

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



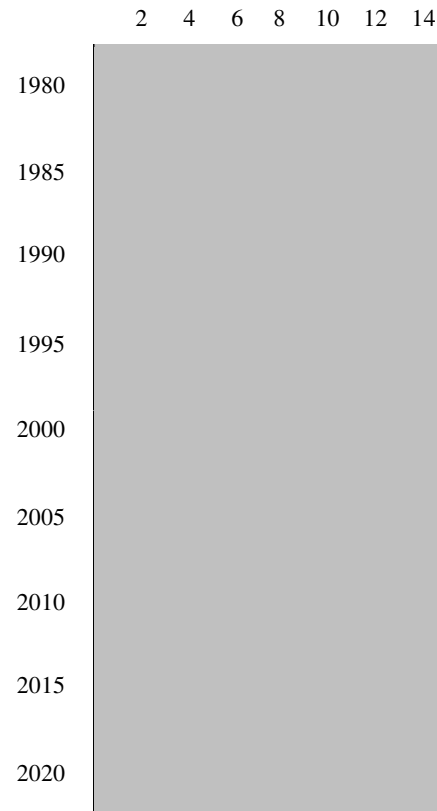
- The heritage of GENESI-DR
 - Present Earth Science “operational” capabilities
 - What is unique in ...**E**arth **S**cience **I**nteroperations
 - **D**igital **R**epositories
- How GENESI-DR works
- Objectives
- Vision
- Initial demonstrations at end of Year 1



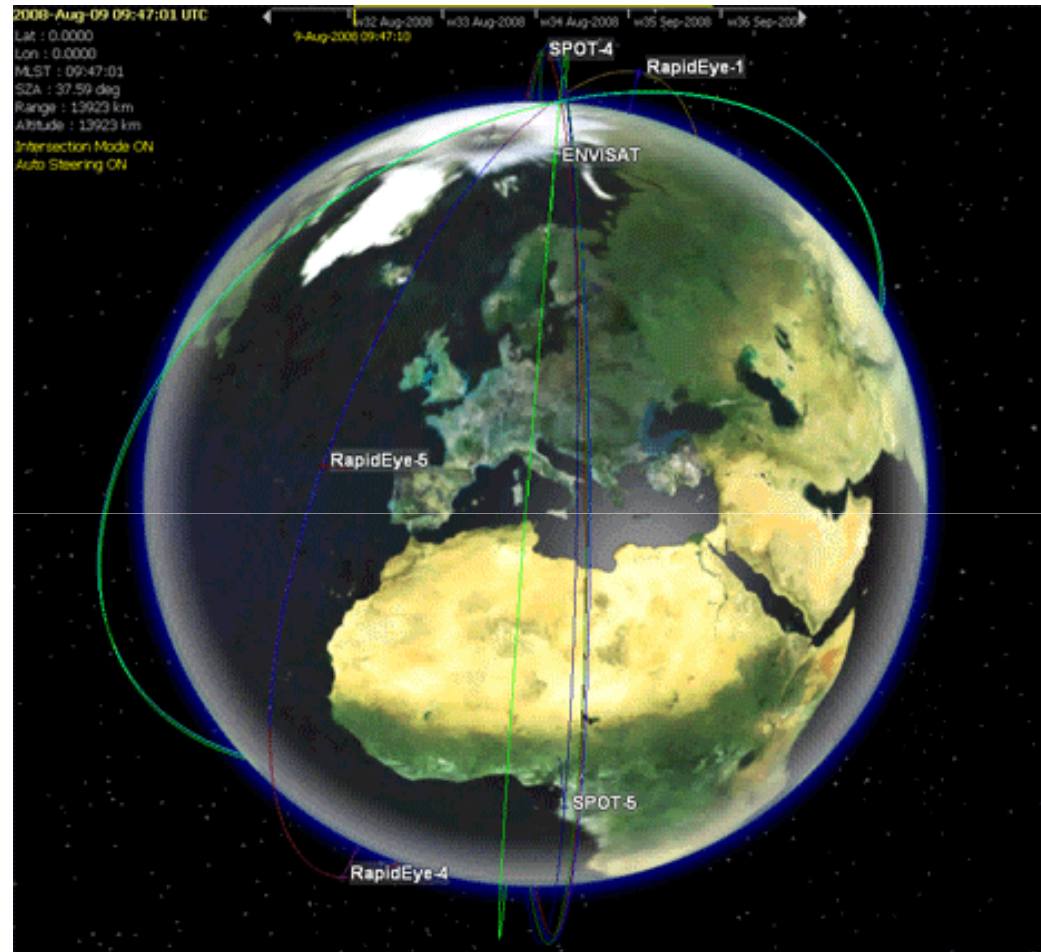
GENESI-DR

EC Grant Agreement no. 016070

Data (Petabytes)



The EO data deluge...



