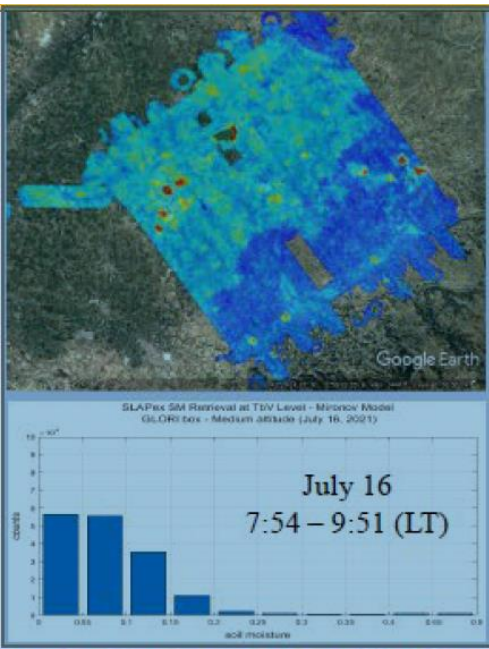


3 type of activities around WG1 meetings:

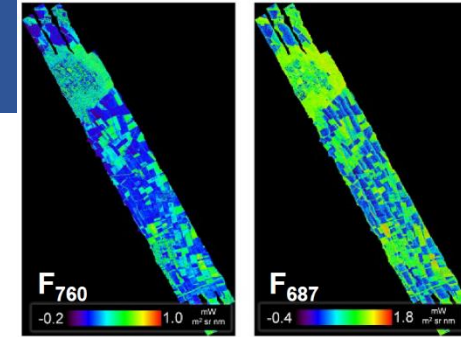
1. Science presentations around “Themes”
2. “Organization of data products”
3. “Group activities” (multiple people, multiple institutes)

WG1: (1) Science presentations

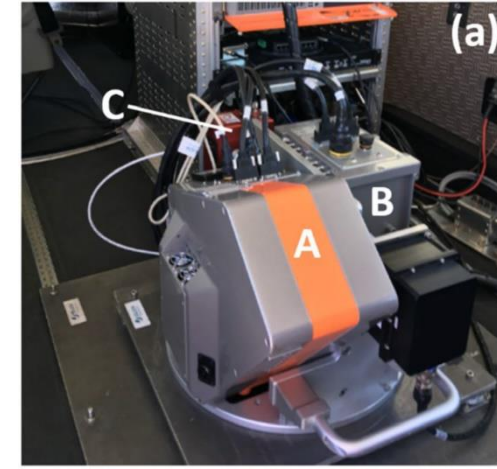
- **WHEN:** 28-April-2022
- **THEME:** Airborne and Satellite Remote Sensing of Surface Parameters
- **TITLES:**
 - **Jordi Cristobal** - Remote sensing products for crop evapotranspiration and water status estimation. Preliminary results in an apple orchard.
 - **Ed Kim & Mehrez Zribi** - Airborne SLAP/GLORI measurements for soil moisture estimation



