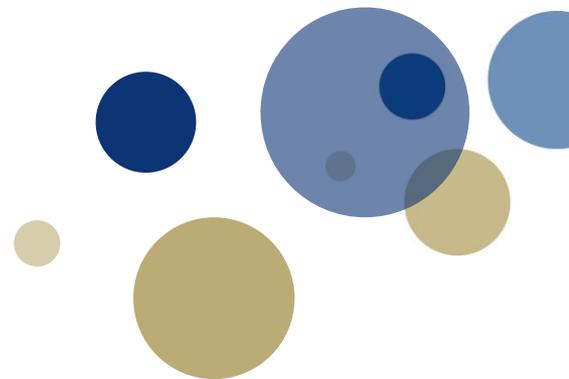




Norwegian University of
Science and Technology



The STOA study for the WMM KIC

Siri Granum Carson
Norwegian University of Science and Technology (NTNU)

Context: The need for a WMM KIC

- Topics of growing concern: Water scarcity and water quality, lack of sustainable practices in fishing and aquaculture, need for a green transition of the maritime sector, for circular models for water and wastewater treatment, and for affordable and efficient solutions for marine and freshwater ecosystems management.
- Europe today: Fragmented education, science, innovation and technology activities in these sectors and a disconnect between academic, research and entrepreneurial activities. “The European paradox”.
- Responsible innovation and technology development, including a more innovative public-private and cross-sector cooperation, is critical for finding holistic and affordable solutions to the sustainability challenges of the hydrosphere.

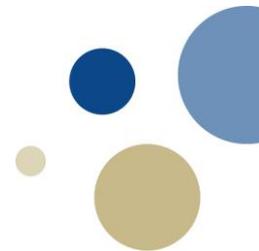


The STOA study

- Commissioned by the STOA panel for the Future of Science and Technology, European Parliament.
- Given overall aim: «*To confirm and qualify* the need to create a Knowledge and Innovation Community (KIC) within the EIT dedicated to Water, Ocean, Marine and Maritime Sectors, Technologies and Ecosystems».
- The study should «...assess the need for a WMM KIC and provide actionable recommendations for setting up WMM KIC and fulfilling its aims in a way that improves quality of life and benefits EU citizens».
- Our title: *Closing the Blue Loops – Responsible and Sustainable Innovation in the fields of Water and Ocean.*

Expert team

- PI: Siri Granum Carson, Norwegian University of Science and Technology (NTNU)
- Lead marine expert: Richard Sempere, Aix Marseille University (AMU)
- Lead maritime expert: Pentti Kujala (Aalto University)
- Lead water tech expert: Sveinung Sægrov (NTNU)
- Analysis support from Marilou SUC (Blue Connections)



Our four-step procedure

- ✓ Literature review; stakeholder mapping
- ✓ Survey, interviews
- ✓ SWOT and Gap analyses; case studies
- ✓ Compilation of key findings, incl. policy options brief
- ✓ Deadline mid-May



SWOT analysis

STRENGTHS

- Strong Research and Innovation Base
- Advanced Technological Infrastructure
- Comprehensive Policy Framework
- Collaborative Networks and Partnerships
- Advanced Digital Infrastructure: European Digital Twin Ocean – Ocean Observation network
- World-leading in development of Blue Technology
- Market Leadership in the Blue Economy
- Commitment to Sustainability and Climate Goals
- Funding and Investment Opportunities
- Skilled Workforce
- Public Awareness and Engagement
- European Leadership in Maritime Policy

WEAKNESSES

- Challenges in Cohesion and Cross-Sectoral Collaboration
- Limited Access to Funding for SMEs, Startups and applied research
- Insufficient funding and investment challenges
- Regulatory and Policy Hurdles
- Skills Gap and Workforce Development
- Public Awareness and Stakeholder Engagement
- Climate Change Adaptation and Resilience
- Data Availability and Technological Integration
- Lack of shared platforms for infrastructure, testing facilities, and capacity building
- Limited technology transfer and commercialization

SWOT analysis continued

OPPORTUNITIES

- Advancements in Blue Economy Technologies Leveraging the European Green Deal and Global Sustainability Trends
- Interdisciplinary and Cross-Sectoral/Transboundary Collaboration
- Policy and Regulatory Evolution
- Access to European and Global Markets Funding and Investment Initiatives
- Education and Workforce Development
- Societal Engagement and Awareness

