



GENESI-DR: *Ground European Network for Earth Science Interoperations - Digital Repositories*

GENESI-DR

Grant agreement no: 212073

<http://www.genesi-dr.eu>

*An environmental perspective –
GENESI-DR
R Cossu - ESA*

Catania, 4 Mar 2009



KONGSBERG



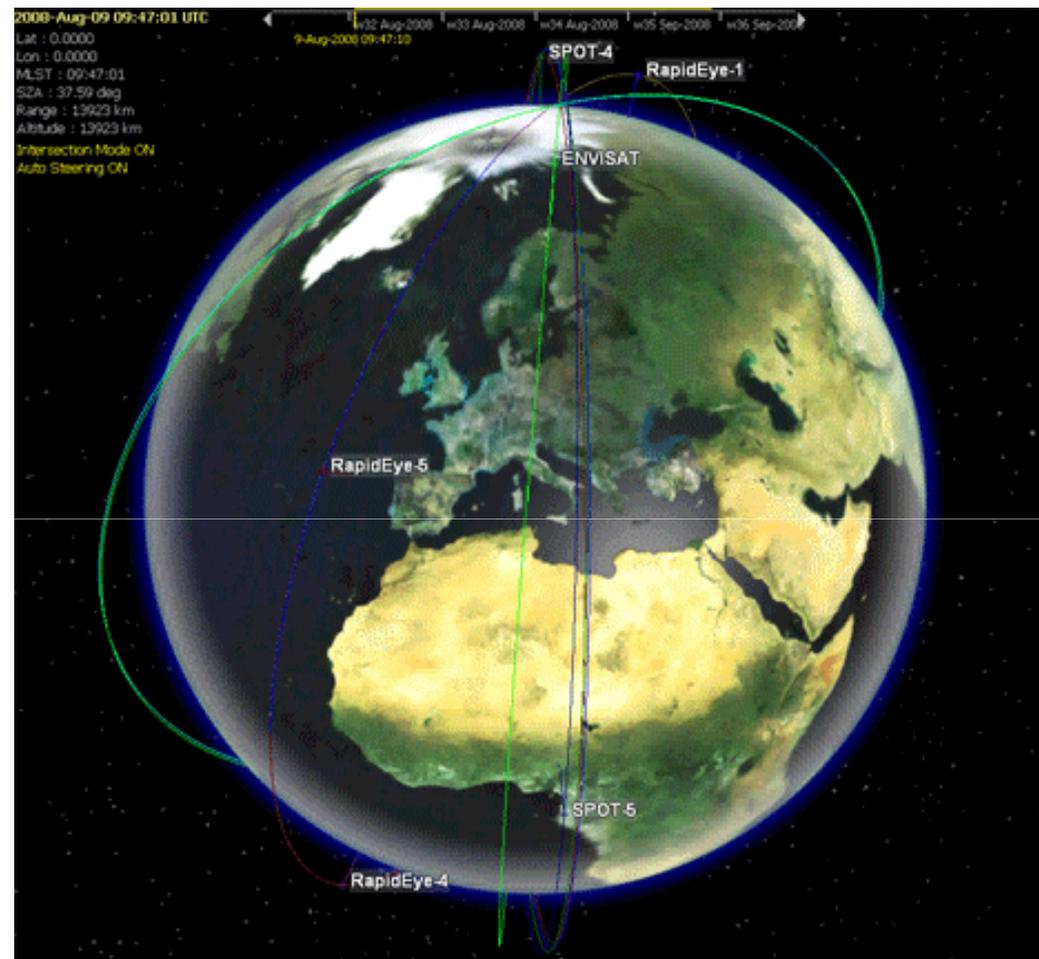
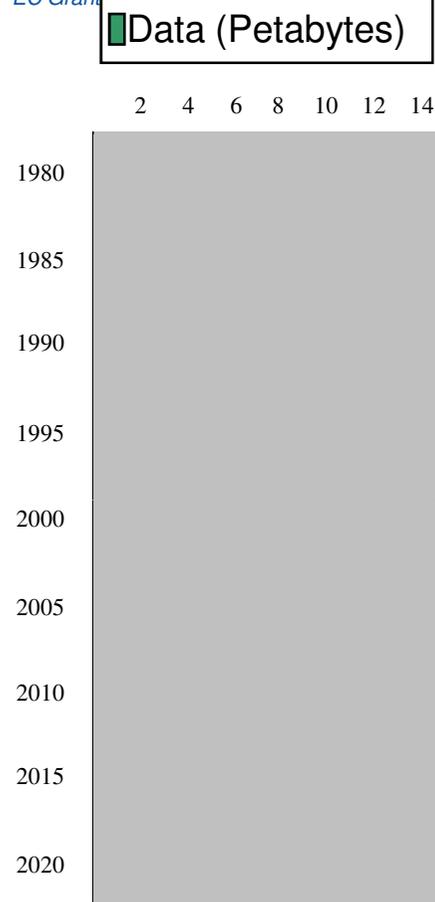
- The heritage of GENESI-DR
 - Present Earth Science “operational” capabilities
 - What is unique in ... **E**arth **S**cience **I**nteroperations
 - **D**igital **R**epositories
- How GENESI-DR works
- Objectives
- Vision
- Initial demonstrations at end of Year 1



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EC Grant Agreement no. 010070

The EO data deluge...



Petabytes of already acquired data are presently underexploited, because to get the results in a reasonable time not enough computing resources, tools and algorithms are available.

