



Developing a Global Agricultural Monitoring System of Systems

Chris Justice
(University of Maryland)
and the
**GEO Agricultural Monitoring (Ag0703)
Community of Practice**

The Washington Post

NORTH KOREA

Huge Gap Predicted In Supply Of Food

By [Blaine Harden](#)

Washington Post Foreign Service
Thursday, April 17, 2008; Page A14

BBC
NEWS

Last Updated: Friday, 23 March 2007, 00:25 GMT

Biofuel demand makes food expensive

INTERNATIONAL
Herald Tribune | Asia - Pacific

US announces US\$40 million in food aid for Bangladesh amid shortages

Published: May 5, 2008

The New York Times

ON THE WEB
Saturday, May 10, 2008

Food Chain: Drought's Toll

The New York Times

Across Globe, Empty Bellies Bring Rising Anger



[guardian.co.uk](#) | TheObserver

Food aid to poorest countries slashed as price of grain soars

UN warns of drastic crisis as relief workers urge donor countries to help beat shortages by switching to giving cash or vouchers

ep drought in Australia
experts wondering how
climate change could affect
way we feed the world.

BBC
NEWS

News Front Page

Page last updated at 10:23 GMT, Wednesday, 7 May 2008 11:23 UK

Bangladesh bans most rice exports

Bangladesh has banned exports of nearly all the rice it produces to prevent shortages and keep food costs down.

The government said the ban began on Tuesday and will last six months.



[berk.com](#) Updated: New York, May 11 00:21

Rice Jumps to Record on Philippine Imports, Curbs on Exports

REUTERS



THOMSON REUTERS

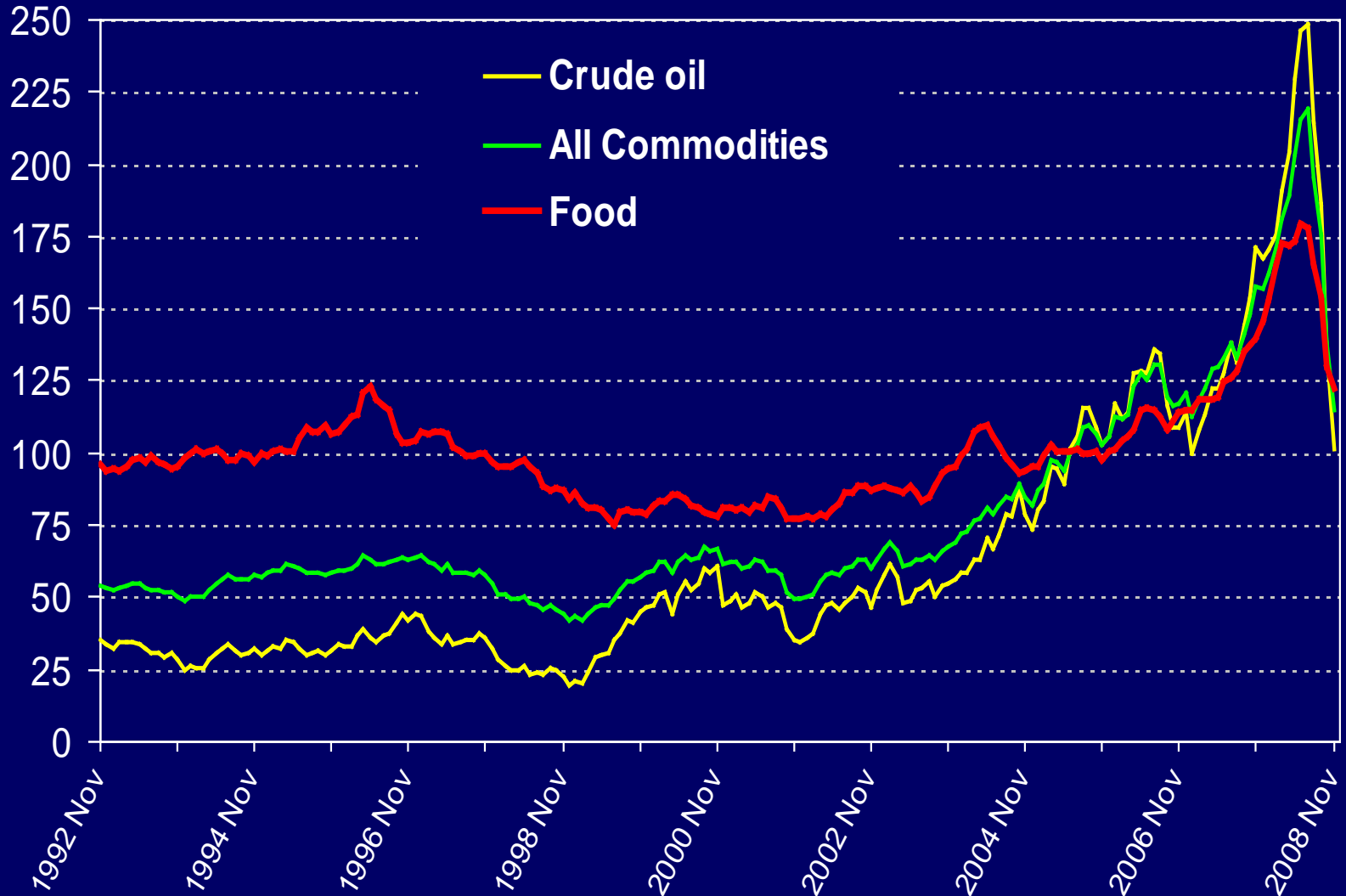
Food riots to worsen without global action: U.N.

Fri Apr 11, 2008 1:57pm EDT

Energy and Food Prices Closely Linked

Energy prices affect ag inputs, processing, transportation, and biofuels

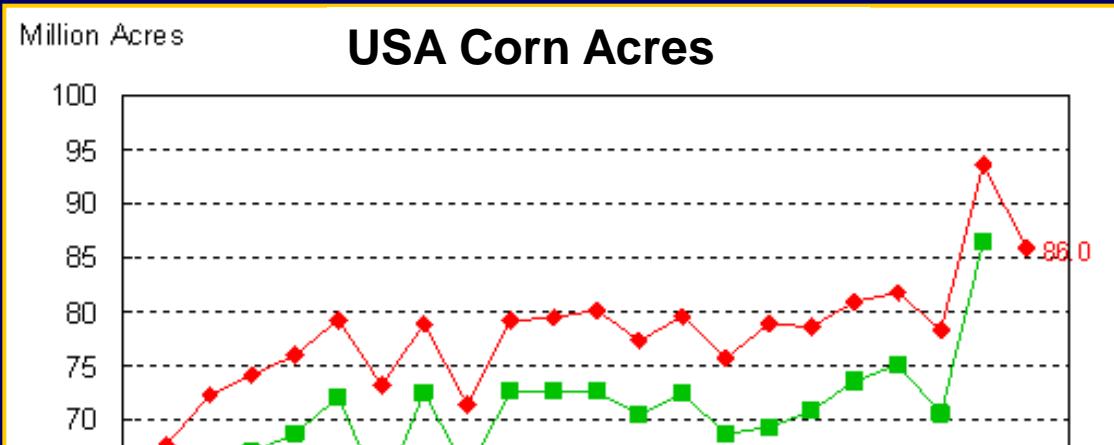
Index: January 2005 = 100



Source: International Monetary Fund: International Financial Statistics

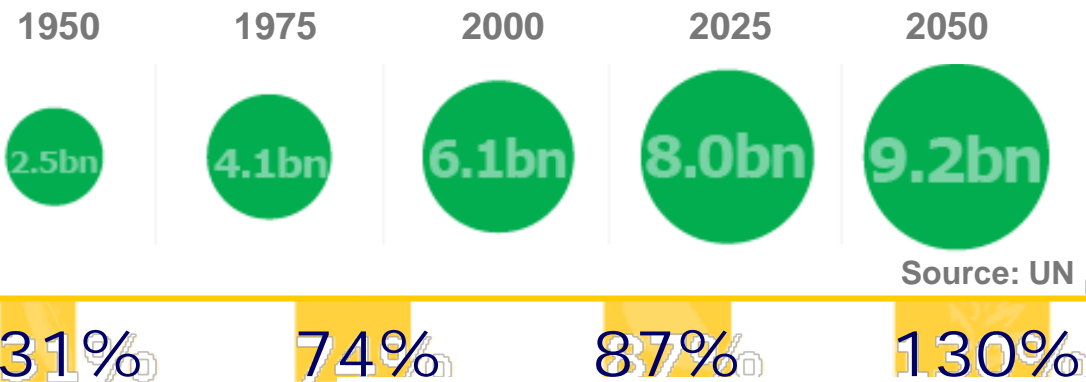
Context for Agriculture Monitoring

Agriculture is an essential component of societal well-being



Price Rises in a single Year, March 2007 - March 2008

WORLD POPULATION GROWTH



Source: Bloomberg, except Rice: FAO/Jackson Sons & Co

ons

S
08



Source: WFP

Source: FAS (Jim Crutchfield)

- 
- Meeting these challenges requires accurate agricultural information that can inform policy
 - Agriculture monitoring systems can help meet these information needs:
 - Timely information on agricultural production and markets
 - Early indication of shortfalls in production
 - Identification of Food Security risks
 - Monitoring of agriculture land use change and trends for policy decisions
 - While there are currently multiple operational agricultural monitoring systems, they operate independently in a poorly coordinated way

USDA FAS Global “Strategic Intelligence” with Satellites

(utilize “all data sources” & “convergence of evidence” approaches)

- FAS Field Travel
- Official Country Reports
- News Wire
- FAS Attach
- <http://www.fas.usda>
- *Weather Data* (stations & satellites)
- *Crop models* (stations & satellites)

Poster by Inbal Becker-Reshef
this pm

Crop Production Estimates Released Each Month

- **World Agricultural Supply & Demand Estimates (WASDE)**
- **Production & Supply Database (PSD Online)**
- **World Agricultural Production (WAP) Circular**

MARS-FOOD Crop Monitoring System

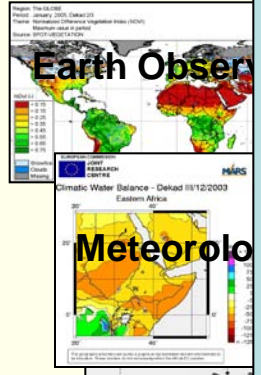
European Commission Joint Research Center (JRC)

System based on the use of global remote sensing and meteorological data and on the development of...
 Focus on 4 Regions

Olivier Leo

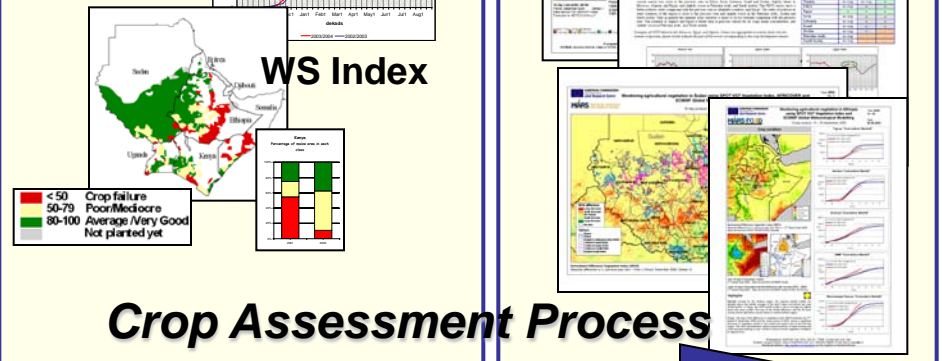
Presentation in this Session

Data collection and retrieval



Agronomic Database

WEB Information
 European Media Monitor



Dissemination



- EU Delegations
- National EW Agencies
- Int. Institutions (FAO, ...)

