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Concepts to Consider in a European Climate Portal and Data Store

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Telespazio VEGA United Kingdom

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1. Telespazio in UK – TPZ is one of Europe's largest Space based Services businesses: >35 years in space industry; 2500 employees; >550m€ turnover
2. Extensive heritage in Earth Observation data processing & archiving, quality control, applications and user services
   - We run ESA's major operational service providing EO data quality on all satellite missions
   - We manage one ECV and have understanding of others
   - Strong involvement in ESA Climate Change Portal
   - Bring EC Copernicus User Uptake heritage – tools technology
   - Build Ground Segment for Copernicus – Sentinel 3
   - We build large Software Intensive platforms
3. Preferred commercial model is working together with specialist institutes, scientists and niche industrial suppliers.

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Concepts for Climate Data Store and Portal

1. The Basic Building Blocks
2. Getting the Data
3. Data/Product Storage
4. Information/Product/Data Accessibility
5. Generating CDS Standard Products
6. Other Relevant Issues
    - Data/Product Quality
    - On-the-Fly Value Add Processing within CDS
    - Visualisation & Reporting
7. Architecture and Programmatic Priorities

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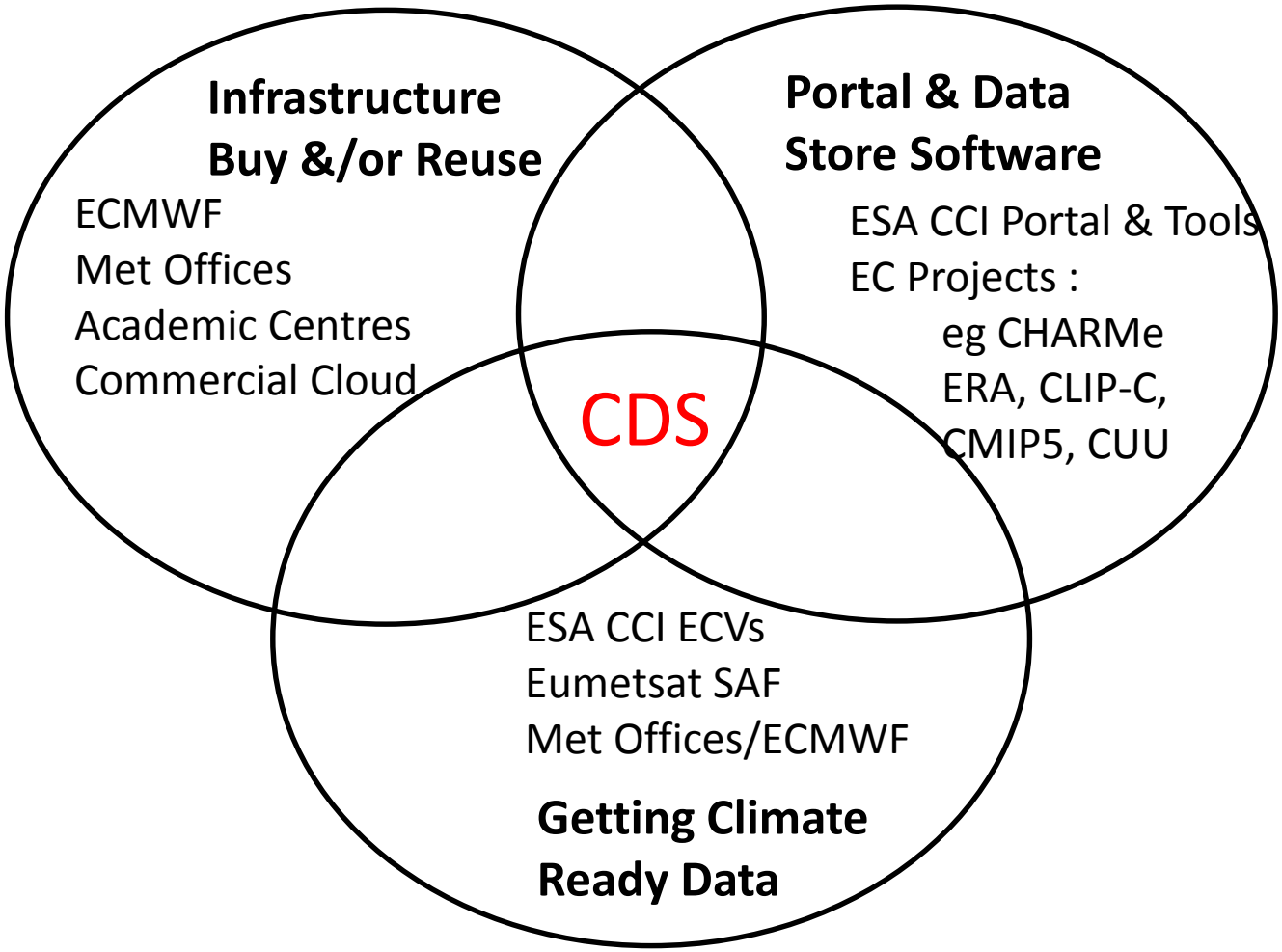
Basic Building Blocks



