



## **The ICOS Ecosystem network and Thematic Center: an infrastructure to monitor and better understand the ecosystem GHGs exchanges**

Ivan Janssens (1), Dario Papale (2,3), Reinhart Ceulemans (1), Bert Gielen (1), Denis Loustau (4), Maarten Op de Beeck (1), Riccardo Valentini (2,3)

(1) Department of Biology, University of Antwerp, Antwerp, Belgium, (2) University of Tuscia, DIBAF, Viterbo, Italy, (3) CMCC, Euro-Mediterranean Center for Climate Change, Viterbo, Italy, (4) Unit EPHYSE, INRA, Bordeaux, France

The ICOS Ecosystem network is part of the ICOS European Research Infrastructure ([www.icos-infrastructure.eu](http://www.icos-infrastructure.eu)) together with the Atmospheric and Ocean networks. The ecosystem network includes highly standardized monitoring sites based on commercially available instruments embedded into an integrated system that is coordinated by the ICOS Ecosystem Thematic Center (ETC), which is also responsible for the methodologies advancement, data processing and data distribution.

The ecosystem monitoring activity will involve human intervention in field activities and for this reason rigorously standardized protocol for field ecosystem measurements are in preparation also in coordination with others international related activities. The core measurement in the ICOS Ecosystem sites are the main GHGs fluxes that include CO<sub>2</sub>, H<sub>2</sub>O, CH<sub>4</sub> and N<sub>2</sub>O, using the eddy covariance method and chambers for the soil effluxes. To better interpret and understand the GHGs exchanges a full series of meteorological data (including spectral reflectance measurements and full radiation and water balance) are also collected and the sites are characterized in terms of carbon stocks, nutrients availability and management and disturbance history. Centralized raw data processing, QAQC and uncertainty estimation, test and development of new methodologies and techniques, assistance to the network and chemical analysis and long term storage of the vegetation and soil samples are the main activities where the ETC is responsible. The ETC, based in Italy and with sections in Belgium and France, is under construction and will be operative in 2013.

We present the actual status of the Ecosystem network, including the variables collected, the protocols under preparation, the data access and data use policies and the Ecosystem Thematic Center role and development strategy, with special emphasis on the approaches followed to reach high level of to standardization together with the uncertainty quantification.