



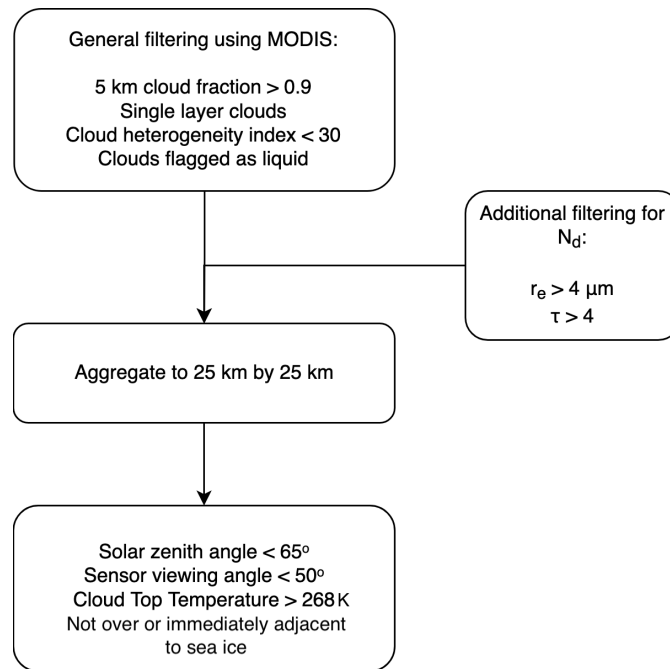
*Supplement of*

## **Stability-dependent increases in liquid water with droplet number in the Arctic**

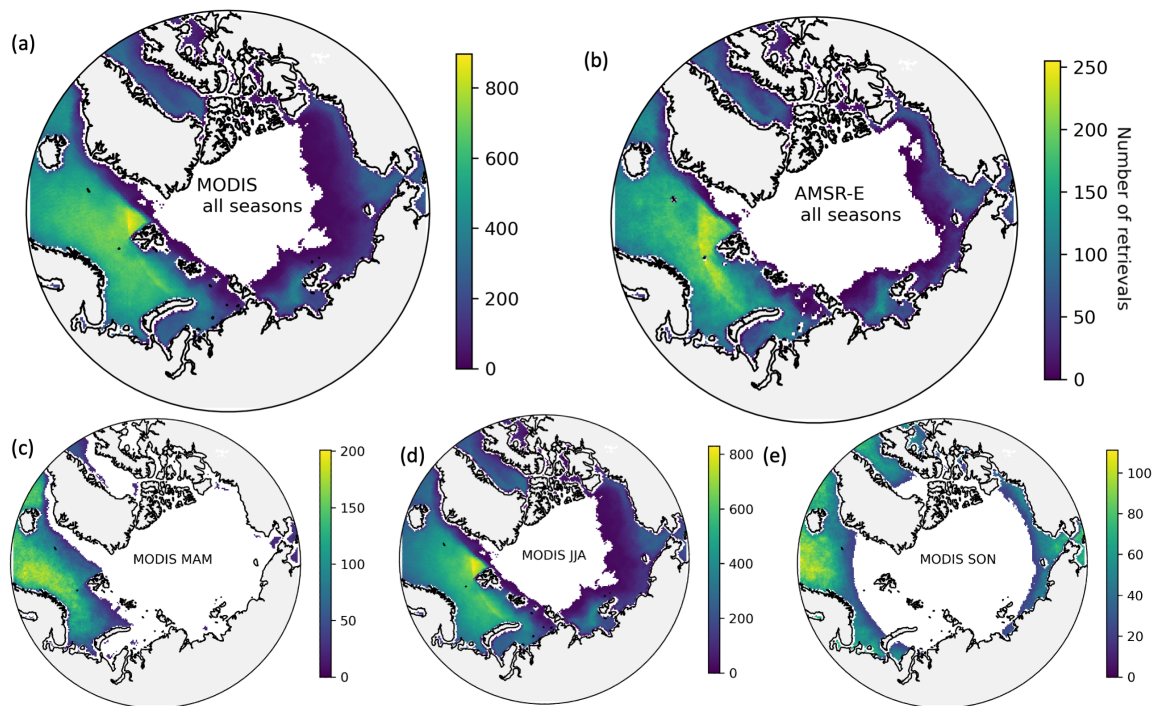
**Rebecca J. Murray-Watson and Edward Gryspeerdt**

