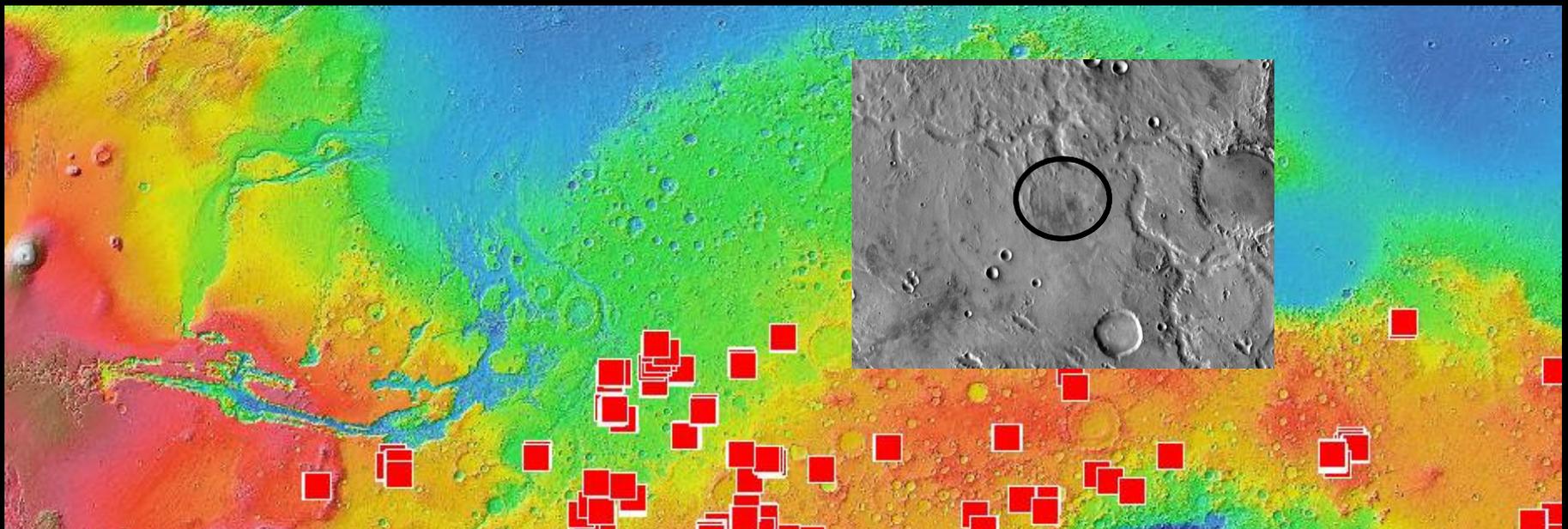


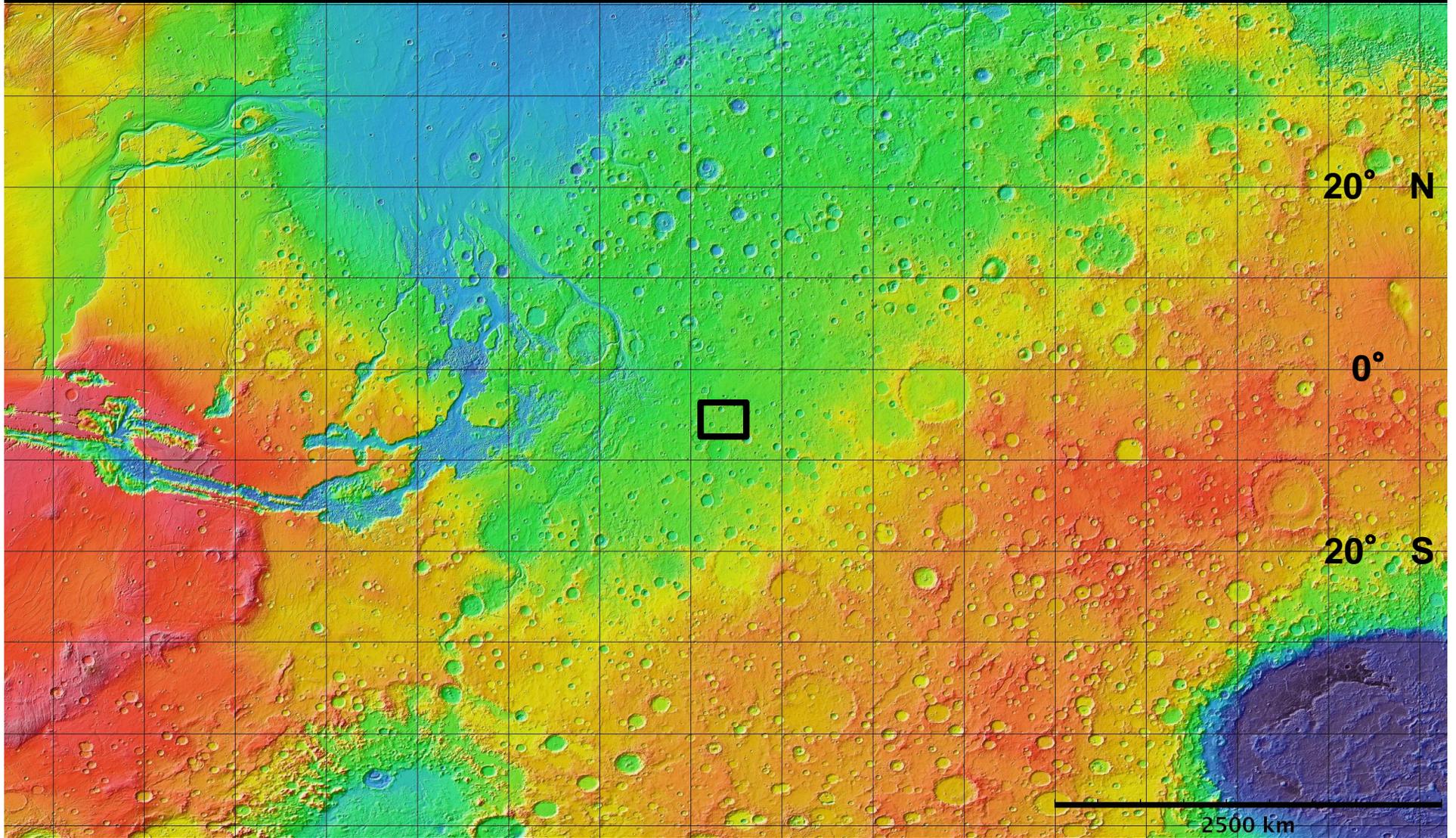
Eastern Margaritifer Terra Mars 2020 Candidate Landing Site

Philip Christensen, Victoria Hamilton, Christopher Edwards, Tullis Onstott, Charles Cockell, Tim Lowenstein, Lori Ziolkowski, and Nicholas Tosca

