RINGO | Readiness of ICOS

Readiness of ICOS for Necessities of integrated Global Observations

D5.3

Concept on data processing, management, and distribution in IG3IS and GEO flagship

RINGO (GA no 730944)

Public Document

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730944

Deliverable: Concept on data processing, management, and distribution in IG3IS and GEO flagship
Author(s): Elena Saltikoff, Alex Vermeulen, Emmanuel Salmon
Date: 22.12.2020
Activity: WP5, Task 5.1
Lead Partner: ICOS ERIC
Document Issue:
Dissemination Level: Public
Contact: elena.saltikoff@icos-ri.eu

	Name	Partner	Date
From	Elena Saltikoff	ICOS ERIC	29.12.2020
Reviewed by	Janne-Markus Rintala	ICOS ERIC	29.12.2020
Approved by	Janne-Markus Rintala	ICOS ERIC	29.12.2020

Version	Date	Comments/Changes	Author/Partner
1.0			

Deliverable Review Checklist

A list of checkpoints has been created to be ticked off by the Task Leader before finalizing the deliverable. These checkpoints are incorporated into the deliverable template where the Task Leader must tick off the list.

- Appearance is generally appealing and according to the RINGO template. Cover page has been updated according to the Deliverable details. x
- The executive summary is provided giving a short and to the point description of the deliverable. x
- All abbreviations are explained in a separate list x
- All references are listed in a concise list. x
- The deliverable clearly identifies all contributions from partners and justifies the resources used
- A full spell check has been executed and is completed. X

DISCLAIMER

This document has been produced in the context of the *project* Readiness of ICOS for Necessities of integrated Global Observations (RINGO). The Research leading to these results has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730944.

Executive summary

This deliverable is documenting co-operation with global organizations. During the progress of RINGO project, their management and strategy have changed. However, the demand for in-situ carbon data and need for harmonizing its processing, management, and distribution has not disappeared, and ICOS still has a central role in this co-operation in various new constellations.

Introduction

The original goal of work reported in this deliverable is exploring the possible usage of data in the framework of the UNFCCC, WMO, UNEP IPCC, GEO and GCP. The task for ICOS ERIC to manage the further development of this cooperation and work towards integration in the framework of GEO and IG3IS.

During the progress of RINGO project, the management and strategy of Group on Earth Observation (GEO) has changed, and the focus is now more clearly in the satellite measurements. ICOS ERIC was active in the GEO-Carbon and Greenhouse Gas Initiative (GEO-C) where ICOS ERIC was hosting the GEO-C Secretariat until 2018. After the changes of GEO strategy, ICOS is no more in position to suggest processing, management, and distribution of in situ data in that framework. However, the demand for this data has not disappeared, and ICOS still has a central role in the co-operation.

ICOS has successfully worked toward becoming an observing international organisation in the United Nations Framework Convention on Climate Change (UNFCCC). This status, given to ICOS during COP 25 at Madrid enabled ICOS to organise official side events and provide statements towards the parties.

ICOS is actively supporting global data integration activities in all domains and we are cooperating with international organisations such as World Meteorological Organisation (WMO), especially the Integrated Global Greenhouse Gases Information System (IG3IS). Its connections to fellow research infrastructures in other regions of the world have been intensified. The vison of an integrated, global carbon and greenhouse gas observation system with ICOS as the European pillar of it is manifesting.

Progress in global co-operation

WMO and IG3IS

ICOS cooperation with WMO and its IG3IS Initiative is intensive. The director if ICOS Carbon Portal is the chair of the WMO GAW scientific advisory board for greenhouse gases, and a member of the executive steering group of WMO IG3IS. Carbon Portal organised a very successful IG3IS/TRANSCOM meeting in Lund on inverse modelling of greenhouse gas fluxes from atmosphere observations. More than 100 scientists from all over the world attended the meeting. During the meeting, more than 35 high-level plenary lectures and 35 posters were presented. During lively discussions, the future of IG3IS and the role of TRANSCOM for the development of inverse techniques and the observation network to serve greenhouse gas information to stakeholders from local urban scales up to the global scale were outlined.

