channel genesis as a function of channel type and morphology, slope, elevation, age, latitude, type of material dissected, and proximity to specific geologic features. In turn, the influence on channel origin by possible global or local anomalous climates may be assessed.

Although some work has been done to assess the timing of erosion and crater obliteration along the highland/lowland boundary [e.g., 28,29], we still know little about the volume of material eroded. We intend to measure depths of dissection by using photoclinometry, which will enable us to estimate these volumes of eroded material (and, consequently, volumes deposited in the northern plains).

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POLAR SEDIMENT ACCUMULATION: ROLE OF SURFACE WINDS AT THE TWO POLES.

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The accumulation of the large deposits of volatile and nonvolatile sediments at both martian poles has occurred through periods of likely climate change. Most data on wind directions near the martian poles and seasonal activity relate to a very short period of time, at one point in climate cycles. It is still uncertain what the net budgets to the poles are and how this budget (if known) would fit into longer climate/sediment cycles. Pending further data we examined the full suite of Viking high-resolution, high-latitude images for wind markers of all sizes and types. These probably represent timescales of formation from days to several tens of thousands of years. The goal is to estimate the effectiveness, and possible drivers, of wind systems that bring materials near the surface to the regions of polar sediments, and also remove materials from the polar areas.

The simple polar vortex model of French and Gierasch [1] accounts for only a part of the observed features; most particularly it lacks the poleward flow seen near 75–80 latitude in both polar regions, but especially the north. Observations of crescentic dunes, framing dunes, and some wind streaks show confinement of the north polar erg by off-pole winds near the margins of the layered deposits and prograde, on-pole winds slightly farther south. The on-pole winds have formed features as transitory as wind streaks and as long lived as large framing dune complexes. Exceptions to the pattern of confining, on-pole wind directions occur in some longitudes and might be due to topographic control. The present topographic data are inadequate to model these effects. In the south, intracrater dune fields are imaged well enough to show field orientations, and thus very-long-term winds, but the bedforms are largely transverse with 180° ambiguities in wind directions. Streaks show some on-pole flow, but in a retrograde sense.

It is desirable to discriminate between feedback effects, such as the dunes' low albedos, that might confine the winds to a narrow belt, and causes that are independent of the dune presence, which would allow poleward transport of the sand and some dust at the surface, for inclusion in the polar deposits. Surface transport of the saltating materials to the polar regions would remove the dilemma of saltating materials being present in deposits thought to be made up of suspension load and condensed volatiles.

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S44-91 ABS. ON

THE MARTIAN SOURCES OF THE SNC METEORITES (TWO, NOT ONE), AND WHAT CAN AND CAN'T BE LEARNED FROM THE SNC METEORITES.

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The SNC meteorites almost certainly from the martian crust, have been inferred to come from a single impact crater site, but no known crater fits all criteria. Formation at two separate sites (S from one, NC from the other) is more consistent with the sum of petrologic, geochronologic, and cosmochronologic data, and eases crater selection criteria. If the source craters for the SNC meteorites can be located, Mars science will advance considerably. However, many significant questions cannot be answered by the SNC meteorites, and await a returned sample.

Introduction: The SNC meteorites are rocks of basaltic parentage, inferred to be samples of the martian crust, and have been important in providing "ground truth" to other observations of Mars throughout the MSATT and predecessor programs. Although the SNCs have provided essential information on mantle and magmatic processes, the hydrosphere, and the composition of the atmosphere, their utility is limited because their source site(s) on Mars are not known. The most comprehensive effort at determining a source impact crater for the SNC meteorites [1] was not entirely successful, as no martian crater met all the criteria for an SNC source. However, it seems likely that the SNC meteorites came from two separate sources on the martian surface, and a number of craters fit this relaxed criterion.