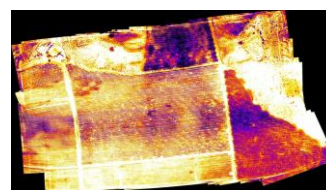
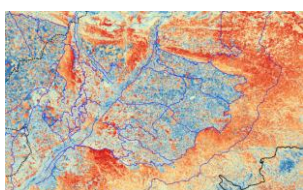


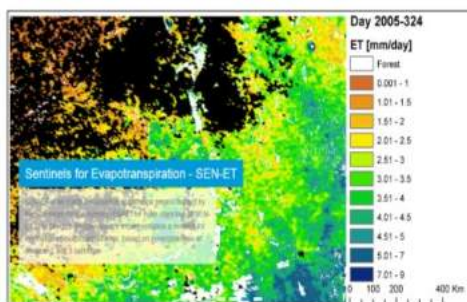
Remote sensing products for crop evapotranspiration and water status estimation. Preliminary results in an apple tree orchard

Jordi Cristóbal, Joaquim Bellvert i Jaume Casadesús- IRTA



SENTINELS FOR EVAPOTRANSPIRATION

www.esa-sen4et.org



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GRAS



Sentinel-2



Sentinel-3



Biophysical properties of vegetation

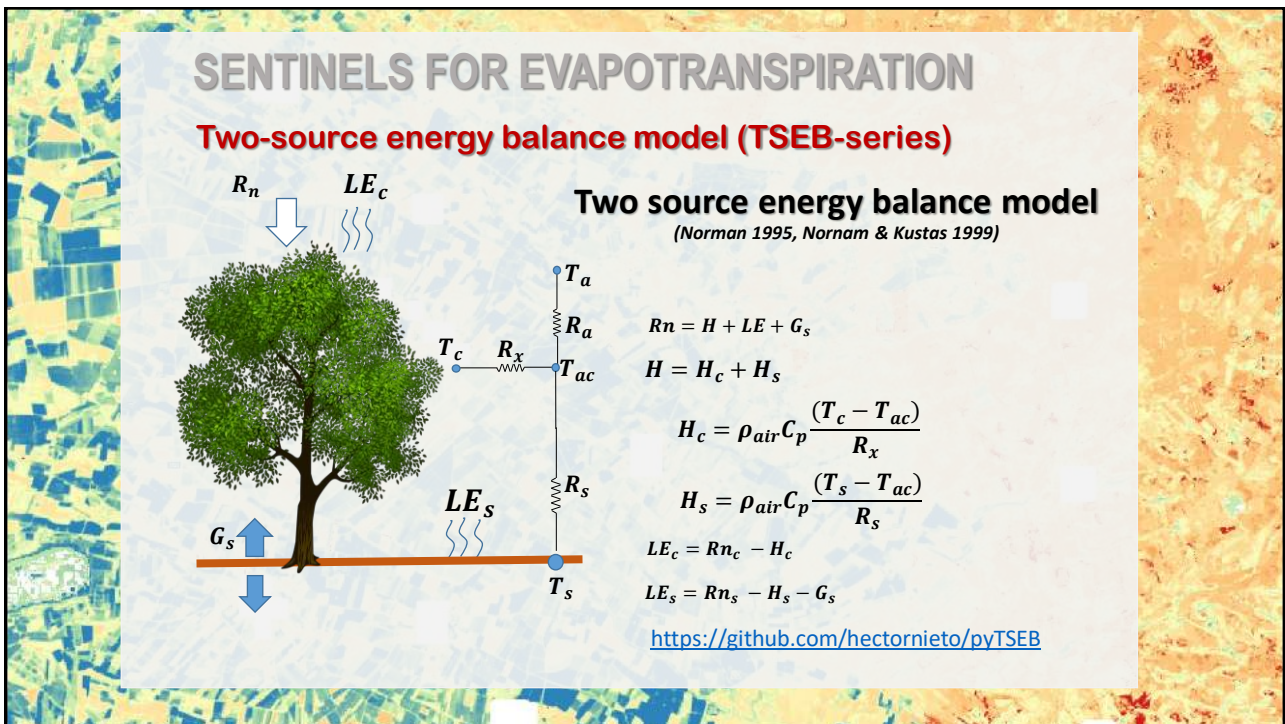
LAI
FAPAR
FVC



TSEB - PT



Daily ET maps at 20 m spatial resolution



Sentinel-2

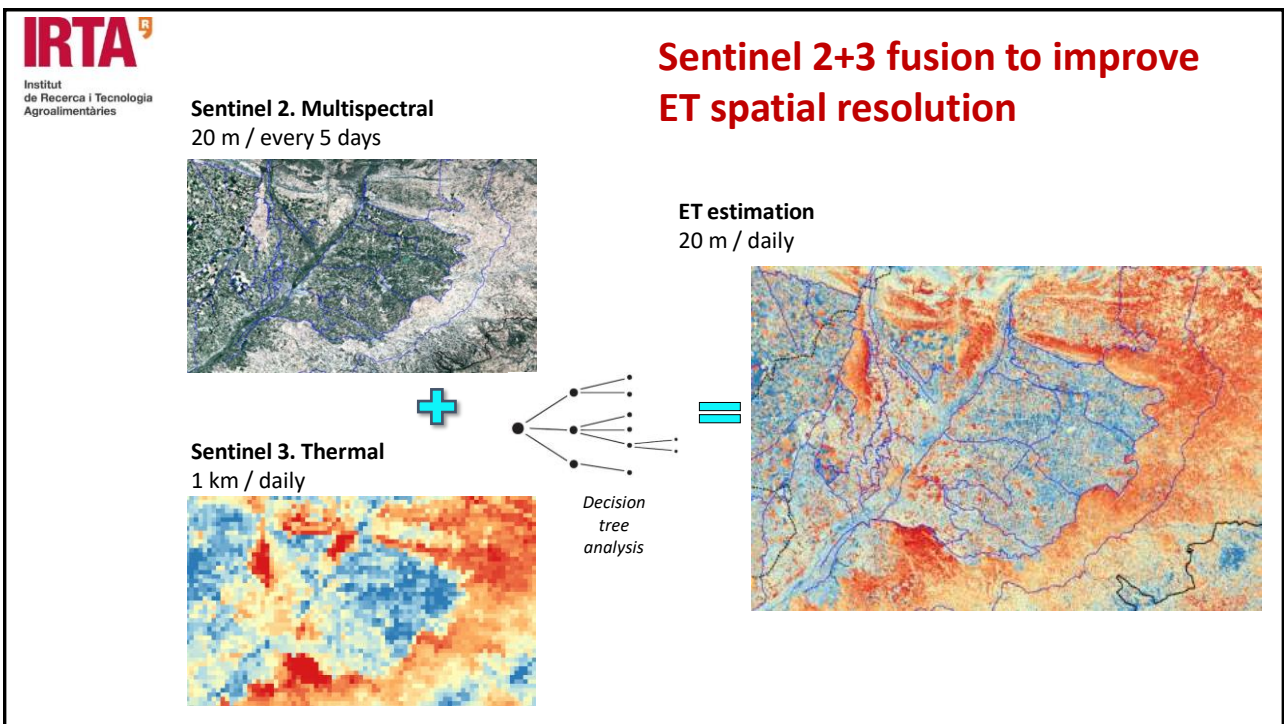
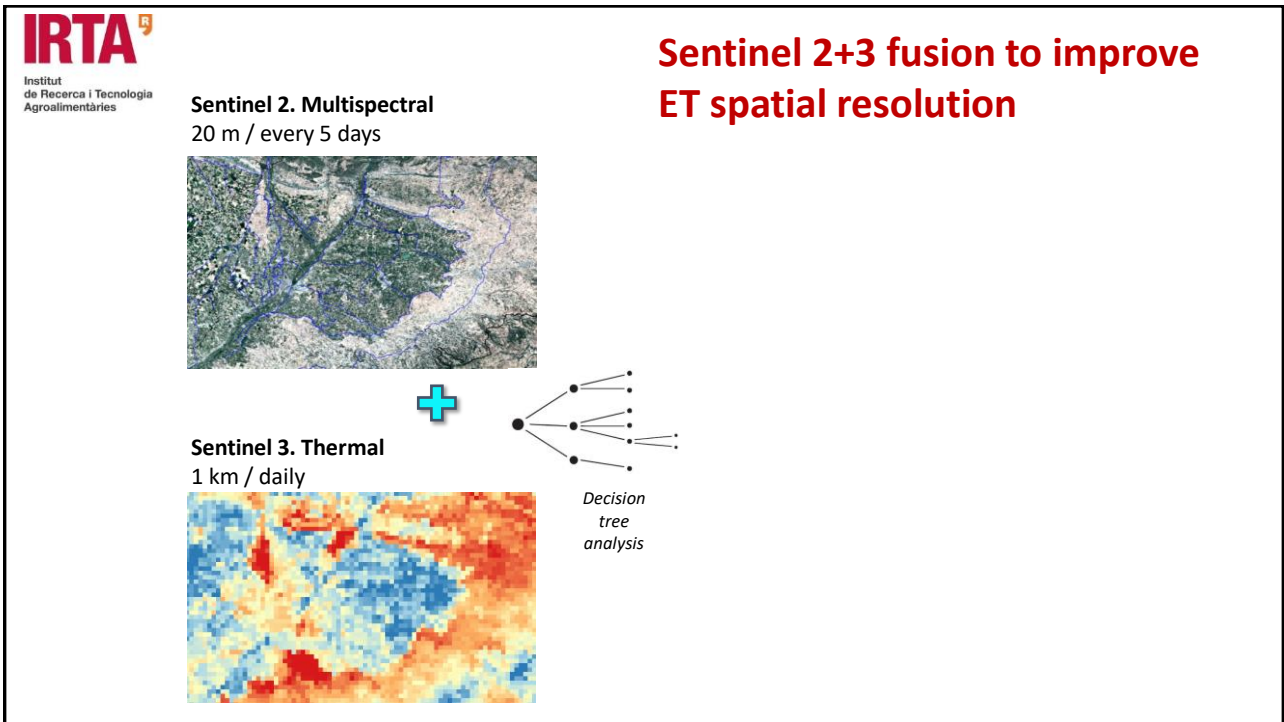
13 spectral bands

