MONITORING WEATHER AND CLIMATE FROM SPACE





INTRODUCTION TO **EUMETSAT DATA** CENTRE

> **Kristina Petraityte Data Centre Product Analyst**

Content of Presentation

1. Overview of the Data Centre

- 2. Recently implemented enhancements:
 - User Ordering Feedback Mechanism
 - "Fast Track" Ordering
 - NetCDF as a new delivery format
- 3. Forthcoming enhancements:
 - New Web based Ordering Client
 - Hardware Upgrades
 - Reprocessed data
- Data access



EUMETSAT Data Centre aims to:

- Guarantee a long-term preservation of data and generated products from EUMETSAT's meteorological satellites;
- Enable users to browse, make automated orders, and retrieve data from EUMETSAT's catalogue of products;





EUMETSAT Data Centre

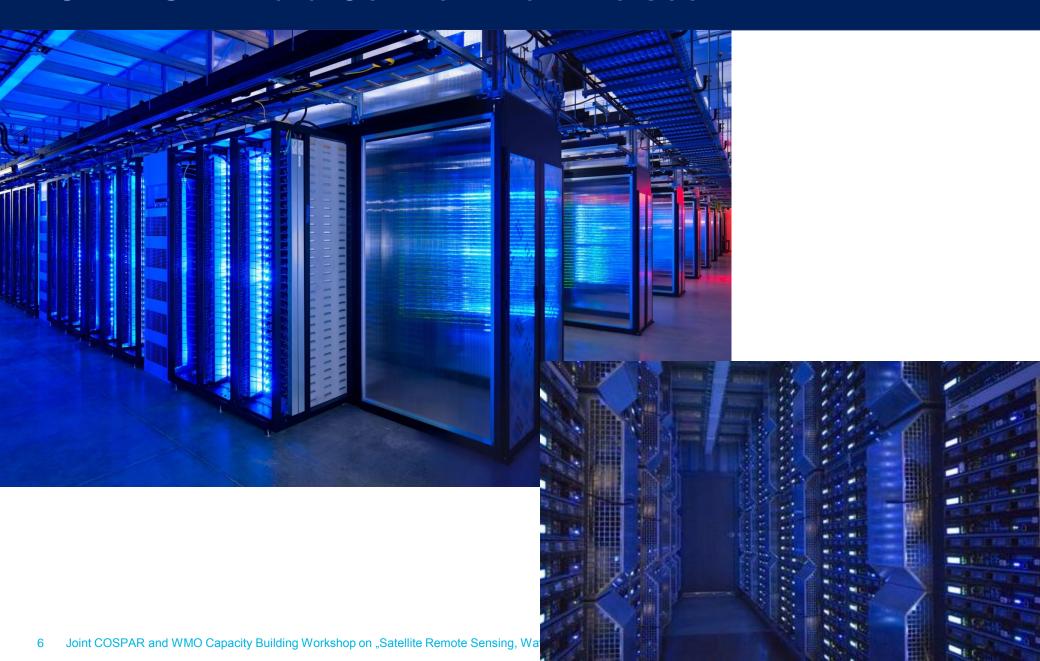
- Set up in 1995, the Data Centre has been developed to become a state-of-theart archive serving all EUMETSAT satellite programmes;
- With more than 150 meteorological satellite products available — in the case of Meteosat spanning a record of more than 30 years (since 1981) — the Data Centre offers one of Europe's largest and most comprehensive collections in this field.



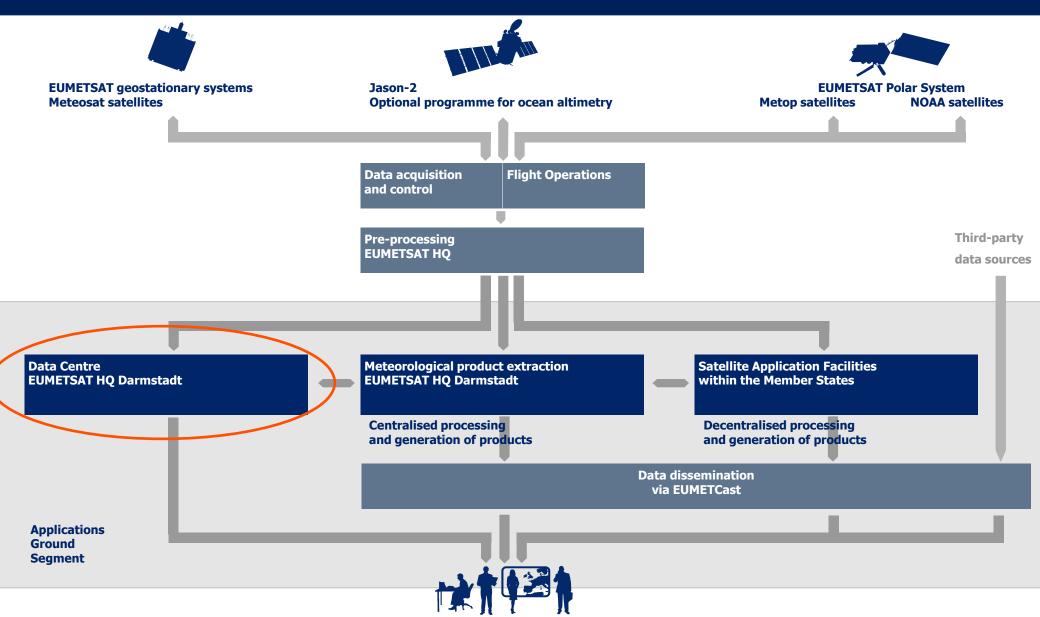
EUMETSAT Data Centre – how our colleagues see it...



