

Summary and availability of CanEx-SM10 datasets

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With the contribution of the CanEx-SM10 team

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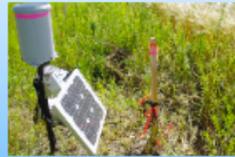
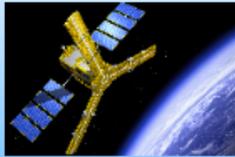
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Overview of CanEx-Sm10

Canadian Experiment for Soil Moisture in 2010 (CanEx-SM10)



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Overview

The Canadian Experiment for Soil Moisture in 2010 (CanEx-SM10) is primarily designed to support the ESA's Soil Moisture and Ocean Salinity (SMOS) validation activities over Land and to develop soil moisture retrieval algorithms in Canada. Due to Canada's involvement in the Soil Moisture Active and Passive (SMAP) mission of NASA, scheduled for launch in 2014, CanEx-SM10 is extended to include the pre-launch validation of SMAP.

During CanEx-SM10, scheduled from May 31st to June 17th, 2010, spaceborne microwave measurements from SMOS, AMSR-E, ASAR-Envisat, RADARSAT-2, and ALOS-PALSAR will be collected along with airborne measurements using passive and active instruments including an L-band radiometer mounted onboard Environment Canada's Twin Otter aircraft and NASA's L-band Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR) flown in a Gulfstream III piloted aircraft. In addition, the experiment will provide ground measurements of soil moisture, surface temperature, and others surface characteristics (vegetation, roughness, soil density, etc.) at a time close to satellite and airborne acquisitions.

Over 50 researchers and students will participate to the field campaigns that will take place over an agricultural site located in Kenaston (Saskatoon, Saskatchewan) and a forested site, which is the Boreal Ecosystem Research and Monitoring Sites (BERMS) also located in Saskatchewan. These sites of about 33 km x 71 km, covering about two SMOS pixels, were selected in order to test SMOS and UAVSAR data and soil moisture retrievals algorithms over very different soil and vegetation conditions. Both sites

<http://www.pages.usherbrooke.ca/canexsm10/>

Summary of CanEx-SM10 datasets

- Available ground, airborne, and satellite measurements during CanEx-SM10

Measurements	Sites	Kenaston														BERMS
	June 2010	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16
Ground		-	√	-	-	√	√	√*	-	√	-	-	-	√	√	√
Satellite	SMOS	√√	√	√√	-	√√	-	√	√√	-	√√	√	√	√√	-	√√
	AMSR-E	√√	√√	√√	√	√√	√√	√√	√√	√√	√√	√√	√√	√√	√√	√√
	RADARSAT-2	√√	√	-	-	√√	-	-	√√	-	-	√	√	-	-	-
	ASAR	-	-	-	-	-	√	√	-	-	√√	-	-	√	-	√
	ALOS-PALSAR	-	-	-	-	-	√	√	-	√	-	-	-	-	√	-
Airbornes	Twin Otter and UAVSAR	-	√	-	-	√	√	√*	-	√	-	-	-	√	√	√

√: one acquisition per day

√√: two acquisitions (ascending and descending) per day

√*: Partial coverage due to rain event

Datasets

Datasets	Description	Contact	Processing
Airborne			
Twin Otter	Micro-wave TBH, TBV 1.4 GHz (40°) 6.9, 19, 37, and 89 GHz at 55°	Anne Walker Environment Canada	100 %
	Landsat simulator 457-521 nm 523-595 nm 630-687 nm 762-897 nm		
	Infra red Ts		
UAVSAR	L-band Sigma0 HH, HV, VV 25-65°	Tom Jackson USDA	100 %
Ground Network			
KEN intensive network (10 km)	Soil moisture profiles	Brenda Toth Environment Canada	100 %
KEN extensive network (40 km)	Soil moisture profiles	Aaron Berg University of Guleph	100 %
BERMS permanent	Meteorological data and soil moisture profiles for 2010	Anne Walker Erin Thompson EC	100 %
BERMS temporary	Soil moisture profiles	Mike Cosh Tom Jackson USDA	??

Datasets	Description	Contact	Processing
Ground data collection			
Kenaston	Soil moisture, soil temperature, bulk density, texture, roughness, LAI, MSR	Ramata Magagi Brenda Toth Heather McNairn Aaron Berg	100 %
	Vegetation water content	Brenda Toth	??
BERMS	Species identification, Vegetation water content and geometric characteristics, soil moisture	Mahta Moghaddam, University of Michigan /	100 %
	Gravimetric soil moisture at temporary sites	Brenda Toth	100 %
	Soil and organic weights		
Ancillary data			
Annual crop maps	NDVI, LAI, Land cover map of of the entire Canadian Prairie	Heather McNairn, Jiali Shang Agriculture and Agri-food Canada	100 %
Field description	Tillage, residue, etc.	Aaron Berg University of Guleph	100 %
MODIS	Surface reflectance	Tom Jackson Iliana Mladenova USDA	100 %

CanEx-SM10

For more information

<http://www.pages.usherbrooke.ca/canexsm10/>

- Current status
 - Data processing ~ 85-90% completed
 - Data analysis
 - Dissemination
- Availability of the data to public in 2012

Thanks!

- **Financial partners:**
 - Natural Sciences and Engineering Research Council of Canada- Strategic Program Grant (NSERC-SPG)
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 - *Agriculture and Agri-Food Canada (AAFC)*
 - National Aeronautics and Space Administration (NASA)
 - Universities (Sherbrooke, Guelph, Michigan)
- All the participants to CanEx-SM10
- ESA for providing us SMOS data