Supplemental Material
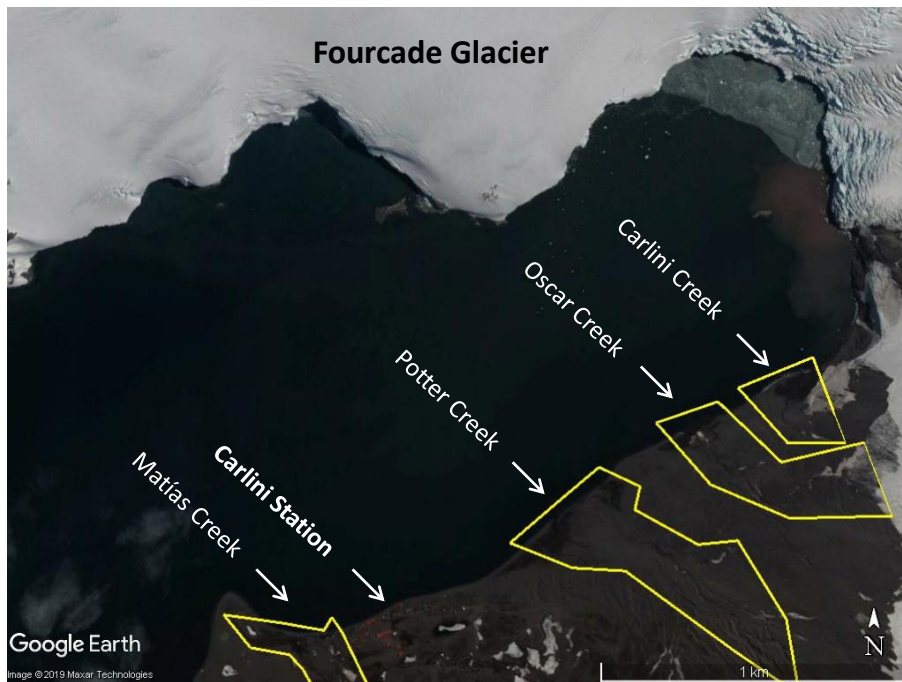
Equations

Simpson´s parameter: $\phi(z) = \frac{g}{h} \int_{-h}^{0} (\rho(z) - \bar{\rho}) dz$ (Eq. 1)

Brunt Väisälä frequency: $N^2(z) = -\frac{g}{\rho} \frac{\partial \rho(z)}{\partial z}$ (Eq. 2)

Where: g is gravity, h is depth of the water column, $\rho(z)$ is water