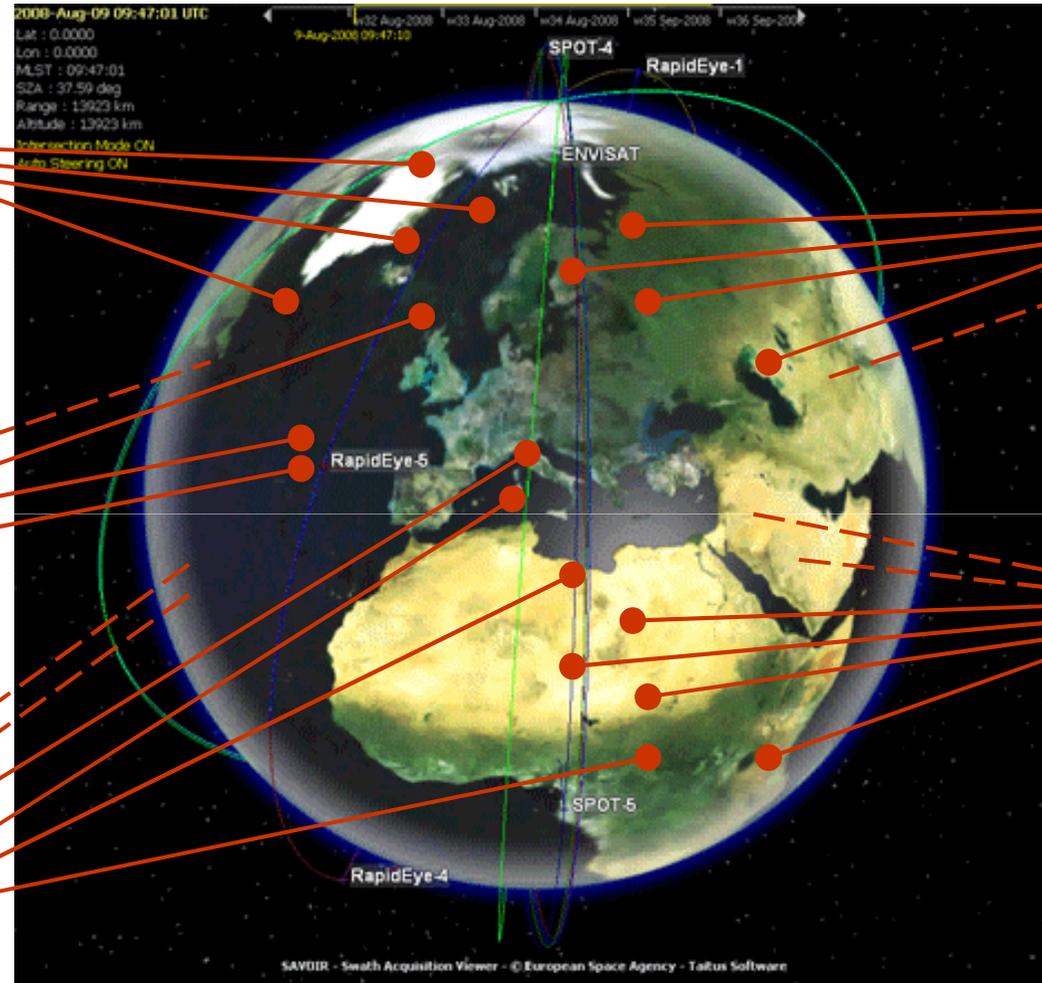




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The ES data deluge...



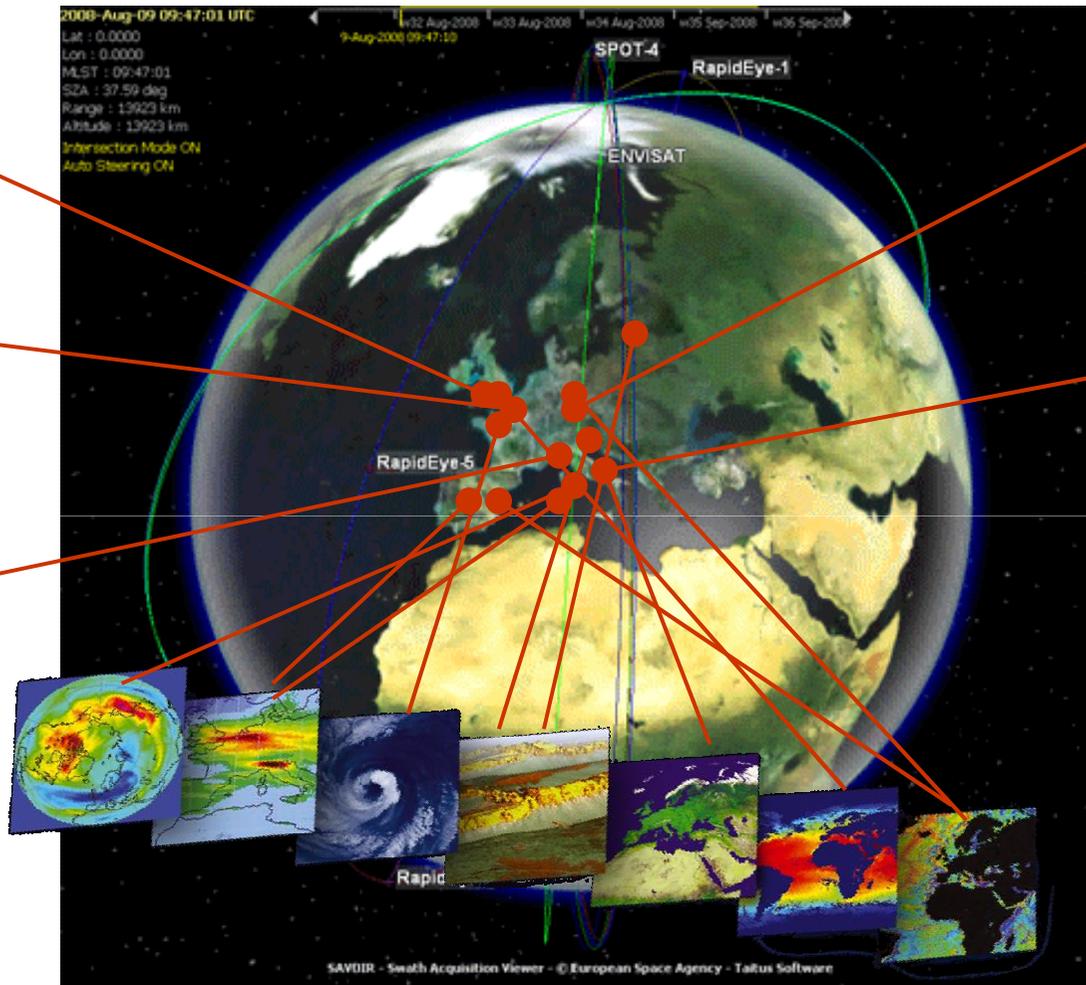
Similar situation with other ES sensors airborne, on ground and in the sea – e.g. **sensor webs**



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Several Digital Repositories



Difficulties in **discovering** and **accessing** data and products
Differences in **data policies, formats** and **quality**...