China Global Crop Monitoring 全球农情监测


- Crop condition monitoring. (monthly) • 作物长势监测-每月
- Productivity monitoring. (quarterly) • 测-每季
- Monitoring

Lu Shanlong

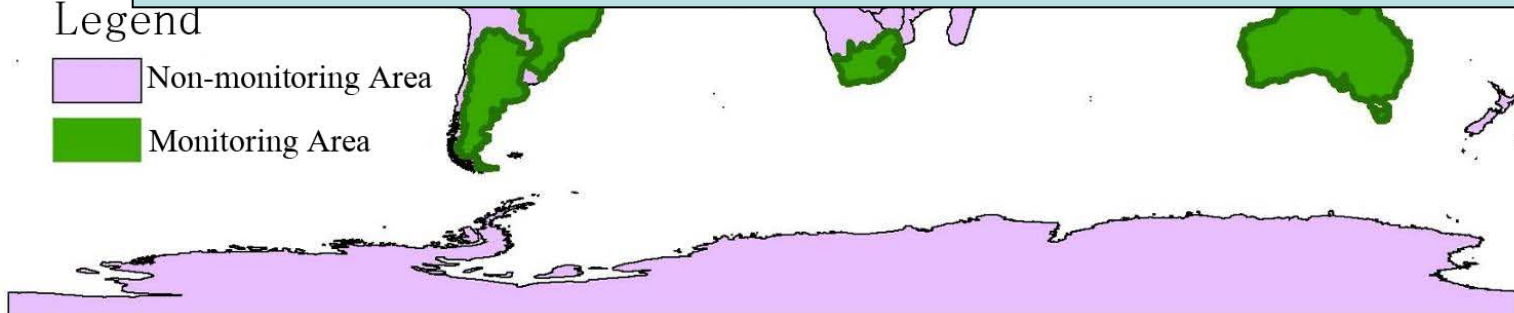
Poster on Crop Watch Central Asia

Poster Session this pm

Legend

 Non-monitoring Area

 Monitoring Area



FEWS –Famine Early Warning System

- Focus on access to food (*Africa, Central America & Afghanistan*)
- Geographically characterizes vulnerability and interperturn hazards to food insecurity through:
 - Routine monitoring of rainfall, vegetation, crops, and market prices

Food Security & Nutrition
Quarterly Brief - Focus on Risk Factors

Issue: March 16, 2007

KEY FINDINGS

Climate: Further strong conditions by ground-moisture indicate that no significant rainfall occurred during February which is unusual for the time of year. Following the above-mentioned Drought, the most serious is considered still, and generally there are no reported problems or fears of access to water, pasture and income throughout the country.

Civil Insecurity: FSAU highlighted in the 2006/07 Post Deyr Analysis that most effective protection and security measures are established, levels of food insecurity would increase. Since then, levels of healthy and suitable conditions have improved, with ongoing evidence that has led to the displacement of an estimated 40,000 people from Mogadishu in February. Although the Kenya-Somalia border remains closed officially to livestock trade and population movement, there has been improvement in humanitarian access with the easing of restrictions on aid convoys into the Juba and Gedo regions from Kenya.

Agriculture: Incoming Deyr off-season crops are currently at different stages, from sowing to harvesting, depending on the time of planting and length of dry season. Cereal availability is improving in most markets in southern Somalia, as early-planted Deyr season food crops and maize and sorghum in unshaded areas have started entering the market. In general, there has led to reductions in cereal prices and improvements in pasture prices for poor households in the rangeland areas, and coalitions to beneficial terms of trade in pastoral areas.

Livestock: Pastoralists and agro-pastoralists are benefiting from a mild Deyr season as a result of the exceptionally good Deyr season rains. Livestock operations are considered overall the best and could

Valid: February 3 - February 9, 2005

Africa Weather Hazards Assessment

NOTE: Black hatched regions depict combined wheat, maize, sorghum, and millet crop zones which are active (owing to harvest) during the current month. (From FAO)

1. Eastern Ethiopia, Kenya and northeastern Tanzania saw below normal rainfall during 2004. This has resulted in reduced moisture for pastures and water supplies.
2. Water resource problems persist in and around western Afar in northern Ethiopia due to light 2004 rains.
3. Seasonal rains were lighter than normal in central Darfur, Sudan and adjacent parts of Chad, reducing water supplies and stressing pastures.
4. Lake Victoria's level remains just above 10-year low, reducing water resources downstream.
5. Northwestern Tanzania, southwestern Uganda and eastern Rwanda have received lighter than normal rains during January.
6. Interior Western Cape, South Africa has received below normal rains during the previous rainy season and has resulted in severe water shortages.
7. Harrier rains have fallen recently, however the drought continues in southern Mozambique and adjacent parts of Zimbabwe and South Africa. The drought has resulted in very low levels on the Limpopo, and reduced water resources.
8. Central Mozambique and southern Malawi have received heavy rains which caused flooding problems. More rain is expected and will likely result in additional flooding, especially near major rivers.
9. Rainfall since early November has been well below normal over western Morocco, reducing moisture for winter grains.

Executive Overview of Food Security in Sub-Saharan Africa
March 28, 2007

FEWS NET Alert Status

Highest Priority—Urgent Action Required

Chad: Civil insecurity continues to prevent the return of internally displaced persons (IDPs), and herders have sought refuge in Darfur. Humanitarian and food access are restricted. IDPs will likely require aid until October 2008.

Ethiopia: Despite very good water-season production, cereal prices are at a 15-year high. The number of people requiring emergency assistance (currently 1.3 million) will increase as prices continue to rise. The 2007 humanitarian appeal includes US\$ 129 million for food-food needs.

Somalia: Above-normal rainfall in the upper catchment of the Juba and Shabelle river valleys is expected in the upcoming pre-season, and crop establishment and food production activities in food-prone areas are recommended before June. Revenue losses will require early prior to the start of rains in April for pre-planting. Recent civil insecurity has disrupted Mozambique market activities.

Urgent Action Required

Kenya: Despite good harvests and improved food security for many pastoralists, food insecurity continues in pastoral areas affected by drought and Rift Valley Fever. Emergency levels of global acute child malnutrition persist in some districts, exacerbated by the impacts of RVF and flooding.

Mozambique: Food insecurity is deteriorating in the south due to a below-average first-season harvest. Drought response continues in cyclone- and flood-affected areas. Agricultural input trade fairs for second-season planting are beginning.

Rwanda: Drought conditions in the south have caused some crop failure, which will increase food insecurity during the 2007/08 consumption year. Substantial food imports will be necessary given low production in good in the north, and high prices will continue to restrict food access.

Preparedness and Monitoring Required

Darfur (Sudan): High and increasing food prices are expected to push many poor urban and rural households from moderate to high levels of food insecurity in the coming months. High global and acute child malnutrition rates persist.

India (Kenya): Pastures and GDPs continue to return, but those receiving dry hay are unlikely to collect before the main June-September cropping season. Malnutrition has spread despite vaccination and treatment activities.

Uganda: Substantial RVF control campaigns are underway, but limited spread of the disease continues. Restricted trade will limit benefits to the livestock industry.

Zimbabwe: Agricultural response to severe prices falls in improving civil insecurity in southern Uganda. IDPs access to

Food Security Alerts in Africa

Legend

- Emergency
- Warning
- Watch
- Quantity of concern
- Conflict or post-conflict situation
- FEWS NET presence

Significant Events Timeline

Food Aid Needs and Beneficiaries

Country	Population at Risk	Food Aid Beneficiaries
Chad	538,830	148,040
Darfur	150,000	76,300 (incl. 4,793 refugees)
Ethiopia	75 million	8.6 million (PDP + reserve)
Kenya	2.8 million	1 million (pastoralist and)
Mozambique	240,000	102,000
Somalia	1 million	137,700 (IDPs)
Southern Sudan	1.1 million (incl. 300,000 IDPs)	380,000 (as of February)
Tanzania	Site available	0 emergency
Uganda	2.4 million (incl. IDPs)	1.7 million
Zimbabwe	11.4 million (incl. 1.1 million urban cities)	1.7 million

FEWS NET is a USAID-funded activity. For more information, please visit www.fews.net or email info@fews.net.
Disclaimer: The views expressed in this publication do not necessarily

ETHIOPIA Food Security Update
March 2007

Figure 1. Estimated current food security status (Emergency = PSNP)

Legend

- Generally Food Secure
- Moderately Food Insecure
- Highly Food Insecure
- Extremely Food Insecure

Data source: Disaster Prevention and Preparedness Agency (DPPA) and Food Security Coordination Bureau (FSCB). Graphics by FEWS NET, February 2007.

conditions, the 2006/07 meher season's harvest is estimated by FAO/WFP and MoARD to the recent five-year average. This season follows three consecutive good major seasons, the meher and deyr seasons also improved the availability of forage and water in the and Somali regions. Most parts of Afar and Somali regions are also expected to maintain for the coming 60 days, according to Livestock Information Network and Knowledge centers have helped to reduce the number of people requiring humanitarian assistance in



UN FAO GIEWS-Global Information and Early Warning System

Provides policymakers and policy-analysts with the most up-to-date information on food supply and demand

Provides regular bulletins on food crop production and markets at the global level and situation reports on a regional and country-by country basis

Global Information and Early Warning System
- on food and agriculture (GIEWS)

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
helping to build a world without hunger

April 2007

COUNTRIES IN CRISIS REQUIRING EXTERNAL ASSISTANCE (total: 34 countries)

-->Table view

■ Shortfall in aggregate food production/supplies ■ Widespread lack of access ■ Severe localized food insecurity

COUNTRIES WITH UNFAVOURABLE PROSPECTS FOR CURRENT CROPS

-->Table view

COUNTRIES IN CRISIS REQUIRING EXTERNAL ASSISTANCE (total: 34 countries)

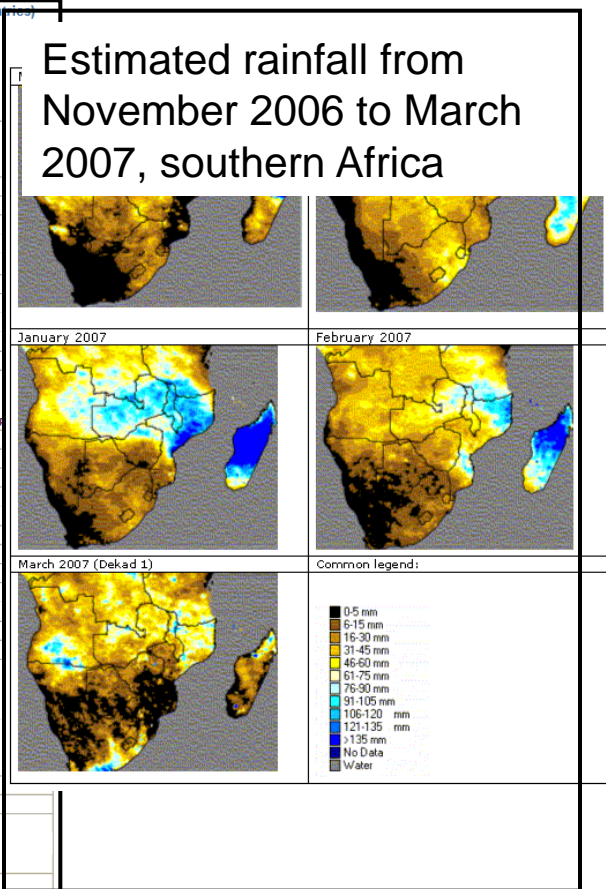
Click on any country to see details in the GIEWS Workstation