WG1: (1) Science presentations

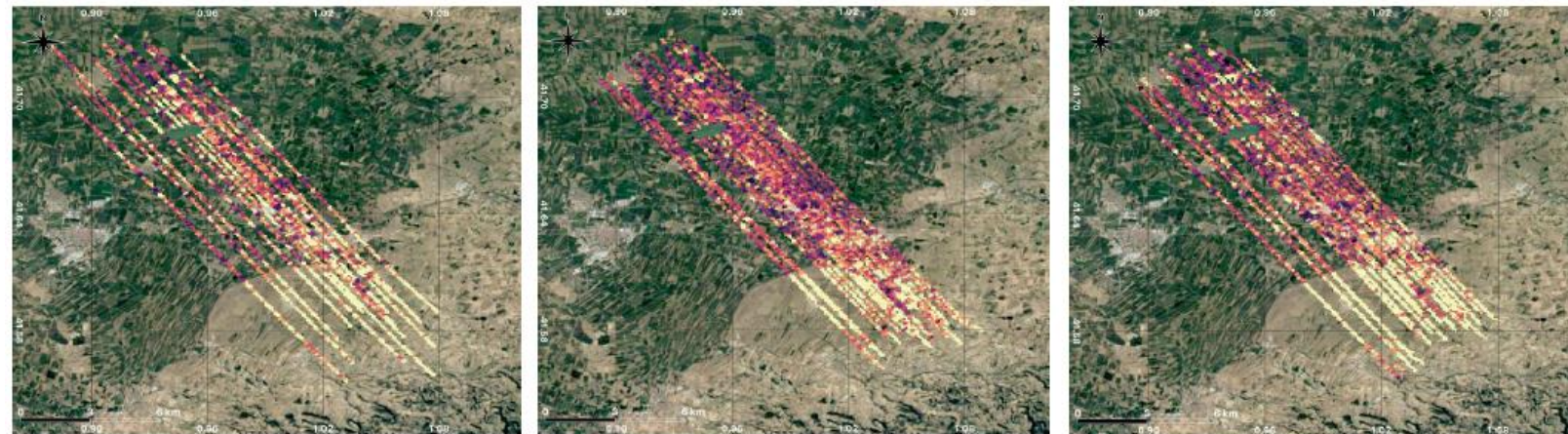
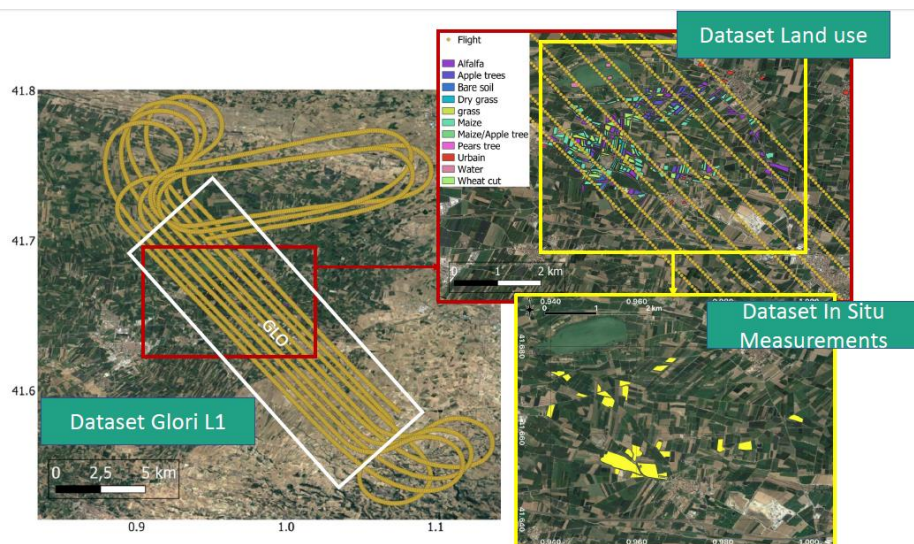


- **WHEN:** 24-Nov-2022
- **THEME:** Chlorophyll Fluorescence measurements
- **TITLES:**
 - **Bastian Siegmann and Uwe Rascher:** SIF measurements across spatial scales
 - **Yves Goulas, Gabriel Hmimina, Valerie Dantec:** Active and passive fluorescence measurements at La Cendrosa



WG1: (1) Science presentations

- **WHEN:** 25-Jan-2024
- **THEME:** Soil Moisture
- **Title:**
 - **Karin Dassas:** Update on soil moisture dataset and GLORI humidity maps



WG1: (2) Data Organization

Topic	WG1 meeting at LIAISE/GEWEX-dET workshop, Lleida
From	Oscar Hartogensis and Mary-Rose Mangan
To	WG1 team
Date	29 March 2023

Agenda:

WG1 meeting – 20230329 - Lleida
<ul style="list-style-type: none">• Brief overview of what has been done in WG1• Discuss the first results of the WG1 activity on ET-methods intercomparison• Organize data products for general use:<ul style="list-style-type: none">• Unified EC fluxes - done• Ecophys: LAI, veg-cover, photosynthesis traits, ...• Soil moisture• Land use map, irrigation data,•• Discuss on how to proceed with WG1 in the future

