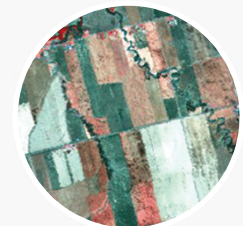
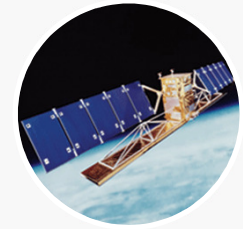


Joint Experiment for Crop Assessment and Monitoring

Food Security, Earth Observations and Agricultural Monitoring
Brussels, November 21, 2013

Ian Jarvis Agriculture and Agri-Food Canada
JECAM GEO Sub Task Co-Lead



Overview of GEO-JECAM

The GEO Agricultural Community of Practice Established JECAM to:

- Enhance international collaboration around agricultural monitoring towards the development of a “systems of systems” to address issues associated with food security and a sustainable and a profitable agricultural sector worldwide

JECAM will achieve this by:

- Network distributed regional research sites
- Share time series datasets from earth observing satellites and in-situ data
- Facilitating the inter-comparison of monitoring and modeling

The Approach:

- **Collect and share** time-series datasets from a variety of Earth observing satellites and in-situ crop and meteorological measurements for each site.
- The Committee on Earth Observing Satellites (CEOS) and member agencies are supporting this activity with the **acquisition and timely provision of data for JECAM.**

General approach to agriculture monitoring - Ukraine

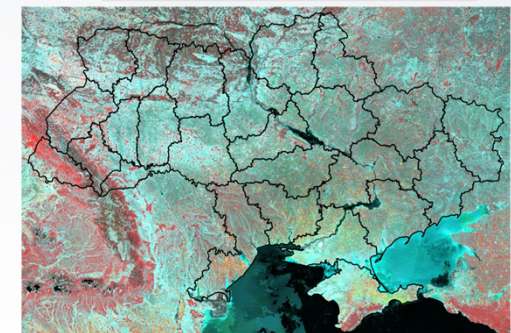
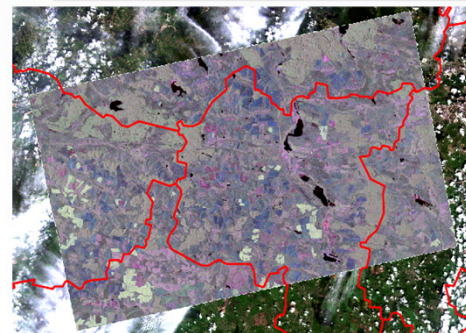
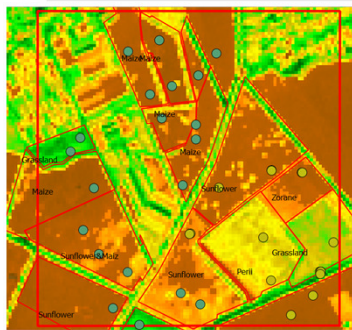


