Supplementary Figure 1

Map of Polar-front Antarctic Zone (PAZ) which is defined at 1°x1° resolution as the region between the subantarctic front and the northern extent of sea ice [Williams et al. 2017]. The red line represents the boundaries of the location of the Subpolar seasonally stratified (SPSS) biome [Fay & McKinley, 2014]. The black box represents the Drake Passage region considered in the supplementary figures that follow.

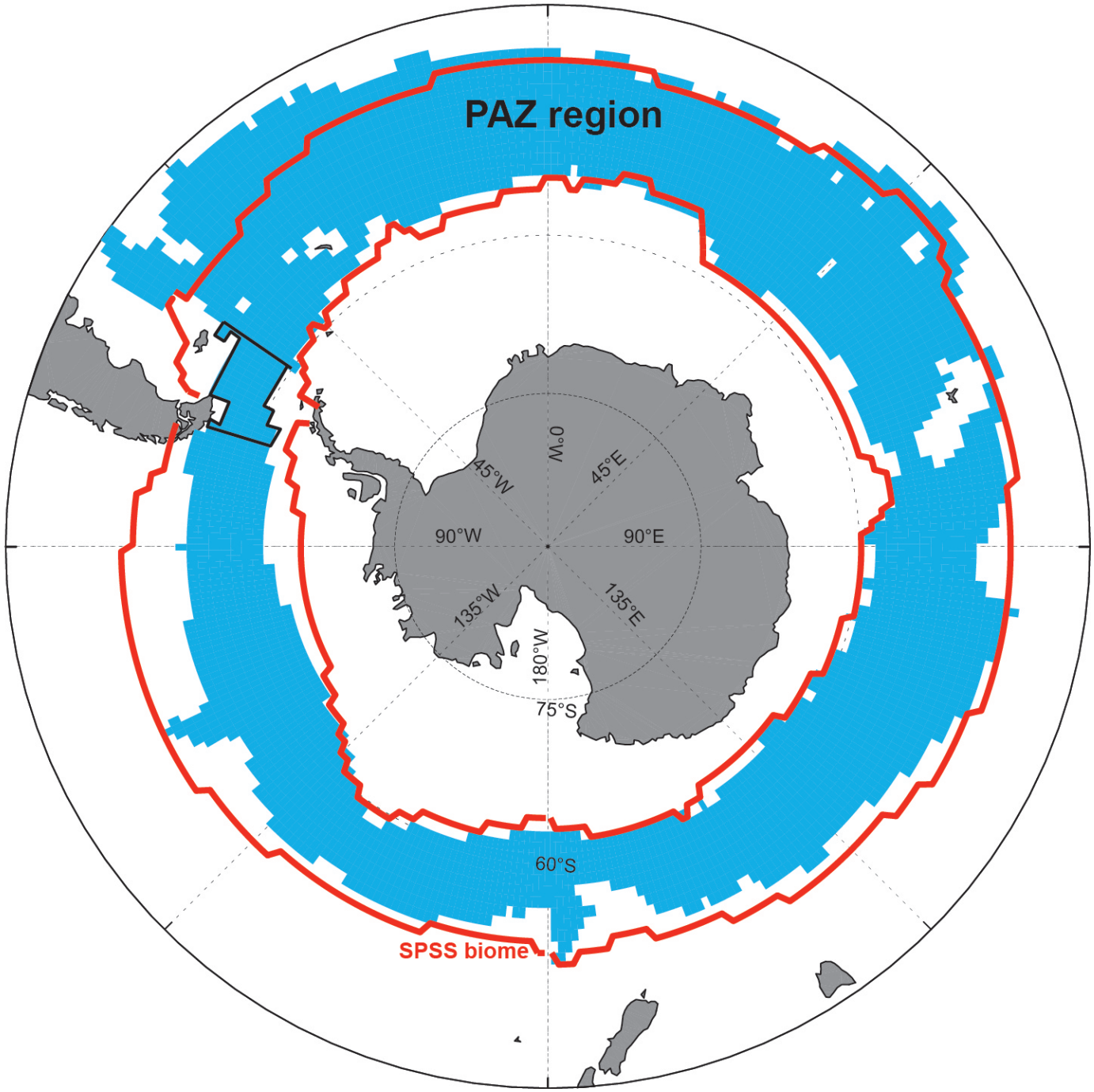
Supplementary Figure 2

Mean surface ocean pCO_2 seasonal cycle estimate for years 2002-2015, for the PAZ region from each dataset, shown on an 18-month cycle, calculated from a time-series with the atmospheric trend removed (1.95 μatm yr^{-1}). Shading represents 1 standard error for biome-scale monthly means. Bar plot indicates the number of years containing observations in a given month (maximum of 14 years) for the SOCAT-DP SOCAT-noDP, and SOCAT-all datasets.

