

Copernicus

il contributo del CNR al maggiore programma europeo di Osservazione della Terra

Conferenza DTA – Online – 18-19/03/2021

B. Buongiorno Nardelli

...a nome di numerosi colleghi di ISMAR, IMAA, ISAC



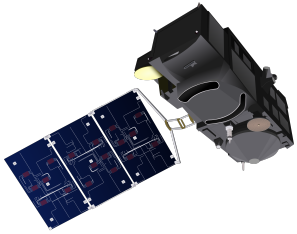
Dipartimento Scienze
del Sistema Terra
e Tecnologie per l'Ambiente



**CNR
ISMAR**
ISTITUTO
DI SCIENZE
MARINE



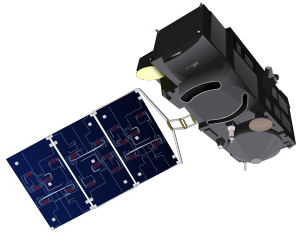
Space component



Copernicus Services



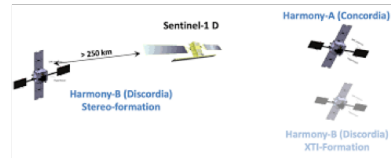
Space component



SCIENCE

Unique Earth Explorer 10 candidate selected for phase A

HARMONY



2 Bi-static SARs, followers of Sentinel-1
Cryosphere, Oceanography

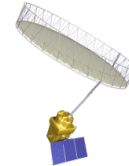
Bruno Buongiorno Nardelli:
Mission Advisory Group Member

Buongiorno Nardelli, Liberti, Ciani:
ESA - Contract case study

COPERNICUS

Copernicus Space Component
Expansion Programme,
6 High Priority missions

CHIME, LSTM, CO2M,
PICE/CRISTAL, ROSE-L
CIMR



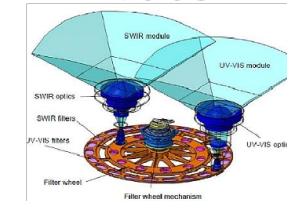
Rosalia Santoleri:
Mission Advisory Group Member

Ciani, Buongiorno Nardelli, Liberti, Santoleri
ESA - Contract case study

METEOROLOGY

EPS-SG Programme

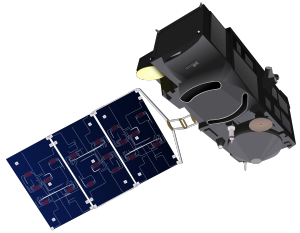
EPS-SG-



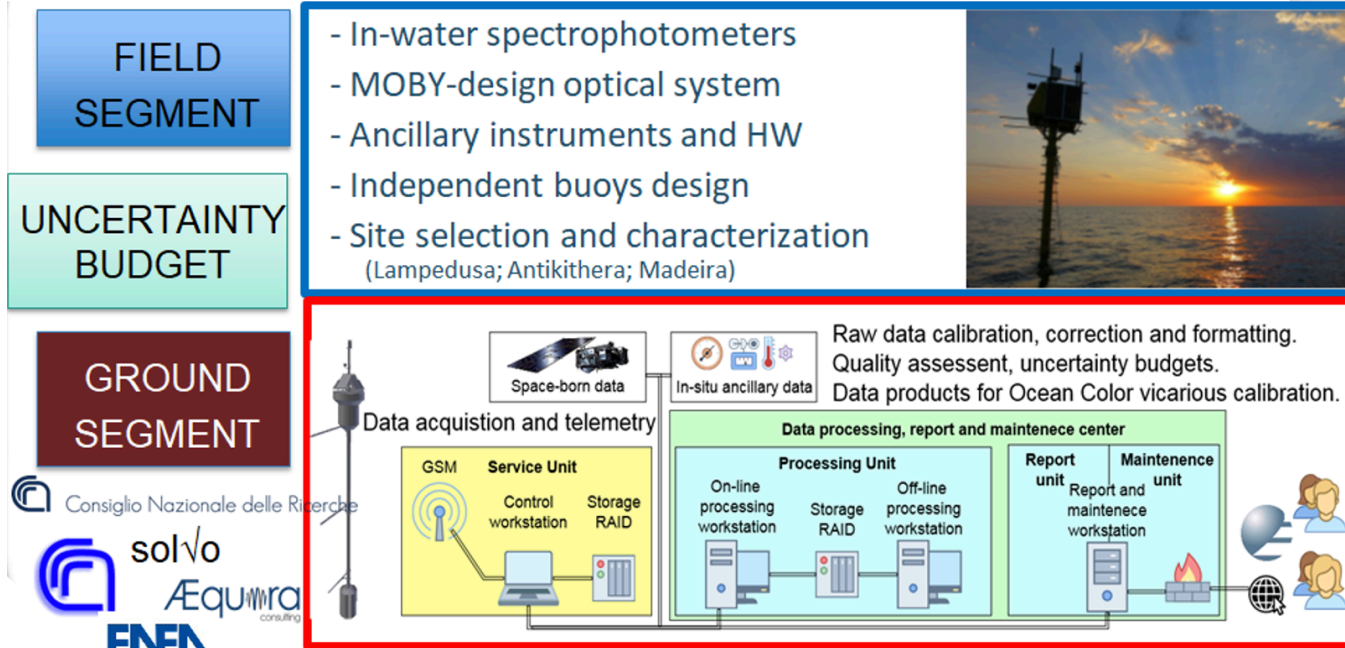
Aerosol characterisation for applications in climate
monitoring, atmospheric chemistry, and Numerical
Weather Prediction.

Gian Luigi Liberti:
3MI Science Advisory Group Member

Space component



Copernicus Ocean Colour Vicarious Calibration Project: EURYBIA: European Radiometry Buoy and InfraStructure



