The ESA Glob Projects Series

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Why is ESA supporting the GlobCloud Workshop?

- Context
- The ESA Data User Element
- (The ESA Climate Change Initiative)
- The way forward…

CONTEXT

Europe's expanding EO capacity

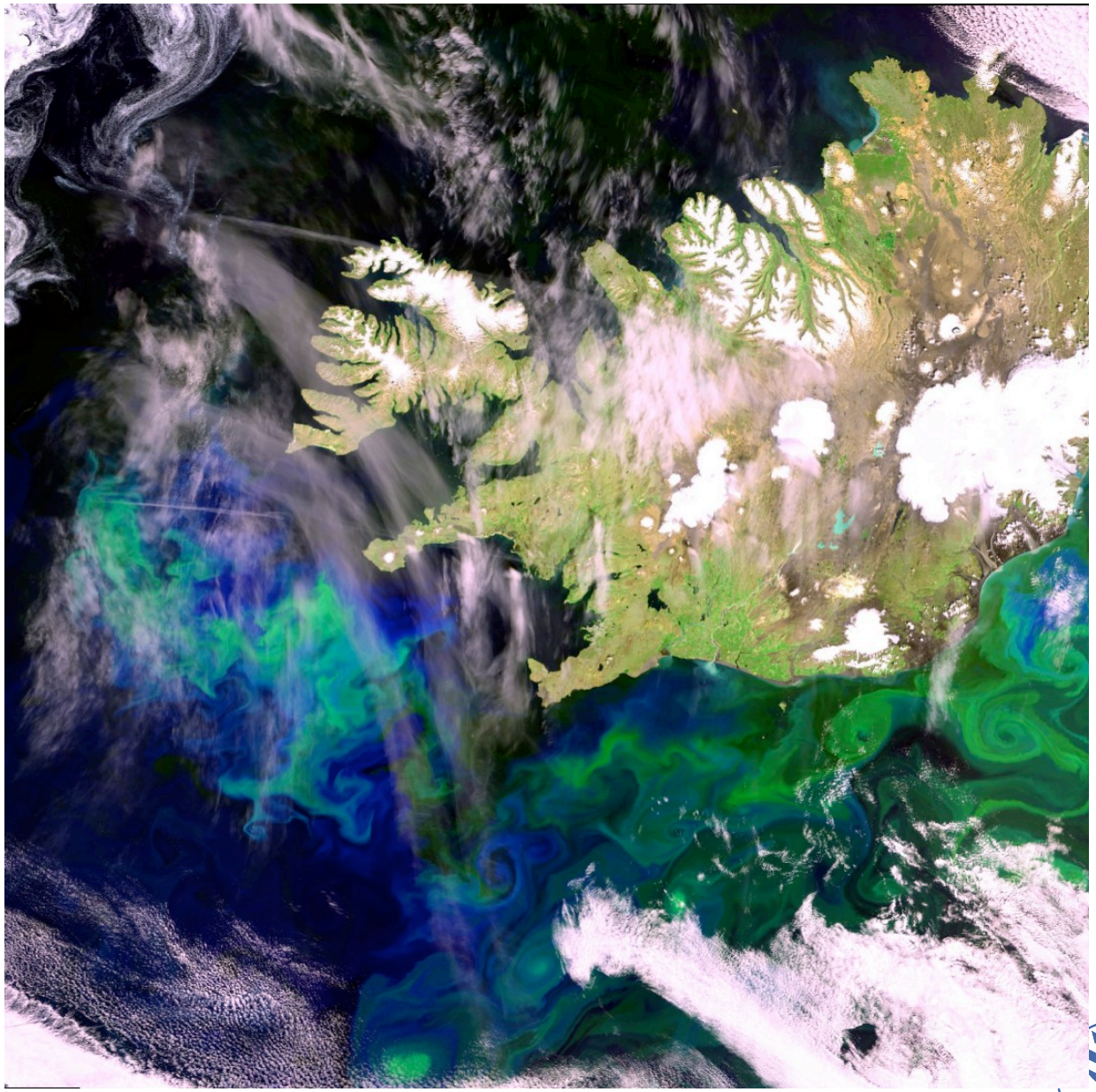
1991 — **ERS 1** → 1995 — **ERS 2** → 2002 — **ENVISAT**

