



Horizon 2020 Societal challenge 5:
Climate action, environment, resource
efficiency and raw materials

VERIFY

Observation-based system for monitoring and verification of greenhouse gases

GA number 776810, RIA

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1. Changes with respect to the DoA

NONE

2. Dissemination and uptake

(Who will/could use this deliverable, within the project or outside the project?)

The deliverable is public and should be use by all partners of the VERIFY project as well as outside the project for all policymakers, institutions and scientists interested by the output of VERIFY.

3. Short Summary of results (<250 words)

Activities towards the global systems reported at M25 in a first report. Will be updated in a second an final report at M45. The report will also include requirements to VERIFY further development. It will ingest other deliverables and provide an overview.

4. Evidence of accomplishment

(report, manuscript, web-link, other)

The report itself is the evidence of accomplishment

Version	Date	Description	Author (Organisation)
V0	18/11/18	Creation/Writing	Werner Kutsch (ICOS-ERIC)
V1	14/08/2019	Writing/Formatting/Delivery	Werner Kutsch (ICOS-ERIC)

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1. Glossary

Abbreviation / Acronym	Description/meaning
COP	Conference of Parties
GCOS	Global Climate Observing System
GEO	Global equity organization
IG3IS	Integrated Global Greenhouse Gas Information System
IPCC	Intergovernmental Panel on Climate Change
SBSTA	Subsidiary Body for Scientific and Technological Advice
UNFCCC	United Nations Framework Convention on Climate Change

2. Introduction

The first dissemination and exploitation plan of VERIFY (Deliverable (8.4) has identified relevant groups for targeted dissemination and communication activities to reach its ambitious objectives and impact. The task 7.2 provides ongoing activities for dissemination of results and ideas towards those organizations within the UN system that are involved in climate change mitigation or for cooperation and coordination with the respective scientific programs. These activities have been ramped up during the first project period in order to set the stage for the dissemination of project results in the upcoming time. This first version of the VERIFY deliverable 7.10 introduces briefly the most important players and lists the main activities conducted during the reporting period.

3. Main Activities

3.1. UNFCCC / SBSTA

The parties of the United Nations Framework Convention on Climate Change (UNFCCC) and the signature countries of the Paris Agreement are one of the core international target groups for the dissemination of the VERIFY results. This is done in the official programme and in side events at the annual Conferences of Parties (COPs) and the meetings of the Subsidiary Body on Scientific and Technical Advice (SBSTA). The VERIFY consortium has built up a good working relationship with the Programme Officer for Research and Systematic Observation of the United Nations Climate Change Secretariat in Bonn who organises official events at COPs and SBSTA meetings. In addition, ICOS ERIC has been accepted as an international organisation eligible to participate as observer in the UNFCCC and can as such organise side events at COPs. This will ensure the full possibility to disseminate to the COP. We further suggest that VERIFY will be considered in the future programme of the EU Pavilions at COPs.

3.1.1. UNFCCC Conferences of Parties

The COPs are the most important dissemination targets of VERIFY. There are several communication channels to the COP. Since VERIFY builds on and supports the work of the Global Carbon Project by enhancing the efforts to provide syntheses, the annual presentation of the Global Carbon Budget at the COP starts, is a highlight of the work (see [Le Quéré et al. 2018](#)). For the COP 2018, we proposed a side event to the COP in Katowice but unfortunately this was not retained, as the competition for side events was very high. Instead, we organised a press conference to present the results of the Global Carbon Budget, and also presented the results at two side events organised by others. These were (1) a side event organised jointly by the governments of UK, Norway and Germany on 1.5oC warming, and (2) a side event on reaching net zero emissions by 2050 organised by the team of Christiana Figueres, both held on 5 December. Both side events were well attended by a mix of policy advisors and broader Stakeholders from the public and private sectors.

The Earth Info Day is designed as a part of the official COP program organised by the Program Officer for Research and Systematic Observation. It has been organised for the first time during COP 22 at Marrakech and shall be used to inform the negotiations process. VERIFY will be involved in the organisation through ICOS ERIC.

3.1.2. SBSTA Research Dialogue

The basic goal of the SBSTA Research Dialogue is to hold a discussion at the science–policy interface with the aim of supporting adaptation and mitigation action under the Paris Agreement based on the best available science. It focused on “science for understanding” and “science for action” as well as science on renewable energy and the carbon cycle. The tenth meeting of the research dialogue was held in Bonn on 3 May 2018 in conjunction with the first part of the forty-eighth session of the Subsidiary Body for Scientific and Technological Advice (SBSTA 48).

VERIFY was directly presented in the 10th Research Dialogue through a poster by ICOS ERIC. This presentation resulted in the following text about VERIFY in the [SBSTA RD 10 summary report](#):

“The VERIFY project aims to enhance the accuracy of national and regional GHG budgets. In situ observations will support inventories that rely on statistical data and allow to measure the effectiveness of emission reduction policies. A comprehensive reconciliation of officially reported and observation-based budgets will contribute to support the effective implementation of the Paris Agreement.”



