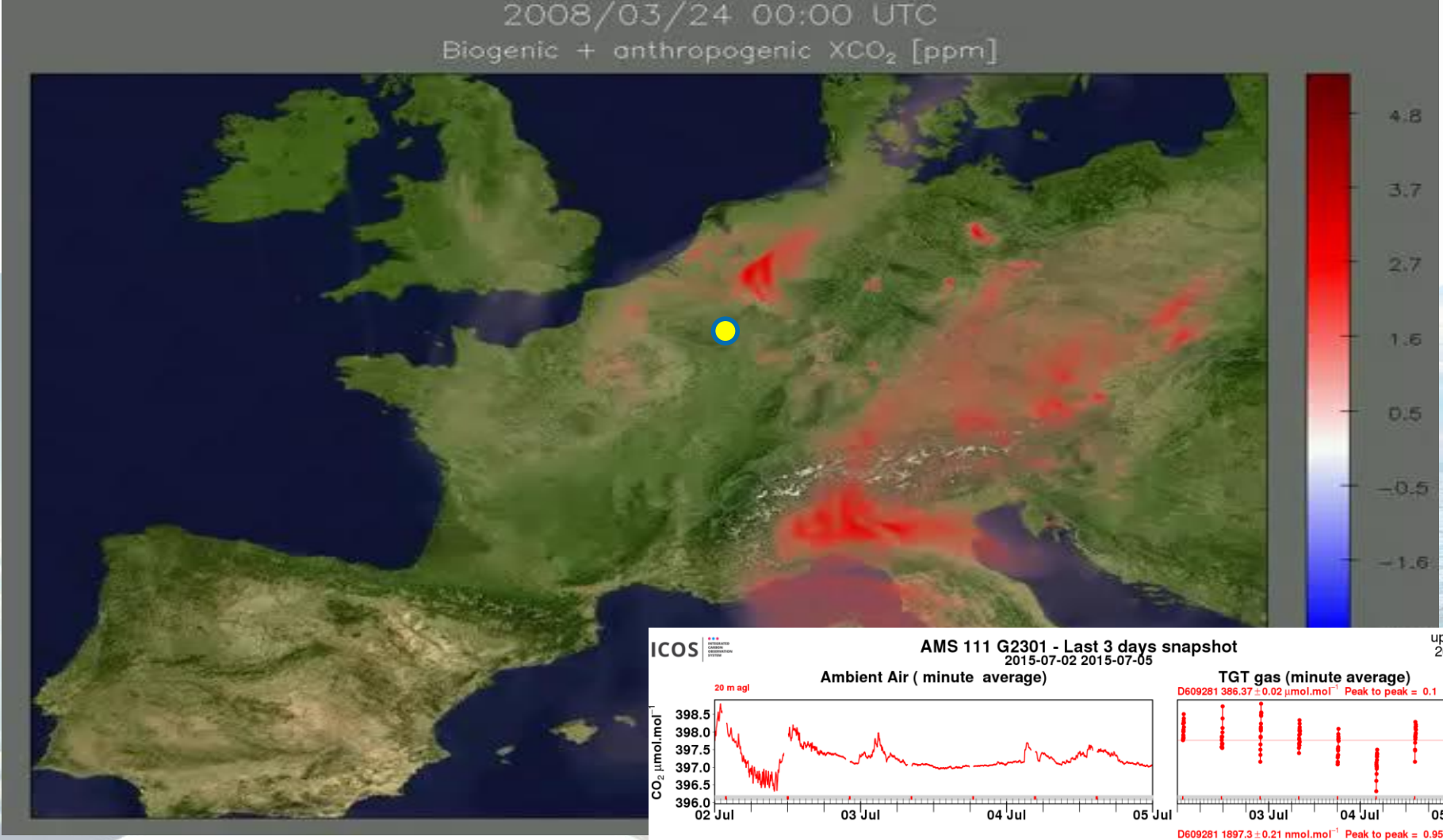
ICOS | INTEGRATED CARBON OBSERVATION SYSTEM

