



Developing a Global Agricultural Monitoring System of Systems

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IRSA Beijing, Feb 11-13th 2009

The Washington Post

Huge Gap Predicted In Supply Of Food

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

Herald Tribune Asia - Pacific

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

Published: May 5, 2008

BBC NEWS

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

Biotfuel demand makes food expensive

guardian.co.uk The Observer

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

The New York Times

Saturday, May 10, 2008

Food Chain: Drought's Toll

The New York Times

Across Globe, Empty Bellies Bring Rising Anger

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

BBC NEWS

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.

berg.com Updated: New York, May 11 00:21

Rice Jumps to Record on Philippine Imports, Curbs on Exports

REUTERS THOMSON REUTERS

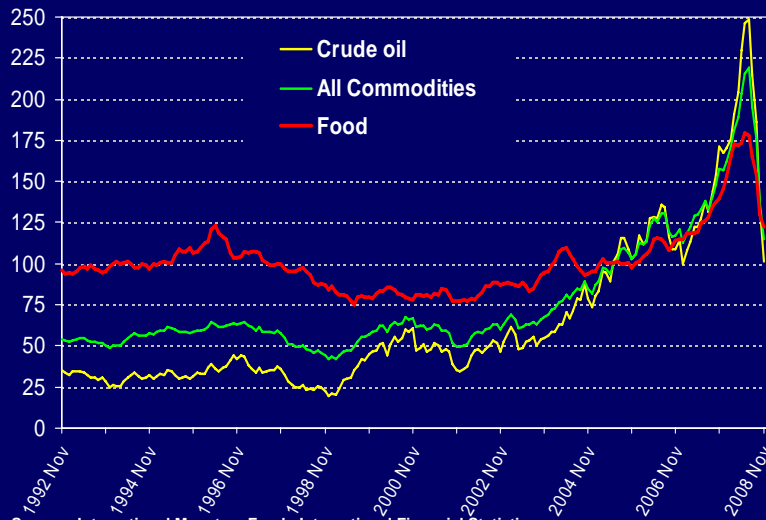
Food riots to worsen without global action: U.N.

Fri Apr 11, 2008 1:57pm EDT

Energy and Food Prices Closely Linked

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

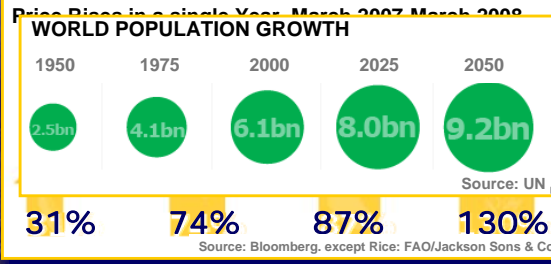
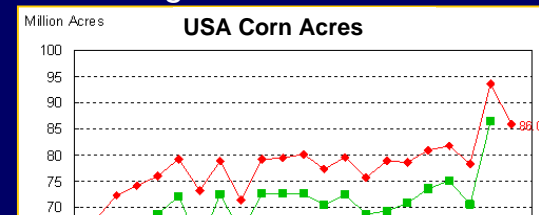
Index: January 2005 = 100



Source: International Monetary Fund; International Financial Statistics

Context for Agriculture Monitoring

Agriculture is an essential component of societal well-being



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

- 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
 - Agriculture trends for policy decisions
- While there are currently multiple operational agricultural monitoring systems, they operate independently in a poorly coordinated way

Global/Regional Monitoring Systems

- Several global/regional scale systems in place – with common data needs, few common standards and protocols and inconsistent results



GEO GROUP ON EARTH OBSERVATIONS

GEOSS

THE GLOBAL EARTH OBSERVATION SYSTEM OF SYSTEMS



GEOSS Agricultural Monitoring Task

- Support the development and improvement of Operational Agricultural Monitoring Systems, *enhancing the current capabilities* by using Earth Observations in the areas of:
 - Agricultural Production Monitoring
 - Famine Early Warning
 - Agricultural Land Use Change
 - Forecasting Agricultural Weather and Climate
- Initial planning for AG-07-03 Task started at an IGOL Workshop on Agriculture Monitoring, FAO Rome, 2006