Another well-attended workshop on urban GHG measurement was organized by ICOS-Finland in September 2019. After these, the work continues towards harmonization of standards and development of a solid concept for city observatories. This was planned to be a subject another workshop in 2020, but it was postponed due to COVID-19 pandemic.

GEO

After 2018, the activities of the GEO Carbon and Greenhouse Gas Initiative (GEO-C) have been limited, due to changes in strategic priorities at the GEO Secretariat. ICOS nevertheless further contributes actively to the definition of a new role for in situ observations in the GEO framework, together with other research infrastructures like ILTER. ICOS participated in the GEO Week in Australia in 2019, which also included this year a ministerial segment.
As part of the Group on Earth Observations (GEO) 2020-2022 Work Programme, Four Working Groups have been established. They focus on the key issues related to Capacity Development, Climate Change, Disaster Risk Reduction, and Data.
Werner Kutsch, the ICOS DG, is part of the Climate Change Working Group (CC-WG). The group is convened to develop and implement a comprehensive GEO climate change action strategy to advance the use of Earth observations in support of climate adaptation and mitigation including, as relevant and appropriate, actions related to the pillars of the Paris Agreement adopted under the United Nations Framework Convention on Climate Change (UNFCCC).
Helen Glaves, our partner in ENVRI FAIR community, is a member of the Data Working Group (Data-WG), which is working with the GEO community and with external stakeholders to address data policy, data ethics and data governance issues related to the collection and use of Earth observations. This group will help GEO advance open data policies, thereby improving the uptake of Earth observations for the benefit of all stakeholders.

Other organizations

Considering the need to address urgent global environmental challenges such as climate change, loss of biological diversity and invasive species, eutrophication of soils and surface waters, and changes in atmospheric chemistry, six major research infrastructures on the global level have decided to engage into closer cooperation. Five of them have established the Global Ecological Research Infrastructure (GERI). In December 2020 ICOS signed a MoU to join this cooperation framework as the sixth partner.

The RIs involved so far are the Chinese Ecosystem Research Network (CERN), China, the European Long-Term Ecosystem Research – Research Infrastructure (eLTER RI), Europe, the National Ecological Observatory Network (NEON), USA, the South African Environmental Observation Network (SAEON), South Africa, and the Terrestrial Ecosystem Research Network (TERN), Australia. They share the view that research on and long-term observation of terrestrial ecosystems are required to support knowledge-based societal action on the aforementioned urgent

environmental challenges. This domain is gaining international relevance, with CO_2 fluxes in the terrestrial domain being considered as a new Global Climate Indicator of the GCOS/WMO system.
There is also growing cooperation between national metrology institutes (NMIs like BIPM) and ICOS on standardisation, directly through RINGO, but also through IG3IS (especially NIST).

ICOS has no direct link to Future Earth, but do connect to some of their most relevant projects, like the Global Carbon Project, to which ICOS data forms an important input and many ICOS scientists participate and from which the yearly data release for the global CO2 and CH4 budget is hosted by Carbon Portal.

Members of the distributed ICOS research infrastructure are prominent scientists in their field, and have important positions in international organizations related to greenhouse gases. Examples of the positions of individuals from the community are listed in the table 1.

