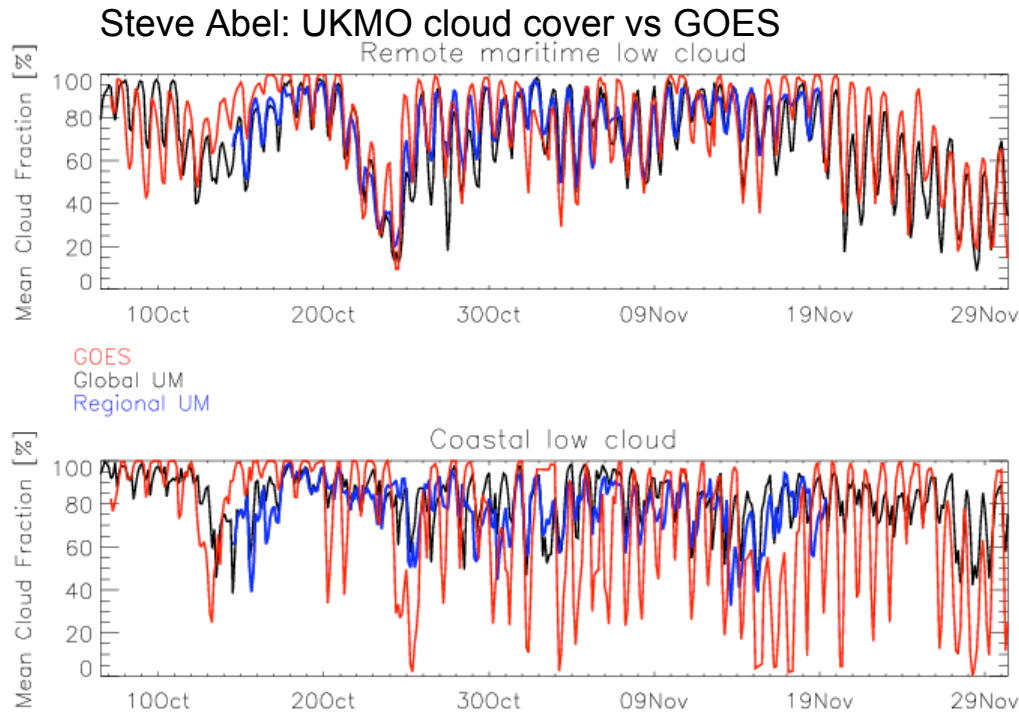


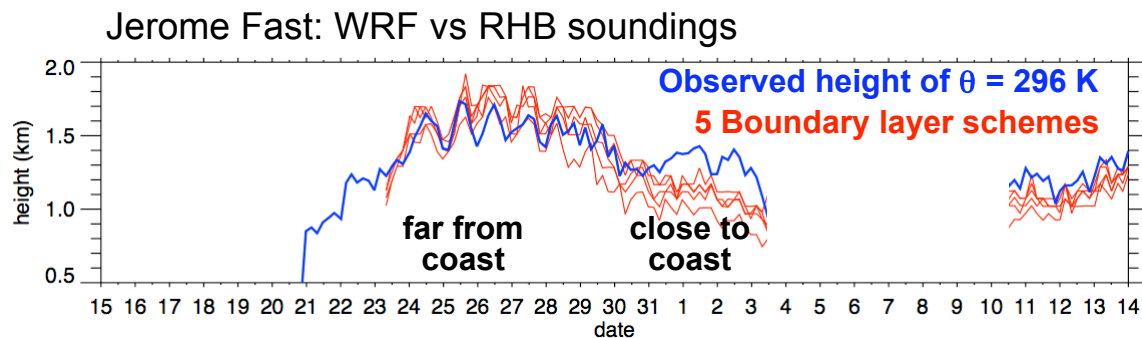
# Session 2B summary

**Regional scale perspective  
(microphysical/chemical/aerosol  
+ *physical*)**

# Large scale models often struggle to simulate the Sc in the coastal region



Observations of the coastal dynamics from VOCALS can be used to better understand the mechanisms that control the cloud in the coastal region and guide the development of models

