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Late Holocene sea level changes along the coast of Southwestern Turkey

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A multi-disciplinary survey has been performed along the coast of southwestern Turkey in order to determine relative sea level changes during the Late Holocene. Especially, the submergence of harbour structures of the ancient coastal settlements provides noticeable evidence for eustatic sea level rise and/or tectonic subsidence. In addition, the traces of bioerosion produced by some organisms along the limestone coasts formed at mean sea level position represent a remarkable data of paleoshorelines. These traces can be found below the current sea level nowadays due to relative sea level rise. Both archaeological and biological data provide an important source on the amount and period of relative sea level rise along the coasts of southwestern Turkey-southeastern Aegean Sea. This region is under the influence of active tectonism as a result of the collision of the Arab-African and Eurasian plates. Thus, a large number of earthquakes have occurred in this zone which must have been an impact on submergence of ancient harbour structures and geomorphological formations. This area is located very important zone in terms of being tectonically active, having a large number of ancient coastal settlements, and consisting of limestone lithology. A number of submerged archaeological structures and bioerosion formations have been investigated by measuring the depths of remains with respect to the present sea level. By comparing the eustatic sea level change, current elevations and construction time of archaeological remains, which dated taking into account construction techniques and ceramic findings, we determine the amount of relative sea level change. In addition, numerous active faults have been detected by performing seismic survey. The results indicate that the vertical tectonic movement has much more effect on submergence of archaeological and geomorphological features than eustatic sea level rise. Uncovering the role of the tectonic movement and sea level changes on the submergence of coastal settlements shed light on the management of the coastal zone in the future.