DOORS project outcomes in support to the Black Sea Common Maritime Agenda

On-line meeting, 29 April 2025

DOORS scientists

DOORS - Developing Optimal and Open Research Support for the Black Sea
Project funded by the European Union N° 101000518

Welcome, meeting objective, who-is-who, agenda

Moderator, **Jos Brils**, Deltares, The Netherlands

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Image: Jasmina_K

Meeting Objectives:

- Highlight to you our DOORS outcomes in support to the Black Sea Common Maritime Agenda
- Collate feedback on questions related to these outcomes and their possible use by you

Made available to you before the meeting:

- Preliminary agenda
- Briefing note (summary of DOORS outcomes)
- 3 factsheets (more detailed DOORS outcomes):
  - System of Systems (SoS)
  - Blue Growth Accelerator (BGA)
  - Knowledge Transfer and Training (KTT)

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Who-is-who in the meeting?

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Agenda

Timing	Agenda item	Who
14.00	Welcome, objective & who-is-who	Jos Brils
14.15	Introduction to the DOORS project	Marian Paiu
14.25	Pitches: **Q&A after each pitch**	
	A. Use and increase of Black Sea environmental system understanding	Violeta Slabakova and Andrew Tyler
	B. Accelerating Blue Growth	Eleni Manousiadi
	C. Education and Training of Blue skills	Rory Scarrott
15.10	Discussion: collating feedback on some questions	Jos Brils
15.30	End of meeting	

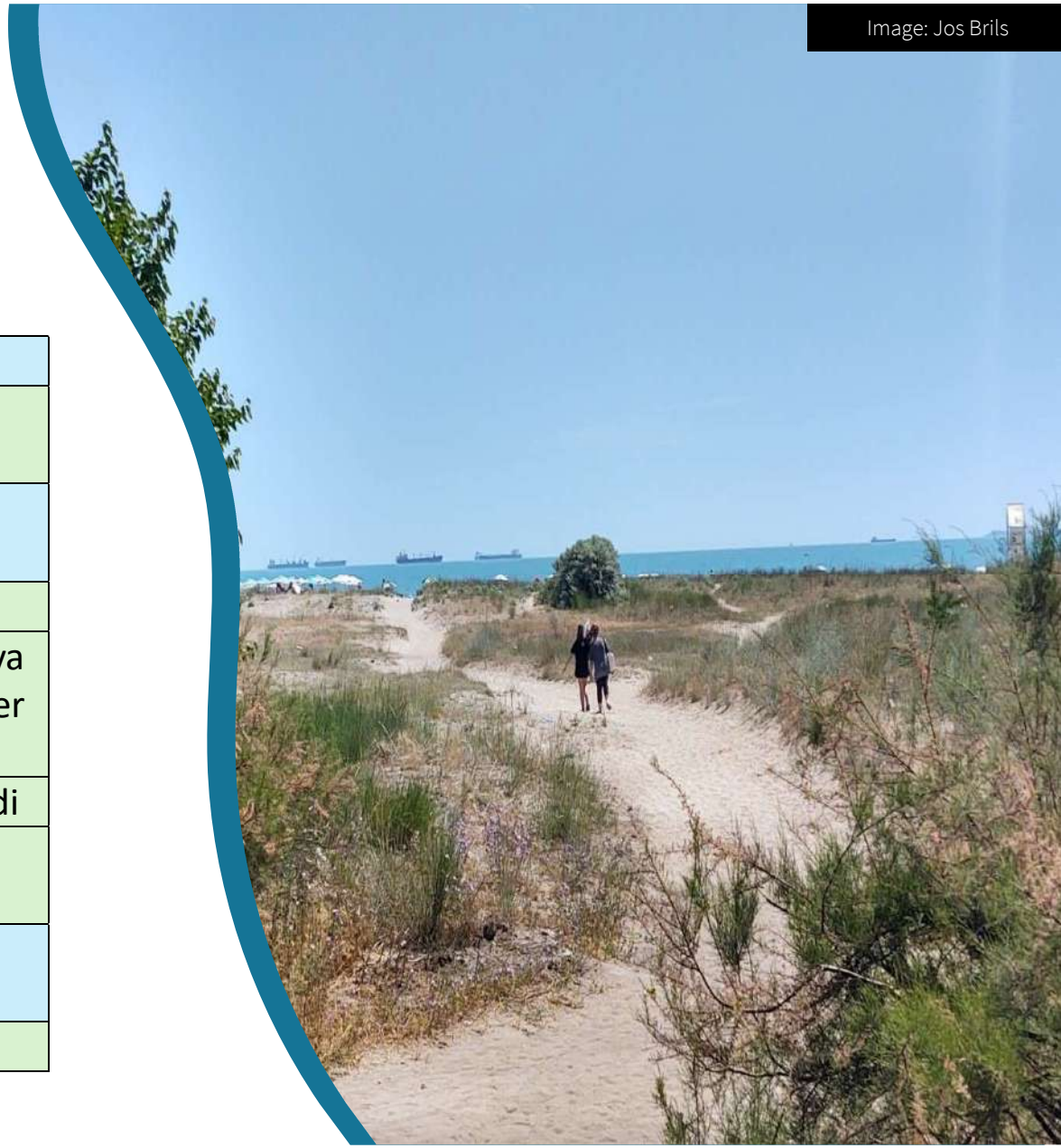

Image: Jos Brils

Introduction to the DOORS project

Marian Paiu, Mare Nostrum NGO, Romania

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Timelines

Jun 2017

DG RTD begins development
of the Strategic Research and Innovation Agenda for the Black Sea (SRIA)

May 2018

Burgas Vision Paper
states need for SRIA with H2020 call for implementation in January 2019

May 2019

BD officially Launches SRIA
with DG RTD BG11 call for the Implementation of the SRIA in Sept 2019

Jan 2020

Step 1 of BG 11
with Step 2 – Sept 2020
Results of evaluation – Dec 2020
DOORS– WINS !

