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Soil moisture-monitoring networks in Saskatchewan and Ontario Canada for use as core validation sites

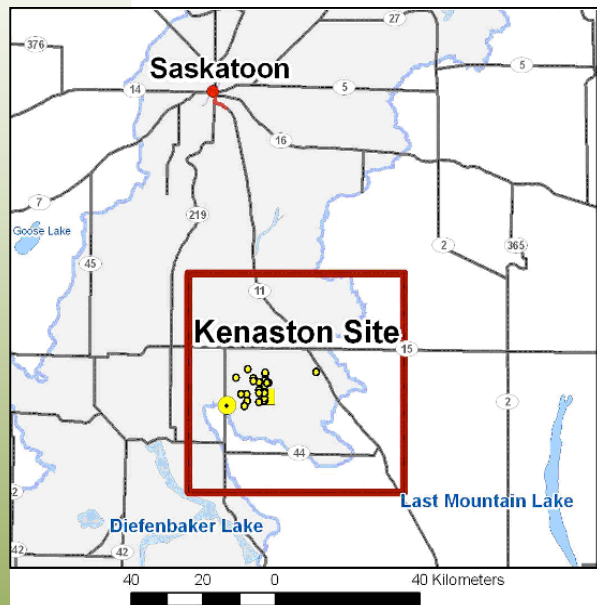
Aaron Berg, University of Guelph

Brenda Toth, HAL MSC Environment Canada

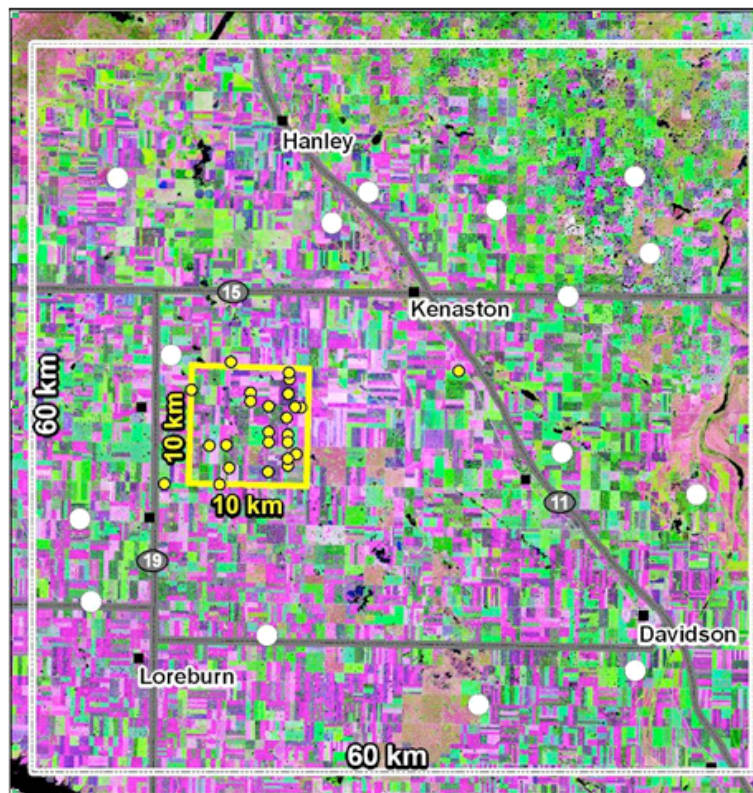
Co-Investigators Stephane Belair, Ramata Magagi,

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Study site – Kenaston/Brightwater Creek



- Duck Lake Well & Meteorological Equipment
- Annie's Well & Meteorological Equipment
- Evaporative Flux & Meteorological Equipment
- Soil Moisture/Rain Station Network
- South Saskatchewan River Basin
- Extent of Univ of Guelph Soil Moisture Network



