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Seafloor observatories, benefits for the Marine and Earth Sciences and synergies

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It is widely recognised that seafloor observatories offer Earth and Ocean scientists new opportunities to study multiple, interrelated processes over time scales ranging from seconds to decades including episodic processes (such as volcanic eruptions, earthquakes, or biological, chemical and physical impacts of storm events); processes with periods from months to several years (like hydrothermal activity and biomass variability in vent communities); global and long-term processes such as the deep ocean dynamics, the oceanic lithosphere dynamics and thermohaline circulation.
Instrumented boreholes could be profitably interoperated in the seafloor observatory infrastructures with the advantage to provide sub-seafloor measurements as integration of seafloor ones, and also to share infrastructures (i.e., underwater cables and communication systems) and sea operation logistics.
This presentation describes the State-of-the-Art of the seafloor multidisciplinary observatories, with particular emphasis on the European experience. The benefits of the multidisciplinary approach for the Marine and Earth Sciences are also shown through some relevant examples. Finally the perspectives at International and European level are depicted towards the establishment of “permanent” submarine networks particularly addressed to the study of seafloor and water-column processes.