Jun 2021

DOORS project starts
with project duration to May 31st 2025

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35 Partners from 15 Countries

- 35 partners from 15 countries – including the most relevant research institutions around the Black Sea – and with global relevance (NOC, IFREMER)
- The 4 relevant ERICs for marine sciences - and one ESFRI Research Infrastructure (to become operational during DOORS duration)
- All WPs bring together best expertise around the Black Sea and in Europe
- WP co-leadership – a step towards the proper integration of the scientific communities and know how, seed for future cooperations

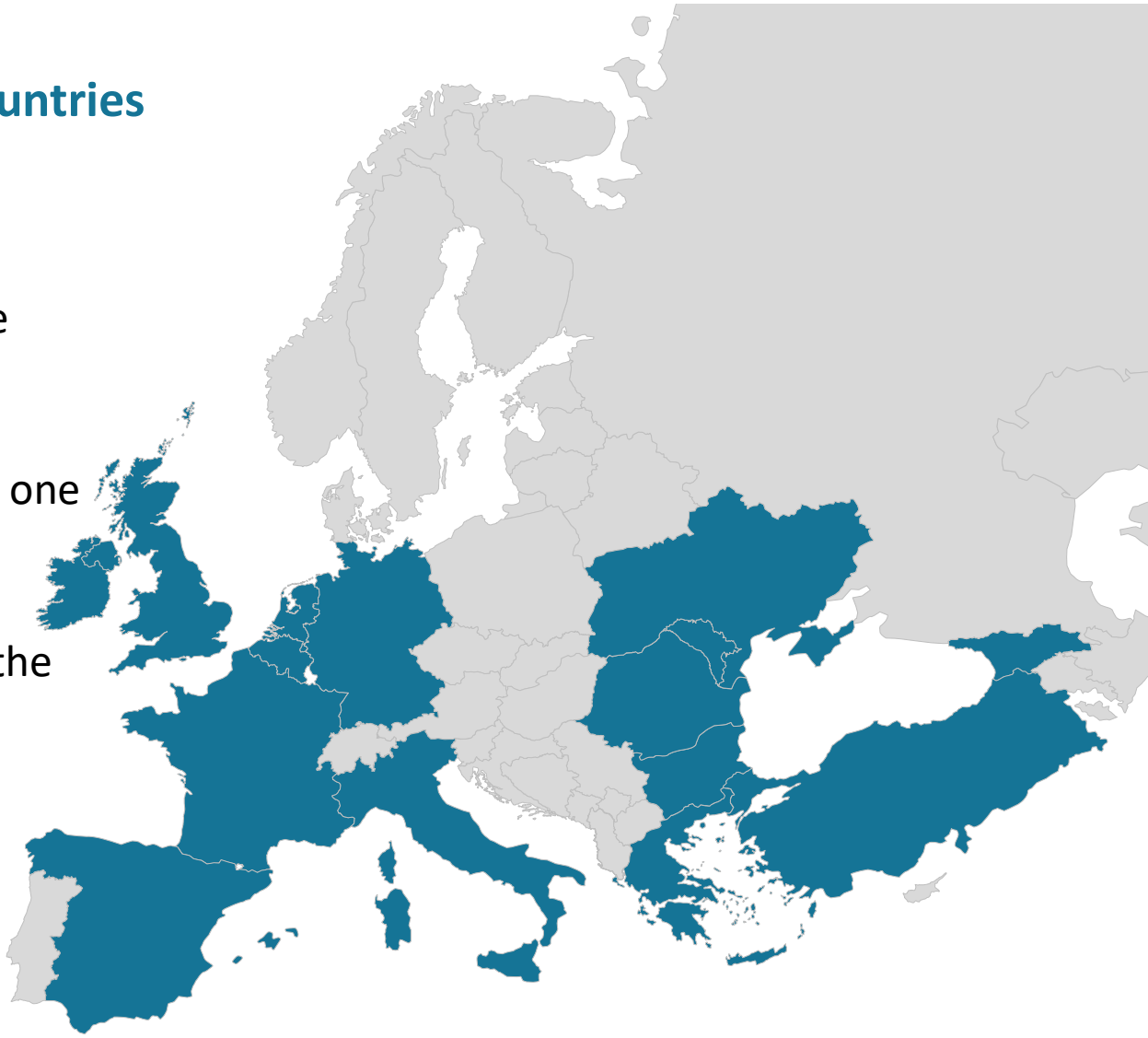

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Image: Dan Borzan

DOORS Objectives

To make operational the Black Sea SRIA, support the successful Blue Growth implementation and contribute to a healthy, productive and resilient Black Sea.

3 Key Programmes:

1

System of Systems (SoS)

The platform giving access to *in situ*, Earth observation and modelled data on the Black Sea informing on physical, geological, chemical, and biological parameters of the Black Sea.

2

Blue Growth Accelerator (BGA)

To identify sectors for innovation, providing professional support to unlock their potential. Facilitating exchange between scientists, entrepreneurs and policy makers for development of Blue Growth sectors. Support matchmaking of funders and entrepreneurs

3

Knowledge Transfer & Training (KTT)

Support training, share best practice and knowledge. Aims to build capacity to make use of the knowledge obtained during the project, support Ocean Literacy and education at all levels.

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System of Systems (SoS)

