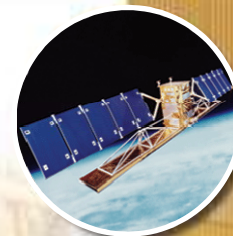




Agriculture and
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Monitoring Agricultural Risk in Canada Using L-Band Passive Microwave Soil Moisture

Catherine Champagne

Agri-Climate, Geomatics and Earth Observation Division

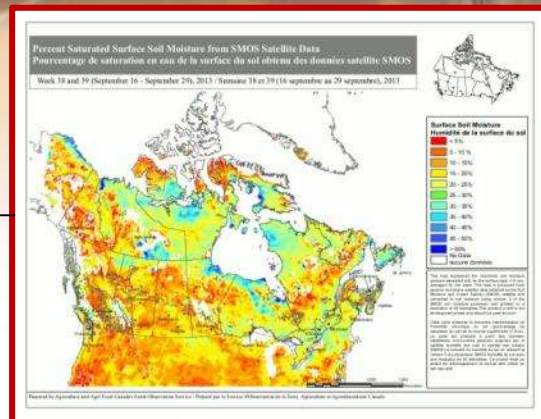
Science and Technology Branch

Agriculture and Agri-Food Canada, Ottawa, ON, Canada

Catherine.Champagne@agr.gc.ca

Canada

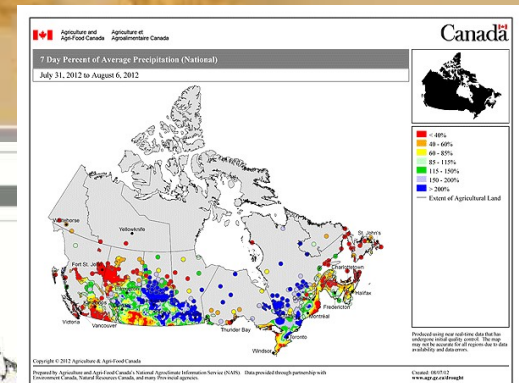
Why Monitor Soil Moisture?



