Supporting Information

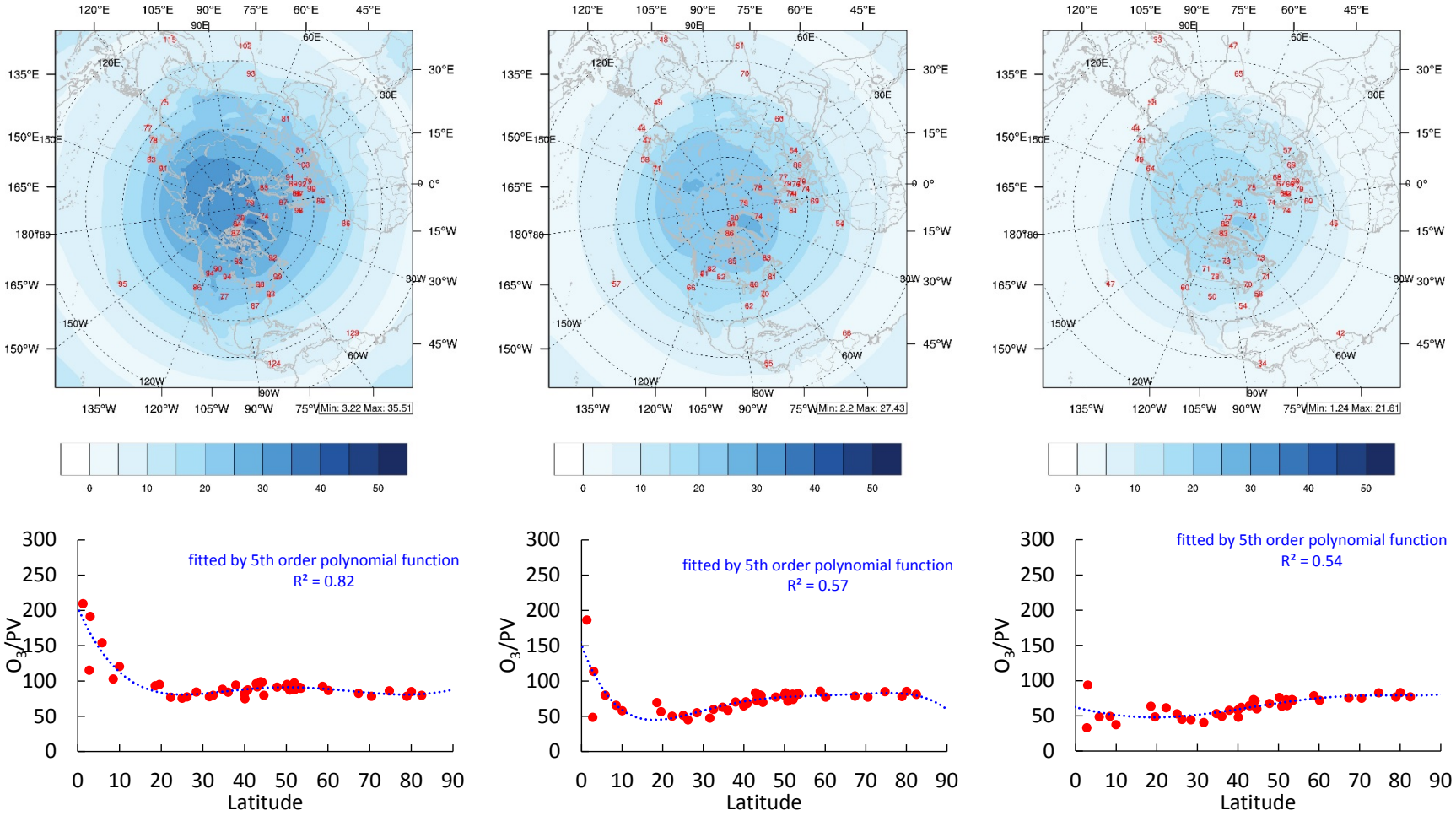

Figure S1 Sensitivity of O_3/PV to spatial location (1st row: background represents the value of PV in PVu averaged for 1990-2010, dots represents the ratio of O_3/PV in ppb/PVu; 2nd row: scatter plot of O_3/PV vs latitude)

