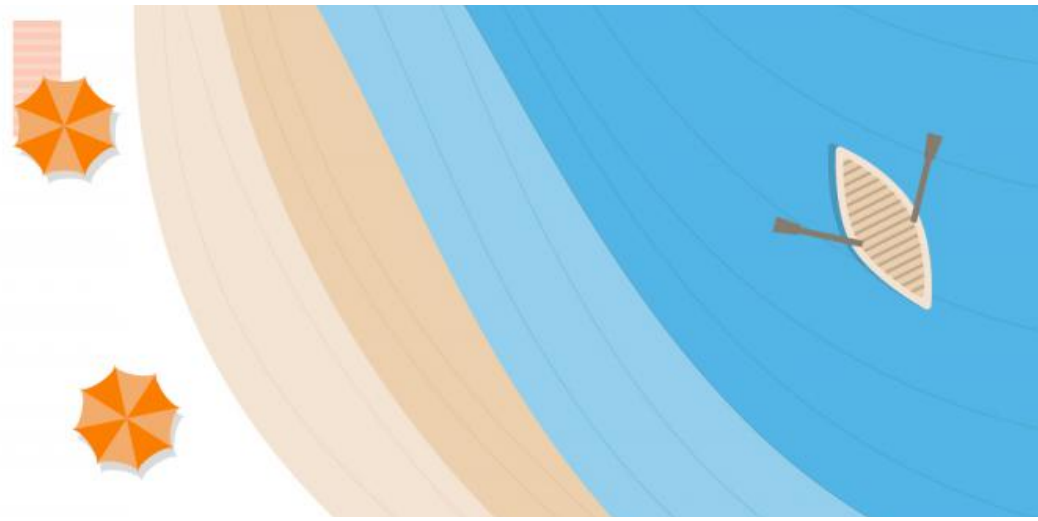


# GESTIONE E PREVENZIONE DEL **RISCHIO COSTIERO** DI UN TERRITORIO IN EVOLUZIONE

**PISA 8 OTTOBRE 2019**

Scuola Normale Superiore  
Piazza dei Cavalieri  
9:00 - 17:30



## Il contributo del programma *Copernicus* al monitoraggio e alla gestione del rischio costiero

*Prof. Andrea Taramelli – ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale)  
Delegato nazionale User Forum Copernicus*

*Ing. Serena Geraldini - ISPRA*

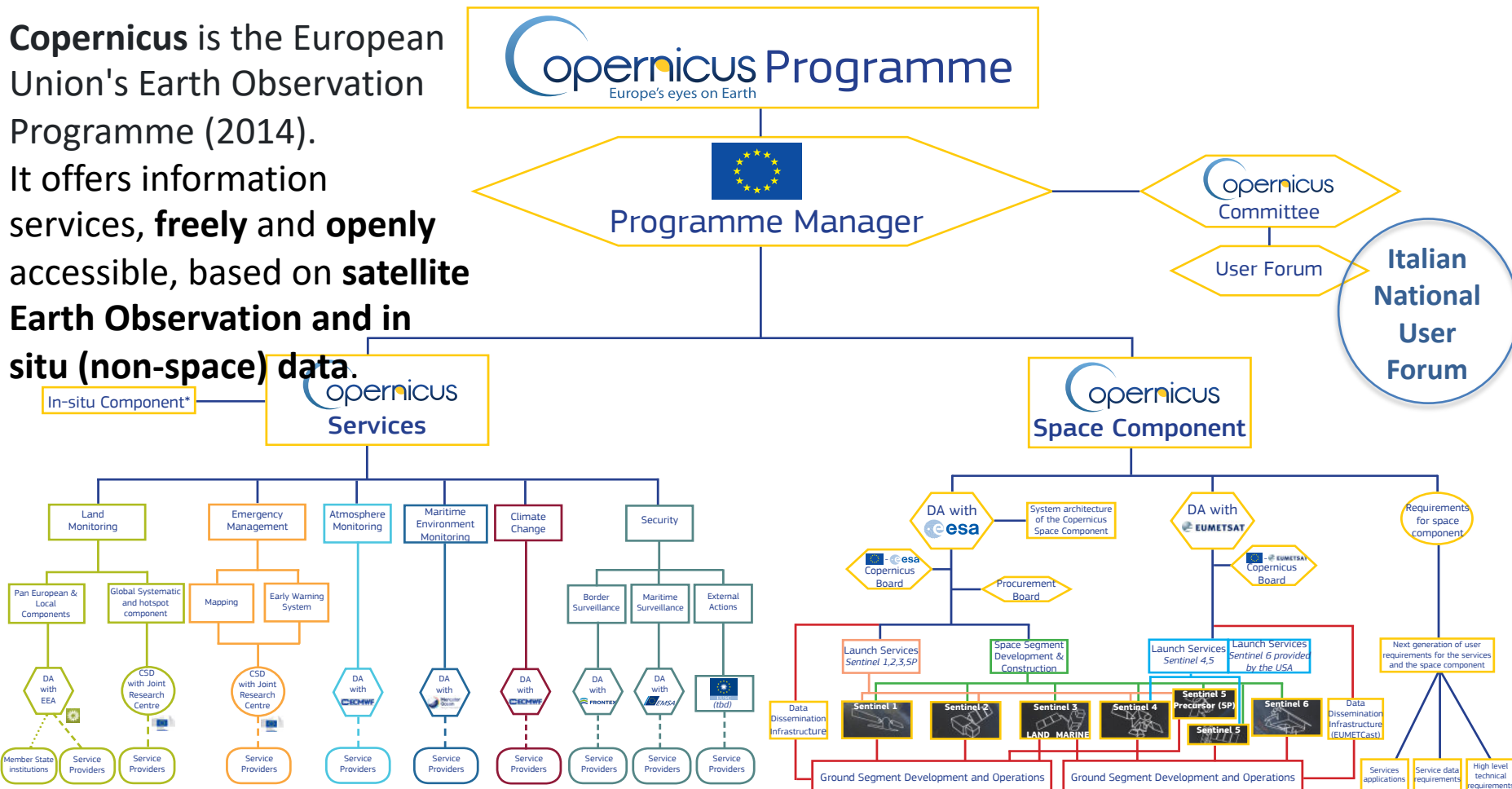


La cooperazione al cuore del Mediterraneo



# REGULATION (EU) No 377/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 3 April 2014 establishing the Copernicus Programme

**Copernicus** is the European Union's Earth Observation Programme (2014). It offers information services, **freely** and **openly** accessible, based on **satellite Earth Observation** and **in situ (non-space) data**.



