GROUP ON EARTH OBSERVATIONS

GEOGLAM
Global Agricultural Monitoring

G20 Global Agricultural Monitoring International Coordination

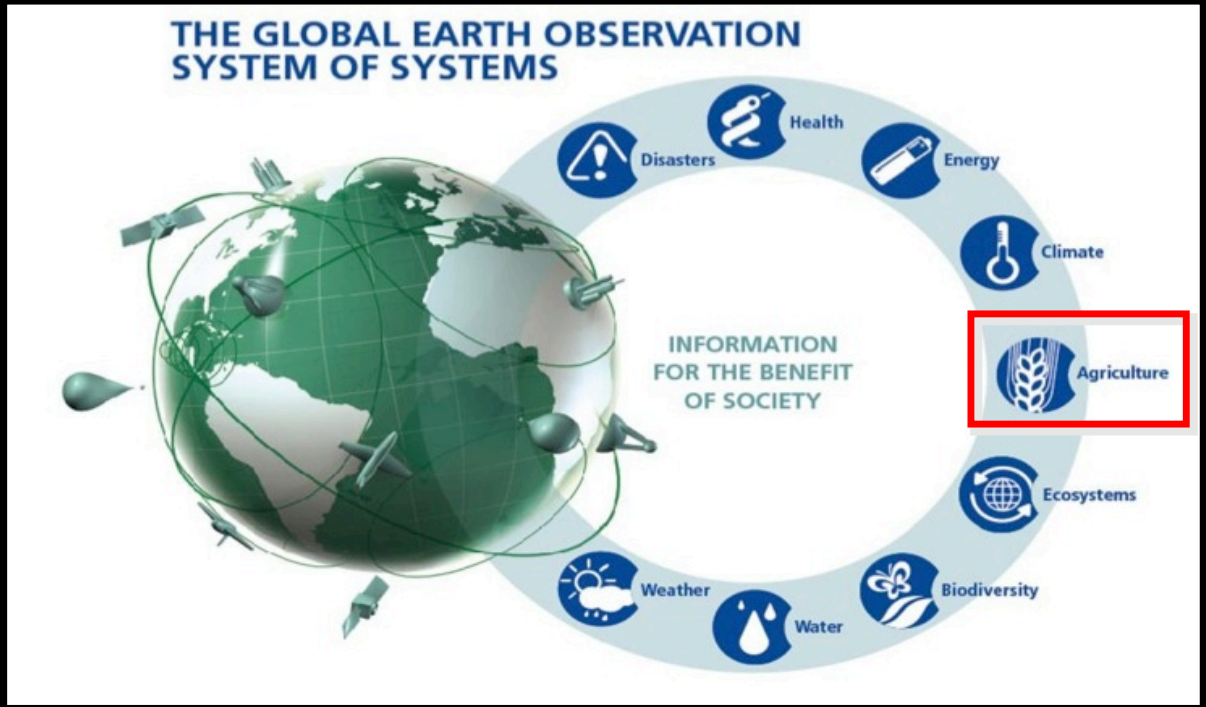
GEOGLAM

Christina Justice

www.geoglam.org
@G20_GEOGLAM

GEO is the interministerial international program focused on the use of Earth Observations for societal benefit

- GEO was initiated in 2005
- Agriculture is one of the GEO societal benefit areas
- GEOGLAM is GEO's Agricultural initiative



Connecting Space Agencies to User Communities

Building a Community Agenda: Identifying and Addressing Common Issues facing Agricultural Monitoring

- Timeliness in obtaining EO data (satellite and in-situ)
- Accessibility to international satellite data
- Continuity of satellite data for operational monitoring
- Robustness of methods for national, regional to global application – lack of field level validation data, absence of best practices for different cropping systems and regions
- Difficulty in transitioning research methods into operational use
- Need for capacity building and support to use EO data in many operational monitoring institutions - including new sensors
- Quality and timeliness of global/national agricultural data and statistics
- Decline and privatization of in-situ weather data
- Accuracy of seasonal forecast data
- In general a low investment in agricultural research and agricultural extension services

GEOGLAM Actors
GEOGLAM Community of Practice

Open Community made up of individuals from international and national agencies concerned with agricultural monitoring including Ministries of Ag, Space Agencies, Universities, & Industry

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GEOGLAM Global Agricultural Monitoring

Context For GEOGLAM

Monthly Wheat Prices 1960-2011($/Metric Ton)

Source: World Bank

Landsat 1 Launched (1972)

1971/2's price hike

NASA NOAA USDA

1996 price hike

2010/11 Price hikes Drought: Russia USA

2008 Price hikes Droughts: Australia & Ukraine

400.00
350.00
300.00
250.00
200.00
150.00
100.00

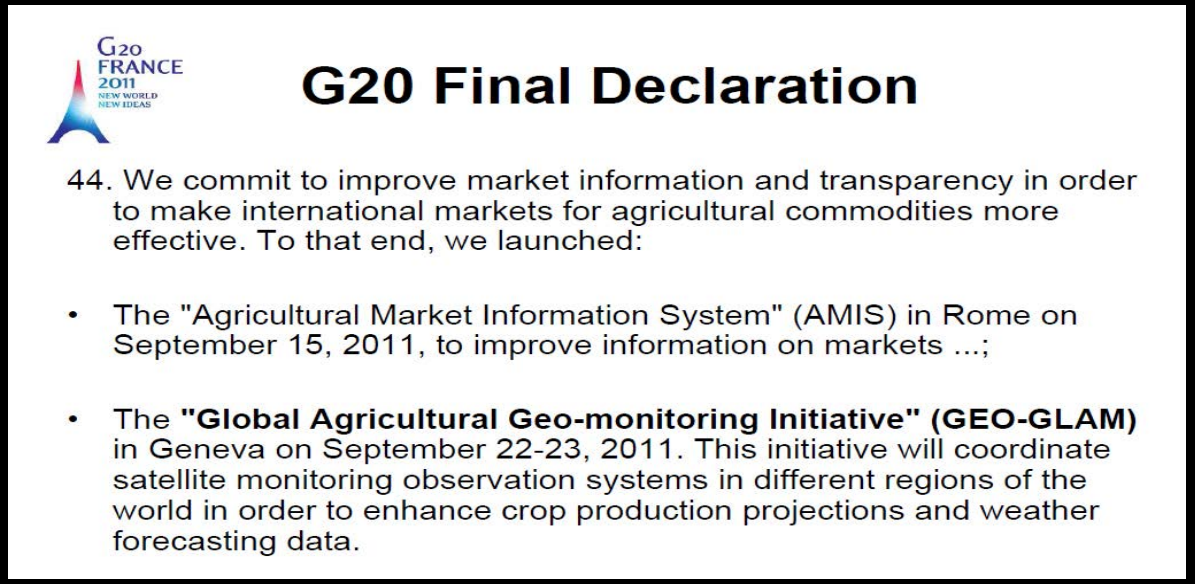
1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010

Nominal wheat price in US $/metric Ton

GEO Ag Task


The Washington
NORTH KOREA
Huge Gap Predicted In Supply
guardian.co.uk | The Observer
Food aid to poorest countries slashed as price of grain soars
Climate change compounds Ethiopia's food crisis
China View
WORLD
Food crisis grip rural parts of Nepali Chitwan district
BBC NEWS
Biofuel demand makes food expensive
The Economist
International recognition of critical need for improved real-time, reliable, open information on global agricultural production prospects
critical for agricultural policies, stabilizing markets, averting food crises
Need to increase food production by 50%-70% by 2050 to meet demands (FAO)
More than 1 billion hungry, UN
15 October 2009
Department of Agriculture, Fisheries and Forestry
ABARES
中国农业科学院
The Chinese Academy Of Agricultural Sciences
Kenya among food crisis nations,
FAMINE
Why are Ethiopians starving again?
What should the world do—and not do?
The New York Times
Food Crisis
BBC NEWS AFRICA
Somalia famine: UN warns of 750,000 deaths
Rush to Use Crops as Fuel Raises Food Prices and Hunger Fears
The New York Times
Thursday, November 10, 2011
Times
2010 Pakistan Floods
Bloomberg.com
Global Food Crisis
Little Keeps Nigeria From Crisis
Hunger in India: The Crisis Wors
SIAP
BBC NEWS
ONE-MINUTE WORLD NEWS
Bangladesh bans most rice expo
TIME

Policy Framework for GEOGLAM

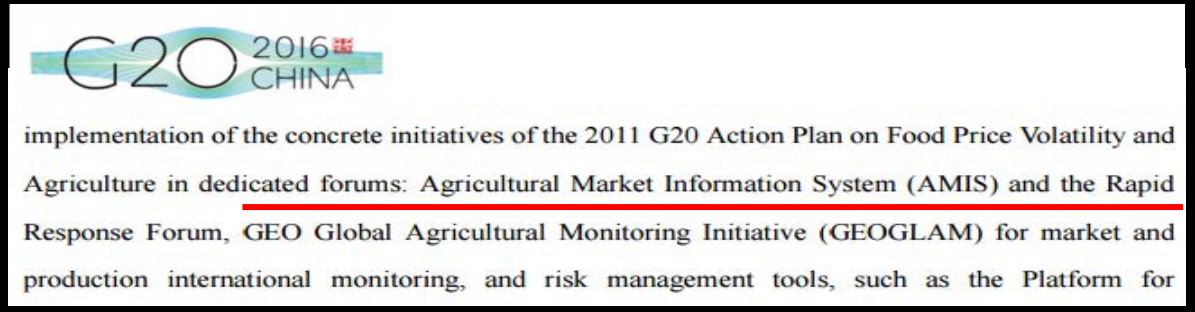


G20 FRANCE 2011 NEW WORLD NEW IDEAS

G20 Final Declaration

44. We commit to improve market information and transparency in order to make international markets for agricultural commodities more effective. To that end, we launched:

- The "Agricultural Market Information System" (AMIS) in Rome on September 15, 2011, to improve information on markets ...;
- The **"Global Agricultural Geo-monitoring Initiative" (GEO-GLAM)** in Geneva on September 22-23, 2011. This initiative will coordinate satellite monitoring observation systems in different regions of the world in order to enhance crop production projections and weather forecasting data.



G20 2016 CHINA

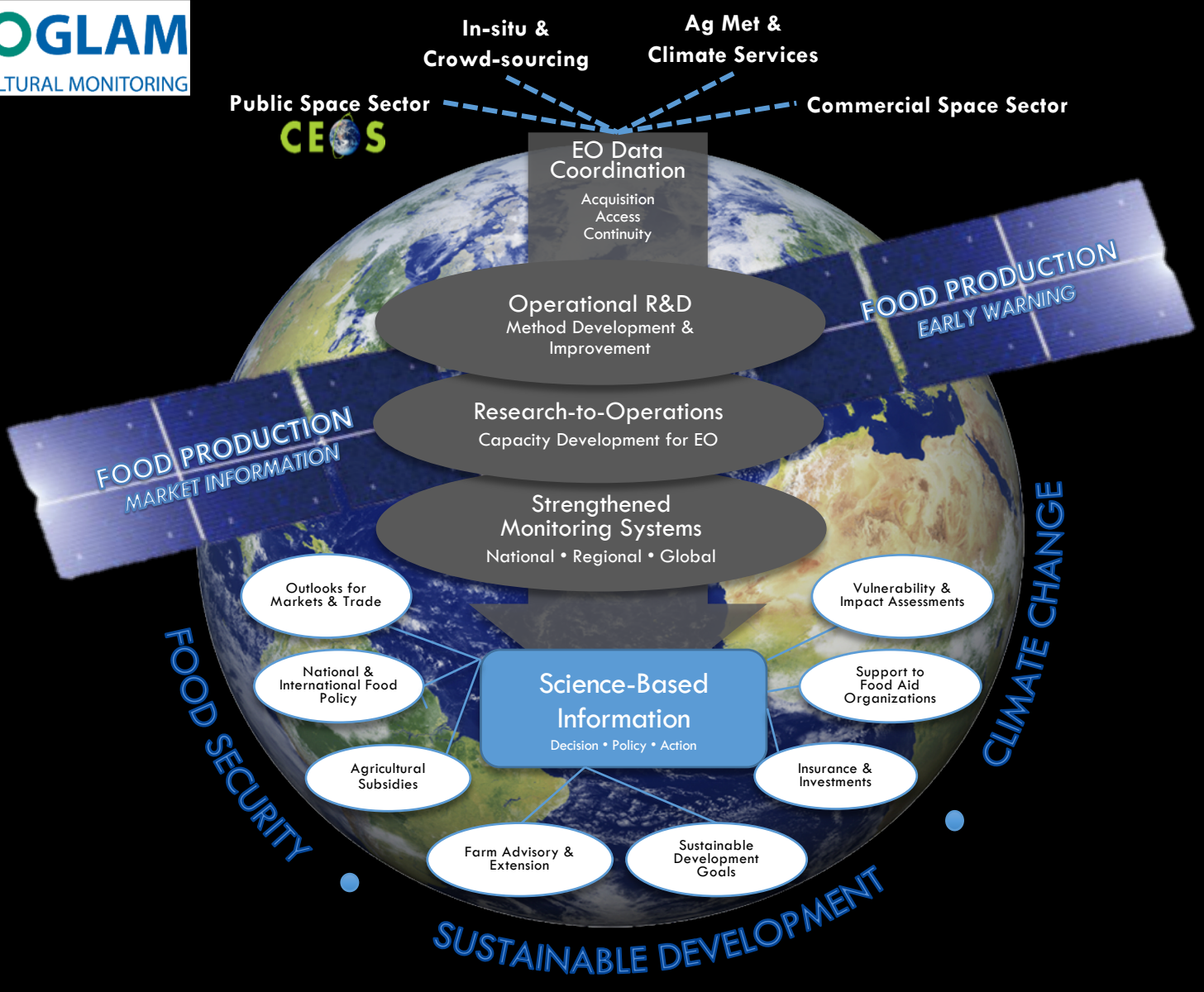
implementation of the concrete initiatives of the 2011 G20 Action Plan on Food Price Volatility and Agriculture in dedicated forums: Agricultural Market Information System (AMIS) and the Rapid Response Forum, GEO Global Agricultural Monitoring Initiative (GEOGLAM) for market and production international monitoring, and risk management tools, such as the Platform for