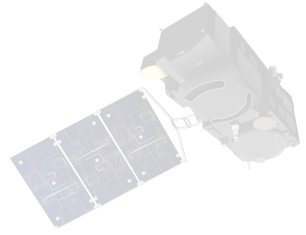
ERS-1
ERS-2
Envisat
Prot
GOCE

Consiglio Nazionale delle Ricerche
solvo
Aequimra consulting
ENEA

coord. G.Liberti/R.Santoleri



Space component



Copernicus Services



Atmosphere



Marine



Land



Climate Change

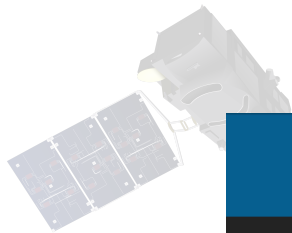


Security



Emergency

Space component



Copernicus Services



Atmosphere



Marine



Land



Climate Change

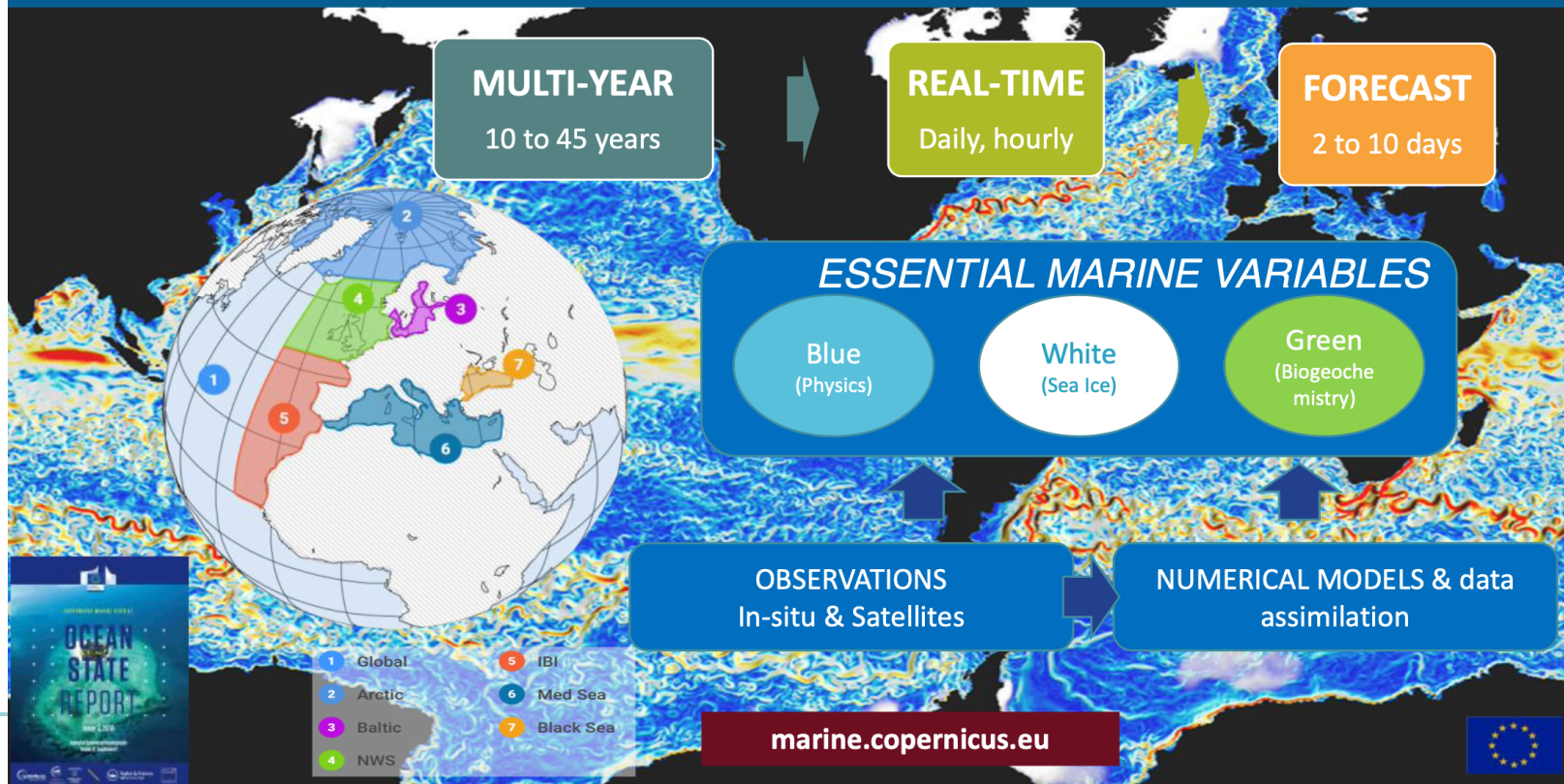


Security



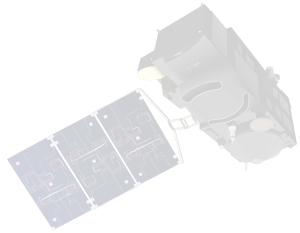
Emergency

The Copernicus Marine Environment Monitoring Service





Space component



Copernicus Services



Atmosphere



Marine



**MERCATOR
OCEAN**
INTERNATIONAL

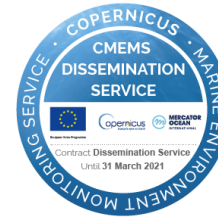


Emergency

CMEMS elements



Modelling/Forecasting



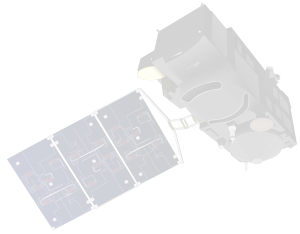
Dissemination



Thematic Assembly Centres



Space component



Copernicus Services



Atmosphere



Marine



**MERCATOR
OCEAN**
INTERNATIONAL

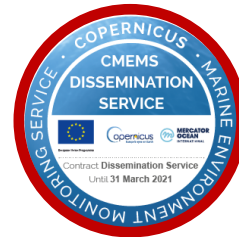


Emergency

CMEMS elements



Modelling/Forecasting



Dissemination



Thematic Assembly Centres



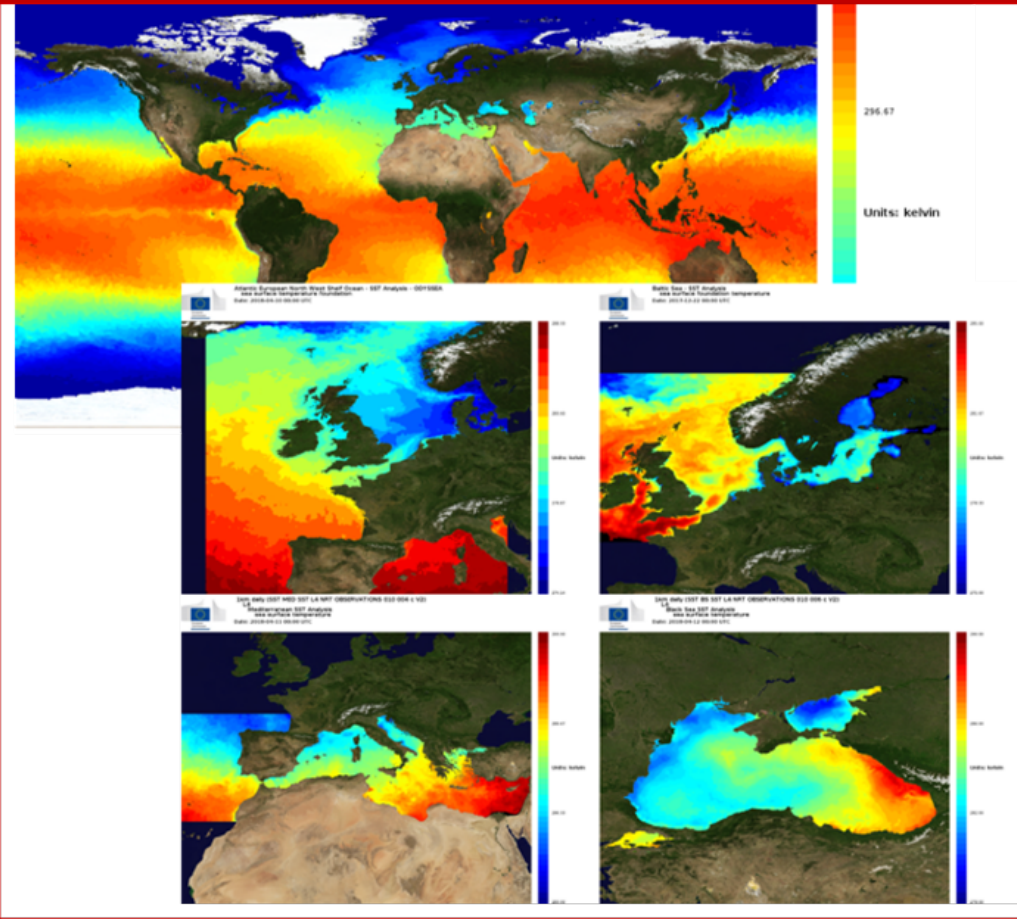
	Acronym	Name	Country	Resp.
1	CNR	National Research Council	Italy	Coordination Data production
2	DMI	Danish Meteorological Institute	Denmark	Data production
3	IFREMER	French Research Institute for Exploitation of the Sea	France	Data production
4	MET	Norway Norwegian Meteorological Institute	Norway	Service Desk
5	METO	Met Office	UK	Data production
6	MF	Météo-France	France	Data production