## Legend:

Implementation mode still to be defined:

--- Commercial contracts  
..... Grants

 Copernicus component  
 Service Providers

**Mode of Implementation (direct/indirect)**  
 Indirect Management  
 Direct Management

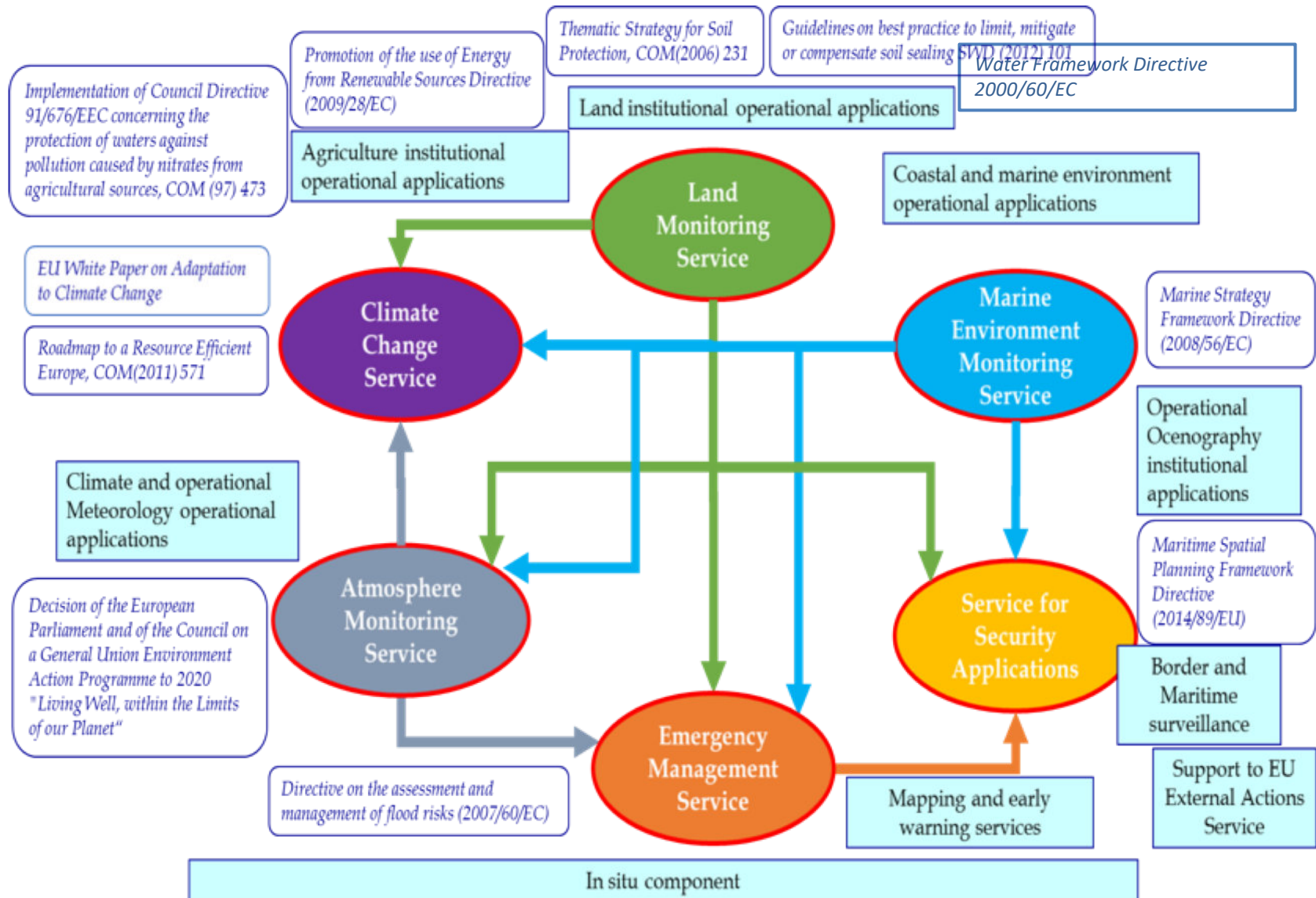
★ Coordination by ESA  
DA - Delegation agreement  
CSD - Crisis Sub-delegation  
ESA - European Space Agency

EUMETSAT - European Organisation for the Exploitation of Meteorological Satellites  
ESA - European Space Agency  
ESOC - European Space Operations Center

CHMWF - The European Agency for the Management of Operational Meteorological Data and the External Archives of the Member States of the European Union  
EUMETSAT - The European Agency for the Management of Operational Meteorological Data and the External Archives of the Member States of the European Union  
ESOC - The European Space Operations Center

Copernicus has been specifically designed to meet user requirements.  
The Copernicus services deliver near-real-time data on a global level

## DOWNSTREAM SERVICE



# The Copernicus programme is now operational and already demonstrates large benefits for intermediate & end-users.

## Operational Copernicus programme



## Operational DIAS



### Downstream: Intermediate users

- Pre-processing
- Analysis
- Access to high and very high resolution imagery
- Value Added Services
- Fusion of EO imagery with other sources of data
- Display



### Non-space community: End users

- Input EO-based products in their activities
- Very specific operational needs



## Summary

The Copernicus programme, and its 6 core services, is now operational and demonstrates already strong benefits:

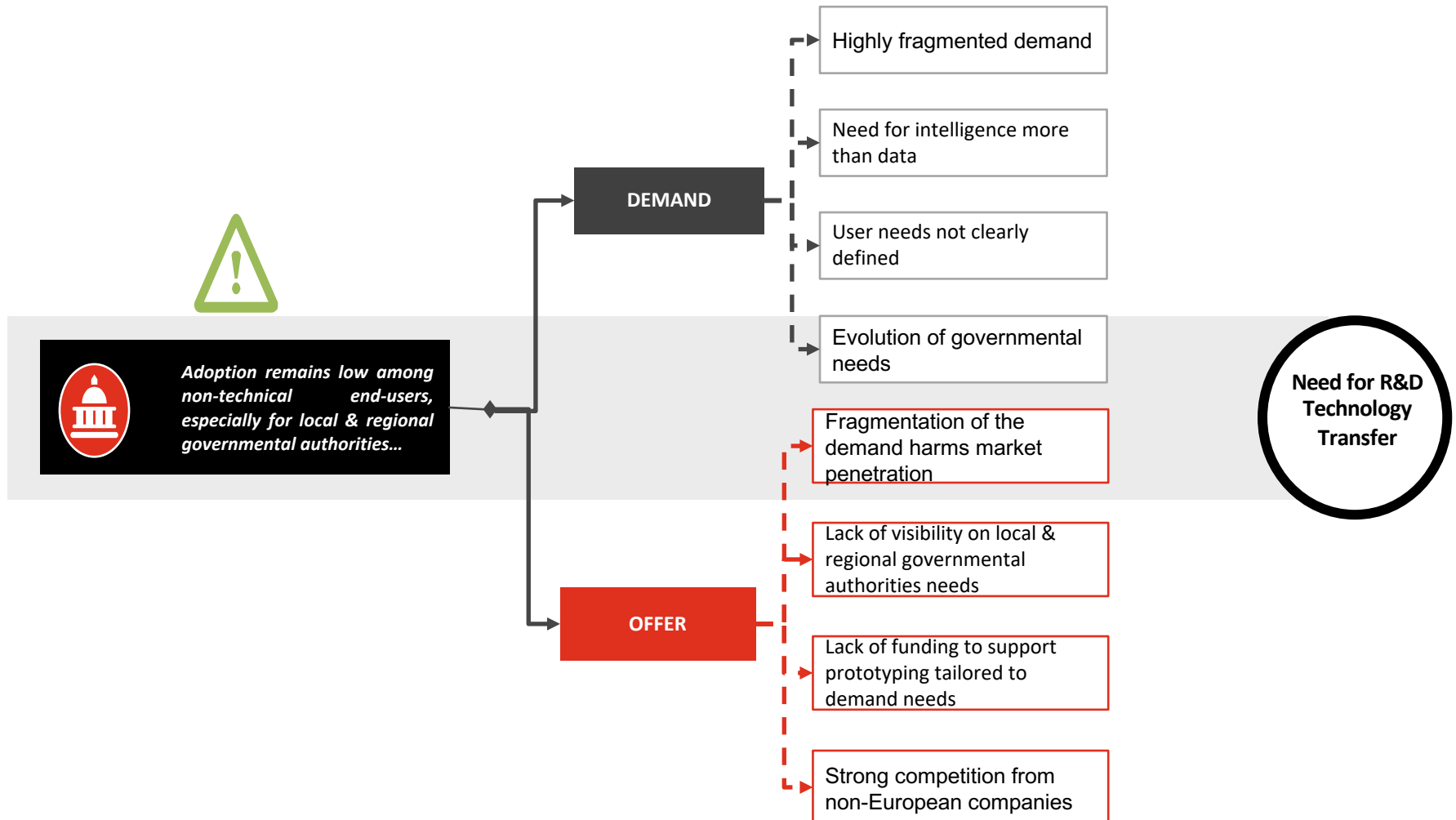
- Intermediate users in Europe: EUR 168 M (2018) and EUR 226 M (2020)\*
- End-users in Europe: EUR 2 700 M (2018) and EUR 3 500 M (2020)\*

