ICOS | INTEGRATED CARBON OBSERVATION SYSTEM

Greenhouse Gases don‘t respect borders

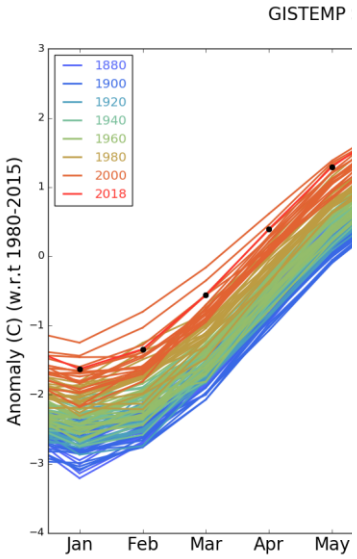
Global Cooperation on in situ GHG observations

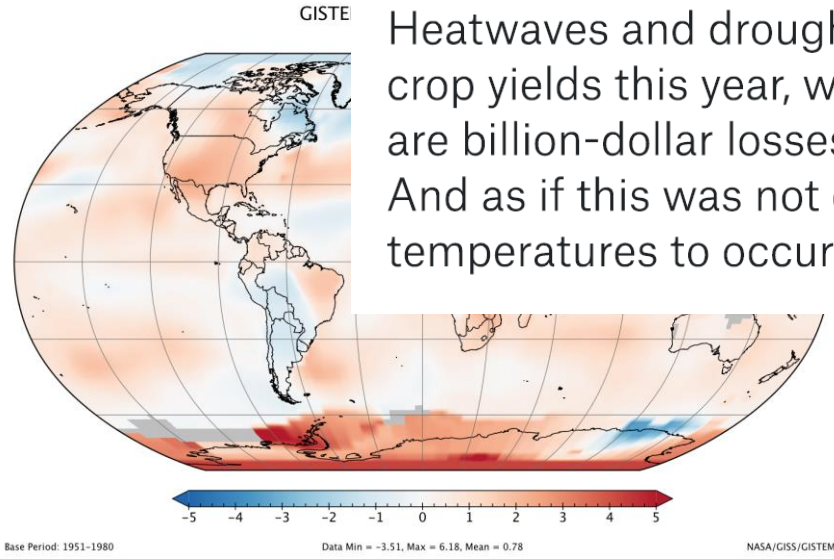
Dr Werner Leo Kutsch, Director General of ICOS ERIC, Helsinki, Finland, Europe

2018 – a year to see Climate Change at work:

pictures: dpa/Patrick Pleul

National Aeronautics and Space Administration
Goddard Institute for Space Studies





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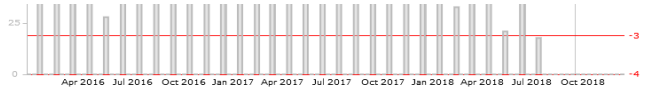
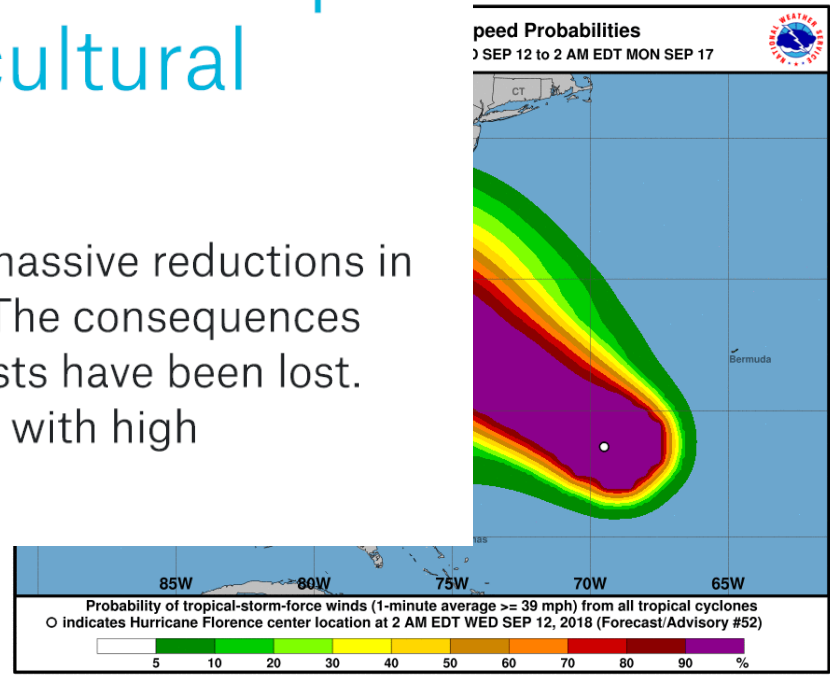
Munich RE

Climate Change

Heatwaves, drought and forest fires in Europe: Billions of dollars in losses for agricultural sector

Heatwaves and drought across large parts of Europe are causing massive reductions in crop yields this year, while forest fires are burning in Scandinavia. The consequences are billion-dollar losses for agriculture. In some cases, entire harvests have been lost. And as if this was not enough, scientists expect summer dry spells with high temperatures to occur more often in the future.





European Commission

EDO - European Drought Observatory

Emergency Management Service

opernicus
Europe's eyes on Earth

Fate of anthropogenic CO_2 emissions (2006-2015)

34.1 $GtCO_2$/yr

91%

Sources = Sinks

9%

3.5 $GtCO_2$/yr

16.4 $GtCO_2$/yr

44%

31%

11.6 $GtCO_2$/yr

26%

9.7 $GtCO_2$/yr

Source: CDIAC; NOAA-ESRL; Houghton et al 2012; Giglio et al 2013; Le Quéré et al 2016; Global Carbon Budget 2016