EUMETSAT Data Centre – how we see it...

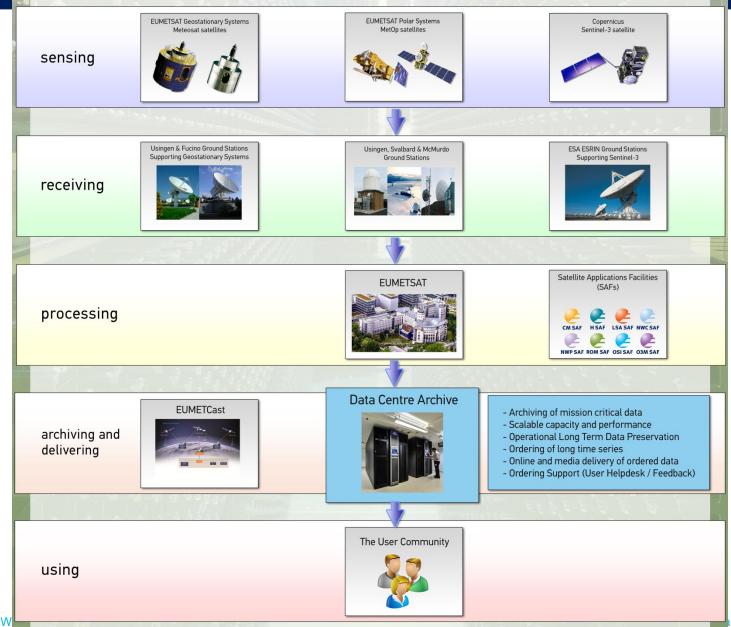


EUMETSAT Data Centre – where it is...

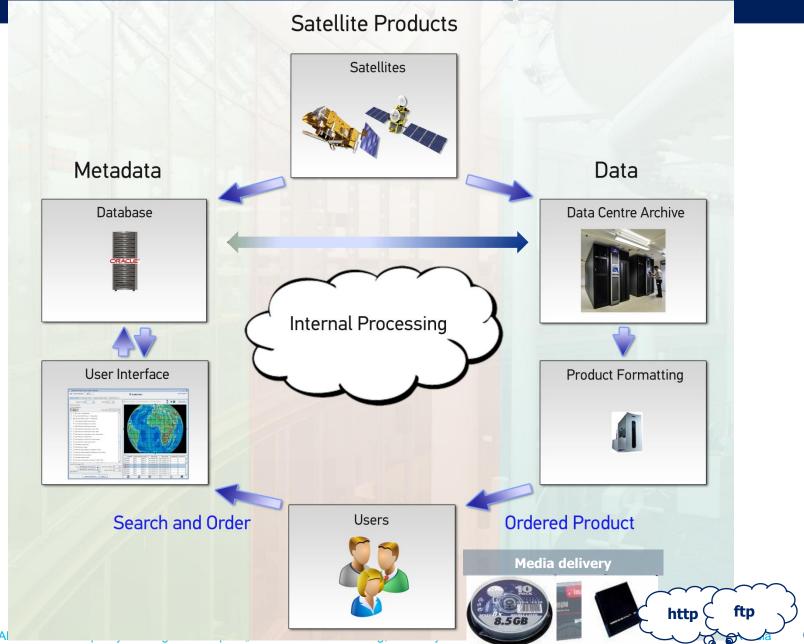




EUMETSAT Data Centre – what it actually is...



EUMETSAT Data Centre – how we present it...



Archive Data Redundancy & Data Preservation

- Up to 3 copies are made for each data set ingested by the Data Centre
- The first copy is created on T10K media and remains in the prime robot;
- The second copy is created on LTO-4 media to be stored off site as the backup copy;
- A third copy is created on disk for the most demanded products (MSG, MTP);
- Integrity of data sets retrieved from all media can be checked against a checksum stored in its meta-data;
- Every five years the data is migrated on new media;
- Every two years the off-site copies are re-spooled to avoid tape sticking;





Data Centre – key usage figures (averages: last 2 years)

 Currently used Archive Capacit 	y: over 1 Petabyte
 Number of archived files: 	50,000,000
• Ratio Ingestion (in): Retrieval	(out) ca. 1 : 10

 Average Retrieval Volume / month: 	120 TB
 Average Delivery Volume / month 	30 TB
 Average no. of Items processed / month 	700,000
 Delivery Online : Media (data volume) 	2:1
Online: Media (user orders)	19:1

