Geomorphic Analysis of the Libya Montes Region: Implications for Geology of Isidis Landing Ellipse

Jeff Moore (NASA Ames) & Alan Howard (Uva)

CONCLUSIONS (from submitted paper)

- **The southern rim of the Isidis Basin (Libya Montes) has been strongly modified by fluvial erosional processes, including weathering, mass wasting, fluvial incision, and transport and deposition of sediment.**

- **Most of this erosion occurred during the Noachian, but a late stage of fluvial incision probably extended into the Hesperian.**

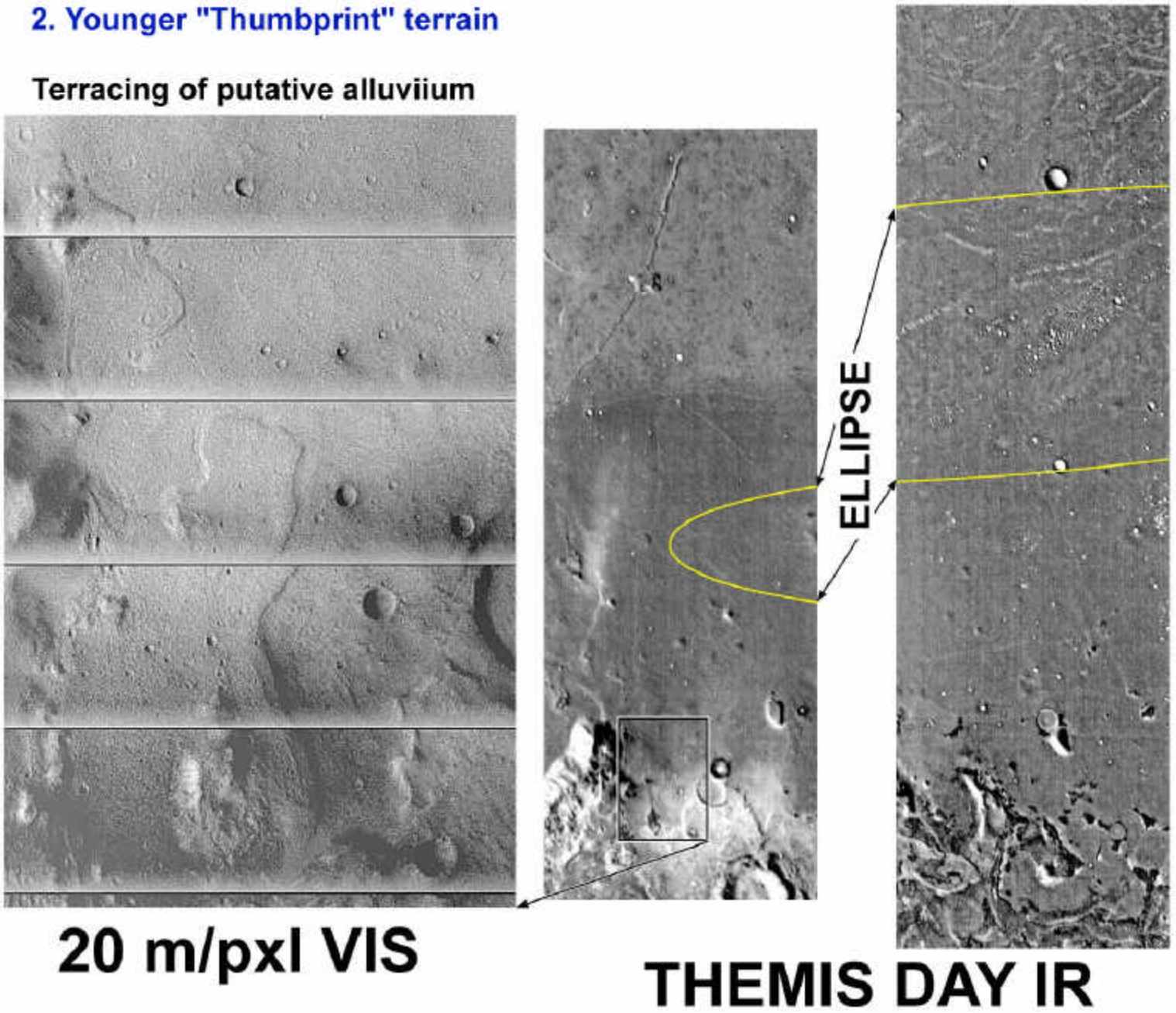
CONCLUSIONS (Continued)

- **Flat upland plateaus remained largely undissected, but the steeper margins of the plateaus, as well as interior and exterior crater rims, were deeply eroded, with sediments accumulating as fans, bajadas, and, possibly, playa lake deposits within crater interiors and in inter-crater basins.**
- **Late in the Noachian the steeper fans systems became dissected, presumably as a result in a decrease in sediment shed from uplands or an increase in runoff.**
- **During the latest Noachian to early Hesperian, further clear water discharges created an integrated set of valleys incised into the earlier basin deposits.**
- **Discharge for the late stage dissection was probably from precipitation runoff rather than groundwater sapping.**

Missing Image

TWO DOMINANT TERRAIN TYPES IN LANDING ELLIPSE

1. Putative Libya Montes-derived Alluvium
2. Younger "Thumbprint" terrain



IMPLICATIONS FOR LANDING ELLIPSE

- **Lot of fluvial erosion in Libya Montes, with many channels heading toward Isidis Planitia. None of the channels we studied cut Isidis itself. Unambiguously fluvial channels were unobserved below -2700 m elevation.**
- **MOLA topography shows several indistinct ramps that slope down into the southern edge of the ellipse from the Libya Montes that might be alluvial fans, though this interpretation is problematical.**
- **Most of the ellipse is dominated by a unit that is superposed (with a sharp contact) on the "fans" that is clearly seen in THEMIS mid-IR images and appears to be associated with "Thumbprint" terrain. This material appears similar to that which will be sampled by *Beagle 2*. We infer no obvious relationship of this "Thumbprint" terrain material with Libya Montes fluvial deposition.**