

# Progetto CADEAU

Assimilation of national water quality data in Coastal Areas for a marine Directives oriented downstream product

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<http://www.bio.isprambiente.it/cadeau/>



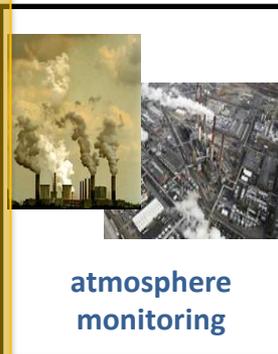
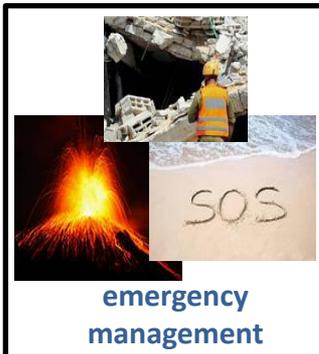
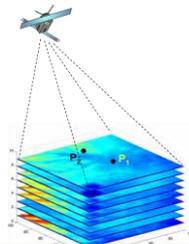


# CADEAU

- ✓ Come nasce il progetto CADEAU
- ✓ Obiettivi del progetto
- ✓ Prodotti/servizi del progetto
- ✓ Chi sono i possibili utenti
- ✓ L'importanza degli stakeholder

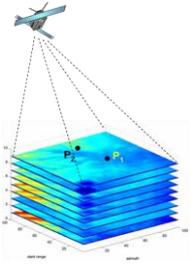
# COPERNICUS

Copernicus è il rivoluzionario **programma** di osservazione e monitoraggio della Terra **dell'Unione Europea**, dai satelliti nello spazio ai sistemi di rilevazione terrestre, marina e aerea, **fornisce dati operativi e servizi d'informazione**, per una vasta gamma di aree applicative.





## Dati satellitari



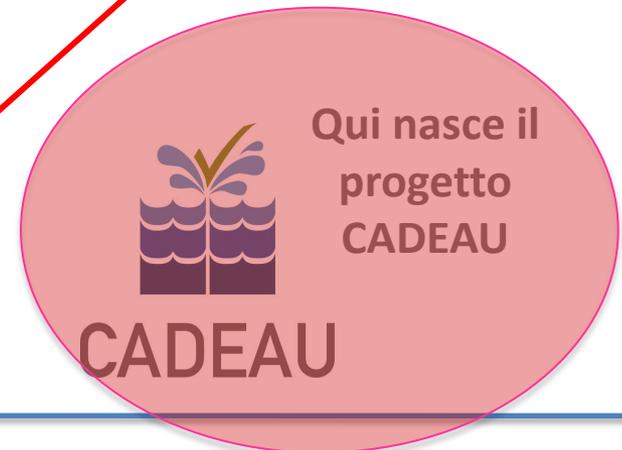
## Dati in situ

## Marine Environment (CMEMS)



Prodotti per gli  
utenti

## Processazione/ modelli



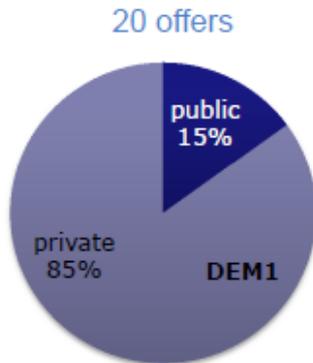
# Come nasce il progetto CADEAU <sup>1/2</sup>