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GLOBAL CARBON PROJECT

GEO CARBON AND GHG INITIATIVE

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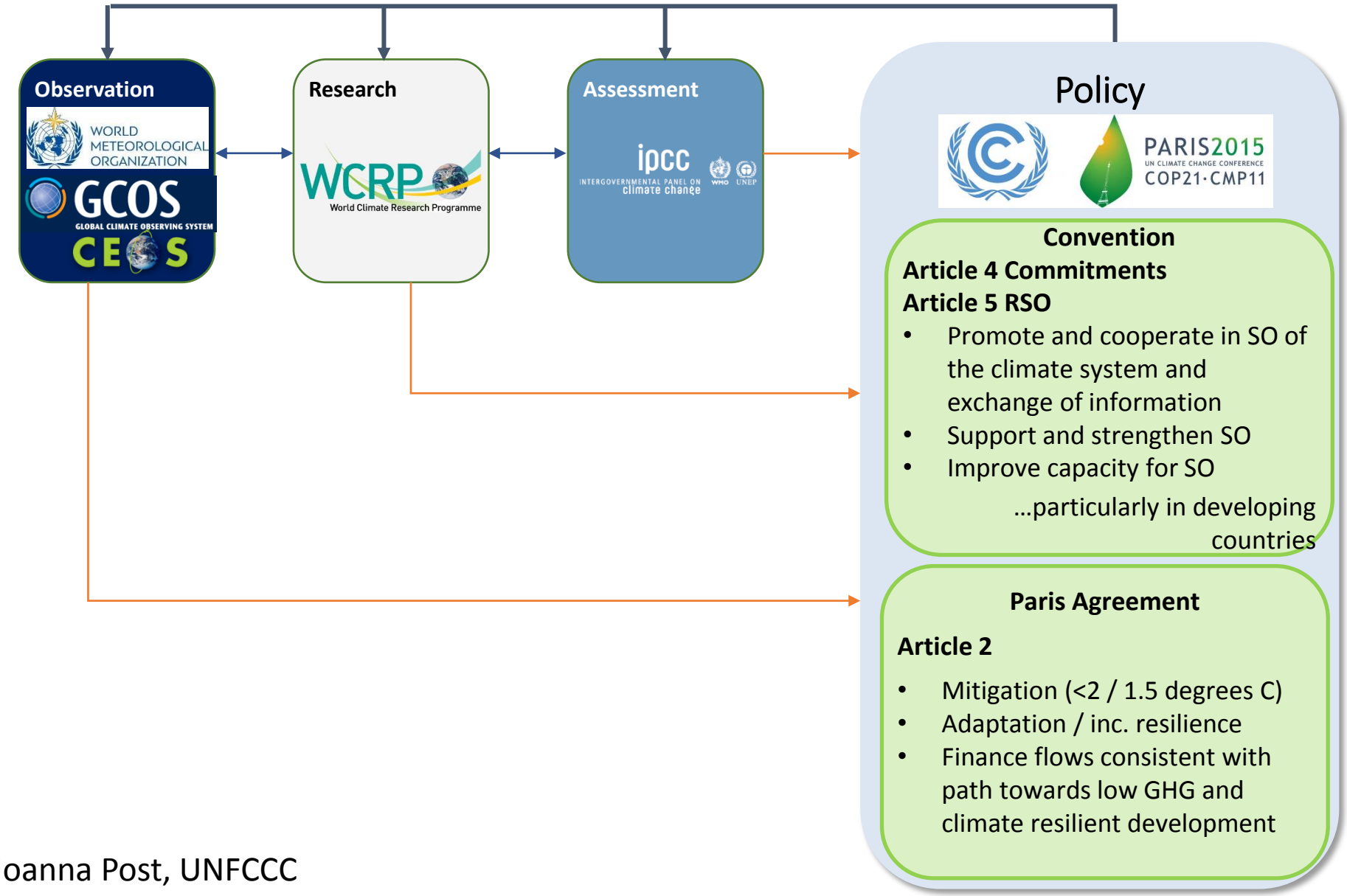
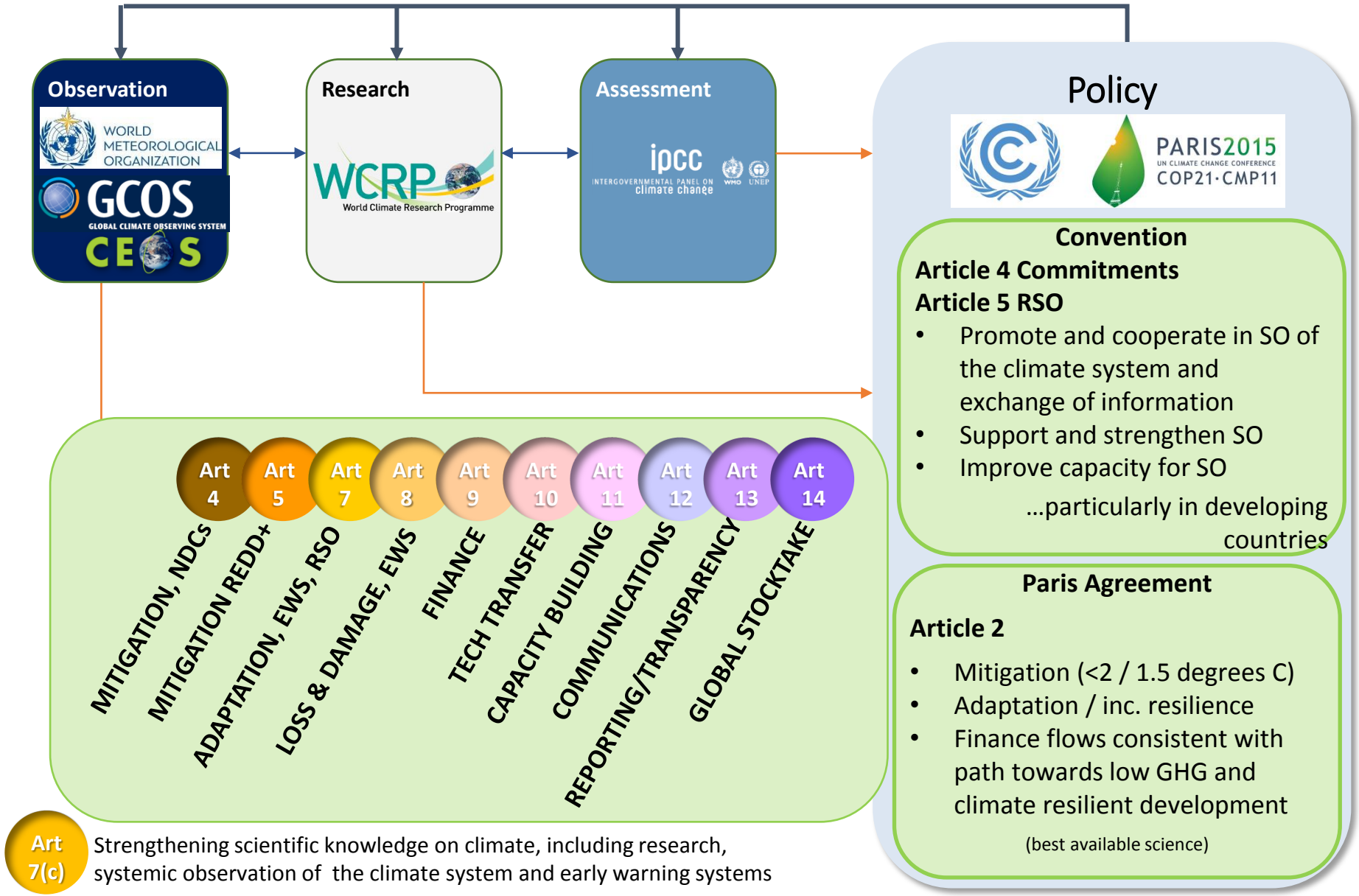
The new Paris paradigm | **Driving the climate agenda – closing the loop**