SST-TAC produces

Sea Surface Temperature data covering the Global Ocean and the European Regional Seas

-Near Real Time (NRT)/Multi-Year (REProcessed) products



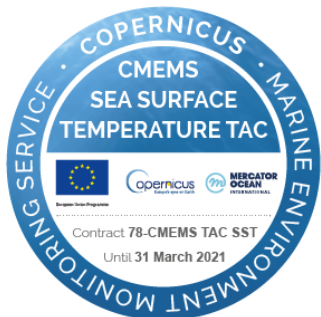
Ifremer



Met Office

Norwegian Meteorological Institute





CMEMS-SST-TAC

Coordinamento a livello europeo

Pianificazione, gestione e monitoraggio attività di progetto
 Coordinatore: *Buongiorno Nardelli*
 Deputy: *Pisano*
 Project Management: *Cesarini*



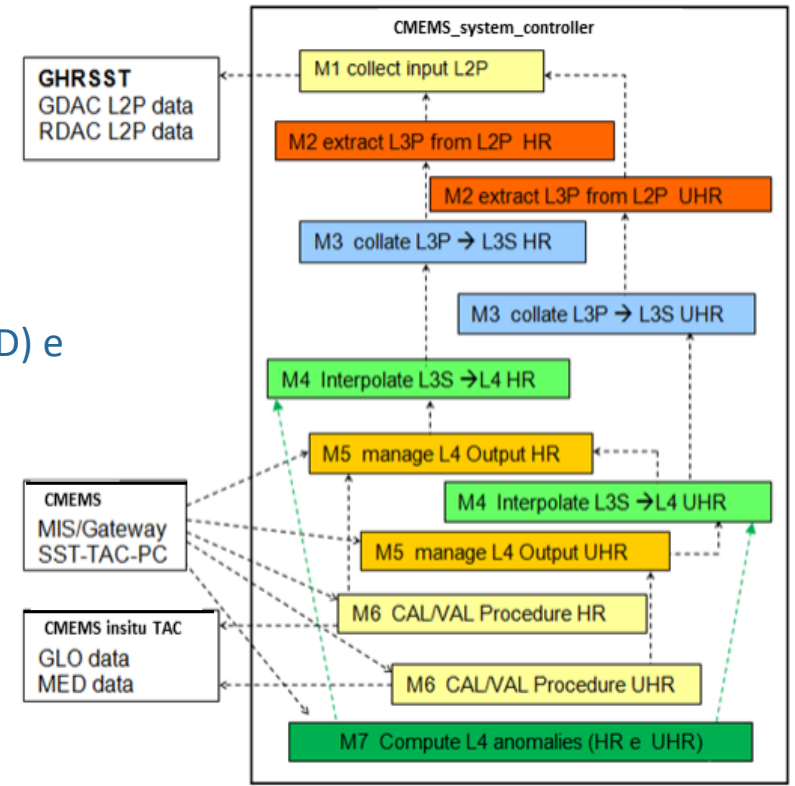
Sviluppo di algoritmi e produzione dati di temperatura superficiale sul Mediterraneo (MED) e sul Mar Nero (BS) in Near-Real-Time (NRT) e reprocessing di serie storiche (REP).

- dati di livello L3S (multi-sensore giornalieri)
- dati di livello L4 (interpolati, giornalieri)

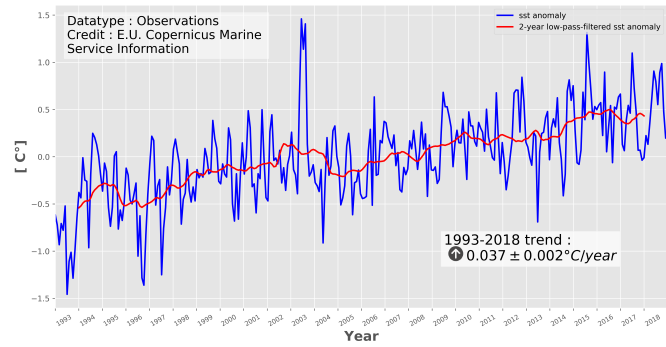
Sviluppo algoritmi/Implementazione/Upgrade catena operativa: Pisano/Tronconi/Marullo
Gestione catena operativa/servizio tecnico: Tronconi, Forneris, LaPadula

Sviluppo e produzione di Ocean Monitoring Indicators

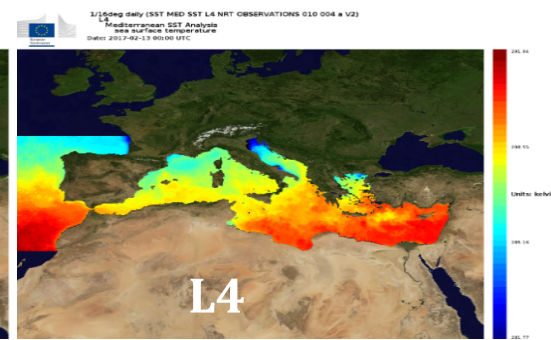
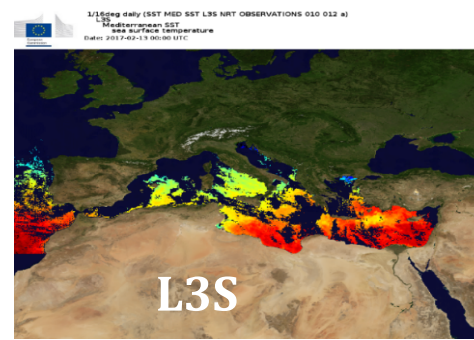
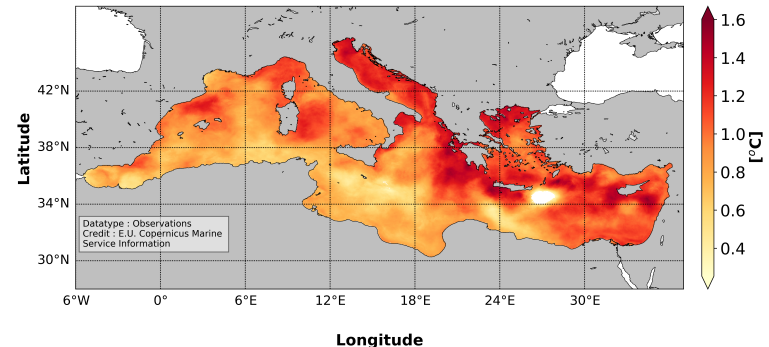
Dati utilizzati per *CMEMS Ocean State Report* e studi su cambiamenti climatici regionali

