

EU activities in the area of Climate Change:

towards an operational GMES Climate Change Service

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Outline

- **The Climate Change challenge**
- **What have we done?**
- **Where do we go?**
- **Conclusions**



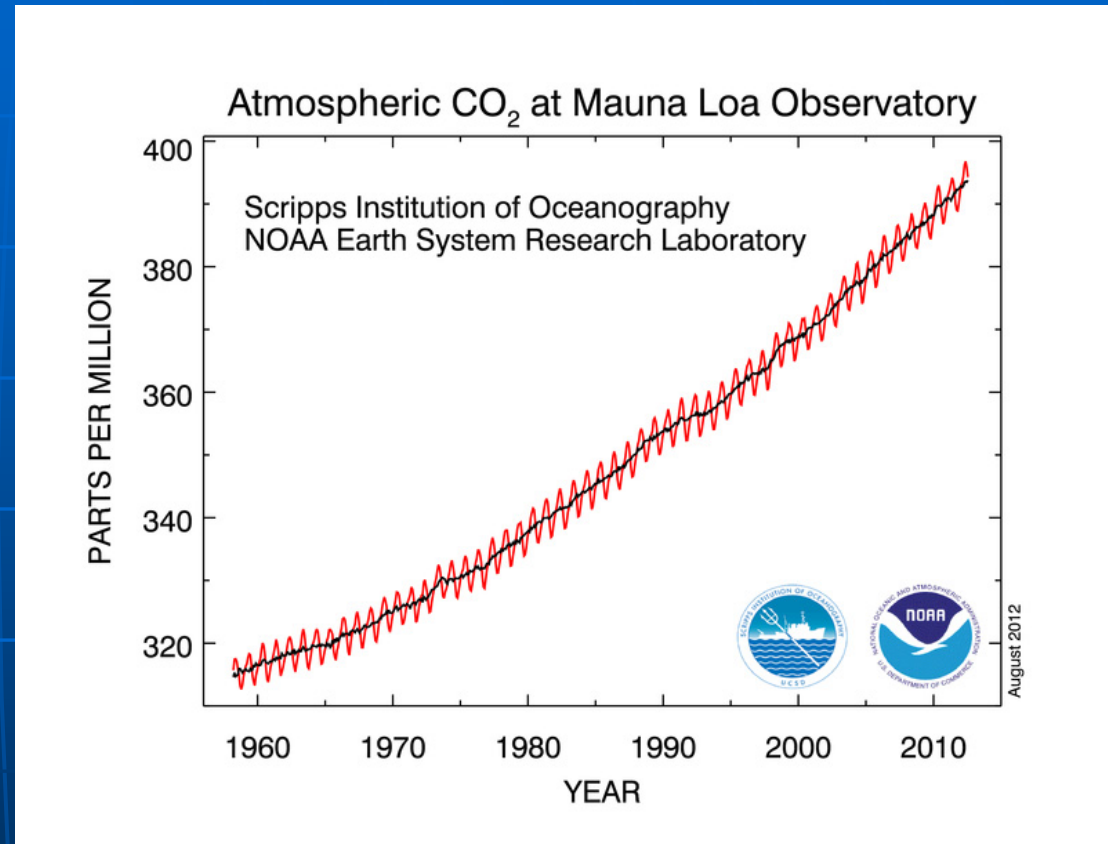
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CO₂ - A Major Climate Driver