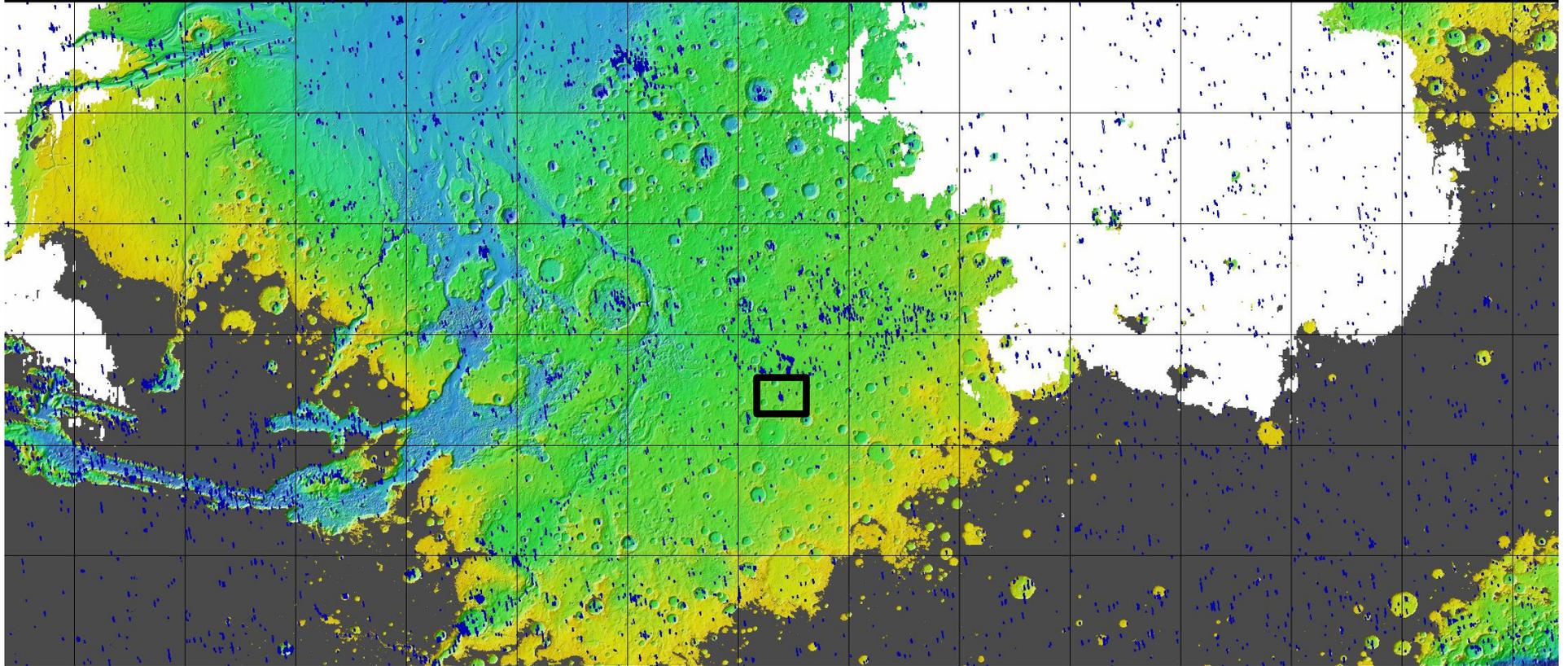


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Eastern Margaritifer Terra Site