24/02/2009

OGF Data Repositories Workshop – Catania, March 4th, 2009

5

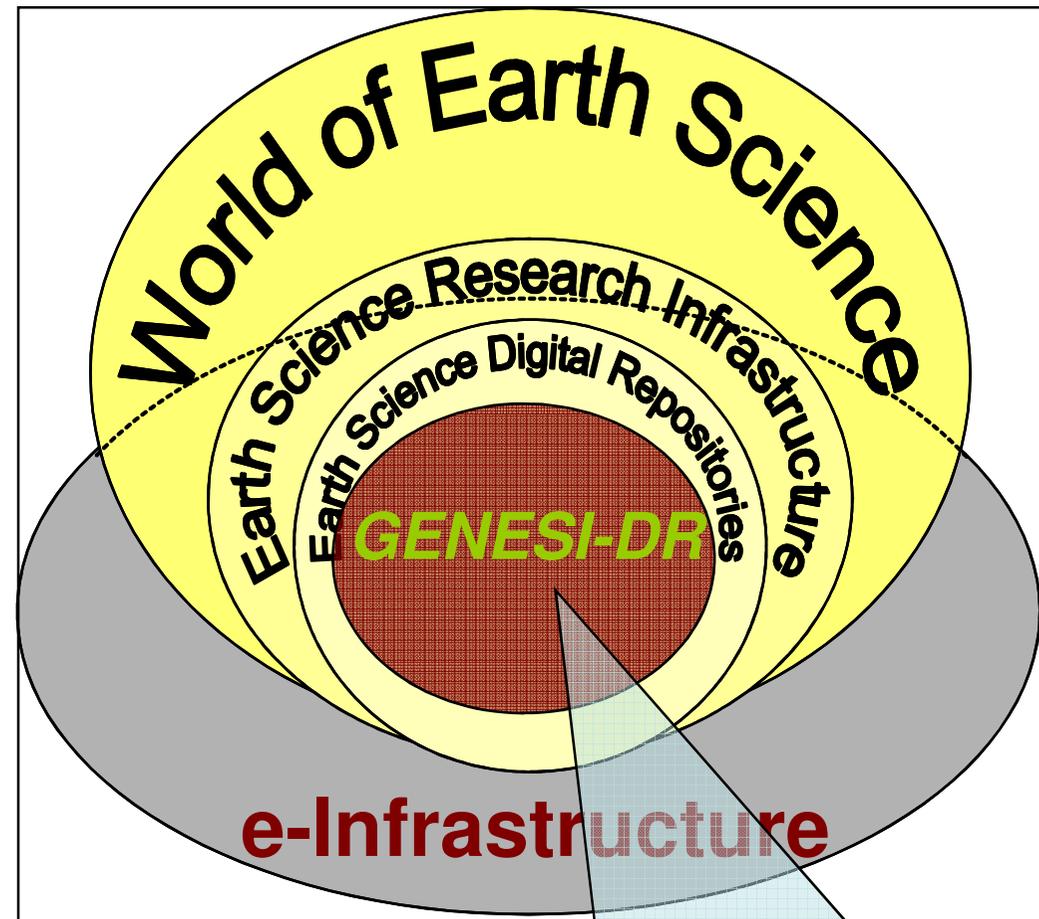


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The GENESI-DR goals

- GENESI-DR will:
 - Demonstrate a single way to **access space** (from various mission operators) and “**non space**” Earth Science data products
 - Experiment **new technologies** (e.g. fast data access by users via P2P)
 - Provide data products (already planned to be accessible online) in **GRID based Storage Elements** for further user processing under user responsibility
 - ...



GENESI-DR is a good example of
DATA INFRASTRUCTURE



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What is unique in GENESI-DR (1)

A centralized discovery service
to seamlessly access
heterogeneous sources of data...



**...in situ, satellite,
airborne...**

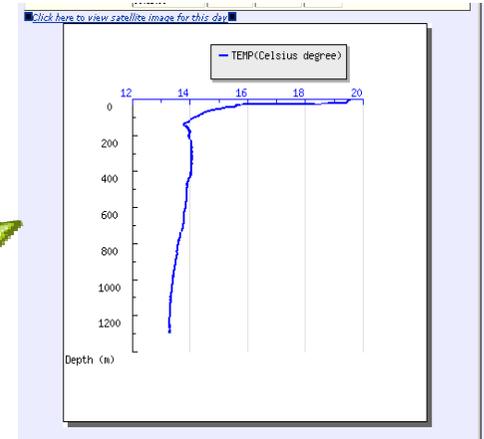


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What is unique in GENESI-DR (2)

Direct online access
with no ordering stage
to authorized users
(following data providers'
policies) ...

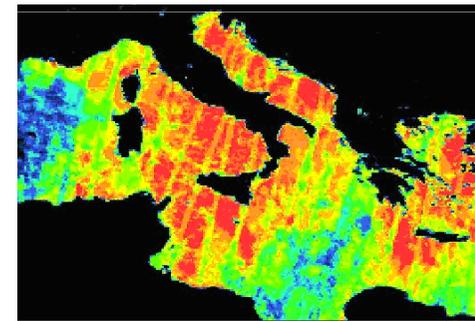


Free text search : q(searchTerms)

Acquisition Station : All Processing Centre : ZRIS

Query

ID	Dataset	Start and End
<input type="checkbox"/>	MER_RR_1PQACR20040901_075603_00002627 https://	2004-09-01T07:00:00Z-2004-09-01T08:00:00Z
<input type="checkbox"/>	MER_RR_1PQACR20040901_093640_0000262930 https://	2004-09-01T09:00:00Z-2004-09-01T10:00:00Z
<input type="checkbox"/>	MER_RR_1PQACR20040902_072433_0000262931 https://	2004-09-02T07:00:00Z-2004-09-02T08:00:00Z
<input type="checkbox"/>	MER_RR_1PQACR20040902_090510_0000262932 https://	2004-09-02T09:00:00Z-2004-09-02T10:00:00Z
<input type="checkbox"/>	MER_RR_1PQACR20040902_104546_0000262933 https://	2004-09-02T10:00:00Z-2004-09-02T11:00:00Z



... for further analysis,
on demand processing
under user control and
publication of results...



