

An aerial photograph of a coastal landscape. In the center is a large, irregularly shaped wetland area with a mottled, light-colored texture, possibly indicating different soil types or water levels. This central area is surrounded by a network of dark, winding channels or roads. The outermost regions of the image are filled with a dense, grid-like pattern of dark, rectangular shapes, which appear to be agricultural fields or a similar land use. The overall color palette is dominated by dark greys and blacks, with the central wetland providing a contrasting lighter, more textured appearance.

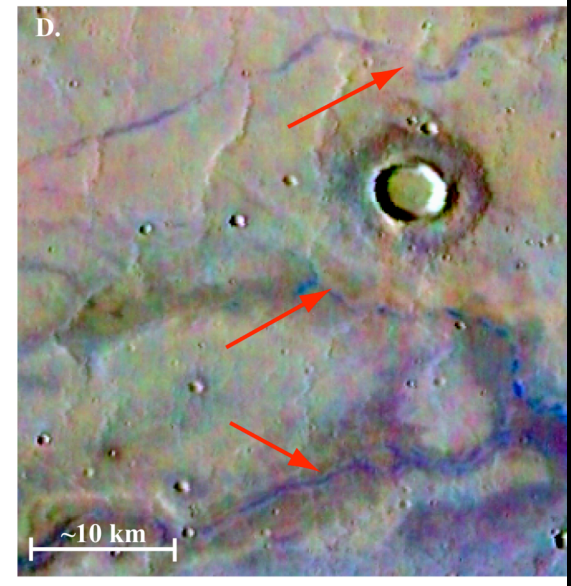
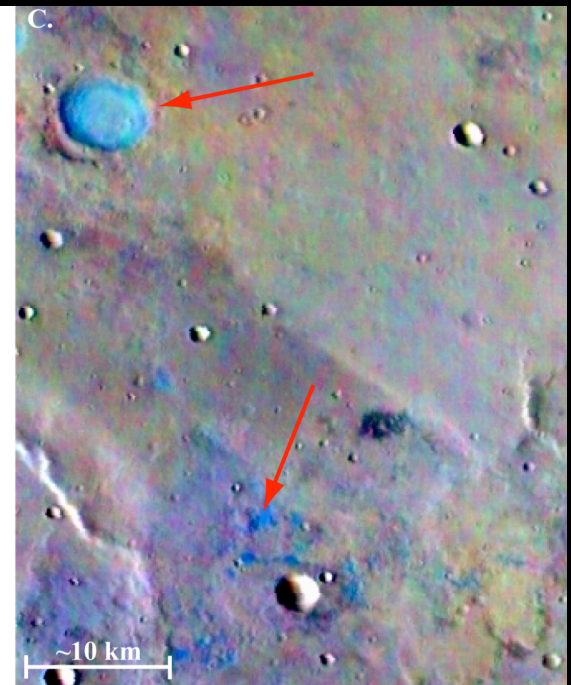
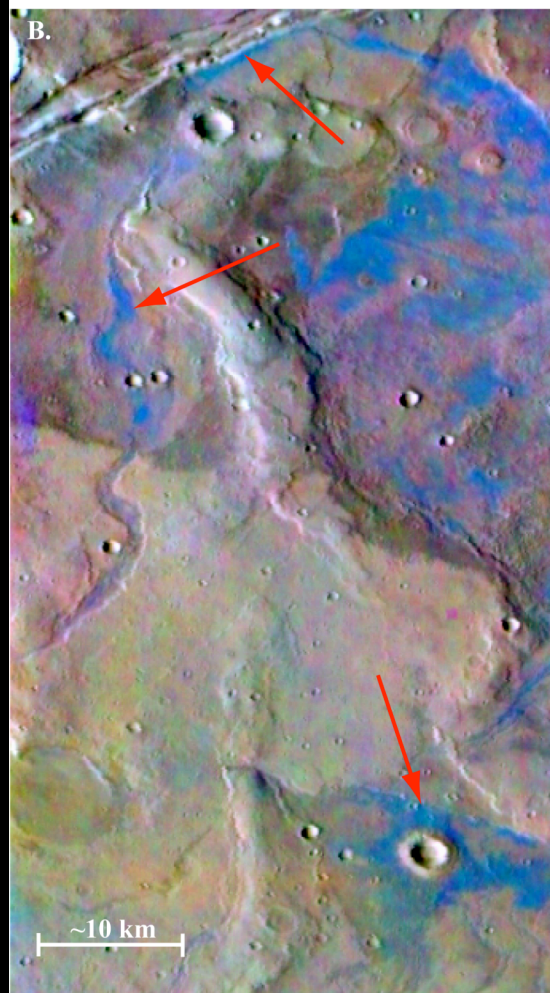
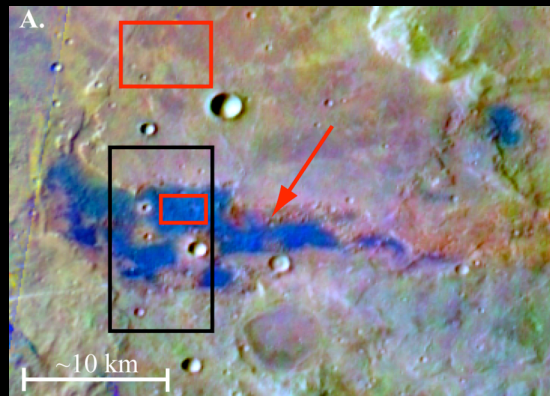
Potential Chloride Salt MSL Landing Sites

Phil Christensen

Mikki Osterloo, Vicky Hamilton, Josh Bandfield, Tim
Glotch, Alice Baldrige, F. Scott Anderson, and
Livio Tornabene

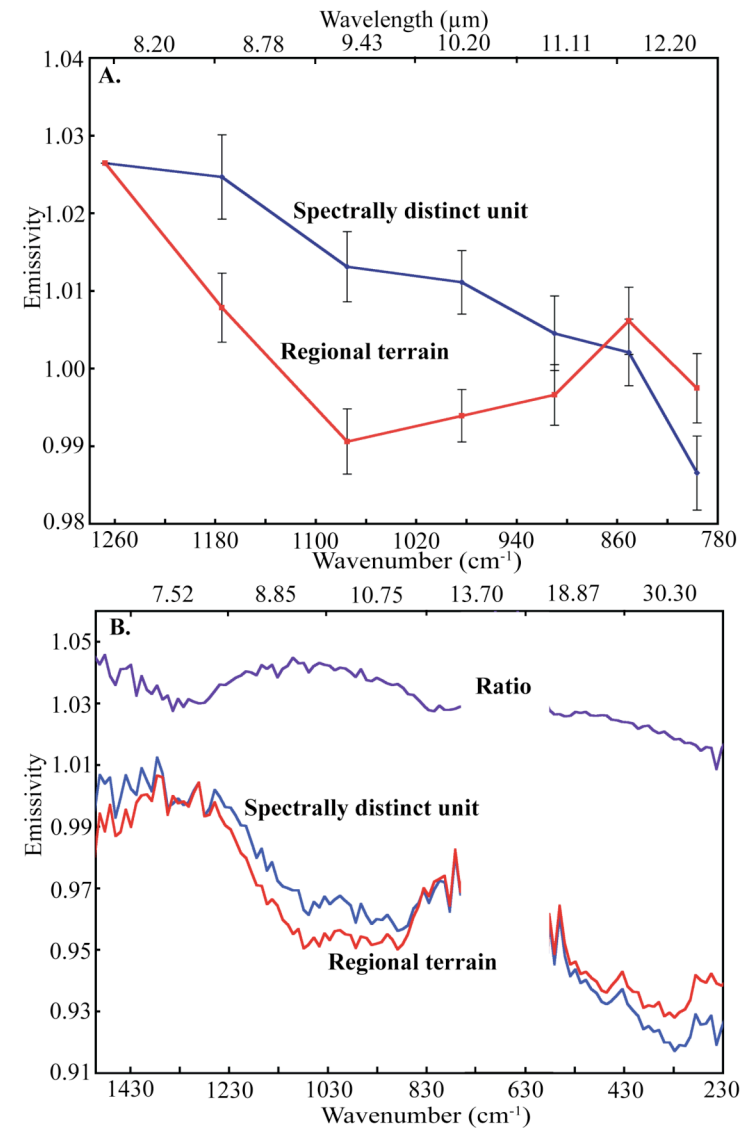
Examples of a spectrally unique material

THEMIS Multi-
spectral IR images



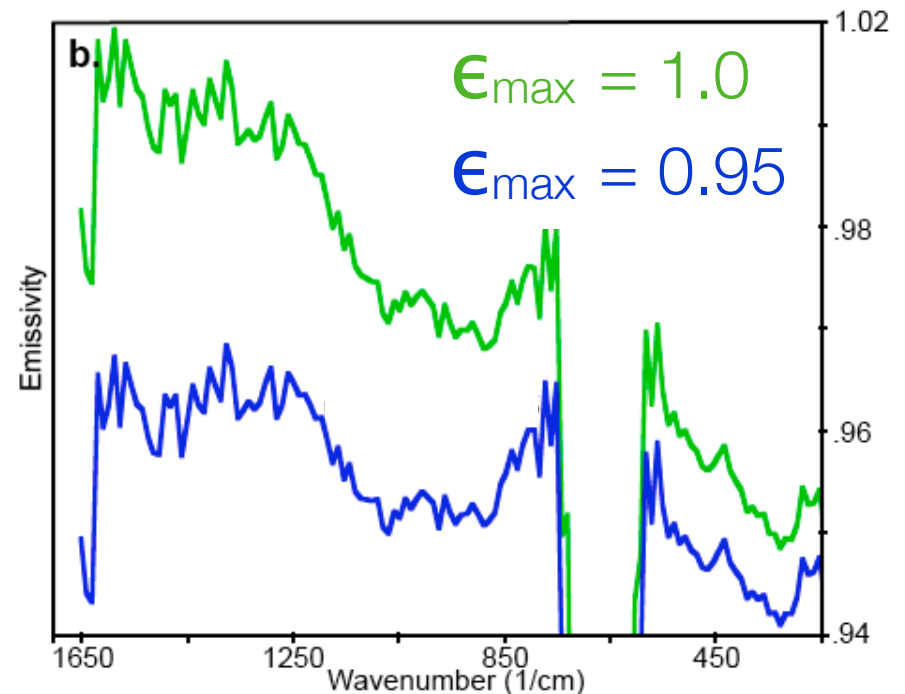
Observed IR Spectral Character

- Virtually featureless slope downward toward long wavelengths in THEMIS spectral data
- TES spectra and ratio spectra show slope mixed with residual basaltic shape
- Source of slope?
 - No good mineral fit
 - Material with non-unit emissivity

