

Enhanced benthic nitrous oxide and ammonium production after natural oxygenation of long-term anoxic sediments - Processes and pools in the benthic nitrogen cycle after natural oxygenation of long-term anoxic sediment

SND-ID: 2022-12-1. **Version:** 1. **DOI:** <https://doi.org/10.5878/7hr7-s215>

Download data

Fluxes.csv (6.47 KB)

Microprofiles.csv (64.92 KB)

NitrateReduction.csv (4.77 KB)

SedimentProperties.csv (7.48 KB)

StationInfo.csv (945 bytes)

Associated documentation

ReadMe_Fluxes.txt (1.92 KB)

ReadMe_Microprofiles.txt (2.48 KB)

ReadMe_NitrateReduction.txt (2.64 KB)

ReadMe_SedimentProperties.txt (1.7 KB)

ReadMe_StationInfo.txt (2.32 KB)

Download all files

2022-12-1-1.zip (~95.62 KB)

Citation

Hylén, A., Bonaglia, S., Robertson, E., Marzocchi, U., Kononets, M., & Hall, P. (2022) Enhanced benthic nitrous oxide and ammonium production after natural oxygenation of long-term anoxic sediments - Processes and pools in the benthic nitrogen cycle after natural oxygenation of long-term anoxic sediment (Version 1) [Data set]. University of Gothenburg. Available at: <https://doi.org/10.5878/7hr7-s215>

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Research principal

[University of Gothenburg](#) - Department of Marine Sciences

Description

In this study, we describe the long-term impact of a natural oxygenation event on the fate of fixed nitrogen in the sediment. We investigated whether the newly oxygenated sediments were sites of efficient removal of fixed nitrogen through denitrification and anammox, which environmental factors affected the division between nitrate reduction processes, and whether nitrate from the water column or sedimentary nitrification was fuelling nitrate reduction processes in the sediment. We conducted three yearly samplings in 2016, 2017, and 2018, where we performed in situ measurements of nitrate reduction process rates and sediment-water fluxes of nutrients, oxygen and dissolved inorganic carbon. We additionally collected sediment samples and measured sediment microprofiles of oxygen, nitrous oxide and hydrogen sulphide to gain further insights into the spatial distribution of the processes in surface sediments.

The data set contains 5 files with the following data:

- Station information; locations, sediment surface and bottom water conditions
- Sediment properties; carbon and nitrogen in the sediment solid phase, porosity, pore water concentrations of NO_x and NH₄.
- Microsensor measurements of O₂, N₂O and H₂S
- Sediment-water fluxes of oxygen, dissolved inorganic carbon, NH₄ and NO_x
- Nitrate reduction rates in the sediment

Full descriptions of the data can be found in the corresponding readme files accessible from the Data and documentation tab.

Data contains personal data

No

Language

[English](#)

Time period(s) investigated

2016-04-10 - 2018-04-30

Data format / data structure

[Numeric](#)

[Text](#)

Geographic spread

Geographic location: [Baltic Sea](#)

Geographic description: Eastern Gotland Basin, Baltic Sea

Responsible department/unit

Department of Marine Sciences

Funding 1

- Funding agency: Swedish Research Council
- Funding agency's reference number: 2015-03717

- Project name on the application: Effect of a natural Baltic oxygenation-deoxygenation cycle on benthic recycling of P, N, Si and C - An in situ observation and modelling study

Funding 2

- Funding agency: Grundfos Foundation

Research area

[Geochemistry](#) (Standard för svensk indelning av forskningsämnen 2011)

[Oceanography, hydrology and water resources](#) (Standard för svensk indelning av forskningsämnen 2011)

[Environmental management](#) (Standard för svensk indelning av forskningsämnen 2011)

Keywords

[Sediment composition](#), [Sediment chemistry](#), [Marine sediment](#), [Mud \(sediment\)](#), [Sediment](#), [Biogeochemical process](#), [Nitrogen retention](#), [Nitrogen removal](#), [Nitrogen metabolism](#), [Ammonium nitrogen compounds](#), [Organic matter](#), [Nitrogen-15](#), [Dissolved inorganic nitrogen](#), [Nitrogen cycle](#), [Oxygen consumption](#), [Sediment organic content proportion](#), [Nitrogen-15 method](#), [Sediment chemistry](#), [Dissolved oxygen](#), [Nitrogen dioxide](#), [Sediment content](#), [Sediment oxygen demand](#), [Marine sediment](#)

Publications

Hylén, A., S. Bonaglia, E. Robertson, U. Marzocchi, M. Y. Kononets, and P. O. J. Hall. 2022. Enhanced benthic nitrous oxide and ammonium production after natural oxygenation of long-term anoxic sediments. *Limnol. Oceanogr.* 1–15. doi:10.1002/lno.12001

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If you have published anything based on these data, [please notify us](#) with a reference to your publication(s). If you are responsible for the catalogue entry, you can update the metadata/data description in DORIS.

Polygon (Lon/Lat)

18.787536973491, 57.912020985121

18.787536973491, 57.052681978717

21.038240428334, 57.052681978717

21.038240428334, 57.912020985121

18.787536973491, 57.912020985121

Accessibility level

Access to data through SND

Data are freely accessible

Use of data

[Things to consider when using data shared through SND](#)

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Versions

Version 1. 2022-04-05

Contacts for questions about the data

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[DDI 2.5](#)

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[File overview \(CSV\)](#)

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