The DIAS initiatives have been developed to support user uptake and Copernicus data & information dissemination to intermediate & end users. The 6 DIAS are operational since June 2018.

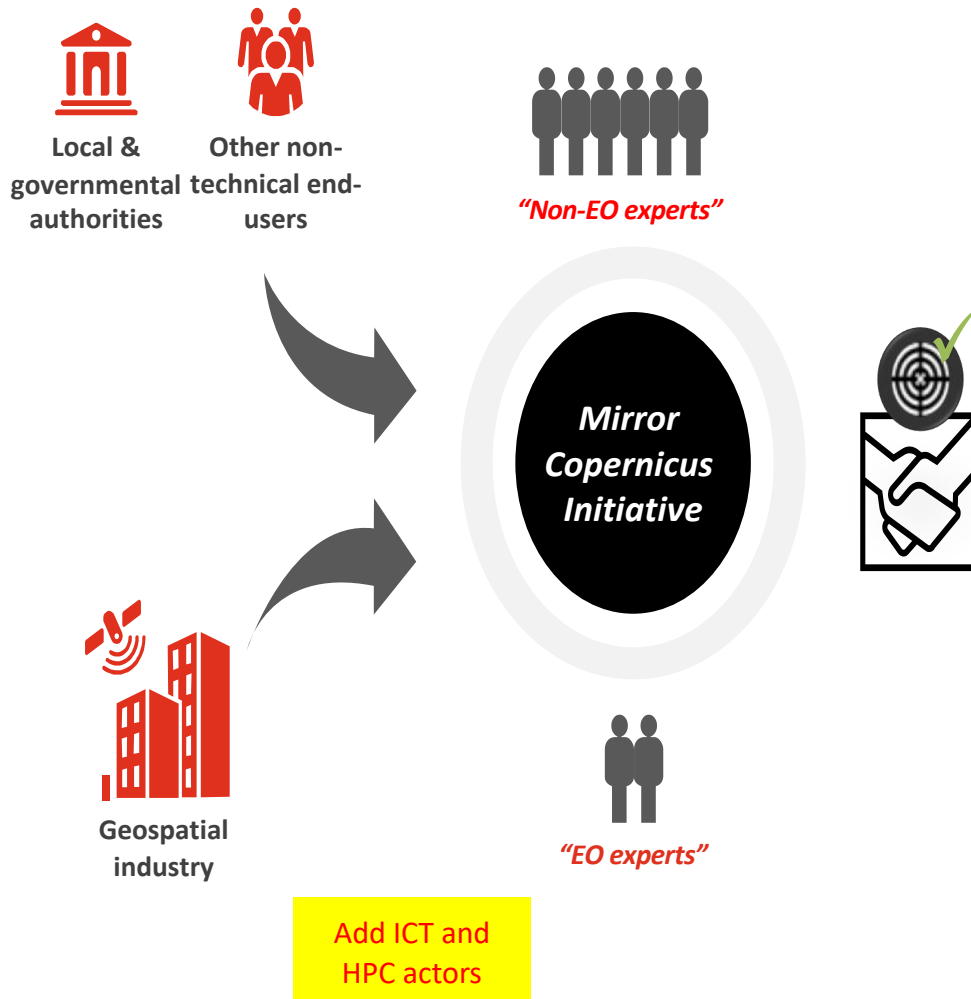
## Data and Information Access Services



If intermediate & technical end-users' adoption rate has significantly grow, adoption at local & regional governmental authorities remains low



The different National User Forum working tables aim at bringing together non-technical end-user, especially institutional ones, and the geospatial industry and research to build a win-win situation



### Summary

The initiative aims at:

1. Providing end-users, first and foremost for institutional organisations, support to decision-making and situational awareness tailored to their operational needs;
2. Hosting and making all data relevant for end-users, including both satellite data and other sources of data, accessible in a user-friendly manner;
3. Offering an open, scalable and interoperable environment facilitating the development of applications;
4. Favouring the access "as a service" of sophisticated information extraction technologies (e.g. Big Data analytics, etc.);
5. Setting up a market place bridging demand and supply of value-added geospatial applications and services (i.e. platform for real time management of exchanges).

**The *Mirror Copernicus* Italian Space Economy Strategic Plan** (CIPE n. 52, 1/12/2016), for the definition of the Italian space policy:

A national initiative to support the **development of coastal products as downstream services of Copernicus Core Services.**

It is a National action, **based on the Public Private Partnership** mechanisms for Innovation, that integrates a multiregional cooperation program with the priority national lines of intervention.



Atmosphere  
(CAMS)



Marine  
(CMEMS)



Land  
(CLMS)



Climate  
(C3S)



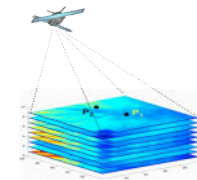
Emergency  
(EMS)



