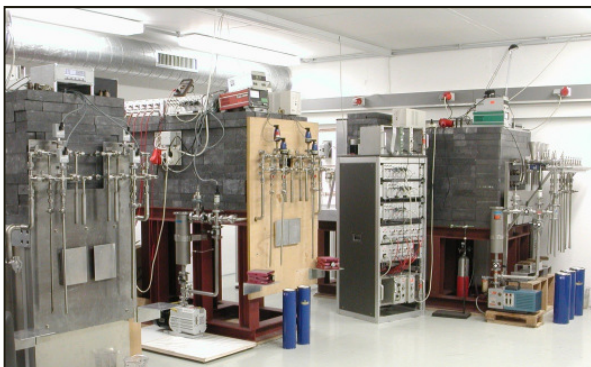


Central Analytical Laboratories: FCL & CRL

ICOS uses two Central Analytical Laboratories for production and delivery of calibration standards and high-precision analysis of grab samples for trace gases and CO₂ isotopes.



A Flask & Calibration Laboratory (FCL) is situated at the Max-Planck-Institute for Biogeochemistry in Jena and a Central Radiocarbon Laboratory (CRL) at the Institut für Umweltphysik, Heidelberg University.



**NATIONAL
CONTRIBUTION
OF GERMANY**



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ICOS

**INTEGRATED
CARBON
OBSERVATION
SYSTEM**



**National contribution
of Germany**

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The German contribution to ICOS RI comprises three observation networks (atmosphere, ecosystems and oceans) and two central facilities. It is operated by 13 national research centres and universities.

Three Observation Networks



The atmospheric observation network comprises the continuous monitoring of atmospheric greenhouse gas (GHG) concentrations (CO_2 , CH_4 and N_2O) combined with flask samples for their isotopic composition, radiocarbon sampling and tracer measurements (CO and ^{222}Rn) from a network of eight high towers distributed over Germany.

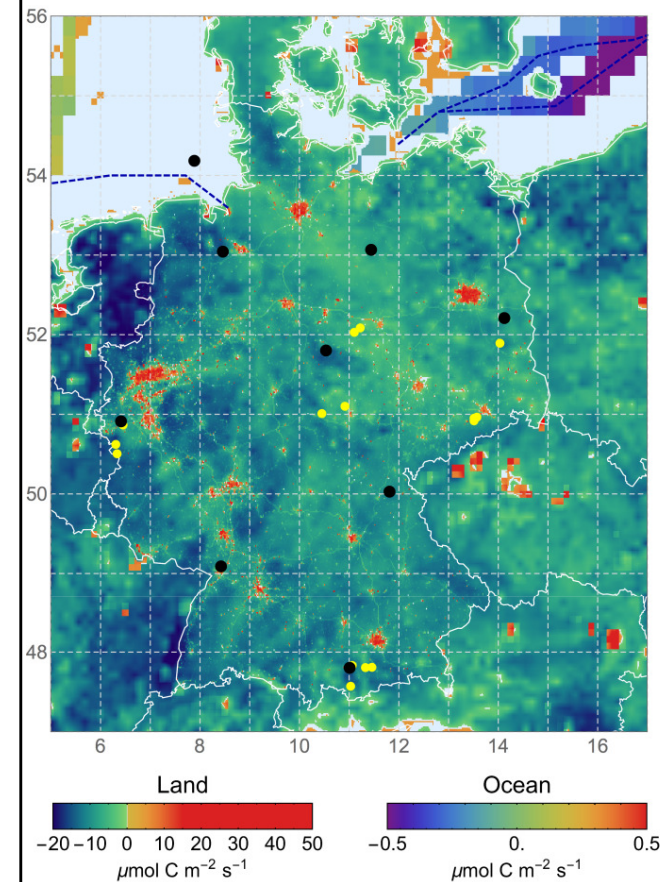
Continuous measurements of GHG fluxes (H_2O , CO_2 , CH_4 , N_2O) between various ecosystems and the atmosphere are carried out in the ecosystem observation network by use of the eddy covariance technique. The flux stations are arranged in clusters with different ecosystems being exposed to similar climatic conditions.



Measurements of GHG concentrations in the surface water and air-sea fluxes are carried out in the ocean observation network from three "Voluntary Observing Ship" (VOS) lines in the North Atlantic Ocean and Baltic Sea and at two oceanic time-series observatories at the polar (Hausgarten) and tropical (Cape Verde) extremes of the North Atlantic.



Modelling



Inverse modelling of greenhouse gas fluxes is based on the atmospheric concentration data (measurement stations shown as black dots), whereas bottom-up modelling uses eddy flux measurements at the ecosystem scale (stations shown as yellow dots) and measurements of partial pressure in sea water and in the air.

The map shows modelled atmospheric CO_2 fluxes for a summer day around noon.