



Enterprise and Industry

The Copernicus Climate Change service

Bernard Pinty

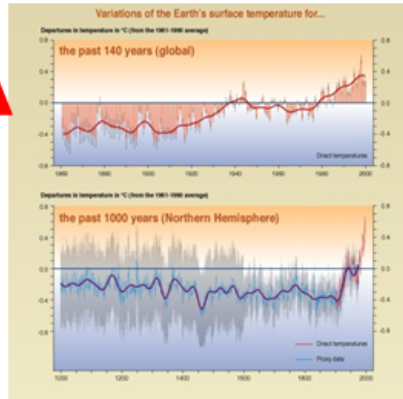
Copernicus unit G.2

February 2014

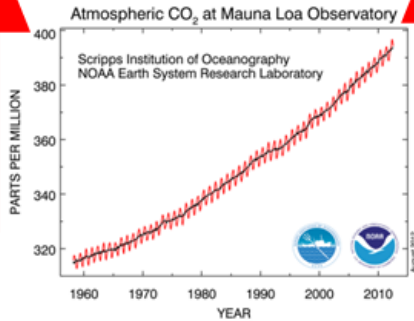


European Commission

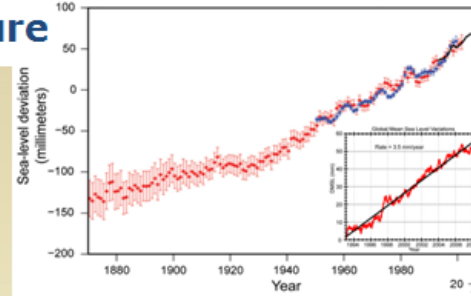
Surface Air Temperature



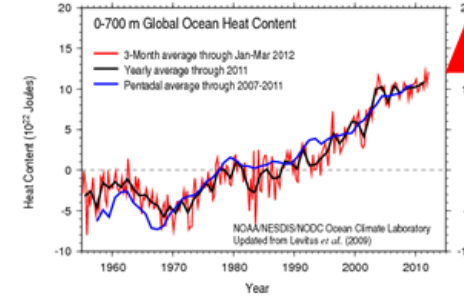
Atmospheric CO2



Global Sea Level

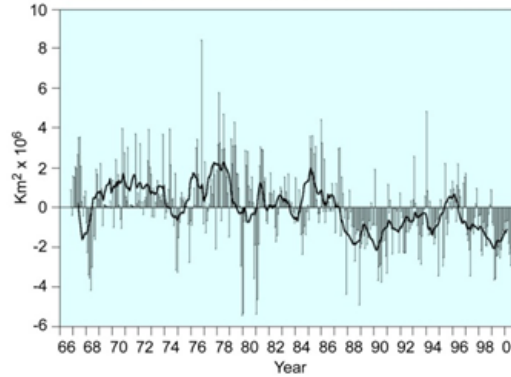


Global Ocean Heat Content

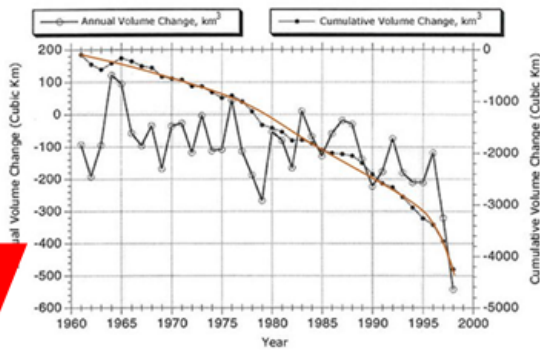


Snow cover

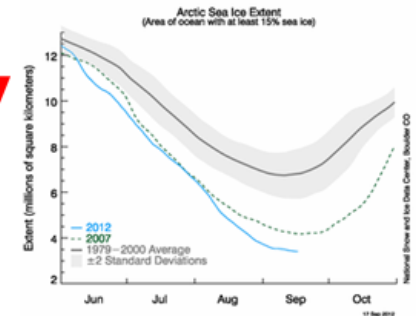
NH Snow Cover from NOAA Satellites



Glacier Volume



Arctic sea ice extent



New EU Regulation (to be adopted):

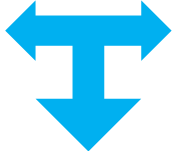
"the Climate Change service shall provide information to increase the knowledge base to support adaptation and mitigation policies. It shall in particular contribute to the provision of Essential Climate Variables (ECVs), climate analyses, projections and indicators at temporal and spatial scales relevant to adaptation and mitigation strategies for various Union's sectoral and societal benefit areas."