Security



National Operational  
Downstreaming -  
Mirror Copernicus



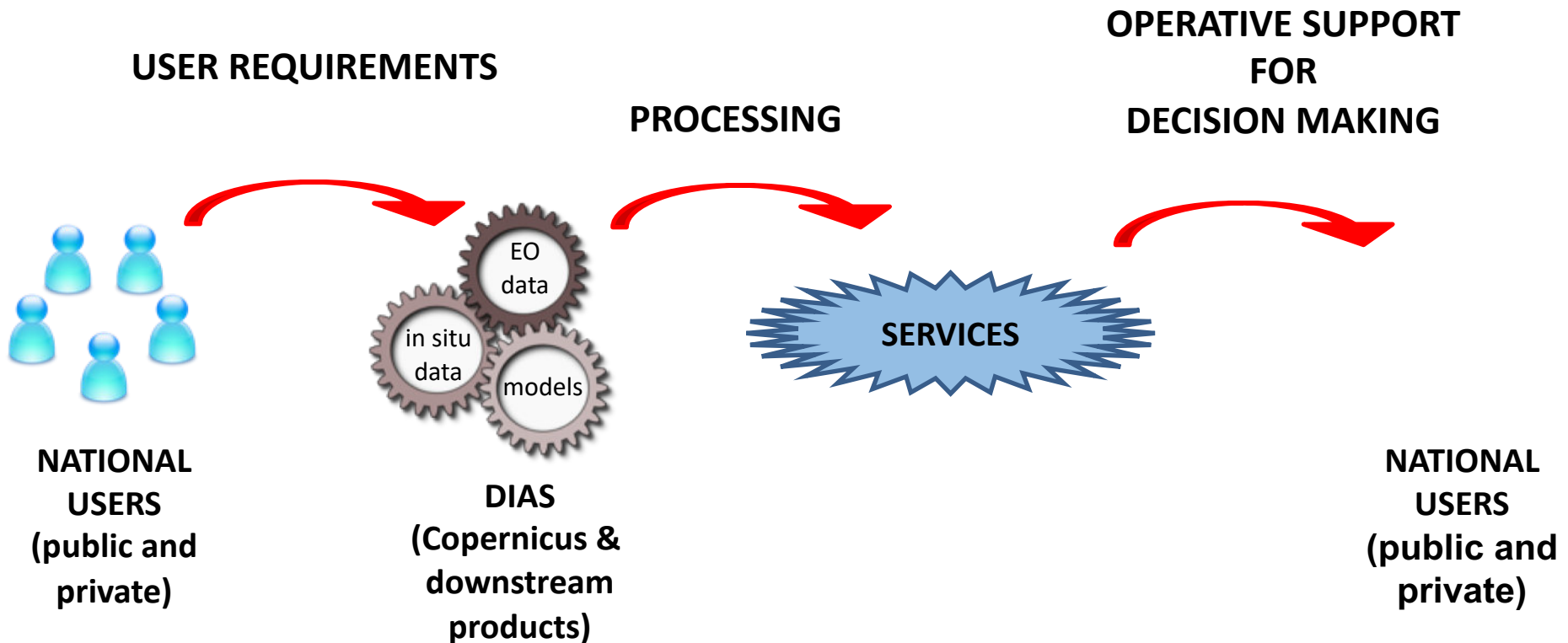
Additional (local)  
remote and in situ  
data, high resolution  
numerical models



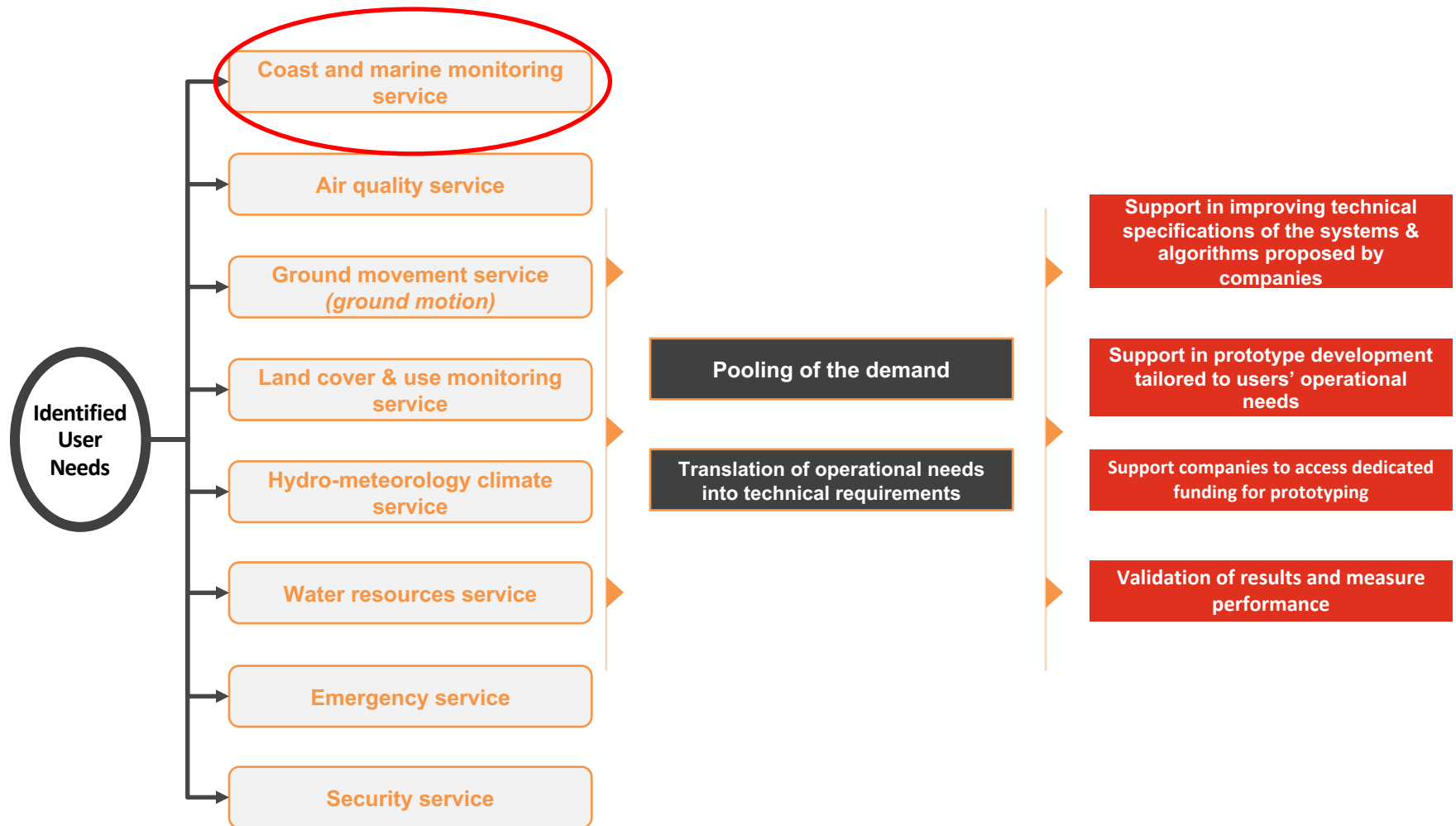
# The *Mirror Copernicus* Italian Space Economy Strategic Plan

The aim is the exploitation of integrated added value EO products (satellite, in-situ, modelling) at national scale in order to support, as a first step, institutional users, expression of a qualified demand for innovative enabling infrastructures, products and services.

An interactive approach was made consulting institutional users in the fields of **environmental protection, civil protection and defense** to identify the institutional users needs.



