How waviness in the circulation changes surface ozone: a viewpoint using local finite-amplitude wave activity

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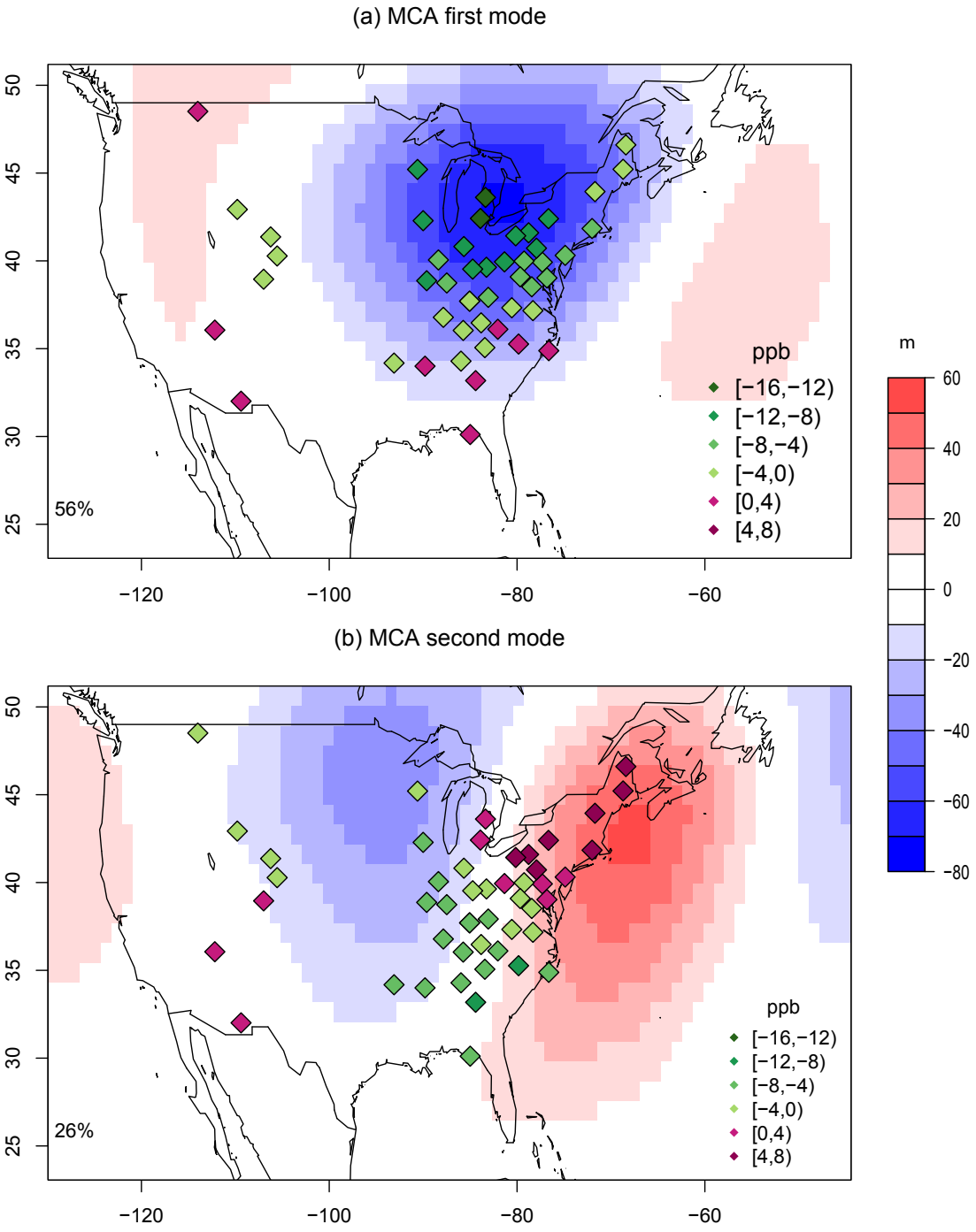

Figure S1. As in Figure 3, except for the first mode (a) and second mode (b) from the Maximum Covariance Analysis of geopotential height (m) and MDA8 ozone at selected CASTNET stations within the analysis domain for JJA. Geopotential height is from the ERA Interim meteorology and ozone is measured at the CASTNET sites. The percent variance explained by each mode is given in the lower-left corner of each figure.

