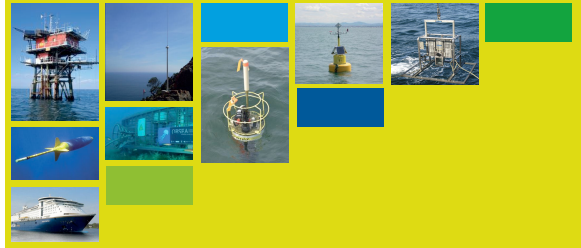


JERICO-NEXT Malta Summer School 2018
Operational Oceanography for Blue Growth

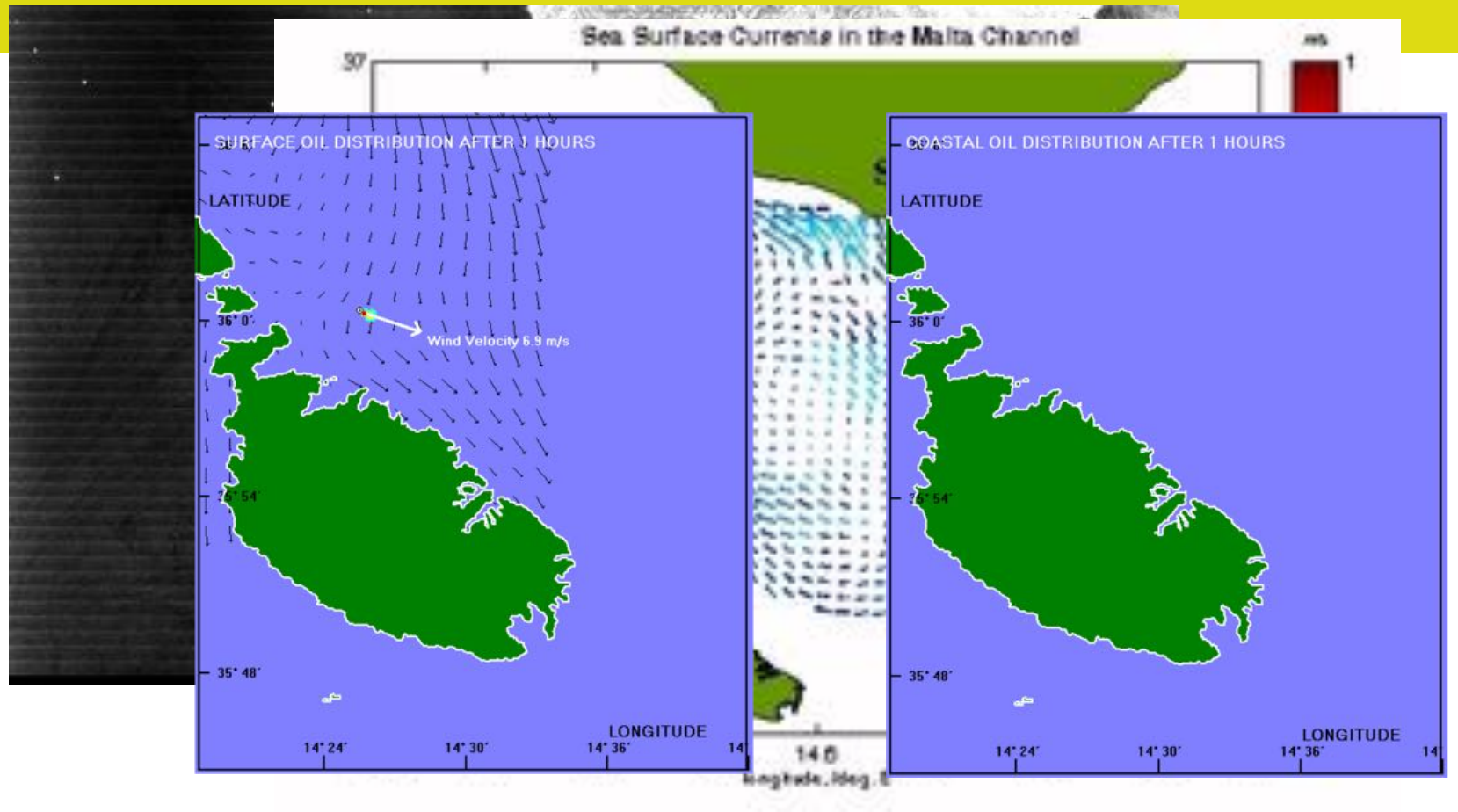
PHYSICAL OCEANOGRAPHY
RESEARCH GROUP

25th Anniversary

Introducing the course

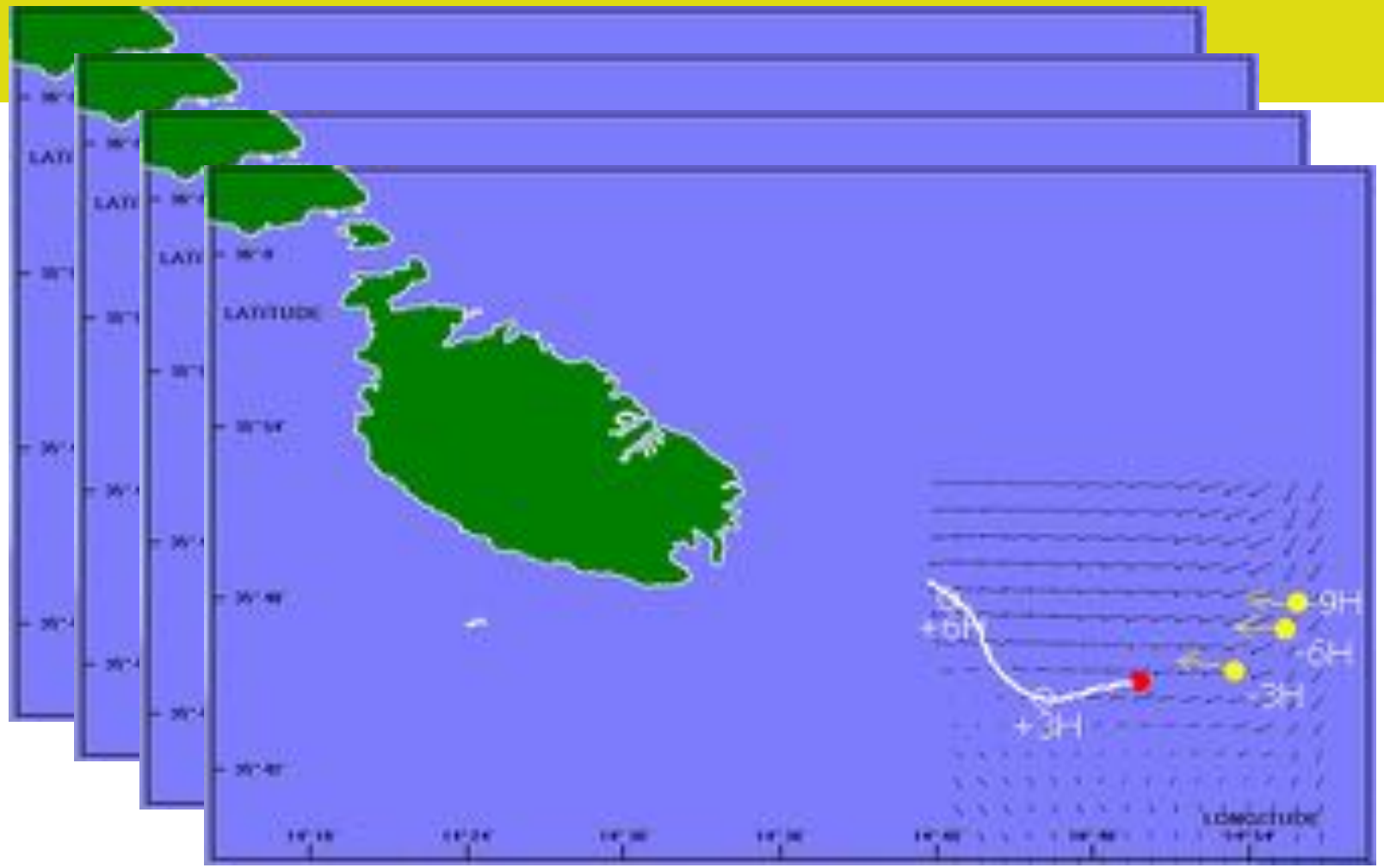
Prof. Aldo Drago, Course Coordinator

REAL CASE STORYLINES



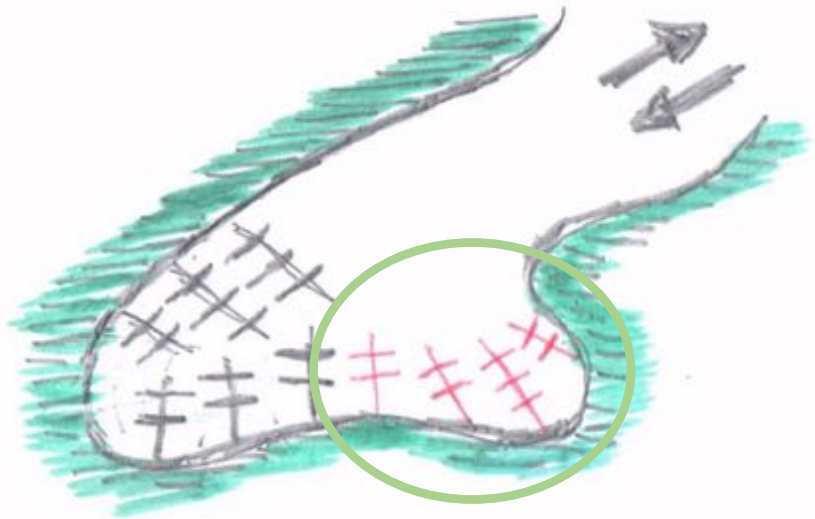
Ship collision in the Malta Channel at 4:55GMT. Rupture in the oil tanker releases 450 tons of oil. Spill position is first observed by satellite (SAR pictures). Sea conditions and