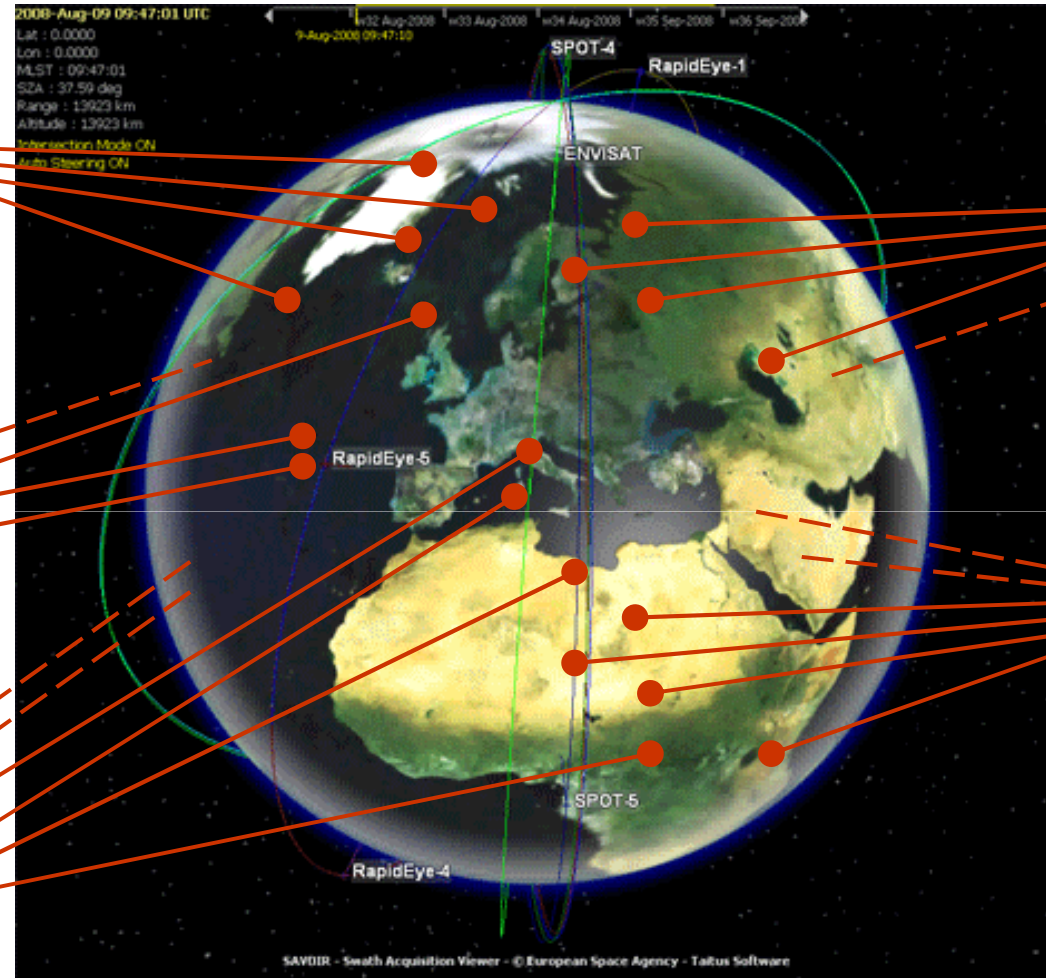
Petabytes of already acquired data are presently underexploited, because to get the results in a reasonable time not enough computing resources, tools and algorithms are available.



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The ES data deluge...



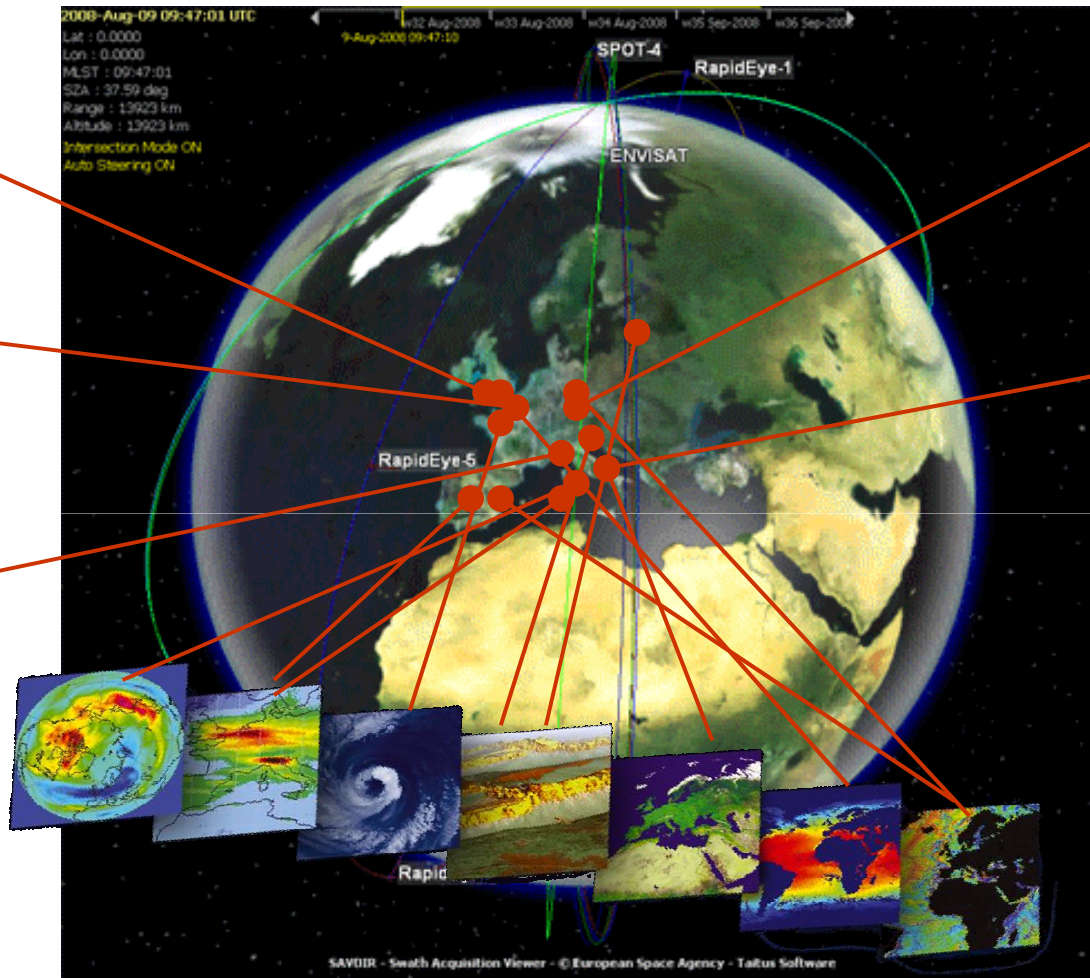
Similar situation with other ES sensors airborne,
on ground and in the sea – e.g. **sensor webs**