Architecture of the Copernicus Climate Change service



from research to operations

from European commission
e.g., FP7 Space call



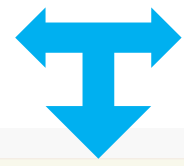
from other bodies e.g., MS,
ESA, Eumetsat, EEA, WMO..

**Selected set
of information for
customer DGs**

**MS and other
users & customers**



from European commission
e.g., FP7 Space call



from other bodies e.g., MS,
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Harmonization/Coordination & QA platform

Consistent Climate Data Store

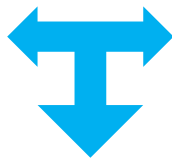
Observed, analysed and simulated Essential Climate Variables plus derived set of indicators relevant to consistently monitor and simulate Earth Climate responses to forcings

of information for
customer DGs

users & customers



from European commission
e.g., FP7 Space call

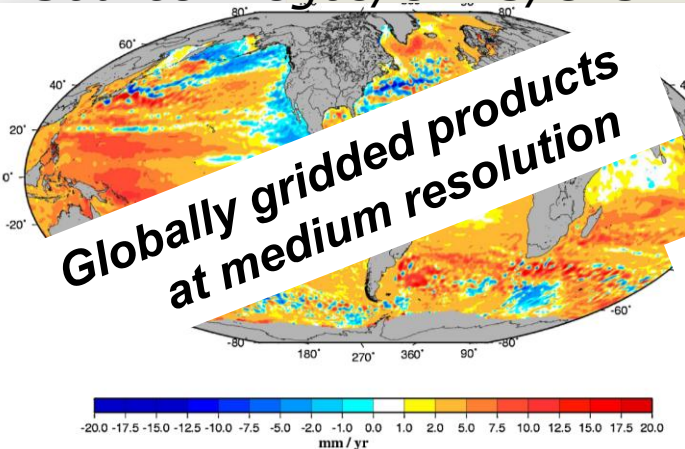


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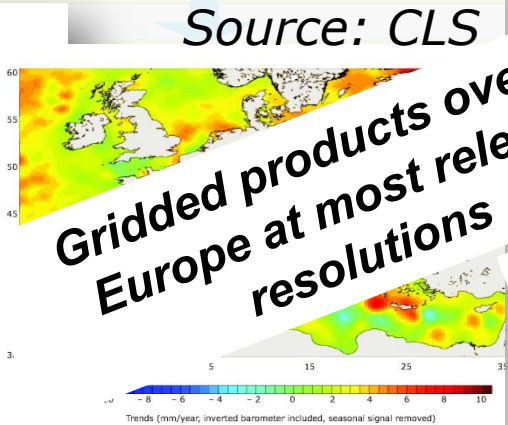
Consistent Climate Data Store

