

P/L-band field campaigns 2018

Cora Lynn

Objective

- to develop algorithms and techniques to retrieve soil moisture profile using L- and P-band radiometers, as well as using L-band radar.

Have you done the OHS induction and risk assessment?

Teams

- 1 x aircraft team: Jeff, and Ling
- 1 x ground sampling team:

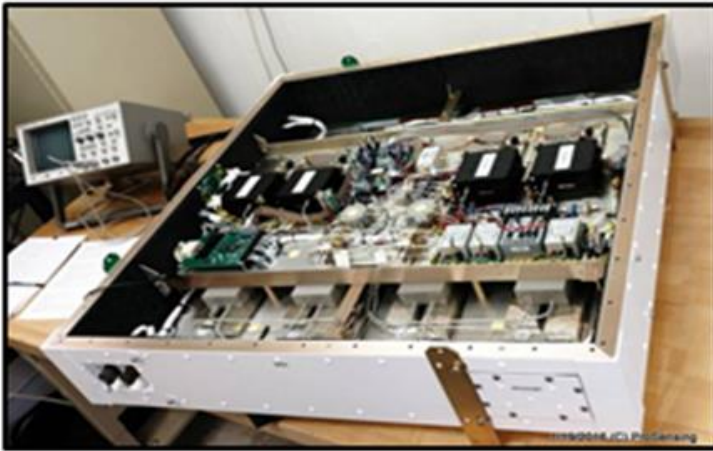
Kiri (driver), Elaheh, Sangita, Nithy (driver), Xiaoji, Liujun, Rifat, Yuxi, Sab/Andreas (driver);

Daily airborne and ground sampling activities

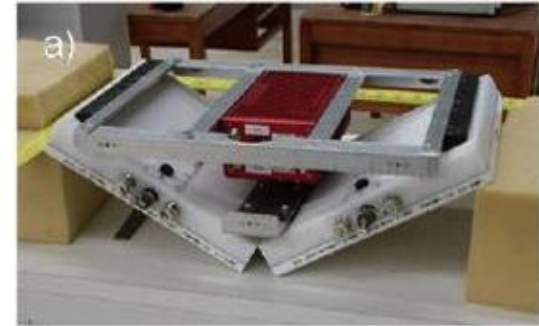
Date	Activities	Personnel
28/09	Test flight	Jeff&Liujun
01/10	Flight*	Jeff, Ling
	HDAS	Nithy, Elaheh, Sangita, Yuxi, Kiri* (priority on stations).
	Veg sampling	Sab, Xiaoji
	Roughness	Xiaoji, Sab
	Cropscan	Liujun
03/10	Flight	Jeff, Ling
	HDAS	Elaheh, Sangita, Kiri* (priority on stations), Sab, Xiaoji, Liujun
	Soil sampling	Nithy, Yuxi
05/10	Flight	Jeff, Ling
	HDAS	Elaheh, Sangita, Kiri* (priority on stations), Xiaoji, Yuxi
	Veg sampling	Sab
	Cropscan	Liujun
	Soil sampling	Nithy
08/10	Flight	Jeff, Ling
	HDAS	Elaheh, Sangita, Rifat, Andreas, Kiri* (priority on stations).
	Veg sampling	Yuxi
	Roughness	Xiaoji, Nithy
	Cropscan	Liujun
10/10	Flight	Jeff, Ling
	HDAS	Elaheh, Sangita, Rifat, Kiri* (priority on stations), Andreas, Xiaoji, Liujun