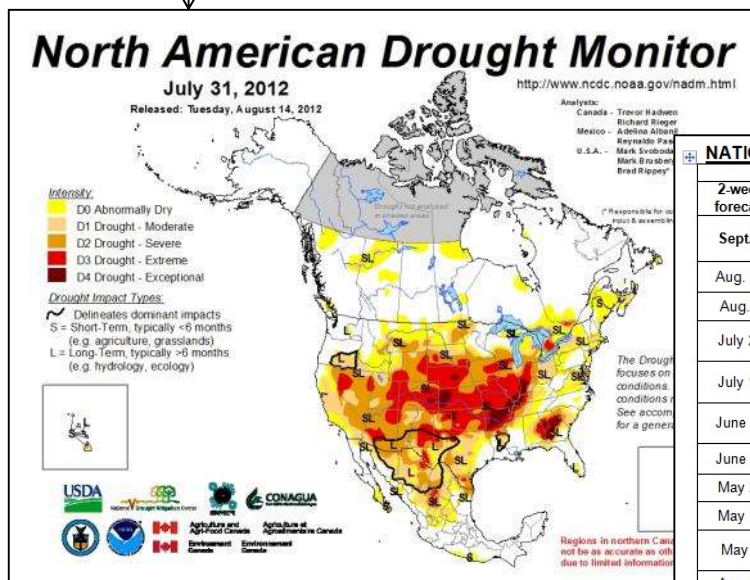
National Satellite Soil Moisture



Satellite NDVI

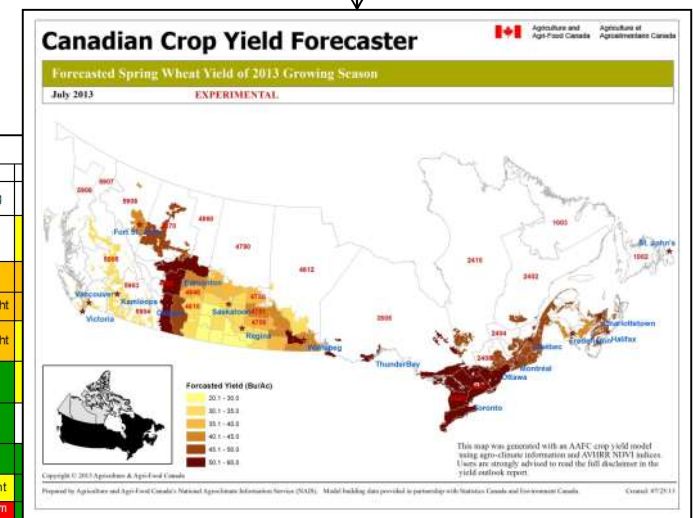


Met Stations



NATIONAL DASHBOARD						
	BC	AB	SK	MB	ON	
2-week forecast	stable	stable	stable	stable	improving	
Sept. 5	dry, impacts from hail			drought and disease	no report	
Aug. 21	dry		excess moisture	dry	heat, drought	
Aug. 8	dry	hail	hail, excess moisture	excess moisture, dry	heat, drought	
July 24	flooding		excess moisture	excess moisture, flooding, heat	heat, drought	
July 10			excess moisture	excess moisture, flooding	heat, dry, drought	
June 26	flooding	hail	excess moisture	excess moisture, flooding	heat, dry, drought	
June 12			excess moisture	excess moisture	drought	
May 29			excess moisture		dry, drought	
May 15		frost	excess moisture, drought, excess moisture	dry, drought	impacts from frost	
May 1		low soil moisture, dry, drought	dry, drought	dry, drought		
Apr. 17			dry, drought	dry, drought	frost	no report
Apr. 3			dry, drought	dry, drought	heat	heat
Mar. 6		dry, drought	dry, drought	dry		no report

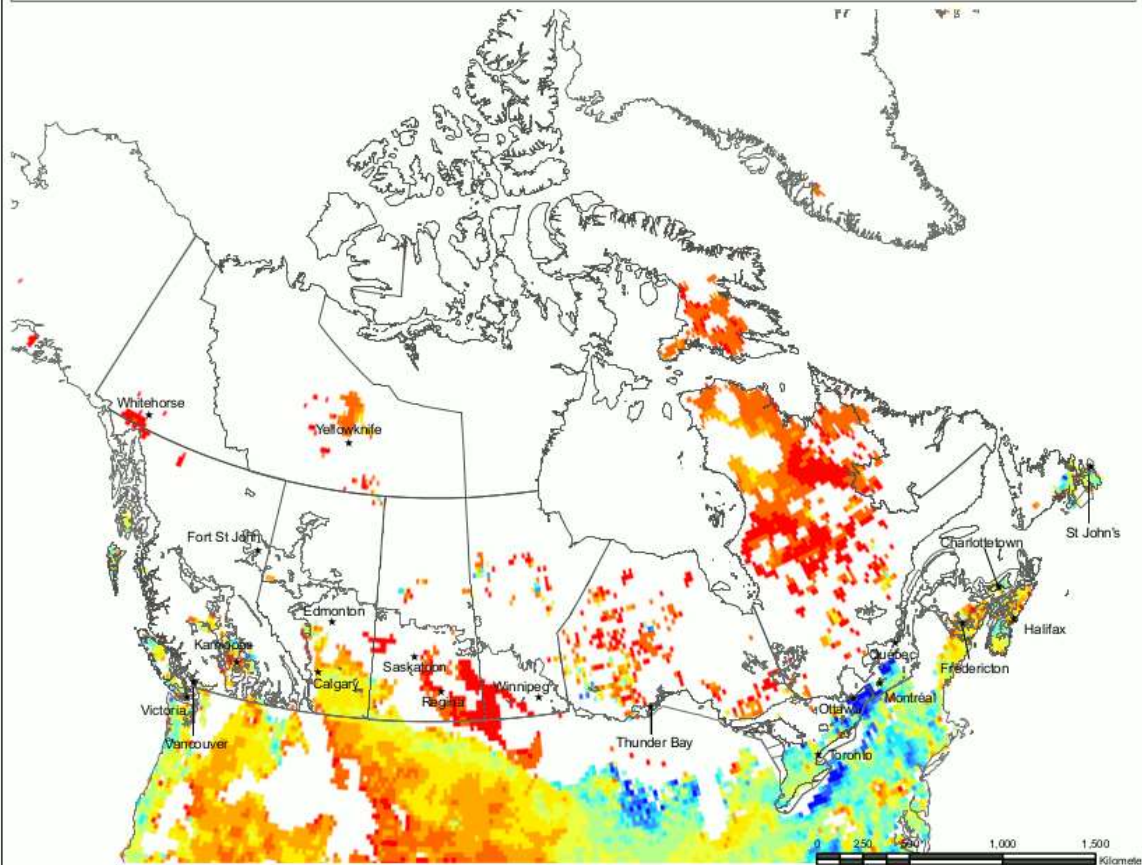
Green – no significant climate-related risks; minimal impacts.
Yellow – one significant climate-related risk; minimal to moderate impacts.
Orange – one or more significant climate-related risks; moderate impacts.
Red – one or more significant climate-related risks; large, urgent, disaster or record impacts