JECAM Activities

Local Scale
Field level
100m – 1km

Mid-Scale
NUTS3 – NUTS2
50x50 – 200x200 km

“Large Scale”
Whole Ukraine
1000x1000 km



Validation



Product development



Operational implementation

FP7 ImagineS

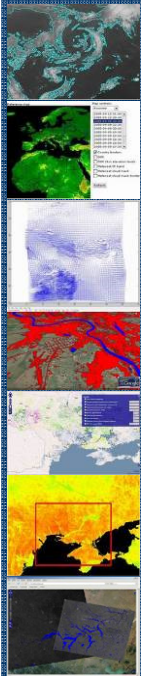
FP7 SIGMA

ESA Sentinel-2 for Agriculture

PROJECTS



SRI
2013



General approach to agriculture monitoring

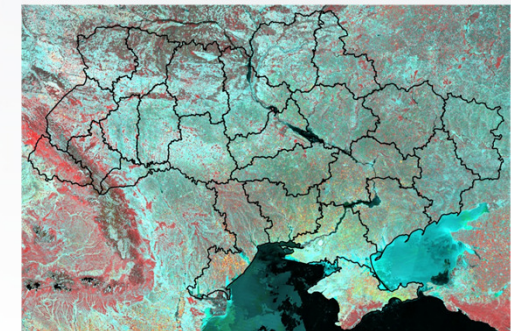
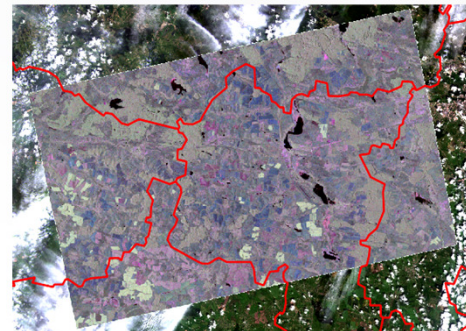
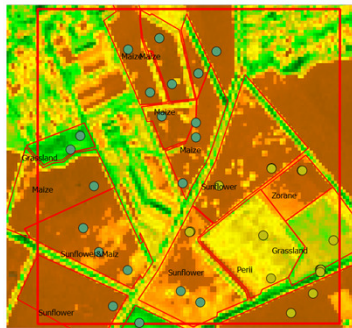


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GEOGLAM
Global Agricultural Monitoring



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2013

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JECAM GOALS

The overarching goal of JECAM is to reach a convergence of approaches, develop monitoring and reporting protocols and best practices for a variety of global agricultural systems.



Joint Experiment of Crop Assessment and Monitoring

The overarching goal of JECAM is to reach a convergence of approaches, develop monitoring and reporting protocols and best practices for a variety of global agricultural systems. JECAM will enable the global agricultural monitoring community to compare results based on disparate sources of data, using various methods, over a variety of global cropping systems. It is intended that the JECAM experiments will facilitate international standards for data products and reporting, eventually supporting the development of a global system of systems for agricultural crop assessment and monitoring. The JECAM initiative is developed in the framework of GEO Global Agricultural Monitoring (GEOSS Task AG0703 a) and Agricultural Risk Management (GEOSS Task AG0703 b).

JECAM

Joint Experiment for Crop Assessment and Monitoring



- JECAM activities are being undertaken at a **series of study sites** which represent many of the world's main cropping systems
- 29 sites currently exist or are in development



Current Status

- JECAM annual reports were initiated for 2012. Report is available on JECAM.org website.
- A supplemental survey of satellite data utilization took place prior to the CEOS SIT meeting in September. 26 sites reported on data acquired and used.
- The interaction with the space agencies through the Committee on Earth Observing Satellites (CEOS) has been effective.
- 2013 annual reporting will take place starting in January

