INTERNATIONAL LITHOSPHERE PROGRAM

Activity Report 2025 – Task Forces

Project Title: LithoMar - Assessing the relationships between lithospheric processes and seafloor topography at oceanic hotspots and divergent margins
Project No.: 2021-TF5
PI(s): A. Savini, S. Krastel, A. Micallef, P. Nomikou

1. Highlights of recent ILP Task Force work/results

The LithoMar Task Force (TF) continued to make significant progress in 2025, with activities ranging from participation in international conferences and field expeditions to the organization of training initiatives and editorial projects. Key highlights include:

- Oceanographic Expeditions: TF LithoMar leader and young researchers participated in the EXTREME25 oceanographic expedition (organized by UiT) aboard the R/V Kronprins Haakon (11-26 November 2025), focused on the exploration of extreme environments such as cold seeps and hydrothermal vents in the Arctic ocean. Among several surveyed sites, the Molloy Hole was of particular interest, as a new hydrothermal vent site was discovered on an oceanic core complex, representing a novel and geologically significant setting. In addition, Prof. Paraskevi Nomikou joined an oceanographic cruise in Santorini/Kolumbo region with the R/V Discovery in March 2025. Her involvement was crucial in explaining and further investigating the earthquake swarm that occurred in Santorini in February 2025, largely driven by tectonic activities.
- HAVEN Project – Ship Time Grant for R/V Gaia Blu: In 2024, the LithoMar TF submitted the HAVEN proposal ("Hydrothermal Venting in the Sicilian Channel: Implications for Fluid Tectonics and Benthic Habitats") to request ship time aboard the R/V Gaia Blu (CNR, Italy). The proposal was successfully selected. However, during negotiations with CNR to schedule the 10-day cruise, the expedition was postponed to 2026. As a result, no ILP funds were requested in 2025; the limited expenses incurred were covered by the remaining funds from 2021-2024 period.
- International School on Drone and VR for Volcano-Tectonic Studies (Etna, First Edition). Organized in collaboration with the ILP Task Force II led by Prof. Alessandro Tibaldi, this school combined expertise in marine-coastal and terrestrial environments. It strengthened ongoing collaborations between research groups working in Iceland and on Mt. Etna, particularly in the field of geomorphological and tectonic visualization through immersive technologies.
- Special Issue on Seamounts and Guyots – Editorial Planning: Planning began for a special issue dedicated to Seamounts and Guyots, inspired by the 2024 Falkor (too) expedition along the Sala y Gomez Ridge. The high-resolution bathymetric data collected revealed large volcanic structures (guyots) shaped by significant subaerial erosion, providing new insights into the evolution of this underwater volcanic chain. Guest editors for the volume have been identified, and preparations are ongoing.

2. Presence at international meetings/workshops (2025)

The majority of ILP LithoMar TF leaders participated in the EGU General Assembly 2025 (27 April – 2 May, Vienna), serving as conveners of the session "Submarine

Geomorphology", officially co-sponsored by ILP. Prof. A. Savini attended the ILP Business Meeting.

3. Important publications of ILP Task Force members (max. five)

- Panieri, G., Argentino, C., Savini, et al. (2025). Sanctuary for vulnerable Arctic species at the Borealis Mud Volcano. Nature Communications, 16(1), 504. https://doi.org/10.1038/s41467-024-55712-x
- Eilertsen, M. H., … Savini, A., Argentino, C., & Panieri, G. (2025). Faunal communities of Arctic deep-water methane seeps are specialised with links to hydrothermal vents. Deep-Sea Research Part I, 225, 104594. https://doi.org/10.1016/j.dsr.2025.104594
- Metcalfe, A., Druitt, T., Pank, K., Kutterolf, S., Preine, J., Beethe, S., Schmitt, A., Hübscher, C., Nomikou, P., …., & Sternai, P. (2025). Tectonic modulation of caldera volcanism on the South Aegean Volcanic Arc. Earth and Planetary Science Letters, 671, 119633. https://doi.org/10.1016/j.epsl.2025.119633
- Nomikou, P., et al (2025). Structural control and depth clustering of extensive hydrothermal venting on the shelf of Milos Island. Scientific Reports, 15(1), 42359. https://doi.org/10.1038/s41598-025-26398-y
- Isken, M. P., Karstens, J., Nomikou, P., et al (2025). Volcanic crisis reveals coupled magma system at Santorini and Kolumbo. Nature, 645, 939–945. https://doi.org/10.1038/s41586-025-09525-7

4. New contacts (2025)

- Marta Ribò. Auckland University of Technology: Auckland, NZ

5. Usage of ILP funding (2025)

A total of 2.111€ were used from ILP funds received from 2021 and 2024, to support Website Maintenance and conference participation:
-Renewal of the ICSLPE conference website domain and technical support (163,76€)
-Renewal of the WordPress subscription for the LithoMar TF website (86,29€)
-Travel expenses for Prof. A. Savini to attend the EGU 2025 in Vienna (1700 €)
-Field Expedition Support: Partial coverage of travel and participation costs for Alessandra Savini and Ph.D. student Fereshteh Hemmateenejad in the EXTREME25 expedition aboard the R/V Kronprins Haakon (161€)

6. Activities planned for 2026

The planned 2026 activities include:

- HAVEN Expedition (Sicily Channel – Mediterranean Sea): The LithoMar Task Force will coordinate the organization and execution of the HAVEN expedition aboard the R/V Gaia Blu (CNR, Italy) in September 2026. This cruise will focus on investigating volcanism in the Sicily Channel and their implications for fluid tectonics and benthic ecosystems. The expedition, originally planned for 2025, was postponed and is now scheduled for 2026.
- EGU General Assembly 2026: As in previous years, ILP will officially sponsor the session "Submarine Geomorphology", co-convened by LithoMar TF members.
- Special Issue and Paper on Guyots: The TF will contribute to a special issue dedicated to Seamounts and Guyots, launched following the 2024 Falkor (too) expedition. Within this framework, a paper will be prepared, offering a comprehensive review of guyot evolution and highlighting their significance in global geological processes. This document will serve both as a scientific synthesis and a strategic research roadmap for the community.
- International Conference on Seafloor Landforms, Processes and Evolution – Third edition, Durban, South Africa. The TF leaders will participate showing results from Flakor(too) expedition on seamounts and guyot of the Sala Y Gomez ridge.