GEO CARBON AND GHG INITIATIVE

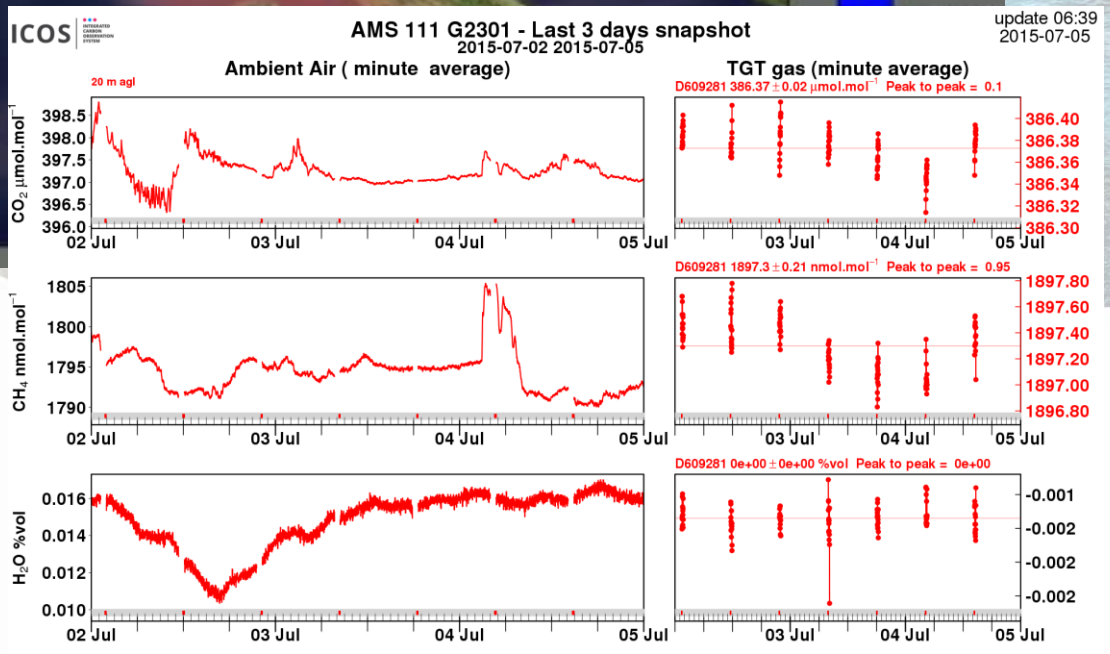
The GEO initiative on Carbon and Greenhouse Gases: Integration across domains

Werner L. Kutsch, Director General, ICOS ERIC

UNFCCC EarthInfoDay, Marrakech, 8. November 2016



Simulation of total column CO_2 (XCO_2)
over Europe 20 Mar – 30 Apr 2008 at
7 km x 7 km resolution
Animation by Dominik Brunner (Empa),
model simulation by Yu Liu and Nicolas Gruber (ETH)



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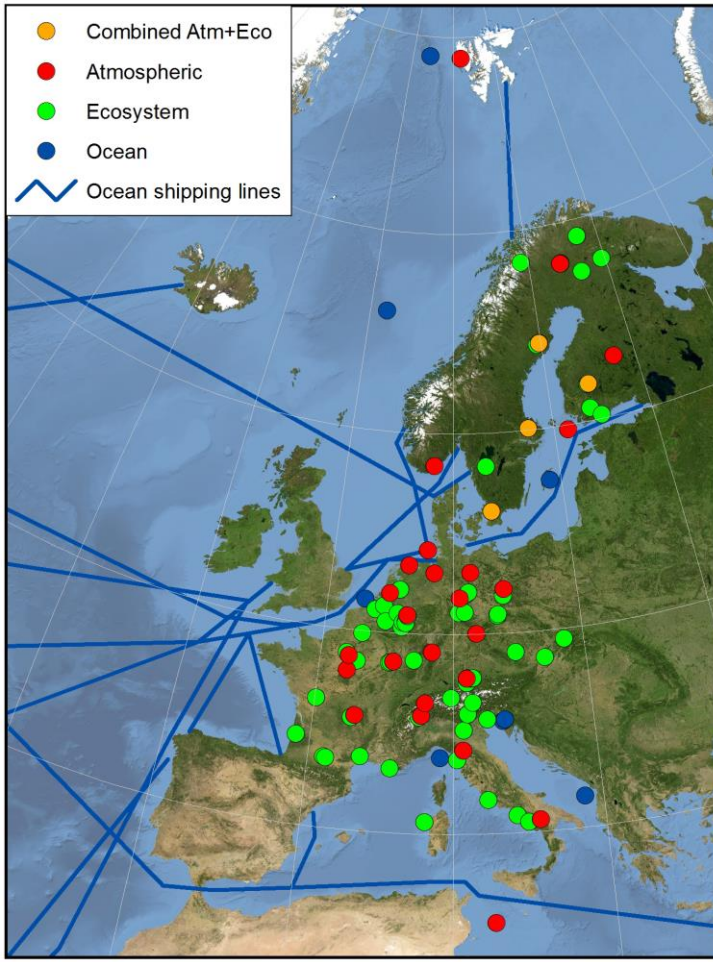
The Integrated Carbon Observation System
A European Research Infrastructure



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Starting with a vision: A global observation system on carbon and GHG fulfilling the needs of the 21. Century