SMOS Surface Soil Moisture (animated time series 2013)

Percent Saturated Surface Soil Moisture from SMOS Satellite Data
Pourcentage de saturation en eau de la surface du sol obtenu des données satellite SMOS

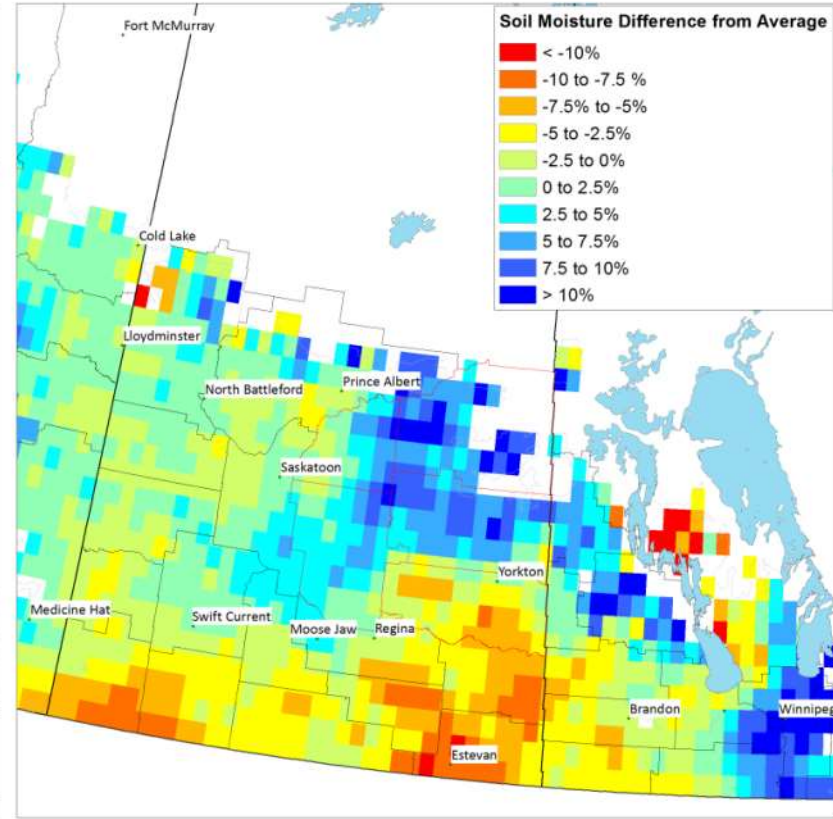
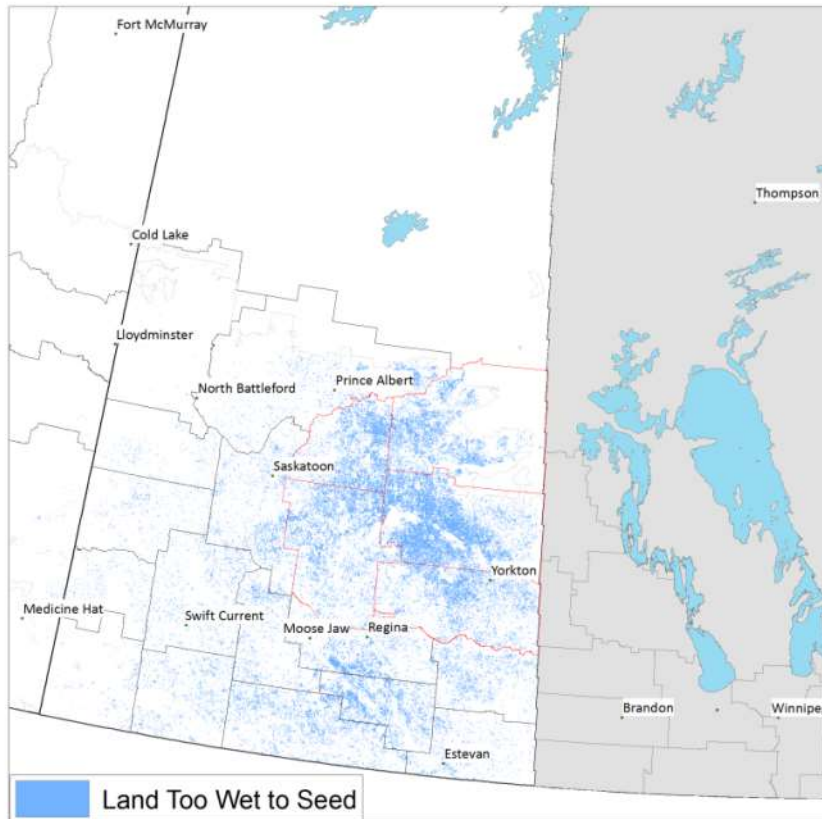
Week 14 and 15 (April 1 - April 14), 2013 / Semaine 14 et 15 (1 avril au 14 avril), 2013