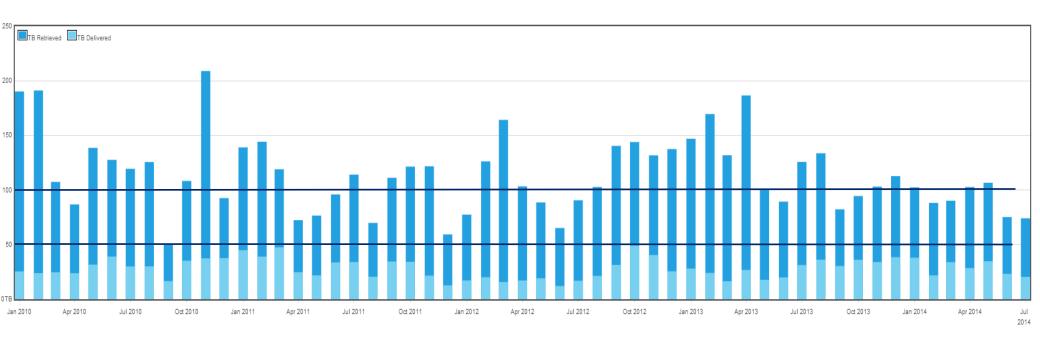
•	Currently registered Users:	3,000
•	Average active Users ordering / month:	200



29 July,2014

Data Centre Ordering

Ordering statistics for 2010 July – 2014 July





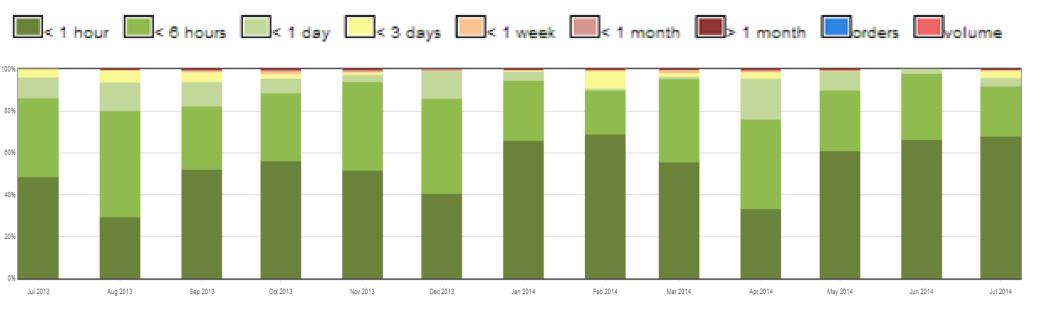
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Recent Enhancements – "Fast Track" ordering

- In response to users' feedback to improve the delivery speed of small orders;
- Small Order:
 - < 10 items
 - Delivery method: online
 - Format: no restriction



Delivery speeds can still vary depending on the number of small orders being processed in parallel.



Tver. Russia

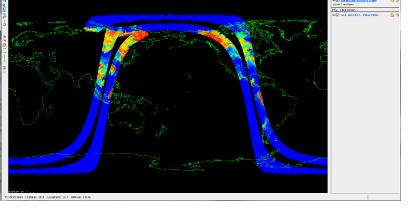
Recent Enhancements – NetCDF delivery format

- Non-Meteorological User Community is often not very familiar with available formats (e.g. Native, BUFR, GRIB);
- NetCDF is introduced as a standard, well-accepted and easy to use delivery format for products from the Data Centre;

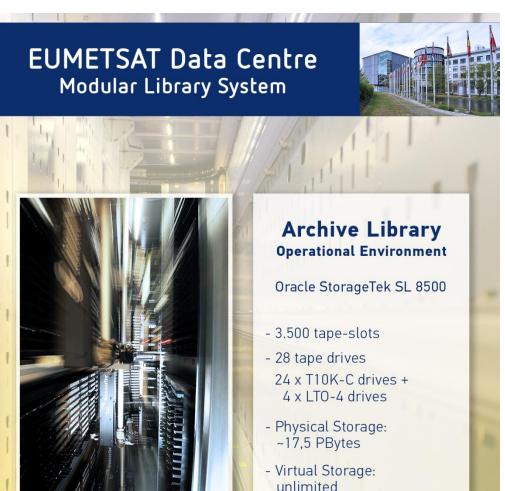
 Most EPS I1 and I2 products (e.g. ASCAT, AVHRR, IASI) can now be ordered in NetCDF format:

- NetCDF is "NetCDF4 Classic", i.e. NetCDF4 libraries with Classic Common Data Model and Climate and Forecast (CF) metadata conventions are applied;
- See Data Centre Internet page for more:

http://www.eumetsat.int/website/home/Data/
DataDelivery/EUMETSATDataCentre/NetCDFFormatforDataCentreProducts/index.html



Recent Enhancements



EUMETSAT Data Centre Modular Library System

Data Centre Library Operational Environment

Oracle StorageTek SL 8500

- 10.000 tape-slots
- 28 Drive's
- 24 x T10K-C drives + 4 x I TO-4 drives
- Physical Storage: ~50 PBytes
- Virtual Storage: unlimited



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Data Centre Ordering Client Update

- Web browser based;
- Availability to users is planned for QIV 2014;
- Aim is to simplify the user interface and make it more intuitive;
- The current Java-based ordering client will still be accessible but not further evolved;
- Improvements summary:
 - The new design will guide users through ordering steps
 - Enhanced product search
 - Estimation of number of items selected + order size
 - Ordering features (e.g. ROI selection, enhanced options) only shown if applicable;