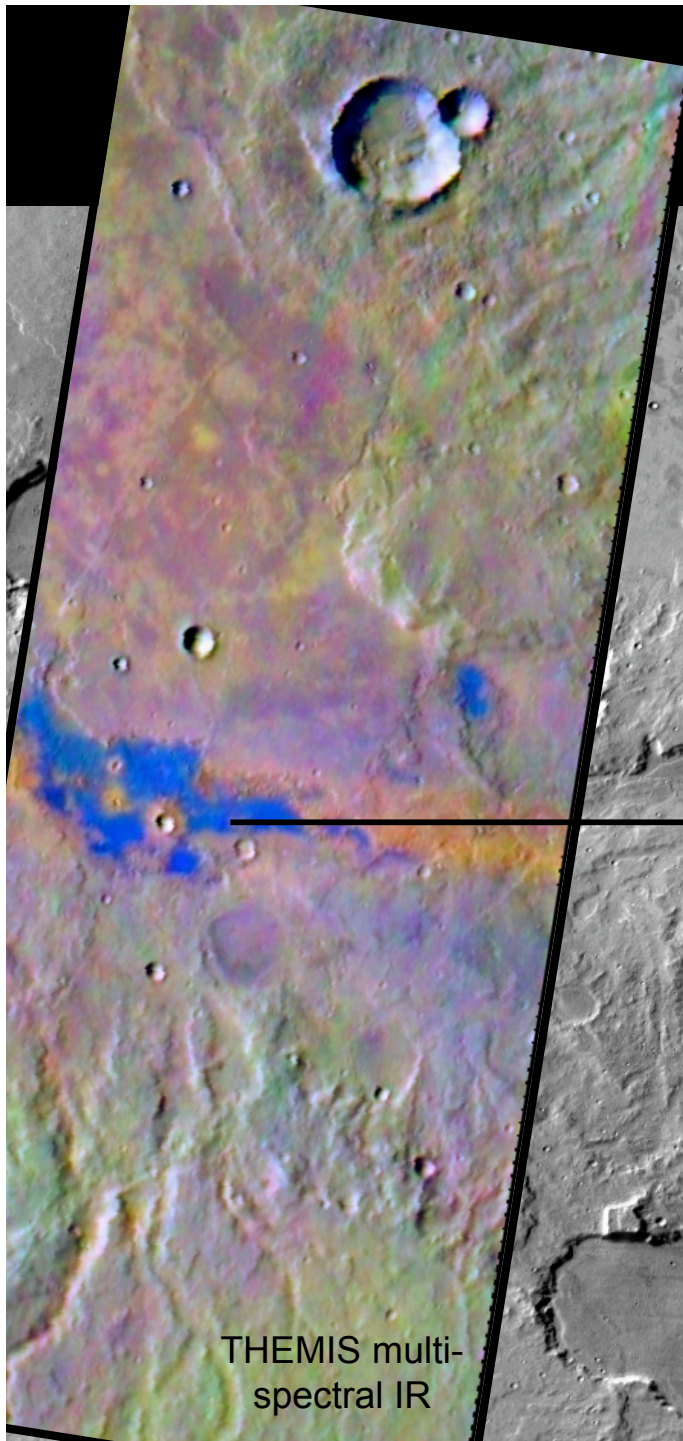


Effect of non-unit emissivity component

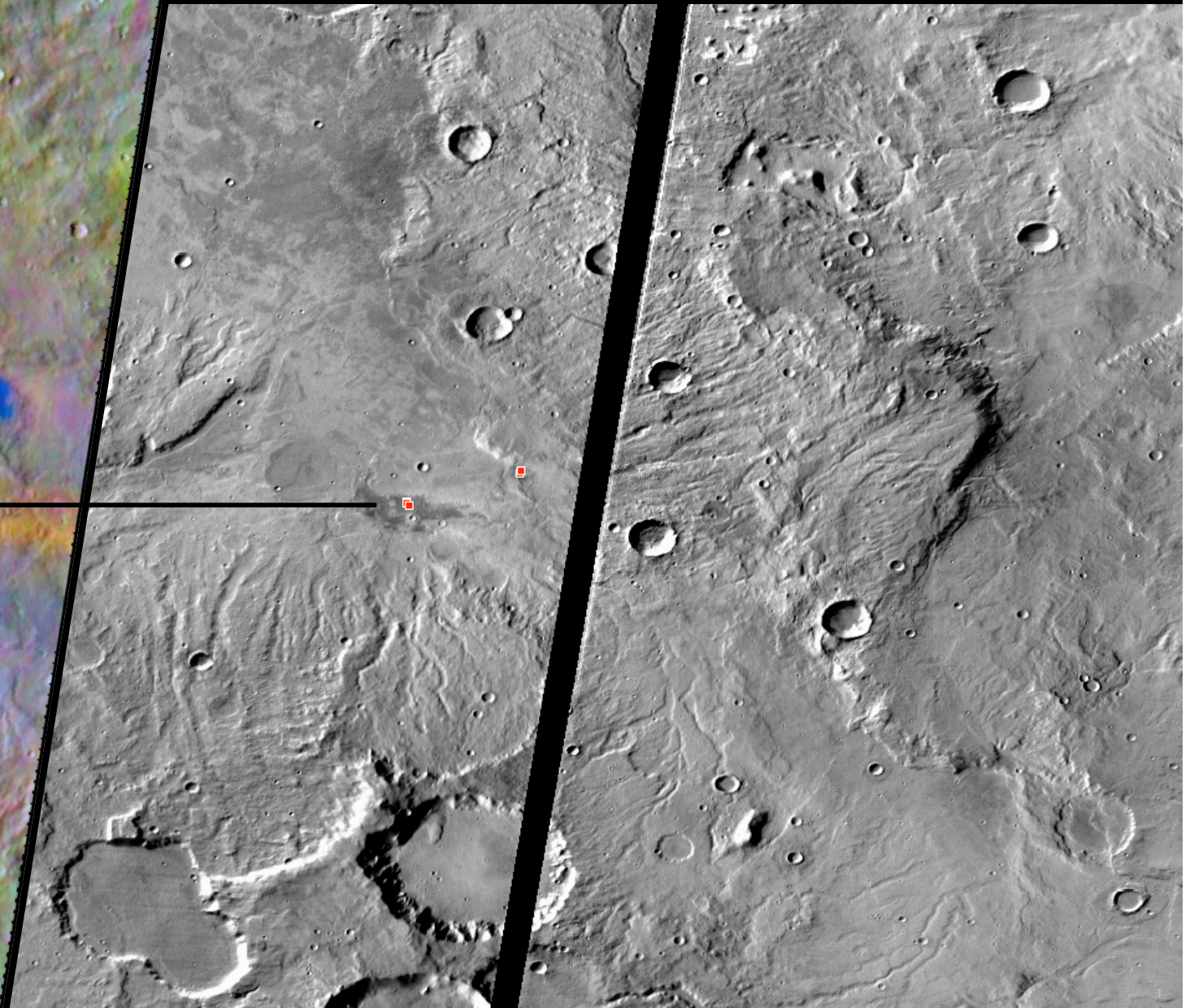
- Current method for converting from radiance to emissivity assumes unit emissivity
- If material has <unit emissivity, a slope will be introduced
- Candidates:
 - Halogens \Rightarrow Chlorides



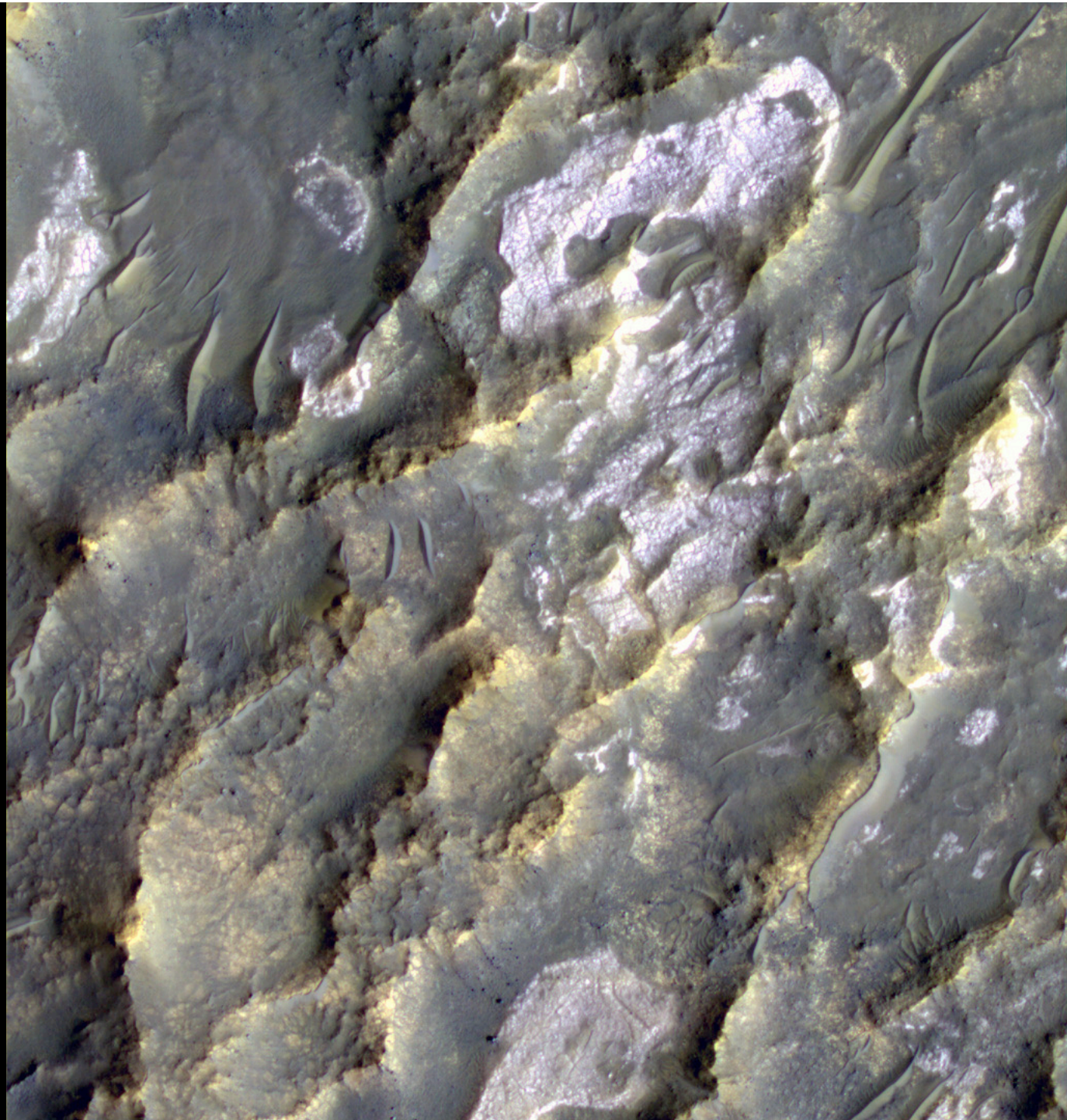
Terra Sirenum (-39° S; 1300 m)



