ICOS INTEGRATED CARBON OBSERVATION SYSTEM

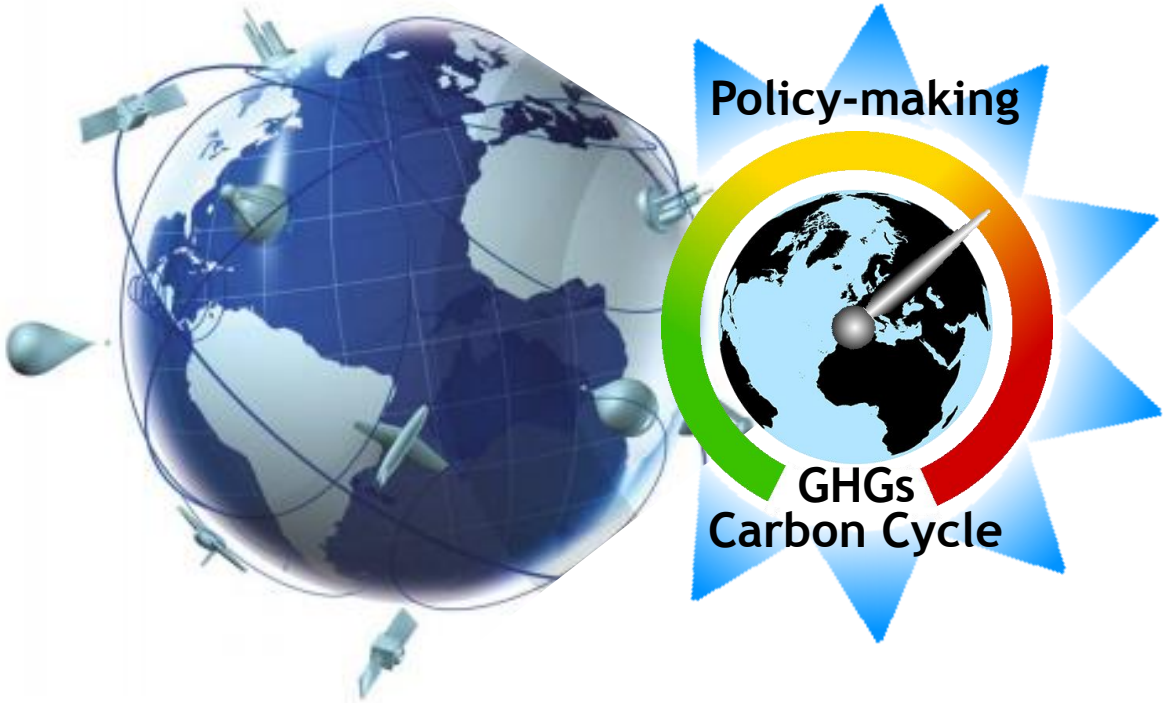
GEO CARBON AND GHG INITIATIVE

The GEO Carbon and GHG Initiative: Toward policy-relevant global carbon cycle observation and analysis

GEO-C Coordinator Jouni Heiskanen
GEO-C Secretariat & ICOS ERIC Head Office
A Bombelli, A Obregon, JH Butler, JG Canadell, P Ciais, P DeCola, AJ Dolman, RM Duren, T Fujimoto, S Houweling, R Jackson, RM Key, D-G Kim, WL Kutsch, H Loescher, H Muraoka, B Pfeil, SE Plummer, N Saigusa, K Shiomi, RJ Scholes, A Shvidenko, V Sivakumar, R Suzuki, T Tanhua, M Telszewski, AT Vermeulen, L Yi

