

Atmospheric constituents in GEOS-5: Components for an Earth System Model

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The GEOS-5 model is being developed for weather and climate processes, including the implementation of "Earth System" components. While the stratospheric chemistry capabilities are mature, we are presently extending this to include predictions of the tropospheric composition and chemistry - this includes CO₂, CH₄, CO, nitrogen species, etc. (Aerosols are also implemented, but are beyond the scope of this paper.) This work will give an overview of our chemistry modules, the approaches taken to represent surface emissions and uptake of chemical species, and some studies of the sensitivity of the atmospheric circulation to changes in atmospheric composition. Results are obtained through focused experiments and multi-decadal simulations.