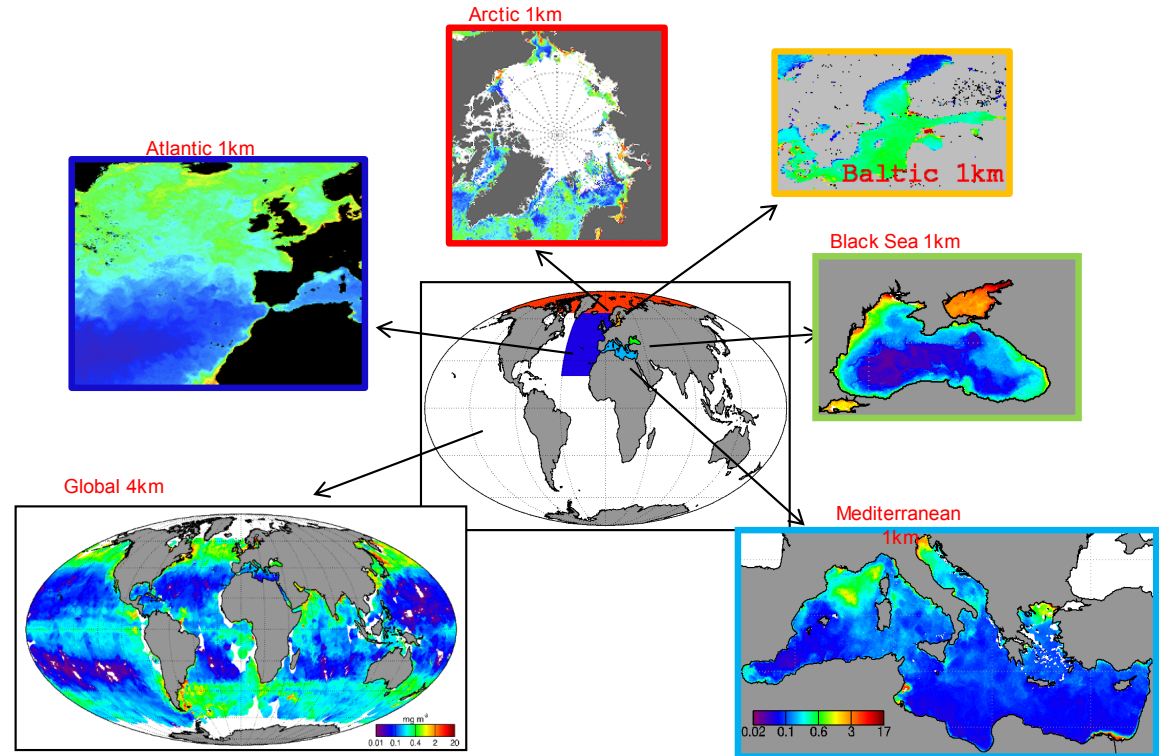


Mediterranean Sea SST Anomaly (1993-2018)



Mediterranean Sea SST Cumulative Trend (1993-2018)





	Acronimo	Nome	Nazione	Resp.
1	CNR	National Research Council	Italy	OC leader/main contractor: coordination, Production Unit & System evolution
2	ACRI	ACRI-ST	France	Production Unit , System Evolution
3	PML	Plymouth Marine Laboratory	UK	Production Unit , System Evolution
4	HZG	Helmholtz-Zentrum Geesthacht	Germany	System Evolution
5	SYKE	Finnish Environment Institute	Finland	System Evolution
6	AEQUORA	Aequora Ltd	Portugal	System Evolution
7	adwäisEO	adwäisEO Ltd	Luxembourg	Data archiving



Plymouth Marine Laboratory



implemented by





CMEMS-OC-TAC

Coordinamento a livello europeo

Pianificazione, gestione e monitoraggio attività di progetto

Coordinatore: R.Santoleri

Deputy: V.Brandò

Project Management: Böhm, Cesarini

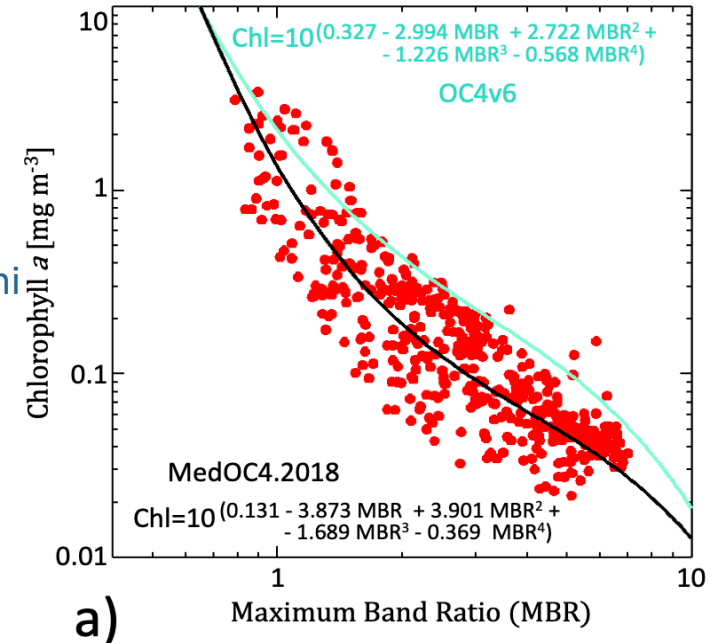


Sviluppo di algoritmi e produzione dati di Ocean Colour (Chlorophyll, Rrs ,IOPs , Kd490, Secchi depth, PAR, SPM) sul **Mediterraneo (MED)**, sul **Mar Nero (BS)**, sul **Baltico (BAL)** e sui **mari Europei (EUR)** in **Near-Real-Time (NRT)** e reprocessing di **serie storiche (REP)**.

- dati di livello L3S (multi-sensore giornalieri)
- dati di livello L4 (interpolati, giornalieri)

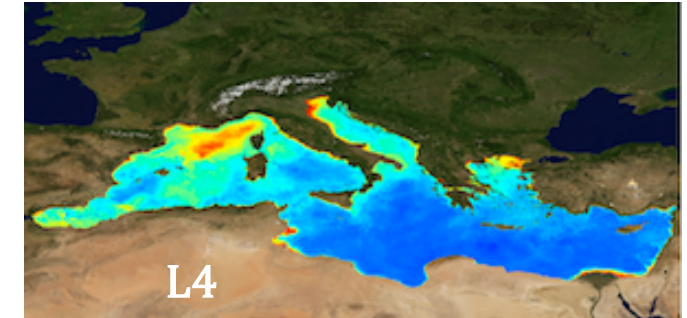
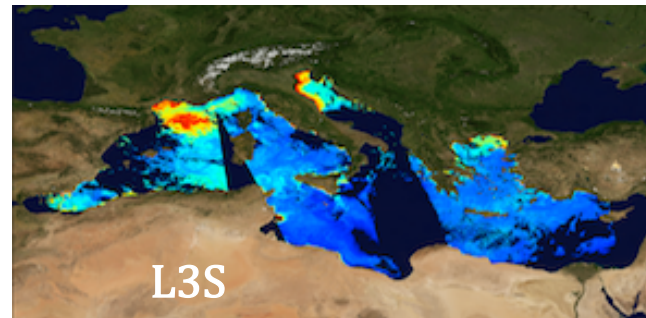
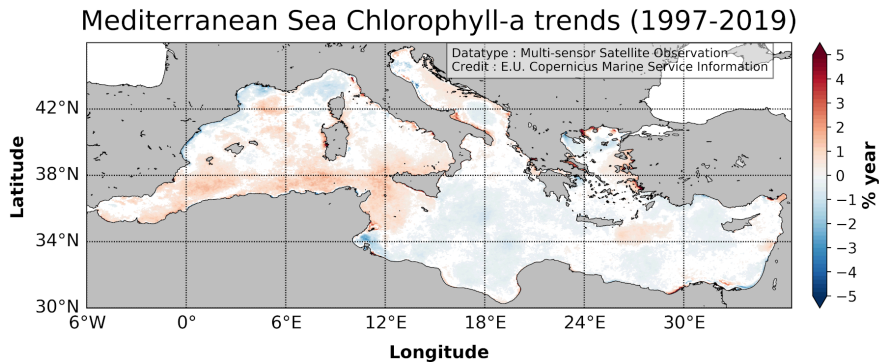
Sviluppo algoritmi/Implementazione/Upgrade catena operativa: Colella/Volpe/Dicicco/Sammartino

