Le missioni iperspettrali e il ruolo degli stakeholder: il Sistema Nazionale Protezione Ambientale (SNPA)

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ISPRA

Sistema Nazionale per la Protezione dell'Ambiente

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Piattaforme di sfruttamento tecnologico

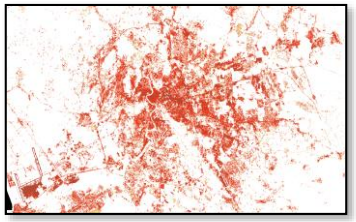
R&D

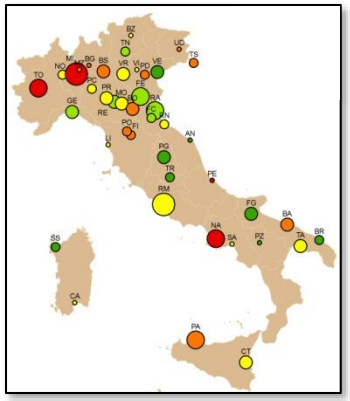
IT

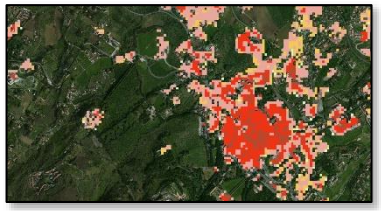
USERS NETWORK

Servizio alle istituzioni e supporto al mercato commerciale

Il ruolo degli utenti







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User requirements

- Essential variables (ConnectinGEO):
  - Essential climate variables (GCOS)
  - Essential biodiversity variables (GEO)
  - Essential Ocean variables (GOOS)

- Technical requirements: range limit values, sampling grid (spatial and temporal resolution), ancillary data, ect.

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GCOS
GLOBAL CLIMATE OBSERVING SYSTEM

HOME News Contact Publications Site map

- News
- About GCOS
- Climate Observation Needs
  - UNFCCC and GCOS
  - UNFCCC Guidelines
  - GCOS Reports to UNFCCC
  - Essential Climate Variables
- Observing Systems and Data
- Activities
- Outreach
- Contact

GCOS Essential Climate Variables

The 50 GCOS Essential Climate Variables (ECVs) (2010) are required to support the work of the UNFCCC and the IPCC. All ECVs are technically and economically feasible for systematic observation. It is these variables for which international exchange is required for both current and historical observations. Additional variables required for research purposes are not included in this table. It is emphasized that the ordering within the table is simply for convenience and is not an indicator of relative priority.

Domain	GCOS Essential Climate Variables
Atmospheric (over land, sea and ice)	**Surface:**[1] Air temperature, Wind speed and direction, Water vapour, Pressure, Precipitation, Surface radiation budget. **Upper-air:**[2] Temperature, Wind speed and direction, Water vapour, Cloud properties, Earth radiation budget (including solar irradiance). **Composition:** Carbon dioxide, Methane, and other long-lived greenhouse gases[3], Ozone and Aerosol, supported by their precursors[4]
Oceanic	**Surface:**[5] Sea-surface temperature, Sea-surface salinity, Sea level, Sea state, Sea ice, Surface current, Ocean colour, Carbon dioxide partial pressure, Ocean acidity, Phytoplankton. **Sub-surface:** Temperature, Salinity, Current, Nutrients, Carbon dioxide partial pressure, Ocean acidity, Oxygen, Tracers.
Terrestrial	River discharge, Water use, Groundwater, caps, Ice sheets, Permafrost, Albedo, La Fraction of absorbed photosynthetically acti (LAI), Above-ground biomass, Soil carbon, Fl

[1] Including measurements at standardized, but globally varying heig

[2] Up to the stratopause.

[3] Including nitrous oxide (N_2O), chlorofluorocarbons (CFCs), hydroc

[4] In particular nitrogen dioxide (NO_2), sulphur dioxide (SO_2), formalc

The Global Ocean Observing System

- Home
- Why A GOOS
- How We Work
- GOOS Framework
  - Requirements
  - Essential Ocean Variables
  - Improving Readiness
  - Evaluation
  - Observations
- Who We Are
- Observations And Data
- Webinars
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Essential Ocean Variables

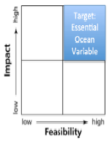
The ocean environment is vast, remote, and harsh, and the cost involved in its observation are high. There is a need to avoid duplication of efforts, across observing platforms and networks, and to adopt common standards for data collection and dissemination to maximize the utility of data. To address these concerns, the Framework is designed to approach ocean observations with a focus on Essential Ocean Variables, ensuring assessments that cut across platforms and recommend the best, most cost effective plan to provide an optimal global view for each EOV.

