

An issued-based and adaptive management approach to coastal resource systems – Case Study: The coastal front of Rälla

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Abstract

Beach wrack prevention, management and utilization have attracted much attention at the international level, as it has been globally distributed and estimated as waste in coastal areas. Poor management of beach wrack waste has negatively impacted the global economy, society and environment. All this has progressively led to the awareness that a more systematic approach to beach wrack could have been useful to the circular economy.

The application of beach wrack biomass for energy production is multifarious in worldwide. Beach wrack utilization frequently results in the practical processing of energy carrier, feedstock and biological high nutrient fertilizer.

The investigated segment of the baltic coastal beach at western Öland is covered by decomposing algae. Along the coastline of Öland, beach wrack is exposed to periods of winter storm events, wind actions and also at other high tidal inundation. The nature and sources of wrack regularly depend on the macroalgae and seagrass species developing on the seabed in the adjoining waters. This study is carried out to assess the growth and decomposition role of beach wrack on the biochemical cycles of certain heavy metals (Hg, Cd, Pb, Cu, Ni, Cr and Zn) in unmanaged beaches. The coastal front of Rälla beach is temporarily flooded by brackish seawater from the Baltic Sea, improving the nutrient conditions of the area and resulting in a relatively high concentration of NaCl in the soil. Thus the soil conditions were rich in nutrients stimulating vegetation's composition with high nutrient demand, and mainly in mono-cultures.

Keywords: beach wrack, vegetation, heavy metals, Baltic Sea