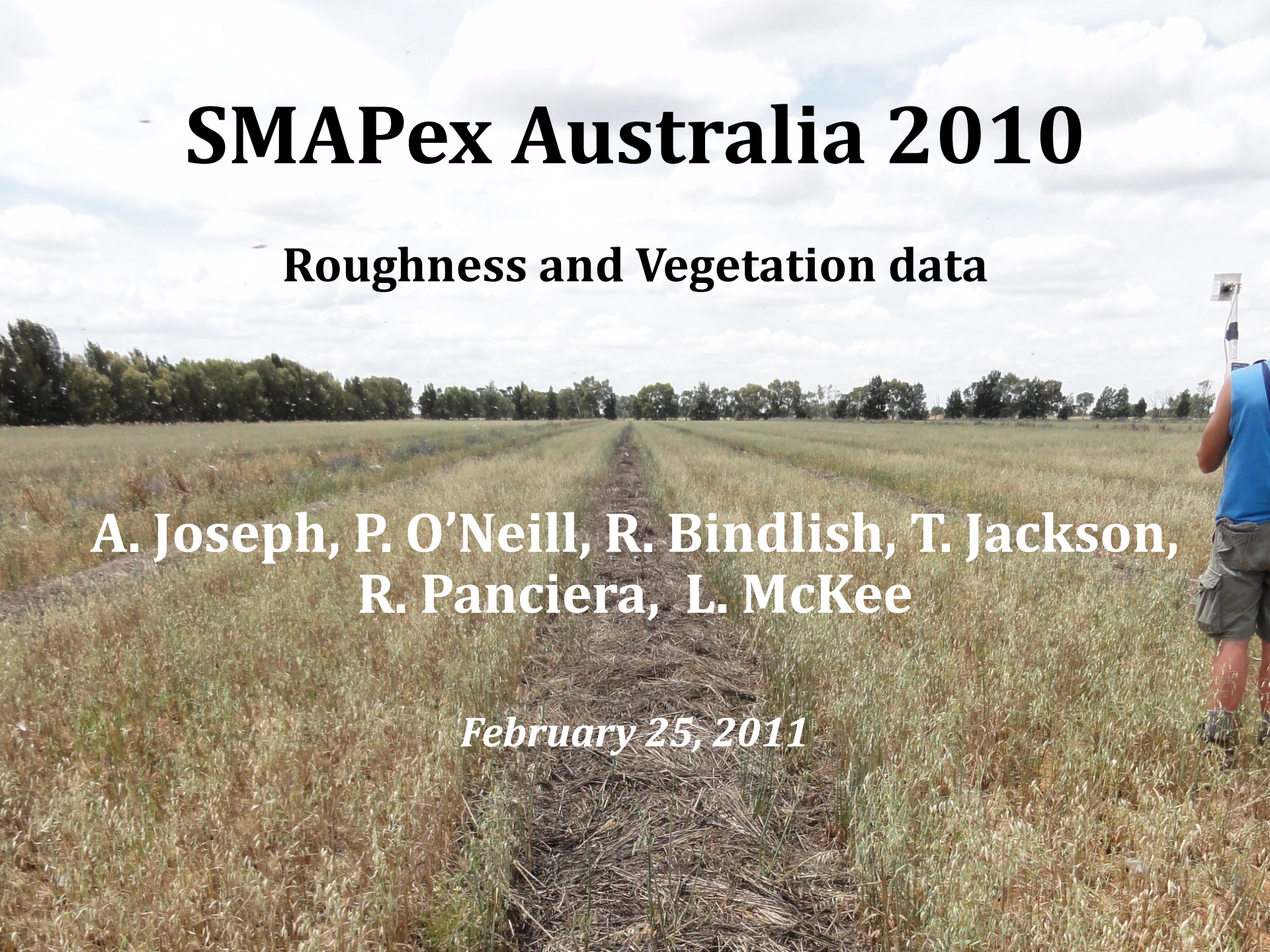
SMAPex Australia 2010

Roughness and Vegetation data



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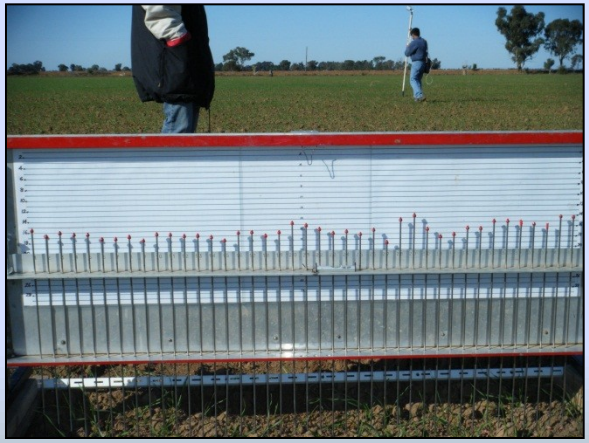
Outline

- Data collection overview
- Surface Roughness
- Vegetation data
- Interpretation/applications