Essential Ocean Variables are identified by the GOOS Expert Panels, based on the following criteria:

Relevance: The variable is effective in addressing the overall GOOS Themes – Climate, Real-Time Services, and Ocean Health.

Feasibility: Observing or deriving the variable on a global scale is technically feasible using proven, scientifically understood methods.

Cost effectiveness: Generating and archiving data on the variable is affordable, mainly relying on coordinated observing systems using proven technology, taking advantage where possible of historical datasets.



When EOVs are identified, a series of recommendations are created and disseminated by the Expert Panels, including what measurements are to be made, various observing options, and data management practices. Below a list of the GOOS EOVs, linking to each EOV's specification sheet.

Readiness level: CONCEPT | PILOT | MATURE [Click on each EOV for their respective spec sheets]

PHYSICS	BIOGEOCHEMISTRY	BIOLOGY AND ECOSYSTEMS
Sea state	Dissolved Oxygen	Phytoplankton biomass and diversity
Ocean surface stress	Inorganic macro nutrients	Zooplankton biomass and diversity
Sea ice	Carbonate System	Fish abundance and distribution
Sea surface height	Transient tracers	Marine turtles, birds, mammals abundance and distribution
Sea surface temperature	Suspended particulates	Live coral
Subsurface temperature	Nitrous oxide	Seagrass cover
Surface currents	Stable Carbon Isotopes	Macroalgal canopy
Subsurface currents	Dissolved organic carbon	Mangrove cover
Sea surface salinity	Ocean Colour *(Spec Sheet under development)*	
Subsurface salinity		
Ocean surface heat flux		