Eastern Margaritifer Terra Site - with constraints



1000 km

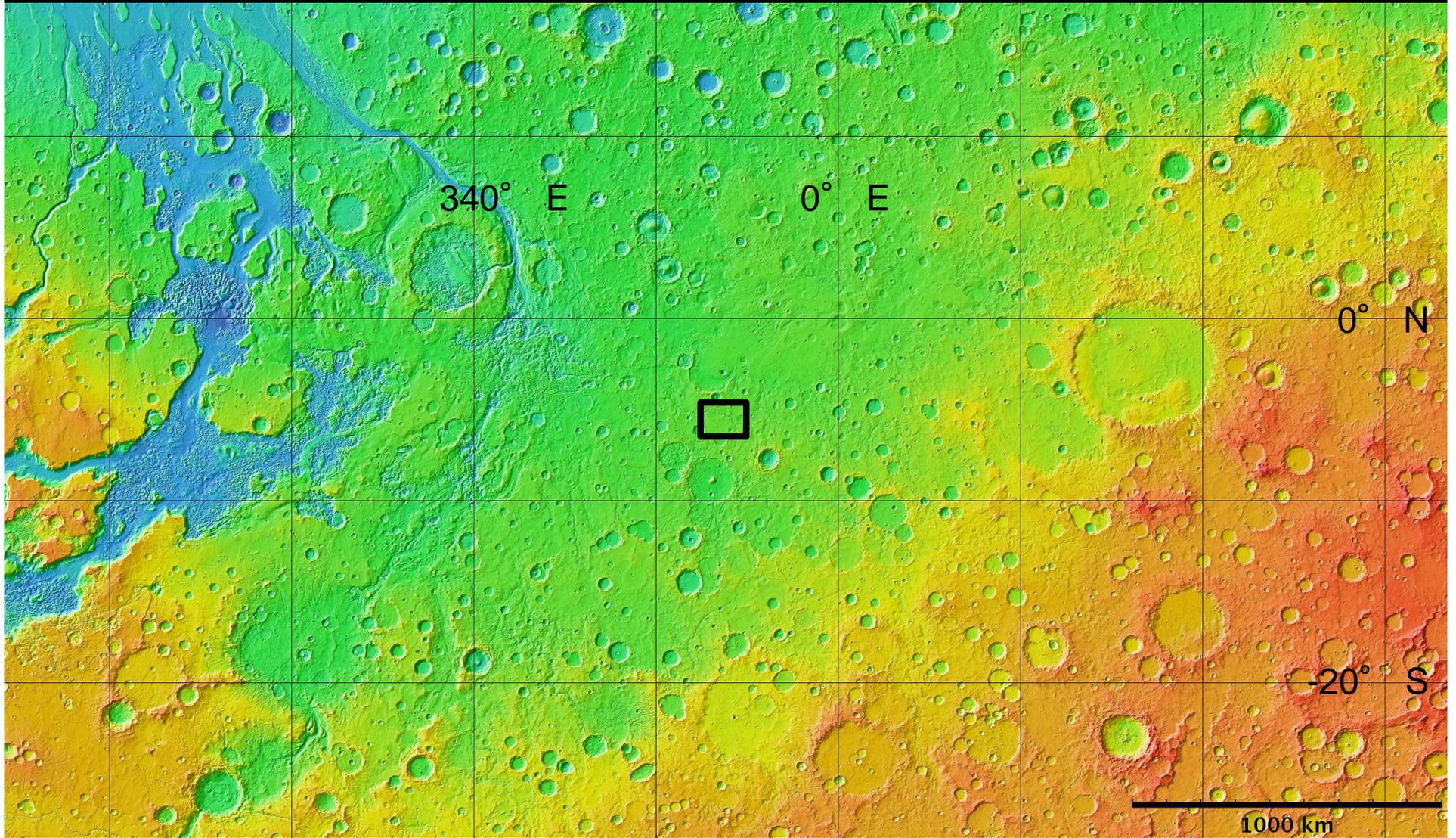
Eastern Margaritifer Terra Overview

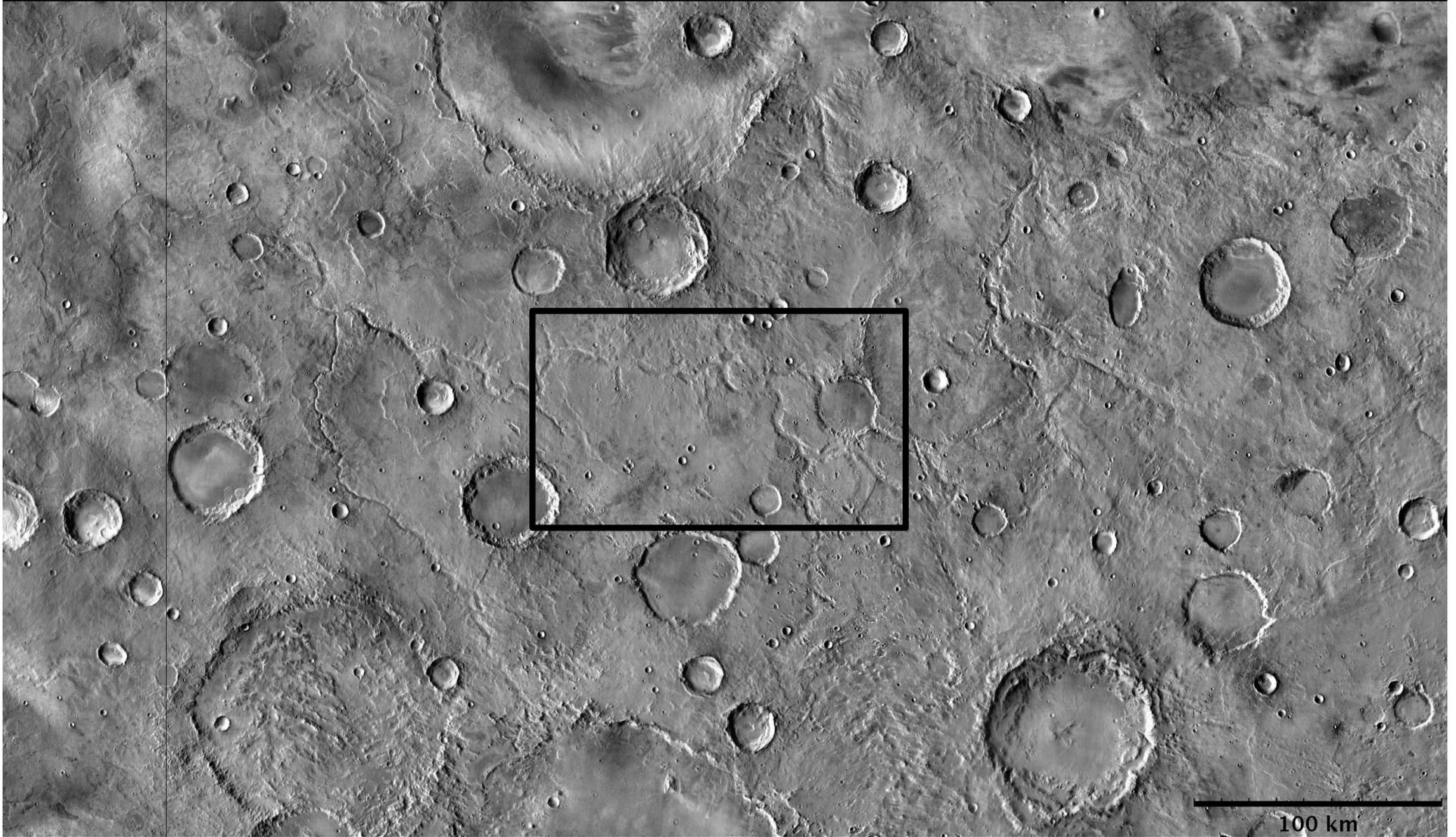
- Equatorial (-5.6°)
- Low elevation (-1.25 km)
- Easily accessed
- Stratigraphic sequence of layered, in-place, geologic units of diverse composition exposed by erosion
 - 50 m of stratigraphic section in 20-km diameter basin
 - Basaltic cap unit
 - Phyllosilicate unit with excellent spectral signature in both CRISM and TES
 - Chloride base unit
- 100 m of section exposed in ancient channel system 13 km to north and east
- Noachian terrain

Eastern Margaritifer Terra Overview

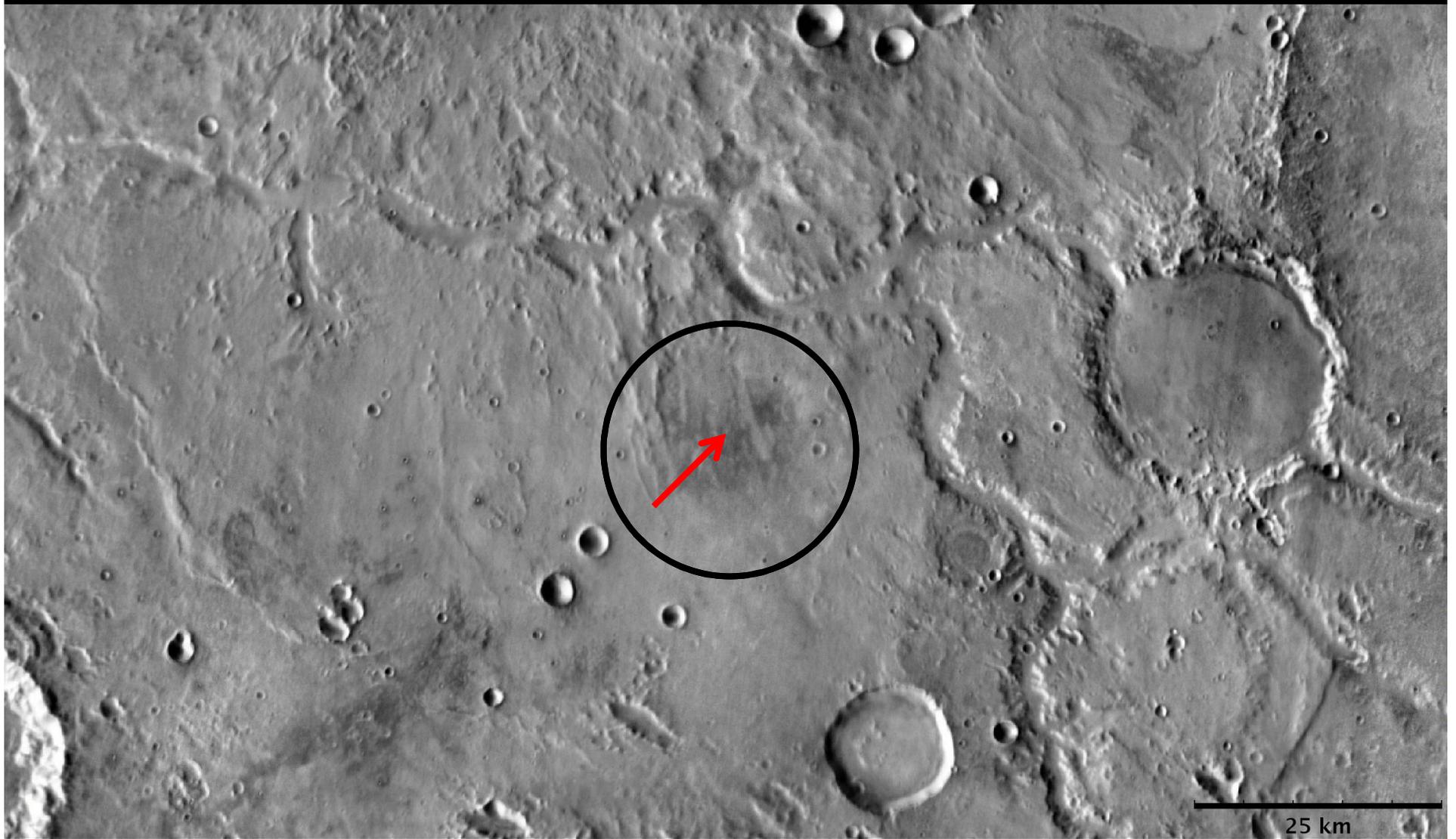
- Relevance to sample return
 - Diverse suite of compositional units
 - Phyllosilicates and chlorides are globally common and are key indicators of (differing?) aqueous processes on early Mars
 - Understanding the origin of *both* of these units is essential to understanding the nature of water on early Mars
 - Potential biosignature preservation in chloride unit
 - Excellent geologic context in layered stratigraphy
 - In-place volcanic units for age dating of sequence