Oceans
Sea Ice
Cryosphere
Land Surface
Climatology

→ + *Global Ozone* → + *Ocean colour*
+ *Terrestrial biosphere* + *Atmospheric chemistry*

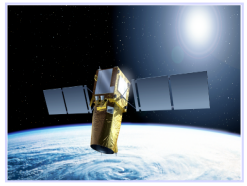
Envisat MERIS example

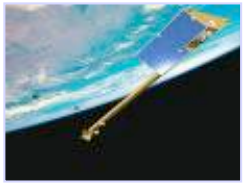
- 2004 high resolution image (300m)
- Phytoplankton bloom
- Contrails/cirrus
- This type of data available on the rolling archive (oa-es.eo.esa.int)
- (Download images from miravi.esa.int)



ESA's Living Planet - Missions

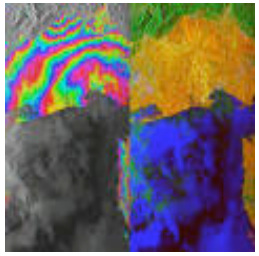
- Research driven
  - Earth Explorer
    - Core Missions
      - GOCE 2009
      - ADM-Aeolus 2010
      - EarthCARE 2013
    - Opportunity Missions
      - CryoSat 2 2009
      - SMOS 2009
      - Swarm 2010
- Operational/Service driven
  - Earth Watch
    - EUMETSAT
      - Meteosat
      - MSG
      - EPS (MetOp)
      - MTG
      - Post EPS
    - GMES
      - Sentinel 1
      - Sentinel 2
      - Sentinel 3
      - Sentinel 4
      - Sentinel 5





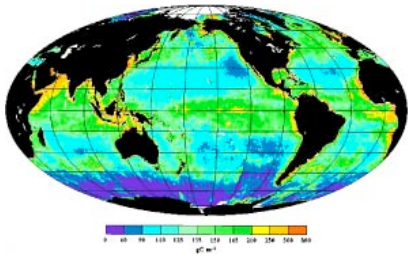
? Earth Explorer 7 2016 ← + 3 Candidate Core Explorers

GMES Sentinel missions



- Sentinel 1 – SAR imaging
  - All weather, day/night applications, interferometry

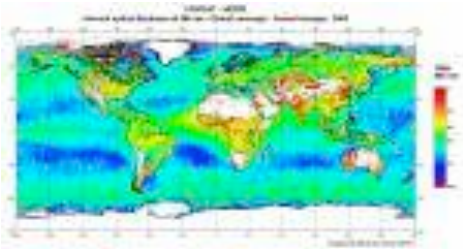
- Sentinel 2 – Superspectral imaging:
  - vegetation, forestry, security



Sentinel 3 - Ocean monitoring

- Wide-swath ocean color and surface temperature sensors, altimeter

- Sentinel 4 – Geostationary atmospheric
  - Atmospheric composition monitoring, trans-boundary pollution



- Sentinel 5 – Low-orbit atmospheric
  - Atmospheric composition monitoring

THE ESA DATA USER ELEMENT (DUE)

Data User Element overview

- The Data User Element (DUE) aims to bridge the gap between research projects, and the sustainable provision of Earth Observation products at an information level that fully responds to the operational needs of User Communities.

- Established in 2000, and currently subscribed to by 18 ESA cooperating States: A, B, CH, D, DK, E, F, FIN, GR, I, IE, LU, N, NL, P, S, UK, CDN

- The DUE is an element of the Earth Observation Envelope Programme (EOEP), an optional programme of ESA

Data User Element overview (cont.)