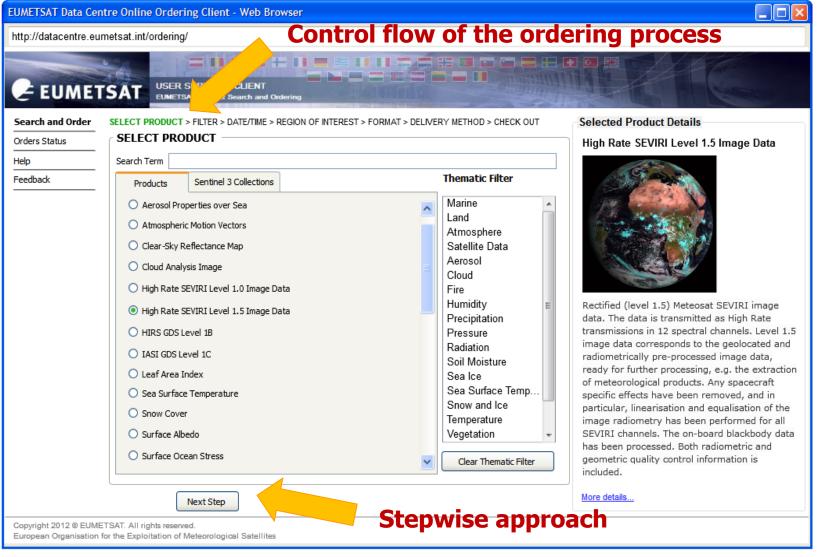






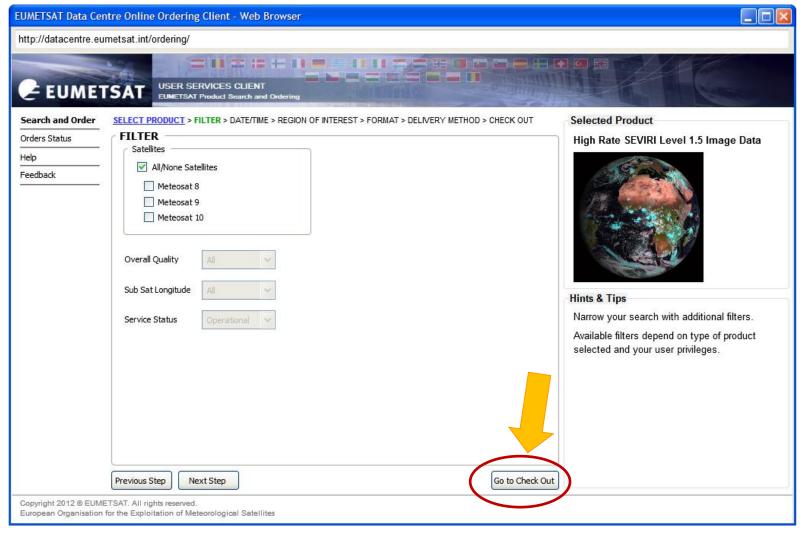


New Ordering Client: Data Centre Product Selection



- Several product search methods are offered (text, thematic, popularity).
- Selecting a product shows product details from the EO-Portal Product Navigator.
- Simplified order processing as an order can only be made for 1 type of product.

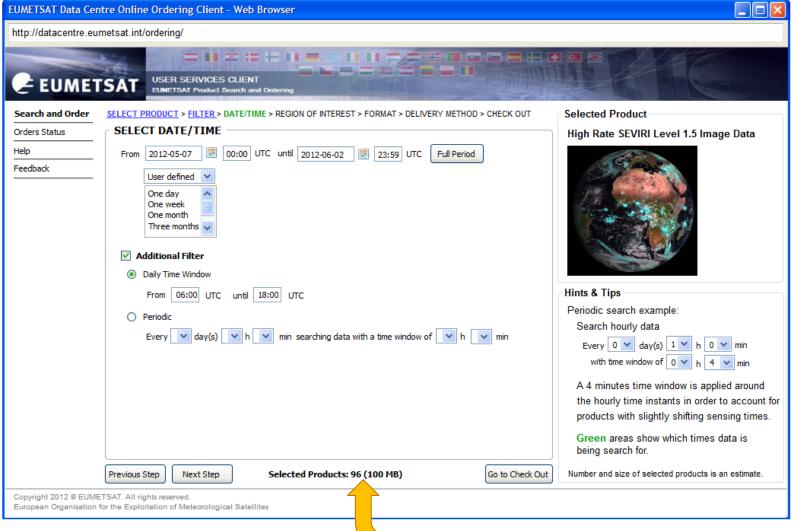
New Ordering Client: Product Filtering



- Search can be narrowed using additional filters
- Available filters depend on type of product selected and user privileges.
- "Go to Check Out" is used to shortcut ordering process by accepting defaults.