During the same event Corinne Le Quéré (WP 7 co-leader of VERIFY) was invited to present the Global Carbon Project (GCP, supported by VERIFY task 7.1) in a panel discussion (see RD 10 summary report, pp 15 – 17) as well as at an Informal meeting hosted by the SBSTA Chair with representatives from the research community. She presented a synthesis of the research needs for reducing uncertainty in the Global Carbon Budget and hence for verification. This analysis was also presented with a poster in the Research Dialogue.

Figure 1: Corinne Le Quéré during her SBSTA presentation

In a related side event at SBSTA 48, commonly organised by WMO, UNFCCC, GCOS, IG3IS, GEO and European Commission, Han Dolman presented among others the basic VERIFY concept. The presentation gained high attention and opened further dissemination channels.

The dialogue made clear that fundamental science and research is still needed, but communication at the science/policy interface and exploration of the opportunities of how best to do this is also an important part of the required action that should be supported by Parties.

3.2. Global Climate Observation System (GCOS)

The Global Climate Observing System (GCOS) is in charge to periodically report to the UNFCCC-SBSTA on the status and developments in the global observing systems for climate. The cooperation between VERIFY and GCOS aims to provide regular information about carbon and GHG observations and concepts to improve knowledge generation from the respective data and modelling approaches supported by VERIFY.

GCOS organized its annual Steering Committee meeting from 23 to 26 October, 2018 in Helsinki, Finland. In conjunction with the GCOS Steering Committee Meeting, there was a GCOS Science Day on Monday, 22 October 2018. The Science Day aimed at informing the regional and national community on activities related to systematic climate observations and their relevance to pressing environmental concerns and facilitated valuable exchange of news and views. The GCOS Science Day will consisted of four sessions:

- GCOS activities in global and regional context
- Arctic now and tomorrow

- Science-based information for decision makers
- Climate change and observing initiatives

Werner Kutsch (ICOS ERIC, WP 7 co-leader of VERIFY) presented an analysis of the GCOS Implementation Plan and suggestions to improve the system of Essential Climate Variables. These suggestions were based on analyses on observational necessities conducted in the VERIFY context (WPs 2 – 4) and well received in the GCOS Steering Committee.

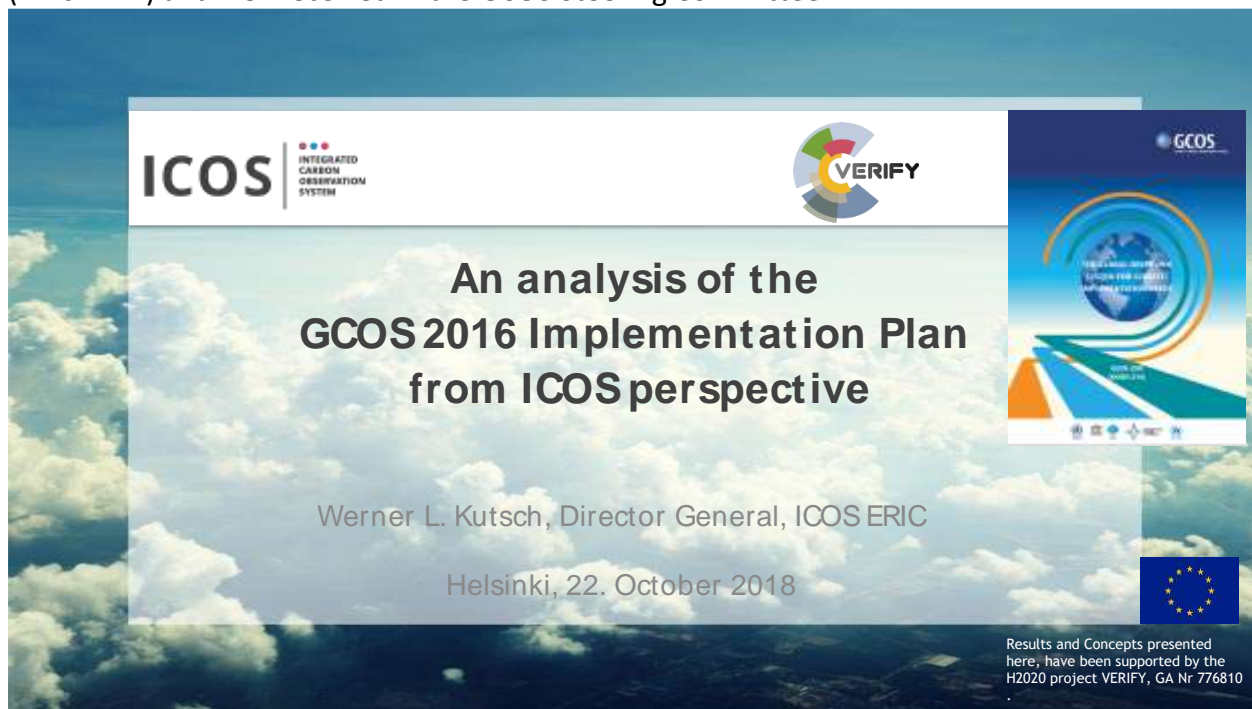


Figure 2: Title page of the presentation at the GCOS Science Day.