CEOS Support - JECAM Data Requests

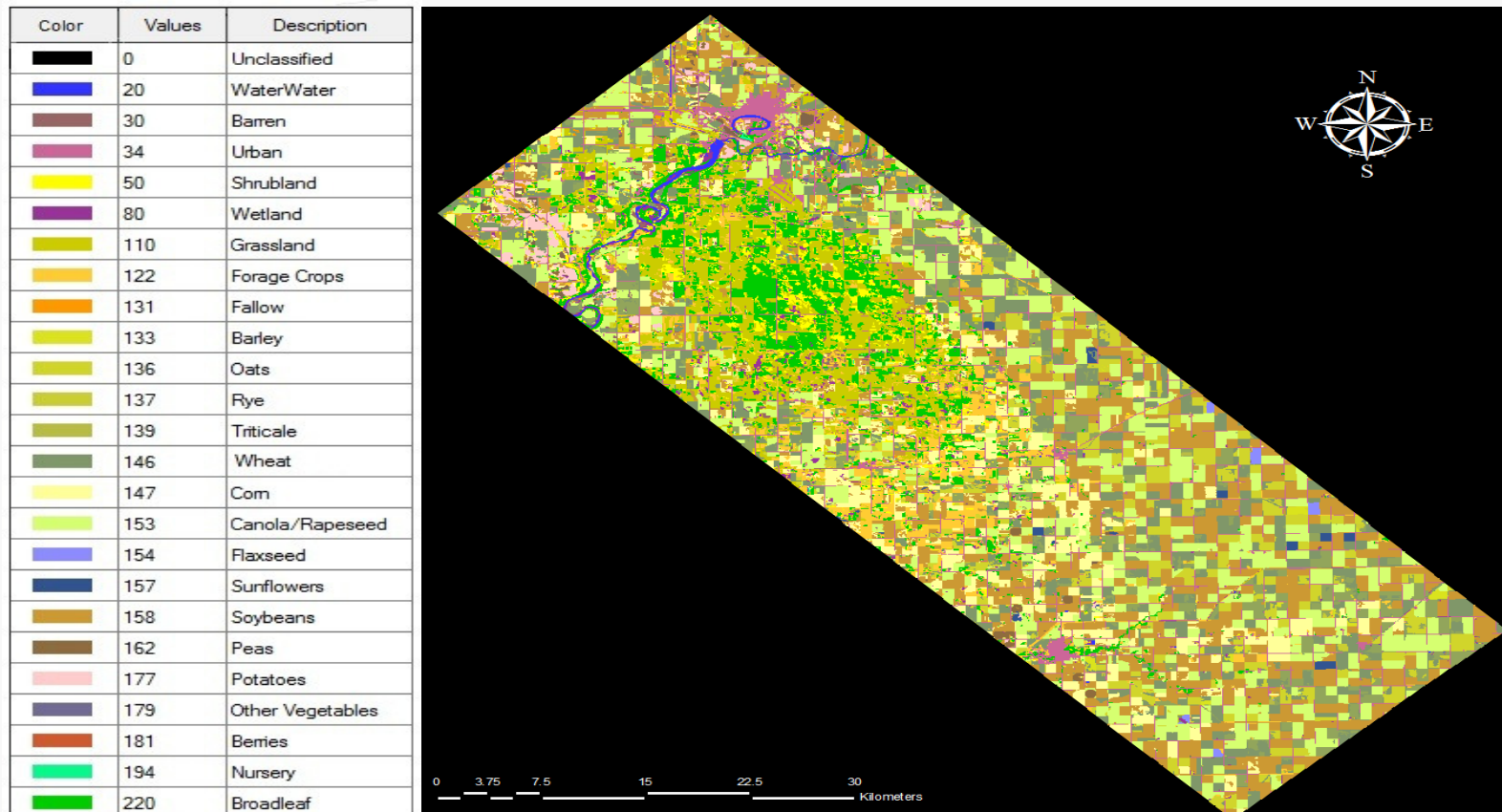
JECAM Site	Cosmo Skymed	Palsar	RADARSAT-2	TerraSAR-X	AWIFS	DMCII	EO-1	HJ-1	Landsat	MODIS	Quickbird	Rapideye	SPOT-4/5/6	Worldview-2	IKONOS	MERIS	FORMOSAT-2
Argentina	x	x	x	x	x	x			x	x	x	x	x				
Belgium/France			x						x			x	x				
Brazil		x							x	x	x			x			
Canada CFIA - Ottawa																	
Canada/Red River			x	x	x	x			x			x	x				
Canada/South Nation			x	x	x	x			x			x	x				
China/Anhui																	
China/Guangdong																	
China/Heilongjiang	x		x	x		x		x	x	x							
China/Jiangsu			x														
China/Shandong	x		x	x		x		x	x	x		x	x				
France																	
Italy Apulian Tavoliere	x	x							x		x	x	x	x	x	x	
Madagascar																	
Mexico			x		x				x	x	x	x	x				
Morocco									x	x	x		x				
Paraguay									x			x	x				
Russia									x	x							
Saudi Arabia																	
South Africa									x	x		x	x				
Taiwan			x	x			x		x	x	x	x	x				x
Tanzania																	
Tunisia (notes 1, 2)	x			x					x	x	x		x				
Ukraine			x		x		x		x	x		x	x				
Uruguay																	
U.S.A.													x				

