European Cooperation in Science and Technology

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Action ES0903: Spectral Sampling Tools for Vegetation Biophysical Parameters and Flux Measurements in Europe

Participating countries: ATBE, DE, DK, EE, ES, FI, FR, HU, IT, IR, NO, PL, SE, TR, UK,

http://costes0903.fem-environment.eu/

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ESSEM

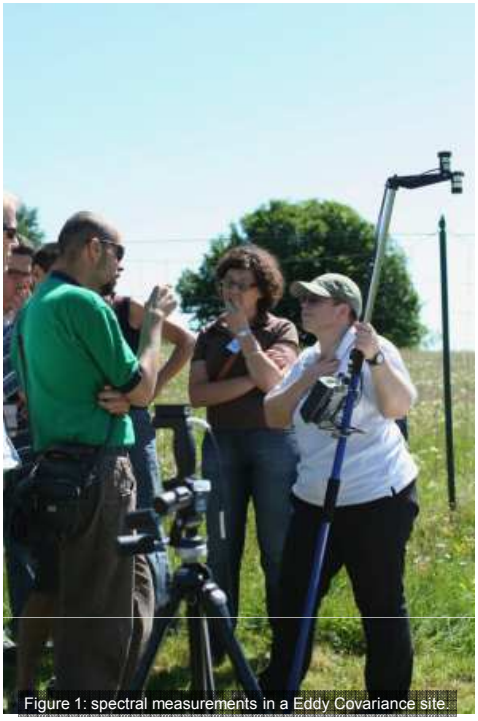

Figure 1: spectral measurements in a Eddy Covariance site.

Objectives:

- To analyze the state of the art of the optical sampling approach to flux studies in Europe
- To standardize the tools and methods in the spectral sampling network approach, focusing on instruments intercalibration-intercomparison
- To discuss a common measurement protocol to be adopted in all the European sites
- To adopt standard sensors for across site continuous spectral data collection
- To expand the optical approach on the existing flux net community (e.g CarboEurope IP) and to provide valuable data for the ecosystem modelling community
- To assimilate long-term continuous spectral measurements into biogeochemical models and upscaling the ecosystem observations

Working Group 1: Networking

In the WG1, the presence of researchers involved in the major carbon fluxes present and past projects (CarboEurope, IMECC, ICOS, Fluxnet, SpecNet) allows a positive interaction between different scientific communities. There are strict relationships between the ES0903 Action and these networks as the scientific activities match with some important objectives of these projects. In particular, ICOS is interested in receiving detailed inputs from the ES0903 experts (particularly from WGs 2 and 3) as regards the optical sampling instrument standards to be adopted in the infrastructural networks.

Working Group 2: Intercomparison

The aim of WG2 is to analyse the impact of using i) different methods to calculate reflectance ii) different instruments iii) same instruments at different sites. The NERC (UK) laboratory and other researchers will work specifically on spectrometers calibration. The contribution of these experts will be very important in defining the data quality standards. Also, they will play a major role in organising the 2011 Summer School, positively interacting with the scientific instruments industries

Working Group 3: New Instruments

The aim of WG3 is to test new or upgraded optical sensors and to agree on instrument standards to be adopted in the European networks. In the WG3, a positive interaction was observed from the researchers interested in continuous spectral measurements and the instrument industries,

Defining the necessary standards for continuous optical measurements will provide relevant impacts both from the scientific and the technological point of view.

Working Group 4: Upscaling

Spectroradiometric measurements across different ecosystems at different scales will be performed. The Action will put together data coming from several sites of the same type of ecosystem (e.g grassland, forest) and different upscaling methods. In the WG4, the different backgrounds of the members (biogeochemical modellers and remote sensing researchers) shows positive stimulus for spectral data assimilation into models and to upscaling fluxes

Main Achievements or Expected Results:

- Standardized protocols and scalable models for extrapolating ecosystem fluxes in a wide range of ecosystems will be developed. New and old technologies will be intercalibrated, tested and marketed to the flux and remote sensing communities.
- Also, the interaction between the scientific community and the scientific instruments industry is expected to new lines of communication and the potential for sustained research and development.
- The testing of sensors for ground reflectance will be a significant step towards the improvement of standardized optical measurements in different ecosystem types and flux tower sites.
- The collection of long-term continuous spectral measurements across a wide range of ecosystems has the potential to greatly improve global models and the potential to further our understanding of global change.

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