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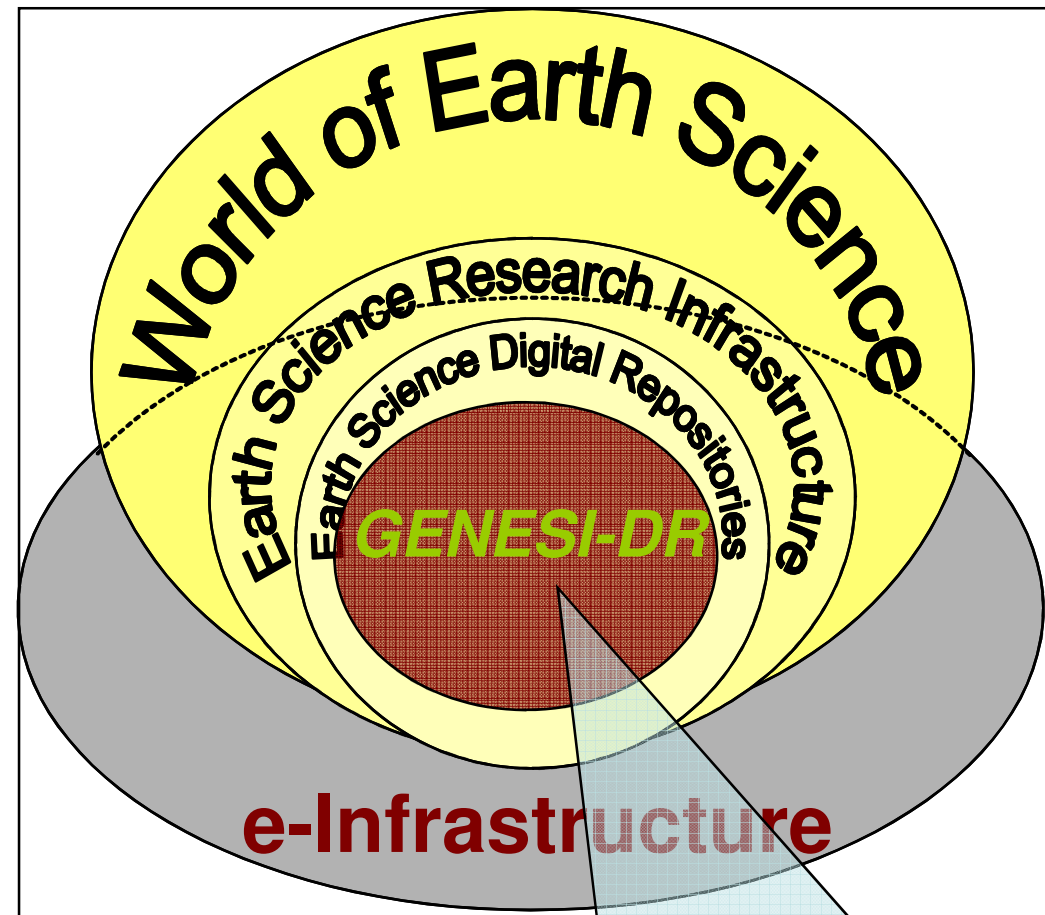
Several Digital Repositories



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

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



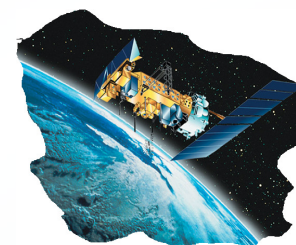
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What is unique in GENESI-DR (1)

**A centralized discovery
service**

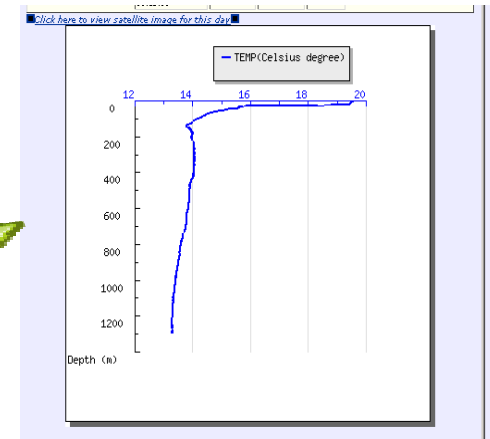
**to seamlessly access
heterogeneous
sources of data...**



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

What is unique in GENESI-DR (2)

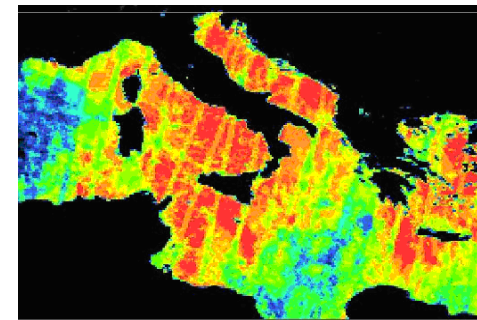
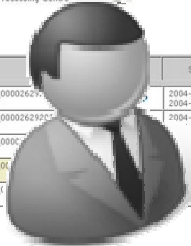
Direct online access
with no ordering stage
to authorized users
(following data providers'
policies) ...