currents are expected to drive the oil spill towards Malta. Simulations are executed to estimate and control the impact of oil on the Maltese coastline.

REAL CASE STORYLINES



Small boat sighted with no crew on board. Boat description coincides to a call of distress received 12h earlier. Search and rescue operation is initiated and several scenarios are investigated to restrict S&R area.

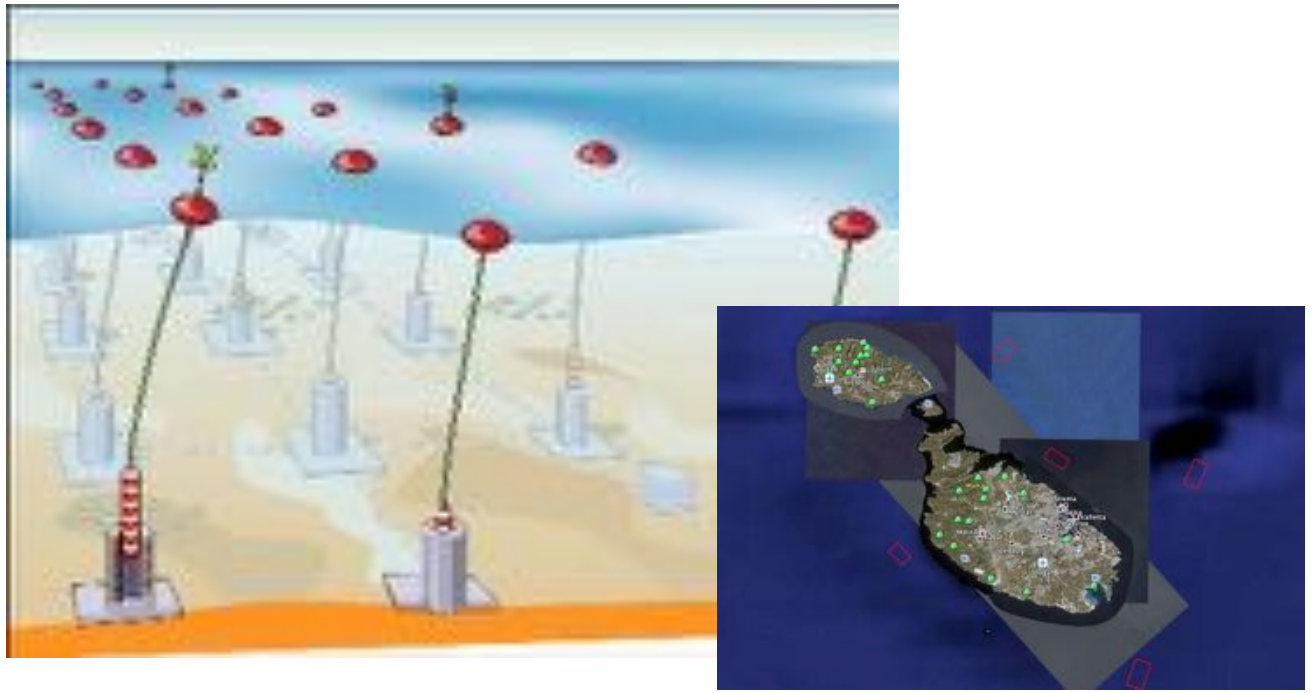
REAL CASE STORYLINES

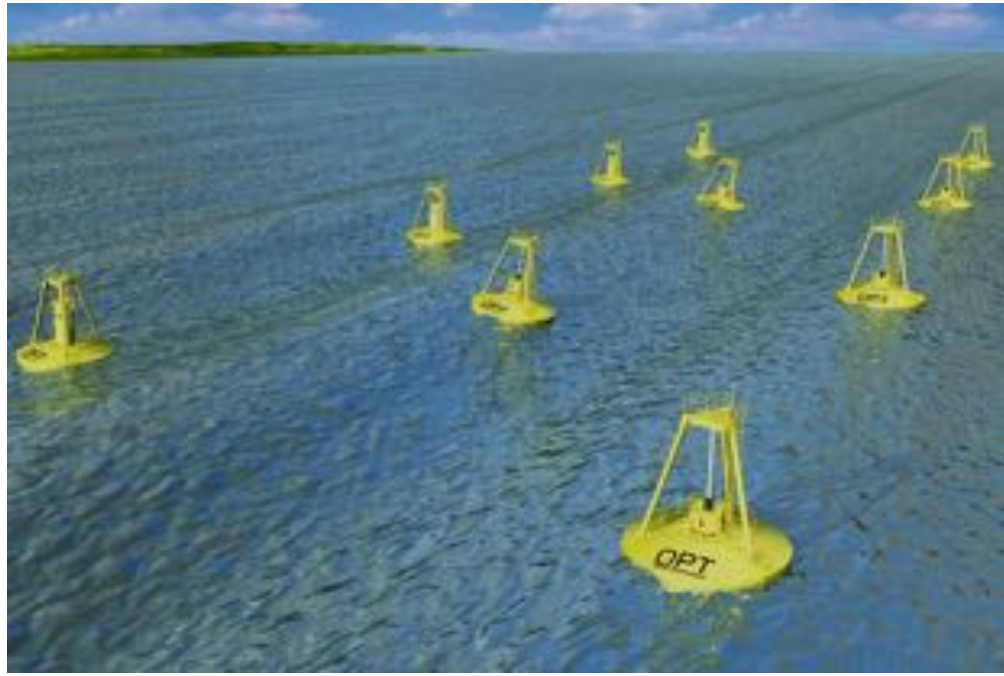


Coastal development in an embayment: extension of a yacht marina.