Helsinki, 23 May 2018

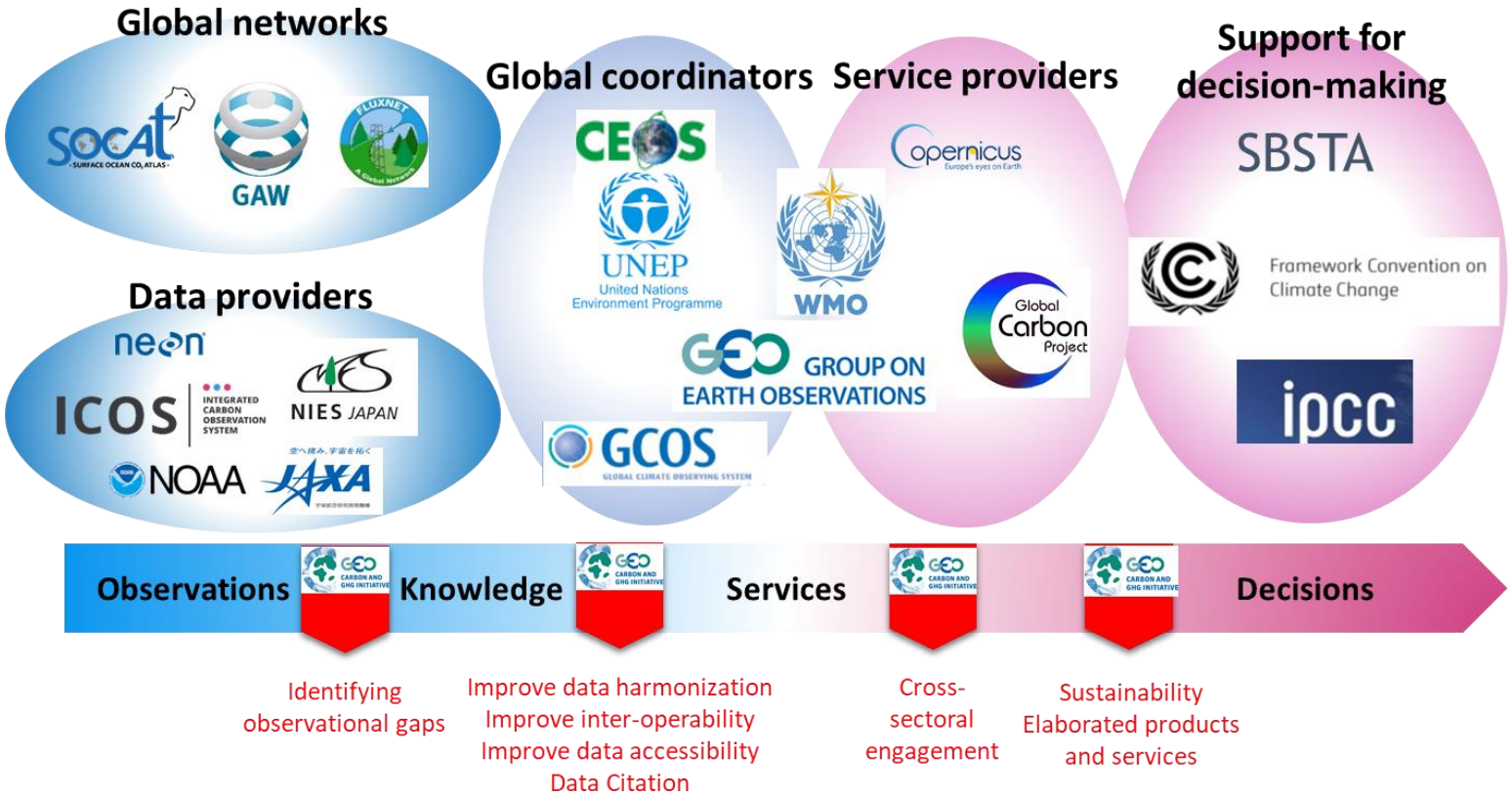
VISION



ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

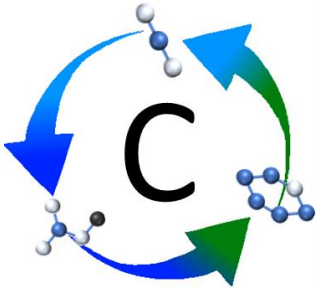
From Observations to Decisions



ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

Fragmented landscape



Carbon Cycle

Climate Change

