CIESM Congress Session : Geodynamics and marine geological hazards

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Session's Synthesis

This session featured four presentations on submarine landslides and their associated geological hazards, with a focus on the Tyrrhenian continental margins and the Levant Fracture system. The talks explored the distribution and morphology of mass-wasting features, the neotectonic reactivation of fault systems, and the factors contributing to submarine landslides.

Key findings highlighted the spatial distribution and morphometric analysis of landslide scars and submarine canyons, emphasizing the risks associated with mass-wasting processes along southern Italy's coastlines. The RETURN project investigates the preconditioning, preparatory, and triggering factors of submarine landslides at canyon heads. By examining multiple case studies, the project aims to deepen our understanding of slope instability and contribute to a time-based classification of landslide factors in the Mediterranean.

Research on the Aeolian-Tindari Letojanni Fault System (ATLFS)—a seismically active strike-slip fault system at the southwestern edge of the Ionian Slab—revealed the complex interplay of slab dynamics, crustal block movements, volcanism, and seismic activity. Additionally, studies of the Levant Fracture System offshore Northern Lebanon, utilizing 2D and 3D seismic data, showed ongoing neotectonic activity throughout the Quaternary period. This activity reactivated deep structures, creating features on the seafloor that pose seismic hazards to the Levantine basin.

The session concluded with a discussion on the challenges of effectively communicating the risks of submarine landslides and geological hazards to the public and policymakers. While Italy has made signficant progress in identifying landslide precursors and triggering factors, other countries need further research to systematically address the characteristics and areas at risk. A critical challenge is bridging the gap between scientific knowledge and policy action, as decision-makers often prioritize immediate concerns over less visible but potentially catastrophic threats. Building trust and fostering ongoing dialogue between scientists and policymakers is essential to promote a proactive approach to managing these hazards.

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