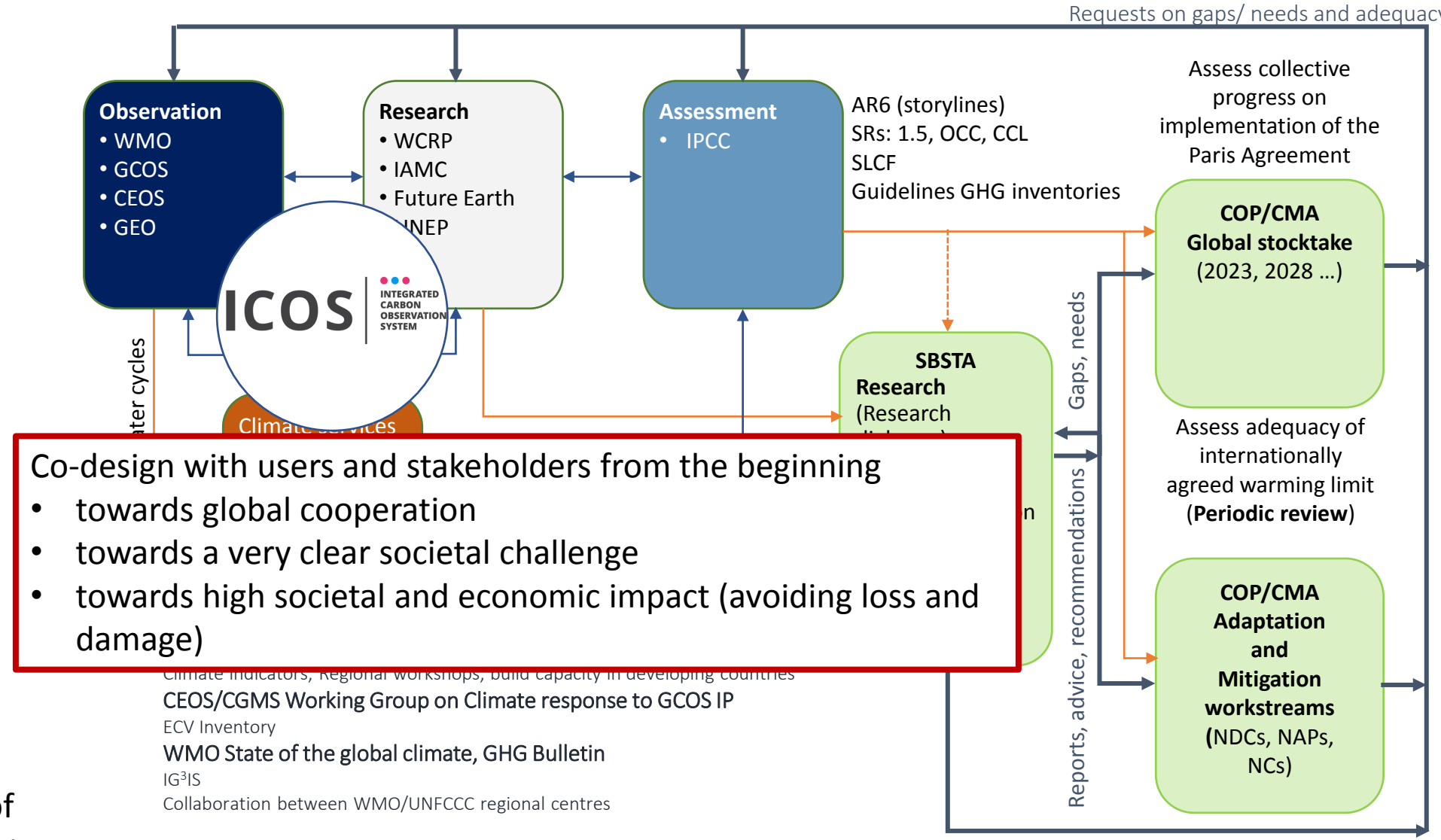
Courtesy of Joanna Post, UNFCCC

The new Paris paradigm | **Driving the climate agenda – closing the loop**



Courtesy of Joanna Post, UNFCCC

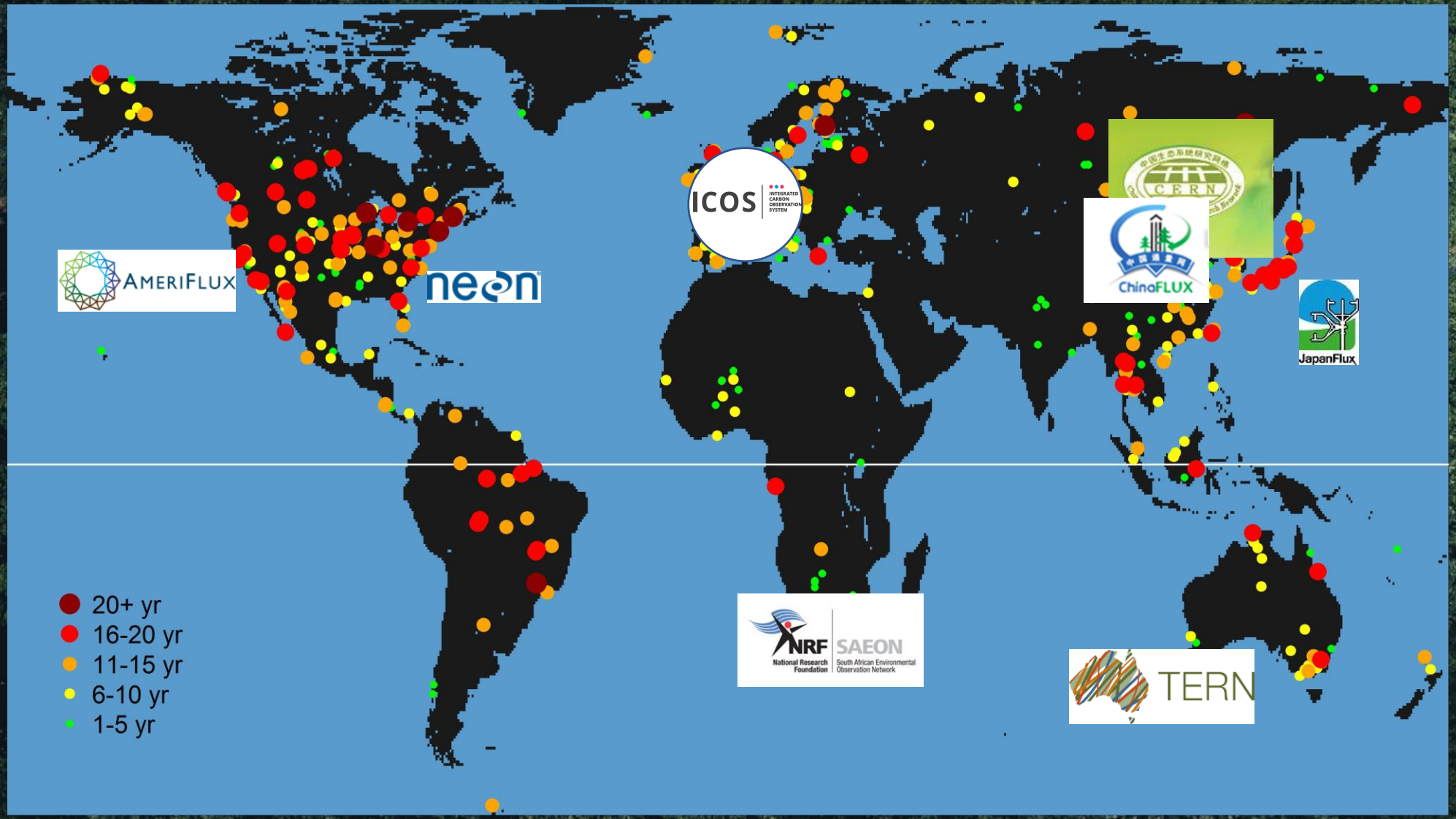
The new Paris paradigm:
From “policy driving policy” to“science driving policy” and “policy driving science”