Current Status – Research Activities

Crop Mapping and Area Estimation

- All sites reporting include crop mapping as an objective

2012 Crop Map, Canada-Red River Site

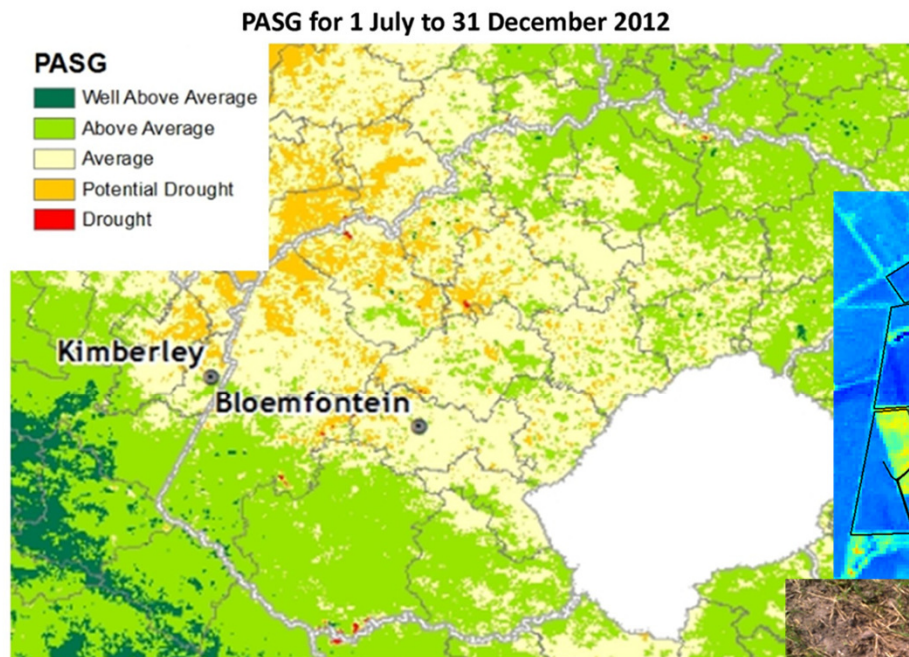


Current Status – Research Activities

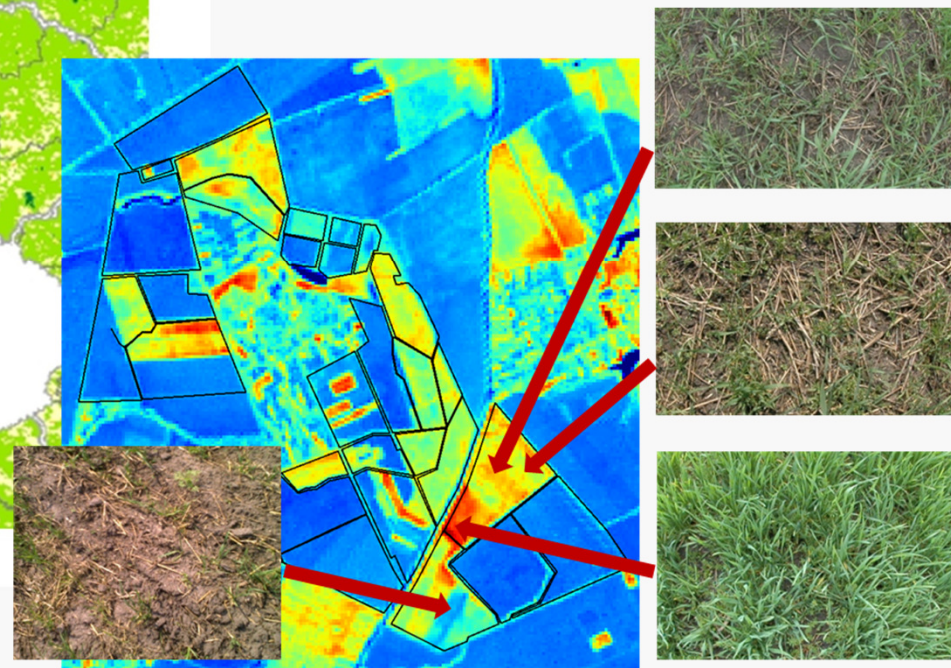
Crop Condition – Crop Growth Parameters

- Most sites research plans include crop condition objectives