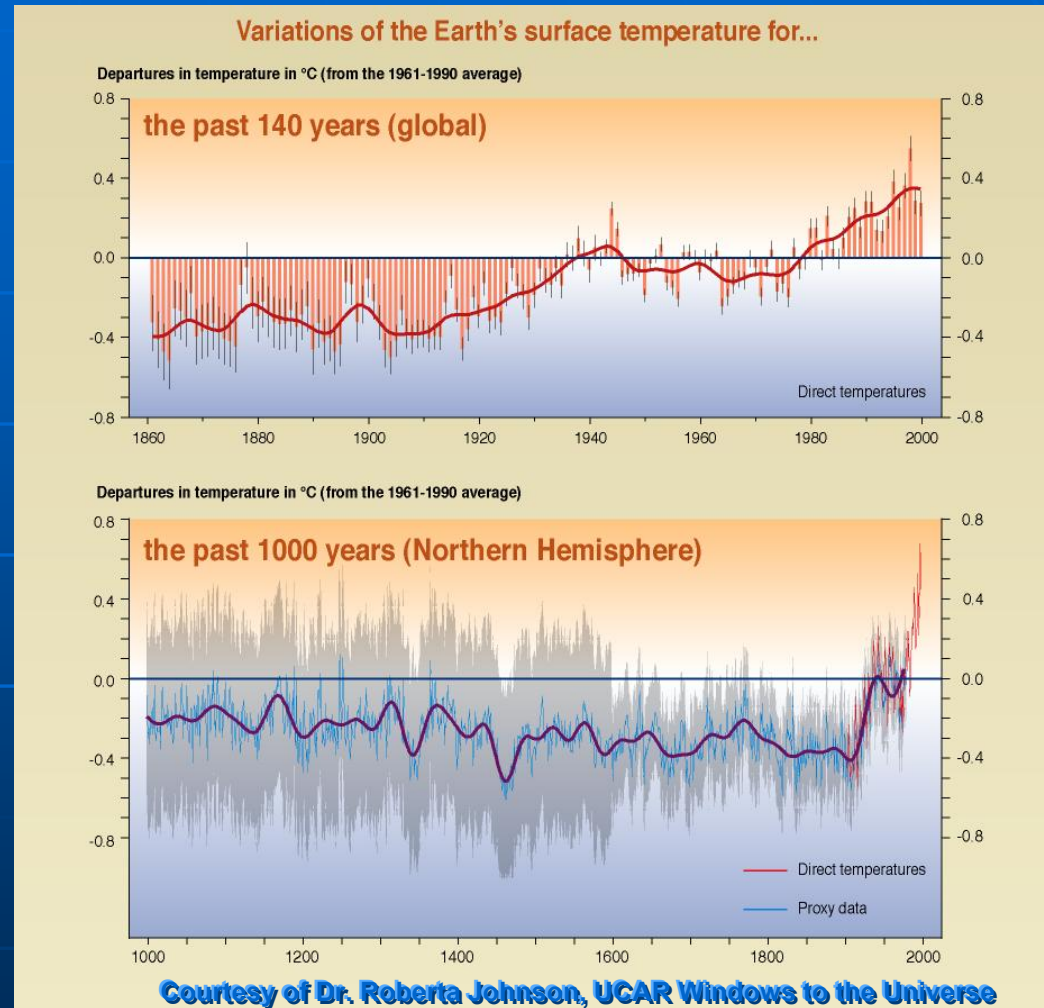
- These carbon dioxide data constitute the longest record of direct measurements of CO₂ in the atmosphere



A Major Climate Impact

Departures (with respect to the 1961-1999 average) in global temperatures in degrees over

- the past 140 years (top graph)
- the past 1000 years (bottom graph)



- The red line is for direct measurements
- The blue line is for proxy measurements