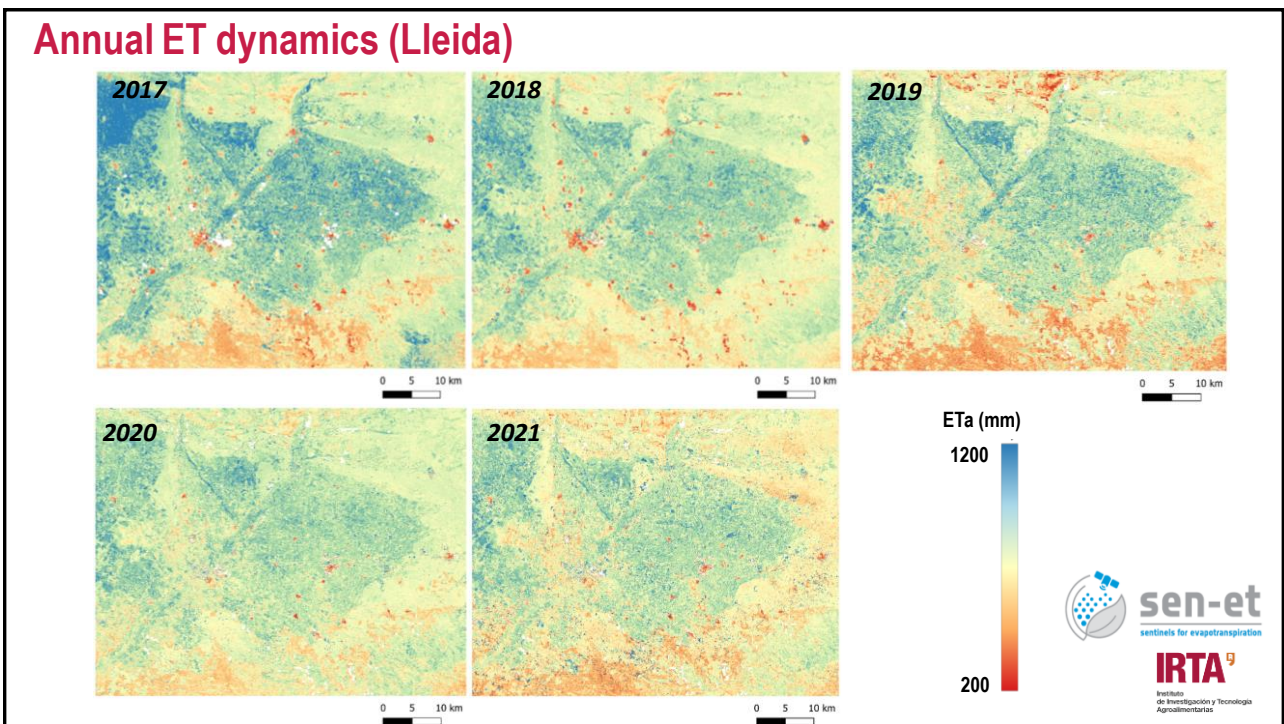
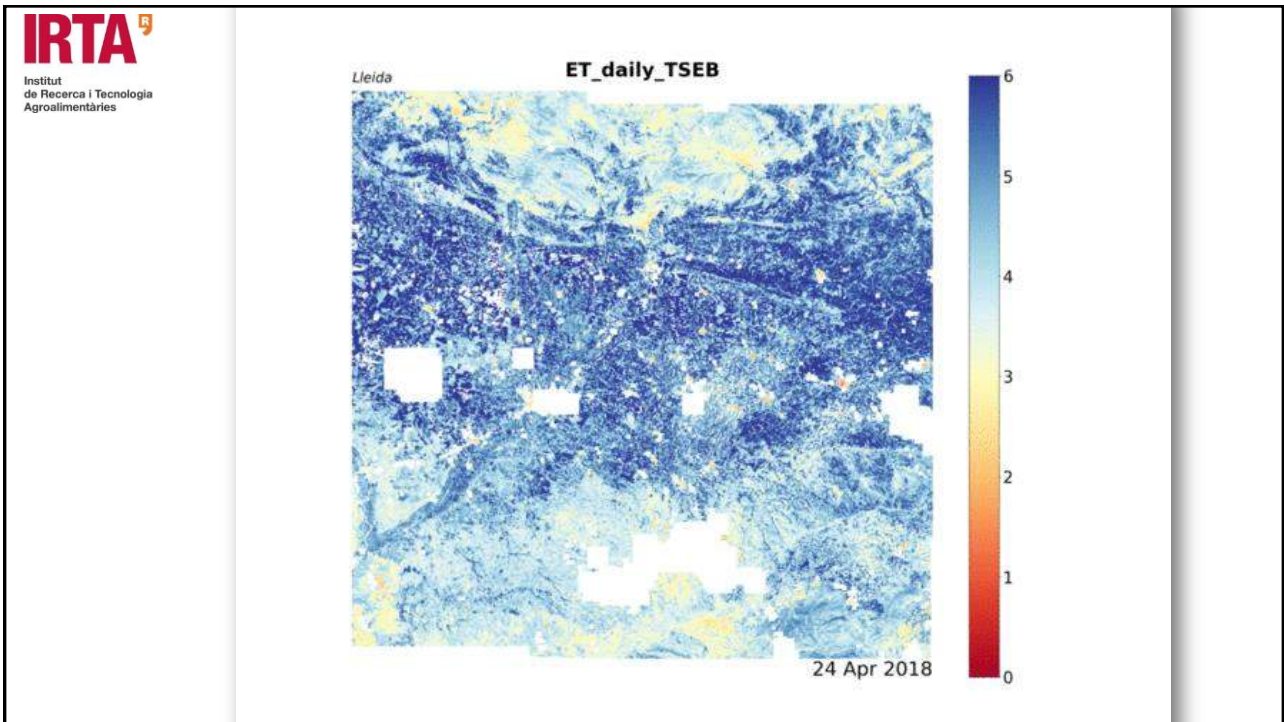
Sentinel-2 bands	Central wavelength (µm)	Resolution (m)
Band 1 – Coastal aerosol	0.443	60
Band 2 – Blue	0.490	10
Band 3 – Green	0.560	10
Band 4 – Red	0.665	10
Band 5 – Vegetation red edge	0.705	20
Band 6 – Vegetation red edge	0.740	20
Band 7 – Vegetation red edge	0.783	20
Band 8 – NIR	0.842	10
Band 8A – Vegetation red edge	0.865	20
Band 9 – Water vapour	0.945	60
Band 10 – SWIR – Cirrus	1.375	60
Band 11 – SWIR	1.610	20
Band 12 – SWIR	2.190	20

