

New insights into the Weddell Sea ecosystem applying a network approach

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Abstract. The abstract goes here. It can also be on *multiple lines*.

1 Introduction

Introduction text goes here. You can change the name of the section if necessary using `\introduction[modified heading]`.

The following settings can or must be configured in the header of this file and are bespoke for Copernicus manuscripts:

- The `journal` you are submitting to using the official abbreviation. You can use the function `rticles::copernicus_journal = '...')` to search the existing journals.
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See the defaults and examples from the skeleton and the official Copernicus documentation for details.

Please note: Per their guidelines, Copernicus does not support additional \LaTeX packages or new \LaTeX commands than those defined in their `.cls` file. This means that you cannot add any extra dependencies and a warning will be thrown if so.

This extends to syntax highlighting of source code. Therefore this template sets the parameter `highlight` in the YAML header to `NULL` to deactivate Pandoc syntax highlighter. This prevent addition of external packages for highlighting inserted

by Pandoc. However, it might be desirable to have syntax highlight available in preprints or for others reasons. Please see `?rmarkdown::pdf_document` for available options to activate highlighting.

Important: Always double-check with the official manuscript preparation guidelines at https://publications.copernicus.org/for_authors/manuscript_preparation.html, especially the sections “Technical instructions for LaTeX” and “Manuscript composition”. Please contact Daniel Nüst, daniel.nuest@uni-muenster.de, with any problems.

The objective of this work is twofold: 1) estimate the interaction strength of the Weddell Sea food web, and 2) determine key trophic species considering its influence on the stability of the network.

2 Methodology

2.1 Study area

The high Antarctic Weddell Sea shelf is situated between 74 and 78°S with a length of approximately 450 km. Water depth varies from 200 to 500 m. Shallower areas are covered by continental ice, which forms the coastline along the eastern and southern part of the Weddell Sea. The shelf area contains a complex three-dimensional habitat with large biomass, intermediate to high diversity in comparison to benthic boreal communities and a spatially patchy distribution of organisms (?, ?).

2.2 Data source

Subsubsection text here.

3 Results

See the R Markdown docs for bibliographies and citations.

Copernicus supports biblatex and a sample bibliography is in file `WeddellSea.bib`. Read (Pawar et al., 2012), and (see ?).

4 Content section with R code chunks

You should always use `echo = FALSE` on R Markdown code blocks as they add formatting and styling not desired by Copernicus. The hidden workflow results in 42.

You can add verbatim code snippets without extra styles by using ````` without additional instructions.

```
sum <- 1 + 41
```

5 Discussion

If you want to insert a list, you must

- leave
- empty lines
- between each list item

because the `\tightlist` format used by R Markdown is not supported in the Copernicus template. Example:

- leave
- empty lines
- between each list item

6 Examples from the official template

6.1 FIGURES

When figures and tables are placed at the end of the MS (article in one-column style), please add

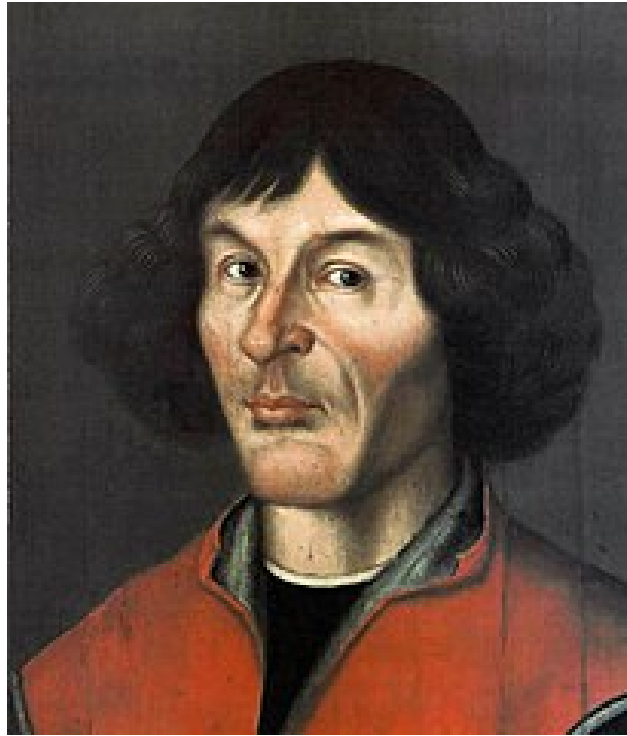


Figure 1. one column figure

between bibliography and first table and/or figure as well as between each table and/or figure.

6.1.1 ONE-COLUMN FIGURES

Include a 12cm width figure of Nikolaus Copernicus from Wikipedia with caption using R Markdown.

6.1.2 TWO-COLUMN FIGURES

You can also include a larger figure.

6.2 TABLES

You can add `\LaTeXtable` in an R Markdown document to meet the template requirements.