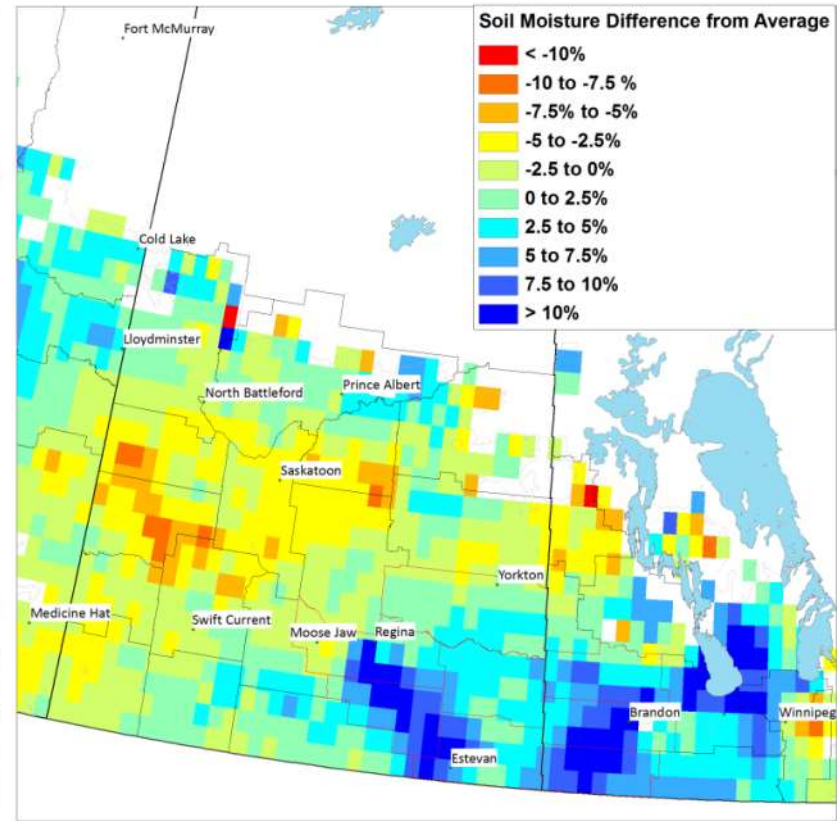
This map represents the volumetric soil moisture (percent saturated soil) for the surface layer (<5 cm), averaged for the week. The map is produced from passive microwave satellite data collected by the Soil Moisture and Ocean Salinity (SMOS) satellite and converted to soil moisture using version 5 of the SMOS soil moisture processor and gridded to a resolution of 30 kilometres. This product is still in the development phase and should be used as such.