Eastern Margaritifer Terra Site

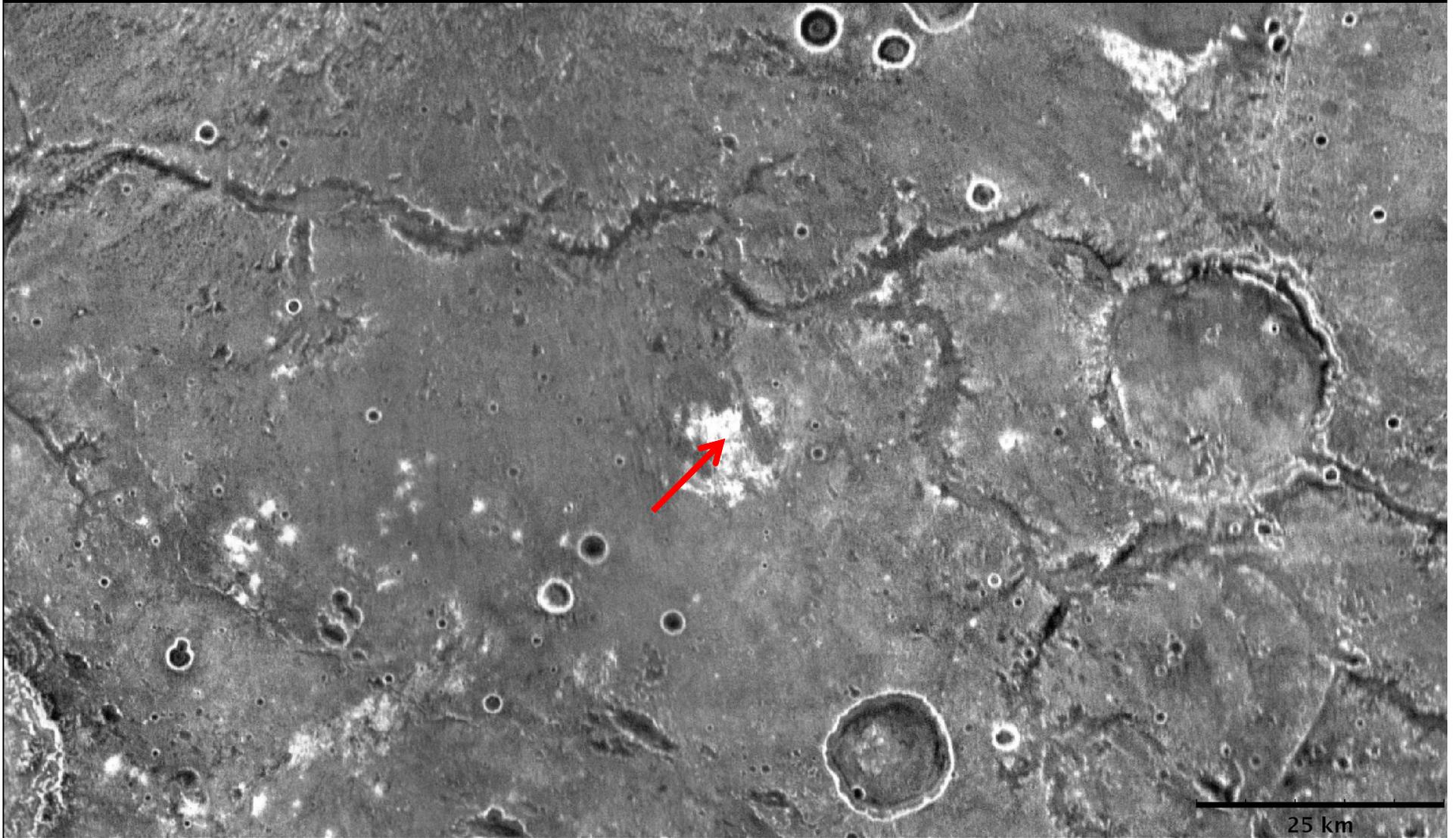


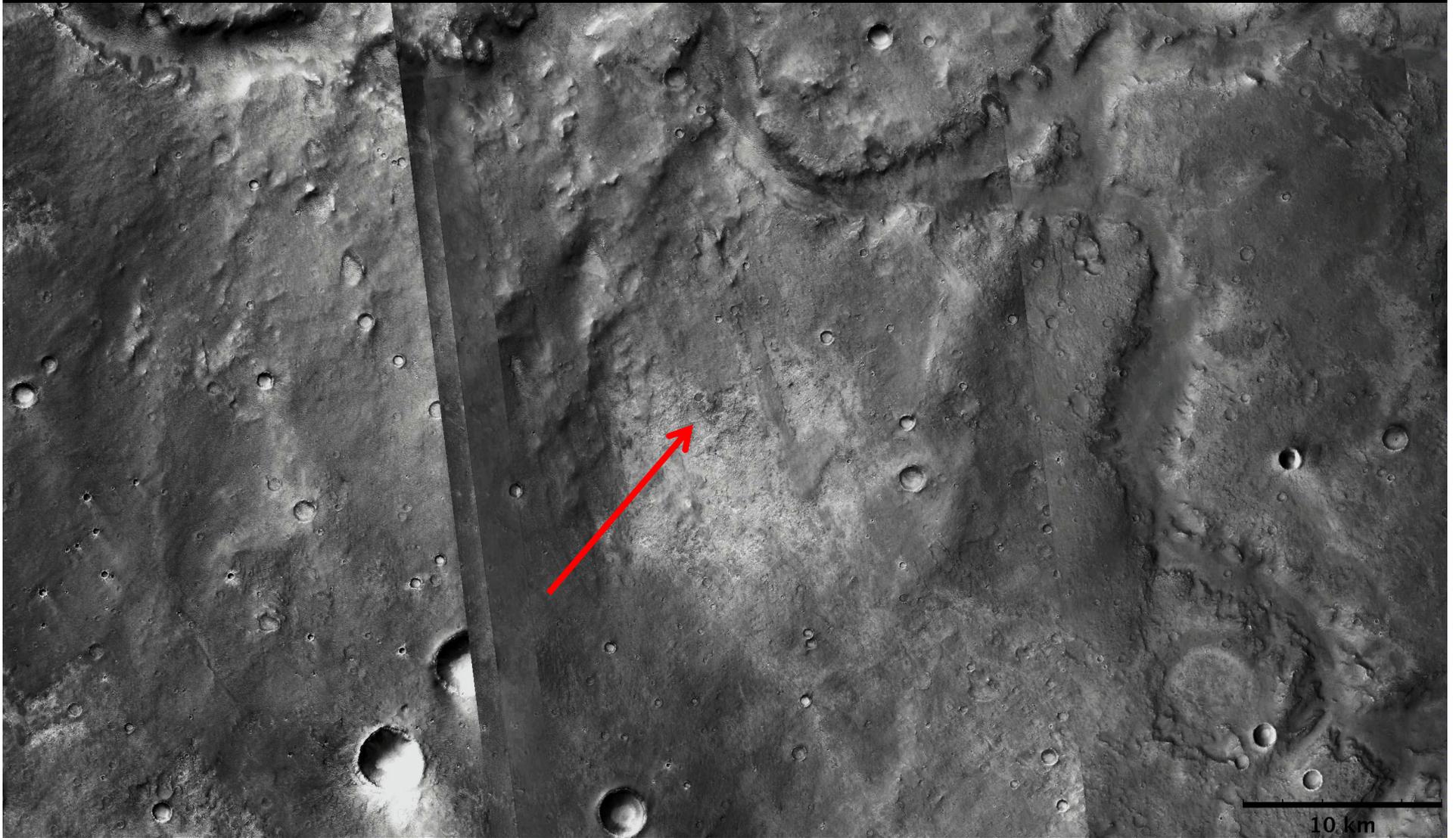


