Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

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

Catherine Champagne

Agri-Climate, Geomatics and Earth Observation Division

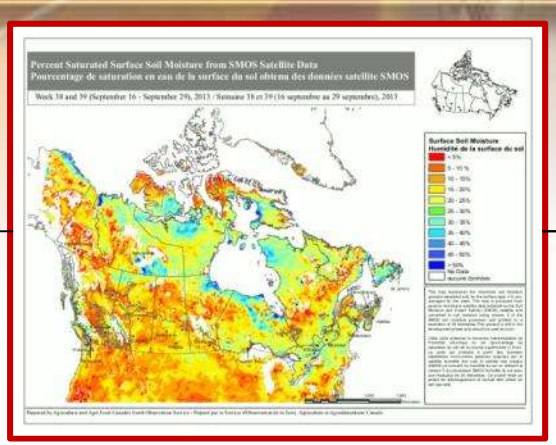
Science and Technology Branch

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

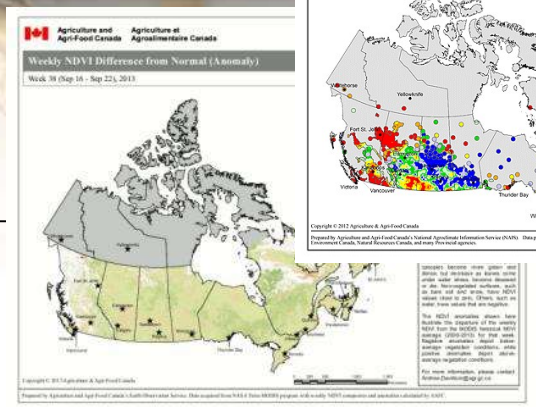
Catherine.Champagne@agr.gc.ca

Canada

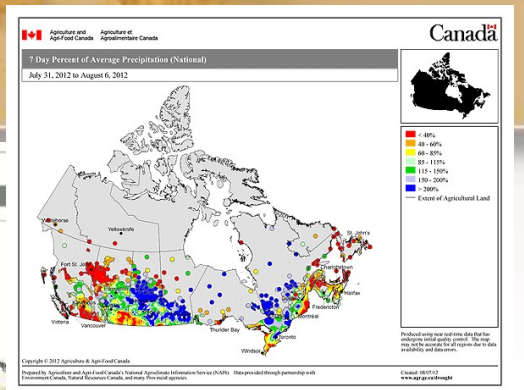
Why Monitor Soil Moisture?