Beyond NDVI ...

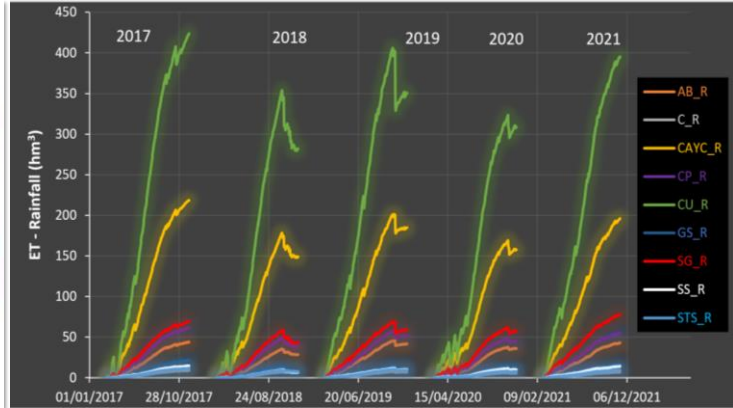
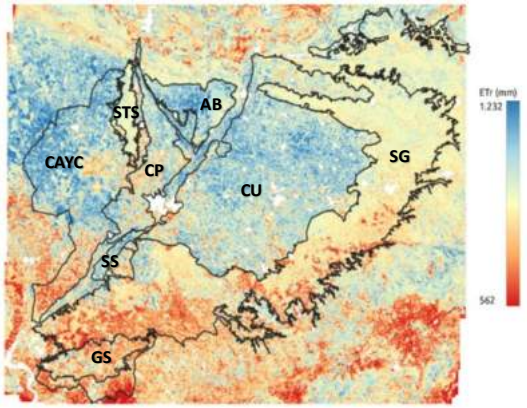
Biophysic parameters of vegetation

- Leaf area index (LAI)
- Absorbed photosynthetic active radiation (FAPAR)
- Green cover fraction (FVC)
- Chlorophyll content (Cab)
- Water leaf content (Cw)
- Albedo