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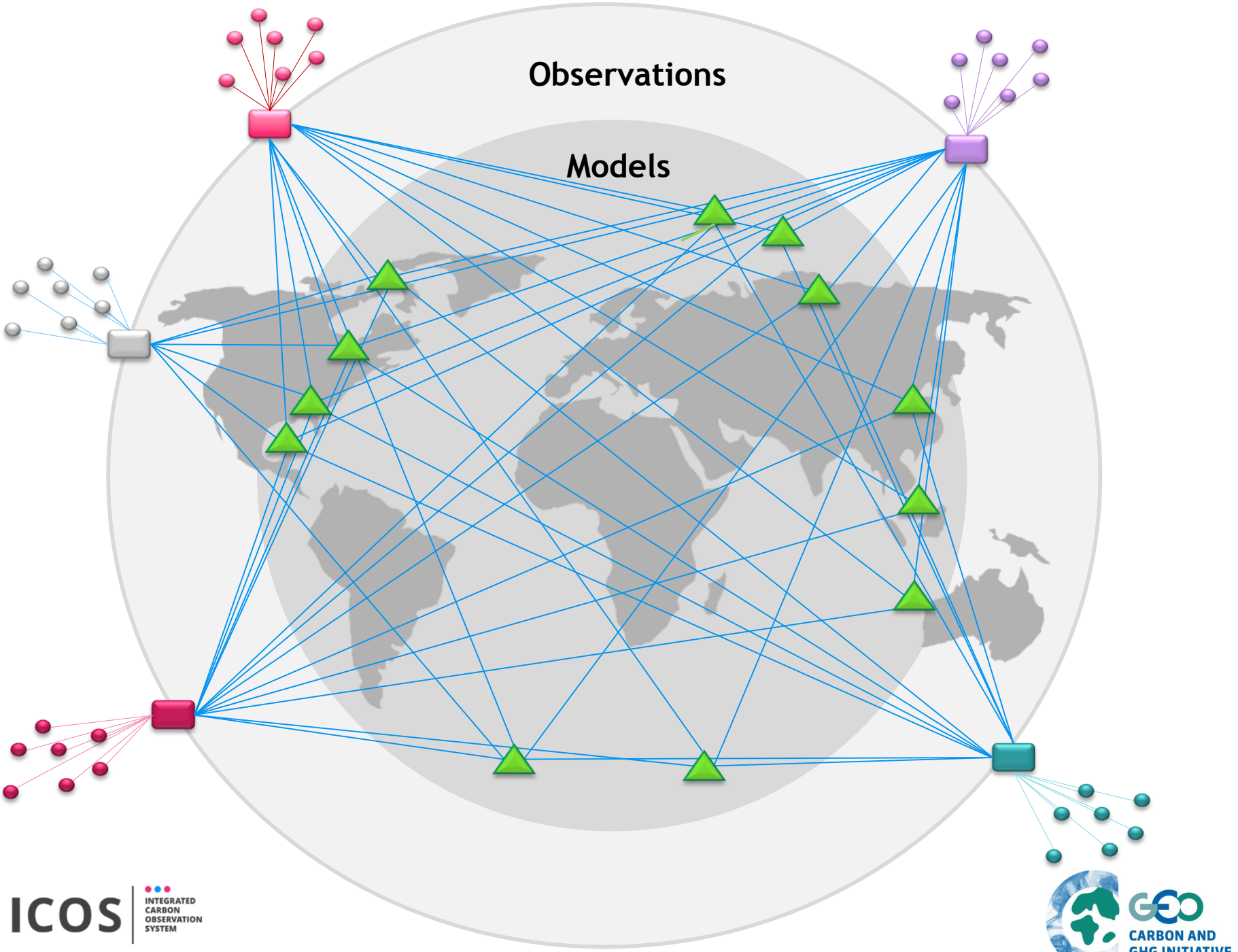

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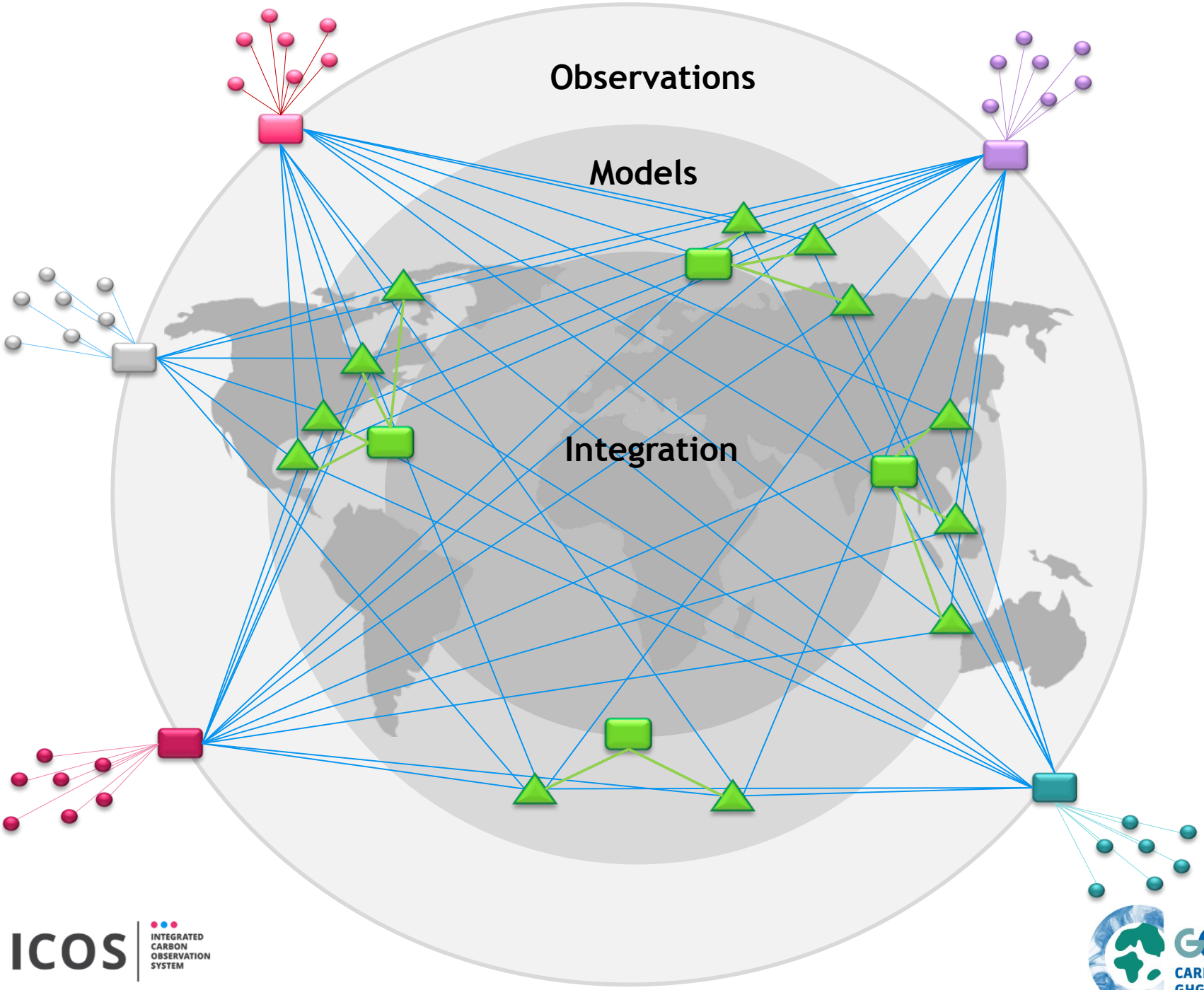