Free text search:

Acquisition Station: Processing Centre:

ID	Dataset	Start and End
<input type="checkbox"/>	MER_RR_1PQACR20040901_075603_00002627	2004-09-01T07:00:00Z - 2004-09-01T08:00:00Z
<input type="checkbox"/>	MER_RR_1PQACR20040901_083640_0000262905	2004-09-01T08:00:00Z - 2004-09-01T09:00:00Z
<input type="checkbox"/>	MER_RR_1PQACR20040902_072433_0000262906	2004-09-02T07:00:00Z - 2004-09-02T08:00:00Z
<input type="checkbox"/>	MER_RR_1PQACR20040902_080510_0000262907	2004-09-02T08:00:00Z - 2004-09-02T09:00:00Z
<input type="checkbox"/>	MER_RR_1PQACR20040902_104546_0000262908	2004-09-02T10:00:00Z - 2004-09-02T11:00:00Z



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

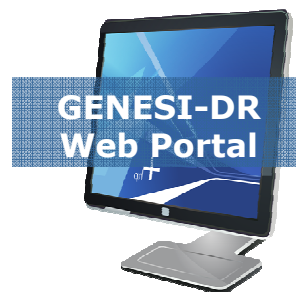
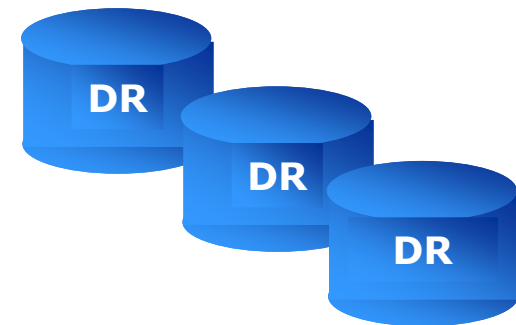
What is unique in GENESI-DR (3)

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

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

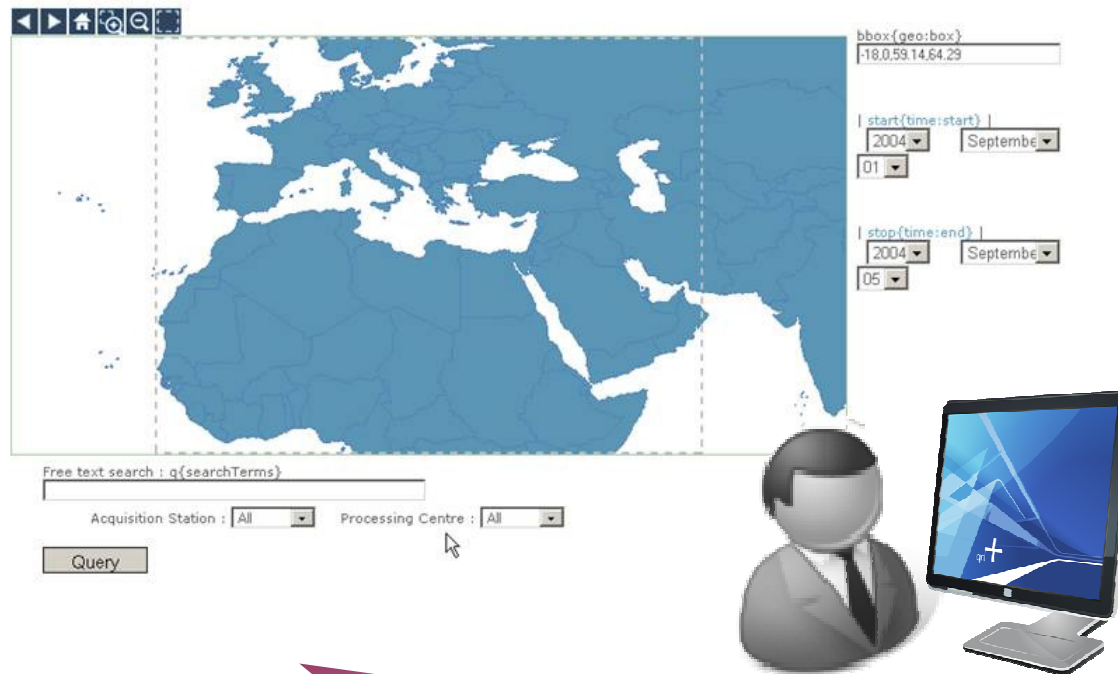


...easy **integration**
of new
**Digital
Repositories**



How it works...

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

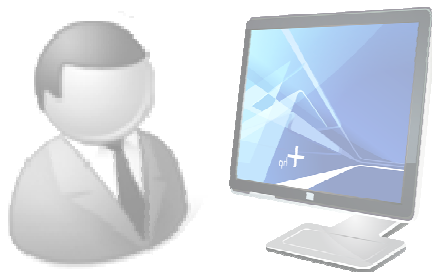


such as
geographical
area,
temporal
range..

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

How it works...