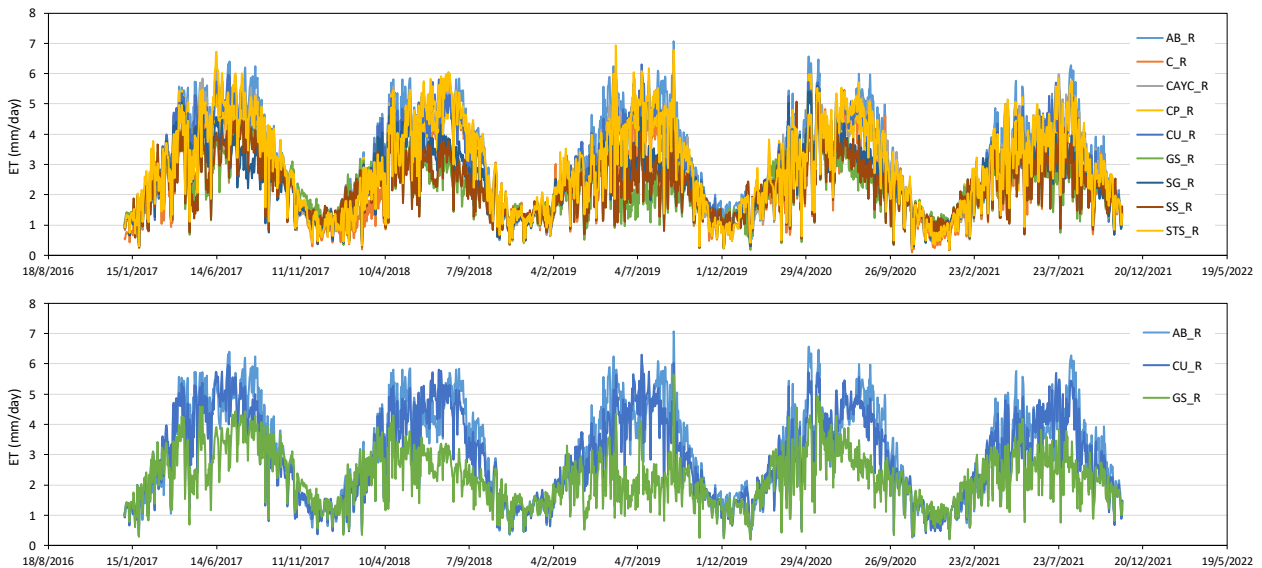


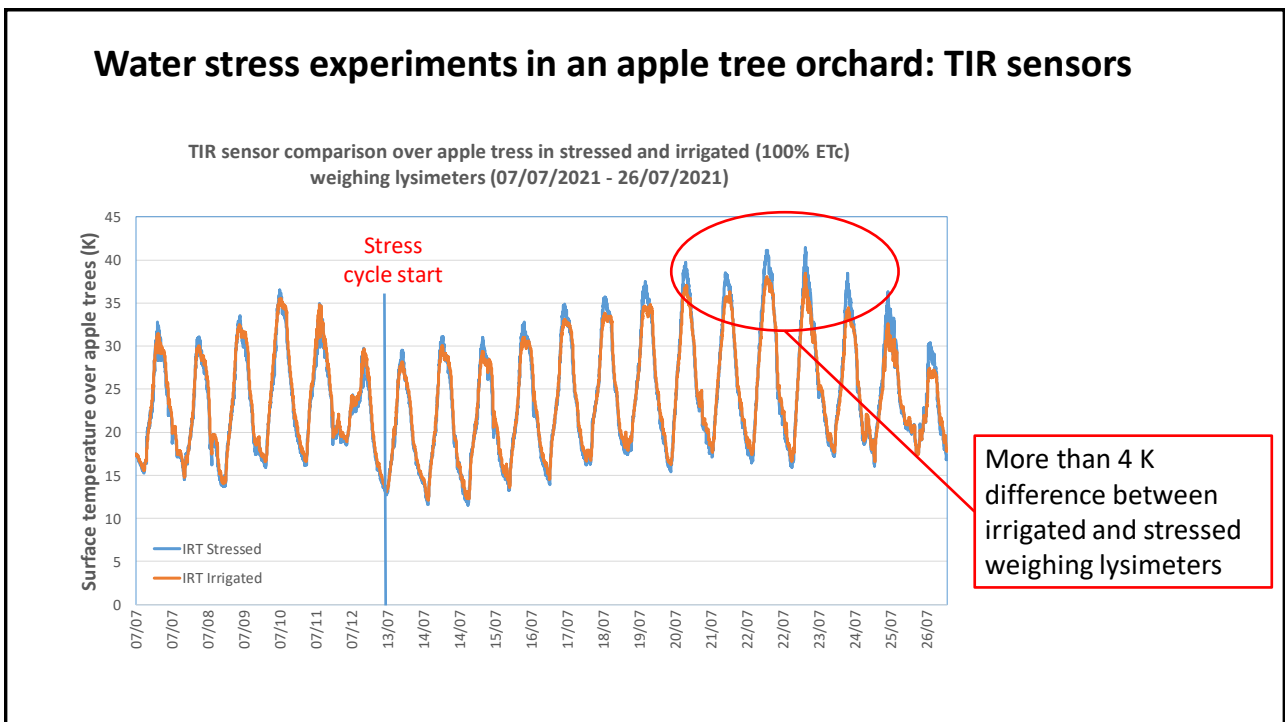