Airborne Facility

PPMR



PLIS



PLMR



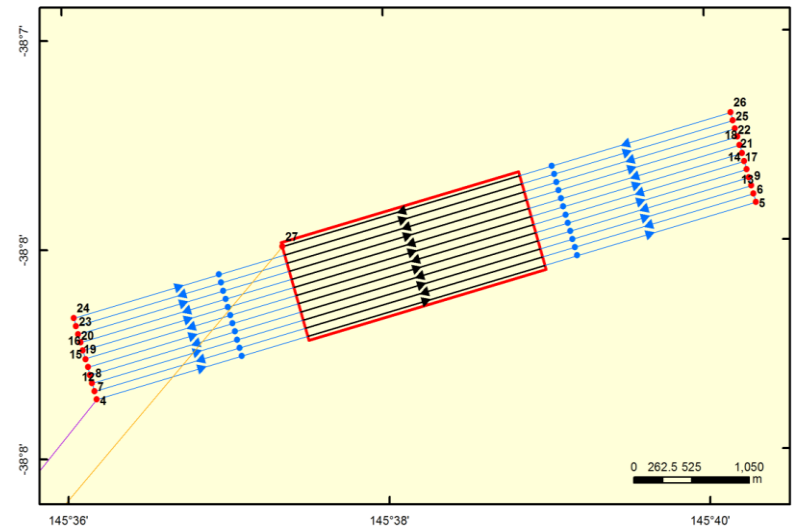
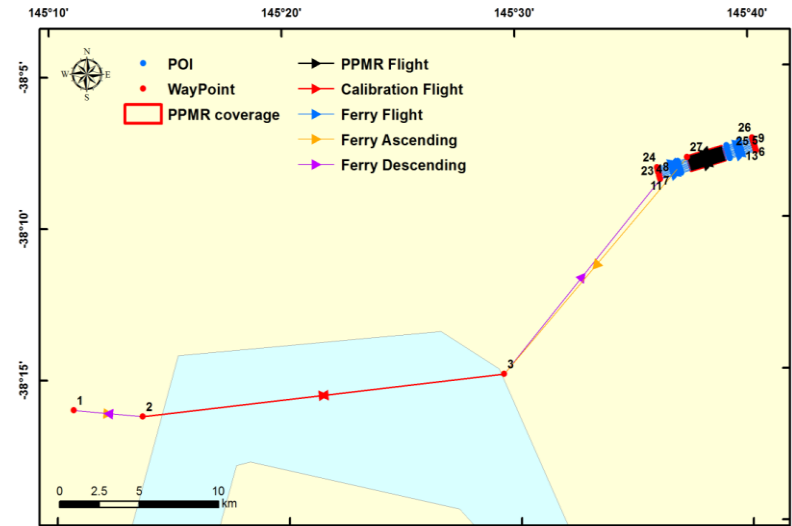
Optical cameras



Fight lines - PPMR

Route: 1 (alt ↑), 2 (2000ft ASL; Multi-angular Calibration), 3 (alt ↓), 4 (565ft ASL), 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27 (alt ↑), 3 (2000ft ASL; Multi-angular Calibration), 2 (alt ↓), 1

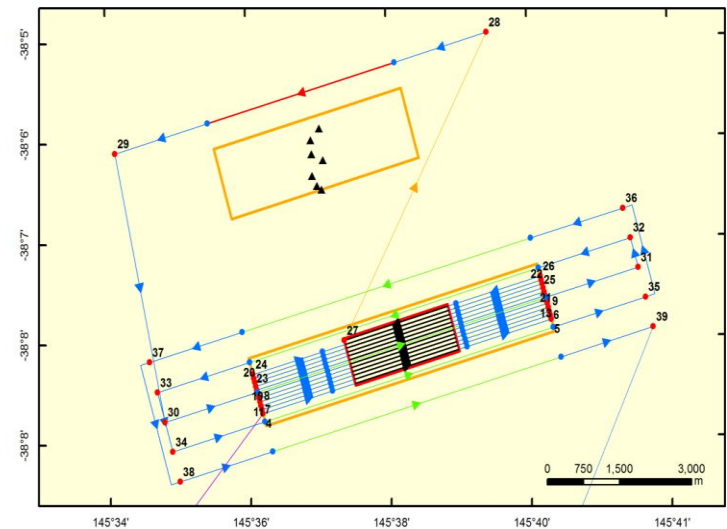
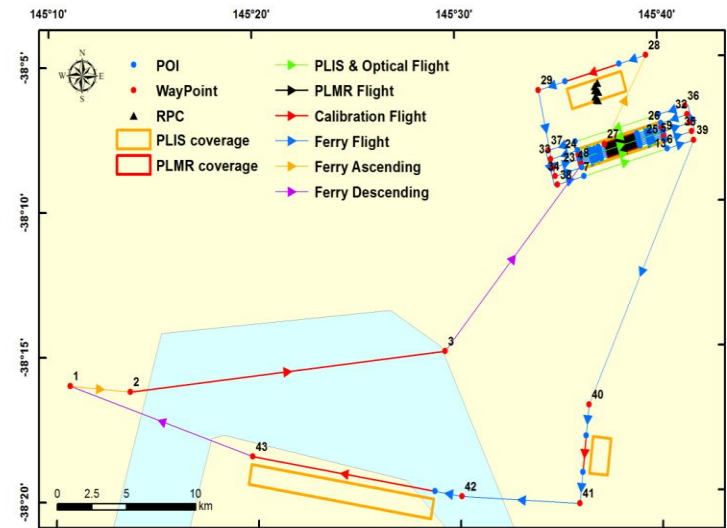
CoraLynn PPMR flight line