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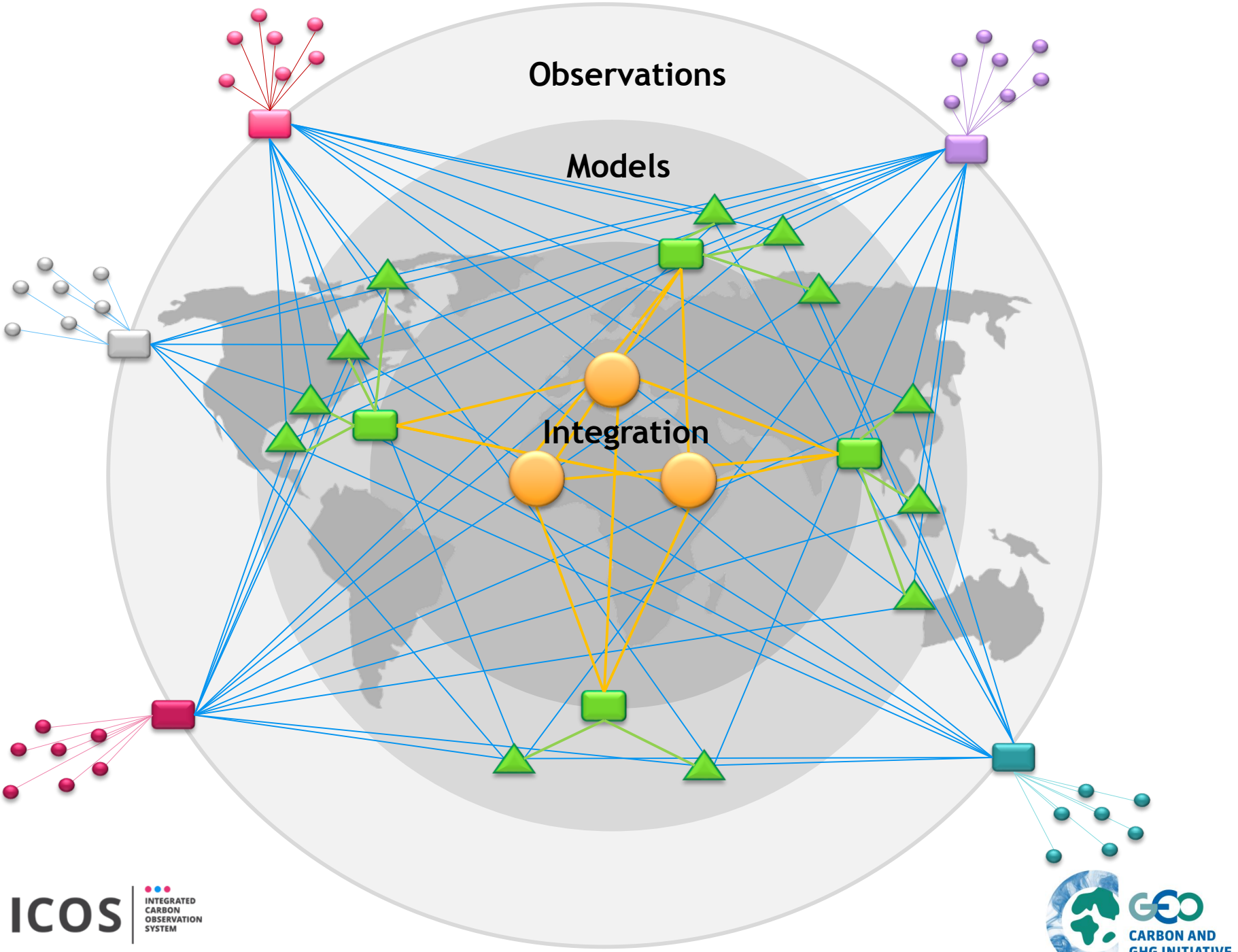

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GEO CARBON AND GHG INITIATIVE

From Observations to Decisions

Communication

SBSTA

Framework Convention on
limate Change

Observations **Services** **Knowledge** **Decisions**

Identifying observational gaps

Data sharing
management (incl. metadata)

Improve data harmonization
Improve inter-operability
Improve data accessibility
Data Citation

From data to
knowledge

Model-Data

Sustainability

Capacity building

Activities of the GEO Carbon and GHG Initiative

Task 1 - User needs and policy interface:

to engage with users and policy makers and ensure the consistency with their evolving needs in order to drive the activities of the GEO Carbon and GHG Initiative and address the policy agenda.