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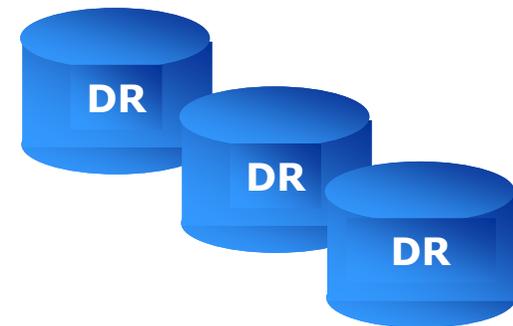
What is unique in GENESI-DR (3)

Attention to **standardisation**,
flexibility and **scalability** of the architecture allow...

...accessibility through
user applications
via the exposed
**programming
interface**



...easy **integration**
of new
**Digital
Repositories**



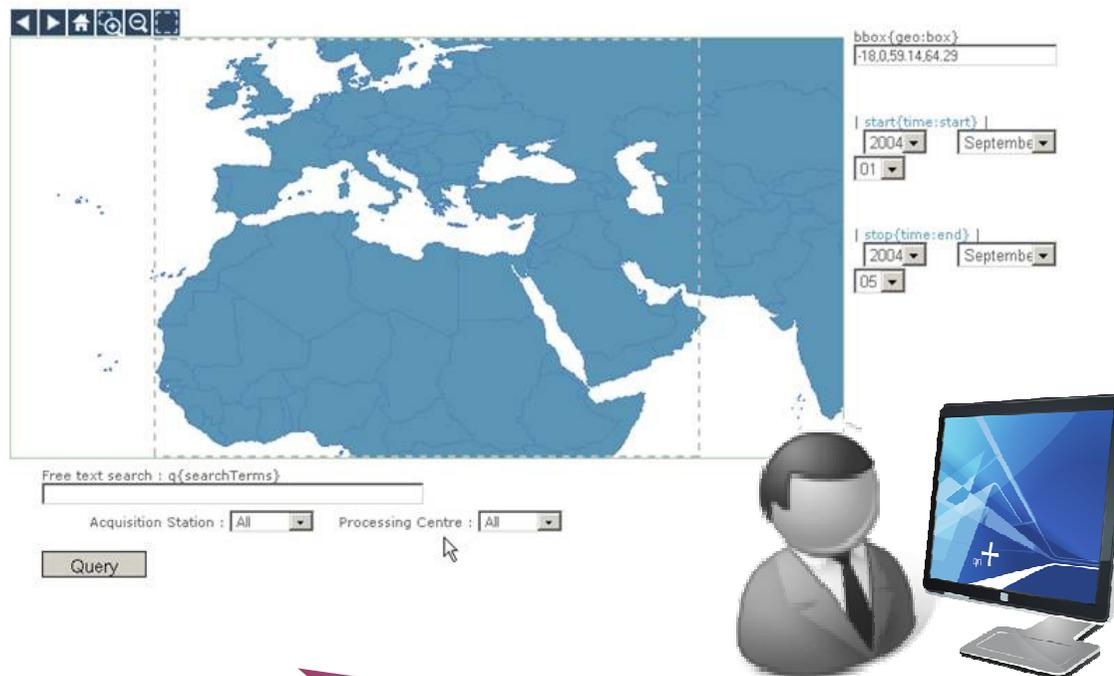


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How it works...

User can discover via the **GENESI-DR Web portal** data and **services** on the base of **free text string** and **metadata...**



such as
geographical
area,
temporal
range..

...and other **specific parameters** as applicable



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How it works...

*GENESI-DR central site **owns a description** of the series of data archived at the **federated DRs***



```

about=rdflib:about="http://earth.esa.int/object/index.cfm?fobjectid=1454"
title=MERIS Full Resolution Geophysical Product (MER_FR_2P)
abstract=MERIS Full Resolution Geophysical Product (MER_FR_2P) MERIS MER_FR_2P is a Full-Resolution Geophysical Product for Ocean, Land and Atmosphere. The product is also specific to Water Leaving Radiance (Reflectance). Each MERIS Level 2 geophysical product is derived from a MERIS Level 1b product and auxiliary parameter files specific to the MERIS Level 2 processing and distributed following the floating scene concept. NRT version is available 1 day after acquisition, OFL (fully consolidated version) 2 weeks after acquisition. The file size is 187 Mbytes per scene and auxiliary data include: Surface identification flags and in the level 1b product, Orbit state parameters, Time correlation parameters, Latitude, Longitude, Altitude and topographic corrections, Sun elevation, view azimuth, view angle, Mean Sea Level pressure, Total column water vapour, Wind speed.
ID Title
DODS Data Prepared for the MERSEA IP EU Project
MERIS Reduced Resolution Geophysical Product (MER_RR_2P)
MERIS Reduced Resolution Geolocated and Calibrated TOA Radiance (MER_RR_1P)
(MER_FR_1b)
(MER_FR_1b)
(MER_FR_1b)
rights=Free Usage with Rights
projection=pseudo-satellite projection along track
resolution=265
spatial=POLYGON((-180.0 -90.0, -180 90, 180 90, 180 -90, -180 -90))
fileFormat=N1 (ENVISAT)
contact=rdflib:resource="http://eohelp.esa.int/"

```



24/02/2009

OGF Data Repo



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How it works...

