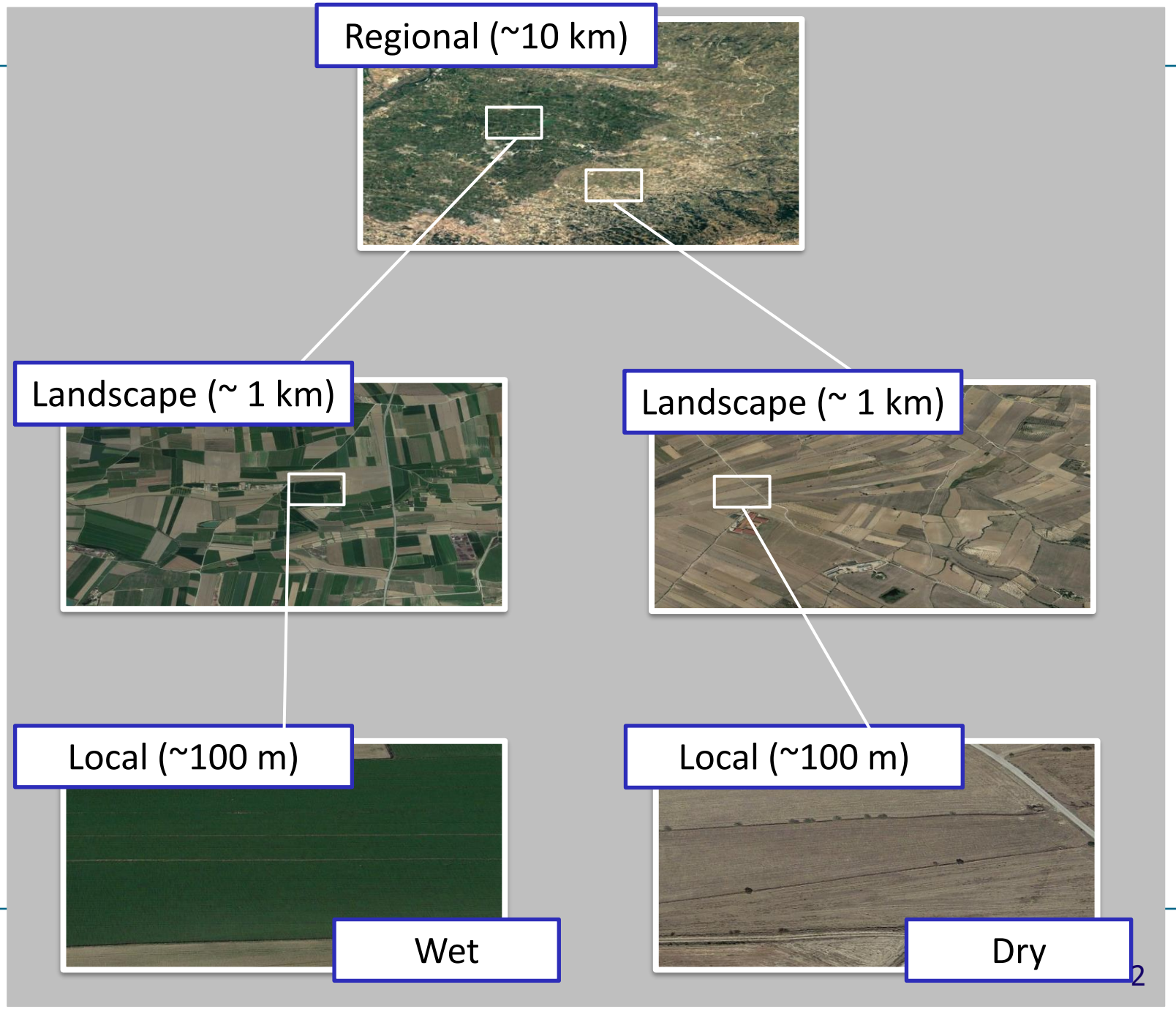
Evaporation Controlled by Boundary Layer Feedbacks in an Irrigated Semi-Arid Environment: a LIAISE Modeling and Data Study

