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ClimaDat: A long-term network to study at different scales climatic processes and interactions between climatic compartments

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ClimaDat (www.climadat.es) is a pioneer project of the Institut Català de Ciències del Clima (IC3) in collaboration with and funded by "la Caixa" Foundation. This project aims at studying the interactions between climate and ecosystems at different spatial and temporal scales.

The ClimaDat project consists of a network of eight long-term observatory stations distributed over Spain, installed at natural and remote areas, and covering different climatic domains (e.g. Mediterranean, Atlantic, subtropics) and natural systems (e.g. delta, karsts, high mountain areas).

Data obtained in the ClimaDat network will help us to understand how ecosystems are influenced by and eventually might feedback different processes in the climate system. The point of focus of these studies will be taken into account regional-and-local conditions to understand climatic global scale eventsThe data gathered will be used to study the behavior of the global element cycles and associated greenhouse gas emissions. The network is expected to offer near real-time (NRT) data free for the scientific community.

Instrumentation installed at these stations mainly consists of: CO_2, CH4, H_2O, CO, N2O, SF6 and 222Rn analyzers, isotopic CO_2, CH4 and H_2O analyzers, meteorological sensors, eddy covariance equipment, four-component radiometers, soil moisture and temperature sensors, and sap flow meters. Each station may have a more focused subset of all this equipment, depending on the specific characteristics of the site.

Instrumentation selected for this network has been chosen to comply with standards established in international research infrastructure projects, such as ICOS (http://www.icos-infrastructure.eu/home) or InGOS (http://www.ingos-infrastructure.eu/).

Preliminary data time-series of greenhouse gases concentrations and meteorological variables are presented in this study for three currently operational ClimaDat stations: the Natural Park of the Ebre Delta (lat 40.75º N - long 0.79º E), the Regional Park of the Sierra de Gredos (lat 40.22º N - long -5.14º E) and the Natural Park of Baixa Limia - Serra do Xurès (lat 41.99º N - long -8.01º E). The wind source influencing regions of the three stations are also presented in this work, according to the results obtained using the HYSPLIT trajectory model (http://ready.arl.noaa.gov/HYSPLIT.php).