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Exceptional loss in ozone in the Arctic winter/spring of 2019/2020

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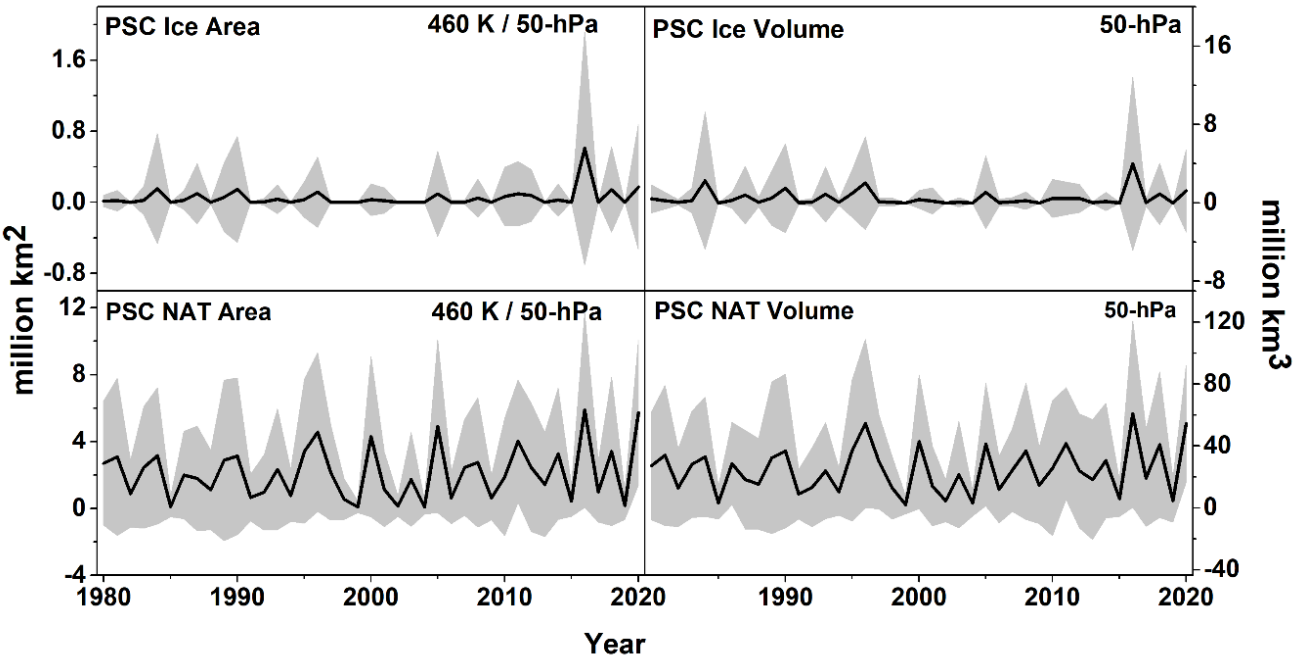

Figure S1: The temporal evolution of area of PSC and volume of PSC in the Arctic winters from 1979 to 2020, as estimated using the MERRA-2 data. The shaded area is the standard deviation from the mean.

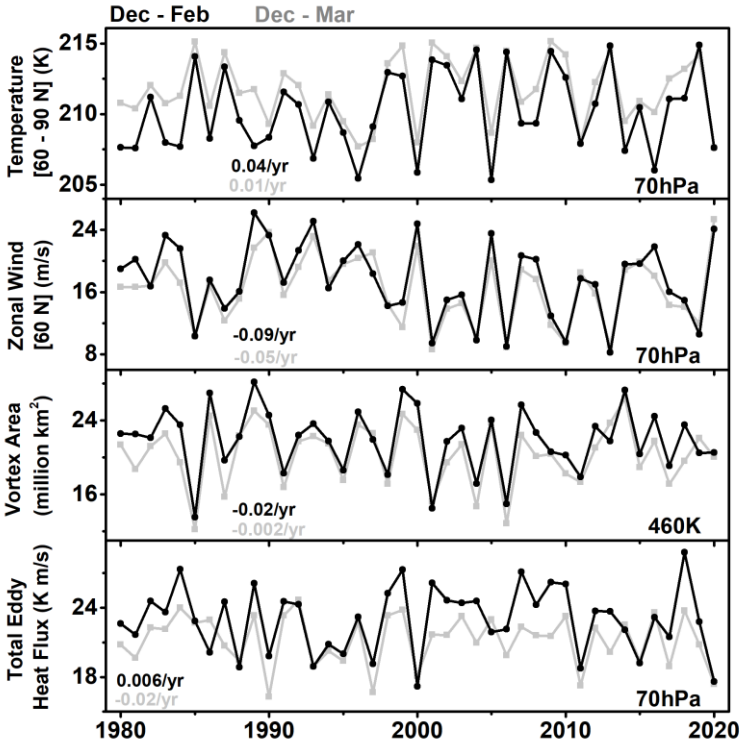

Figure S1b: The temporal evolution of temperature, zonal winds, vortex area, and heat flux in the Arctic winters from 1979 to 2020, as estimated using the MERRA-2 data.