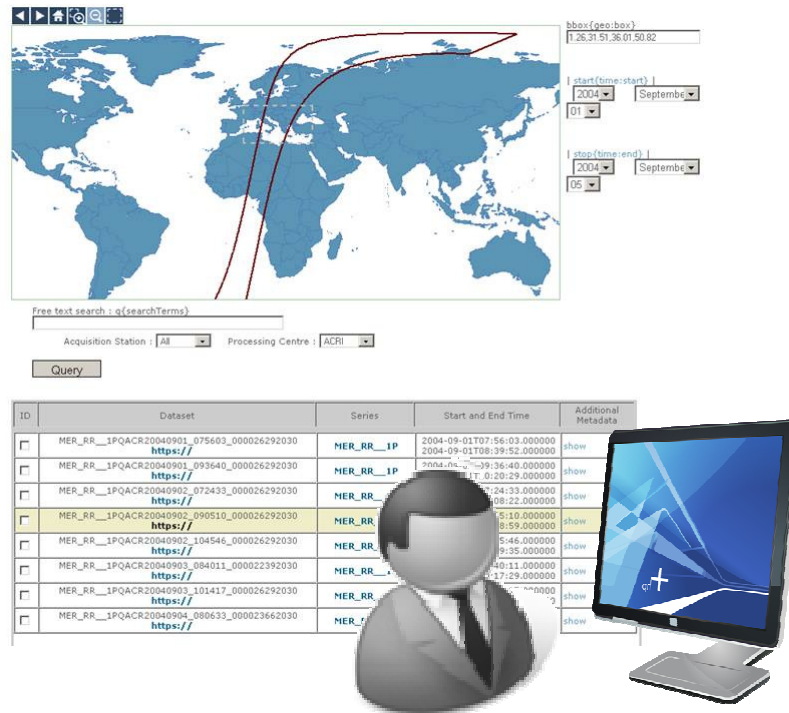
*GENESI-DR central
site **owns a**
description of the
series of data
archived at the
federated DRs*



```
about=rdf:about="http://earth.esa.int/object/index.c
fm?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
added in the level 1b product, Orbit state
time correlation parameters, Latitude,
altitude and topographic corrections,
Sun elevation, view azimuth, view
angle, Mean Sea Level pressure, Total column
water vapour, Wind speed.
=MER_FR_2P
process=Level=Level 2
satellite=ENVISAT
sensor=MERIS
subject1=Atmosphere (Clouds)
subject2=Ocean and Coast (Sea Surface
Temperature, Ocean Colour/Biology)
subject3=Atmosphere (Air Quality (Ozone), Atmospheric
Winds, Clouds, Precipitation)
subject4=Land (Soil)
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=rdf:resource="http://eohelp.esa.int/"
```

How it works...

DRs reply with all data and services matching the query



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_104546_000026292030 http	MER_RR__1P	2004-09-03T08:40:11.000000 2004-09-03T09:17:29.000000	show
<input type="checkbox"/>	MER_RR__1PQACR20040903_104546_000026292030 http	MER_RR__1P	2004-09-03T10:14:17.000000 2004-09-03T10:58:06.000000	show
<input type="checkbox"/>	MER_RR__1PQACR20040903_104546_000026292030 http	MER_RR__1P	2004-09-04T08:06:33.000000 2004-09-04T08:45:58.000000	show

Apri in nuova finestra
Apri in nuova scheda
Aggiungi link nei segnalibri...
Salva destinazione con nome...
Invia link...
Copia indirizzo
Proprietà

Configuration

Impersonate | Add Blog entry | Control Panel

powered by  ESRI | graduated 2006-2008 | Last modified: 2008-09-02 10:45:46



How it works...

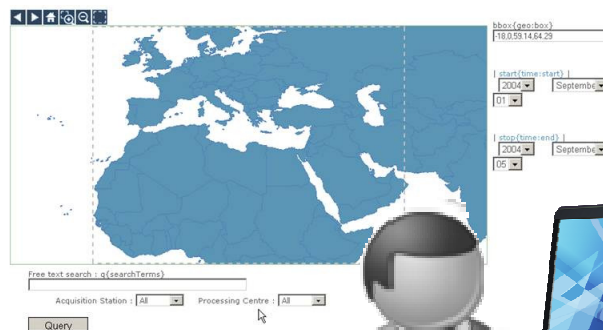
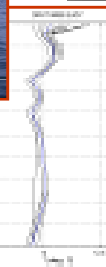
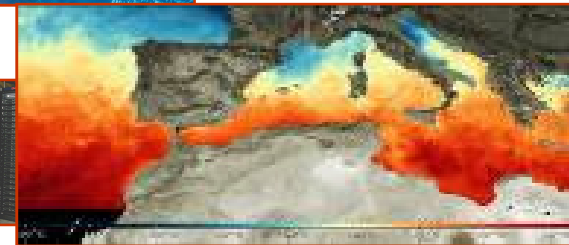
User can access and
manipulate data ...

...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

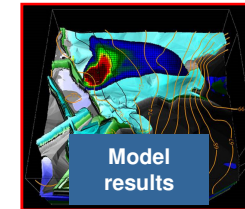
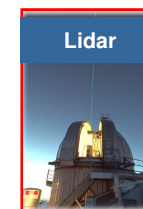
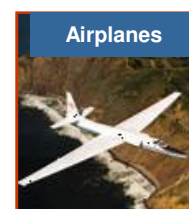
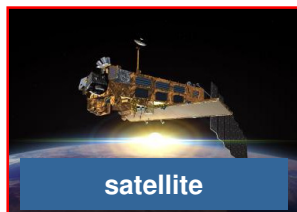


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The deployed operational infrastructure

- 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”