## CMEMS USER UPTAKE SELECTION

**DEM1** Promotion of demonstrations of CMEMS downstream operational services

700 000 €

14 lots: 2 by regions  
ARC, BAL, NWS, IBI, MED, BS,  
GLO/RUP

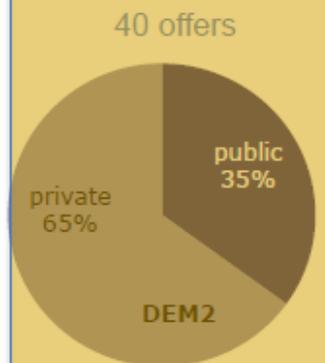


From 6 countries:  
5 European + Australia

**DEM2** Development and promotion of demonstrations of downstream operational service

1 050 000 €

7 lots: 1 by regions  
ARC, BAL, NWS, IBI, MED, BS,  
GLO/RUP

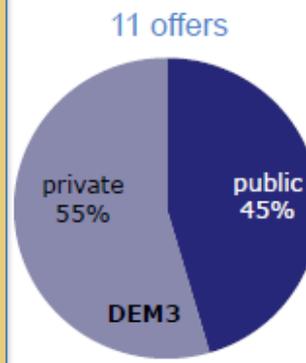


From 13 European countries

**DEM3** Development and promotion of demonstrations of services contributing to the implementation of the MSFD

600 000 €

4 identical lots

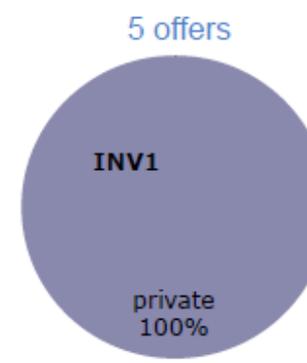


From 6 European countries

**INV1** Inventory of mobile applications

30 000 €

1 lot



From 3 European countries

## Come nasce il progetto CADEAU 2/2

### CMEMS USER UPTAKE SELECTION

**DEM1** Promotion of demonstrations of CMEMS downstream operational services

700 000 €

14 lots: 2 by regions  
ARC, BAL, NWS, IBI, MED, BS, GLO/RUP

7 lots successful

4 private / 2 public  
5 countries

SHOM  
Nologin  
Planetek  
NIMRD  
Noveltis  
Hidromod (2x)

**DEM2** Development and promotion of demonstrations of downstream operational service

1 050 000 €

7 lots: 1 by regions  
ARC, BAL, NWS, IBI, MED, BS, GLO/RUP

6 lots successful

3 private / 3 public  
6 countries

Polar View  
FMI  
DTU  
Telespazio  
ISPRA  
Hidromod

**DEM3** Development and promotion of demonstrations of services contributing to the implementation of the MSFD

600 000 €

4 identical lots

All lots successful

3 private / 1 public  
4 countries

AZTI  
CEFAS  
Deltares  
Quiet Oceans

**INV1** Inventory of mobile applications

30 000 €

1 lot

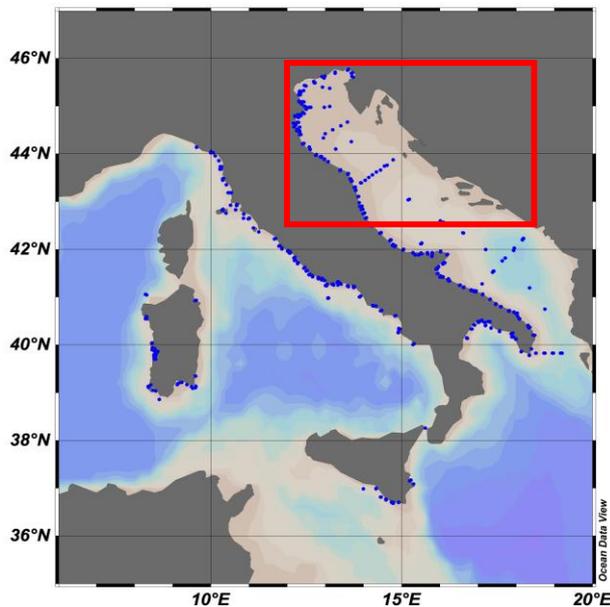
Lot successful

1 private

TEAMSURV

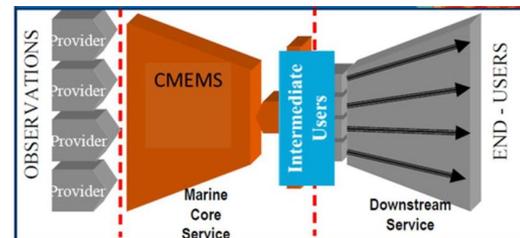
## Obiettivi del progetto CADEAU

CADEAU ha come obiettivo quello di sviluppare nuovi **servizi e prodotti** derivati dal Servizio Core Copernicus Marine Environment Monitoring (CMEMS) a supporto delle **Direttive Europee** per la valutazione dello stato delle acque marino costiere e della loro gestione ambientale con un focus specifico nell'**Alto Adriatico**.