Minutes:

- Overview of WG1 activities so far (see slides at the end of this document):
 - 3 monthly presentations with advances on data processing.
 - Unified EC flux processing and flux maps (Mary-Rose Mangan, Oscar Hartogensis, Dani Martinez)
 - ET methods intercomparison at IRTA (Oscar Hartogensis, Mary-Rose Mangan et al.)
- Organization of data products:
 - **Soil Moisture (aircraft)**:
 - Additional data is needed to process aircraft soil moisture products from GLORI (CSIC, Dr. Fati Maheri) and CLAR (NASA, Dr. Ed King) satellite systems

• (Additional) Data Products :

- Soil Moisture (aircraft)
- Landuse maps
- Irrigation and alfalfa cutting
- Soil texture
- Ecophysiology
- Rain events during SOP
- AWS network
- ...

WG1: (3) Group Activities

EDDY-COVARIANCE:

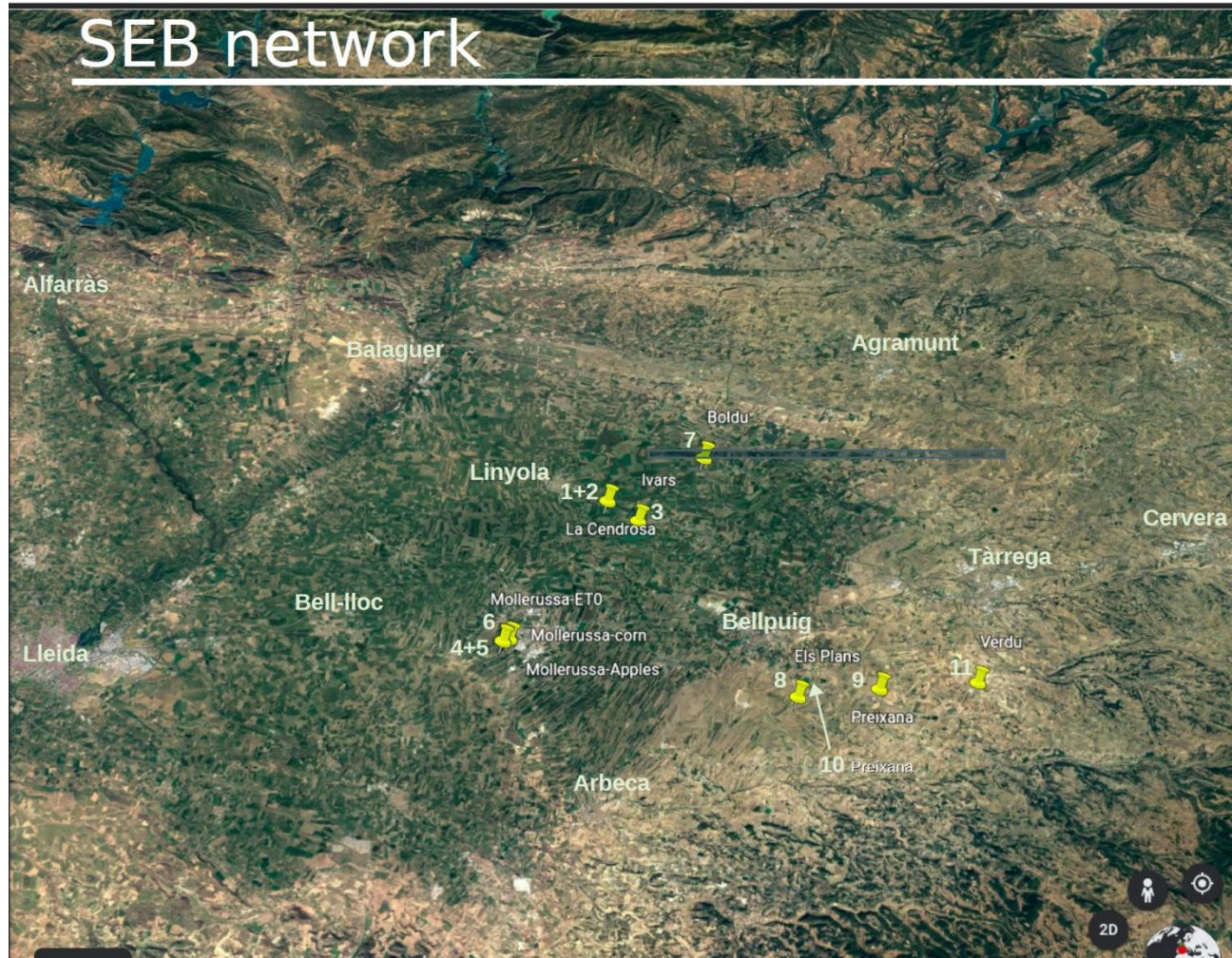
- Unified Processing by **Mary-Rose Mangan** and Dani Martinez

