

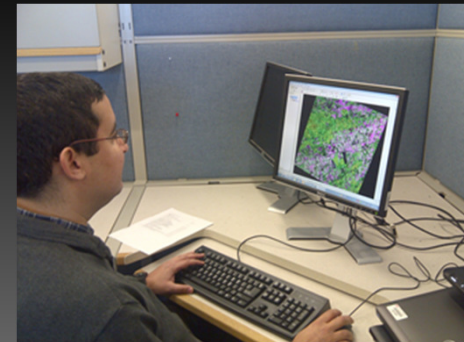
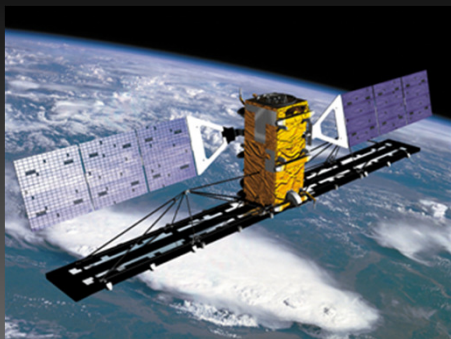
Space for Agriculture: Supporting a Competitive Agricultural sector in Canada

Ian Jarvis

Earth Observation

Science and Technology Branch

Agriculture and Agri-Food Canada



The Context

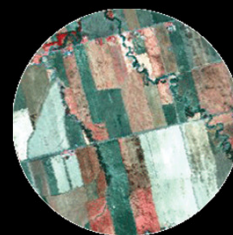
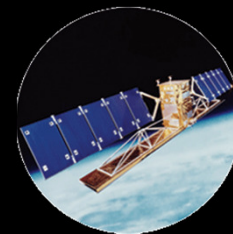
- Canada's Agricultural landscape is large and complex

- 229,000 farms
- 67.6 million hectares of **total farm area**
- 35.9 million hectares of **land in crops**
- 8.1% of total GDP
- 5th largest exporter of agricultural products
- Employs 2.2% of Canada's total population

- The Global Challenge: The UN FAO estimates that food production must double in the next 40 years if we are to meet the global food needs.

- To meet these challenges sound policies and programs require appropriate, timely and more than ever cost effective information

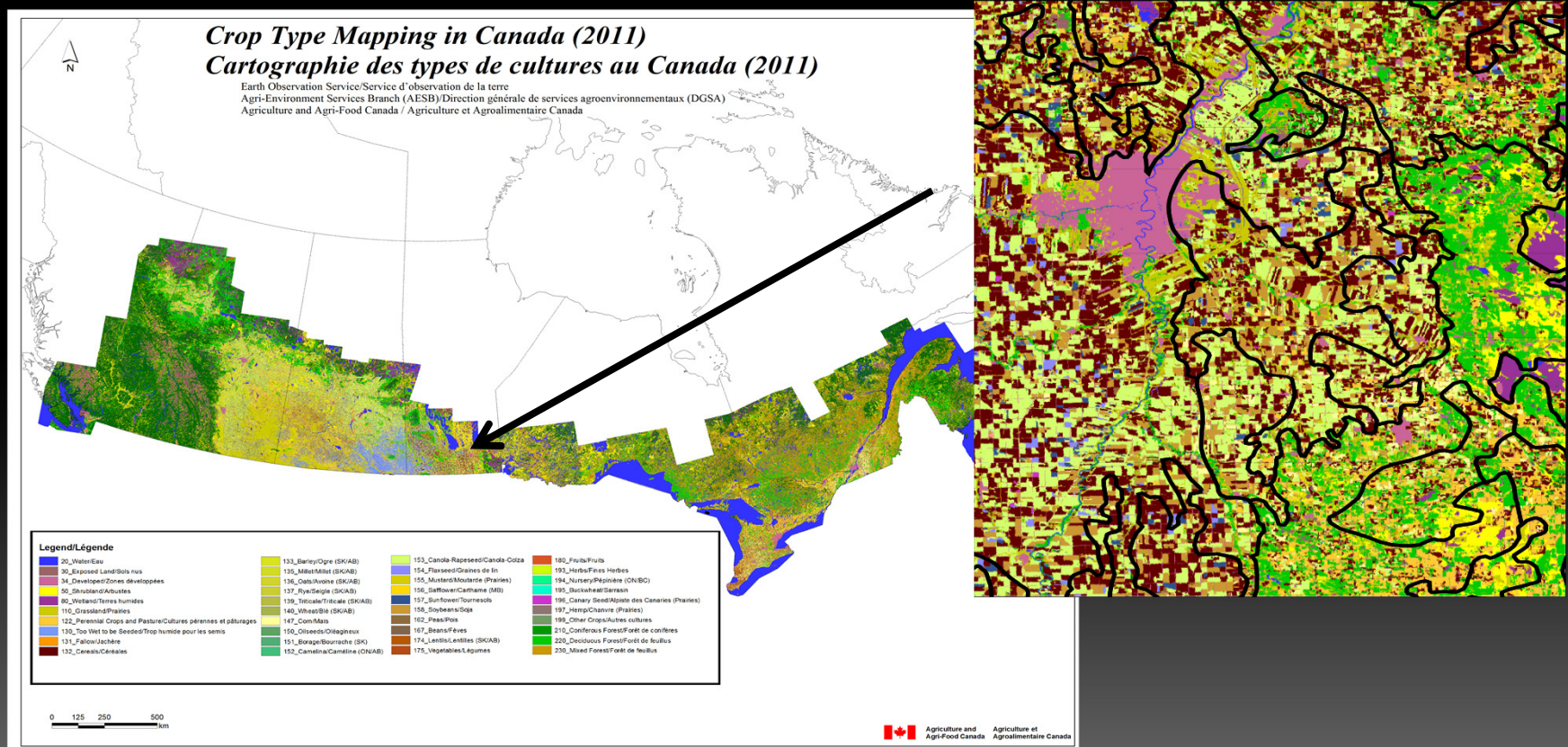
- Agriculture and Agri-Food Canada strives to harness the power of space technology. Earth observation has become increasingly essential to addressing these challenges, both within Canada and Globally