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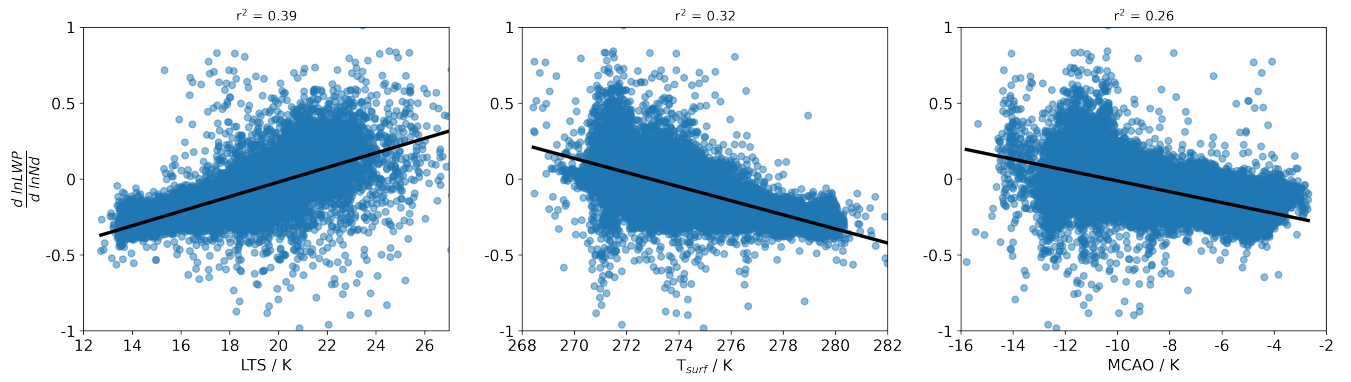
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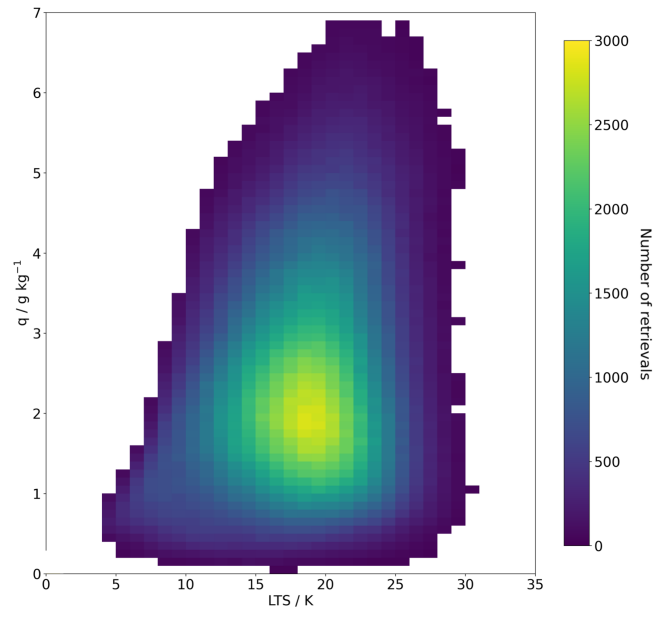
**Figure S1.** Flowchart describing the filtering process used for the MODIS L2 pixels.