Ecosystems Oceans Atmosphere Gases Aerosols Human activities Natural processes

Very diverse scientific domains that need specialized approaches

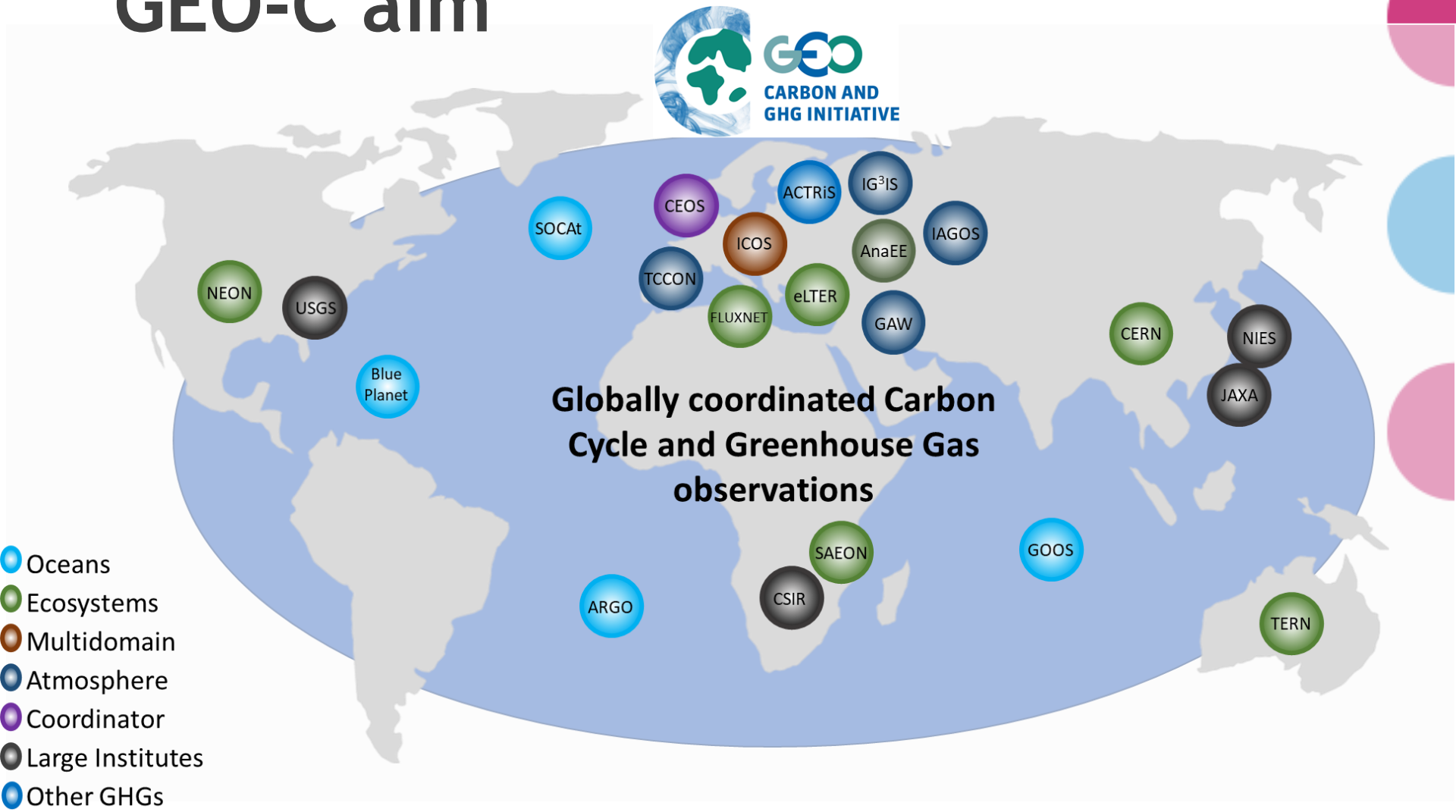
NEON
FLUXNET
eLTER
GOOS
SOCAt
Blue Planet
ARGO
IG³IS
GAW
IAGOS
USGS
TCCON
ICOS
ACTRiS
NIES
CEOS
AnaEE
JAXA

… and many others!

ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

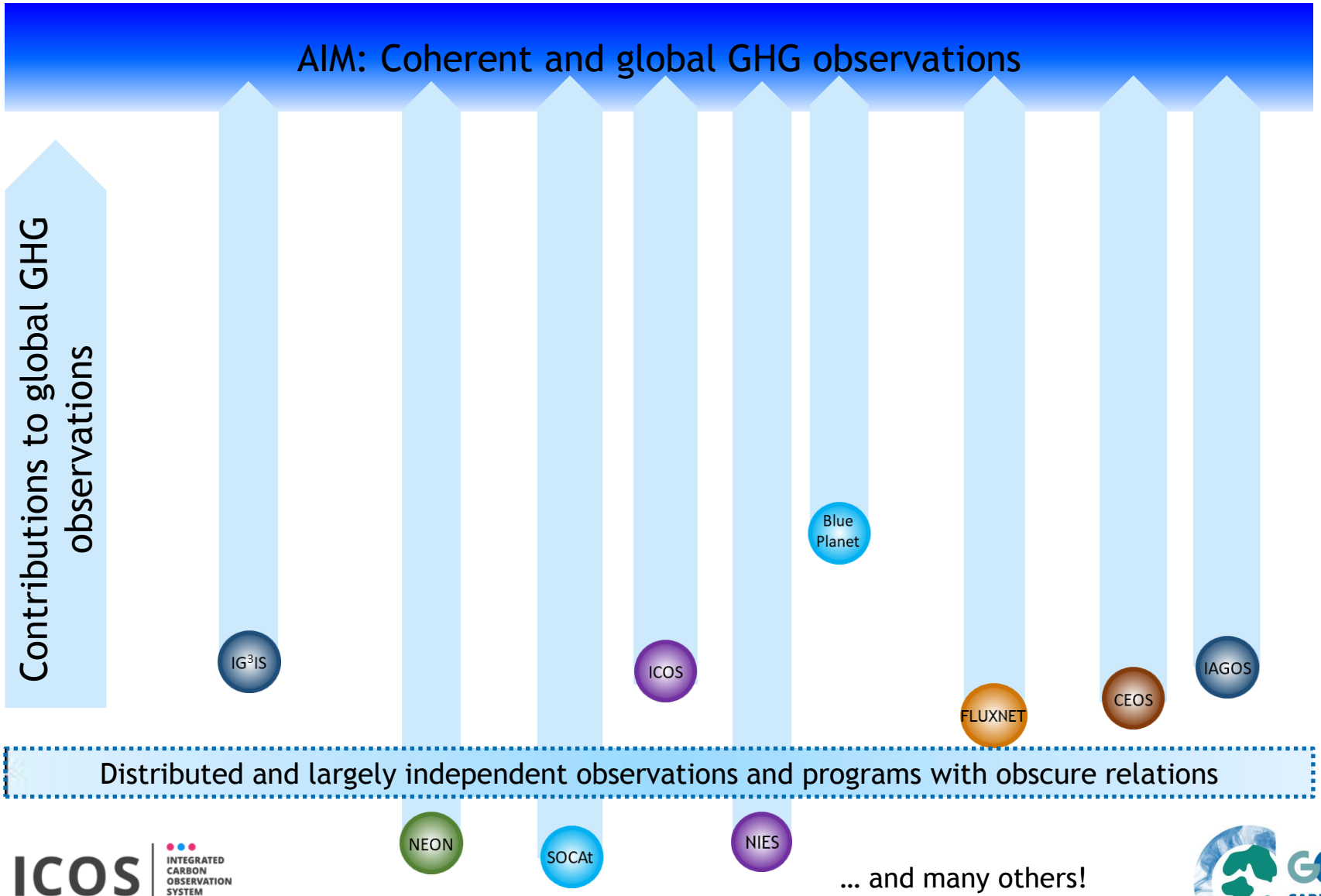
GEO-C aim



ICOS INTEGRATED CARBON OBSERVATION SYSTEM

CARBON AND GHG INITIATIVE

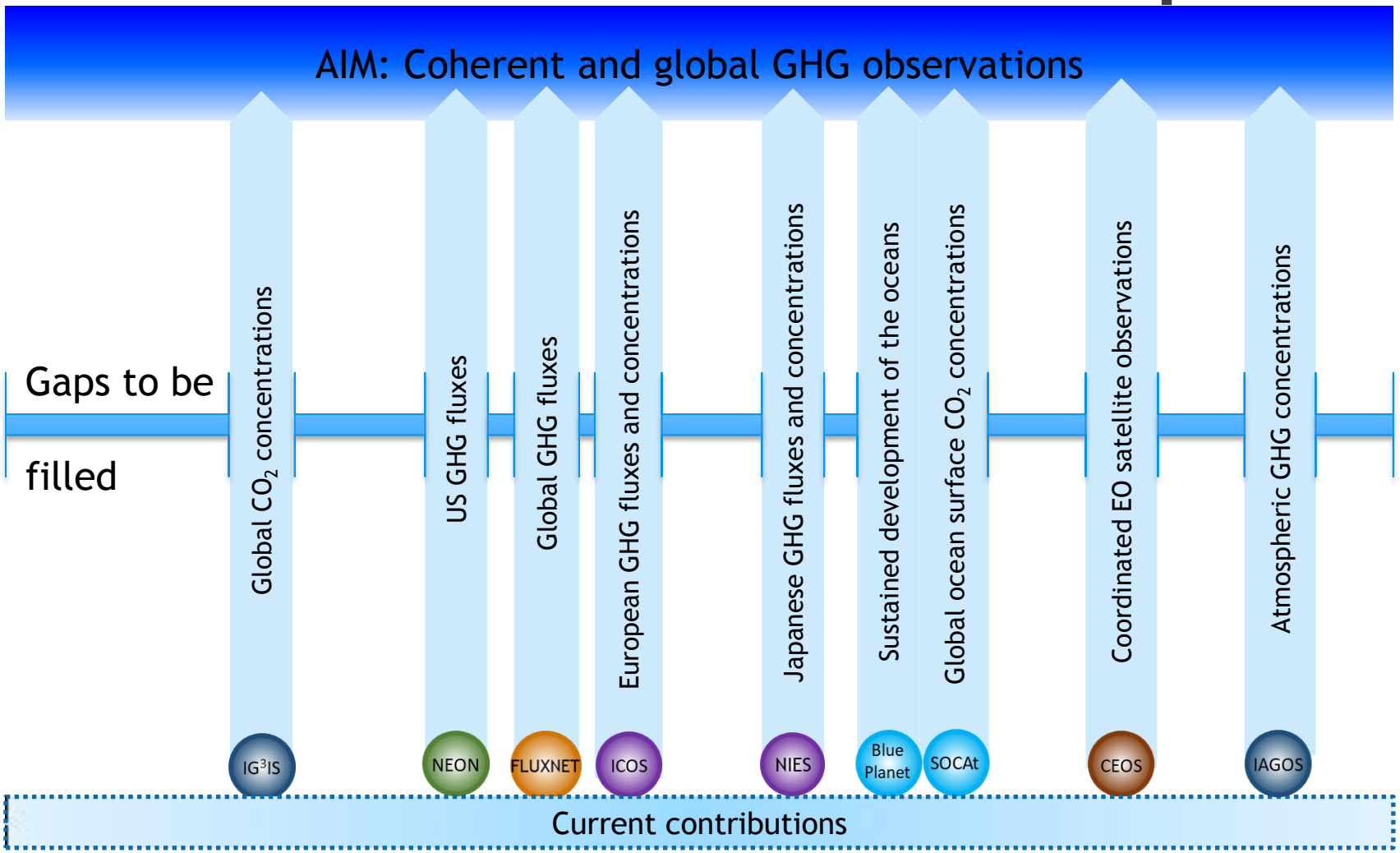
Current situation



ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

GEO-C's role: follow landscape

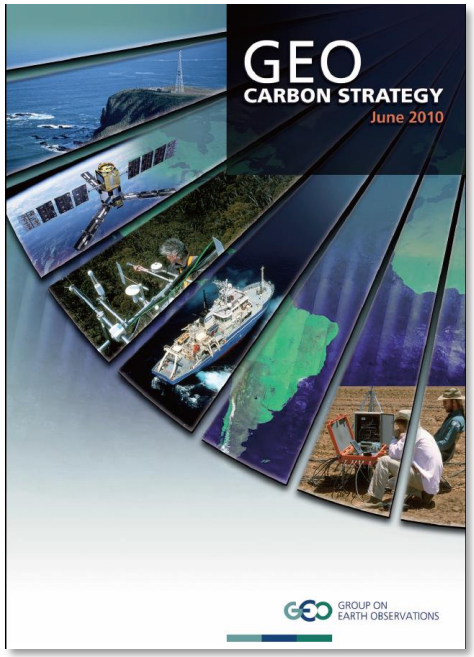