Marine Environment  
(CMEMS)

Direttive Europee (WFD-MSFD-BW)





# Come viene sviluppato il servizio?

**MEDITERRANEAN SEA BIOGEOCHEMISTRY REANALYSIS (1999-2015)**  
Metadata provided by CMEMS  
Credits: E.S. Copernicus Marine Service Information

**MEDITERRANEAN SEA PHYSICS REANALYSIS (1955-2015)**  
Metadata provided by CMEMS  
Credits: E.S. Copernicus Marine Service Information

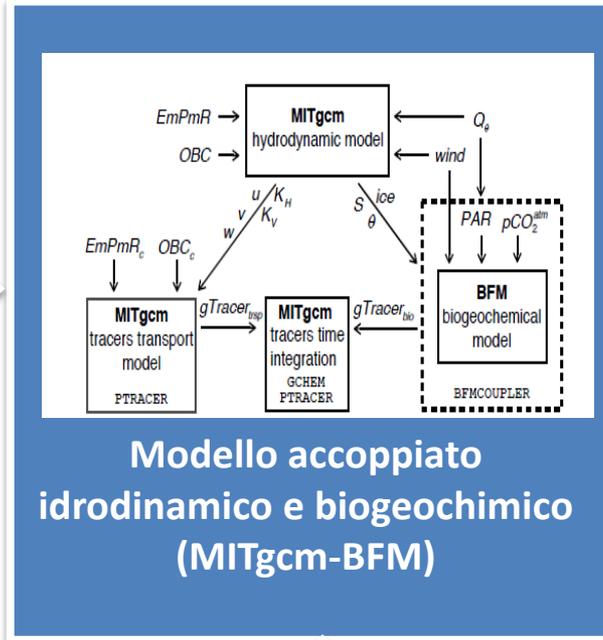
**MEDITERRANEAN SEA REPROCESSED SURFACE CHLOROPHYLL CONCENTRATION FROM MULTI SATELLITE OBSERVATIONS**  
Metadata provided by CMEMS  
Credits: E.S. Copernicus Marine Service Information

**MEDITERRANEAN SEA PHYSICS ANALYSIS AND FORECAST**  
Metadata provided by CMEMS  
Credits: E.S. Copernicus Marine Service Information

**MEDITERRANEAN SEA SURFACE CHLOROPHYLL CONCENTRATION FROM MULTI SATELLITE OBSERVATIONS**  
Metadata provided by CMEMS  
Credits: E.S. Copernicus Marine Service Information

**MEDITERRANEAN SEA BIOGEOCHEMISTRY ANALYSIS AND FORECAST**  
Metadata provided by CMEMS  
Credits: E.S. Copernicus Marine Service Information

**Servizi CMEMS**



**Prodotti per gli utenti**

**Assimilazione  
Validazione  
dati 2001-2017**

**dati *in situ* dei programmi di monitoraggio nazionali  
delle ARPA**

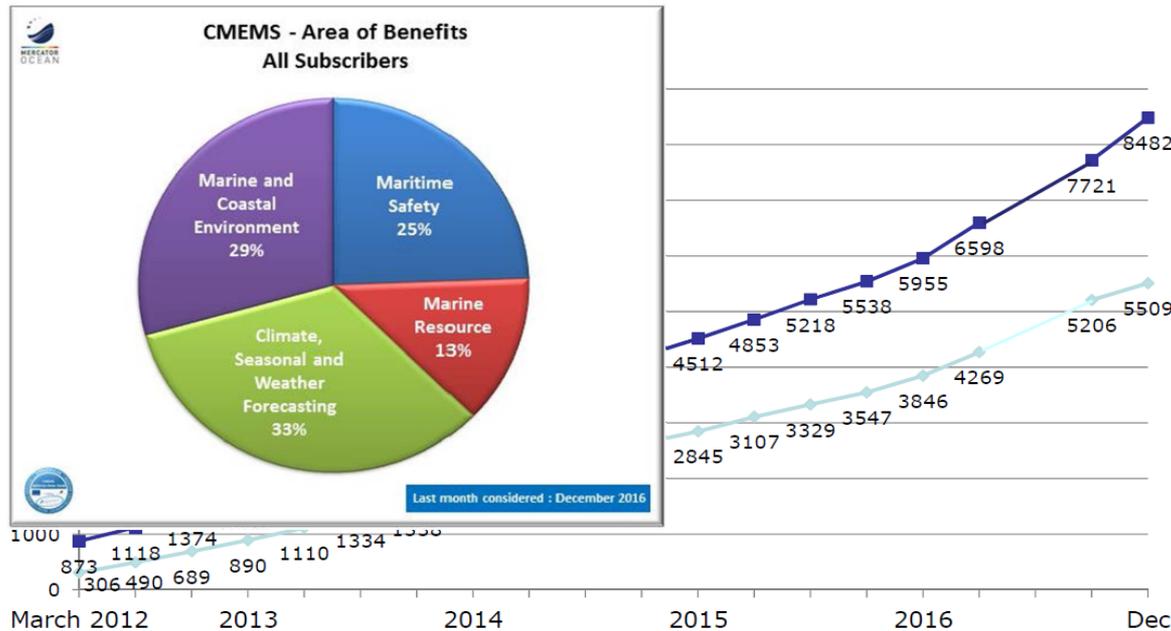
NO <sub>2</sub> (μmol/l)	Sat. Ossig. (%)	PO <sub>4</sub> (μmol/l)	pH	Salinità	Trasparenza (m)	SiO <sub>4</sub> (μmol/l)	Trasparenza (m)	SiO <sub>4</sub> (μmol/l)	Temperatura (°C)	P tot (μmol/l)	NH <sub>4</sub> (μmol/l)	Conducibilità (S/m)	DOC (μmol/l)	Chl-a (μg/l)	DIN (μmol/l)	DO (μmol/l)	Ntot (μmol/l)	NO <sub>3</sub> (μmol/l)
0,43	95,4	0,05	8,404	33,1888	2,1	3,9	2,1	3,9	9,1394	0,54	0,6	35,5379		2,97		277,2	27,3	9,43
0,38	96,2	0,19	8,327	32,2844	3,1	10,54	3,1	10,54	7,849	0,79	0,6	35,5407		3,24		289,7	28,2	14,26
0,79	95,4	0,03	8,307	30,4938	3,6	9,23	2,1	3,9	9,1394	0,54	0,53	38,9277		1,51		243,45	49,38	23,13
0,43	86,9	0,09	8,222	33,6482	3,2	5,06	3,1	10,54	7,849	0,79	2,95	45,7904		1,83		203,76	23,59	6,23
0,53	103,1	0,03	8,299	29,6297	0,9	15,14	3,6	9,23	16,1442	0,55	3,66	30,7959		0,97		318,14	41,24	24,11
0,96	131,4	0,08	8,67	30,4046	2	1,08	3,2	5,06	19,5215	0,62	0,79	33,5238		10,18		381,89	35,18	13,29
1,1	106,4	0,08	8,461	26,3156	0,9	11,27	0,9	15,14	7,5453	0,63								
							2	1,08	9,9595	0,56								
							0,9	11,27	10,1962	0,58								