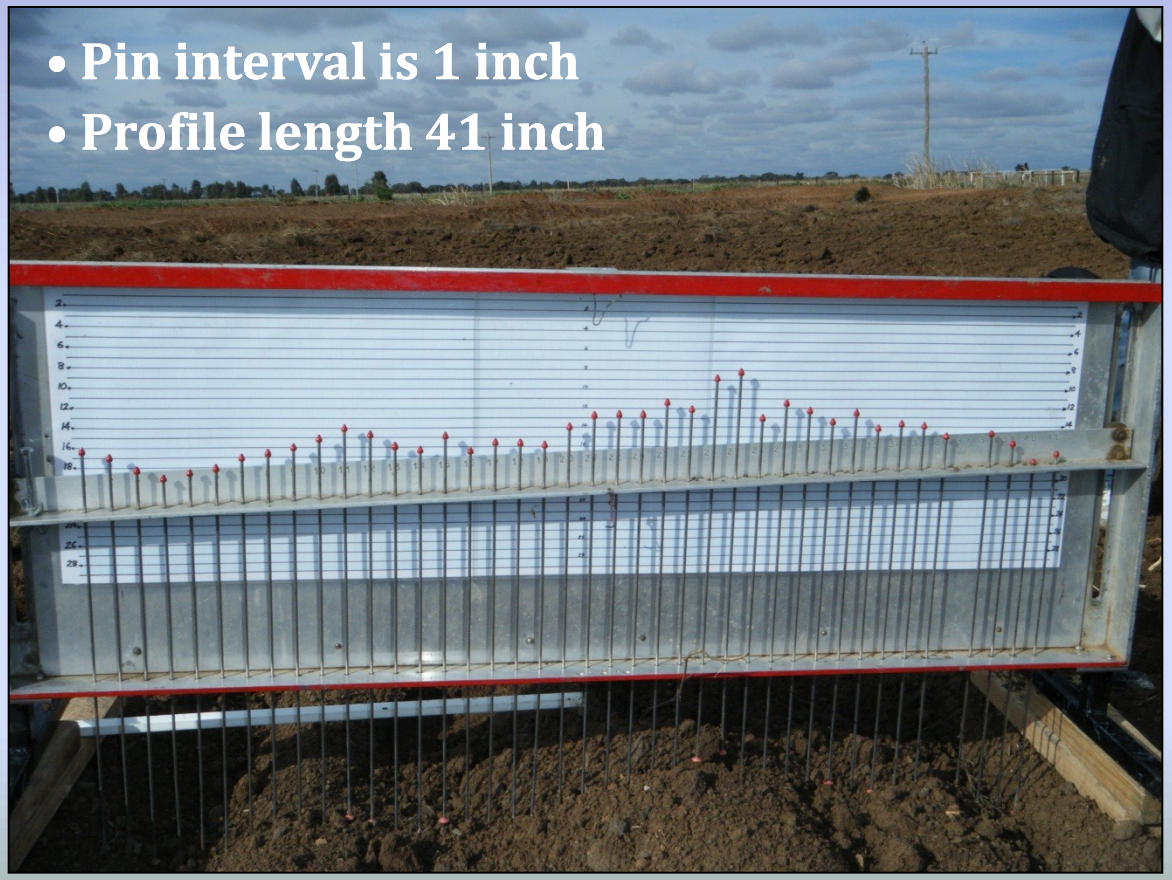
Data collection overview

- Surface roughness and the collection of vegetation data took place on five days from **6 July till 10 July 2010**;
- **Sixteen fields** were sampled with both agricultural and natural vegetation covers;