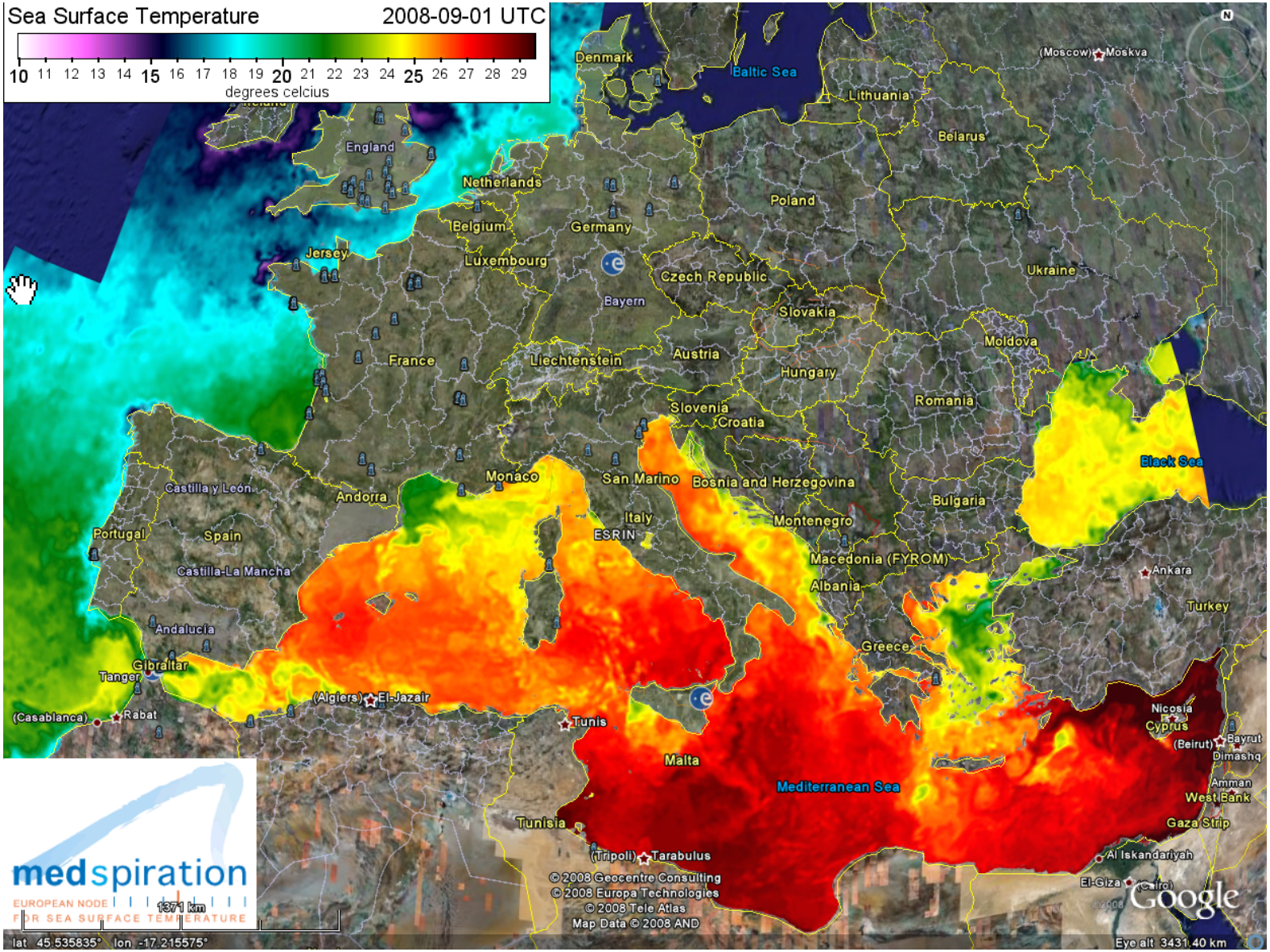
- The projects are addressing Global topics in land, oceans and atmosphere
- Focus is on using European datasets (but not limited to)
- Aiming at supporting future activities – Capability building
- In the spirit of: "Periodically evaluated in peer-reviewed manner and completely reprocessed"

Data User Element overview (cont.)