THEMIS multi-
spectral IR



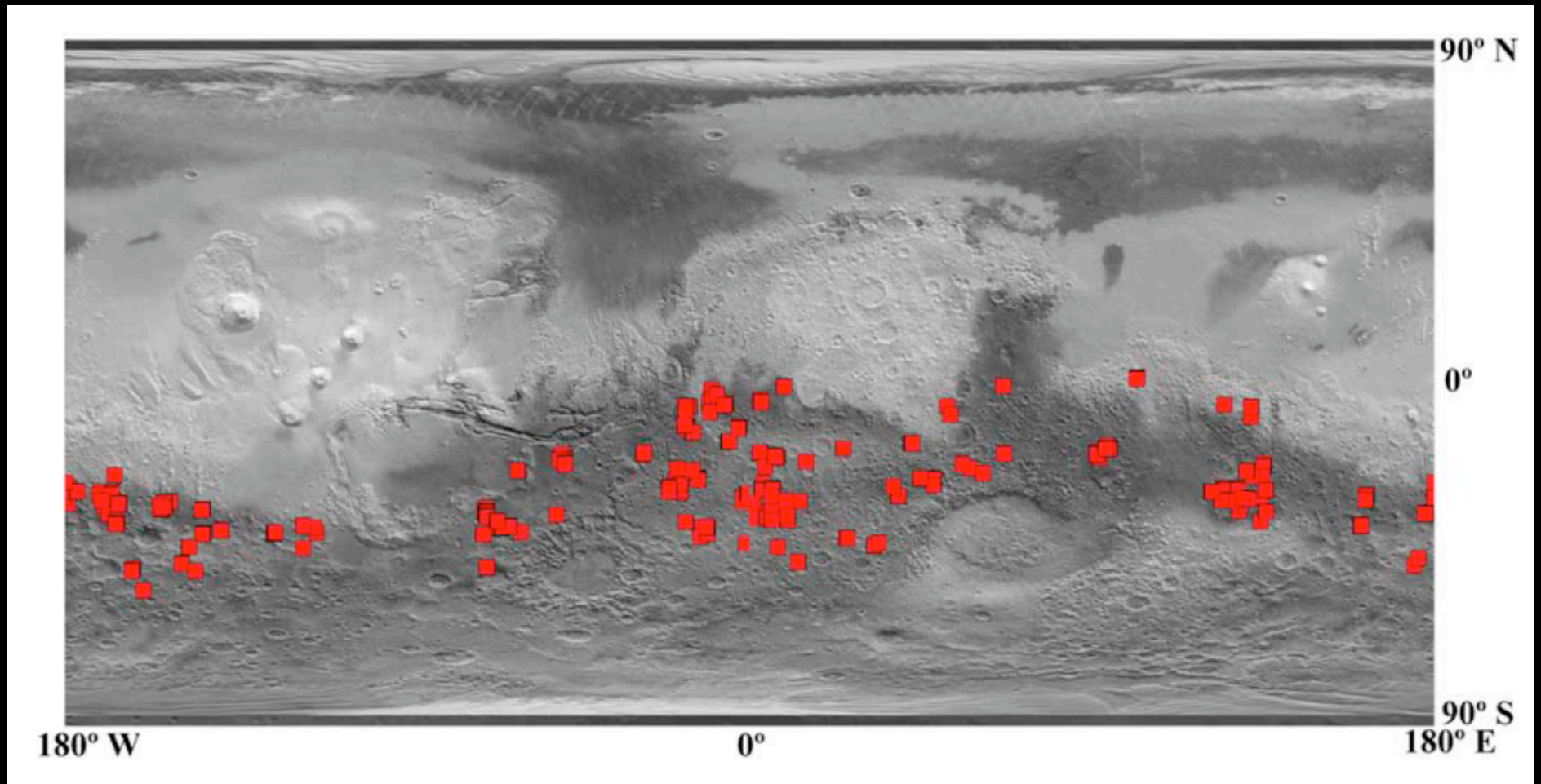
HiRISE



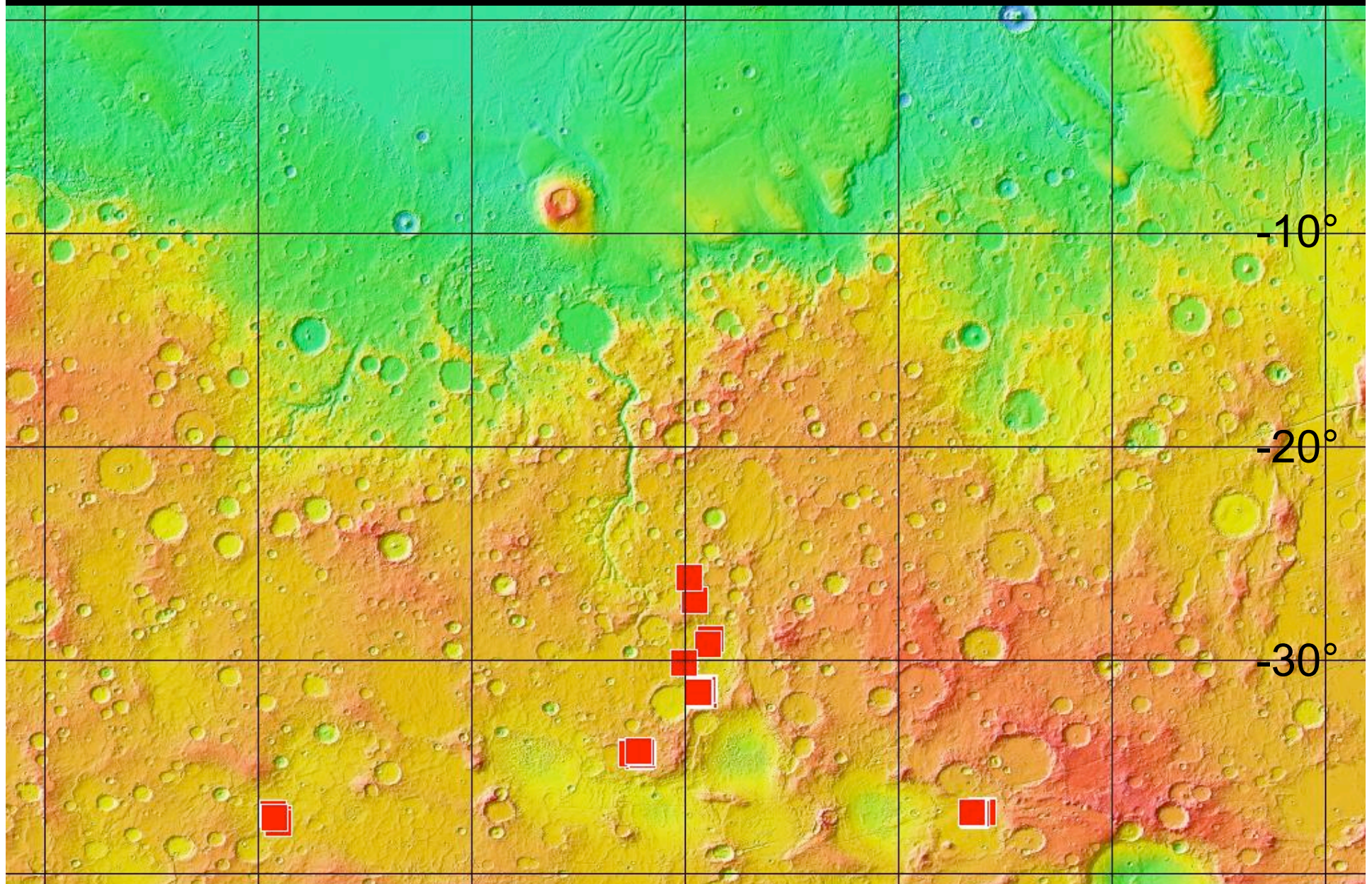
HiRISE



THEMIS/TES Chloride Salt Identification Sites