Applying Space Technology

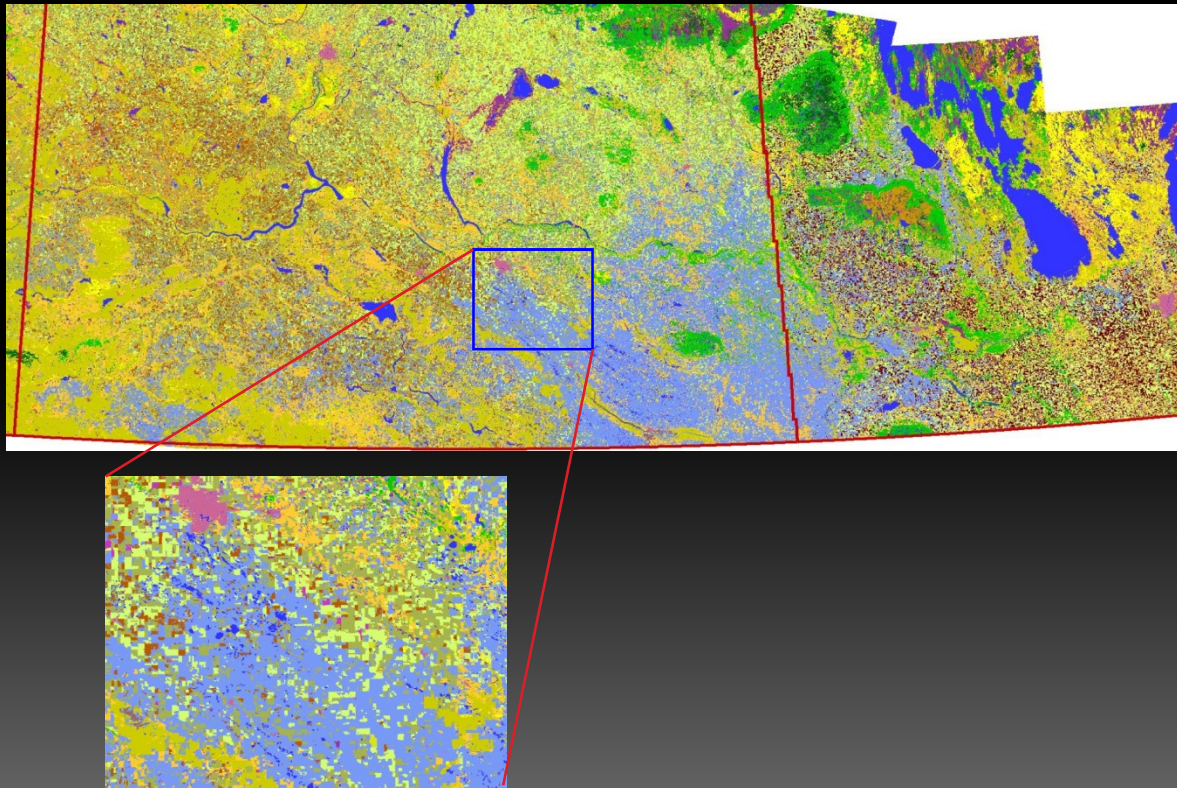
National Crop inventory

- Using a combination of Radar and optical satellites we now map the crops grown on virtually every agricultural field in Canada on an annual basis



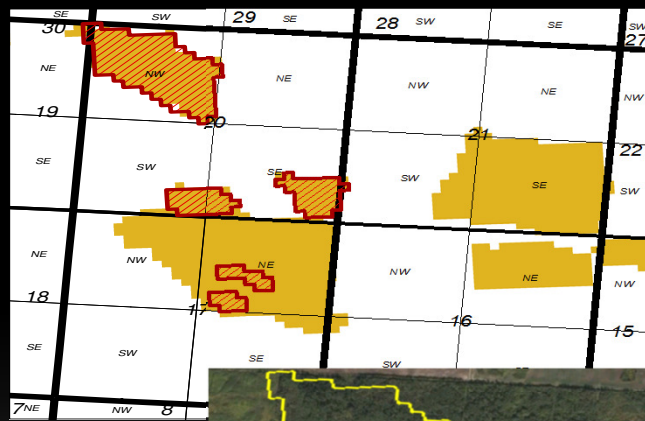
Example Application: Disaster Mapping, Excessive wetness