Gestione catena operativa/servizio tecnico: Concha, Forneris, LaPadula



Sviluppo e produzione di Ocean Monitoring Indicators

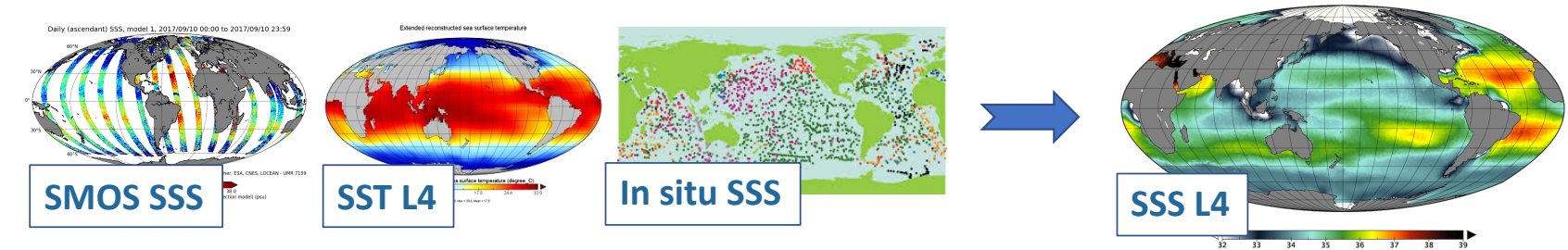
Dati utilizzati per *CMEMS Ocean State Report* e studi su cambiamenti climatici regionali





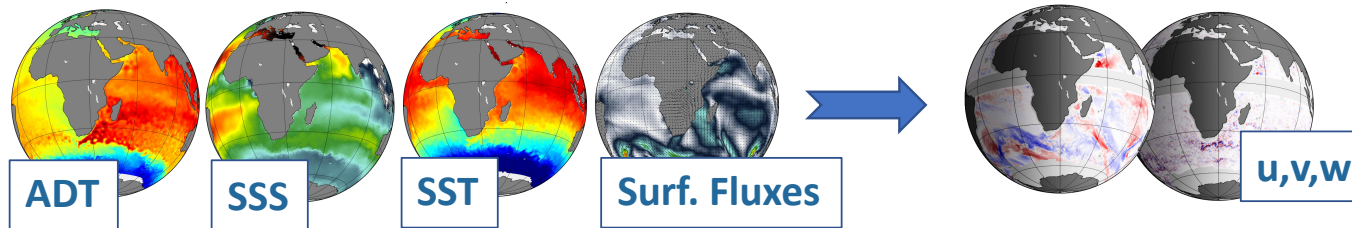
Sviluppo di algoritmi e produzione dati dalla combinazione di misure in situ/satellite

Global Sea Surface Salinity and Density Dataset (Near-Real-Time/Reprocessed Timeseries)

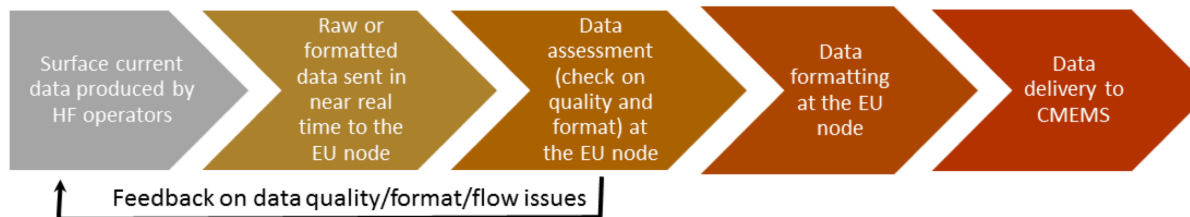


Scientific Team: Buongiorno Nardelli, Durante, Ciani

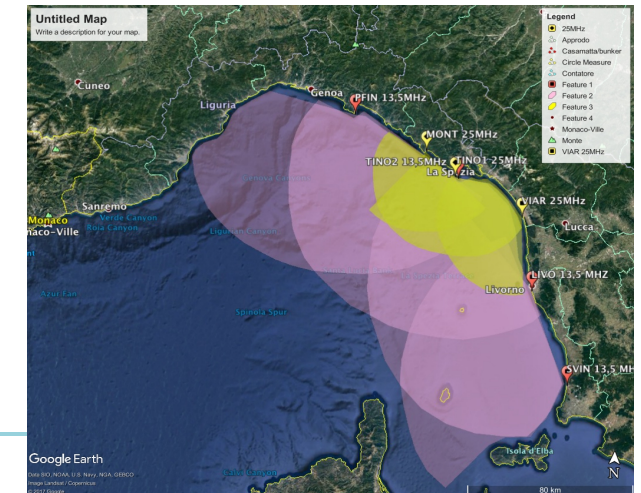
Global3D horizontal and vertical quasi-geostrophic ocean currents (Reprocessed 1993-2018 Timeseries)



Sviluppo di algoritmi e produzione dati da misure HF Radar



Scientific Team: L. Corgnati, C. Mantovani





Coordinamento a livello europeo

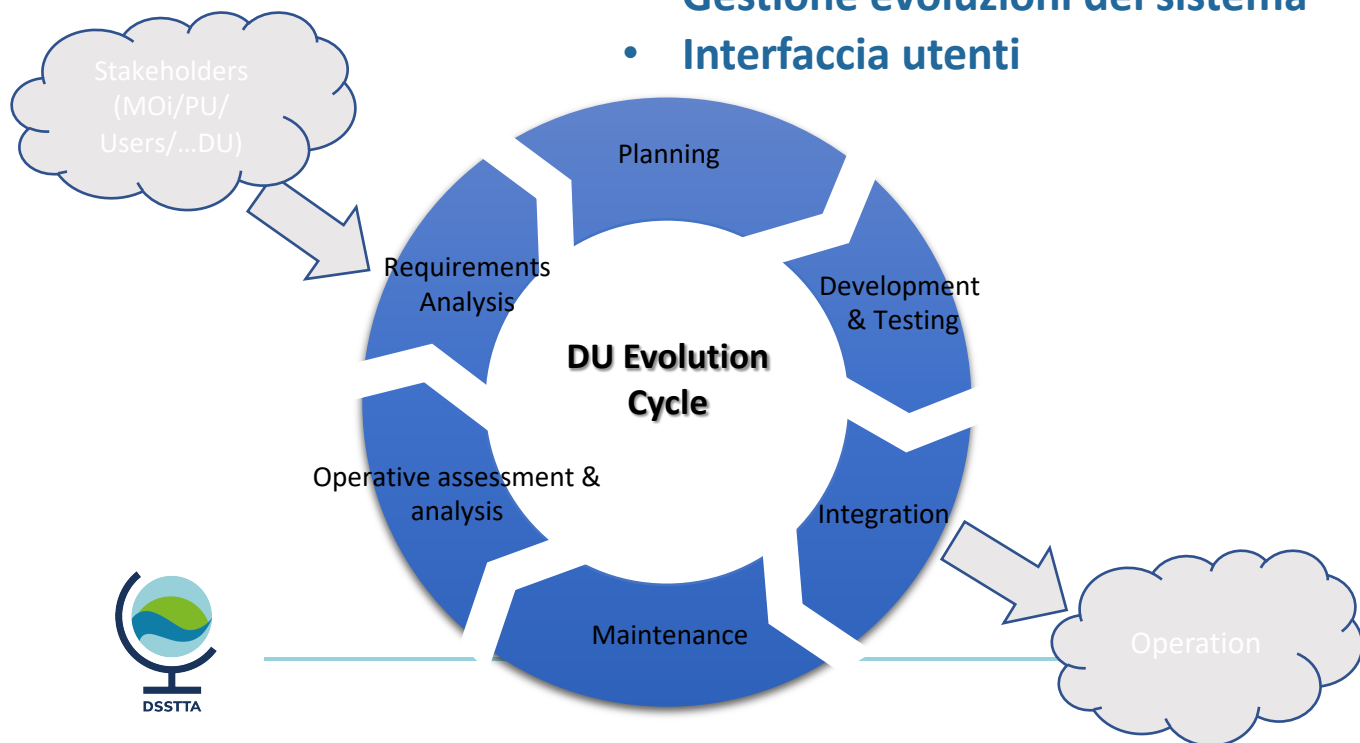
Pianificazione, gestione e monitoraggio attività di progetto