# Chi potrebbero essere gli utenti di CADEAU?

## CMEMS USERS



Utenti



- ✓ ARPA
- ✓ Amministrazioni coinvolte nell'attuazione delle Direttive (WFD,MSFD,BWD)
- ✓ Enti locali per il Turismo
- ✓ Gestori delle aree di produzione dei molluschi



CADEAU

Operational Service in support of the EU directives in the North Adriatic coastal areas

Region	Areas of Benefit
Mediterranean Sea region	Coastal & Marine Environment
	Biogeochemical model
	Water quality
	Bathing waters
	Marine resources
	Pressures and Impacts
	Aquaculture

CADEAU is a Copernicus Marine Environment Monitoring Service (CMEMS) downstream coastal service devoted to operationally deliver a bulletin based on the Copernicus Marine Service derived products to quantify nutrient dynamics, eutrophication and bathing water quality in coastal areas in support of the application of the EU Directives relative to coastal and marine environment (Water Framework Directive - WFD, Urban Waste Water Treatment Directive - UWWTD, Bathing Water Directive - BWD, Marine Strategy Framework Directive - MSFD). In particular, the products will be designed for the Italian Adriatic coast to give information on the space-time distribution of major parameters related to water quality (nitrogen and phosphorus concentration, chlorophyll, dissolved oxygen), with an emphasis on the North Adriatic region. These data will then be elaborated to derive information on specific activities:

- the level of impacts associated to urban waste water treatment plants (UWWTPs), with discharge points in or near the sea and rivers,
- the water quality in the Adriatic Sea for WFD/BWD/MSFD requirements for water bodies and bathing waters,
- the nutrients availability and primary production near aquaculture plants and its relation to annual fishing landings.