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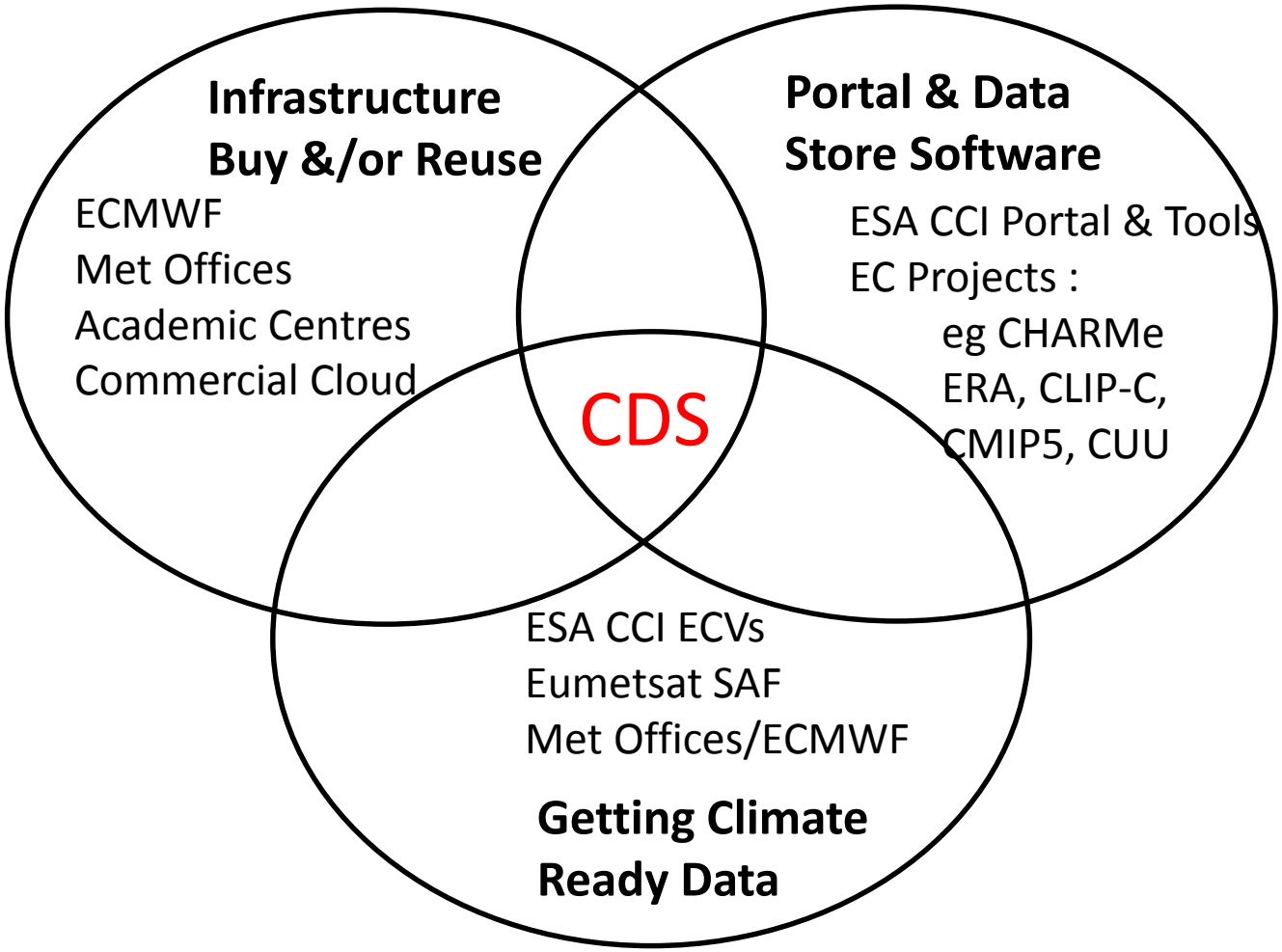
Basic Building Blocks



From RESEARCH projects to OPERATIONAL service under measured SLA

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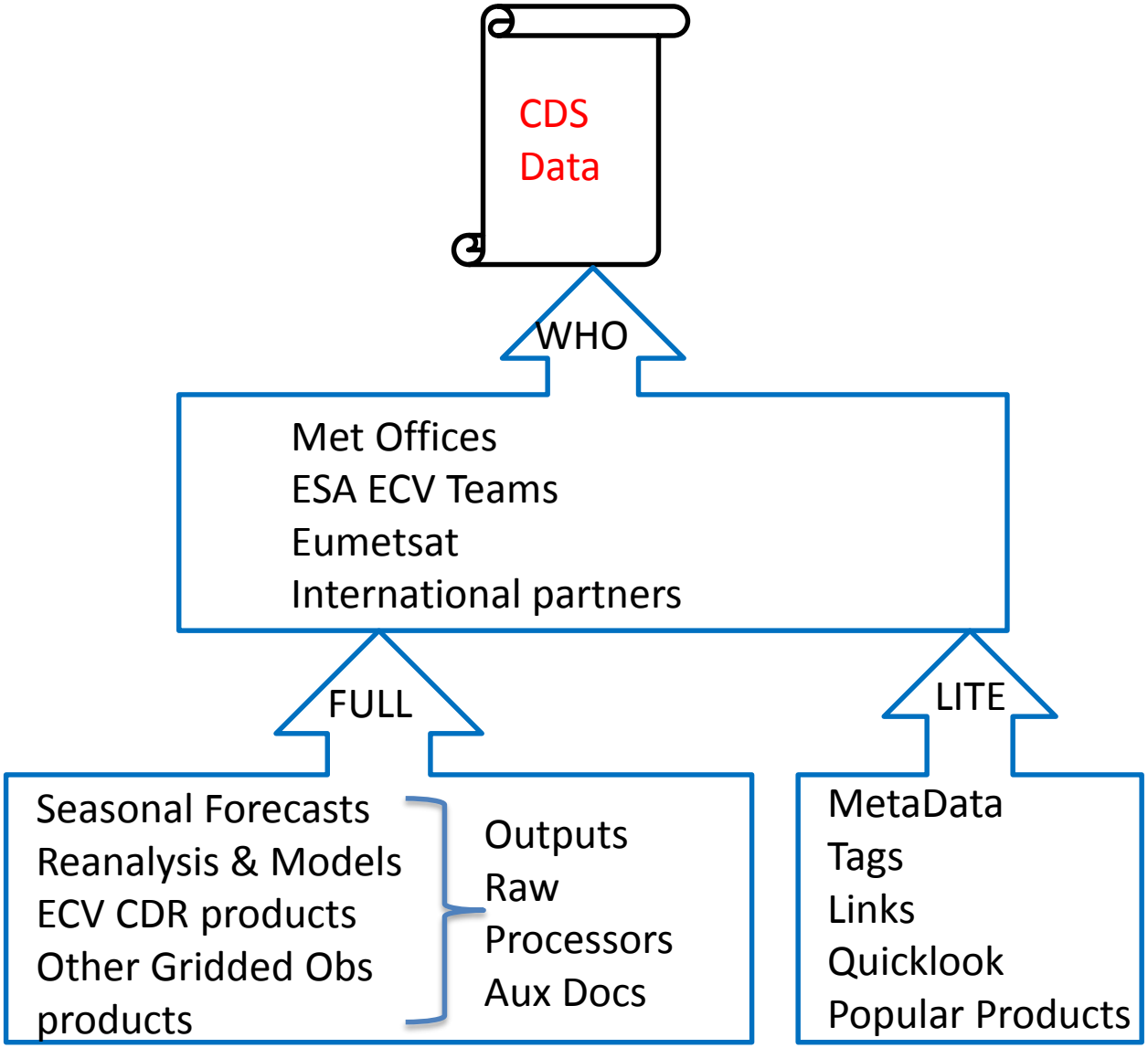
Getting the Data



