Impacts of future climate change on the air quality over US National Parks

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We present a modeling analysis to show the potential future consequences of climate and land cover/use changes on the air quality over the US National Parks. Poor air quality in national parks adversely affects park ecosystems, staff and visitors. To develop air quality management and mitigation plans, the National Park Service needs to understand the contributions of current emission sources as well as contributions from projected future emission scenarios. To assess the impact of climate change on air quality in National Parks, we focus on changes in ozone and particulate matter. The modeling analysis is conducted using the global National Center for Atmospheric Research (NCAR) Community Earth System Model (CESM). NCAR's CESM is driven by present-day and archived projected anthropogenic and biomass burning emissions in combination with meteorological scenarios predicted for 2050 obtained from the Representative Concentration Pathways inventory to be used in the Intergovernmental Panel on Climate Change simulations. Changes in biogenic emissions, and land cover and land use are also taken into account in the analysis.