Flight lines - PLMR+PLIS+Optical

CoraLynn PLIS PLMR opt flight line

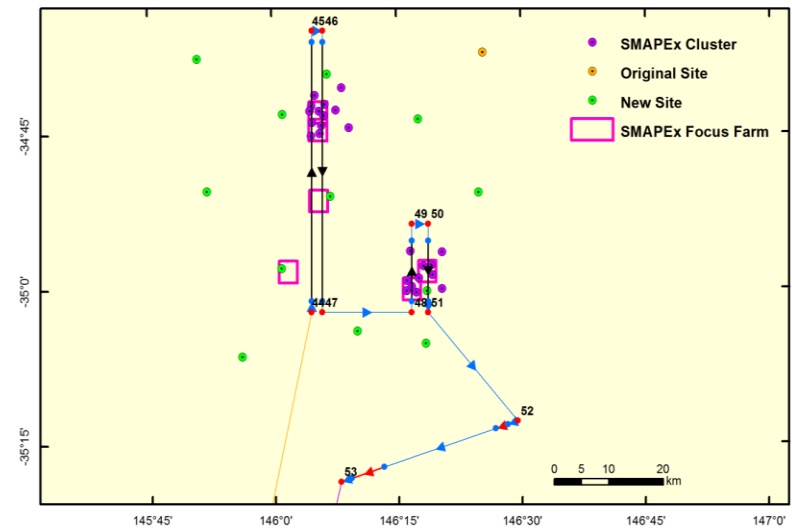
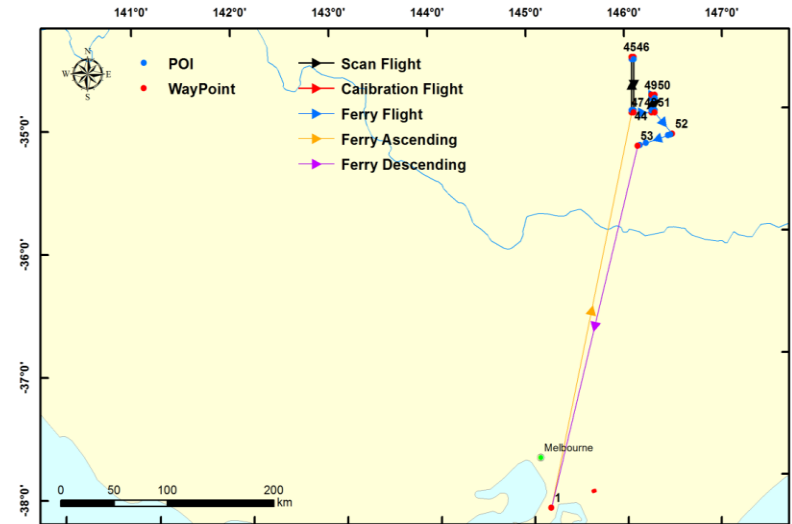
Route:1(alt ↑), 2 (2000ft ASL; Multi-angular Calibration), 3(alt ↓), 4(1000ft), 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27(alt ↑), 28(6065ft), 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39,40,41, 42, 43 (alt ↓), 1
Operational limitation: not more than 175Kts GROUND speed



Yanco flight

Route: 1 (alt ↑ 5000ft → alt ↓), 44 (1000 feet ASL), 45, 46, 47, 48, 49, 50, 51, 52, 53 (alt ↑ 2000ft → alt ↓), 1

Yanco flight line



Ground Sampling

- HDAS
- Vegetation sampling
- Roughness sampling
- Cropscan

Sampling points and land cover map



- HDAS: please record soil moisture value, height of vegetation and type of land cover.
- In wheat paddocks: if the plants are too dense to step/walk in, please sampling at the nearest boundary so as to protect the plants and yourself.



