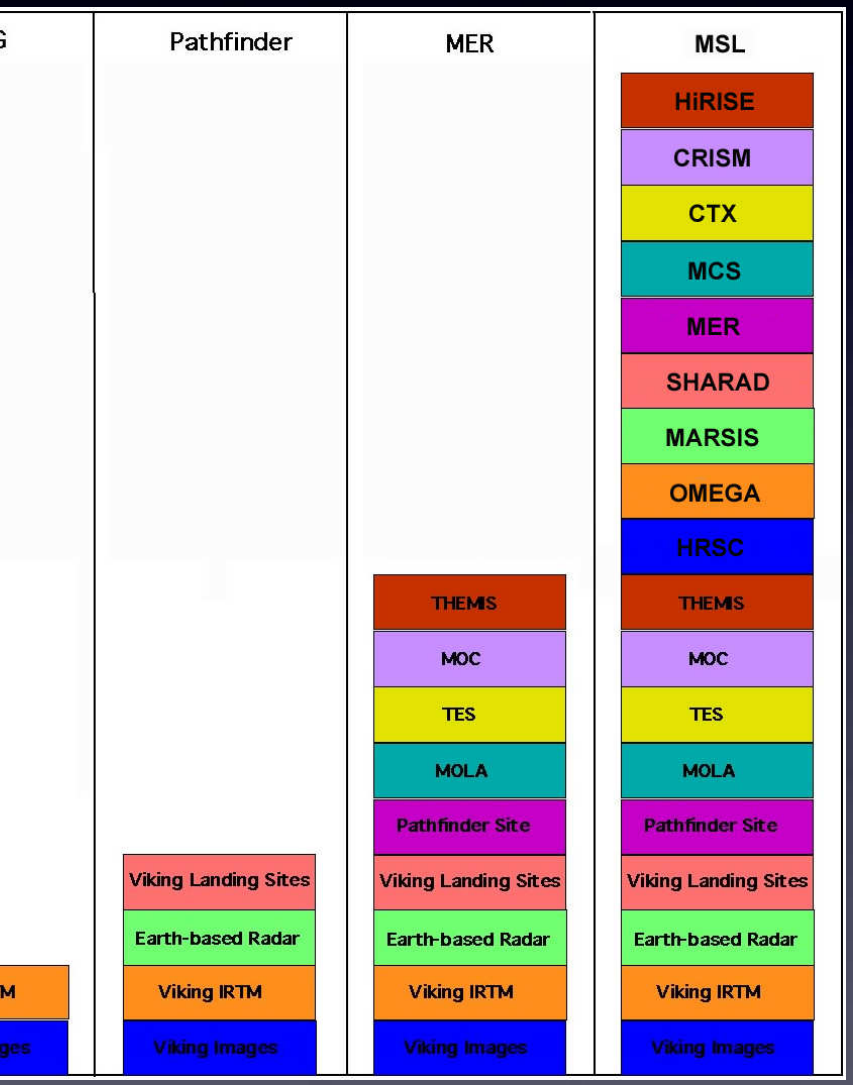
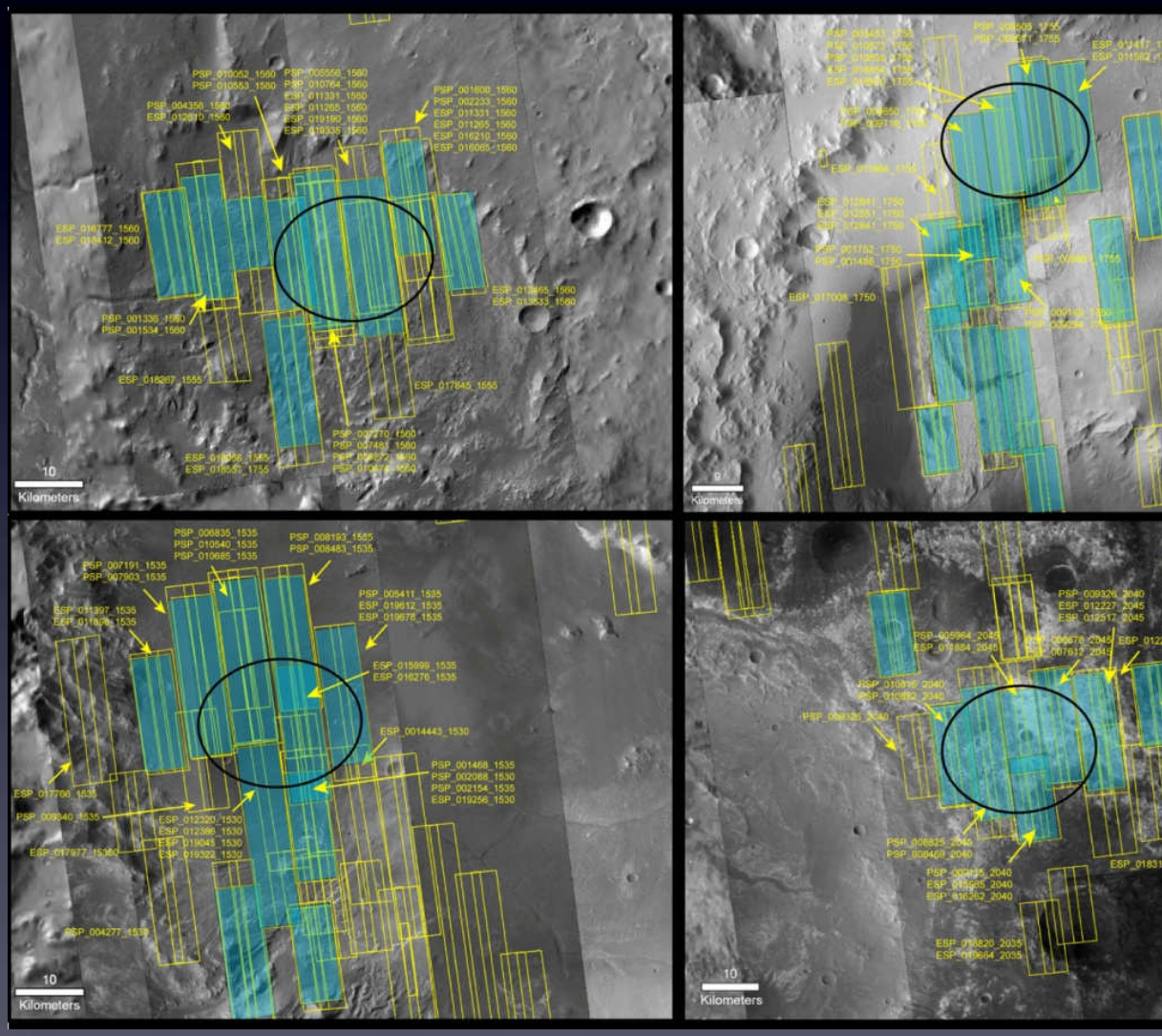
Studying New Candidate Landing Sites on Mars