density, $\bar{\rho}$ is mean water density and $\frac{\partial \rho(z)}{\partial z}$ is the vertical density gradient of the water column. Higher ϕ and N^2 values represent a more stratified and more stable water column, respectively.
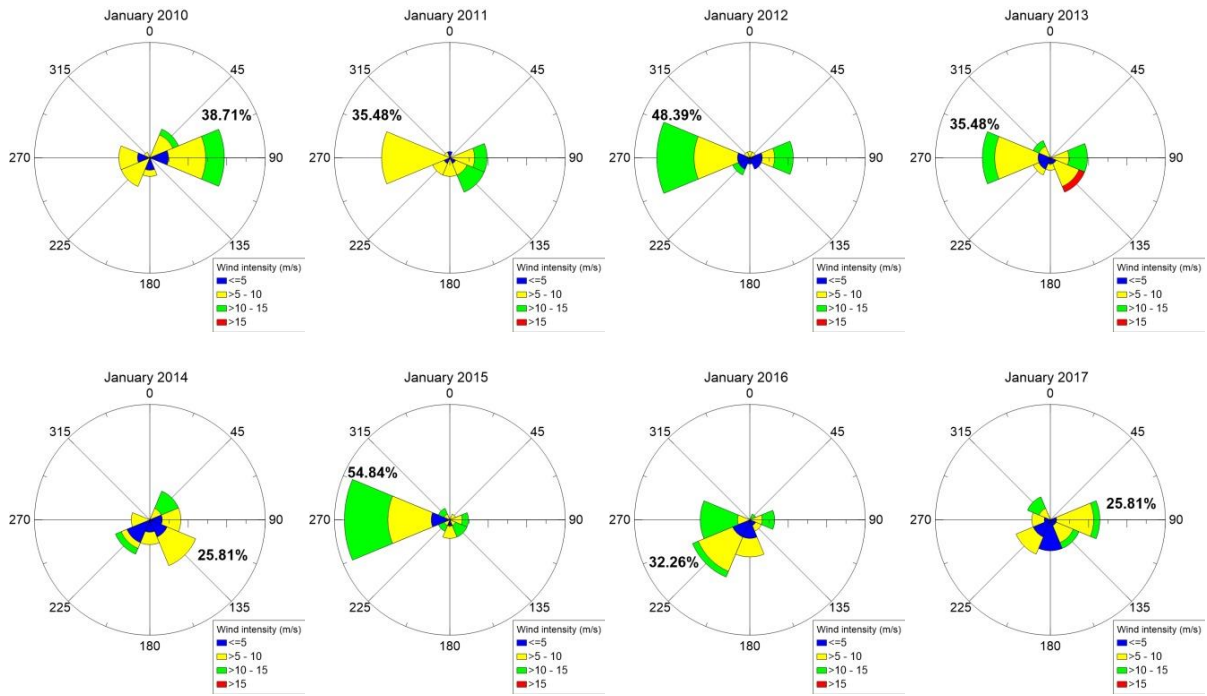
Figures

Figure S1 - Localization of the Carlini Station, Fourcade