Task 2 - Data access and availability:

to provide long-term, high quality and open access near-real-time data and data products, complying with the GEOSS principles, from a domain-overarching carbon cycle and GHGs monitoring system.

Task 3 - Optimization of observational networks:

to develop and implement a procedure for achieving observations of identified essential carbon cycle variables within user-defined specifications and at minimum total cost.

Task 4 -Budget calculations and breakdown across scales:

To support the development of consistent budgets of GHGs (CO_2, CH_4, and N_2O) across scales using a combination of observations, inventories, models and data assimilation techniques.

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GEO-XII Plenary & Ministerial Summit
Mexico City 9-13 November 2015

- Ministerial Declaration that focuses on harnessing critical environmental observations
- Adoption of a ten year Strategic Plan (2016-2025)

*"GEO will supply the requisite Earth observations in **support of effective policy responses** for **climate change adaptation, mitigation** and other impacts across the SBAs."*

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New Societal Benefit Areas (SBAs)

Climate change and its impacts cut across all SBAs

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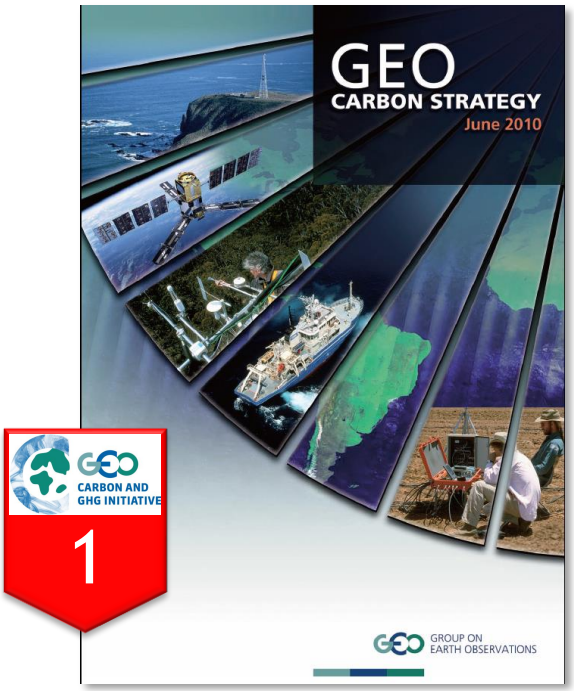
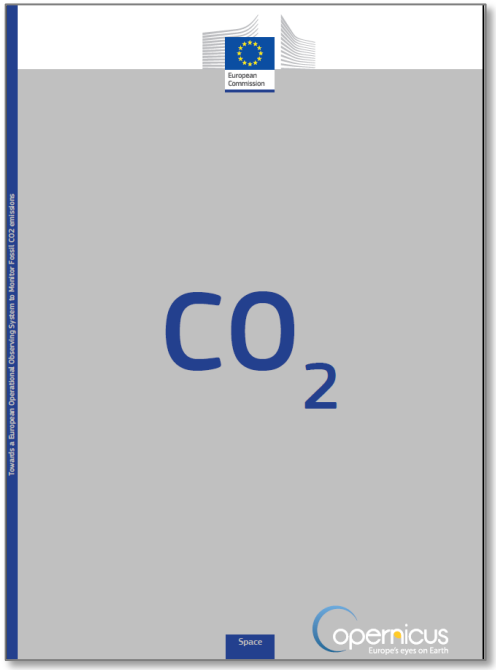
Background of the GEO Carbon and GHG Initiative



"GEO through its Members and Participating Organizations, has begun work to implement a global carbon observation and analysis system addressing the three components of the carbon cycle (atmosphere, land and ocean) to provide high quality information on carbon dioxide (CO_2) and methane (CH_4) concentrations, and emission variations."

"This report, the *CEOS Strategy for Carbon Observations from Space*, is a response from the Committee on Earth Observation Satellites (CEOS) 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."

