João Soares
Scientific Consultant for Agriculture
GEO Secretariat

Monthly Market Prices of Corn, Soybeans and Wheat Highlighting Current Prices
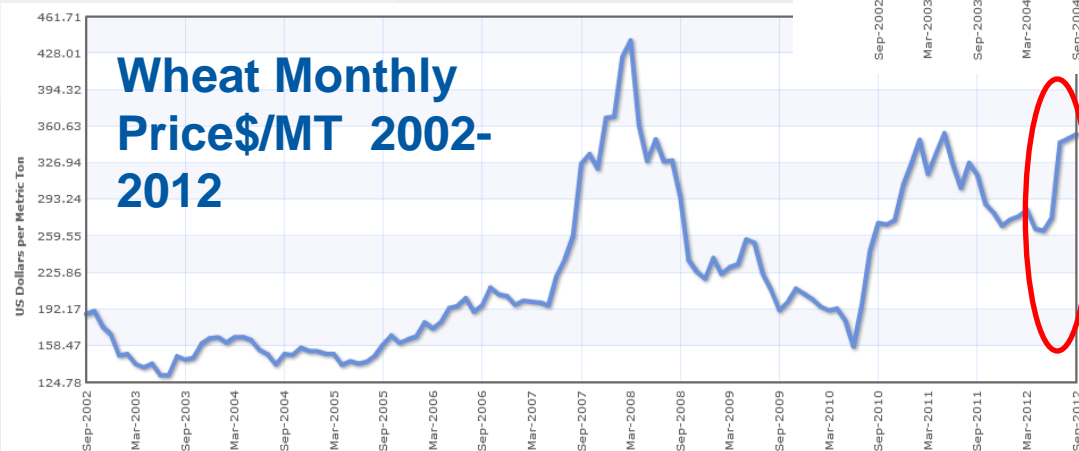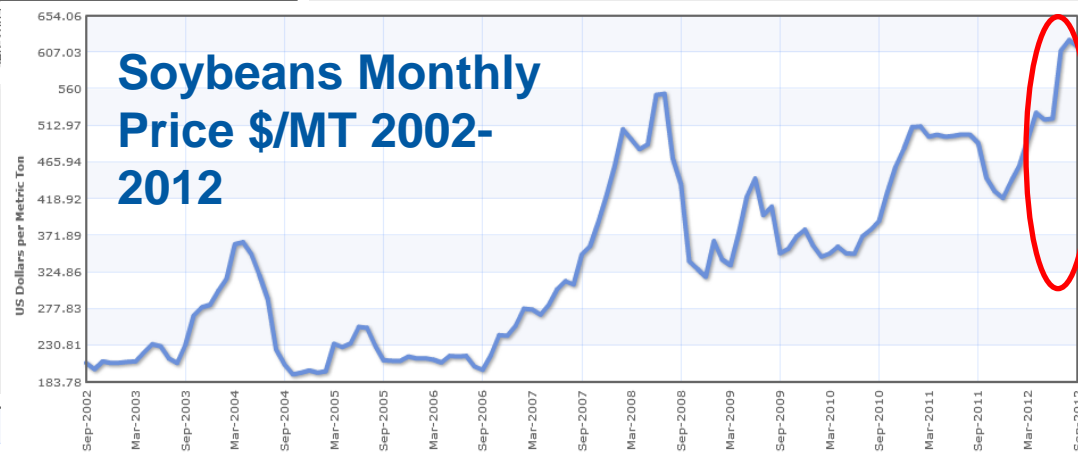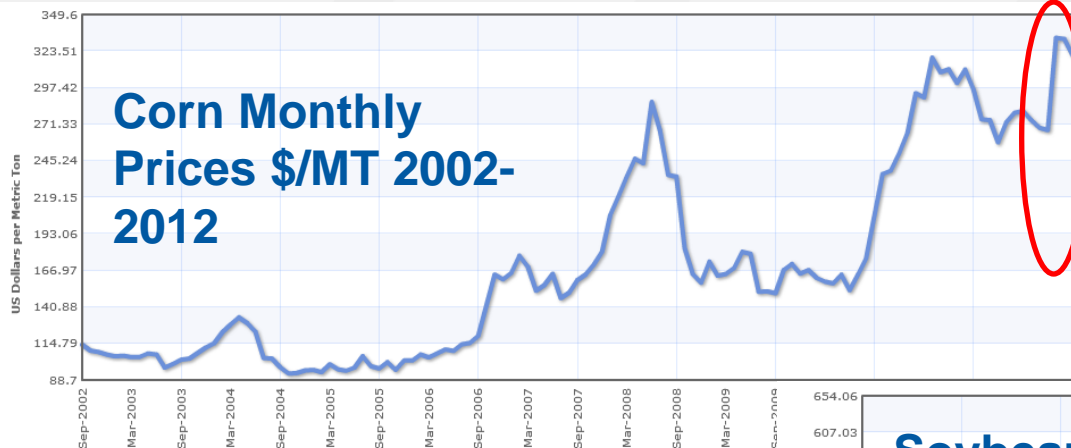
G20 Final Declaration – Cannes, November 2011

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" (GEOGLAM)** 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.*

