

Accepted Manuscript

Cross-shore stratified tidal flow seaward of a mega-nourishment

Saulo Meirelles, Martijn Henriquez, Ad Reniers, Arjen P. Luijendijk, Julie Pietrzak, Alexander R. Horner-Devine, Alejandro J. Souza, Marcel J.F. Stive



PII: S0272-7714(16)30633-3

DOI: [10.1016/j.ecss.2017.10.013](https://doi.org/10.1016/j.ecss.2017.10.013)

Reference: YECSS 5649

To appear in: *Estuarine, Coastal and Shelf Science*

Received Date: 26 December 2016

Revised Date: 12 October 2017

Accepted Date: 16 October 2017

Please cite this article as: Meirelles, S., Henriquez, M., Reniers, A., Luijendijk, A.P., Pietrzak, J., Horner-Devine, A.R., Souza, A.J., Stive, M.J.F., Cross-shore stratified tidal flow seaward of a mega-nourishment, *Estuarine, Coastal and Shelf Science* (2017), doi: 10.1016/j.ecss.2017.10.013.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Cross-shore stratified tidal flow seaward of a mega-nourishment

Saulo Meirelles^a, Martijn Henriquez^a, Ad Reniers^a, Arjen P. Luijendijk^{a,b}, Julie Pietrzak^a, Alexander R. Horner-Devine^c, Alejandro J. Souza^d, Marcel J. F. Stive^a

^a*Department of Hydraulic Engineering, Delft University of Technology, Delft, the Netherlands.*

^b*Deltares, Delft, the Netherlands.*

^c*Department of Civil and Environmental Engineering, University of Washington Seattle, USA.*

^d*National Oceanography Center, Liverpool, the United Kingdom.*

Abstract

The Sand Engine is a 21.5 million m^3 experimental mega-nourishment project that was built in 2011 along the Dutch coast. This intervention created a discontinuity in the previous straight sandy coastline, altering the local hydrodynamics in a region that is influenced by the buoyant plume generated by the Rhine River. This work investigates the response of the cross-shore stratified tidal flow to the coastal protrusion created by the Sand Engine emplacement by using a 13 hour velocity and density survey. Observations document the development of strong baroclinic-induced cross-shore exchange currents dictated by the intrusion of the river plume fronts as well as the classic tidal straining which are found to extend further into the nearshore (from 12 to 6 m depth), otherwise believed to be a mixed zone. Estimates of the

*Saulo Meirelles

Email address: s.meirellesnunesdarocha@tudelft.nl (Saulo Meirelles)

Download English Version:

<https://daneshyari.com/en/article/8885072>

Download Persian Version:

<https://daneshyari.com/article/8885072>

[Daneshyari.com](https://daneshyari.com)