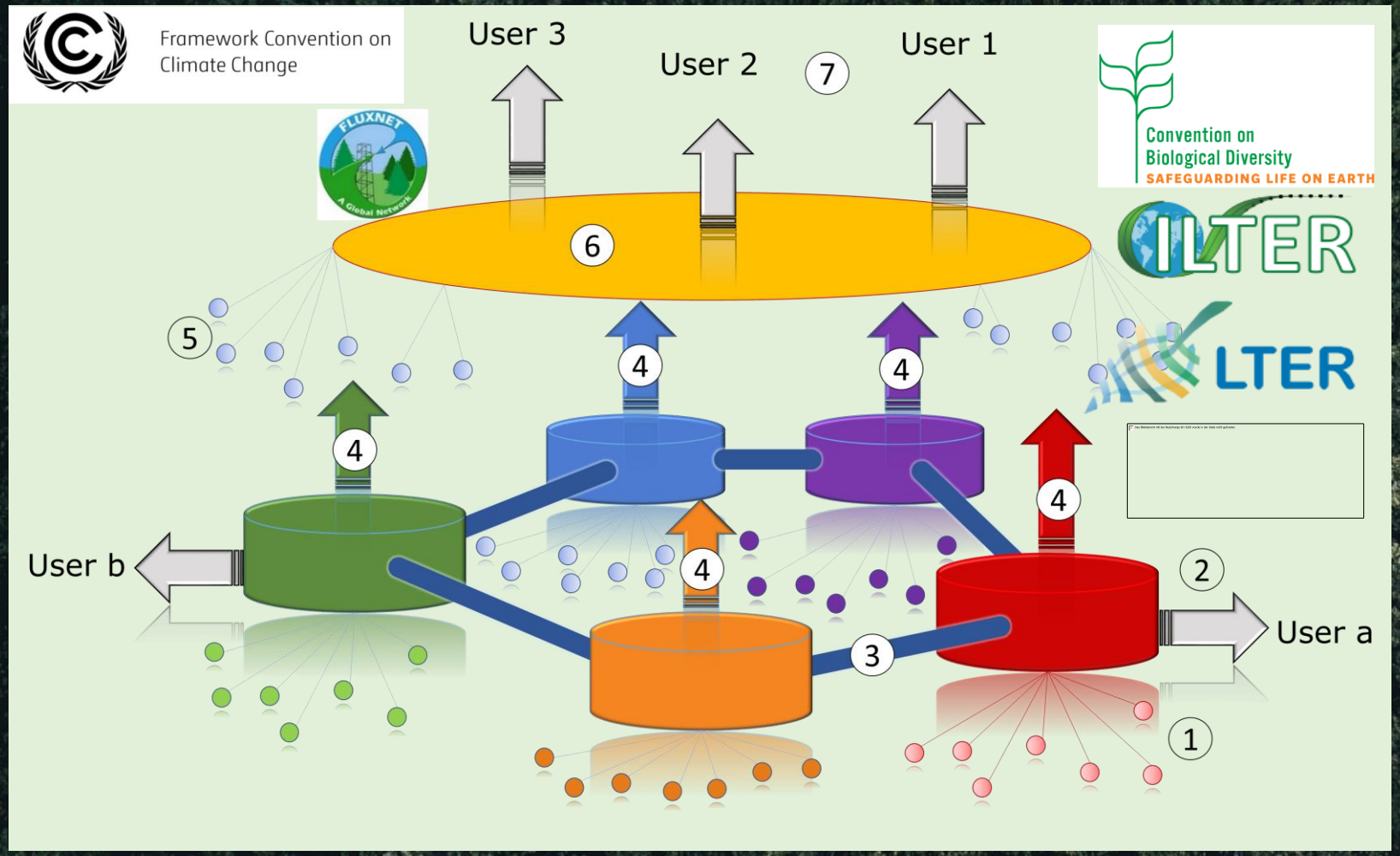
Courtesy of Joanna Post, UNFCCC

NDCs: Nationally Determined Contributions
NAPs: National Adaptation Plans
NCs: National Communications

