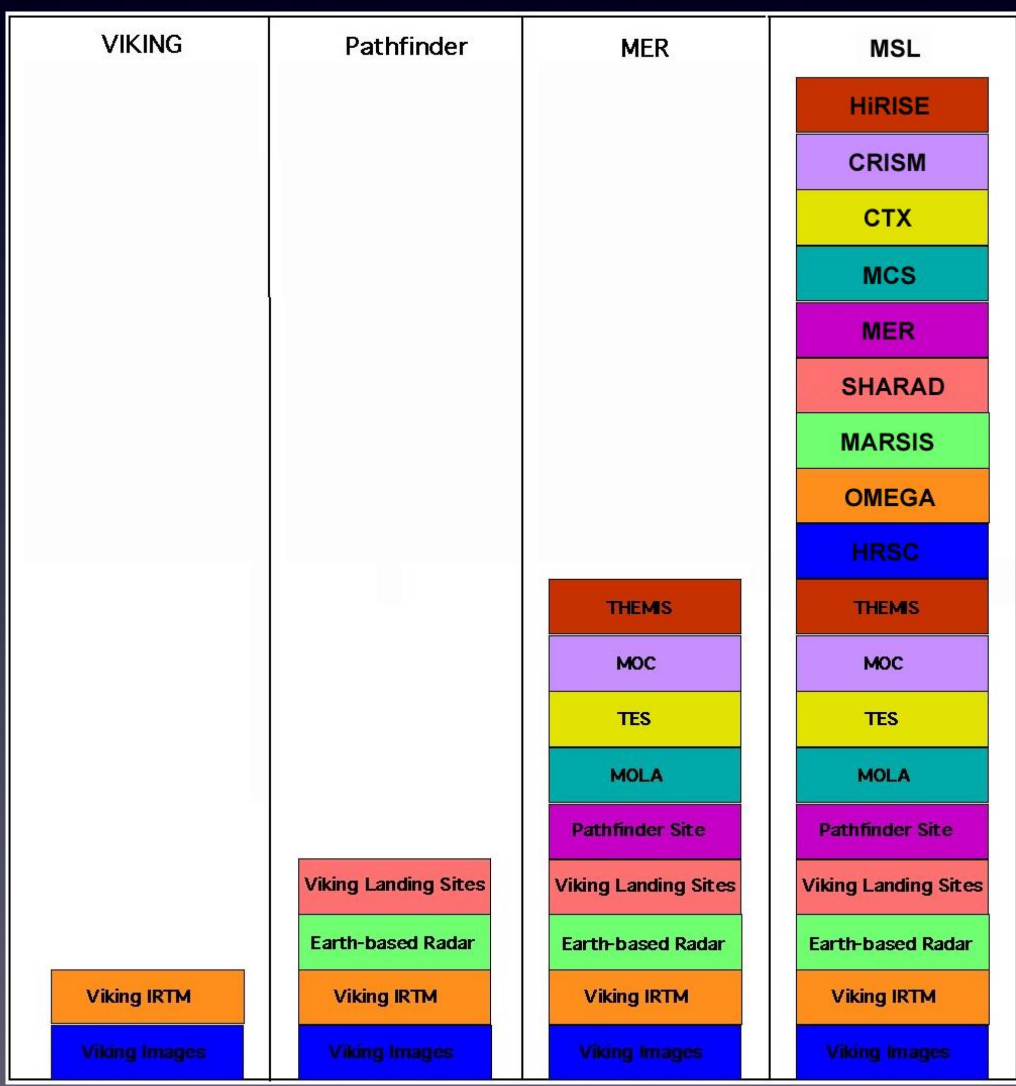
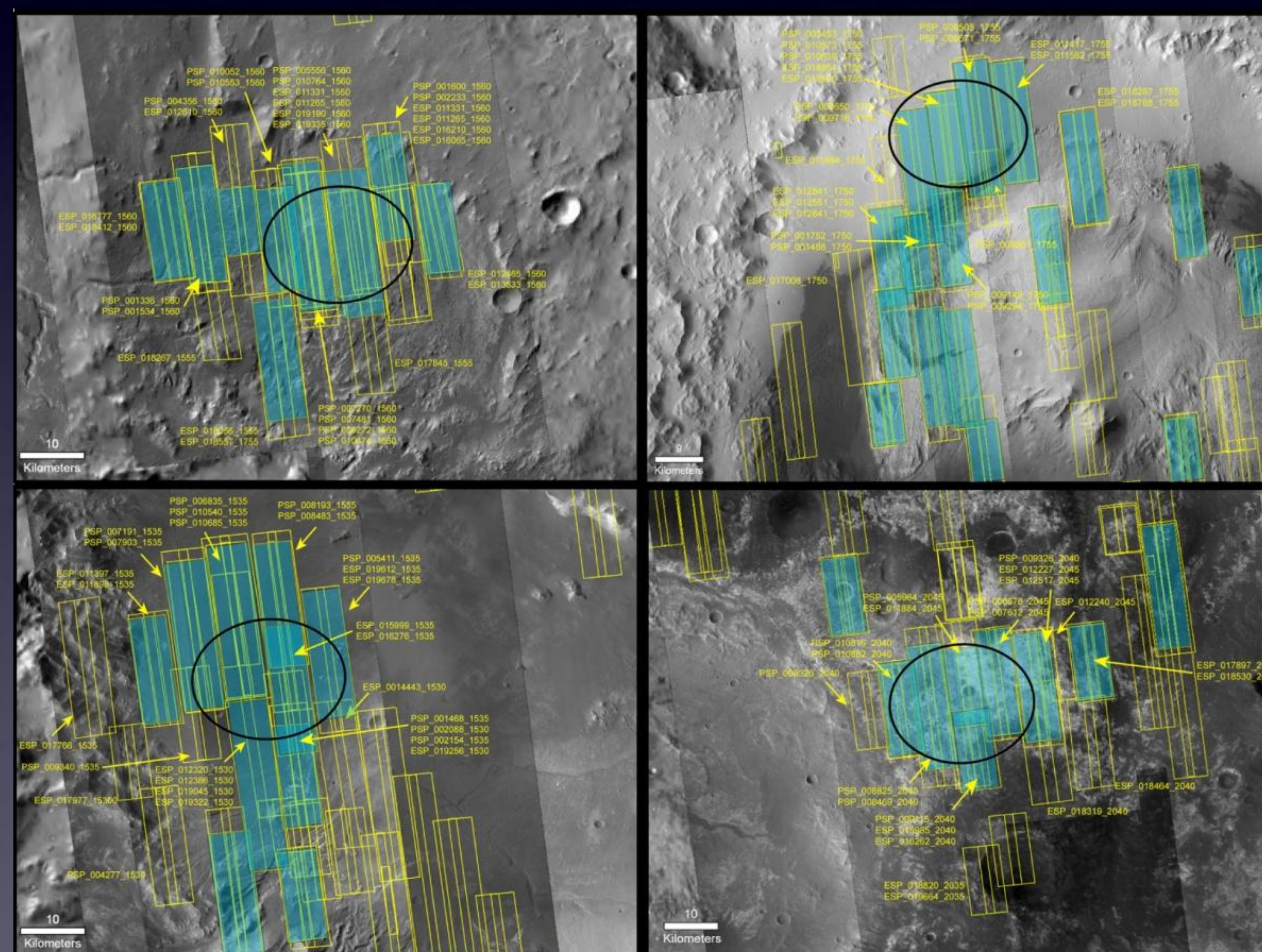
A Process for Evaluating New Candidate Landing Sites on Mars:

Current orbital assets have set the new standard for data required for identifying and qualifying 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 for replacement of most capabilities

Candidate Future Landing Sites on Mars:

- Call for new sites issued in 10/2009, resulted in 15 candidates
  - Includes wide range of future mission scenarios
- Call for Critical Data Products V (CDP V) yielded additional candidates
  - 7 CDP V proposals selected for funding at 25K for 1 year
  - Possibility for renewal
  - Some overlap with candidate sites from first call (e.g., Melas)
- New sites (in response to call and CDP V) were reviewed by Steering Committee to assess merits and rank for imaging by MRO
- Steering Committee represents broad interests (Astrobiology to SR and others)
- Steering Committee includes John Grant, Matt Golombek (co-chairs), Dave Des Marais, Brad Jolliff, Nicolas Mangold, Alfred McEwen, John Mustard, Gian Ori, Steve Ruff, and Ken Tanaka

Nuts and Bolts:

- 19 New Candidate Sites Proposed
- Range of missions and ellipses

    7 sites received CDP V funds in FY10

- Some sites have multiple, prioritized targets

    Total of 34 submitted targets

    New targets for several sites not submitted

- Out of 28 New Targets:

    Imaging of 18 is complete

    Stereo imaging of 11 is complete

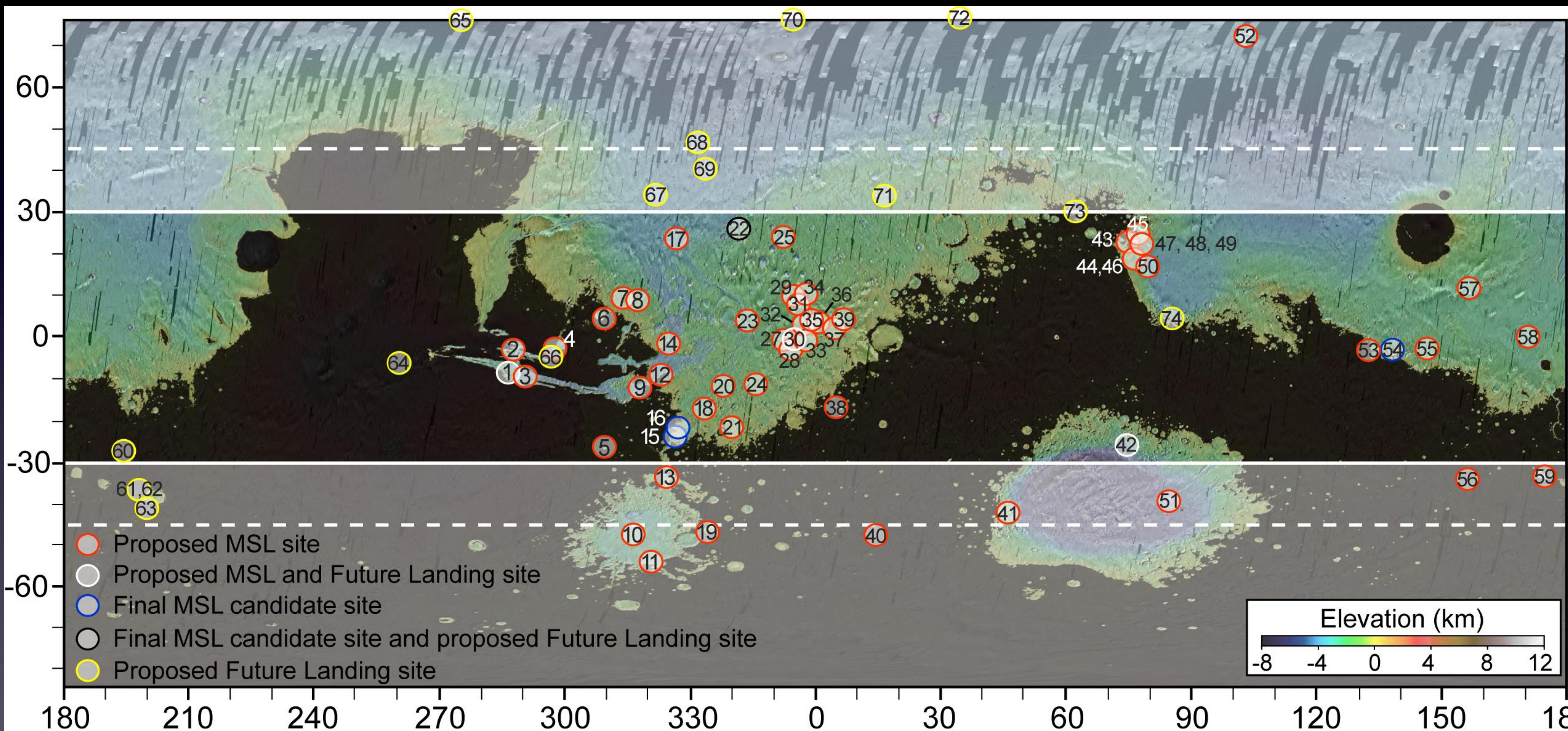
    Total of 29 images of new candidate sites

