Introducing the course

Prof. Aldo Drago, Course Coordinator
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.
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.
Coastal development in an embayment: extension of a yacht marina.

- Assessments 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.
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
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

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

MARINE INTELLIGENCE

DATA + INFORMATION → SKILL → KNOWLEDGE → INNOVATION → SKILL → DATA + INFORMATION
WHAT IS INNOVATION?

A + B = C
A + \mathcal{B} = C'
A \sim B = C''
A + B + x = D
P + Q = R

Current product
Change ingredient
Change process
Add ingredient
Completely new
MARINE INTELLIGENCE
The evolving data value chain……

DATA ➔ INFORMATION ➔ KNOWLEDGE

OBSERVATIONS ➔ ADDITIONAL PRODUCTS ➔ APPLICATIONS

Integration of information across scales: global – regional – local
Integration of information across fields: climate – geophysical – fisheries - other
Integration of information across sectors: environment – social - economical

information networks for integrated services
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
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)
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

NOW
- Fragmented research
- Not enough marine RDI
- Not just publishing papers
- Direct support to research
- Few links to industry

WHAT
- Target creation of
  Human resource + Knowledge & Data resources
- COMMON PUBLIC GOOD + SERVICE PROVIDER

EXCELLENCE AND ECONOMIC GROWTH

MARKET
- Anticipate customer needs; arrive before competitor; track customer response

CONTENT
- Deliver value on top of service; multi-purpose & multi-functional; smart & innovative; connecting systems

QUALITY
- Faster and reliable product & service; user friendly; best for money; affordable; brand

Sharing same platforms and resources

Meeting challenges in a holistic approach

- Private sector RDI
- Incentives for business
- Incentives for RDI & ICT?
- Demand for skilled workforce
- Tap international resources
- Global markets
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

• 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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