



The ICOS impact assessment report – the first impact study of a distributed environmental research infrastructure

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The European Research Infrastructure ‘Integrated Carbon Observation System’ (ICOS) has conducted, together with Technopolis, the first impact assessment of a distributed environmental research infrastructure. The study has gathered a substantial base of qualitative evidence for ICOS’ impacts. Interviews, together with an analysis of internal and external documents, survey results and an analysis of the scientific publications, news articles and policy papers that could be linked to ICOS, paint a picture of a research infrastructure that is highly relevant within the European GHG research community mainly through the successful implementation of standardisation throughout the research infrastructure. Scientist working with ICOS who were interviewed as part of the study are very positive about the improvements in data quality and data access that ICOS has brought about data users. Scientific data providers were very positive about the development and implementation of measurement standards, across atmosphere, ecosystem and ocean domains by ICOS.

The study developed 17 ‘key impact indicators’ that will be used in future follow-up analyses of the impact of ICOS. Using these results as a baseline, future impact analyses will be better able to link impact to the performance of the infrastructure.

Despite the clear narrative on ICOS scientific impact, it was not yet possible to measure this using traditional methods like bibliometrics of academic publications. This is a direct consequence of the fact that official ICOS data have only very recently become available, and that the impact of academic publications occurs with a time lag. The analysis that has been performed using publications which predate the ICOS ERIC indicate the high potential of regularly updated data from ICOS certified stations, both for use inside and outside the academic world.

The finding that there is a high uptake of ICOS’ data-related services and global data products, even in the absence of ICOS-certified measurements, suggest that ICOS fulfils a need in providing a platform for data analysis, both in Europe and globally, by providing access to European in-situ measurements with high temporal and spatial resolution. A DOI minting process recently implemented by ICOS should improve attribution to ICOS both in academic publications and can potentially be used to improve attribution to ICOS data products, provided that this process is adequately implemented.

The ‘contribution of timely information relevant to the GHG policy and decision making’ is one of ICOS’ explicit aims. The combination of reliable high-quality data on GHG, pan-European coverage and the presence of a research community means that ICOS data, even in their early stage, are already used by various communities and organizations who provide information to policy makers. Yet, at the same time it is an example of an outcome where attribution is notoriously difficult. To maintain and improve its relevance, it will be of key importance to develop better knowledge about what type of information is required to reach decision makers, and about at what stage in the decision process ICOS data can contribute most to improve policy decisions, and to support climate action.