Vision:

Strengthen international community's capacity to provide actionable, science-driven, open, information at sub-national to global scales, in support of policies, investments and decisions, in food security, & ag. Markets

- Through use of coordinated Earth Observations (EO)
- Building on existing systems

GEOGLAM
GLOBAL AGRICULTURAL MONITORING



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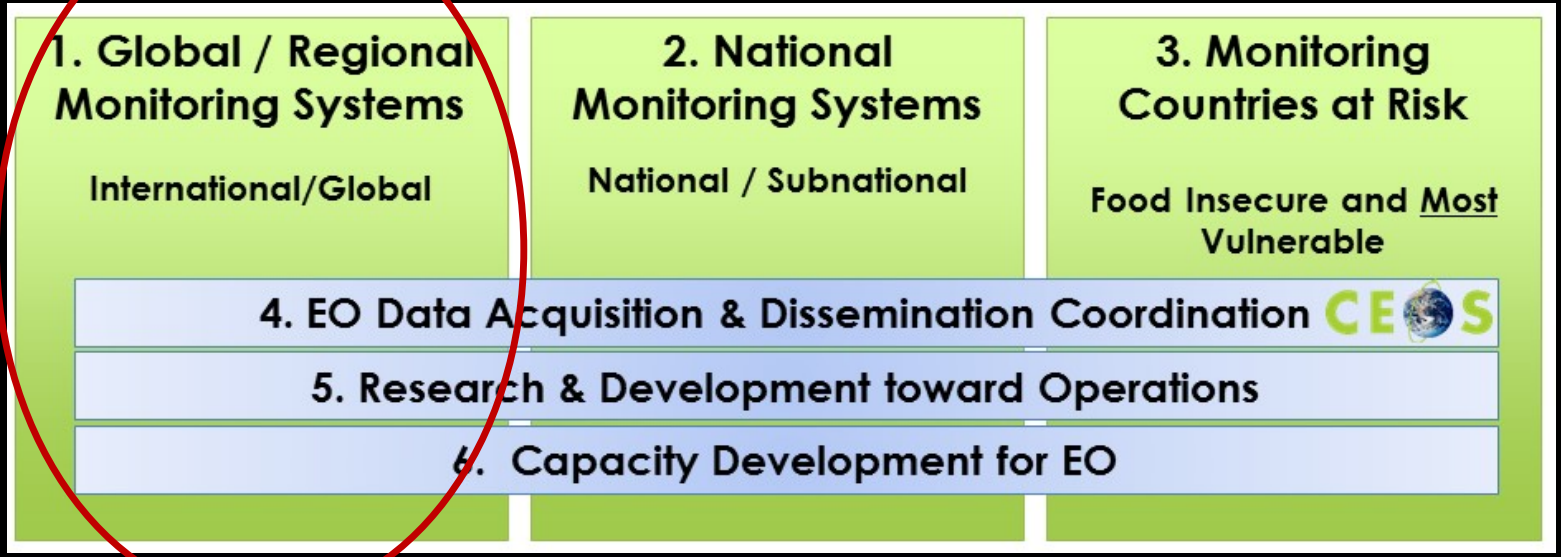
GEOGLAM
Global Agricultural Monitoring

The GEOGLAM Components



AMIS: Agricultural Market Information System

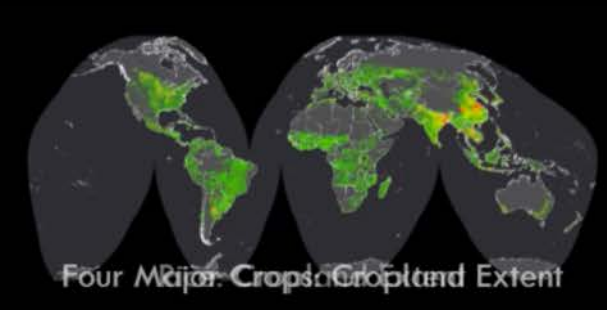
Improve market information and transparency

inter-Agency Platform to enhance food market transparency and encourage coordination of policy action in response to market uncertainty

www.amis-outlook.org

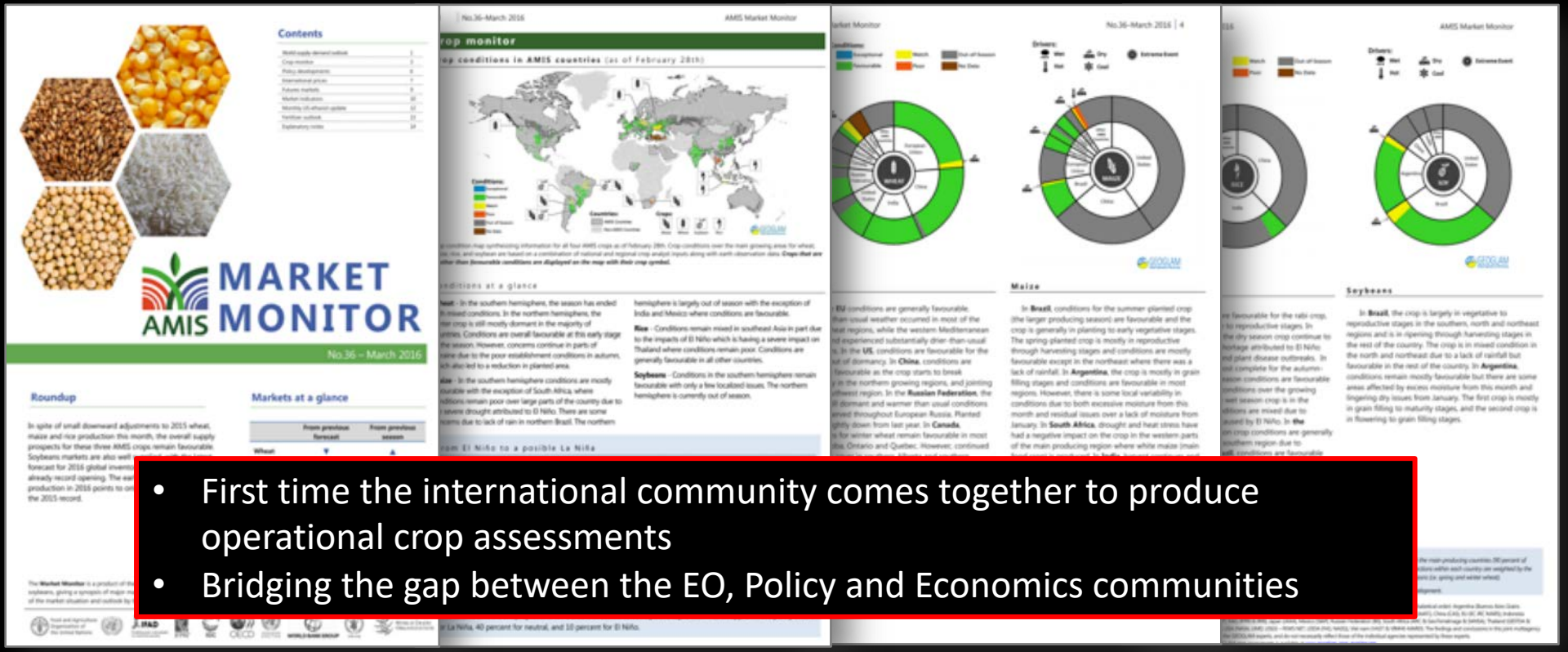
Launch of Global Operational Crop Assessments:
AMIS Request to GEOGLAM

- Provision of timely and transparent monthly crop condition assessments in primary agricultural production areas
- Reflecting an international consensus, building on existing systems
- Four Major Crops: Wheat, maize, soybean, rice
- Focus: main production/export countries (AMIS Countries), stabilizing/ calming markets, avoid unexpected food price shocks
- Output: Crop Monitor, published in Market Monitor



Operational Monthly Bulletin Since 2013
Published in the AMIS Market Monitor

Focus on primary production and export countries
> 40 contributing organizations

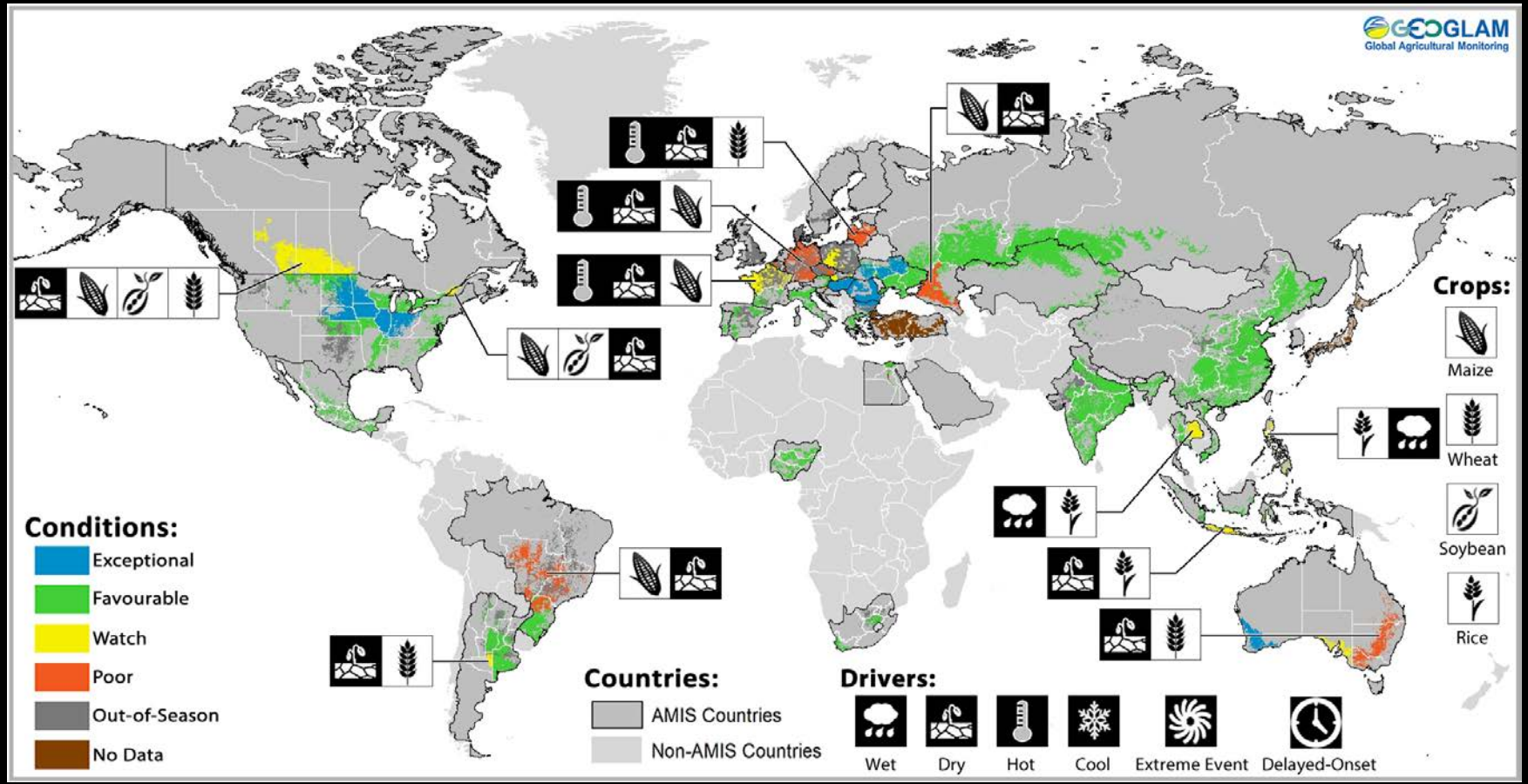


- First time the international community comes together to produce operational crop assessments
- Bridging the gap between the EO, Policy and Economics communities

GEOGLAM AMIS Crop Monitor Partners

43 partners and 16 inter-governmental organizations over 28 countries actively participating in the GEOGLAM community