**8 thematic reference services** have been identified based on large institutional users' needs to facilitate the match between demand and offer

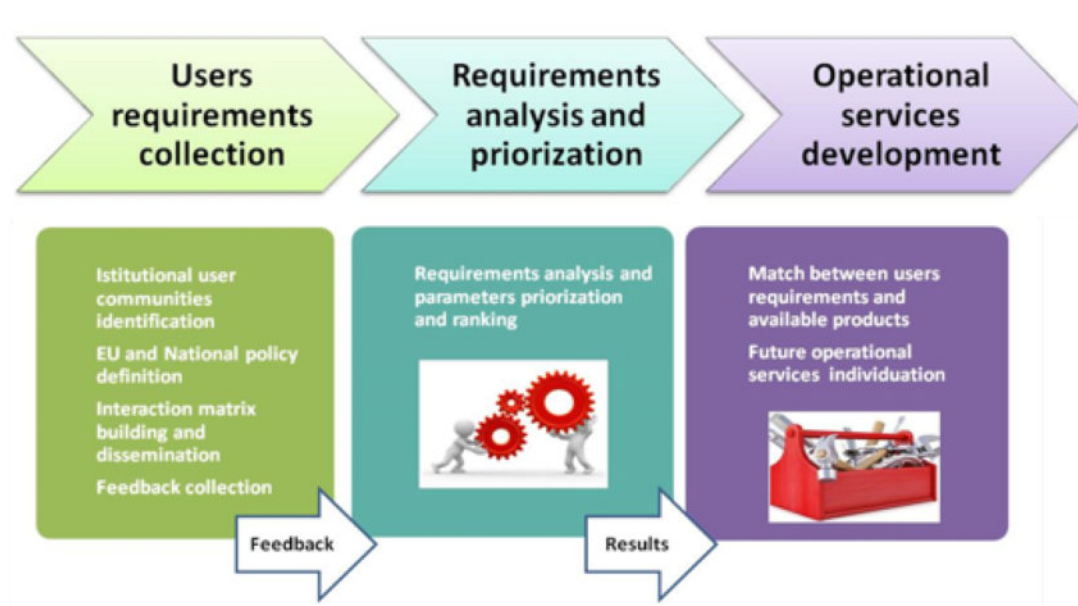




## The Italian user needs survey

A survey was carried consulting institutional users in the fields of environmental protection, civil protection and defense to identify the institutional users needs.

### USER REQUIREMENTS ANALYSIS



Legislation framework at EU and National level				User community		Operational Service technical details								
EU DIRECTIVES	COPERNICUS		NATIONAL LAW	USER	CONTACT	NEED	OPERATIVE SERVICE	STATE OF THE ART	INPUT DATA	APPLICATION (OUTPUT)	INNOVATIVE REQUIREMENTS			
	COPERNICUS APPLICATION DOMAIN	COPERNICUS CORE SERVICE									SPATIAL RESOLUTION	TEMPORAL RESOLUTION	ACCURACY	COVER

## THE SURVEY DETAILS

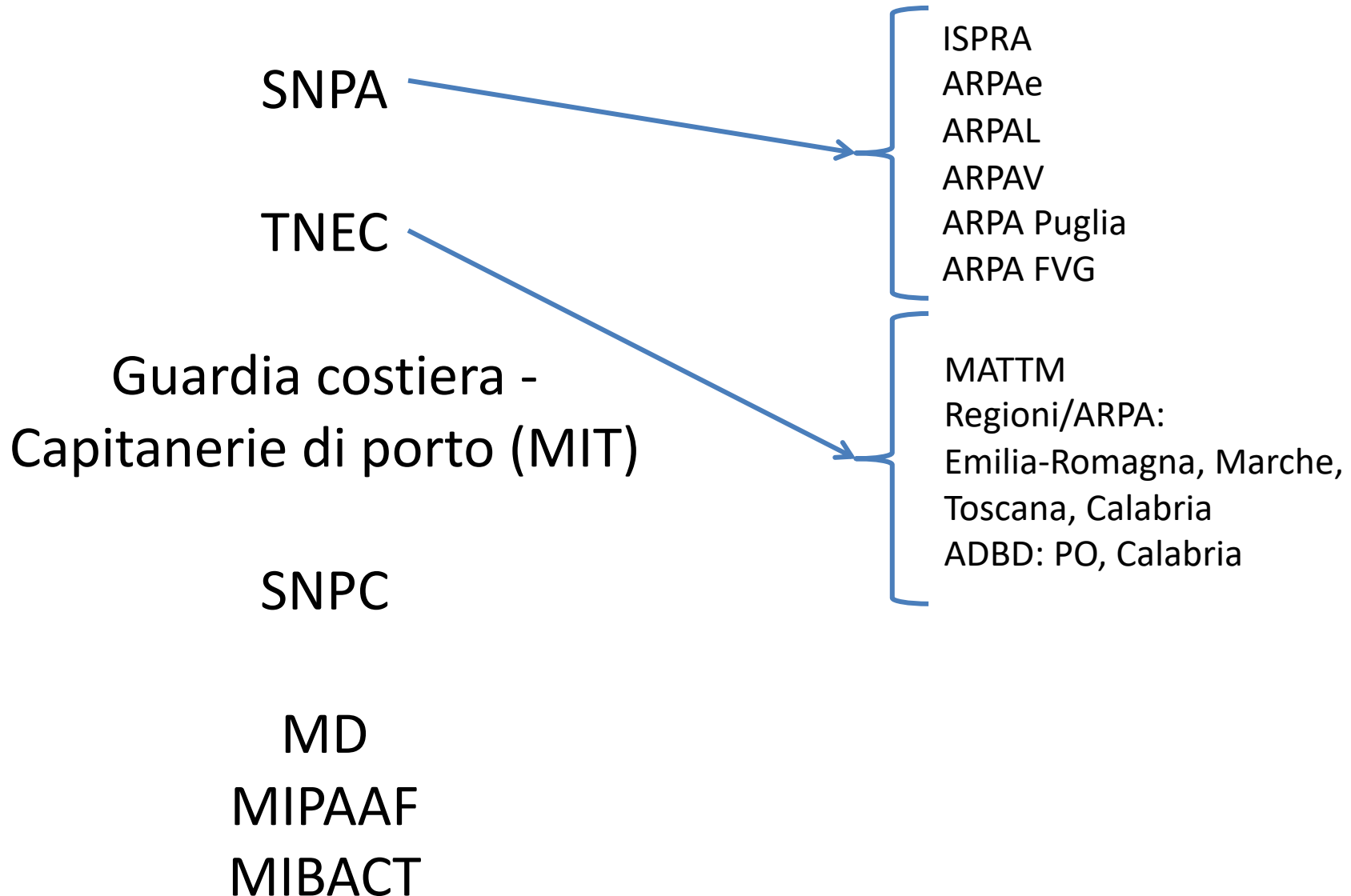
<b>Agenzia/Ente che ha fornito i requisiti</b>	<b>Struttura dell'Agenzia/Ente coinvolta</b>	<b>Contatto</b>
--	--	-----------------

<b>DIRETTIVE EUROPEE</b>	<b>COPERNICUS</b>		<b>Legge/regolamento nazionale/regionale</b>
	<a href="#"><u>DOMINIO APPLICATIVO COPERNICUS</u></a>	<a href="#"><u>SERVIZIO CORE COPERNICUS</u></a>	