- Assesments on wave impact on new installations
- Changes in circulation,
- Carrying capacity of the embayment
- Quantify risks

REAL CASE STORYLINES





Tapping wave energy from the sea around the Maltese Islands.
Assess the wave resource potential.

WHAT IS OPERATIONAL OCEANOGRAPHY

More than research .....
...observe **the sea to provide support to**
a wide range of **users**

Operational oceanography delivers an interoperable, fully integrated multiplatform observing and forecasting capability, with systematic and long-term routine measurements of the seas and oceans and atmosphere, and the rapid interpretation and dissemination of information with the production of dedicated data services, supporting the conservation of biodiversity, forecasting and management of risks and emergencies at the coast and at sea

WHAT IS OPERATIONAL OCEANOGRAPHY

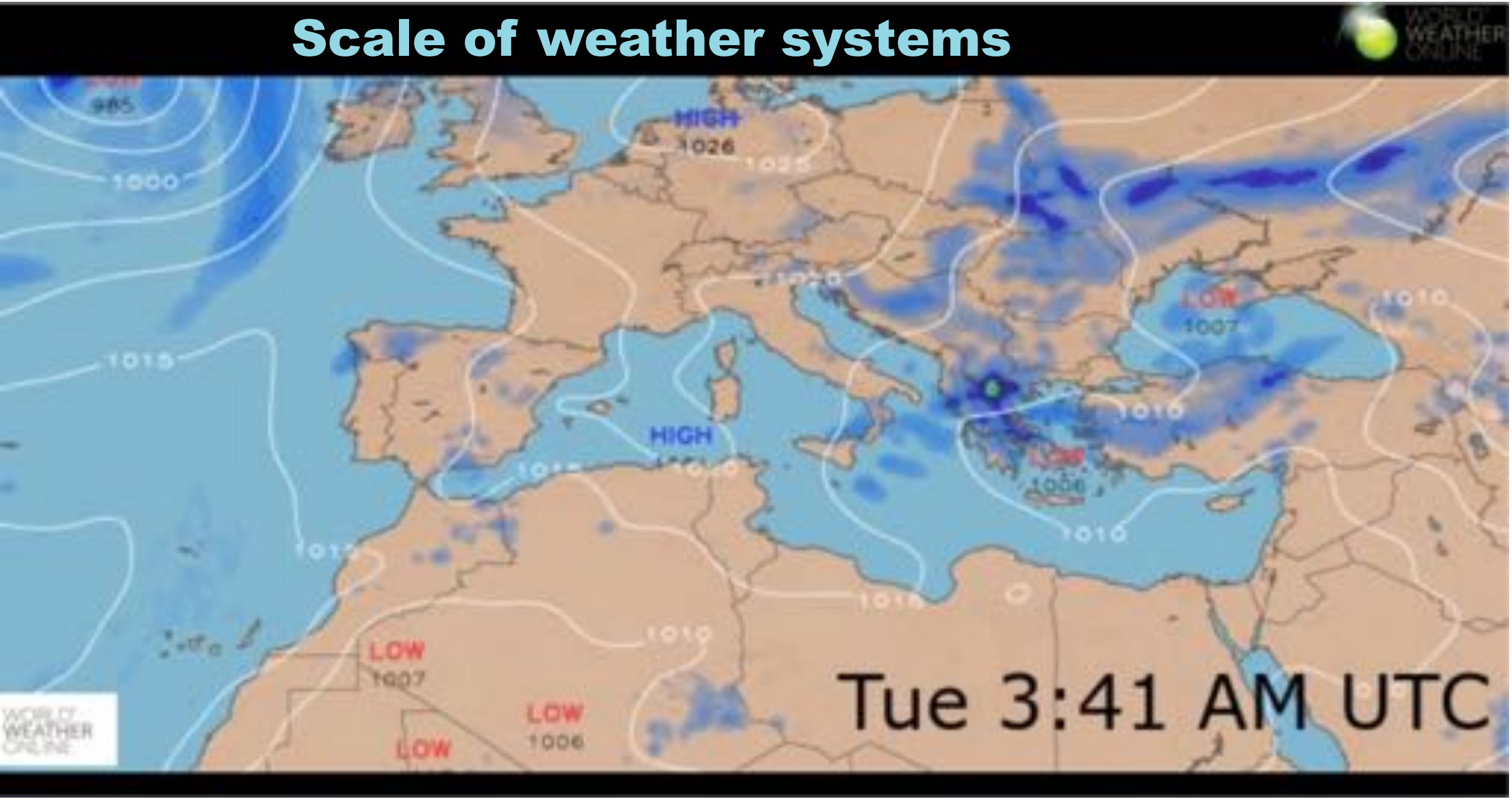
in situ + remote

Ecosystem observations …
…not only physics

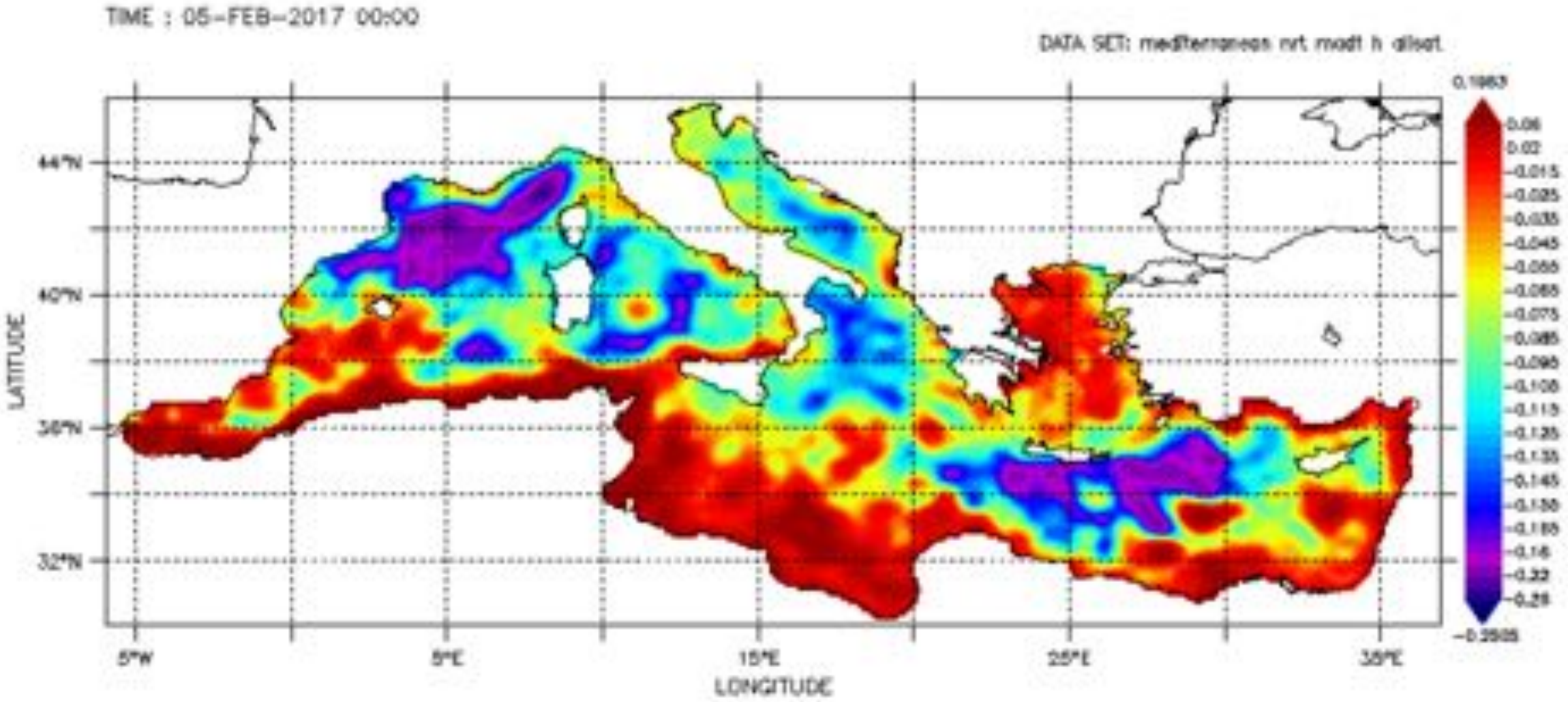
Use new technologies
- Coastal HF radars - drifters - gliders - AUVs