Crop Monitor: an international consensus assessment – September 28th

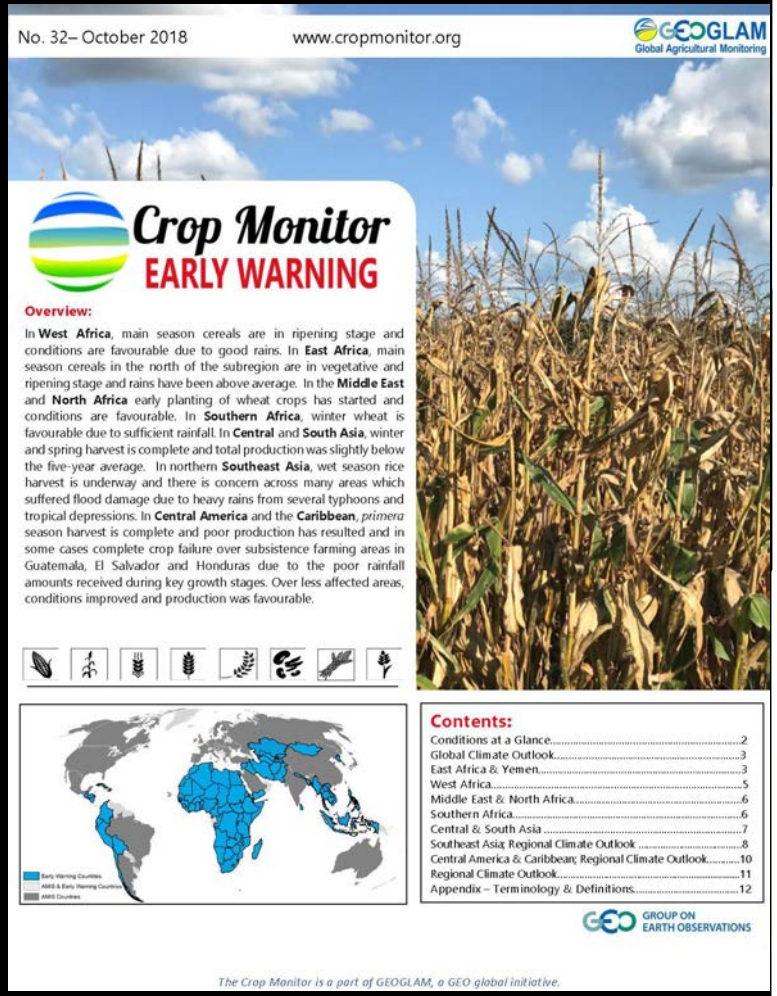


Crop condition and driver map synthesizing information for all four AMIS crops. **Crops that are in other than favorable conditions are displayed on the map with their crop symbol.** (Cropland area shown is an aggregation of all cropland areas)

Becker-Reshef et al.

Crop Monitor for Early Warning

- Grew out of the success of the AMIS Crop Monitor
- Recognition even more pressing need for enhanced, reliable, vetted information on crop conditions within countries at risk
- Response to the Early Warning Community's request



No. 32– October 2018 www.cropmonitor.org

GEOGLAM Global Agricultural Monitoring

Crop Monitor EARLY WARNING

Overview:

In **West Africa**, main season cereals are in ripening stage and conditions are favourable due to good rains. In **East Africa**, main season cereals in the north of the subregion are in vegetative and ripening stage and rains have been above average. In the **Middle East** and **North Africa** early planting of wheat crops has started and conditions are favourable. In **Southern Africa**, winter wheat is favourable due to sufficient rainfall. In **Central** and **South Asia**, winter and spring harvest is complete and total production was slightly below the five-year average. In northern **Southeast Asia**, wet season rice harvest is underway and there is concern across many areas which suffered flood damage due to heavy rains from several typhoons and tropical depressions. In **Central America** and the **Caribbean**, *primera* season harvest is complete and poor production has resulted and in some cases complete crop failure over subsistence farming areas in Guatemala, El Salvador and Honduras due to the poor rainfall amounts received during key growth stages. Over less affected areas, conditions improved and production was favourable.

Contents:

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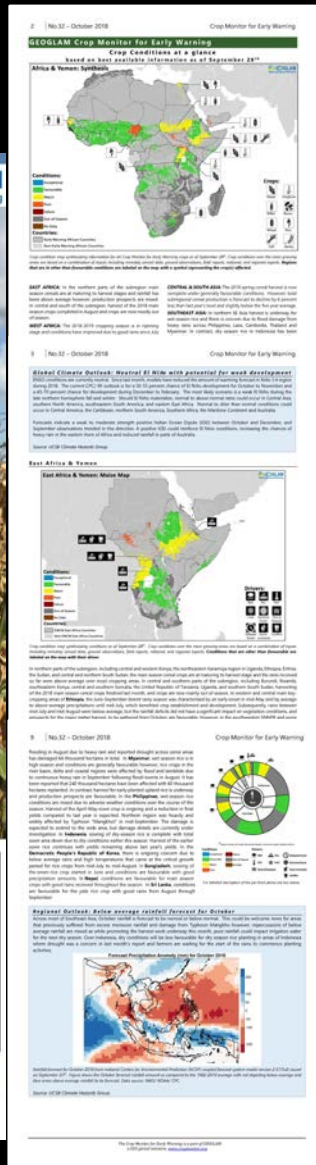
The Crop Monitor is a part of GEOGLAM, a GEO global initiative.

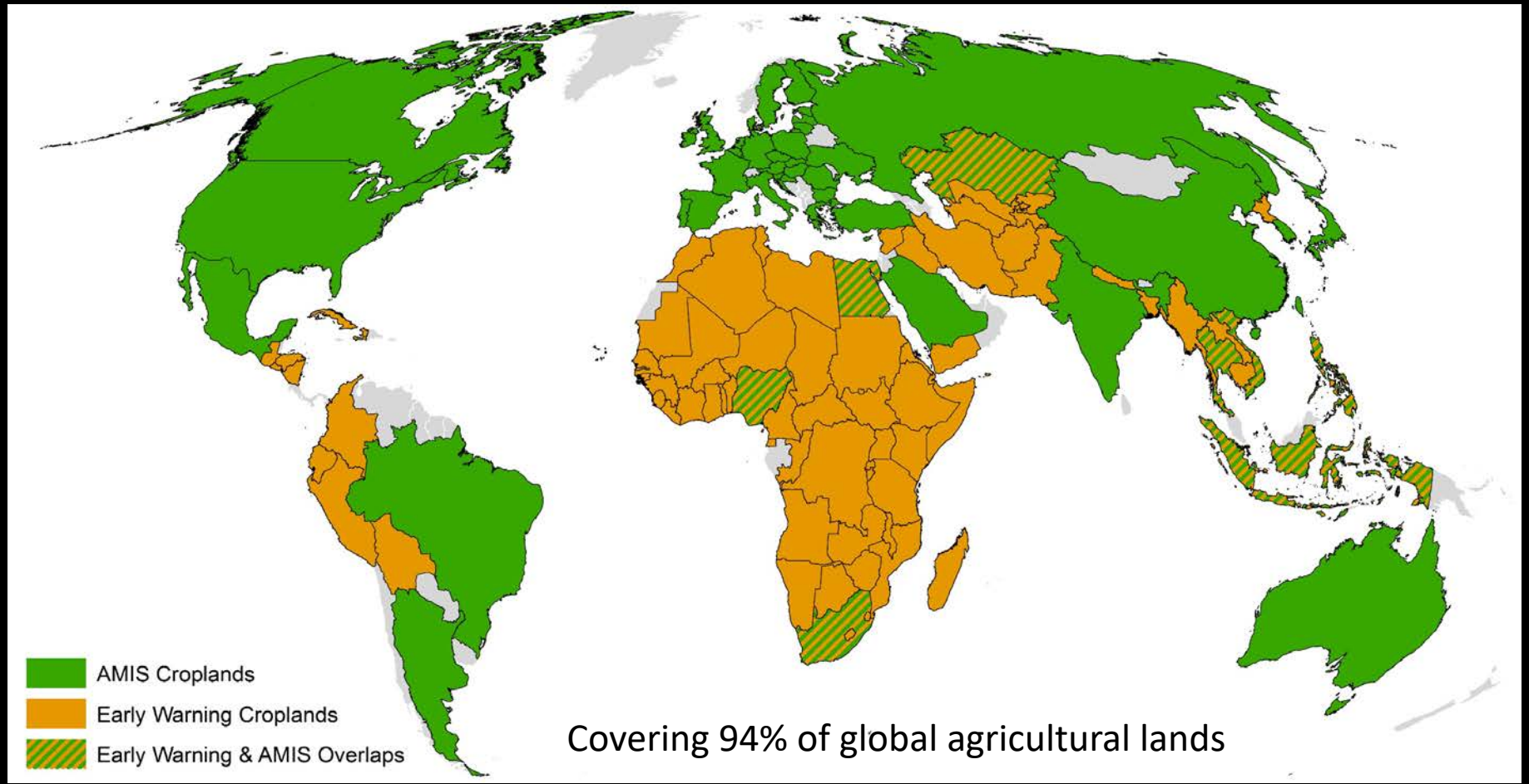


Objective and Partners

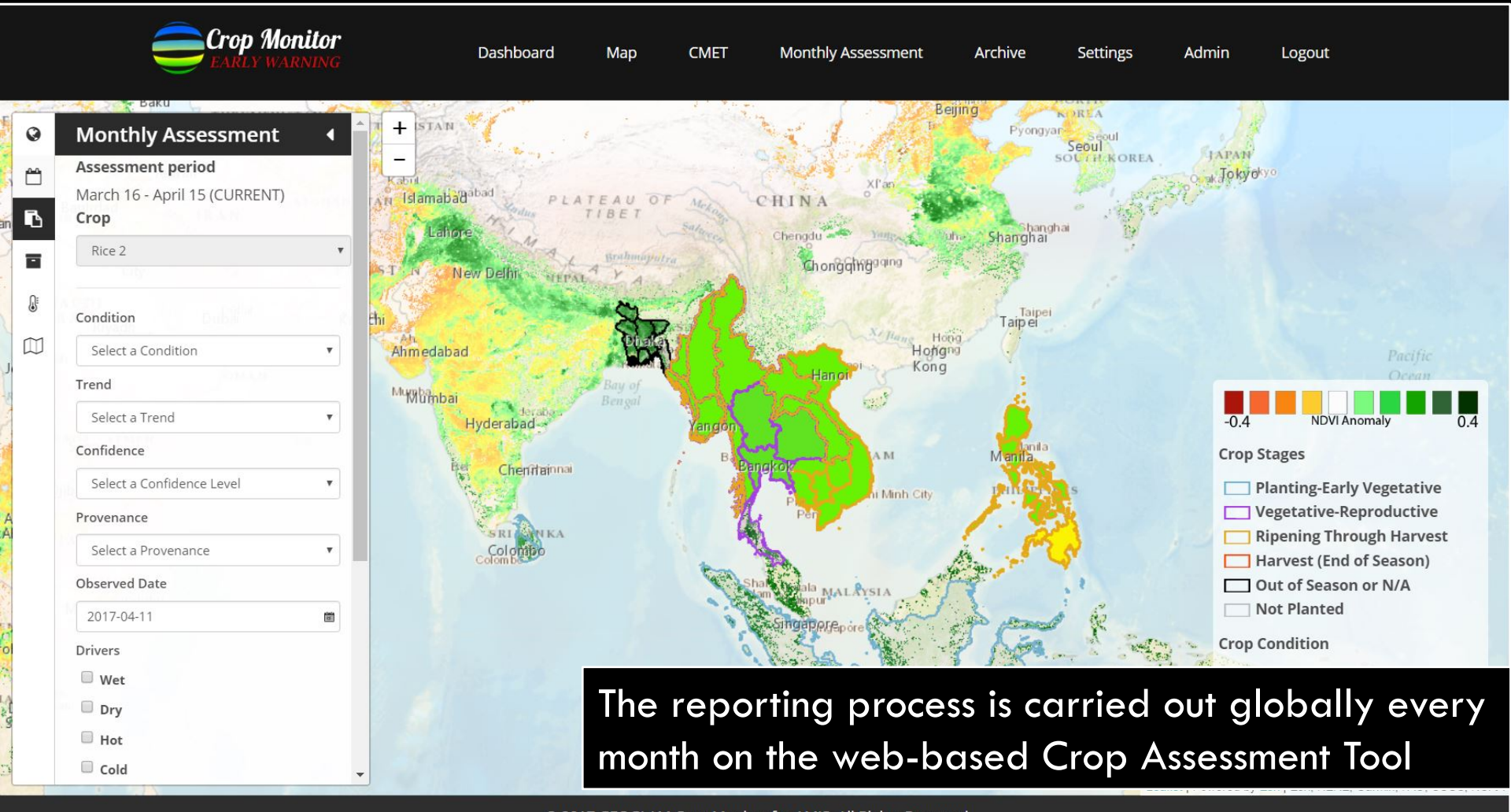
- Exchange information, build consensus and reduce uncertainty in countries most vulnerable to food insecurity, to strengthen agricultural decision making
- Monthly publication, first bulletin published Feb 2016
  - Building on AMIS CM bulletin
  - 14 crops: main food security crops for each region
- Strong focus on continued expansion to regional networks, and national partners