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

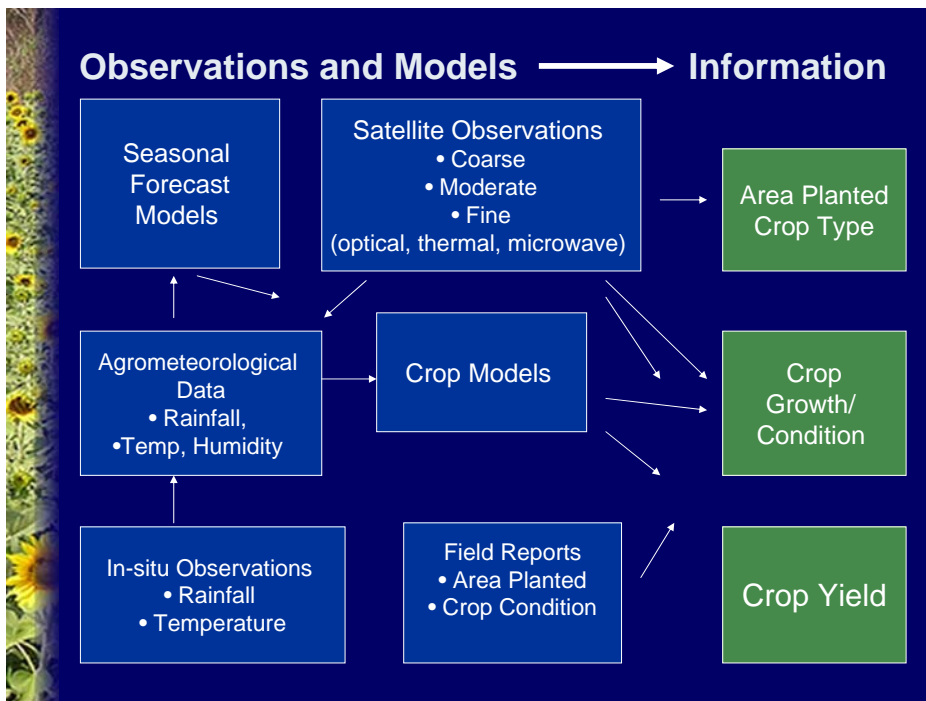
GEO Agriculture Monitoring Community of Practice Website:
http://www.earthobservations.org/cop_ag_gams.shtml

GEO Agricultural Monitoring System of Systems: Approach

1. Share a common vision for the system amongst the community of practice (COP)
2. Establish the conditions under which such a system can develop
3. Identify near term practical steps (task activities) 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

GEO Agricultural Monitoring System of Systems: Functional Components

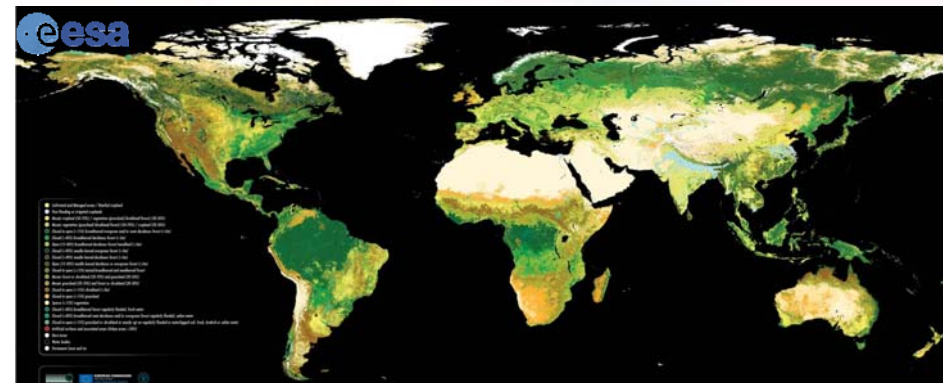
1. Global monitoring of agricultural production, facilitating reduction of risk and increased productivity at a range of scales
2. Timely and accurate national (sub-national) agricultural statistical reporting
3. Accurate forecasting of shortfalls in crop production and food supply
4. Effective early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