GEOGLAM

2 initiatives to increase information availability, quality and transparency

Supply

Price

Demand Policies
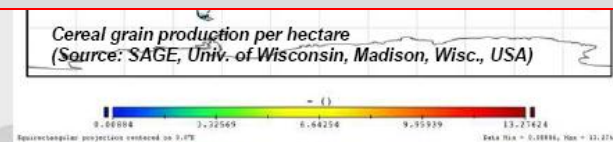
Finance

Trade

Stocks

AMIS
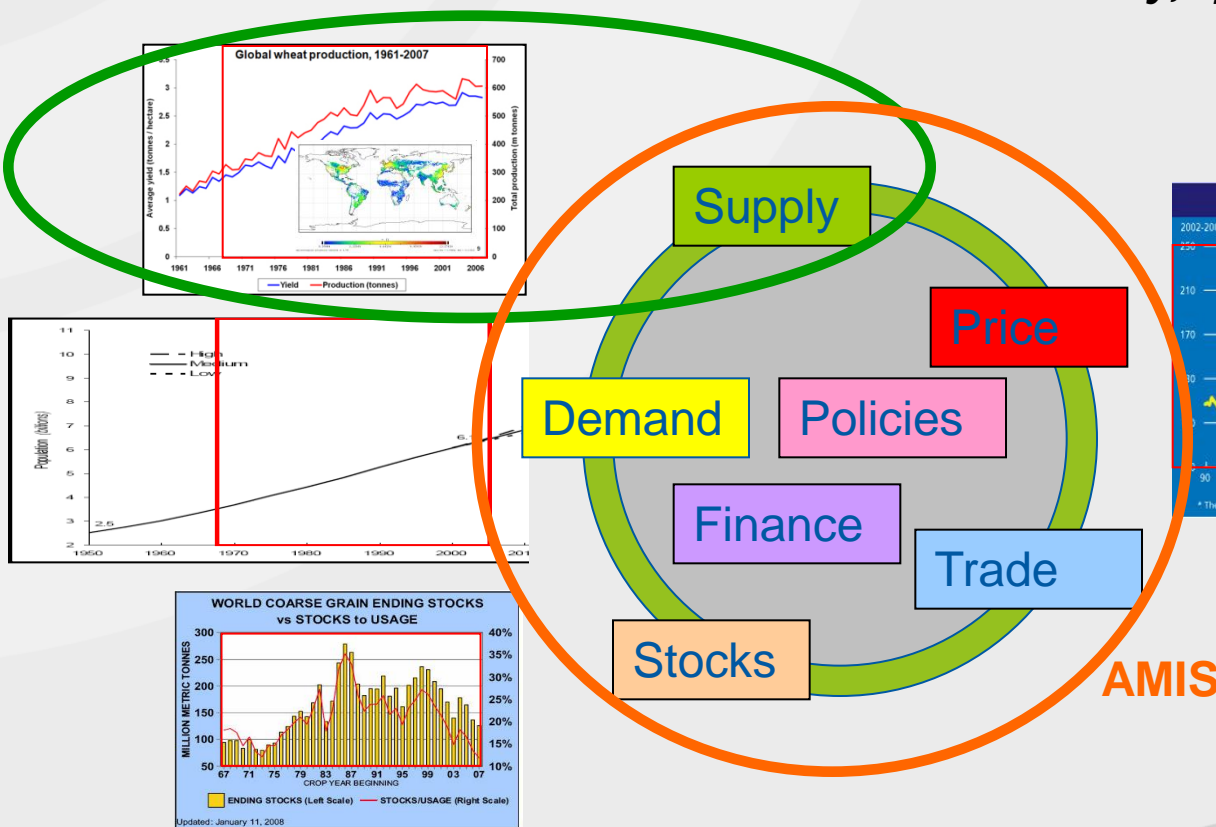
GEOGLAM : Objective, structure, workplan

To strengthen the international community's capacity to produce and disseminate relevant, timely and accurate information and forecasts on agricultural production at national, regional and global scales, through reinforced use of Earth Observations.

Croplands of the Earth
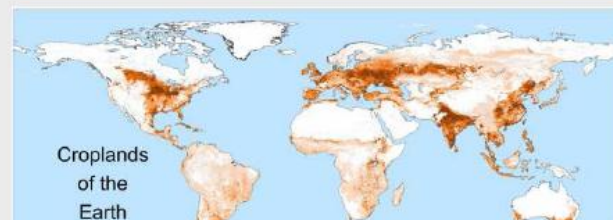
GEOGLAM is a « coordination programme », aiming at
- supporting, strengthening and articulating existing efforts
- developing capacities and awareness at national and global level
- disseminating information

Cereal grain production per hectare
(Source: SAGE, Univ. of Wisconsin, Madison, Wisc., USA)

Crop yield forecast

GEO-GLAM COMPONENTS

Agricultural Expertise (GEO CoP+)

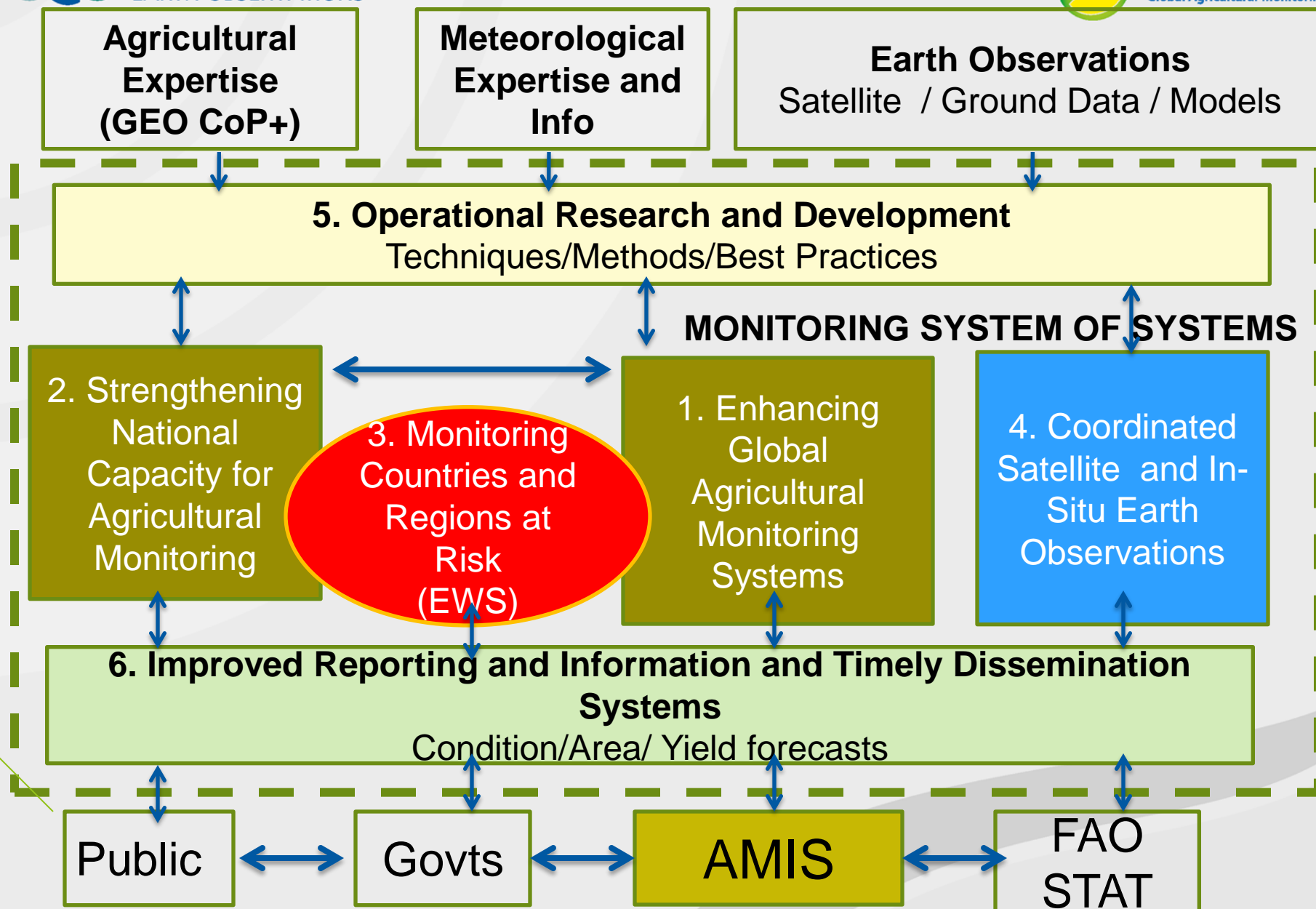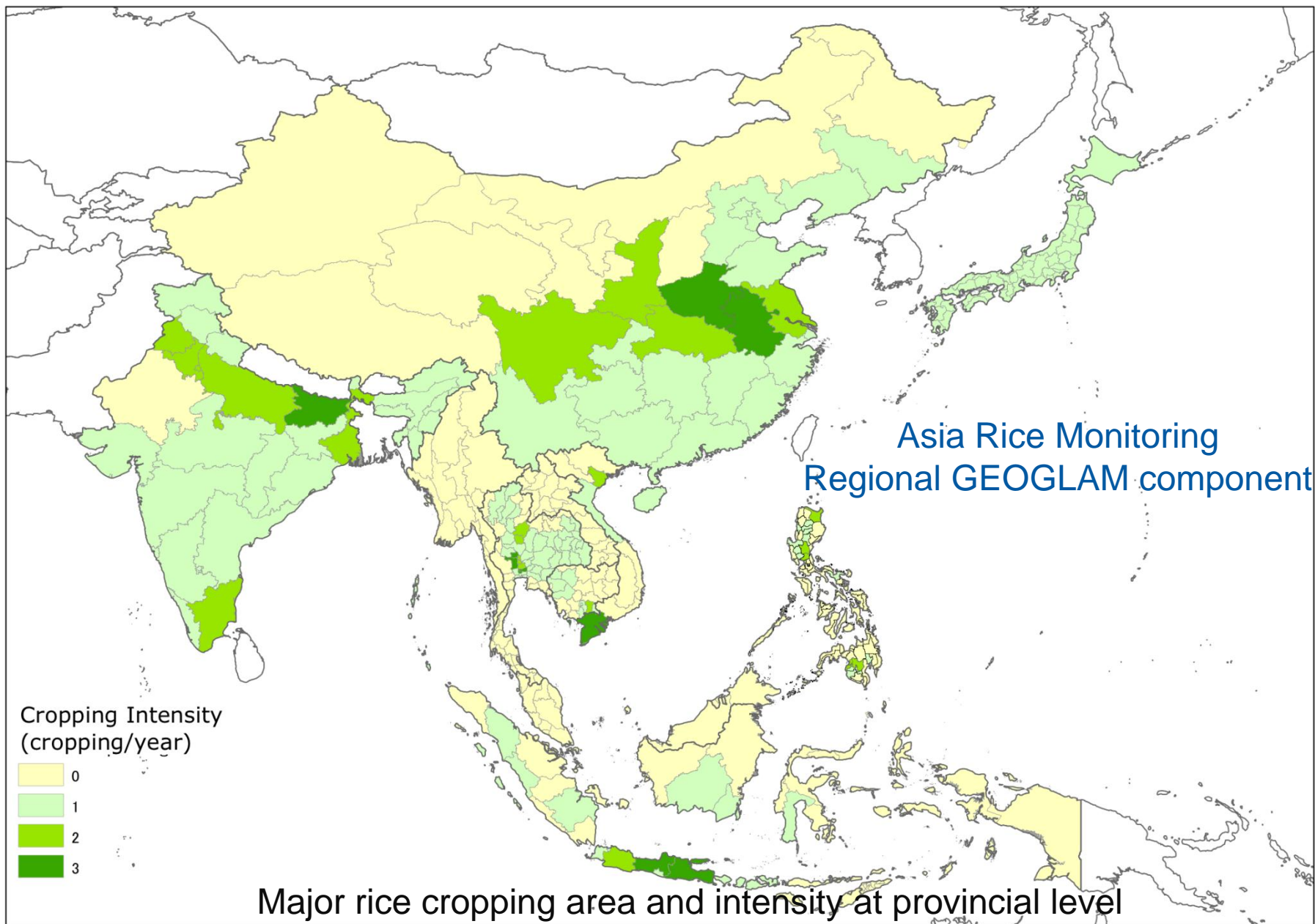**Meteorological Expertise and Info**