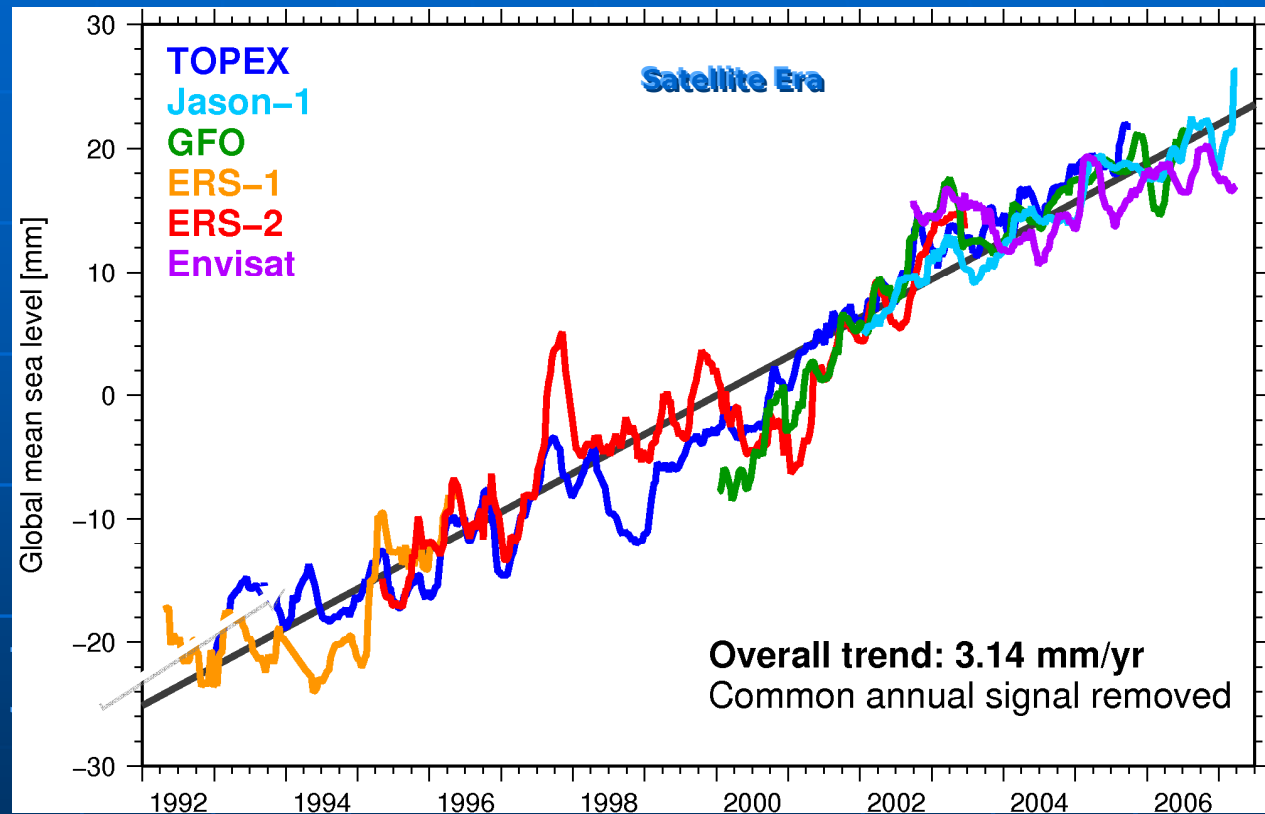
Global sea-level rise

➤ Observed trend

+3.1 mm/yr

±0.7 mm/yr

➤ IPCC AR4, 2007



Outline

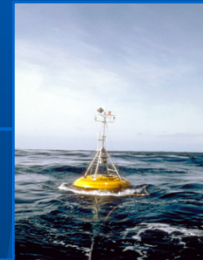
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Global Monitoring for Environment & security

GMES is an EU-led initiative

- aims at developing **operational** user services,
- based on satellite earth observation and in-situ data,
- consists of 3 components:
 - Space Component – coordinated by ESA
 - In-situ component – coordinated by EEA
 - **Service Component – EU/public supported**



GMES Climate Change Service (1)

The GMES Regulation (911/2010) includes:

- access to information for climate change monitoring in support of mitigation and adaptation policies

A Climate Change service must meet the Global Climate Observing System goals:

- **Monitor the climate system**
- Detect and attribute climate change
- Assess impacts of, and support adaptation to, climate variability & change



GMES Climate Change Service (2)

A Climate Change service shall:

- **support (Climate policy) users**
- **complement and interact with existing activities**
- **provide tools to develop CC policies and information on attribution of high impact events**



Key messages (1)

GMES climate service is moving ahead:

- consultation process involving CC experts
 - the 'Helsinki GMES climate' conference (July 2011)
 - the GMES user forum (Nov 2011)
- FP7 'space' calls (2011 and 2012) had focus on the GMES CC Service
- **A preliminary design of the CC service is now becoming available**



Key messages (2)

Helsinki 2011 Climate conference:

- need for a robust dialogue between the EU, WMO and the European Meteorological Infrastructure
- coordination and consolidation of the European contribution to the **Global Framework for Climate Services (GFCS)**



5th FP7 'space' call (July 2011)

Projects (under negotiation) of relevance to CC

- **CHARMe** (24 months) Characterisation of metadata to enable high-quality climate applications and services:
 - 'To create a **repository of metadata** plus a set of interfaces through which users can interrogate the information over the Internet'
- **CORE-CLIMAX** (30 months) Coordinating Earth observation data validation for re-analysis for climate Services:
 - 'To **coordinate the identification of available physical measurements**, which can be reconciled with previously existing data records, to form long time series'