Coordinatore: Forneris

Deputy: Novellino

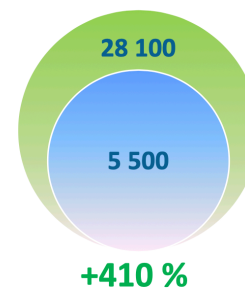
Project Management: Cesarini

- Design del servizio (adattamento a infrastruttura cloud esterna)
- Sviluppo e implementazione dei flussi dati
- Monitoraggio servizi
- Gestione evoluzioni del sistema
- Interfaccia utenti

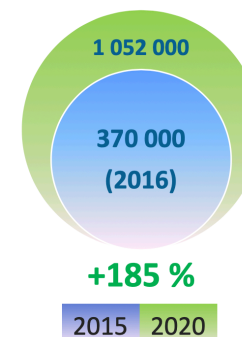


28 100 Subscribers (31-12-2020)

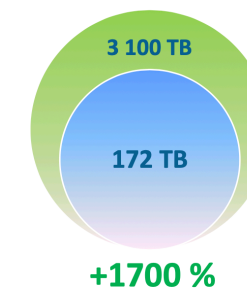
Subscribers



Downloads
i.e. 1 Download = 1 user/dataset/day

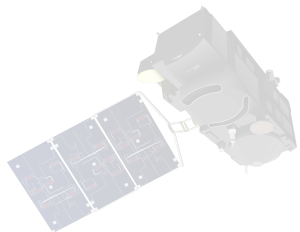


Size downloaded
i.e. Size of files downloaded per year in TB





Space component



Copernicus Services



Atmosphere



Marine



Land



Climate Change



ECMWF



Climate Change Service

climate.copernicus.eu

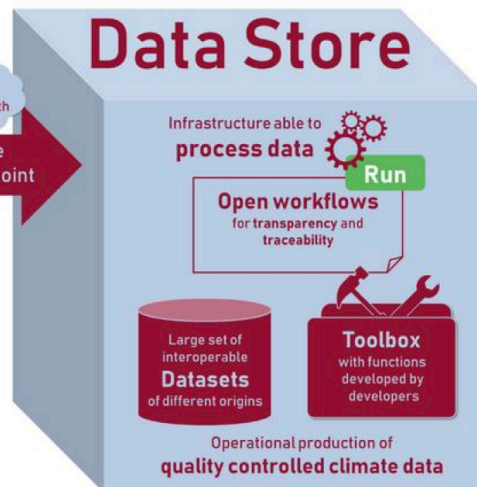
fornitura di dati e informazioni per lo studio dei cambiamenti climatici e il supporto alle politiche europee di adattamento



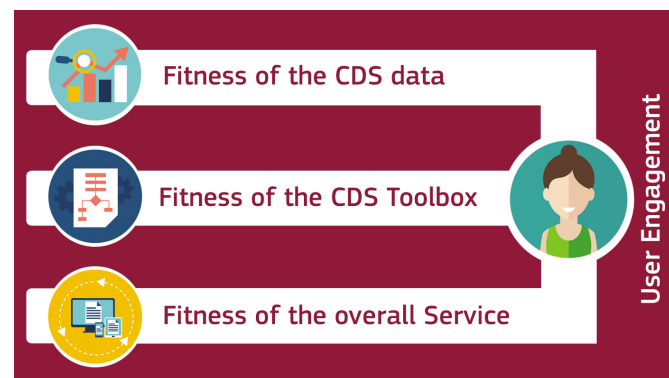
No need for large bandwidth

One entry point

Climate Data Store

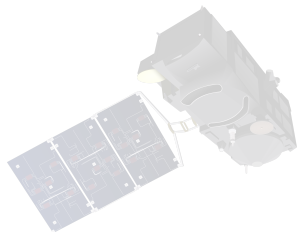


Evaluation and Quality Control (EQC)





Space component



Climate Change Service

climate.copernicus.eu

fornitura di dati e informazioni per lo studio dei cambiamenti climatici e il supporto alle politiche europee di adattamento



Copernicus Services



Atmosphere



Marine



Land



Climate Change

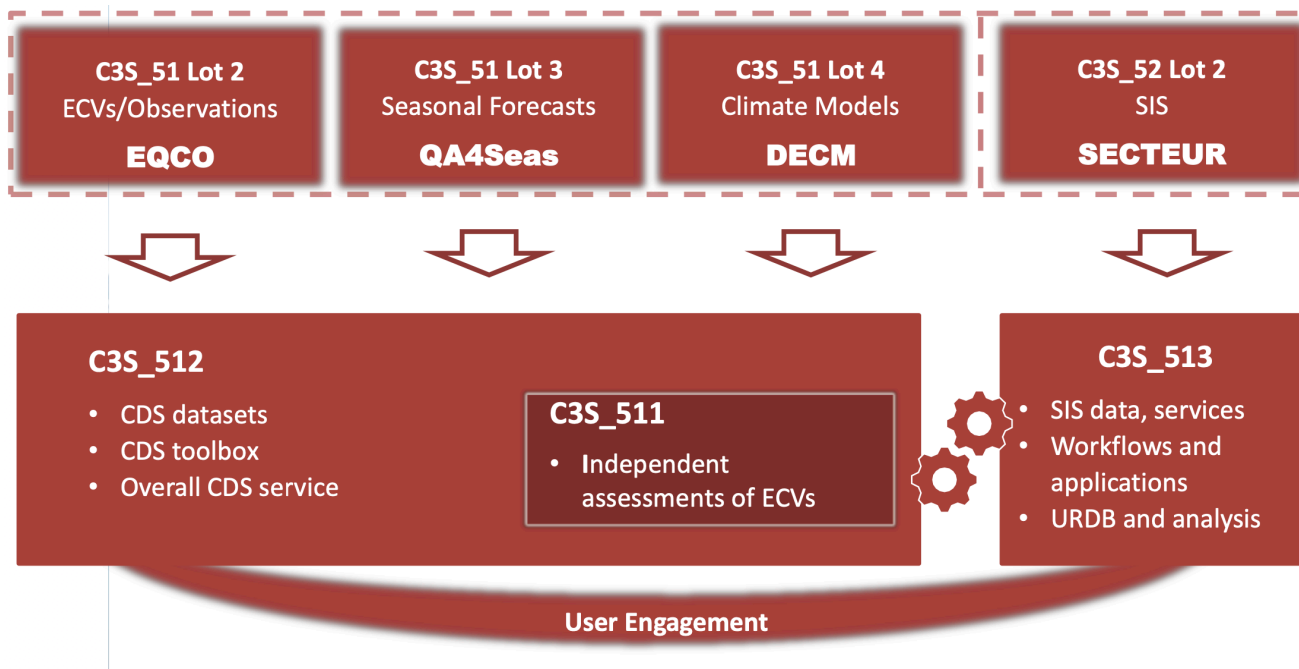


Security



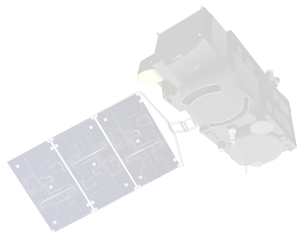
Emergency

Quality Control Function for the Climate Data Store





Space component



Climate Change Service

climate.copernicus.eu

fornitura di dati e informazioni per lo studio dei cambiamenti climatici e il supporto alle politiche europee di adattamento