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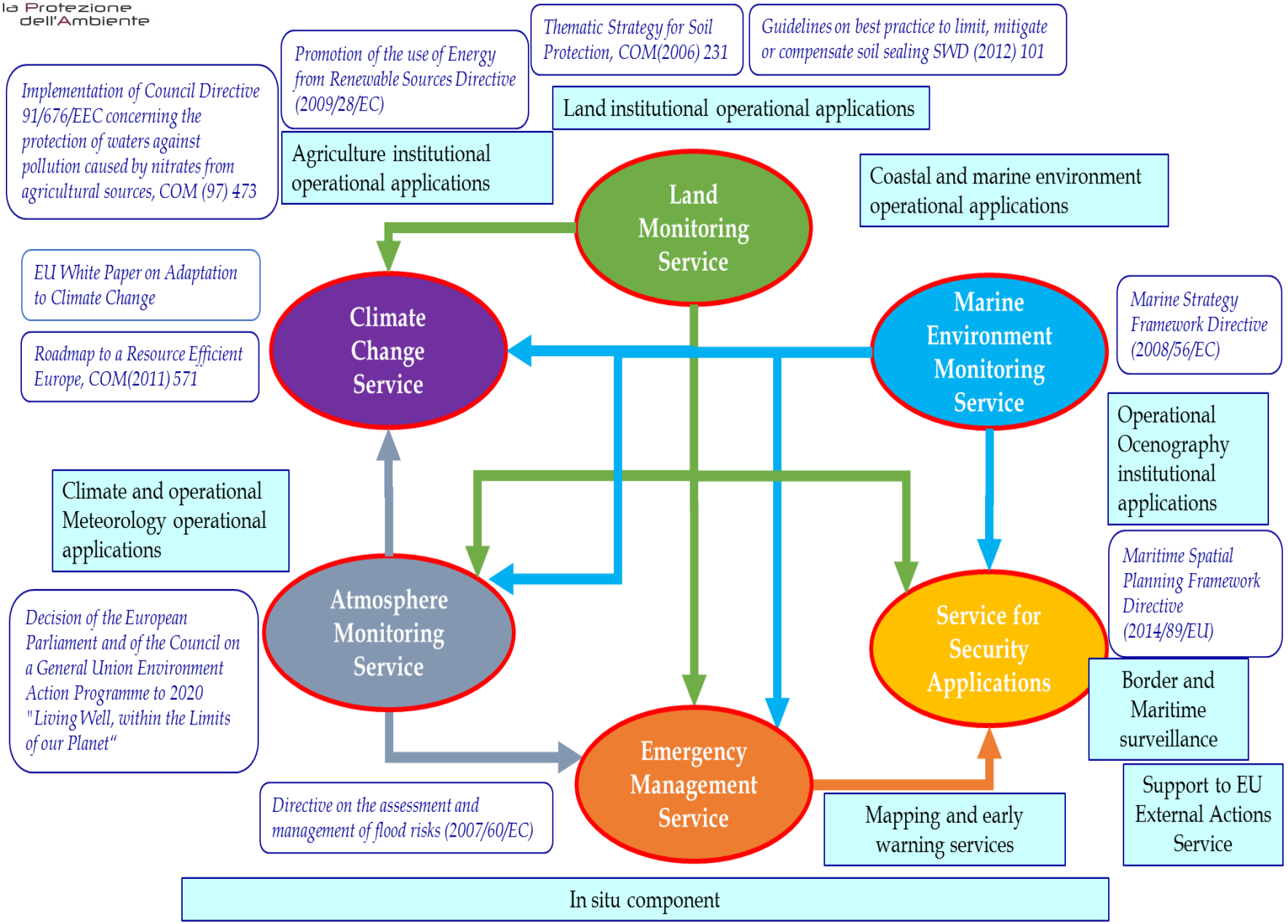
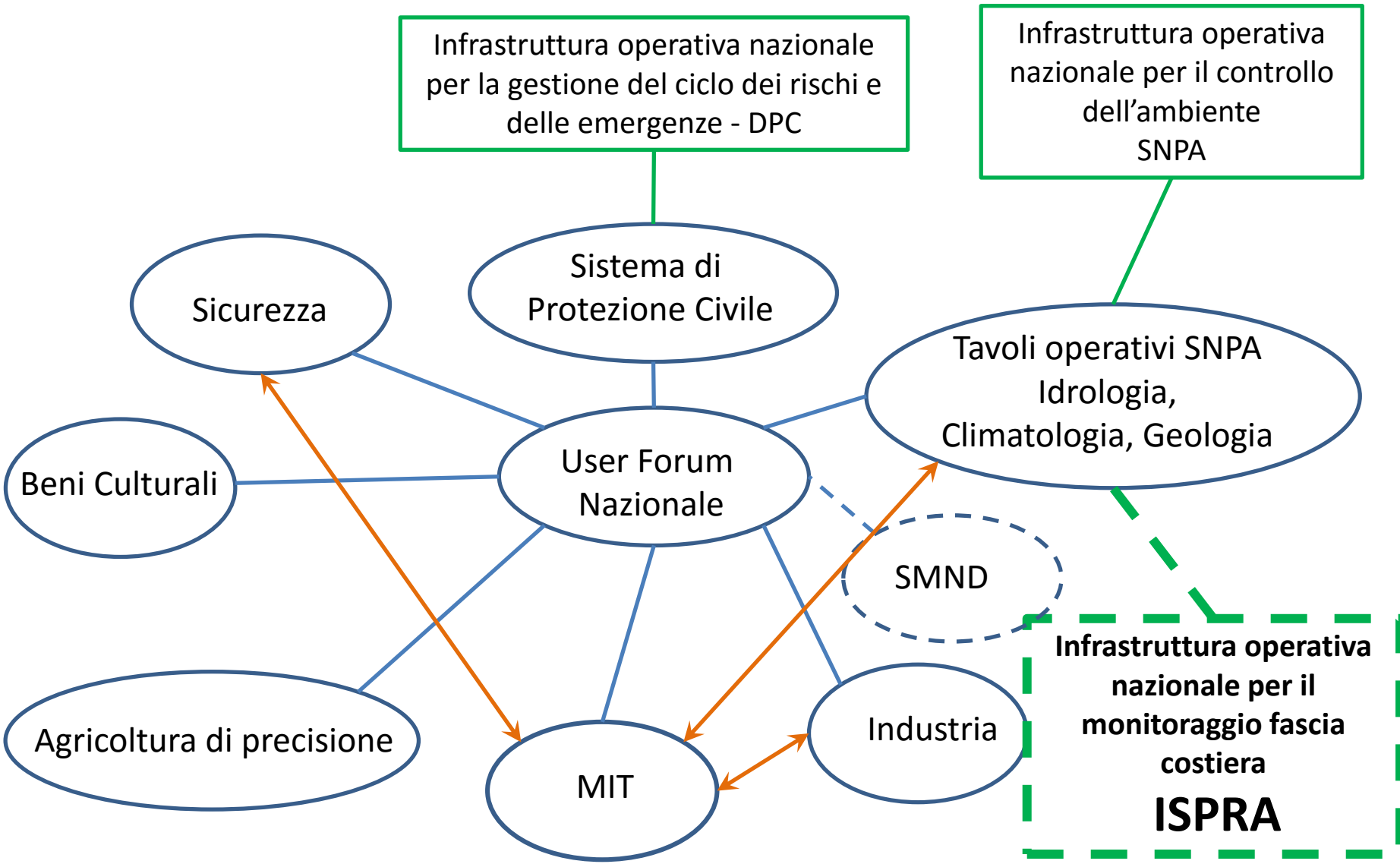