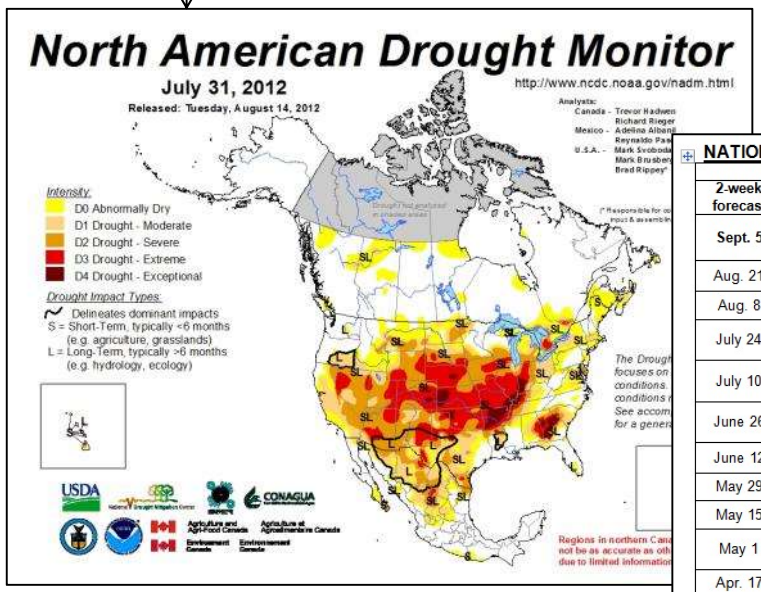
National Satellite Soil Moisture

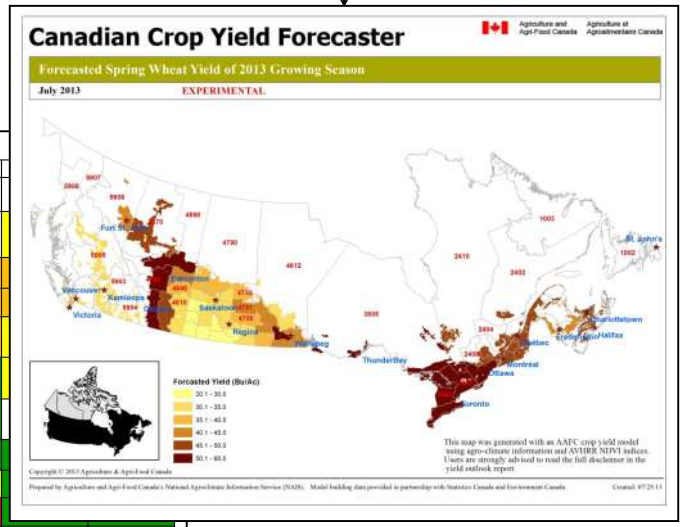


Satellite NDVI



Met Stations



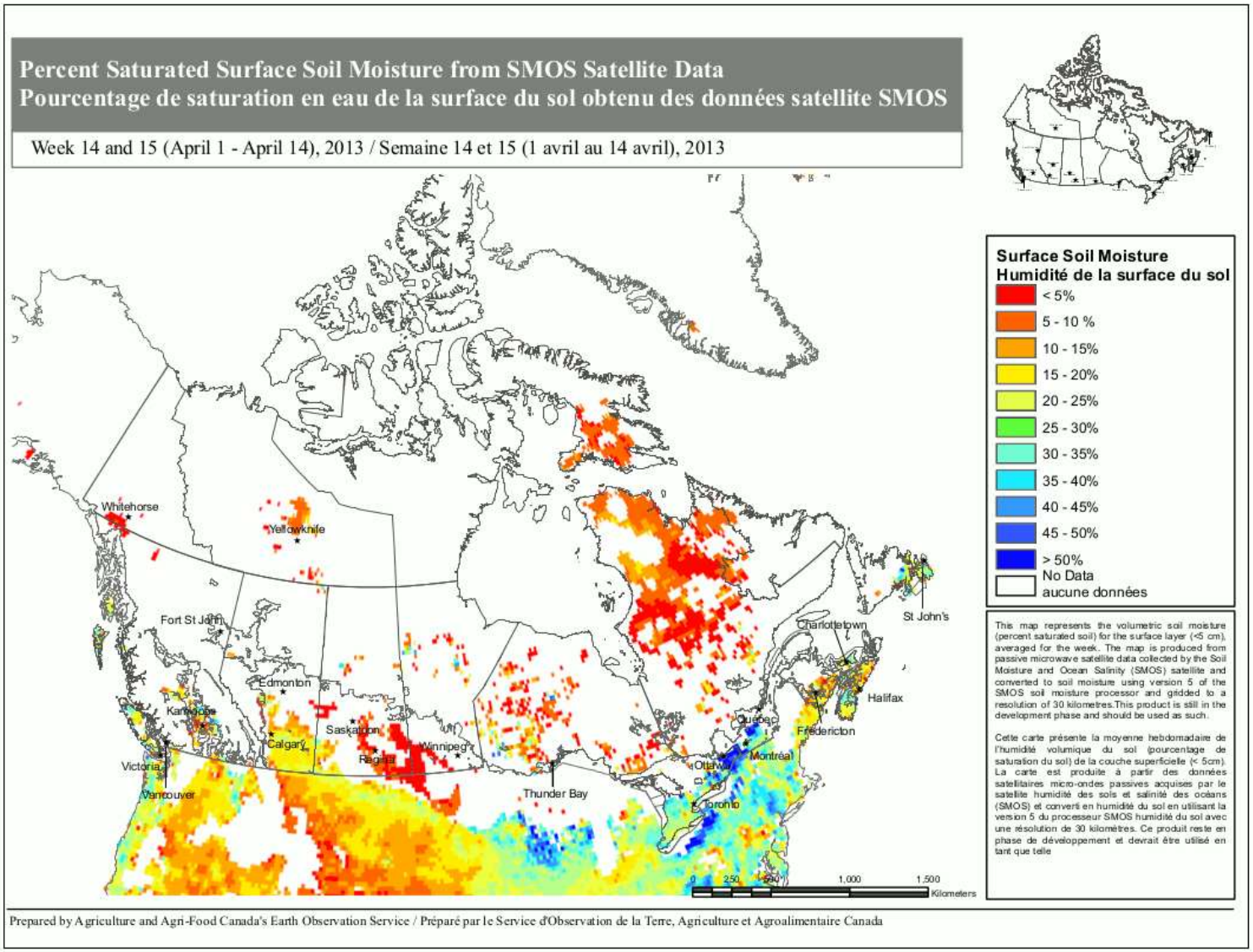


NATIONAL DASHBOARD

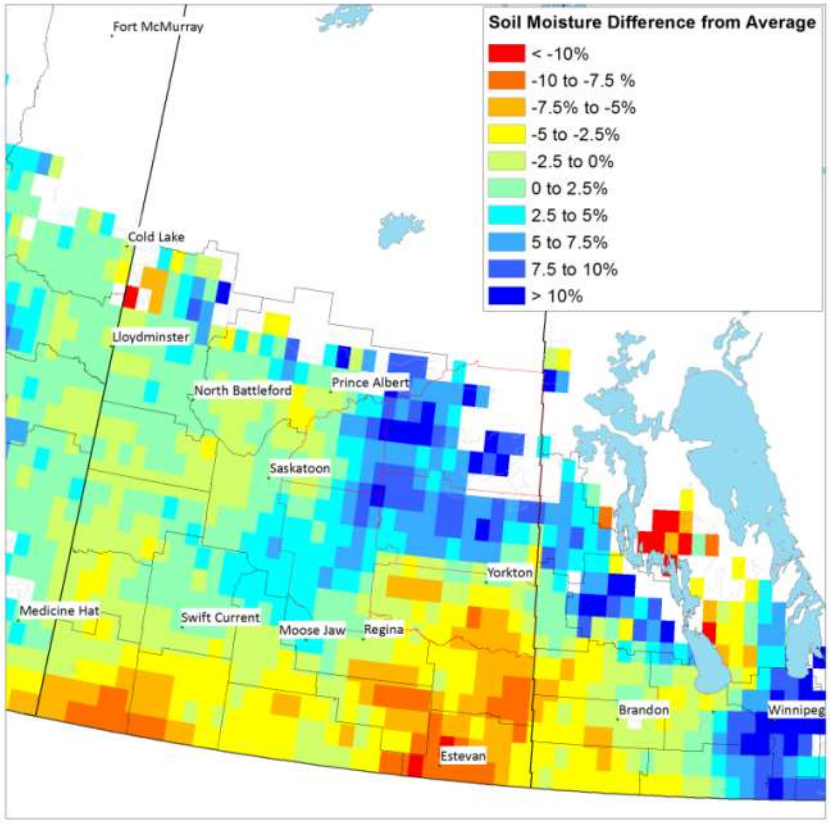
	BC	AB	SK	MB	ON		
2-week forecast	stable	stable	stable	stable	improving		