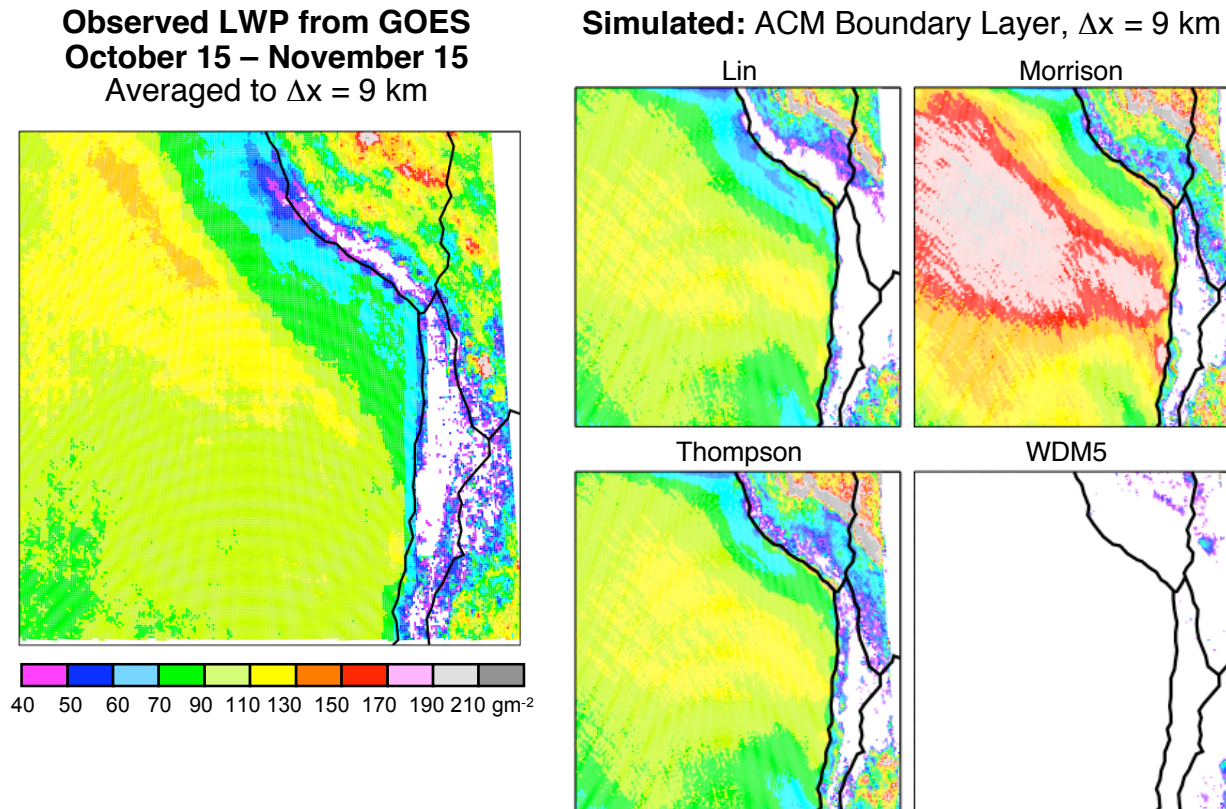


Technical Issue: How to define PBL and mixed layer depth. Is there a common definition that can be applied to observations and model simulations?

# Regional scale simulations of aerosol-cloud interactions

**Scott Spak:** Developing an updated regional emission inventory for modelling groups (includes new anthropogenic SO<sub>2</sub> and marine DMS emissions). QA against VOCALS observations. **Release planned for Q3, 2009**

**Jerome Fast: IMPORTANT TO GET THE CLOUD RIGHT FIRST.** Currently assessing WRF simulations of Sc in VOCALS region: sensitivity to resolution, BL and microphysics schemes. Next stage is to assess the impact of aerosol-cloud interactions in the model.



*Results in figure use  
fixed CDNC = 250 cm<sup>-3</sup>*

*Microphysics schemes  
respond differently to  
changes in the CDNC*

**VOCALS observations can be used to constrain microphysics parameterizations**

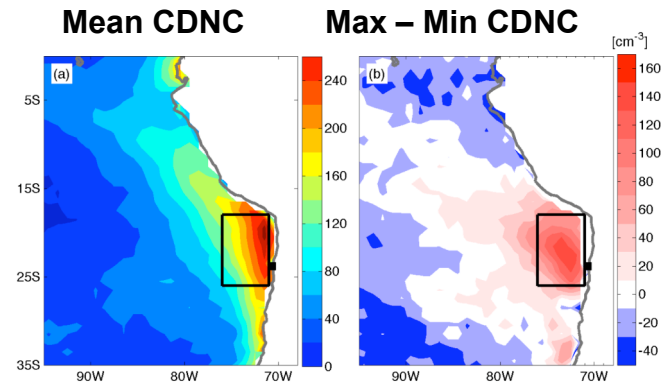
# David Painemal: Is coastal CDNC variability linked with the large-scale meteorology of the SEP?