Sea-level

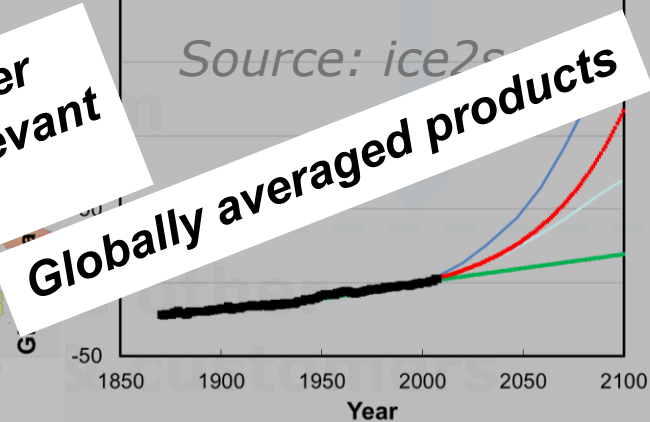
Source: Legos/CNES/CLS



Source: CLS

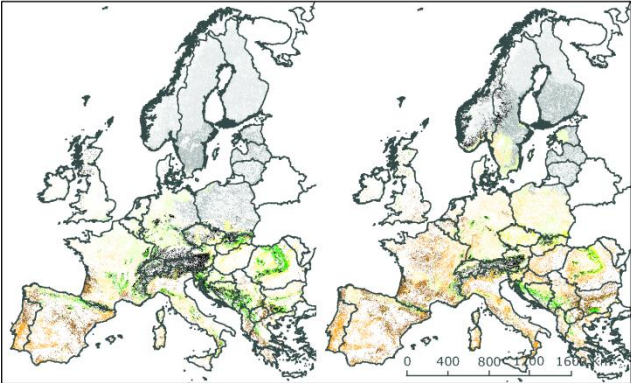


Source: ice2c



Forestry

Source: JRC



- Modelled year 2000 (left) and year 2100 (right) of the 10 most dominant European forest categories**
- Boreal forests
 - Hemiboreal, nemoral coniferous, mixed broadleaved
 - Alpine coniferous
 - Acidophilous oak, oak-birch
 - Mesophytic deciduous
 - Beech
 - Montane beech
 - Thermophilous deciduous
 - Broadleaved evergreen
 - Coniferous forest of the Mediterranean region

Coastal zones

Source: ice2sea



Sectoral Information System

Climate indices relevant to the various EU sectoral policies

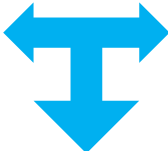
Architecture of the Copernicus Climate Change service



A logical view

from European commission
e.g., FP7 Space call

from other bodies e.g., MS,
ESA, Eumetsat, EEA, WMO..



Harmonization/Coordination & QA platform



Consistent Climate Data Store



Customization platform



Sectoral Information System



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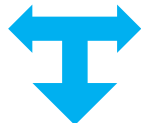
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Consistent Climate Data Store