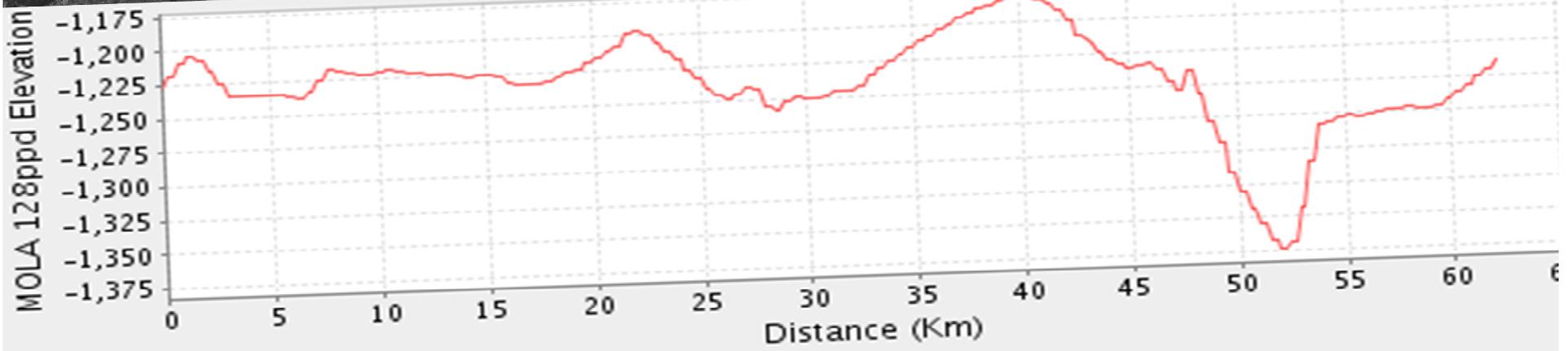
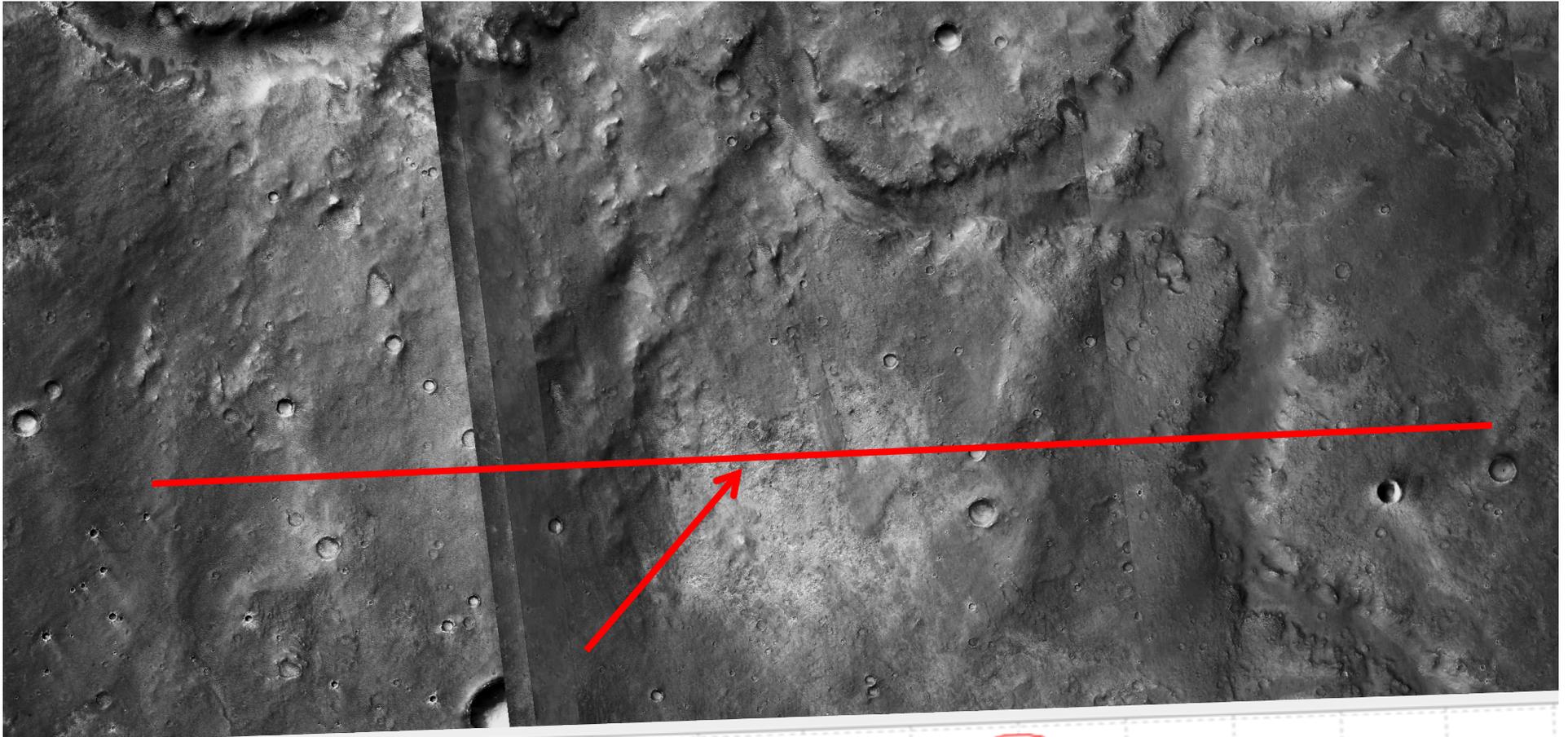
THEMIS Day IR



