FURTHER CHARACTERIZATION OF THE AEOLIAN TRANSPORT ENVIRONMENT NEAR ENDEAVOUR CRATER. T. I. Michaels[1], [1]Carl Sagan Center at the SETI Institute, Mountain View, CA, USA (tmichaels@seti.org).

Introduction: Meridiani Planum has been a focus of Mars research since at least the late 1990s when the Thermal Emission Spectrometer (TES; on the Mars Global Surveyor spacecraft) found a strong hematite signature there. It was rigorously vetted as a Mars Exploration Rover (MER) landing site using the Mars Orbiter Camera (MOC), the Thermal Emission Imaging System (THEMIS), and other instruments. In 2004 the MER Opportunity began its *in situ* exploration of a small portion of the region (that continues to this day). More recently, imagery from the High Resolution Imaging Science Experiment (HiRISE) and the Context Camera (CTX) aboard the Mars Reconnaissance Orbiter has greatly added to our ability to both perceive details and detect change on the surface.

Evidence for present-day aeolian activity within Meridiani Planum was observed by the MER Opportunity in the form of the deposition and erosion of basaltic sand in a dark streak at Victoria Crater [1]. Further such evidence from orbit was discovered in very high-resolution imagery (HiRISE, CTX, and/or MOC Narrow-Angle) of Endeavour crater, the current location of the Opportunity rover [2]. Further monitoring for and detection of aeolian change within Endeavour crater using HiRISE and CTX imagery will be reported at this meeting [3].

In addition to image analysis, high-resolution atmospheric modeling work can help fill the gaps in time and space between images of aeolian features/changes, and provide insight into the driving forces creating/maintaining those features.

Approach: This work utilizes the Mars Regional Atmospheric Modeling System (MRAMS; [4]) to simulate the space- and time-variation of the surface aerodynamic surface stress on a 1x1 km grid within a subregion of Meridiani Planum that includes both Opportunity's landing site and Endeavour crater. [2] showed that seasonal change was significant in this location (over 4 seasons), so for this work 12 evenly-spaced seasonal runs were performed, encompassing an entire Mars-year. Each run was ~10 sols in duration in order to look for any potential multi-sol variability in the aeolian forcing.

Preliminary Results: The simulations indicate that there is significantly more short-term seasonal variation than the 4 seasonal simulations performed for [2] were able to resolve. This is particularly true for the aerodynamic surface stress magnitude, and thus aeolian transport. Multi-sol variability appears to be minimal, at least without any effects of local and regional dust storms (not treated). Analysis of the apparent origins and nature of the north and northwest winds that are currently causing aeolian change within Endeavour crater [2,3] (at least) will be presented. The origin and nature of the other two main wind regimes (see [2]) in this subregion will also be discussed. Comparisons of the model output to carefully mapped aeolian features (both those that appear static and those that are presently changing) within and in the vicinity of Endeavour Crater will be displayed and discussed.

References:

[1] Geissler P. et al. (2008) *JGR, 113,* E12S31.
[2] Chojnacki M. et al. (2011), *JGR*, *116*, E003675.
[3] Chojnacki M. et al. (2014) *LPS XLV*, this meeting.
[4] Rafkin et al. (2001) *Icarus, 151*, 228-256.

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