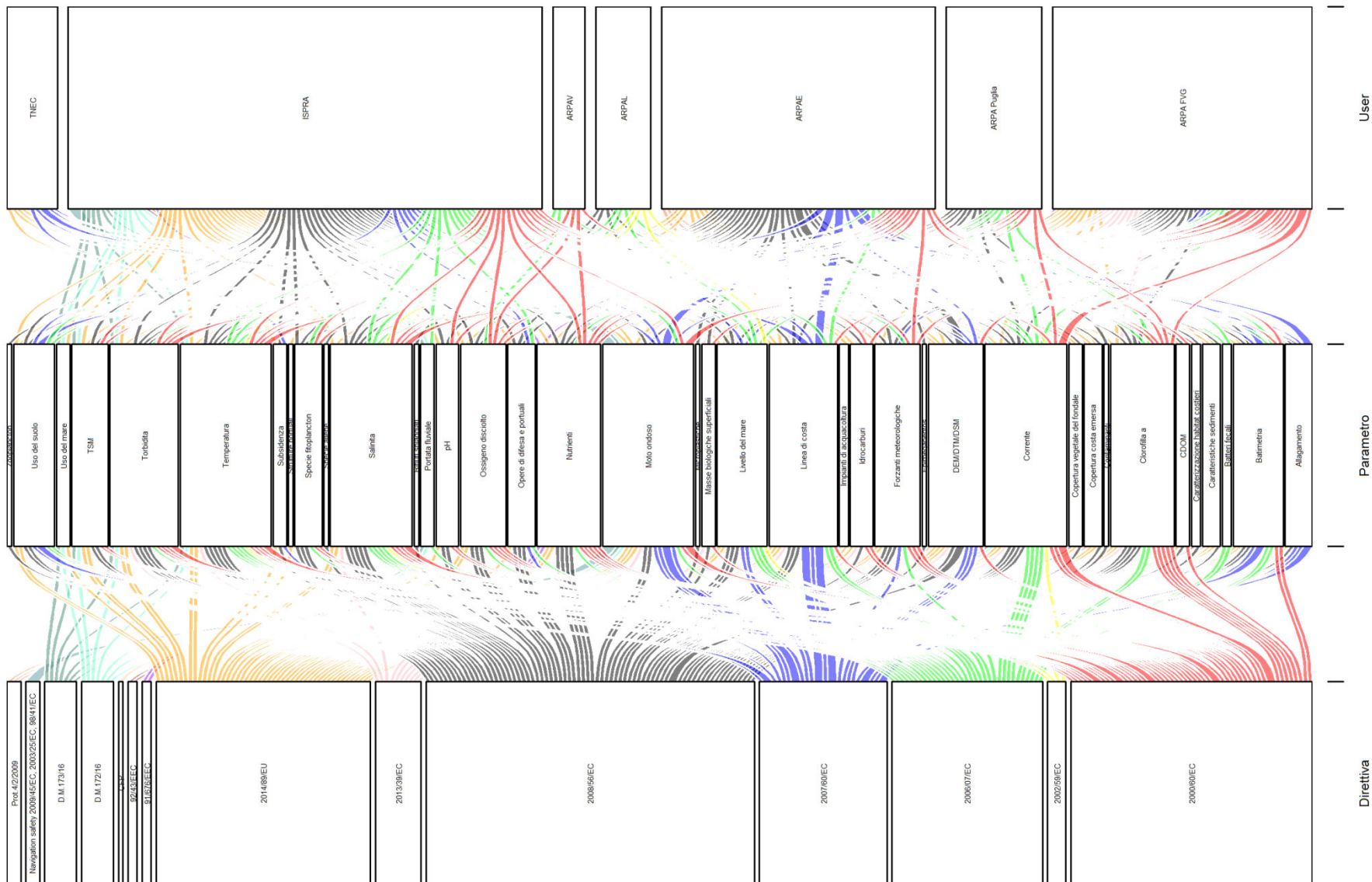
<b>Obiettivo</b>	<b>SERVIZIO OPERATIVO</b>	<b>Tempo REALE/ DIFFERITO</b>	<b>Stato dell'Arte</b>	<b>Dati e prodotti a valore aggiunto in INPUT</b>	<b>OUTPUT applicativo</b>	<b>Requisiti minimi (innovativi)</b>			
						<b>Risoluzione spaziale</b>	<b>Risoluzione Temporale</b>	<b>Accuratezza /Livello Processing dato immagine</b>	<b>Copertura servizio</b>

<b>Investimento ad oggi</b>	<b>Stima futuri investimenti</b>	<b>Note</b>
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## THE SURVEY: INSTITUTIONAL COASTAL USERS