THEMIS Night IR

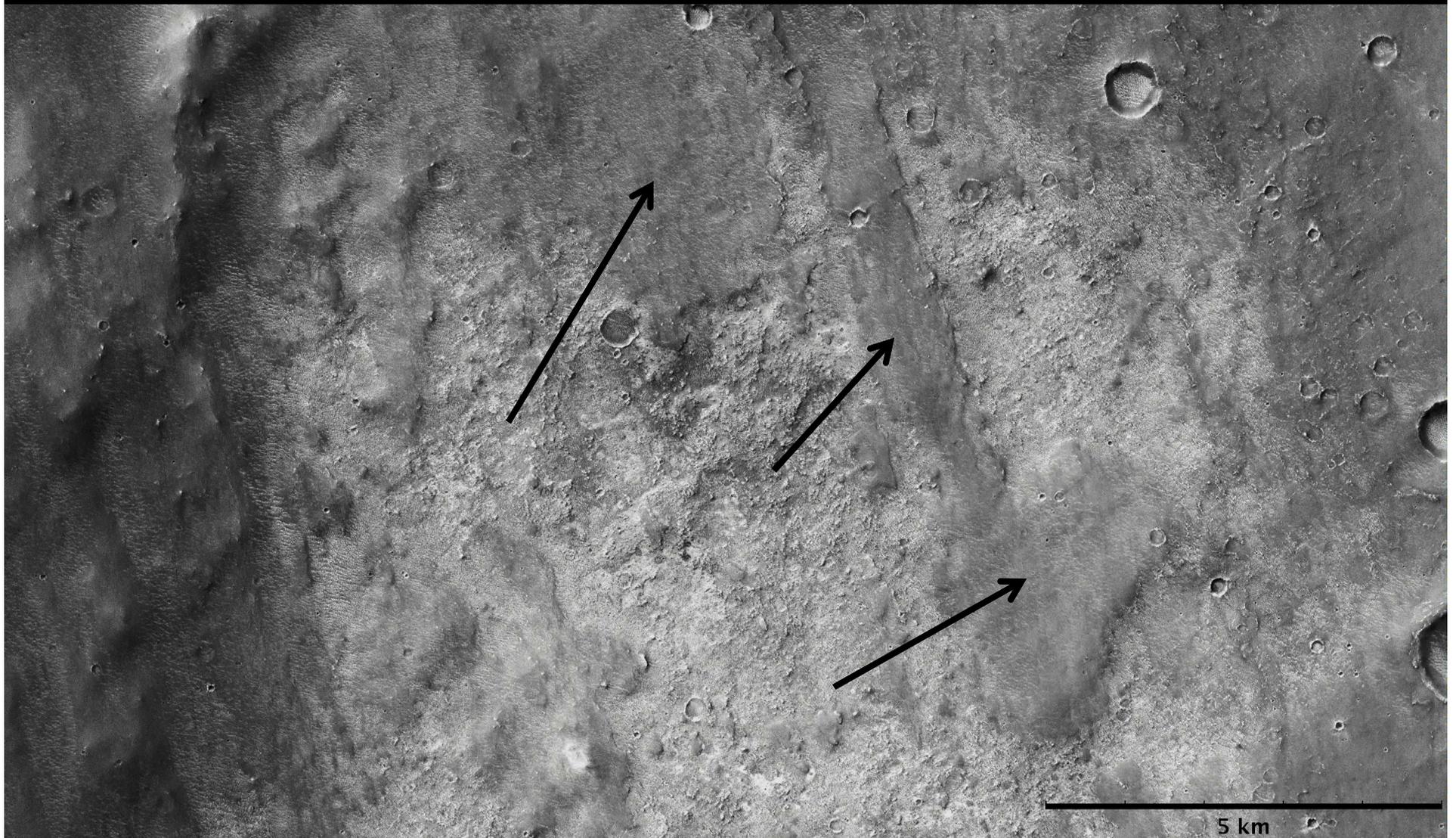




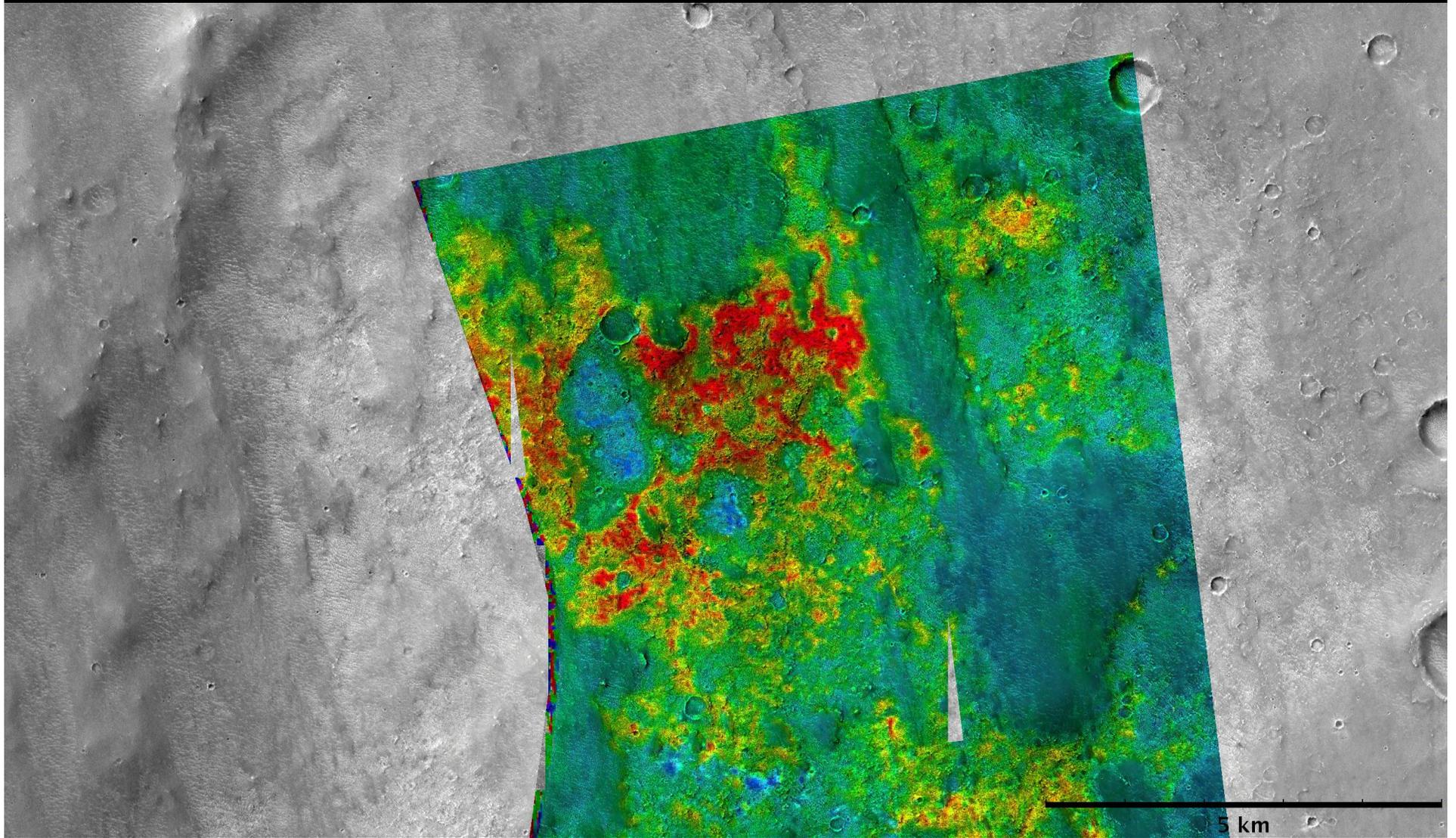


— MOLA 128ppd Elevation

Basaltic Cap Unit



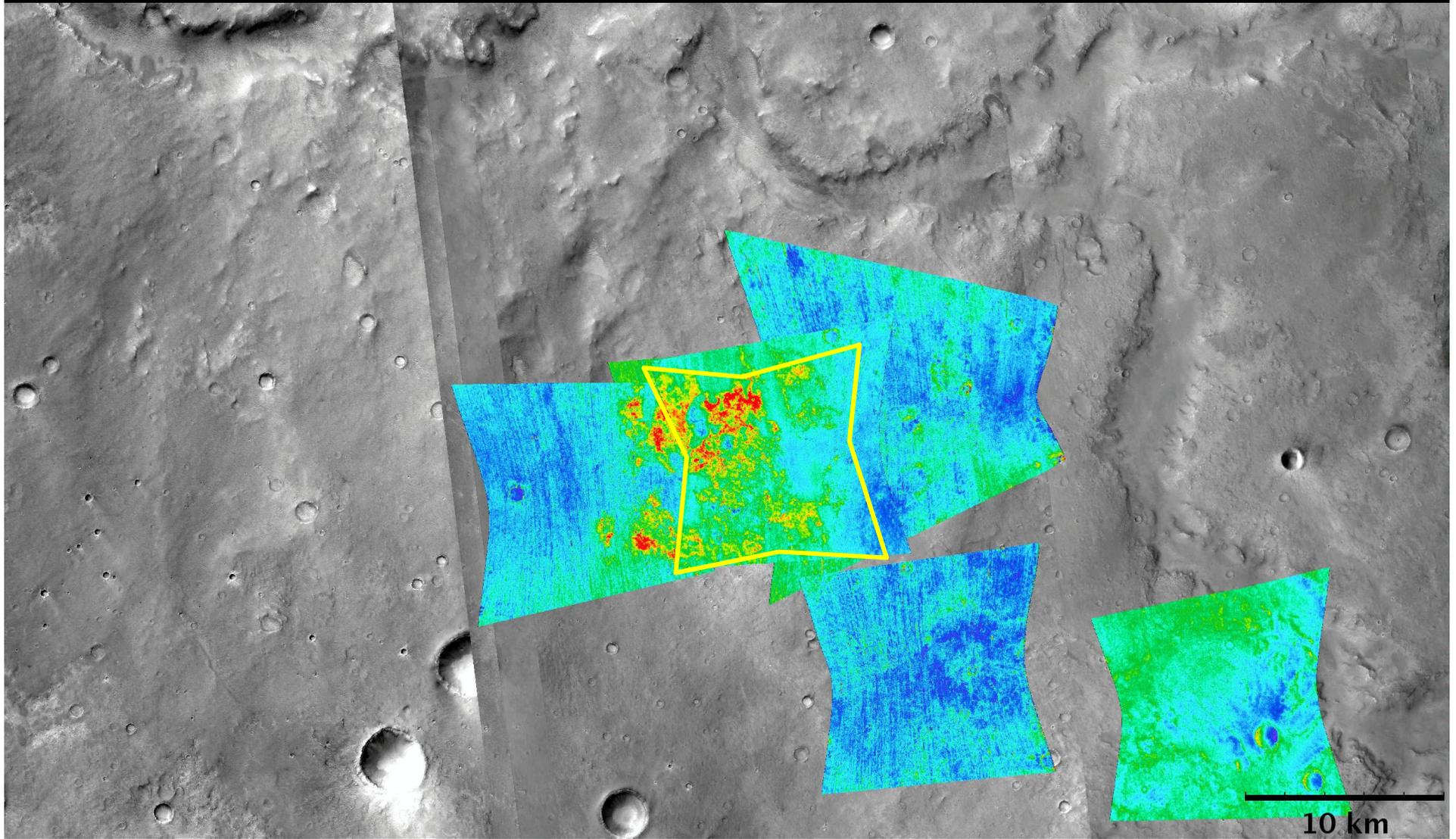