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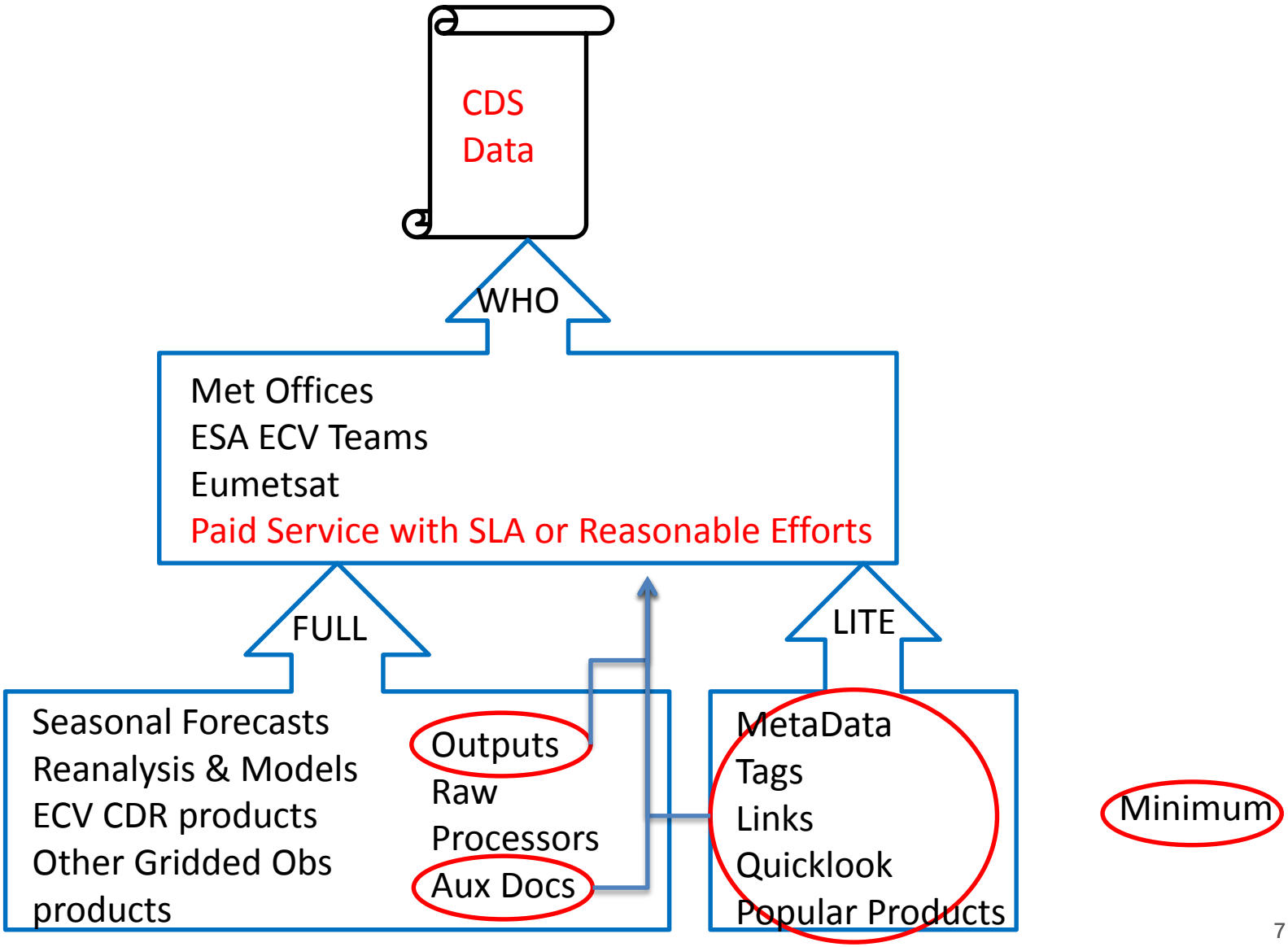
Getting the Data