2012 PASG Map, South Africa Site



2012 Ukraine Site

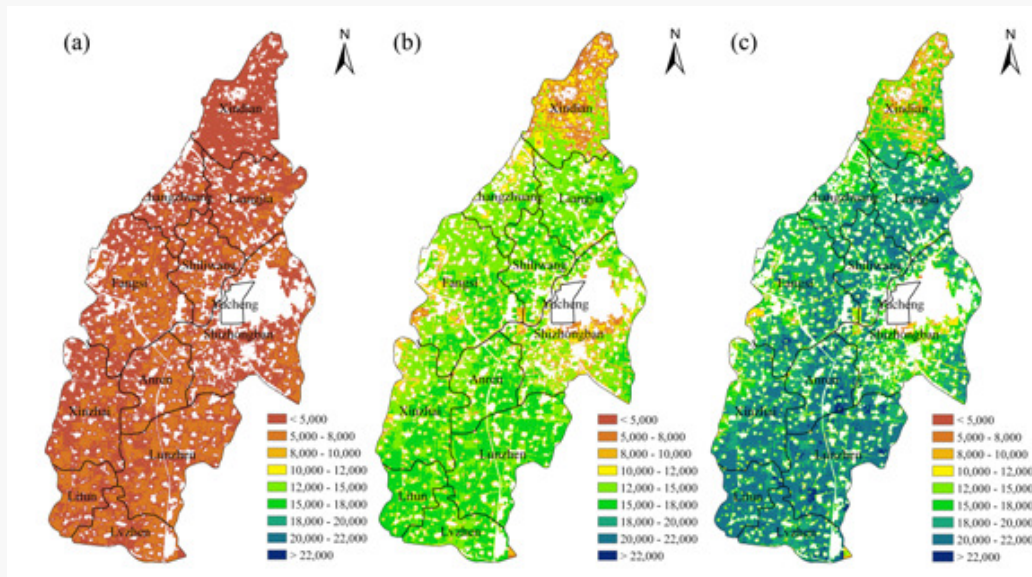


Current Status – Research Activities

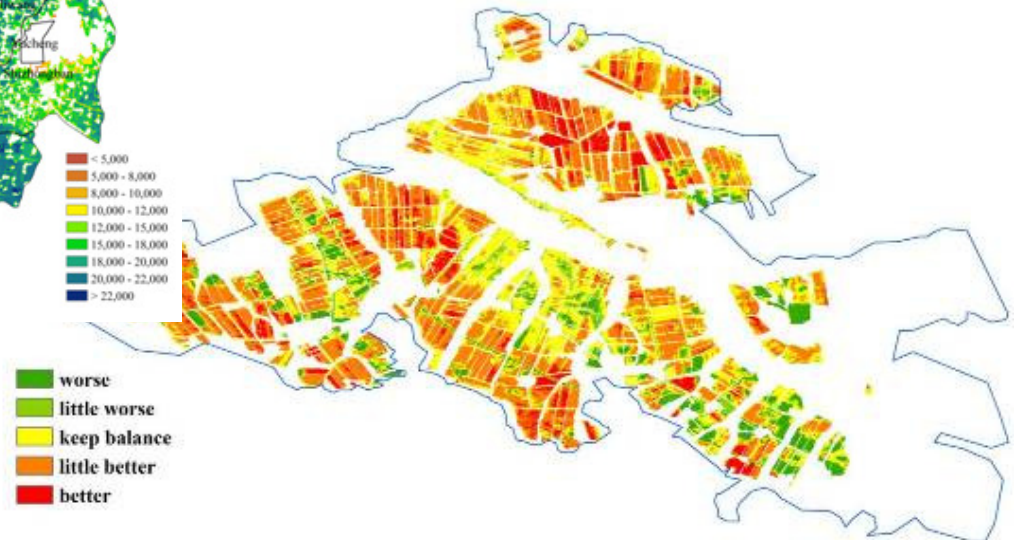
Crop Yield Forecasting

- Most sites reporting include yield research

2012 Crop Biomass, China Shandong Site



July 2012 Crop Status, China Heilongjiang