Quality of the product depends on the inputs and commitment of the contributors

Countries Covered: AMIS vs. EW

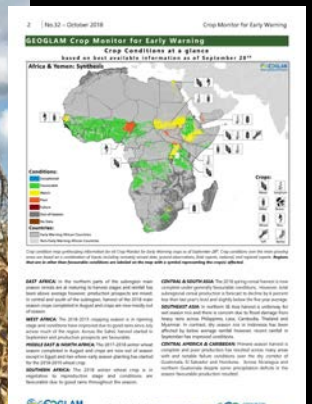


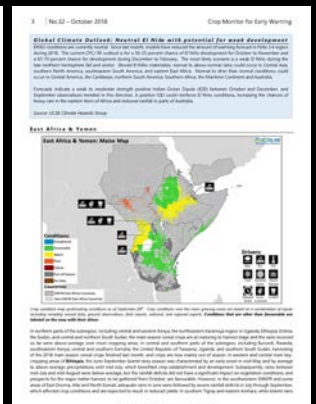
Crop Condition Reporting Interface

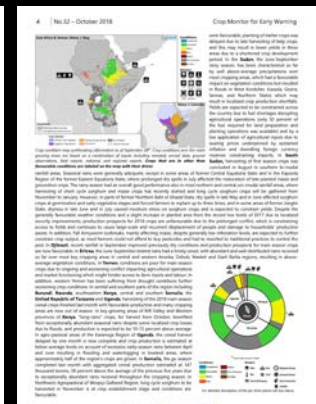


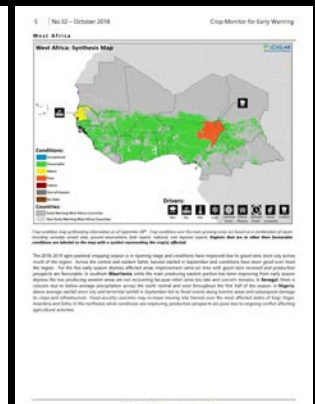
Crop Monitor for Early Warning Bulletin

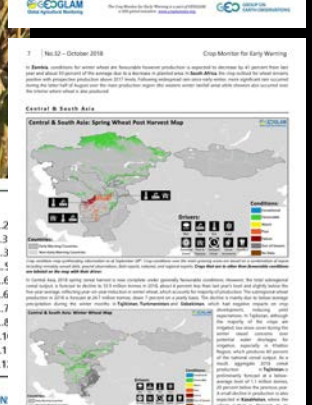
www.cropmonitor.org

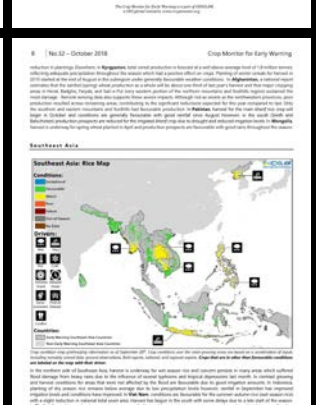


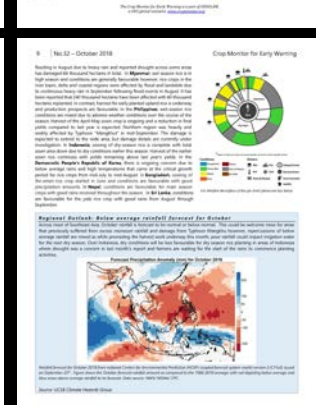


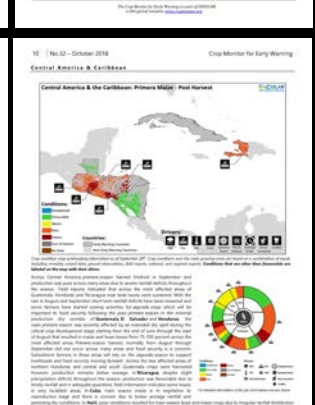













Business / Land & Agriculture
Dry and brown Southern Africa will need food aid
BY EMIKO TERAZONO AND ANDREW ENGLAND, FEBRUARY 15 2016, 05:52
Related articles
Escalating costs hammer Pioneer
Food prices to soar as drought bites
High red meat prices could mean a crash in the market
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Vegetation Status and Crop Production Perspectives
WFP VAM Report
Southern Africa Growing Season 2015-2016:
A Season of Regional Drought
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Already informing agricultural decisions
Southern Africa
Friday 25 March 2016 09:40
ANA
ARC, South Africa
FINANCIAL TIMES
MARKETS OPINION LIFE & ARTS PORTFOLIO
Financial Times
Southern Africa warned of severe food crisis
AFRICA Thursday 24 March 2016 - 4:04pm
GEO Announces Launch of Early Warning Crop Monitor: A New Tool to Fight Food Insecurity
Agricultural Commodities
South African corn withers amid worst drought on record
Impact of extreme weather on food prices set to remain se
Humanitarian RESPONSE
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United Nations Office for the Coordination of Humanitarian Affairs
OCHA
Special alert: Food and Nutrition Security Working Group, 8 February 2018
Highlights
Joint Statement
World Food Programme
FEWS NET
Food and Agriculture Organization of the United Nations
El Niño Set to Have a Devastating Impact
on Southern Africa's Harvests and Food Security

Crop Monitor Impact – Southern Africa 2018

United Nations Office for the Coordination of Humanitarian Affairs

OCHA

Humanitarian RESPONSE

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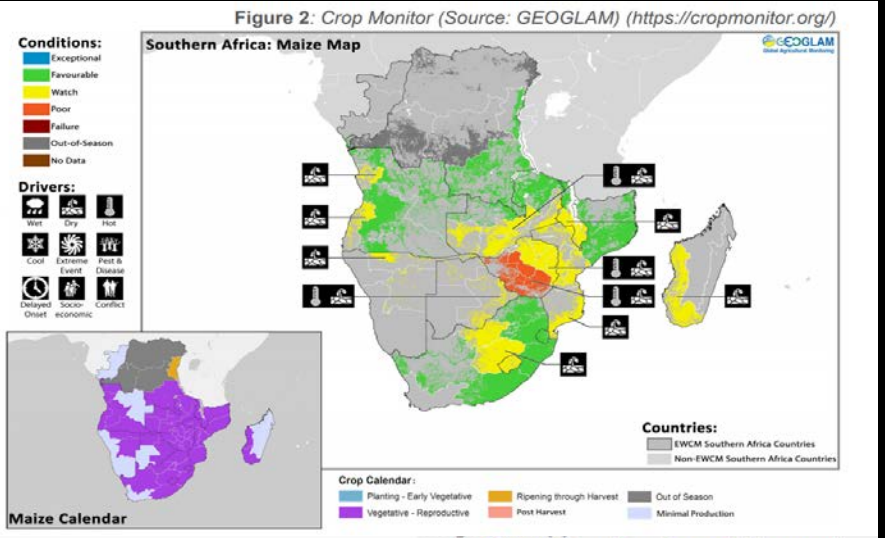
Special alert: Food and Nutrition Security Working Group,



Urgent Actions:

"There is urgent need for members states and development partners to **determine the scale and extent** of the possible impact of the prolonged dry spell on the agricultural season (crop and livestock) to inform appropriate response actions for food security and nutrition and build the resilience of vulnerable populations in the region. **Recommended actions include increased monitoring of the situation**, ascertaining available cereal stocks, fast-tracking of planned crop assessments and annual vulnerability assessments for early warning and early action and increasing off season production where possible."

- These conditions are likely t… produce in the 2018/19 cons…
- Urgent action is required by … production, ascertain the av…

…lication Date: …018

Next Step: Develop Rapid Response mechanism for more detailed and frequent assessments

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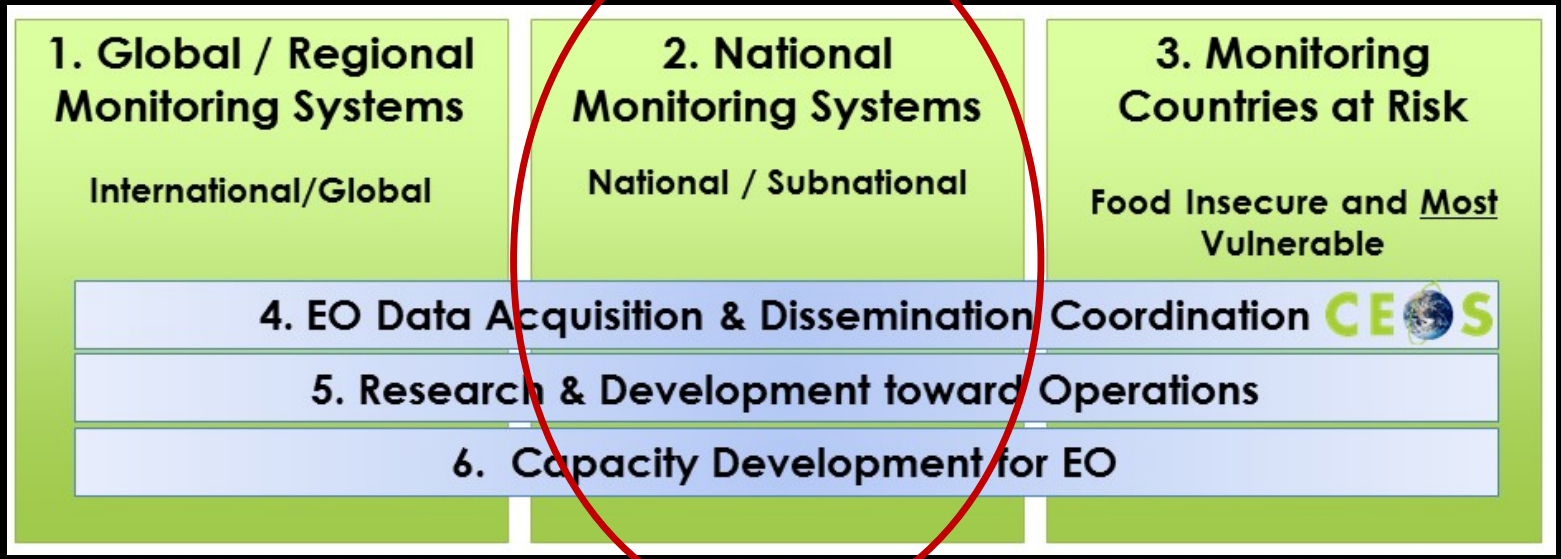
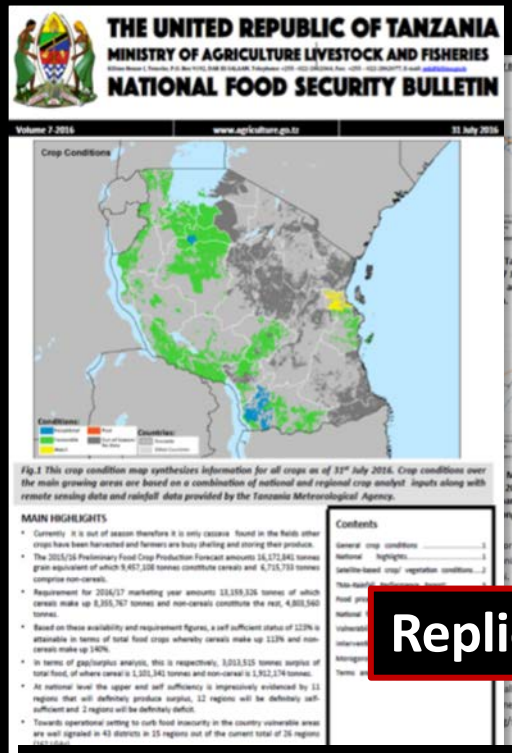
GEOGLAM Global Agricultural Monitoring

The GEOGLAM Components



Development of National Crop Monitors, Facilitating National Food Security Reports


THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF AGRICULTURE LIVESTOCK AND FISHERIES
NATIONAL FOOD SECURITY BULLETIN

Volume 7 2016 | www.agriculture.go.tz | 31 July 2016

Crop Conditions

Fig.1 This crop condition map synthesizes information for all crops as of 31st July 2016. Crop conditions over the main growing areas are based on a combination of national and regional crop analyst inputs along with remote sensing data and rainfall data provided by the Tanzania Meteorological Agency.

MAIN HIGHLIGHTS

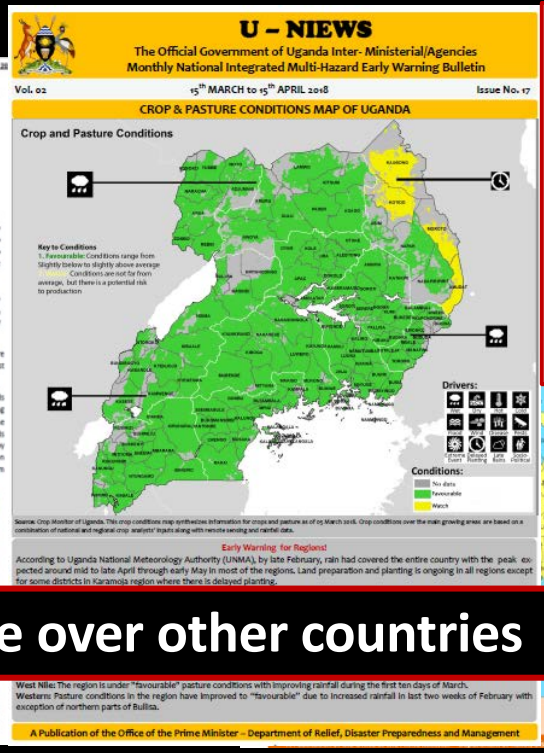
- Currently it is out of season therefore it is only cassava found in the fields other crops have been harvested and farmers are busy shelling and storing their produce.
- The 2015/16 Preliminary Food Crop Production Forecast amounts 16,172,841 tonnes grain equivalent of which 9,457,108 tonnes constitute cereals and 6,715,733 tonnes comprise non-cereals.
- Requirement for 2016/17 marketing year amounts 13,159,326 tonnes of which cereals make up 8,355,767 tonnes and non-cereals constitute the rest, 4,803,560 tonnes.
- Based on these availability and requirement figures, a self sufficient status of 123% is attainable in terms of total food crops whereby cereals make up 113% and non-cereals make up 140%.
- In terms of gap/surplus analysis, this is respectively, 3,013,515 tonnes surplus of total food, of where cereal is 1,101,341 tonnes and non-cereal is 1,912,174 tonnes.
- At national level the upper and self sufficiency is impressively evidenced by 11 regions that will definitely produce surplus, 12 regions will be definitely self-sufficient and 2 regions will be definitely deficit.
- Towards operational setting to curb food insecurity in the country vulnerable areas are well signaled in 41 districts in 15 regions out of the current total of 26 regions

Contents


BULLETIN TANZANIA JULY 2016

Tanzania MODIS 16 day NDVI July, 2016 as it compared to and 2016 and the longterm

MODIS 16 day NDVI for 27 2016 for Pwani Region as ured to 2014 and 2016 and ngterm mean.