Sept. 5	dry, impacts from hail			drought and disease	no report		
Aug. 21	dry		excess moisture	dry	heat, drought		
Aug. 8	dry	hail	hail, excess moisture	excess moisture, dry	heat, drought		
July 24	flooding		excess moisture	excess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

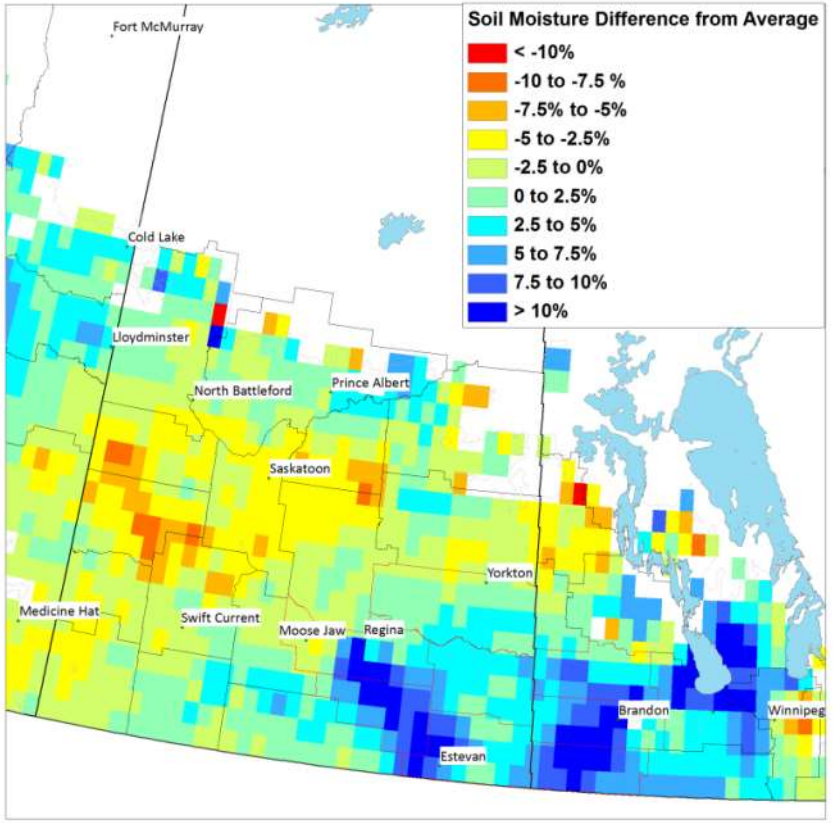
SMOS Surface Soil Moisture
(animated time series 2013)