AFRICA (23 countries)

Nature of Food Insecurity	Main Reasons
Exceptional shortfall in aggregate food production/supplies	
Lesotho	Multiple year droughts, HIV/AIDS impact
Somalia	Conflict, floods and drought
Swaziland	Multiple year droughts, HIV/AIDS impact
Zimbabwe	Deepening economic crisis; drought
Widespread lack of access	
Eritrea	IDPs, returnees, high food prices
Ethiopia	Low incomes, localized floods
Liberia	Post conflict recovery period, IDPs
Mauritania	Multiple year droughts
Niger	After effects of 2004 drought and locusts
Sierra Leone	Post conflict recovery period, refugees
Severe localized food insecurity	
Burundi	Civil strife, IDPs, returnees and recent dry s
Central African Republic	Civil strife, IDPs
Chad	Refugees, insecurity
Congo	IDPs, refugees
Cote d'Ivoire	Civil strife, IDPs
Democratic Republic of the Congo	Civil strife, IDPs and refugees
Guinea	IDPs, refugees, high food prices
Guinea-Bissau	After effects of floods, localized insecurity
Kenya	Drought and floods in parts
Madagascar	Dry weather in southern areas
Sudan	Civil strife, returnees, drought in parts
Uganda	Civil strife, IDPs, drought in Karamoja
United Republic of Tanzania	Drought in parts and refugees

ASIA/NEAR EAST (9 countries)

Nature of Food Insecurity	Main Reasons
Exceptional shortfall in aggregate food production/supplies	
Azerbaijan	Drought
Iraq	Conflict and insecurity, IDPs
Philippines	Successive typhoons
Widespread lack of access	
Afghanistan	Conflict, IDPs and returnees, localized drought
Dem People's Rep of Korea	Economic constraints, floods



Global/Regional Monitoring Systems

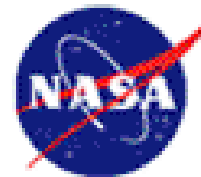
- Several global/regional scale systems in place – with common data needs, few common standards and protocols and inconsistent results – (most countries have national systems)



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
helping to build a world without hunger

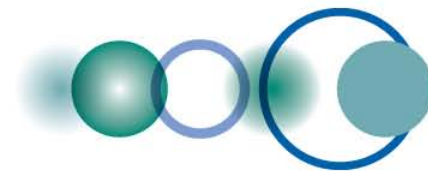


MARS FOOD - Crop Monitoring for food security



GEOS

THE GLOBAL EARTH OBSERVATION
SYSTEM OF SYSTEMS



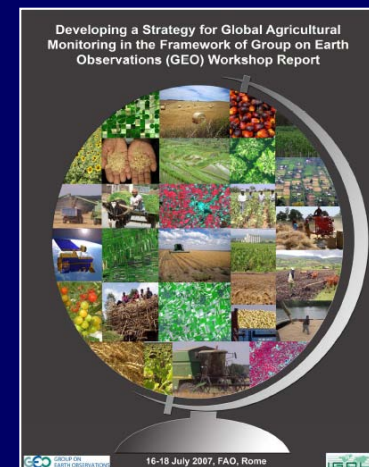


GEOSS Agricultural Monitoring Task (Ag 0703)

- Support the development and improvement of Operational Agricultural Monitoring Systems, *enhancing the current capabilities* by using Earth Observations in the areas of:
 - Agricultural Monitoring - sub task A (w. IGOL and GOFC/GOLD)
 - Agricultural Production Monitoring
 - Famine Early Warning
 - Agricultural Land Use Change
 - Agricultural Risk - Forecasting Weather and Predicting Climate - sub task B
 - Capacity Building for Agricultural Monitoring - sub task C

Initial GEOSS/IGOL Agricultural Monitoring Workshop July 2007, UN-FAO

- IGOL/GEO workshop to develop a strategy for global agricultural monitoring in the framework of GEO
- 47 participants representing 25 national and international organizations attended and established the *'GEOSS/IGOL Agricultural Monitoring Community of Practice'*



- Reviewed the current state of agricultural monitoring and developed a set of priorities and recommendations
- ISRO agreed to establish Task Secretariat (J.S. Parihar)



GEO Agricultural Monitoring System of Systems: Approach

1. Develop a common vision for the system amongst the Community of Practice (CoP)
2. Establish the conditions under which such a system can develop (GEO partners)
3. Identify near term practical steps (task activities and initiatives) that would contribute to achieving the vision (CoP)
4. Raise awareness to the importance of EO for agricultural monitoring and the level of national commitments for the Task Activities (CoP)

GEO Agricultural Monitoring System of Systems : Functional Components

1. Global monitoring of agricultural production, facilitating reduction of risk and increased productivity at a range of scales
2. Timely and accurate national (sub-national) agricultural statistical reporting
3. Accurate forecasting of shortfalls in crop production and food supply
4. Effective early warning of famine, enabling a timely mobilization of an international response in food aid
5. Global mapping, monitoring and modeling of changes in agricultural land use, type and distribution, in their social and ecological context (land use change / climate change)

GEO Agriculture Monitoring Community of Practice Website: http://www.earthobservations.org/cop_ag_gams.shtml




Home
About GEO
Meetings
Press Room
Documents
Contact



Global Agricultural Monitoring System

- About us
- Participating programs
- Events
- Documents
- Links
- Contact

Home > GEOSS > SBA: Agriculture > Community of Practice: Global Agricultural Monitoring System



Global Agricultural Monitoring System

The Group on Earth Observations (GEO) / Integrated Global Observing Strategy (IGOL) Agricultural Monitoring Community of Practice was established in July of 2007 at the second IGOL/GEO workshop convened at the headquarters of the UN twenty-five national and international organizations to assess and implement a strategy for

A number of global trends in agricultural monitoring systems are adversely affecting agriculture. The community continues to respond to these trends that sustains us. Understanding and addressing long-term threats to stable and productive agriculture requires strategic investments over time (e.g., based on satellite measurements and soil management) of our agriculture for the Millennium Development Goals.

The IGOL and the GEOSS: Agriculture is an essential component of human health, water quality and quantity and ubiquity of agriculture makes it a priority. Assessing the need for enhanced Global Observing of Land requires requirements for improved data. The GEO established the GEOSS over the next ten years. The GEOSS is addressing a broad range of international systems to provide a ten year strategy for developing a ten year strategy for a specific task of the program.

The Agricultural Community of Practice: The GEO acknowledges successful cooperation and collaboration includes the following three main tasks:

- Global mapping and monitoring of agricultural systems
- Global monitoring of agricultural systems and accurate forecasting of crop yields and increased productivity

Key documents

- [AG-07-03 Task Sheet](#)
- [Workshop report: Developing a Strategy for Global Agricultural Monitoring in the framework of Group on Earth Observations \(GEOSS\)](#)




Home
About GEO
Meetings
Press Room
Documents



Global Agricultural Monitoring System

- About us
- Participating programs
- Events
- Documents
- Links
- Contact

Home > GEOSS > SBA: Agriculture > Community of Practice: Global Agricultural Monitoring System > Participating programs

Participating programs

Examples of Global to Regional Agricultural Monitoring Systems

The UNFAO Global Information and Early Warning System (GIEWS)

The GIEWS was established in 1975 to monitor food supply and demand at the global scale and to provide early warning of serious regional food shortages. Information from GIEWS is used to identify impending food security crises so that the UN World Food Programme and other international and national agencies can develop country-specific needs assessments (Figure X.). GIEWS integrates satellite-derived information on land cover and land use with in situ data on agricultural statistics, livestock, agricultural markets, and weather. GIEWS monitoring is designed to enable direction of ground-based sampling to validate crop production estimates and development of quick, early, partial indemnity for immediate action.

Figure: GIEWS map of countries in need of food aid in October 2007

The USDA Foreign Agricultural Service (FAS)

The goal of the Office of Global Analysis (OGA) of FAS, specifically within the International Productions Assessment Branch, is to produce reliable, objective, timely, transparent, accurate data on global agricultural production. FAS monitors world agricultural production and world supply and demand for agricultural products to provide baseline market information and information for US domestic early warning. FAS analyses rely upon a combination of meteorological data, field reports and satellite observations at moderate and high spatial resolutions to aid in crop and growth stage identification and yield analysis. These data are used to confirm or deny unsubstantiated information about forecast crop yields and to identify unreported events likely to impact crop yields. To bring these disparate sources of data together, FAS has developed the Crop Explorer, a GIS-based decision support system. The Global Agricultural Monitoring (GLAM) Project jointly funded by USDA and the NASA Applied Sciences Program, is updating the FAS decision support system with the new generation of NASA satellite observations.

Figure: FAS decision support system images showing vegetation stress predominantly in croplands, during the 2006 drought, in southeastern Australia. The anomaly image compares NDVI values for the September 14 to September 29, 2006.

GEO Workshop on Best Practices for Crop Area Estimation with Earth Observations

Chairs:

Chris Justice (USA),
Olivier Leo (EC),
Wu Binfang (China)