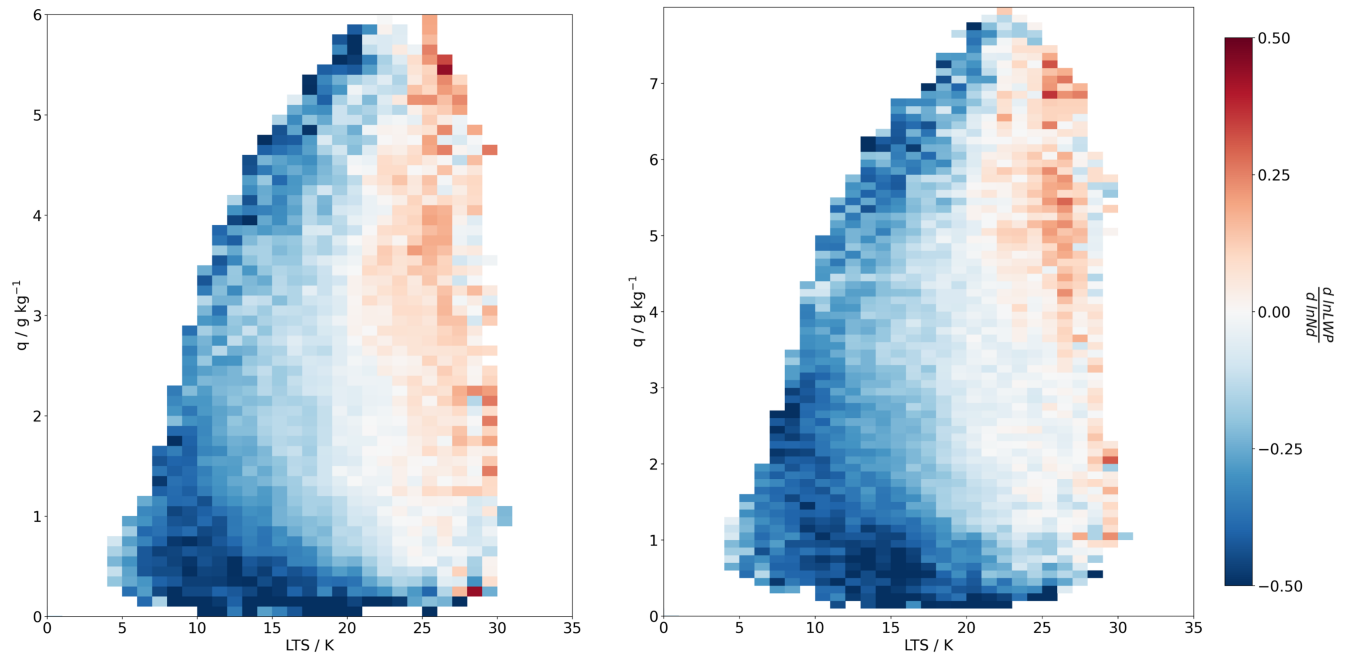
**Figure S2.** Geographic and seasonal distribution of the number of satellite retrievals used to generate the  $N_d$ -LWP sensitivity for each pixel of Figure 1 in the main manuscript.