- Composite high and low CDNC cases from coastal region

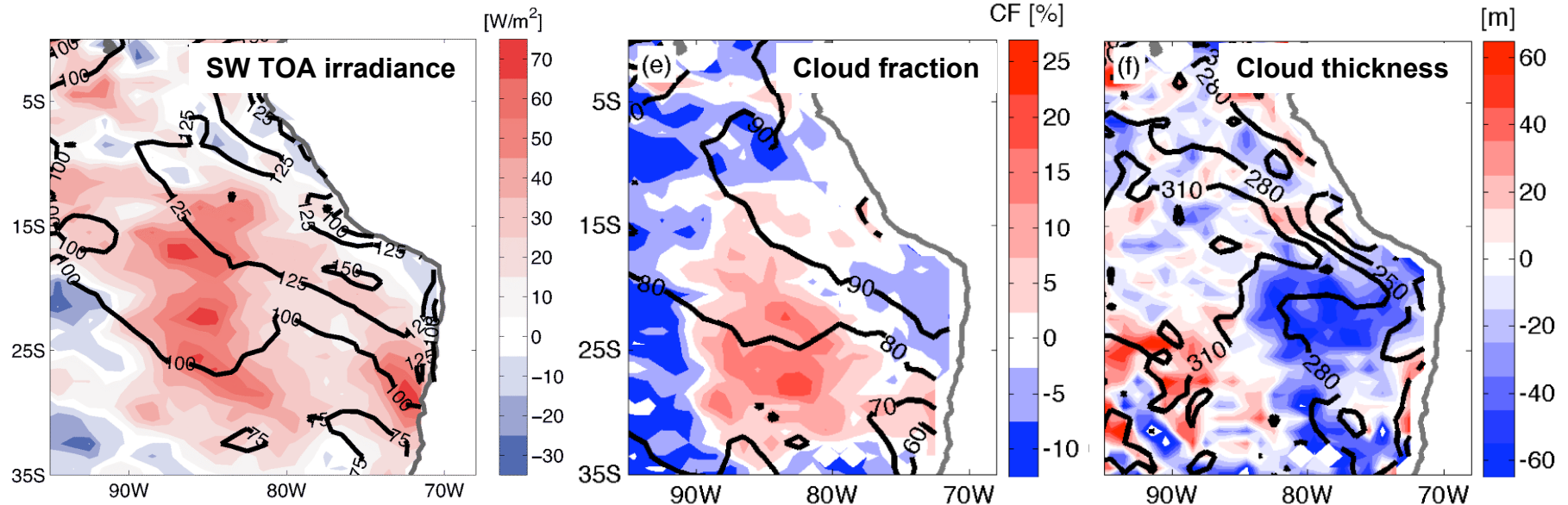
- The changes in coastal CDNC are associated with different synoptic conditions. High CDNC composite associated with

- weaker anticyclone (reanalysis data)
- weaker low level winds along coast (satellite)
- lower cloud top height and thinner clouds (satellite)
- differences in cloud cover (satellite)

- What controls the TOA SW irradiance in these regimes (aerosol vs meteorology)?



## Contours: Mean, Colors Max - Min CDNC composites



- Radiative changes are not related to the region with larger CDNC
- Albedo effect is counteracted by the cloud thinning and reduced CF as CDNC increases

# Lorenzo Labrador: Remote sensing measurements from the Dornier 228 during VOCALS



Eagle pixel: 2.8 x 2.4 m

1024 pixels, 400-970 nm,  $\Delta\lambda = 2.9$  nm

Hawk pixel: 1.6 x 4.6 m

320 pixels, 1000 - 2400 nm,  $\Delta\lambda = 8$  nm

- Remote sensing retrievals of cloud properties from hyperspectral imagers and reflectance characteristics of Sc
- Comparison with in-situ measurements from aircraft in below the Dornier
- Leosphere lidar for cloud top height and aerosol backscatter
- Polarimeter – remote sensing retrievals of cloud properties