Earth Observations
Satellite / Ground Data / Models

5. Operational Research and Development
Techniques/Methods/Best Practices

MONITORING SYSTEM OF SYSTEMS

2. Strengthening National Capacity for Agricultural Monitoring

3. Monitoring Countries and Regions at Risk (EWS)

1. Enhancing Global Agricultural Monitoring Systems

4. Coordinated Satellite and In-Situ Earth Observations

6. Improved Reporting and Information and Timely Dissemination Systems
Condition/Area/ Yield forecasts

Public

Govts

AMIS

FAO STAT

GEO GROUP ON EARTH OBSERVATIONS

GEOGLAM Global Agricultural Monitoring

Cropping Intensity
(cropping/year)
- 0
- 1
- 2
- 3

Asia Rice Monitoring
Regional GEOGLAM component

Major rice cropping area and intensity at provincial level

Current Cropland Distribution:
best available from existing satellite-derived sources

Source: IIASA, Fritz et al. Beta Version 1
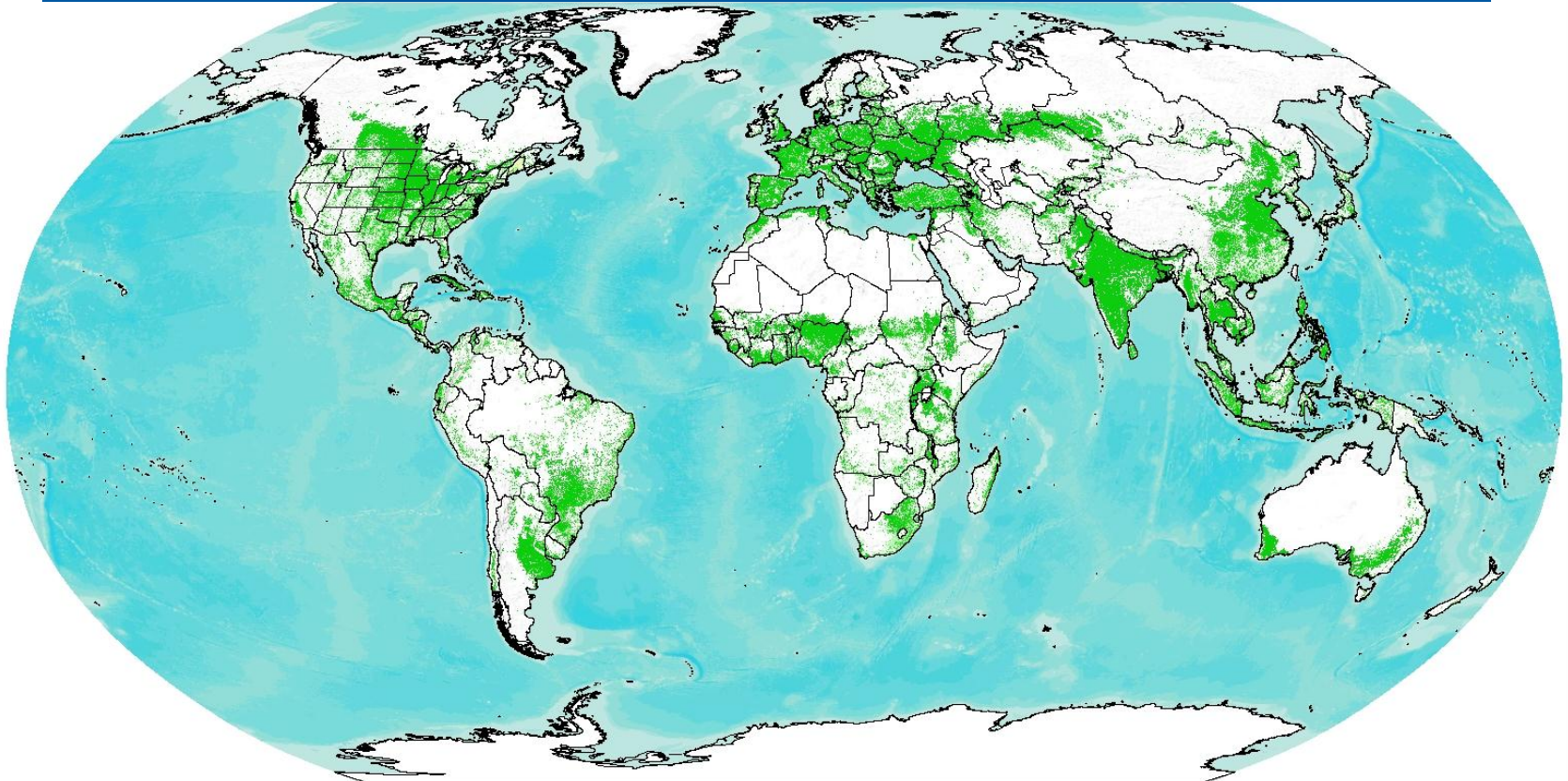
NATIONAL COMPONENT: COUNTRY SELECTION