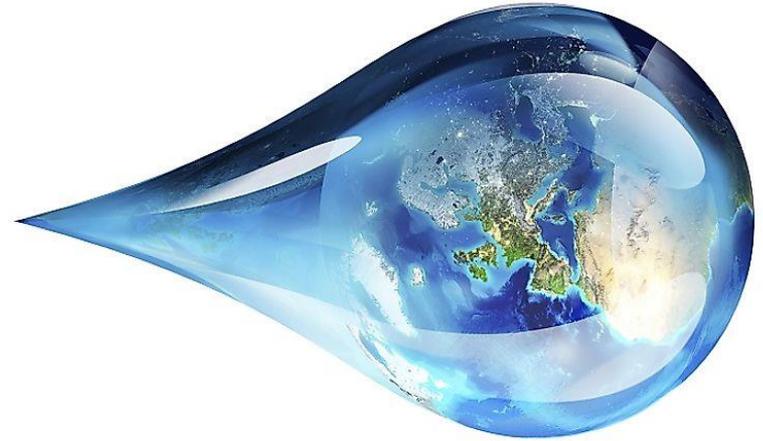
THREATS

- Climate Change and Environmental Degradation
- Economic Volatility and Funding Uncertainties
- Regulatory and Policy Barriers
- Technological Disruption and Adoption Rates
- Competition and International Rivalries
- Societal and Political Shifts
- Data Security and Cyber Threats
- Knowledge and Skill Gaps
- Geopolitical Tensions and Resource Conflicts



Transversal topics for a holistic approach to the hydrosphere

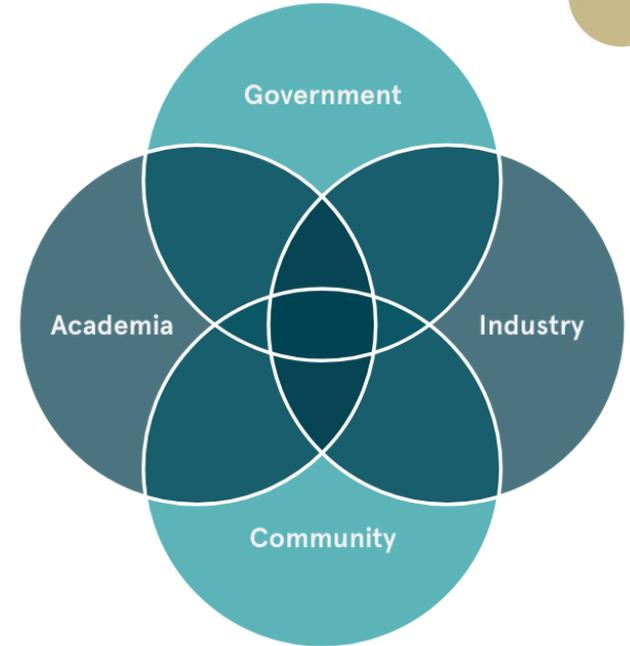
- Digitalization, data management and accessibility
- Cyber security
- Nature-based solutions.
- Autonomous systems and robotics for ocean and water monitoring
- Innovative governance of the hydrosphere
- Circular approach and water reuse, especially for industry, agriculture, and aquaculture



Source: Worldatlas.com

Policy Recommendations

- ✓ Integrative Legislation for the Hydrosphere
- ✓ Flexibility and Agility in Regulation
- ✓ Public-Private Partnerships (PPPs)
- ✓ Harmonization and Standardization
- ✓ Mission-Oriented Innovations
- ✓ Harmonise Legal Frameworks



Source: GRRIP Project (2020)

Overall conclusion from our analysis

- WMM KIC's capacity to contribute to European leadership in sustainable blue economy is supported by its strategic alignment with EU policies and the engagement of diverse stakeholders.
- Crucial policy, regulatory, and systemic deficiencies may be addressed through a WMM KIC, and could markedly enhance European innovation potential across ocean and water sectors.
- Need to balance the transformative potential of emerging ocean and water technologies against risk of misuse and unintended consequences => WMM KIC should support sustainable use and protection of crucial water and ocean resources, and create affordable solution to global challenges.

Thank you for your attention

Questions and comments are welcome!