1. 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



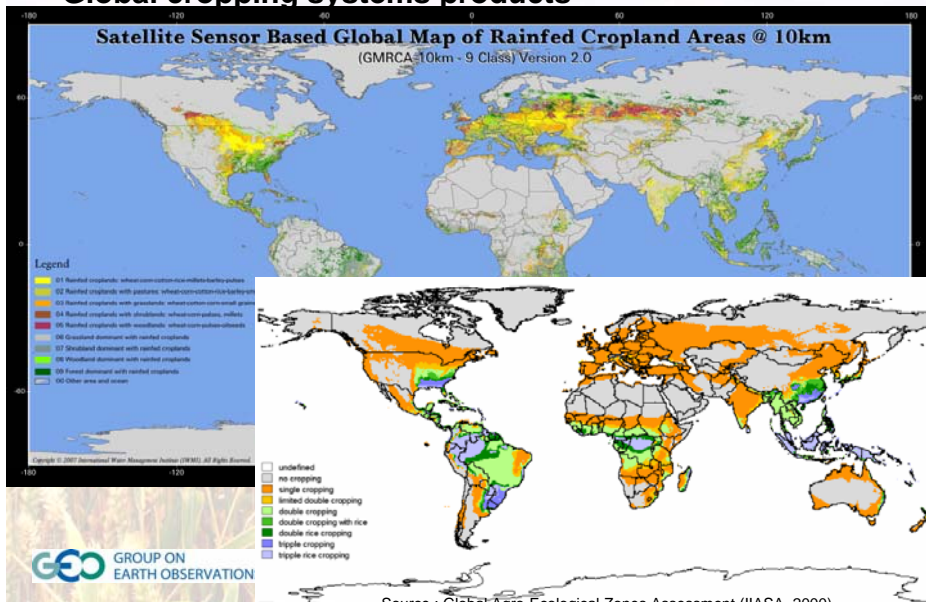
GEOSS Workshop – Beijing, February 2009

Developing an Agricultural Monitoring System of Systems



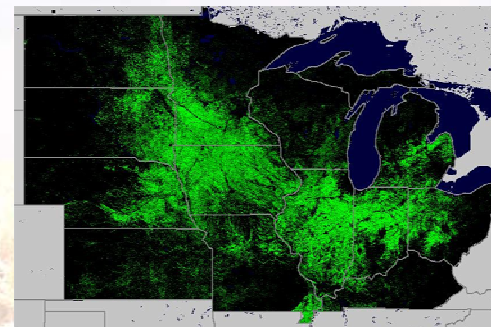
1. State of the Practice – R&D Community

Global cropping systems products



Crop area indicator from MODIS

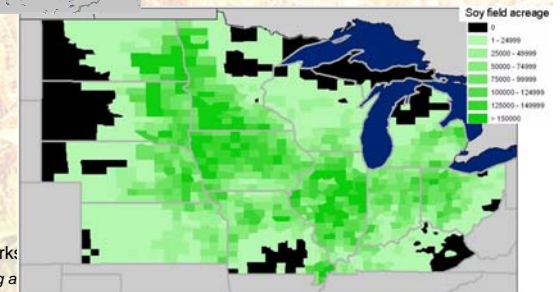
R&D Community



Percent soy cover, 2002 from MODIS time-series

Year	Regression	r ²
2000	y = 1.1044x + 3.41	0.8059
2002	y = 1.0369x + 2.314	0.7459
2003	y = 1.0826x + 1.086	0.8125
2004	y = 1.1257x + 1.800	0.8292
2005	y = 1.007x + 5.54	0.9031
2006	y = 1.0778x + 2.37	0.9071
2007	y = 1.0798x + 3.013	0.9057