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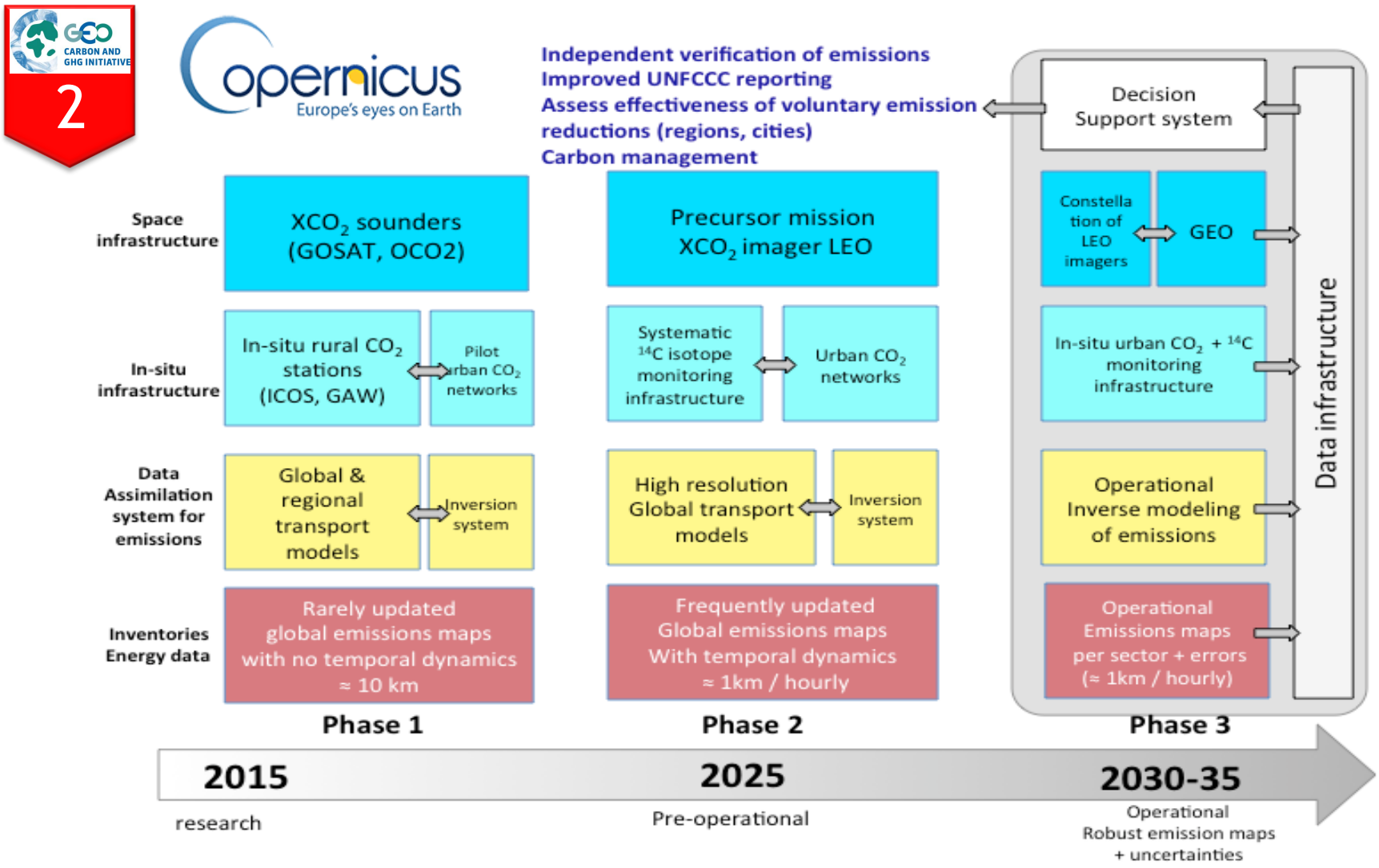
COPERNICUS CONCEPT FOR A VERIFICATION SYSTEM
(CIAIS ET AL. 2015)



