

Data Paper

Ryosuke Makabe, Shintaro Takao, Kunio T. Takahashi and Tsuneo Odate. Chlorophyll a and macro-nutrient concentrations and photosynthetically active radiation during the training vessel Umitaka-maru cruise of the 59th Japanese Antarctic Research Expedition in January 2018. *Polar Data Journal*. 2020, 4, p.121–132. <https://doi.org/10.20575/00000018>.

(Received 7/8/2020; Accepted 8/18/2020)

---

1st submission

Editor Start Date: 7/8/2020

Editor Stop Date: 8/7/2020

Reviewer #1 (7/8/2020–7/13/2020)

Reviewer #2 (7/17/2020–8/7/2020)

Reviewer #1: Anonymous

In the manuscript entitled “Chlorophyll a and macro-nutrient concentrations and photosynthetically active radiation during the training vessel Umitaka-maru cruise of the 59th Japanese Antarctic Research Expedition in January 2018”, authors provide chlorophyll a concentration, size fraction of chlorophyll a, macro-nutrients, and photosynthetically active radiation (PAR) data obtained from sub-tropical to polar waters in the Southern Ocean. These parameters are comprehensive for understanding variability of phytoplankton biomass in the changing Southern Ocean. The manuscript also provides clear descriptions of provided parameters. I thus consider that both the manuscript and provided data substantially benefit the readers. Although being subject to minor revision, the manuscript is almost ready for publication. I have a few minor comments as listed below.

L. 23-24: The description that “ecosystem change with climate changes” is ambiguous to me. How about “ecosystem change in the changing climate”?

L. 30-32: The sentence is a little bit complicated. I suggest that it should be divided into 2 sentences as; Umitaka-maru takes almost same course every year; after leaving Fremantle, goes down to sea ice edge (ca. 65°S) along 110°E meridian and then, and goes back to Hobart. The course thus covers sub-tropical to polar waters in the Southern Ocean.

L. 50-51: I consider that the word “decadal” is too much assertive for describing El Niño and/or Southern Annular Mode. How about “decadal or shorter time scale environmental changes (e.g. El Niño and Southern Annular

Mode)”?

L. 51-52: “In such phytoplankton observation”. How about changing to “Under such a variability in chlorophyll a”.

L. 56-60: The sentence is not clear to me. Is the sentence claiming that nutrients and temperature are important (in terms of affecting phytoplankton biomass and their distributions) in equator to mid latitude region and light and temperature are important in polar to subpolar regions? Also, is “light” equivalent to “light intensity”? If so, please consider modifying the sentence as “A model simulation from 1980 to 2100 suggested that dominant factors affecting phytoplankton biomass and their distributions varies meridionally (Marinov et al., 2010). Namely, while nutrients and temperature are dominant in the equator to mid latitude regions, light intensity and temperature become dominant in the polar to subpolar regions”.

L. 61: Change “help us better understand” to “help us for better understanding”.

L. 70: Change “other routine observation programs,” to “other routine observation programs;”.

L. 105: add comma after occasions (on all occasions,) and delete comma after bottles.

L. 231: Is “Chlorophyll a” should be changed to “chlorophyll a”?

L. 236: “chlorophyll a” or “chlorophyll a concentration”? Please unify throughout the manuscript.

Figs 1-7: Please increase graphic resolution of the figures.

Reviewer #2: Anonymous

This paper provides important data of chlorophyll a concentration, macro-nutrients and photosynthetically active radiation in the Indian sector of the Southern Ocean collected during the T/V Umitaka-maru cruise, as part of the long-term monitoring programs.

The paper is worth publishing. I do have some grammatical suggestions to improve the manuscript.

Detailed comments:

L72: change ‘Shirase’ to ‘*Shirase*’

L137: change ‘Chlorophyll a’ to ‘Chlorophyll *a*’

L164: change ‘Umitaka-maru’ to ‘*Umitaka-maru*’

L187: change ‘12788-12793’ to ‘12788–12793’

L187: add doi

L189: change ‘chlorophyll a’ to ‘chlorophyll *a*’

L190: change ‘Letters’ to ‘Lett.’

L191: change ‘chlorophyll a’ to ‘chlorophyll *a*’

L193: change 'Umitaka-maru' to '*Umitaka-maru*'

L194: change '46-58' to '46–58'

L197: change '3941-3959' to '3941–3959'

L197: add doi

L200: change '2106-2117' to '2106–2117'

L200: add doi

L203: change '1137-1144' to '1137–1144'

L209: change 'Makabe R, Takao S, Odate T' to 'Makabe, R., Takao,S., Odate, T.'