Glacier and their tributary streams Matías, Potter, Oscar and Carlini.
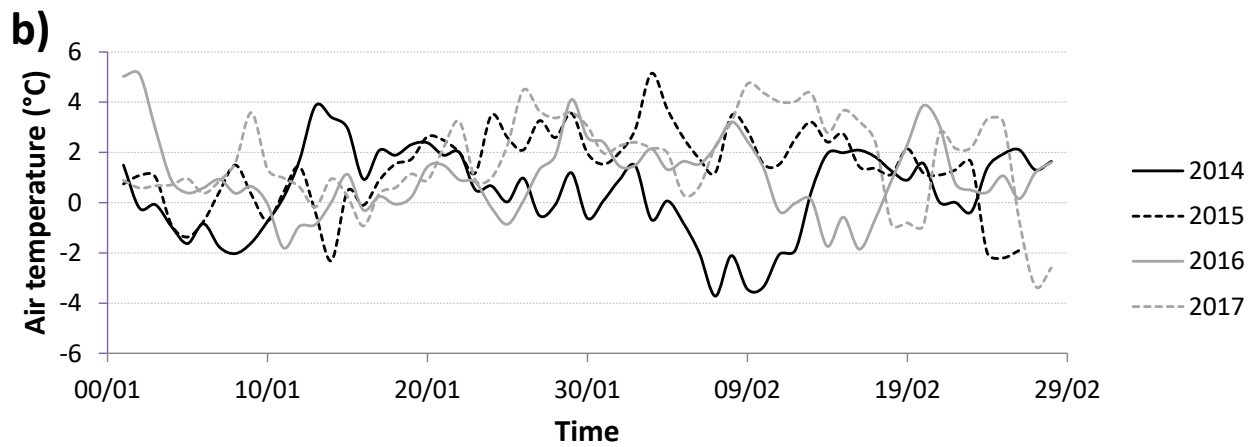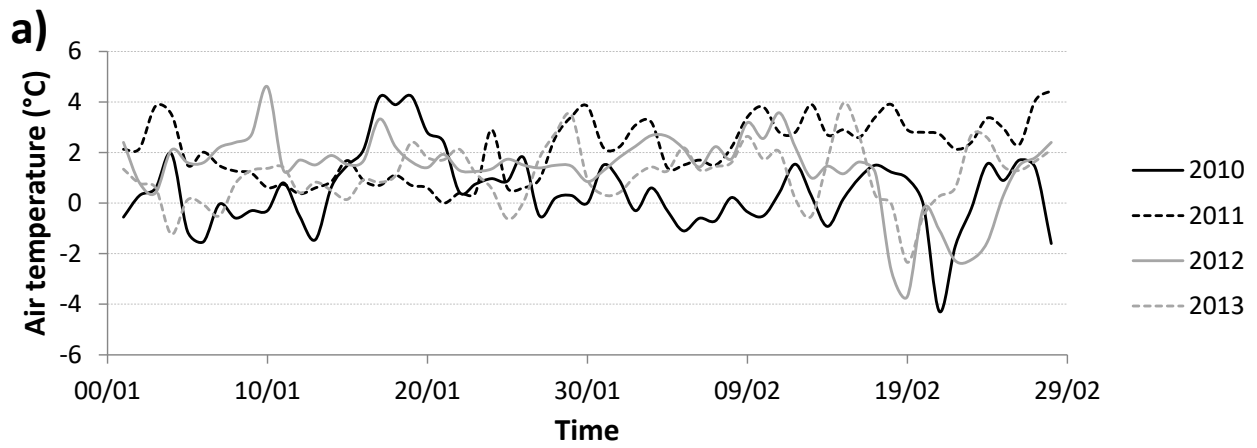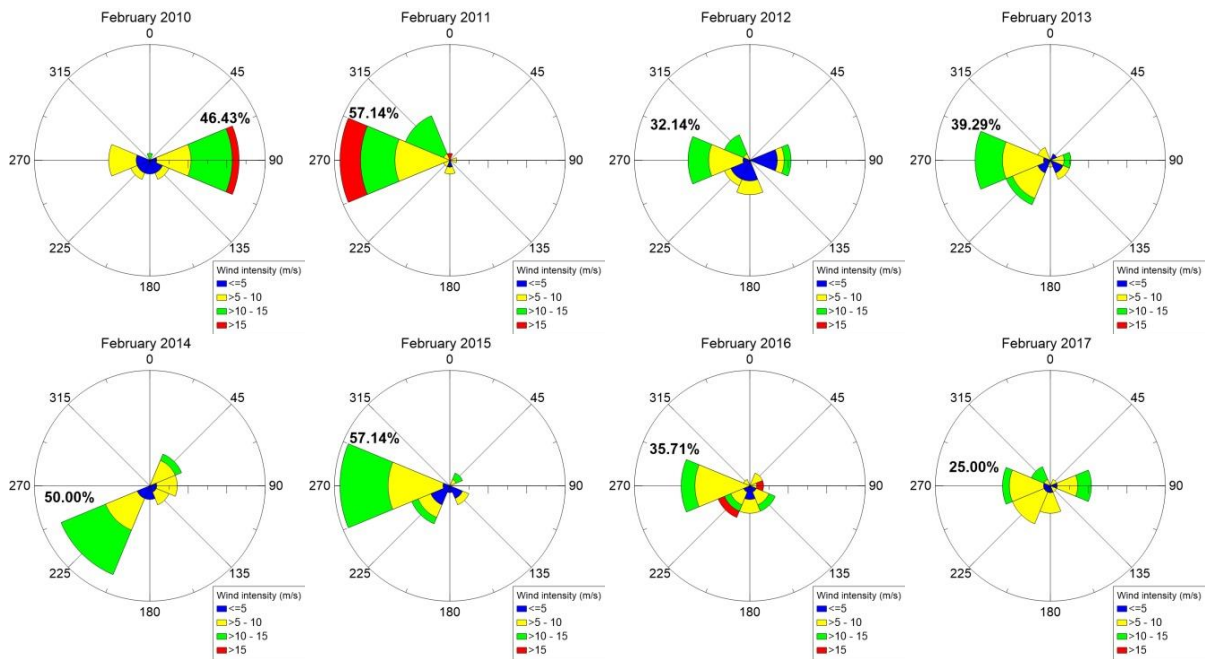
Figure S2 - Time series for daily averages of air temperature recorded at PC for January and February during (a) 2010-13 and (b) 2014-17.