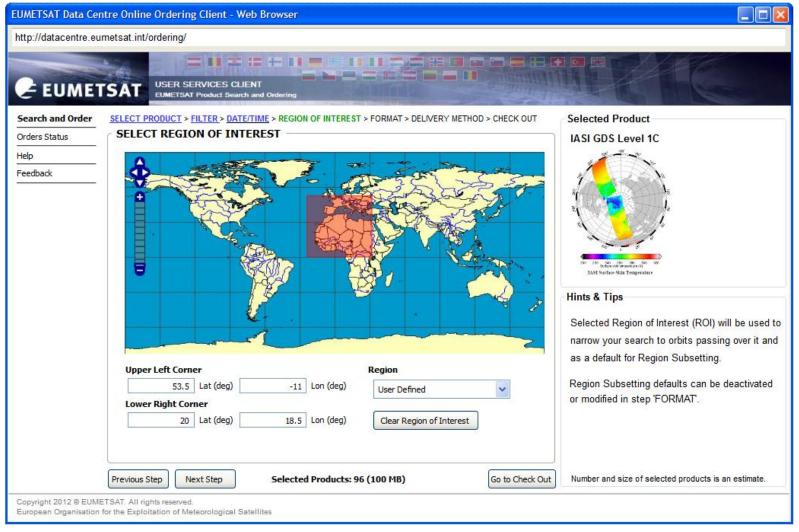


New Ordering Client: Product Data/Time Selection



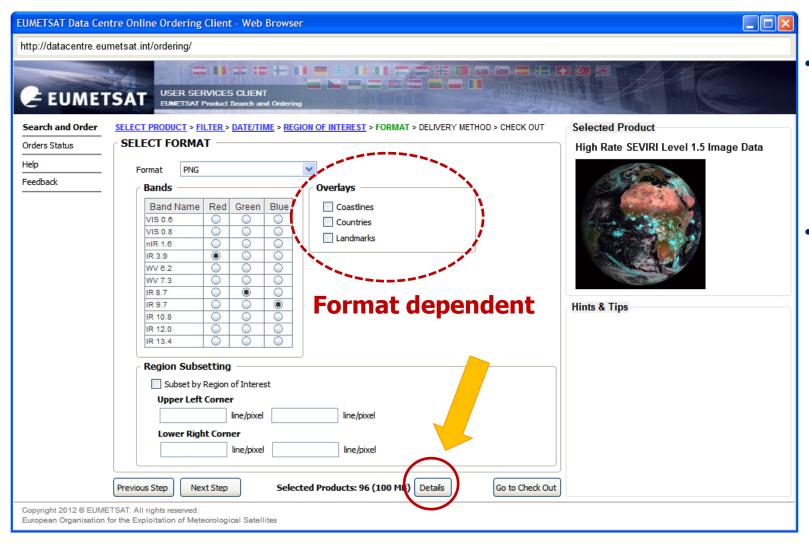
- Filter the product selected using date/time range.
- Hints & Tips provide additional usability information based on users' experiences.

New Ordering Client: Region of Interest (ROI) Search



- Filter the product selected depending on its orbits crossing the ROI.
- Hints & Tips provide additional usability information based on users' experiences.

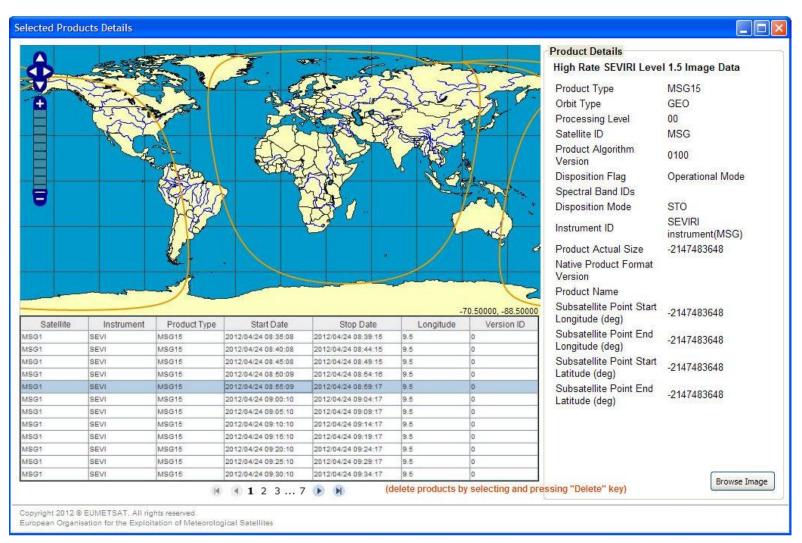
New Ordering Client: Delivery Format Selection



- Users selects the delivery format and ROI subsetting for all products in the order
- "Details" Examine the details of the products in this order, as sufficient information has been provided to return the 'filtered' products from the **Data Centre** Catalogue (see next slide)