- QC + D&M + NRT transmission

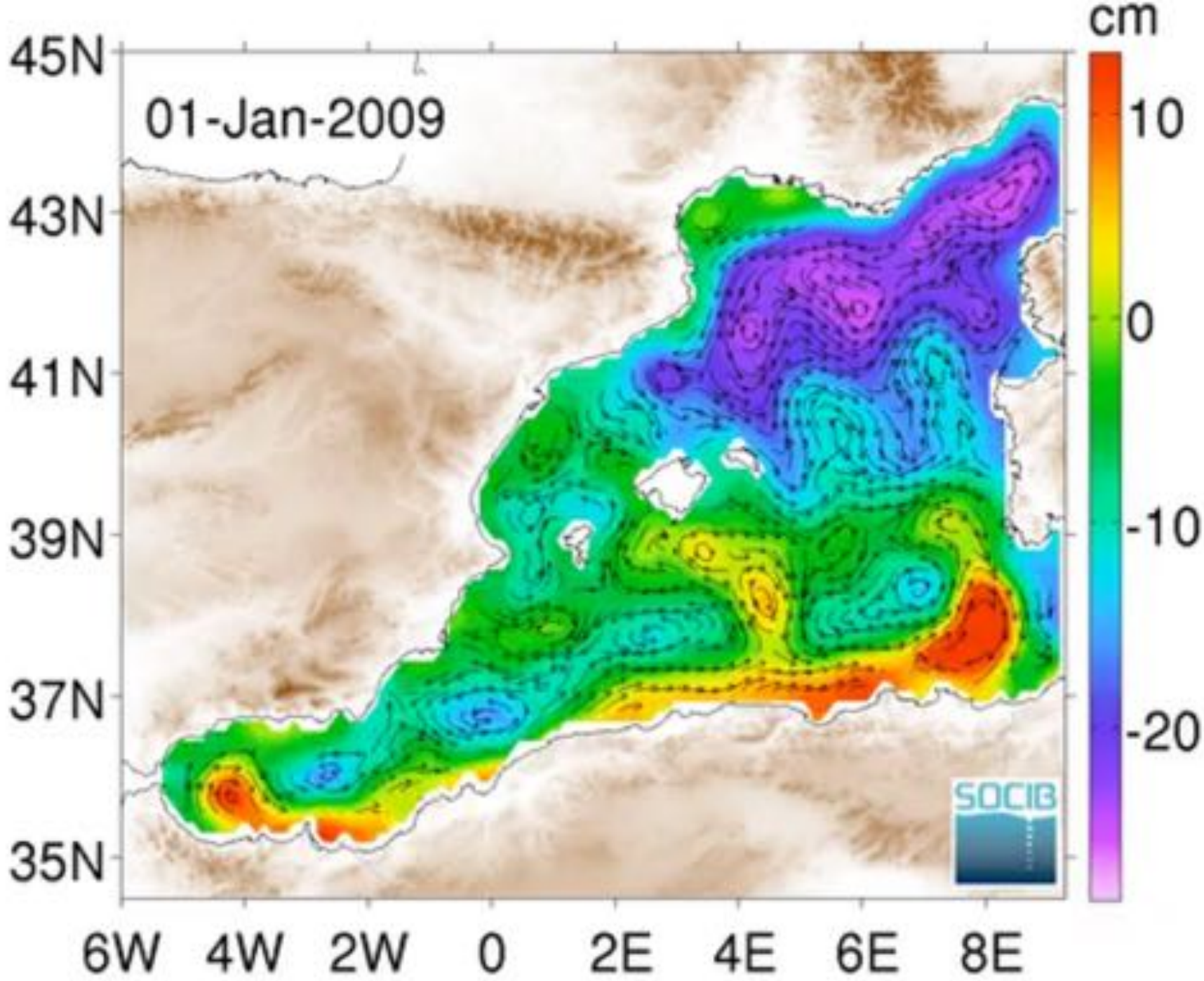
Scale of weather systems



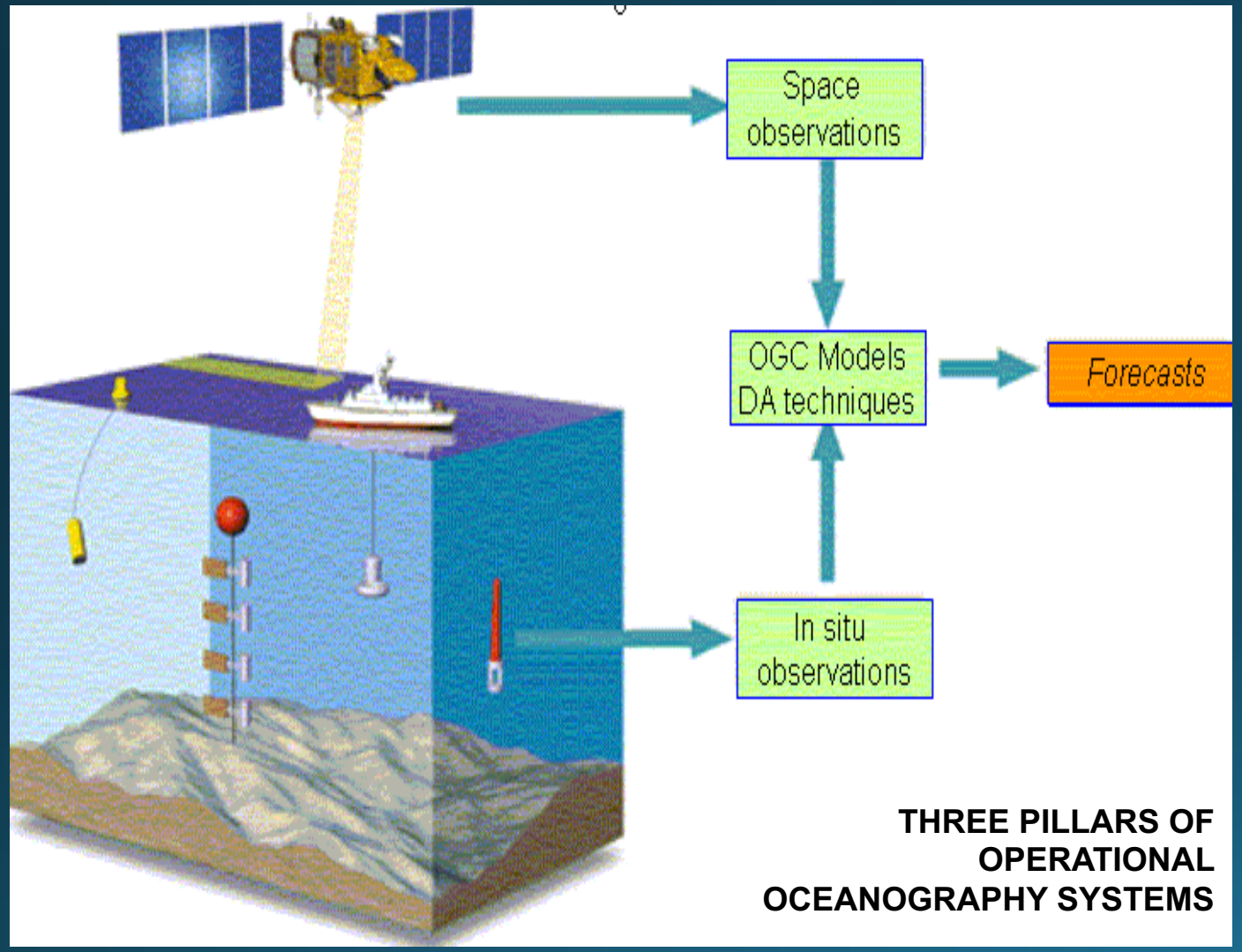
Scale of ocean variability



Maps of Absolute Dynamic Topography Allsat (m)


45N
43N
41N
39N
37N
35N
01-Jan-2009
6W
4W
2W
0
2E
4E
6E
8E
cm
10
0
-10
-20
SOCIB

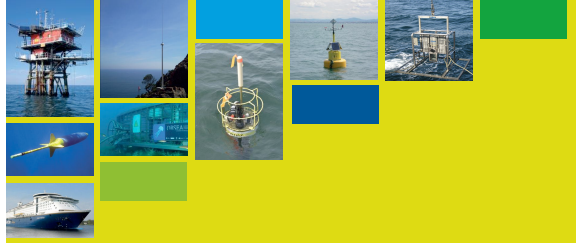
Operational Oceanography Systems in a nutshell



THREE PILLARS OF OPERATIONAL OCEANOGRAPHY SYSTEMS

An Operational Oceanography System (OOS) comprises a network of observation networks of different platforms (automated or semi-automated equipment) that collect mostly in real-time relevant observations of the marine environment (from physics to biology)

An OOS includes also:
the component of remote sensing of the marine environment,
a numerical modeling component for data integration, analysis and forecasting



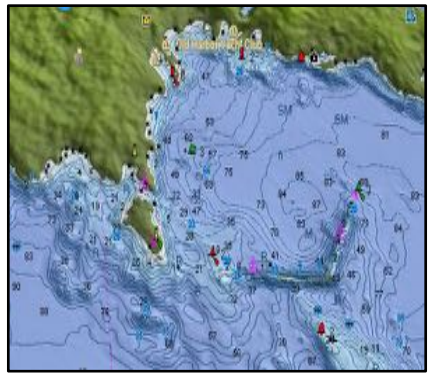
WHAT IS OPERATIONAL OCEANOGRAPHY

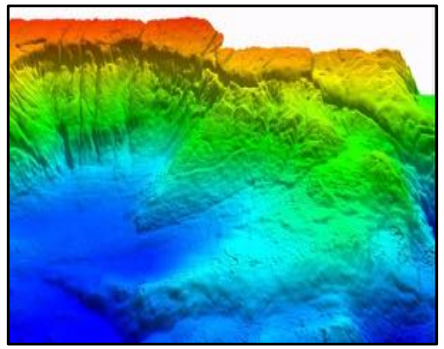
- Delivery of products and services
- Meeting user needs