Phyllosilicate-bearing Unit



CRISM BD2300 Fe/Mg Phyllosilicates Index

Red = High Abundance
Blue = Low Abundance

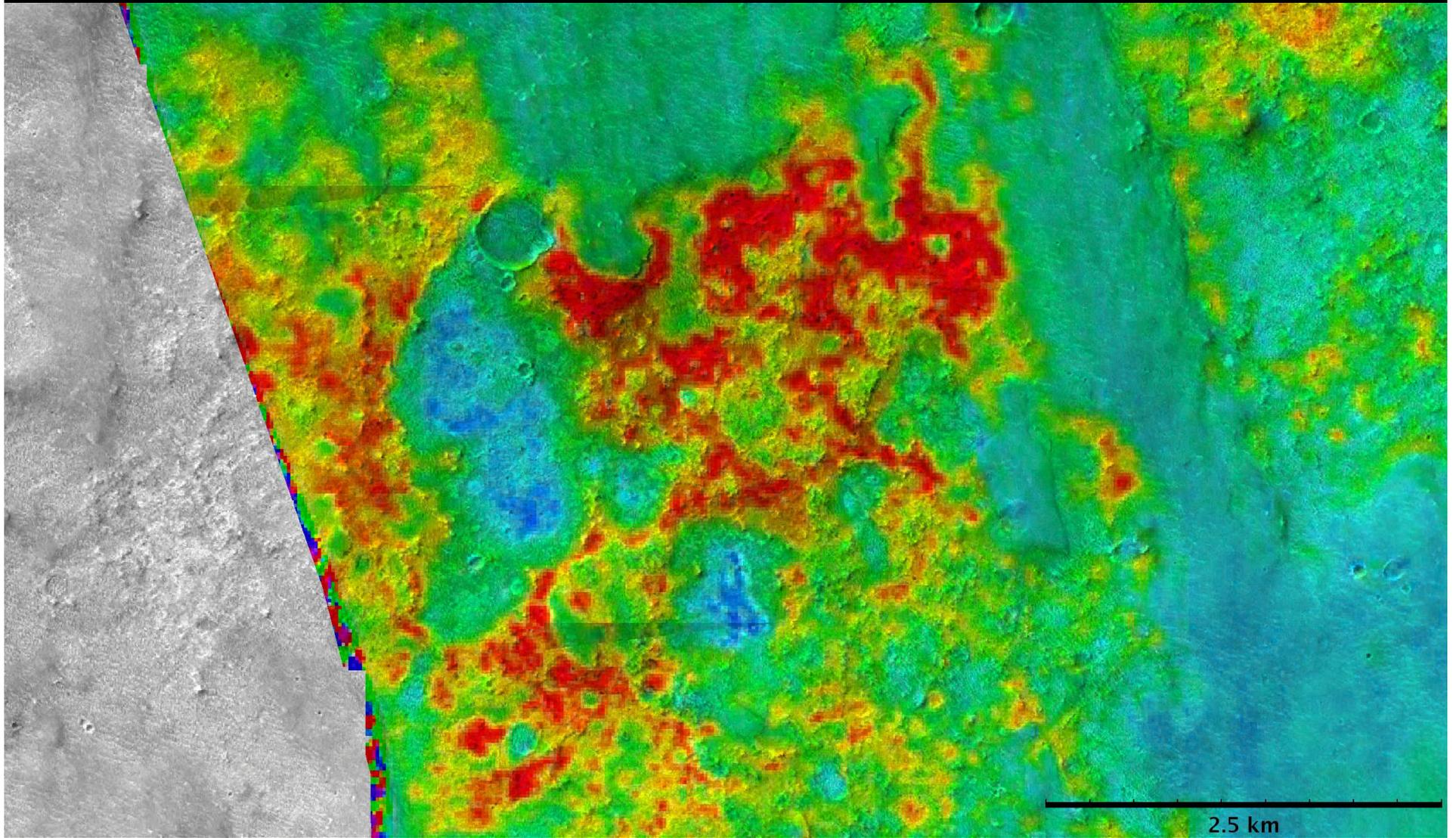