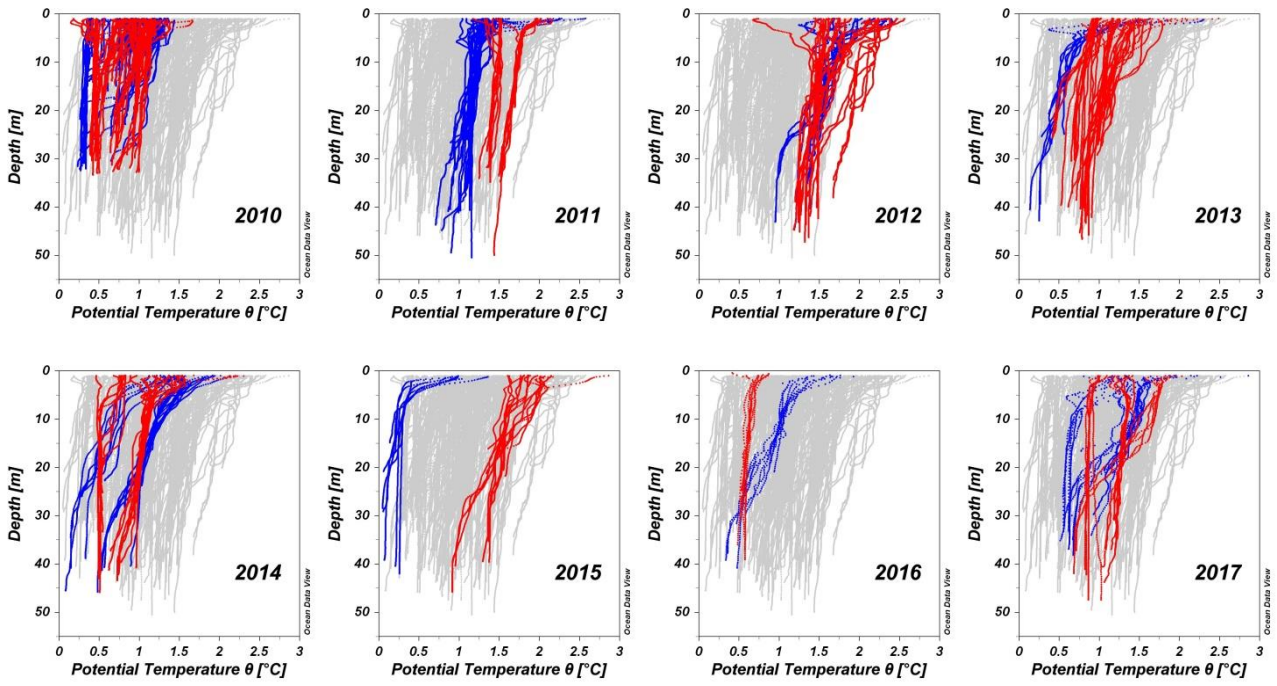
Figure S3 - Accumulated monthly wind roses recorded at PC during (a) January and (b) February between 2010 and 2017. The wind roses indicate the direction from where the wind comes. Wind intensity references and the percent frequency of the outer circle are included in each panel.

Figure S4 – Potential temperature profiles in PC between 2010 and 2017. Values are classified by January (blue) and February (red). All the remaining data in each panel are shown in light gray.