- Supporting short and long range weather predictions, climate monitoring and climate services
- From data collection, data management to knowledge and evidence creation
- Data for evidence based decision and policy making

SUPPORT OF OCEANOGRAPHY

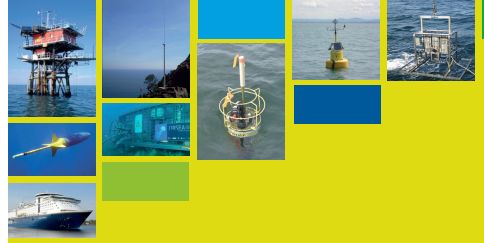
DATA FEEDING THE ADDED VALUE CHAINS ……

Environmental monitoring……ICZM and Ecosystem based approach ……Marine Spatial Planning… Policy Making and Strategic Planning…..Surveillance and Enforcement etc.





All activities contribute to blue job creation but demand of supporting professionals is not matched by the supply



Blue Growth is the long term strategy to support sustainable growth in the marine and maritime sectors as a whole.

It is the maritime contribution to achieving the goals of the Europe 2020 strategy for smart, sustainable and inclusive growth

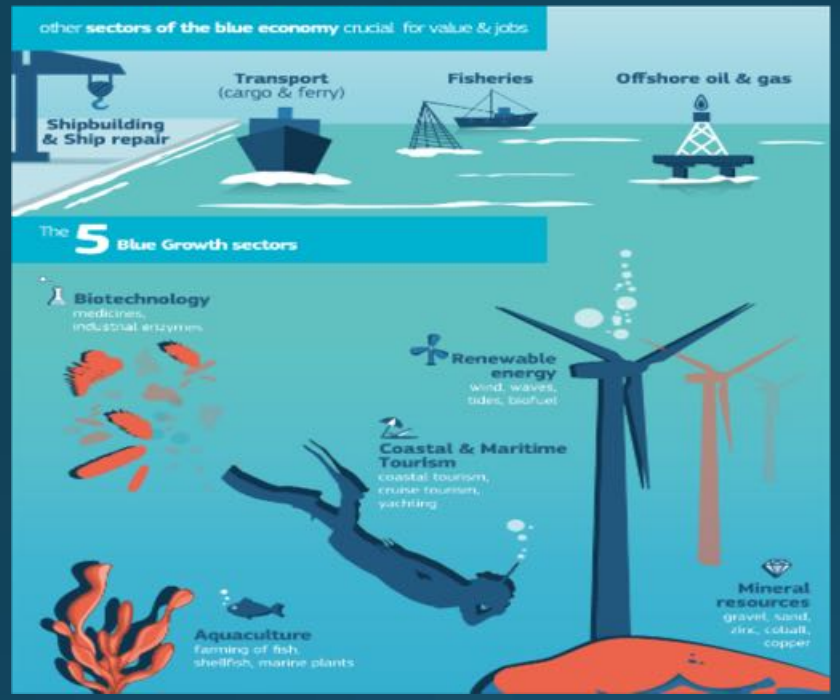
HTTPS://EC.EUROPA.EU/MARITIMEAFFAIRS

Seas and oceans are drivers for the European economy and have great potential for innovation and growth.