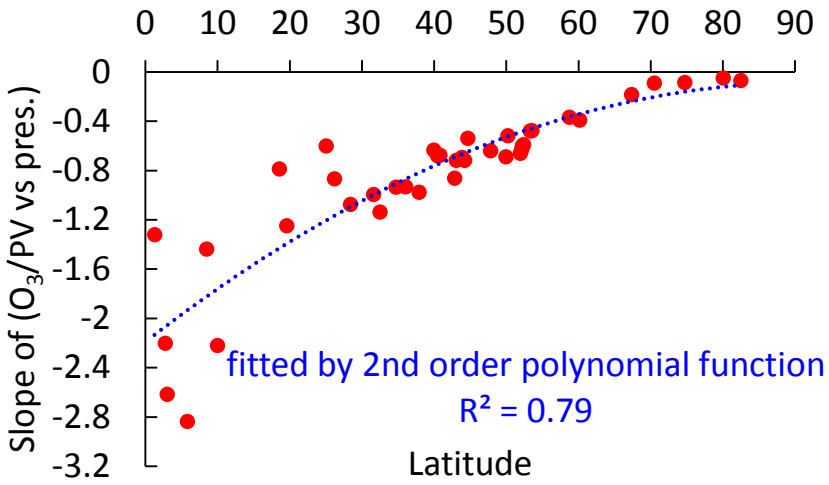

Figure S2 Correlations between the slopes of O_3/PV vs pressure (in hPa) and latitude

