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Controls on the Past and Future Depletion of Antarctic Ozone

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We evaluate polar ozone depletion chemistry using the Specified Dynamics version of the Whole Atmosphere Community Climate Model. We show that the key control on total ozone depletion in both hemispheres is the occurrence of cold temperatures (below 192K) and associated heterogeneous chemistry on polar stratospheric cloud (PSC) particles composed of solid and liquid material. Reactions limited to warmer temperatures above 192 K yield little modeled polar ozone depletion in either hemisphere. A detailed analysis will be presented of how variations in total chlorine, temperature, dynamics, and volcanic eruptions have influenced the Antarctic ozone hole from 1979 through 2015, including the important influence of several volcanic eruptions that have occurred since 2005.