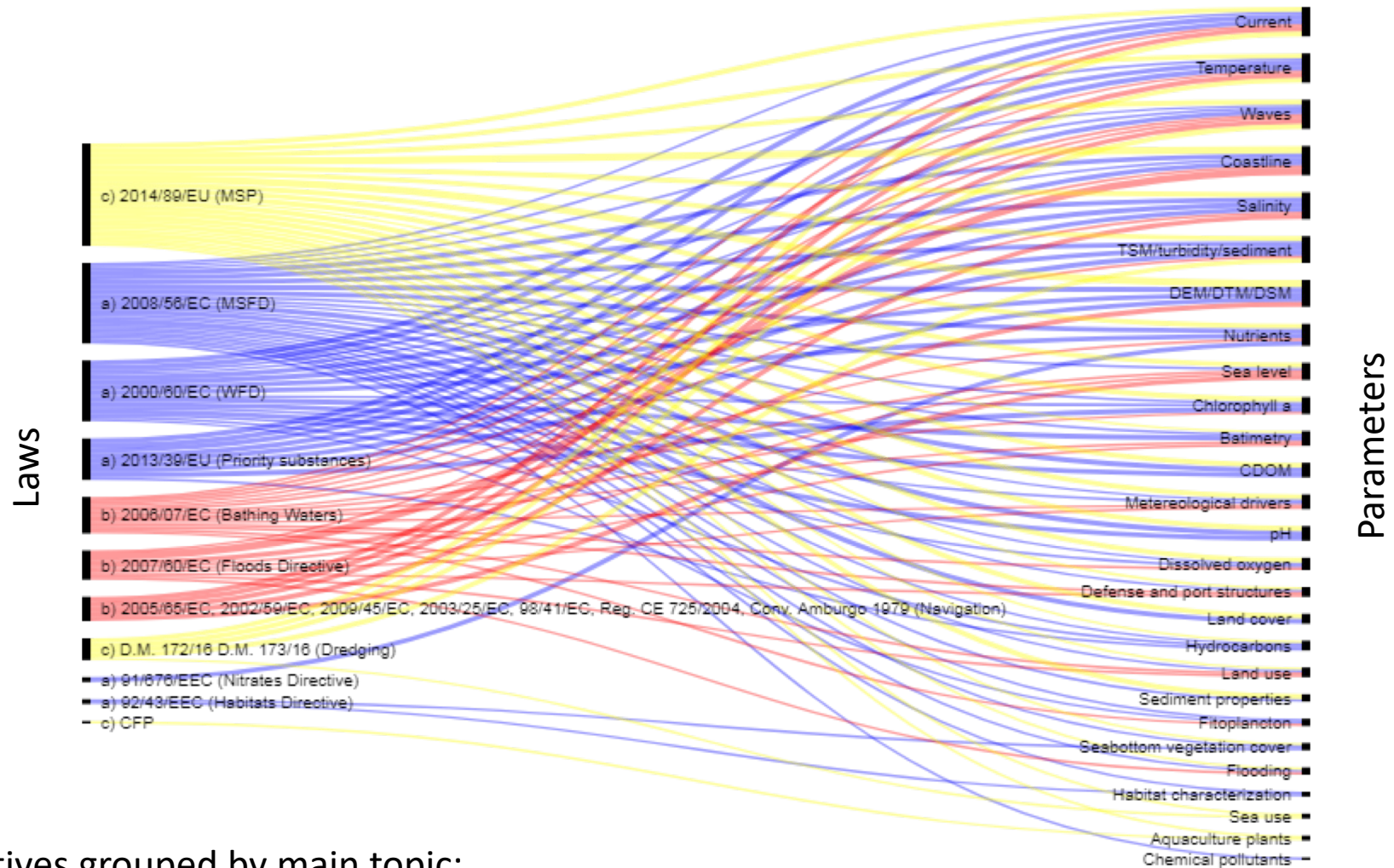


# Elaborazione dei requisiti per l'utenza costiera: Riferimenti normativi ed esigenze evidenziate



## The Italian user needs survey

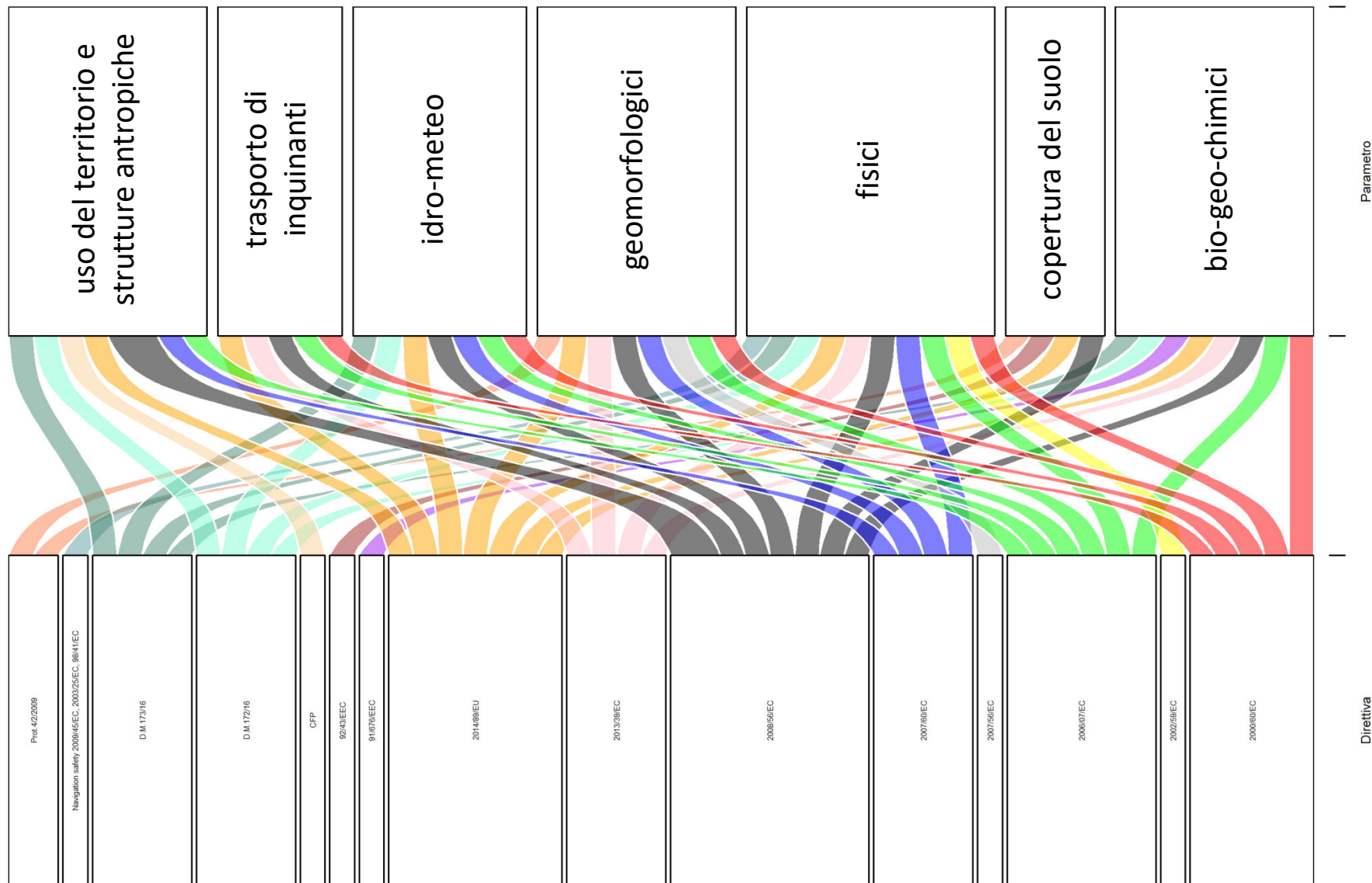
The analysis of the survey data shows relations between laws to be enforced, requested environmental parameters and potential services producing such parameters.



Directives grouped by main topic:  
blue= environmental protection; red=risk and human health; yellow= anthropic activities

