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Global Agricultural Monitoring Systems: Current Gaps and Possible Solutions

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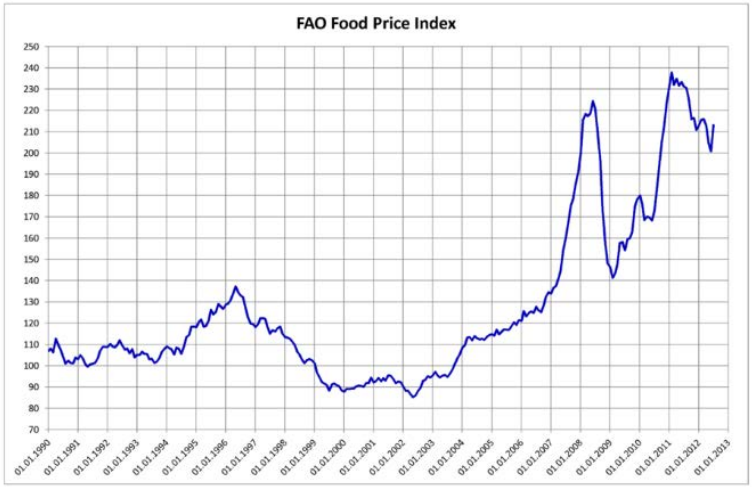
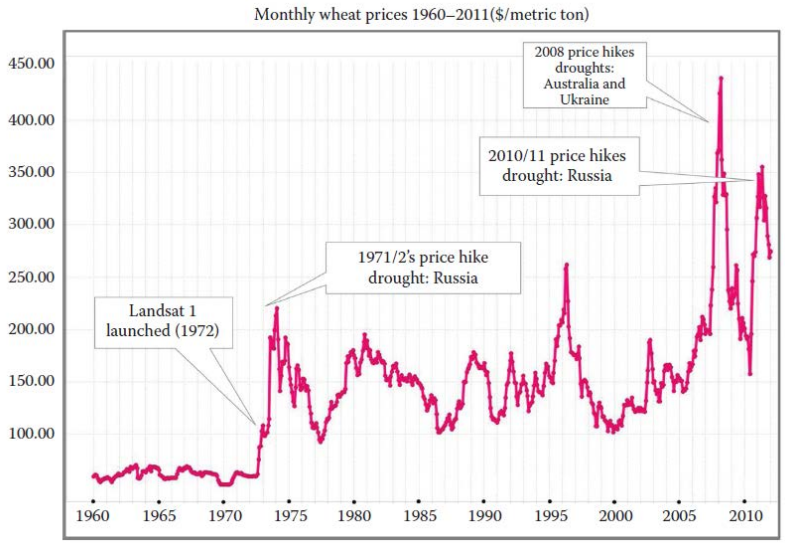
Context

- Priority to achieve global food security
- Significant increases in the world food prices (maize, wheat rice) late 2007 and 2008 and again in 2011 sparked political and social unrest around the world
- To better prepare for disruptions in food supply and global crop market prices, timely and accurate information on current and forecasted global food production is needed





From http://wmp.gsfc.nasa.gov/uploads/science/slides/Justice_ASP-WR_2012-09-06.pdf

Global Agricultural Monitoring Systems (GAMS)

- three main functions:
  - the global mapping and monitoring of changes in distribution of cropland area
  - the global monitoring and forecasting of agricultural production (yield)
  - the effective early warning of famine, enabling the timely mobilization of an international response in food aid

Current GAMS

- GLAM
- FEWS NET
- GIEWS
- MARS
- CropWatch
- FMSM
- Vital Signs
- Crop Explorer

GEOGLAM and SIGMA

- Launched by G20 in 2011 to improve crop forecasts and input to AMIS
  - Enhance national ag reporting systems
  - Establish a global network of experts in ag monitoring
  - Create an operational sys of systems based on EO and in situ data
- EU-funded project as EU's contribution to GEOGLAM

Gaps

- Need better information in three main areas:
  - Baseline data
  - Statistical data on agricultural production, area and yield
  - In-situ data (yield)

Gap #1 Baseline Data

- Crop calendars
- Cropland extent
- Field size
- Cropping intensity
- Maps of crop type
- Environmental management datasets
- Meteorological data for improving crop models

Gap #2 Statistical Data on Agricultural Production, Yield and Area

- Available nationally through FAOSTAT since 1961
- Sub-national data collected by IFPRI but many gaps
- Lack of spatially explicit information
- No harmonized data collection methods

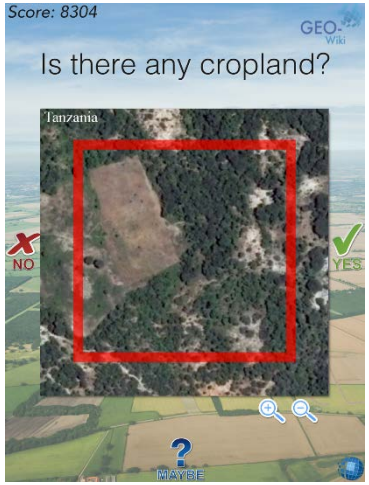
Gap #3 In-situ Data (Yield)

- Needed to develop/validate crop models
- Needed as inputs to RS-based models of yield/production estimation
- Number of sites where crop trials and yield data are available
- Lack of sharing, sits in the commercial sector, very ‘sensitive’ information

Earth Observation

- remote sensing already assists in:
  - assessment of crop production, yield and acreage estimation
  - crop phenology
  - stress situations and anomalies
- problems due to medium resolution, lack of cloud-free images, insufficient temporal resolution
- launch of Sentinel 2, 3 and Proba-V sensors will address some of these issues

Crowdsourcing



- 7 billion human sensors
- GPS-enabled mobile devices
- Apps for agricultural advice gathering info on yields, management info, YieldCheck, high frequency household surveys
- Geo-Wiki crowdsourcing of cropland, field size (Cropland Capture, Picture Pile)
- New citizen observatories:
  - LandSense (http://landsense.eu/)
  - GROW (http://growobservatory.org/)

LandSense
A Citizen Observatory and Innovation Marketplace for Land Use and Land Cover Monitoring

GROW OBSERVATORY

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Better Sharing of the Data

- Diverse variety of data sources distributed globally
- Needs integration
- Needs interoperability
- Needs open licensing
- Needs algorithms (data fusion, data mining, analytics)
- Needs repositories
- Needs action

Thanks! Questions?

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