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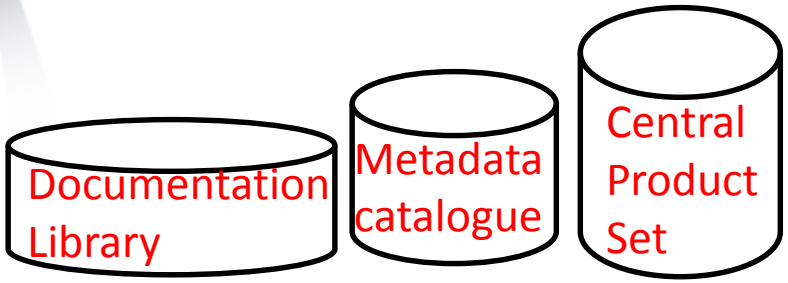
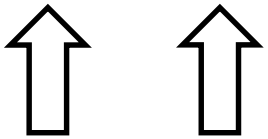
Data / Product Storage

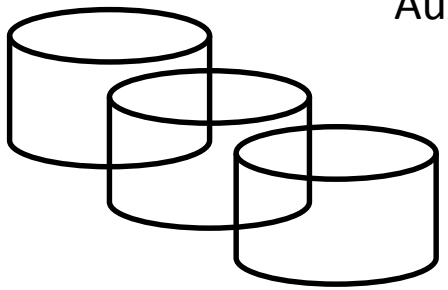




Input data:

Raw??/Product?/Metadata

Aux data for traceability



Distributed Federated Datastore

Flexible, Robust

Assurance of data & software preservation?

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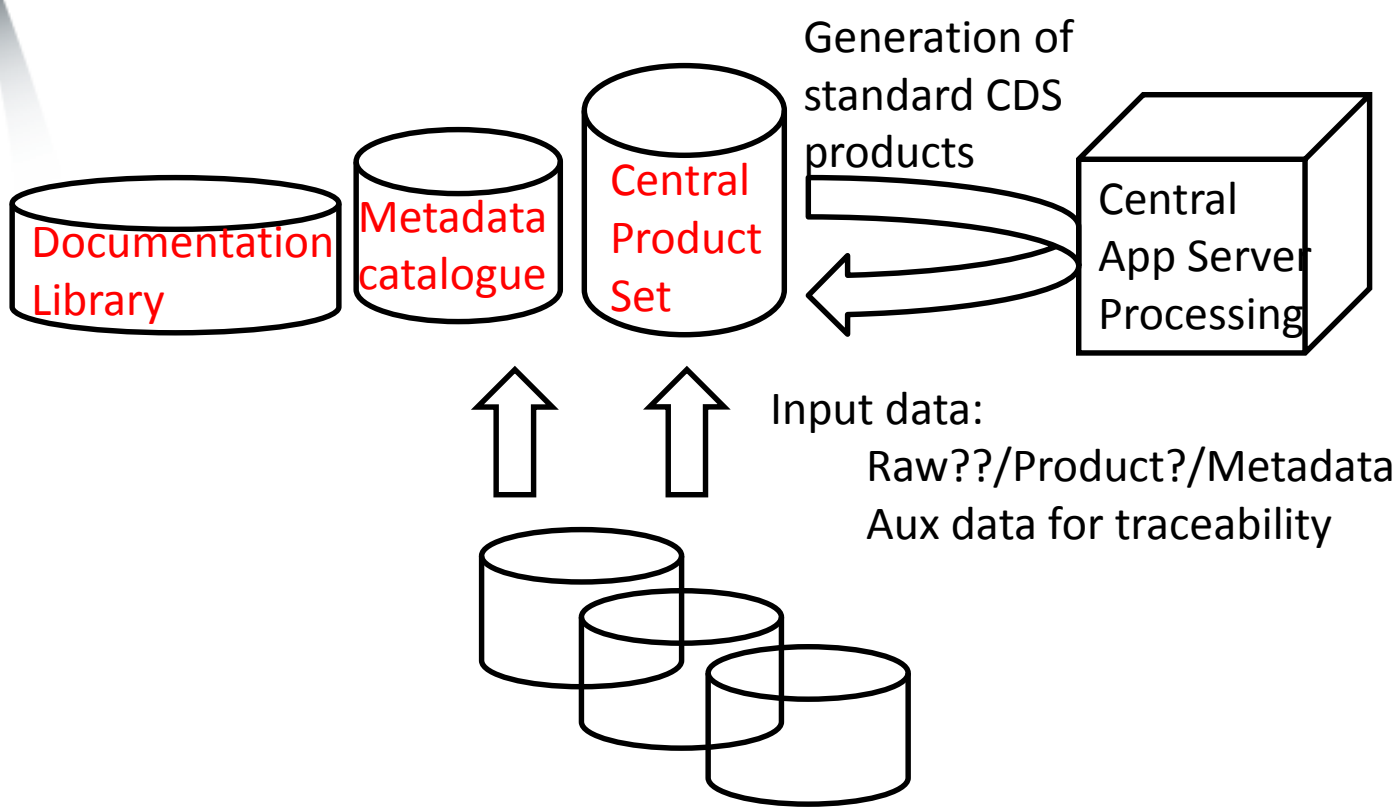
Data / Product Storage