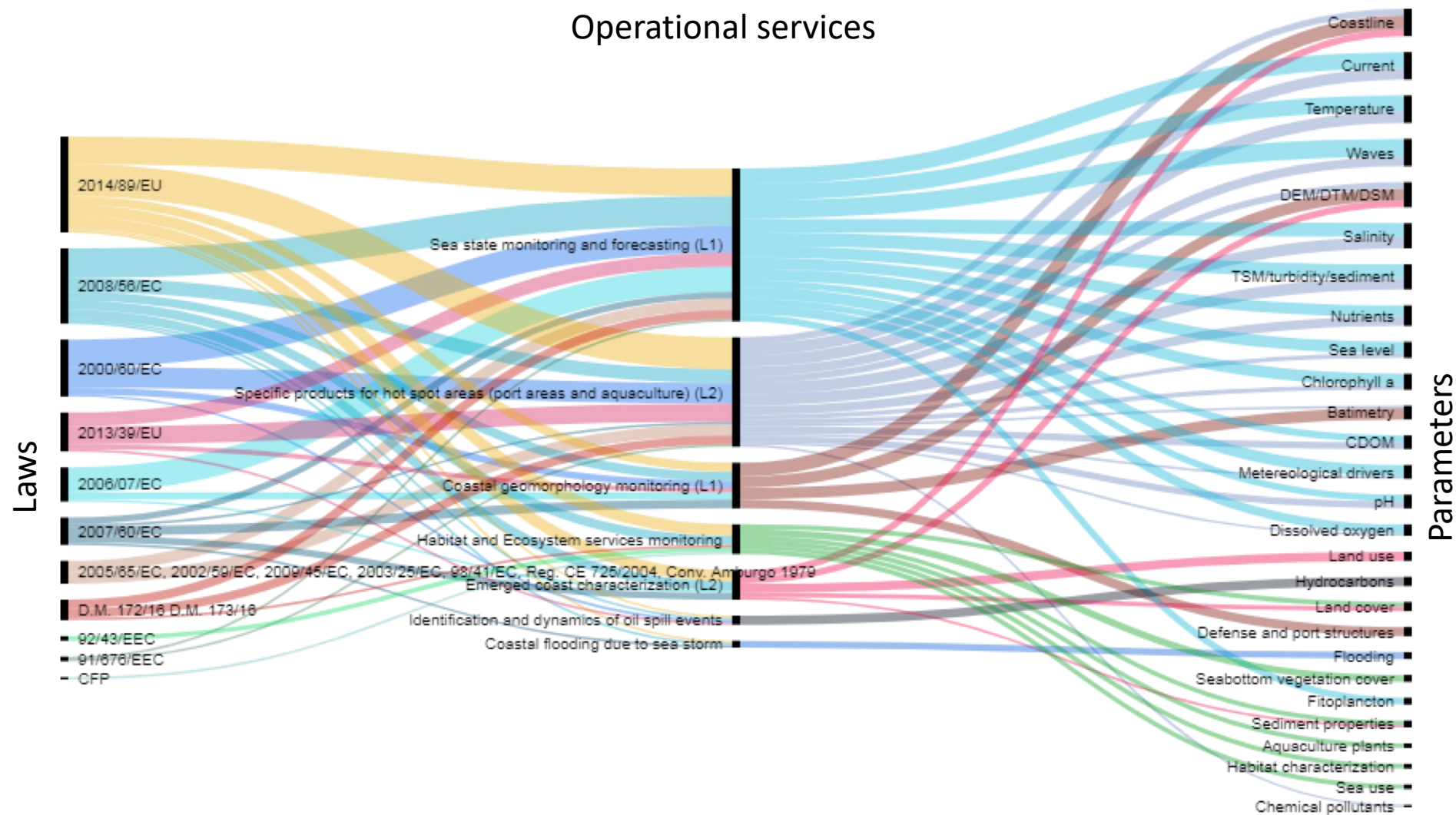


# Elaborazione dei requisiti per l'utenza costiera: Riferimenti normativi e tipologie di monitoraggi richiesti



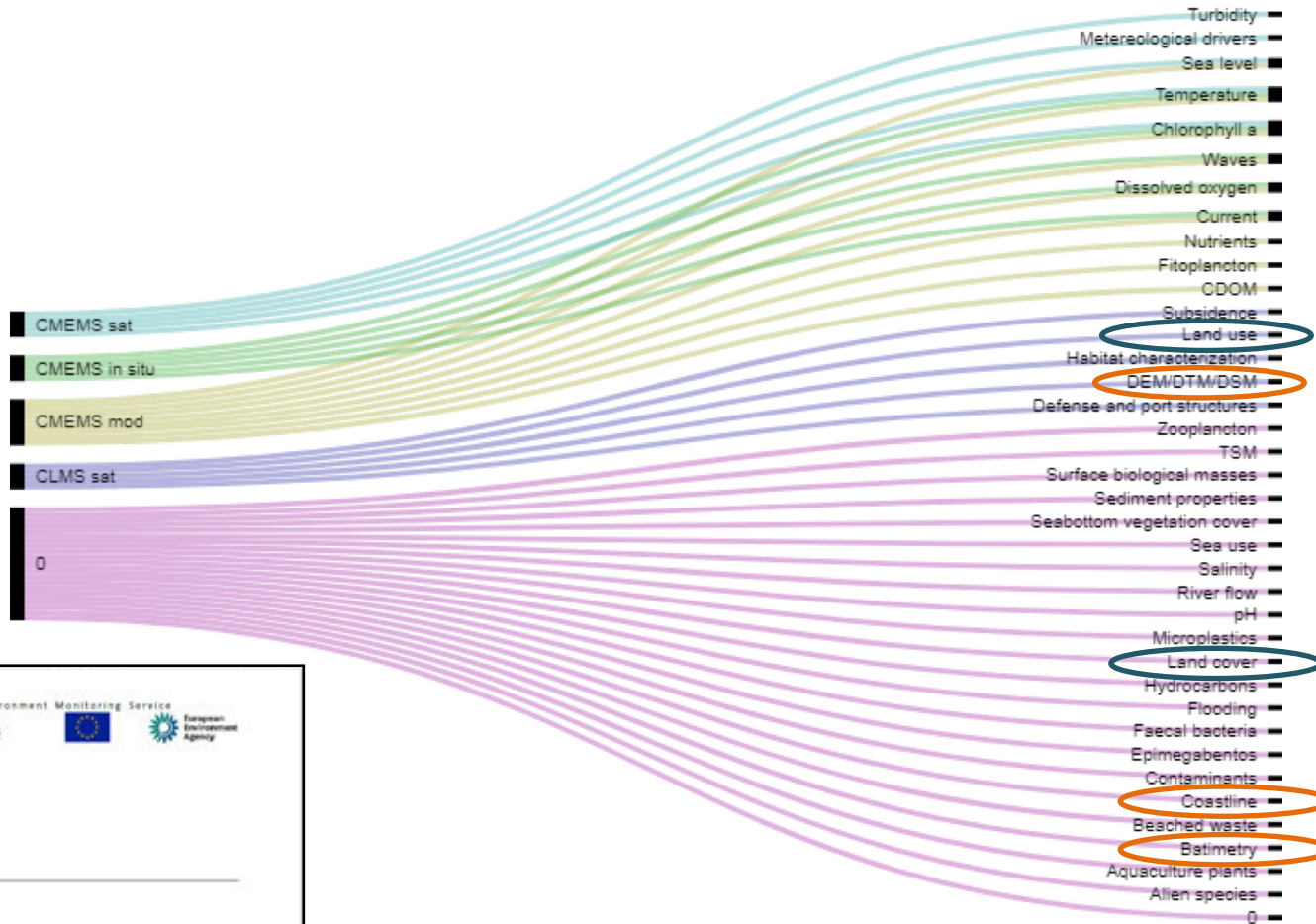
# The Italian user needs survey

## Operational services



# Copernicus products / user needs

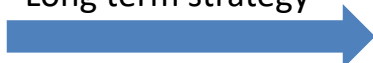
## Copernicus products



## Parameters



Long term strategy



[...] Copernicus Marine and Land services aim at making the best use of existing and future Copernicus EO observations. This will require a significant evolution of Copernicus Marine and Land core monitoring services and a strengthening of the links with downstream coastal monitoring activities organized both in the public (member states) and private sectors. [...]

## Elaborazione dei requisiti per l'utenza costiera: criteri per l'elaborazione dei servizi

- Partire dai requisiti di legge (rafforzare e completare i monitoraggi dei parametri richiesti dalle normative)
- Mettere a sistema le parti comuni a più servizi
- Valorizzare l'integrazione di prodotti in-situ da remoto e modellistici
- Inserire solo prodotti consolidati dal punto di vista dell'affidabilità dei risultati e pronti per l'operatività
- Dare importanza prioritaria alla validazione del dato

SERVIZI TEMATICI		BUYERS GROUP	EROGAZIONE SERVIZIO IN REAL TIME		EROGAZIONE SERVIZIO IN TEMPO DIFFERITO		NORMATIVA DI RIFERIMENTO	
			MODEL DRIVEN = M SPACE DATA DRIVEN= S		MODEL DRIVEN = M SPACE DATA DRIVEN= S		EU	Nazionale
cod	nome		Primo Livello	Secondo Livello	Primo Livello	Secondo Livello		

- Definizione (obiettivi operativi in relazione ai compiti istituzionali e normativa di riferimento)
- Stato dell'arte
- Requisiti minimi d'innovatività (requisiti non derogabili)



## Conclusions

- ✓ Needs of strong interaction with the National Institutional services and expert Knowledge
- ✓ Needs for the IN-situ national data
- ✓ Final definition of what is the thresholds value between Core services and Donwstreaming services
- ✓ **Trans border discussion initiative for European Coastal services: The MED7 Initiative (MS: Portugal, Spain, France, Italy, Malta, Greece, Cyprus)**





# Thank you!

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Thanks to Antonello Bruschi and ISPRA team.