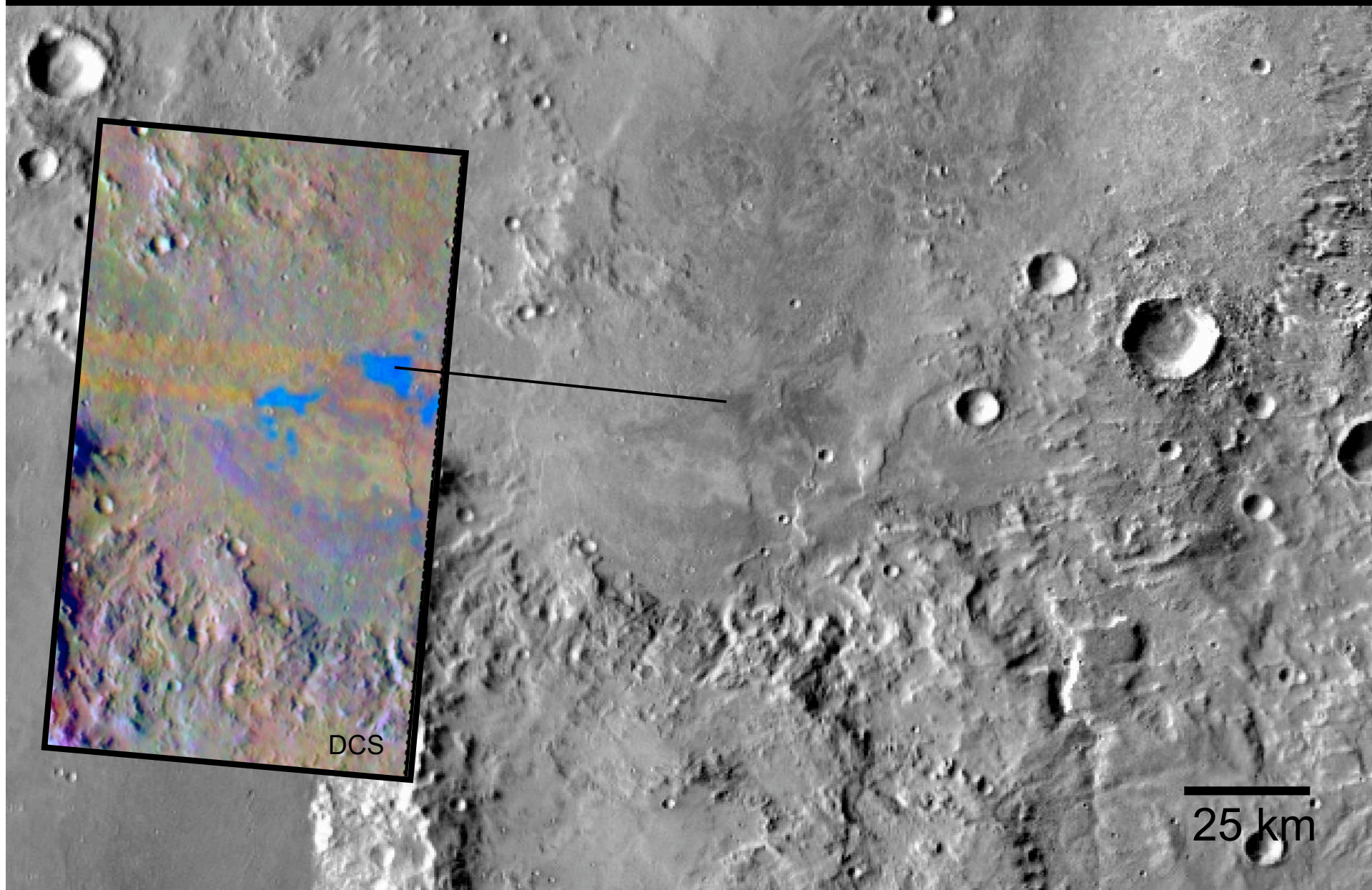


Sites at Elevation < 1 km

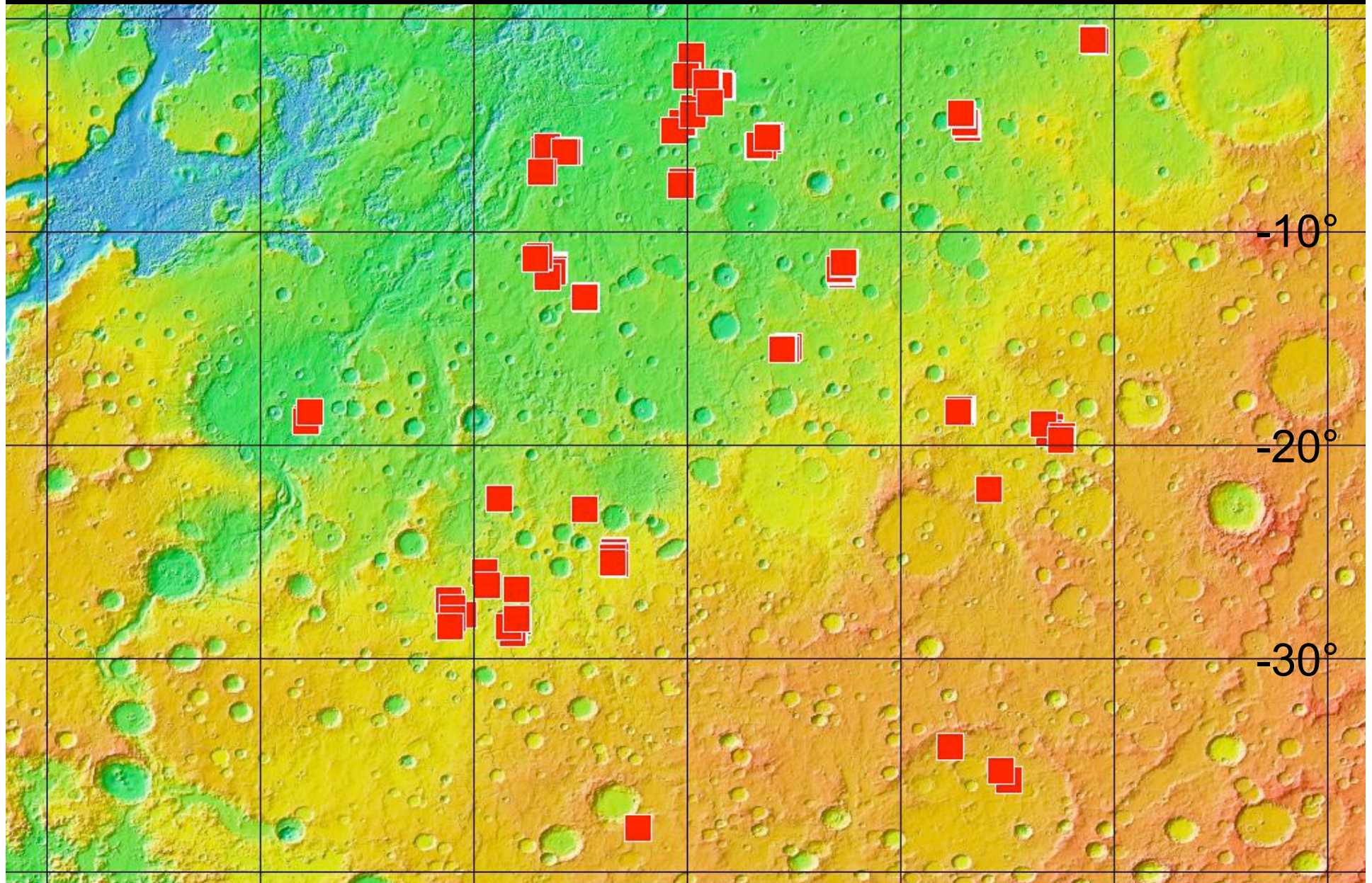


180° E

Site 2 (-31°S; 400m)