Cette carte présente la moyenne hebdomadaire de l'humidité volumique du sol (pourcentage de saturation du sol) de la couche superficielle (< 5 cm). La carte est produite à partir des données satellitaires micro-ondes passives acquises par le satellite humidité des sols et salinité des océans (SMOS) et converti en humidité du sol en utilisant la version 5 du processeur SMOS humidité du sol avec une résolution de 30 kilomètres. Ce produit reste en phase de développement et devrait être utilisé en tant que telle.

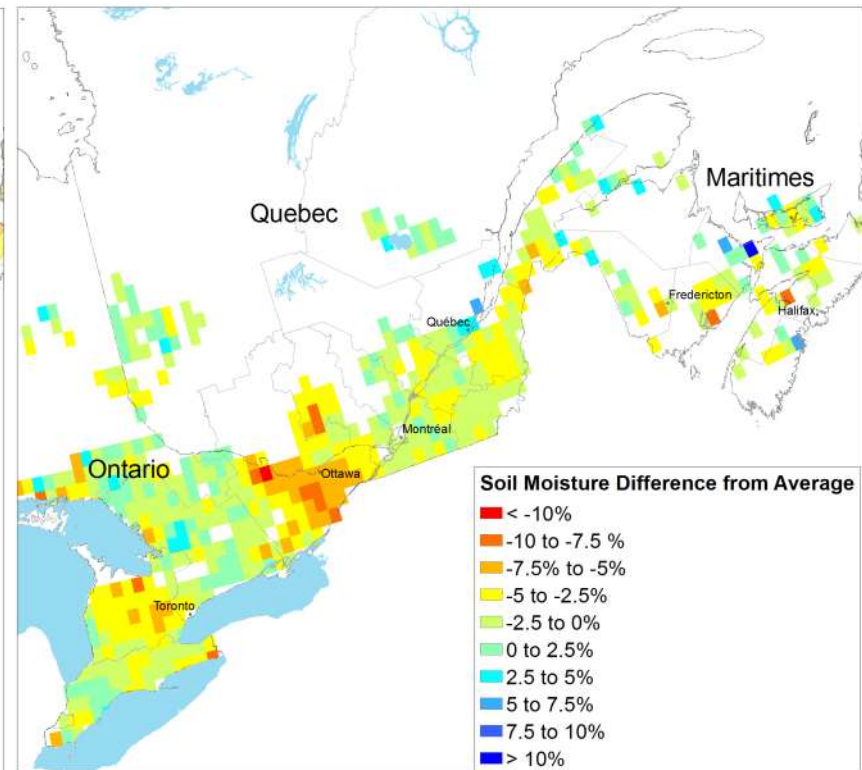
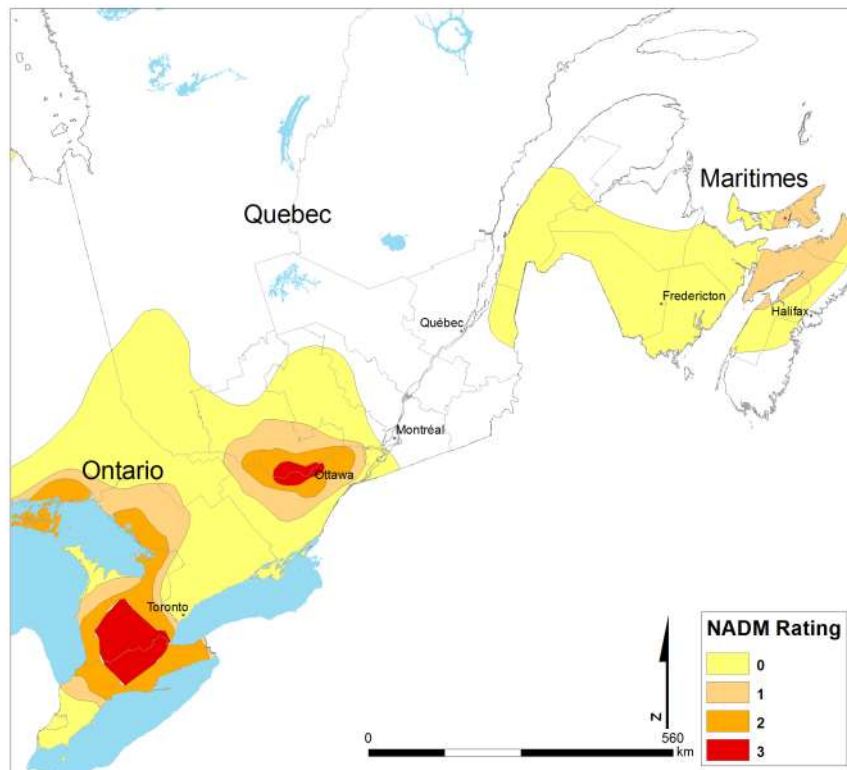
Too Wet To Seed 2010 and SMOS Soil Moisture Anomalies