Table 1: Activities of individuals from the ICOS community involved in international organizations

	Organization	ICOS people
Global Observations	FluxNet	Dario Papale (ETC)
	GAW/IG3IS	Alex Vermeulen (CP) Leonard Rivier (ATC) Armin Jordan (CAL) Samuel Hammer (CAL) Martin Steinbacher (A-MSA)
	GCOS	Werner Kutsch (DG) Han Dolman (founder)
	GOOS/IOCCP	Benjamin Pfeil (OTC)
	ObsPack	Alex Vermeulen (CP) Leonard Rivier (ATC)
	SOCAT	Benjamin Pfeil (OTC) Thanos Gkritzalis (O-MSA)
	WMO	Werner Kutsch (DG) Olivier Laurent (ATC) Benjamin Pfeil (OTC)
	WCRP	-
Global Research	IPCC	Werner Kutsch (DG) Philippe Ciais (founder)
Global Assessment	GEO	Werner Kutsch (DG) Emmanuel Salmon (HO)
Global Policy-Making	UNFCCC	Werner Kutsch (DG) Emmanuel Salmon (HO)
	Copernicus	Werner Kutsch (DG) Alex Vermeulen (CP) Benjamin Pfeil (OTC) Leonard Rivier (ATC)
Climate Services	GFCS	-
	ENVRI Community	Werner Kutsch (DG) Alex Vermeulen (CP) Dario Papale (ETC) Leonard Rivier (ATC) Benjamin Pfeil (OTC) Magdalena Brus (HO) Emmanuel Salmon (HO)
	GERI	Werner Kutsch (DG) Alex Vermeulen (CP)

	Organization	ICOS people
Other European & International RIs and organizations		Dario Papale (ETC) Emmanuel Salmon (HO)
	NEON	Alex Vermeulen (CP) ETC
	NOAA	Armin Jordan (CAL) Samuel Hammer (CAL) Alex Vermeulen (CP) Benjamin Pfeil (OTC)
	NASA	
	NIST, BIPM	Alex Vermeulen (CP) Armin Jordan (CAL)
	Others	Benjamin Pfeil (OTC)

Conclusions and further work

During RINGO project ICOS has achieved a firm position in the landscape of different international organizations, The work started in this Work package will continue in new frameworks such as GERI and ENVRI FAIR.

Abbreviations

ATC	Atmosphere Thematic Centre
BIPM	Bureau International des Poids et Mesures (FR)
CERN	Chinese Ecosystem Research Network
DG	Director General of ICOS ERIC
ELTER	European Long-Term Ecosystem Research
ENVRI FAIR	H2020project which connects the Environmental Research Infrastructure (ENVRI) community to the European Open Science Cloud (EOSC) open data policy of FAIR (Findable, Accessible, Interoperable, Reusable)
ETC	Ecosystem Thematic Centre
FLUXNET	Network of Flux research. 1) The data portal and 2) measurement site network.
GAW	Global Atmosphere Watch
GCOS	Global Climate Observing System
GERI	Global Ecological Research Infrastructure
GFCS	Global Framework for Climate Services
GHG	Green House Gases (CO2, NH4, N3, water vapor)
GOOS	Global Ocean Observing System
IG3IS	Integrated Global Greenhouse Gas Information System
ILTER	International Long-Term Ecological research network
IOCCP	International Ocean Carbon Coordination Project
IPCC	Intergovernmental Panel on Climate Change
UNFCCC	United Nations Framework Convention on Climate Change
GCOS	Global Climate Observing System
GEO	Group on Earth Observation
GEO-C	GEO-Carbon and Greenhouse Gas Initiative
GERI	Global Ecological Research Infrastructure
MoU	memorandum of Understanding
NASA	National Aeronautics and Space Administration (USA)
NEON	National Ecological Observatory Network (USA)

NMIs	National Meteorological Institutes
NOAA	U.S. National Ocean and Atmosphere Administration
NASA	National Aeronautics and Space Administration (USA)
NIST	National Institute of Standards and Technology (USA)
OTC	Ocean Thematic Centre
SAEON	South African Environment Observation Network
SOCAT	Surface Ocean CO_2 Atlas
TERN	Terrestrial Ecosystem Research Network that operates in Australia. It's land ecosystem observatory that measure key terrestrial ecosystem attributes over time from continental scale to field sites at hundreds of representative locations and openly provide model-ready data that enable researchers to detect and interpret changes in ecosystems
WMO	World Meteorological Organization