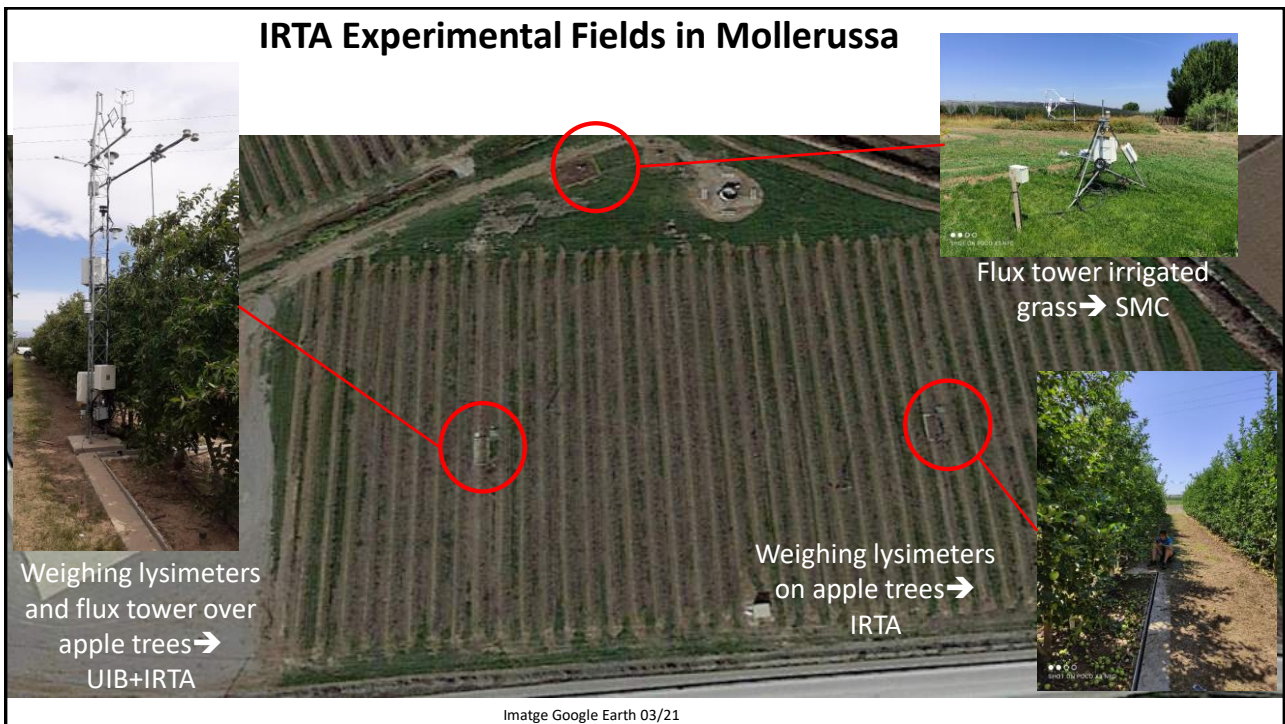