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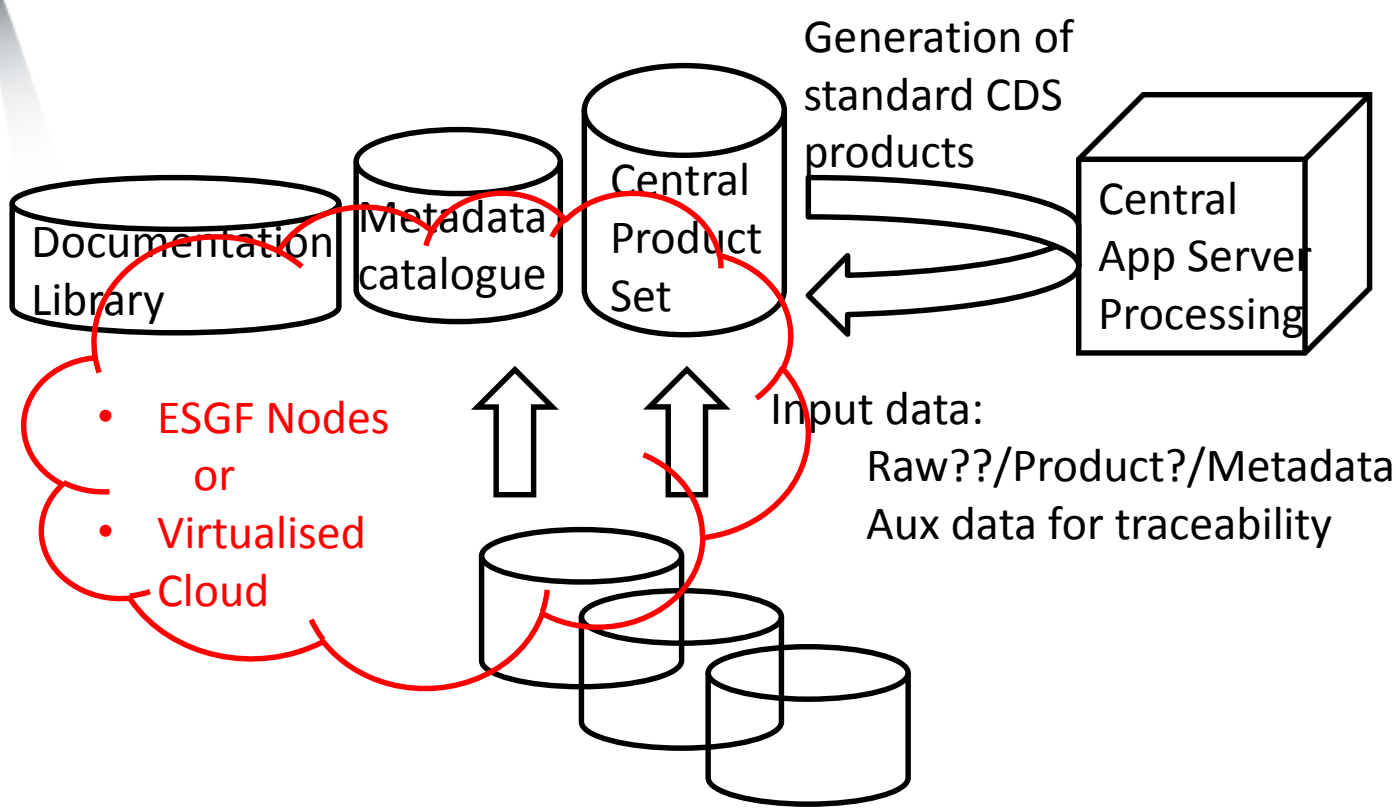

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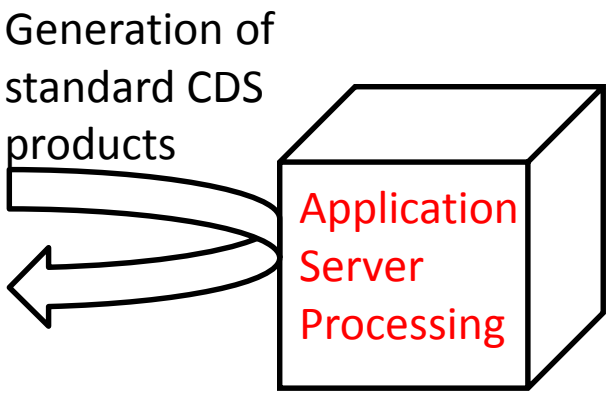
Generating CDS Standard Format Products

What is needed

1. Standardised regridded products suitable for – European regional analysis, global analysis
2. Standardised temporal/area datasubsets
3. Generation of Standard Indicators/Indices for use by SIS
4. Additional generated input products for/from SIS