Mechanisms for global cooperation, example 1: Ecosystems



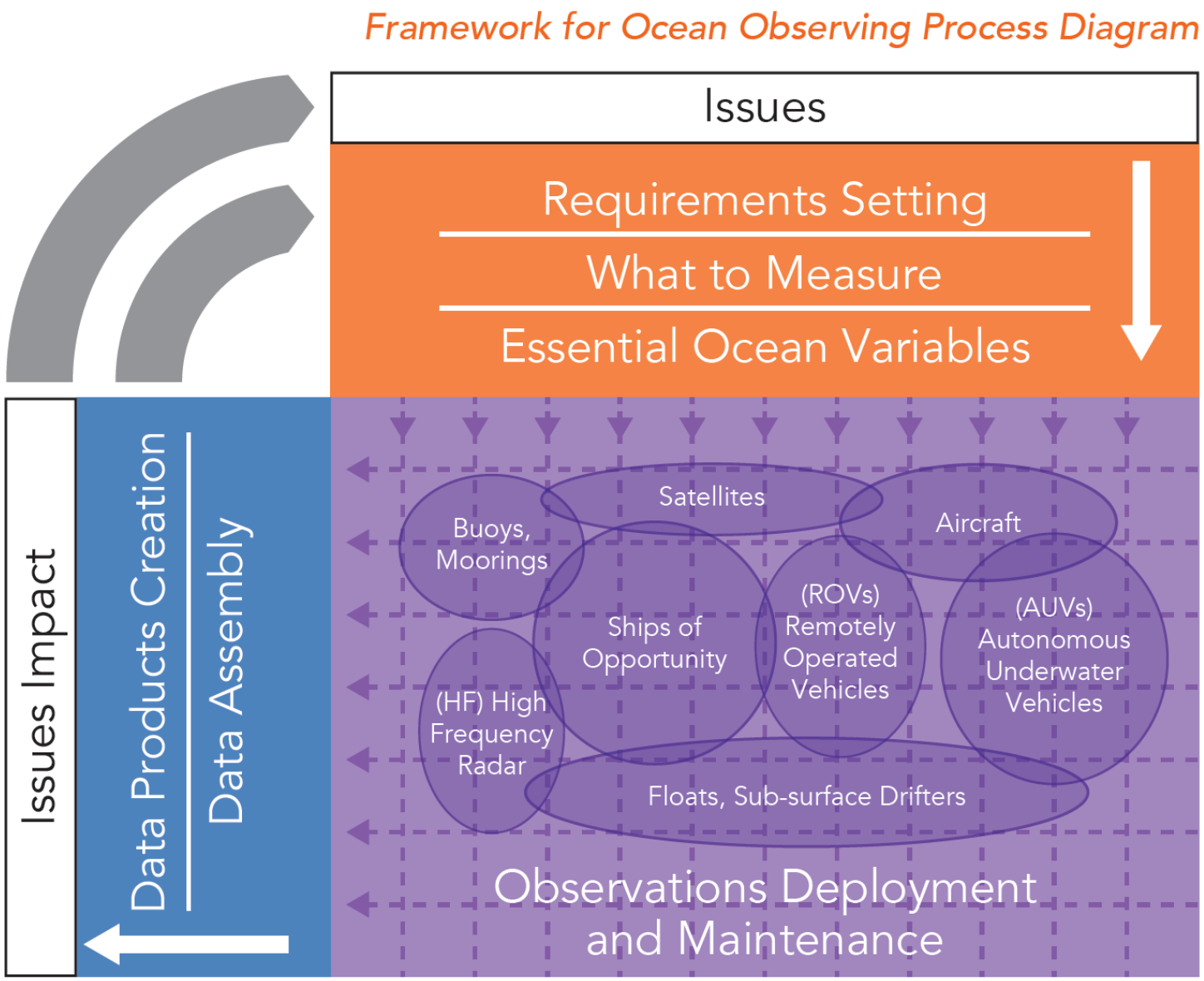
Global cooperation is organized along societal challenges and international conventions

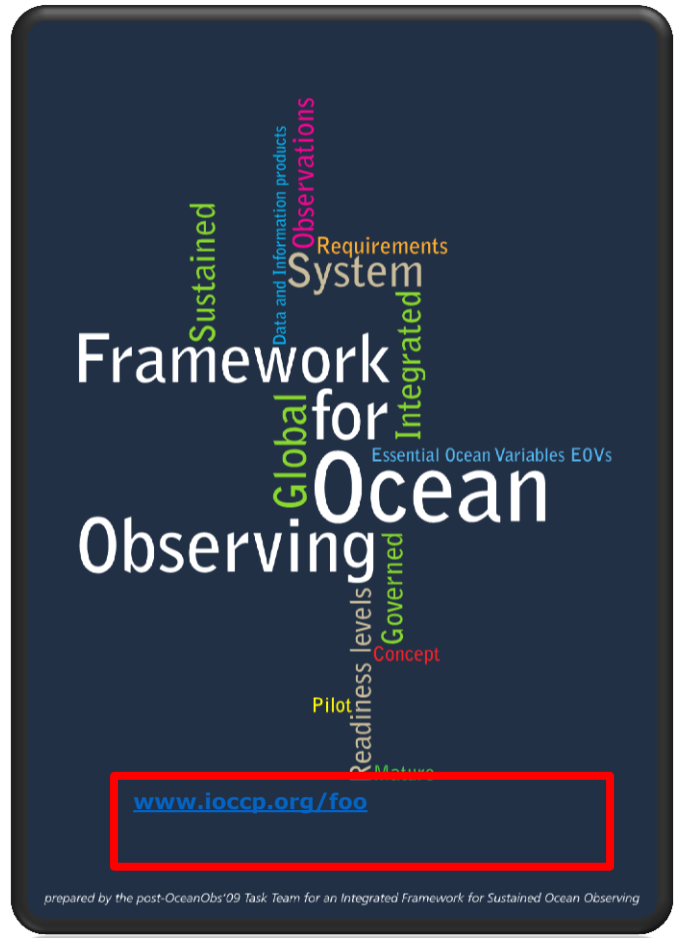


Cooperation between major global Rs

- essential variables for ecological observations;
- coherent standards
- site registration system
- open data policies
- metadata cataloguing and data citation
- support existing global data efforts (e.g. FLUXNET);
- capacity-building and human resource management;
- towards a global ecosystem research infrastructure