Nature of Candidate Ellipses:

Site Name	Proposer	Location		Elevation	Target	Mission	Ellipse Diameter	Special Region
		Lat (°N)	Lon (°E)	(km)			(km)	(Planet. Protection)
Columbus crater	J. Wray, R. Milliken, C. Dundas, G. Swayze, A. Baldridge, J. Andrews-Hanna, Chojnacki, R. Clark, S. Murchie, B. Ehlmann, J. Bishop, F. Seelos, L. Tornabene, S. Squyres	-28.8	194	+0.9	Intracrater layered deposits, kaolinite, smectites, jarosite, mono- and polyhydrates sulfates	MAX-C, Rover	15	no
Kamnik crater	T. Harrison	-37.49	198.13	+2.3	Gullies, mantling material, mid-latitude "fill"	Rover	1 km inside crater, or outside	yes
Naruko crater	T. Harrison	-36.55	198.2	+2.7	Gullies, mantling material, mid-latitude "fill"	Rover	1 km inside crater, or outside	yes
Avire crater	T. Harrison	-41.25	200.14	-0.77	Gullies, mid-latitude fill material, layered lobate features, dunes	Rover, MAX-C	15	yes
Noctis Labyrinthus	**C. Weitz**	**-6.798**	**260.956**	**+2.2**	**Smectites, gypsum, opal, light toned deposits**	**Rover**	**15**	**no**
Noctis Labyrinthus	C. Weitz	-6.854	261.052	+2.2	Smectites, gypsum, opal, light toned deposits	Rover	15	no
Noctis Labyrinthus	C. Weitz	-6.843	261.151	+2.2	Smectites, gypsum, opal, light toned deposits	Rover	15	no
North Pole A	S. Milkovich & M. Hecht	88	275.6	-2.58	Polar layered deposits, ice	Mars Scout, thermal drill	250x25	no
Melas Chasma	J. Grotzinger et al.	-9.806	283.493	-1.7	Sublacustrine fans, clinoforms, folds, channels, opaline silica	Rover	15	no
Melas Chasma	Williams et al.	-9.84	283.63	-1.8	depositional fans, opaline hills	Rover	15	no
Melas Chasma	Williams et al.	-9.8	283.721		distal fans in eastern portion of basin. Overlap with western image is desireable, so slight offset from ESP_017807_1700. Ideally extend across entire basin.	Rover	15	no
Melas Chasma	Williams et al.	-9.804	283.381		Southwestern Melas Chasma basin gap-fill image on western side	Rover	15	no
Juventae Plateau	J. L. Bishop et al.	-4.6	296.4	+2.0	Sulfates, silica, aqueous deposits	Rover	15	no
Northern Chryse	D. Oehler & C. Allen	32.2	322.7	-4	mud flow mounds	Rover	15	no
Acidalia Mensa	**D. Oehler & C. Allen**	**46.7**	**331.12**	**-4.5**	**Mound (interpreted as mud volcano) cut by polygon**	**Rover**	**15**	**no**
