Supplementary Material

# Supplementary Figures

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**Figure S1.** Geographic distribution of chlorophyll fluorescence profiles recorded within Cape-Darnley polynya in August. Profiles are represented by a different color according to their location: red and blue points correspond to profiles recorded on the continental shelf and on the continental slope, respectively. Bigger points represent profiles with a fluorescence signal greater than 0.06 mg.m-3 between 125 and 170 m depth. Those points were located within the continental slope or in its vicinity. The bathymetry used for the map is the one from GEBCO data (2021).

# Supplementary Tables

**Table S1.** Temporal and vertical distribution of the water masses identified within Cape-Darnley polynya on the shelf. When the sum is not equal to 100% this means that other water masses, not considered in this study, were present. The number of profiles used to compute the percentages is indicate in the column title.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Feb***n = 13* | **Mar***n = 11* | **Apr***n = 19* | **May***n = 12* | **Jun***n = 43* | **Jul***n = 3* | **Aug***n = 23* | **Sep***n = 12* |
| 1 – 50 m | AASW | 98.95% | 100% | 100% |  | 3.30% | 70.80% | 70.87% | 75% |
| mCDW |  |  |  |  |  |  |  |  |
| ISW |  |  |  | 11.17% | 0.17% |  |  |  |
| DSW |  |  |  | 61.5% | 71.61% |  | 9.83% | 8.33% |
| mSW |  |  |  |  |  |  |  | 8.33% |
| 51 – 100 m | AASW | 90.86% | 100% | 98.95% |  | 2.17% | 60% | 55.83% | 58.67% |
| mCDW |  |  |  |  |  | 16% | 4.09% | 3.17% |
| ISW |  |  |  | 48.83% | 16.96% |  |  |  |
| DSW |  |  |  | 31.67% | 62.48% |  | 11.13% | 6.33% |
| mSW |  |  |  |  |  |  |  | 12% |
| 101 – 150 m | AASW | 66.57% | 100% | 86.25% |  | 2.23% | 58.33% | 48.70% | 48.91% |
| mCDW | 3.33% |  |  |  |  | 20.83% | 10.26% | 7.56% |
| ISW |  |  |  | 84.83% | 41.96% |  |  |  |
| DSW |  |  |  | 5.67% | 47.68% |  | 19.04% | 14.29% |
| mSW |  |  |  | 1.17% |  |  |  | 13.11% |
| 151 – 170 m | AASW | 38.1% | 92.73% | 78.42% |  | 1.98% | 33.33% | 26.09% | 39.1% |
| mCDW | 23.57% |  |  |  |  | 58.33% | 8.70% | 9.1% |
| ISW |  |  |  | 75% | 39.53% |  |  |  |
| DSW |  |  |  | 8.33% | 55.81% |  | 26.09% | 18.18% |
| mSW |  |  |  | 5% |  |  | 0.65% | 9.1% |

**Table S2.** Temporal and vertical distribution of the water masses identified within Cape-Darnley polynya on the slope. When the sum is not equal to 100% this means that other water masses, not considered in this study, were present. The number of profiles used to compute the percentages is indicate in the column title.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Feb***n = 13* | **Mar***n = 53* | **Apr***n = 18* | **May***n = 4* | **Jun***n = 25* | **Jul***n = 18* | **Aug***n = 25* | **Sep***n = 2* |
| 1 – 50 m | AASW | 100% | 99.61% | 100% | 71.43% | 87.10% | 100% | 96.15% | 100% |
| mCDW |  |  |  |  |  |  |  |  |
| ISW |  | 0.25% |  | 7.71% | 2.06% |  |  |  |
| DSW |  |  |  | 20.86% | 10.84% |  |  |  |
| mSW |  |  |  |  |  |  |  |  |
| 51 – 100 m | AASW | 100% | 99.12% | 100% | 71.43% | 86.30% | 100% | 92.46% | 100% |
| mCDW |  |  |  |  |  |  |  |  |
| ISW |  |  |  | 28.57% | 8.01% |  |  |  |
| DSW |  |  |  |  | 2.67% |  |  |  |
| mSW |  |  |  |  | 0.82% |  |  |  |
| 101 – 150 m | AASW | 97.69% | 98.24% | 100% | 70.15% | 86.01% | 100% | 88.42% | 100% |
| mCDW |  |  |  |  |  |  | 0.15% |  |
| ISW |  |  |  | 19.70% | 10.49% |  |  |  |
| DSW |  |  |  | 10.15% |  |  |  |  |
| mSW |  |  |  |  |  |  |  |  |
| 151 – 170 m | AASW | 84.62% | 98.18% | 100% | 31.25% | 84% | 100% | 88% | 100% |
| mCDW |  |  |  |  |  |  |  |  |
| ISW |  |  |  |  | 12% |  |  |  |
| DSW |  |  |  | 50% |  |  |  |  |
| mSW |  |  |  |  | 2.40% |  |  |  |

**Table S3.** Temporal and vertical distribution of the water masses identified within Shackleton polynya. When the sum is not equal to 100% this means that other water masses, not considered in this study, were present.The number of profiles used to compute the percentages is indicate in the column title.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Jan***n = 32* | **Feb***n = 110* | **Mar***n = 63* | **Apr***n = 55* | **May***n = 57* | **Jun***n = 11* | **Jul***n = 44* | **Aug***n = 35* |
| 1 – 50 m | AASW | 95.86% | 98.47% | 100% | 100% | 100% | 100% | 100% | 94.29% |
| mCDW | 1.21% | 0.3% |  |  |  |  |  |  |
| ISW | 0.6% |  |  |  |  |  |  |  |
| DSW | 0.09% |  |  |  |  |  |  |  |
| mSW |  |  |  |  |  |  |  |  |
| 51 – 100  | AASW | 81.62% | 90.52% | 100% | 100% | 100% | 100% | 100% | 93.94% |
| mCDW | 2.6% | 2% |  |  |  |  |  |  |
| ISW | 5.35% | 1.77% |  |  |  |  |  |  |
| DSW | 5.81% | 1.92% |  |  |  |  |  |  |
| mSW | 0.98% | 0.18% |  |  |  |  |  |  |
| 101 – 150 m | AASW | 71.1% | 84.46% | 96.77% | 100% | 100% | 100% | 100% | 89.09% |
| mCDW | 0.71% | 0.05% | 0.47% |  |  |  |  |  |
| ISW | 15.37% | 8.58% |  |  |  |  |  |  |
| DSW | 3.13% | 2.57% |  |  |  |  |  |  |
| mSW | 0.2% | 0.35% |  |  |  |  |  |  |
| 151 – 170 m | AASW | 52.9% | 73.22% | 89.13% | 100% | 100% | 100% | 100% | 79.86% |
| mCDW | 3.35% | 2.75% | 4.2% |  |  |  |  |  |
| ISW | 19.82% | 10.66% |  |  |  |  |  |  |
| DSW | 4.57% | 1.78% |  |  |  |  |  |  |
| mSW |  |  |  |  |  |  |  |  |

# References

GEBCO Bathymetric Compilation Group 2021 (2021). The GEBCO\_2021 Grid - a continuous terrain model of the global oceans and land. doi: 10.5285/c6612cbe-50b3-0cff-e053-6c86abc09f8f.