Land cover type

Bare soil



Fallow



Broccoli



Wheat



Strawberry



Triticale



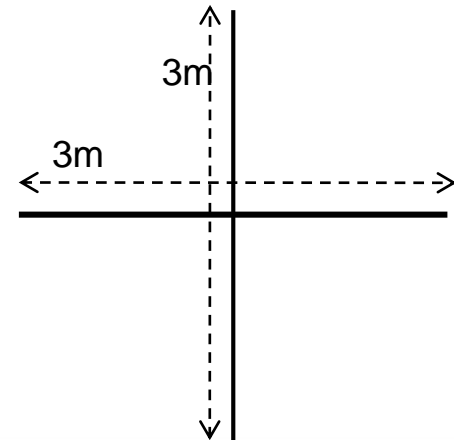
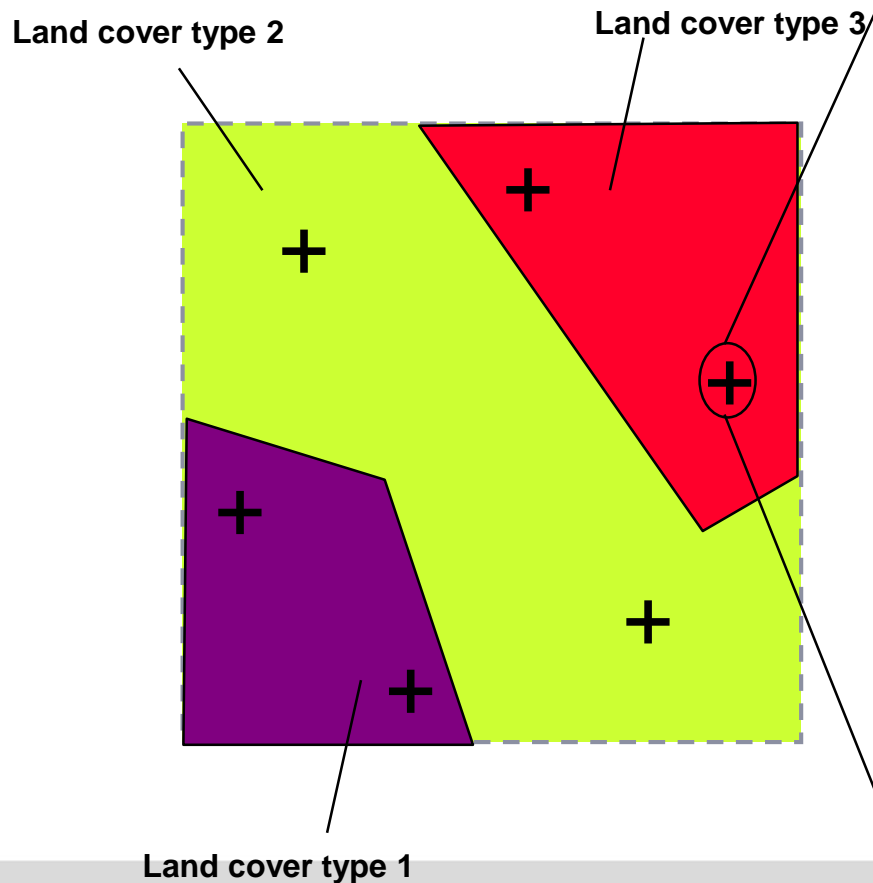
Vegetation sampling

- Removal of all above ground biomass within a 0.5m x 0.5m quadrant, put in bag and have it sealed properly; measure the height of vegetation; count the number of plant within this quadrant.
- Record weight before and after drying in oven
- Calculate dry biomass and water content



Roughness sampling

- will be conducted two locations at each paddock. At each of the locations two 3m-long surface profiles will be recorded in orthogonal direction, perpendicular to row direction.



- Same locations as HDAS, but only on croplands.

- Bring Food (e.g. sandwich for lunch)+ energy bar + water bottle (enough for one day)
- Sunscreen+hat+long thick pants, sturdy shoes, sunglasses
- DO NOT approach, touch or eat any unidentified objects in the field
- Snake-If you see a snake, do not panic, make your way around it, do not try to approach it or take a photo
- Communication – keep communicated, work at a distance that allows visual contact; Bring mobile phone/walkie-talkie

End of sampling day

- Upload HDAS data
- Upload roughness images
- Fill the form for vegetation sampling: weigh vegetation and put in the oven for at least 48 hours and weigh again
- Recharge HDAS gel cell batteries, Getacs, Cropscan, and radios.

- Backup

PLIS configuration: Range settings

PLIS Settings					Gamma RS Parameters	
Height AGL (ft)	Height AGL (m)	Max. Pulse Length (us)	Range Samples Used	Max. Trigger Delay (ns)	Range Extension	Image Samples
1000	304.8	2	192	3700	100	211
1500	457.2	3	256	4700	100	235
6000	1828.8	10	704	13800	100	403
9500	2895.6	10	832	21000	100	531
10000	3048	10	832	22000	100	531
10500	3200.4	10	832	22800	100	531
11000	3352.8	10	896	24000	100	595

PLIS configuration: PRI settings

Max. Speed (m/s): 90
 Frequency (GHz): 1.26
 Wavelength (m): 0.2381
 Max. Doppler Bandwidth (Hz): 756

Antenna	Mode	Channels	PRF Min. (Hz)	PRI Max. (us)	PRI Used (us)
Main Only	Single Tx Pol – Single Side	1	756	1322.8	1320
Main Only	Single Tx Pol – Two Side	2	1512	661.4	660
Main Only	Dual Tx Pol – Single Side	2	1512	661.4	660
Main Only	Dual Tx Pol – Two Side	4	3024	330.7	330 (320 for SMAPEX-3)
Main / Aux	Single Tx Pol – Single Side	2	1512	661.4	660
Main / Aux	Single Tx Pol – Two Side	4	3024	330.7	330
Main / Aux	Dual Tx Pol – Single Side	4	3024	330.7	330
Main / Aux	Dual Tx Pol – Two Side	8	6048	165.3	160

PLIS configuration: other settings

Decimation	3
Bandwidth (MHz)	30
Attenuator	0
Filter	none
**Operational limitation: not more than 175Kts GROUND speed	