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Beach wrack and the issue of methane release, the case of Køge Beach

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Accumulation of beach wrack may lead to methane emissions

1000 to 10000 tons per year





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CONTRA
BALTIC BEACH WRACK
CONVERSION OF A NUISANCE TO A RESOURCE AND ASSET

Accumulation of beach wrack may lead to methane emissions

nature
geoscience

ARTICLES

<https://doi.org/10.1038/s41561-021-00715-2>

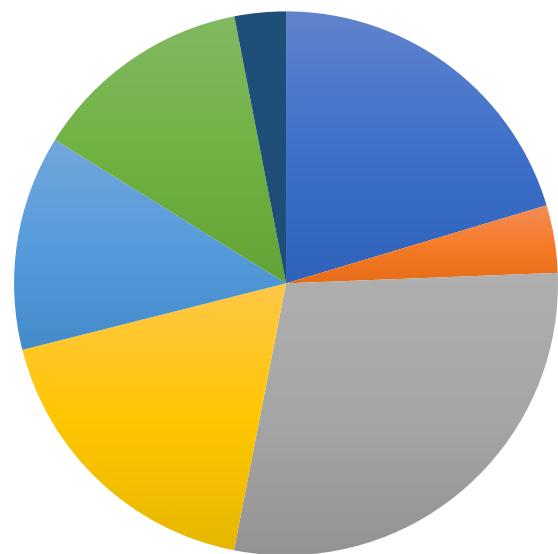


Half of global methane emissions come from highly variable aquatic ecosystem sources

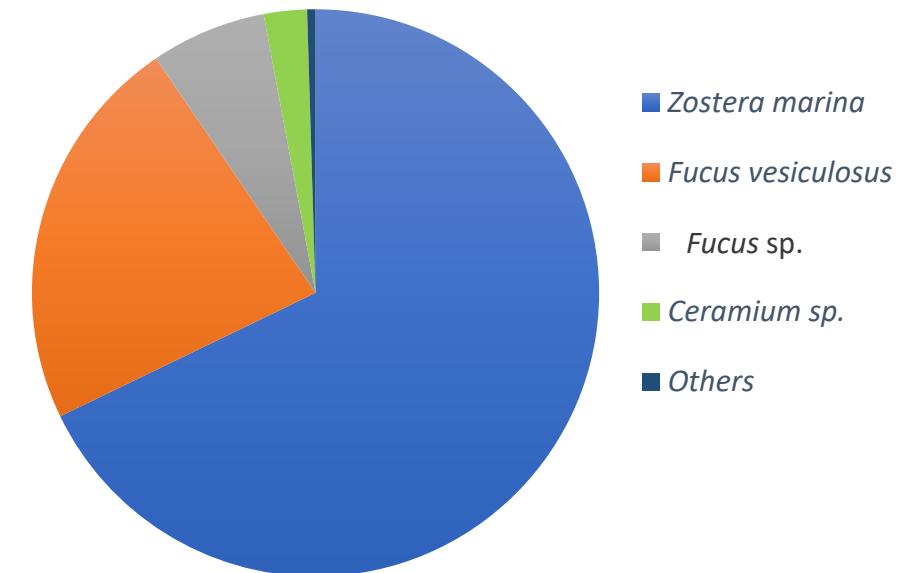
Judith A. Rosentreter^{1,2✉}, Alberto V. Borges³, Bridget R. Deemer⁴, Meredith A. Holgerson^{5,6,7}, Shaoda Liu^{2,8}, Chunlin Song^{9,10}, John Melack¹¹, Peter A. Raymond², Carlos M. Duarte^{12,13}, George H. Allen¹⁴, David Olefeldt¹⁵, Benjamin Poulter¹⁶, Tom I. Battin¹⁷ and Bradley D. Eyre¹

Køge Managed beach

Composition year - new wrack (%)



Composition year - old wrack (%)



How much GHGs are released?





Areal estimation of GHG

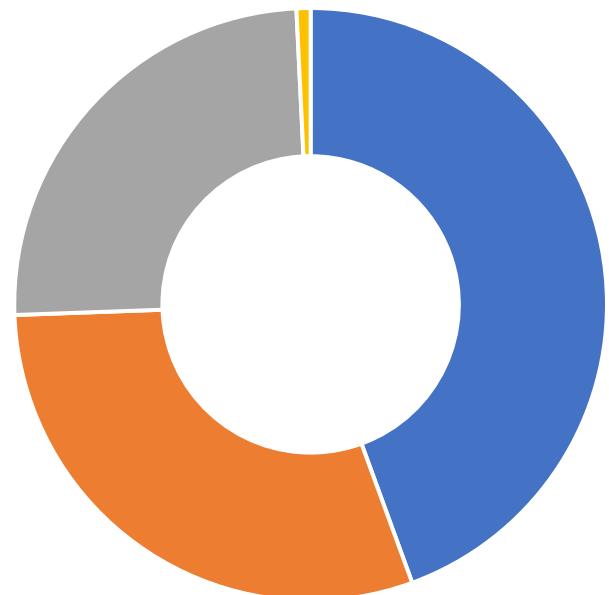
Køge Beach	CO ₂ eq (tons yr ⁻¹)
Total Managed	53.0
Sand	23.5
Water	15.9
NW	13.1
OW	0.4
Total Unmanaged	25.0
Sand	2.0
Water	9.0
NW	11.2
OW	2.7

Pile of BW: 12 tons yr⁻¹
Total Managed: 65 tons yr⁻¹

Diffusive emission in eutrophic
lake: 300 tons yr⁻¹

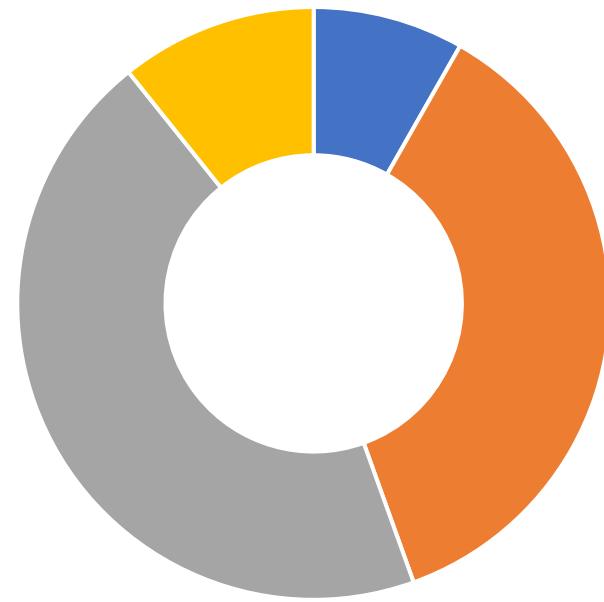
Total emission of GHG

Køge Managed Beach



■ Sand ■ Water ■ NW ■ OW

Køge Unmanaged Beach



■ Sand ■ Water ■ NW ■ OW

Summary

- New wrack and macrophytes in the water release highest amount of CH₄
- New wrack and sand release highest amount of CO₂
- Management practices led to high water and sand GHG emissions
- Areal estimates suggest 2-fold higher GHG emissions in managed compared with unmanaged beach
- Management should consider cleaning of material in the water