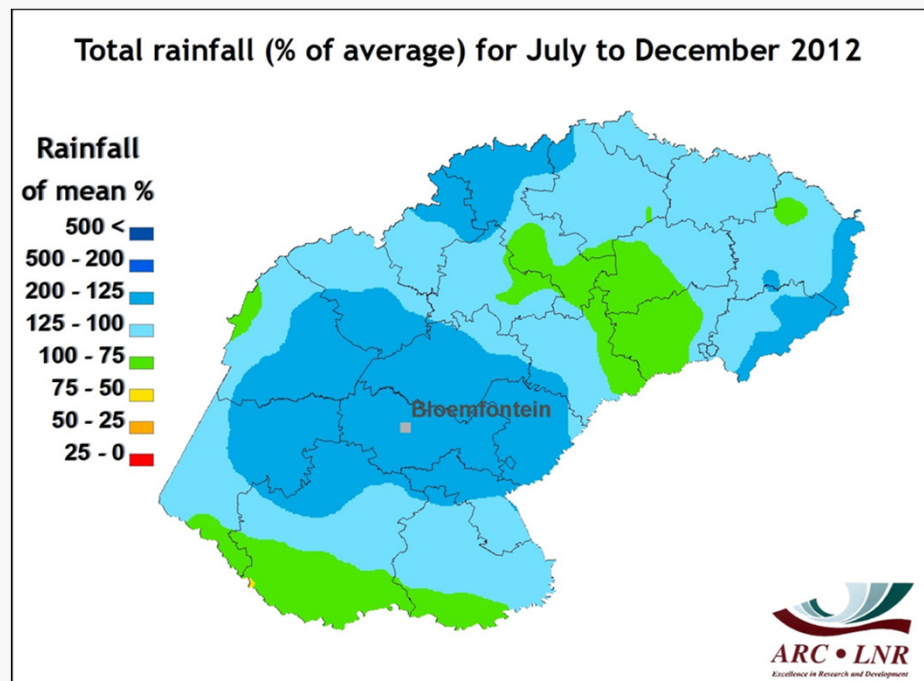


Current Status – Research Activities

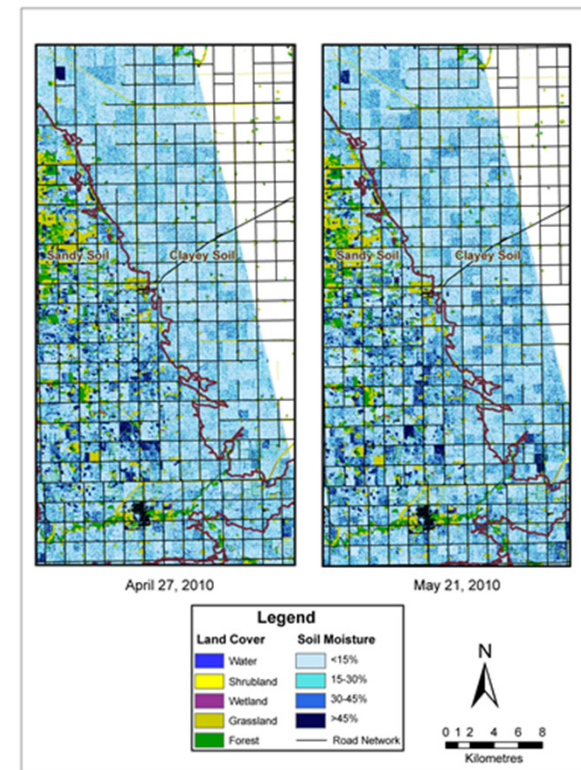
Soil Moisture Monitoring

- Half of the sites reporting include soil moisture monitoring research objectives

December 2012 Rainfall Map, South Africa Site



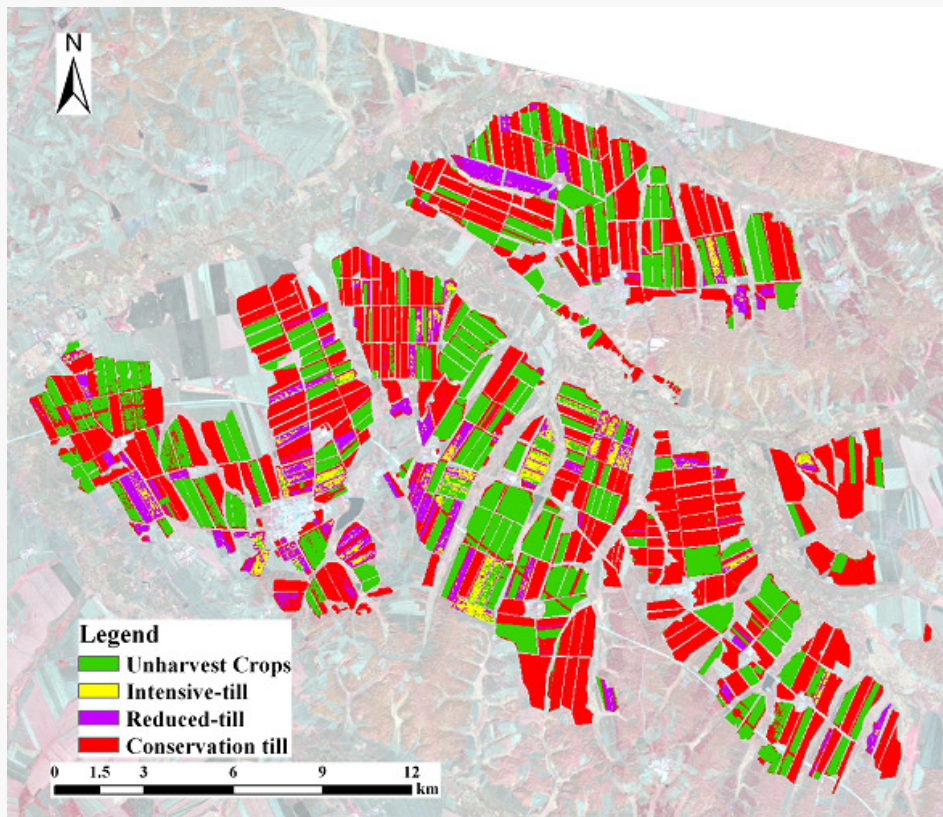
Radarsat 2, Soil Moisture, Canada South Nation Site