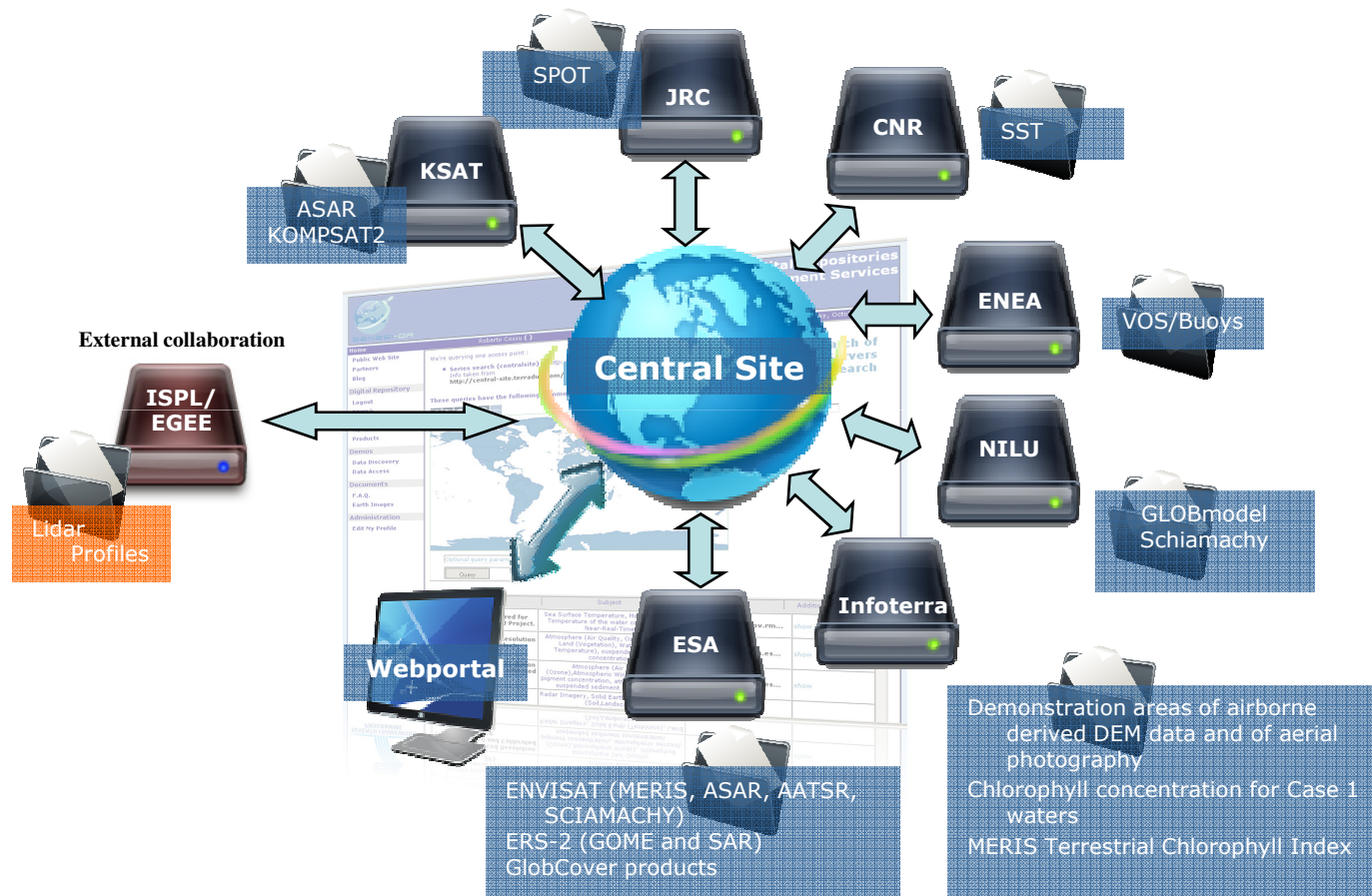




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The deployed operational infrastructure



Demonstrations

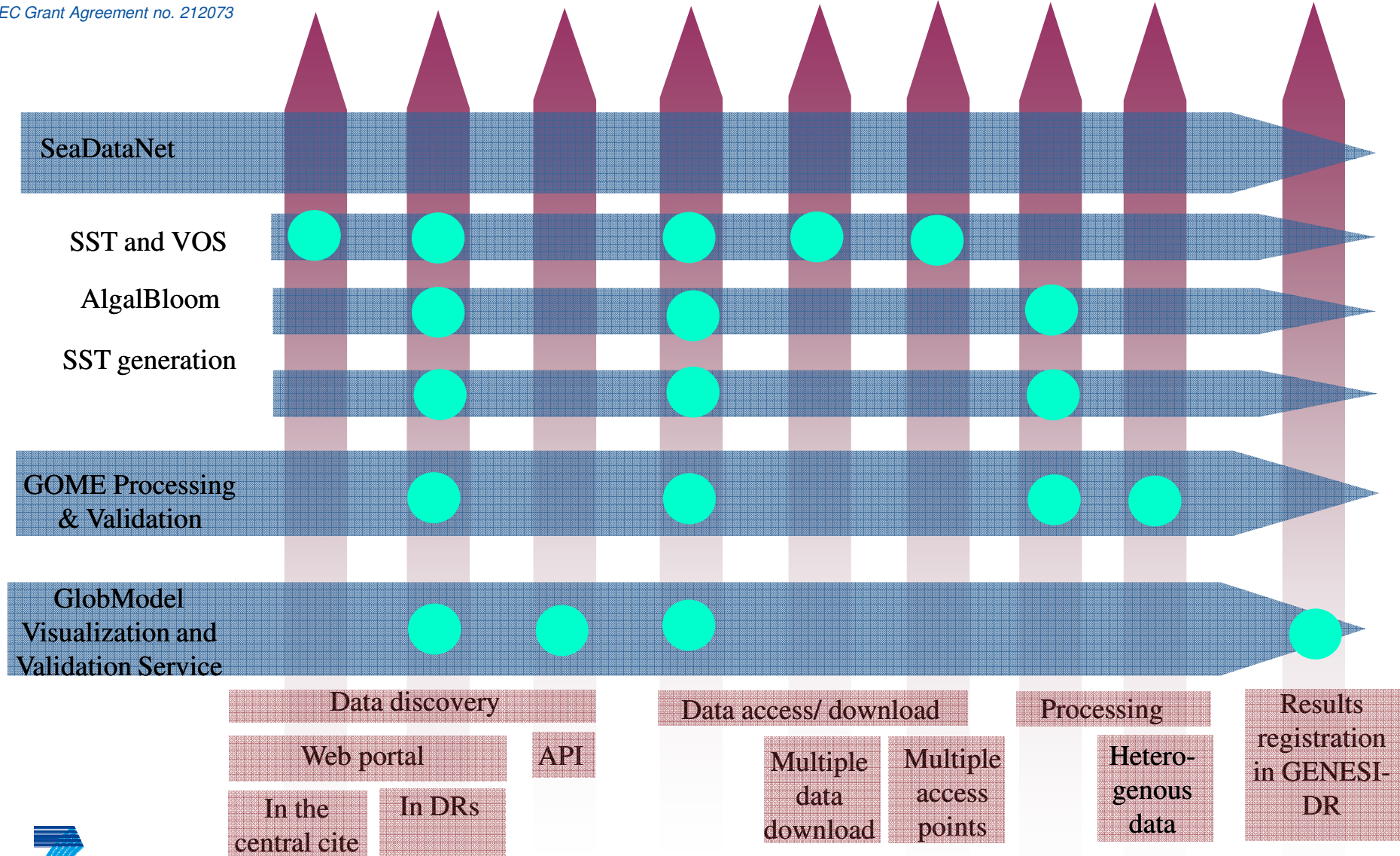
- Three demonstrators representative of services/feature currently available in GENESI-DR infrastructure
 1. GOME data processing and validation
 2. Ocean data/products discovery, access, processing and visualization
 3. GlobModel results discovery and comparison with satellite observations

