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Quantifying and attributing changes in tropospheric ozone from a combination of satellite measurements and models

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Given the importance of tropospheric ozone as a greenhouse gas and a hazardous pollutant that impacts human health and ecosystems, it is critical to quantify and understand long-term changes in its abundance. Satellite records are beginning to approach the length needed to assess variability and trends in tropospheric ozone, yet an intercomparison of time series from different instruments shows substantial differences in the net change in ozone over the past decade. We discuss our efforts to produce Earth Science Data Records of tropospheric ozone and quantify uncertainties and biases in these records. We also discuss the role of changes in the magnitude and distribution of precursor emissions and in downward transport of ozone from the stratosphere in determining tropospheric ozone abundances over the past 15 years.