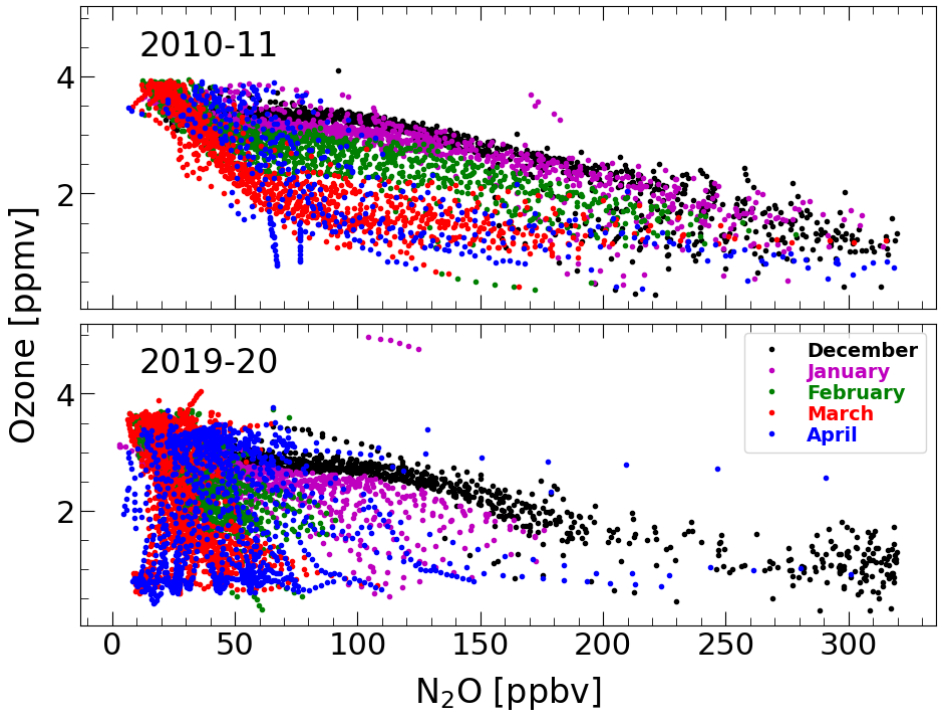

Figure S2: The time evolution correlation between ozone and N_2O in the Arctic winter 2020. The measurements selected inside the vortex.

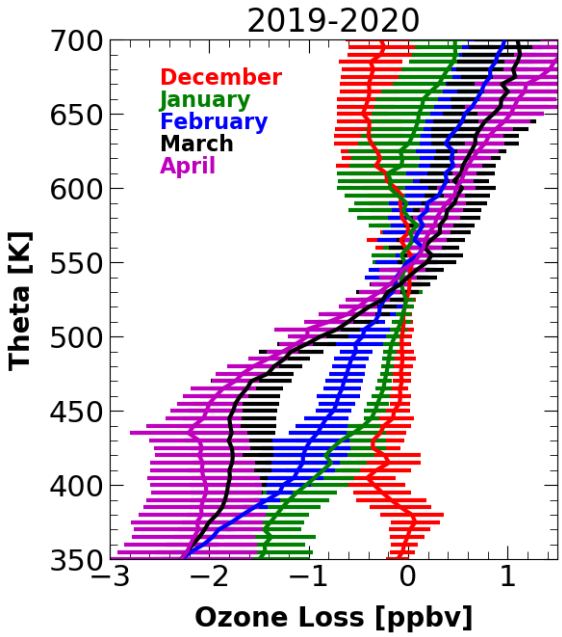

Figure S3: The monthly averaged ozone loss and the standard deviation (horizontal bars) computed using the tracer descent method.

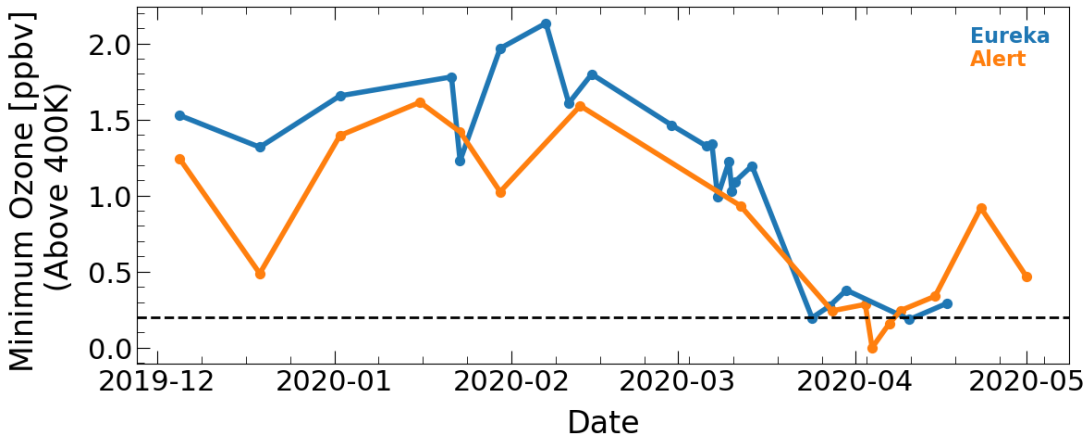

Figure S4: The temporal evolution stratospheric ozone as observed by the ozonesonde at Eureka and Alert stations.

Table 1: OZONE HOLE DAYS (TCO LESS THAN 220 DU ANYWHERE IN THE VORTEX REGION) OBSERVED IN DIFFERENT DATASETS

OMPS (24 Days)

- Dec 01 – 05 (5 Days)
- Jan 01 – 02 (2 Days)
- Jan 23, 25 – 30 (7 Days)
- Mar 05, 12 – 19, 28 (10 Days)

MERRA-2 (19 Days)

- Dec 01 – 05 (5 Days)
- Jan 25 – 26 (2 Days)
- Mar 05, 12, 17 – 22 (8 Days)
- Apr 06 – 07 (2 Days)