DRs reply with all data and services matching the query

ID	Dataset	Series	Start and End Time	Additional Metadata
<input type="checkbox"/>	MER_RR_1PQACR20040901_075603_000026292030 https://	MER_RR_IP	2004-09-01T07:56:03.000000 2004-09-01T08:39:52.000000	show
<input type="checkbox"/>	MER_RR_1PQACR20040901_093640_000026292030 https://	MER_RR_IP	2004-09-01T09:36:40.000000 2004-09-01T10:20:29.000000	show
<input type="checkbox"/>	MER_RR_1PQACR20040902_072433_000026292030 https://	MER_RR	2004-09-02T07:24:33.000000 2004-09-02T08:52.000000	show
<input type="checkbox"/>	MER_RR_1PQACR20040902_090510_000026292030 https://	MER_RR	2004-09-02T09:05:10.000000 2004-09-02T08:59.000000	show
<input type="checkbox"/>	MER_RR_1PQACR20040902_104546_000026292030 https://	MER_RR	2004-09-02T10:45:46.000000 2004-09-02T09:55.000000	show
<input type="checkbox"/>	MER_RR_1PQACR20040903_084011_00002392030 https://	MER_RR	2004-09-03T08:40:11.000000 2004-09-03T17:29.000000	show
<input type="checkbox"/>	MER_RR_1PQACR20040903_101417_000026292030 https://	MER_RR	2004-09-03T10:14:17.000000 2004-09-03T17:29.000000	show
<input type="checkbox"/>	MER_RR_1PQACR20040904_080633_000023662030 https://	MER_RR	2004-09-04T08:06:33.000000 2004-09-04T17:29.000000	show





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How it works...



User is provided with the **direct access** to the DR catalogue, data and services. (Data are not copied to the central site).



Individual DR data policies are considered and respected

ID	Dataset	Series	Start and End Time	Additional Metadata
<input type="checkbox"/>	MER_RR__1PQACR20040901_075603_000026292030 https://	MER_RR__1P	2004-09-01T07:56:03.000000 2004-09-01T08:39:52.000000	show
<input type="checkbox"/>	MER_RR__1PQACR20040901_093640_000026292030 https://	MER_RR__1P	2004-09-01T09:36:40.000000 2004-09-01T10:20:29.000000	show
<input type="checkbox"/>	MER_RR__1PQACR20040902_072433_000026292030 https://	MER_RR__1P	2004-09-02T07:24:33.000000 2004-09-02T08:08:22.000000	show
<input type="checkbox"/>	MER_RR__1PQACR20040902_090510_000026292030 https://	MER_RR__1P	2004-09-02T09:05:10.000000 2004-09-02T09:48:59.000000	show
<input type="checkbox"/>	MER_RR__1PQACR20040902_104546_000026292030 https://	MER_RR__1P	2004-09-02T10:45:46.000000 2004-09-02T11:29:35.000000	show
<input type="checkbox"/>	MER_RR__1PQACR20040903_112935_000026292030 http	MER_RR__1P	2004-09-03T08:40:11.000000 2004-09-03T09:17:29.000000	show
<input type="checkbox"/>	MER_RR__1PQACR20040903_141700_000026292030 http	MER_RR__1P	2004-09-03T10:14:17.000000 2004-09-03T10:58:06.000000	show
<input type="checkbox"/>	MER_RR__1PQACR20040904_063300_000026292030 http	MER_RR__1P	2004-09-04T08:06:33.000000 2004-09-04T08:45:58.000000	show

Configuration

Impersonate | Add Blog entry | Control Panel
powered by ... radue 2006-2008 Last modified

https://dr-site.esrin.esa.int/data/store11/eo/MER_RR__1P/2004/09/MER_RR__1P_104546_000026292030_3117_0000.N1



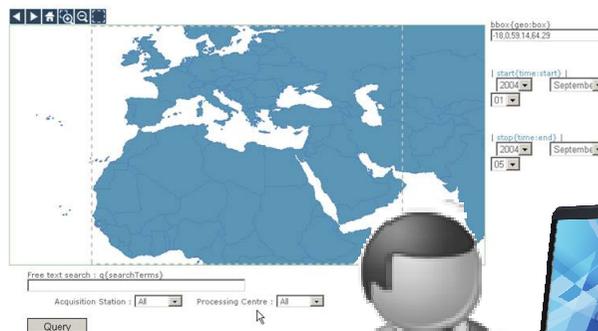
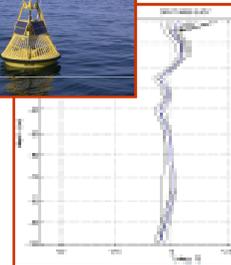


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How it works...

- User can access and **manipulate** data ...
- ...buoys archived at ENEA
- ...SST maps previously archived at CNR
- ...SST generated on the fly from satellite data at ESA
- using **Grid resources**



- ...to perform new science (and **collaborate**)
- ...to **generate** new products
- ... to **populate** new repositories

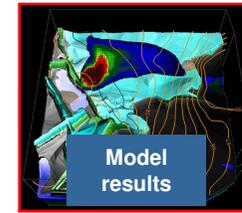


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The deployed operational infrastructure

- Currently:
 - 8 DRs have been GENESI-fied
 - 42 different dataset series
- Data discovery, data access, processing
- “GENESI-DR Operations Manual” and “GENESI-DR User Manual”