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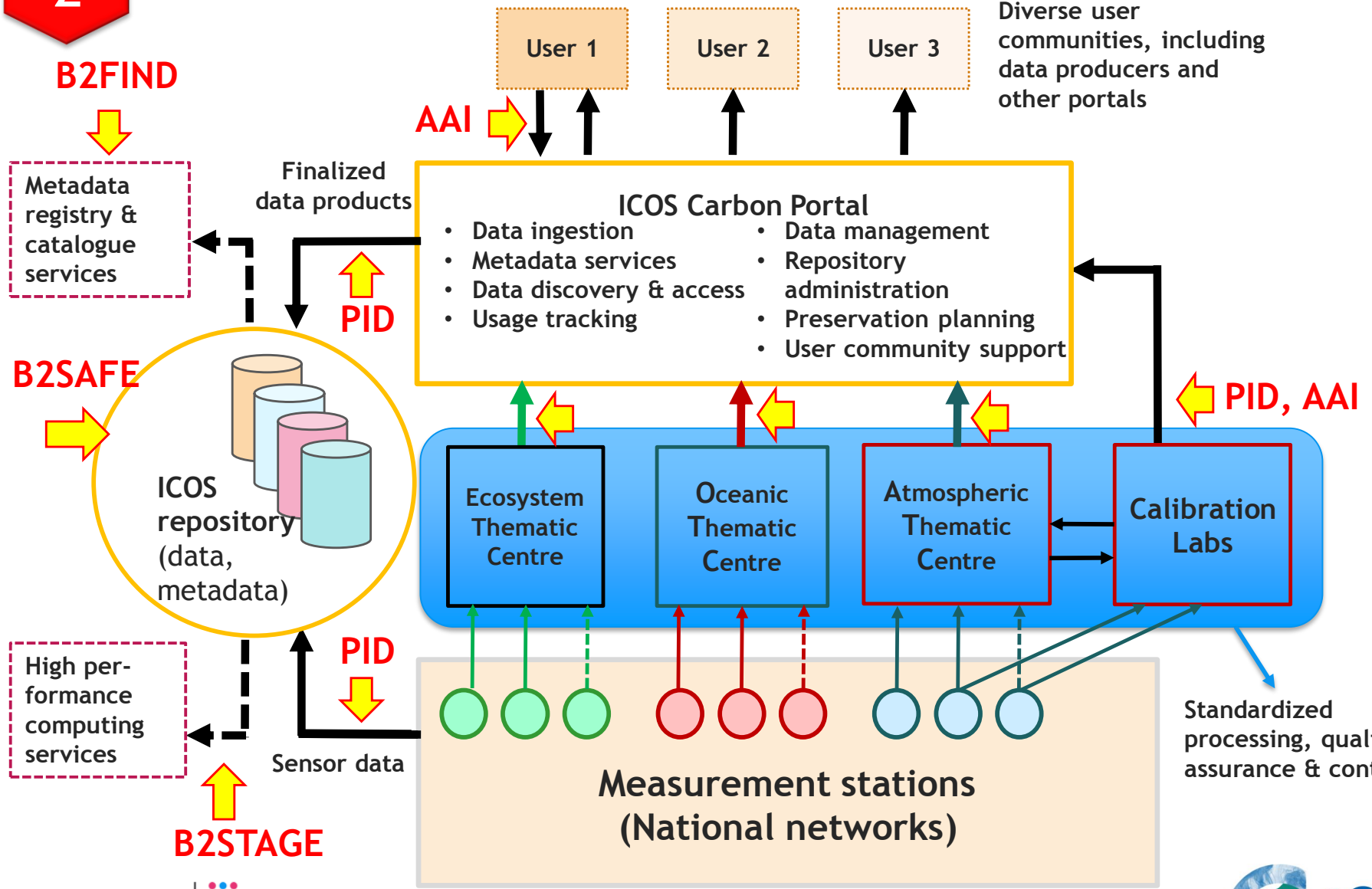
The Data life cycle of ICOS



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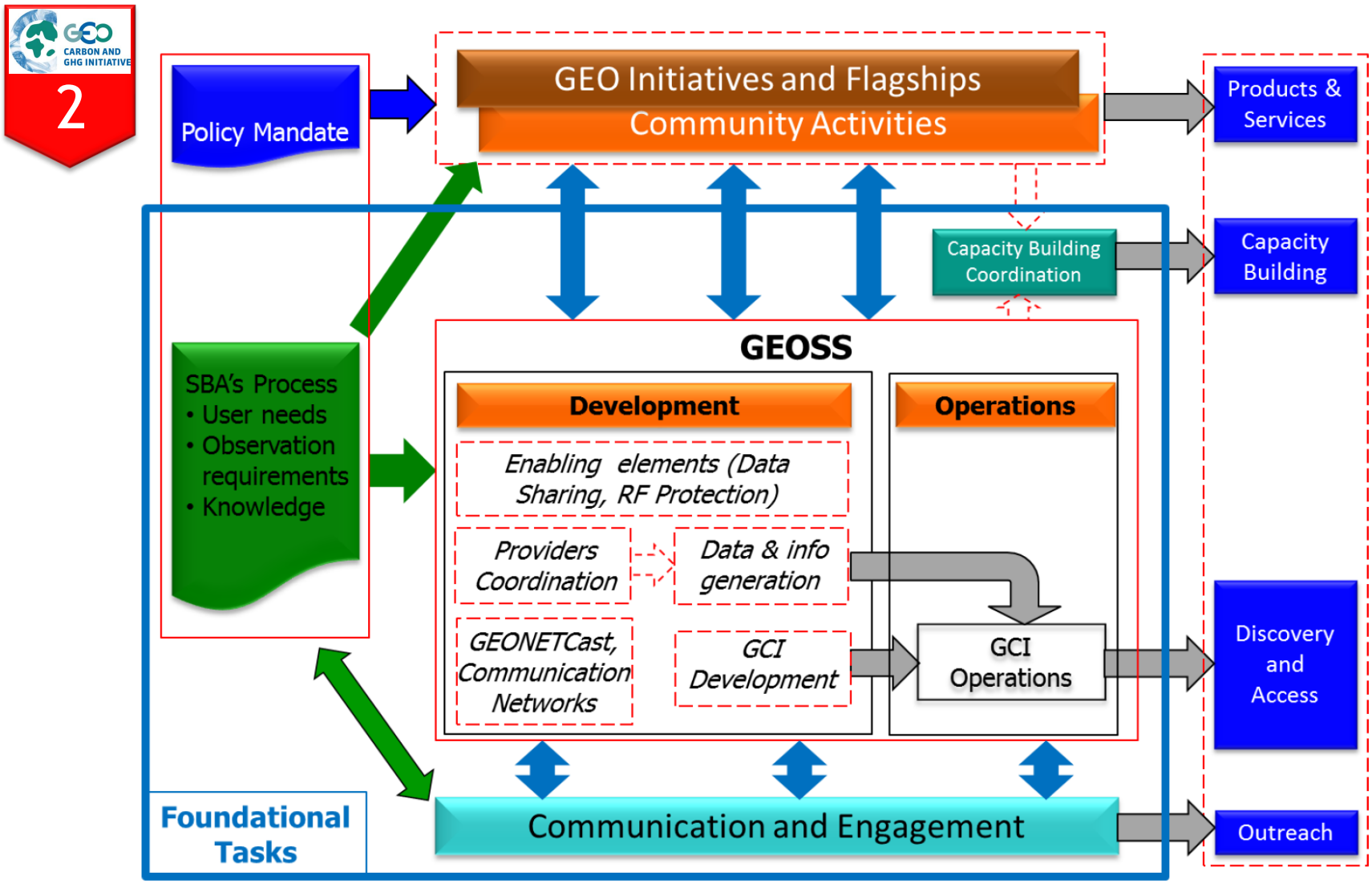
Task 2 - Data access and availability: the GEO workflow



