

AGU Fall Meeting 2021

Session T024: Records of continental rifting and their fidelity

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The North Evia Gulf Rift System in Central Greece: An Asymmetric Rift in the North Anatolian Fault Prolongation (WATER Project)

Eastern Mediterranean Domain is controlled by coeval westward extrusion of the Anatolia-Aegean microplate, mainly accommodated to the north by the North Anatolian Fault, and by the northward subduction of the African Plate beneath the Aegean Domain. This subduction trench retreats southward since the Eocene times, inducing widespread back-arc extension within the upper plate. This crustal stretching is responsible for the opening of several rift basins such as the Corinth Gulf and the Sperchios Basin – North Evia Gulf. The later developed during a late Pliocene to Quaternary major extensional episode coevally with clockwise rotations on the western side of the Aegean Domain. Several km-scale normal fault systems, still seismically active, have been precisely characterized onshore and offshore. The WATER surveys (Western Aegean Tectonic Evolution and Reactivations), conducted in 2017 and 2021 onboard the R/V “Téthys II”, allowed to acquire more than 2000 km of very high resolution seismic reflection profiles (Sparker 50-300 Joules) around the North Evia Island (North Evia Gulf, Oreoi Channel and Skopelos Basin) in order to constrain the deformation pattern inside the rift basin and to precise the variations in fault polarities. The new dataset issued from these surveys allows us to constrain the onshore-offshore continuum of the structures and to discuss the overall geometry of the rift in this particular context. Our results show that the major km-scale faults from the rift borders have strong offset variations and vanish rapidly along-strike (WNW-ESE). Moreover, the overall geometry of the rift also changes along-strike with the main bordering fault being alternatively on both sides of the basin. This active continental rifting is characterized by a clear subsidence partitioning. The western part is mainly driven by north-dipping faults (Ipati - Sperchios FZ, and Kamena Vourla - Arkitsa FZ) whereas subsidence in the eastern part is mainly controlled by the south-

dipping Aedipsos - Politika Fault System running along the North Evia coast. This area corresponds with the deepest part of North Evia Gulf (450 m), and with high reliefs in North Evia Island. We discuss this asymmetrical organization with polarity changes between western and eastern parts of the rift as well as inheritance from crustal-scale structures.