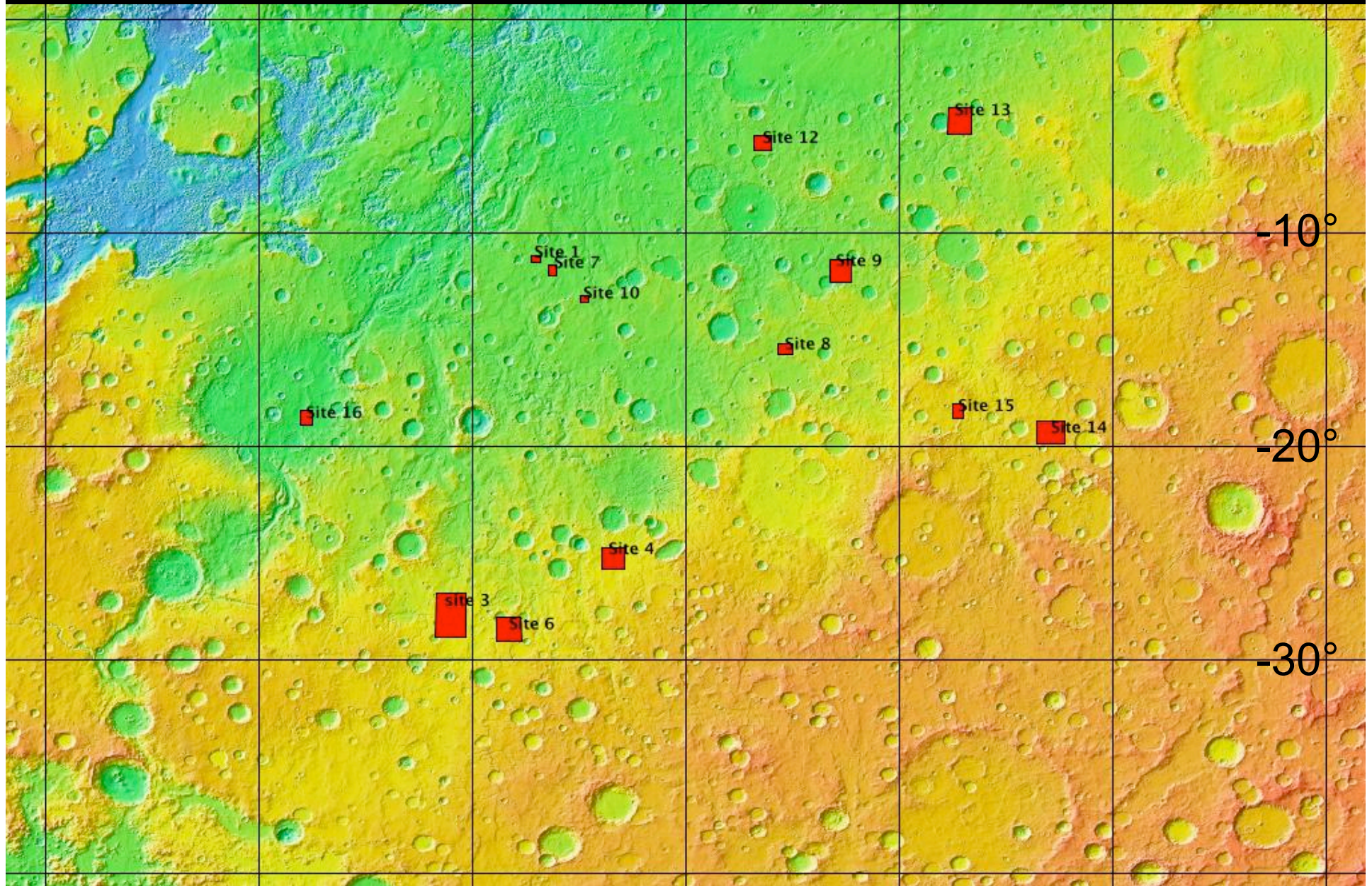


Sites at Elevation < 1 km



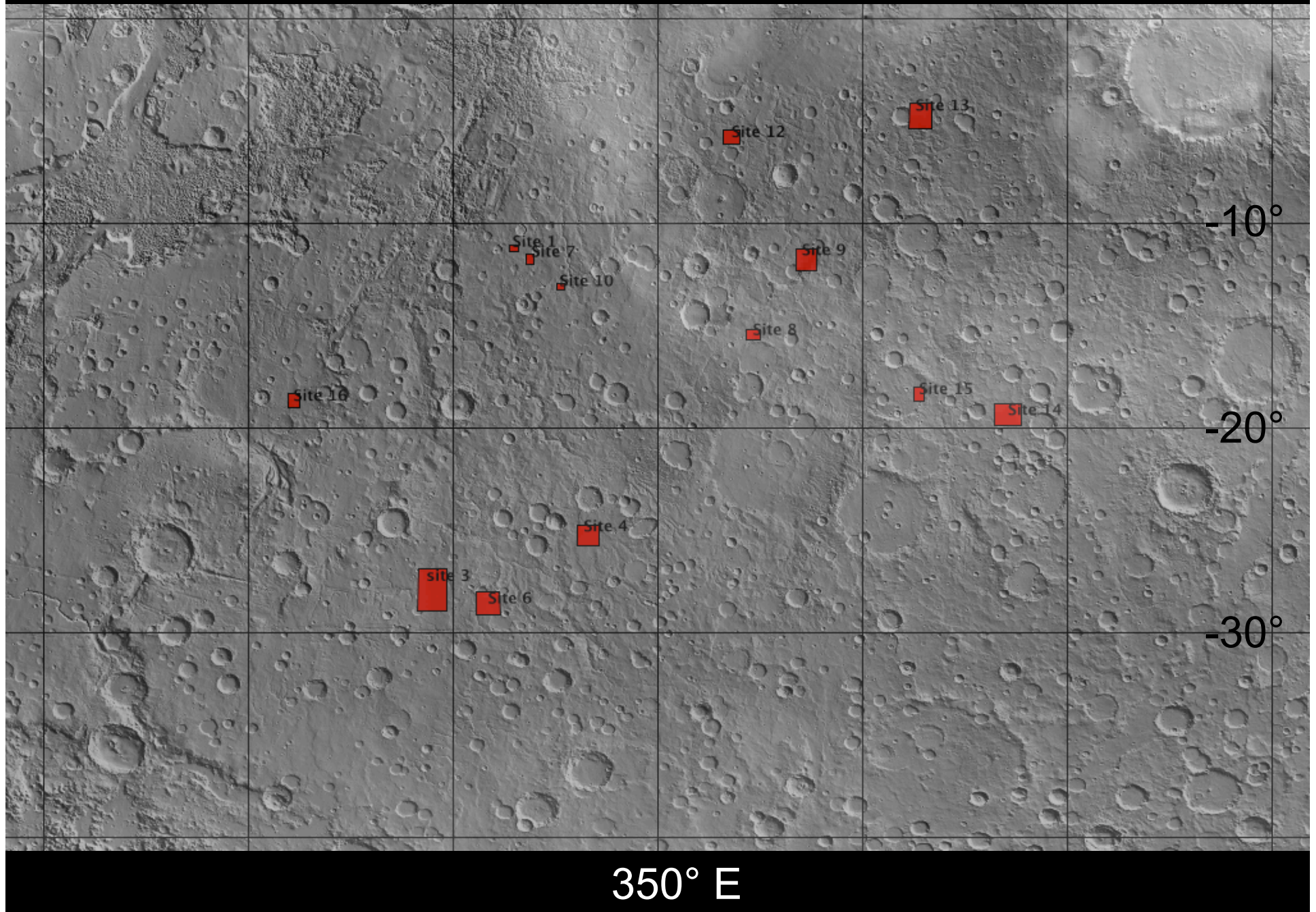
350° E

Sites at Elevation < 1 km

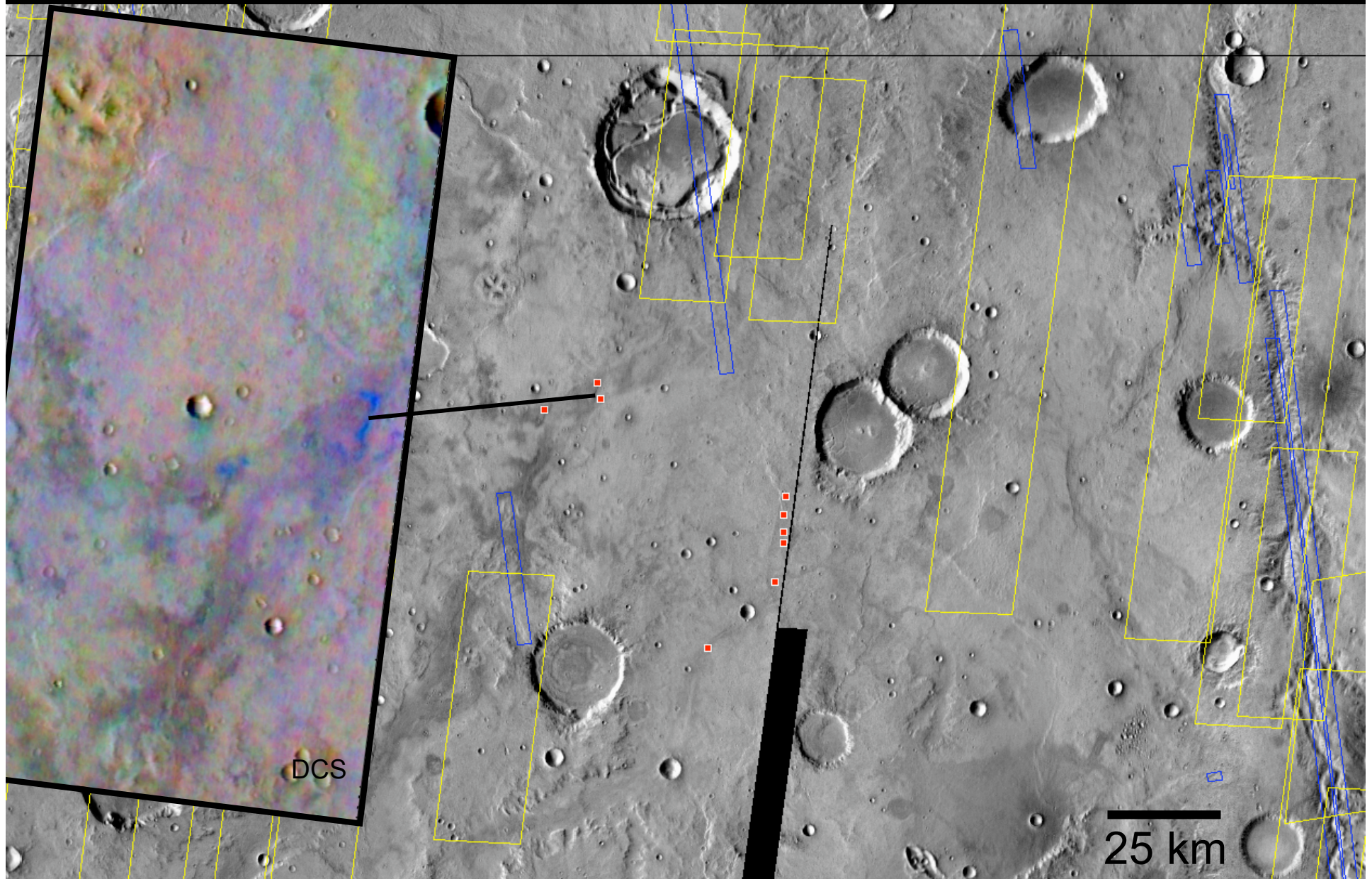


350° E