- EC High Density Network
- Univ of Guelph Low Density Network

- 24 sites (EC)
- 10 x 10 km grid

- Additional 16 sites (U of Guelph)
- 60 x 60 km grid

51.5°N 106.283°W
Operating since 2007



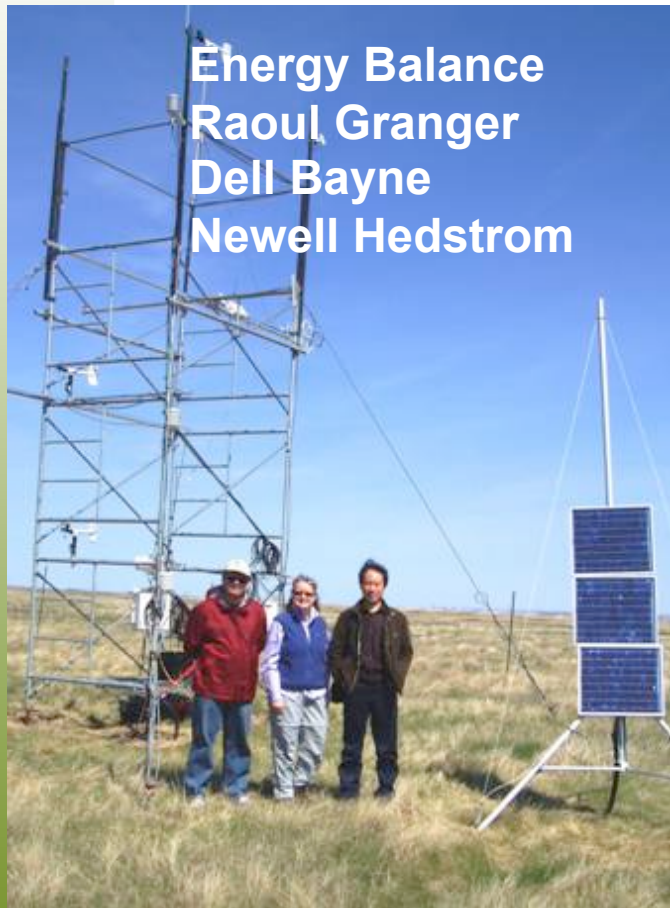
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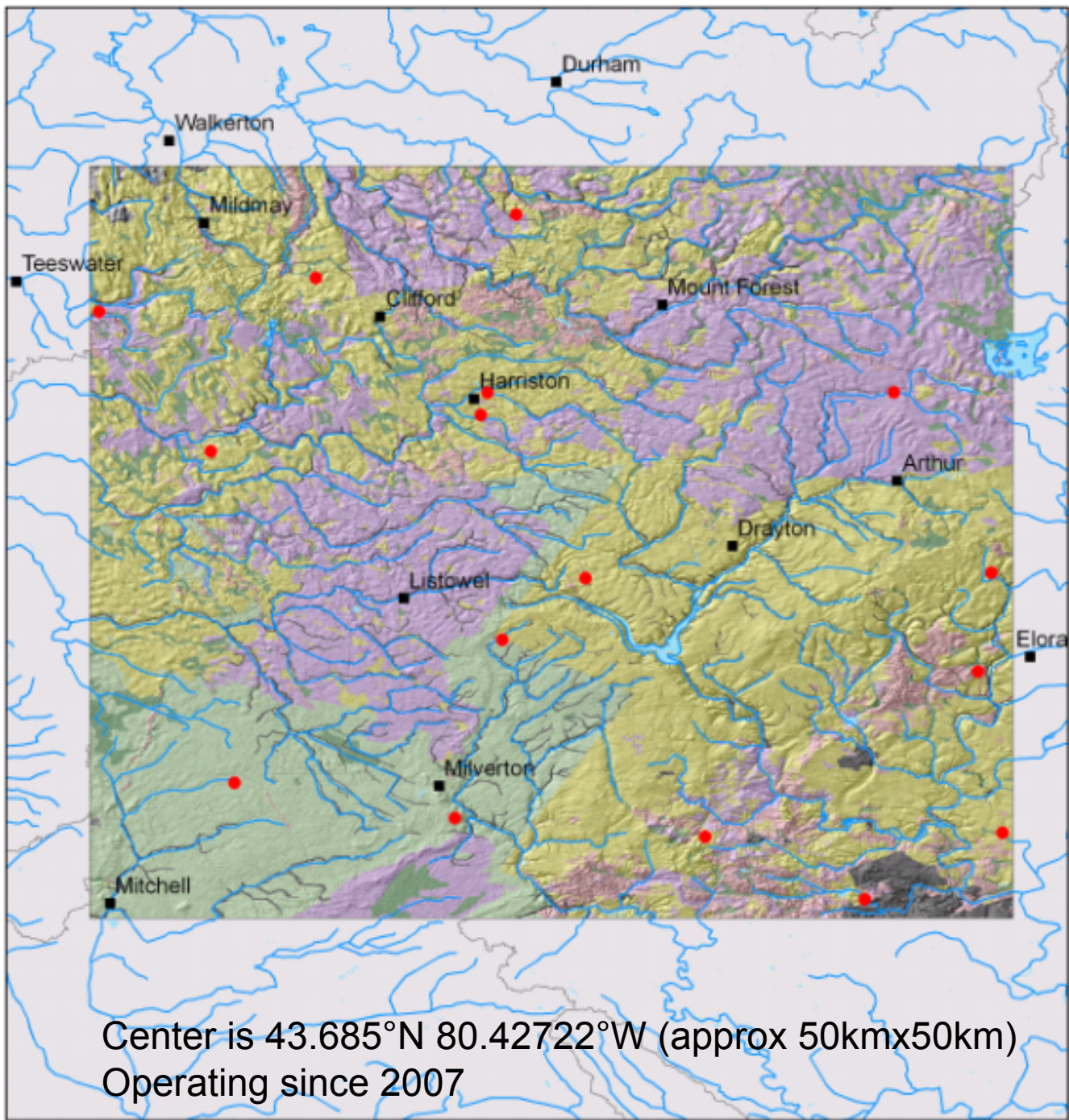
Multiple Collaborations over the Saskatchewan Site



