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Posters 1

[KSxAOV1I-13] Digital Twins of the Ocean for Mediterranean Climate Adaptation: Integrating Coastal Monitoring and Decision Support

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Climate change is intensifying risks across Mediterranean marine and coastal systems through sea-level rise, coastal erosion, marine heatwaves, biodiversity loss, water stress, and increasing pressure on coastal livelihoods and infrastructure. Despite significant advances in climate science, translating scientific knowledge into effective adaptation policies remains fragmented across the region.

This study presents the Regional Climate Change Adaptation Framework for Mediterranean Marine and Coastal Areas (2026–2035), developed to strengthen the science–policy interface and support climate-resilient coastal governance. The framework identifies four strategic pillars: (1) adaptive governance and stakeholder engagement, (2) ecosystem-based and scalable adaptation solutions, (3) improved access to climate adaptation finance, and (4) evidence-based decision support through integrated monitoring, research, and climate information services.

A central component of the framework is the operationalization of scientific knowledge through enhanced vulnerability and risk assessments, coordinated coastal and marine observatories, accessible climate data platforms, participatory approaches, and regional knowledge-sharing mechanisms. It also promotes the conservation of blue carbon ecosystems and encourages coordination among local, national, and regional stakeholders to accelerate climate adaptation.

By integrating environmental observations, monitoring systems, climate information, and stakeholder engagement into a coherent regional framework, this work provides an important foundation for future Digital Twins of the Ocean in the Mediterranean. The proposed approach demonstrates how interoperable monitoring networks and decision-support systems can strengthen climate resilience, improve coastal governance, and bridge the gap between scientific research and policy implementation under rapidly changing environmental conditions.

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