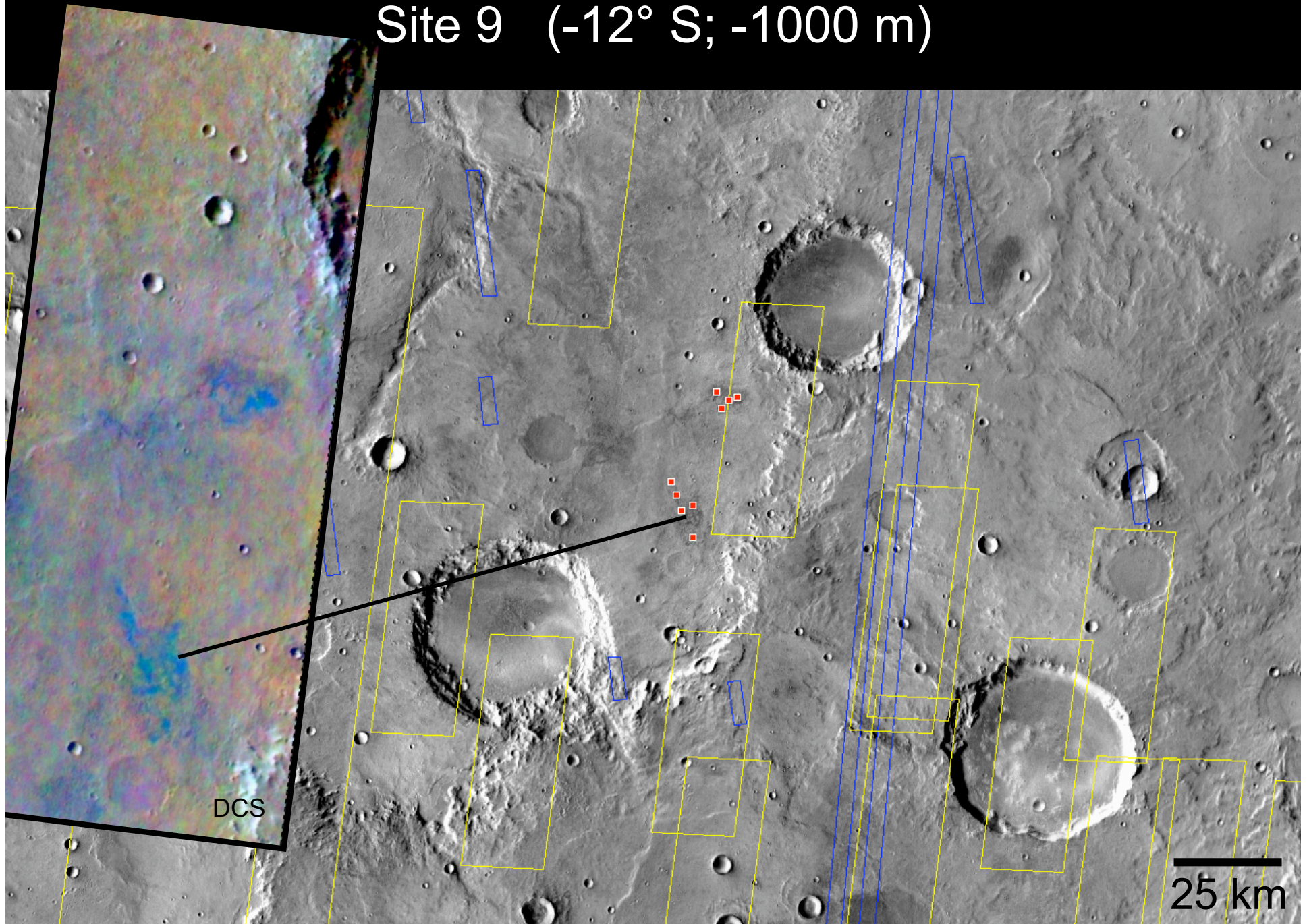
Sites at Elevation < 1 km



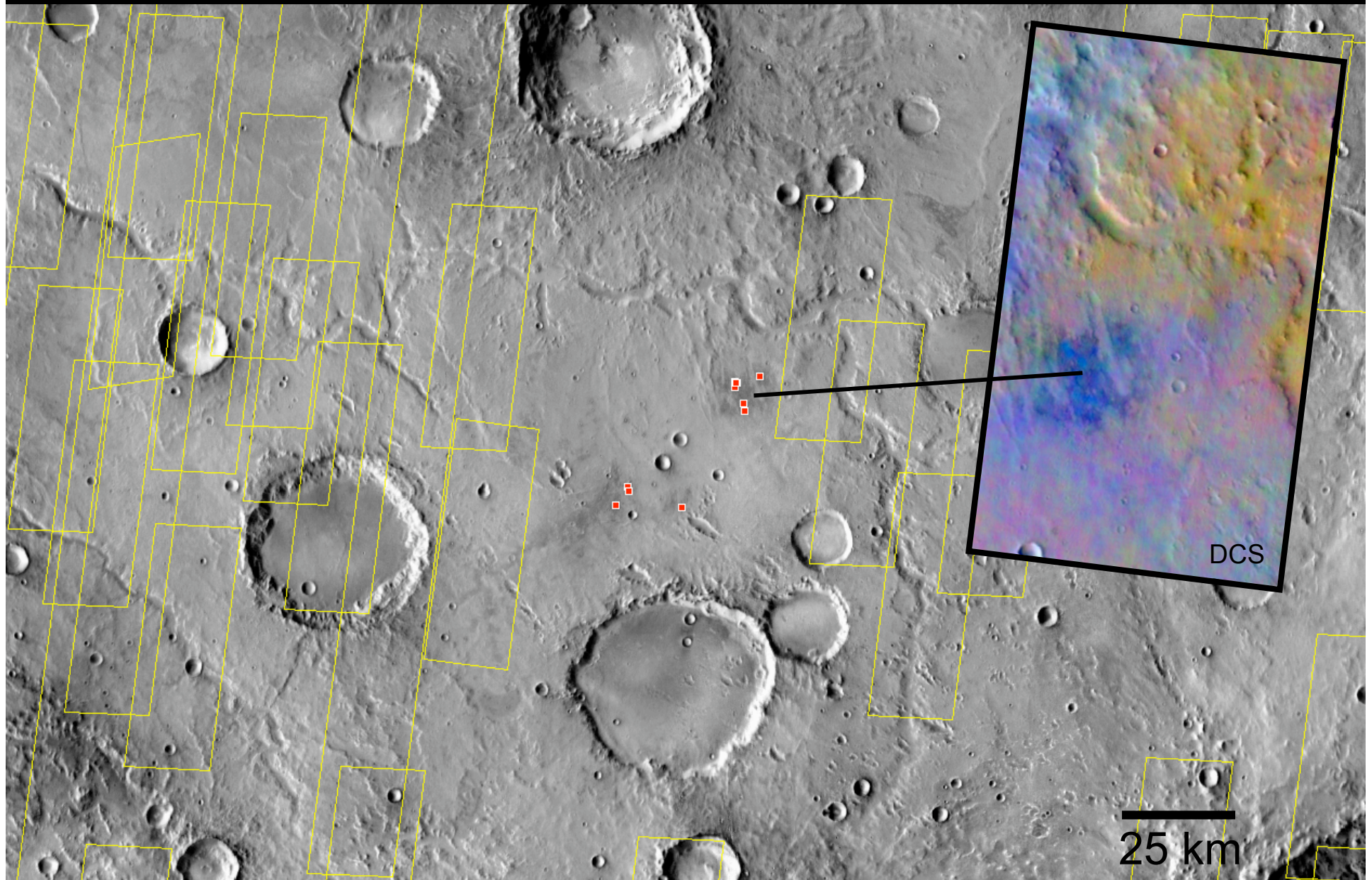
Site 1 (-11° S; -1400 m)



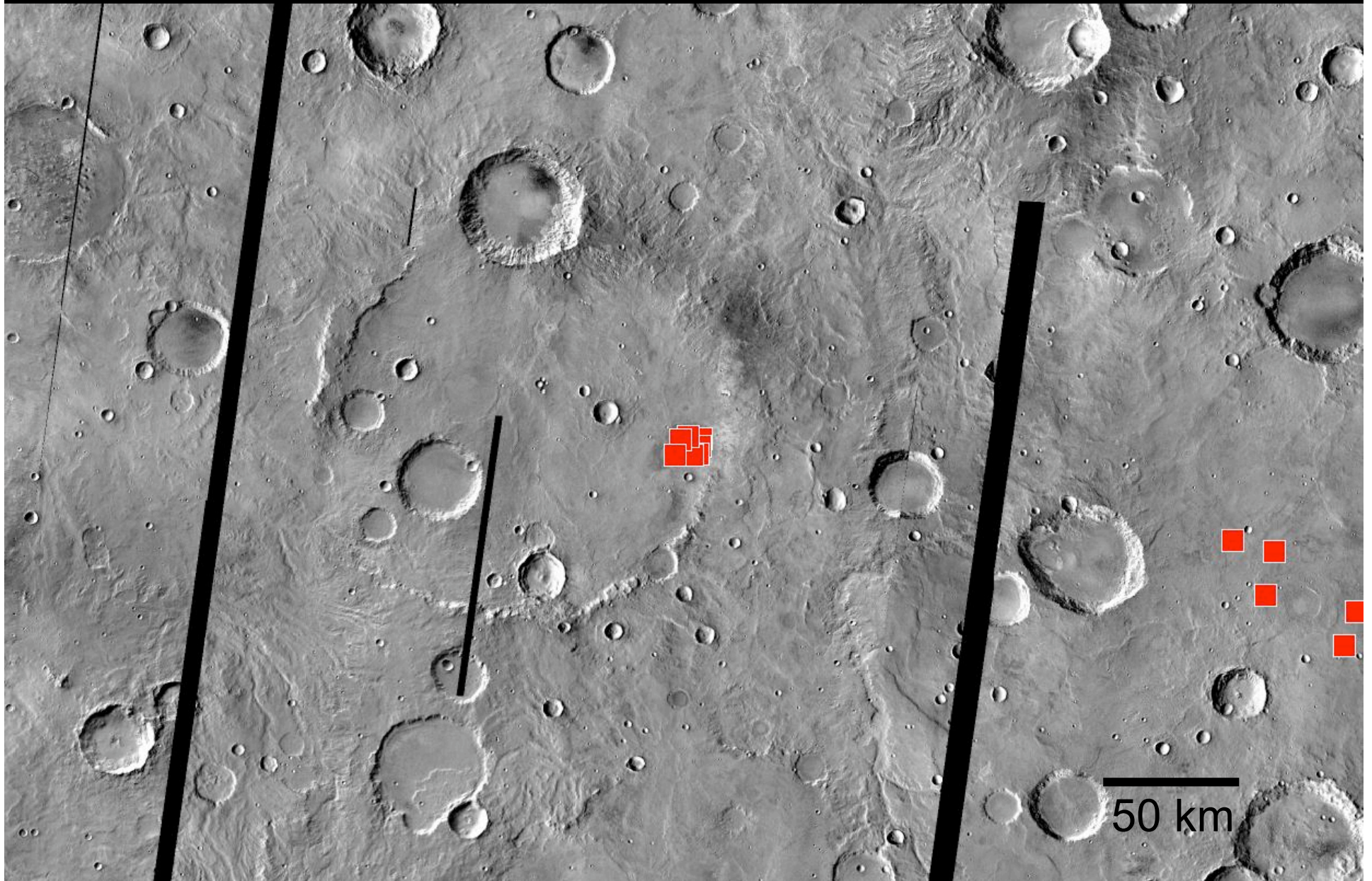
Site 9 (-12° S; -1000 m)