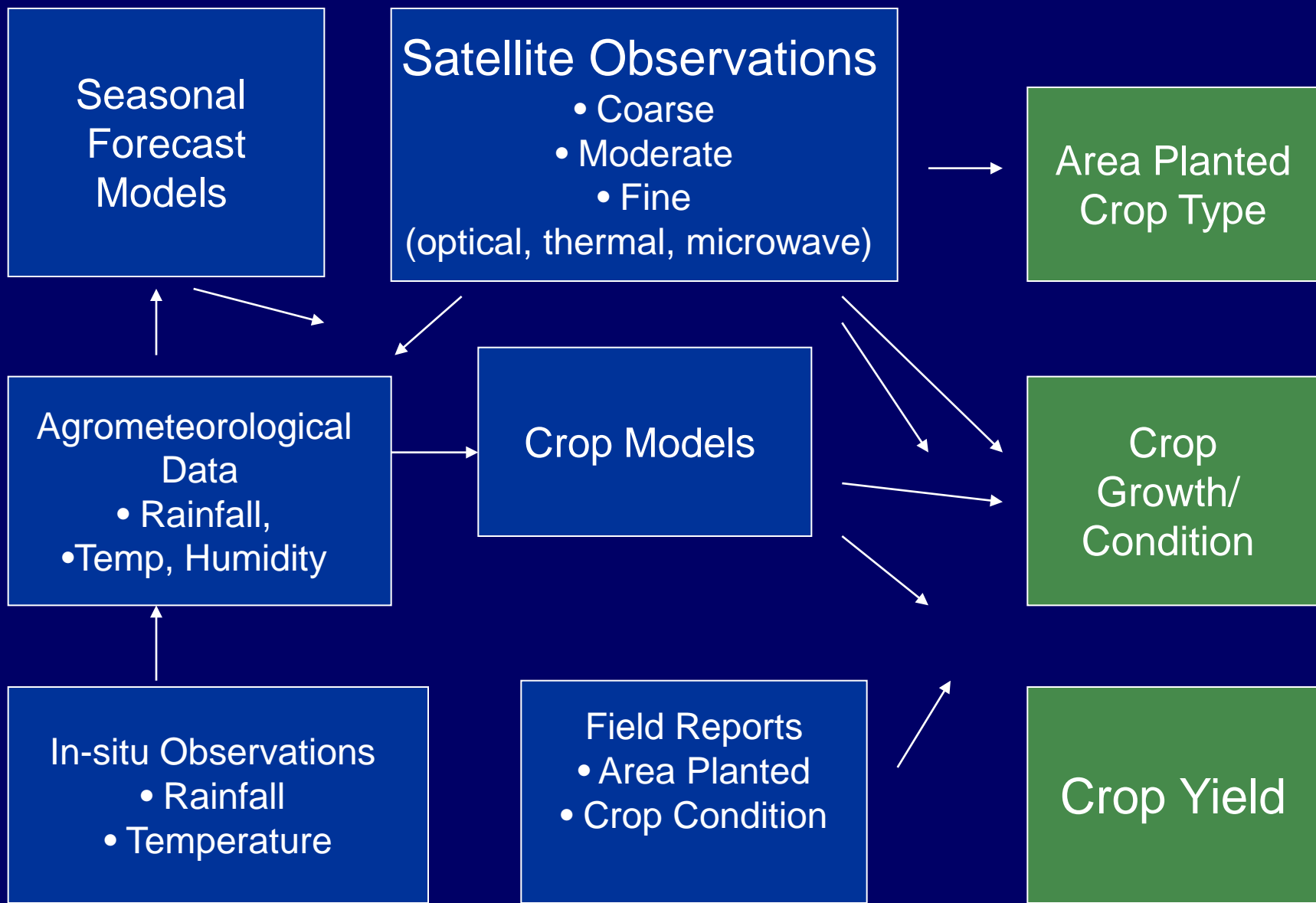
Secretariat:

Jai Parihar (India)



Monitoring of Agricultural Production

Observations and Models → Information



Global – Regional scale

National - Sub-nat.

Local - Parcel

Spatial resolution

5km - 1km

1km - 250m

250m - 20m

20m - 5m

5m - 1m

Use

hourly images

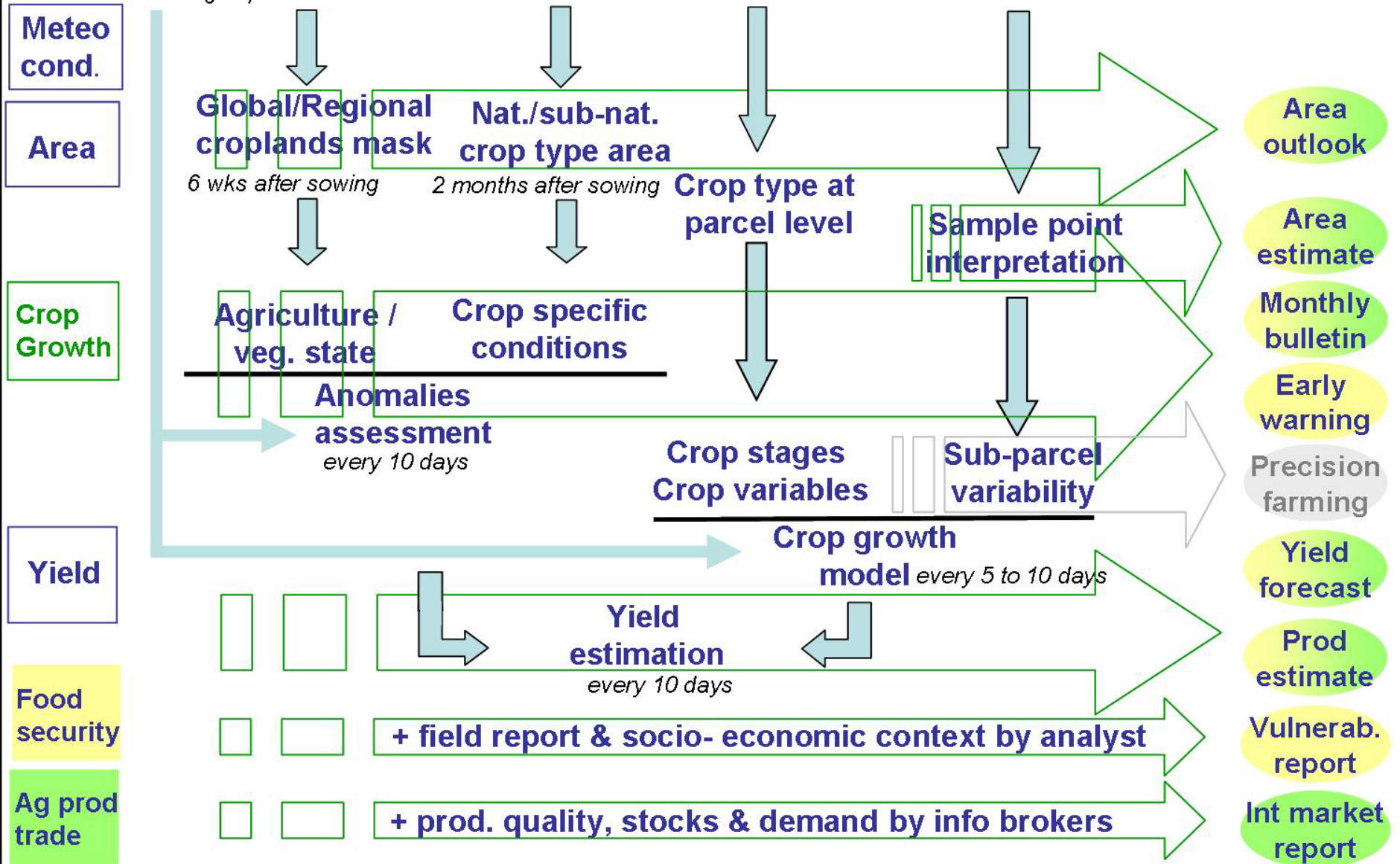
daily images

2 to 3 images per 10 days

1 to 2 images per 10 days

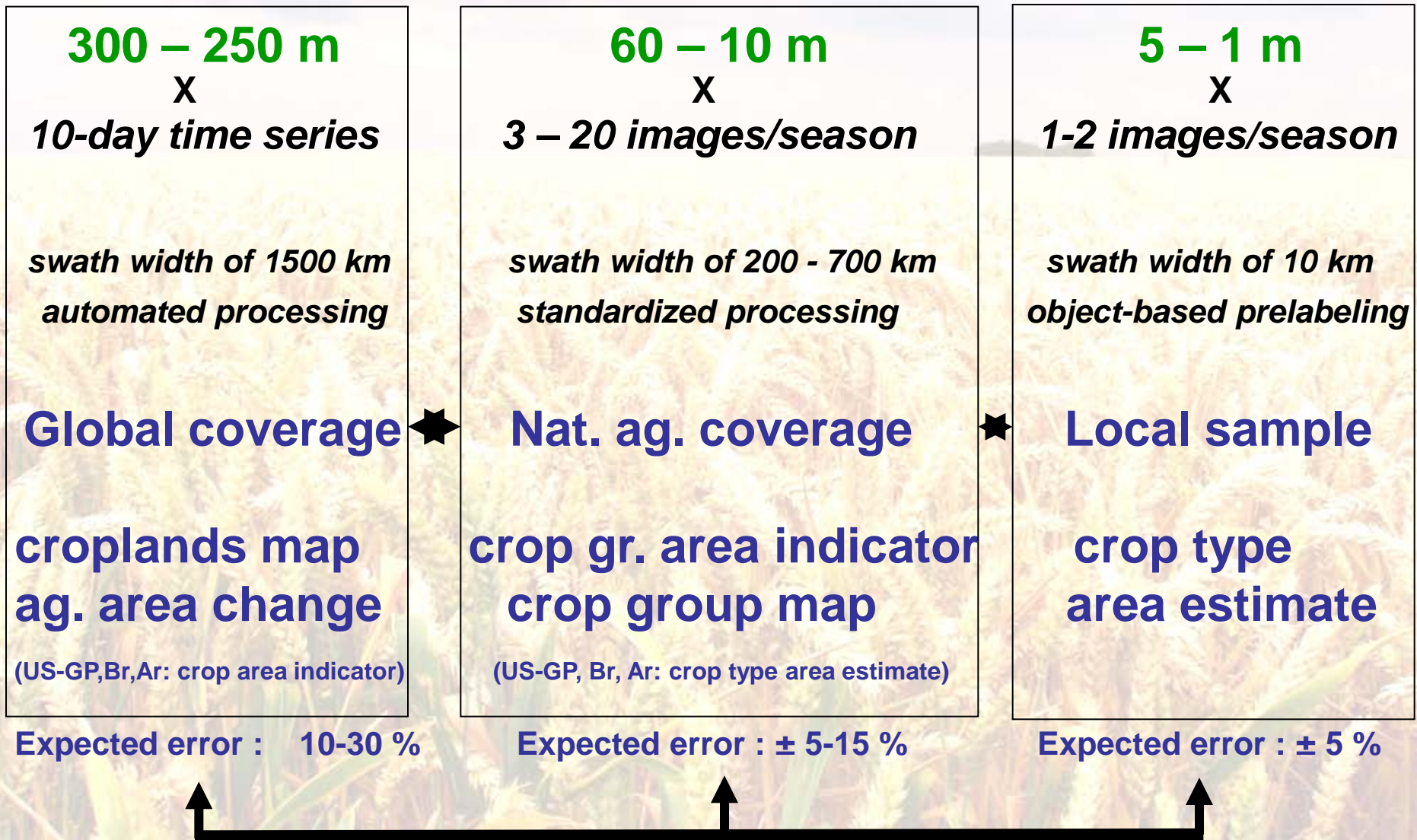
1 to 2 images per month

Revisiting capabilities



2. Goal for a GEO System of Systems - 2015 Vision

Annual EO products for Ag. land cover change information



Concerns Raised about the Adequacy of Current Observation Capabilities

- Concerns about **inconsistent data policies** and pricing
- Concerns about **inadequacy of data coverage** and **coordination of acquisition** strategies
- Concerns about **timeliness of delivery**
- Concerns about **accuracy of the products**
- Concerns about **data continuity**
- Concerns about the need for expanded **capacity building**