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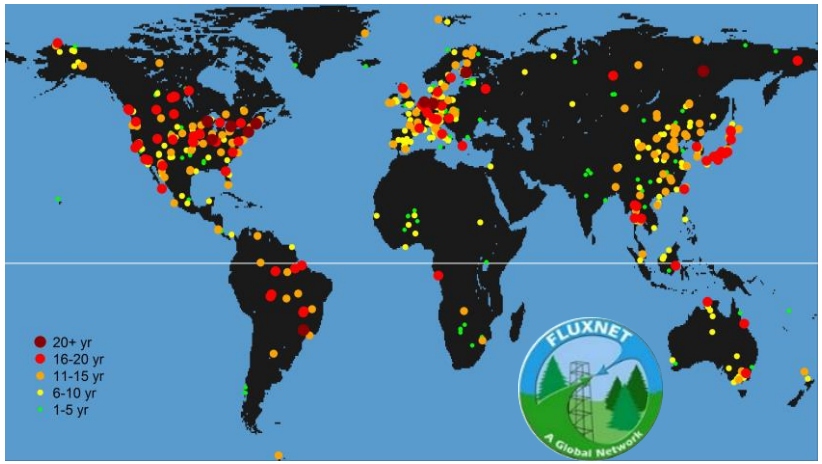
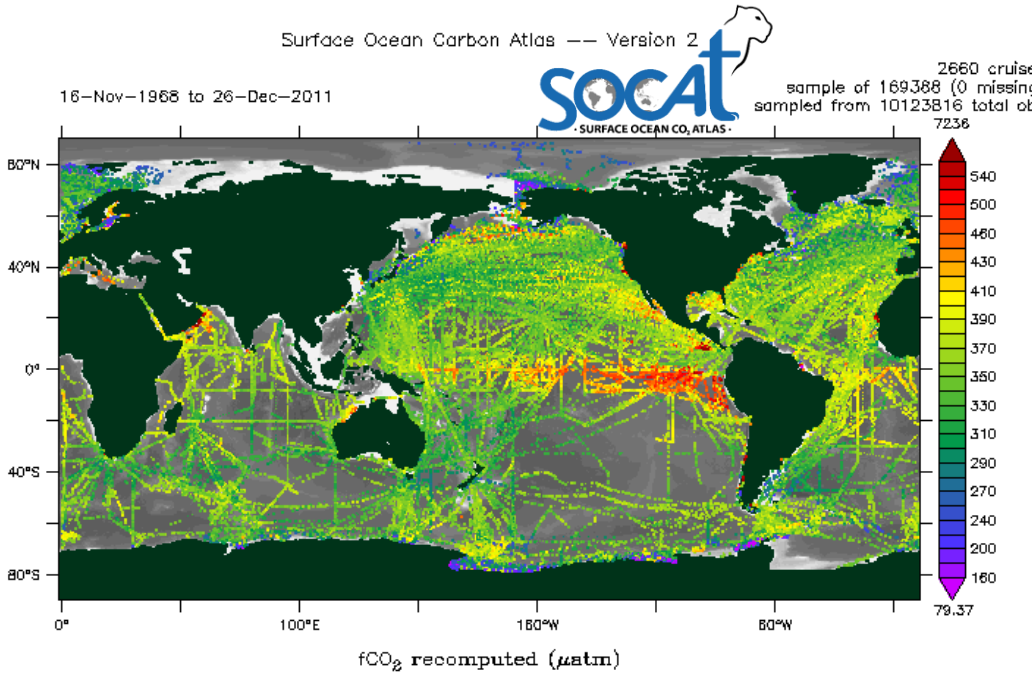
Task 3 - Optimization of observational networks:





- Closing spatial observational gaps
- Supporting new technologies and concepts
- Translating user needs to observational concepts.

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Features of the GEO Carbon and GHG Initiative

A framework / platform for cooperation

that is seeking integration across domains.

Builts on existing infrastructures

and supports their efforts to cooperate.

Providing opportunities

to optimize the data fabric from observations to decisions,

to identify geographical or conceptual gaps,

to gather additional resources from member countries.

Not running in parallel or duplicating other efforts

but seeking cooperation and communication.

THANK YOU FOR YOUR ATTENTION!

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