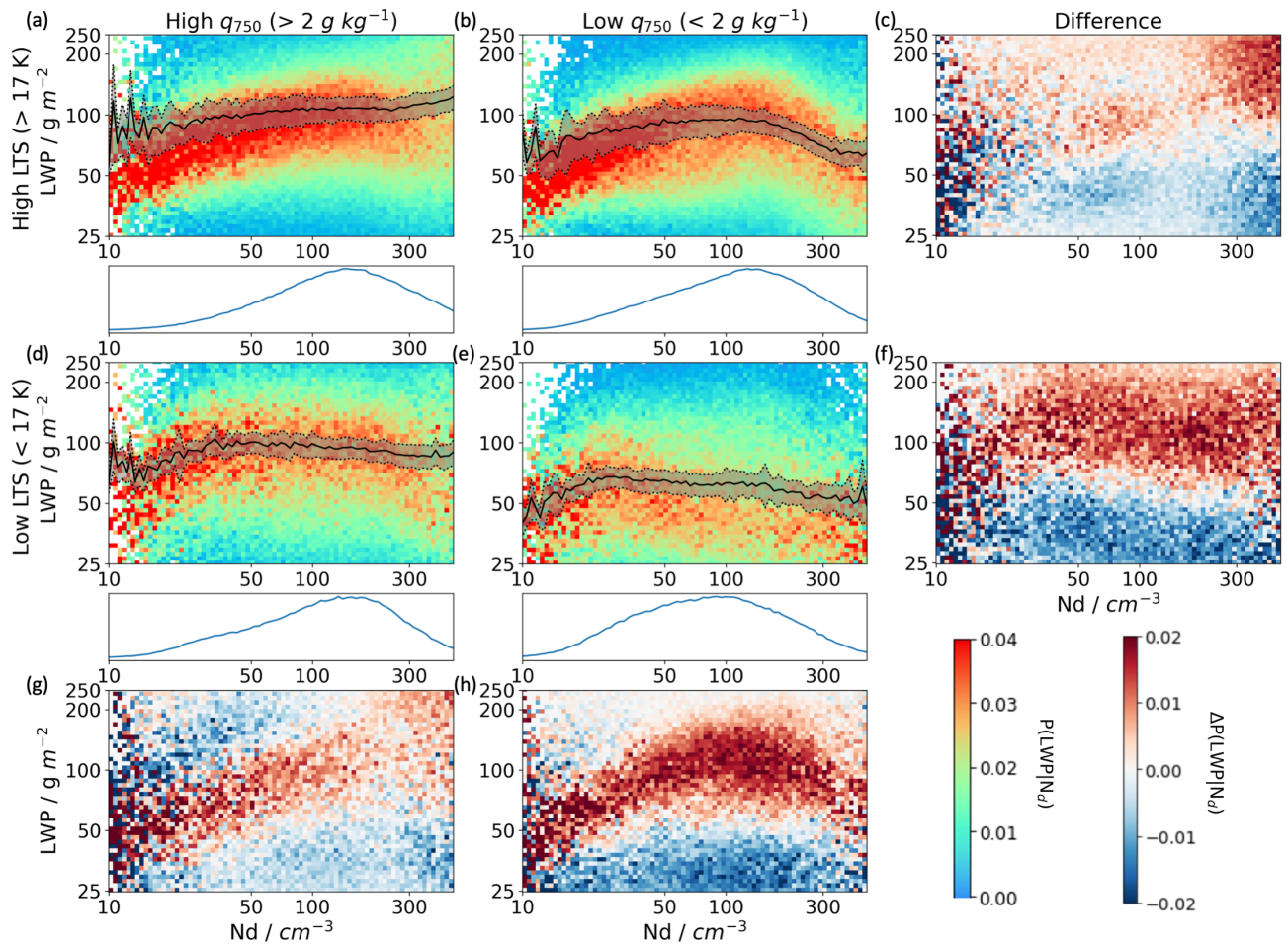
**Figure S3.** Scatterplots of the  $N_d$ -LWP sensitivity for each pixel in Figure 1 (a) plotted against the mean value of (a) LTS (b)  $T_{surf}$  and (c) MCAO index for that variable over the 6 years considered. The line of best fit is shown in black and the  $r^2$  value is shown above each plot.



