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ICOS and global initiatives working towards policy-relevant, coordinated carbon and greenhouse gas observations

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The political demand for climate related information is high. The Paris Agreement clearly identifies the need for an effective response to the threat of climate change based on best available scientific knowledge. It states that Parties should strengthen scientific knowledge and systematic observation of the climate system in a manner that informs climate services and supports decision-making. The scientific community has made many recent advances to answer to this call. Specifically, the progress within Europe has been rapid as the Integrated Carbon Observation System (ICOS) became operational during 2017. ICOS integrates the atmosphere, ecosystem and ocean science related to carbon (C) and greenhouse gases (GHG).

The scientific challenges regarding C and GHG cycles are enormous. The cycles cut through different spatio-temporal scales, from local to global level and from rapid to very slow processes, and they are studied in different scientific fields with methods varying from in-situ observations to remote sensing and modelling. One of the major achievements of ICOS is to coordinate the diverse in-situ observations successfully to provide high-precision, standardized, quality-controlled open data available for all scientists. Together with related scientific communities, more tailor-made information and data products, such as emission maps for the use of decision-making can be provided.

Climate change is a global issue requiring even wider than regional-scale scientific coordination. ICOS is, therefore, well integrated into global initiatives. It has been constructed along the “Essential Climate Variables” (ECVs) developed under the United Nations Framework Convention on Climate Change (UNFCCC) with strong inputs by the World Meteorological Organisation (WMO) the UN Food and Agriculture Organisation (FAO) and the Group on Earth Observation (GEO) and documented in the Implementation Plan of the Global Climate Observation System (GCOS).

ICOS is participating actively in global initiatives such as Global Atmosphere Watch (GAW), the Integrated Global Greenhouse Gas Information System (IG3IS), both coordinated by the WMO, and the GEO Carbon and GHG Initiative (GEO-C). These initiatives aim to facilitate cooperation among existing C and GHG observing organizations, promoting interoperability between data and information systems, and improving integration among atmospheric, terrestrial and ocean networks. The presentation will introduce the ICOS strategy to participate in a coordinated, global system of observations to provide decision makers with timely and reliable policy-relevant information.