Customization platform

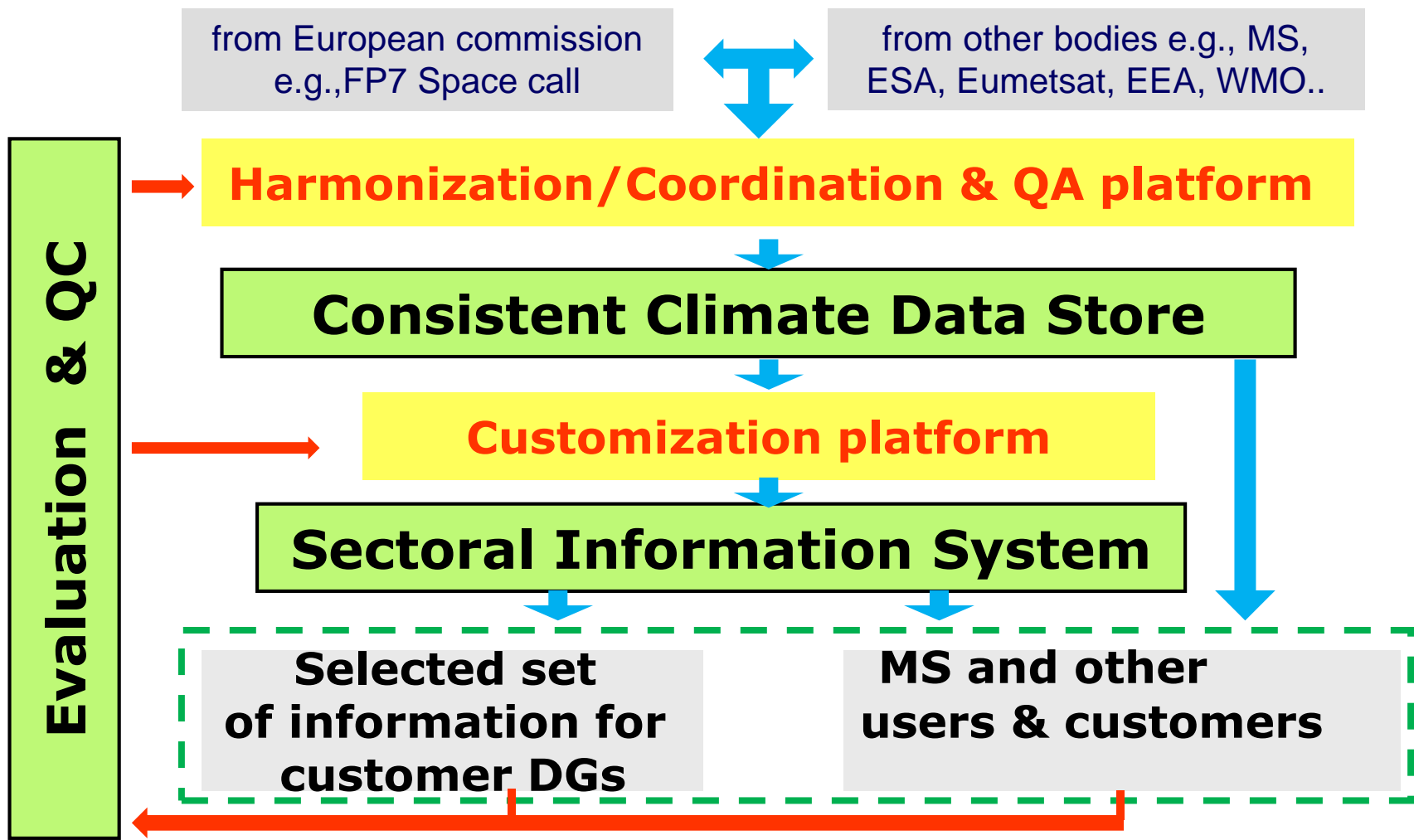
Sectoral Information System

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Evaluation & QC

Monitoring, QA of the service and
feedbacks to production or R&D



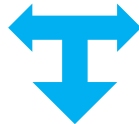
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Harmonization/Coordination & QA platform