A broad schematic of a full value chain in sustained ocean observing programs



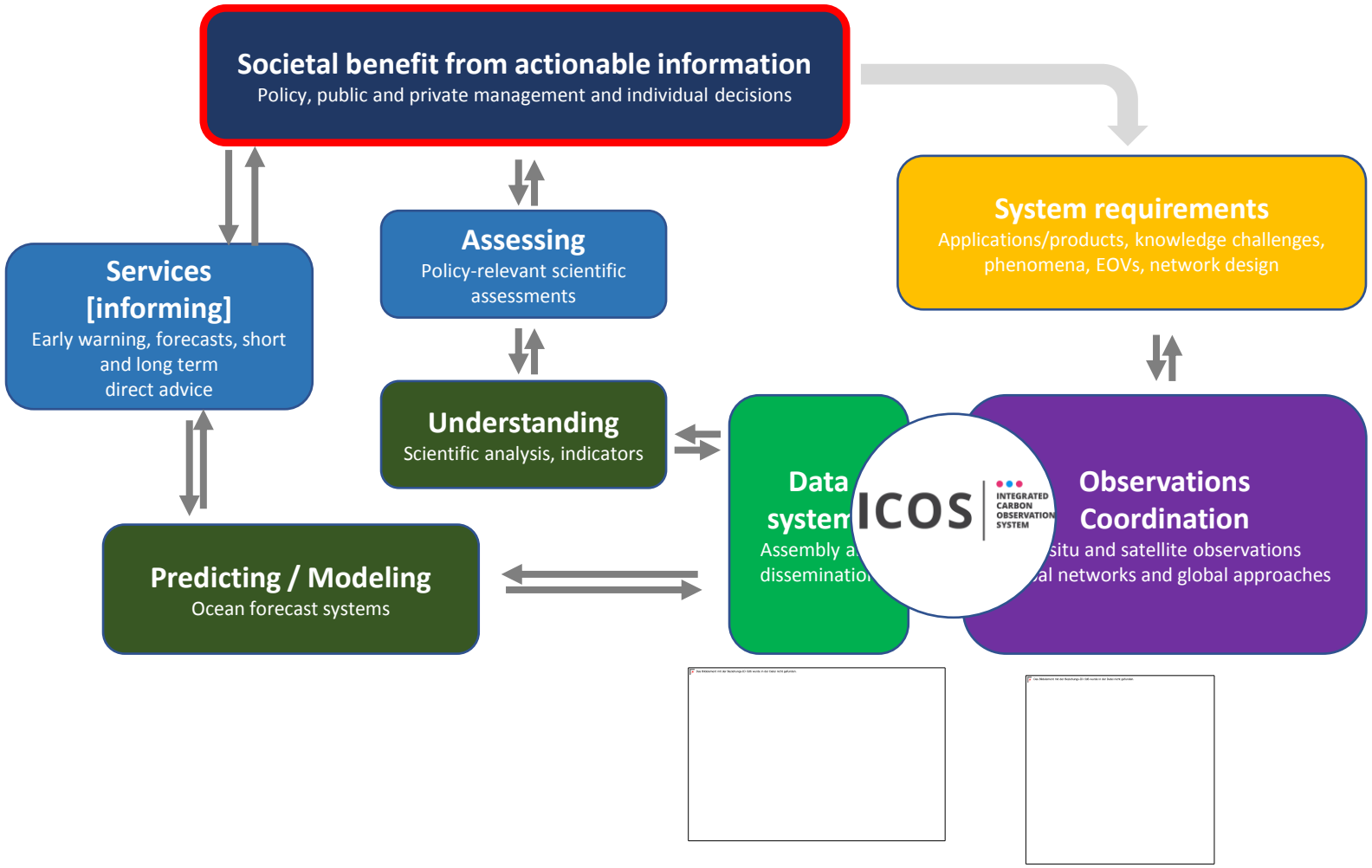


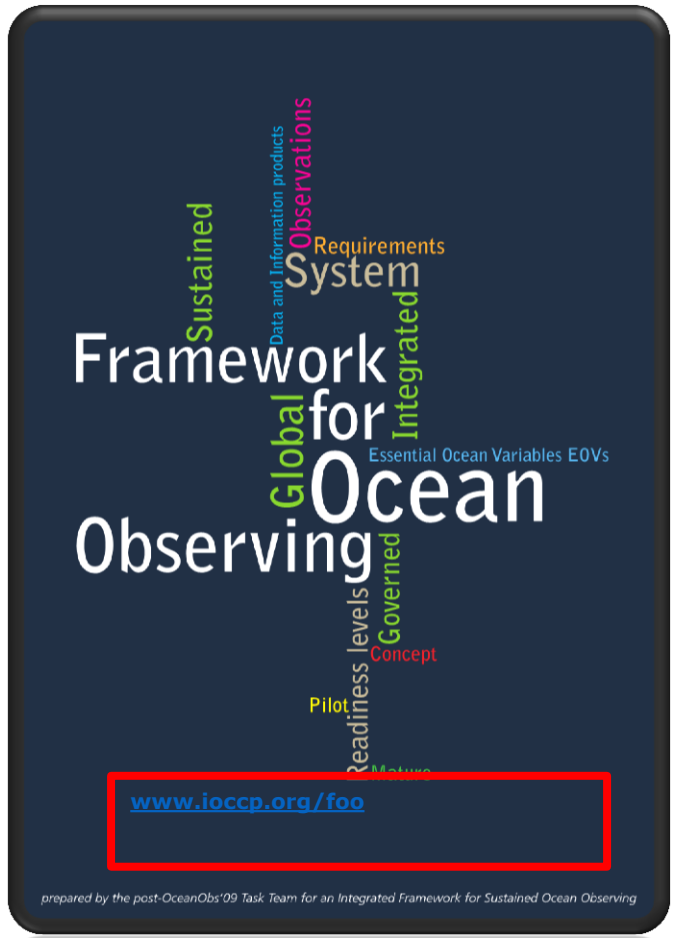
GOOS

Biogeochemistry Panel

System

A broad schematic of a full value chain in sustained ocean observing programs



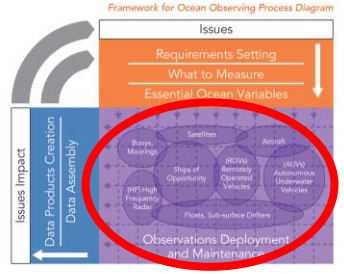


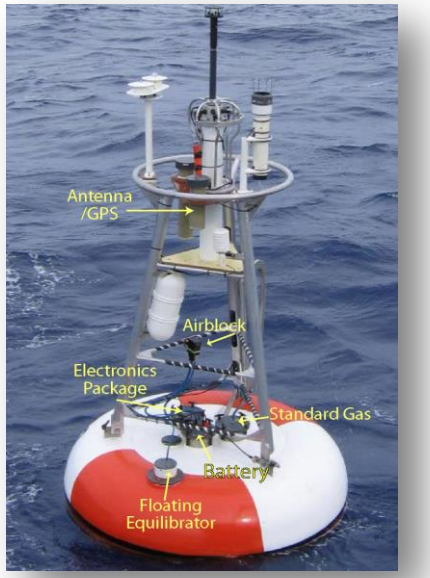
GOOS

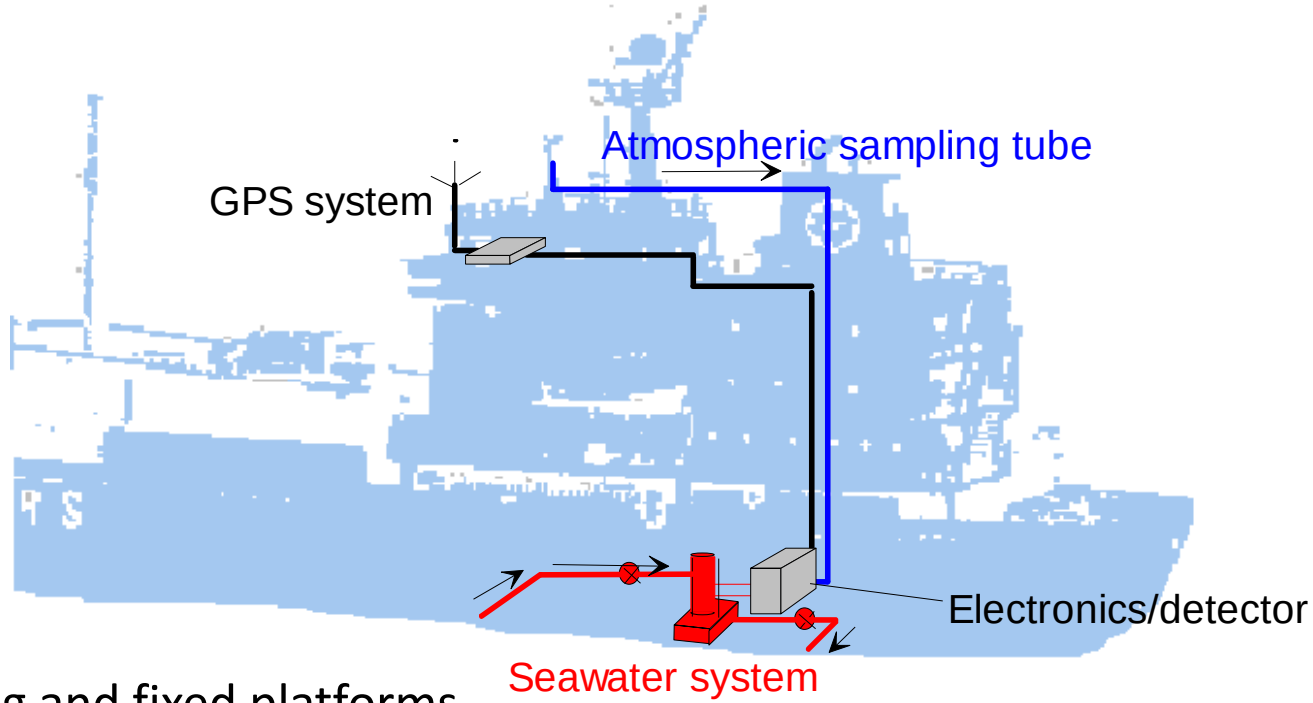
Biogeochemistry Panel

soconet

• SURFACE OCEAN CO_2 OBSERVING NETWORK •







SOCONET:

- **Surface ocean CO_2 measurements** from moving and fixed platforms (With other parameters in concept and pilot phase pH, TA, DIC);
- **Atmospheric CO_2** from some data originators (discussions with GAW);