ICOS INTEGRATED CARBON OBSERVATION SYSTEM

… and many others!

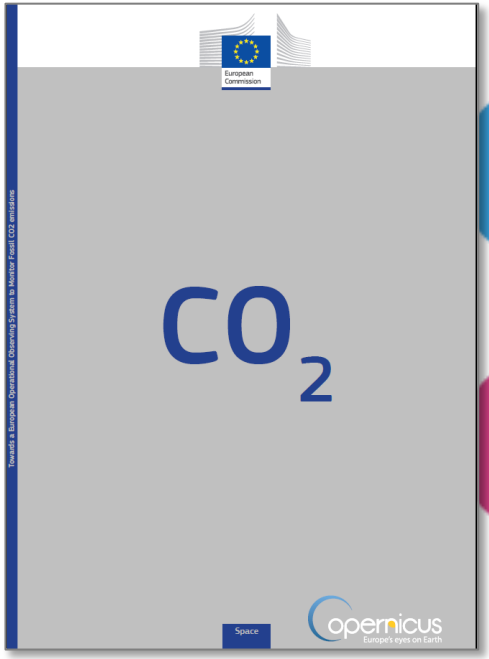
GEO CARBON AND GHG INITIATIVE

Background of the GEO Carbon and GHG Initiative



"GEO through its Members and Participating Organizations, has begun work to implement a global carbon observation and analysis system… to provide high quality information on carbon dioxide (CO_2) and methane (CH_4)…"