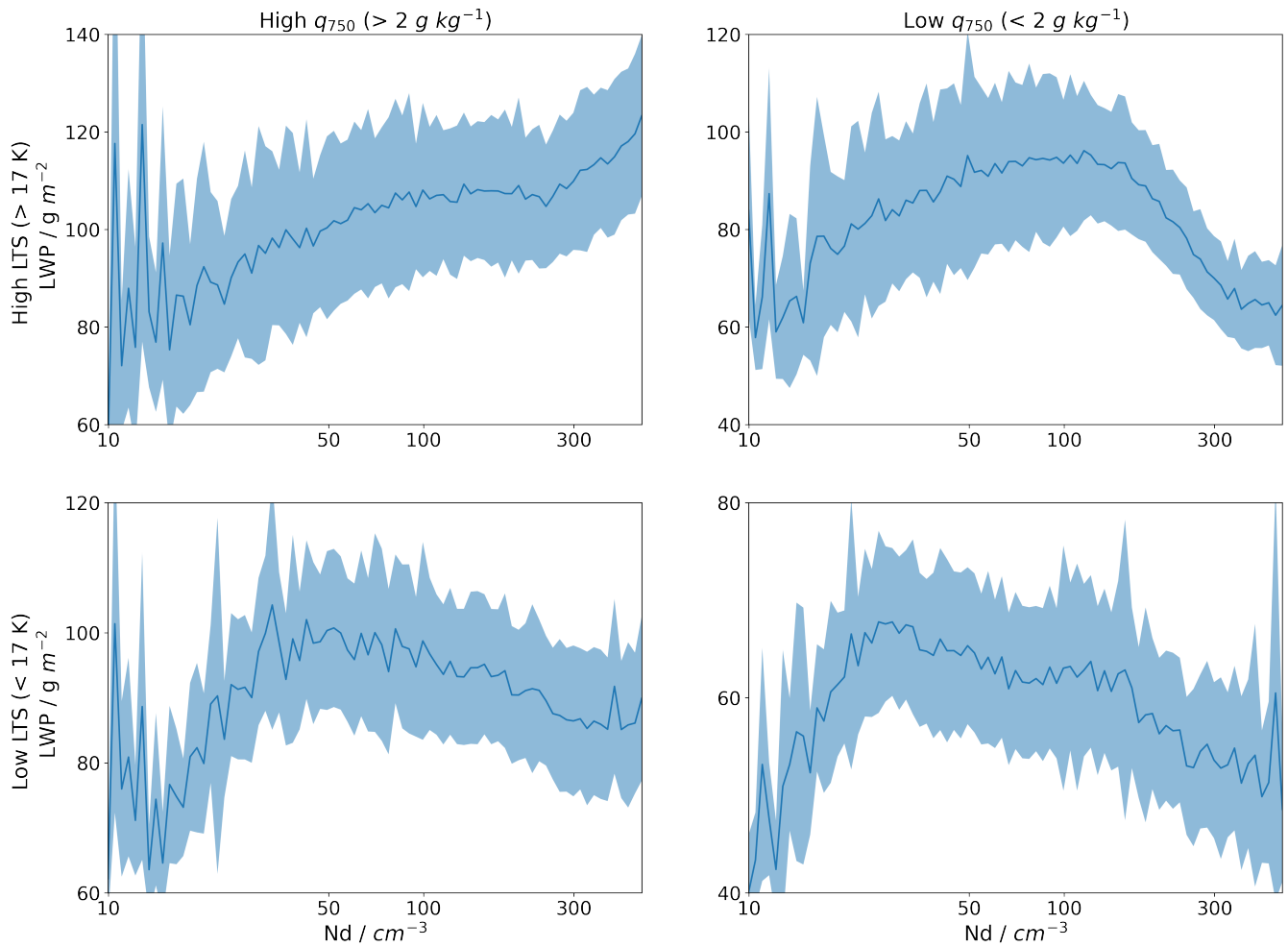
**Figure S4.** The number of points used for the  $N_d$ -LWP sensitivity plotted as a function of LTS and cloud-top humidity ( $q_{750}$ ) for Figure (3) in the main manuscript. Only bins which included over 100 valid retrievals were included in the analysis.



**Figure S5.** The linear  $N_d$ -LWP sensitivity plotted as a function of LTS and cloud-top humidity  $q$  with  $q$  taken at (a) 700 hPa (b) 800 hPa



**Figure S6.** Joint probability histograms for the AMSR-E LWP-MODIS  $N_d$  divided into four meteorological regimes based on LTS and  $q$ . The difference plots are shown at the end of each row and column, with red over blue indicating higher LWP at higher humidity/LTS. The black lines and grey shading on the joint probability histograms represent the mean LWP value for each  $N_d$  bin and the 95 % confidence interval, respectively.



**Figure S7.** The mean AMSR-E LWP for each MODIS  $N_d$  bin and the 95 % confidence interval for different meteorological regimes. The blue line is for all seasons and equivalent to the black lines in Figure S6.



## References