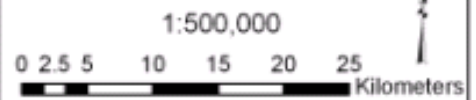
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SOIL TEXTURES IN ONTARIO OBSERVATORY



Legend

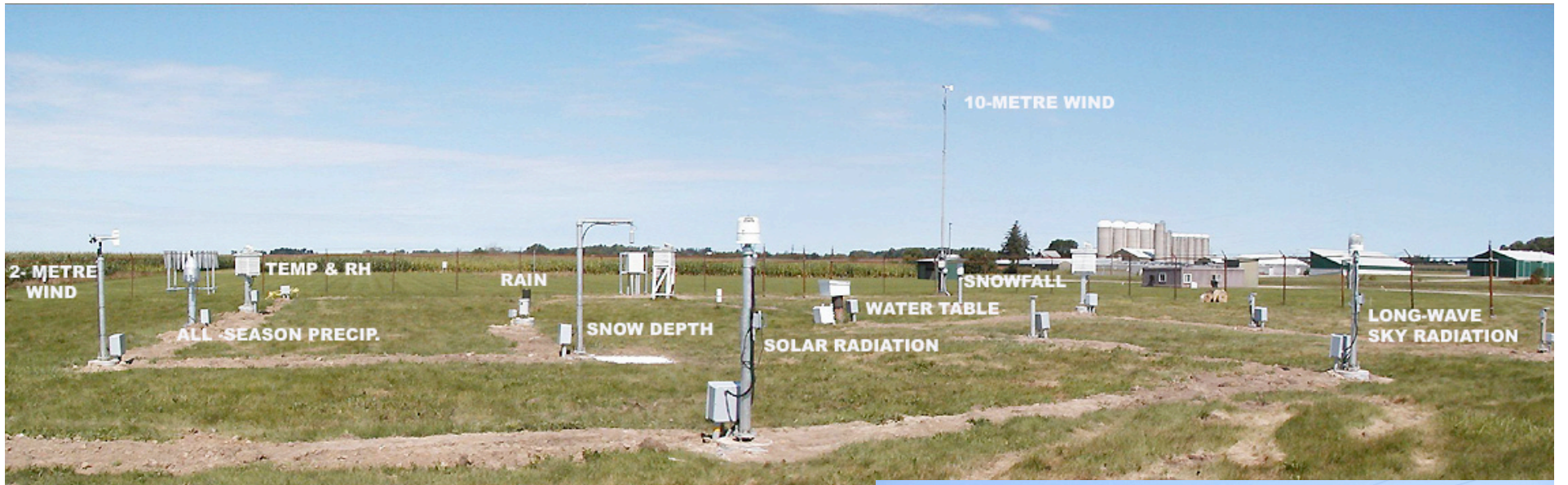
- Study Sites
- Cities/Towns
- Rivers
- Soil Textures**
- Organic
- Unclassified
- Loam
- Sand Loam
- Clay Loam
- Silt Loam