- **Largest producing countries of four major crops (AMIS countries)**

Focus on Major Producer Countries

- India
- China
- Philippines
- Indonesia
- Thailand
- Viet Nam
- Mexico
- Brazil
- South Africa
- Argentina
- Kazakhstan
- Ukraine
- Turkey
- Japan
- Egypt/Nigeria

- Russia
- United States
- Australia
- Canada
- Saudi Arabia
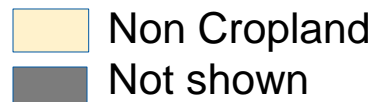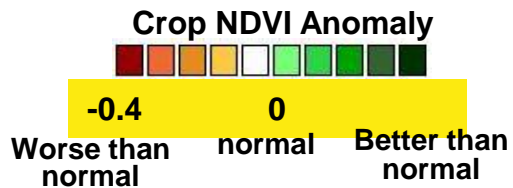
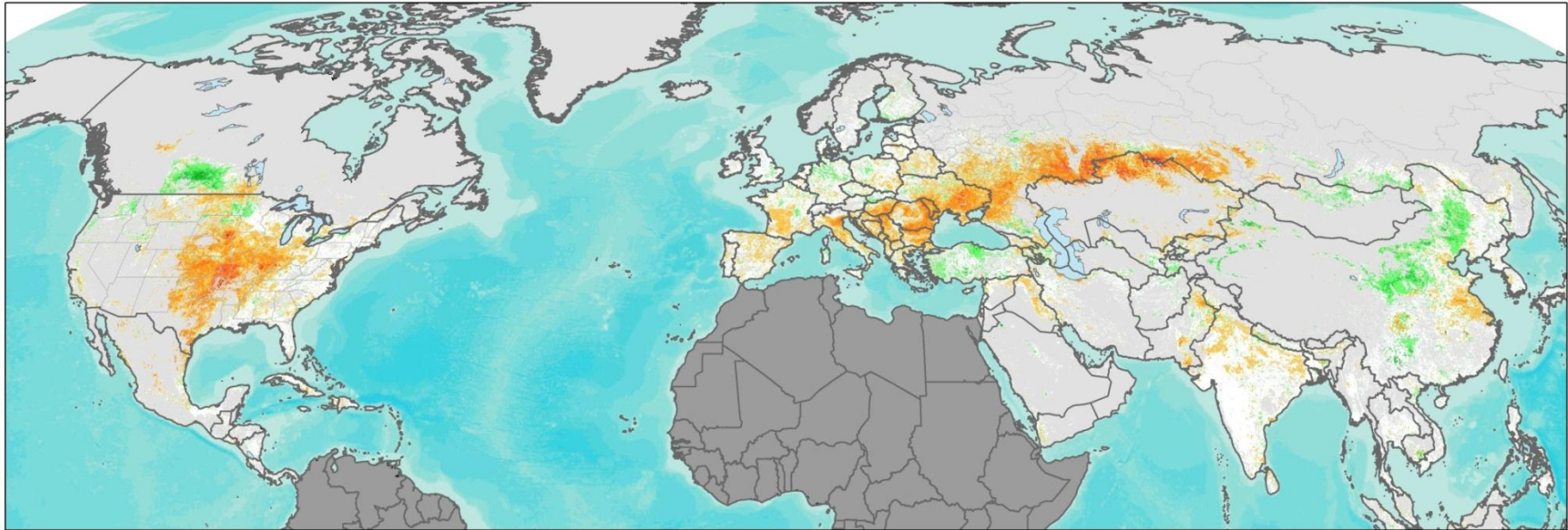- EU (Germany, France, Italy, UK, Spain)

■ AMIS Countries
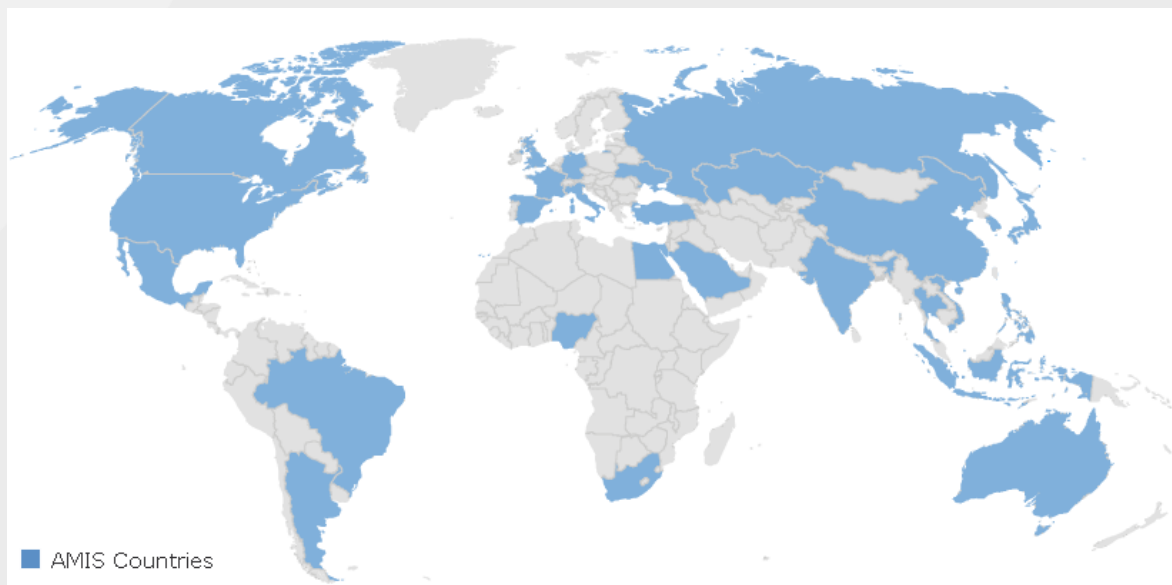
90% producers
80% consumers

