

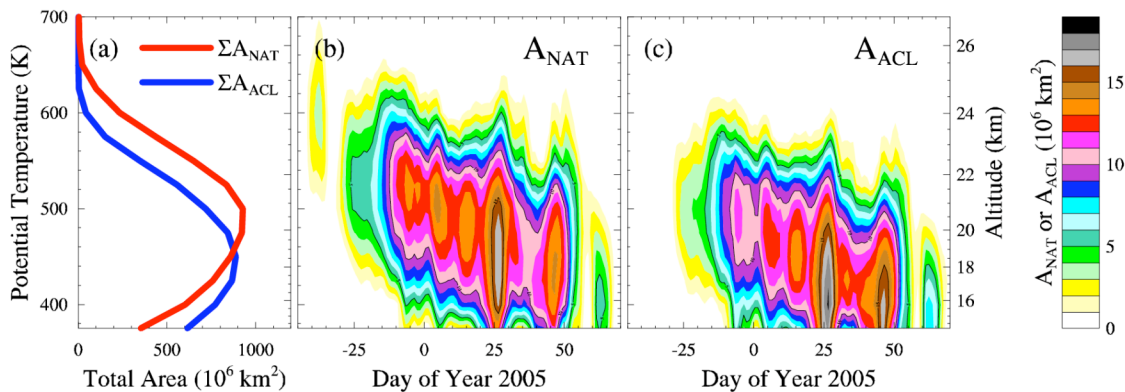


## Re-Examining Polar Ozone Loss

Over the last two decades, dramatic ozone loss has occurred every winter over the south pole. This phenomenon, commonly known as the “ozone hole,” continues to be of concern, as demonstrated by the record ozone hole that occurred in October 2006, even though international regulations limiting the production of the responsible chemicals have taken effect.

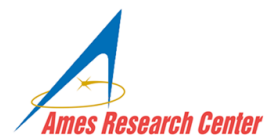
The earliest studies on ozone loss inferred that the polar stratospheric clouds (PSCs) that form each winter played a critical role in the ozone depletion, because PSC chemistry can activate the chlorine that destroys ozone. But revisions to PSC microphysics and chemistry have decreased the PSC reactivity by orders of magnitude relative to initial estimates. Research at Ames has re-evaluated the fundamental factors that control chlorine activation, and thus control ozone loss. This research has identified background sulfate aerosol, that is always present in the stratosphere, as the primary source of chlorine activation, rather than the infrequently occurring PSCs. The shift from clouds to aerosol implies that aerosol properties, rather than PSC microphysics and PSC-related parameters, determine when and where chlorine activation and subsequent ozone loss occur. For example, the aerosol properties are more sensitive to changes in the earth’s atmosphere that may occur over the next few decades.

Research at Ames will continue to investigate the implications of sulfate aerosol for polar ozone loss. New parameterizations of ozone loss are being developed for incorporation into large scale models such as climate models and numerical weather prediction models. Analysis of Arctic and Antarctic ozone loss over the last two decades will be examined for further evidence of the role of sulfate aerosol. The sensitivity of future ozone loss to factors such as volcanic eruptions, temperature changes, and humidity changes will continue to be explored.



*The extent of calculated Arctic chlorine activation, comparing the traditional metric ( $A_{NAT}$ ) with the new proposed metric ( $A_{ACL}$ ). Note the differences in vertical extent between the two calculations, and the difference in the initial onset of activation.*

**Points of Contact:**  
 Katja Drdla  
 Project Principal Investigator  
 650-604-5663, Katja.Drdla@nasa.gov



## Re-examining Polar Ozone Loss

**Points of Contact:**

Katja Drdla  
Project Principal Investigator  
650-604-5663, [Katja.Drdla@nasa.gov](mailto:Katja.Drdla@nasa.gov)