UFN


Infrastruttura operativa nazionale per la gestione del ciclo dei rischi e delle emergenze - DPC
Infrastruttura operativa nazionale per il controllo dell'ambiente SNPA
Sistema di Protezione Civile
Sicurezza
Tavoli operativi SNPA Idrologia, Climatologia, Geologia
Beni Culturali
User Forum Nazionale
SMND
Agricoltura di precisione
Industria
MIT
Infrastruttura operativa nazionale per il monitoraggio fascia costiera
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Concept model

Application Domains
- Agricolture/Food security
- Inland/coastal water and environment
- Natural and man-made
- Ect.

European Directives
- Nitrogen European Directive (91/676/EEC)
- Water Framework Directive (2000/60/EC)
- Floods Directive (2007/60/EC)
- Ect.

National and local regulations and laws
- D.Lgs 152/2006 e ss.mm.ii.
- D.M. 260/2010
- D.L. 172/2015
- Ect.

Variables
- Land cover (including vegetation type)
- Fraction of absorbed photosynthetically active radiation (FAPAR)
- Leaf area index (LAI)
- Sea Superfice Temperature

Parameters
- Temperature
- Salinity
- Nutrients
- DO
- Ect.

Characteristic
- **qualitative**
- **quantitative**

Sampling grid
- **Spatial resolution**
- **Temporal resolution**

Requirements priority methodology

- Requirements/Variables vs. Application domain (agricolture, geology, etc.)
- Number of users to which requirements contribute to rules and laws

REQUIREMENTS	DIMENSIONS	D1	D2	D3
Agricolture				
R1				
R2				
R3				
Inland/coastal water and environmental				
R1				
R2				
R3				

