

Data Services for Carbon Cycle Science at the ICOS Carbon Portal

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The ICOS Carbon Portal (CP) is the data platform of ICOS but has also the role to coordinate, facilitate and ensure production of elaborated products based on ICOS data in direct collaboration with the modelling community. Global as well as regional flux and emission datasets are collected and will be analysed and displayed at the CP.

A prototype synthesis of European CO₂ surface flux estimates is presented at the CP, based on the inverse model results from three European research groups that also contributed to Global Carbon Project. CP is ready to integrate more contributed flux maps from inverse as well as process-based flux modelling as they become available.

In order to facilitate a coordinated generation of elaborated products, e.g. in inverse modelling intercomparisons, the CP provides access to a variety of datasets that can be used as prior and ancillary information in models, but also to measurement data, like of course the ICOS observations, for example in the form of the ObsPack CO₂ product GLOBALVIEWplus, for which CP collects and processes the contributions from the European laboratories.

As a further service, the CP provides an online tool to analyse potential contributions of natural fluxes and anthropogenic emissions to the atmospheric CO₂ concentrations at currently existing and planned ICOS sites. The tool is based on model simulations of the up-stream influences on the observation location, the so-called footprints, which are coupled to surface flux maps to derive tracer concentration changes at the station. The tool can also generate footprint for any custom location in the model domain.

The model framework currently consists of the Lagrangian transport model STILT together with emission-sector and fueltype specific emissions from the EDGARv4.3 inventory and biospheric fluxes from the diagnostic biosphere model VPRM, but can in general use any model footprint data. Both, footprints and concentration time series, are displayed on the webpage, providing a very simplified approach for the evaluation of measurement strategies.