Consistent Climate Data Store

Customization platform

Sectoral Information System

**Selected set
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Evaluation & QC

Outreach & Diffusion

Monitoring, QA of the service and
feedbacks to production or R&D

Education, general public and
authorities, reports, media, bulletin

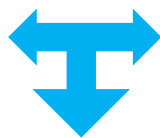
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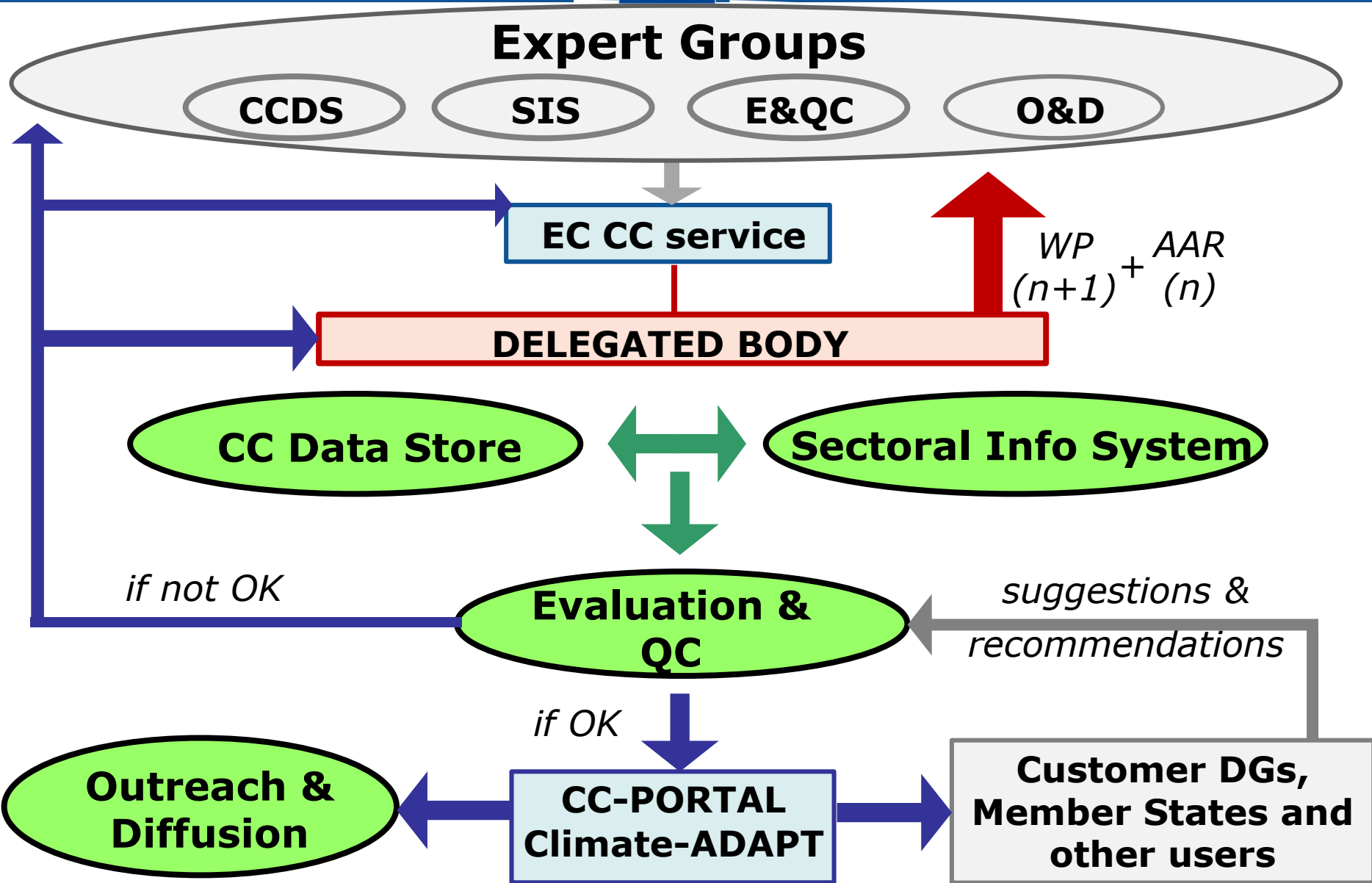
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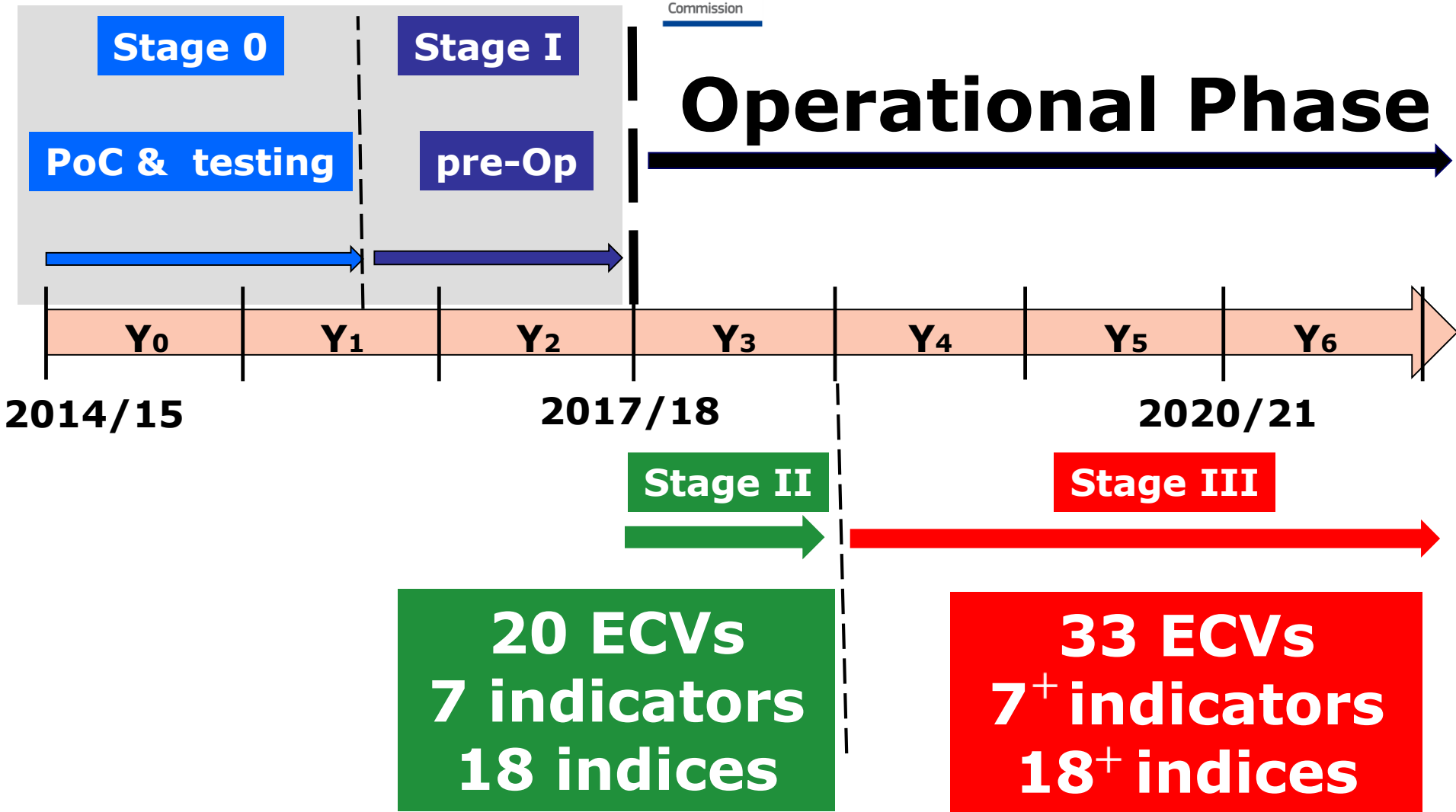