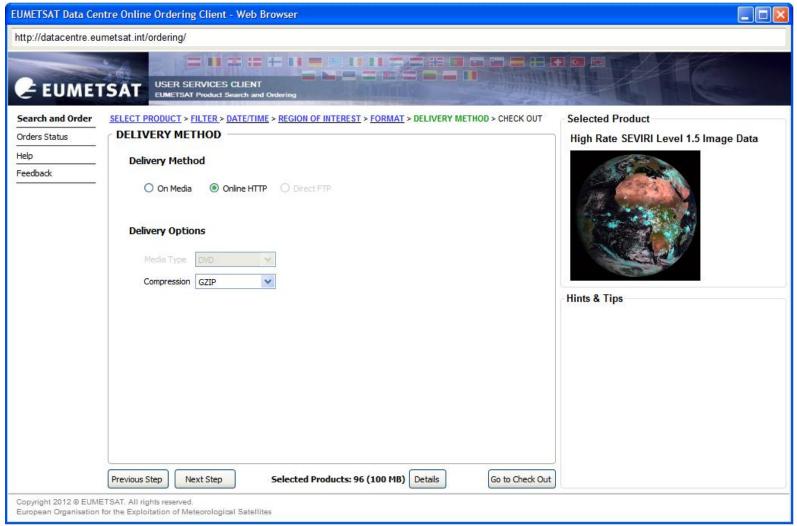


New Ordering Client: Products' Details for this Order



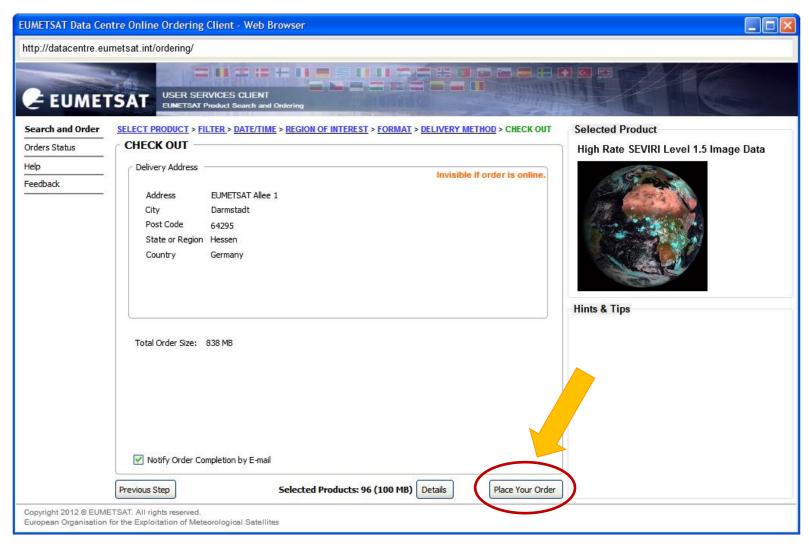
- Users should use this page to ensure their filtering criteria contains the products expected;
- Products in the order are split into lists:
- Users can easily browse these lists and select / delete any product in them:
- Metadata for the selected product is displayed. A browse Image can be displayed

New Ordering Client: Delivery Method Selection



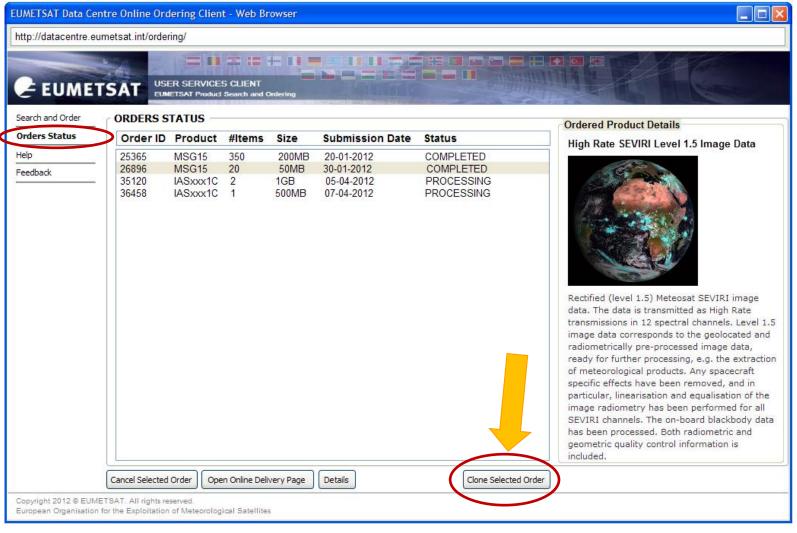
 Users select the preferred delivery method and whether data compression should be applied to their order.

New Ordering Client: Place the Data Centre Order



 To submit the order for processing, select the "Place Your Order" button

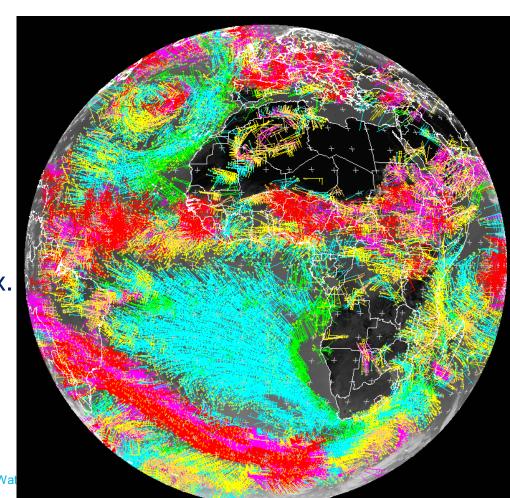
New Ordering Client: Order Status



- Users can track the status of their order(s) from this page.
- It also provides the order history for the user
- For convenience, previous orders can be cloned for the creation of new 'similar' orders.

Reprocessed Data

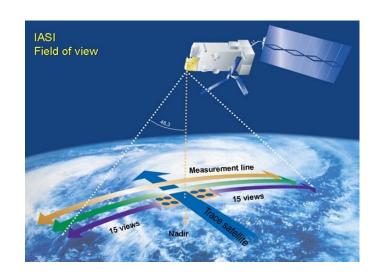
- Meteosat Second Generation Level 1.5 image data 2004-2012 products:
 - Atmospheric Motion Vectors;
 - All Sky Radiances;
 - Clear Sky Radiances;
 - Cloud Analysis;
 - Cloud Mask;
 - Clout Top Height;
 - Divergence Product;
 - Tropospheric Humidity;
 - High Resolution Precipitation Index.