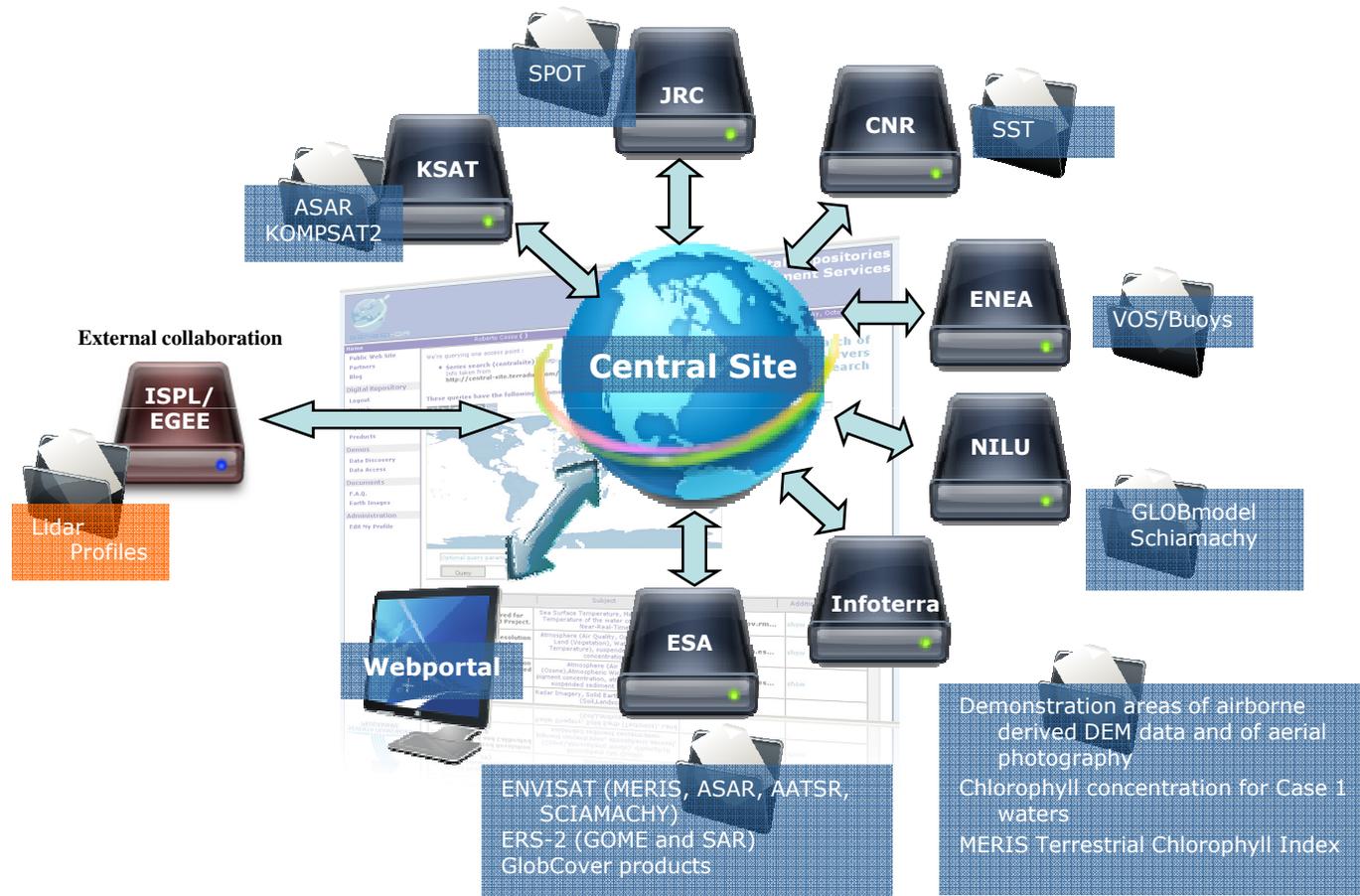




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The deployed operational infrastructure



Demonstrations

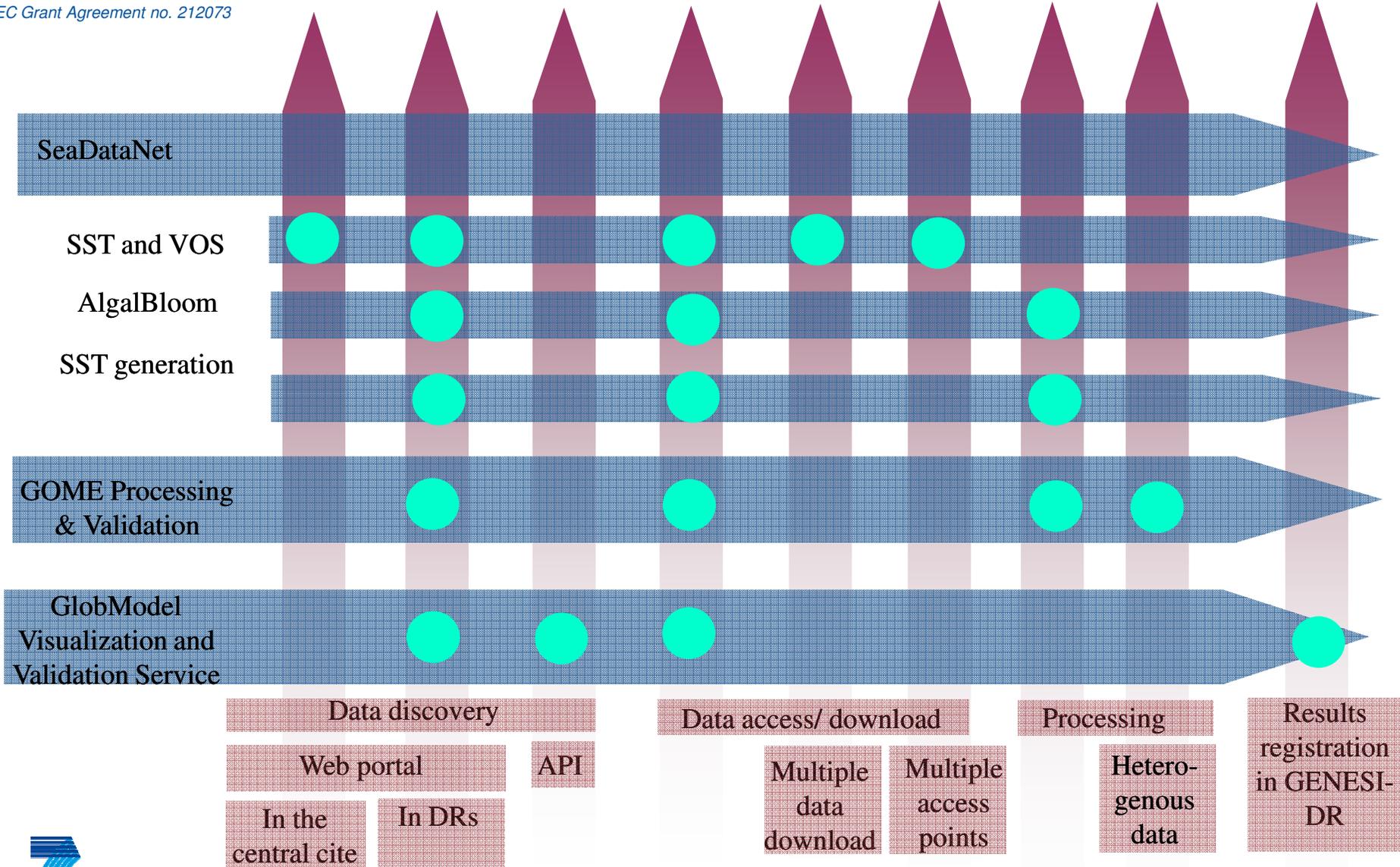
- Three demonstrators representative of services/feature currently available in GENESI-DR infrastructure
 1. GOME data processing and validation
 2. Ocean data/products discovery, access, processing and visualization
 3. GlobModel results discovery and comparison with satellite observations