Copernicus Climate Change service



Provisional timing





Consistent Climate Data Store - 20 ECVs & 7 indicators - Observed, re-analyzed and model projected products

ATMOSPHERE

- Surface Air Temperature
- Surface Precipitation
- Water Vapor
- Surface Radiation Budget
- Earth Radiation Budget
- Carbon Dioxide & Methane
- Ozone & Aerosols
- Cloud properties

OCEAN

- Ocean Color
- Sea Ice
- Sea Level
- Sea Surface Temperature
- Global Ocean Heat Content

LAND

- Snow Cover
- Glaciers & Ice Caps
- Albedo
- FAPAR
- Fire Disturbances
- Ice Sheets

Sectoral Information System – 8 sectors & 18 indices

Agriculture and forestry

Health

Energy

Infrastructure

Insurance

Coastal areas

Water management

Tourism



**Consistent Climate Data Store - 20 ECVs & 7 indicators -
Observed, re-analyzed and model projected products**

- **Global means, trends and anomalies**
- **EU means, trends and anomalies**
- **Global and EU anomaly ranking**
- **EU Records**
- **Climate Extreme Index**
- **Drought Palmer Index**
- **Common Sense Climate Index**
- **...**



Sectoral Information System – 8 sectors & 18 indices

index	Sector
Vegetation health	Agriculture & Forestry
Crop moisture stress	Agriculture & Forestry
European Drought	Agriculture & Forestry
Ocean colour/currents/level	Coastal areas
Heat Stress	Health
Climate extremes	Health
Air freeze	Infrastructure
Residential Energy Demand Temperature	Infrastructure
Climate means and trends	Tourism
Extreme events	Tourism
Regional snowfall	Tourism
Snow	Water management
EU drought	Water management
Lake level	Water management
SST means & trends	Marine & fisheries
Residential Energy demand Temperature	Energy
Climate Means & trends	Energy



**Think Operational
for Policy makers**

Time runs against us !!

We cannot fail



Thank you



Consistent Climate Data Store - 33 ECVs & 7+ indicators - Observed, re-analyzed and model projected products

ATMOSPHERE

Surface Air Temperature
Surface Precipitation
Water Vapor
Surface Radiation Budget
Earth Radiation Budget
Carbon Dioxide & Methane
Ozone & Aerosols
Cloud properties
Upper Air Temperature
Other Long-Lived GHGs
Wind Speed & Direction

OCEAN

Ocean Color
Sea Ice
Sea Level
Sea Surface Temperature
Global Ocean Heat Content

CO₂ partial pressure
Ocean Activity
Sea Surface Salinity
Current Salinity

LAND

Snow Cover
Glaciers & Ice Caps
Albedo
FAPAR
Fire Disturbances
Ice Sheets
Lakes
Permafrost
Land Cover
Leaf Area Index
Soil Moisture

Sectoral Information System – 12 sectors & 18+ indices

Agriculture and forestry

Health

Energy

Infrastructure

Insurance

Coastal areas

Water management

Tourism

Biodiversity

Disaster risk reduction

Marine and fisheries

Transportation