- **Three sites** were selected for roughness and vegetation data collection per field.

Overview land covers

Surface Roughness

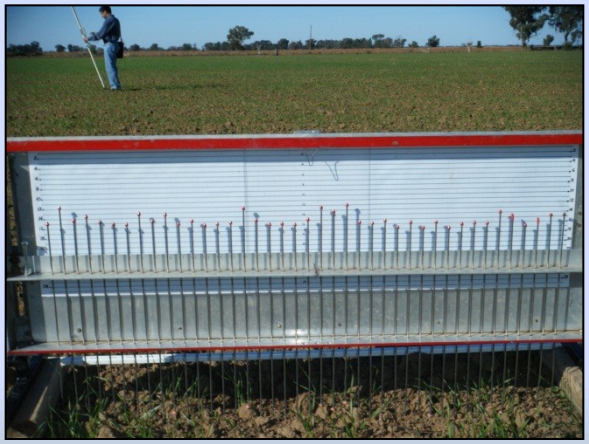
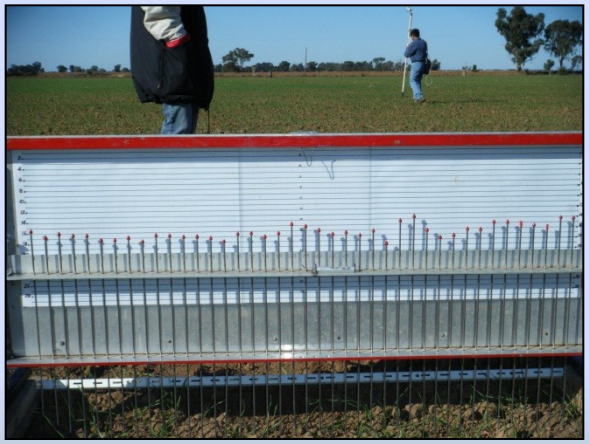
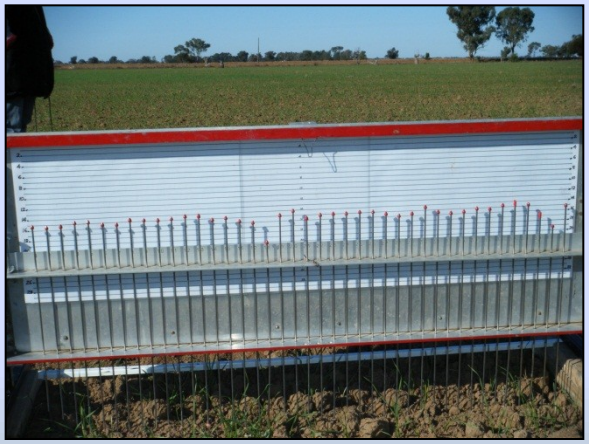
Pin profiler Method:



Surface Roughness

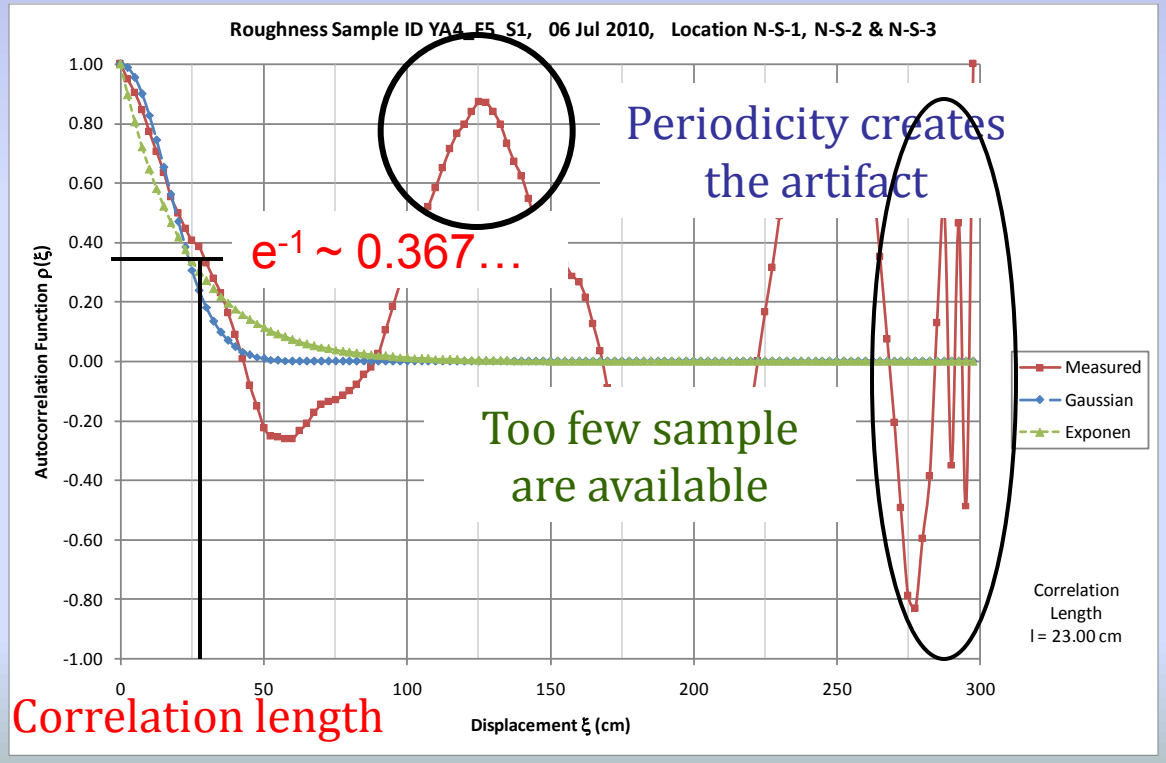
Protocol:

- **In each field, three height profiles were recorded along and one was recorded across tillage rows;**
- **Each profile consists of a sequence of three pin profiler recordings.**