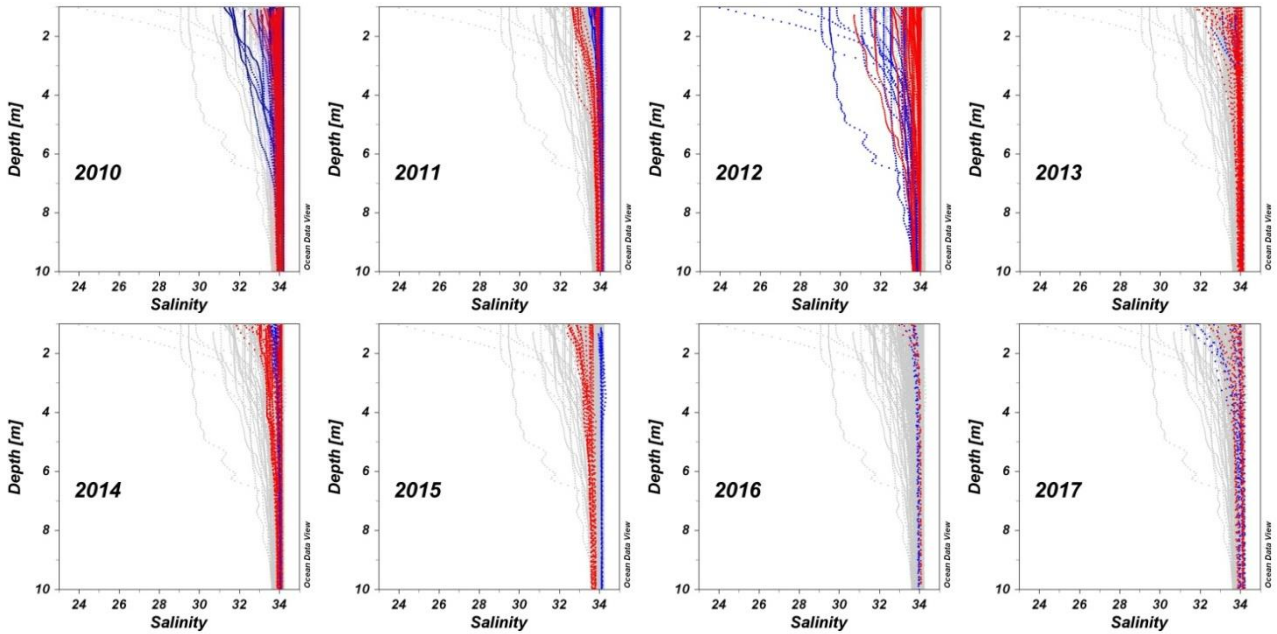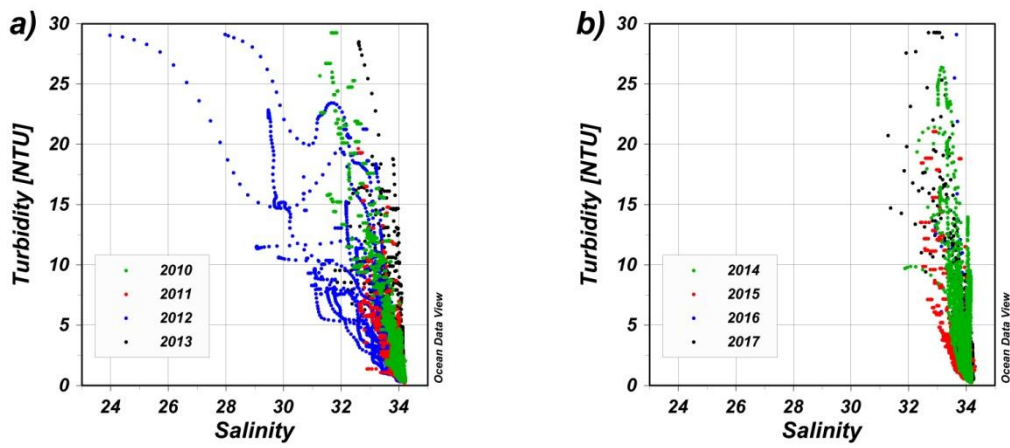