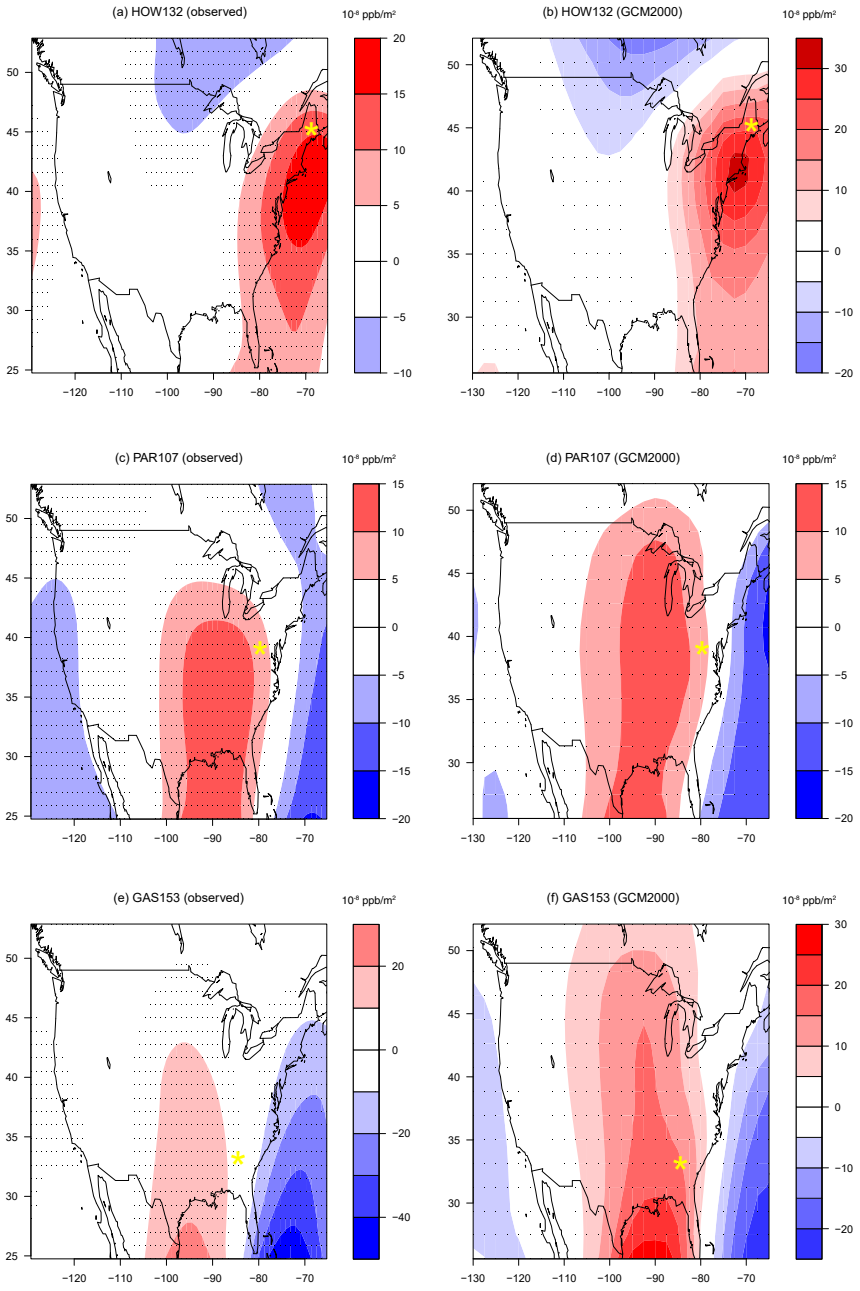

Figure S2. Regression coefficients between MDA8 ozone at representative sites (star sign) and AWA in the study region. The sites are HOW132 (68.7W, 45.2N), PAR107 (79.7W, 39.1N), GAS153 (84.4W, 33.2N) from north to south. The left column (a, c, e) are results using CASTNET ozone and AWA from ERA Interim meteorology. The right column (b, d, f) is from the GCM2000 simulation. Stippling represents where the regression coefficient is significant at 5% significance level.