Mary Rose Mangan, Oscar Hartogensis & Jordi Vila

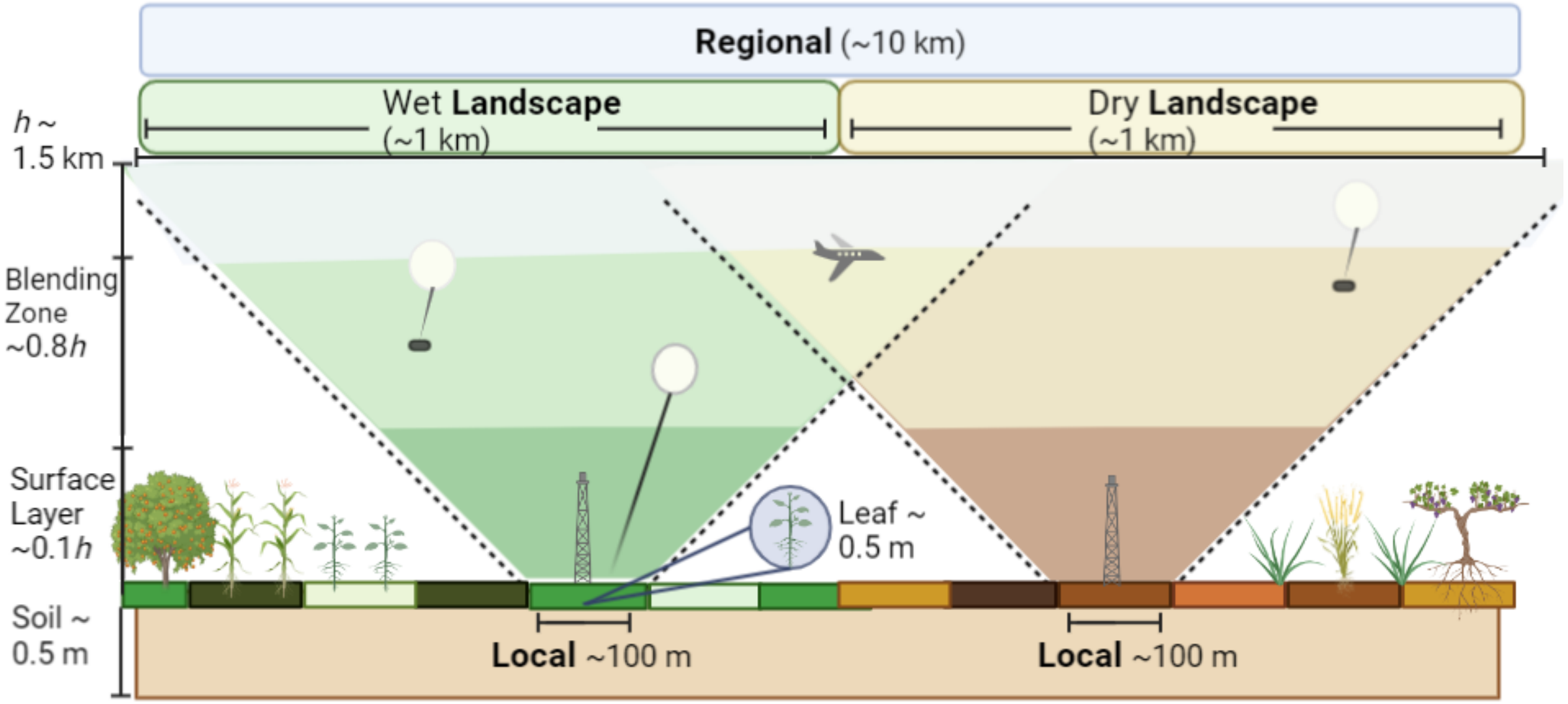
Meteorology and Air Quality, Wageningen University

24 May 2022

How does spatial **heterogeneity** impact **evaporation** across **spatial scales**?