Eddy Covariance fluxes

LIAISE - WG1. Online, 27 Jan 2022

SEB network

3



Irrigated:

- ✓ **La Cendrosa (Flooded):**
 1. Alfalfa (CNRM)
 2. Alfalfa (WUR)
- ✓ **Lake Ivars:**
 3. Shallow water (CNRM)
- ✓ **Mollerussa (sprinkler-drip-flooded):**
 4. Natural grass – ET0 (SMC)
 5. Apple Orchard (UIB)
 6. Corn (UIB, OWL)
- ✓ **Boldú (Flooded):**
 7. Corn (UH)

Rain-fed:

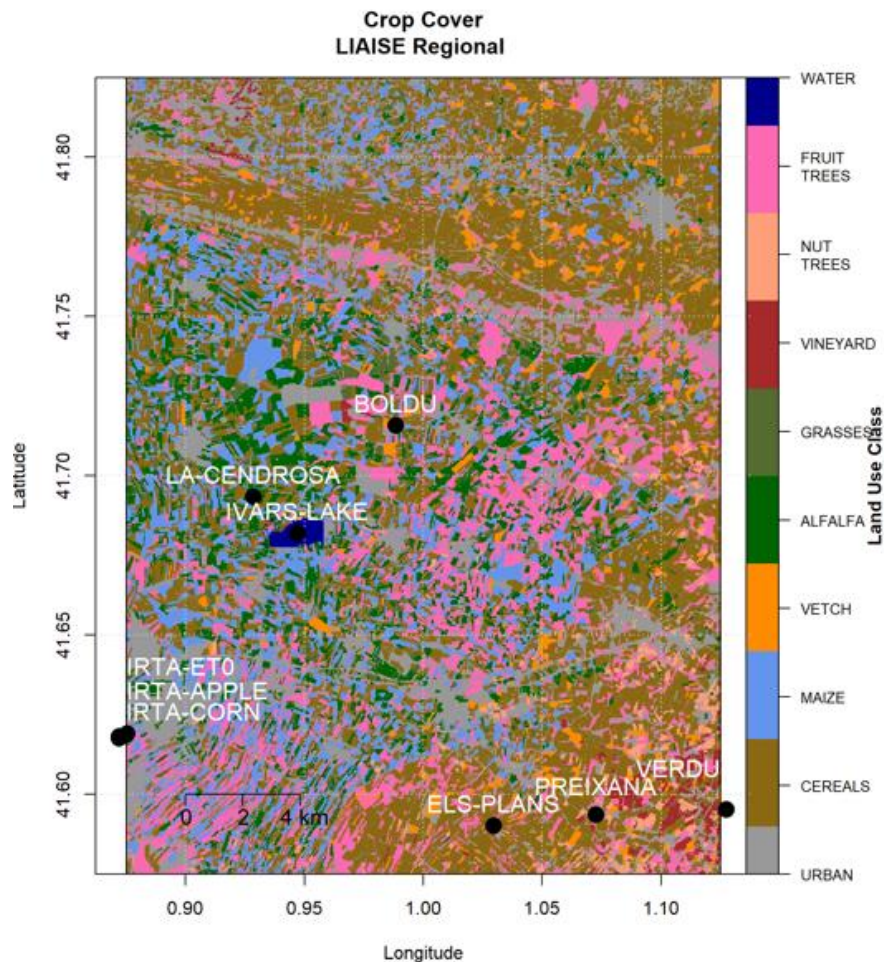
- ✓ **Els Plans (Rain-fed):**
 8. Natural (UKMO)
- ✓ **Preixana:**
 9. Almond trees (Drip?, CNRM)
 10. Alfalfa? (Flood?, LMD)
- ✓ **Verdú (Drip):**
 11. Vineyard (CESBIO)