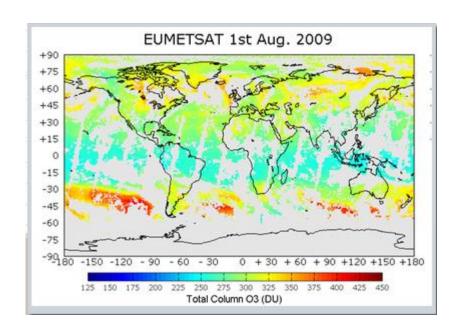


Reprocessed Data

- EUMETSAT Polar System (LEO) Satellites:
 - ASCAT (Metop A);
 - Radio Occultation (GPS data for ROM SAF -> NWP);
 - AVHRR Polar Winds (Metop A);
 - Total Ozone (GOME, IASI, AVHRR).

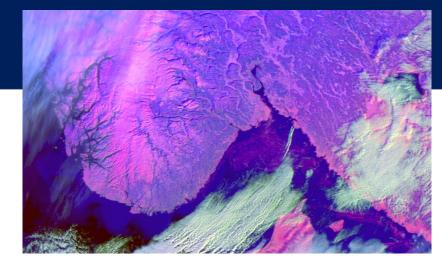








Reprocessed Data



LEO Metop A:

- ASCAT (Advanced SCATterometer) prime objective is to measure wind speed over the oceans:
- AVHRR (Advanced Very High Resolution Radiometer) multi-purpose imaging instrument used for global monitoring of cloud cover, sea surface temperature, ice, snow and vegetation cover characteristics, aerosols and fire detection;
- IASI (Infrared Atmospheric Sounding Interferometer) mission is to provide temperature and humidity profiles of troposphere and lower stratosphere;
- GOME-2 (Global Ozone Monitoring Experiment-2) is used to get detailed picture of total atmospheric content of ozone and the vertical ozone profile in the atmosphere.



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Data Centre - Data Holdings

Meteosat data since 1981;





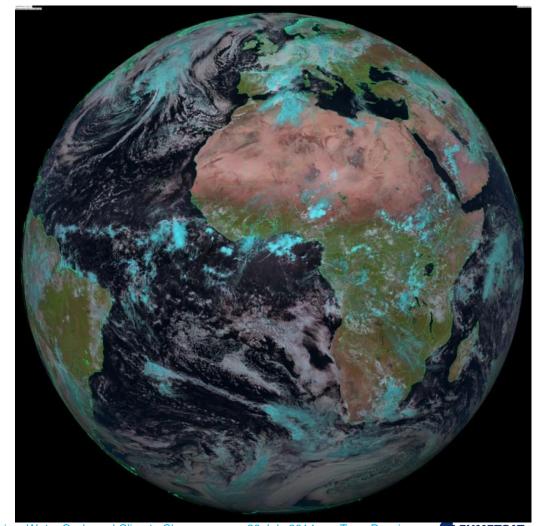
Data Centre - 0 degree Service

 Meteosat data since 1981 - radiances and derived meteorological products from geostationary satellites, which are positioned over Europe – 0 degree,

36000 km;

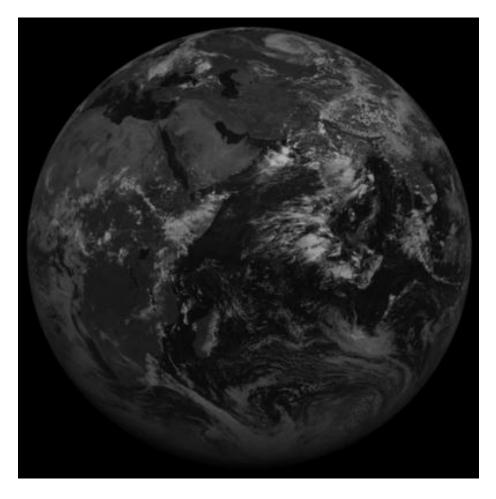
Meteosat-10 (MSG-3);

- High Rate SEVIRI Image Data in 12 spectral bands;
- Resolution (11ch. 3km at the sub-satellite point, HRV – 1km);
- Full Earth Scan every 15min
 (11ch. 8 segments, HRV 24);



Data Centre - Indian Ocean Data Coverage Service

- **Meteosat** data since **1998** radiances and derived meteorological products from geostationary satellite, which is positioned over Indian Ocean;
- Meteosat-7 (MFG);
- MVIRI Image Data in 3 spectral bands;
- Data every 30 min;
- Resolution (WV and TIR 5 km, VIS - 2.5 km;
- Wind and water vapour data for NWP;
- Information for tropical cyclones and dust storm monitoring;





Data Centre - Rapid Scan Service



- Meteosat data since 2001;
- Meteosat-9 (MSG-2);
- Rapid Scan High Rate SEVIRI Image Data;
- Every 5 min;
- 12 channels not all segments;



Data Centre - Data Holdings

Meteosat data since 1981;



