6.177 Stratospheric intrusions investigated using high-resolution global simulations from the NASA GEOS-5 model.

Early Career Scientist

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Abstract:

The influence of stratospheric intrusions on surface ozone (O_3) concentrations is explored using a combination of observational datasets and modeling tools. In October 2015, the Environmental Protection Agency (EPA) revised the US air quality standard for O_3 from 75 ppbv to 70 ppbv. In many communities around the country, mitigations on O_3 precursors will be the driver to remain below the air quality standard. However, natural injection of high levels of O_3 from the stratosphere can cause air quality exceedences, especially for communities at high elevations in the springtime. Despite decades of research, the influence of stratospheric intrusions on air quality is still poorly understood.
Using a multitude of observational datasets, including flight campaign data, ozonesondes and air quality monitoring surface sites, in combination with GEOS-5 modeling and assimilation products, the transport of O_3 from the stratosphere toward the surface is assessed. By focusing on recent reports of high O_3 at monitoring station sites likely associated with stratospheric intrusions, we aim to provide the public with tools which are available in near-real time to be able to more rapidly identify the impact of stratospheric air as opposed to anthropogenic sources.