WG1: (3) Group Activities

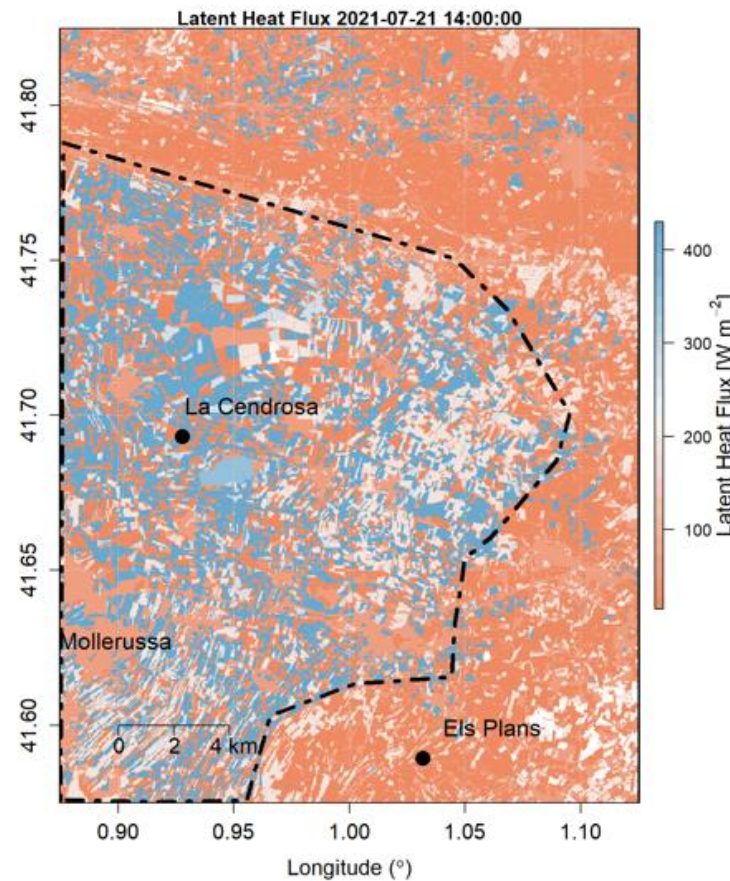
EDDY-COVARIANCE:

- Fluxmaps (also EB terms, ecophysiology) by **Mary-Rose Mangan**

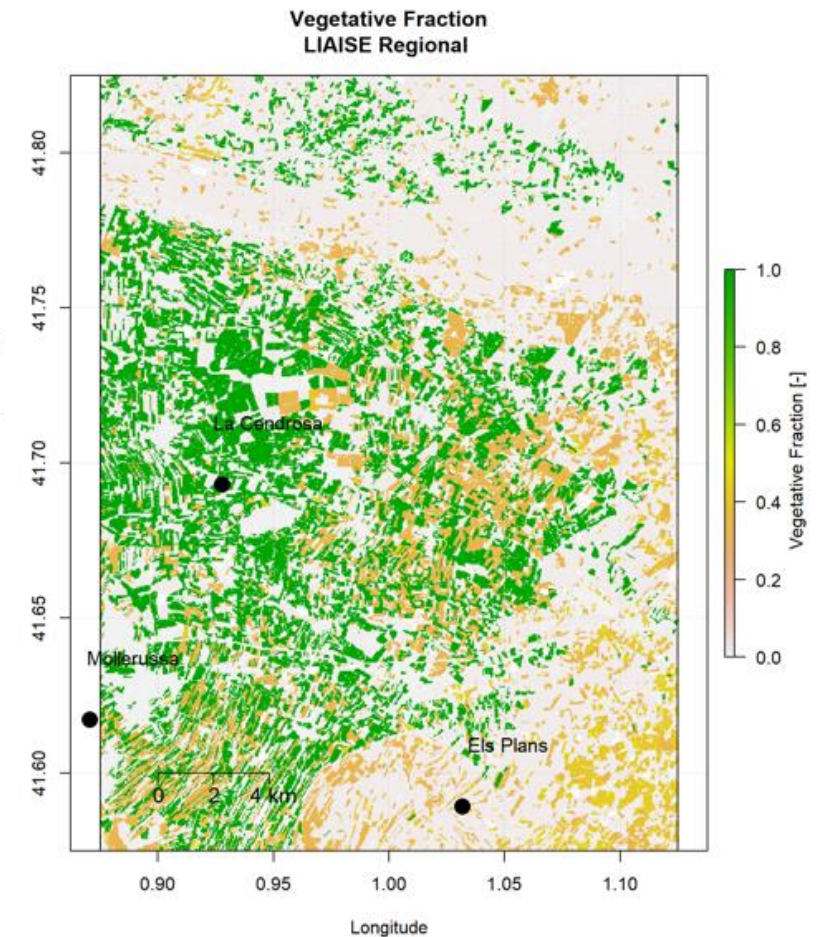
Verified Land-Use map



Flux maps



Ecophys maps



WG1: (3) Group Activities

ET methods comparison at Mollerussa:

- EC
- Flux Profile (MOST)
- Lysimeter (100% and 60% irrigation)
- FAO station
- Remote Sensing? (satellite, aircraft, drones)
- Leaf transpiration
- Soil evaporation
- Modelled ET data based (e.g. Penman Monteith)
- Modelled ET



WG1: (3) Group Activities



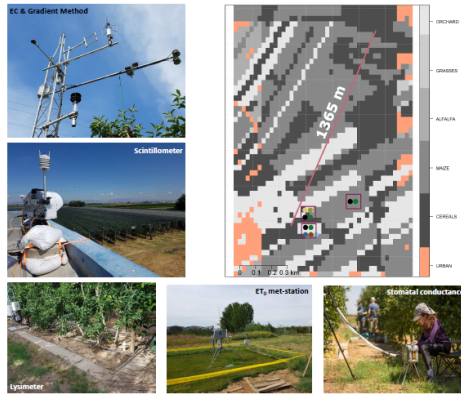
Evapotranspiration Methods Inter-Comparison at LIAISE

Hartogensis, Oscar - Mangan, Mary Rose - Cuxart, Joan - Martinez Villagrana, Daniel - Marti, Belén - Bellvert, Joaquim - Cristóbal, Jordi Girona, Joan - Sobrino, Jose Antonio - Skokovic, Drazen - Llorens, Rafael - Groh, Jannis - Siegmann, Bastian - Rascher, Uwe - De Boer, Hugo - Gonzalez Armas, Raquel - Goulas, Yves - Miró, Josep Ramon - Mercader Carbó, Jordi - Boone, Aaron

Goal

Compare ET methods gathered at the Mollerussa site (IRTA) during the LIAISE campaign (LIAISE WG1 activity).