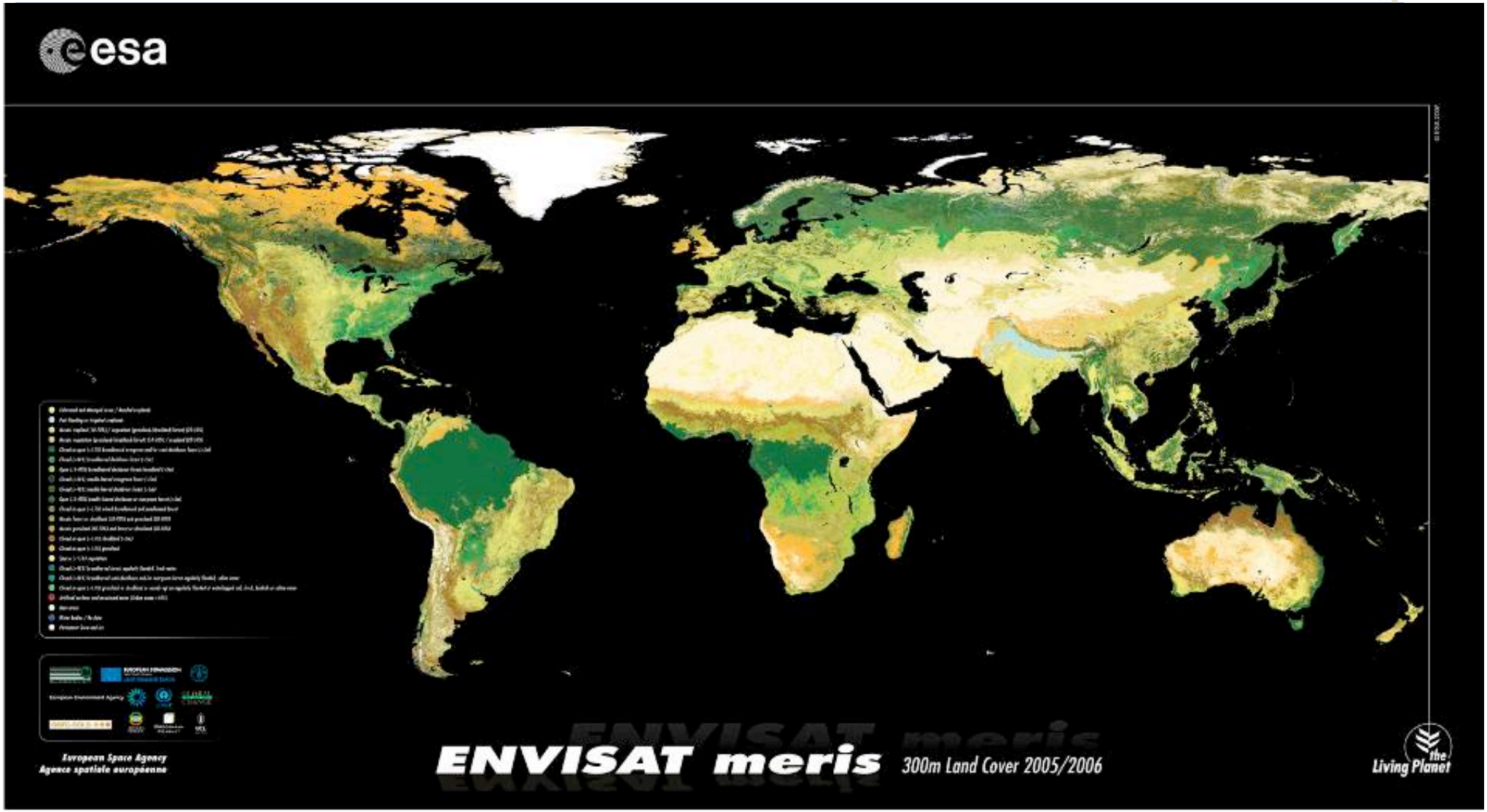
- DUE projects are run in close collaboration with users:
  - User Requirements are defined prior to issue of the Invitation to Tender
  - Collection of letters of commitment from Users
  - Users involved as advisors during the project (annual user consultation workshop)
  - Users assess the project results