KEY MAP OF SOUTHERN ONTARIO



Data Sources:
 Agricorp (2006)
 Ontario Ministry of Natural Resources (2005)
 Ontario Ministry of Agriculture, Food and Rural Affairs (2004)

Center is 43.685°N 80.42722°W (approx 50kmx50km)
 Operating since 2007



Typical Soil Moisture/Precip site



- 3 depths/orientation
- 5 cm vertical (EC), horizontal (EC and U of G)
- 20 cm horizontal
- 50 cm horizontal
- Stevens Hydra Probe II
- Site specific calibration

EC 24 sites

U of G 16 sites

Temporal Frequency Hourly

Variables Observed:

Soil temperature

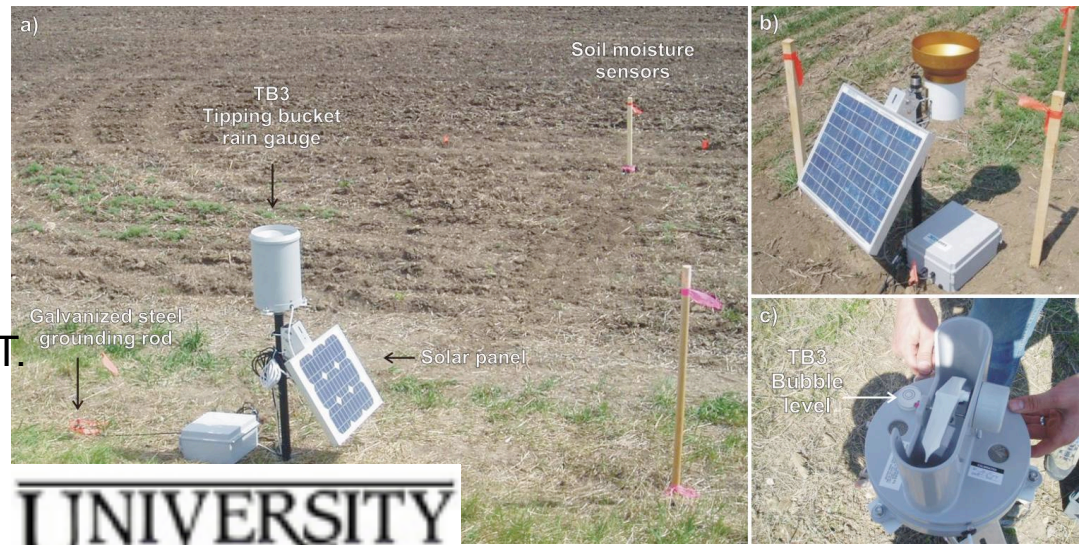
Soil Moisture

Precipitation

Latency: EC network will be NRT.