- Checked sea surface temperature and salinity as well as other BGC parameters (oxygen, nutrients)

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In Earth Science international collaboration is not a ‚nice to have', it's a questions of

Summary
International cooperation is requested and guided by UN convention related to Grand Challenge.

There are extremely high values at stake.

Co-design with users and stakeholders from the beginning

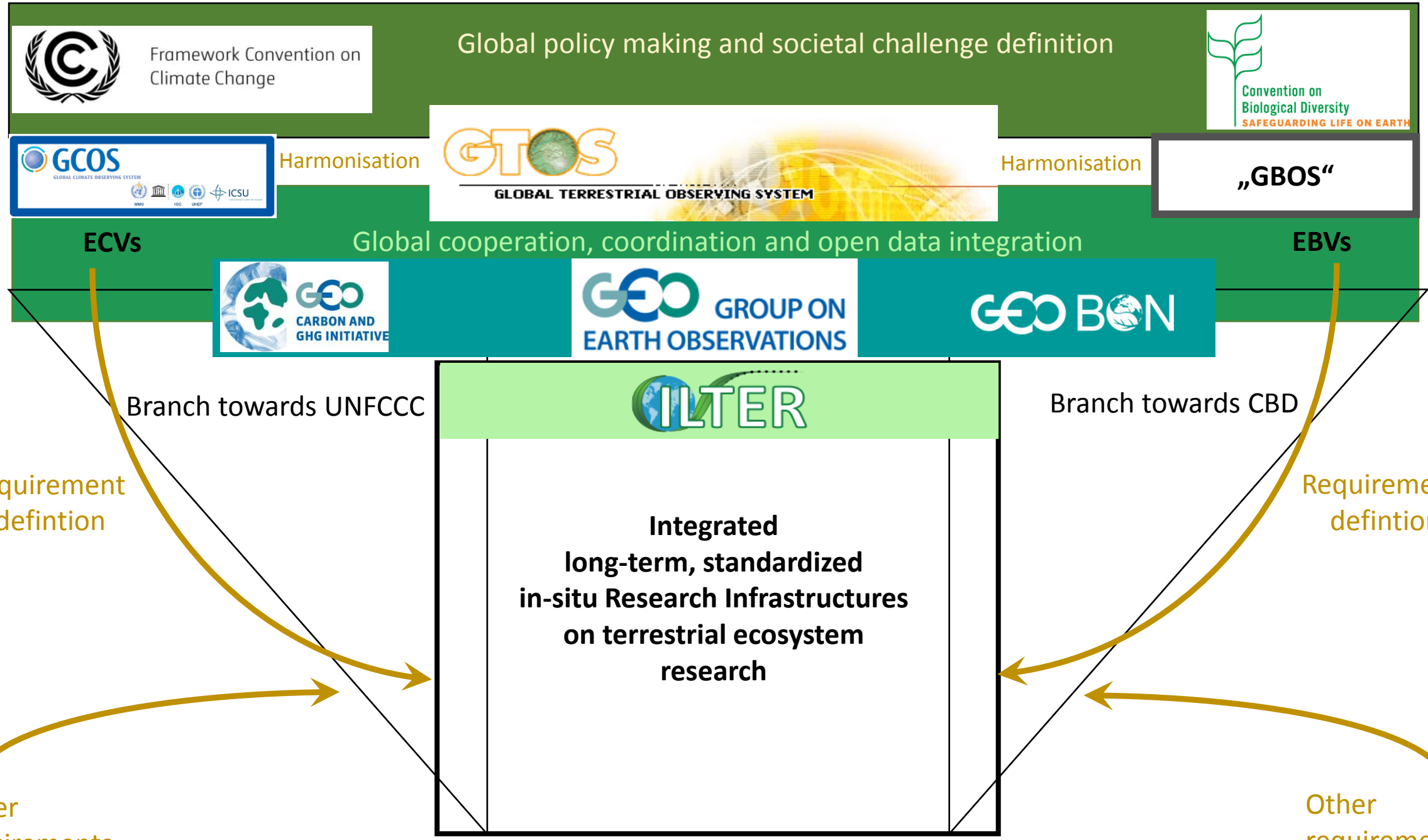
- towards global cooperation
- towards a very clear societal challenge
- towards high societal and economic impact (avoiding loss and damage)

2° be or not 2° be

And what does the Higg's Boson for it?

