

EB1
EB2

EuroGOOS
European Global Ocean
Observing System

European ocean observation requirements and gaps

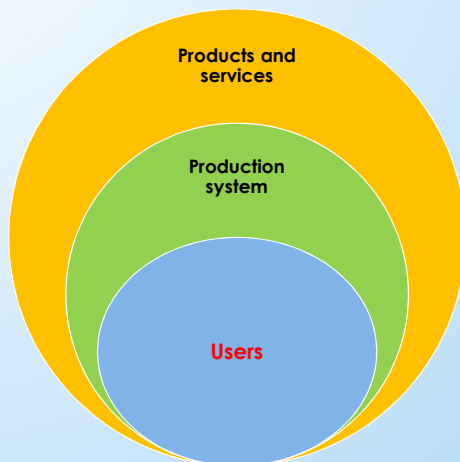
Insight from from AtlantOS, Copernicus and other projects

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Requirements



- **Users:**
 - articulate requests for a particular service or product
- **Service providers:**
 - deliver the services and products.

Slide 1

EB1 Erik Buch, 2/26/2014

EB2 Erik Buch, 2/26/2014

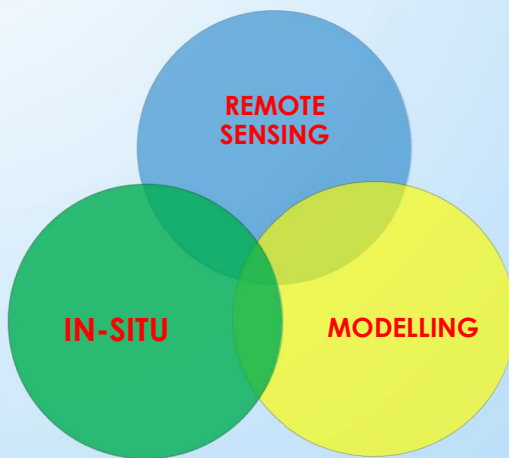


USER REQUIREMENTS

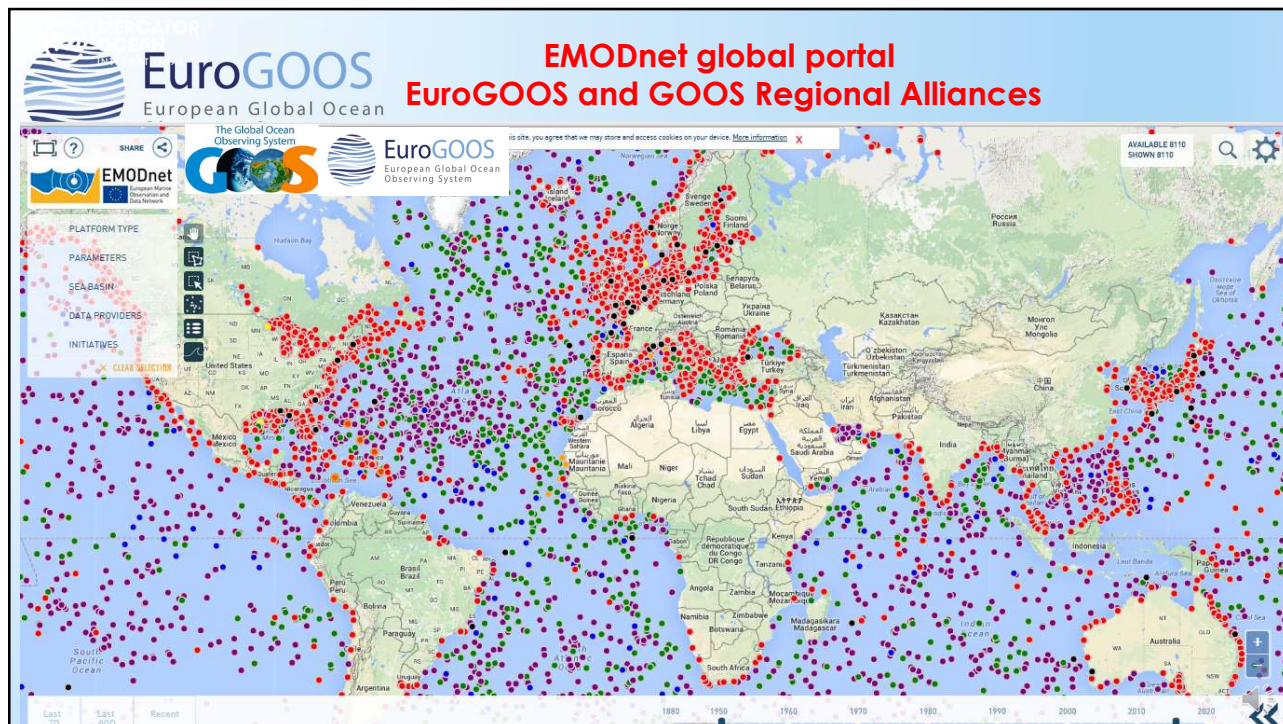
- **Disaster Resilience:** Storm surge, hurricane, tsunami warnings are provided with enough advanced notice and precision to support successful emergency response.
- **Blue Economy:** Supporting sustainable prosperity from the ocean through advanced seafloor mapping and habitat characterization, pollution tracking, identification of renewable energy options and understanding the value of ecosystem services.
- **Food Security:** Helping to realize the goals of achieving global food security, maximizing the sustainable food benefit that we can extract from the ocean by supporting fisheries and aquaculture operations and management.
- **Biodiversity and Ecosystem Sustainability:** Understanding changes in biodiversity and ecosystems to determine impacts on natural capital and ecosystem services and ensure our ocean resources can support human nutritional, recreational, and health needs. This includes improved forecasting of events such as harmful algal blooms, marine life mortality, or coral bleaching that impact recreational and commercial use of the ocean.
- **Marine Transportation:** Forecasts of extreme wave events, hurricanes and tropical storm tracks, forecasts of ocean currents, sea-ice monitoring and iceberg tracking, oil spill and pollutant dispersals, and the locations of whales and other protected species, with advisories to modify ship routes or decrease speeds to avoid collisions.
- **Climate Change:** Cutting edge research that includes climate change indicators, including measurements of ocean heat and circulation providing regional sea level monitoring, ocean circulation changes and climate feedbacks, and changes that affect ocean life, such as regional pH and oxygen levels.



PRODUCTION SYSTEM




- **Experts define the best solution**
 - phenomenon's
 - Model resolution
 - Data – remote sensing and in-situ incl definition on **requirements to data** (resolution in space and time, quality, timeliness etc)