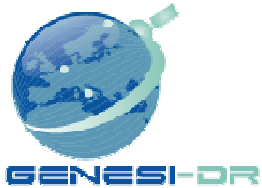


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Which services/features we demonstrate

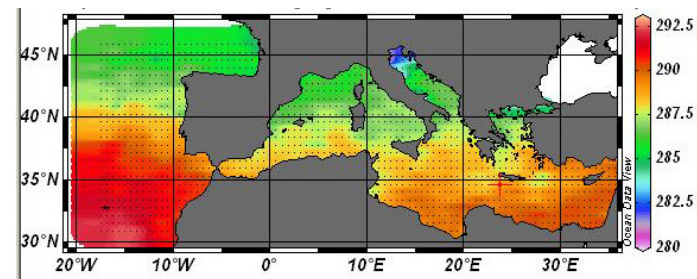




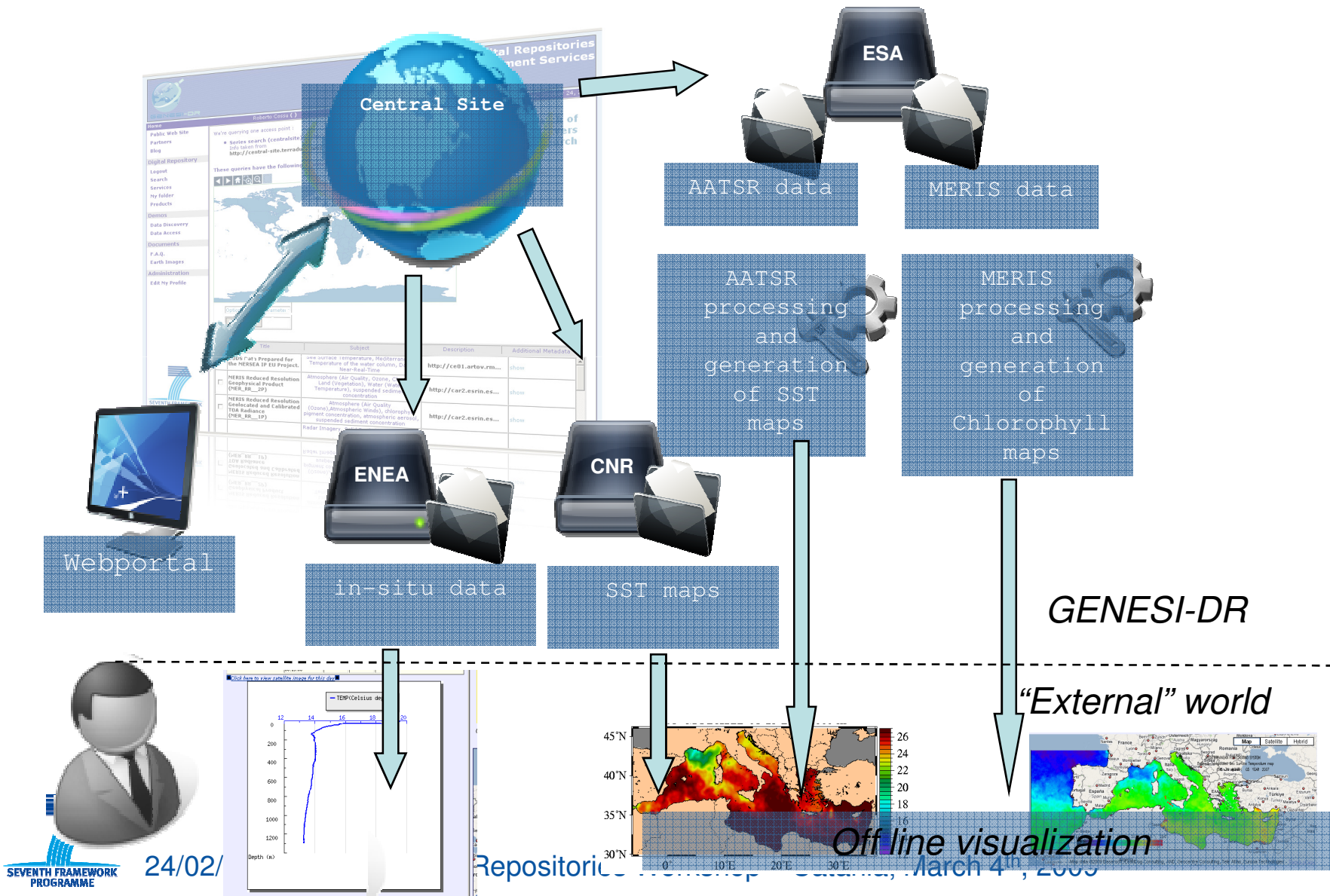
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Ocean data/products discovery, access, and processing