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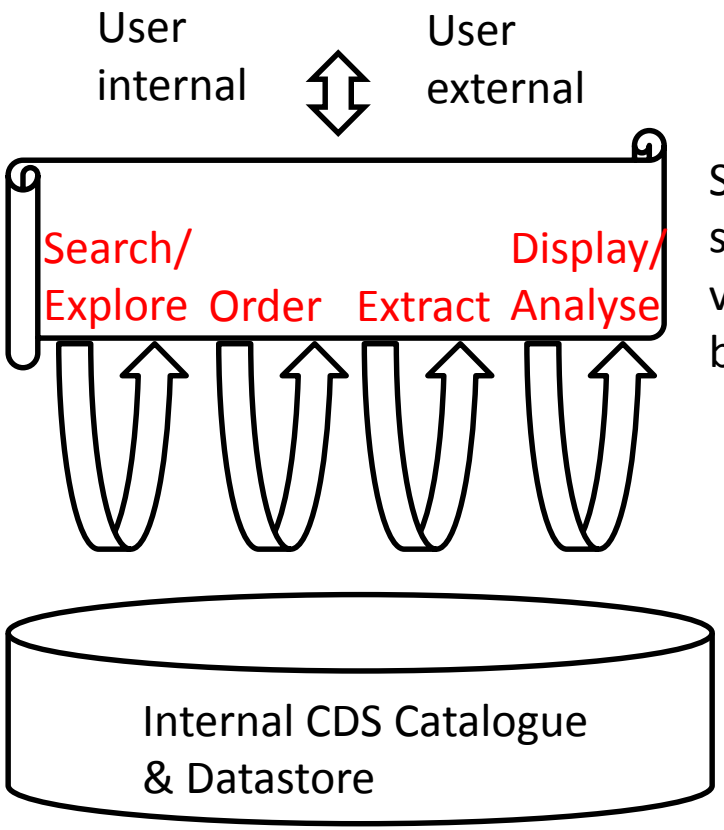
Information /Product/Data Accessibility



Suggest to specify a subset of data and visual formats as being available

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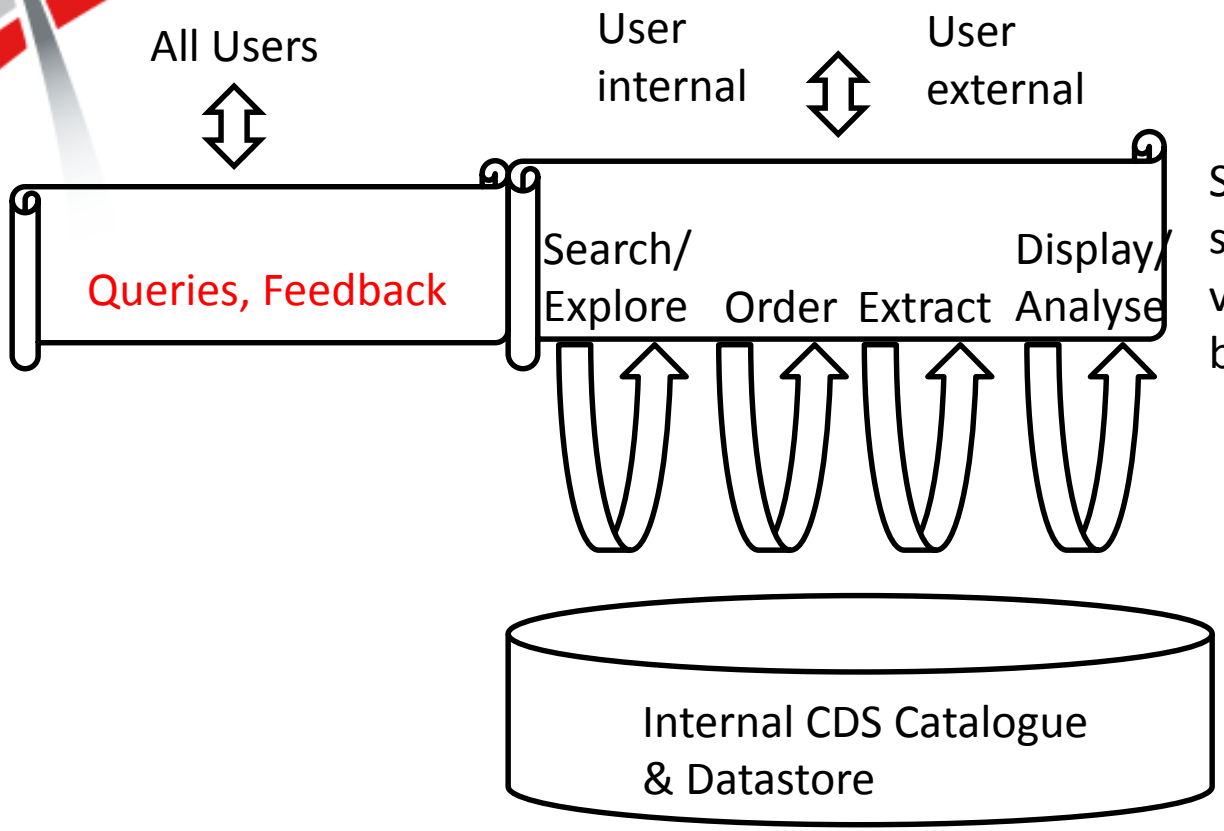
Information /Product/Data Accessibility