In 2011 over 10 million acres of farmland in the west went unseeded and we were able to accurately map these areas. This can be used to scope business risk programs and verify losses.



Market Access: Demonstrating Sustainability

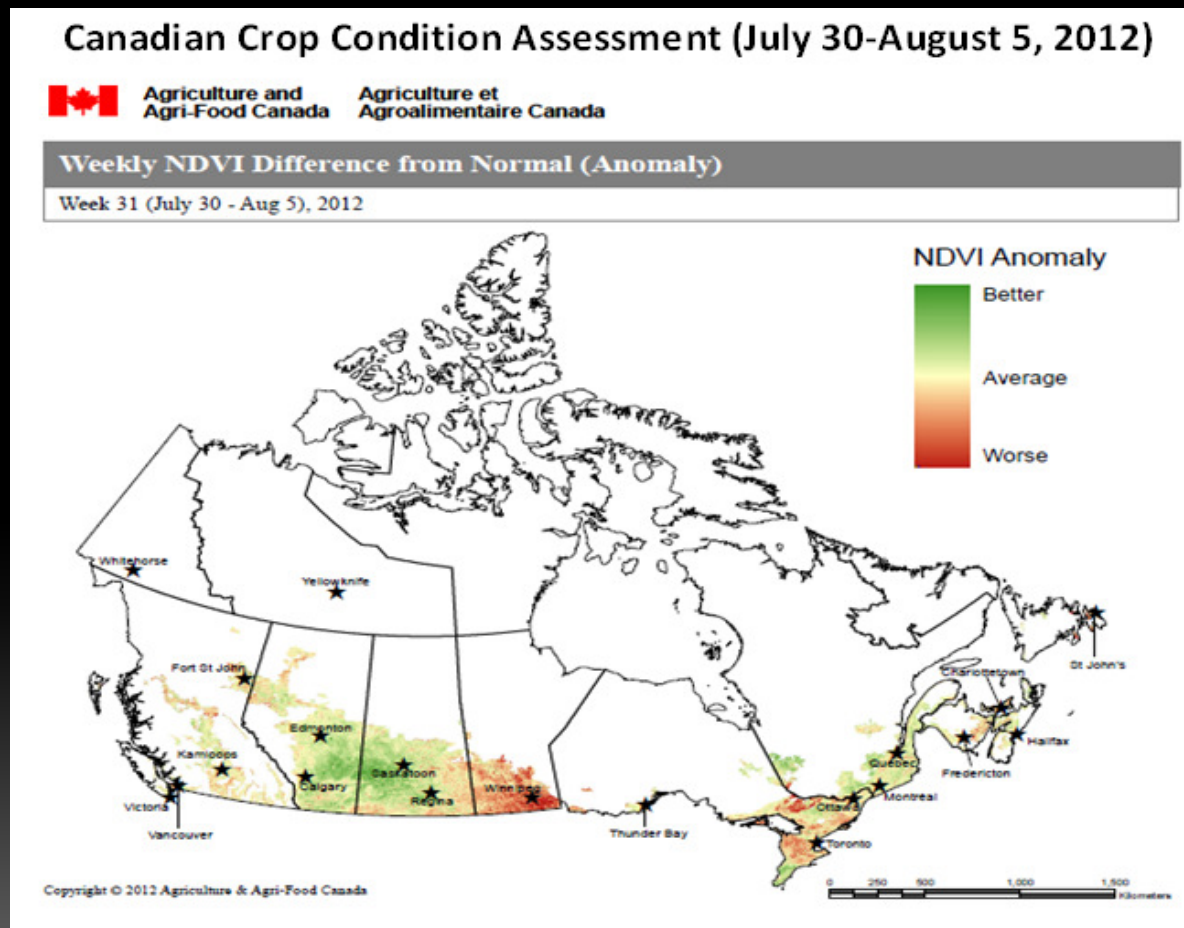
Use the information to address market access sustainability criteria such as EU RED