Which services/features we demonstrate

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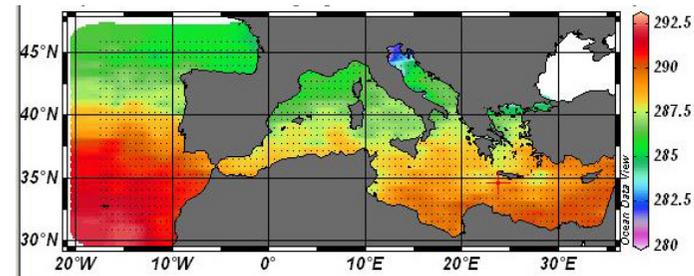




Ocean data/products discovery, access, and processing

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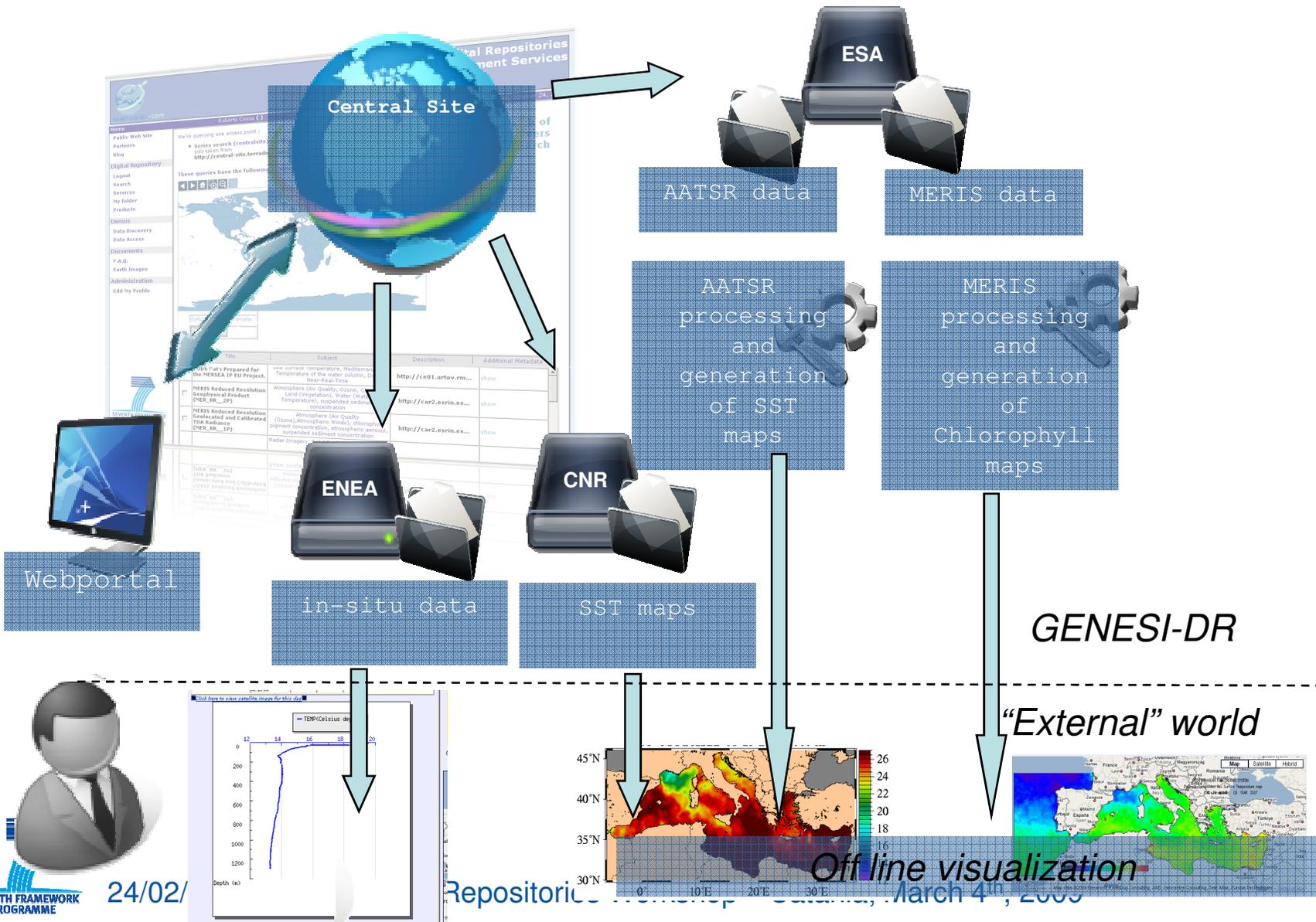
- **Aim:** to discover, access, process and visualize (off-line) different typologies of Ocean related data and products
- **Data and services:**
 - Sea Surface Temperature maps generated and archived at CNR
 - Voluntary Observing Ship (VOS) data archived at ENEA
 - L3 products (algal bloom, SST) generated on-the-fly from Envisat data (MERIS and AATSR) archived at ESA-ESRIN
- The scenario includes in-situ and satellite data, already generated products, and products generated on the fly from satellite data