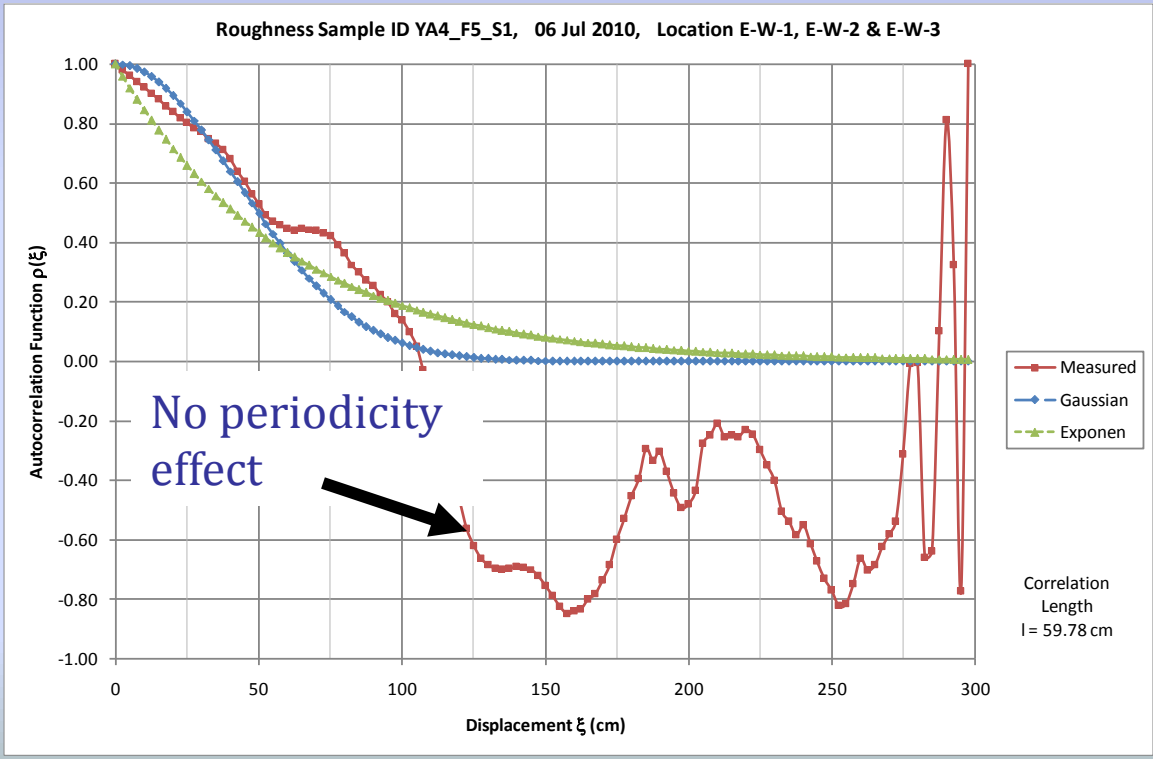
Surface Roughness

Example of autocorrelation length function in the **across** tillage row direction



Surface Roughness

Example of autocorrelation length function in the **along** tillage row direction



Vegetation

- Biomass (0.5 m x 0.5 m)
- Leaf Area Index
- Multispectral Radiometer (MSR)


LI-COR LAI 2000


CROPSCAN MSR

Vegetation

LI-COR LAI 2000

Calculates the Leaf Area Index (LAI) and provides a measure of other canopy structure attributes from radiation measurements made at 5 angles by an optical sensor (320 – 490 nm).

Measurements are made above and below the canopy to determine the light intercepted by the foliage.

LI-COR LAI 2000

Vegetation

CROPSCAN multispectral radiometer

Measures up- and down welling radiation (reflectance) in 9 bands with wavelengths from 450 up to 1720 nm similar to LandSat and MODIS.

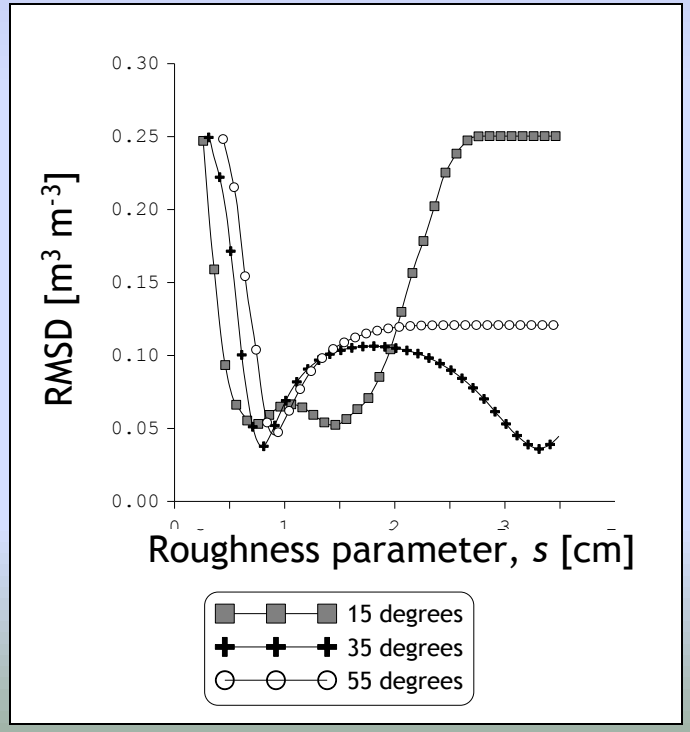
Band	Wavelengths	Satellite Band
1	450 - 520 nm	LandSat Band 1
2	520 - 600 nm	LandSat Band 2
3	630 - 690 nm	LandSat Band 3
4	760 - 900 nm	LandSat Band 4
5	1550 - 1750 nm	LandSat Band 5
6	630 - 670 nm	MODIS Band 1
7	820 – 880 nm	MODIS Band 2
8	1234 - 1246 nm	MODIS Band 5
9	1632 – 1648 nm	MODIS Band 6