Methods



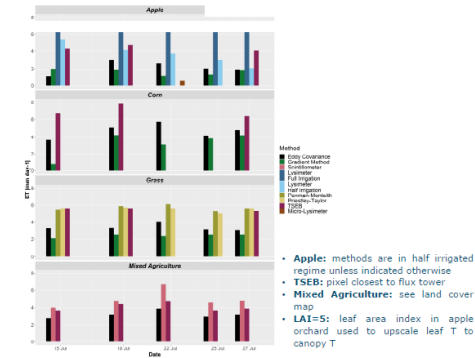
Method	ET E/T	Land Cover	Footprint (Scale)	Meas. Principle	PI
01 Eddy Covariance	ET	Apple* Corn Grass Mixed agriculture	~10 m ~10 m ~10 m ~1 km	Turbulence	Daniel Martínez Daniel Martínez Josep Ramon Miró Mary Rose Mangan
02 Gradient Method	ET	Apple* Corn Grass	~10 m ~10 m ~10 m	MOST	Daniel Martínez
03 Optical-Microwave Scintillometer	ET	Mixed agriculture	~1 km	MOST	Oscar Hartogensis
04 Lyimeter	ET	Apple fully-irrigated Apple half-irrigated	~1 m	Weighing	Joan Girona
06 Penman-Monteith	ET ₀	Grass	~10 m	EB/MOST	Josep Ramon Miró, Joan Cuxart
07 Priestley-Taylor	ET ₀	Grass	~10 m	EB	Joan Cuxart
08 TSEB (Priestley-Taylor)	ET	Apple* Corn Grass	~20 m	Satellite Remote Sensing	Joaquim Bellvert, Jordi Cristóbal
09 TASI/CASI (S-SEBI Method)	ET	Mixed agriculture (not around IRTA)	~1 m	Airborne Remote Sensing	José Sobrino
10 Micro-lysimeter	E	Apple half-irrigated	~0.5 m	Weighing	Jannis Groh
11 Stomatal Conductance	T	Apple fully-irrigated Apple half-irrigated	~0,1 m	Chamber	Jannis Groh, Hugo de Boer

Conclusions (based on very preliminary results)

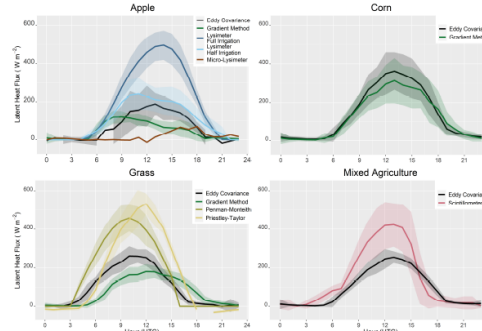
- Differences methods > differences land cover
- Lyimeter ET > Atmospheric ET methods
- Half-irrigated apple: unique data of E (~0.6 mm/day) and T (~6.4 mm/day)

Results

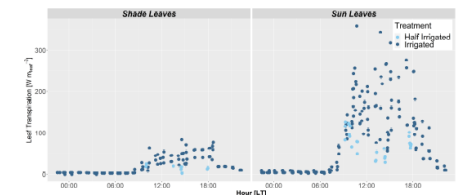
1. Daily Evapotranspiration



2. Latent Heat Flux: mean Diurnal Cycle (15-30 July 2021)



3. Leaf Transpiration (from Stomatal Conductance): 22 July 2021



by Mary-Rose Mangan and Oscar Hartogensis

WG1: (3) Group Activities

manuscript submitted to *JGR: Atmospheres*

Variability of Evapotranspiration depending on the type of surface in a semi-arid region with irrigation

J. Cuxart¹, J. Bellvert², M. Best³, A. Boone⁴, G. Canut⁴,
P. Fanise⁵, J. Girona², J. Groh^{6,7,8}, O. Hartogensis⁹, P. Le Moigne⁴,
M. Le Page⁵, T. Lunel⁴, B. Martí^{1,4}, D. Martínez-Villagrasa¹,
J.R. Miró¹⁰, J. Price³, A. Rouchon^{1,4}, A. Verhoef¹¹, B. Wrenger¹²

¹University of the Balearic Islands, Palma, Spain

²Institute of AgriFood Research and Technology, Lleida, Spain

³Met Office, Exeter, UK

⁴CNRM, Météo-France/CNRS, Toulouse, France

⁵CESBIO (UPS/CNRS/INRA/IRD/CNES), Toulouse, France

⁶Institute of Bio- and Geoscience IBG-3: Agrosphere, Forschungszentrum Jülich GmbH, Germany