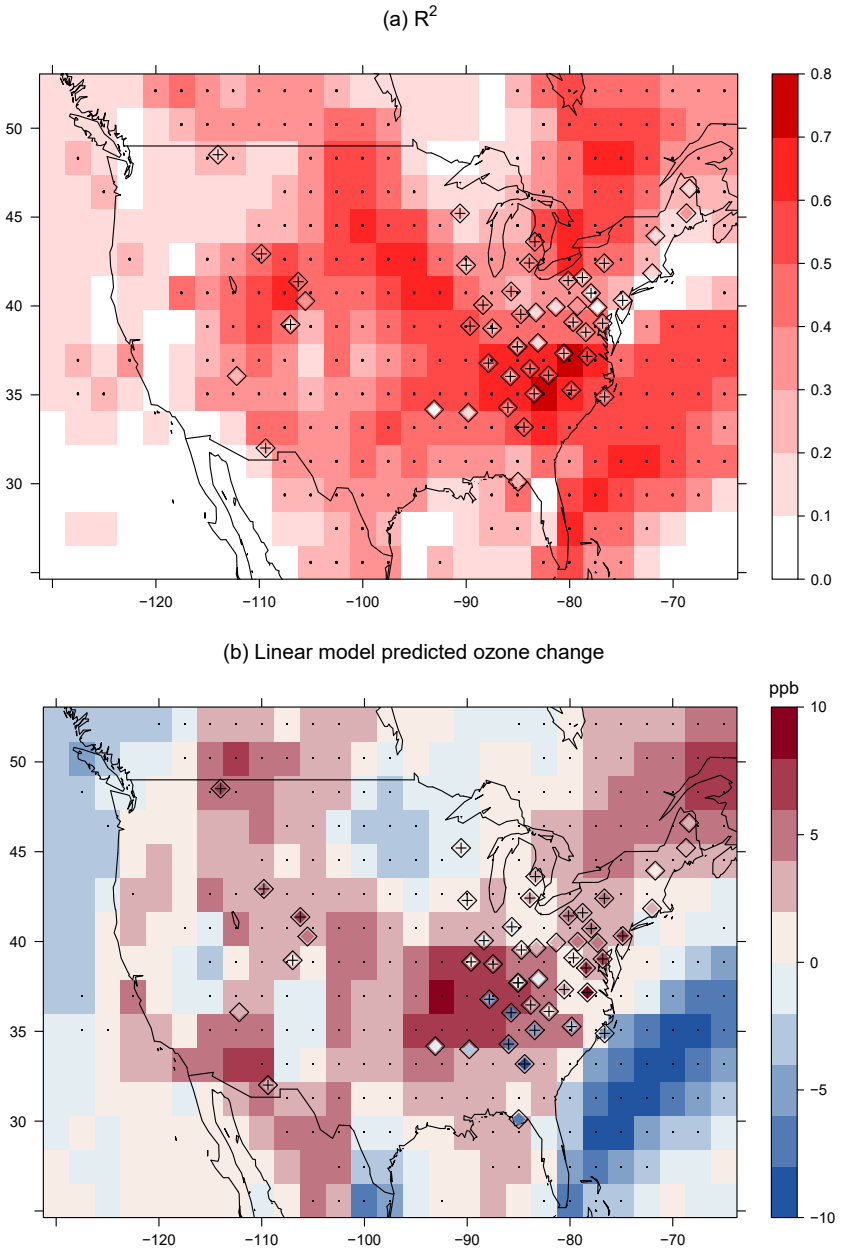

Figure S3. (a) Ozone's interannual variance explained (R^2) of the linear regression model using Z500 projection value as the explanatory variable, with modeled results in shades and observed results in diamonds. Plus signs and stippling represent where R^2 is significant (at 5% significance level) at CASTNET sites and model grids. (b) Change in MDA8 ozone between future climate (2100s) and present climate (2000s) predicted by linear regression models using CAM4-chem fitted slope pattern (S) and regression coefficient (β) (shades) using Z500 overlaid with predicted ozone change at CASTNET sites using reanalysis fitted S and β (diamonds).