- Glob project scope is “Development and Demonstration”:
  - Prototyping techniques built on established research
  - Processing chain development
  - Production of a large data set meeting users’ needs
  - Validation
  - Demonstration exploitation

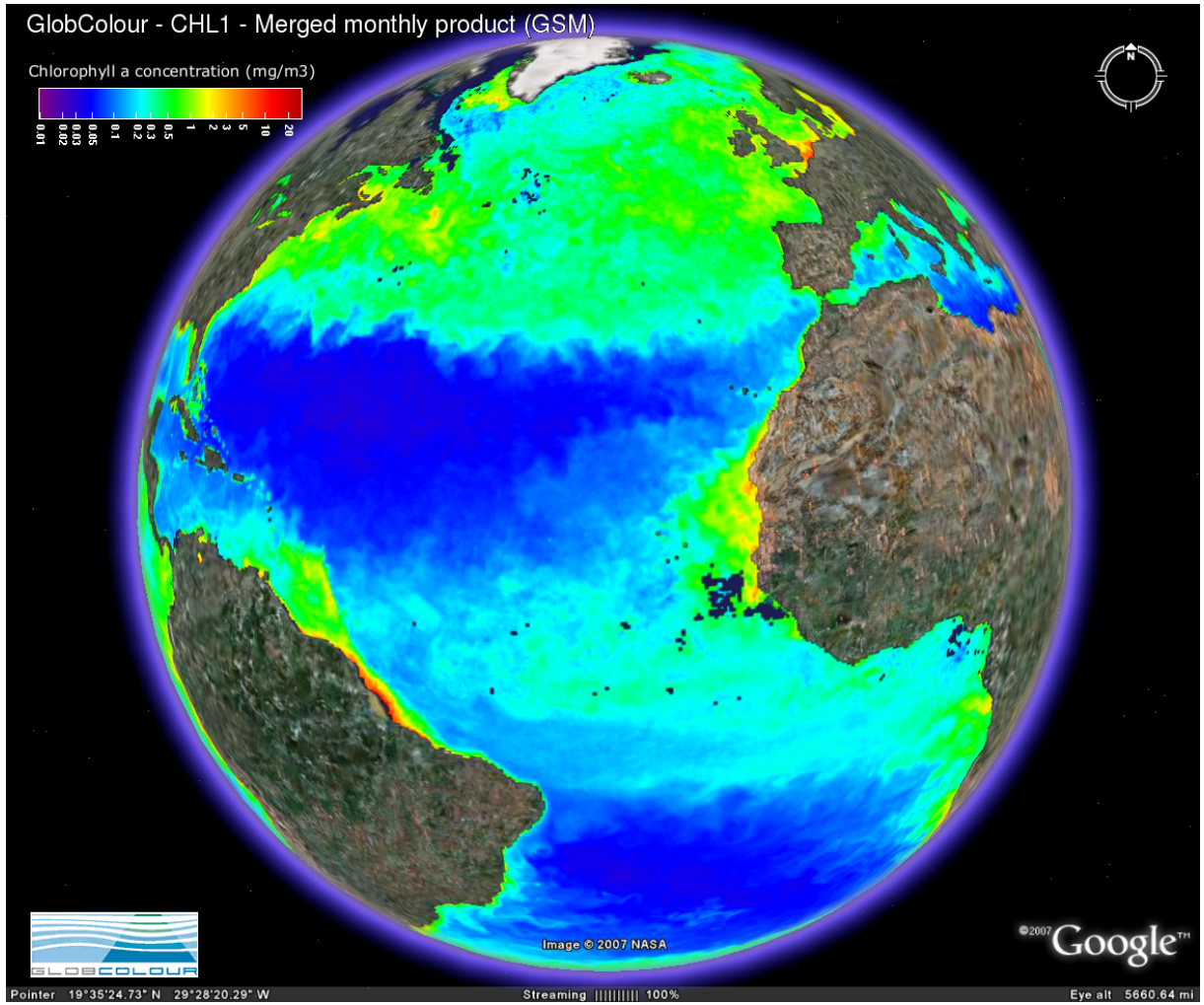
DUE project example: medspiration



DUE project example: GlobCover



DUE project example: GlobColour



10 years of merged MERIS, MODIS, SeaWiFS global ocean colour product

(Chl_a, April 2003)

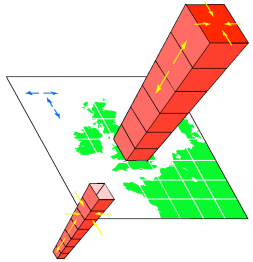
Credit: ACRI, LOV, U. Plymouth, ICESS, NIVA, Brockmann Consult, DLR, ESA, NASA, GeoEye

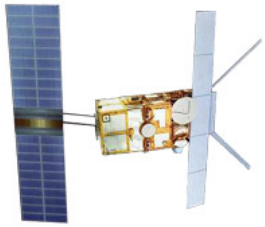
http://www.globcolour.info

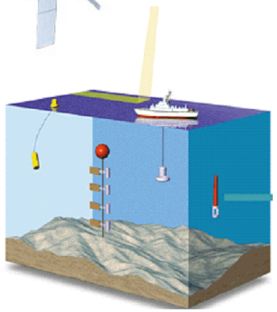
(THE ESA CLIMATE CHANGE INITIATIVE - CCI)

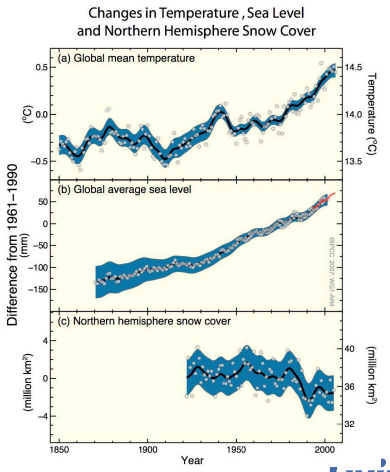
Rationale of ESA's initiative

- Europe is leading post-Kyoto negotiations 2008-2009 (Bali-roadmap)
- Key European Asset: EO Archives (ESA & other)
- Space Agencies have taken actions wrt UNFCCC
  - Systematic observations
  - Generation of ECVs
- Opportunity to strengthen European role
  - ESA in coordination with other Space Agencies
- High communication value for benefits of space
- ESA DUE Global projects provide precursors









Approved budget of ~75 MEuro

THE WAY FORWARD

Coming back to the question…

Why is ESA supporting the GlobCloud Workshop?

- To meet the cloud needs of various end-user communities
- To improve and/or develop new cloud retrieval methods
  - From historic satellite datasets and for future missions
- To support European capability and capacity building
- To learn from the leading cloud science and user communities
- To establish a list of “cloud” priorities for ESA through a GlobCloud workshop white paper

Participants to address…

1. Which current cloud parameters observed from satellite are most useful for:
   - data assimilation in weather and climate models?
   - evaluation of weather and climate models?
   - satellite retrievals schemes?

2. Which important cloud parameters are currently missing from satellite observation for:
   - data assimilation in weather and climate models?
   - evaluation of weather and climate models?
   - satellite retrievals schemes?

Participants to address… (cont.)

3. What is the needed geographical and temporal coverage for satellite observation of clouds in data assimilation, weather forecasting and climate research?

4. Which model improvements, complimented by satellite based information, are needed to better forecast clouds in weather and climate models?

GLOBCLOUD

THANK YOU!

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