Figure 2. two column figure

Table 1. TEXT

a	b	c
1	2	3

Table Footnotes

Table 2. TEXT

a	b	c
1	2	3

Table footnotes

6.2.1 ONE-COLUMN TABLE

6.2.2 TWO-COLUMN TABLE

6.3 MATHEMATICAL EXPRESSIONS

All papers typeset by Copernicus Publications follow the math typesetting regulations given by the IUPAC Green Book (IUPAC: Quantities, Units and Symbols in Physical Chemistry, 2nd Edn., Blackwell Science, available at: http://old.iupac.org/publications/books/gbook/green_book_2ed.pdf, 1993).

Physical quantities/variables are typeset in italic font (t for time, T for Temperature)

Indices which are not defined are typeset in italic font (x, y, z, a, b, c)

Items/objects which are defined are typeset in roman font (Car A, Car B)

Descriptions/specifications which are defined by itself are typeset in roman font (abs, rel, ref, tot, net, ice)

Abbreviations from 2 letters are typeset in roman font (RH, LAI)

Vectors are identified in bold italic font using \boldsymbol{x}

Matrices are identified in bold roman font

Multiplication signs are typeset using the LaTeX commands `\times` (for vector products, grids, and exponential notations) or `\cdot`

The character `*` should not be applied as mutliplication sign

6.4 EQUATIONS

6.4.1 Single-row equation

Unnumbered equations (i.e. using `$$` and getting inline preview in RStudio) are not supported by Copernicus.

$$1 \times 1 \cdot 1 = 42 \tag{1}$$

$$A = \pi r^2 \tag{2}$$

$$x = \frac{2b \pm \sqrt{b^2 - 4ac}}{2c}. \tag{3}$$

6.4.2 Multiline equation

$$3 + 5 = 8 \tag{4}$$

$$3 + 5 = 8 \tag{5}$$

$$3 + 5 = 8 \tag{6}$$

6.5 MATRICES

$x \quad y \quad z$

$x \quad y \quad z$

$x \quad y \quad z$

6.6 ALGORITHM/PROGRAMMING CODE

If you want to use algorithms, you need to make sure yourself that the \LaTeX packages `algorithms` and `algorithmicx` are installed so that `algorithm.sty` respectively `algorithmic.sty` can be loaded by the Copernicus template. Both need to be available through your preferred \LaTeX distribution. With TinyTeX (or TeX Live), you can do so by running `tinytex::tlmgr_install(c("algorithms", "algorithmicx"))`

```
## tlmgr update --all --self
```

```
## tlmgr install algorithms algorithmicx
```

Copernicus staff will no accept any additional packages from your LaTeX source code, so please stick to these two acceptable packages. They are needed to use the example below

6.7 CHEMICAL FORMULAS AND REACTIONS

For formulas embedded in the text, please use `\chem{ }`, e.g. $A \rightarrow B$.

The reaction environment creates labels including the letter R, i.e. (R1), (R2), etc.

Algorithm 1 Algorithm Caption

```
 $i \leftarrow 10$   
if  $i \geq 5$  then  
   $i \leftarrow i - 1$   
else  
  if  $i \leq 3$  then  
     $i \leftarrow i + 2$   
  end if  
end if
```

- `\rightarrow` should be used for normal (one-way) chemical reactions
- `\rightleftharpoons` should be used for equilibria
- `\leftrightarrow` should be used for resonance structures



6.8 PHYSICAL UNITS

Please use `\unit{}` (allows to save the `math/$` environment) and apply the exponential notation, for example 3.14 km h^{-1} (using LaTeX mode: `\(3.14\,, \unit{...} \)`) or 0.872 ms^{-1} (using only `\unit{0.872\,, m\,, s^{-1}}`).

7 Conclusions

The conclusion goes here.

Appendix A: Figures and tables in appendices

A1 Option 1

If you sorted all figures and tables into the sections of the text, please also sort the appendix figures and appendix tables into the respective appendix sections. They will be correctly named automatically.

A2 Option 2

If you put all figures after the reference list, please insert appendix tables and figures after the normal tables and figures.

`\appendixfigures` needs to be added in front of appendix figures `\appendixtables` needs to be added in front of appendix tables

Please add `\clearpage` between each table and/or figure. Further guidelines on figures and tables can be found below. Regarding figures and tables in appendices, the following two options are possible depending on your general handling of figures and tables in the manuscript environment: To rename them correctly to A1, A2, etc., please add the following commands in front of them:

. TIM and LAS: Conceptualization (lead); Data curation (lead); Formal analysis (lead); Methodology (lead); Coding (lead); Writing – original draft (lead); Writing – review and editing (lead). SK: Conceptualization (lead); Formal analysis (supporting); Methodology (supporting); Coding (supporting); Writing – original draft (supporting); Writing – review and editing (supporting).

. The authors declare no competing interests.

. Thanks to the rticles contributors!

References

Pawar, S., Dell, A. I., and Van M. Savage: Dimensionality of Consumer Search Space Drives Trophic Interaction Strengths, *Nature*, 486, 485, <https://doi.org/10.1038/nature11131>, 2012.