

Climate change impacts on local air quality: A case study for surface ozone in Southern Austria

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Southern Austria is regularly experiencing exceedances of the Austrian ozone (O_3) target values. It is well understood that besides O_3 precursor emissions and ambient meteorological conditions (e.g., temperature, stagnation, radiative flux) strongly influence O_3 formation and persistence. Here we investigate the connection between high ozone events at 21 urban and rural sites in Southern Austria and meteorological regimes for the recent past (observations for 2001-2014) and future (out to 2100, in chemistry-climate model simulations under selected Representative Concentration Pathways (RCPs)). To characterize individual meteorological regimes we apply a weather classification approach. Our results show a clear connection between high ozone episodes and stagnant weather-types. Furthermore we investigate effects of changes in O_3 precursor emissions and global methane abundances on ozone air quality at the local level in targeted RCP sensitivity simulations. These efforts aim to inform air quality managers on implications of climate and emission changes for near- and long-term attainment of the O_3 target values on local/regional scale.