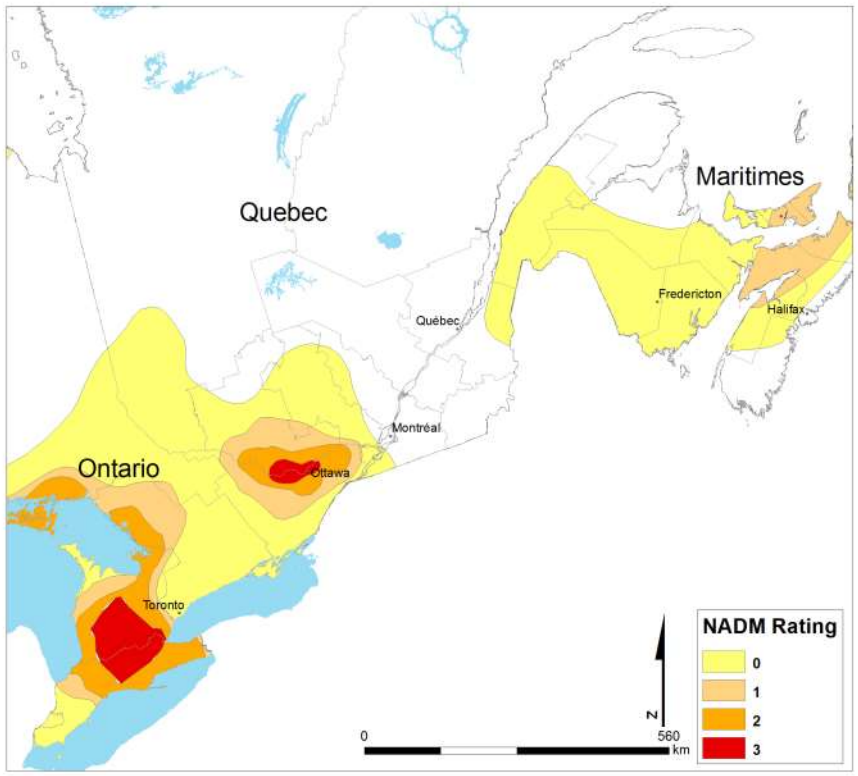
Too Wet To Seed 2010 and SMOS Soil Moisture Anomalies