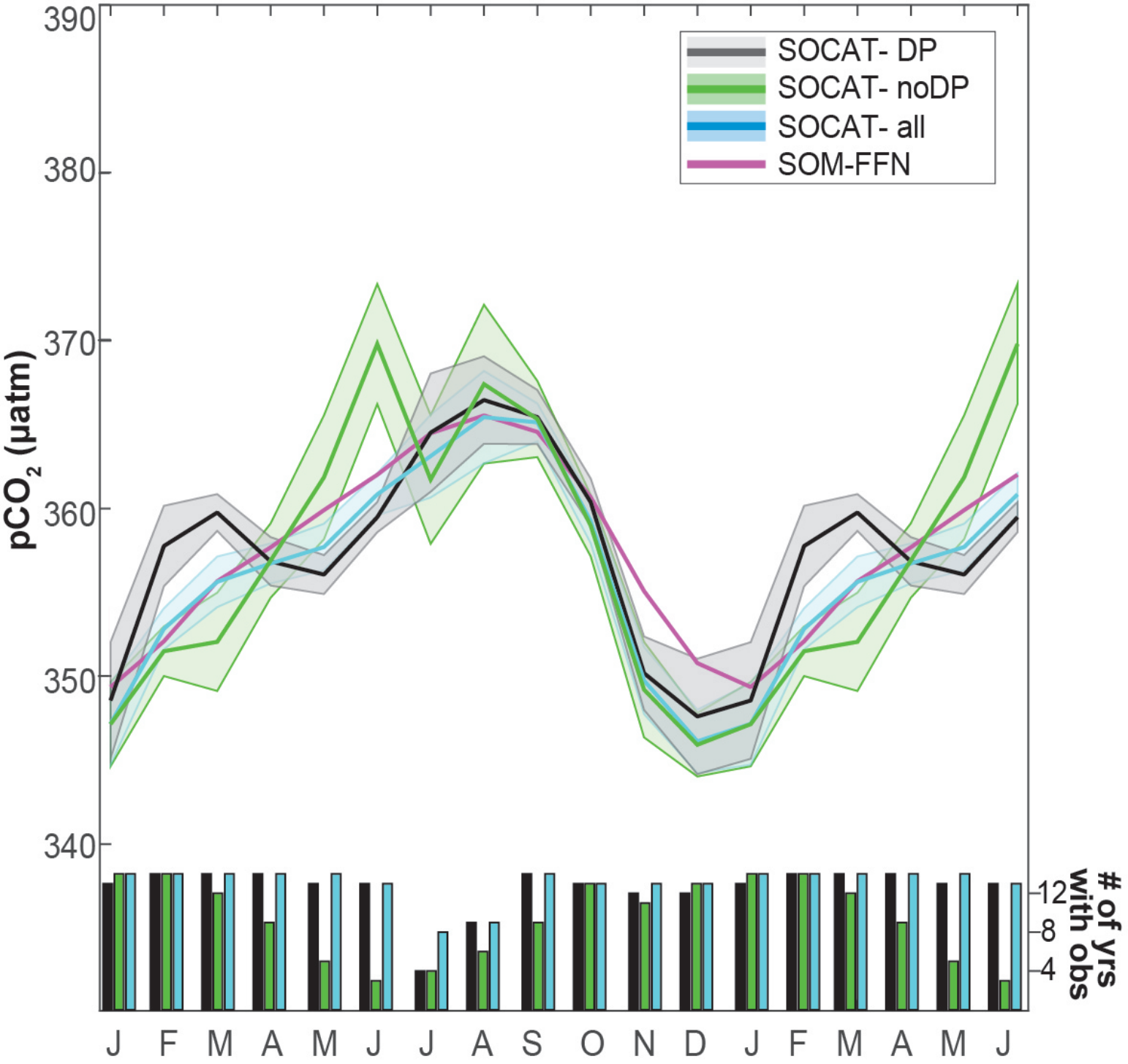
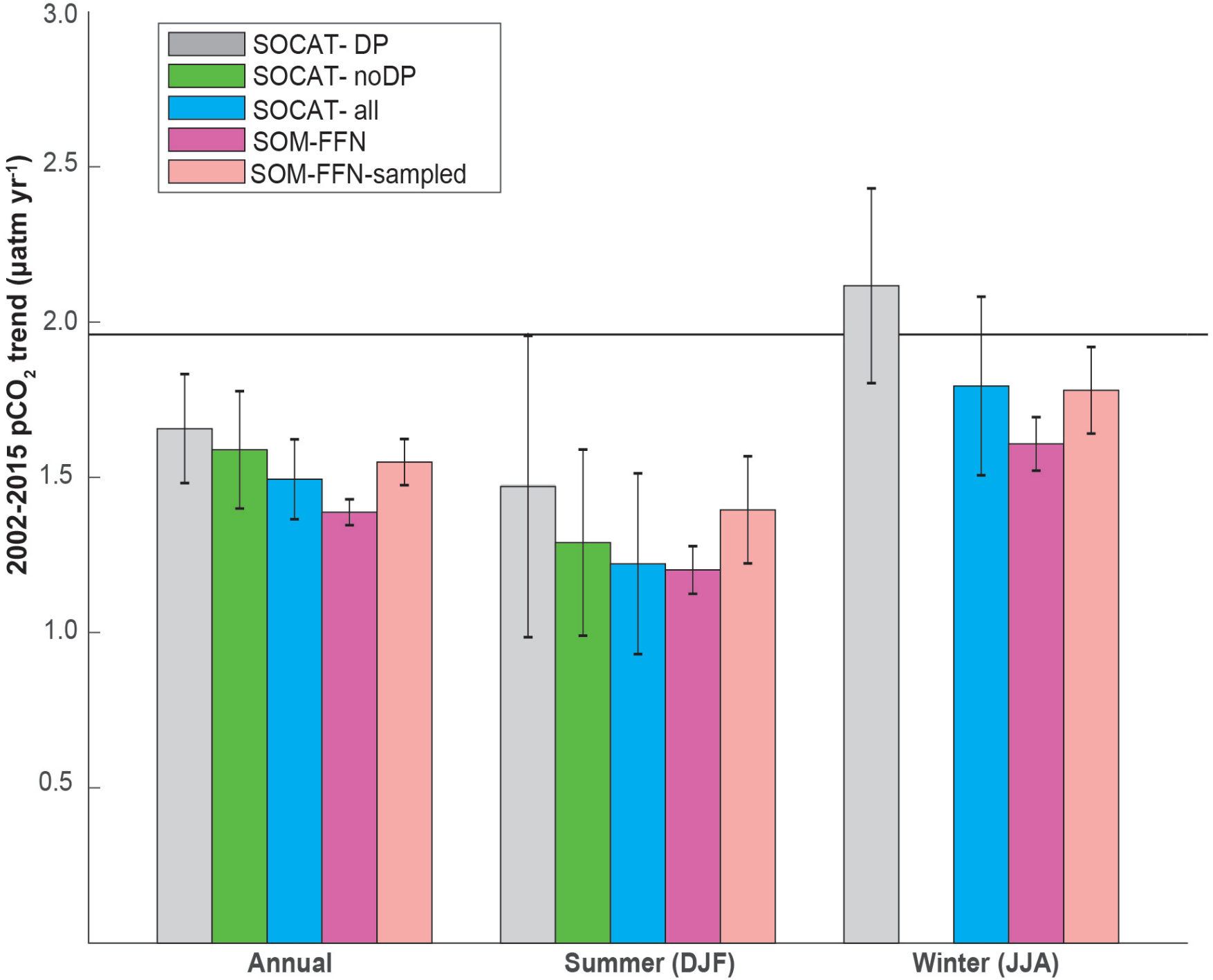
Supplementary Figure 3

Surface ocean pCO_2 trends in the PAZ region for years 2002-2015 (μatm yr^{-1}): SOCATv4 data within the Drake Passage box (gray); SOCATv4 data excluding data from the Drake Passage box (green); SOCATv4 (blue); SOM-FFN product (magenta); SOM-FFN pCO_2 product sampled as SOCATv4 data in the Drake Passage box (light pink). Figure includes annual trends (left), summer trends (center) and winter trends (right). SOCAT-noDP winter trend omitted because it did not contain a JJA value for every year of the time-series. For reference, the atmospheric pCO_2 trend during the 2002-2015 period (1.95 μatm yr^{-1}) is shown as a horizontal black line.

Supplementary Figure 1



Supplementary Figure 2



Supplementary Figure 3