Engineering

Good Practices of Soil Moisture Validation

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OzNet

www.oznet.org.au

Welcome to OzNet

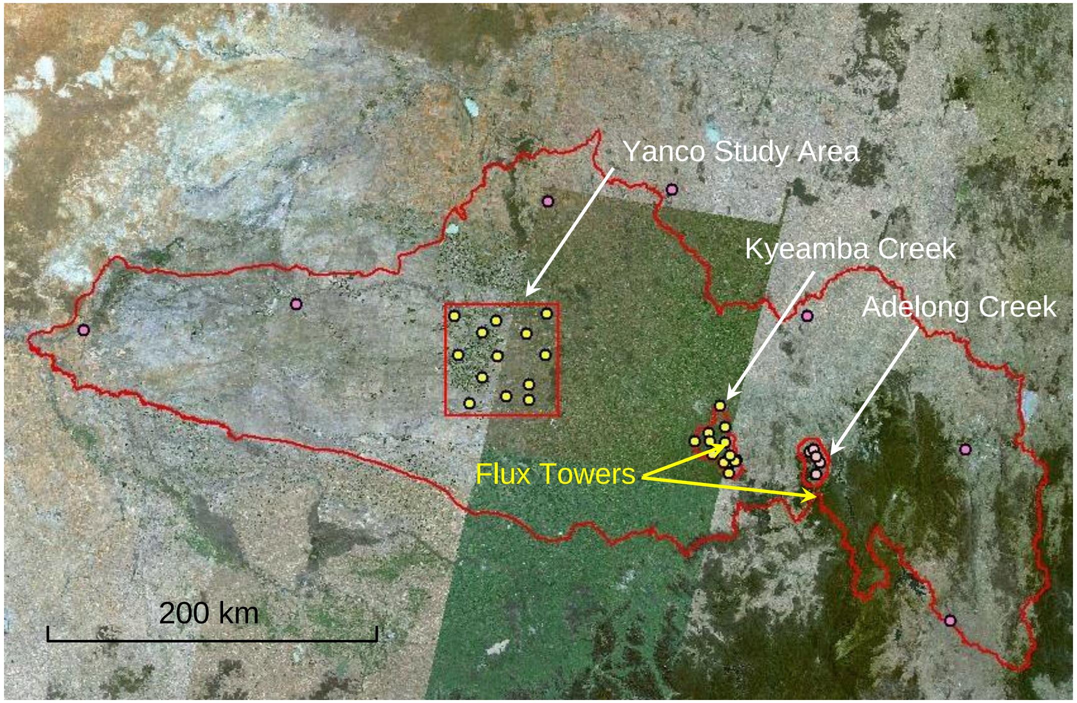
Hydrological monitoring network.

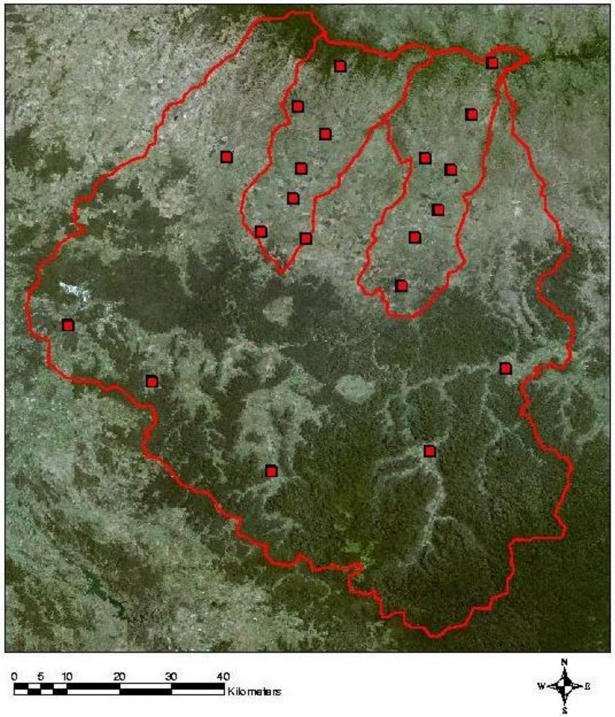
An Australian monitoring network for soil moisture and micrometerology.