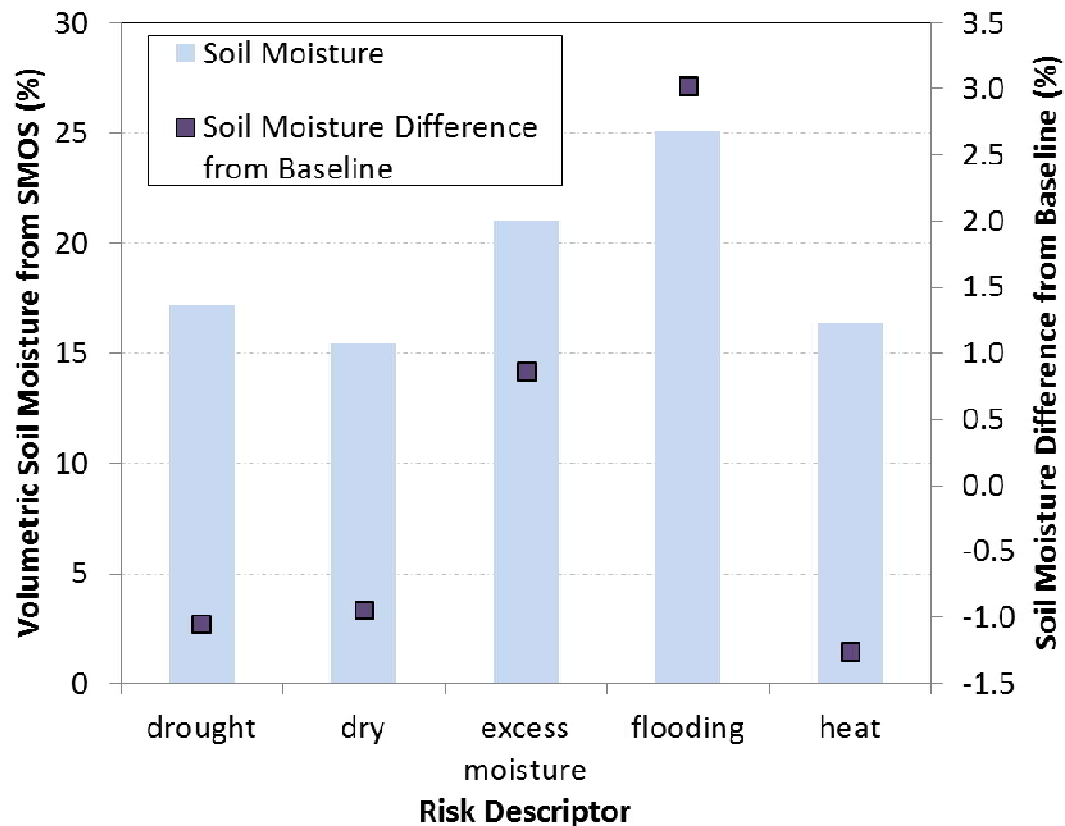
Too Wet To Seed 2011 and SMOS Soil Moisture Anomalies



2012 Drought in Southern Ontario



How does SMOS capture risk events?



- Soil moisture anomalies (from four year baseline) capture regional scale risk events well
- Can inter-calibrate data sets to get a longer time series for forecasting, risk assessment?