rrent orbital assets have set the new standard for data required for identifying and qualifyin new Mars landing sites

An incredible effort by instrument teams has gone into obtaining high quality data used to evaluate candidate sites

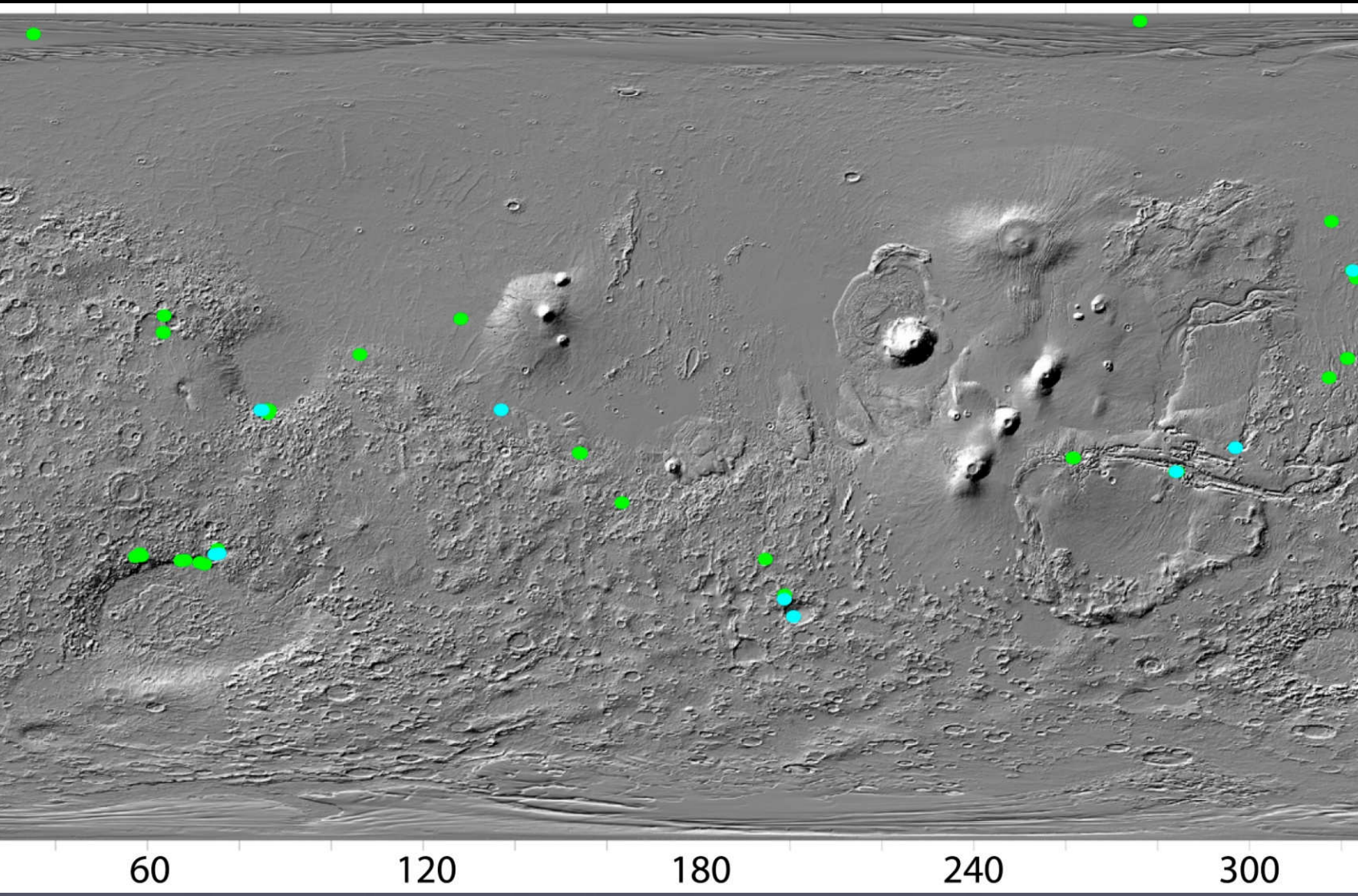




Orbital assets have a finite lifetime and there is no current plan fo replacement of most capabilities – use them before we lose them

- Multiple calls for new sites resulted in 40+ candidates
- Includes a wide range of future mission scenarios
  - Many candidate ellipses are 10 km X 15 km, but others specified by proposer
- Call for Critical Data Products V and VI (CDP V and VI) yielded additional candidates (and some funding!)
- New sites queued for imaging by MRO and other orbital assets
- Mars Steering Committee assembled that represents international interest and broad scientific topics (Astrobiology to Sample Return and others)
- Steering Committee includes John Grant, Matt Golombek, and Nicolas Mangold (co-chairs), Steve Ruff, Dave Des Marais, Scott McLennan, Brad Jolliff, Jack Mustard, Ken Tanaka, Barb Sherwood-Lollar, Gian Ori, Ernst Hauber, John Bridges, Mark Sephton, David Fernandez Remolar,

