajeev Jaiswal
ALOS-2	SAR L-band	JAXA	TBD	Access / Coverage	Shin-Ichi Sobue (?)
TerraSAR-X	SAR X-band	DLR	Restricted	Access / Coverage	Helmut Staudenrausch

Future of Ad Hoc WG?

- Discussion around LSI-VC & longer-term transitioning

Linkages with CEOS WGCapD

- Discussions initiated with Jane Olwoch and Eric Wood – co-leads
  - Desire to support the CAHWGG
- There are two points of connection possible:
  - GEOGLAM Lead/PoC on CEOS Ad Hoc WG (Alyssa)
  - GEOGLAM Capacity Development Component 6
    - *Lack of coordination in this component is what led to the initial contact with CEOS WGCapD (desire to move us forward in some way)*
- Both communities need to formulate a comprehensive, higher level plan for coordinating activities around CD
  - It makes sense to collaborate on the ag piece
- For now, agreed:
  - Alyssa to call into WGCapD telecons
  - Look for synergistic opportunities



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Discussion Questions

- What are strategic issues and top priorities for CEOS and GEOGLAM in the next 12-18 months?
  - Short & Long Term Plans for GEOGLAM (as impacting CEOS)
- What can CEOS do for GEOGLAM…
  - …that it is not already doing?
  - …that it is already doing (and should keep up the good work)?
- Key communication points
  - Disambiguation of the term “user”
  - Mechanisms for requesting and fulfilling data requests
- How to move forward on “ARD” definition for Agriculture?

Plans for SIT TW & 30th Plenary

- SIT TW
- Plenary