L210: change 'Umitaka-maru' to '*Umitaka-maru*'

L211: change '1-29' to '1–29'

L218: change '1-16' to '1–16'

L231: change 'chlorophyll a' to 'chlorophyll *a*'

-----  
Authors Response:

We revised the MS according to reviewer's comments as followings.

Response to reviewer #1;

Comments:

L. 23-24: The description that "ecosystem change with climate changes" is ambiguous to me. How about "ecosystem change in the changing climate"?

**These words indicates, for example, primary productivity and size composition of primary producers with global warming. Since these are explained in "Background & Summary", we did not state its details here.**

L. 30-32: The sentence is a little bit complicated. I suggest that it should be divided into 2 sentences as; Umitaka-maru takes almost same course every year; after leaving Fremantle, goes down to sea ice edge (ca. 65°S) along 110°E meridian and then, and goes back to Hobart. The course thus covers sub-tropical to polar waters in the Southern Ocean.

**It has been corrected accordingly.**

L. 50-51: I consider that the word "decadal" is too much assertive for describing El Niño and/or Southern Annular Mode. How about "decadal or shorter time scale environmental changes (e.g. El Niño and Southern Annular Mode)"?

**It has been corrected accordingly.**

L. 51-52: "In such phytoplankton observation". How about changing to "Under such a variability in chlorophyll *a*".

It has been corrected accordingly.

L. 56-60: The sentence is not clear to me. Is the sentence claiming that nutrients and temperature are important (in terms of affecting phytoplankton biomass and their distributions) in equator to mid latitude region and light and temperature are important in polar to subpolar regions? Also, is “light” equivalent to “light intensity”? If so, please consider modifying the sentence as “A model simulation from 1980 to 2100 suggested that dominant factors affecting phytoplankton biomass and their distributions varies meridionally (Marinov et al., 2010). Namely, while nutrients and temperature are dominant in the equator to mid latitude regions, light intensity and temperature become dominant in the polar to subpolar regions”.

It has been corrected accordingly.

L. 61: Change “help us better understand” to “help us for better understanding”.

It has been corrected accordingly.

L. 70: Change “other routine observation programs,” to “other routine observation programs;”.

It has been corrected accordingly.

L. 105: add comma after occasions (on all occasions,) and delete comma after bottles.

It has been corrected accordingly.

L. 231: Is “Chlorophyll a” should be changed to “chlorophyll a”?

It has been corrected accordingly.

L. 236: “chlorophyll a” or “chlorophyll a concentration”? Please unify throughout the manuscript.

It has been unified to “chlorophyll a concentration” through the MS

Figs 1-7: Please increase graphic resolution of the figures.

The high resolution version can be available from the link described header of each figure.

Reponse to reviewer #2;

Detailed comments:

L72: change ‘Shirase’ to ‘Shirase’

L137: change ‘Chlorophyll a’ to ‘Chlorophyll a’

L164: change ‘Umitaka-maru’ to ‘Umitaka-maru’

L187: change ‘12788-12793’ to ‘12788–12793’

L187: add doi

L189: change ‘chlorophyll a’ to ‘chlorophyll a’

L190: change ‘Letters’ to ‘Lett.’

L191: change ‘chlorophyll a’ to ‘chlorophyll a’

L193: change ‘Umitaka-maru’ to ‘Umitaka-maru’

L194: change '46-58' to '46–58'

L197: change '3941-3959' to '3941–3959'

L197: add doi

L200: change '2106-2117' to '2106–2117'

L200: add doi

L203: change '1137-1144' to '1137–1144'

L209: change 'Makabe R, Takao S, Odate T' to 'Makabe, R., Takao,S., Odate, T.'

L210: change 'Umitaka-maru' to 'Umitaka-maru'

L211: change '1-29' to '1–29'

L218: change '1-16' to '1–16'

L231: change 'chlorophyll a' to 'chlorophyll a'

They all have been corrected accordingly.

---

2nd submission

Editor Start Date: 8/7/2020

Editor Stop Date: 8/18/2020

---

Editorial Office's note

Calculate checksum date: 9/1/2020

Algorithm:SHA256

Hash: c20840ac950cc54c64a769a6f8b4023d13623e2b6508ca98a78a7b796f606846

Path:

<https://ads.nipr.ac.jp/data/meta/A20200707-002/>

Original Data

Ryosuke Makabe, Shintaro Takao, Kunio Takahashi, Tsuneo Odate. Chlorophyll a and macro-nutrient concentrations and photosynthetically active radiation during the training vessel Umitaka-maru cruise of the 59th Japanese Antarctic Research Expedition in January 2018, 1.00, Arctic Data archive System (ADS), Japan, 2020.

<https://doi.org/10.17592/001.2020070702>.

Postscript by editorial office,

The above Path had been not available. (accessed 2020-10-12)

Pleaser refer instead: <http://id.nii.ac.jp/1434/00000018>