Data summary

- Surface Roughness;
- Vegetation Biomass;
- Leaf Area Index;
- Multispectral Radiometer.

Interpretation/applications

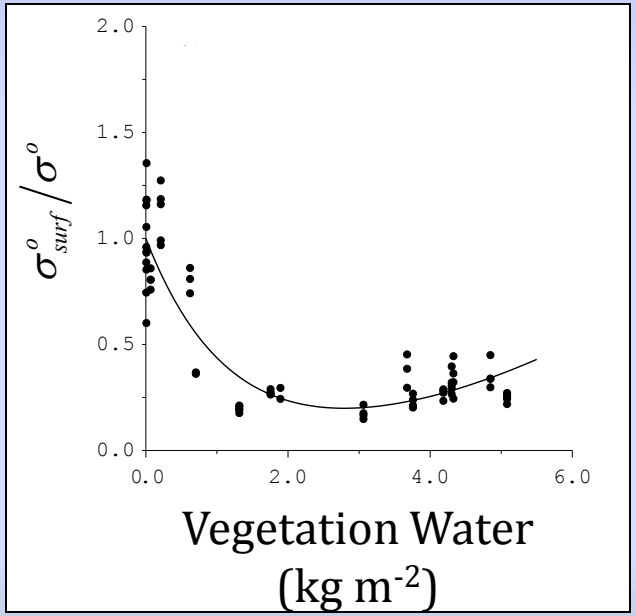
- Soil moisture retrievals are highly sensitive to the surface roughness parameters.
- Measurements necessary to quantify the uncertainty imposed on soil moisture retrievals.



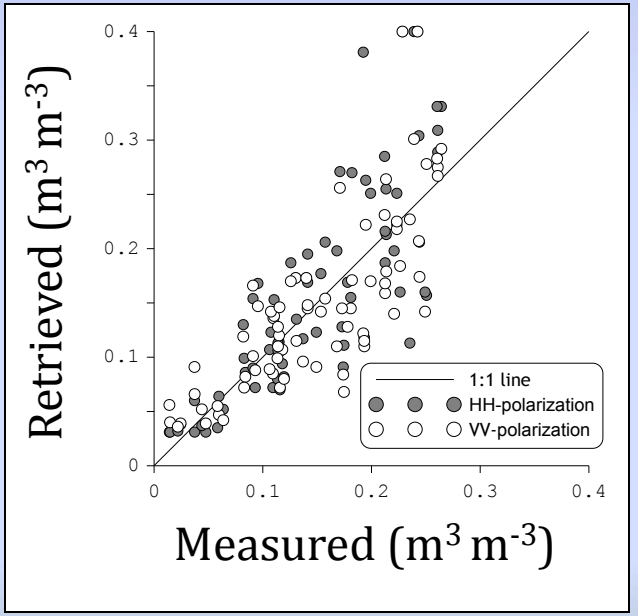
Interpretation/applications

Vegetation measurements can be used to:

Formulate vegetation corrections



Improve soil moisture retrievals



A.T. Joseph, R. van der Velde, P.E. O'Neill, R. Lang, T. Gish, (2010) "Effects of corn on C- and L-band radar backscatter: A correction method for soil moisture", *Remote Sensing of Environment*, **114**, 2417-2430.

Thank you for your attention …

Science is also fun!

Team Work