"…a response to the *GEO Carbon Strategy*. It details the adequacy of past, present, and planned satellite measurements of carbon in the land, oceans and inland waters, and atmosphere domains to support GEO…"



"Improve the inter-operability with other carbon observation systems, contributing to the new GEO Strategy and the new GEO 10 years Implementation Plan (IP) for 2016-2025."

ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

Type of gaps identified

1. Access to existing data
2. New data using existing stations
3. New stations for new data
4. Developing technical and scientific methodology
5. Sustained observations and products
6. Data architecture to bind these all together

ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

Identified gaps specified

- Improve fossil fuel GHG emission estimates
- Improve estimation of carbon capture and export in the ocean
- Improve satellite data accessibility
- Improve carbon pool estimates
- Decadal carbon pool monitoring
- Develop spatial scaling techniques for pCO_2 and land flux observations
- Develop space measurements of global GHG distributions
- Data architecture for combination of different data streams
- Increase the density and geographical coverage of in situ networks

ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

GEO-C's role: support and build on existing efforts

Existing efforts
- Data sources
- Data infrastructures (portals)
- Data tools (software, codes)
- Elaborated products (models, visualisations)

Existing actors
- RIs
- Communities
- Institutes
- Programs
- Initiatives

Existing practices
- GEOSS Data Sharing Principles
- ICOS Measurement Standards
- EU guidelines (e.g. Inspire directive)
- Cross-domain integration

Many necessary things are already present,
mutual benefits and joint actions need to be identified and promoted

ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

Benefits of GEO-C

- Way to contribute to the Paris Agreement challenges
- Scientists benefit from easier access to different data streams
- More use for ‘own’ data and services
- Opportunities for collaboration
- Learn from others, improve operations
- Good for the image
- Opportunities for funding

ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

Summary of GEO-C contributions

- follow the landscape and identify current efforts and their relations
- identify and facilitate needed projects
- promote and support existing efforts
- explore cross-domain and cross-societal-sector opportunities

ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

Outcomes in 2017-2018

Steering Committee and Secretariat established

GEO-C Steering Committee:

Han Dolman (Netherlands) / Chair
Werner Kutsch (ICOS) / Co-Vice Chair
Hiroyuki Muraoka (Japan) / Co-Vice Chair
Steven Volz, Alternate: Pascal Lecomte (CEOS)
Mauro Facchini, Alternate: Mark Dowell (EC)
Carolin Richter (GCOS)
Phil DeCola (IG3IS)
Kiyoto Tanabe (IPCC TFI)
Joanna Post (UNFCCC)
Deon Terblanche (WMO)
Bob Scholes (South Africa)
Pep Canadell (Global Carbon Project)

GEO-C Secretariat:

Jouni Heiskanen (ICOS, Host)
Antonio Bombelli (Italy)
Nobuko Saigusa (Japan)
Andre Obregon (GEO Secretariat)

Outcomes of 1st Meeting (2/2/2018)

- Appointment of governance positions
- Agreement to develop a White Paper for GEO-C including a common roadmap

Major short-term outputs

- Provide a global forum for formal and informal discussions to identify the complementary roles and responsibilities within the carbon observation landscape;
- Map the carbon observations landscape, with the goal to support planning, outreach and communication efforts;
- Identify observational and modelling requirements to define requirements for an integrated global carbon monitoring system;
- Improve policy science interface, with the aim to produce rapid feedback in both directions.
- Identify current contributions from key actors, which leads to identification of existing gaps;
- Jointly agree on roadmap to reach goals;
- Establish common terminology;
- Explore cross-boundary opportunities between science and society.

ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

THANK YOU FOR YOUR ATTENTION!




ICOS INTEGRATED CARBON OBSERVATION SYSTEM

GEO-C Coordinator, Dr. Jouni Heiskanen, jouni.heiskanen@icos-ri.eu,
www.icos-ri.eu/geo-c

GEO CARBON AND GHG INITIATIVE