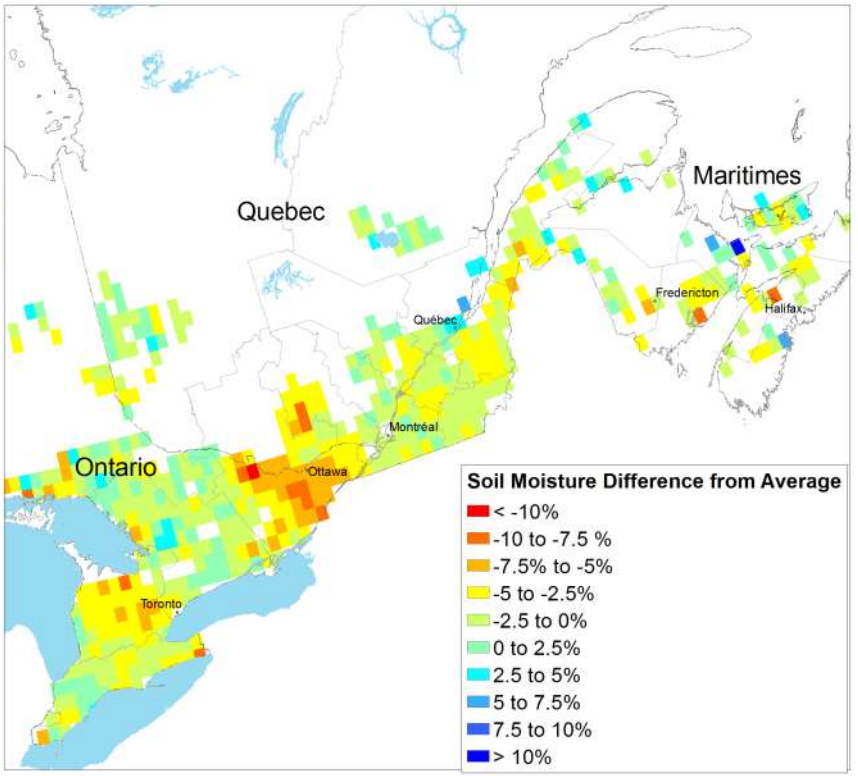


Too Wet To Seed 2011 and SMOS Soil Moisture Anomalies

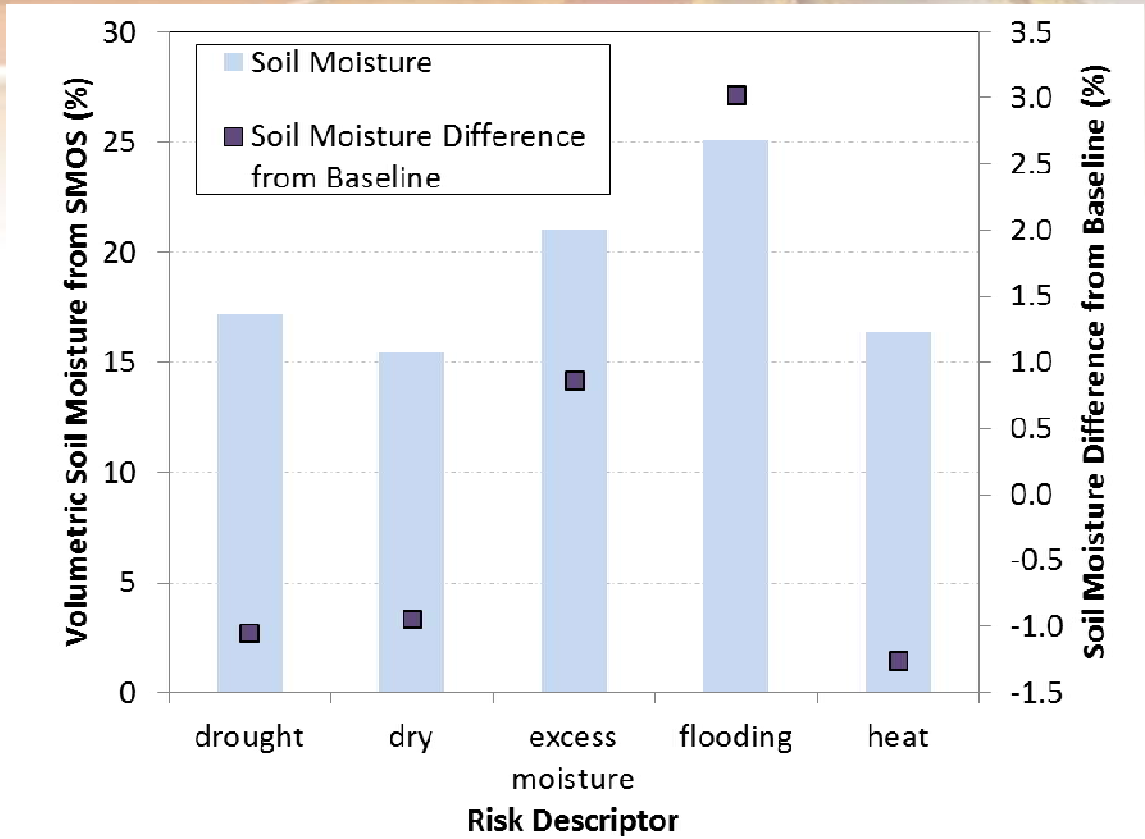


2012 Drought in Southern Ontario





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?