SECTORS HAVE HIGH POTENTIAL FOR SUSTAINABLE JOBS AND GROWTH

Marine Data and Information for Blue Growth

Blue Growth priority areas



Data and Information

'Sustainable Blue Growth is simply not possible without sustained ocean observations'

EOOS Consultation Document, September 2016, EU

Ocean observations sustain the value chain of marine knowledge

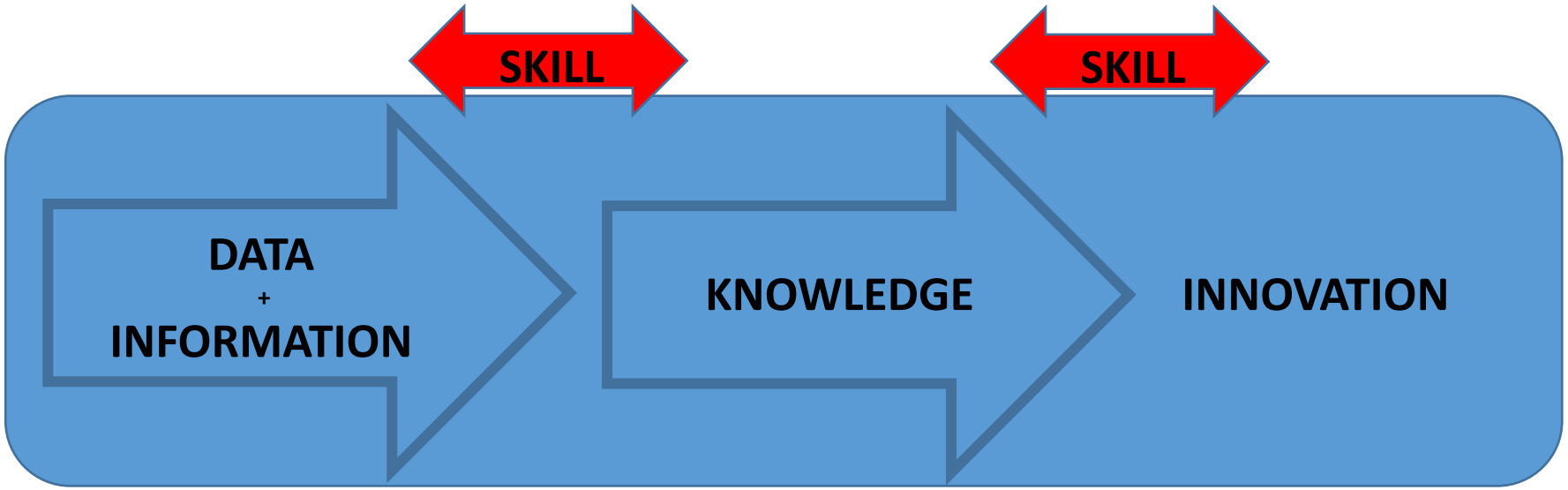
provide timely information and background knowledge to better manage human activities

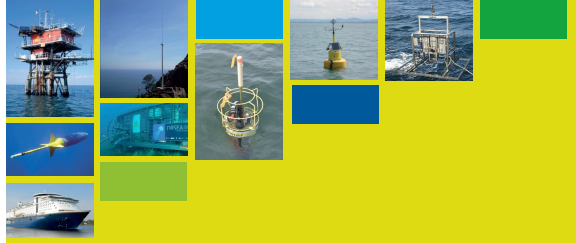
Fulfil national / international regulations

Preserve the ecosystem services

Minimize marine hazards

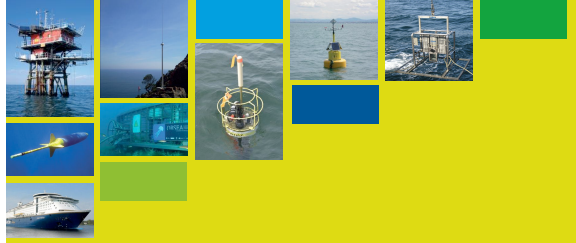
MARINE INTELLIGENCE





WHAT IS INNOVATION?

A + B = C	Current product
A + Ƀ = C’	Change ingredient
A ~ B = C’’	Change process
A + B + x = D	Add ingredient
P + Q = R	Completely new



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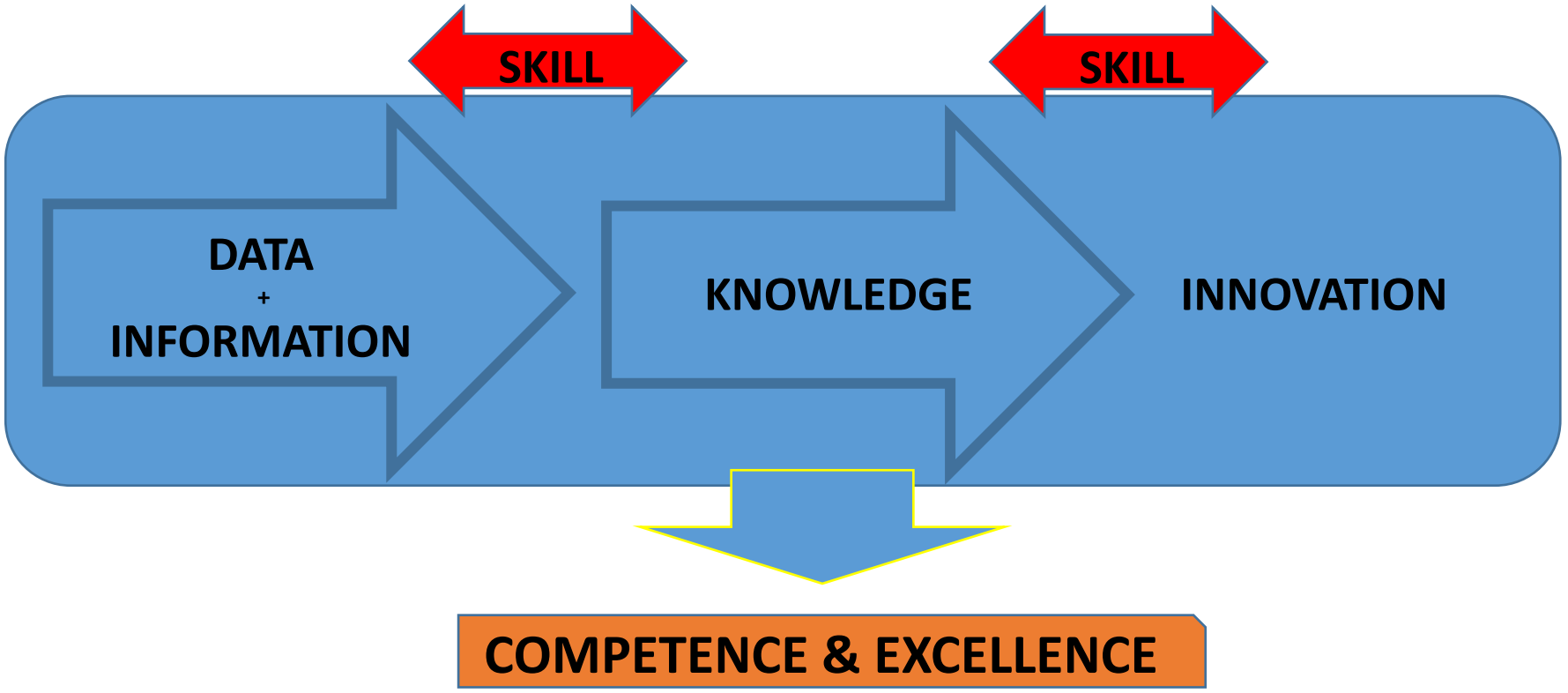
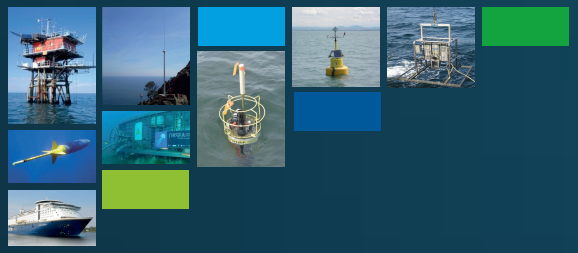
Operational Oceanography for Blue Growth