**Figure S5** - Same as **Figure S4** but for salinity profiles in the first 10 m depth.
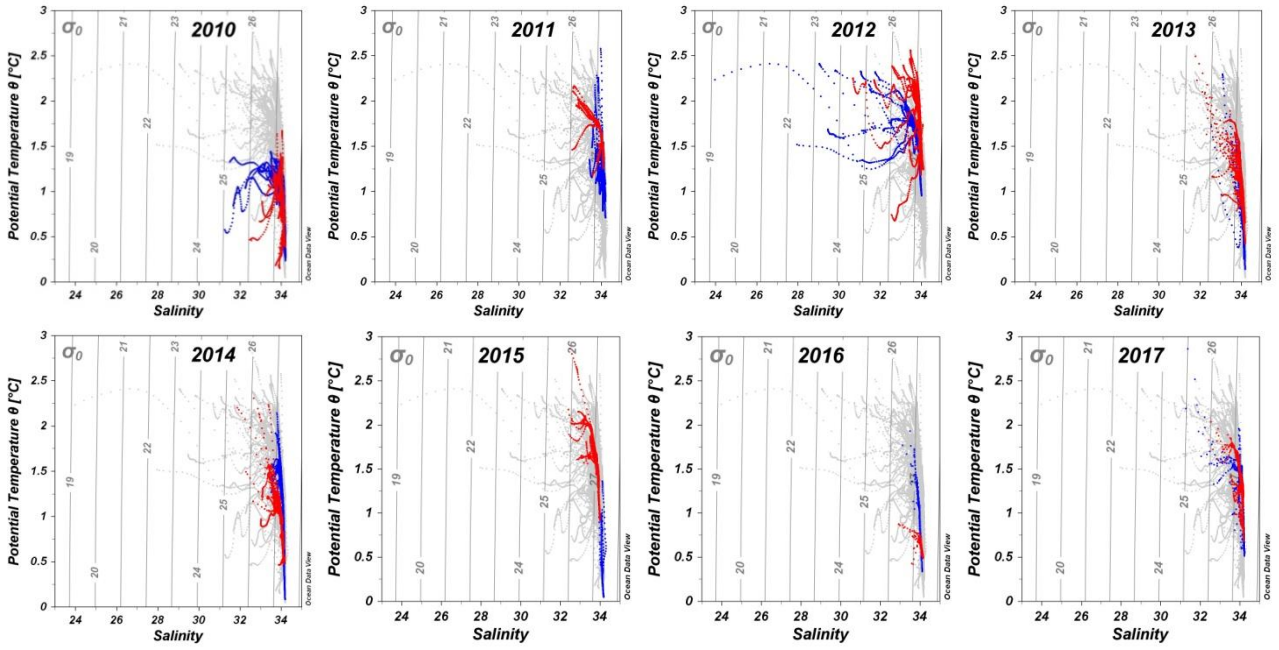
Figure S6 - *θ-S* diagrams during January (blue) and February (red) between 2010 and 2017. All the remaining data in each plot are included in light grey. Potential density anomalies (σ₀) are contoured in dashed gray lines.
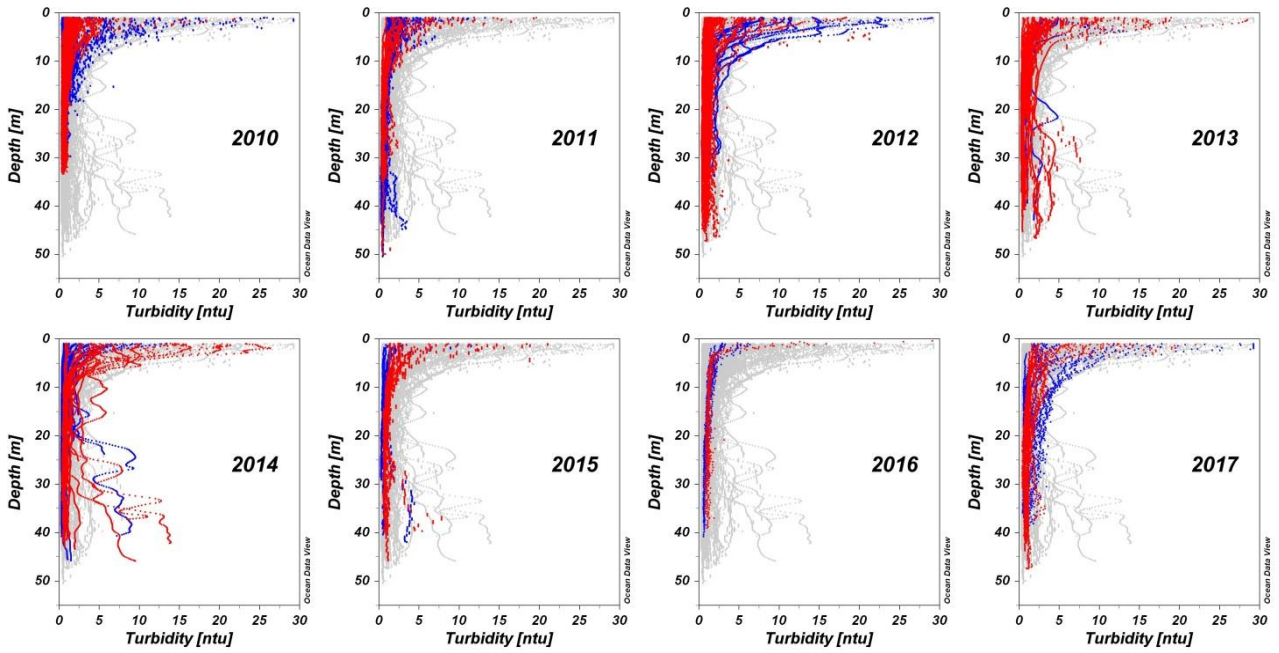
Figure S7 - Same as **Figure S4** but for turbidity profiles.