U – NIEWS
The Official Government of Uganda Inter- Ministerial/Agencies
Monthly National Integrated Multi-Hazard Early Warning Bulletin

Vol. 02 | 15th MARCH to 15th APRIL 2018 | Issue No. 17

CROP & PASTURE CONDITIONS MAP OF UGANDA

Crop and Pasture Conditions

Key to Conditions

Drivers:

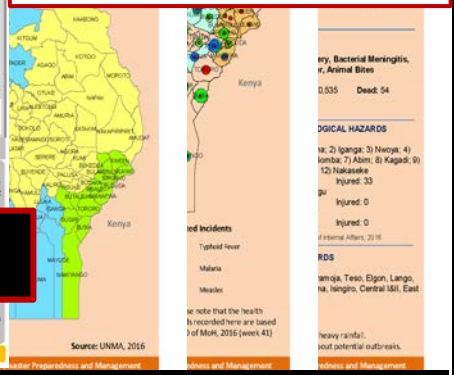
Conditions:

Early Warning for Regions!

According to Uganda National Meteorology Authority (UNMA), by late February, rain had covered the entire country with the peak expected around mid to late April through early May in most of the regions. Land preparation and planting is ongoing in all regions except for some districts in Karamoja region where there is delayed planting.

West Nile: The region is under "favourable" pasture conditions with improving rainfall during the first ten days of March.
Western: Pasture conditions in the region have improved to "favourable" due to increased rainfall in last two weeks of February with exception of northern parts of Bullisa.

A Publication of the Office of the Prime Minister – Department of Relief, Disaster Preparedness and Management


Kenya

Source: UNMA, 2016

Kenya

Typhoid Fever
Malaria
Measles

Dead: 54

Injured: 33
Injured: 0
Injured: 0

U-NIEWS DISTRIBUTION
- 7,000 people by Email (Ministers, MP's, Ministries, technical offices…)
- 15 million phones; SMS
- 200 publications distributed to top leaders

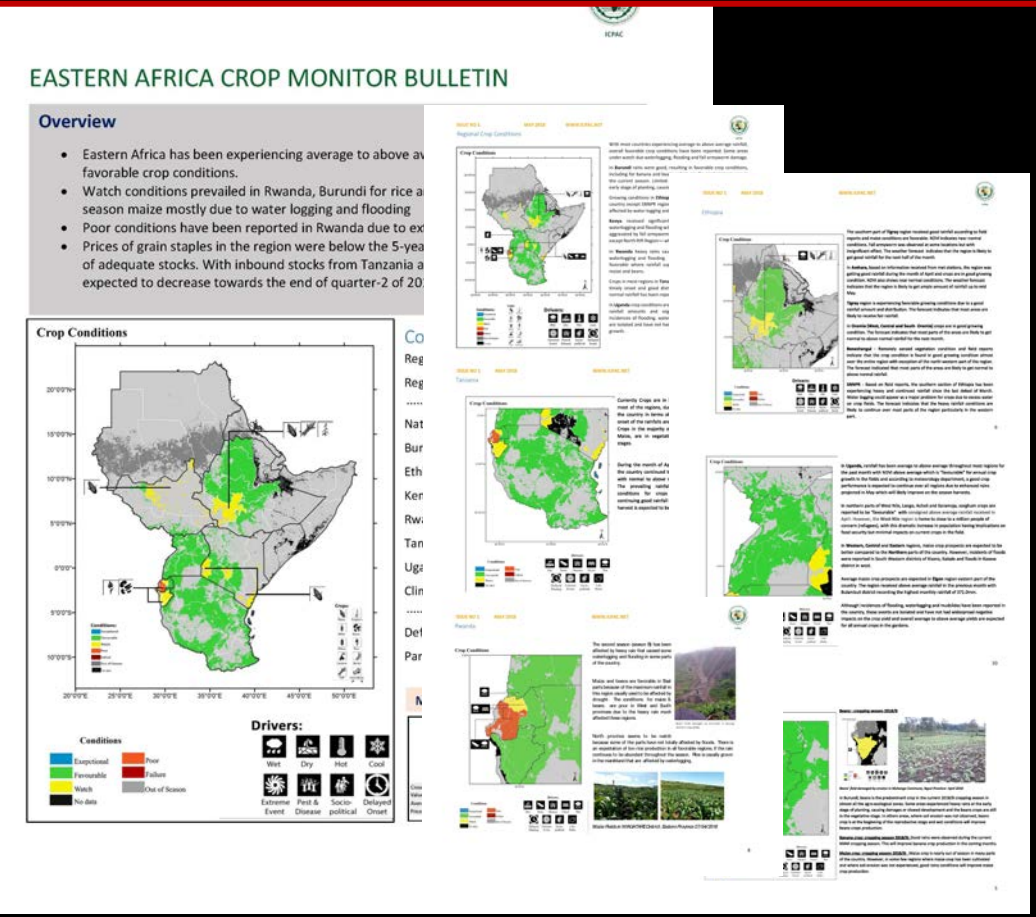
Replicable and scalable over other countries

National Food Security Bulletin, published by the Tanzania Ministry of Agriculture Food Security, National Food Security Division

The Inter-Ministerial/Agencies Monthly National Integrated Multi-Hazard Early Warning Bulletin, published by the Uganda Office of the Prime Minister

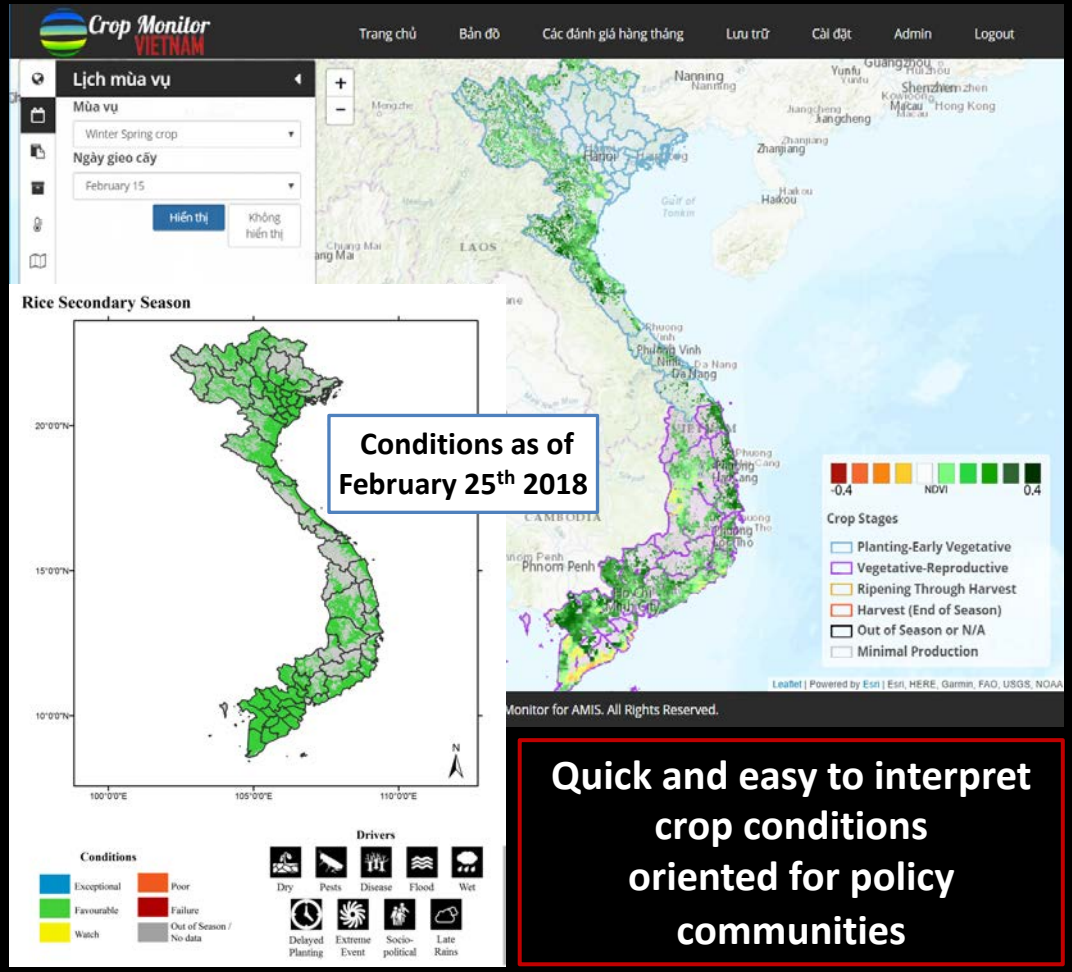
The Eastern Africa Crop Monitor, launched May 2018

Replicable and scalable at the regional scale



- IGAD Climate Prediction and Applications Centre (ICPAC) Eastern Africa Crop Monitor Report
  - Launched in Djibouti May 2018
  - Published in The Greater Horn of Africa Climate Outlook Forum (GHACOF) Bulletin
- 19 analysts trained and 11 national focal points
- Strong regional support

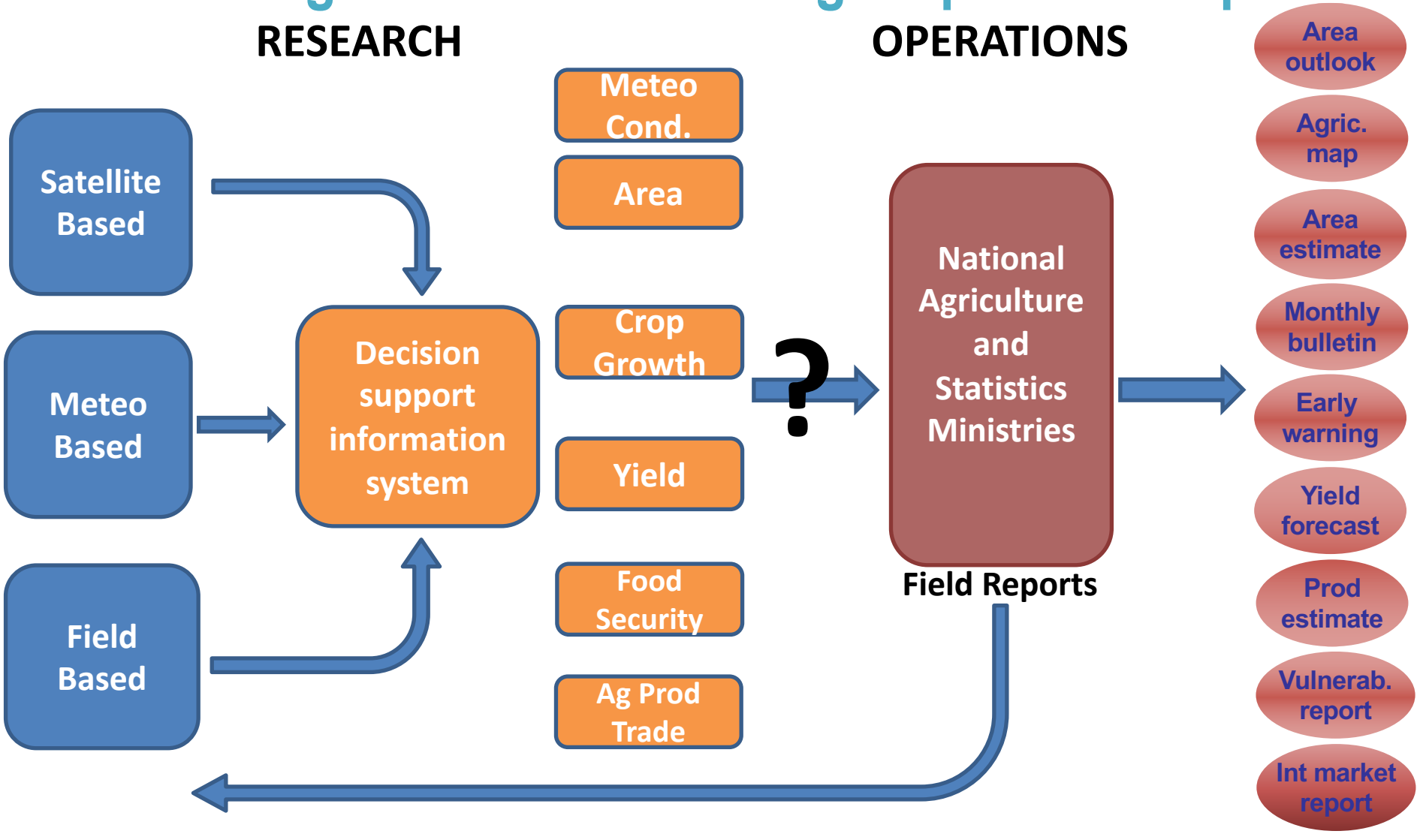
National Crop Monitor for Vietnam



Quick and easy to interpret crop conditions oriented for policy communities

- National Crop Monitor for Vietnam coordinated with MARD and VNSC (in Vietnam & English lang. version)
- Bridging gap between earth observations, research, and policy communities nationally
  - Enhancing remote sensing capabilities within the Ministry to better inform national reporting
- Integration of remote sensing products into national bulletins on crop condition (Vietnam & English lang.)