#### The Copernicus Marine Service products used in the service

- [MEDSEA\\_REANALYSIS\\_BIO\\_006\\_008](#)
- [MEDSEA\\_REANALYSIS\\_PHYS\\_006\\_004](#)
- [OCEANCOLOUR\\_MED\\_CHL\\_L3\\_REP\\_OBSERVATIONS\\_009\\_073](#)
- [MEDSEA\\_ANALYSIS\\_FORECAST\\_BIO\\_006\\_014](#)
- [MEDSEA\\_ANALYSIS\\_FORECAST\\_PHY\\_006\\_013](#)

#### Usefulness of Copernicus Marine Service information

- [MEDSEA\\_REANALYSIS\\_BIO\\_006\\_008](#)  
Copernicus Marine Service Mediterranean Sea biogeochemistry reanalysis products. This product will be used to build the initial conditions and boundary conditions (section at Lat 42.5°N) of the biogeochemical variables of BFM (Biogeochemical Flux Model) model for the operational restarts and simulations of the North Adriatic high-resolution reanalysis. The data will be interpolated from the 1/16° resolution of the CMEMS product to the 1/128° resolution of the present service.
- [MEDSEA\\_REANALYSIS\\_PHYS\\_006\\_004](#)  
Copernicus Marine Service Mediterranean Sea physics reanalysis products. This product will be used to build the initial conditions and boundary conditions (section at Lat 42.5°N) of the physical variables of the MITgcm (Massachusetts Institute of Technology general circulation model) transport model for the operational restarts and simulations of the North Adriatic high-resolution reanalysis. The data will be interpolated from the 1/16° resolution of the CMEMS product to the 1/128° resolution of the present service.
- [OCEANCOLOUR\\_MED\\_CHL\\_L3\\_REP\\_OBSERVATIONS\\_009\\_073](#)  
Copernicus Marine Service Mediterranean Sea surface chlorophyll concentration from multi satellite observations reprocessed (ESA-CCI). This product will be used as input for the coastal high resolution data assimilation implemented in the reanalysis run.
- [MEDSEA\\_ANALYSIS\\_FORECAST\\_BIO\\_006\\_014](#)  
Copernicus Marine Service Mediterranean Sea biogeochemistry analysis and forecast products. This product will be used to build the initial conditions and boundary conditions (section at Lat 42.5°N) of the biogeochemical variables of BFM model for the operational restarts of the annual updates. The data will be interpolated from the 1/16° resolution of the CMEMS product to the 1/128° resolution of the present service.
- [MEDSEA\\_ANALYSIS\\_FORECAST\\_PHY\\_006\\_013](#)  
Copernicus Marine Service Mediterranean Sea physics analysis and forecast products. This product will be used to build the initial conditions and boundary conditions (section at Lat 42.5°N) of the physical variables of MITgcm model for the operational restarts of the annual updates. The data will be interpolated from the 1/16° resolution of the CMEMS product to the 1/128° resolution of the present service.
- [OCEANCOLOUR\\_MED\\_CHL\\_L3\\_NRT\\_OBSERVATIONS\\_009\\_040](#)  
Copernicus Marine Service Mediterranean Sea surface chlorophyll concentration from satellite observations. This product, presently based on MODIS-Aqua and NPP-VIRS sensors, or its update featuring the Sentinel 3 data, will be used as input for the coastal high resolution data assimilation implemented in the annual operational updates.

[Access the CADEAU Portal](#)

Contact CADEAU News Pictures Other documents

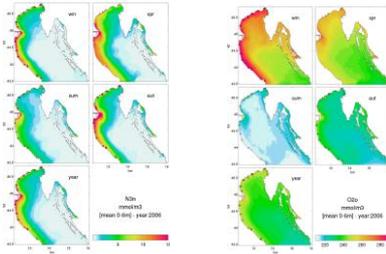
More information about the service

[cadeau@isprambiente.it](mailto:cadeau@isprambiente.it)

More information about the Copernicus Marine Service

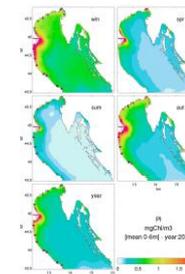
[service@cmems@mercator-ocean.eu](mailto:service@cmems@mercator-ocean.eu)

<http://www.bio.isprambiente.it/cadeau/>



## Il ruolo degli UTENTI

I servizi COPERNICUS



Sostenere l'utente  
istituzionale

Rappresentano anche una  
nuova economia

- ✓ Ai decisori politici deve essere garantito l'accesso a valutazioni fondate su dati e informazioni di alta qualità volte a delle azioni per la qualità dell'ambiente riducendo gli impatti su di esso.
- ✓ I cittadini, le imprese, il mondo accademico e le ONG necessitano di informazioni in maniera regolare e credibile.

- ✓ Il programma Copernicus cerca di attrarre maggiori investimenti nel mercato per offrire applicazioni innovative a valore aggiunto per soddisfare le crescenti esigenze e le aspettative degli utenti.

La realizzazione dei servizi da erogare e delle infrastrutture di osservazione, sono e saranno quindi guidati da esigenze degli UTENTI.

# Grazie per l'attenzione