Acidalia Mensa	D. Oehler & C. Allen	44.74	331.72	-4.8	mounds (mud volcanoes) with potential flows	Rover	15	no
Acidalia Planitia	**D. Oehler & C. Allen**	**40.08**	**333.27**	**-4.5**	**Densly occurring mounds (mud volcanoes)**	**Rover**	**15**	**no**
Acidalia Planitia	D. Oehler & C. Allen	40.67	332.32	-4.5	Densly occurring mounds (mud volcanoes) with flows	Rover	15	no
Acidalia Planitia	D. Oehler & C. Allen	44.53	317.3	-4	thumbprint terrain (mud volcanoes)	Rover	15	no
Mawrth Vallis	**J. Michalski**	**25.213**	**339.623**	**-3**	**Phyllosilicates (Al, Fe/Mg),**	**MAX-C**	**15**	**no**
Mawrth Vallis	J. Michalski	25.271	339.502	-3	Phyllosilicates (Al, Fe/Mg), sulfates	MAX-C	15	no
Mawrth Vallis	J. Michalski	25.033	339.871	-3	Phyllosilicates (Al, Fe/Mg), sulfates	MAX-C	15	no
North Pole C (Gemini Lingula)	S. Milkovich & M. Hecht	82.86	354.5	-3.3	Polar layered deposits, ice	Mars Scout, thermal drill	250x25	no
Southern Meridiani	S. Wiseman & R. Arvidson	-3.331	354.578	-1.5	Land on and traverse from sulfates to phyllosilicates in highlands	MAX-C	15x15	no
Ismenius Cavus	J. Wray, S. Murchie, A. Hughes	33.5	17	-~3	Paleolake. Phyllosilicates in crater breached by Mamers Vallis. Well formed delta on NE wall	Astobio, MAX-C	15x15	no
North Pole B (the saddle)	S. Milkovich & M. Hecht	85.21	34.6	-3	Polar layered deposits, ice	Mars Scout, thermal drill	250x25	no
Antoniadi crater site 1	**Smith et al.**	**20.471**	**62.83**	**+0.1**	**Granitoid, phyllosilicates, zeolites**	**MAX-C**	**15**	**no**
Antoniadi crater site 1	**Smith et al.**	**20.471**	**62.83**	**+0.1**	**Granitoid, phyllosilicates, zeolites**	**MAX-C**	**15**	**no**
Antoniadi crater site 2	Smith et al.	24.07	63.07	+0.1	Granitoid, phyllosilicates, zeolites	MAX-C	15	no
Antoniadi crater site 3	Bandfield et al.	20.34	62.91	+0.1	Granitoid, phyllosilicates, zeolites	MAX-C	15	no
Terby crater	Grotzinger et al.	-27.79	74.17	-4.9	Layered mound, possible evaporates, phyllosilicates	Rover	15	no
Libya Montes	L. Crumpler	3.68	85.62	-3.11	Carbonates, phyllosilicates, basalt	Rover	15	no
Libya Montes	L. Crumpler	3.57	84.43	-2.5	Carbonates, phyllosilicates, basalt	Rover	15	no
Libya Montes	L. Crumpler	3.58	84.1	-3.3	Carbonates, phyllosilicates, basalt	Rover	15	no