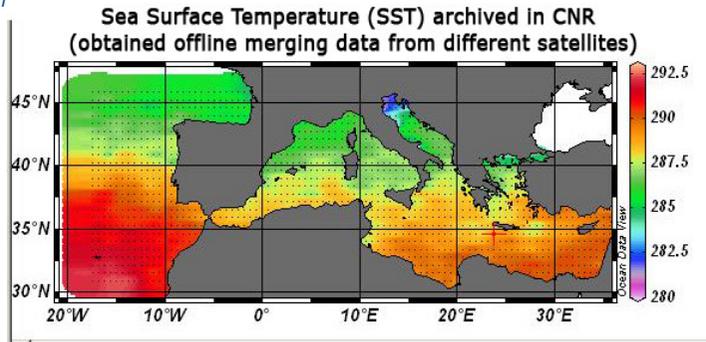


Ocean data/products discovery, access, and processing

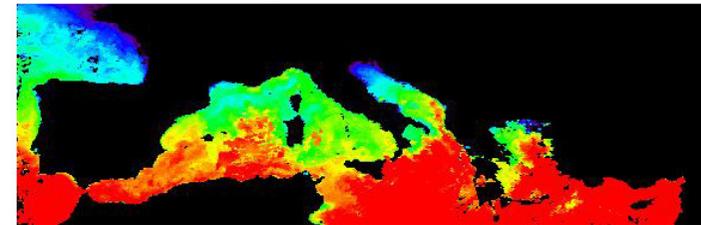
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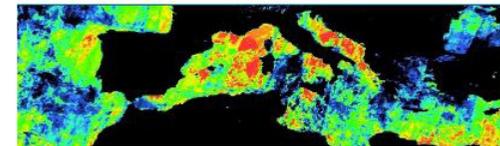
Ocean data/products discovery, access, and processing



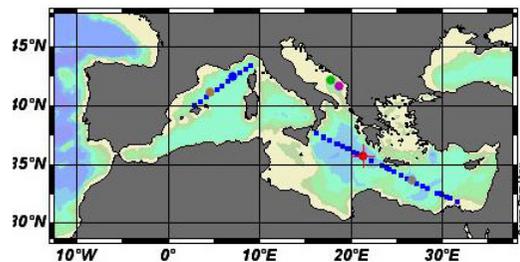
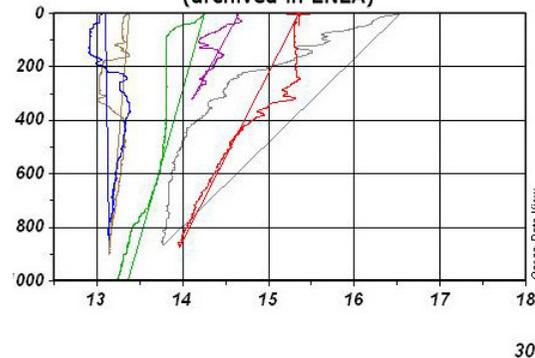
SST generated on-the-fly by GENESI-DR processing service using Envisat AATSR data



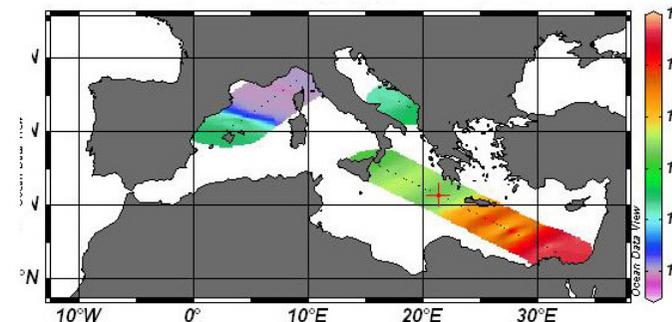
Chlorophyll map generated on-the-fly by GENESI-DR processing service using Envisat MERIS data



Temperature profiles measured by buoys
(archived in ENEA)

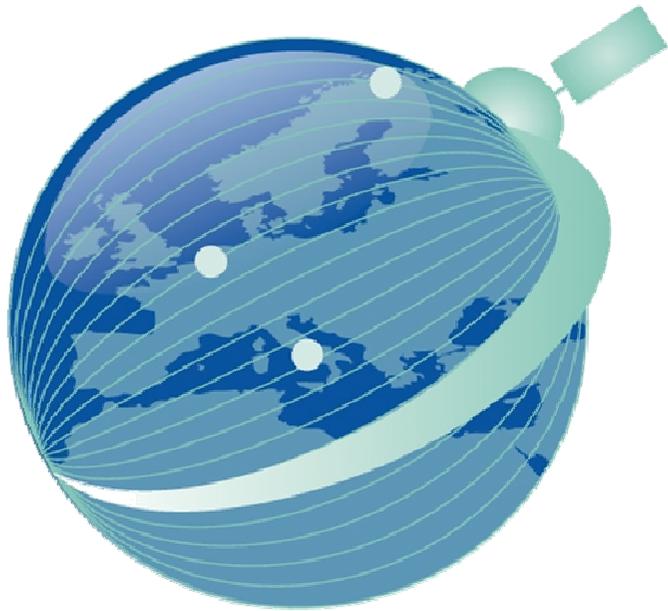


Surface Temperature measured by buoys
(archived in ENEA)



Conclusions

- GENESI-DR is an ambitious project with large implications on present operations in ES data providers
- Getting the right set of demonstration and validation scenarios are of fundamental importance to convince both Data Providers and Data Users to join the GENESI-DR federation of Earth Science Digital Repositories



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Thank You!

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<http://www.genesi-dr.eu>

Catania, 4 Mar 2009



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