

## **STENCIL - Strategies and Tools for Environment-friendly Shore Nourishments as Climate Change Impact Low-Regret Measures**

Stefan Schimmels (1), Catrina Cofalla (2), Björn Deutschmann (3), Caroline Ganal (2), Rik Gijsman (4), H. Christian Hass (5), Henner Hollert (3), Finn Mielck (5), Thorsten Schlurmann (4), Holger Schüttrumpf (2), Gholamreza Shiravani (1), Franziska Staudt (1), Agnieszka Strusinska (6), Jan Visscher (4), Karen Wiltshire (5), and Johanna Wolbring (6)

(1) Forschungszentrum Küste (FZK), Merkurstr. 11, 30419 Hannover, Germany, (2) Institute of Hydraulic Engineering and Water Resources Management, RWTH Aachen University, Templergraben 55, 52062 Aachen, Germany, (3) Institute for Environmental Research, RWTH Aachen University, Worringerweg 1, 52074 Aachen, (4) Ludwig-Franzius-Institute for Hydraulic, Estuarine and Coastal Engineering, Leibniz Universität Hannover, Nienburger Str. 4, 30167 Hannover, Germany, (5) Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Wadden Sea Research Station, Hafensstraße 43, 25992 List/Sylt, Germany, (6) Leichtweiß-Institute for Hydraulic Engineering and Water Resources, Technische Universität Braunschweig, Beethovenstr. 51a, 38106 Braunschweig, Germany

Shore nourishments are regarded as an almost routine coastal protection measure and have been carried out worldwide for several decades. Recent studies generally conclude that “soft” coastal protection measures are an effective option for a sustainable coastal management. However, more research on economic sustainability, species-specific habitat demands and availability of sand deposits is required.

Nowadays, the recent paradigm shifts to concepts like the Integrated Coastal Zone Management (ICZM) and the Ecosystem Approach to Management (EAM). For the German Wadden Sea these management objectives are an important issue of the “Wattenmeerstrategie 2100” (MELLUR-SH, 2015), a political strategy report that demands an adaptation against the global change and the expected sea-level rise up to the year 2100. Hence, also new concepts and tools for the implementation of more sustainable, effective and environment-friendly shore nourishments are needed.

The research project STENCIL joins the expertise of coastal engineers, geologists, biologists and toxicologists in order to make a first step towards the long-term goal of establishing an ICZM and EAM for shore nourishments in the German Wadden Sea. The project focuses on providing improved tools, models and methods for the prediction of coastal hydro- and morphodynamics. Furthermore, the impact of dredging and dumping activities on benthic habitats and their natural regeneration potentials will be evaluated. Since these impacts are still widely uninvestigated, monitoring of dredging areas and the surrounding sites using hydroacoustic devices, aerial photos and sediment samples for grain-size and benthos analysis remains of high importance.

In order to develop standardized operative observation methods, analysis and decision-supporting tools, an implementation of field measurements, laboratory experiments as well as conceptual and numerical models is planned. These combined approaches will result in valuable data sets for habitat evaluation, improved prediction methods as well as process and work-flow studies.

Finally, a strategy for future planning and monitoring of shore nourishment projects will be established in close cooperation with the coastal authorities.

STENCIL has recently started in October 2016 within the research program “Research for sustainable development” (FONA) of the German Federal Ministry of Education and Research (BMBF). The poster will give an overview of the project structure and present the research objectives and methods in more detail.