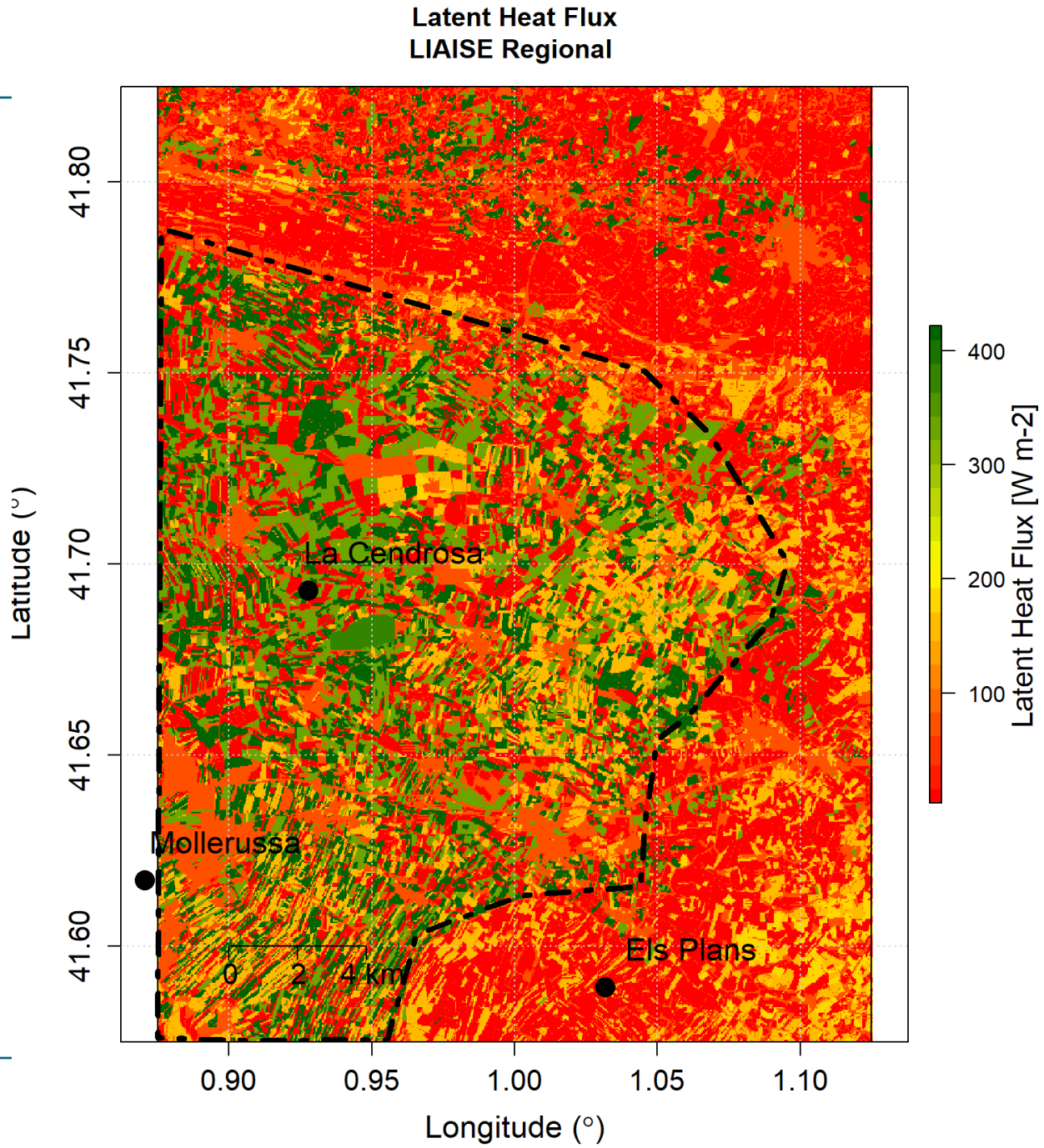


How does spatial **heterogeneity** merge in the **ABL**?

