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[@levinson_coupled_1989; @delisle_aerodis:_2008; @benhamou_aerodis:_2014] Aerodis is the newer generation of air dispersion model that considers chemical reactions among ambient species and changes in species concentrations due to gaseous transfer, wind, and deposition from the atmosphere [@sismEPM]. Aerodis is currently in its third iteration and can be used to simulate many of the transport mechanisms described in this study. For all air-dispersion models, calculations must be performed at a series of receptor locations that form a geospatial grid, and the modeled concentration or fluxes must be interpolated into the geospatial grid. These receptor locations are typically residential or agricultural regions that are not overlaid with urban land use to avoid double-counting of the modelled air. However, when it comes to ozone, receptor locations are always located within a city, and therefore we use the list of cities for the United States and Mexico obtained from . Due to the temporal and spatial resolution of the data, we only use modeled concentrations at a daily average. Daily averages are obtained by averaging concentrations over all hours of a given day. We do not consider diurnal variations and, because we are only considering gaseous ozone, we assume that all species are in local thermodynamic equilibrium (LTE). For this study, we use a spatial resolution of 1 km, to capture the spatial features of ozone source regions in the North American context. The concentration of each species is then obtained as follows: $$C(\bm{x}) = C_0(\bm{x}) \times M(\bm{x})$$ where $C_0(\bm{x})$ is the concentration field of species at time t, $M(\bm{x})$ is the mass field of species, and $\bm{x}$ is the location of the receptor. Note that for the gaseous species (ozone and nitric oxide), mass is the same as concentration. For both source and receptor locations, we use a linear covariance function to interpolate the concentration fields at the receptor locations. This is because there is no data for receptor locations that would enable nonlinear interpolation of the concentration field. Evaluating Gradient 82157476af