these sustainability criteria are just the tip of the iceberg, as environmental performance and market considerations are becoming intrinsically one and the same.

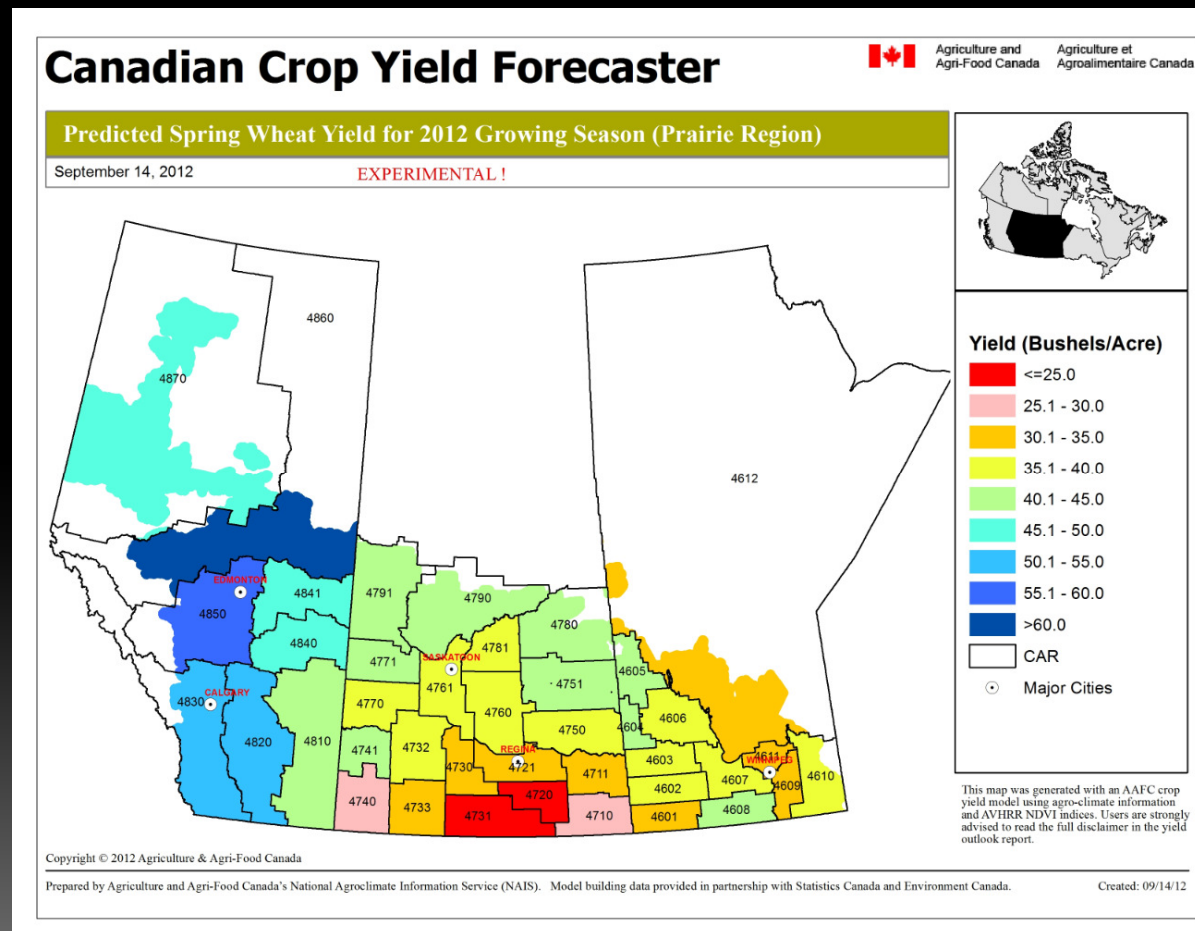
Crop Condition Assessment (MODIS NDVI)