LEGEND

R1, R2, R3 = Collected requirements

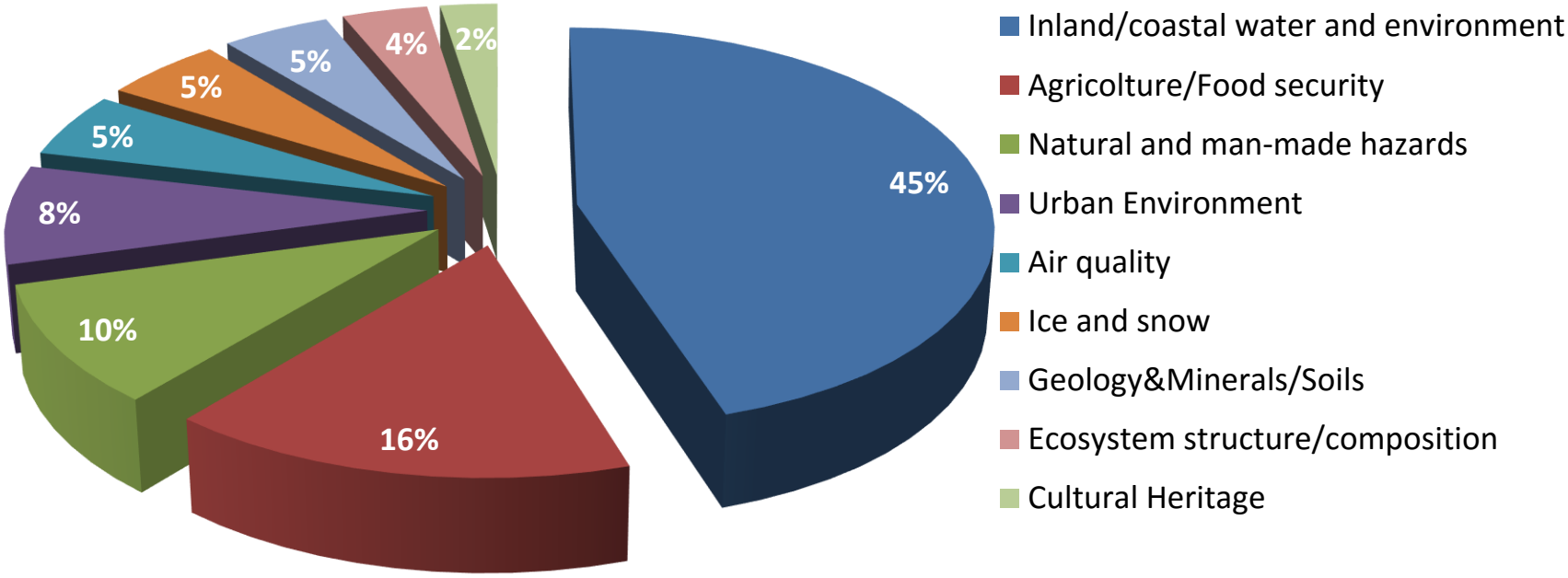
D1, D2, D3 = Dimensions to which requirements contribute to :