As of February 16, 2012



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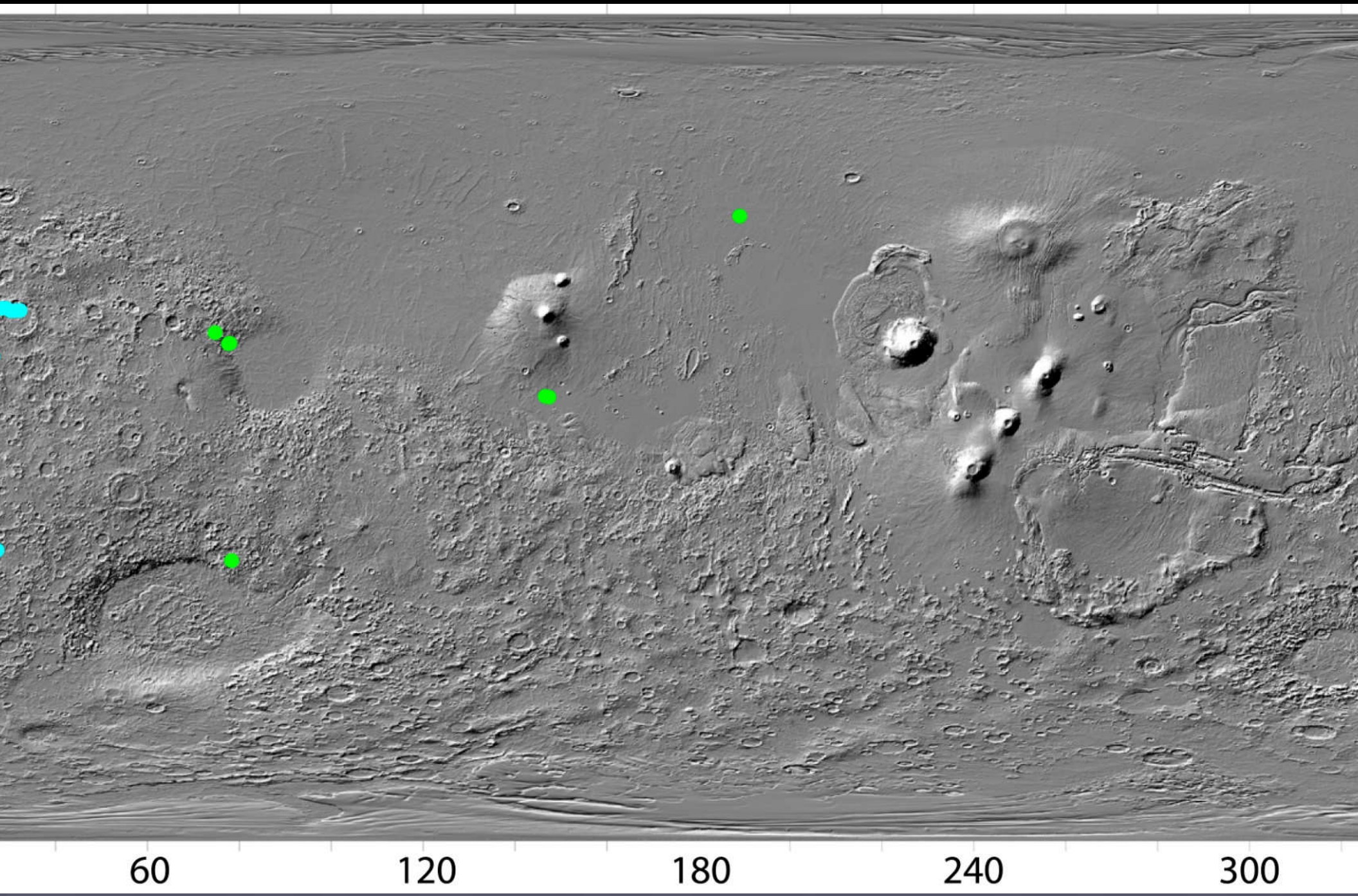