We also map the condition of Canada's crops on a weekly basis,



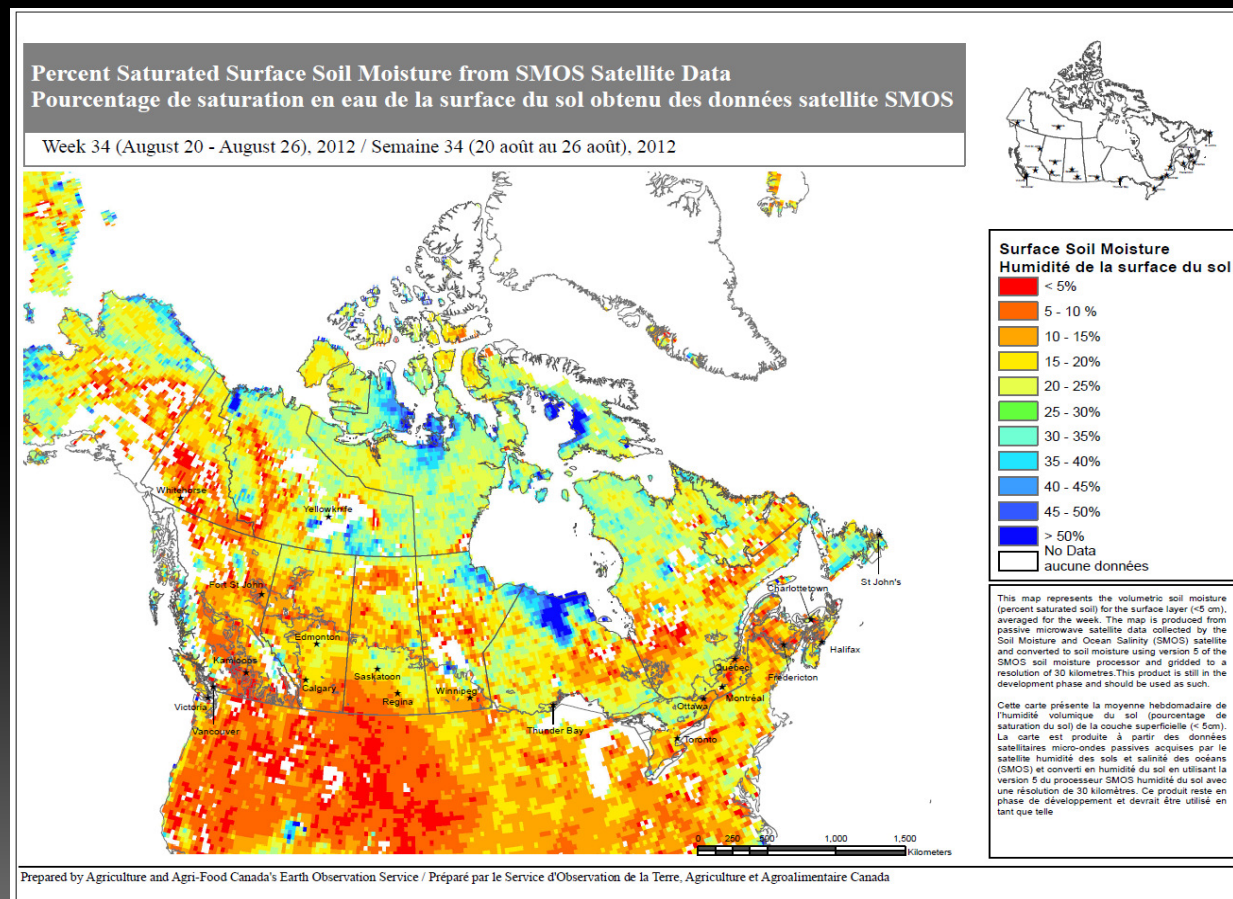
Canadian Yield Forecaster

We use space based information to support better, cost effective yield forecasts.