HOME

Murrumbidgee

Goulburn


Yanco Study Area
Kyeamba Creek
Adelong Creek
Flux Towers
200 km

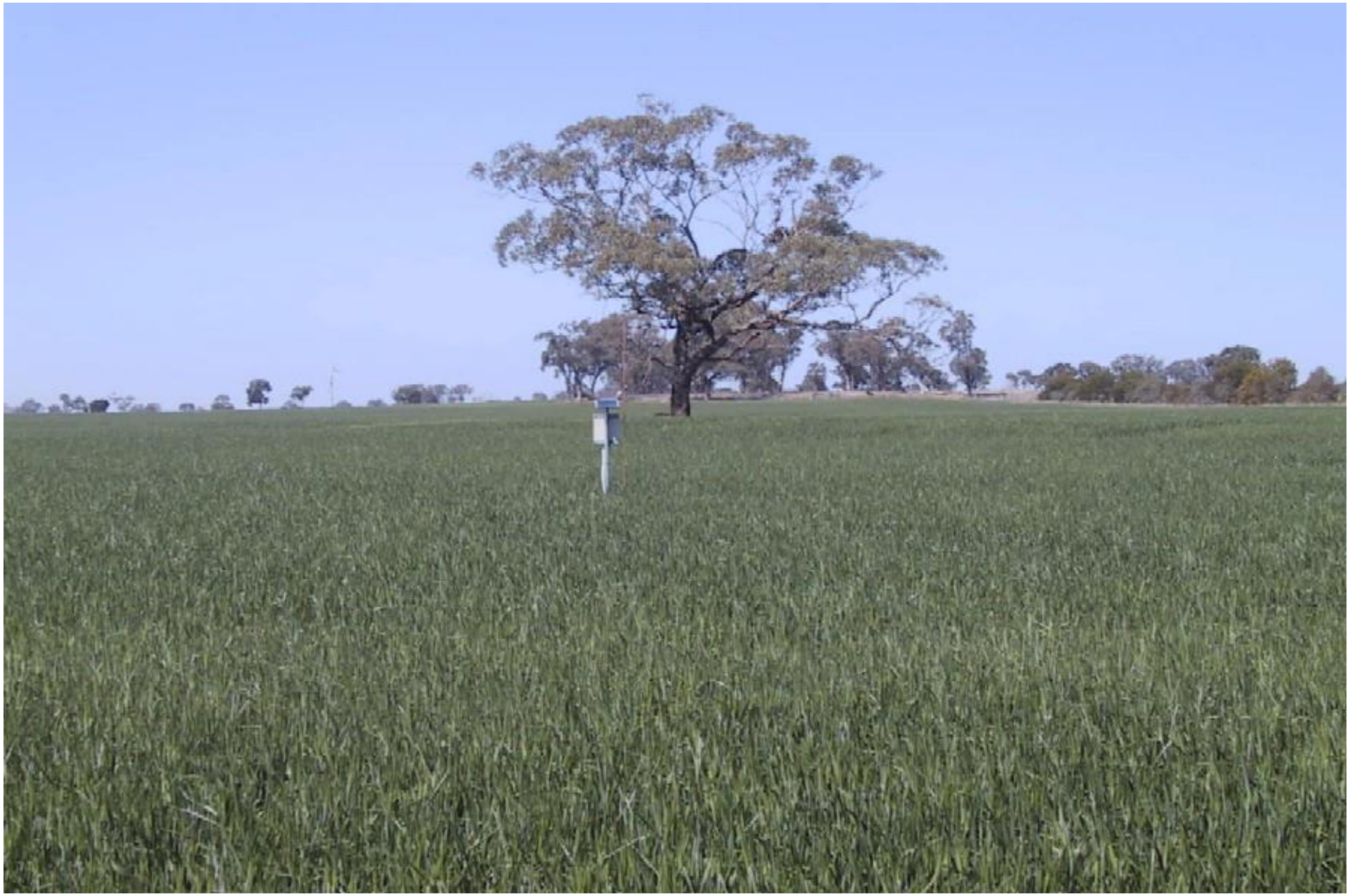