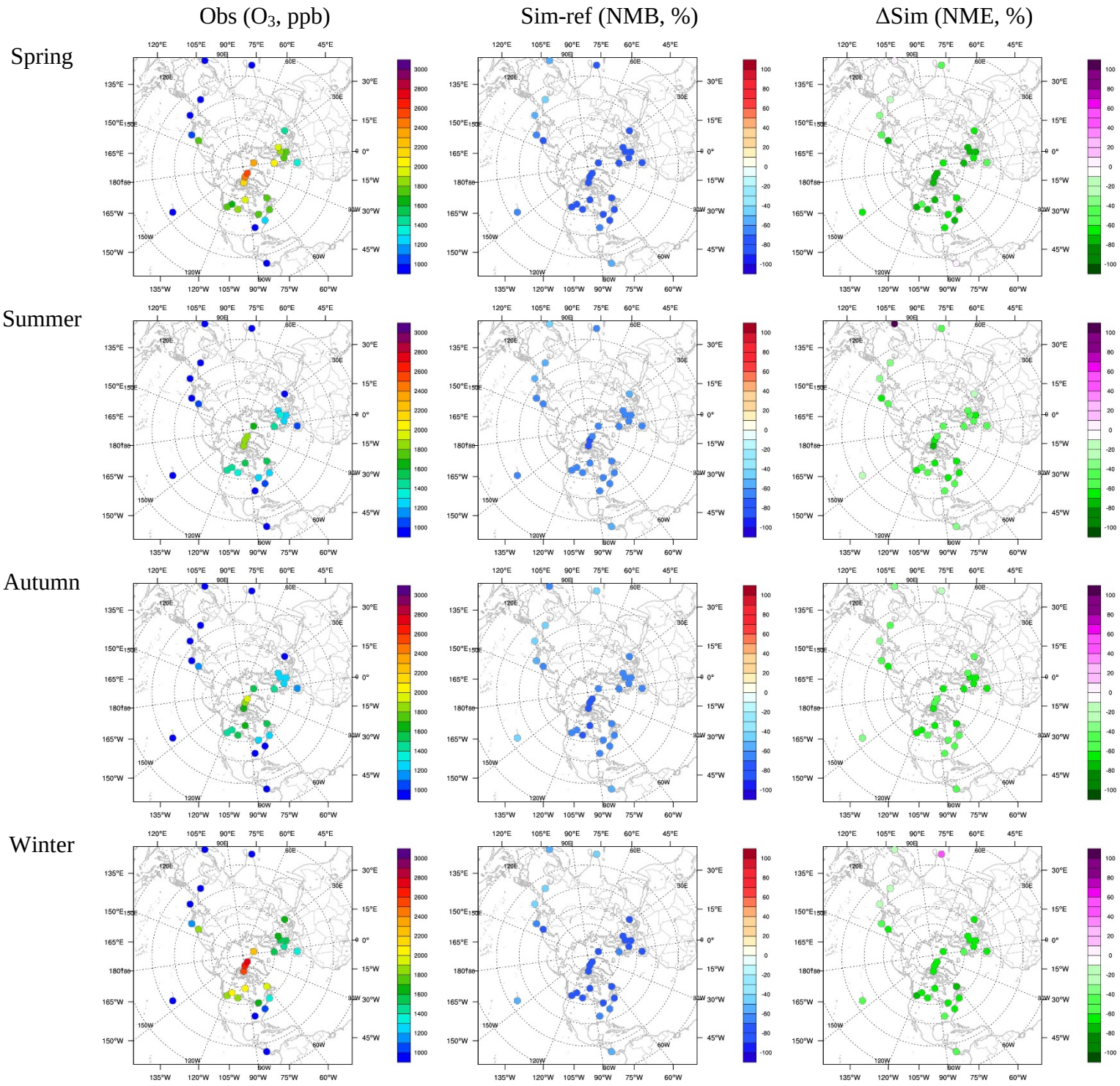

Figure S3 Comparison with WOUDC O_3 sonde at high layers (Pressure < 100hPa)
(ΔSim= Sim-new minus Sim-ref in NME)