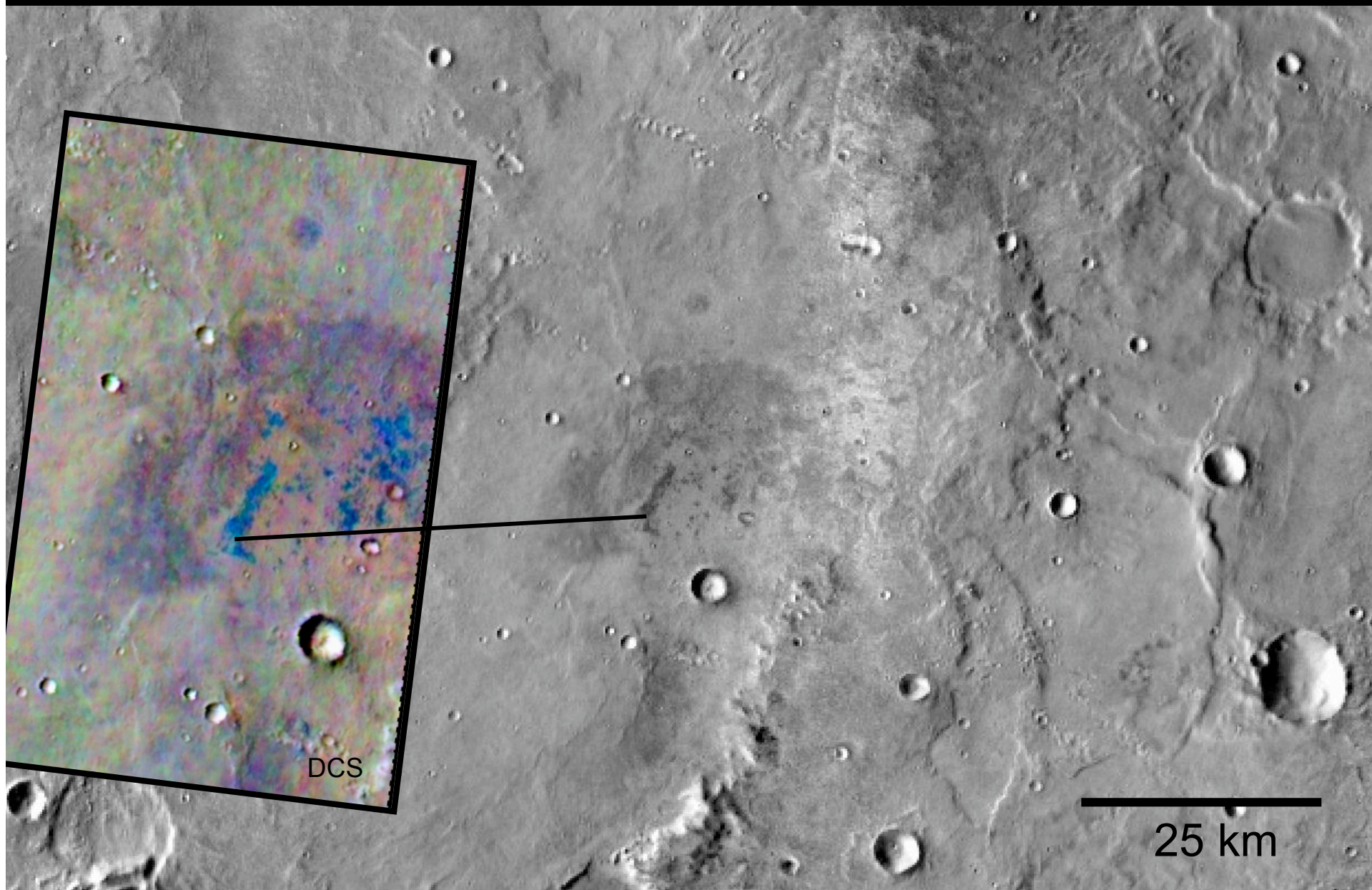
Site 12 (-6° S; -1200 m)

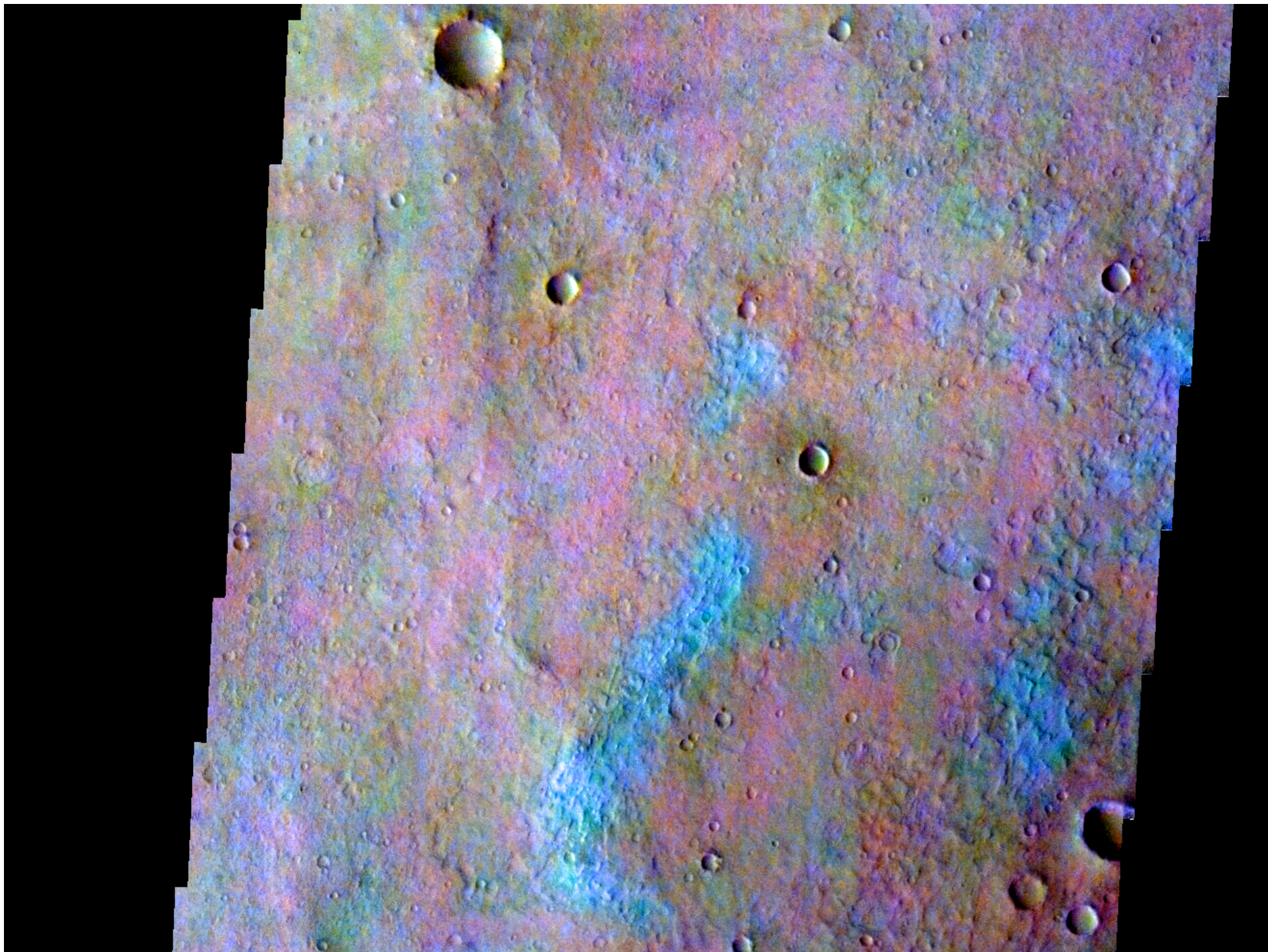


Candidate 1: Site 15 (-18°S; 250 m)