Copernicus Services



Atmosphere



Marine



Land



Climate Change

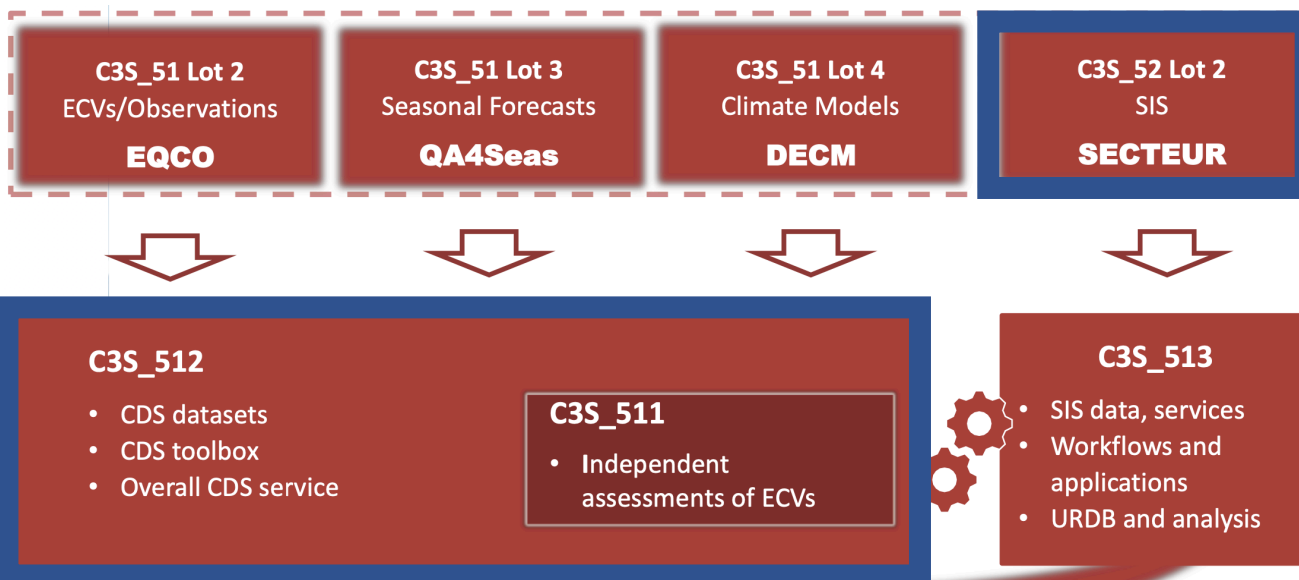


Security



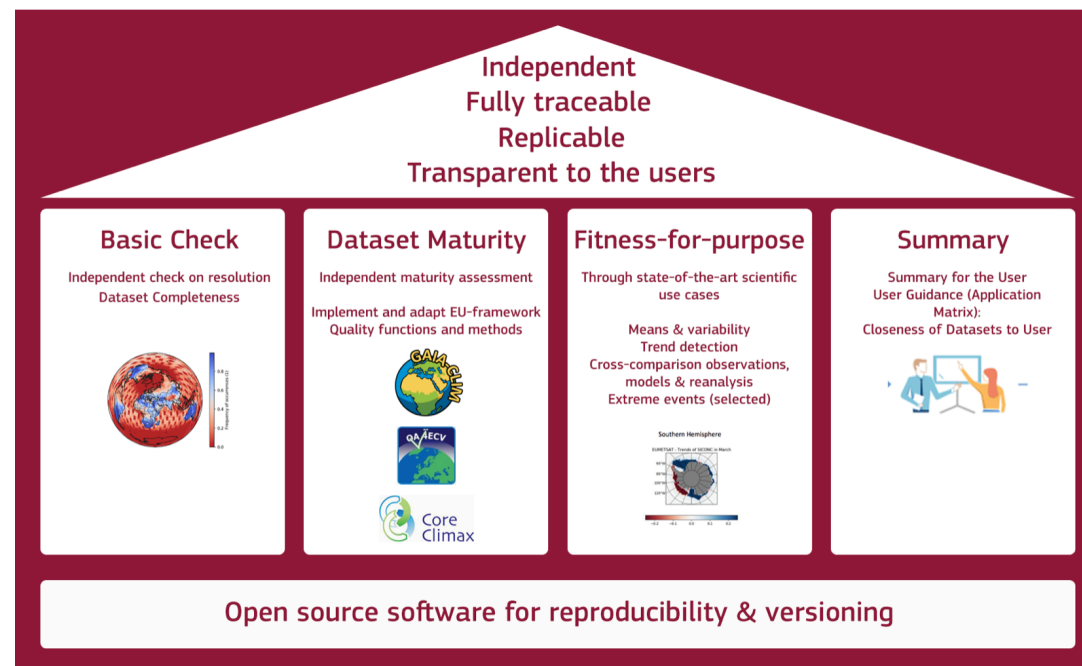
Emergency

Quality Control Function for the Climate Data Store



Valutazione dei dataset presenti nel **Climate Data Store** (CDS) per lo studio dei segnali climatici osservabili nelle diverse ECV (**atmosfera, oceano e ghiaccio marino, terra, ghiacciai**)

- **Responsabilità** delle attività di validazione dei **dati oceanici e atmosferici globali** (*Pisano, Cristofanelli*)

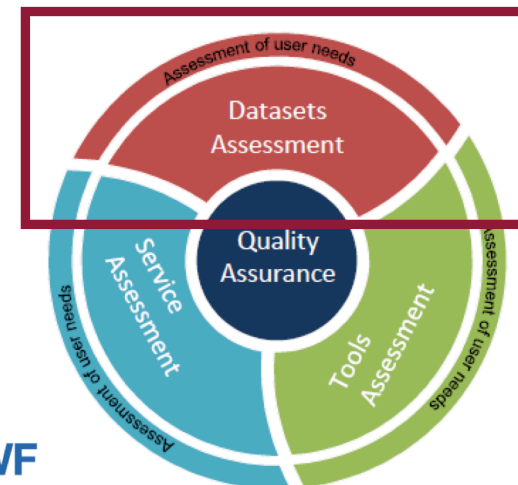


Quality Assurance for the Climate Data Store (C3S_512)

P.I. *Santoleri*

Implementazione della funzione di **valutazione e controllo della qualità** (EQC) per i dati e i metadati del CDS (*Madonna, Cristofannelli, Serva*)