Priority value

1-5	
6-10	
11-15	
16-20	
21-25	

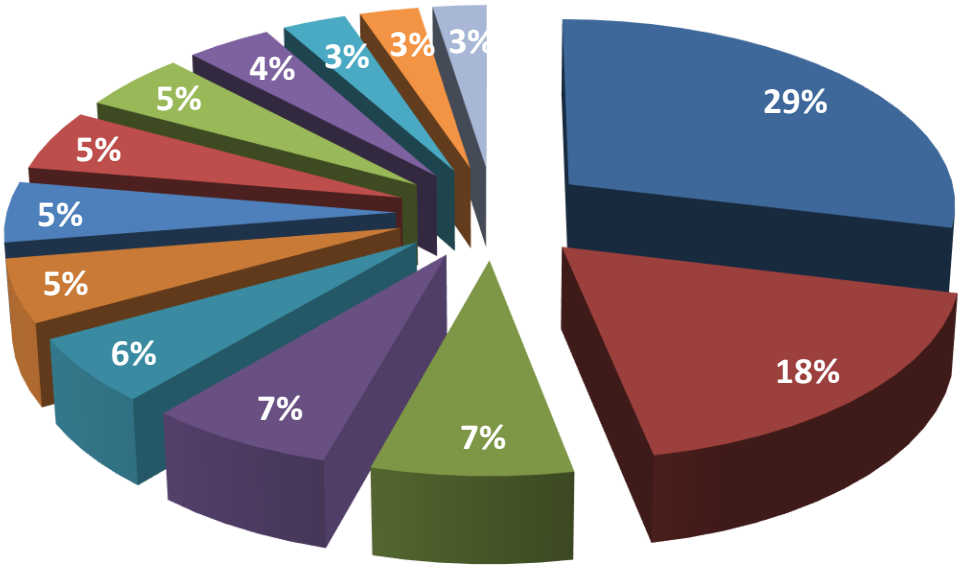
First step

Application Domains



First step

European Directives



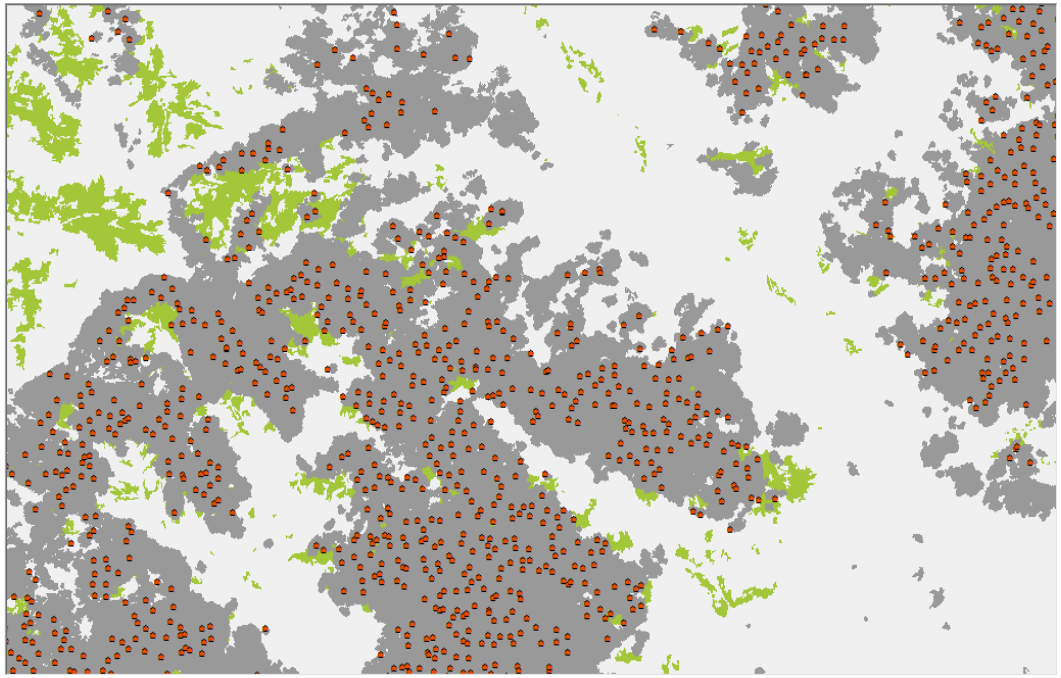
- Water Framework Directive (2000/60/EC) and Floods Directive (2007/60/EC)
- Marine Strategy Framework Directive (2008/56/EC) Water Framework Directive (2000/60/EC); Bathing Water Directive (2006/7/EC)
- Nitrogen European Directive (91/676/EEC) Directive urban waste water treatment (91/271/EEC)
- Raw Materials Initiative (COM 2008/699)
- Waste Directive (2008/98/EC)
- Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC)
- Ambient Air Quality Directive 2008/50/EC

Miglioramento dei dati ad alta risoluzione spettrale e spaziale a livello nazionale

1) Verifica del dato

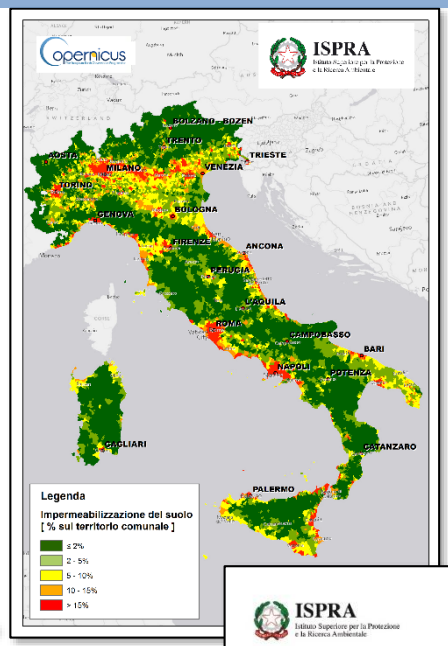
- Qualitativa
  - General overview
  - Look and feel
- Quantitativa → Analisi statistica del dato

2) Effettuare il miglioramento del dato → Dati in-situ



Sistema SNPA per la produzione del rapporto Nazionale attraverso l'utilizzo del dato PRISMA