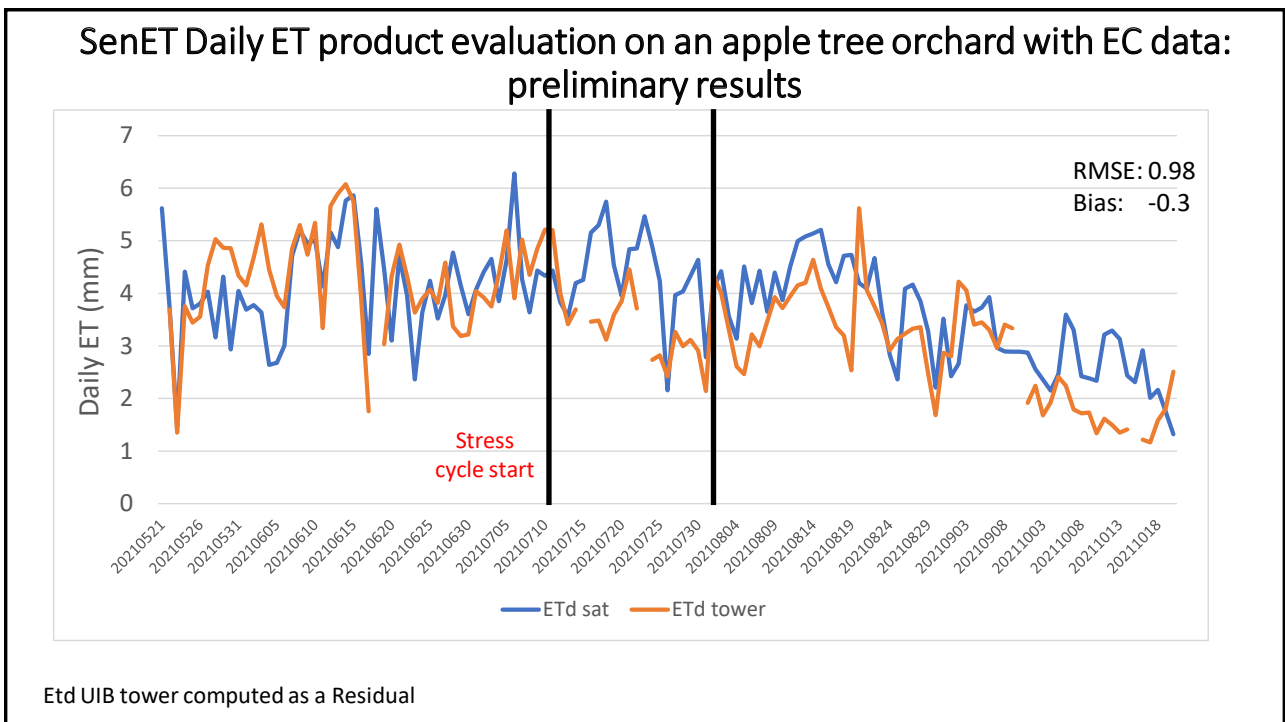
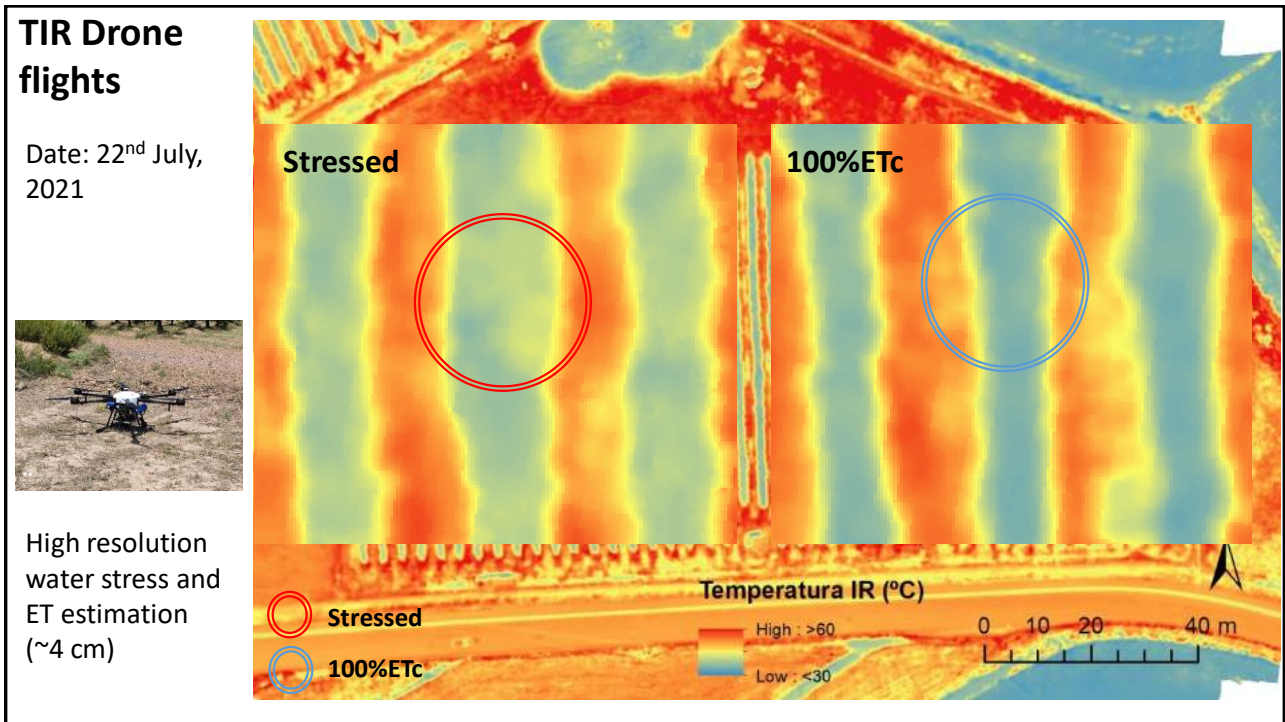
Estimation of water demand in irrigation districts (Lleida)



Irrigation districts: ET dynamics







What is next?

- CAL/VAL Sent4ET methodology for the whole LIAISE dataset using → Landsat-8/ECOSTRESS → Upscaling and downscaling surface energy fluxes with high resolution drone and airborne data (TES/HyPlant).
- Use of different reanalysis datasets as input for Sent4ET methodology.
- To assess the relationship between crop water status ($1-ET_a/ET_p$) and solar-induced fluorescence (SIF) at two scales:
 - UAV at the apple tree orchard
 - Regional: Satellite at 20 m versus airborne HyPlant SIF

