



Burried MIS 5 abrasion platforms in the Bay of Koper (Gulf of Trieste, Northern Adriatic) confirm long-term subsidence of the Northern Adriatic region

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The youngest seafloor sediments of the Gulf of Trieste (Northern Adriatic) are represented by an up to several 100 meters thick succession of Pliocene to Quaternary continental and shallow-marine deposits recording numerous transgressive-regressive cycles. These sediments are separated from older lithologies (mainly Eocene flysch) by an erosional unconformity. Previous geophysical campaigns conducted in the Italian part of the Gulf of Trieste revealed a complex undulating morphology of the unconformity characterised by numerous morphological steps in the flysch appearing between 40 and 200 m below sea level. From correlation with onshore well data from the Friuli and Veneto area it is assumed that the highest system of these unconformities located at approximately 40 mbsl represents a marine abrasion platform formed during the MIS 5 period sea-level highstand. We present the first observations of these abrasion platforms in the Bay of Koper in the southern (Slovenian) part of the Gulf of Trieste.

A series of perpendicular sub-bottom sonar profiles with a spacing of 250-500 meters was acquired in the Bay of Koper between 2009 and 2012 with the Innomar parametric sediment echo sounder SES-2000. Along the northern coast of the bay several acoustic facies were resolved, including the top erosional unconformity surface of the flysch. On this surface we located platforms at 35 ms (platform A), 40 ms (platform B) and 50 ms (platform C) of two-way-travel time. The top of abrasion platform B coincides with the top of a sediment progradational wedge which overlies abrasion platform C. No progradational wedge is developed at the top of platform A. Due to signal attenuation and multiples sub-bottom profiles could not be interpreted below 53 ms TWT time. We used a sound velocity of 1650 m/s for the time to depth conversion, which places the platforms at the depth of 28, 33 and 41 mbsl, respectively. Assuming that the abrasion platforms are a remnant of the MIS 5 highstand, this implies an average subsidence rate of the area between 0.28 and 0.38 mm/year, which agrees with previously published data for the Gulf of Trieste.

This new dataset demonstrates that the Bay of Koper was connected to the Adriatic Sea approximately 125,000 ky ago during the MIS 5 sea-level highstand. Together with marine abrasion platforms and well data previously documented in the northeastern part of the Gulf of Trieste and well data from the northwestern part of the gulf our data corroborates the long-term subsidence of the Northern Adriatic region.