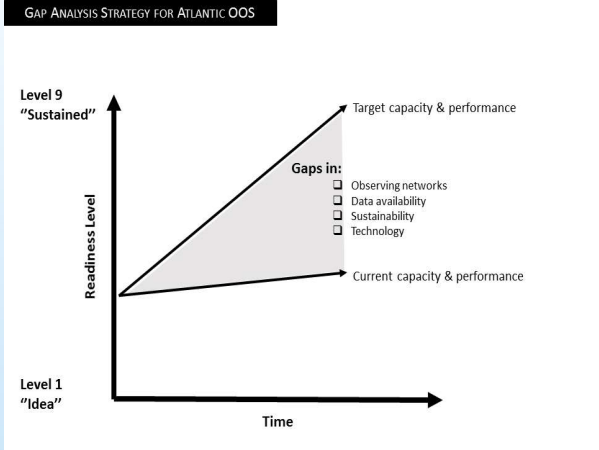


Example of data requirements in CIS²

Requirements for ocean data						
Name	Group	Uncertainty	Update Frequency	Timeliness	Horizontal resolution	Vertical resolution
Sea Surface Salinity	Ocean	Threshold: 0,1psu Breakthrough: 0,07psu Goal: 0,05psu	Threshold: 72d Breakthrough: 24d Goal: 6d	Threshold: 3d Breakthrough: 2d Goal: 1d	Threshold: 25km Breakthrough: 10km Goal: 5km	
Sea surface Temperature	Ocean	Threshold: 0,5K Breakthrough: 0,2K Goal: 0,1K	Threshold: 3d Breakthrough: 24h Goal: 6h	Threshold: 3h Breakthrough: 2h Goal: 1h	Threshold: 25km Breakthrough: 10km Goal: 5km	
Subsurface currents	Ocean	Threshold: 50cm/s Breakthrough: 20cm/s Goal: 10cm/s	Threshold: 3d Breakthrough: 1d Goal: 6h	Threshold: 3h Breakthrough: 2h Goal: 1h	Threshold: 100km Breakthrough: 50 km Goal: 10km	Threshold: 50m Breakthrough: 10m Goal: 1m
Subsurface salinity	Ocean	Threshold: 0,1psu Breakthrough: 0,07psu Goal: 0,05psu	Threshold: 12h Breakthrough: 3h Goal: 1h	Threshold: 1d Breakthrough: 6h Goal: 3h	Threshold: 30km Breakthrough: 5km Goal: 1km	Threshold: 100m Breakthrough: 10m Goal: 1m
subsurface temperature	Ocean	Threshold: 1k Breakthrough: 0,5k Goal: 0,1k	Threshold: 24d Breakthrough: 3d Goal: 1d	Threshold: 3d Breakthrough: 1d Goal: 12h	Threshold: 50km Breakthrough: 10km Goal: 2km	Threshold: 50m Breakthrough: 10m Goal: 1m
surface currents	Ocean	Threshold: 20cm/s Breakthrough: 10cm/s Goal: 5cm/s	Threshold: 3d Breakthrough: 1d Goal: 12h	Threshold: 3d Breakthrough: 1d Goal: 6h	Threshold: 20km Breakthrough: 5km Goal: 1km	