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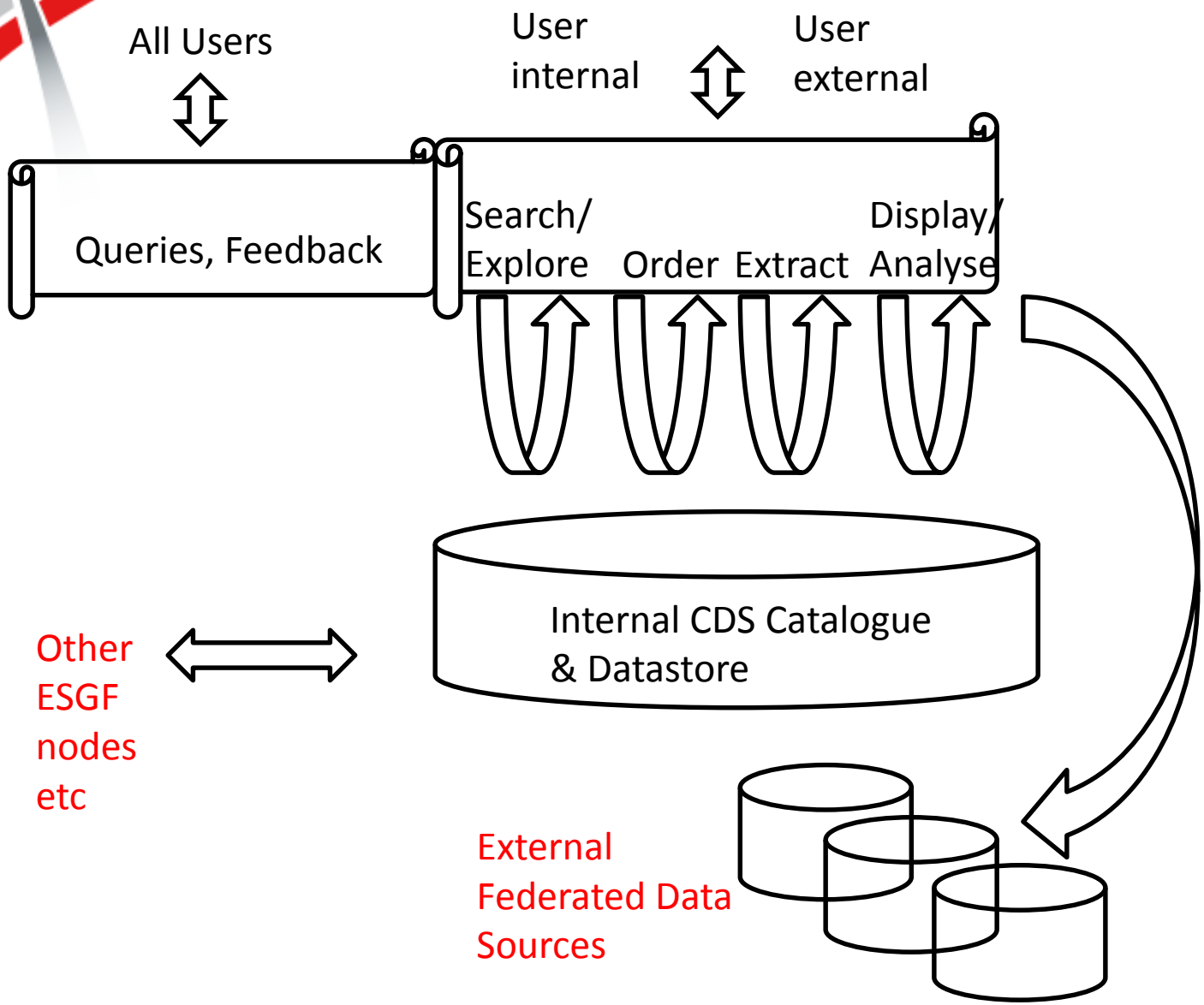

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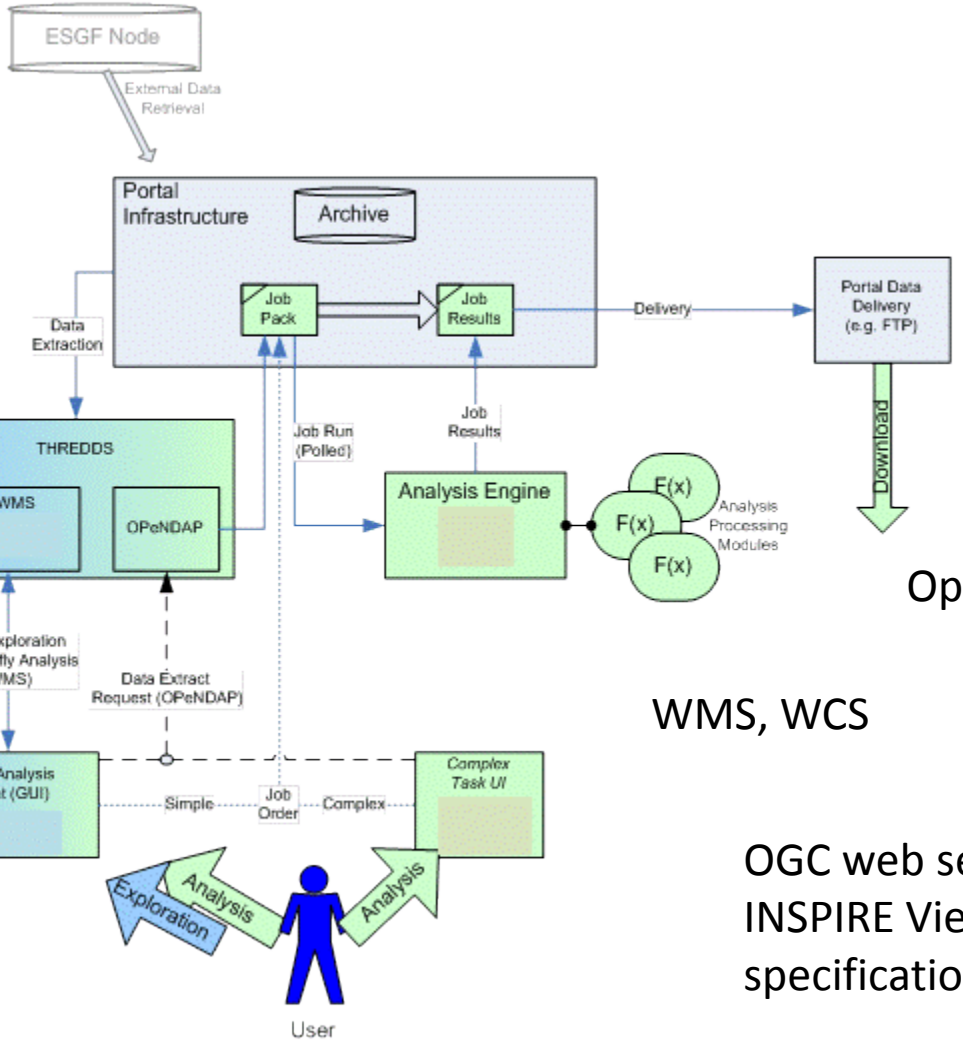
Typical “Explore & Analyse” Architecture & Technologies