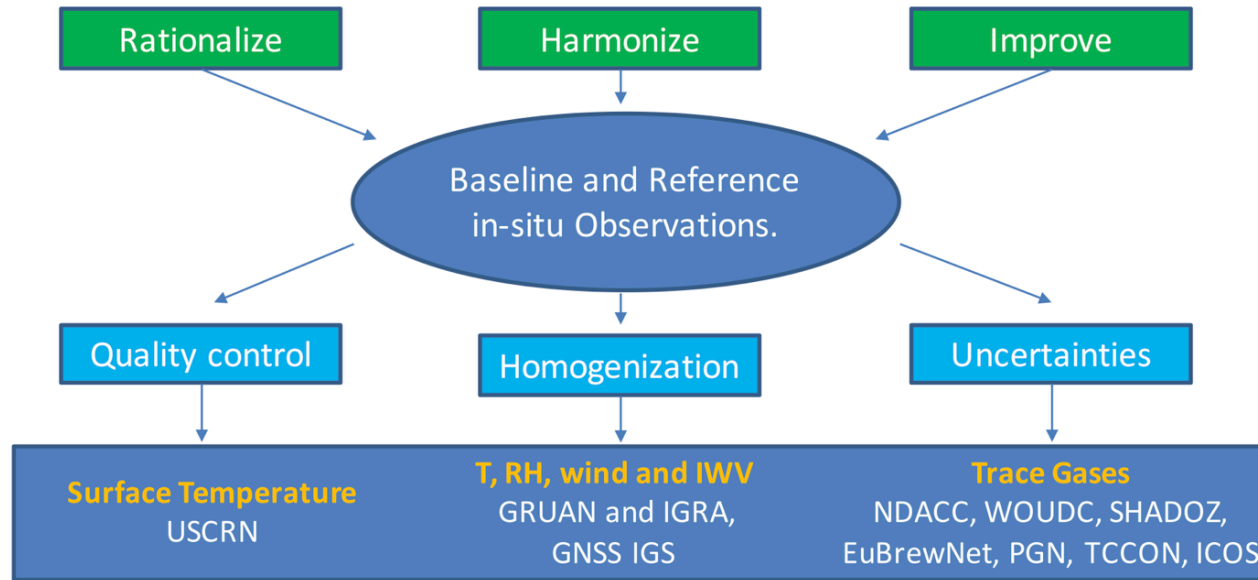
- Definizione metriche EQC
- Validazione dati in situ
- Validazione Toolbox



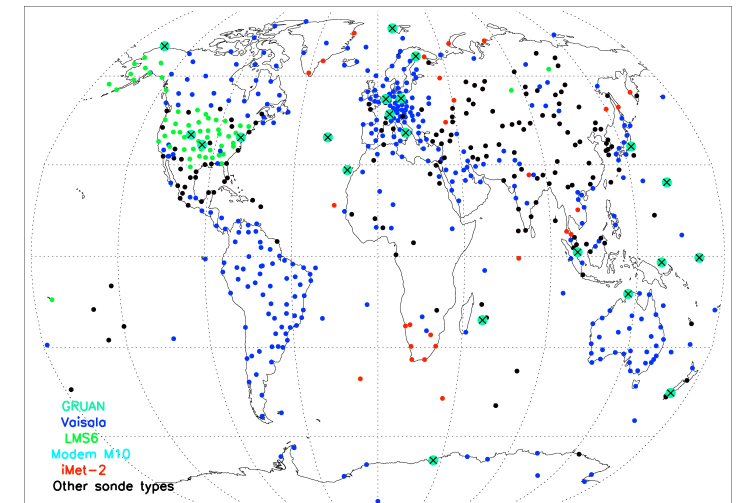
Baseline And Reference Observations Network (C3S_311a_Lot3)

Coordinamento a livello europeo: *Madonna*

University Maynooth (IE)
 Royal Belgian Institute for Space Aeronomy (BE)
 BK Scientific GmbH (D)
 National Physical Laboratory (UK)
 Tallinn University of Technology (EW)
 University of Bergamo (IT)
 University of Bremen (D)
 World Meteorological Organization (CH)

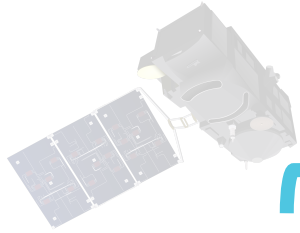


- Razionalizzazione, armonizzazione e validazione delle osservazioni in situ
- 14 dataset, forniti da 10 reti osservative per un totale di oltre 2500 stazioni di osservazione





Space component



Copernicus Services



Atmosphere



Security



Emergency

Detects emissions and estimate surface fluxes

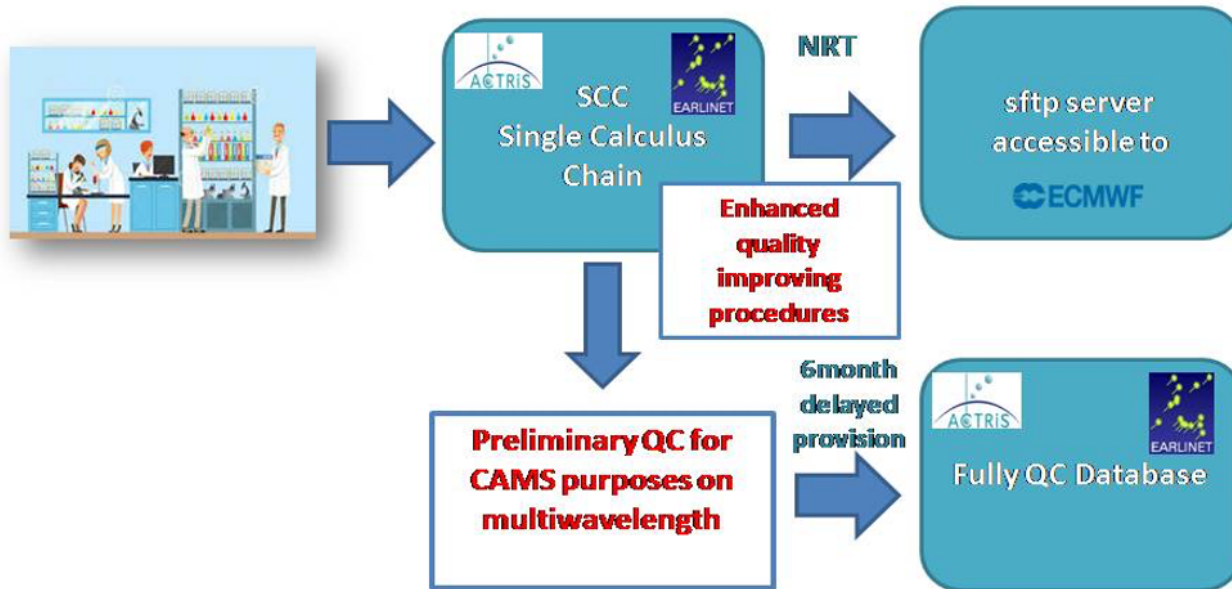
Quantifies transport, removal and transformations of atmospheric constituents

Forecasts and informs on impacts



Coordinamento: *Mona*

Sistema pilota per la fornitura di profili di aerosol atmosferici da 9 siti ACTRIS al CAMS in NRT

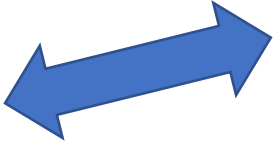


CNR, Potenza, (Italy); CNRS, Palaiseau, (France); DWD, Hohenpessenberg, (Germany); INOE, Bucharest, (Romania); NOA, Antikythera, (Greece); TROPOS (Germany)with measurements in Limassol, (Cyprus); University of Granada, Granada, (Spain); University of Warsaw, Warsaw, (Poland), FMI, Kuopio, (Finland).

- Implementazione di fornitura di profili in NRT elaborate in modo centralizzato, tracciabile e con controllo della qualità del dato
- Provision iniziata per Potenza a ottobre 2020 e per tutti I siti da gennaio 2021.



Copernicus Services



Horizon 2020
European Union funding
for Research & Innovation



- Servizi Downstream
- Sviluppo di algoritmi e prodotti avanzati
- Progetti di ricerca e innovazione