MARINE INTELLIGENCE





The evolving data value chain……

DATA → INFORMATION → KNOWLE…

OBSERVATIONS → ADDE…AL … → APPLICATIONS

…UCTS

…ation of inform…ti…

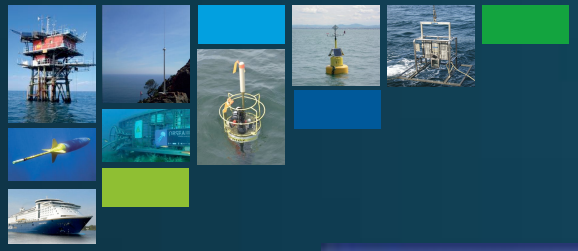
across scale… o… …egional – local

…climate – geophysical – fisheries - other

across sectors: environment – social - economical

information networks for integrated services


OCEAN ECONOMY in 2030 (OECD)
Ocean economy encompasses ocean-based industries (eg shipping, fishing, offshore wind, marine biotechnology) + natural assets + ocean ecosystem services (eg. fish, shipping lanes, CO_2 absorption, etc.).
Ocean-based economy in 2010 (1.5 trillion USD in value added, 2.5% of world GVA)
.....will double by 2030 even on a 'business as usual' scenario
strongest growth: marine aquaculture, offshore wind energy, fish processing, shipbuilding & repair.
40 million full-time equivalent jobs by 2030

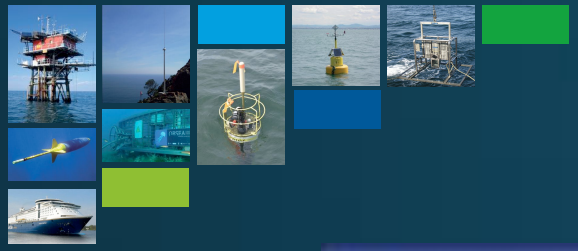


OCEAN ECONOMY IN EUROPE

The coastal oceans, including coastal zones and offshore and open coastal waters, are important economic zones and key areas of European Blue Growth.

1/3 of the EU population lives within 50 km of the coast and GDP generated by this population exceeds 30% of the total EU GDP.

The economic value of coastal areas within 500 m of the European shores has a total between 0.5 and 1 trillion per annum (European Commission, http://ec.europa.eu/environment/iczm/state_coast.htm)



OCEAN ECONOMY IN EUROPE

For the established sectors between 2009 and 2016 Blue Economy has grown 9.7% amounting to 174.2 BN Euro GVA
(*living resources +22%; transport +20%; ports +12%; ship building +11%; coastal tourism +5%; oil & gas -6%)*

Blue Economy jobs were 3.48 billion in 2016
(20% ES; 11% UK; 11% IT; 10% GR)

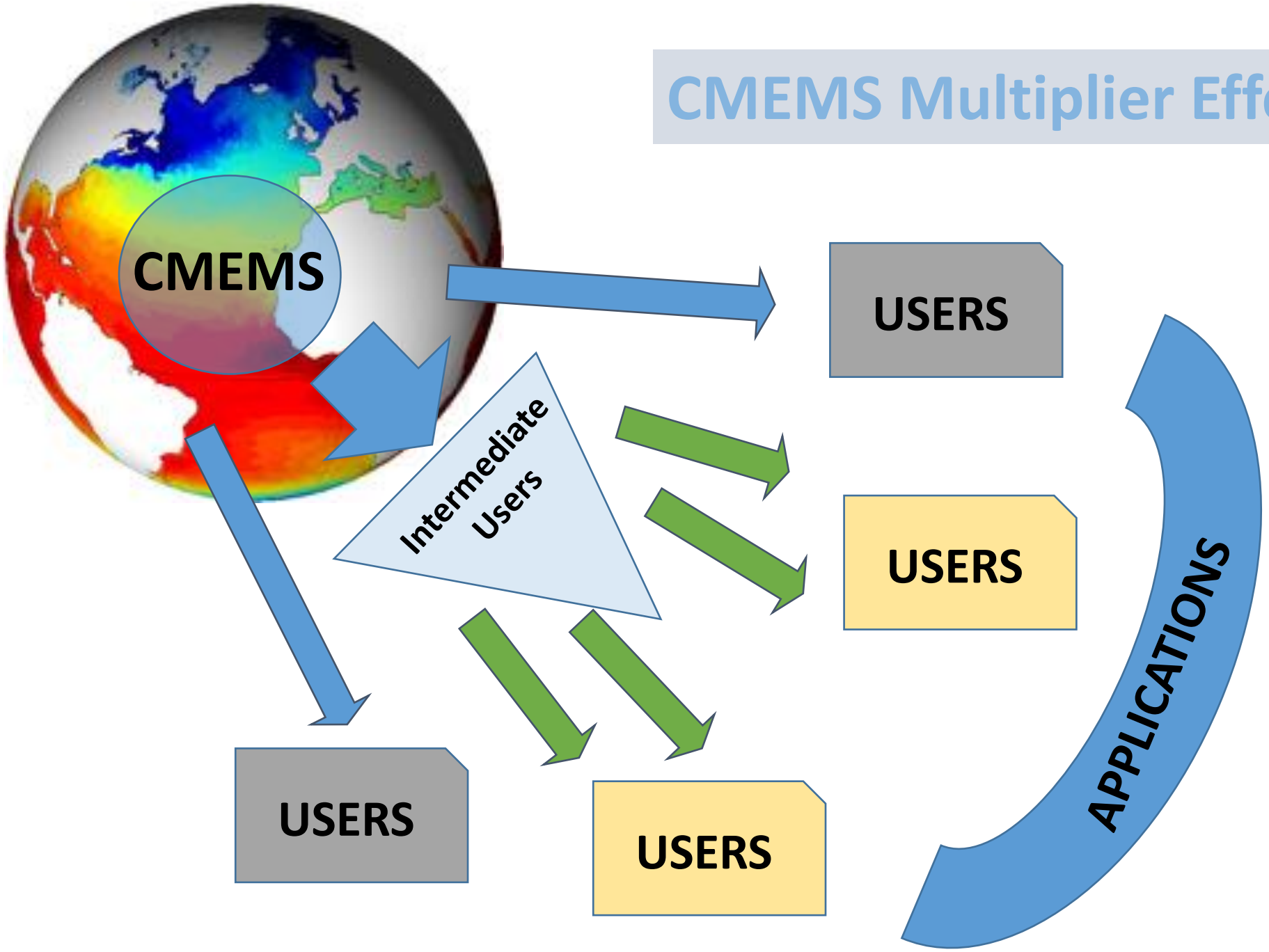
Blue Economy wages increased on average by 14.2%