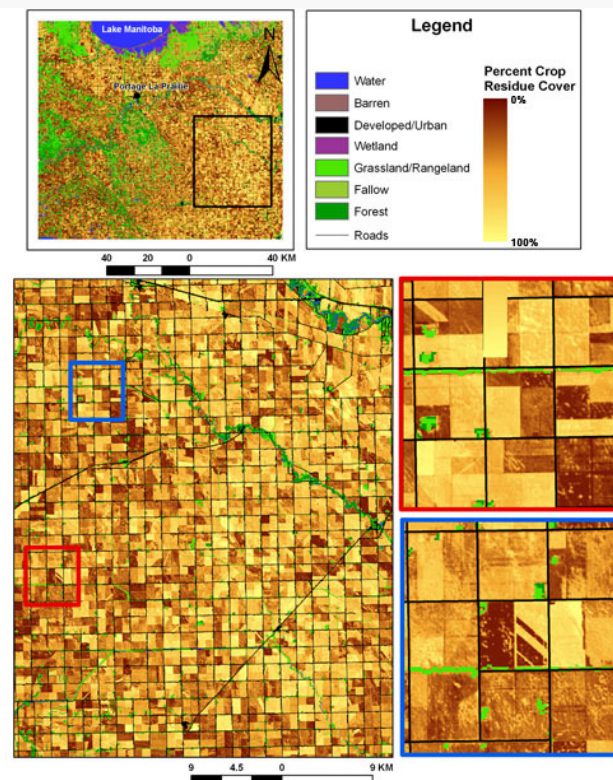
Current Status – Research Activities Residue and Tillage Mapping

- Half of the sites reporting include residue and tillage monitoring research

Tillage Mapping, China, Heilongjiang Site



Crop Residue, Canada Red River Site



JECAM Status

- JECAM research has already been very productive locally. Sites are receiving data, research is informing operational developments within nations and significant contributions have been made to the scientific literature.
- There is significant bi-lateral collaboration between a number of sites
- JECAM has already proven itself as a tremendous asset to Global Agriculture Monitoring.
- Based on these observations we can already conclude JECAM is a success. Great....So where to next??

Current Status – Expanding the Collaboration to Meet the Challenge

- We feel the true value of JECAM will only be fully realized when the sites are involved in cross cutting collaborative research
- Some of this type of work has already happened:
 - ESA Sentinel 2 Simulation over JECAM sites (Take 5)
 - IMAGINES project
 - NASA-Canada and NASA-Australia SMAP Validation Experiment (SMAPVEX)
- But much more is possible:
 - Build regional networks of JECAM sites to concentrate on regional issues of common interest (e.g. South America , Northern Eurasia)
 - Unite under broader initiatives (i.e. SIGMA and Sentinel 2 Agri...) to address global needs and support GEOGLAM
 - JECAM has become the foundation of the R&D component of GEOGLAM

Current Status – Grasping the Opportunity

- In response to these opportunities we have expanded JECAM leadership to include Pierre Defourny (UCL) as co-lead to help us capitalize on these emerging major research opportunities
 - Strong linkage to SIGMA initiative
- Grow JECAM to be responsive to GEOGLAM needs:
 - Use the JECAM network to **test/contrast/compare** national monitoring approaches
 - Create common **minimum datasets** for JECAM sites
 - Development of comparative studies to develop **standards and best practices** that inform GEOGLAM “system of systems” for agricultural monitoring
 - Continue to use JECAM sites to **validate** new sensors

Thank You