Nuts and Bolts:

- 40+ Candidate Sites Proposed
- Range of missions and ellipses

  Some have appeared before (MER and MSL)
- Some sites have multiple, prioritized targets
- 137 HiRISE images (34 in past 7 months)

  - 86 HiRISE targets left to image
- CRISM Lead on targets during “cold cycles”

  - 40 FRTs at cold temperatures (future and referen

  - Remaining CRISM lead queued every 4th cycle

in Priority Order

	Critically assess any evidence for past life or its chemical precurso place detailed constraints on the past habitability and the potentia preservation of the signs of life
	Quantitatively constrain the age, context and processes o accretion, early differentiation and magmatic and magnet history of Mars.
	Reconstruct the history of surface and near-surface processes invo water.
	Constrain the magnitude, nature, timing, and origin of past planet climate change.
	Assess potential environmental hazards to future human explorati
	Assess the history and significance of surface modifying processes including, but not limited to: impact, photochemical, volcanic, and
	Constrain the origin and evolution of the martian atmosphere, acc for its elemental and isotopic composition with all inert species.
	Evaluate potential critical resources for future human explorers.
	Determine if the surface and near-surface materials conta

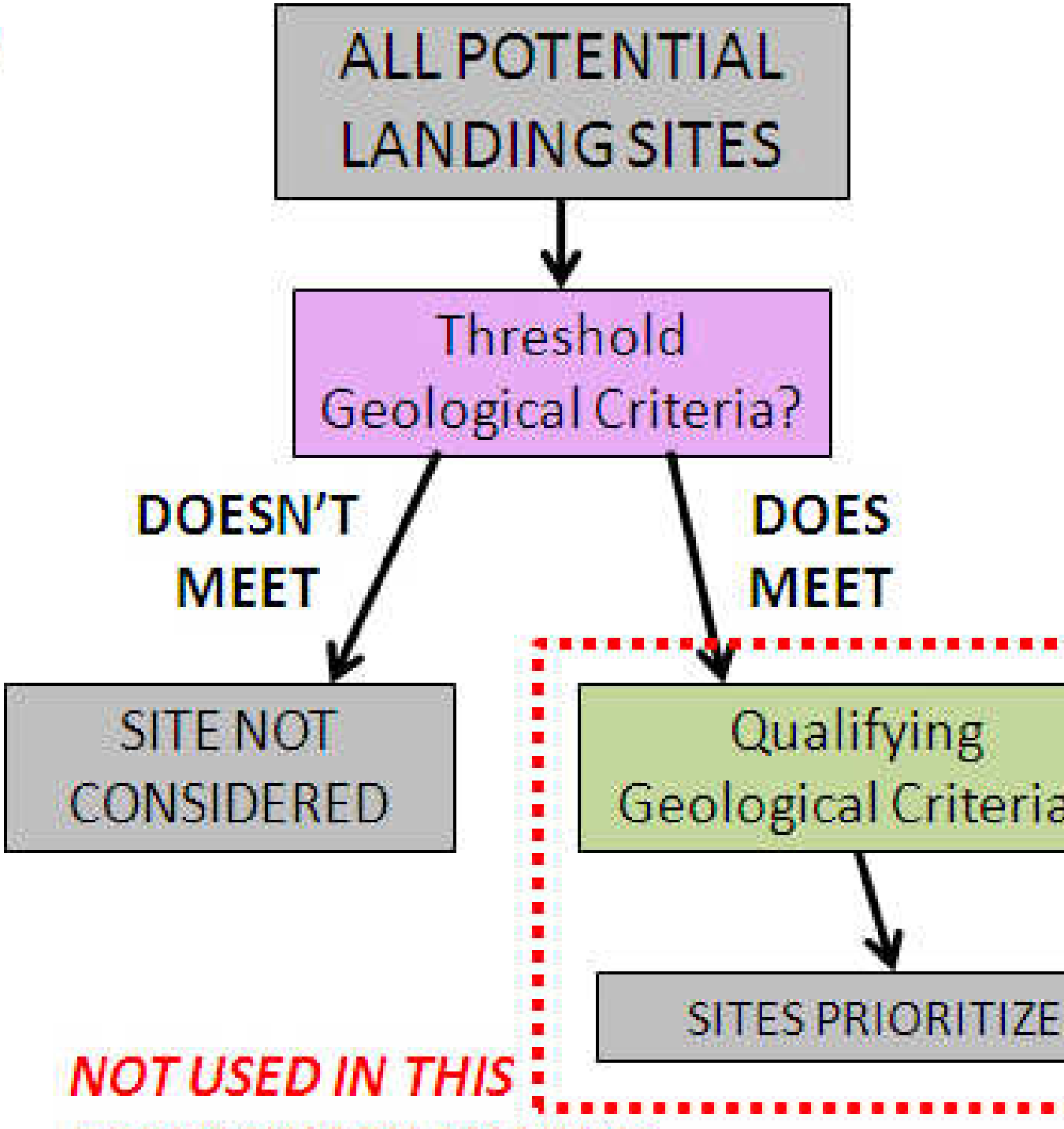
Proposed Selection Criteria

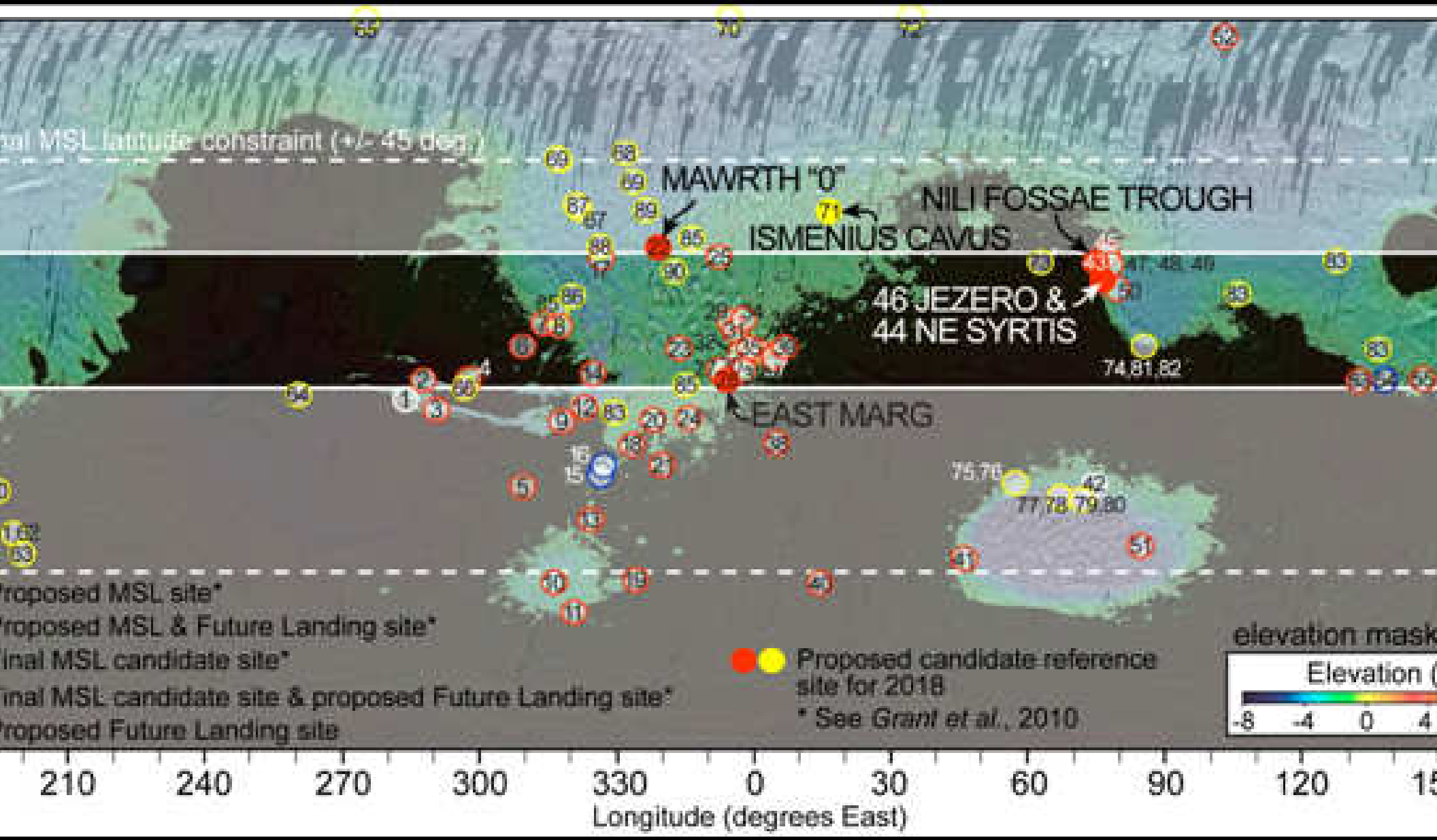
pes of selection criteria can ied:

shold" - sites must meet to be considered

ifying" – used to prioritize g the remaining sites

e is learned about sites selection process, many be dropped from ration. To end up with at he acceptable site, **it is ary to begin scientific n process with a able array of candidates.**





k shows draft latitude & elevation constraints for the proposed MSR (

ites are community-proposed:

59 sites from MSL landing site process, 26 sites from CDP future landing sites

led sites are 7 E2E-iSAG reference sites that may meet science object

BE POSSIBLE TO MEET ALL 8 PROPOSED MSR SCIENTIFIC OBJECTIVES AT ANY OF THESE

	Lat (°N)	Lon (°E)	Elev. (km)	The Sedimentary/hydrothermal story	The igneous st
fer	-6	354	-1	In the channeled Noachian uplands south of Meridiani Planum is a small, shallow basin with an exposure of possible chlorides stratigraphically overlain by an eroding unit with very strong CRISM and even TES signatures of phyllosilicates.	The rocks appear to be capped unit of Noachian age.
ter	-14	175	-2	The Noachian-aged Columbia Hills contain outcrops of opaline silica likely produced from hot springs or geysers and outcrops rich in Mg-Fe carbonates likely precipitated from carbonate-bearing solutions. Sulfate-rich soils and outcrops also are present.	Extensive unaltered Hesperian basalts embay the Noachian Co Also present are several differ rock types with minimal altera
ter	18	78	-3	Delta with incorporated phyllosilicates and carbonates along west margin of crater. The crater formed in Noachian olivine and pyroxene-rich crust.	The crater floor has a more rec Hesperian that looks like fresh flows. Would land on volcanic to delta.
e 0	25	339	-3	Layered Al and Fe/Mg Phyllosilicates in poorly understood setting. Possible mud volcano in the vicinity of ellipse. Land on science for exobiology.	Mafic material present in ellip be partly altered. Unaltered He volcanic at ~30 km.
	16	77	-2	Extensive and diverse mineral assemblages within ellipse in Hesperian Syrtis Major volcanic region. Maybe water-lain deposits or in situ alteration. Likely go to required for all materials of exobiological interest.	Hesperian Syrtis Major volcani
e	21	75	-1	Widespread altered materials, as ejecta at eastern side of ellipse, in place to west of ellipse.	Land on unaltered Hesperian v
				Single site to combine clay-bearing paleolake sediments and current	

Workshop Program is Posted at:

http://marsnext.jpl.nasa.gov/workshops/index.cfm

Workshop will be on Webex

…and for those of you staying around this afternoon...