Soy acreage, 2002 from NASS data

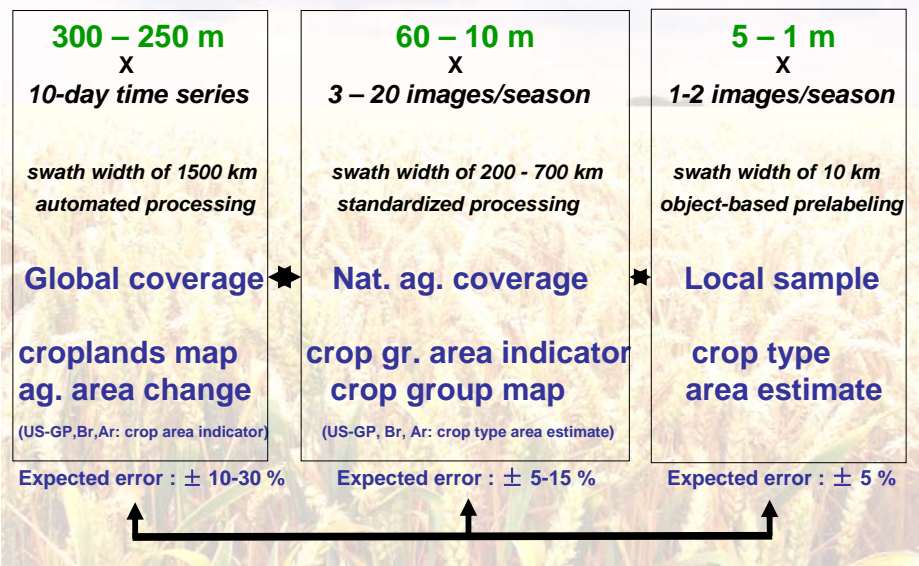


GEOSS Work

Developing a

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

Annual EO products for ag. land cover change information



Recognize the need for Enabling Conditions

- Cooperation amongst the community of practice
- Non-prohibitive data pricing policies, allowing for free and open sharing of data and enabling affordable regional agricultural monitoring –improve accessibility
- Coordinated data acquisition over critical agricultural areas during the growing season
- EO data continuity for operational systems
- Improved coverage of meteorological stations especially for Africa
- Established best practices, standardized data products and reporting
- The integration of the satellite data into operational monitoring systems in developing countries

Broad Objective for this Workshop

- Planning for the Global Agricultural Monitoring System of Systems, addressing:
 - The state of the science
 - The adequacy of the existing systems
 - The priority observation enhancements
 - The ‘best’ monitoring practices
 - Develop Work plans for the GEO Ag Tasks for the next 36 months and establish the 2015 Targets

Summary Agenda

- Overview of the State of the Science
 - Production monitoring, Early Warning, Agricultural Land Use Change, Forecasting
- Review of Chinese Agricultural Monitoring
- *Adequacy of the Current Observing Systems*
- Observing systems overview
- *Identifying Best Practices*
- Vision and Goals for the Program
- *Priority observation enhancements*
- Developing the workshop recommendations
(Breakout Discussion Sessions)

Workshop Sub-Focus on China

- Take the opportunity provided by holding the workshop in Beijing with broad local participation to better understand Chinese capabilities for agricultural monitoring
- Understand the potential role that China might play in the development of a Global Agricultural Monitoring System of Systems

GEO Agricultural Monitoring System of Systems: Focus for the Work

- Monitoring Crop Exporting Countries (emphasis on timeliness, reporting standards and accuracies)
- Monitoring Countries at Risk (emphasis on Early Warning)
- Improving National Agricultural Production Estimates using Earth Observations (emphasis on data timeliness and capacity building)

Agricultural CoP Sub-Tasks

- A series of Thematic Workshops on methodological issues
 - Thematic Workshop SAR/Optical Agricultural Monitoring, Banff, (Canada, Oct 19-24, 2009)
 - 2nd Workshop Satellite Rainfall Estimation, EC Ispra (Fall 2009)
 - ISPRS/GEO Climate Change and Agriculture, India (Fall 2009)
- Regional Experiments on methods, inter-comparison and accuracy assessment (China, Argentina, Ethiopia, Canada) - *China Pilot 2009*
- Global cropland and crop type mask at 250m resolution (NASA /USDA 2009)
- Global map of field size distribution and cropping system complexity in order to guide both EO data acquisition and crop area estimation methods (Lead TBD)
- Global 2009-2010 60-30m data set (USGS, NASA, CEOS) (2010)
- Best Practices Document – ready for the GEOSS Plenary (2009)
- Develop a Multi-source Production, Acreage, Yield (PAY) database on a common platform (USDA, JRC, IRSA) (2009)
- Experiments Improved Integration of Forecasts into Famine Early Warning Systems Kenya, Ethiopia (WMO, USAID, FAO) –

Workshop Recommendations

- More frequent imaging of agricultural areas and timely availability of data
- Compatible data sets from different sensor systems
- Free and more open access to satellite data
- Requirement for thermal infrared sensors
- Methods and Model intercomparison experiments
- Enhanced capacity building ‘training by doing’

Thank You

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