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## Difference in H<sub>2</sub>O Sensitivity of the Temperature-Based Proxies for Solid and Liquid Aerosols and Its Consequence in the Prediction of Polar Ozone Losses

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We evaluated the impact of increased stratospheric water vapour mixing ratios on future Arctic ozone column losses by determining the H<sub>2</sub>O sensitivity of the temperature-based proxies for solid ( $V_{PSC}$ ) and liquid ( $V_{ACl}$ ) aerosols. Possible causes for future stratospheric water vapour increases are the likely rise of tropospheric methane levels and leakages from a hydrogen prioritized energy supply. We found that  $V_{ACl}$  increases significantly faster with increasing H<sub>2</sub>O mixing ratios and decreasing temperatures in the altitude range of 400 K to 550 K potential temperature. Our findings show that the additional ozone column loss is most pronounced for cold winters where a maximum simulated H<sub>2</sub>O increase of 1.05 ppmv causes an additional ozone column loss of 35 DU using  $V_{ACl}$  and 20 DU using  $V_{PSC}$  as a proxy, respectively.