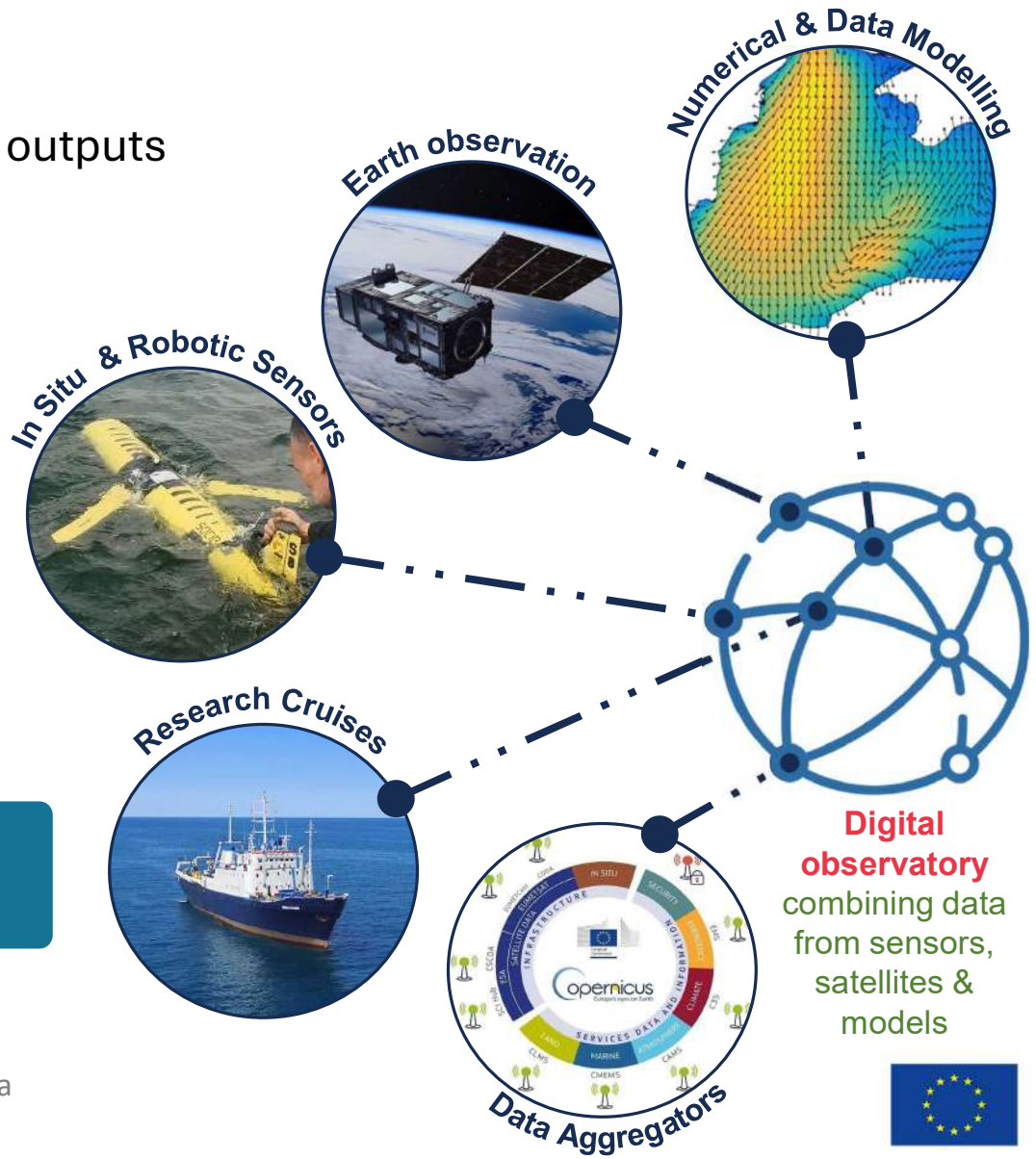
A one-stop-shop for standardised data and model outputs for the Black Sea

Uses latest technology to bring complex data together
Brings together heterogeneous data streams into analysis (or even interpretation) - ready data cubes using the same (meta)data standard and format

Harmonises data
Deliver harmonised spatial and temporal data products (sampling, cruises, fixed & mobile oceanographic platforms , EO observations and models)

A single smart intuitive portal
Tailored to the needs of stakeholders, using FAIR principles

Support knowledge transfer
Building a common understanding, opportunities for growth and collaboration for sustainable growth and prosperity



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Co-Development: Priority Areas

Country	Blue Economy Priorities								Environmental Challenges								
	Aquaculture	Capture Fisheries	Data for for Evidence	Marine R&D	Oil & Gas	Renewable Energy	Shipping & Ports	Tourism incl. Coastal & Marine	Biodiversity	Climate change Extreme Events	Coastal Erosion	Environmental Shocks	Eutrophication	Marine litter	Over fishing	Pollution, incl. sources	Water level
Ukraine				●								●	●	●		●	
Romania	●	●		●		●		●		●	●		●	●		●	
Moldova								●	●								●
Bulgaria		●		●			●	●	●	●	●		●	●		●	
Turkey	●	●		●	●	●	●	●	●	●	●		●	●	●	●	
Georgia	●	●	●	●			●	●		●	●		●	●	●	●	
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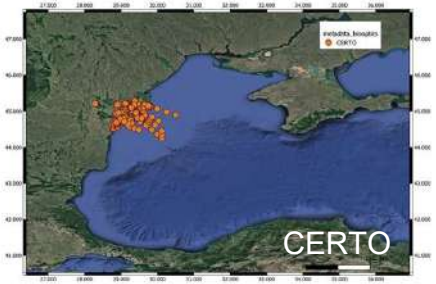
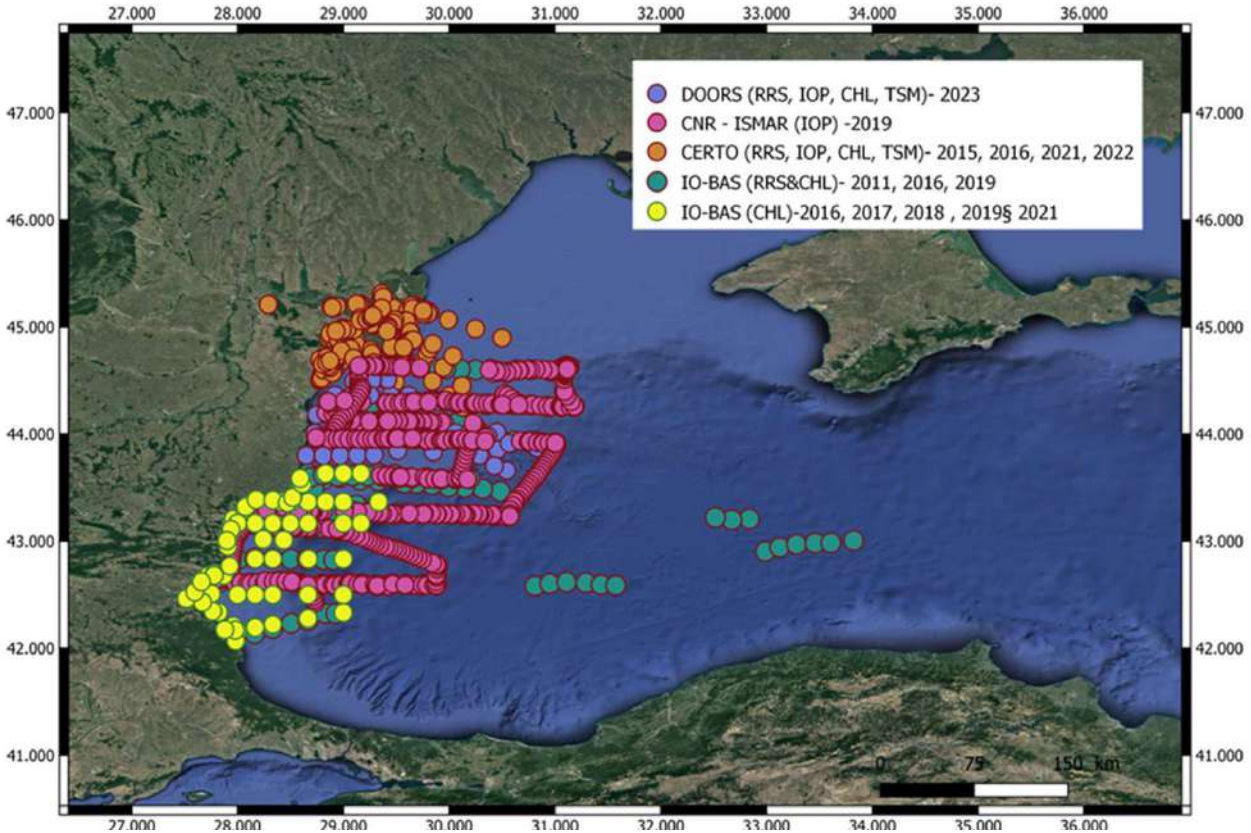
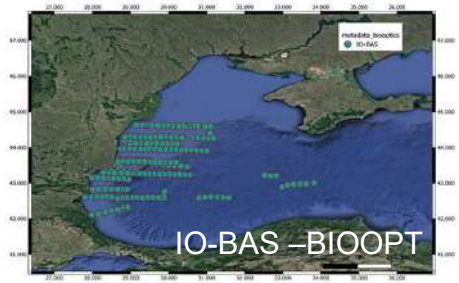
In situ campaigns Satellite Data Calibration & Validation