Maize, wheat, rice, soybeans

THE NORTHERN HEMISPHERE 2012 AGRICULTURE DROUGHT CASE

…A DEMONSTRATION ON WHAT GEOGLAM IS DELIVERING (GLOBAL PRODUCTS)

Northern Hemisphere Crop NDVI Anomalies

Crop NDVI Anomaly

-0.4   0

Worse than normal   normal   Better than normal

Non Cropland

Not shown

2012 Daily Crop NDVI Anomaly from MODIS
January 1 through September 10th, 2012
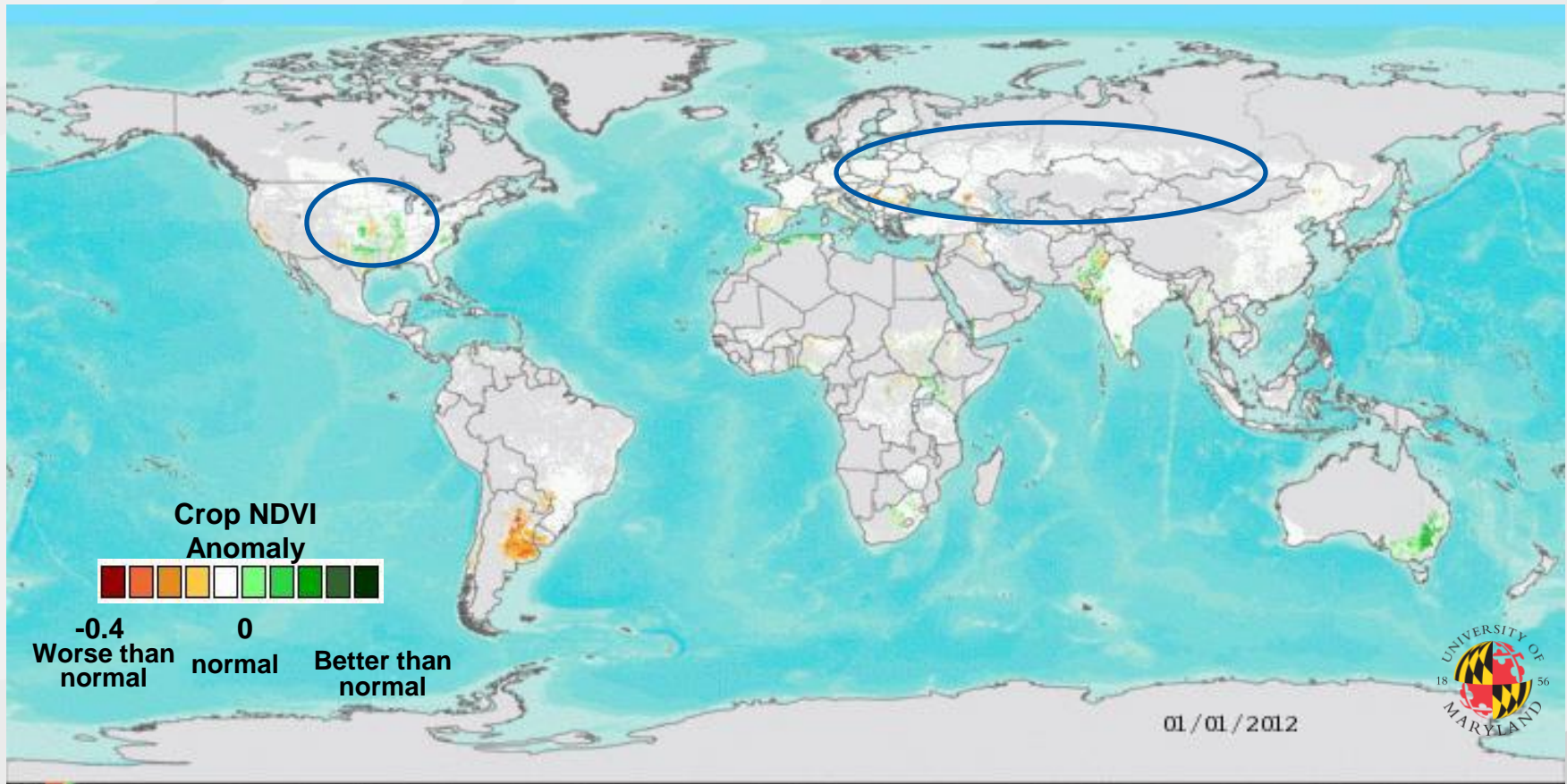
NDVI Departure from Median (2000-2011)

Northern Hemisphere Crop NDVI Anomalies
August 13th, 2012
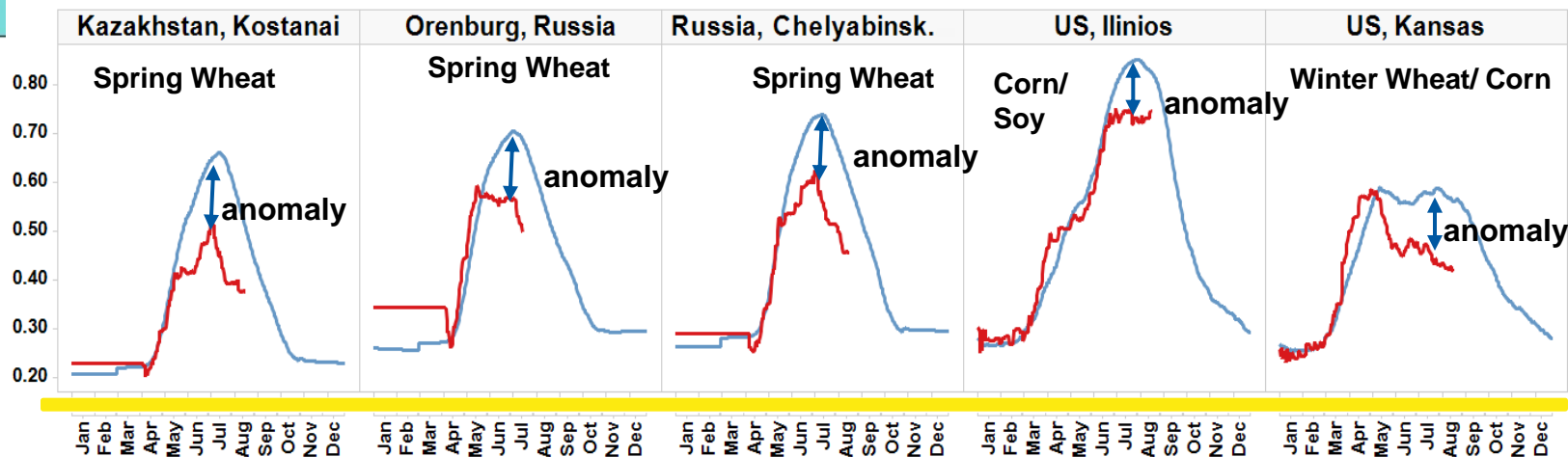
PROGRESS AND WATER SATISFACTION INDEX - NORMAL
GRAIN MAIZE

from : **21 August 2012**
to : **31 August 2012**

Year of interest (YOI)