0
5
10
20
30
40
Kilometers
N
W
E
S

Kilometers

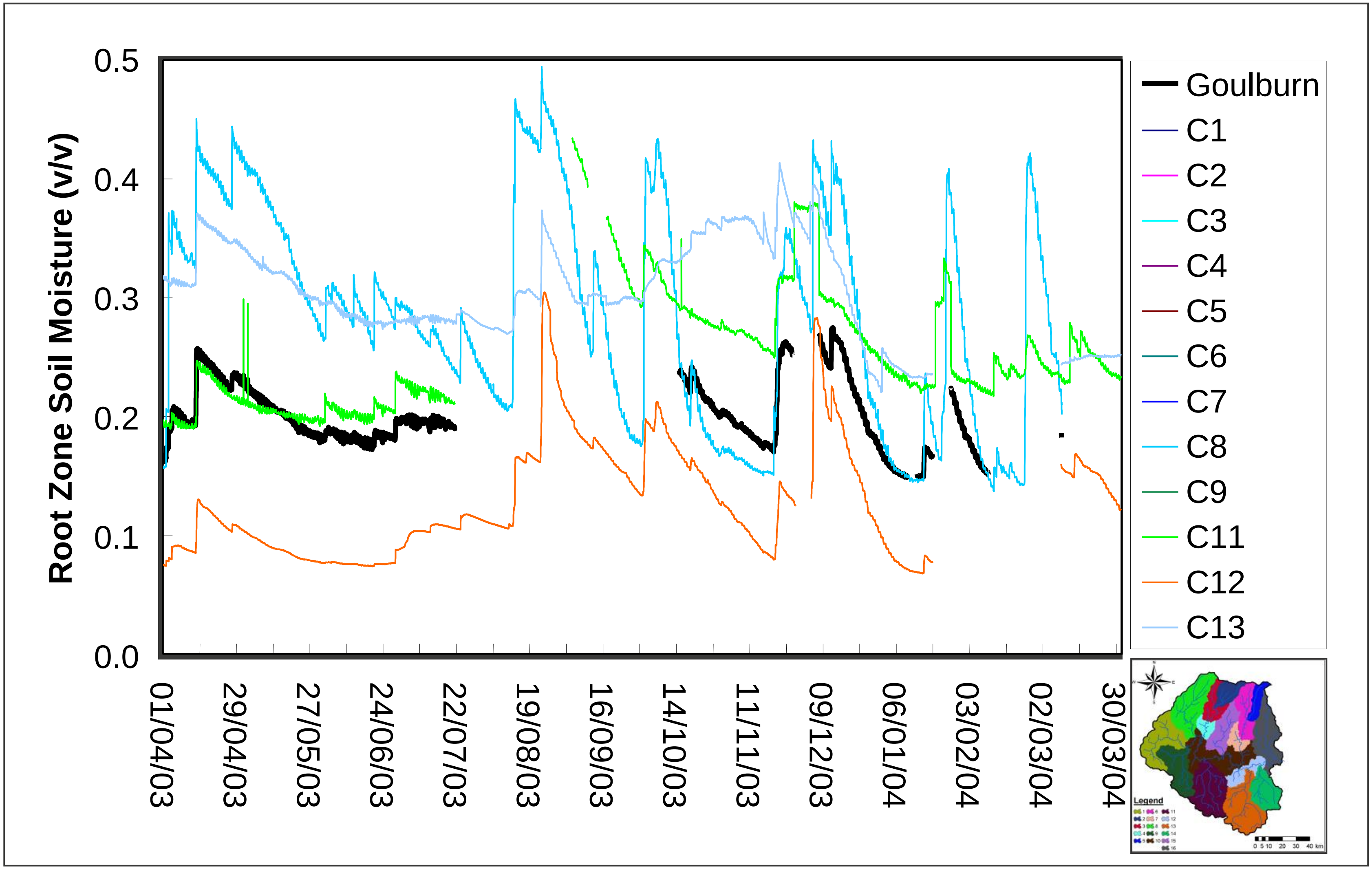
Click on location for a closer view.

