

Versus

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Improving surveillance and forecasting regional systems of atmospheric risks:

Do changes in land cover play a role in the occurrence of atmospheric extreme events on the Spanish coasts ?

Contact : Joseluis@ceam.es

The **VERSUS** project was launched in January 2016 and is funded for four years. It is a transversal research project that uses a combination of different techniques, approaches and branches of knowledge (numerical modelling, satellite data, terrestrial meteorological and air quality data, and field measurements conducted specifically for this project along a coastal valley of Valencia, Spain) to answer the following two questions:

- a) **Is it possible to improve the surveillance and early warning systems on environmental (atmospheric) risks like extreme temperatures, torrential rains and high-pollution events, identifying some "key" observables? If so , which ones are they?**
- b) **To what extent can changes in land cover at local/regional scales cause changes in rainfall patterns at different meteorological scales (meso-alpha to meso-gamma) in the Western Mediterranean Basin?**

Team



Jose Luis Palau
P.I. - Meteorologist



Jose Antonio Valiente
P.I. - Meteorologist



Esteban Chirino
P.I. - Ecohydrologist



Francisco Pastor
Meteorologist



José Antonio Alloza
Agricultural Engineer



Pau Benetó
PhD Student



Enrique Mantilla
Meteorologist



José Jaime Dieguez
Meteorologist



Francisco Alacreu
Technician



Elisabeth K. Larsen
PhD Student

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VERSUS – Working Packages

WP - 1 : Compilation of the temporal series, for the period 2003 - 2018, of satellite data of sea surface temperature (SST), Total Column of Precipitable Water Vapor (TPW) and Precipitation. For the same period, data collection from the Air Quality Network of the Valencian Community and Meteorological Measurements.

WP - 2 : Statistical characterization of spatiotemporal distributions in the Mediterranean basin of potentially triggering magnitudes of extreme meteorological events and secondary pollution episodes: SST, TPW, and Tropospheric Ozone.

WP - 3 : Identification and characterization of atmospheric scenarios associated with orographic-convective summer storms and tropospheric ozone pollution episodes.

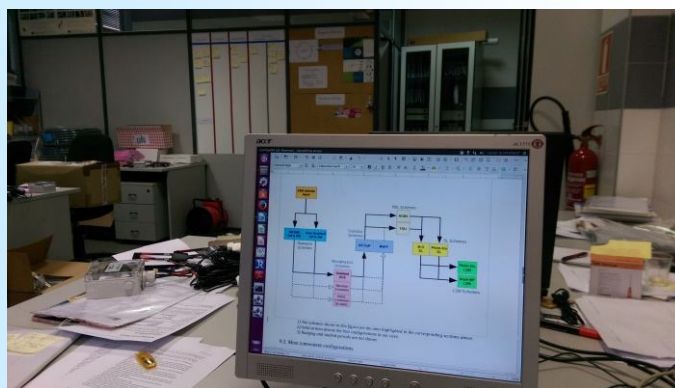
WP - 4 : Estimation of the contribution of vegetal cover evapotranspiration to the precipitable water vapor recharge within the diurnal breeze circulations along the Turia river valley.

WP - 5 : High-resolution numerical modelling of a base year over the Comunitat Valenciana (year 2015).

WP - 6 : Meteorological characterization of the impact of local and non-local disturbances of land use in rainfall, high temperatures and pollution episodes.

WP - 7 : Characterization of the difference of vegetal cover contribution to the precipitable water vapor recharge under different IPCC scenarios of land use.

WP - 8 : Communication and transference of the results.



Expected Outcomes

- Quasi-automatic monitoring network of the Mediterranean forest evapotranspiration and the tropospheric wind patterns along the Turia river valley (Valencia, Spain).
- Identification of key observables for the monitoring and forecast of potentially risky atmospheric events over the Comunitat Valenciana (Spain).
- Sensitivity analysis of the variation of critical thresholds for topographically aided summer storm generation under land-use changes.
- Annual Research International Communications (EGU, EMS, MetMed, etc.) and Peer-Review Scientific Articles.
- Workshop on monitoring and forecast of atmospheric environmental risks in the Western Mediterranean.
- Two PhD Thesis on :
 - *The influence of changes in the land cover on the content of water vapor in the troposphere and the generation of topographically-aided summer storms.* Pau Benetó
 - *The contribution of vegetal cover evapotranspiration to the precipitable water vapor recharge within the diurnal breeze circulations along the Turia river valley.* Elisabeth K. Larsen