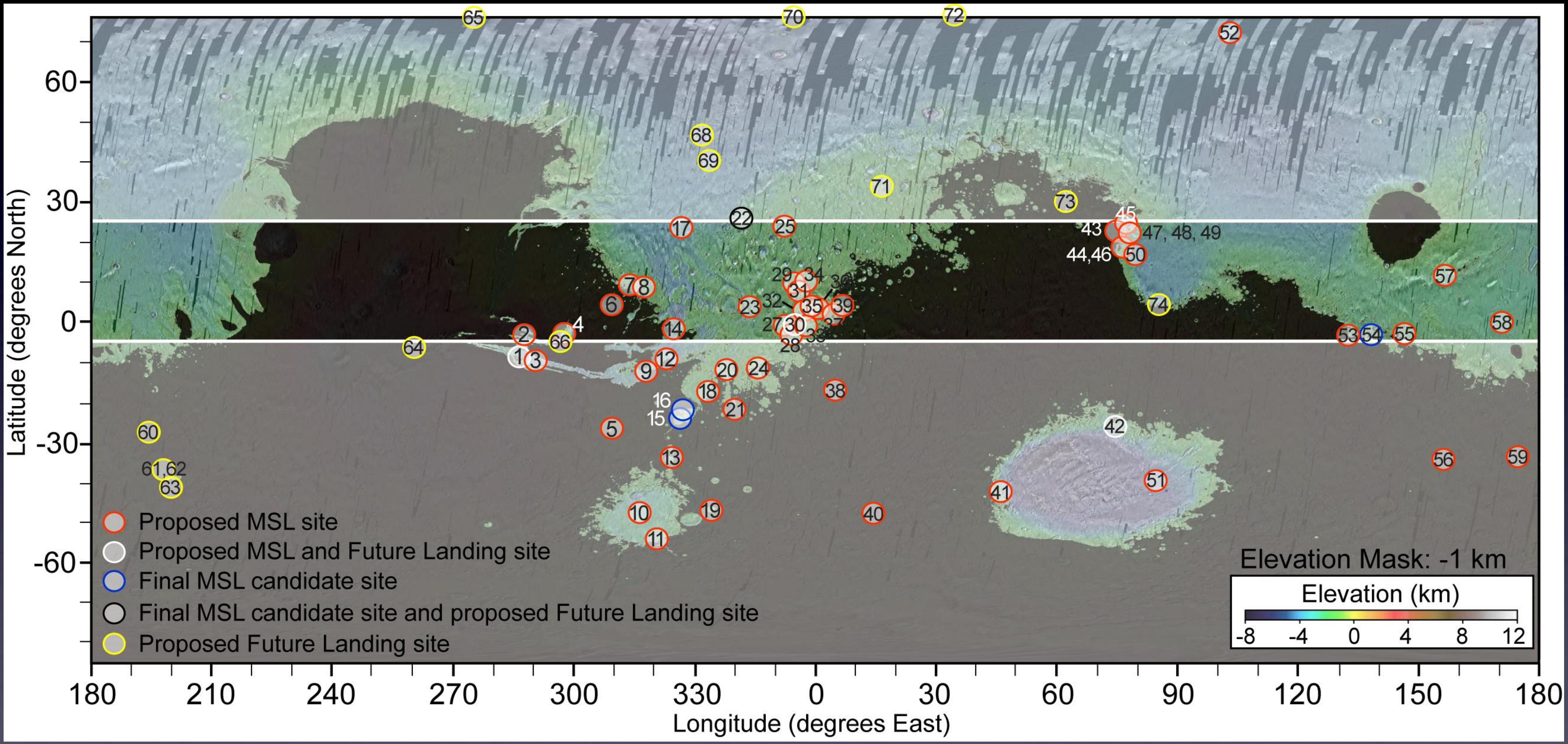
- Most candidate ellipses are 10 km X 15 km (or 15 km), but others specified by proposer
- Steering Committee Chairs work with proposers to establish image footprints
- Targets for viable Candidate Sites entered as "Wanna Haves" in HiRISE and get imaged along with CTX and CRISM (mostly VNIR). Sites also provided to Odyssey.

MSL and New Candidate Landing Sites



Mask shows latitude and elevation constraints for MSL

New Candidate Landing Sites:



Mask shows possible latitude and elevation constraints for MSR

The Future of Future Sites:

- Process helps set stage for evaluation of future landing sites while orbital assets are available.
- New call for sites to be issued in Fall 2010
- New call for CDP VI to be issued late 2010
- Process will provide foundation for separate mission specific site selection activities (e.g., 2018 2 rover/MSR)
- A great way to get fantastic data and some funding to do Mars science