



UNIVERSITAT
**RAMON
LLULL**



CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

Simulation of the real water cycle: Impacts of irrigation using a land-surface model and remote sensing data

Pere Quintana Seguí, Anaïs Barella Ortiz, Jacopo Dari, Omar Cenobio and Jaime Gaona

Observatori de l'Ebre (URL-CSIC)

LIAISE Virtual Workshop 8-9/3/2021



IDEWA

IRRIGATION+

HUMID






Research questions and strategy

LIAISE Science Questions:

- Anthropogenic impacts on the hydrological water cycle.
- Sustainability of current agricultural activities.

Methodology:

-  SASER modelling chain (SURFEX LSM).
-  New irrigation scheme in v9.
-  Data to validate and improve our simulations
 - a. Remote Sensing Data.**
 - i. ET.
 - ii. Soil moisture.
 - iii. Irrigation.
 - b. In-situ observations.**
 - i. Irrigation observations from canal network (areal).
 - ii. Irrigation observations in Algerri-Balaguer (plot).
 - iii. Drainage network in Algerri-Balaguer.
 - iv. ET observations (LIAISE and IDEWA).
 - v. Streamflow and dam volume.

IDEWA (PRIMA)

Related to previous presentation by Lionel Jarlan

- Area: Algerri-Balaguer (AB) and Ebro basin.
- Impact of different irrigation scenarios on drainage, ET and streamflow.
 - Observed scenario.
 - Alternative scenarios.

IRRIGATION+ (ESA)

Related to previous presentation by Michel Le Page.

- Area: Urgell, Pinyana, CAyC, AB and Ebro basin.
- Development of RS irrigation datasets (soil-moisture based).
- Validation by feeding RS irrigation observations to SASER and comparing to observations (streamflow, ET, ...).
- Assessment of impact of irrigation on ET and streamflow (using SASER).
- Usefulness of RS datasets for stakeholders.

HUMID (Spanish National Plan)

- Improvement of SASER (peak flow, low flows and dams).
- Drought assessment using remote sensing data and SASER.

PIRAGUA (POCTEFA)


- Future climate scenarios using SASER (natural cycle only).

SASER : SAFRAN-SURFEX-Eudyssée-RAPID

SAFRAN

- Meteorological forcing dataset.
- 1979-2016-2020-....
- Iberia (5 km resolution)
- Pyrenees (2.5 km resolution).
- ERA-Interim (to be upgraded to ERA5) as first-guess.
- AEMET observations (need to include SMC observations).

SURFEX LSM

-  New irrigation scheme.
- ECOCLIMAP SG.
- Generation of irrigation type map.
- 5 km (Iberia), 2.5 km (Pyrenees), 1 km (Segre-Cinca).

Eaudyssee-RAPID

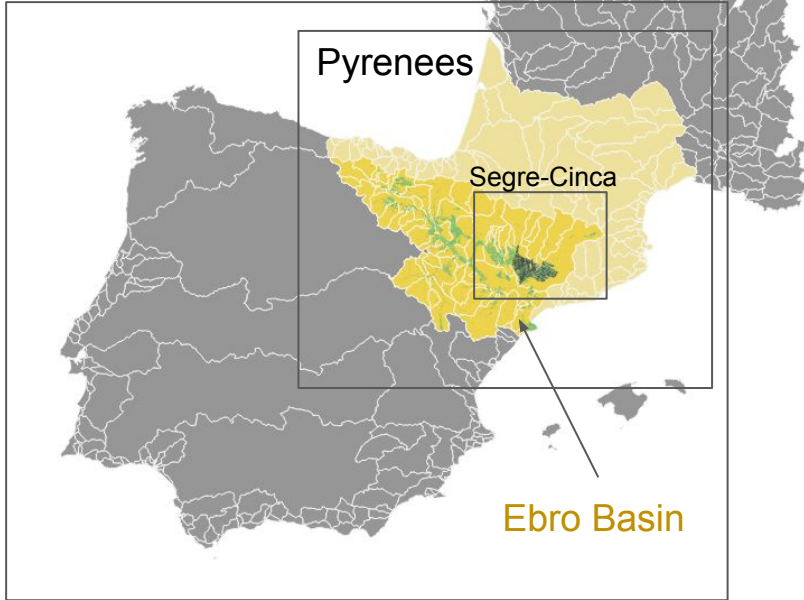
- River routing
- Dams (not fully implemented).
- 1 km (HydroSheds).

Irrigation

- Simulation using the new SURFEX irrigation scheme.
 - Validation of the ECOCLIMAP SG cover map (just started).
 - Creation of a irrigation method map.
 - modernized / non modernized.
 - herbaceous / trees.
 - Determination of model parameters (dose, dates, etc.).
- Forcing with observed irrigation (RS).
 - Modification of precipitation forcing (sprinkler).
 - Modification of soil moisture (drip, flood).

Area of study

Iberian Peninsula



Russian doll
strategy