National Agricultural Monitoring : Inputs to Outputs



GEOGLAM Lessons Learned in moving from Research to Operations

- Initial system Co – development/Partnership between Research and Agricultural Ministry
- Customize system for national situation (baseline data sets, cropland masks, cropping systems)
- Parallel Operation over several seasons to build confidence
- Eventual Operational Agency Ownership
- Continued System monitoring/improvement / enhancement by the Research partner (instrument calibration, new sensors, new techniques, additional data sets)

GEOGLAM Crop Monitor

- GEOGLAM Crop Monitor provides a public good: open, timely, science-driven, actionable information on crop conditions
- Proven effective & scalable mechanism for coordination of crop assessments
- First time the International and Early Warning communities have come together on a monthly basis
  - to produce joint assessments that reflect a consensus
- End user driven with strong community & high level support
  - Bridging the gap between the policy and EO communities
- Increasing communication and knowledge transfer amongst national, regional & international organizations
  - Thereby strengthening national monitoring systems
- Internationally recognized as a highly valuable source of information
  - Already informing decisions

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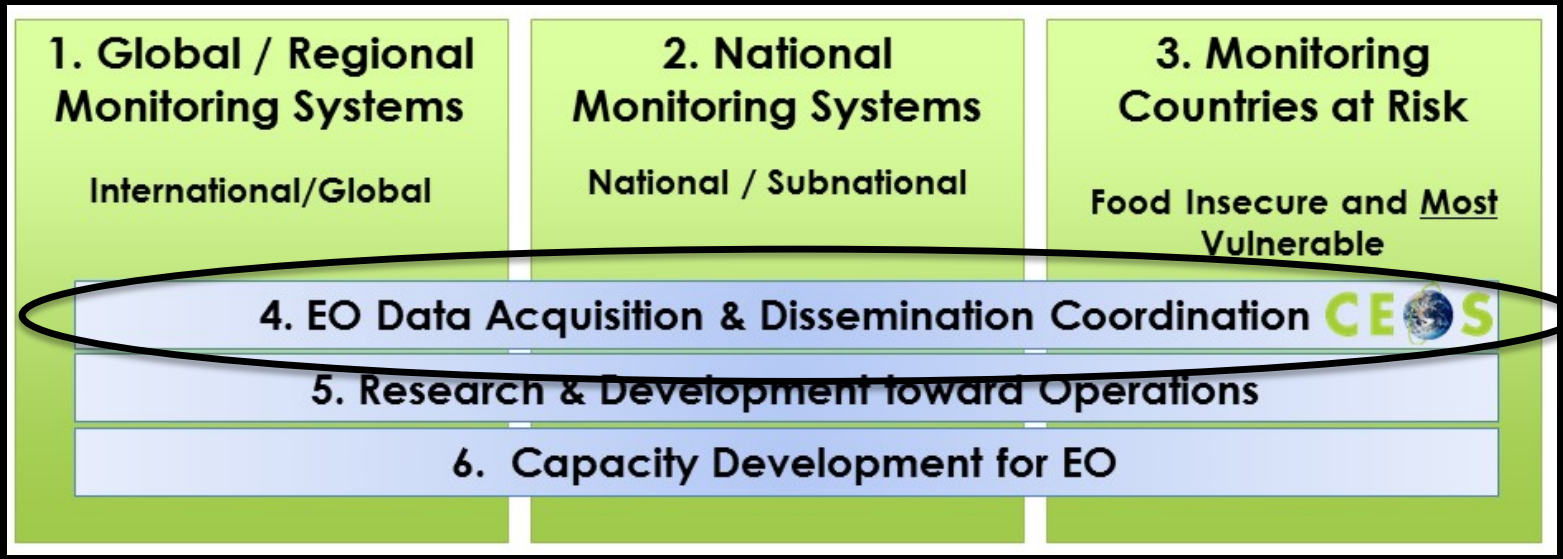
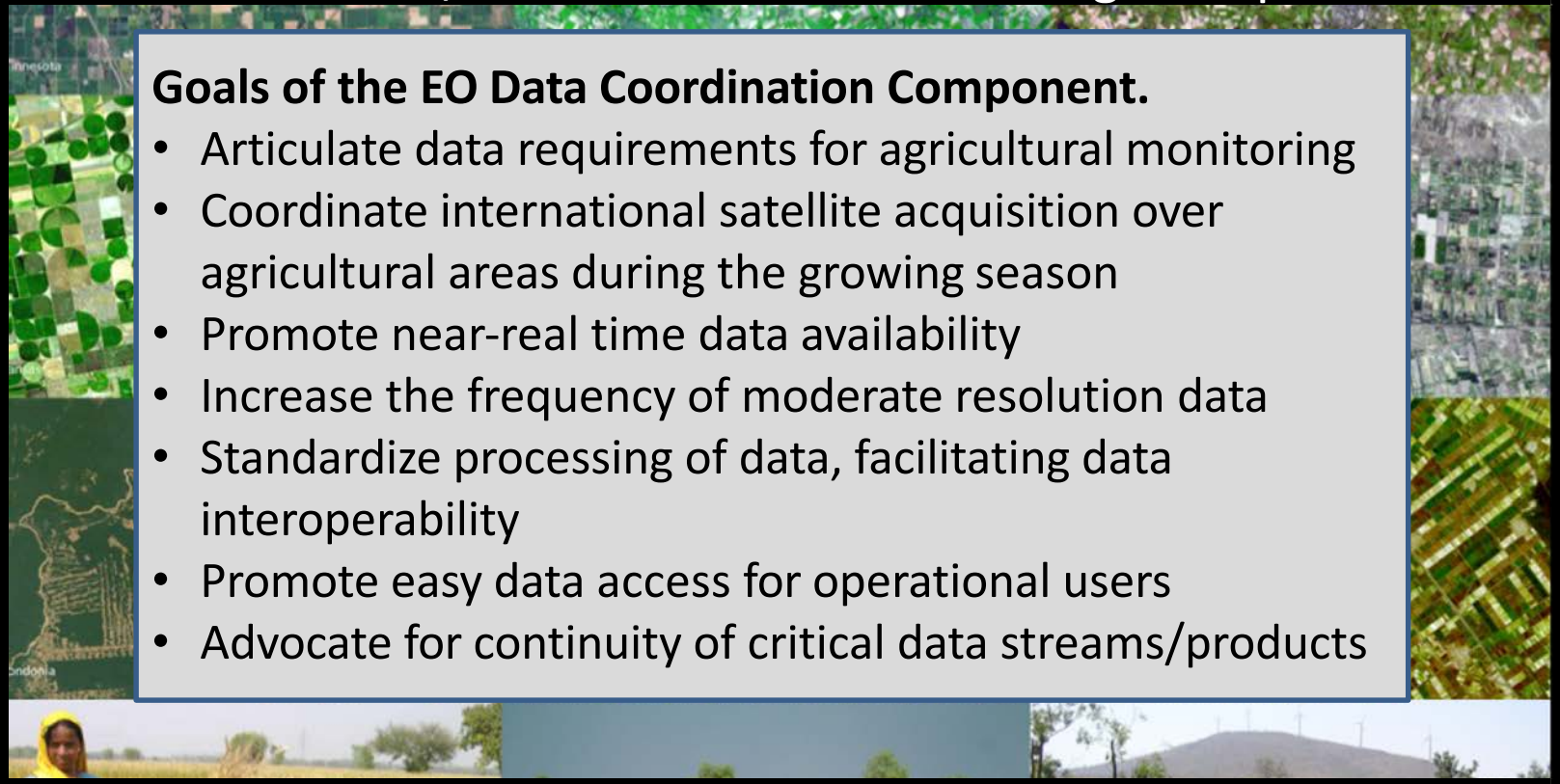


Developing the EO Data Requirements for GEOGLAM: through a CEOS/GEOGLAM Ad Hoc Working Group



Goals of the EO Data Coordination Component.

- Articulate data requirements for agricultural monitoring
- Coordinate international satellite acquisition over agricultural areas during the growing season
- Promote near-real time data availability
- Increase the frequency of moderate resolution data
- Standardize processing of data, facilitating data interoperability
- Promote easy data access for operational users
- Advocate for continuity of critical data streams/products

Recognition that cropping systems are inherently diverse which dictates the monitoring observations and methods

No one system can meet agricultural monitoring needs

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GEOGLAM Global Agricultural Monitoring

GEOGLAM CEOS: EO Data Requirements Table

developed taking into consideration the observation needs, the derived products they will serve, and regional specificities; CEOS-GEOGLAM July 2012 Montreal)

	OBSERVATION & SENSOR TYPE			REGIONAL CHARACTERISTICS & GEOGRAPHICAL EXTENT						DERIVED PRODUCTS & MONITORING APPLICATONS							
	SPATIAL RES.	SPECTRAL RES.	TEMPORAL RES.	WHERE? (+ cropland mask & sampling scheme)				WHEN?									
Sensor Mission	Spatial resolution	Spectral range	Effective observ. frequency (cloud free)*	Swath / Extent	Sample (s), Refined (rs) or Wall -to-Wall (w2w)	Large, Medium, Small fields	Crop types diversity	Calendar/ Multiple cropping	Cloud coverage	Use (Primary or Secondary Source)	Cropland s mask	Crop type area	Crop cond. indicators	Crop bioph. var.	Env. variables (reservoir , water, soil moisture)	Ag. Practices / Cropping systems	Crop yield
MODIS (aqua/Terra), VIIRS(NPP), Vegetation (SPOT-5)	2000 - 500 m	thermal IR + optical	few per day	global	w2w					NRT products (PS)			x	x (L)			
MODIS (optical not SWIR), Sentinel 3? (future), CMA FY series? , Probo-V (future)	100-300m	optical + SWIR	2 to 5 per week	global	w2w	L/M/S		*		NRT products (PS)	x	x	x	x (L)		x (L)	x (L)
FUTURE	1-15km	passive microwave	daily	global	w2w					NRT products (PS)					x		
FUTURE	50-150 m	SAR dual pol. (X,C,L) ****	5 per season	main crops	s	L/M/S	rice area	entire growing season	high cloud cov.	NRT products (SS/PS)*	x	x	x	x (L)	x	x (L)	
FUTURE	5-20m	SAR dual pol. (X,C,L) ****	5 per season	main crops	s	L/M/S	rice area		high cloud cov.	NRT products (SS/PS)*		x	x	x	x	x	
FUTURE	Footprint	RADAR Altimetry	weekly		s					NRT products (PS)					x		
ETM+ (Landsat-7), ASTER (Terra), TIRS(LDCM), IRMSS (CBERS-3)	50-100m	thermal	daily ?	main crops	s	L/M/S		entire growing season		NRT products (PS)			x				
All Optical Mid-Resolution (Landsat, Terra, EO-1, ResourceSat-2, CBERS-3, Sentinel-2)	20-70m	optical + SWIR	1 per month (if possible same sensor) (min 2 out of season + 3 in season)	croplands	w2w	all M/S		year-round, focus on growing season		annual products (PS)	M/S	M					
All Optical Mid-Resolution (Landsat, Terra, EO-1, ResourceSat-2, CBERS-3, Sentinel-2)	20-70m	optical+SWIR	1 per week (min. 1 per 2 weeks)	main crops	s	country specific (see phasing) L/M/S		entire growing season		NRT products (PS)	L/M/S	M/S	x	x	x	x	
HGR (SPOT-5),Rapid Eye (optical)	5-10 m	optical (+SWIR)***	1 per month (if possible same sensor) (min 2 out of season + 3 in season)	croplands	rs	L/M/S (focus on S)		year-round, focus on growing season		annual products (PS)	L/M/S	L/M/S					
HGR (SPOT-5), Rapid Eye (optical)	5-10 m	optical (+SWIR)***	1 per week (min. 1 per 2 weeks)	main crops	rs2	country specific (see phasing) S		entire growing season		NRT products (PS)			x	x	x	x	
HRI (Pleiades), IKONOS, GeoEye, WorldView2 (optical)	< 5 m	optical	1 to 2 per month	croplands	rs3	demo. case (2 - 5% of croplands L/M/S)		2 - 4 coverages per year		annual products (PS)			x			x	x

spatial & spectral

How often ?

Where?

When?

For What?