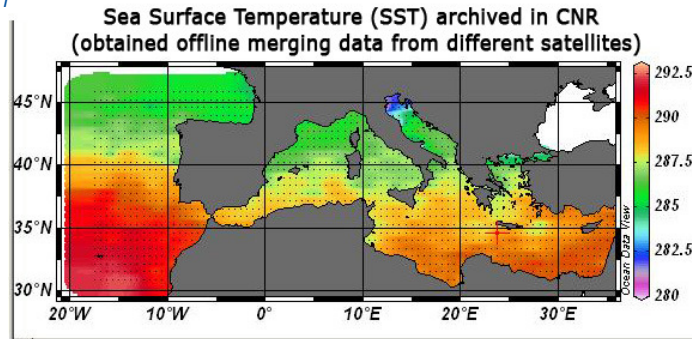
- **Aim:** to discover, access, process and visualize (off-line) different typologies of Ocean related data and products
- **Data and services:**
 - Sea Surface Temperature maps generated and archived at CNR
 - Voluntary Observing Ship (VOS) data archived at ENEA
 - L3 products (algal bloom, SST) generated 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



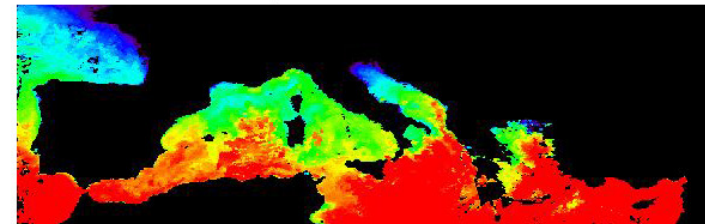
Ocean data/products discovery, access, and processing



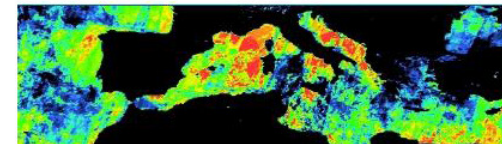
Ocean data/products discovery, access, and processing



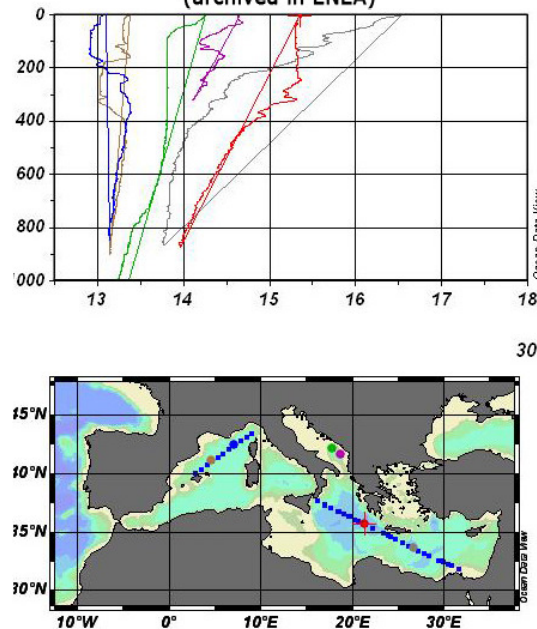
SST generated on-the-fly by GENESI-DR processing service
using Envisat AATSR data



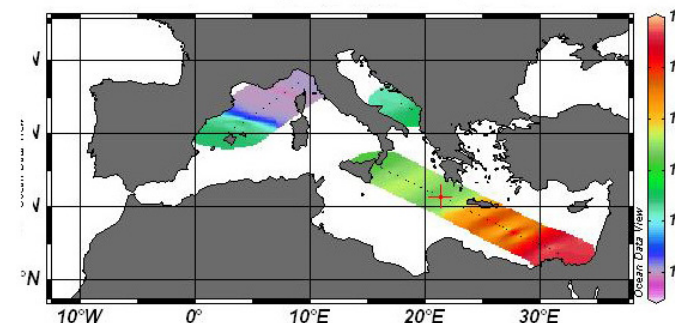
Chlorophyll map generated on-the-fly by GENESI-DR processing service
using Envisat MERIS data



Temperature profiles measured by buoys
(archived in ENEA)

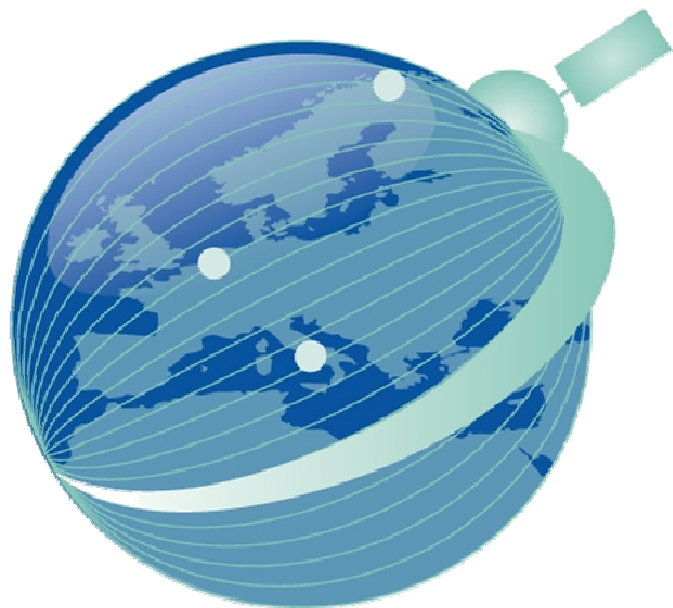


Surface Temperature measured by buoys
(archived in ENEA)



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



GENESI-DR

Thank You!

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

Catania, 4 Mar 2009



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