Web design by Merrick Underwood

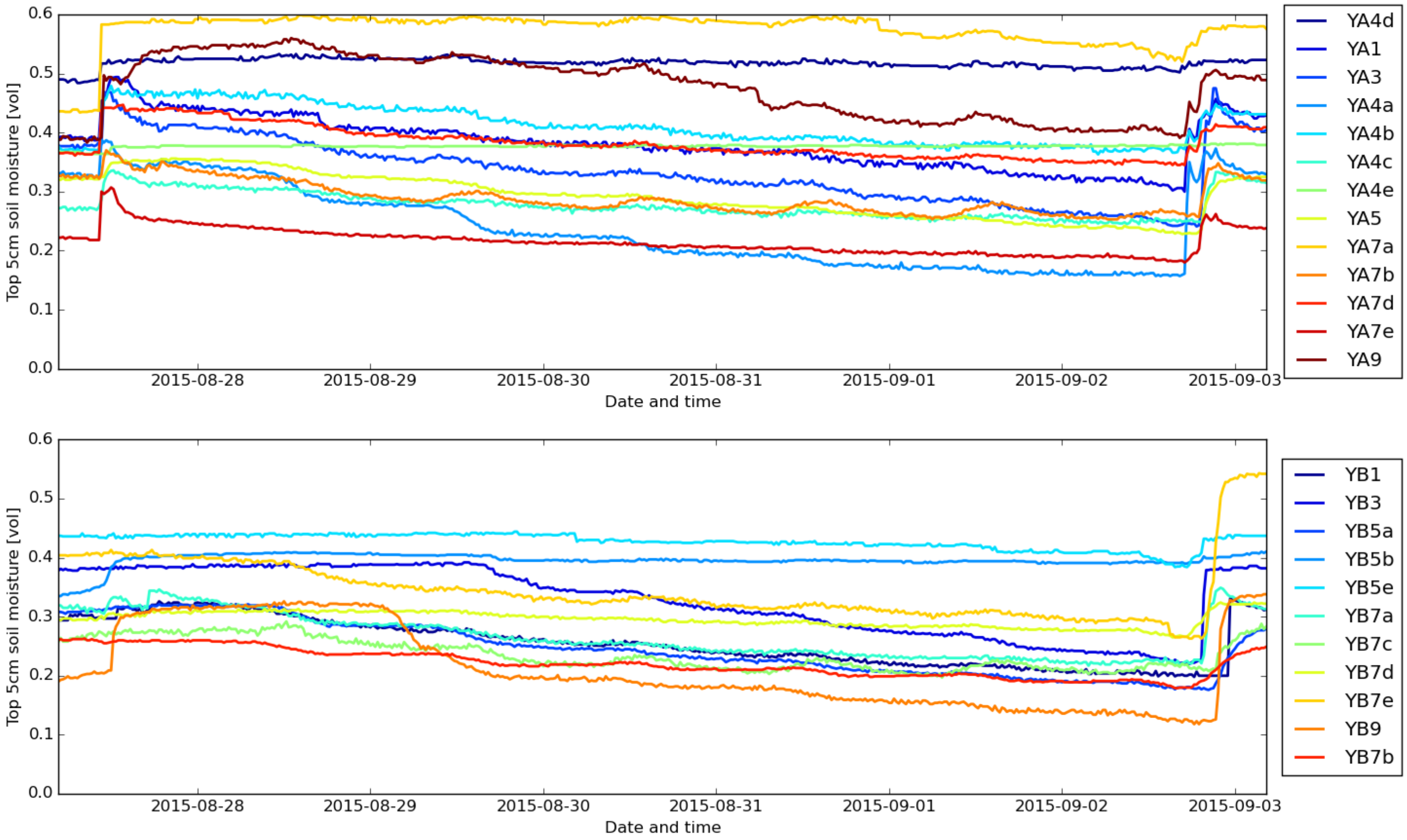
Typical monitoring site



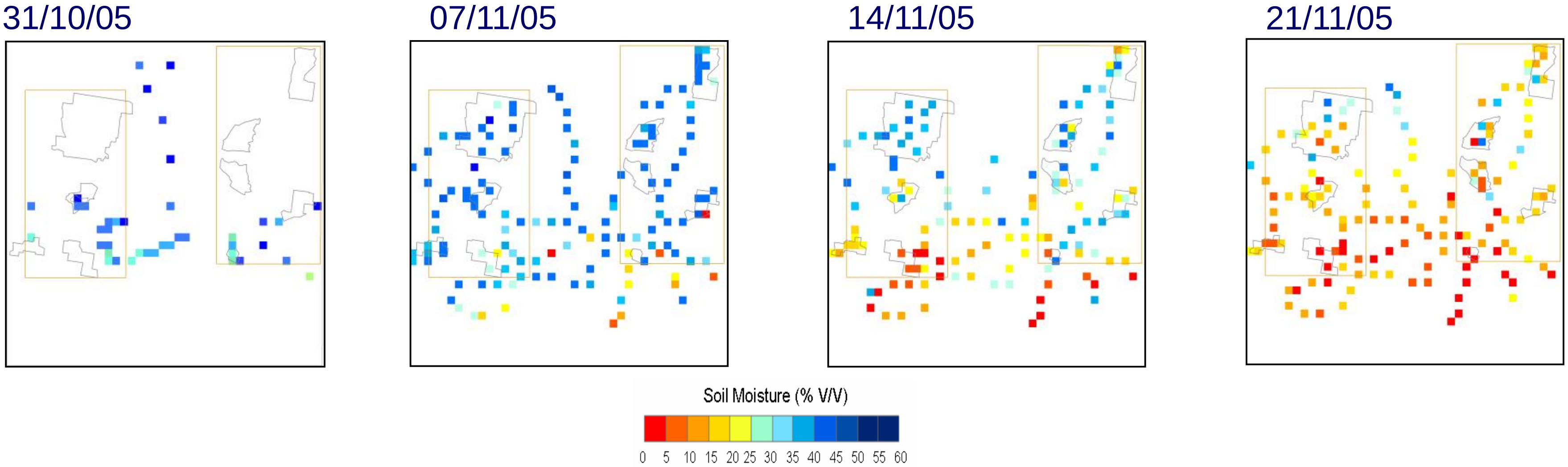
The soil moisture conundrum



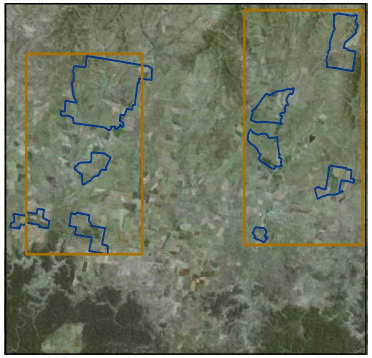
The soil moisture conundrum



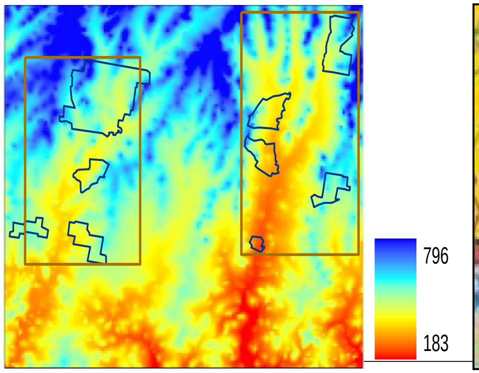
How many stations to monitor?


31/10/05
07/11/05
14/11/05
21/11/05
Soil Moisture (% V/V)
0 5 10 15 20 25 30 35 40 45 50 55 60

