



## **Amphibic scientific drilling transect across the Hellenic subduction zone (HSZ)**

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Scientific drilling and long-term monitoring is a powerful way to monitor densely populated areas in Southern Europe, especially the HSZ (near megacities like Athens) and elsewhere to minimize societal and environmental dangers, which millenia ago destroyed entire cultures, two of the seven wonders of the world (Colossus of Rhodes 224 BC, Lighthouse on Pharos 365 AD) and several historical sites in the in the circum-Mediterranean. The Eastern Mediterranean hosts one of the most prominent retreating convergent margins worldwide that was capable to generate  $M > 8$  earthquakes (365 AD, western Crete, see above) and exhaustive volcanic eruptions (1650 BC, Santorini) in historic times. The HSZ is an ideal natural laboratory to study collisional processes which are well recorded over the past ca. 35 million years, including an intermittent stage of micro-continent collision between about 30 and 20 Ma, followed by breakoff of the subducting slab, and incipient collision with the passive African margin today. An “amphibic” scientific drilling approach is outlined for the HSZ from the accretionary complex to the volcanic arc. It comprises a northern (ICDP-driven) and a southern (IODP-driven) domain. Proposals for backstop drilling in the Cretan Sea (ICDP), on Crete (ICDP), and in the Mediterranean Ridge accretionary complex (IODP) have been developed to a comprehensive, multidisciplinary transect. With moderately deep marine drill sites (ca. 1 km depth) in the backstop region south of Crete, one continental 3-4 km deep drill hole onshore Crete, and further ICDP Glad800 offshore holes within the Cretan Sea (i.e. the forearc-backarc transitional zone) and the volcanic arc (i.e. the submerged Kolumbo volcano as part of the Santorini volcanic complex), a substantial contribution to the understanding of earthquake hazard and mitigation, tectonic evolution and rheology of active collision zones

is anticipated.