GEO Ag Monitoring Workshop Beijing, February 2009

Focus on Agricultural Monitoring, Risk & Capacity Building

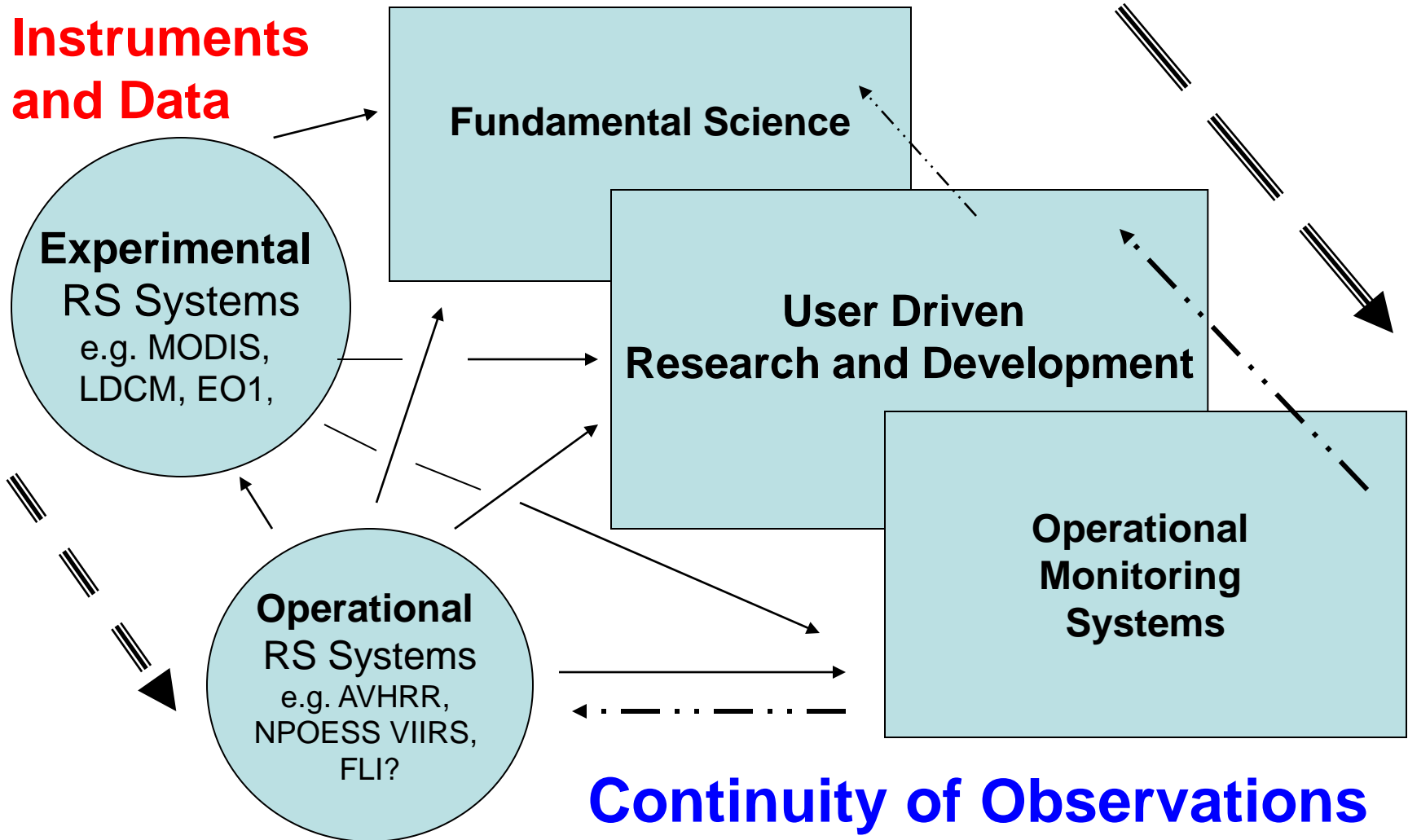


Operational Agricultural Monitoring
requires reliable and timely data, at
multiple scales, collected
systematically over the long term
(operationally)

Transitioning Research to Operations

Methods and Products

Instruments and Data



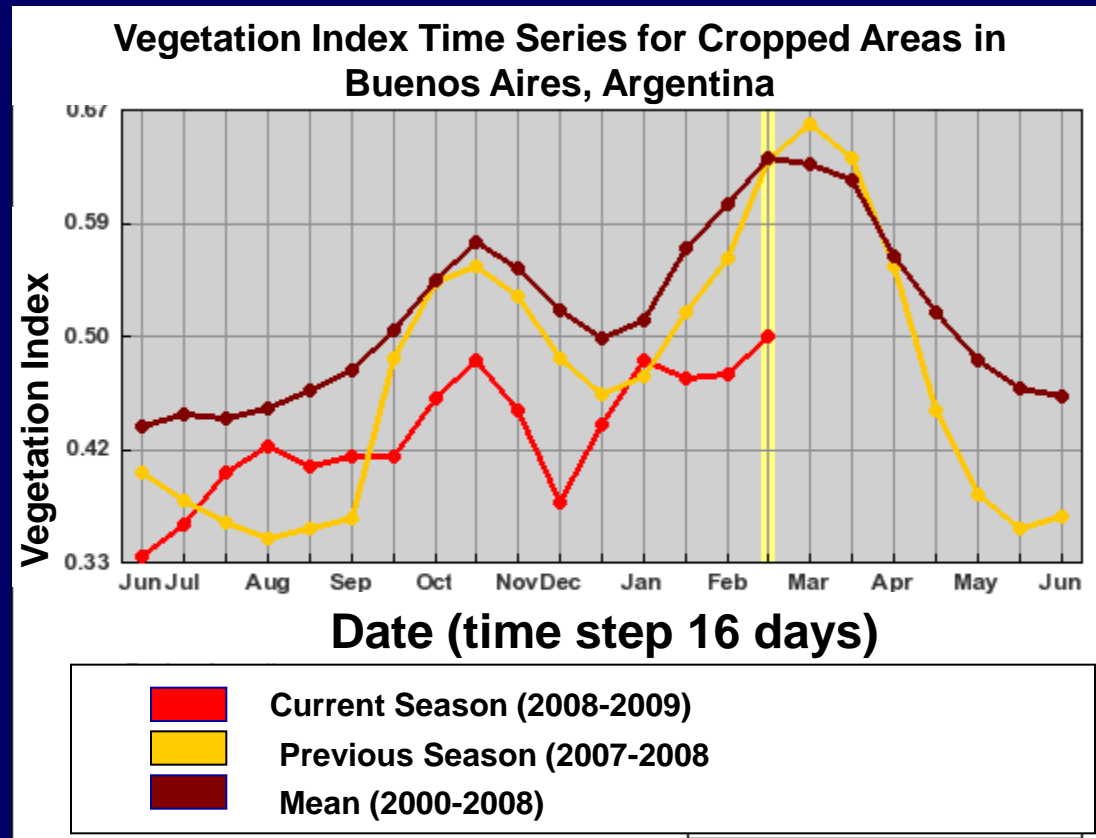
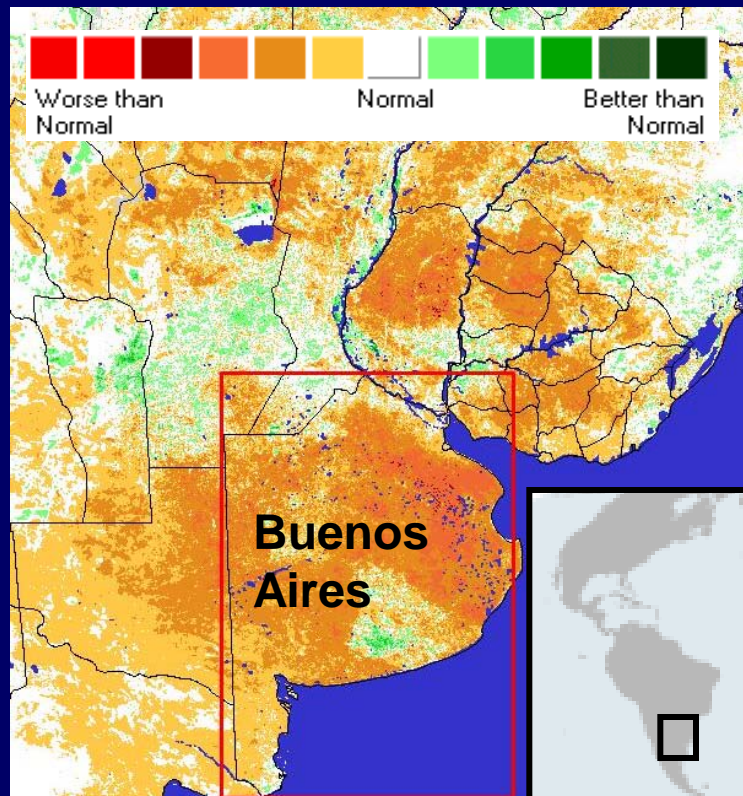
Example of Utility of the GLAM MODIS NDVI DBMS to Track Drought impact on Crops in Argentina

Argentina is currently experiencing one of the worst droughts in decades

According to FAS estimates:

- Argentina 2009 Wheat production dropped to 8.4 Million tons from 16.3 in 2008
- Argentina 2009 Corn production dropped to 13.8 MT from 20.85 in 2008

Buenos Aires NDVI Anomaly Image
Feb 02-Feb 17, 2009



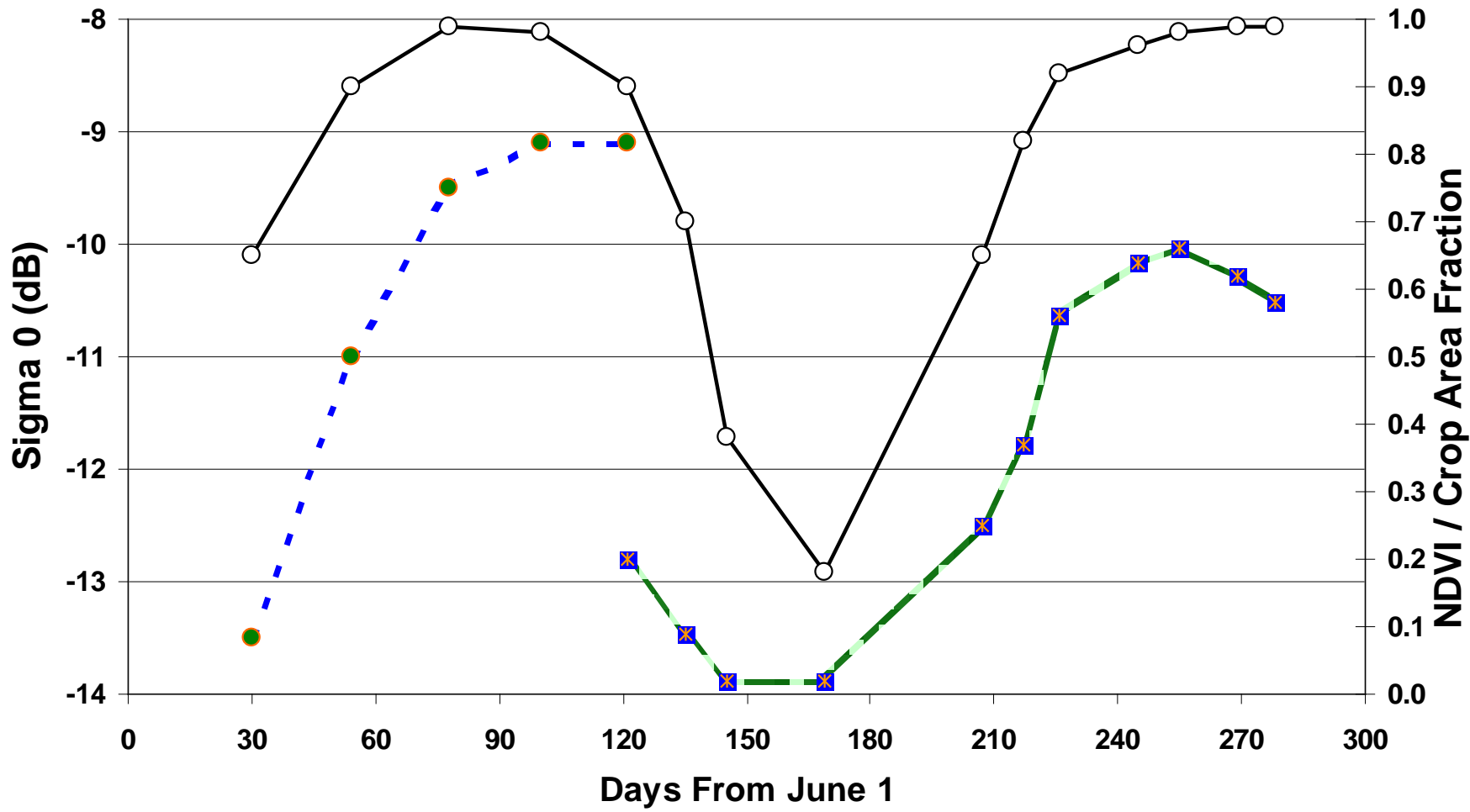
Indian Remote Sensing satellites – IRS Series (1A, B, C, D and P6)

