Supplementary Material

1 Supplementary Tables

Supplementary Table 1. Number of living foraminiferal specimens retrieved per site, genus and depth range.

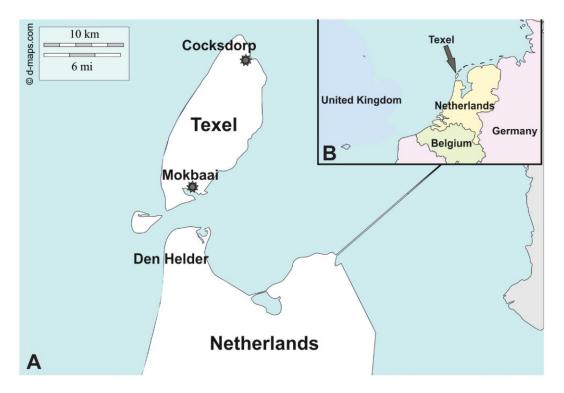
| Site | Conva | No. of spe | Total | | | |
|--------------|---------------|------------|--------|---------|-------|--|
| Site | Genus | 0-2 cm | 2-6 cm | 6-10 cm | Total | |
| | Ammonia sp. | 4 | 4 | 3 | 23 | |
| Mokbaai | Elphidium sp. | 1 | 3 | 6 | | |
| | Haynesina sp. | 0 | 1 | 1 | | |
| de Cocksdorp | Ammonia sp. | 0 | 0 | 0 | | |
| | Elphidium sp. | 3 | 2 | 0 | 5 | |
| | Haynesina sp. | 0 | 0 | 0 | | |
| | Sum | 8 | 10 | 10 | 28 | |

Supplementary Table 2. Sediment contents in organic carbon, nitrogen, their ratio (C/N) and their averages for the selected depth ranges.

| Site | Depth (cm) | N | C | C/N_ wt | C/N_ mol | Depth Range (cm) | N Average | C Average | C/N_wt Average | C/N_mol Average |
|------|------------|------|------|------------|-------------|------------------------|--------------|--------------|-------------------|--------------------|
| M | 0-1 | 0.06 | 0.63 | 10.77 | 12.57 | | | | | |
| M | | | | | | 0-2 | 0.07 | 0.75 | 10.25 | 11.96 |
| | 1-2 | 0.09 | 0.87 | 9.73 | 11.35 | | | | | |
| M | 2-3 | 0.11 | 1.03 | 9.01 | 10.52 | 2-6 | 0.07 | 0.74 | 10.47 | 12.21 |
| M | 3-4 | 0.07 | 0.70 | 10.28 | 12.00 | | | | | |
| M | 4-5 | 0.06 | 0.64 | 10.99 | 12.82 | | | | | |
| M | 5-6 | 0.05 | 0.60 | 11.58 | 13.51 | | | | | |
| M | 6-7 | 0.05 | 0.55 | 12.01 | 14.02 | 6-10 | 0.05 | 0.63 | 11.54 | 13.47 |
| M | 7-8 | 0.06 | 0.68 | 11.33 | 13.22 | | | | | |
| M | 8-9 | 0.05 | 0.60 | 11.88 | 13.86 | | | | | |
| M | 9-10 | 0.06 | 0.69 | 10.95 | 12.78 | | | | | |
| С | 0-1 | 0.14 | 1.10 | 8.10 | 9.45 | 0-2 | 0.13 | 1.08 | 8.26 | 9.63 |
| С | 1-2 | 0.13 | 1.06 | 8.41 | 9.81 | | | | | |
| C | 2-3 | 0.22 | 1.54 | 6.89 | 8.04 | 2-6 | 0.15 | 1.18 | 8.31 | 9.69 |
| С | 3-4 | 0.08 | 0.81 | 9.73 | 11.35 | 2-0 | 0.13 | 1.10 | 0.31 | 9.09 |

 $N = total \ nitrogen \ content \ (weight \% \ of \ dry \ sediment); \ C = organic \ carbon \ content \ (weight \% \ of \ dry \ sediment); \ C/N_wt = C/N \ ratio \ (g\% \ C/g\% \ N); \ C/N_mol = C \ mol/N \ mol.$ $M = Mokbaai; \ C = de \ Cocksdorp.$

2 Supplementary Figures

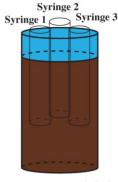


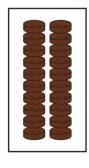
C

1. A core was subsampled with three 50 ml truncated syringes.

3. Syringe 3 was sliced outside the glove bag at 1 cm interval down to 10 cm depth. From each slice a small subsample, approximately 1-1.5 g of sediment, was taken with a sterile spatula to obtain environmental DNA samples (eDNA). These were immediately frozen in liquid nitrogen and stored at -20°C. The remaining sediment from each slice was used for analyses of living foraminifera.