GEOGLAM data plan submitted to the CEOS plenary in 2013

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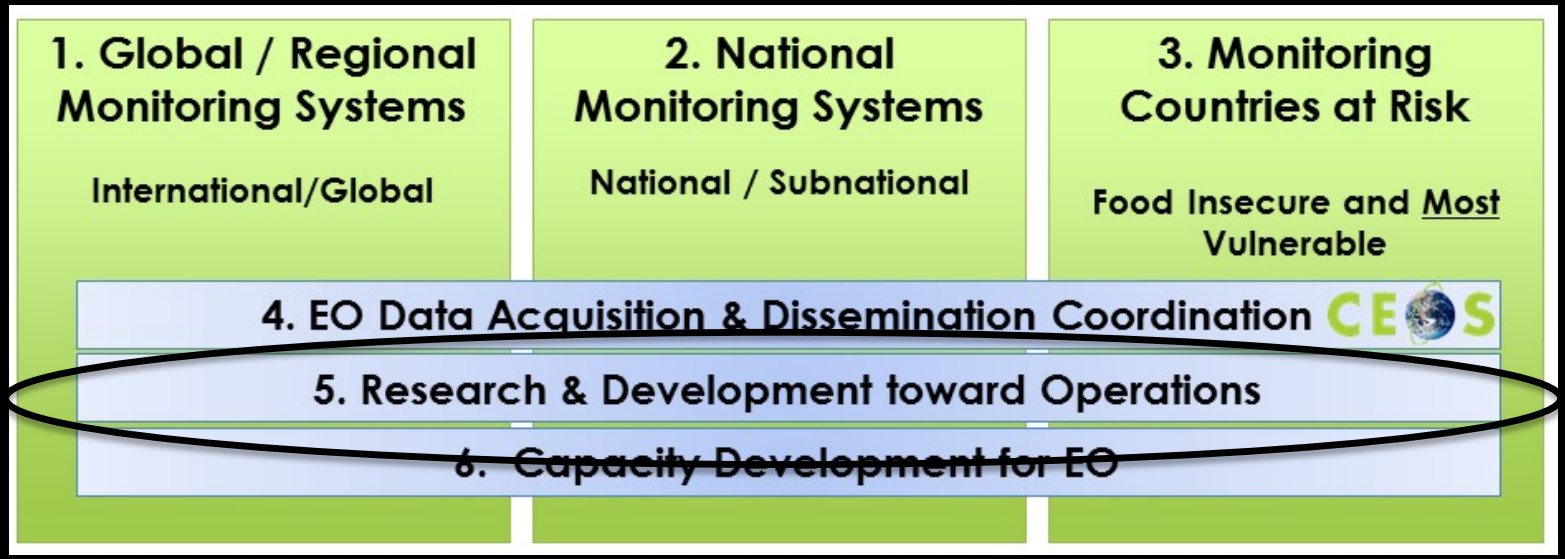
The GEOGLAM Components



JECAM
Joint Experiment for Crop Assessment and Monitoring

GEO GROUP ON EARTH OBSERVATIONS

JECAM Principles

- **Collect and share** time-series datasets
- Develop **common standards** in definition, reporting methods and field protocols.
- The Committee on Earth Observing Satellites (CEOS) and member agencies support with the **acquisition and timely provision of data.**
- **R&D focused on operational implementation**


JECAM
Joint Experiment for Crop Assessment and Monitoring
GROUP ON EARTH OBSERVATIONS

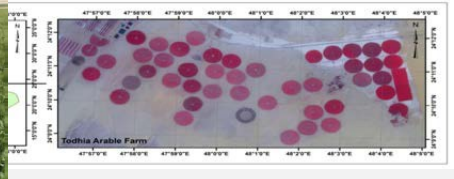
JECAM Guidelines for cropland and crop type definition and field data collection

This document is the first version of the JECAM Guidelines for field data collection. It has been prepared based on 24 JECAM site reports for 2013, and the discussions from several working sessions in the framework of different international on-going efforts, including the ESA Sen2Agri and FP7-SIGMA projects which supports this work.

I. Objective

II. Cropland and crop types definition
A. Annual cropland
B. Annual cropland class from remote sensing perspective (legend definition)
C. Crop types and land cover classes (legend definition)

III. Field data collection for cropland and crop type
A. Objective
B. Field observation for validation data set
C. Complementary data collection for cropland information



GEOGLAM
Global Agricultural Monitoring

@G20_GEOGLAM
www.geoglam.org

Global network of over 30 voluntary JECAM sites

JECAM
Joint Experiment for Crop Assessment and Monitoring

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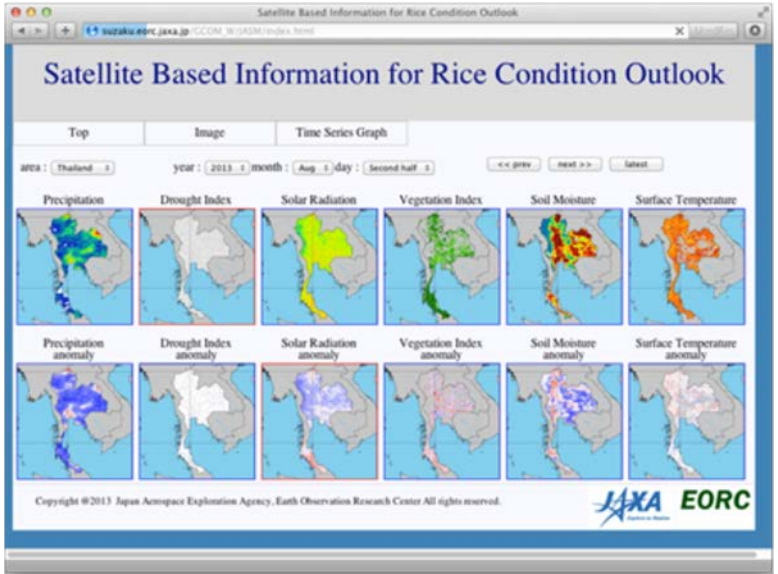
GEOGLAM Global Agricultural Monitoring

Asia-RiCE Crop Estimation and Monitoring

Asia-RiCE Regional Monitoring

- **A multi-national project led by Japan (JAXA), with collaborations in ASEAN+3 countries and India**
- **A regional view using agro-meteorological data derived from low resolution optical satellite imagery (MODIS, GCOM-W, TRMM and others)**
- **A local view to estimate rice crop area and production using available radar and other satellite data with ground observation data and statistical information (test-sites in Indonesia, Thailand and Vietnam)**

http://www.asia-rice.org



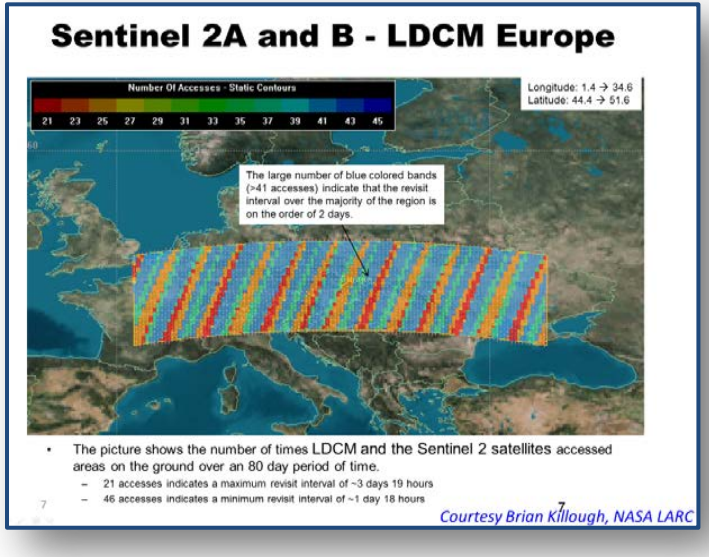
GEOGLAM Latinoamérica

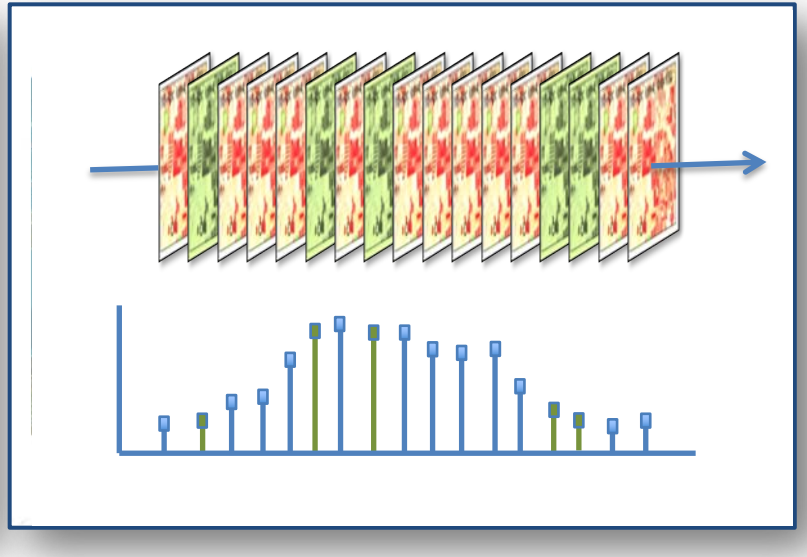
National Scale Mapping Initiative

- Argentina-led initiative
  - strong support from Jesus Silveyra (Undersec for Ag Markets)
- First in series of training workshops on Cropland Mapping held at UMD in March 2018
- Product: 2017 National Cropland Extent with 30m spatial resolution
- Ministry Participants from:
  - Mexico, Brazil, Argentina, Chile

Harmonized Landsat Sentinel-2 (HLS) Project

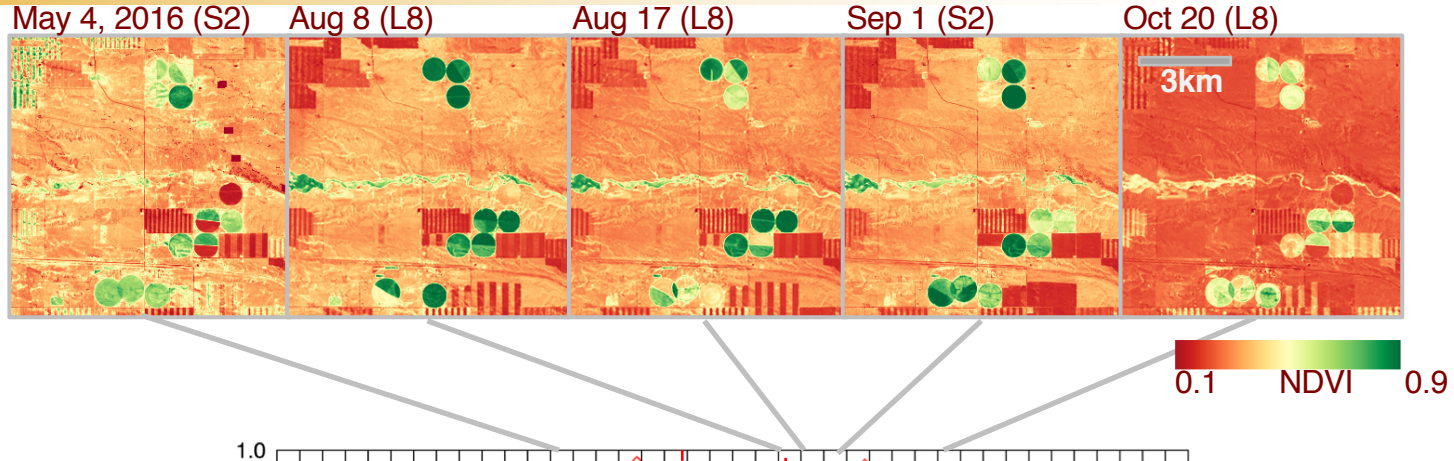
- Merging Sentinel-2 and Landsat data streams can provide **2-3 day global coverage**
- Goal is “seamless” near-daily 30m surface reflectance record including atmospheric corrections, spectral and BRDF adjustments, regridding
- Project initiated as collaboration among GSFC, UMD, NASA Ames

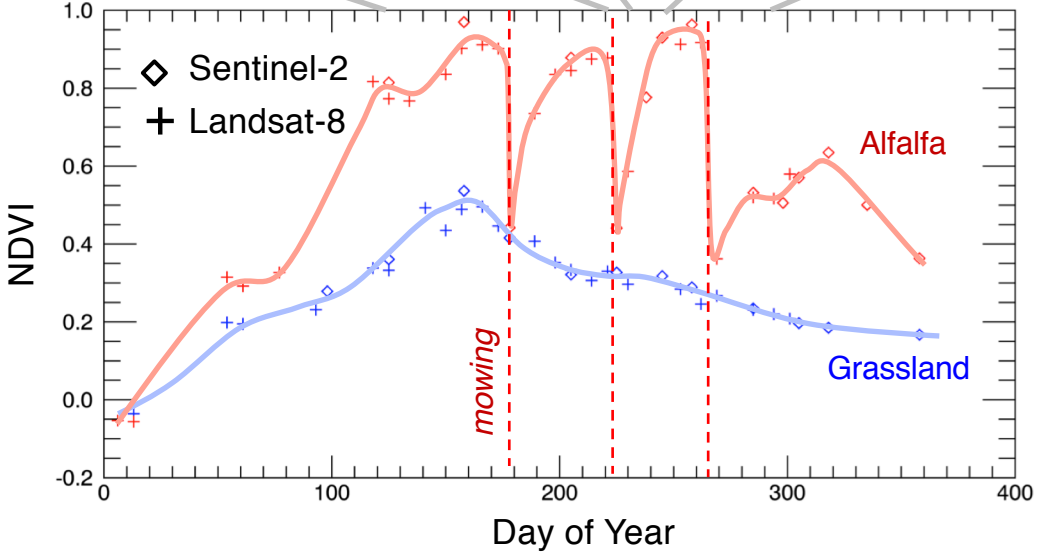




Harmonized Landsat / Sentinel-2 Products

Laramie County, WY





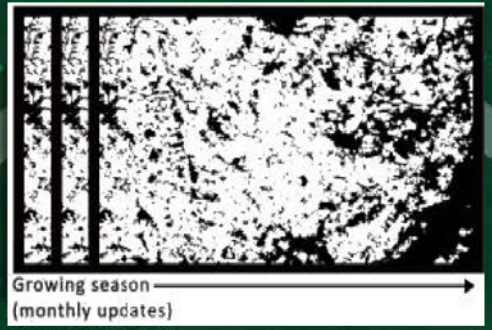
Seasonal phenology (greening) for natural grassland (blue line) and irrigated alfalfa fields (red line) near Cheyenne Wyoming observed from Harmonized Landsat/Sentinel-2 data products. The high temporal density of observations allows individual mowing events to be detected within alfalfa fields. HLS Products available from https://hls.gsfc.nasa.gov

