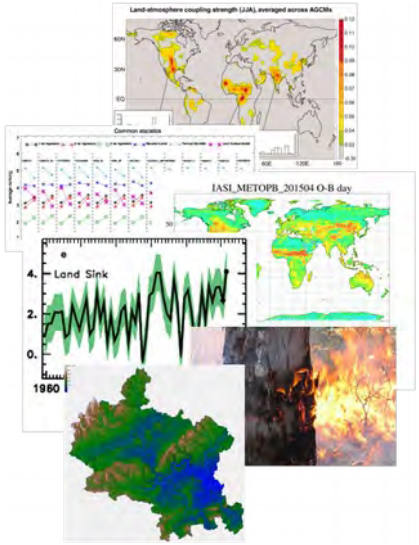
LIAISE: Land surface Interactions with the Atmosphere over the Iberian Semi-arid Environment

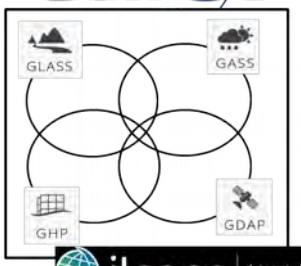
Science Questions



Observational Capabilities

Community Experiments

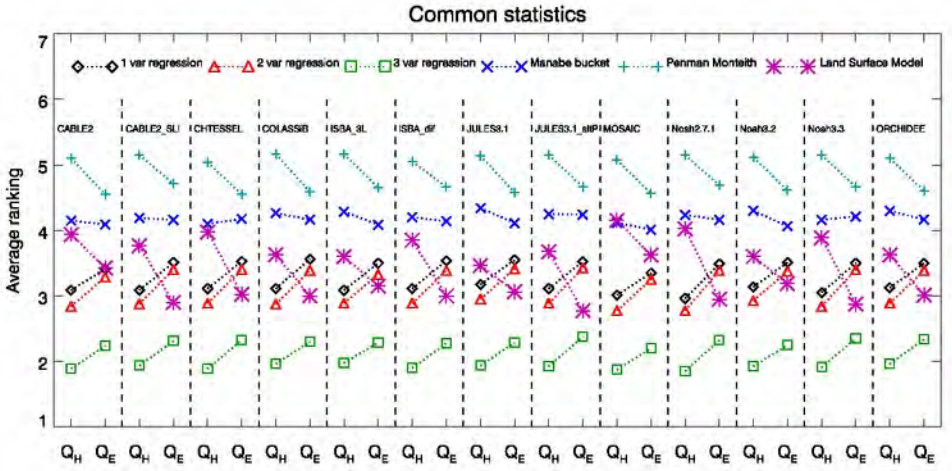
GEWEX



ileaps Integrated Land Ecosystem - Atmosphere Processes Study

Field Site Selection

Science questions: 1



Surface fluxes :

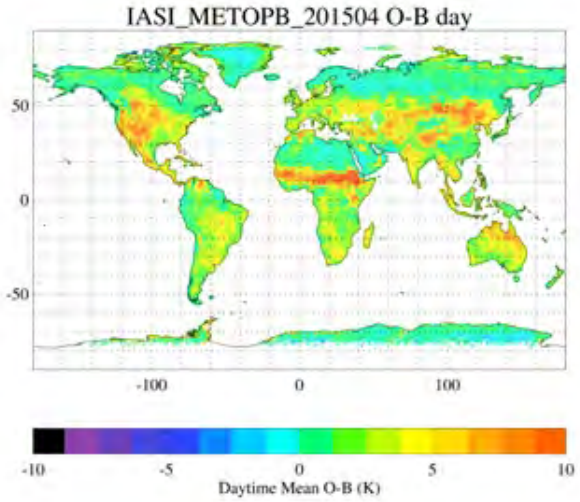
Semi-arid context

- Impact of sparse canopies and isolated obstacles on momentum
- Transpiration versus bare soil evaporation
- Transpiration dependence on soil moisture
- Evolution of fluxes during dry down
- Impact of heterogeneity
- Parameter transferability

Science questions: 2

Land Surface

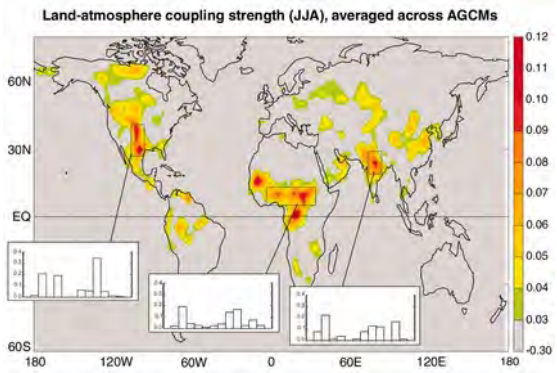
Temperature (LST)



- Biases in modelled LST
- Impact of heterogeneity on LST signal
- Spatial scales of modelled and observed LST
- Formulation of conceptual energy balance equations