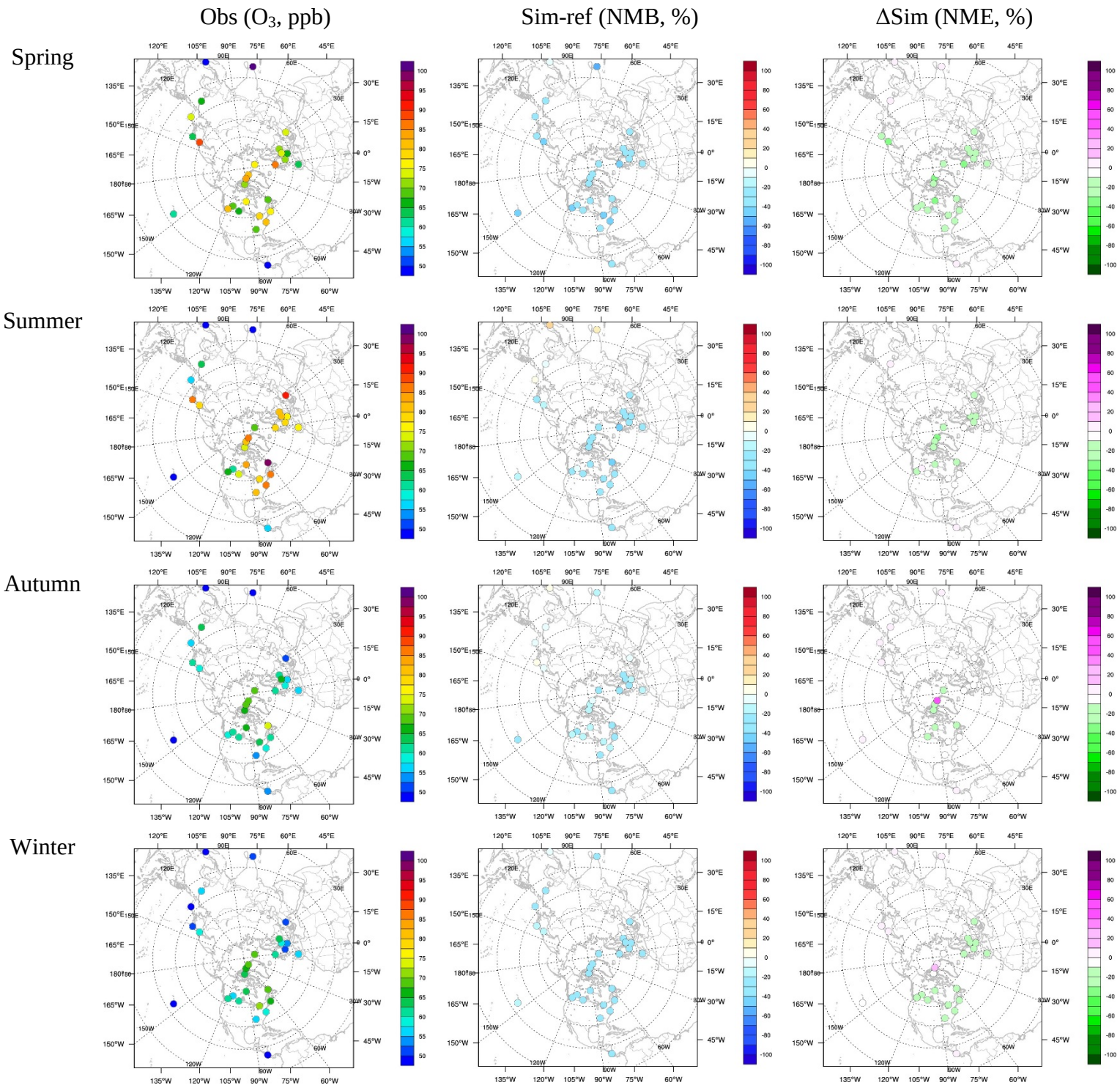

Figure S4 Comparison with WOUDC O_3 sonde at middle layers (300hPa<pressure<500hPa) (ΔSim= Sim-new minus Sim-ref in NME)

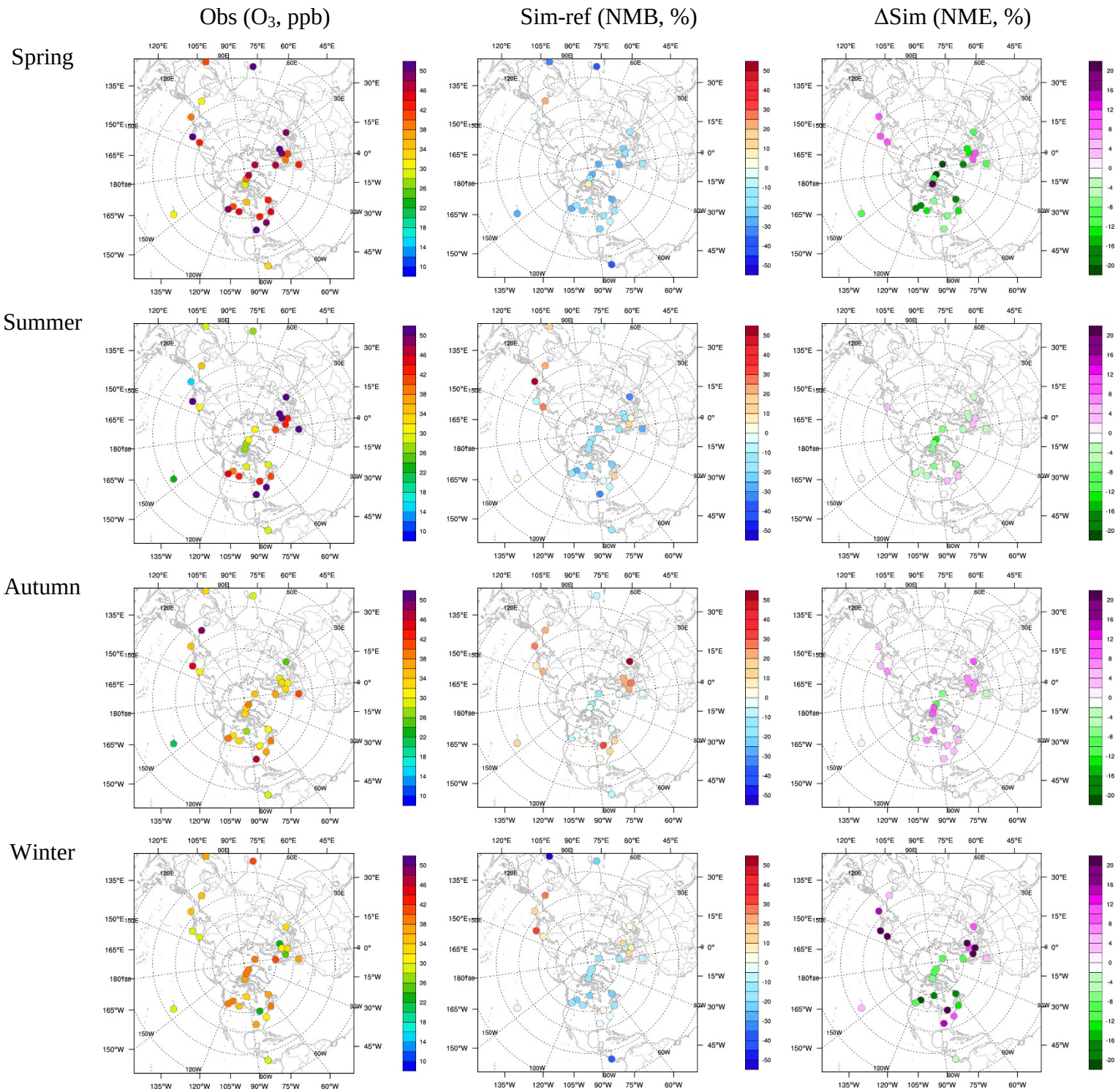

Figure S5 Comparison with WOUDC O_3 sonde at low layers (Pressure > 800hPa)
(ΔSim= Sim-new minus Sim-ref in NME)