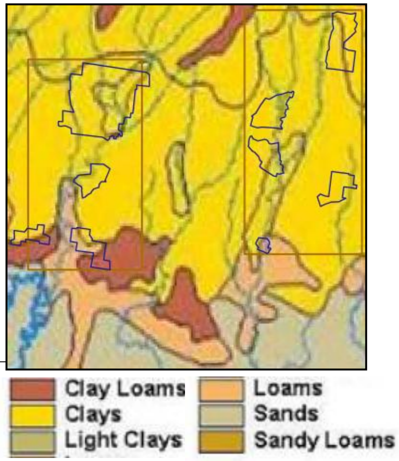
Landsat



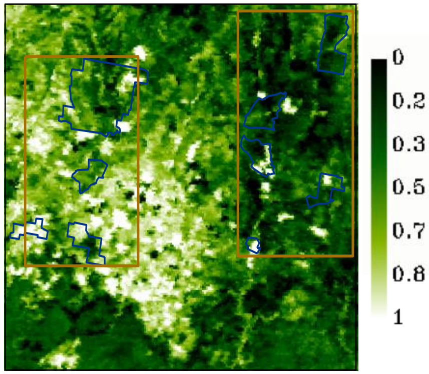
Elevation



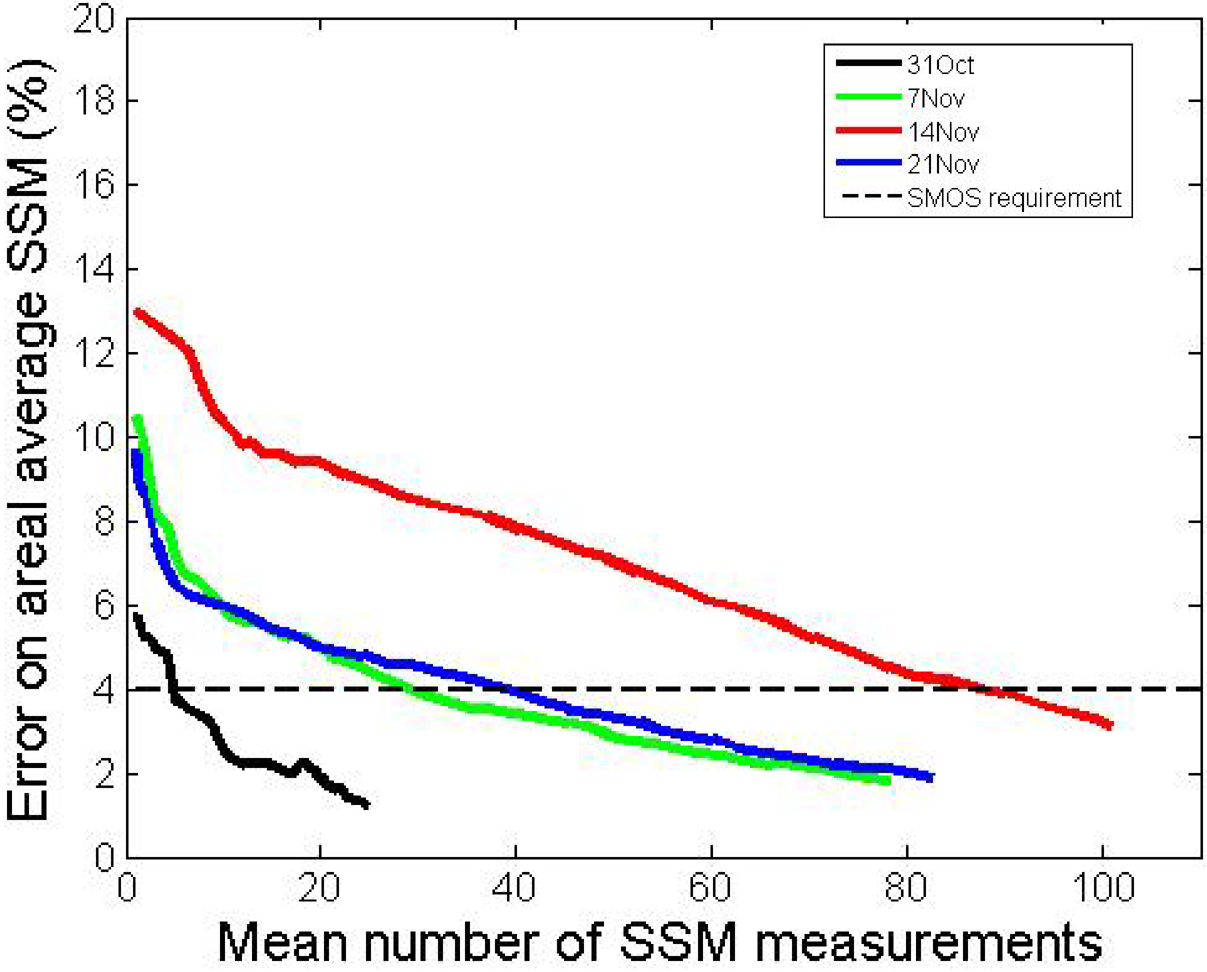
Soil type


Clay Loams
Clays
Light Clays
Loams
Sands
Sandy Loams

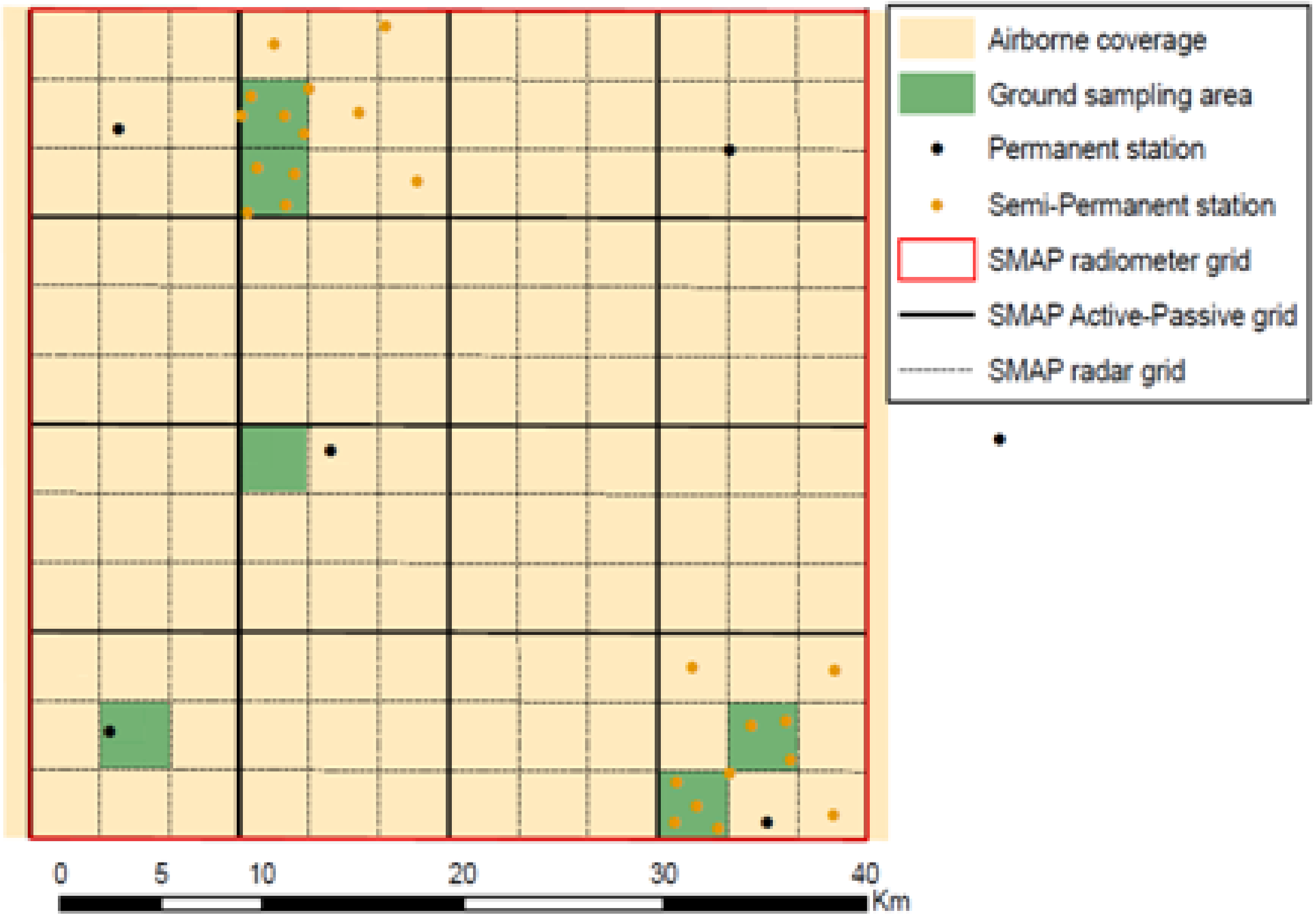
NDVI


0
0.2
0.3
0.5
0.7
0.8
1

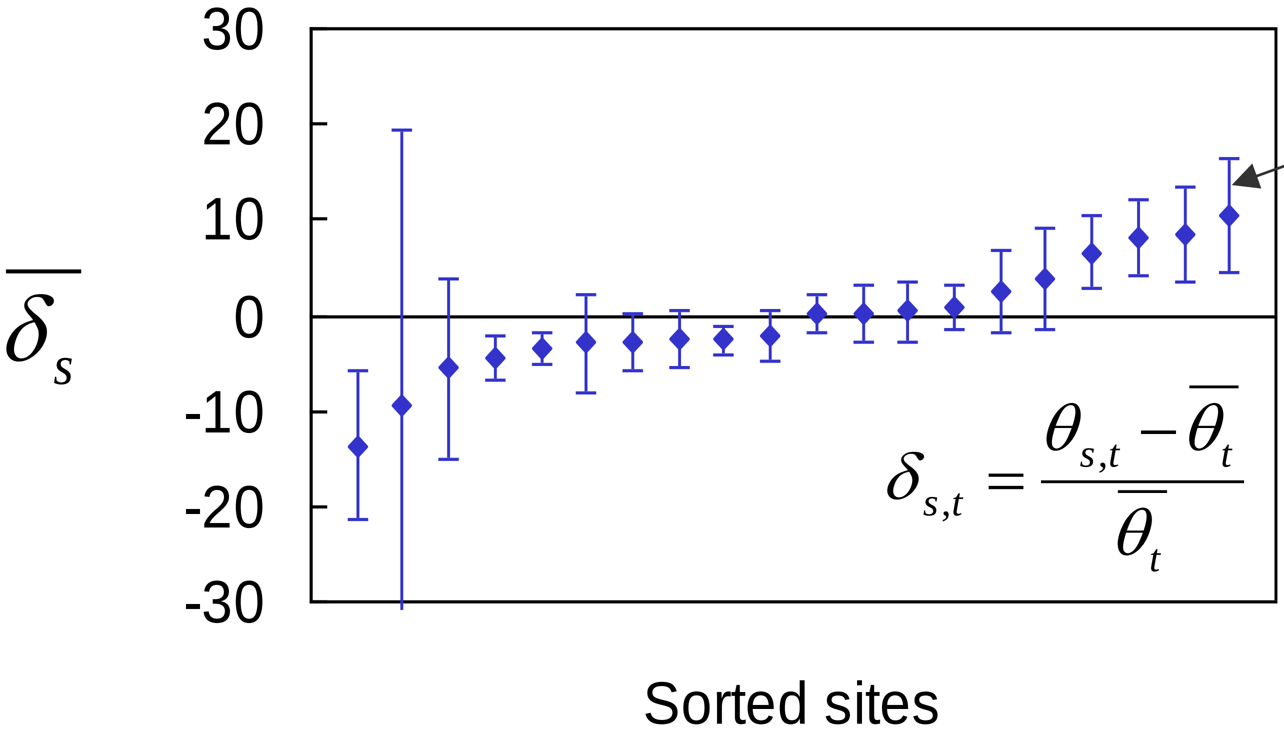
How many stations to monitor?



How to layout stations?


Airborne coverage
Ground sampling area
Permanent station
Semi-Permanent station
SMAP radiometer grid
SMAP Active-Passive grid
SMAP radar grid
0
5
10
20
30
40
Km

Where do we monitor?



$$\delta_{s,t} = \frac{\theta_{s,t} - \overline{\theta}_t}{\overline{\theta}_t}$$

