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Estimation of longshore sediment transport: the case of Lithuania

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The Baltic Sea is a semi-enclosed sea that connects with the Global ocean through the Danish straits. The Lithuanian coast of the Baltic Sea is a generic type of almost straight, relatively high-energy, actively developing coasts that (1) contain a large amount of finer, mobile sediment, (2) are open to predominating wind and wave directions, and (3) are exposed to waves from a wide range of directions.

The combination of angular wind distribution and coastal geometry is such that the longshore sediment transport caused by waves is, on average, to the north through the entire Curonian Spit and the mainland coast of Lithuania. This predominant sediment flow means that sediment availability or transportation changes in these areas significantly impact the sediment budget north of Klaipėda. While sediment flows along the spit predominantly occur under natural conditions, further sediment transport to Lithuania's mainland coast is obstructed by jetties and breakwaters of Klaipėda Port, out-flowing currents from Klaipėda Strait, dredging of the port entrance channel, and other factors.

Knowledge of the cross-shore distribution of longshore sediment transport in the surf zone is necessary to design and plan groins, jetties, weirs, and pipeline landfalls.

Accurate estimation of the longshore sediment transport distribution helps understand spit development, migration of sediments, natural or artificial, and the development of other coastal morphologic features.