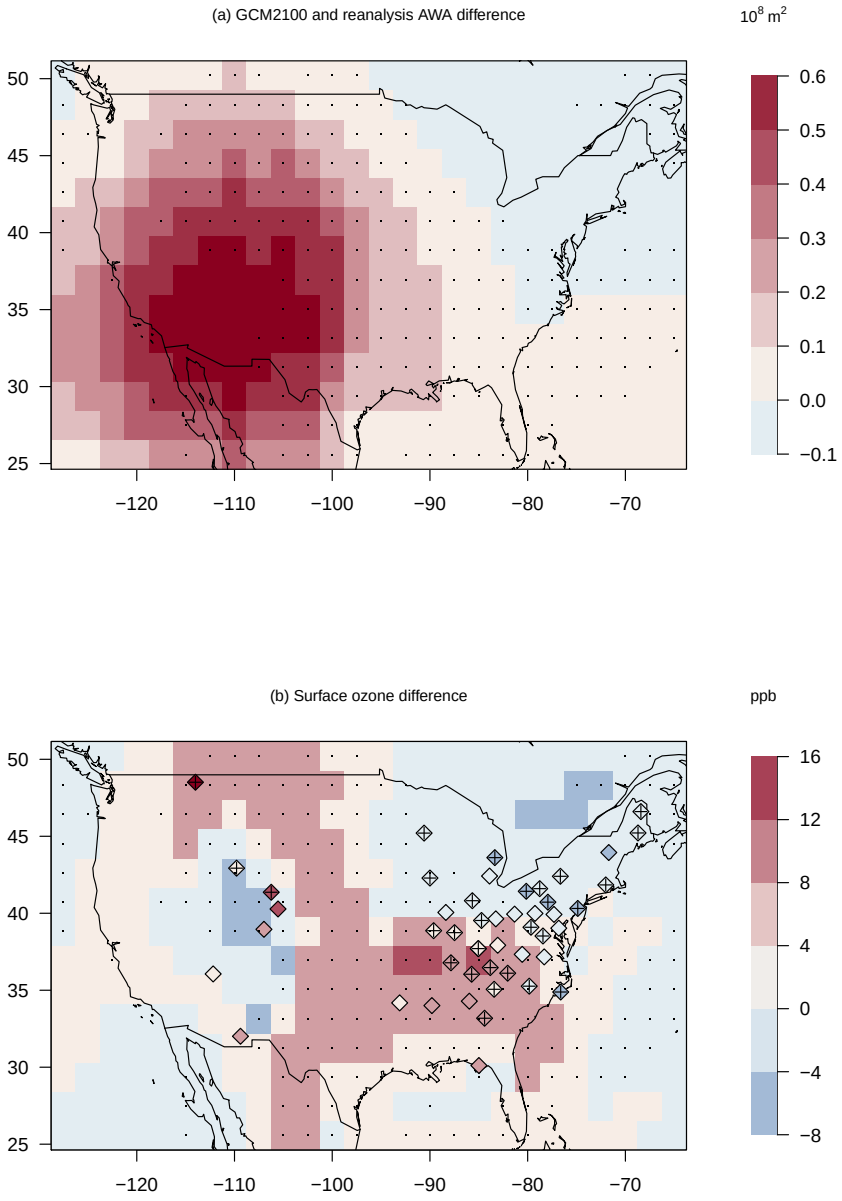

Figure S4. (a) JJA difference between AWA in the GCM2100 simulation minus AWA in the ERA-Interim simulation. (b) Change in MDA8 ozone from the linear regression model derived from the GCM2000 simulation (shaded) or the measurements (diamonds) using the difference in AWA as the explanatory variable, where the differences in AWA are calculated between the GCM2100 simulation and the ERA-Interim reanalysis.