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Polar Crater Deposits as a Probe for Ancient Climate Change on Mars JOHN ARMSTRONG, Weber State University — Dynamical studies of the Martian orbit suggest a planet that has undergone extreme orbital change. How has this affected the planet's climate? Is there a record of this orbit-induced climate change written in the geology that is expressed on the surface? If so, such a record would provide insight into Mars' climate history, and shed light on the types of habitats for life that may have existed in the past. We are exploring how the current seasonal polar caps interact with polar craters in an effort to identify modification that can be linked to the proximity of the polar cap. Ice deposits within the craters are evident in both thermal spectra and imagery from Mars orbiters. We have linked these ice deposits to morphological deposits that can be identified in other craters that are further from the pole. These deposits may act as a probe of the variations suggested by orbital calculations, as well as provide an indicator of the extent of the sub-surface ice table. We will present preliminary results from a sample of northern craters, and explain how this can be extended to southern craters, and possibly mid-latitude craters, in an effort to understand more fully the martian climate through time.

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