Sensor	Blue	Green	Red	NIR	SWIR	Spatial Resolution (m)	Swath (~km)	Re-visit (days)
LISS-I	✓	✓	✓	✓		72	140	22
LISS-II	✓	✓	✓	✓		36	70	22
LISS-III		✓	✓	✓	✓	24	140	24
LISS-IV		✓	✓	✓		6	23/70	5
WiFS			✓	✓		180	780	5
AWiFS		✓	✓	✓	✓	56	780	5

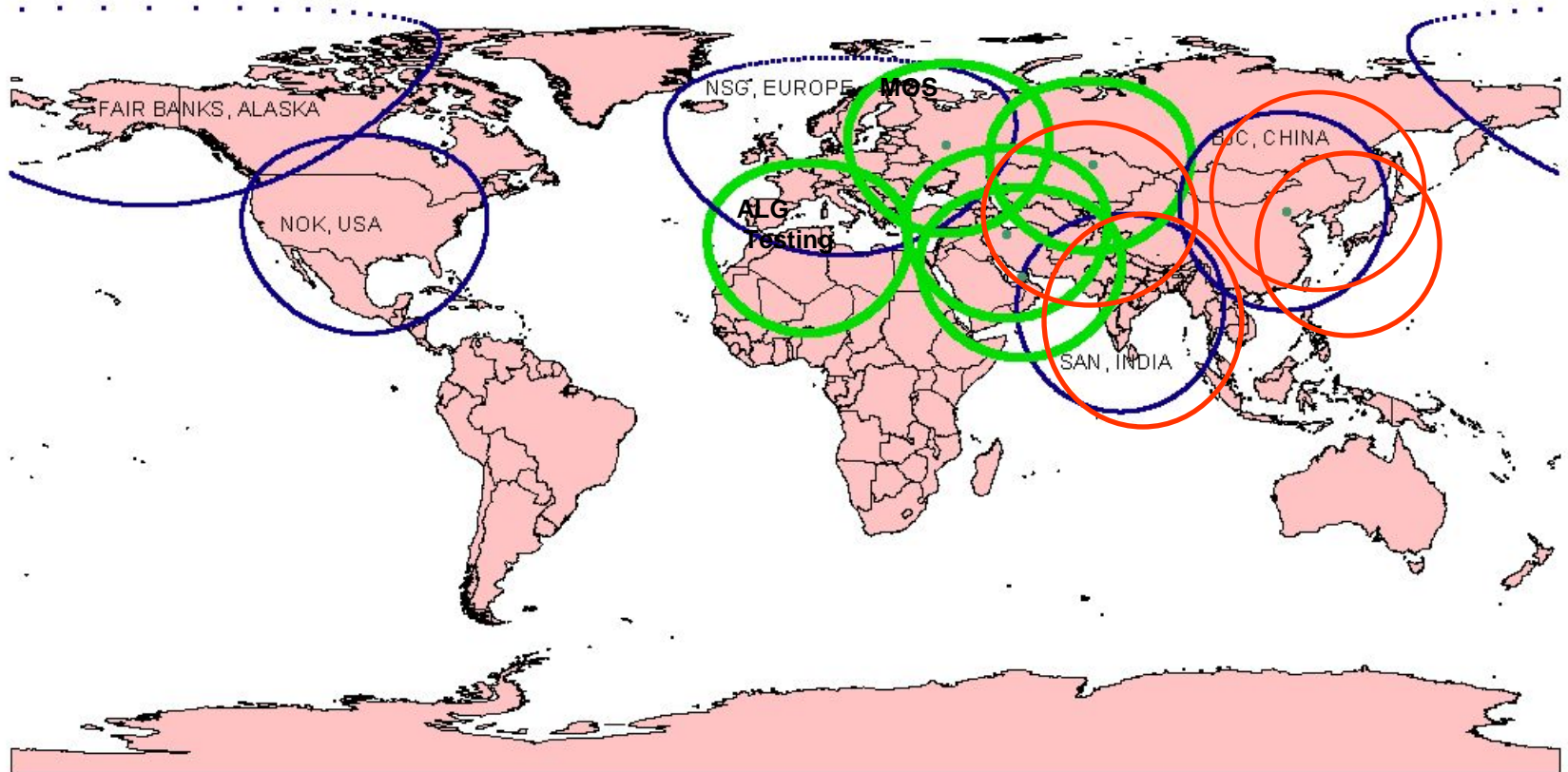
Monitoring Crop Growth Indicators & Crop Area Using RS Data



- - - Kharif (dB) - Microwave RS
- - - Rabi (NDVI) - Optical RS
- - - Crop Area Fraction