Guelph approx. 1 month

Instrumented for Freeze/Thaw



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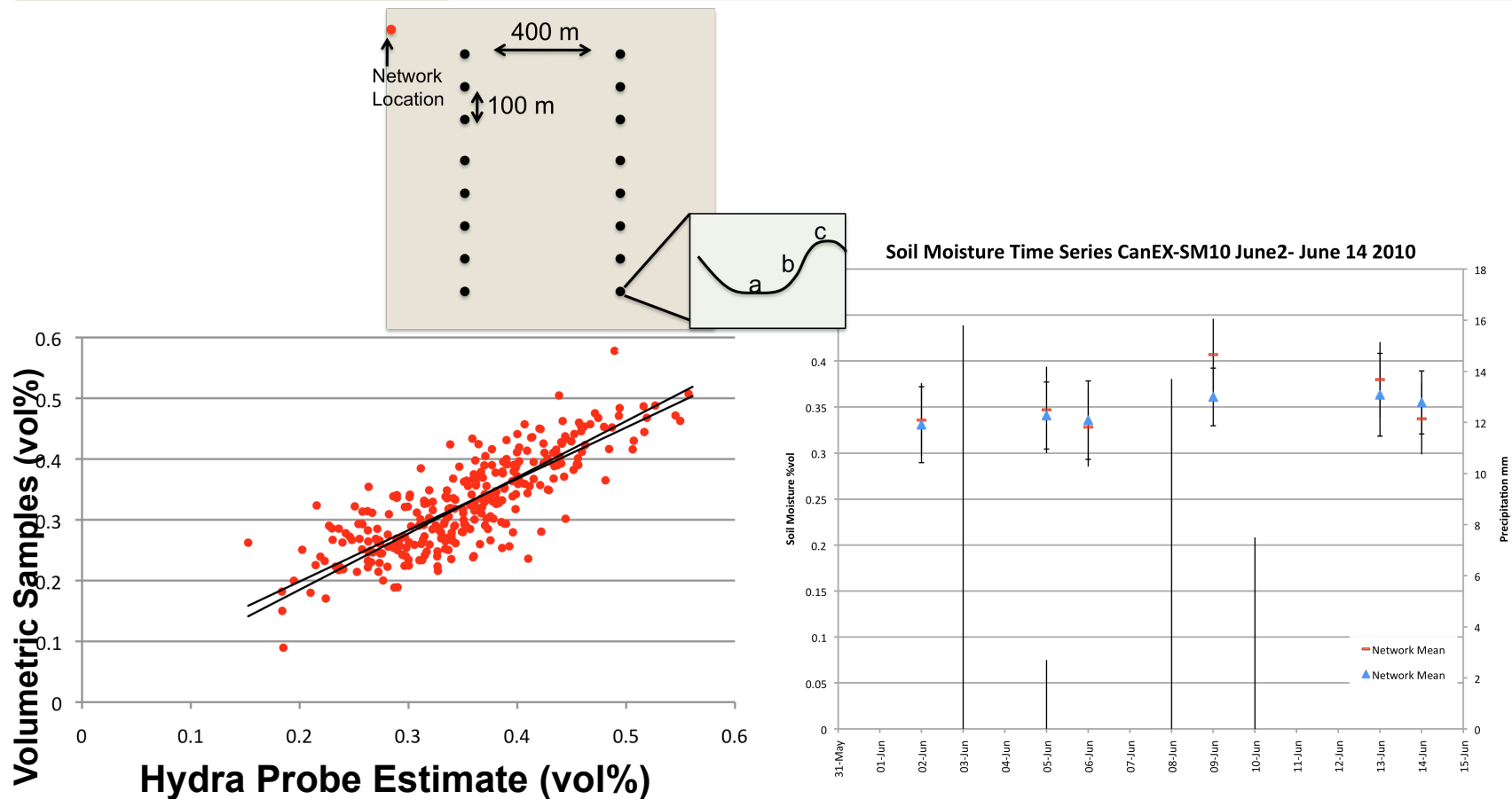


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Calibration of *in situ* Sensors and Network (scaling issues)



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Funding and Support

- Canadian Space Agency
- National Snow and Ice Data Center
- Environment Canada
- Agriculture and Agri-Food Canada
- National Science and Engineering Research Council
- Ontario Ministry of Agriculture Food and Rural Affairs
- Canadian Foundation for Innovation
- Ontario Research Trust
- Canadian Foundation for Climate and Atmospheric Science



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