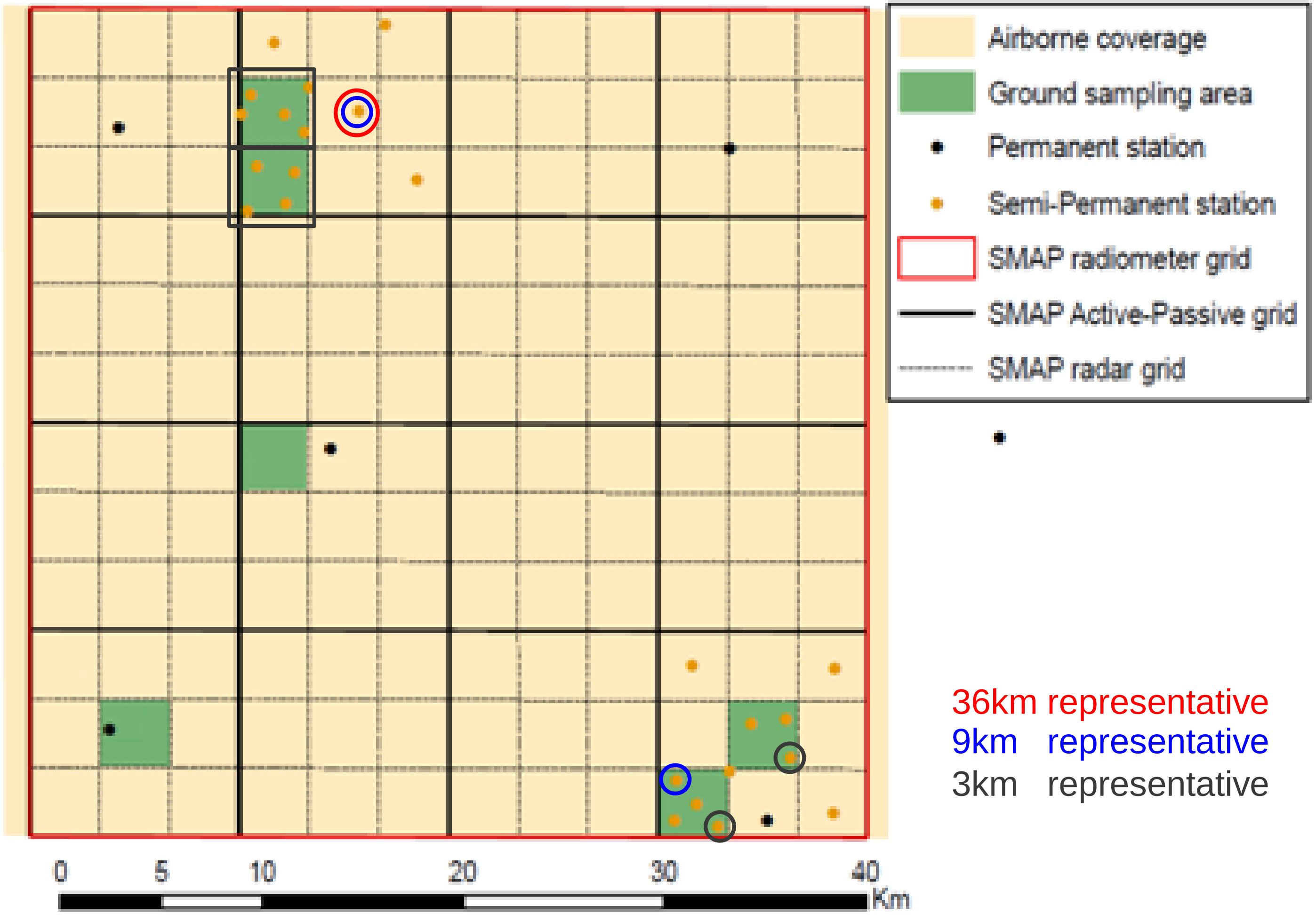
Error bars represent temporal variability

Where do we monitor?

Pixel	Focus Area	MRD	SD	TS (RMSE)	Point to pixel	Recommendations
3 km	YA4	YA4b	YA4c	YA4e	YA4b	Weighting
	YA7	YA7d	YA7e	YA7d	YA7b	Weighting
	YB5	YB5a	YB5a	YB5a	YB5e	YB5e
	YB7	YB7a	YB7b	YB7a	YB7e	YB7e
9 km	YA	YA1 (YA1)	YA7e (YA7e)	YA5 (YA5)	-	YA5
	YB	Y10 (YB7d)	YB7b (YB7a)	YB7a (YB7c)	-	YB7a
36 km	Y	Y7 (YA4c)	YB5d/YB7b (YB5d/YB7b)	YA5 (YB7c)	YB7e, YA5	YA5

Stations in brackets are representative stations when analysis was carried out without eliminating stations from one pixel scale to another.

Representative stations?


Airborne coverage
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SMAP radar grid
0
5
10
20
30
40
Km

36km representative

9km representative

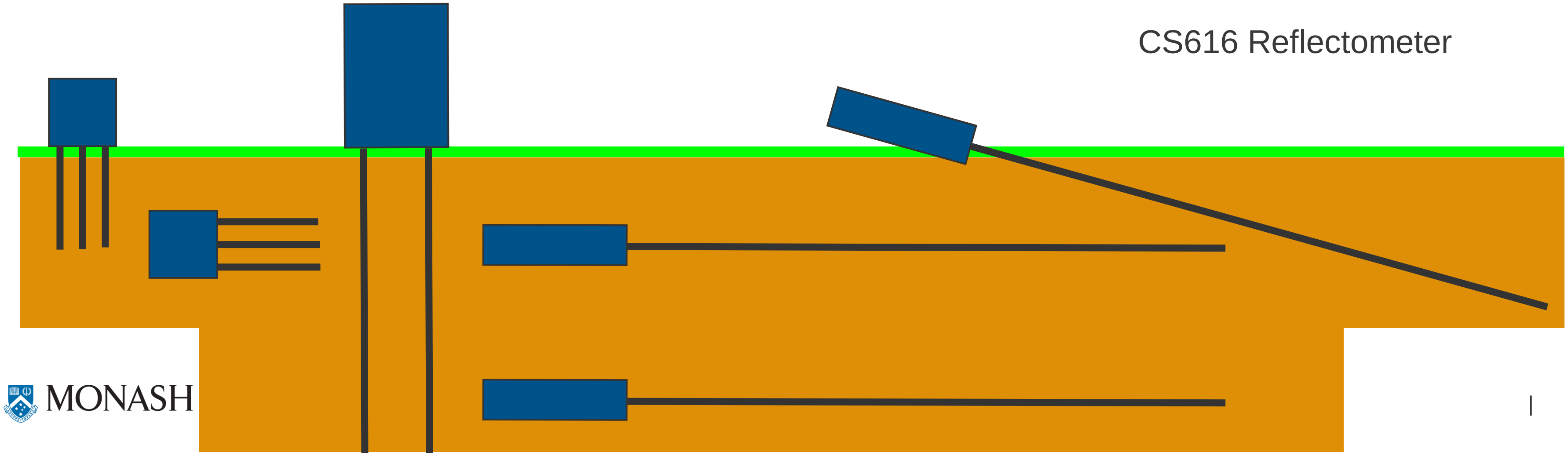
3km representative

How do we monitor?