Science questions: 3

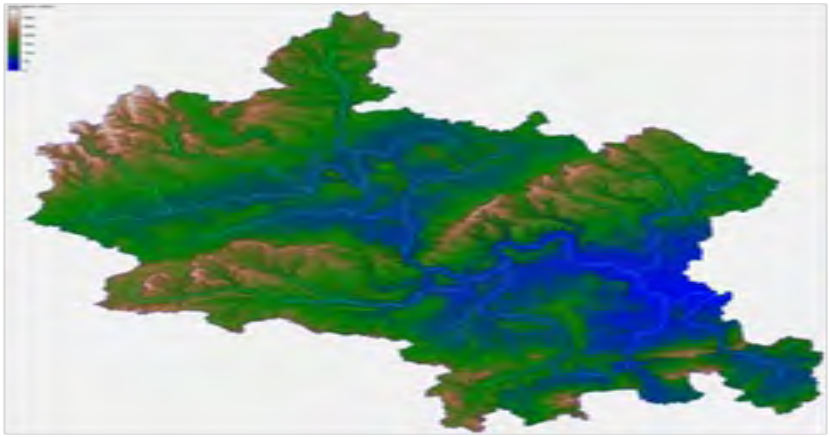
Land / atmosphere coupling



- Sensitivity of atmosphere to surface flux forcing
- Sensitivity of surface fluxes to atmospheric variability
- Boundary layer structure evolution (day-time + night-time)
- Increased understanding for implementation of coupling metrics
- Human imprint on land-atmosphere coupling

Science questions: 4

Rivers

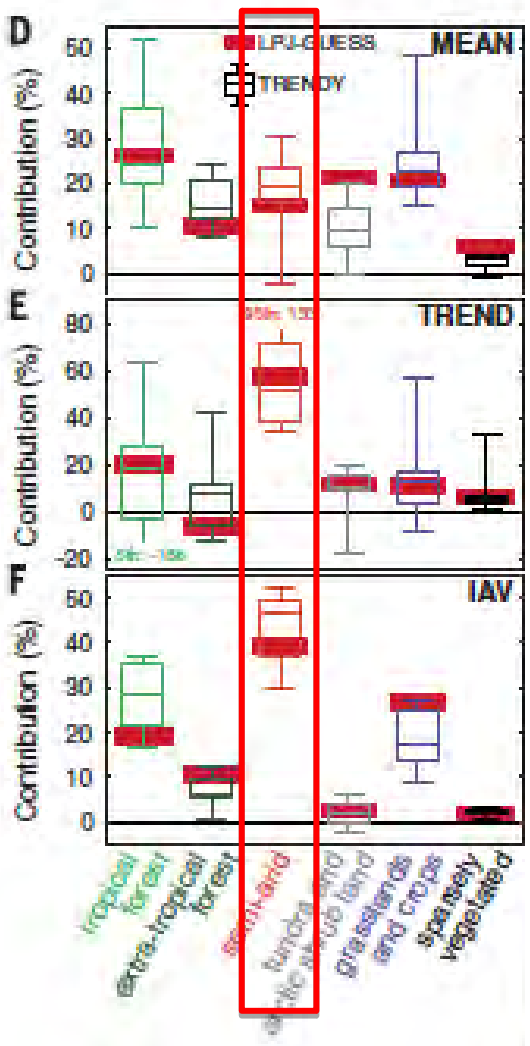


- Soil moisture / groundwater interactions
- Streamflow modelling
- River / groundwater extractions
- Impact of irrigation

Science questions: 5

Carbon fluxes

- Soil moisture controls on carbon uptake
- Semi-arid contribution to Inter- Annual Variability of carbon fluxes



D) Contribution of land cover classes to global mean NBP (1982–2011) (mean NBP of land cover class as a proportion of mean global NBP). Horizontal lines in box plots show, from top to bottom, 95th, 75th, 50th, 25th, and 5th percentiles. (E) Contribution of land cover classes to global NBP trend (land cover class NBP trend as a proportion of global NBP trend). (F) Contribution of land cover classes to global NBP IAV. *Anders Ahlström et al. 2015, Science.*

Science questions: 6

Wildfires

- Need for processed based models
- Understanding of human controls
- Fire dependent biology
- Better inventory datasets

Observational capabilities: 1

Surface sites

- Boundary layer profiles (T,q,U,V)
- Atmospheric fluxes (R, S_W, L_W)
- LST
- Surface fluxes (τ, H, λE, GPP, G)
- Fluxes from scintillometry
- Thermal imaging
- Soil temperature profiles
- Soil moisture profiles
- COSMOS soil moisture

