

Abstract Formatting and Template

Abstract formatting

Abstracts must be clearly and concisely written in good English with the 11-point Arial font and single-spaced lines. The only text that can be in italics are scientific names. Use capital letters only when the letters or words should appear in capitals. Please remove hyperlinks from email addresses and webpages included in the abstract text. Please check symbols, abbreviations and technical terms for accuracy, consistency and readability.

Abstract content should be in the following order.

Title

Write in lower case. Use capital letters only when the letters or words should appear in capitals – do not capitalize the entire title.

Author(s)

List each author, last name first followed by initials, using superscripts to identify multiple author affiliations, and underlining the name of the presenter. The correspondence author should be identified by an asterisk.

Affiliation(s)

List each affiliation on a separate line and superscript to match to author's names.

Correspondence author contact email

List the correspondence author's contact email. Remove any hyperlinks associated with the address.

Abstract Text

Write with 11-point Arial font and left justified. Do not indent the first line of each paragraph. Abstract text should be limited to 300 words (including the sub-headings but excluding the title, authors, affiliations and correspondence author contact email). Do not add keywords or references.

For abstract template, please proceed to the next page.

The legacy effect of changing nutrient inputs to coastal ecosystems

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Abstract

Nutrient management plans have been successful in reducing nutrient inputs to many coastal ecosystems, but ecosystem responses have been unanticipatedly weak. This lack of recovery has been attributed to a legacy effect of past nutrient inputs, possibly sustaining sediment nutrient release and eutrophication over longer periods. We analyzed sediment pools of carbon (measured as Loss-of-Ignition, Lol), total nitrogen (TN) and total phosphorus (TP) sampled over 25 years in two separate periods (1999-2003 and 2017-2023) across 14 Danish estuaries and coastal ecosystems, following substantial reductions in inputs of nitrogen (>50%) and phosphorus (>80%) from land, the majority of these occurring from 1985 to 1997. Sediment properties were not connected with water properties at station level, whereas Lol, TN and TP increased with water column depth and decreased with physical exposure, suggesting that sedimentation properties governed the overall concentrations. Sediment pools of Lol, TN and TP decreased by 6-8% between the two periods, although these changes were not significant. Variability among sediment cores was high, particularly spatial variability but also temporal variability, although variability could be reduced by normalizing TN and TP to Lol. Only TP changed significantly with sediment depth, but there was no significant difference in the shape of the profiles over time. Given the relatively large sampling effort (>130 cores), we estimated that it should be possible to detect changes of 15-20% with a probability of 80%. The changes in sediment pools are consistent with other studies, when considering the relative reductions in nutrient inputs. Collectively, the trends also suggest that the legacy effect of nutrient reductions was within a few years rather than decades and that the legacy effect is small. Hence, the lack of coastal ecosystem recovery is most likely due to other factors.