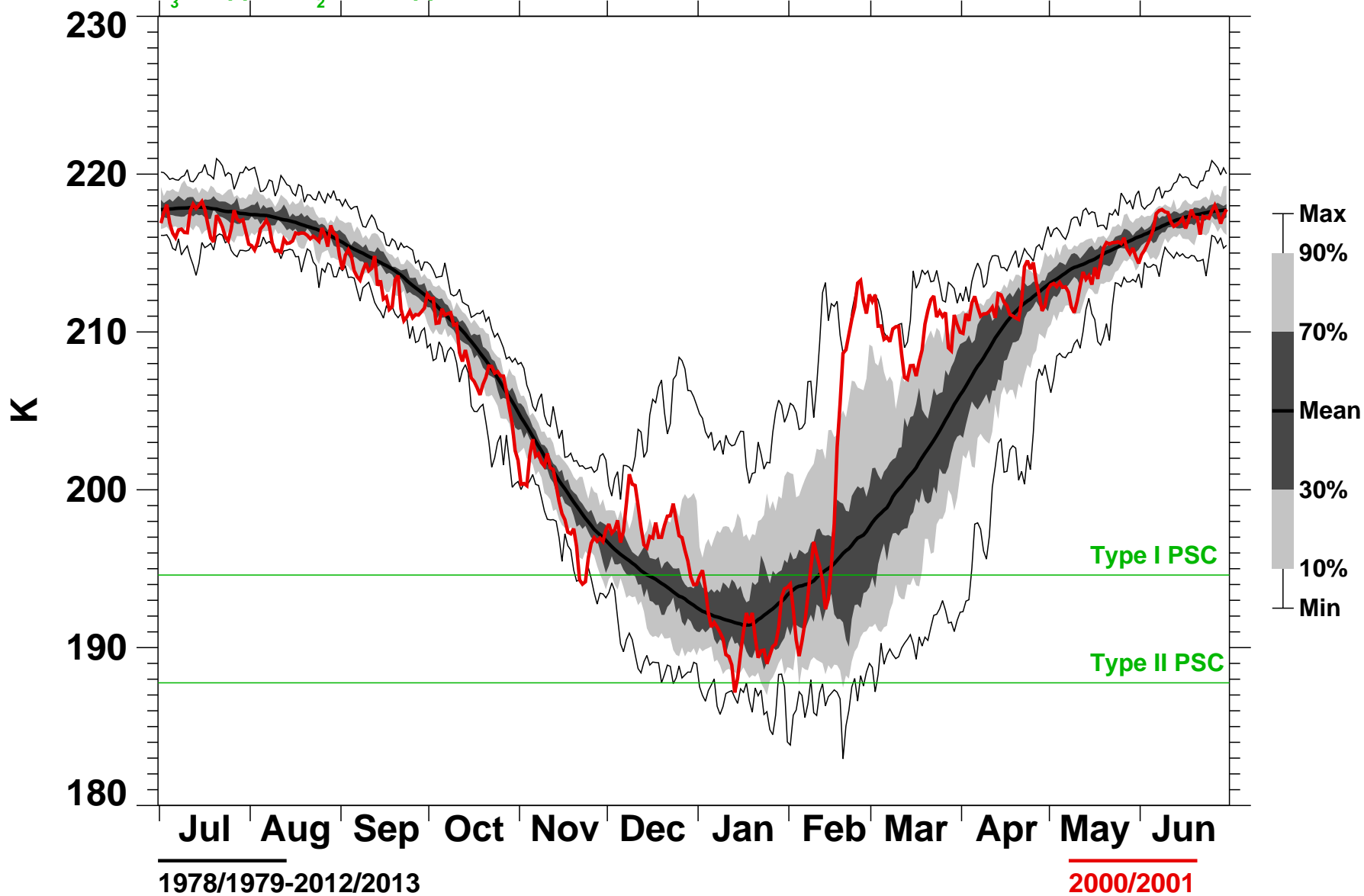


# 50-90°N Minimum Temperature

$\text{HNO}_3 = 6 \text{ ppbv}$ ,  $\text{H}_2\text{O} = 4.5 \text{ ppmv}$

50 hPa MERRA



1978/1979-2012/2013

2000/2001

P. Newman (NASA), E. Nash (SSAI), S. Pawson (NASA)