→ ATLANTIC FROM SPACE WORKSHOP

23–25 January 2019
National Oceanography Centre
Southampton, UK

Towards Quality-assured EO-based Climate Services in the Atlantic Region

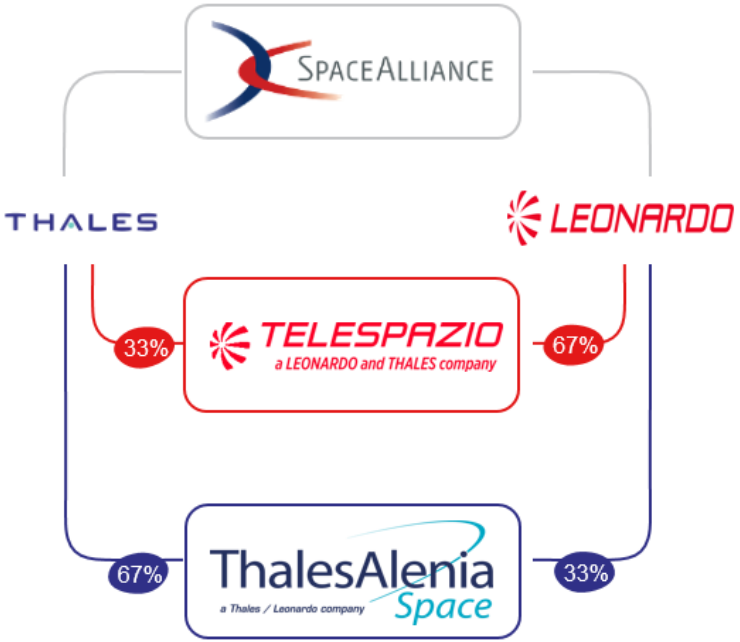
Geoff Busswell

Telespazio VEGA UK

Agenda

- Climate Value Chain
- System Build & Integration
- Sectoral Applications
- Data Quality
- Conclusions & Recommendations

	Telespazio VEGA UK	Telespazio Group	Leonardo
Employees	130	2,500	67,400



Global player in satellite solutions and service delivery

Telespazio S.p.A (Italy)
Telespazio VEGA Deutschland
***Telespazio VEGA UK**
***Telespazio France**
***Telespazio Iberica**
***Telespazio Brasil**
***Telespazio Argentina**

e-geos AN ASI / TELESPAZIO COMPANY GAFAG RARTEL TELESPAZIO a LEONARDO and THALES company

*Coastline on Atlantic region

Climate Value Chain: Telespazio Involvement

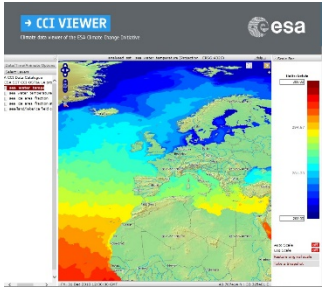
Market / Requirements Analysis

- Agriculture
- Health
- Coastal
- Insurance
- Infrastructure

System Build & Integration

- CCI Open Data Portal
- C3S Climate Data Store

Service Operations



ECV's as a Service
- Sea temperature
- Atmospheric Composition
- Atmospheric Physics

Quality Control

Sectoral Applications

- Agriculture
- Insurance
- Fisheries
- Retail

Training

InfoSessions in
- Greece
- Denmark
- Portugal
- Malta

<u>Portfolio Dashboard</u>
- Size: >€10M
- # Projects: 16 across value chain

System Build & Integration: CCI Data

The CCI Open Data Portal is a single point of entry to CCI data

Key features include:

Multiple data download protocols

incl.FTP, HTTP, OPeNDAP, WMS, WCS

CCI Search

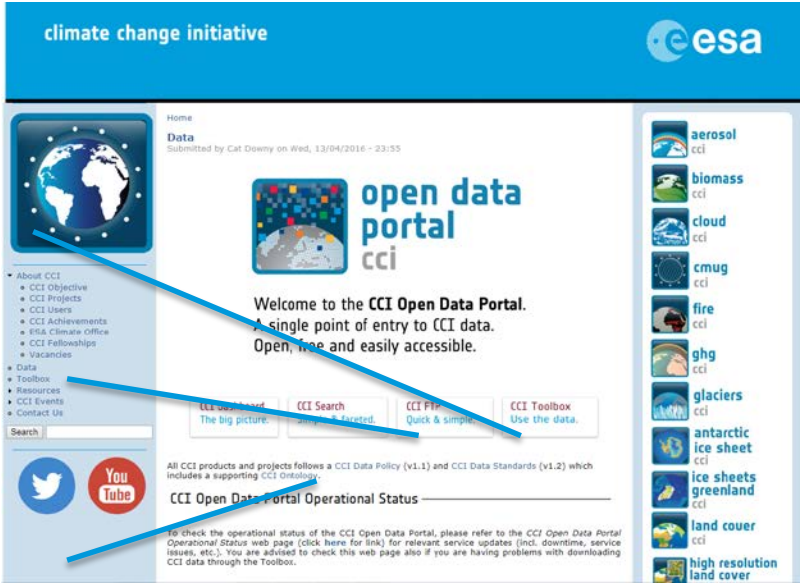
a faceted search service in which users can search for and download CCI data

CCI Dashboard

provides users with a high level view of all the individual CCI ECV datasets contained within the ODP

Peep Data Visualisation Tool

quick visual access to the data



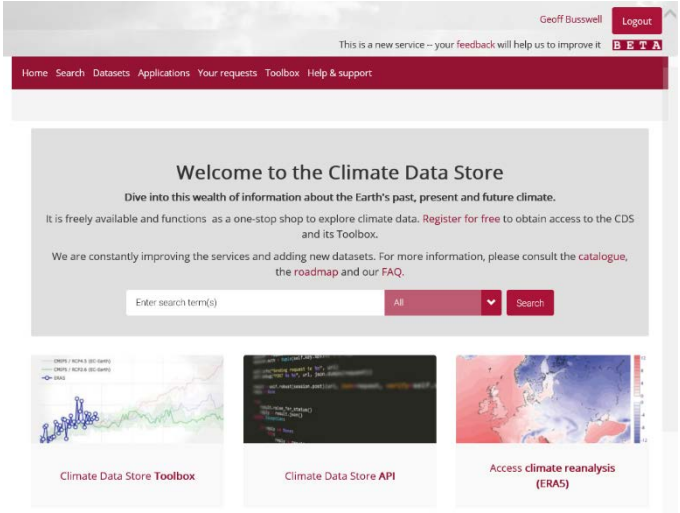
Accessed via http://cci.esa.int/data

System Build & Integration: Climate Data Store

Centralized access to climate data distributed over multiple data suppliers

Toolbox of tools that can perform processing, computation, transformation and visualisation of the catalogued data.

- **Data is catalogued** and made available for download
- **Evaluation & Quality Control (EQC)** adds quality evaluation
- Portal **users discover, visualise & retrieve** products
- **Applications** invoke **workflows** that apply **tools** to retrieved data
- **Standard services**, INSPIRE compliant (WMS, WFS, etc)
- **CDS API** provides programmatic access
- **Flexible** and **scalable** to support the growing and evolving need
- Currently Beta version, data getting built up over time – ECV and ERA5 data available currently



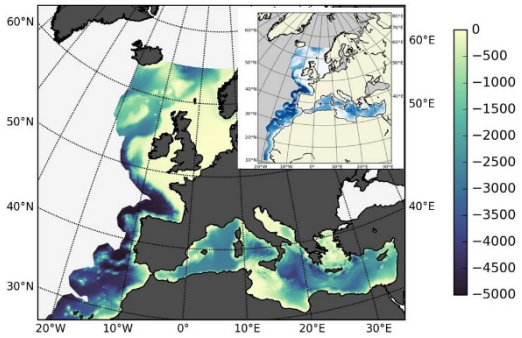
Climate Change Service
climate.copernicus.eu

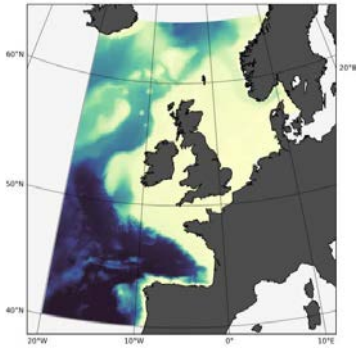
Sectoral Applications: Ocean

Developing European-focused climate services concerning the **marine, fisheries and coastal** sectors.