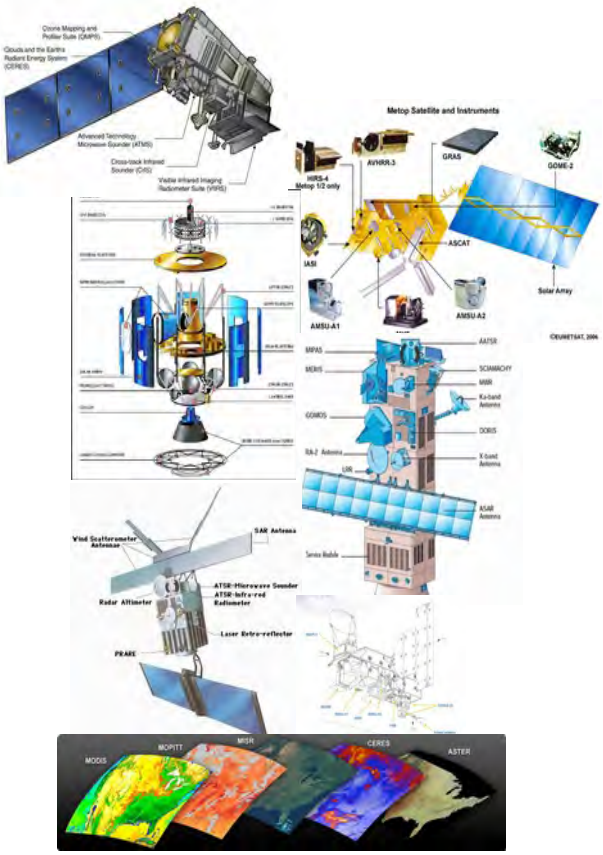
Observational capabilities: 2

Aircraft

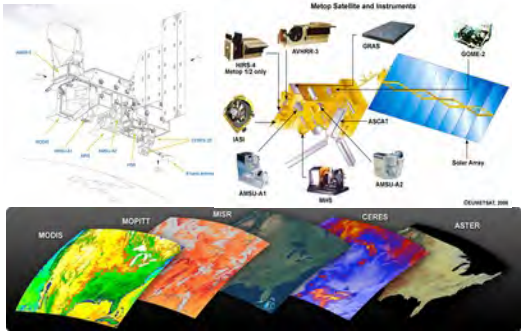
- T, q distributions
- Dropsondes
- MW and IR radiometers
- Surface energy balance
- Cloud microphysics
- Aerosol sampling
- Lidar

Observational capabilities: 3

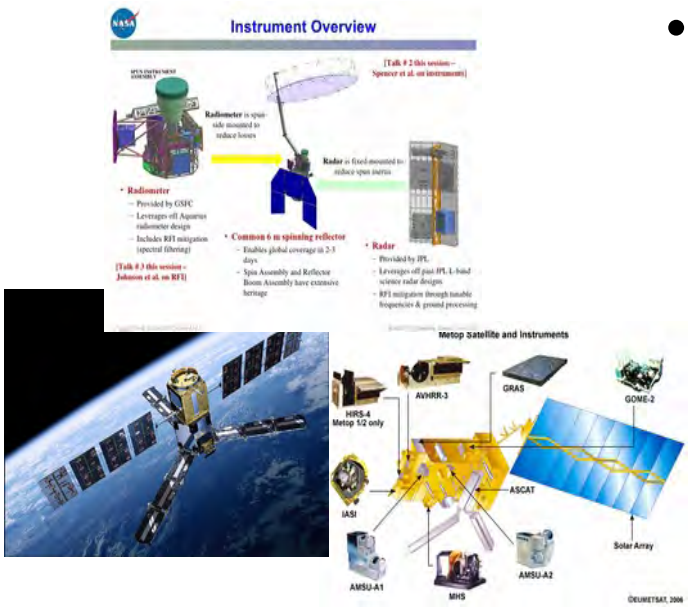
Satellites



- LST



- Albedo / emissivity



- Soil moisture

Observational capabilities: 4

Inventories

- Land management
- Waterways management
- Water extractions
- Irrigation practices
- Wildfire management

Field site selection

Community Experiments

A true GEWEX cross-cutting campaign

GLASS

- Benchmarking: PLUMBER 2
- Land/atmos coupling: DICE 2
- MDF: Soil moisture assimilation?

GASS

GHP

- Regional hydrological study of basin:
  - River discharge evaluation
  - Human interactions
    - Reservoirs
    - Irrigation
    - Extractions

GDAP

- Evaluation of LST from various satellites

- Modelled IAV of carbon fluxes

Met Office

Next steps :

- Clearly defining several key science questions (currently working on this : whitepaper after HyMex meeting in early July-Barcelona)
- Funding – UKMO has secured a certain level : Météo-France has a good level (aircraft, but also possibly mobile surface flux sites and drones) proposals being prepared on French side for mid-June, & Autumn. Coordination with European partners
- Building Iberian Network (Pere, Jan)
- Leaders for Community MIPs !

Contacts/organizers : Martin, Jan, Aaron, Pere