RECENT LIQUID WATER IN THE POLAR REGIONS OF MARS. A. V. Pathare and D. A. Paige, Department of Earth and Space Sciences, University of California, Los Angeles, 405 Hilgard Avenue, Los Angeles CA 90098-1567, USA (avp@mvacs.ess.ucla.edu; dap@mvacs.ess.ucla.edu).

The potential presence of liquid water on a planetary body during a given epoch is important to both climatology and exobiology. Our modeling of the martian surface heat balance at high latitudes and obliquities in the recent past (i.e., during the last 100 m.y.) indicates that liquid water has been stable during local spring and summer in the polar regions of Mars. Previous martian climate models concluded that liquid water would not be stable at high obliquity. However, our model differs from these previous models in three crucial respects: a more detailed atmospheric radiative transfer model is employed to assess the surface heating due to a water vapor greenhouse; the effects of atmospheric dust are incorporated; and perhaps most importantly, idealized sublimation into a dry atmosphere is not assumed. Our results indicate that liquid water would indeed be stable at the martian poles at obliquities of 45° and higher during much of local spring and summer. Furthermore, using the best estimates of martian near-polar surface properties such as thermal inertia and albedo, we also find that such liquid water "oases" would also be stable just off of the northern polar cap at obliquities as low as 35°. The importance of such stable liquid water to climatology is twofold, as water not only influences climate but also readily erodes the surface, thereby recording past climate change. We will attempt to discuss the geologic evidence for such change in the context of new observations from Mars Global Surveyor.