6th FP7 'space' call (July 2012)

The FP7 space call for 2013 prioritises developments relevant for a climate change service

- Global **20th century re-analysis** and coupling methods
- Ensemble system of **regional re-analyses**
- Traceable **quality assurance** system for multi-decadal ECVs
- Provision of **access to simulated & observed climate datasets** and climate indicator toolbox
- **Attribution products**

EC funding: **26 M€**



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The GMES Climate Change service

mission

EU knowledge in support of Mitigation & Adaptation

tasks

Observations

**Last century
re-Analysis**

**Modelling
scenario**

outputs

**Set of indicators and indices for the
climate drivers and climate impacts**



Architecture of the service

from European Commission
e.g. FP7 Space call

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



Harmonization/Coordination & QA platform

Climate Indicator Data Store

Customisation platform

Sectoral Information System

Selected set
of information for
Commission DGs

Member States and other
users & customers



Architecture of the service

Harmonization/Coordination & QA platform

Specification of the Data Store:

- selection,
- generation,
- delivery and
- validation

**of BioGeophysical
gridded science products**

**Science Advisory
Group**



Architecture of the service

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Climate Indicator Data Store I



- **Observed, analysed and simulated ECVs plus**
 - **derived set of indicators relevant**
 - **to monitor and**
 - **to simulate**
- Earth climate responses to forcings**



Architecture of the service

from European Commission
e.g. FP7 Space call

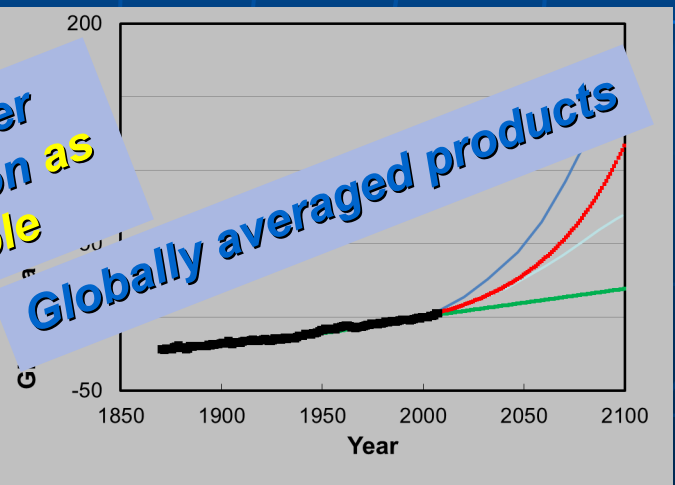
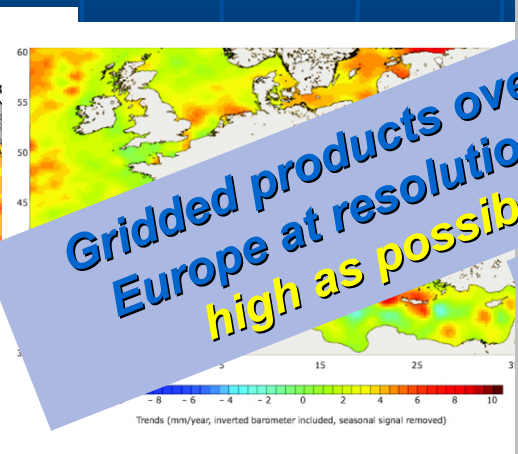
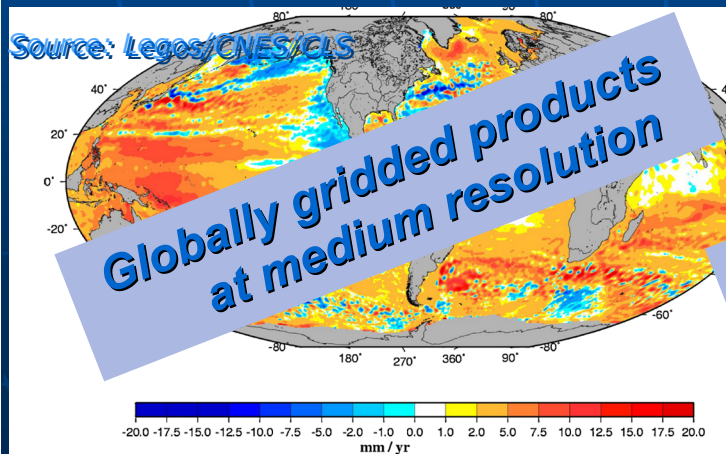
from other bodies e.g. ESA,
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Climate Indicator Data Store II



