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# Environmental Sensitivity Index: Estonian shoreline geology classification (Gulf of Finland, Baltic Sea)

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At International Maritime Organization's (IMO) Marine Environment Protection Committee's 53rd session in July 2005, the Baltic Sea was designated as a Particularly Sensitive Sea Area (PSSA). At the same time the oil transportation is growing significantly in the Baltic Sea area and especially in the Gulf of Finland exceeding 250 million tons a year by 2015. Despite of improving navigation measures there is a growing risk for incidental oil spills and associated oil pollution. Oil spill accident history and simulations show that once the oil spill at sea has occurred, it is almost impossible to prevent it from reaching ashore. Advice on sensitive shoreline likely to be impacted by the oil washing ashore is of critical importance in order to support decisions whether or not a response is necessary or what kind and extent of response is appropriate. Furthermore, choices made in cleanup strategies and the decision-making process in the aftermath of a spill are significantly affecting the cleanup costs. This paper introduces the Environmental Sensitivity Index (ESI) shoreline geology classification adapted and modified according to the environmental conditions of the Estonian coast of the Gulf of Finland (Baltic Sea) and ranked according to substrate type and grain size related natural persistence of oil and ease of cleanup. Relative exposure to wave (hydrodynamic energy level) and the shoreline slope are characterized and taken into account. The length of the shoreline is over 700 km. The most common shore types are till shores (40%) and sandy shores (25%). Long stretches of cliff shores (11% in total) and gravel-pebble shores (10%) on the close neighborhood of the cliffs are the most characteristic features of the Estonian coast of the Gulf of Finland. Silty shores and artificial shores make up to 7% and 6% respectively of the total shoreline length here. Over 2/3 of the shores here are with very high ESI values. Till shores are often covered by coarse gravel, pebble, cobble and boulders (finer grained sediments are washed away) making this type of the shores very difficult to clean up and at the same time creating ideal conditions for numerous biological species. Gravel-pebble shore is probably the most difficult shore type to recover from the potential oil pollution while the cliff shores are the most difficult to access from the land. Issue is exemplified by the series of the oil spill scenario simulation results showing the practical use of the adapted ESI shoreline geology classification.