

Dry & irrigated contrasts in the morning transition

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Methods:

Els Plans & La Cendrosa

Radio soundings: 04Z-09Z

7 IOPs (IOP1-3, 5-7,11)

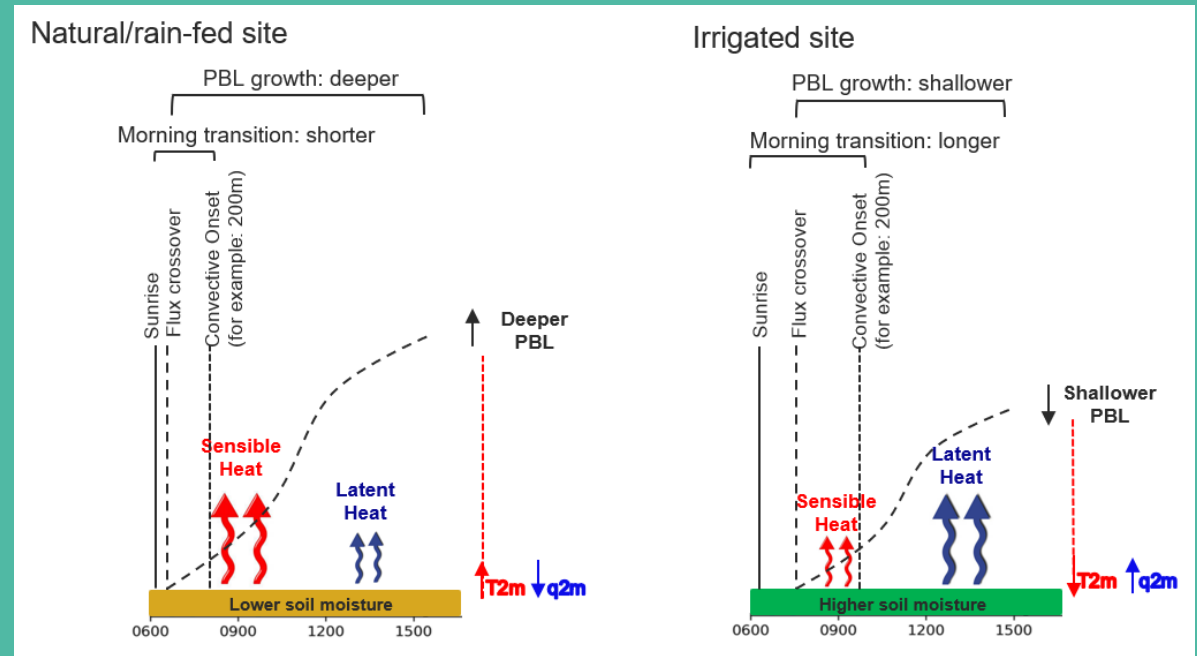
Regional modelling

Data thanks:

J. Price, S. Osborne, J. McGregor

O. Hartogensis

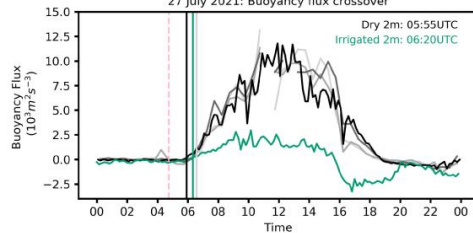
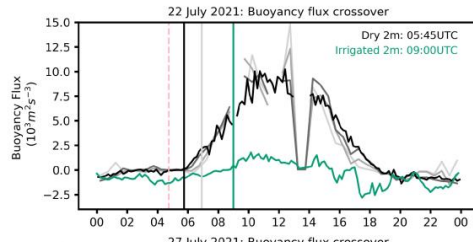
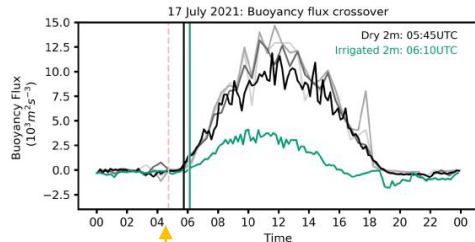
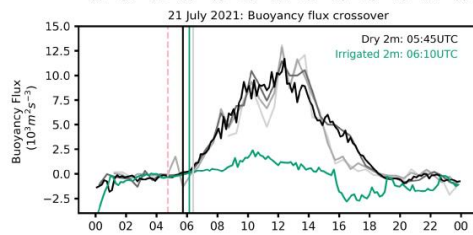
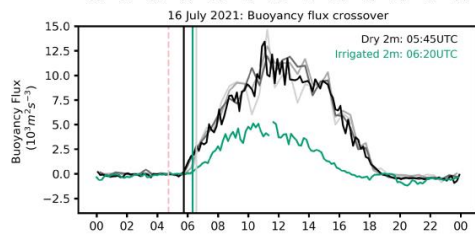
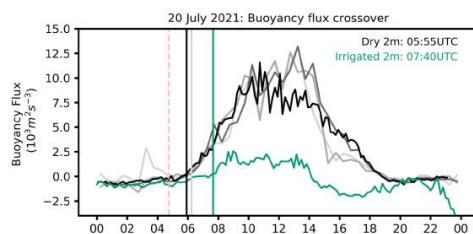
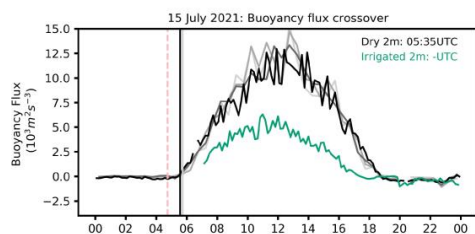
G. Canut, A. Roy