Since 2009 the EU Blue Economy has recorded a positive trend in net investments

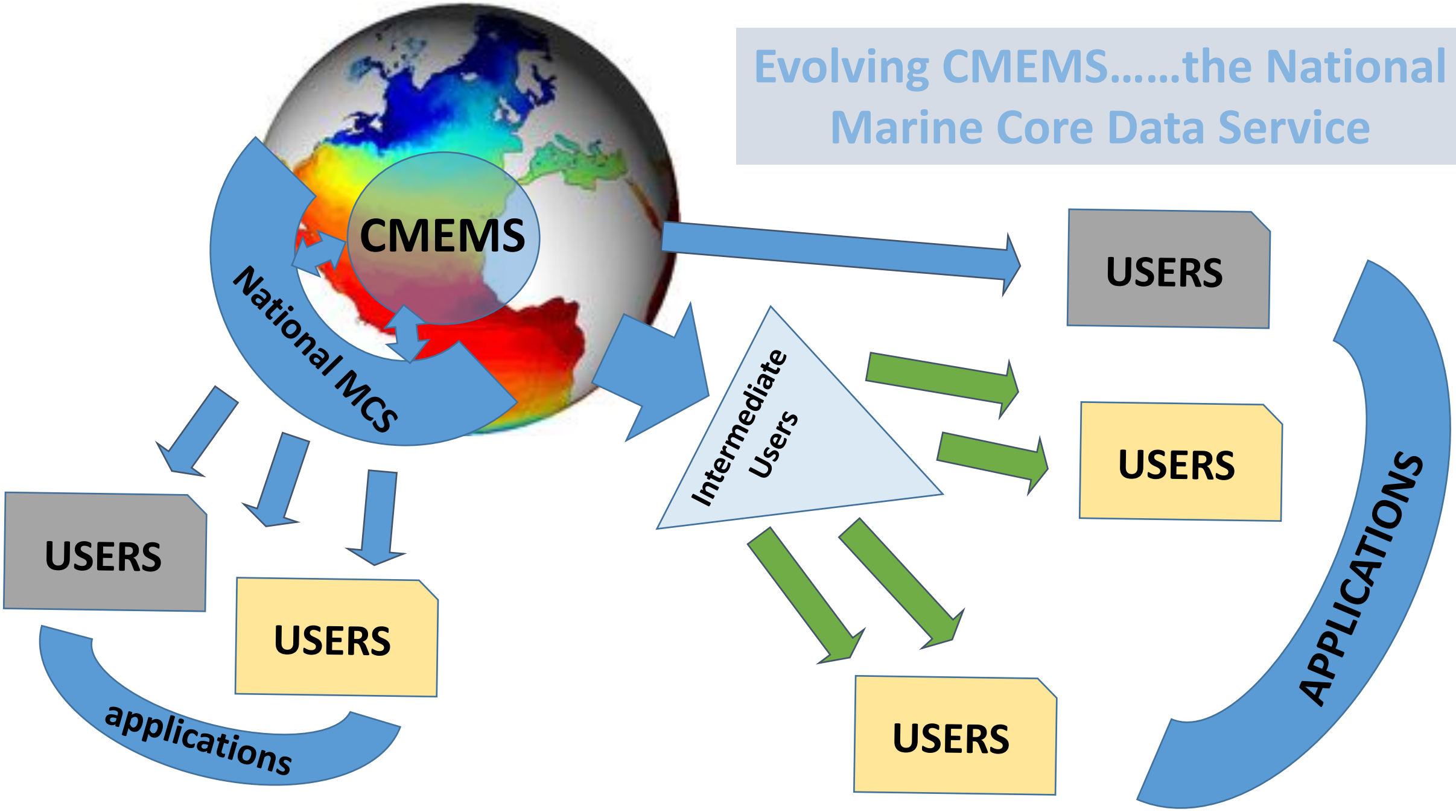
Emerging sectors although small in size, are innovative and show great growth and employment potential
(*in the marine renewable energy sector, the offshore wind sector reached 160K jobs in 2016; 3.24 BN Euro invested in the ocean energy sector since 2007 ¾ of which by the private sector)*

WIN-WIN APPROACH FOR ACADEMIA & INDUSTRY

CMEMS Multiplier Effect



Evolving CMEMS……the National Marine Core Data Service



Next Steps? MARINE AND MARITIME CLUSTERS

Academy-Industry Corporate Partnership

Create a maritime cluster and
corporate partners contribute actively to the cluster

PARTNER BENEFITS

- Targeted training and recruiting of students, graduates and alumni
- Shaping flexible curricula & study programmes
- Cross networking across minds and practice, ideas and demand
- Joint venturing for RDI & smart applications
- Critical mass for excellence
- International impact
- Boost the economy

BLOCKCHAIN IS THE FUTURE OF DATA SHARING AND EXPLOITATION

THE BLOCKCHAIN PROTOCOL CAN BE USED FOR NON-CURRENCY PURPOSES TOO AND IS REVOLUTIONIZING THE BUSINESS WORLD INCLUDING THE MARITIME DOMAIN

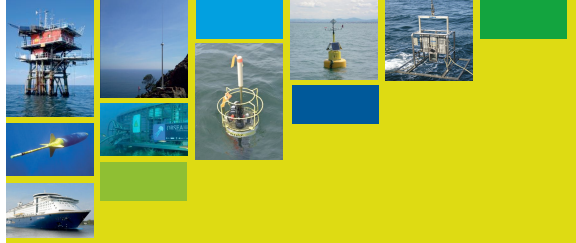
MSc COURSE IN APPLIED OCEANOGRAPHY
UNIVERSITY of MALTA

PREPARING MARINE PROFESSIONALS OF THE FUTURE

http://www.um.edu.mt/science/geosciences/physicaloceanography/msc

L-Università ta' Malta

- *Scientific Baseline of Oceanography*
- *Practical Baseline of Oceanography*
- ***Essentials of Operational Oceanography***
- ***Data Resources in Operational Oceanography***
- *Oceanography Boot Camp - Field survey and hands-on marine data analysis*
- *Ocean Governance*
- ***Applications and Services deriving from Operational Oceanography***



CONTACTS AND FOLLOW UP

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L-Università ta' Malta

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