Top Priority: open source system to deliver 4 Sen2Agri products along the season

in line with the GEOGLAM core products

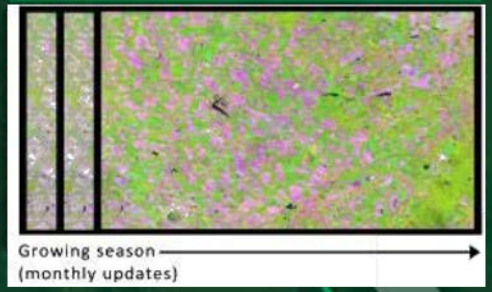
Monthly cloud free surface reflectance composite at 10-20 m

DYNAMIC CROPLAND MASK



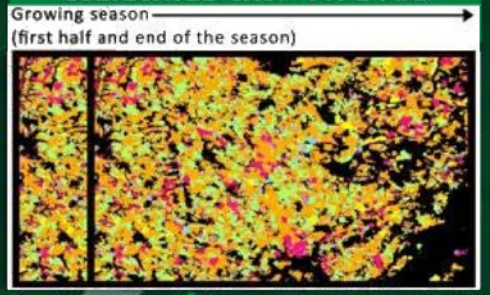
Binary map identifying annually cultivated land at 10m updated every month

CLOUD FREE SURFACE REFLECTANCE COMPOSITES



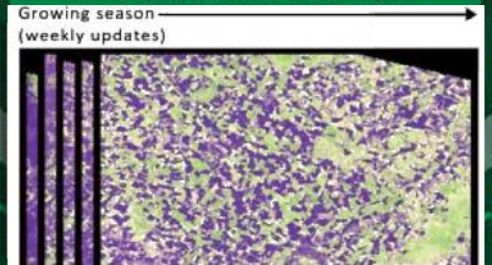
Open source toolbox
Capacity building and training

CULTIVATED CROP TYPE MAP



Crop type map at 10 m for the main regional crops including irrigated/rainfed discrimination

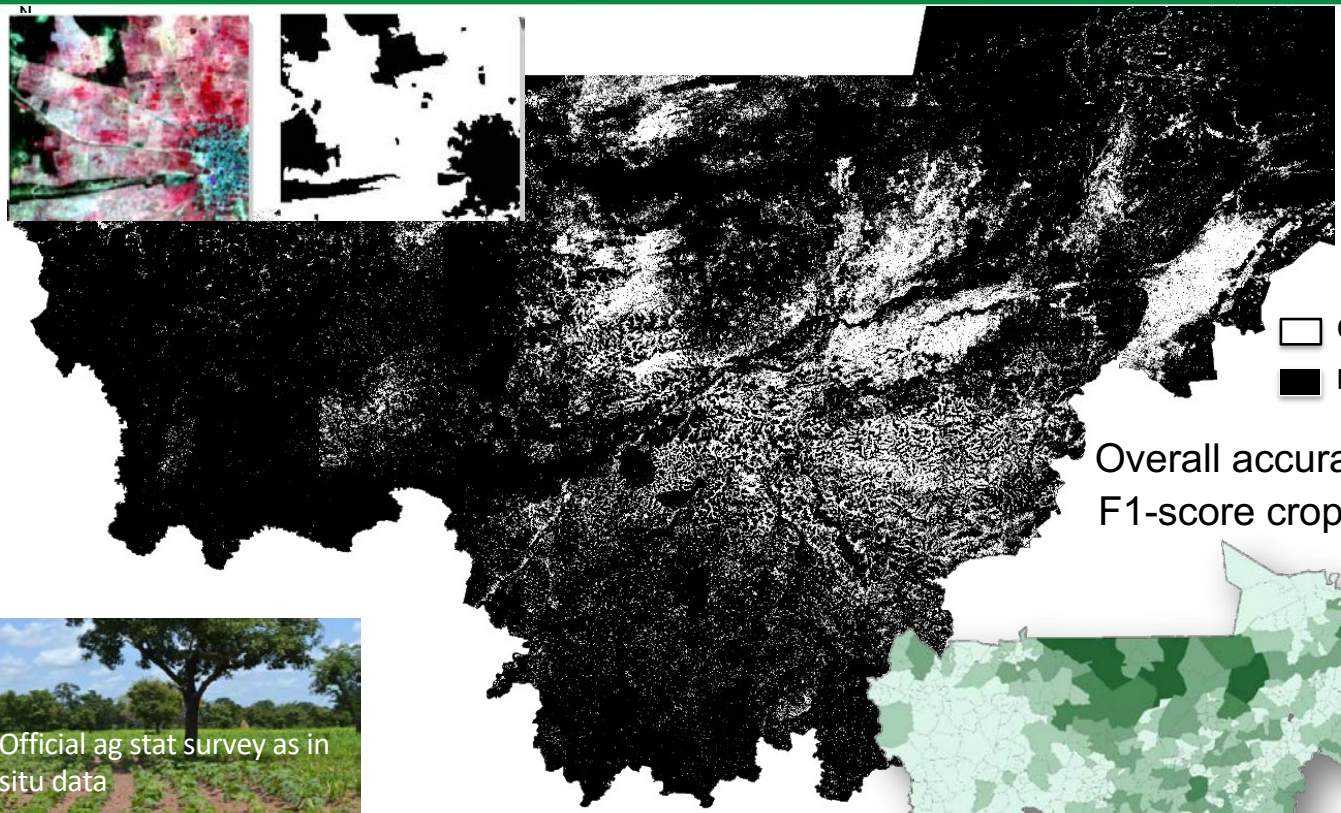
VEGETATION STATUS



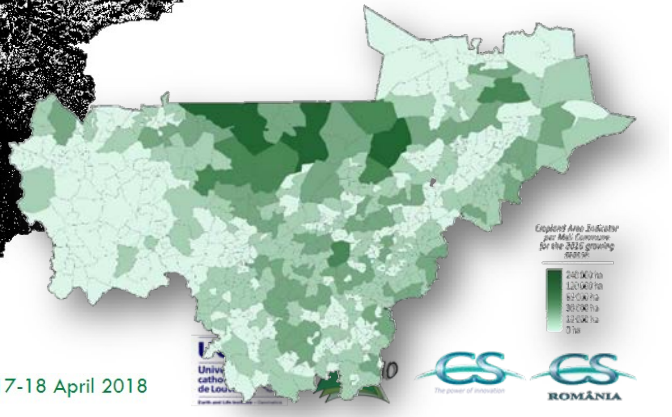
Vegetation status map at 10 m delivered every week (NDVI, LAI, *phenoindex*)

Defourny et al.

2016 Cropland mask at 10m resolution for Mali from Sentinel-2 and Landsat 8



Overall accuracy: 94 %
F1-score cropland: 80 %



Defourny et al.

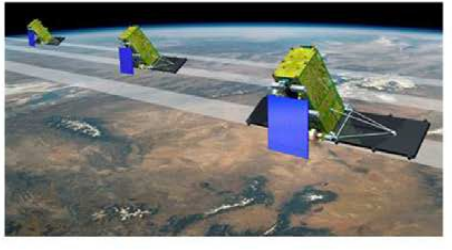
Radarsat Constellation – February 2019

The Evolution of RADARSAT

RADARSAT-1 (1997-2013)
16 years

RADARSAT-2 (2007-)

RADARSAT-Constellation
launch 2018



	RADARSAT-1	RADARSAT-2	RCM
# satellites	1	1	3
Centre frequency	5.3 GHz	5.405 GHz	5.405 GHz
Exact revisit	24 days	24 days	12 day (each satellite) 4 days (constellation)
SAR time/orbit	28 min	28 min	15 min/sat
Polarization	HH	HH, VV, HV, VH (Quad)	HH, VV, HV, VH (quad) Compact pol.
Look direction	Right	Right or Left	Right
Altitude	800 km	800 km	600 km
Descending node	6 h	6 h	6 h +/- 15 min
Ascending node	18 h	18 h	18 h +/- 15 min

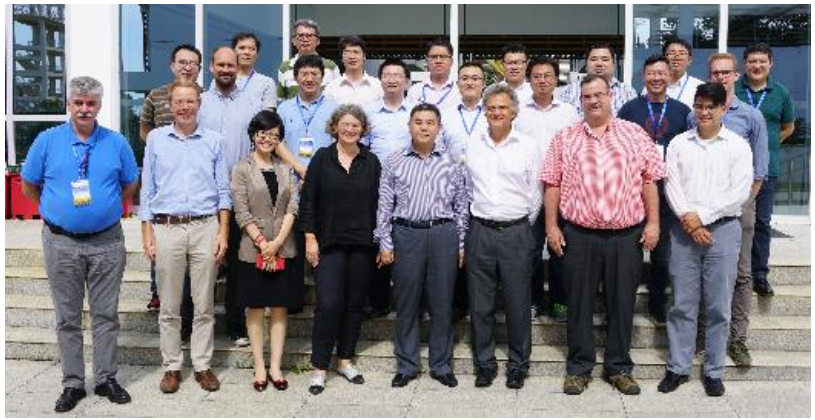
Workshop on Cloud Computing and Knowledge Management for Agricultural Monitoring (GEOGLAM)

29-31 August 2018; Sanya, China (Host: RADI-CAS)

Cloud Computing is enabling big data analysis for agricultural monitoring (e.g. GEE, AWS, Alibaba, DIAS, Data Cube)

- *Increased volumes of accessible data in the cloud*
- *Proliferation of tools*
- *Increasing number of satellite-based products generated*

Community requirement for guidance on best practices and coordinated data sharing.



Selected Workshop Outcomes:

- Task Force established for coordinating cloud computing– focus on developing country capacity building (China DBARAgri/EU)
  - GEO(GLAM) to approach Alibaba to host Chinese satellite data
- Community Algorithms and Tools to be shared via a GEOGLAM TEP (Thematic Exploitation Platform)
  - EU targeting ESA funding
- Document and report archives through Knowledge Management Hub (GEOGLAM Sec)
  - GEOGLAM Best Practices documentation given priority (Fund being established at GEOSec)
- Community Research Agenda in development (NASA Harvest with JECAM EC/Canada)

GEOGLAM
GLOBAL AGRICULTURAL MONITORING

Upcoming Meetings

2018

- AGU, Washington D.C USA (December 10-14)
  - GEOGLAM Session

2019

- ISPRS, GEOGLAM, ISRS Joint International Workshop on Earth Observations for Agricultural Monitoring, New Delhi India (February 18-20)
  - Abstract submission deadline October 31st
- NASA LCLUC SARI Workshop, Malaysia (July 22-24)
  - Agricultural Session

NASA HARVEST

www.nasaharvest.org
@NASAHarvest

Earth Data for Informed Agriculture Decisions

A new NASA program to advance the awareness, use, and operational uptake of satellite-based Earth observations to guide decisions that support food security, stable markets, economic progress, and sustainable, resilient crop production.

EO INVESTMENTS TARGETED AT END USER NEEDS → IMPROVED AGRICULTURAL ASSESSMENTS → ENHANCED, TIMELY, ACTIONABLE INFORMATION → IMPROVED DECISION MAKING BY END-USERS

- Link NASA's agriculture & food security activities
- Strengthen communication between EO, economics, and statistics communities
- Improve application-ready research methods
- Transition research to operational users
- Strong partnership with NASA Food Security Office with strong support/linkages to GEOGLAM (G20 initiative)
- Established 2017 with initial 5 year period

A diverse Consortium of >40 members from public, private, NGO, intergovernmental, & humanitarian sectors

So in Summary
What is GEOGLAM doing?

- Increasing communication and sharing experience amongst the Ag Monitoring Community of Practice and with related programs
- Helping improve national agricultural monitoring systems
- Promoting EO-based approaches to agricultural monitoring and raising the importance of agricultural remote sensing
- Articulating and advocating for community requirements to the EO data providers
- Translating EO data into policy relevant information
- Increasing the awareness of EO by the econ/policy community
- Method testing and inter-comparison, developing best practices
- Developing new monitoring capabilities and products

GEOGLAM Contributes to Multiple Goals

Monitoring, Measuring


Thank you
www.geoglam.org, www.cropmonitor.org
@G20_GEOGLAM, @GEOCropMonitor
Contact: Christina Justice, justicec@geoglam.org