International Ground Stations

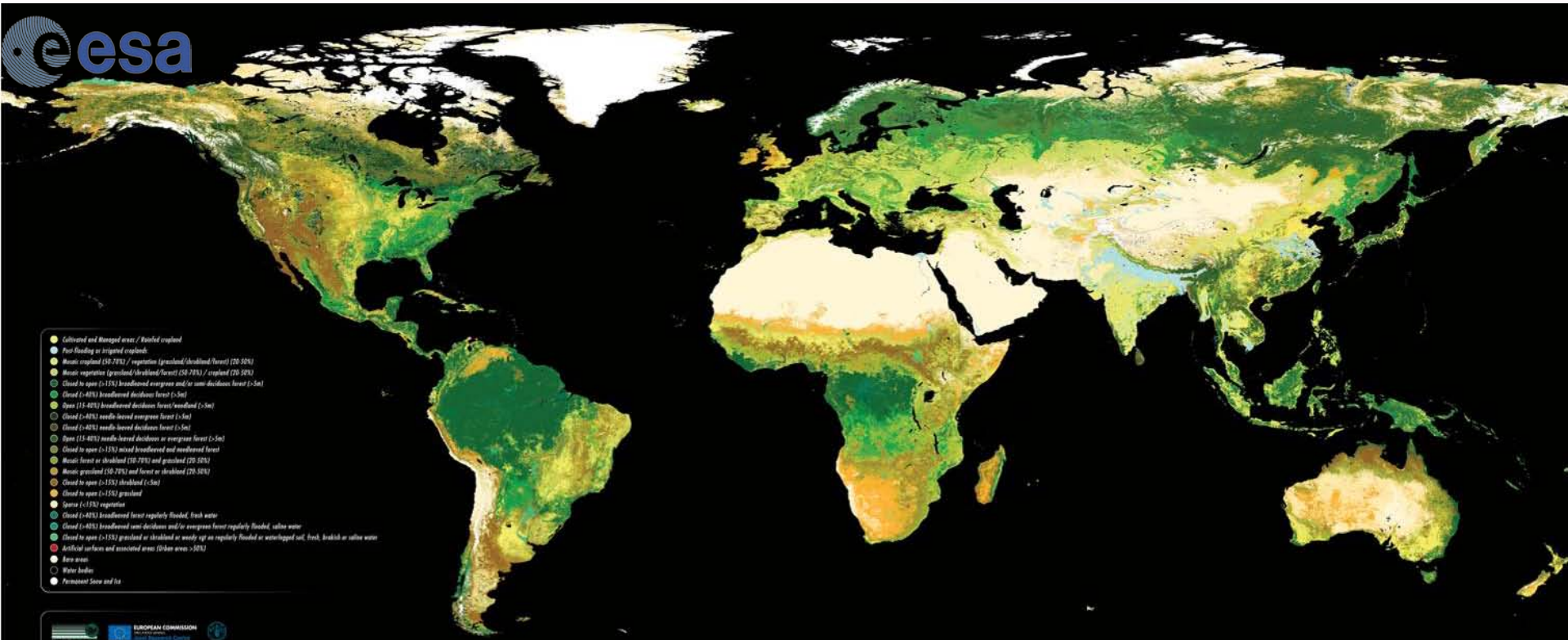


○ New Ground Stations for IRS-P6 ○ Existing ○ New Stations for IRS-P5

State of the Practice – R&D Community

Global land cover / croplands product

- ESA-GLOBCOVER MERIS 300m product released in 2008

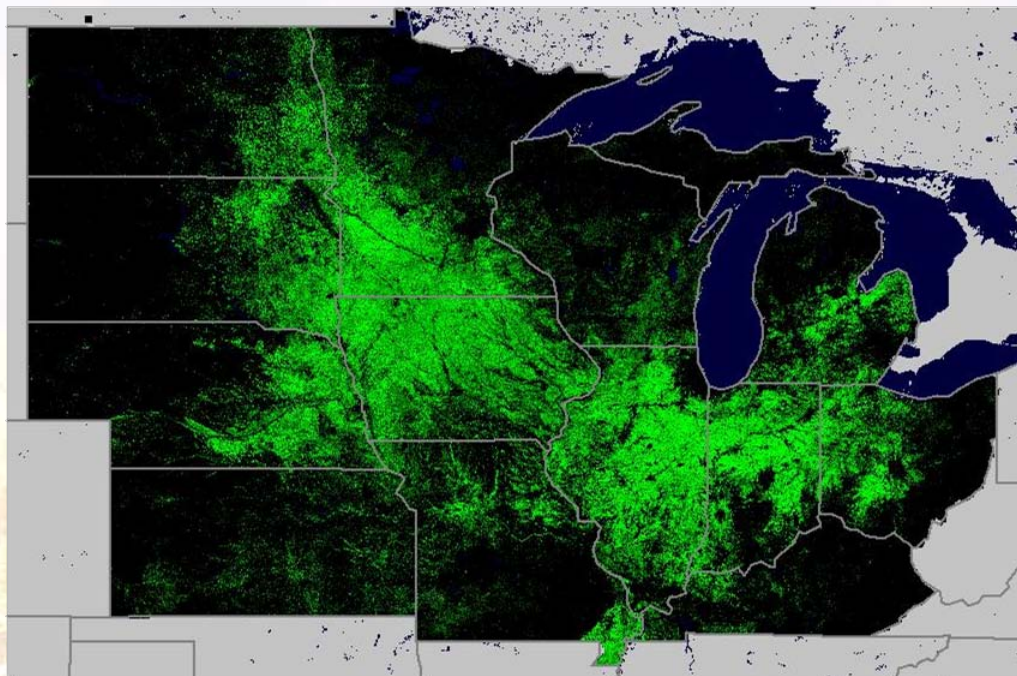


- Forthcoming MODIS 250 m crop likelihood product

GEOSS Workshop – Beijing, February 2009

Developing an Agricultural Monitoring System of Systems

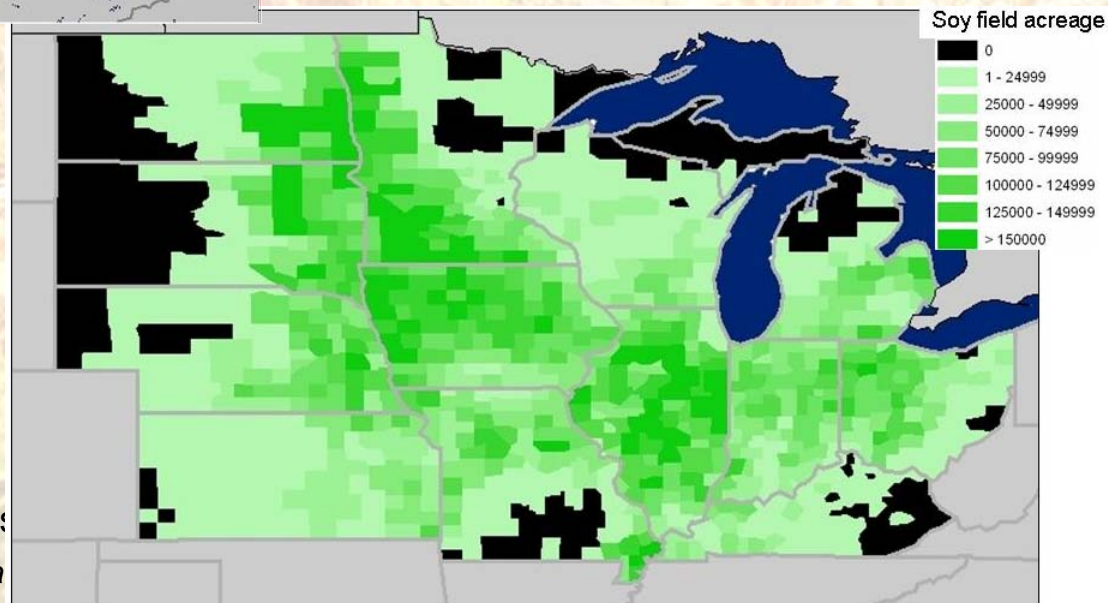
Crop area indicator from MODIS



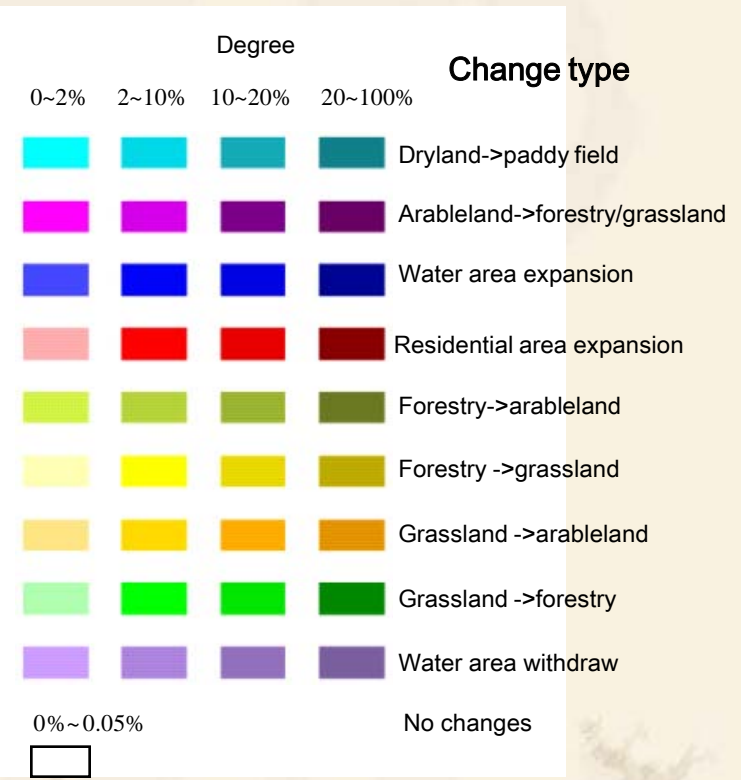
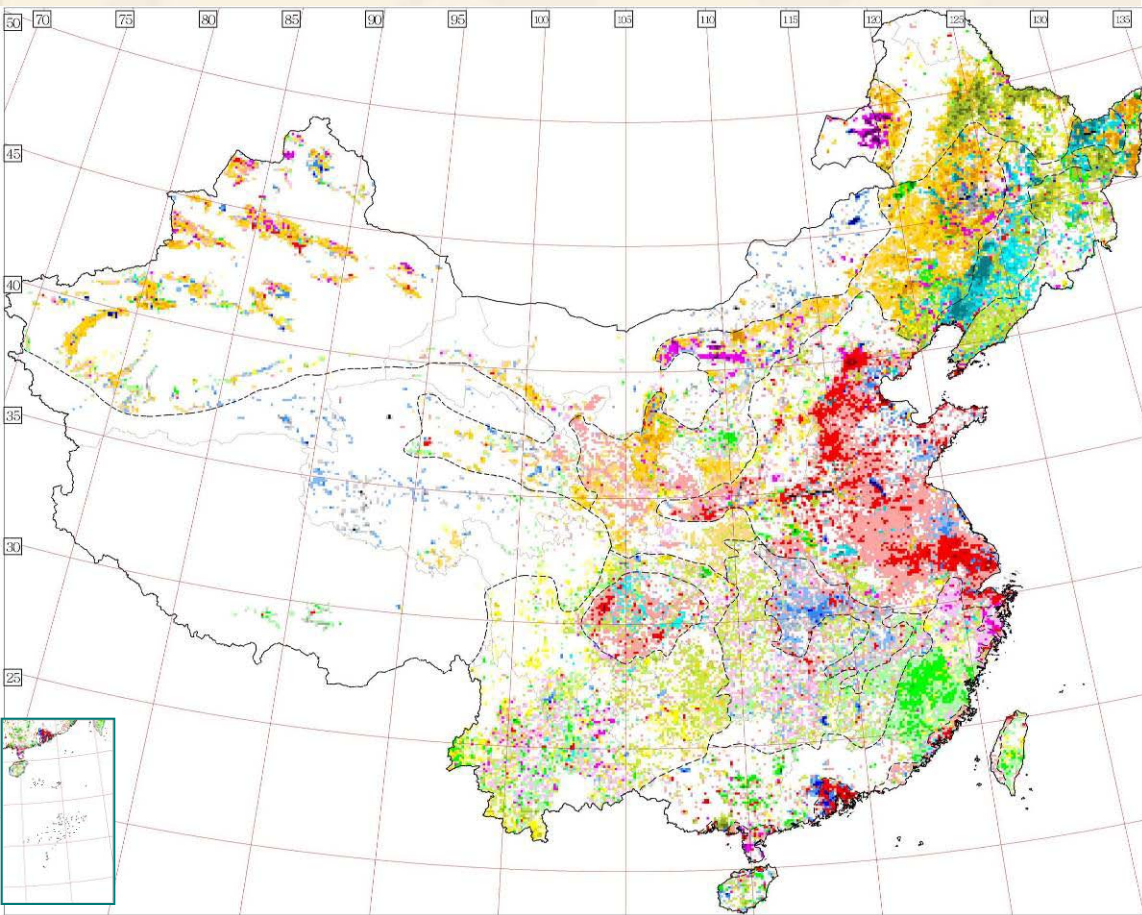
Percent soy cover, 2002 from MODIS time-series

Year	Regression	r ²
2000	$y=1.1044x + 341$	0.8059
2002	$y=1.0369x + 2314$	0.7459
2003	$y=1.0826x + 1086$	0.8125
2004	$y=1.1251x + 1800$	0.8292
2005	$y=1.007x + 554$	0.9031
2006	$y=1.0778x + 237$	0.9071
2007	$y=1.0798x + 3013$	0.9057

Soy acreage, 2002 from NASS data



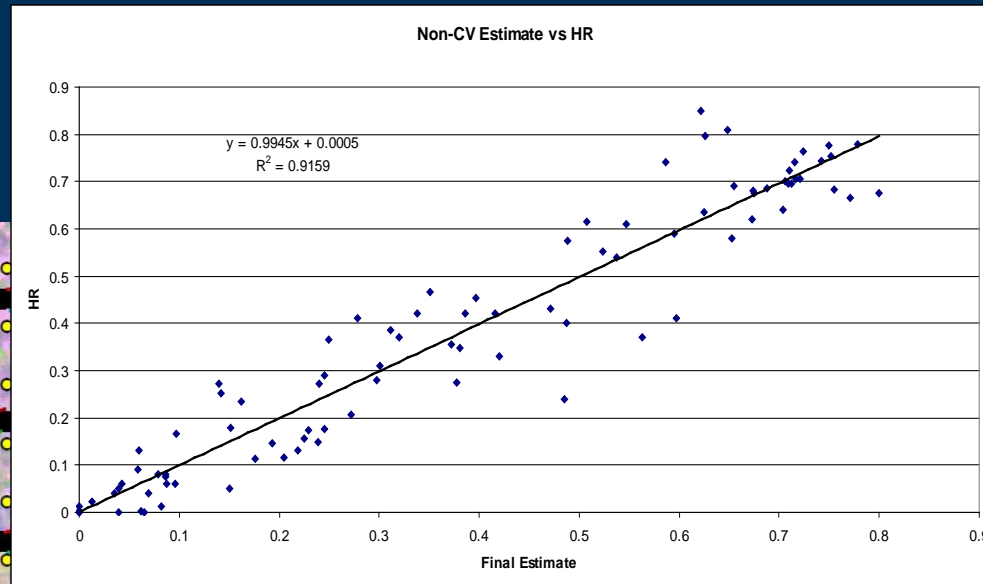
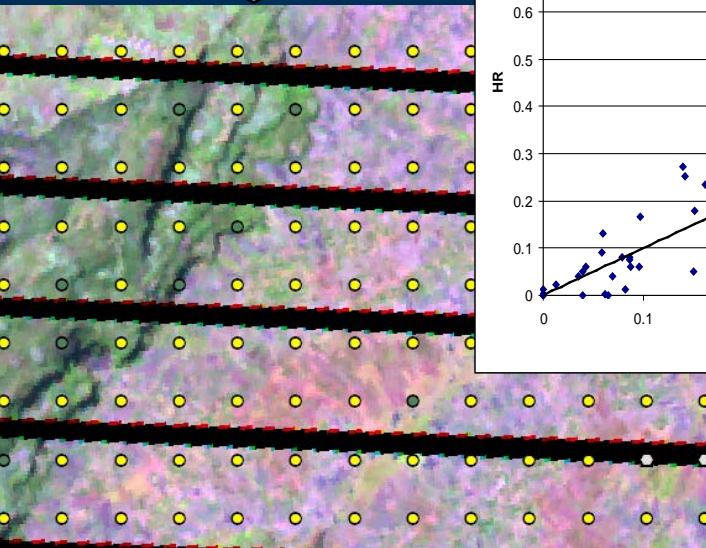
China Landuse Changes in 1990 -2000