Further cooperation with GCOS has been the participation of W. Kutsch (ICOS ERIC) in the GCOS panel on terrestrial observations (TOPC).

VERIFY co-coordinator Han Dolman (VU Amsterdam) and WP 7 co-leader Werner Kutsch (ICOS ERIC) participated in the [GCOS Joint Panels Meeting at Marrakesh, Morocco, 18-22 March 2019](#). This joint meeting should be focusing on panel work plans until 2023 including a possible conference on climate observations, the update of the 2015 Status Report and of the 2016 Implementation Plan, activities to support climate services and improving monitoring of the Earth cycles (Energy, Water, Carbon); observations in support of adaptation; and interface issues, such as air sea fluxes and land-ocean fluxes. The underlying overall aim of this joint meeting should be to agree on consistent approaches to panel activities including review of ECV requirements, monitoring how well ECVs are being observed and reviewing implementation plan actions, and to start inter-panel discussions on cross-cutting issues.

In preparation of this meeting, Han Dolman took the coordination of the Carbon Cycle working group that definitely benefited from the conceptual approaches developed in the VERIFY and GCP context. The upcoming processes in GCOS, namely the review of the ECVs and the adoption of cycle approach are important developments that will be actively supported by the VERIFY project.

3.3. World Meteorological Organisation (WMO)

3.3.1. IG3IS

One of the objectives of the Integrated Global Greenhouse Gases Information System (IG³IS) is to use atmospheric observations and analysis (including inverse modelling techniques) to improve the national emission estimates that are reported to the UNFCCC. IG³IS methodology can be applied on the scales from national to urban and to facility and the need for information is defined through the dialog with the user community. The cross-cutting activity is meant to support the development of the techniques, their application to the various scales relevant for emission estimates, the definition of "good practice" approaches, and benchmarking methods. Many of these aspects are of scientific interest and relevance, in particular the need to move to higher resolution national and urban scale emission estimation. To establish the user requirement and map them against the existing technical capabilities, IG³IS organized its first Symposium from 13 to 15 November 2018 (<https://ig3is.wmo.int/en/events/first-ig3is-symposium-and-user-summit>) where the members of VERIFY consortium actively contributed.

VERIFY is connected to the WMO-lead initiative for an IG³IS via WMO Secretariat (the WMO Secretariat is directly involved in the VERIFY consortium) and ICOS ERIC. The results of the VERIFY project will affect the further development of the initiative and therefore are already/ and will be regularly communicated to the IG³IS Science Team. One of the examples of such communication and close collaboration is the joint scientific session that was organized at the EGU General Assembly in Vienna (7-12 April 2019) entitled "Science-based Greenhouse Gas Emission Estimates in Support of National and Sub-National Climate Change Mitigation".

3.3.2. IG3IS/TRANSCOM workshop

A first highlight to present VERIFY results has been the IG3IS/TRANSCOM workshop on inverse modelling of greenhouse gas fluxes from atmosphere observations commonly organized by WMO GAW and ICOS at Lund, Sweden. The workshop was dedicated to the use of atmospheric measurements to improve the quantification and understanding of greenhouse gas fluxes. It covered the full scope of methods and applications, including the use of various types of measurements (global & regional networks, aircrafts, satellites, isotopes, etc.), and different methods (flux inversion, CCDAS, FFDAS, etc.) to constrain fluxes and processes (land biosphere, ocean, fossil) at scales ranging from global to local. The meeting provided ample opportunity to discuss new developments, remaining bottlenecks, and how to take advantage of international cooperation and coordinated joint activities to support progress. Many preliminary results from VERIFY activities were presented by various beneficiaries.

3.4. ICOS biennial Science Conference

The ICOS Science Conferences have established themselves as a market place to present outcomes and impacts from observations, to advertise observational and scientific priorities, to

further develop the Monitoring, Reporting and Verification (MRV) system and to translate requirements that are formulated in the political sphere (e.g. at COPs or SBSTA meetings) into scientific and observational approaches. During the 3rd ICOS Science Conference in September 2018 in Prague, the VERIFY concept was discussed with various stakeholders among them UNFCCC, EC,

3.5. Other channels

3.5.1. International Conferences

Presentations of the Global Carbon Budget and VERIFY contribution by C. Le Quéré:

- Keynote presentation at the Gordon Polar Marine Science Conference, Ciocco, Italy (March 2019)
- Medal lecture, International Union of Geodesy and Geophysics (IUGG) conference, Montreal (July 2019)

3.5.2. Global Carbon Budget database

ICOS EU is now (since 2018) hosting the database produced by the Global Carbon Budget. The new website

icos-cp.eu/GCP/2018 developed in 2018 is replacing the US website at CDIAC which hosted the files over the last 10 years. A web portal was developed for this, and the doi produced by the ICOS team who published the databases as soon as the embargo from the publication lifted.

4. Conclusions

VERIFY has successfully liaised with the core international organisations. The activities so far have established important dissemination and cooperation channels that will be very valuable for the upcoming phases of the project. First conceptual ideas have already been disseminated.