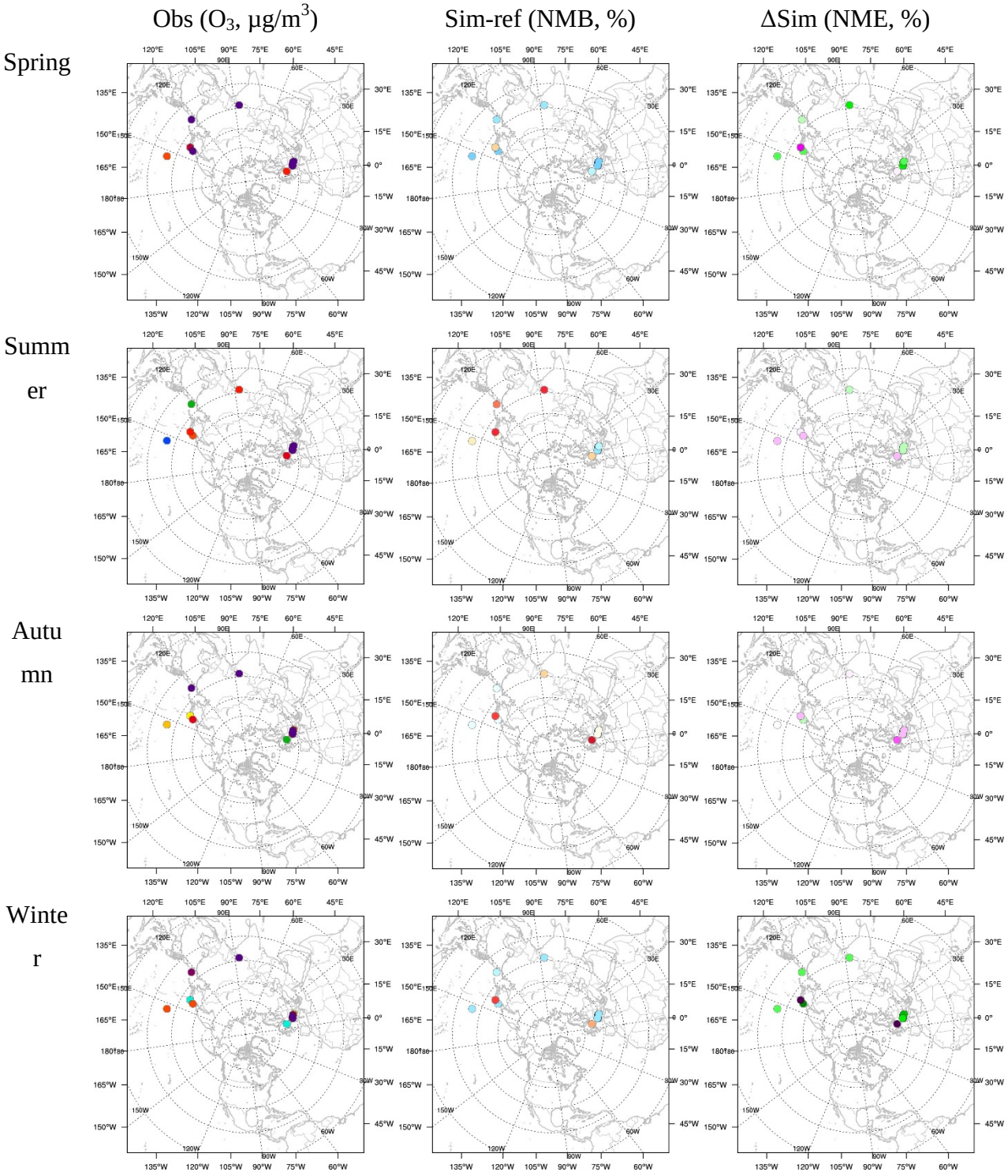

Figure S6 Comparison with WDCGG surface daily maximum 8-h average O_3 concentration (ΔSim= Sim-new minus Sim-ref in NME)