Westerly flow IOPs (1-3) & short irrigated canopy

Anticyclonic IOPs (5-7,11) & taller irrigated canopy



↑ Els Plans 2m +ve flux

↑ La Cendrosa 2m +ve flux

Westerly flow IOPs & short irrigated canopy:

Buoyancy flux **x2** magnitude ($4.3 \text{ m}^2 \text{ s}^{-3}$ vs $10.1 \text{ m}^2 \text{ s}^{-3}$)

- Natural site flux cross-over: T+55min (after sunrise)
- Irrigated site flux cross-over: T+90min (after sunrise)
- > 35 minute delay at La Cendrosa

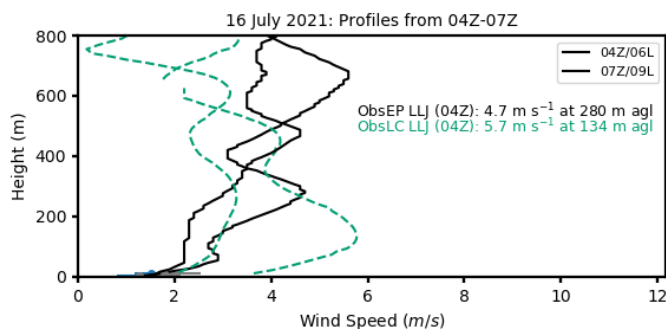
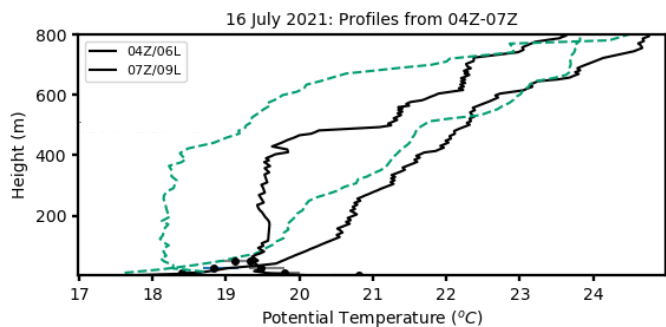
Anticyclonic IOPs & taller irrigated canopy:

Buoyancy flux **x5** magnitude ($1.6 \text{ m}^2 \text{ s}^{-3}$ vs $8.9 \text{ m}^2 \text{ s}^{-3}$)

- Natural site flux cross-over: T+60min (after sunrise)
- Irrigated site flux cross-over: T+140min (after sunrise)
- > 70 minute delay at La Cendrosa

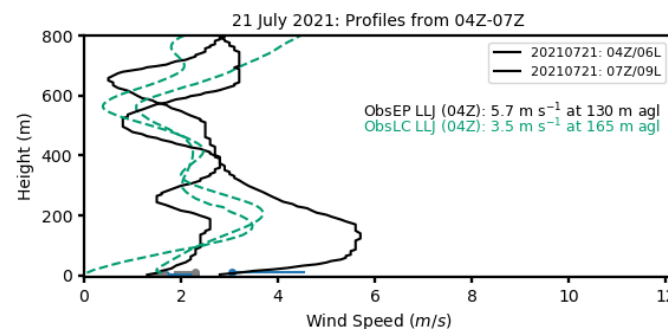
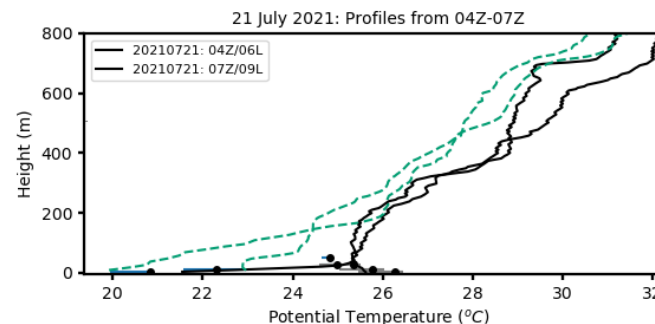
Westerly flow IOPs (1-3):