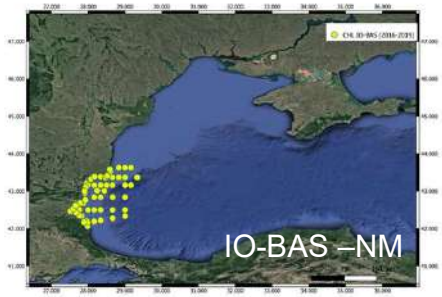
✓ 1410 data records from cruises

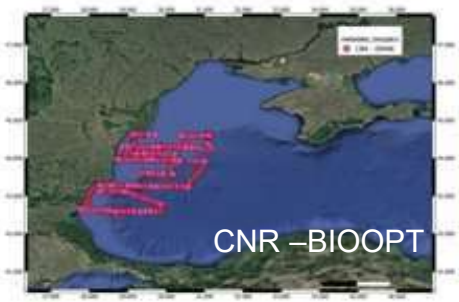
✓ real time data from BS AERONET –OC sites (Gloria, Galata & Sector-7)











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Blue Growth Accelerator (BGA)

Key activities/tasks:

1. Map Black Sea Ecosystem Services, Blue Growth Sectors & Entrepreneurs
2. Provide professional support to Black Sea actors to exploit Blue Growth opportunities
3. Foster collaboration between academia & industry for the sustainable development of the Black Sea Blue Economy
4. Facilitate access to investors- Black Sea Special Interest Group (SIG)

Achieved outcome	Impact aimed for
• Biotechnology and wind energy provide most potential	Safe and sustainable growth of marine and maritime sectors
• 22 entrepreneurs selected and supported by Black Sea Accelerator • Trainings delivered	Enhanced entrepreneurial culture
• Entrepreneurs trained • SIG initiated and continued (portfolio for investment finalised and presented) • Financing sources identified	Increased capacity for blue innovation

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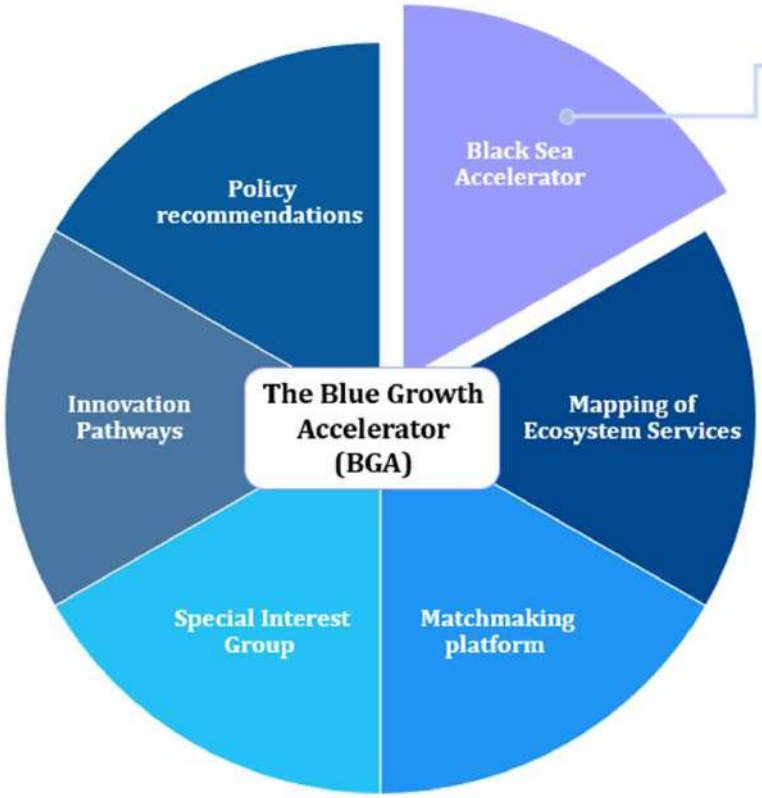
Blue Growth Accelerator (BGA)

Provide professional support to the Black Sea actors for exploitation of Blue Growth opportunities



The Black Sea Accelerator (BSA)

The Black Sea Accelerator (BSA) was developed in collaboration with the H2020 BRIDGE-BS project, in an effort to set up the first startup accelerator in the Black Sea region, ensuring a robust and coordinated approach to fostering blue innovation in the Black Sea.

Clarifying the Difference: BGA vs. BSA

- BGA includes the call for the first ever business accelerator for blue business in the Black Sea, the selection of startups, training programs, the formation of a Special Interest Group, the innovation pathways.
- BSA includes all joint activities related to the call launch, startup selection, and training initiatives

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Knowledge Transfer and Training (KTT)

- Capacity building - assets and programmes
  - Tailored **MSc.** And **Life-Long Learning** Training Opportunities Courses
  - A co-designed and delivered **Training of Trainers** Programme

- Mutual Mobilisation & Learning – 2 rounds of **Mutual Mobilisation Learning Workshops** in each Black Sea country

- Research Exchange 4 Next Gen. – **Early-Stage Research Exchange** experiences



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Early-Stage Researcher Exchange (ESRE)

- **Early-Stage Researcher Exchange** programme success-fully developed

- **8 applicants, 6** selected for ESRE & exchanges kicked-off, represent-ting a diverse range of collaboration topics, and connections between the Black Sea countries and further afield

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Pitch A: Use and increase of Black Sea environmental system understanding

Violeta Slabakova, IOBAS, Bulgaria
Andrew Tyler, University of Stirling, United Kingdom