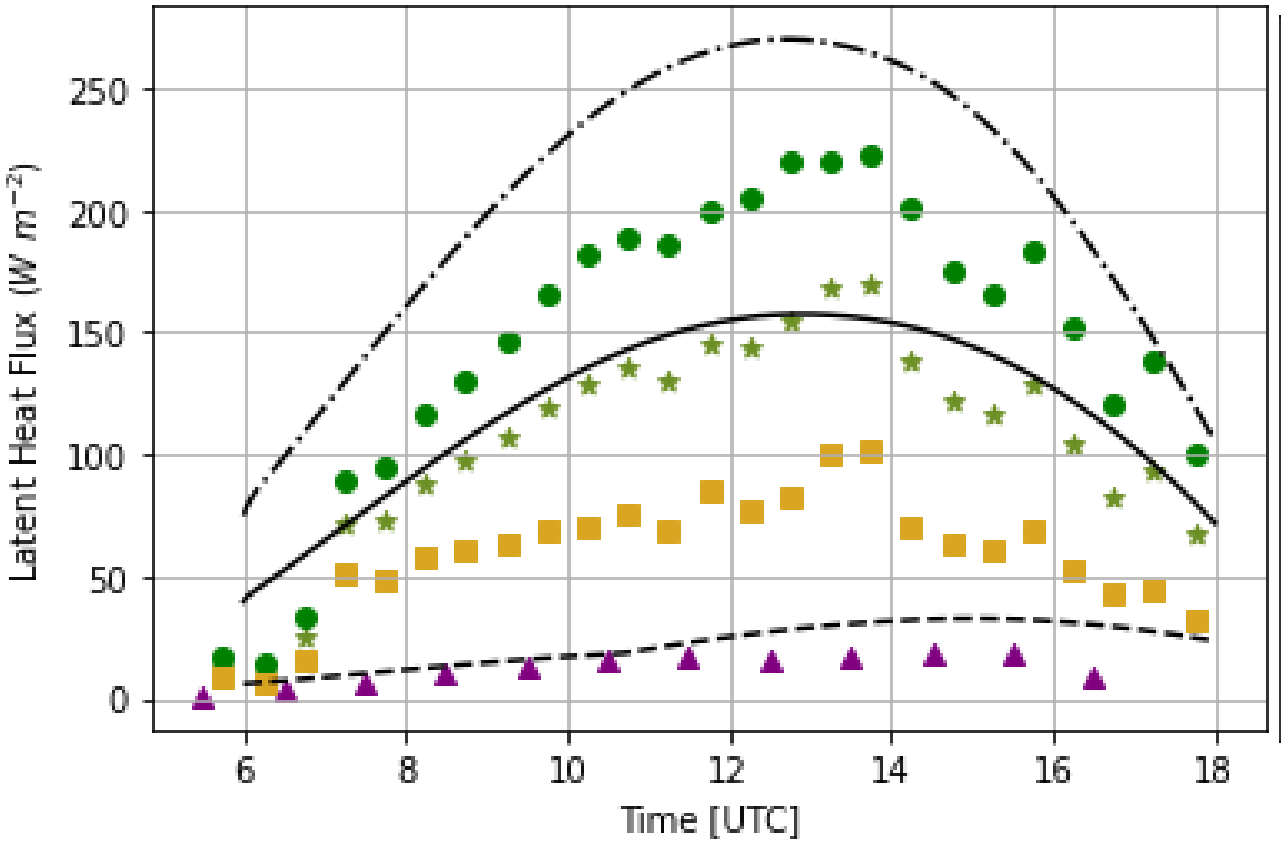


Scale		Scale-View	Model Parameters			Scale Measurements	Target Parameters
			LAI	Vegetative Fraction	Soil Moisture (top layer)		
Regional (X_H~10 km)	LIAISE		1.7	0.3	0.18	Radiosondes Aircraft Balloons **Flux Maps**	h, θ, Δθ, q, Δq, H, **LE**
Landscape (X_H ~1 km)	Wet		2.2	0.45	0.23	Aircraft Balloons Scintillometer 50 m fluxes **Flux Maps**	H **LE**
	Dry		0.5	0.13	0.15		
Local (X_H ~100 m)	Wet		2.5	1.0	0.21	50 m fluxes Surface Fluxes	H **LE**
	Dry		0.1	0.1	0.1		

Spatial Flux Maps at the regional and landscape scales allows us to identify sub-grid scale flux and vegetation heterogeneity.



Mixed-Layer Model: Latent Heat Flux (Regional to Landscape Scales)



By combining **observations** with **modeling** studies, we can better quantify the bi-directional impact between **land surface and the ABL** in a heterogenous environment.

Evaporation Controlled by Boundary Layer Feedbacks in an Irrigated Semi-Arid Environment: a LIAISE Modeling and Data Study

Mary Rose Mangan*, Oscar Hartogensis & Jordi Vila

Meteorology and Air Quality, Wageningen University

24 May 2022

*Contact: maryrose.mangan@wur.nl