After-season period length (dekads): 9

Unit: -

- sowing rule scanning
- outside crop season
- no water shortage - early vegetative
- no water shortage - vegetative and reproductive
- no water shortage - maturity
- no water shortage - after season
- light water shortage - early vegetative
- light water shortage - vegetative and reproductive
- light water shortage - maturity
- light water shortage - after season
- medium water shortage - early vegetative
- medium water shortage - vegetative and reproductive
- medium water shortage - maturity
- medium water shortage - after season
- severe water shortage - early vegetative
- severe water shortage - vegetative and reproductive
- severe water shortage - maturity
- severe water shortage - after season
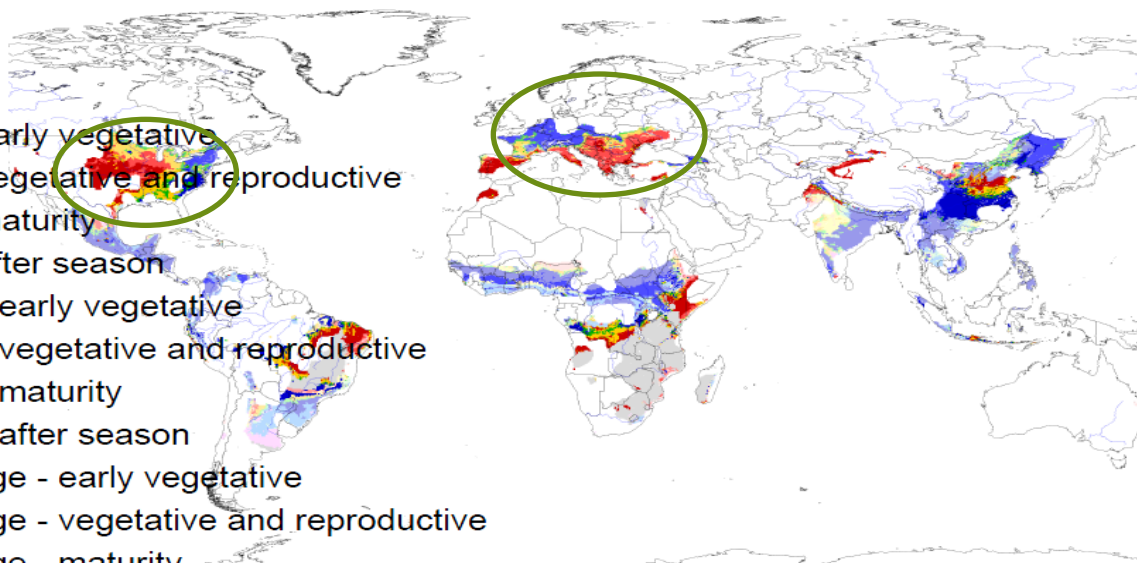
05/09/2012
resolution: 0.125 x 0.125 degrees

Source: JRC - FOODSEC Action - MARS Unit
source: Joint Research Centre
Processed by: ALTERRA consortium

Identifying Information and Product Types

INFORMATION PRODUCTS

- Crop outlook / Early warning
- Area estimate
- Yield forecast
- Production estimate
- Food Sec/vulnerability report
- Statistics reports

EO Data Products

- Cropland mask /Pasturelands
- Ag practices
- Crop condition indicators
- Crop type
- Biophysical variables
- Environmental variables (soil moisture)
- In-situ Weather

2. GEOGLAM : Earth Observation requirements

Input to CEOS : Summary **table of requirements**

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

300m, daily, optical, superspectral

10-20m, weekly, optical, multispectral

100m, daily, thermal

	OBSERVATIONS				DERIVED PRODUCTS						GLOBAL	REGION SPECIFIC ACQUISITIONS**			
Spatial resolution	Spectral range	Frequency (cloud free)	Swath	Use (Primary Source /Secondary S.)	Croplands mask	Crop type area	Crop cond. indicators	Crop bioph. var.	Env. variables (reservoir, water, soil moisture)	Ag. Practices / Cropping systems	Crop yield	Agricult. coverage	Large, Medium, Small fields	Crop types diversity	Calendar/Multi-ple cropping	Cloud coverage
2000 - 500 m	thermal IR + optical	few per day	global	NRT products (PS)			x	x (LF)				x				
100-300m	optical + SWIR	2 to 5 per week	global	NRT products (PS)	x	x	x	x (LF)		x (LF)	x (LF)	x	all L			
1-15km	passive microwave	daily	global	NRT products (PS)					x			x				
150-75 m	SAR dual pol. (X,C,L)	5 per season	main crops	NRT products (SS/PS)*	x	x	x	x (LF)	x	x (LF)			all L	rice area	entire growing seasons	high cloud cov.
5-10m	SAR dual pol. (X,C,L)	5 per season	main crops	NRT products (SS/PS)*									L/M/S	rice area		high cloud cov.
20-70m	optical + SWIR	1 per month (if possible same sensor)											all M		year-round, focus on growing season	
Footprint	RADAR Altimetry	weekly		NRT products (PS)					x							
50-100m	thermal	daily ?	main crops	NRT products (PS)			x						L/M/S		entire growing seasons	
20-70m	optical+SWIR	1 per week (min. 1 per 2 weeks)	main crops	NRT products (PS)			x	x	x	x			country specific (1) L/M		entire growing seasons	
5-10 m	optical (+SWIR)***	1 per month (if possible same sensor)	croplands	annual products (PS)	x	x							all S		year-round, focus on growing season	
5-10 m	optical (+SWIR)***	1 per week (min. 1 per 2 weeks)	main crops	NRT products (PS)	x	x	x		x				country specific (1) S		entire growing seasons	
< 5 m				products (PS)		x				x	x		demo. case (2 to 5% of		2 to 4 coverages per year	

Input to CEOS :
Regional analysis of EO data requirement (specifications, frequency)

GEOGLAM EO Data Detailed Requirements Table:		Europe & North Africa	Medium fields Growing season varies north-south Assume Apr - Oct
P r o d u c t R e q u i r e m e n t s	Croplands mask	100-300m optical + SWIR	
		50-150m SAR (X, C, L)	
		20-70m optical + SWIR	
		5-10m optical	
	Crop type area	100-300m optical + SWIR	
		50-150m SAR (X, C, L)	
		5-20m SAR (X, C, L)	
		20-70m optical + SWIR	
		5-10m optical	
		<5m optical	
	Crop condition indicators	500-2000m thermal IR+optical	
		100-300m optical + SWIR	
		50-150m SAR (X, C, L)	
		5-20m SAR (X, C, L)	
		50-100m thermal	
		20-70m optical+SWIR	
		5-10m optical	
	Crop biophysical variables	500-2000m thermal IR+optical	
		100-300m optical + SWIR	
		50-150m SAR (X, C, L)	
		5-20m SAR (X, C, L)	
		20-70m optical+SWIR	
		5-10m optical	
	Soil moisture	1-15km passive microwave	
		50-150m SAR	
		5-20m SAR	
		radar altimetry	
		20-70m optical +SWIR	
		5-10m optical	
	Water extent	1-15km passive microwave	
		50-150m SAR	
		5-20m SAR	
		radar altimetry	
		20-70m optical +SWIR	
		5-10m optical	
	Cropping systems	100-300m optical + SWIR	
		50-150m SAR (X, C, L)	
		5-20m SAR (X, C, L)	
		20-70m optical+SWIR	
		5-10m optical	
		<5m optical	
	Crop yield	100-300m optical + SWIR	
		<5m optical	