- Colder profiles through morning transition
- Rapid BL growth & deeper BL at 'onset'
- Irrigation differences in SBL at sunrise
- $T_{diff_irrig} \cong 2K$ at 'onset'



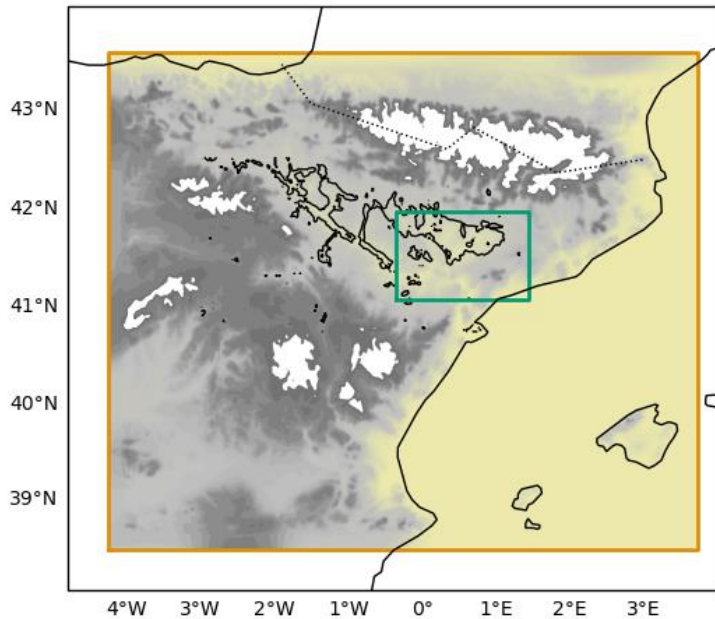
Anticyclonic IOPs (5-7,11):

- Increasing stability and stronger surface inversion
- More prominent LLJ
- Shallower BL depths at 'onset'
- $T_{diff_irrig} \cong 3.4K$ at 'onset'

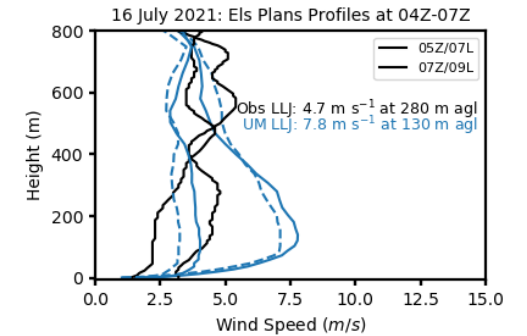
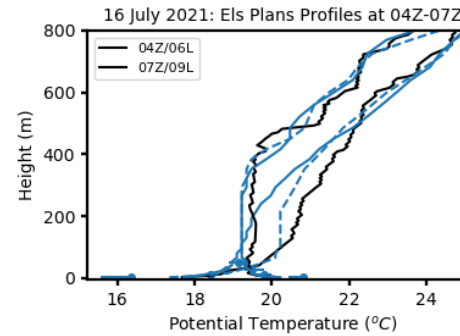


Running daily **2.2km forecasts** Unified Model (UM)
 Running **333m forecasts** for July SOP
 With & without irrigation
 Regional atmosphere & land configurations (RAL2, RAL3)
 Single column modelling (RAL2, RAL3)

LIAISE Forecast Domain: 2.2km and 333m
 With and without irrigation (black)

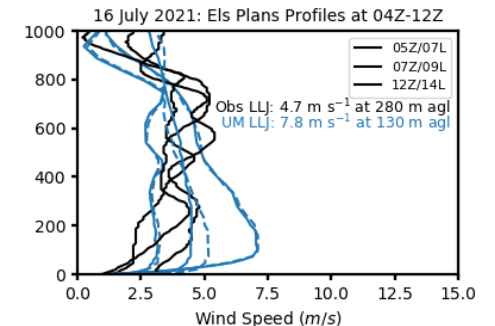
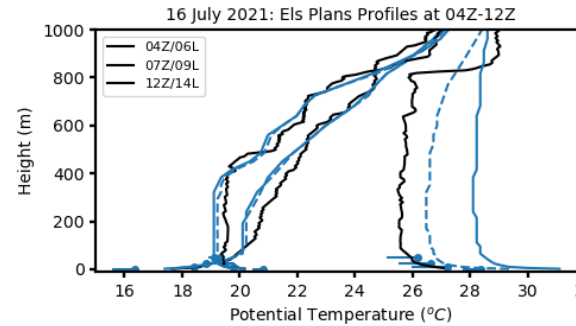


Testing regional atmosphere & land configurations



— Els Plans sonde — UM configuration 2 ---- UM configuration 3

Testing irrigation



— Els Plans sonde — UM without irrigation ---- UM with irrigation