Assist stakeholders in analysing climate change adaption strategies through Use Cases for:

- Coastal Eutrophication
- Fisheries and Aquaculture
- Marine Spatial Planning
- Natural Capital Accounting



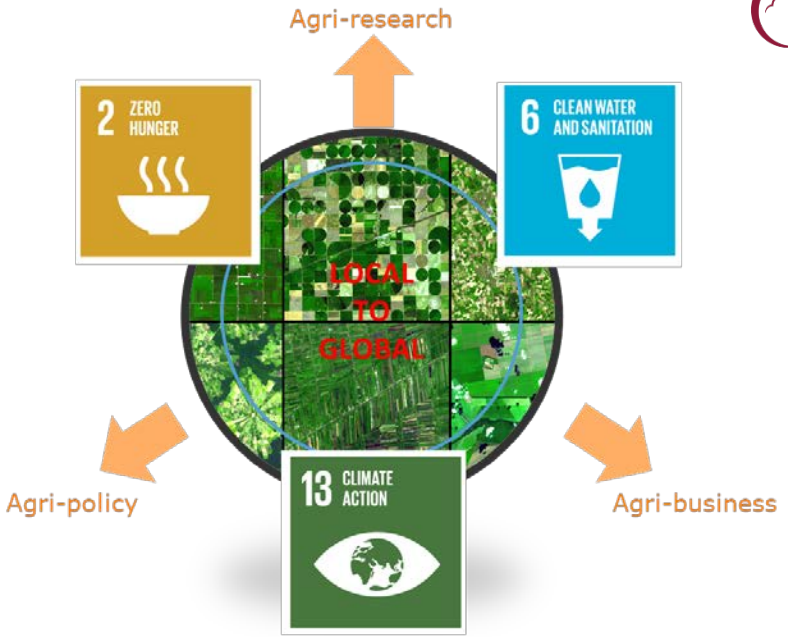


- Satellite ECV data: Ocean Colour & SST
- European Regional Seas Ecosystem Model (ERSEM)
- Ancillary data

Credit: Plymouth Marine Laboratory

Sectoral Applications: Land

- Food, Water and Climate are three prominent elements in the Sustainable Development Goals (SDG)
- The consortium will develop crop/climate indicators at global scale to address the needs of regional to global stakeholders



Credit: University of Wageningen

Data Quality: Motivations / Considerations

- For (potential) users of climate (& EO) information products, finding the right source of data is not easy.
- Understanding of what's available – and if it meets your needs - is a barrier to entry into the market
- "Good" or "bad" data is a subjective view. Instead data should be characterised in such a way as to support decision making for the user
- Items to consider for inclusion at data-set level are:
  - Quantitative error/uncertainty information contained within the data;
  - Data availability (mission length, coverage etc.)
  - Data traceability (input data, processing algorithm and version)
  - Data calibration (QC check & cal/val activity results)
- Climate community has done a lot of work in this area; data quality should be a central consideration in any Atlantic from Space initiative to 1) allow users to select the right data for their needs; 2) stimulate take-up and use of data

Data Quality: Implementation Example

Project: Evaluation & Quality Control framework (EQC) for the Sectoral Information System (SIS)

Aim:

- To guarantee fitness-for-purpose, user relevance and quality of SIS activities across 10 sectors
- To build trust in terms of what is being provided by the C3S and in the providers themselves

Objectives:

- Define an EQC Framework that provides C3S users with the ability to assess whether the SIS services and data are fit-for-purpose
- Ensure that workflows accepted into the CDS are of good quality and will generate outputs that uphold the standards required for ensuring C3S is a trustworthy source of climate information

Approach:

- Specific Quality Assurance Templates (QATs) defined to evaluate service components
- QAT's are self-completed by data / service providers and are submitted online and managed by a content management system
- EQC for SIS team then validate and verify that information in the QAT's is a fair representation
- Motivation for self-certification is that data / service providers want their offering in the CDS

	Energy	Water Management	Agriculture & Forestry	Health	Transport	Coastal Areas	Tourism	Insurance	Infrastructure	Disaster Risk Reduction
TVUK			○							○
DWD	●	●		●	●				●	
UK MET Office	○	○	○	○	○	○	○	●	○	●
TEC Conseil			●			●	●			

● = Sector Lead, ○ = Sector support

Conclusions & Recommendations

- Climate change market place is strongly evolving
- Consider entire value chain
    - Market / requirements analysis
    - Training
- System Build & Integration:
    - Rich and wide variety of climate data sets available
    - Consider data brokering approach for efficiency and re-use
    - Interfacing standards
- Sectoral applications: fusion of different data sources and model output is key
- Quality Assurance:
    - Allows transparency so user can select the “right” data for their application
    - Stimulates take up of satellite-derived data products