⁷Soil Science and Soil Ecology Lab - INRES, University of Bonn, Germany

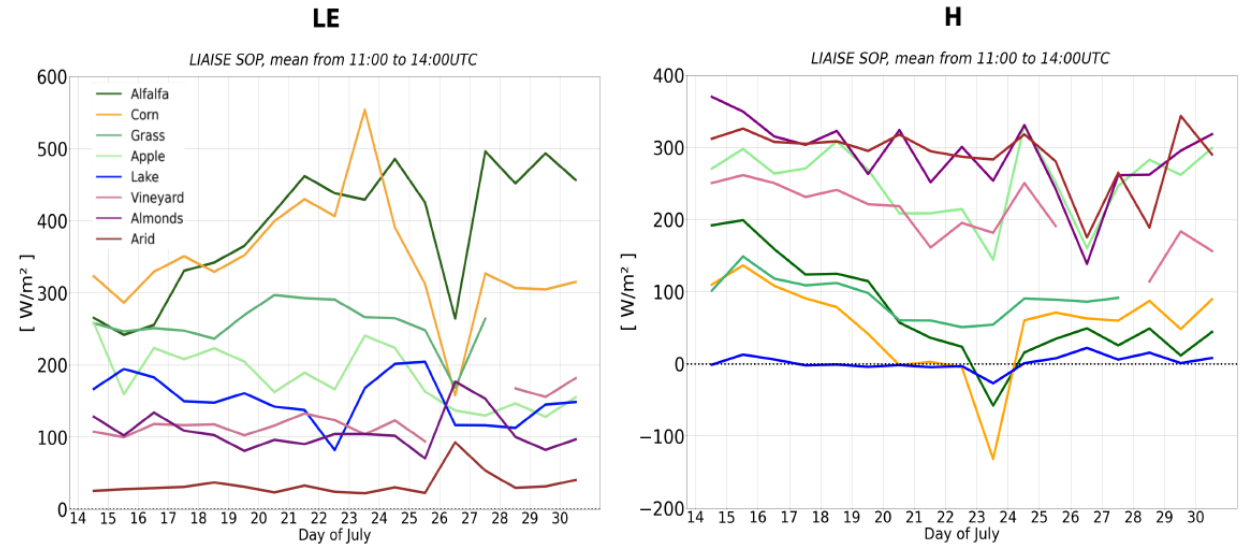
⁸Leibniz Centre for Agricultural Landscape Research (ZALF), Müncheberg, Germany

⁹Wageningen University and Research, Wageningen, The Netherlands

¹⁰Meteorological Service of Catalonia, Barcelona, Spain

¹¹University of Reading, UK

¹²Technical University of Ostwestfalen-Lippe, Höxter, Germany



- Mangan, M. R., O. Hartogensis, A. Boone, O. Branch, G. Canut, J. Cuxart, H. de Boer, M. Le Page, D. Martínez-Villagrasa, J. Ramon Miró, J. Price, J. Vilà and G. de Arellano, 2022: The surface-boundary layer connection across spatial scales of thermal heterogeneity. *Agri. and Forest Meteorology*, DOI:10.1016/j.agrformet.2023.109452
- Elwan, E., M. Le Page, L. Jarlan, N. Baghdadi, L. Brocca, S. Modanesi, J. Dari, P. Quintana Segui and M. Zribi, 2022: Irrigation Mapping on Two Contrasted Climatic Contexts Using Sentinel-1 and Sentinel-2 Data. *Water*, 14, 804. doi:10.3390/w14050804
- Brooke, J. K., S. R. Osborne, M. J. Best, J. Price, G. Canut-Rocafort, A. P. Lock, J. Cuxart, O. Hartogensis, A. Boone, and A. Roy: 2023: Irrigation contrasts through the morning transition. *Q. J. Roy. Meteorol. Soc.*, 1-25. DOI:10.1002/qj.4590.
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WG1: How to proceed?

- Easy to organize,
- Little commitment,
- WG leaders lead



1. Science presentations around “Themes”?
- ~~2. “Organization of data” products?~~
3. “Group activities” (multiple people, multiple institutes)?

- More challenging to organize,
- Strong commitment,
- Others lead (as well)