Sea-level rise



Architecture of the service

Customisation platform

Specification of the Sectoral Information System:

- selection,
- generation,
- delivery and
- validation

of indicators and indices relevant to the various EU sectoral policies

Application Advisory Group



Architecture of the service

Sectoral Information System

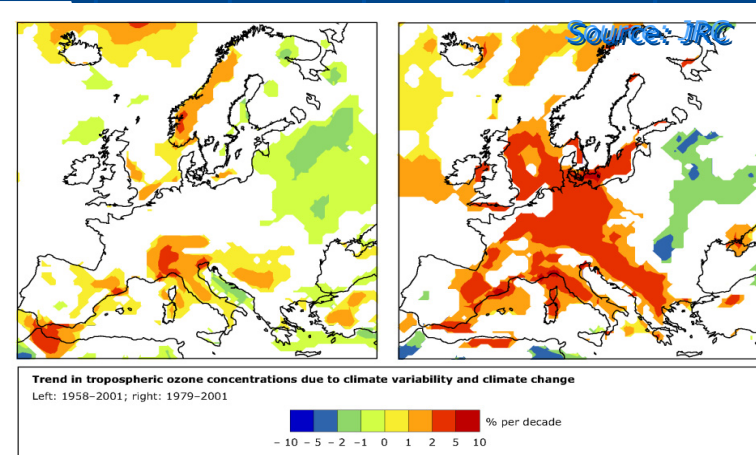
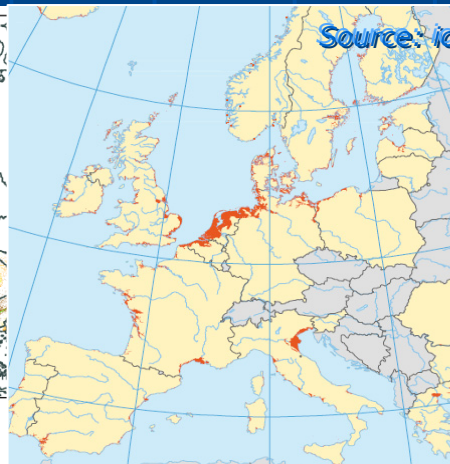
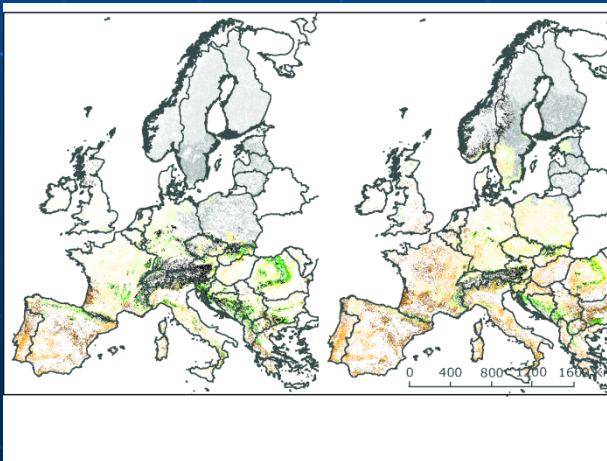


Climate indicators & indices relevant to the various EU sectoral policies

Forestry

Coastal zones

Air quality



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Harmonization/Coordination & QA platform

Climate Indicator Data Store

Customisation platform

Sectoral Information System

Selected set
of information for
Commission DGs

Member States and other
users & customers

Evaluation platform

Outreach platform

Monitoring, quality
assessment of the service and
feedbacks to production

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

Thank you for your attention

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<http://ec.europa.eu/enterprise/policies/space/gmes/>

http://ec.europa.eu/enterprise/policies/space/research/fp7-projects/index_en.htm