Jan   Feb   Mar   Apr   May   Jun   Jul   Aug   Sep   Oct   Nov   Dec

Time legend:

daily	
> once /week	
once/ week	
once/month	
annually	

Phases for GEOGLAM (11 July 2012 meeting)
(1) = tentatively 5 producer countries + 3 at-risk countries for Phase 1 (3 years)
(2) = adding 2 countries per year in Phase 2 (3 years)

THANK YOU !

earthobservations.org

jsoares@geosec.org

2. GEOGLAM : Earth Observation requirements

- **Rationale** : translating monitoring objectives into information needs and EO requirements

Obs. requirements

- Seasonal, real time global, reg., nat., local
- multi-year global, reg., nat., local
- long term global, reg., nat., local

Information needs

- Reference data
- Environm. data
- Crop map (area, loc.)
- Crop type map
- Crop conditions
- models stat. rel.
- Farming system
- Farming practice
- Land use evolution
- Farm. syst. evolution
- Crop cond./ yield evol.

Objective

- Yield forecast
- Agricultural statistics
- Environmental impact
- Agriculture changes

4. The GEOGLAM Initiative : Budget

Component	Annual budget	6-year budget
Global /regional systems	1.00	6.00
National capacity development	2.00	12.00
Global/Regional Systems for Countries At Risk	1.40	9.00
Earth Observations Assessment (satellite and in situ)	1.20	6.00
Research Coordination for Monitoring Enhancements	0.60	4.20
Data, products and information dissemination	0.30	1.80
Coordination	1.00	6.00
Total	7.50	45.00

GEOGLAM 2012-2017 Budget requirements (M US$) – phased and scalable

GEO GROUP ON EARTH OBSERVATIONS

GEOGLAM Global Agricultural Monitoring

NATIONAL CAPACITY AND ENHANCEMENT NEEDS: Argentina

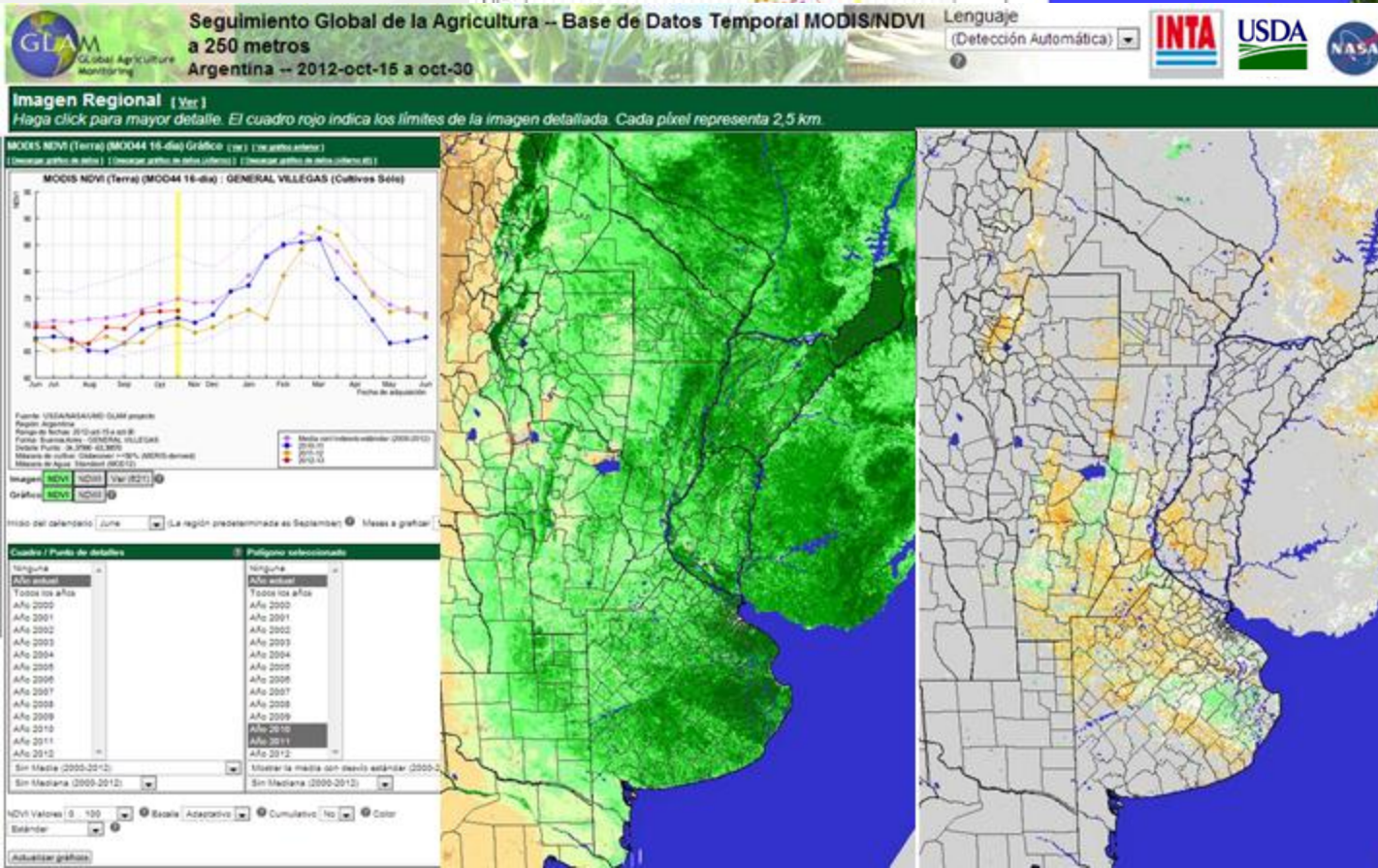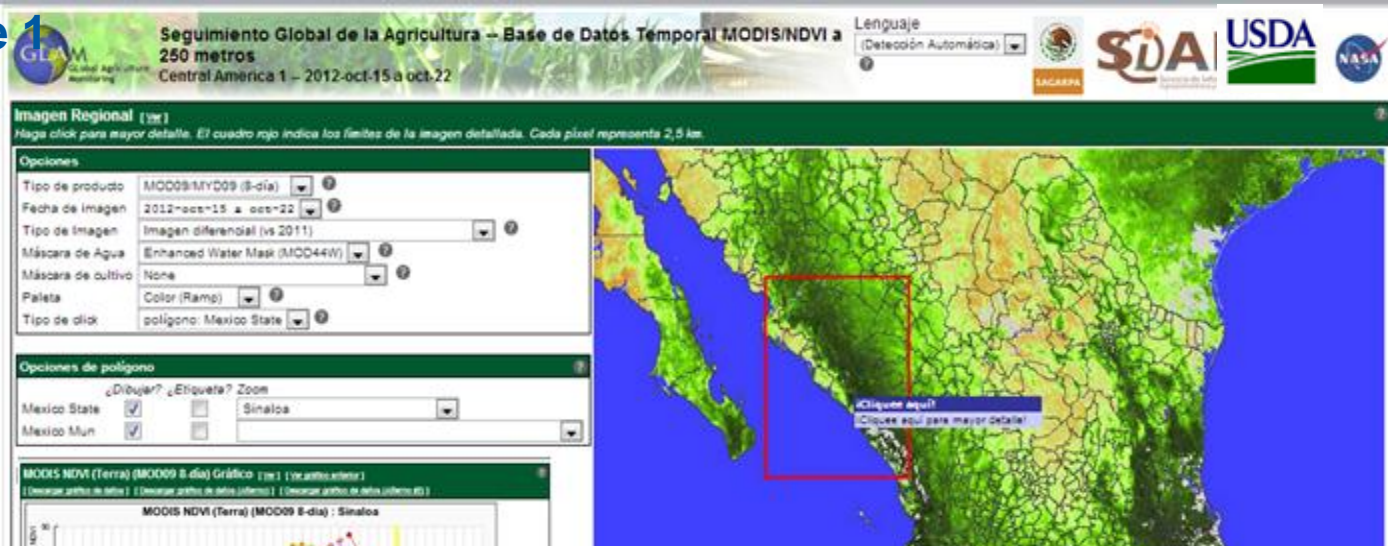| CURRENT NATIONAL AGRICULTURAL MONITORING SYSTEM GENERAL STATUS						
	INFORMATION TYPE					
QUESTIONS	**Cropland Map**	**Crop Condition**	**Crop Type**	**Crop Area Estimate**	**Yield Forecasts**	**Statistics**
Available/produced by current system?	Y	Y	Y	Y	Y	Y
Are the products available operatively and in real time?	N	Y	N	Y	N	Y
Are products generated using remote sensing?	NY	NY	NY	NY	NY	NY
Importance of EO contribution (1-5)	4	4	4	4	3	5