Virtualised Environments

Hadoop



Client-server architecture

THREDDS

OpenDAP

Java, Python

WMS, WCS

OGC web services & INSPIRE View Service specification

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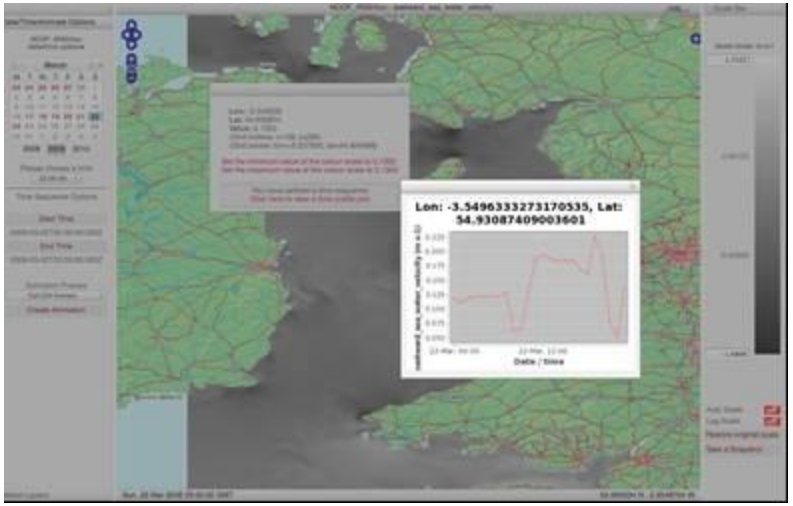
Example Visualisation – EC Copernicus User Uptake Project

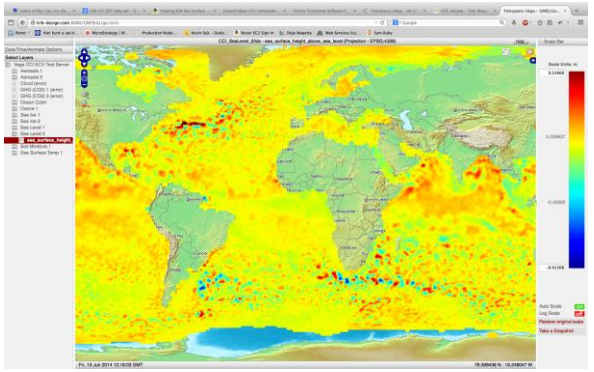
- View multiple ECV datasets
- Display >1 active data layer
- Switchable between layers
- Subsetting – area & temporal
- The need for a “stretchable” display.
- Multi-lingual

PeeP Toolset

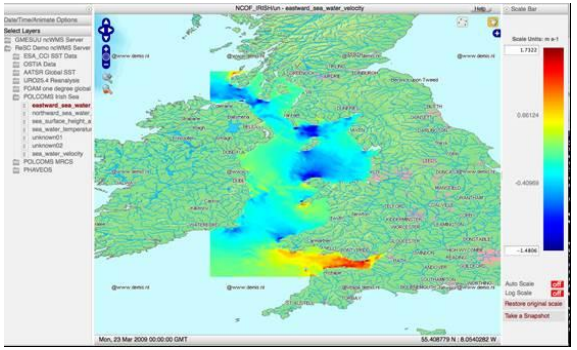


Time Series Extraction

Soil Moisture



Sea Level



Sea Surface Temp.

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Other Issues : Data / Product Quality

1. Reliance of Climate information is on the trust placed on the underlying data and its processing methodology
2. Must tag data and products with source quality, processing chain version etc.
    - Use Digital Object Identifier Tags (DOI's)
3. Must enable reprocessing/reanalysis at a later date – raw data accessibility
4. Must do Long Term Data Preservation – not just of data but also of Aux documentation, & past software processor versions
5. Must have interface to enable user feedback
6. Must have KPI collection and interface to enable EQC capability

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Other Issues: On-the-Fly Value Add Processing within CDS

1. Providing platform for analysis
    1. To what depth – for who
        1. C3S internally – SIS, EQC
        2. External users – for central CDS data is this non-specialists
    2. Subsection geo/temporal extraction
    3. Multiple parameter plotting
    4. Statistical analysis
    5. What is interface to SIS

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Other Issues: Visualisation & Reporting

1. Possible to visualise all data ?
2. Possible to visualise all CDS products
3. Possible to chart/graph
4. CDS should enable collection of internal CDS KPIs
5. Enable production of CDS reporting

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Architecture & Programmatic Priorities

1. Robust and scalable
2. Embrace modern concepts
3. Balance between control of centralised store and flexible distributed system
4. Strongly suggest centralised capability in addition to links to distributed data
5. Simplicity in core design, simplicity in initial supported formats
6. Get the basic in place soon & do it well
7. Add complexity in stages
8. Users will feedback the priority on where it is most effective to spend on evolution

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