Drought – Passive Microwave Satellites

Soil moisture extremes are very important to Canada. For example the 2001-02 drought in Western Canada resulted in a \$5.8B GDP hit to the Canadian economy. We now use satellites to map the status of soil moisture through the growing season on a weekly basis.



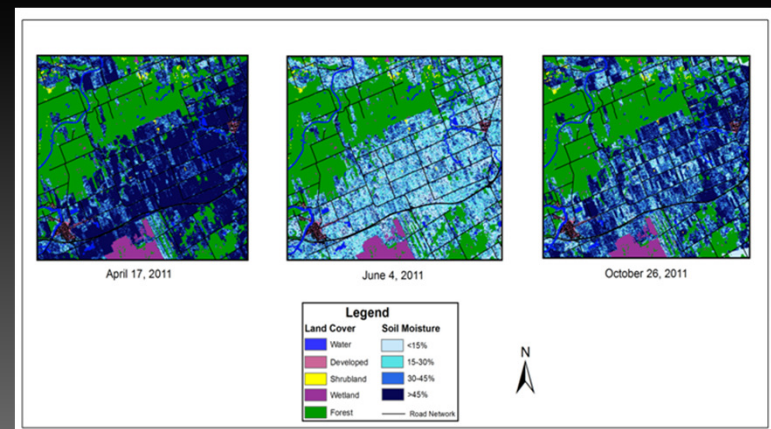
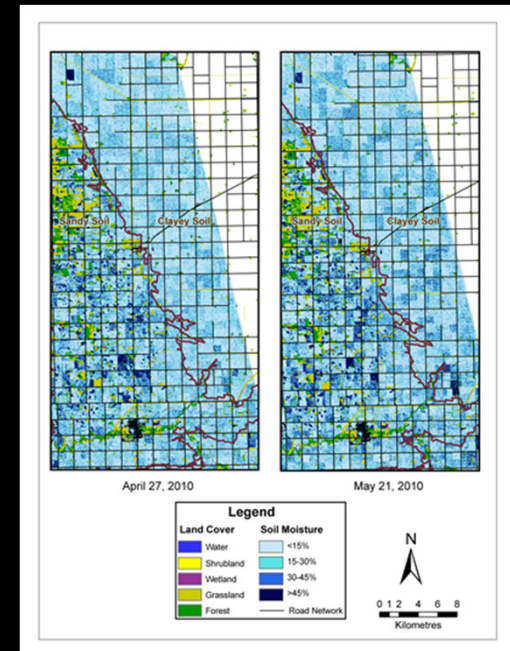
Monitoring Soil Moisture

AAFC science has developed models to estimate field level soil moisture using Canada's RADARSAT-2. As this method is implemented, research will adapt methods to newer generations of satellites.