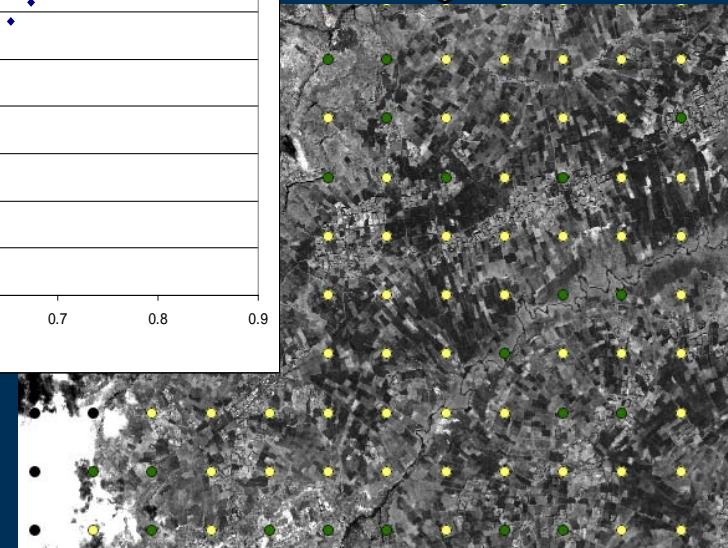
Crop area estimation - Ethiopia

IKONOS, Landsat, and SRTM used in a statistical framework

Full area
ETM+ and SRTM



IKONOS at
sample locations



Agreement between
IKONOS and model

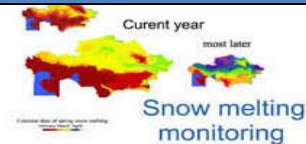
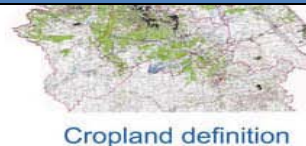
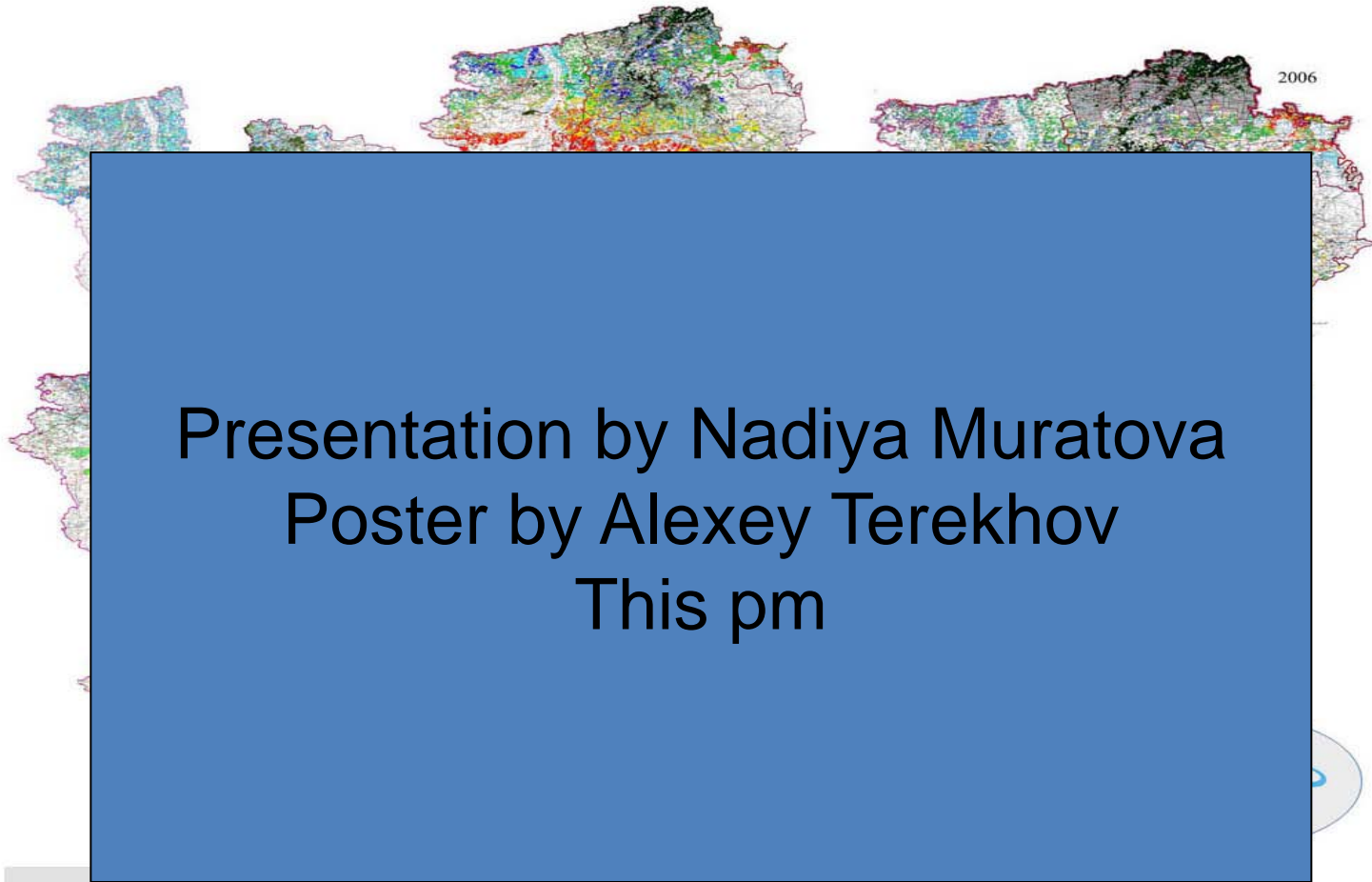


Jim Verdin EDC



Operational Crop Monitoring Scheme

National Centre of Space Research and Technology
National Space Agency, Kazakhstan





Recognize the need for **Enabling Conditions** for a Global Agricultural Monitoring Systems of Systems

- **Expanded International Cooperation** amongst space agencies and the community of practice (CoP)
- **Non-prohibitive Data Pricing Policies**, allowing for free and open sharing of data and enabling affordable regional agricultural monitoring –improve accessibility (GEO Sec)
- **Coordinated Data Acquisition** over critical agricultural areas during the growing season (GEO Sec/CEOS)
- **EO Data Continuity** > operational systems (CEOS)
- Improved coverage of meteorological stations especially for Africa (GEO Sec / WMO)
- Established best practices, standardized data products and reporting (COP)
- The integration of the satellite data into operational monitoring systems in developing countries (GEO Partners)

GEO Agricultural Monitoring Task Initiatives

- **Initiative 1. A Multi-source Production, Acreage and Yield (PAY) database** on a common platform. This will enable inter-comparison of results from different global and national reporting systems.
- **Initiative 2. Joint Experiments on Crop Assessment and Monitoring (JECAM)** undertaking data, modeling and monitoring method intercomparisons, accuracy assessments and integration, based on multi-source satellite and in-situ data – prototyping a system of systems
- **Initiative 3. Coordinated Data Initiatives for Global Agricultural Monitoring (CDIGAM).**
 - To ensure the on-going, frequent and timely acquisition, accessibility of satellite data during agricultural growing season and the continuity of those observations necessary for agricultural monitoring,
 - Compile the best available information on agricultural areas, crop calendars and cropping systems,
 - To fill the gaps in the current in-situ observations.
- **Initiative 4. GLAMSS Thematic Workshop Series (GTWS).** Community workshops will be held on thematic methodological issues and topics to improve communication amongst the CoP, develop best practices and standards and encourage cooperation, coordination and data sharing.

Agricultural CoP Near-term Activities

- **PAY** (Shared Production Database) – *in development (USDA, JRC, IRSA – initial development complete in 2009)*
- **JECAM** (Regional Experiments) on methods, inter-comparison and accuracy assessment (China, Argentina, Ethiopia, Canada, Brazil) - *China Pilot - start 2009 – Leadership Role from Canada in discussion*
- **CDIGAM** (Data initiatives) -
 - *Compilation best available crop mask and calendars (FAO GIEWS 2009)*
 - *Global cropland and crop type mask at 250m resolution (NASA /USDA/SDSU – 2010)*
 - *Global 2009-2010 60-30m data set (USGS, NASA, CEOS – GLS 2010)*
- **GTWS** (Thematic Workshops – *Planned*)
 - *Thematic Workshop SAR/Optical Agricultural Monitoring, Alberta, Canada, (Oct 19-24, 2009)*
 - *2nd Workshop Satellite Rainfall Estimation, JRC Ispra (Fall 2009)*
 - *ISPRS/GEO Climate Change and Agriculture, India (Dec 2009)*
 - *Development of a New Initiative of Climate and Agricultural Change*
- Ag Monitoring Best Practices Document

Minnesota

Kansas

Germany

GEOSS - JECAM Initiative Joint Experiments on Crop on Agricultural Monitoring

Bolivia

Thailand

Brazil

Image: NASA, ASTER Science Team

JECAM - Joint Experiment on Crop Assessment and Monitoring

- The proposed JECAM experiment aims to bring together the Community of Practice to undertake inter-comparison of EO data, analysis techniques, monitoring methods and models around a series of experimental data sets acquired for a small set of pilot sites around the World representing a range of agricultural systems

This joint scientific experiment has two strategic objectives:

- (i) to offer a unique opportunity for the ag. community to collaborate on selected sites to compare and share methods and products
- (ii) to demonstrate the fitness of in orbit EO instrument and their effective acquisition capabilities according to the different cropping systems in various regions.

Targeted Experiment Data Request

The following set of EO data is required from the most suitable sensors currently available belonging to GEO-partner space agencies:

- Very high res. imagery for area estimate production and crop mapping validation: 3 acquisitions over samples distributed in the site from ALOS 2,5m sensor and Resourcesat VHR sensor
- Wide swath instrument for crop mapping and crop monitoring: all possible acquisition of AWiFs and HJ-1
- Coarse instrument for crop condition monitoring: daily FR MERIS
SAR instrument for crop area indicator: all possible acquisition using ENVISAT ASAR and ALOS PALSAR

Also requested but already systematically acquired MODIS, SPOT-VEGETATION, LANDSAT, RADARSAT2

JECAM - Kazakhstan ?

- Is there an interest from Kazakh scientists in developing a GEOS Agricultural Experiment to test methodologies and data types to improve operational monitoring of agricultural production using satellite observations?
- If so, are there some agricultural test sites already in place that could be built upon ?
- How should we proceed ?



Canadian Group on Earth Observations
www.cgeo.gc.ca

CGEO

– ANNOUNCEMENT –

International GEO Workshop on Synthetic Aperture Radar (SAR) to Support Agricultural Monitoring

Workshop: 2 – 4 Nov 2009

Training Course (by invitation): 31 Oct – 1 Nov 2009



Alberta, Canada

Canada

The GEOS Ag CoP
welcomes anyone interested to
participate in this international
program

Please contact:
Chris Justice
Olivier Leo

Inbal Becker Reshef

Thank You

спасибо