Rete nazionale di monitoraggio del consumo di suolo



ASI-Ispra qualità dell'aria

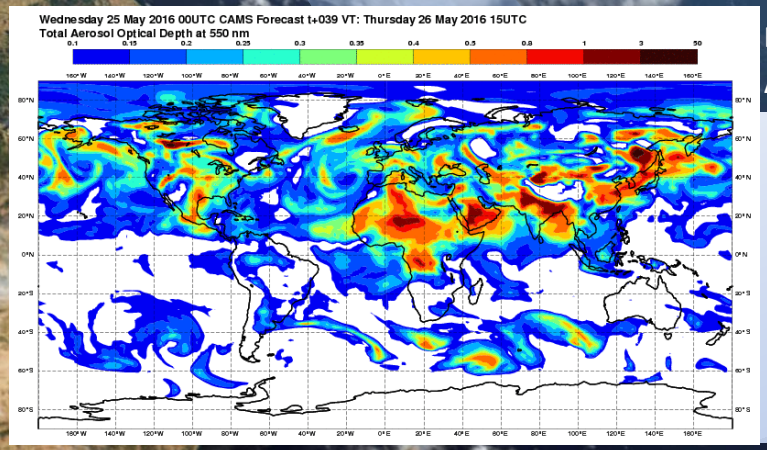
Nuove piattaforme e sensori:

ESA-sentinel & ASI-Prisma

- Sentinel-3A, Lanciato16 febbraio 2016, attraverso il sensore OLCI fornisce dati aerosol (AOD) e vapor d'acqua
- Sentinel-4 e -5, lancio previsto 2018 e 2019, forniranno dati di Gas atmosferici, AOD e polveri:
- **PRISMA, fornirà dati per la caratterizzazione degli Aerosol**

Maggior accessibilità dei dati: il sentinel italian collaborative ground segment ASI

- Servizi di consultazione e accesso ai dati
- Punto di accesso e distribuzione dati OT a valenza nazionale ..
- Inclusione di tecnologie di elaborazione dei dati direttamente a livello di archivio



Nuovi servizi a scala globale e continentale:

Air Quality & Atmospheric Composition CAMS-services

- Analisi e previsione a scala globale (IFS) e continentale (ensemble) gas reattivi e aerosol,
- Assimilazione di dati osservati da terra e dallo spazio
- verifica

Grazie per l’attenzione

Copernicus

SERVIZIO	Finanziamento CE della fase pre-operativa (ante 2015) in M€	Finanziamento italiano del programma (14%) in M€	Valore delle attività realizzate in Italia nelle fasepreoperativa		Ritorno sull'investimento nazionale (%)
			(M€)	(%)	
LAND	*25,3*	3,542	*0,6*	2,4%	17%
MARINE	*81,1*	11,354	*7,9*	9,7%	70%
ATMOSPHERE	*36,1*	5,054	*0,2*	0,6%	4%
EMERGENCY	*37,7*	5,278	*6,3*	16,7%	119%
SECURITY	*35,4*	4,95	*8,4*	23,7%	169%
CLIMATE CHANGE	24,281	3,39	*0,5*	2,1%	15%
TOTALE	**239,88**	**33,58**	**23,9**	**10%**	**71%**

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Environmental & European directives

Satellite output ⟷ data in situ

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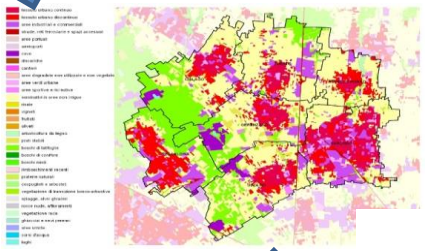
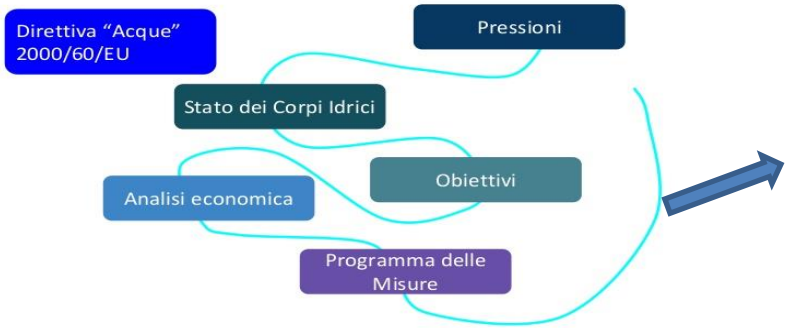


CENSIMENTO

6° Censimento Generale dell'Agricoltura

Istat
Istituto Nazionale di Statistica
2011

Water Framework Directive (2000/60/EC)



State of the Environment