Why ?

1. The statistics agencies have not trained groups to process, analyze and evaluate information operatively

2. Universities and research groups do not participate in inter-institutional projects as in many other countries

3. When they do, the time of research is not compatible with the times of public Institutions and there is a lack of continuity in policies
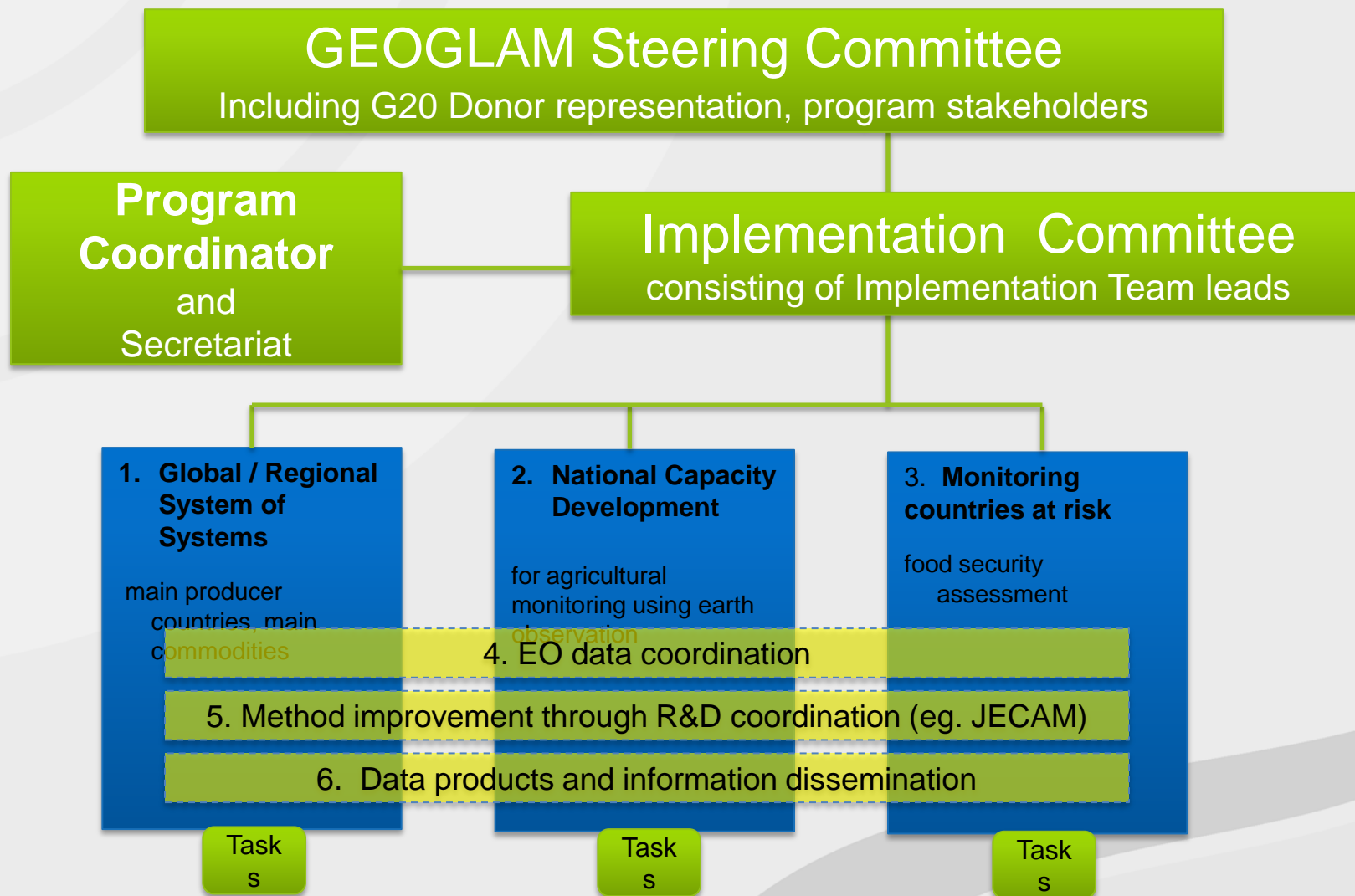
Component 2: Phase 1 National Capacity Building

Argentina and Mexico Examples: Developing National EO Crop Condition Monitoring Systems

GEOGLAM PROGRAM GOVERNANCE

GEOGLAM Steering Committee
Including G20 Donor representation, program stakeholders

Program Coordinator
and Secretariat

Implementation Committee
consisting of Implementation Team leads

1. Global / Regional System of Systems

main producer countries, main commodities

2. National Capacity Development

for agricultural monitoring using earth observation

3. Monitoring countries at risk

food security assessment

4. EO data coordination

5. Method improvement through R&D coordination (eg. JECAM)

6. Data products and information dissemination

Tasks

Tasks

Tasks

GEOGLAM 'CAPACITY BUILDING'
GENERIC ENHANCEMENT PROCESS

Step 1. Regional Status Assessment, Needs and Priorities Workshop

Step 2. National Engagement / Commitments – interested parties

Step 3a. National Implementation

Step 3b. Regional Training / Information Exchange and continued regional networking

Linkages & feedback between the global/regional monitoring systems and activities