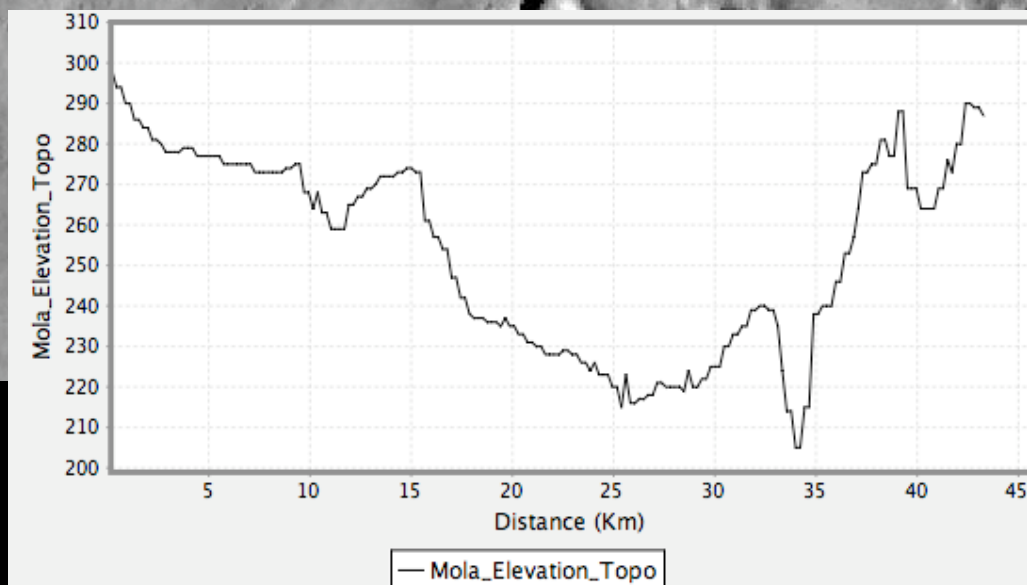


Site 15

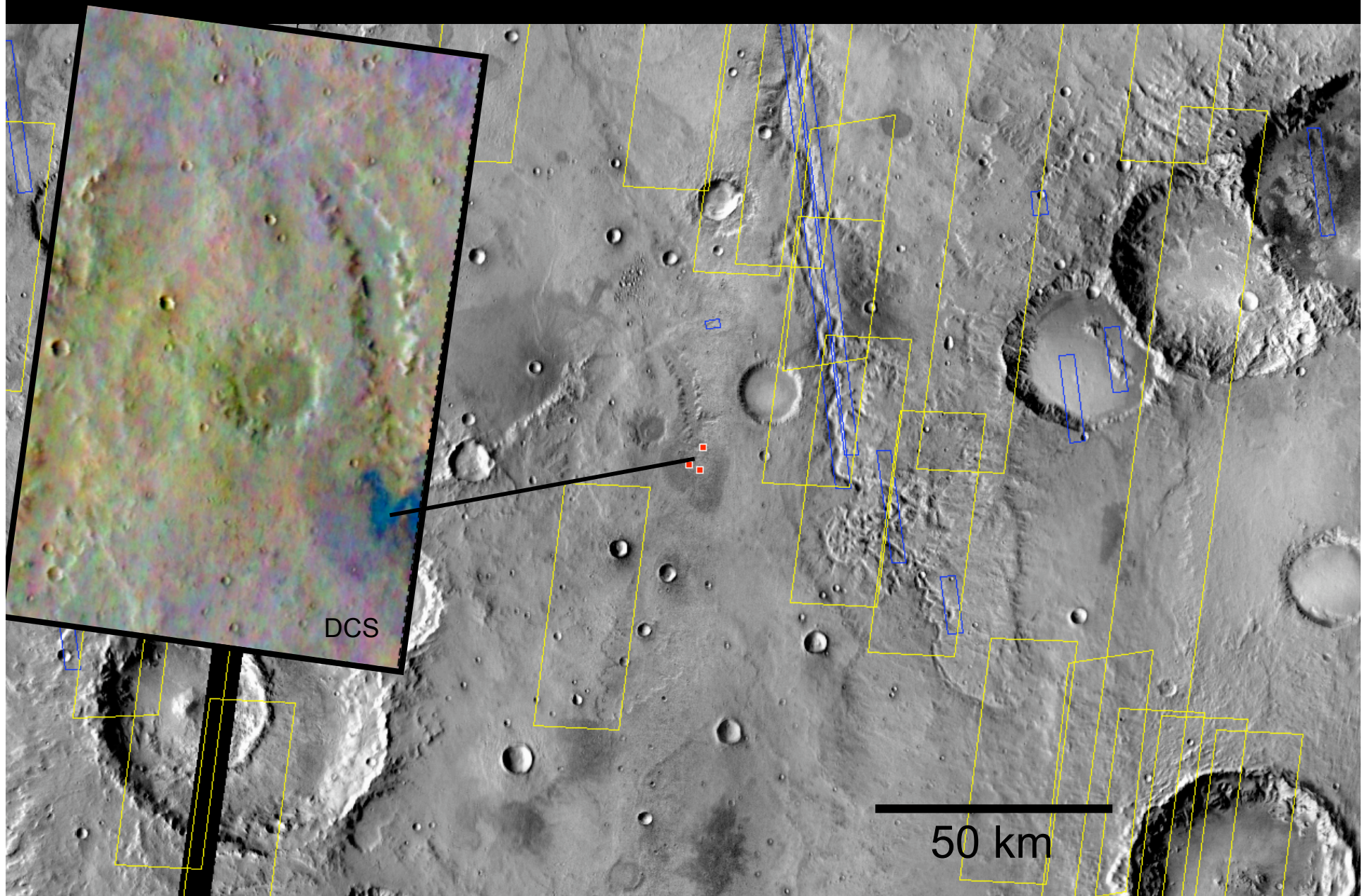


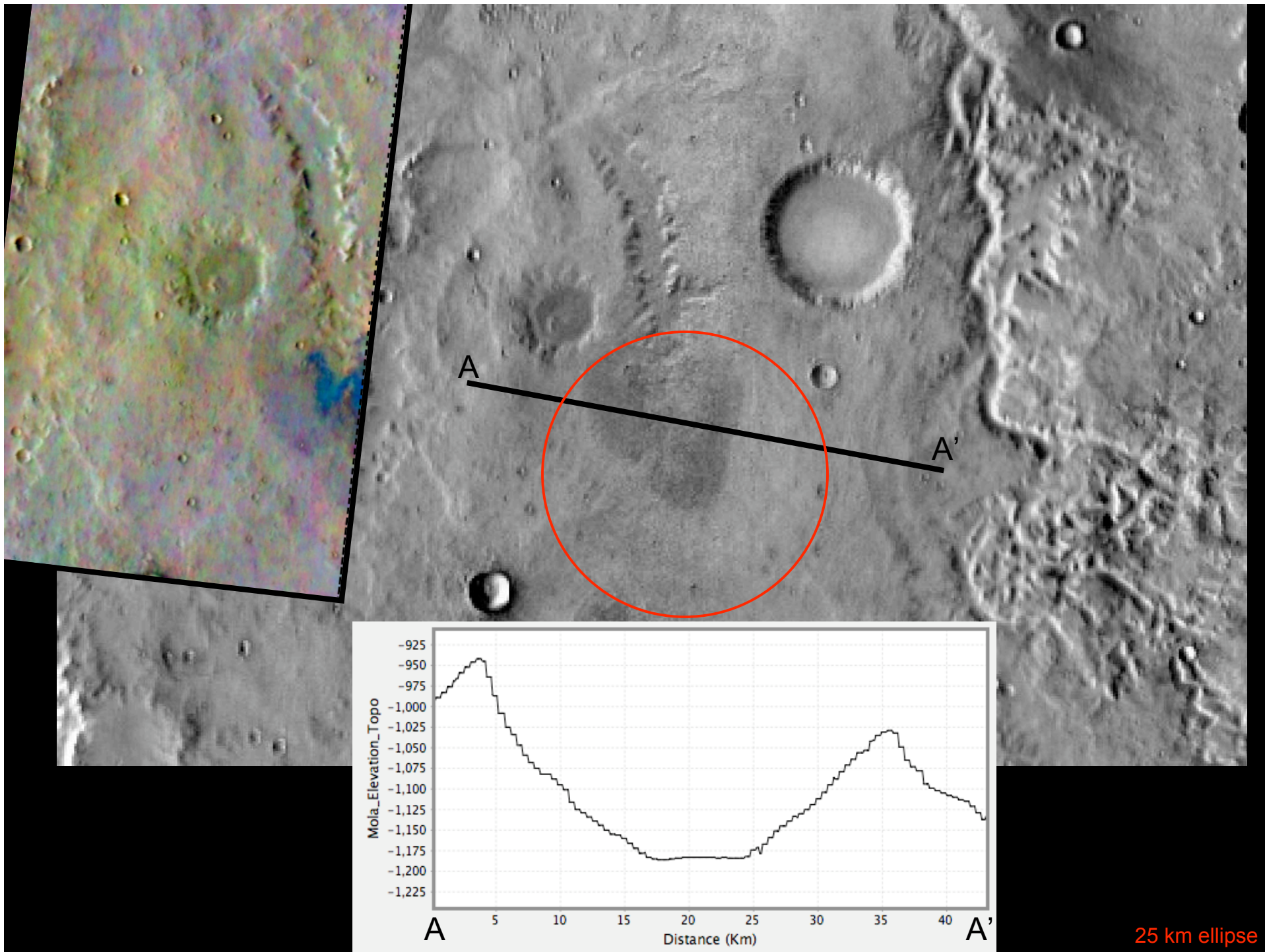


Site 15



Candidate 2: Site 10 (-13° S; -1200 m)



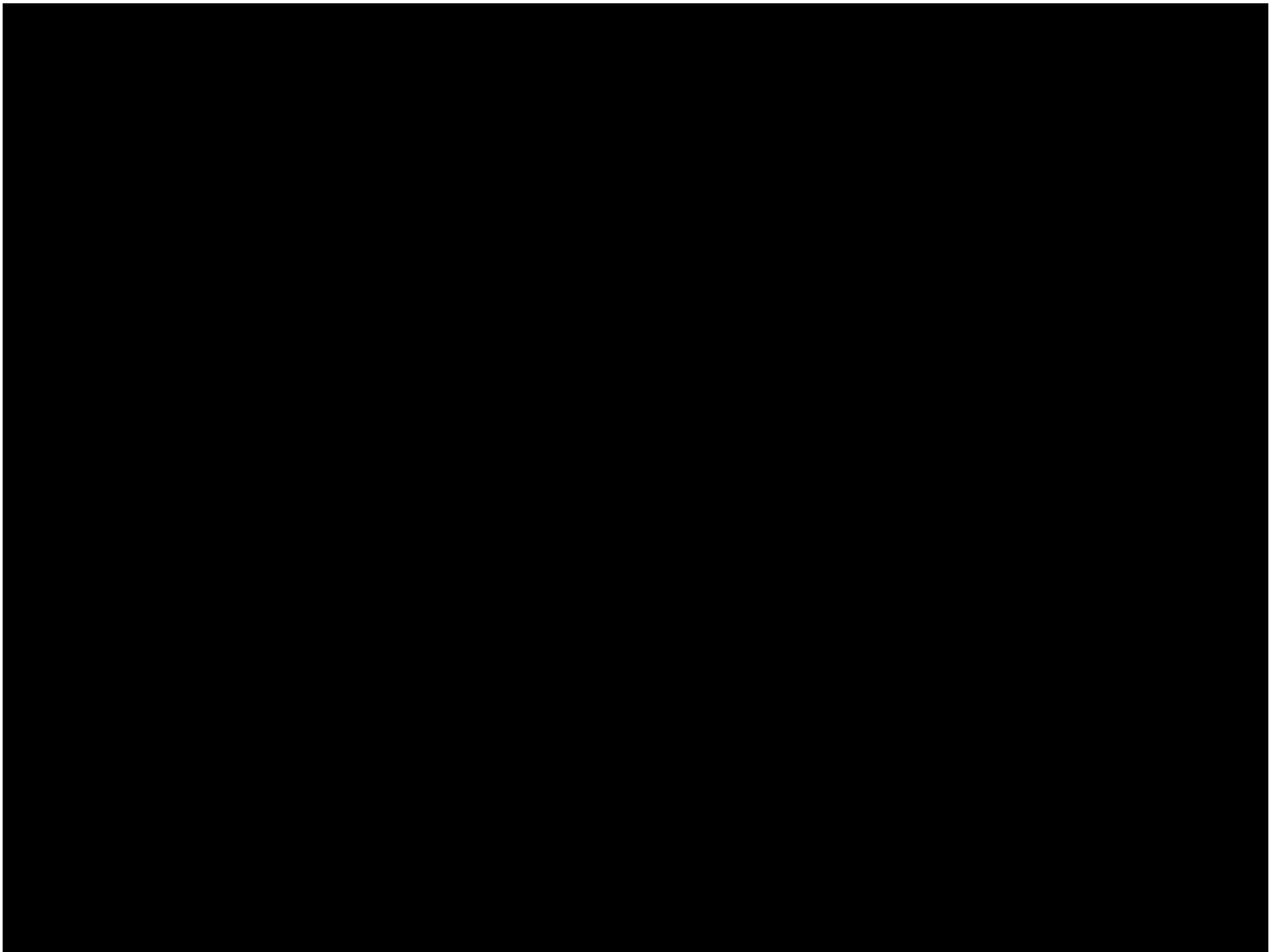


Relevance to MSL Objectives

- Habitability
 - Chloride concentrations would indicate significant water abundances
 - Occur in basins
 - Associated with channels and layered strata
 - In situ precipitated minerals within a sedimentary sequence
- Preservation (and access)
 - Chloride salts excellent for preserving organic material
 - Occur in eroded layers - exposed units

Summary

- New class of mineralogic sites
- Spectral evidence for chlorides in significant abundance
- Relatively common
- Morphologic evidence consistent with meters-thick chloride (halite?) stratigraphic layer
- Occur in Noachian cratered highlands
- Often occur in basins associated with channels and layered units
- Exhumed
- Propose further investigation of these sites before elimination
 - Need HiRISE and CRISM



Site 15