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Harmonised observation

DOORS outcome:

- Data gaps identified for high interest sectors: fisheries, aquaculture, wind energy
- Manual produced to guide minimisation of these gaps through harmonisation of research efforts and knowledge sharing between the Black Sea countries

How to best utilise and apply this outcome:

- Establish and enhance pressures' monitoring activities related to these sectors
- Include observation/monitoring, measures and evaluation in a strategic operational plan
- Eliminate misalignment across countries by establishing common monitoring programs through regional agreements

How this supports the CMA:

- Availability of harmonised and quality controlled marine data will enhance the understanding of marine ecosystems and how these are affected through Blue Economy activities
- This is essential for assessing the sustainability of these activities


Image: Jos Brils


Image: Esra Bürçün


Image: Deltares

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Deeper Knowledge on Unique Black Sea Habitats

DOORS outcome:

- Contribution to BGE via new technologies development: glider, Lab–on-chip sensors, deep-se
- Assessment across the entire Black sea of microplastics and marine litter
- Methane in the Black Sea: production, storage (gas hydrates), emissions, dynamics and role in massive landslides
- Assessment of time evolution of the three water masses for the last 50 years
- New discover of underwater cultural heritage

How to best utilise and apply this outcome:

- Integrate the new technologies in day-to-day monitoring and research activities
- Developing new and more efficient strategies to remove the marine litter & mitigate the impact in natural systems
- Endorse a sustainable use of energetic resources & better evaluate the environmental needs and challenges as well as tailor solutions for specific needs
- Marine and archaeology tourism highlights the value of underwater heritage while promoting its preservation

How this supports the CMA:

- Boosting the blue economy through innovation and technologies
- Protecting the marine environment and ecosystem health
- Preserving and promoting maritime heritage and scientific understanding

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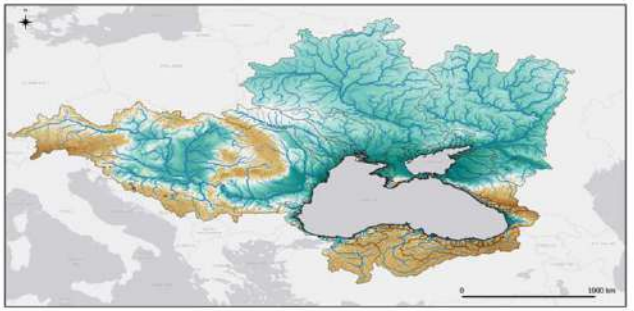
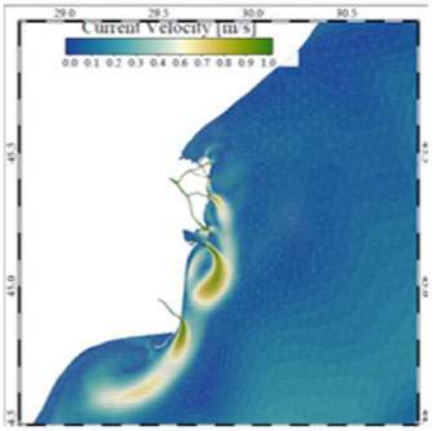
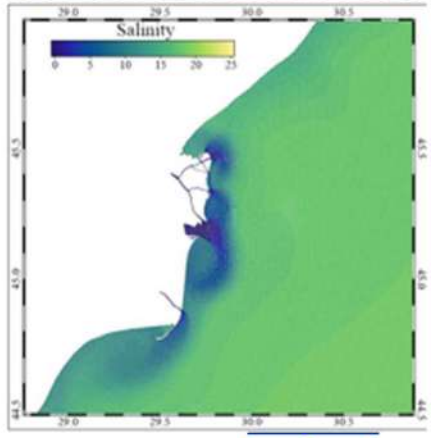
Modelling tools to increase understanding







DOORS outcome:

- Suite of models and integrated model chains, from land input to the open sea:
  - **Biogeochemical** to quantify nutrient distribution at the Black Sea scale
  - **Marine litter** to evaluate its distribution, origin and area of accumulation
  - **Basin and coastal scale waves** to investigate wave climate and effects of extreme events
  - **Morpho-dynamic and flooding** to quantify storm effects and barrier beach modifications
- Modelling output:
  - Characterising present state of the Black Sea: circulation, wave, sediment, litter, biogeochem.
  - Climate change (2080-2100) estimates of Black Sea river loads: discharge, sediment, nutrients
  - Discharge, sediment and nutrient loads (2010-2020) for 11 major rivers entering the Black Sea

How to best utilise and apply this outcome:

- Use models and output to inform policy development and adaptation measures
- Build early warning system based on DOORS prototypes of operative model chains

How this supports the CMA:

- Modelling and output informs better management of the Black Sea system

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New and Improved Earth Observation Products for the Black Sea

DOORS outcome:

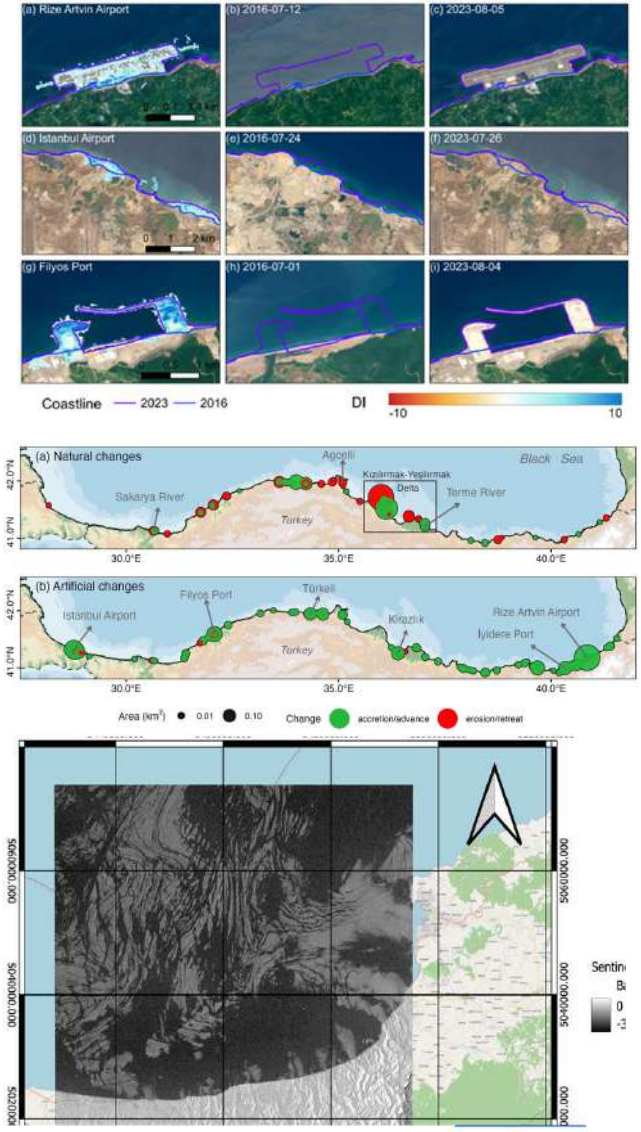
- New algorithms to improve Water Quality Products for the Black Sea, Chlorophyl-*a* and Total Suspended Sediment
- New products on coastal dynamics (sediment erosion and deposition)
- New approach for the detection of marine litter