5. Healthy looking foraminifera with intact protoplasm were picked from the sediment. The vitality of the specimens was further assessed based on motility and only the ones that moved were used for subsequent analyses.











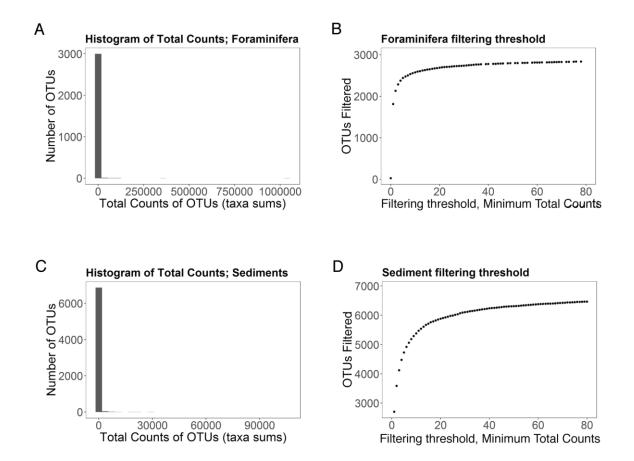


2. Syringes 1 and 2 were directly transferred to a nitrogen filled glovebag where they were sliced at 1 cm resolution down to 10 cm depth. The slices were transferred to centrifuge tubes. Tubes were centrifuged outside the glove bag. After, supernatant was filtered in the glove bag and preserved for subsequent analyses. The remaining sediment was frozen at -20°C and used for solid phase analyses, such as sedimentary organic carbon content.

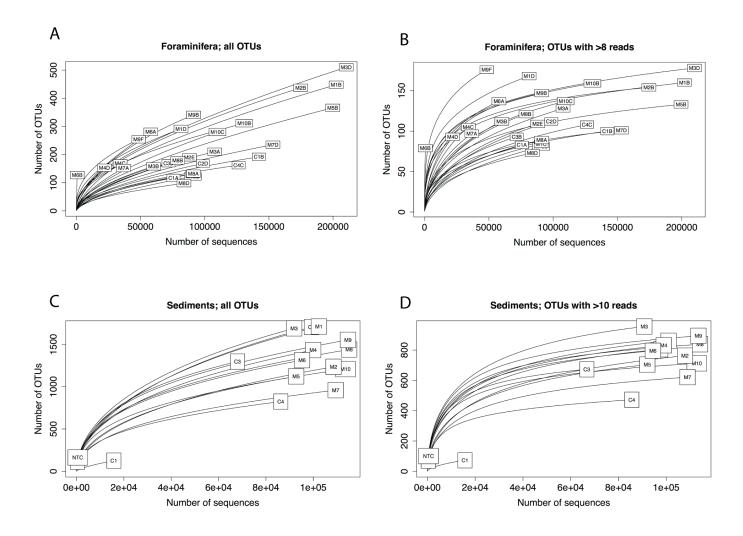
4. Sediment reserved for foraminiferal analyses was sieved over 125μm with filtered seawater.

6. Living specimens were cleaned and rinsed three times in sterile artificial seawater. After, each specimen was preserved in RNA*later* solution.

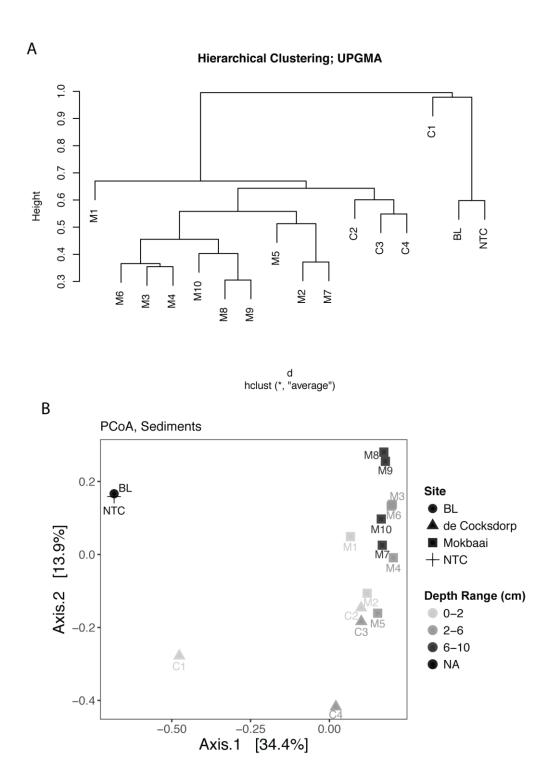
Supplementary Figure 1. Map of the sampling area. **(A)** Overview of the wider North Sea area. **(B)** The sampling sites (de Cocksdorp, Mokbaai) on the island of Texel, Netherlands. Map modified from http://d-maps.com/. **(C)** Schematic of the sediment and foraminifera sampling process.



