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Artificial pebbles nourishment on microtidal sandy beaches

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Artificial beach nourishment has become a common practice in coastal engineering. On sandy beaches, initiatives are emerging concerning pebble nourishment. Indeed, by increasing the granulometry, coastal managers hope to reduce shoreline recession more significantly than what would have been achieved by artificial sand nourishment.

In this presentation we estimate the effectiveness and impact of artificial pebble nourishment on two microtidal beaches along the French Mediterranean coastline: (1) exposed to wave in Camargue (annual $H_{sig} = 3.5\text{m}$) and (2) subjected to low wave (annual $H_{sig} < 2.0\text{m}$) along the shoreline of the Etang de Berre. In both cases the beach has been recharged in order to widen it. On the beach exposed to waves, the nourishment did not significantly slow the retreat of the shoreline, whereas it succeeded in stabilizing it on the less exposed beach. In the Camargue, pebble deposits reworked by waves take the form of overwash. In both cases, the pebbles are subject to the dominant longshore littoral drift which exports the pebbles outside the nourished zone. We do not observe any significant morphological evolution of the surf zone, although we would expect an increase in slope in relation to the morphology that has become rather reflective in the swash zone. The pebbles remain on the foreshore and beach without moving offshore.