How to best utilise and apply this outcome:

- Supporting Blue Economy Sectors, including Aquaculture, Tourism and Ports and Martine Infrastructure
- Monitoring the current and changing state of the Black Sea environment
- Reporting for EU Directives (MSFD and WFD)

How this supports the CMA:

- Support for the Blue Economy:
  - Aquaculture (Water Quality, Temperature and coastal erosion)
  - Tourism (Water Quality, Temperature, coastal erosion and Marine Litter)
  - Ports and Marine Infrastructure (sediment dynamics)



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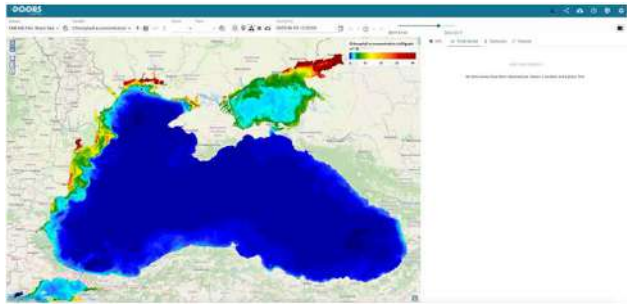
System of Systems: Digital Observatory for the Black Sea

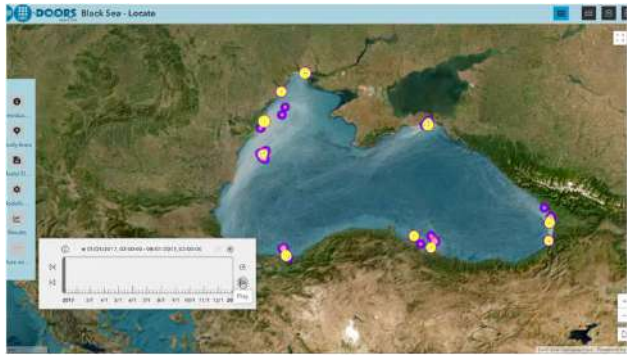
DOORS outcome:

- Co-design of the first of kind digital observatory of the Black Sea:
- Integrates data from multiple sources (sensors, satellites and models) into a single one-stop-shop to provide a comprehensive environmental systems understanding for the Black Sea
- Co-developed a series of use-cases with stakeholders to demonstrate the art-of-the-possible



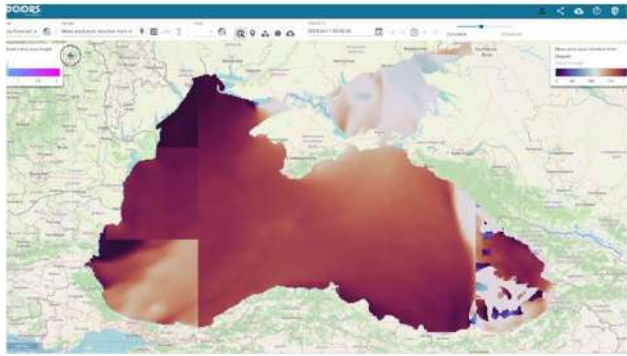
How to best utilise and apply this outcome:

- Supporting Blue Economy Sectors, including aquaculture, tourism, ports and marine infrastructure, energy, resource recovery
- Supporting decision making and policy through the provision of real time information on the current, changing and future state of the Black Sea, for example: managing pollution (marine litter, eutrophication and oil spill); resilient communities (floods, storms and droughts); and safety and security (consequences of conflict)
- Supporting knowledge transfer and education on the Black Sea



How this supports the CMA:

- Single source of truth as well as support for the Blue Economy:
  - Aquaculture (water quality, temperature and coastal erosion)
  - Tourism (water quality, temperature, coastal erosion and Marine Litter)
  - Ports and marine infrastructure (sediment dynamics) & marine navigation (sea state)
  - Energy and resource recovery (wave, wind, marine resources)



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Pitch B: Accelerating Blue Growth

Eleni Manousiadi, KANTOR, Greece

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Sectors with sustainable Blue Growth potential

DOORS outcome:

- Assessed how the Black Sea region can grow its Blue Economy by making better and environmentally sustainable use of marine and coastal ecosystem services
- **Biotechnology** and **wind energy** emerged with potential for sustainable growth
- Risk analysis of wind farming identified possible impacts (positive and negative)

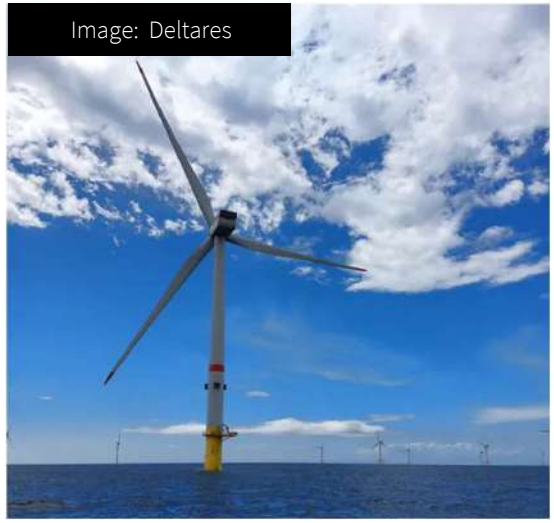
Image: Deltares

How to best utilise and apply this outcome:

- We recommend several actions to further develop offshore wind energy potential:
  - Provide an improved Geographical Information System (GIS) platform (build on SoS?)
  - Start ecological monitoring as soon as possible
  - Assess the perceived benefits and negative impacts of offshore wind farming
  - Invest in training of specialised people and in infrastructure like ports
  - Collaborate with other countries that have longer experience with offshore wind energy


Image: Jos Brils

How this supports the CMA:

- Outcome of above actions supports the further design of the implementation plan on how to exploit the wind energy potential in an environmentally sustainable way

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Black Sea Accelerator (BSA)

DOORS outcome:

- Trained entrepreneurs in several Blue Economy sectors
- BSA training sessions and training materials
- Blue Economy Brochure
- Matchmaking platform which connects BSA participants directly with investors and new partners

How to best utilise and apply this outcome:

- Make training resources widely accessible for startups
- Integrate them into national entrepreneurship programs
- Promote the use of the matchmaking platform

How this supports the CMA:

- Training and use of platform fosters innovation, supports entrepreneurship and builds capacity
- And thus, promotes sustainable business development in the Blue Economy in the Black Sea region

✅ **22 start-ups** granted access
🌍 **All Black Sea Countries** were represented
🌊 **Focus sectors included:**
✓ Aquaculture
✓ Blue biotechnology
✓ Renewable energy
✓ Ports & Transport
📈 **60%+ at TRL 7-9**

Download our Blue Economy Brochure

Join the Platform

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Innovation pathways

DOORS outcome:

- **Multi-Actor Forums (MAFs)** held in all Black Sea countries, which facilitated structured, inclusive stakeholder engagement
- Prioritised **Blue Economy sectors** and co-identified, key environmental, socioeconomic, and policy **challenges** in the Black Sea (on a national and regional level) through the MAF rounds and supporting surveys
- **Preliminary Innovation Pathways**, aligned with stakeholder priorities, enabling the utilisation of solutions coming from the BGA for regional sustainability

How to best utilise and apply this outcome:

- Leverage the Pathways **as strategic roadmaps** for R&I, and policy alignment within national and regional programs
- Incorporate stakeholder **needs into national policy and research funding agendas** to ensure impact relevance
- Use the MAF model as **a replicable engagement methodology** for future regional projects and Living Labs, enabling long-term stakeholder collaboration

How this support the CMA:

- **Fosters cooperation among Black Sea nations** on maritime and blue economy challenges
- Supports CMA's emphasis on **stakeholder participation and co-creation,** strengthening ownership of innovation and policy agendas
- Provides a mechanism for **stakeholder-driven prioritisation** for targeted implementation of CMA objectives
- Feeds into CMA **monitoring and policy evaluation** with stakeholder-verified data

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Facilitated access to funding through Special Interest Group (SIG)

DOORS outcome:

- Black Sea SIG has captured interest numerous investment entities including Venture Capitalists, businesses, and philanthropists.
- Focusing on Digital and AI technologies, aligned with the DOORS SoS, investment prospects include opportunities in Heritage and Tourism, Energy, Aquaculture and Shipping
- All merged in **a portfolio of investment opportunities,** launched on 15 April 2025.

How to best utilise and apply this outcome:

- Champion the blue economy, endorse the investment opportunities, and support a nurturing environment

How this supports the CMA:

- Portfolio raises the profile of the distinct investment opportunities within the Blue Economy
- A thriving blue economy contributes to sustaining regional recovery and prosperity across the Black Sea

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Pitch C: Education and Training of Blue skills

Rory Scarrott, University College Cork, Ireland

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Training courses

DOORS outcome:

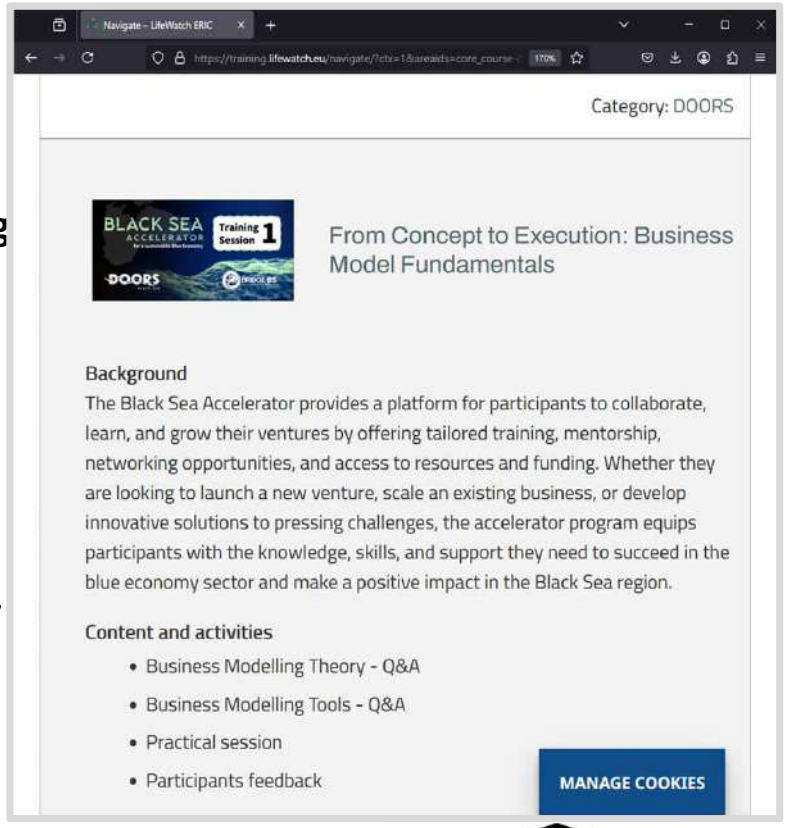
- DOORS has created a **free**, **publicly available** collection of **online Training Courses**, connecting DOORS research to vocational learners
- Available beyond DOORS on the LifeWatch online training platform
- See https://training.lifewatch.eu/, search for “DOORS”

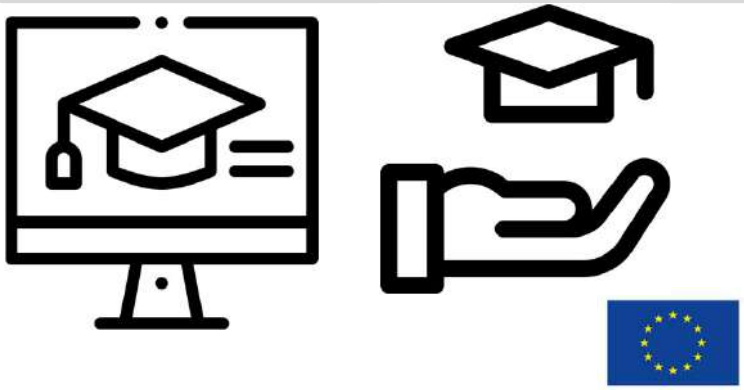
How to best utilise and apply this outcome:

- **Use the learning courses** as part of your professional development.
- Support universities to deliver **Micro-credentia**l courses, and **ERASMUS+ Blended Intensive Programmes** developed following DOORS guidance
- Support uptake of the courses into local languages (currently in English)

How this supports the CMA:

- Helps equip Black Sea entrepreneurs, innovators and next generation researchers with the latest knowledge about the Black Sea, and skills to innovate with
- Targets vocational, already working, learners as well as others





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Black Sea tailored university and college programme guidance

DOORS outcome:

- Black Sea universities and DOORS partners designed **a** targeted **Masters programme** – to build key regional skills for **Blue Economy**, **Marine Sciences**, and **Marine Policy**
- Masters Programme can be delivered as a **globally prestigious Erasmus Mundus** masters.
- Masters proposition also provides subject guidance for **micro-credential courses**, and **Blended Intensive (Learning) programmes** to immediately target regional skills weaknesses
- Course subjects are **based on extensive surveying** of Black Sea region's Blue Economy knowledge and skillset needs

How to best utilise and apply this outcome:

- **Use the analysis** to guide your national educational goals
- **Support** third level education institutes, universities and colleges, **to deliver courses** in line with the **guidance, and national ambitions**
- Support universities to **deliver the Masters Programme** in their application process

How this supports the CMA:

- Ensures the region's third level sector is actively involved in realising the CMA's Blue Economy ambitions
- Provides evidence-based guidance on what skillsets and knowledge need to be taught in the region.

Ocean Literacy Network

DOORS outcome:

- Established an Ocean Literacy Network in the Black Sea to **enhance public understanding** of ocean science, and sustainability
- Brings together **academia, NGOs, science communicators, and policy experts** from all Black Sea countries involved in DOORS

How to best utilise and apply this outcome:

- **Use the network** to seek expertise and advice
- **Support the work and administration** of this network, encouraging it to grow and embed itself within the Black Sea region
- **Get involved** in the DOORS Ocean Literacy Network, develop enhanced policy connections between your ministries and the Network communities (knowledge, activities, and expertise)

How this supports the CMA:

- The Network's activities foster public engagement, enhance scientific understanding, and promote sustainable practices
- It is a useful connection point to the Black Sea oceans community, for ministries seeking advice and knowledge

Our key-recommendations

- Transform the SoS in an operational Digital Twin (real time digital replica) of the Black Sea, where hydrographic basins are well connected to the Black Sea basin to drive Black Sea's resilience and prosperity
- Enhance the development of the blue economy by advancing sustainable practices, driving innovation, and strengthening collaboration across key maritime sectors
- Expand targeted training and education, from schools to formal and life-long forms for the Black Sea
- Use science and innovation to support a safe and secure Black Sea environment

Discussion: collating feedback on some questions

Moderator, **Jos Brils**, Deltares, The Netherlands

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Image: Adrian Stanica

Our questions to you:

A. Which of the presented outcomes and recommendations are useful to you and why?
   - Which of your existing activities or workstreams do they align with?

B. How likely are you to utilise and apply these outcomes and recommendations?
   - What challenges to application exist?
   - How can these challenges be overcome?

C. Do you have sufficient funding instruments available to be able to utilise, apply and sustain these outcomes and recommendations?
   - Which funding instruments you have?
   - Suggestions for establishing of new funding instruments?

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Thank you!

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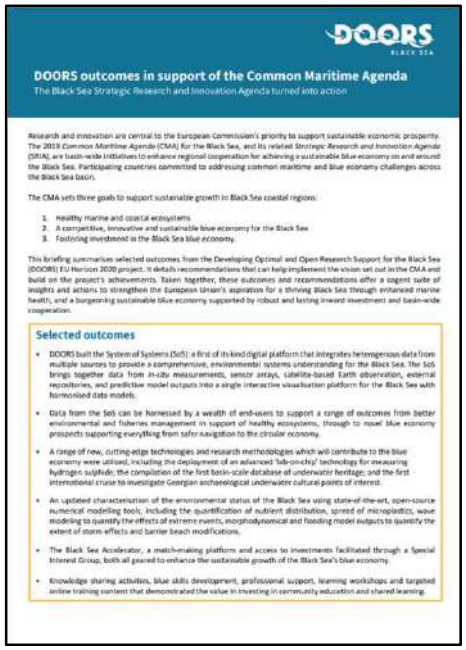
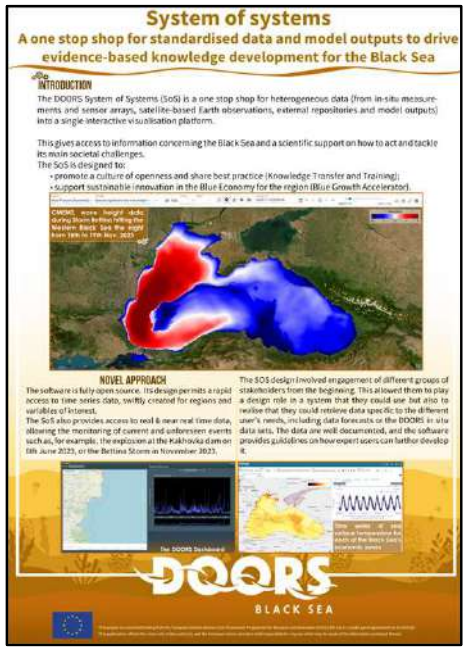
DOORS outcome:

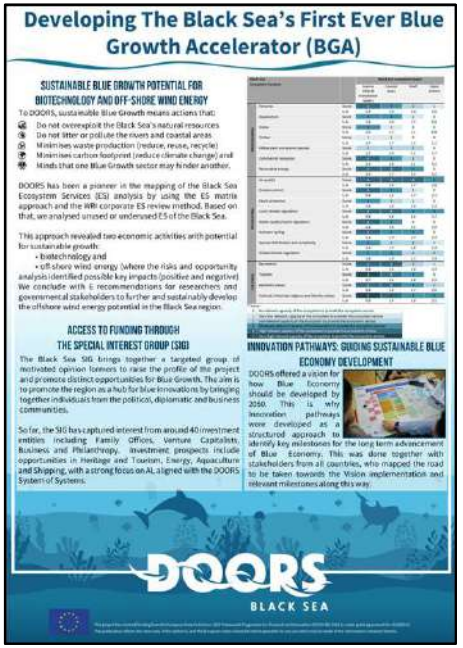
Briefing note



SoS factsheet



BGA factsheet



KTT factsheet

All available here: https://drive.google.com/drive/folders/1Wd5BbI1wPRQTlQ7U_nGFw4nMdwo9BSzc

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