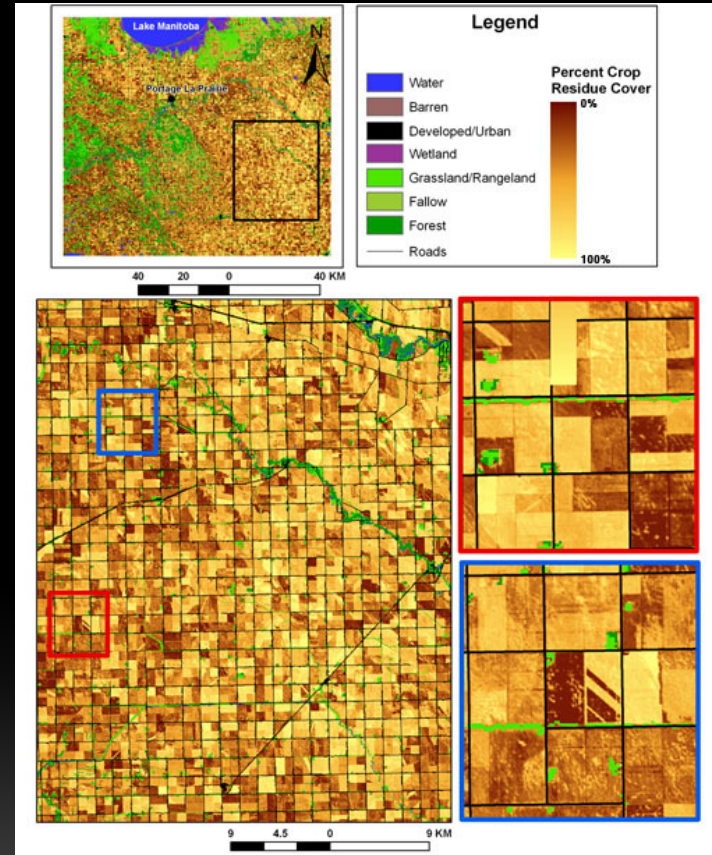
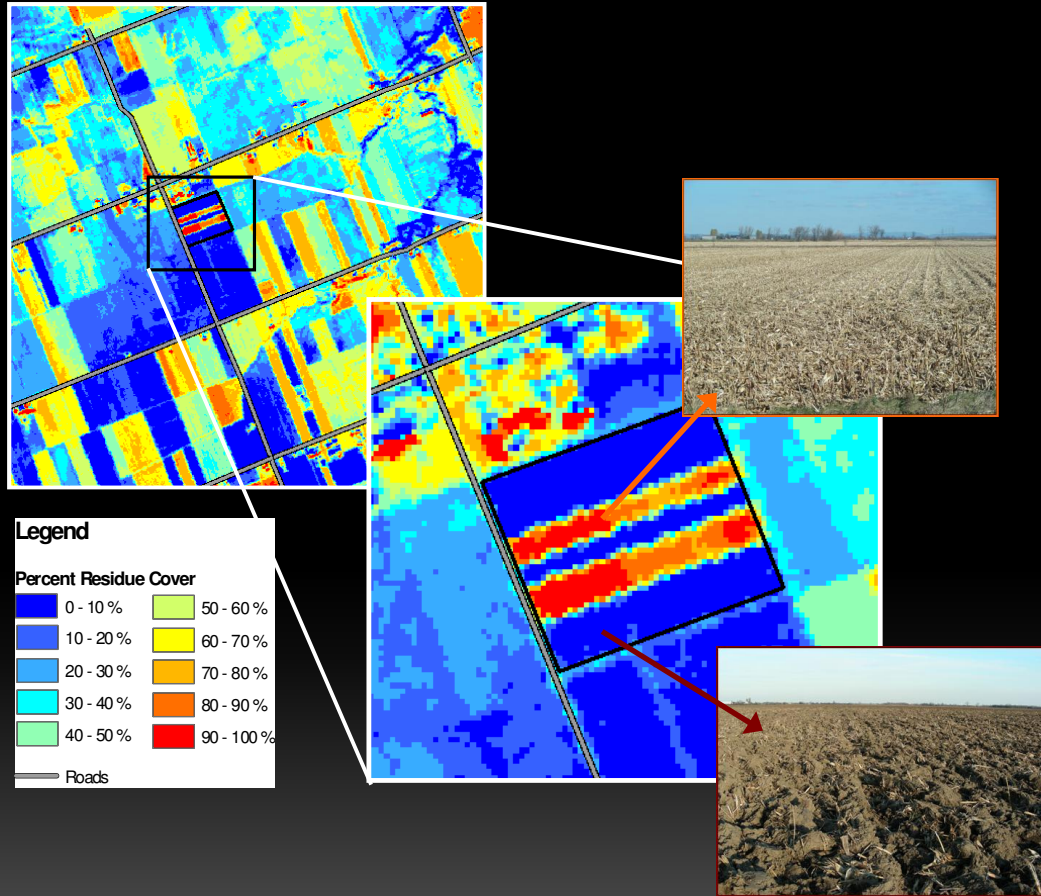
Radarsat Constellation Mission

The RCM will provide an operational source of information on soil moisture, land use and crop health.

Along with Sentinel 1 there will be 5 new C-band satellites by 2018.



Land Management: Tillage and Residue



Research to Operational Priorities Going Forward

- Operational Soil Moisture Monitoring (drought and excess)
- Early season crop acreage estimation to support early season production forecasts
- Crop specific growth parameters (phenology and condition) to support improved crop yield forecasts

Thank You