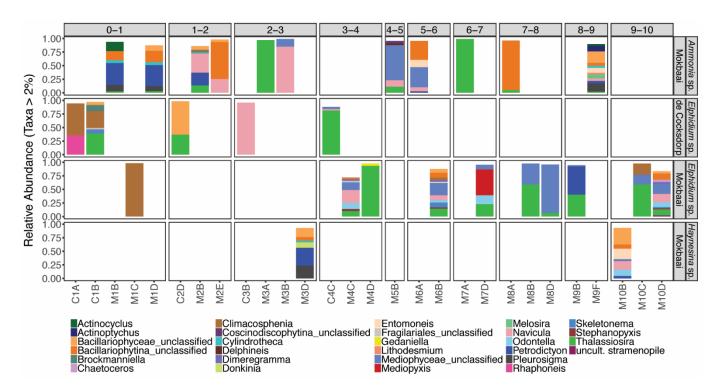
Supplementary Figure 2. Total counts (total number of observations of an OTU across all samples) in (A) the foraminiferal (C) the sediment dataset, and cumulative sum of OTUs that would be filtered against the total counts for (B) foraminiferal and (D) sediment datasets. A filtering threshold of ≥ 8 total counts was applied to foraminifera (retaining 99.86% of total sequence reads) and ≥ 10 total counts to sediments (retaining 99.03% of total sequence reads).



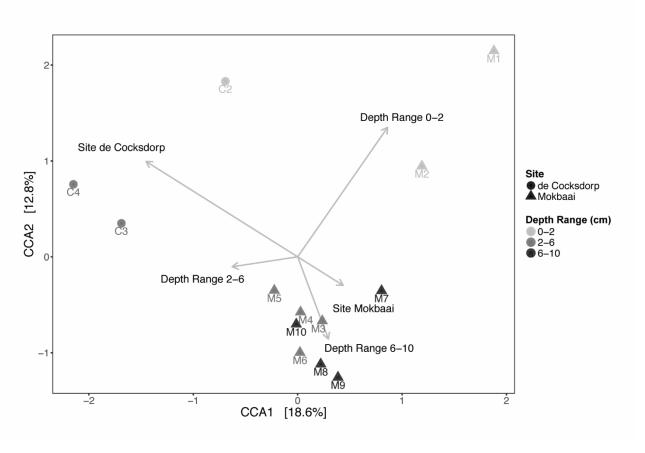
Supplementary Figure 3. Rarefaction curves of foraminiferal (**A**, **B**) and sediments datasets (**C**, **D**) using all the OTUs (**A**, **C**) and after application of the filtering threshold for OTUs containing low number of reads (**B**, **D**).



Supplementary Figure 4. (A) Hierarchical clustering of the sediment OTUs using the Unweighted Pair Group Method with Arithmetic Mean (UPGMA), based on a Bray-Curtis distance matrix. (B) Principal Coordinate Analysis (PCoA) of the sediment data. Samples are grouped by depth range (cm). BL=blank sample of the DNA extraction kit; NTC=PCR non-template control; NA=not applicable. "C" indicates de Cocksdorp and "M" Mokbaai samples.



Supplementary Figure 5. Relative abundance of diatoms at genus level inside the foraminifera specimens (showing diatom genera with >2% abundance., i.e. 93.54% of all diatom sequences). Sediment depth intervals (cm) are shown on the top grid, foraminiferal species (*Ammonia* sp., *Elphidium* sp., *Haynesina* sp.) and sampling sites (de Cocksdorp, Mokbaai) on the side.



Supplementary Figure 6. Canonical Correspondence Analysis (CCA) of sediment communities. Samples from different sediment depths (cm) are grouped in three depth ranges: 0-2 cm, 2-6 cm and 6-10 cm. "C" indicates samples from de Cocksdorp and "M" from Mokbaai. Arrows, indicating the correlation between the canonical axes and the explanatory variables, are only shown for the significant variables. Average organic carbon content (in weight % of dry sediment), average total nitrogen content (in weight % of dry sediment) and average C/N per depth range (C mol/ N mol) were also included in the CCA model but were not significant (p>0.1).