GEO WEEK & MINISTERIAL SUMMIT 2023

Flash Talk

#TheEarthTalks
Showcasing the ocean observing value chain to respond to stakeholder information needs

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OUTLINE

1. Introduction
2. Ocean observation: why & how?
3. Ocean observing value chain
4. Examples of thematic use cases
Why do we need to observe the ocean?

The ocean covers 71% of our planet and is our planet’s life support system.

Living inland or in a coastal area WE ALL rely on the ocean and its resources.

Climate change and human activities are taking an ever-growing toll on the marine world and so is the urgency to better protect marine ecosystems, safeguard coastal communities and use the ocean resources in a sustainable and responsable way.

Earth observation is more than ever needed to understand the changing state of marine environments, make accurate projections and provide the evidence needed to find solutions and make effective decisions.
How do we observe the ocean?

Earth observation has revolutionized our understanding of the ocean and changes it is undergoing.

Thanks to space-based data, together with ground-based data, scientists can accurately and effectively gather data related to a multitude of ocean parameters such as:

- temperature
- salinity
- oxygen
- currents
- sea ice thickness
- wave height
- productivity
- and so much more,

Providing crucial information on climate and anthropogenic impacts such as ocean warming, acidification, sea level rise, plastic pollution, biodiversity loss, etc.
A wide range of platforms allow man-operated and autonomous observations at sea (*in situ*)

Since the 70s satellites have been providing a global coverage of sea surface parameters (remote sensing)

Right: **EU Copernicus Sentinel-3** (3A launched in 2016 and 3B in 2018), measures sea temperature, ocean colour, topography, among others.

Left: **NASA-CNES SWOT** satellite (Surface Water and Ocean Topography) launched on 16 December 2022.
Given the ever-growing need for information to drive evidence-based decision making, ocean observation needs to be transformed into actionable products answering users' requirements.

Ocean observation is fundamental for and make the basis of a complex value chain that combines numerical modelling and data management to provide a comprehensive picture of the ocean’s state and assess impacts of human activities.
Ocean observation essential for actionable ocean information

- Provides ground truth data for research on the baseline state and changes in the ocean
- Transformed into indicators and other data products to assess and monitor the state of the ocean and marine and coastal ecosystems
- Used to develop and improve operational monitoring and forecasting systems
- Assimilated into numerical models to provide forecasts, real-time analyses and re-analyses time series over several decades
- Fed into tools and other downstream services for focused applications and information products
Ocean observation responds to the information needs of multiple stakeholders
Thematic use cases showing the societal and environmental value of Ocean observation

- Sargassum
- Fisheries
- Marine litter
Ocean observation value chain to detect, monitor and forecast *Sargassum* inundation and spread

- **Stakeholders & end-users**: policymakers, public authorities, blue economy industries (transport, fisheries, tourism, etc.) coastal communities
- **Decision points**: early warning systems, seasonal forecasts & monitoring reports
- **Benefits**: effective mitigation & adaptation plans, timely clean-up operations/harvesting, coastal resilience & preparedness, reduced environmental & socioeconomic impacts
Ocean observation value chain to support sustainable fisheries

- **Stakeholders & end-users**: policymakers, public & local authorities, fishers farmers, coastal communities
- **Decision points**: monitor and forecast fish stocks, establish marine protected areas, enforce regulations, monitor illegal, unreported and unregulated (IUU) fishing, weather forecasts, optimal vessel routing
- **Benefits**: safety-at-sea, sustainable fishing practices, safeguard marine ecosystems, food & job security
Ocean observation value chain to detect and monitor marine litter

- **Stakeholders & end-users:** UN-level policy making, governments, public & local authorities, civil society
- **Decision points:** monitoring reports (distribution & quantity), trajectory modelling & forecasting, indicator, targets
- **Benefits:** evidence for international negotiations for the global treaty on marine litter, effective mitigation & adaptation plans, prevent and reduce plastic pollution, monitor efficiency of policy directives, etc.
Partners and Affiliations

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Thank you!