Hydra Probe

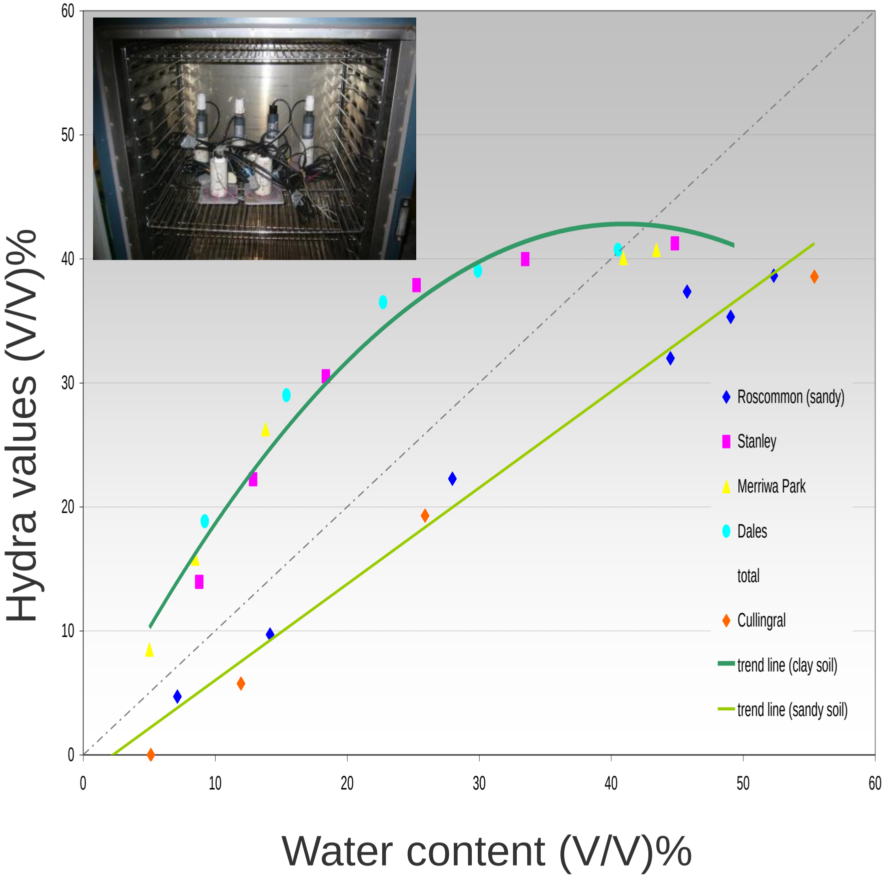
Theta Probe

CS616 Reflectometer

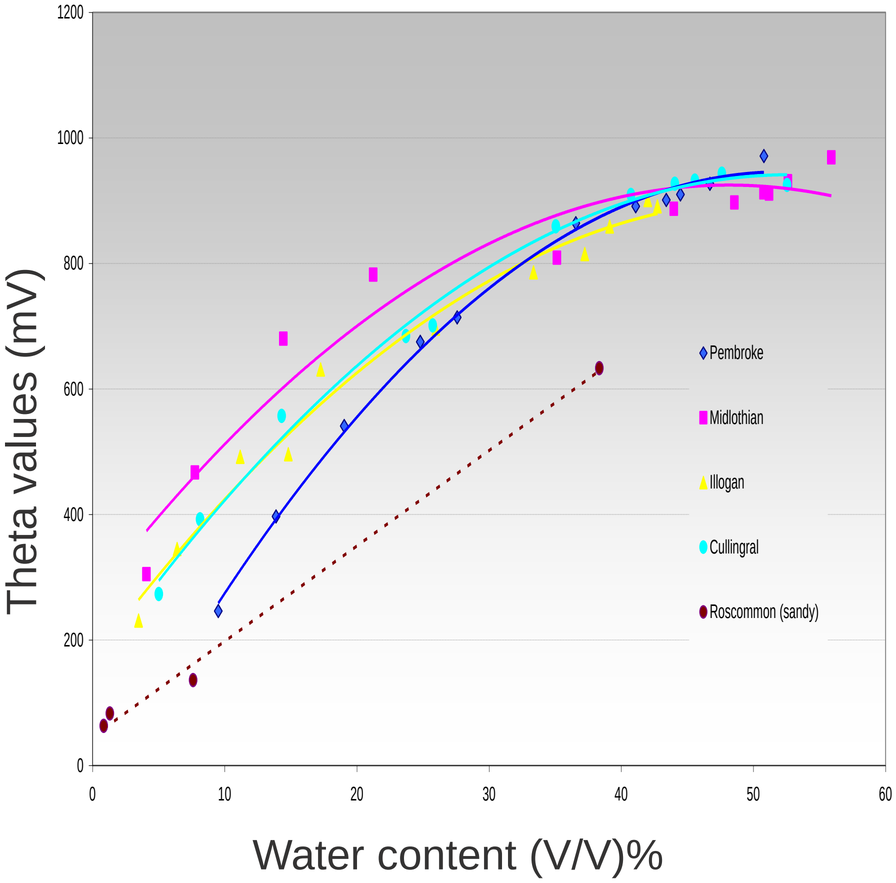


How do we monitor?

Hydra Probe



Theta Probe



What auxiliary data?

- Precipitation at the site
- Other met data locally
- Transects to give information on representativeness of site
- Soil and vegetation properties
- Landscape position