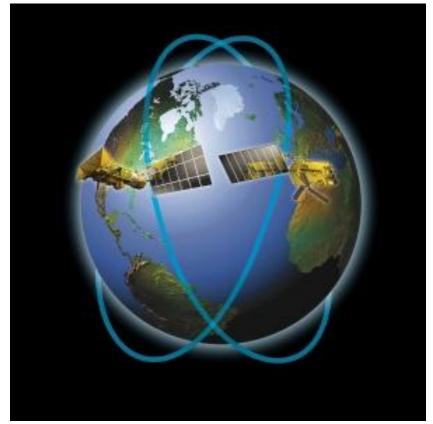
Metop-A and **Metop-B** data since **2007**;



Data Centre - Low Earth Orbit



- Metop-A and Metop-B data since 2007, including global and regional products of the various sensors, i.e. AMSU, ASCAT, AVHRR, GOME-2, GRAS, HIRS, IASI, MHS;
- 817 km;
- Satellites fly in complementary orbits to ensure global data coverage at intervals of less than 6 hours;



Data Centre - Data Holdings

Meteosat data since 1981;



Metop-A and Metop-B data since 2007;

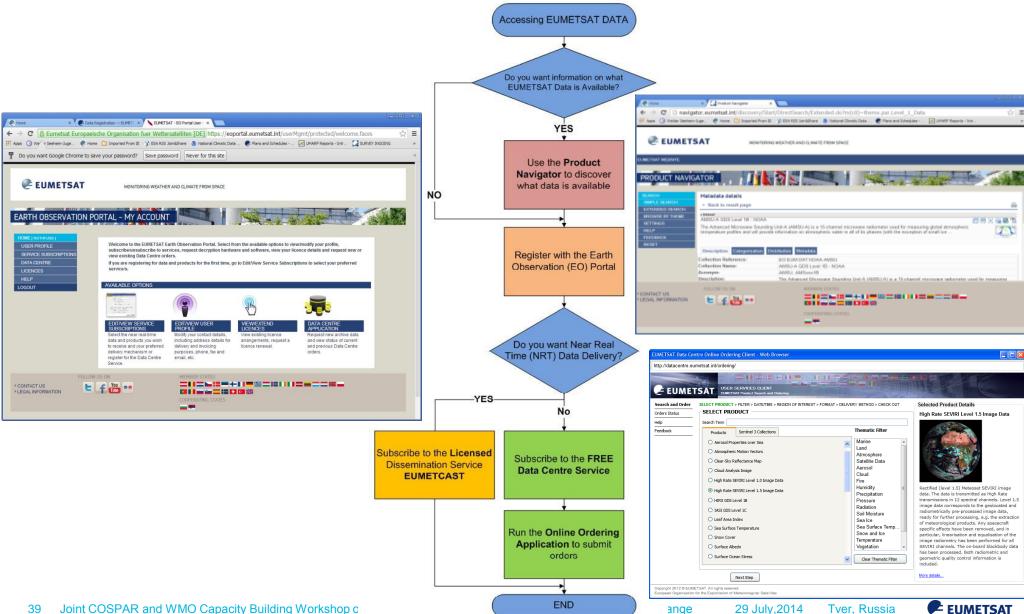


 Jason- 2 data since 2008, including various sea surface altimetry products;



- SAF data: product entries or catalogue collections (Metadata) from the EUMETSAT network of Satellite Application Facilities (SAFs) since 2008, including climate, land, oceanographic and atmospheric;
- Data from International Partners, including NOAA AVHRR data since 2006.

Flowchart – accessing Data at EUMETSAT



Accessing Data from the Data Centre Archive

- Anyone can register using the EO Portal to become a U-MARF user;
- EO Portal URL http://eoportal.eumetsat.int into your browser;
- User should subscribe to the Data Centre Service subscription;
- This service offers an Online Ordering Application were EUMETSAT data can be queried and ordered;
- The Data is free but there is no guarantee on delivery times;
- User guides, training slides and general information about the Data Centre can be found under:

http://www.eumetsat.int/Home/Main/DataAccess/EUMETSATDataCentre/



Links

EUMETSAT: http://www.eumetsat.int

Helpdesk: ops@eumetsat.int

http://www.eumetsat.int/Home/Main/DataProducts/ Data and Products:

FO Portal: http://eoportal.eumetsat.int/

Product Navigator: http://navigator.eumetsat.int/

EUMETCast: http://www.eumetsat.int/Home/Main/DataAccess/EUMETCast

Data Centre: http://www.eumetsat.int/Home/Main/DataAccess/EUMETSATDataCentre

Registering on Earth Observational Portal

http://eoportal.eumetsat.int **EUMETSAT** MONITORING WEATHER AND CLIMATE FROM SPACE HOME LOGIN Authentication HELP Welcome to the Earth Observation portal. Please login to access your account. PLEASE LOGIN Please enter your user ID and password to login User ID: * Password: Please note the fields marked with * are mandatory. ▶ FORGOTTEN YOUR PASSWORD? ▶LOGIN ► NEW USER - CREATE NEW ACCOUNT FOLLOW US ON ▶ CONTACT US ▶ LEGAL INFORMATION



MONITORING WEATHER AND CLIMATE FROM SPACE



THANK YOU!

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