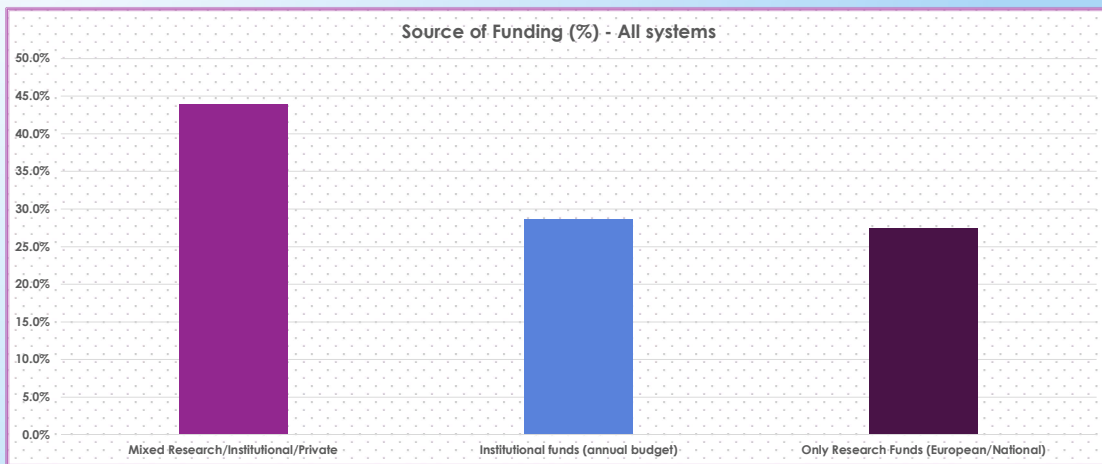


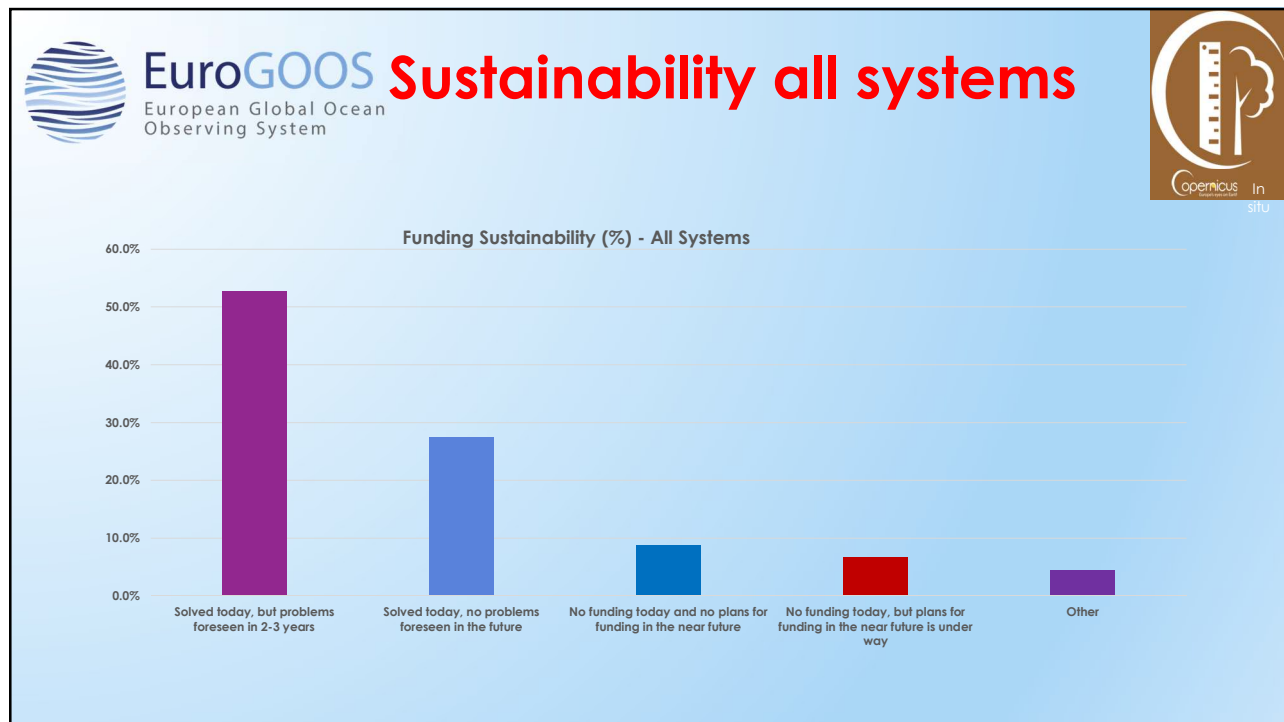
GAP ANALYSIS



- Missing Observations
- Missing Data
- Sustainability gaps
- Technology gaps

Source of funding





EuroGOOS Funding Sources
European Global Ocean Observing System

Funding source	Ocean	Meteo.	Atm. composition
Institutional funds (annual budget)	28.6%	73.0%	45.0%
National research fund	15.4%	4.1%	
EU Research Funding	4.4%	0.8%	
Institutional funds (annual budget), National research fund	8.8%	5.7%	25.0%
Institutional funds (annual budget); EU Research Funding	3.3%	5.7%	
Institutional funds (annual budget); National research fund; EU Research Funding;	7.7%	0.8%	15.0%
Institutional funds (annual budget) + various combinations of external funding	9.9%	4.9%	15.0%
National research fund; EU Research Funding	7.7%	0.8%	
Various combinations of external funding	14.2%	4.2%	



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Sustainability



Funding sustainability	Ocean	Meteo.	Atm. Composition
Solved today, no problems foreseen in the future	28%	68%	30.0%
Solved today, but problems foreseen in 2-3 years	52%	27%	40.0%
No funding today, but plans for funding in the near future is under	7%	3%	
No funding today and no plans for funding in the near future way	9%	2%	30.0%
Other	4%		



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Conclusions

- **Be specific when talking about requirements:**
 - Users requirement's for products and services
 - Service providers requirements for observations
- **In situ observation requirements must be more specific than done today if a proper gap analysis shall be performed**
- **Gaps**
 - Missing Observations
 - Missing Data
 - Sustainability gaps
 - Technology gaps
- **The clear difference in the funding sustainability in the meteorological and ocean communities reflects the fact that the ocean community today do not have the same national and international commitments to monitor the environment on a regular and operational basis, a majority of their observations are linked to research activities.**
- **The ocean communities therefore need to take a different strategic approach towards a sustained in situ observation network than the meteorological community.**
- **Important components of future strategies towards sustained in situ observations will be regular mapping of user requirements, cost benefit analysis, national and international commitments as well as free and open exchange of data. EOOS can play a vital role in this strategic work in Europe**