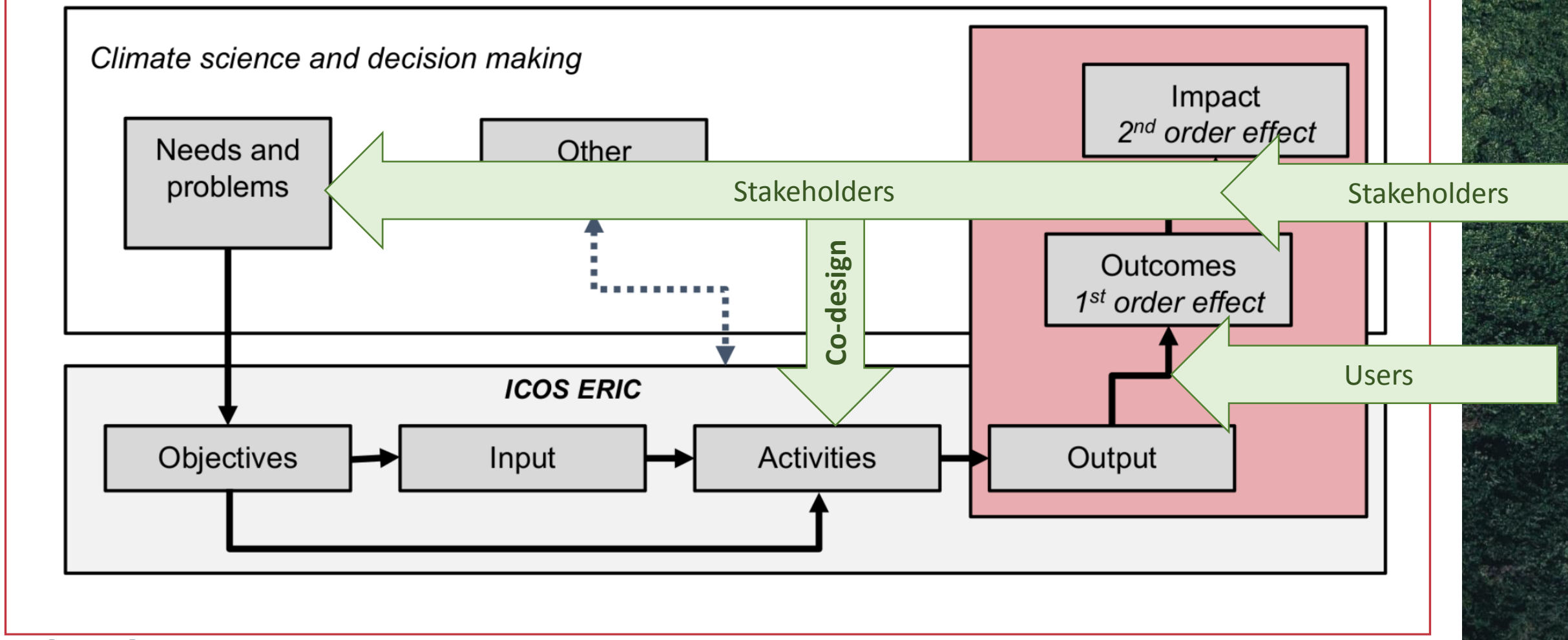
Thank you for your attention!

plus ENVRI


Framework Convention on Climate Change
Global policy making and societal challenge definition
Convention on Biological Diversity
SAFEGUARDING LIFE ON EARTH
GCOS
Harmonisation
GTOS
GLOBAL TERRESTRIAL OBSERVING SYSTEM
Harmonisation
„GBOS“
ECVs
Global cooperation, coordination and open data integration
EBVs
CARBON AND GHG INITIATIVE
GEO GROUP ON EARTH OBSERVATIONS
GEO BON
Branch towards UNFCCC
ILTER
Branch towards CBD
Requirement defintion
Integrated
long-term, standardized
in-situ Research Infrastructures
on terrestrial ecosystem
research
Requirement defintion
Other requirements
Other requirements

A basic concept for impact assessment of ICOS

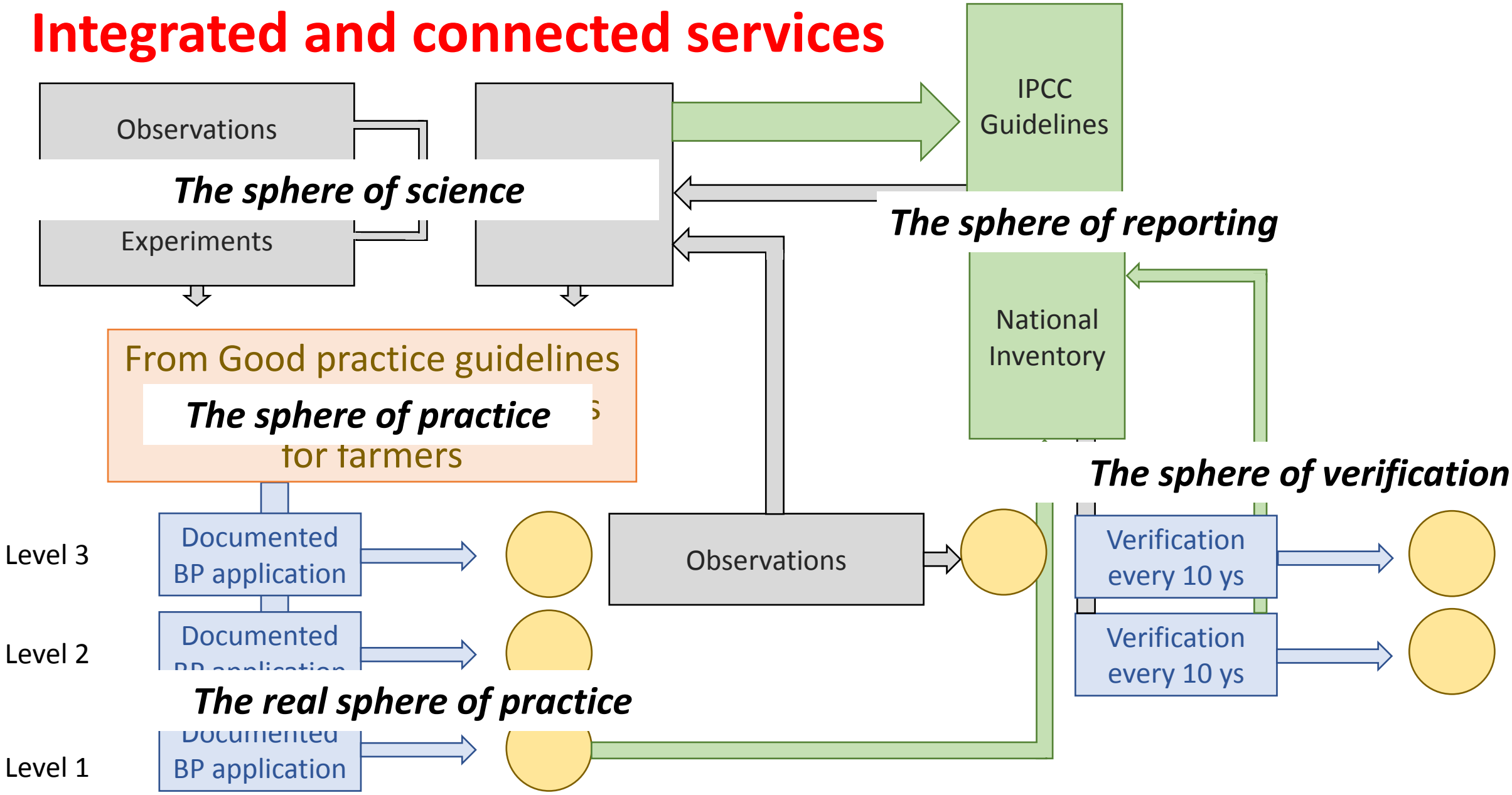
Figure 2: Framework to analyse effects from problem to impact



Technopolis Group

Innovative approaches in GHG measurements in agriculture

Integrated and connected services



In-situ atmosphere measurements – Global Atmosphere Watch