Figure S8 - τ-S diagrams for the summers (January-February) in the periods (a) 2010-13 and (b) 2014-17. Annual color references are included in each panel.
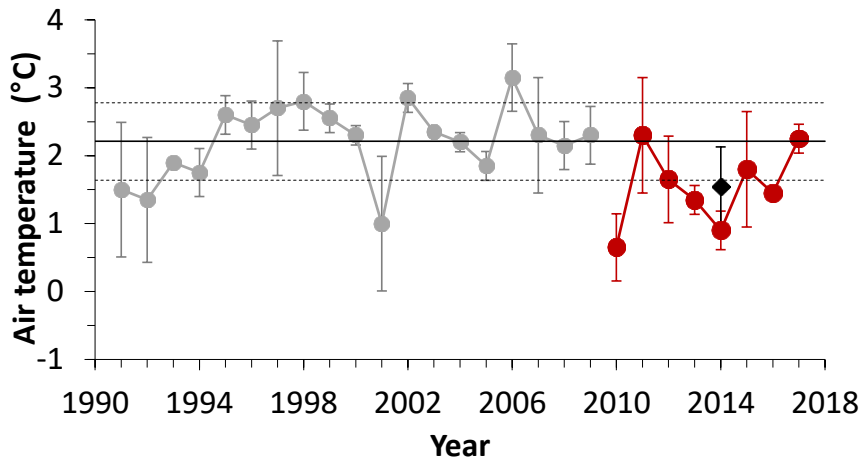
Figure S9 - Temporal evolution of the summer air temperature (January-February) averages measured during 2010-17 (red dots) and by the Jubany Station (SMN) for the period 1991-2009 (gray dots). The black diamond represents the mean value between 2010 and 2017. Horizontal lines represent average (continuous) and one standard deviation from the mean (dashed) for the period 1991-2009. Vertical lines represent one standard deviation around the means.

Table S1 - Monthly mean and standard deviation of the meteorological records in Potter Cove in January and February between 2010 and 2017. The predominant wind direction of each month and its percentage of frequency in parentheses are indicated.

Month	Parameter	2010	2011	2012	2013	2014	2015	2016	2017
January	Air temperature (°C)	0.82 ± 1.53	1.48 ± 1.10	1.76 ± 0.78	0.94 ± 0.99	0.63 ± 1.57	1.07 ± 1.49	0.98 ± 1.64	1.48 ± 1.31
	Wind intensity (m s^{-1})	7.11	8.32	7.62	7.64	6.53	8.21	7.34	6.40
	Predominant wind direction (Frequency)	E (38.71 %)	W (35.48 %)	W (48.39 %)	W (35.48 %)	SE (25.81 %)	W (54.84 %)	SW (32.26 %)	E (25.81 %)
February	Air temperature (°C)	0.06 ± 1.29	2.82 ± 0.80	0.97 ± 1.92	1.25 ± 1.26	0.09 ± 1.85	1.72 ± 1.62	1.06 ± 1.38	1.90 ± 2.14
	Wind intensity (m s^{-1})	7.55	10.97	7.40	7.64	8.25	8.04	8.20	7.69
	Predominant wind direction (Frequency)	E (46.43 %)	W (57.14 %)	W (32.14 %)	W (39.29 %)	SW (50.00 %)	W (57.14 %)	W (35.71 %)	W (25.00 %)