Phyllosilicate-bearing Unit



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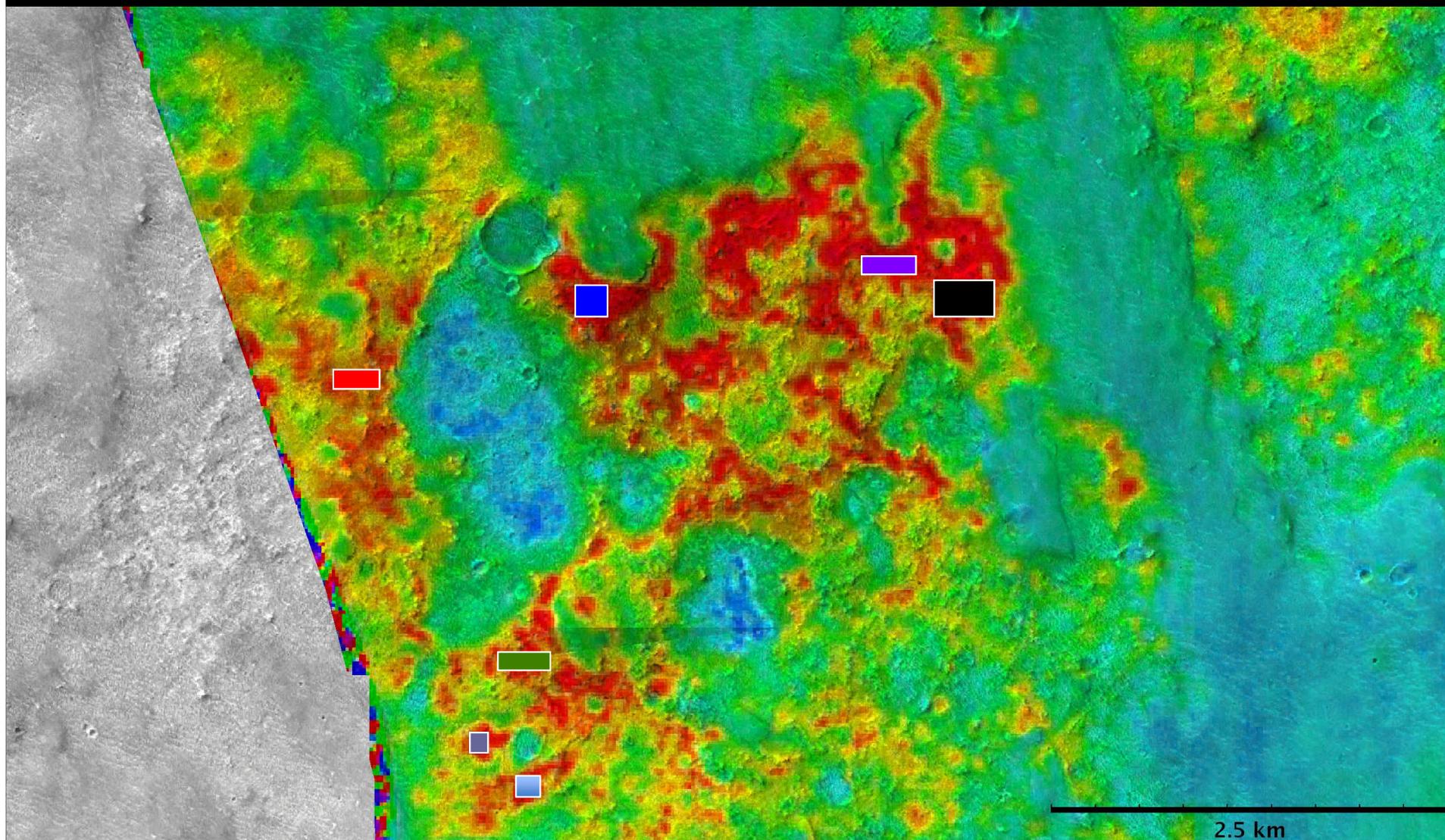
Phyllosilicate-bearing Unit

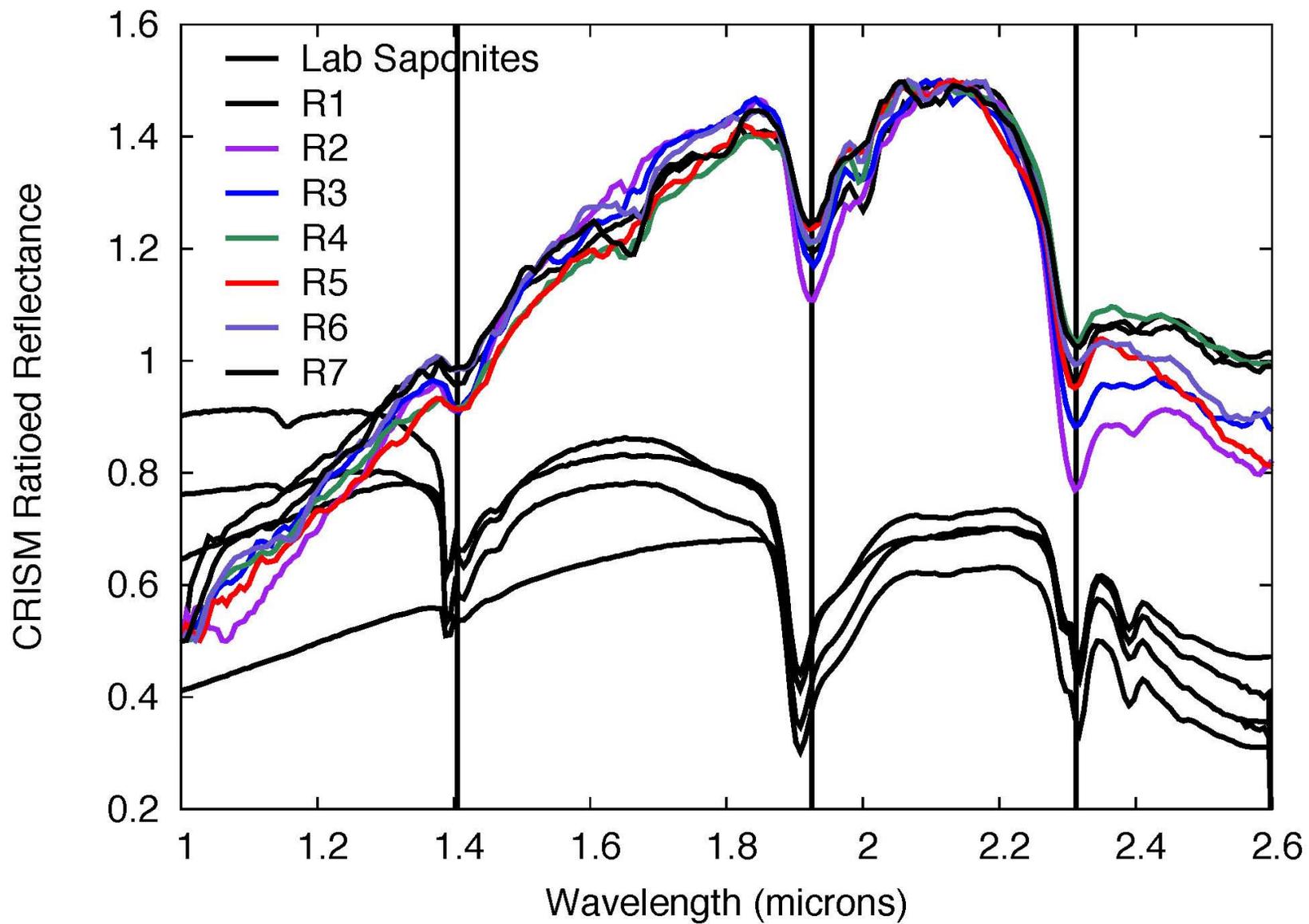


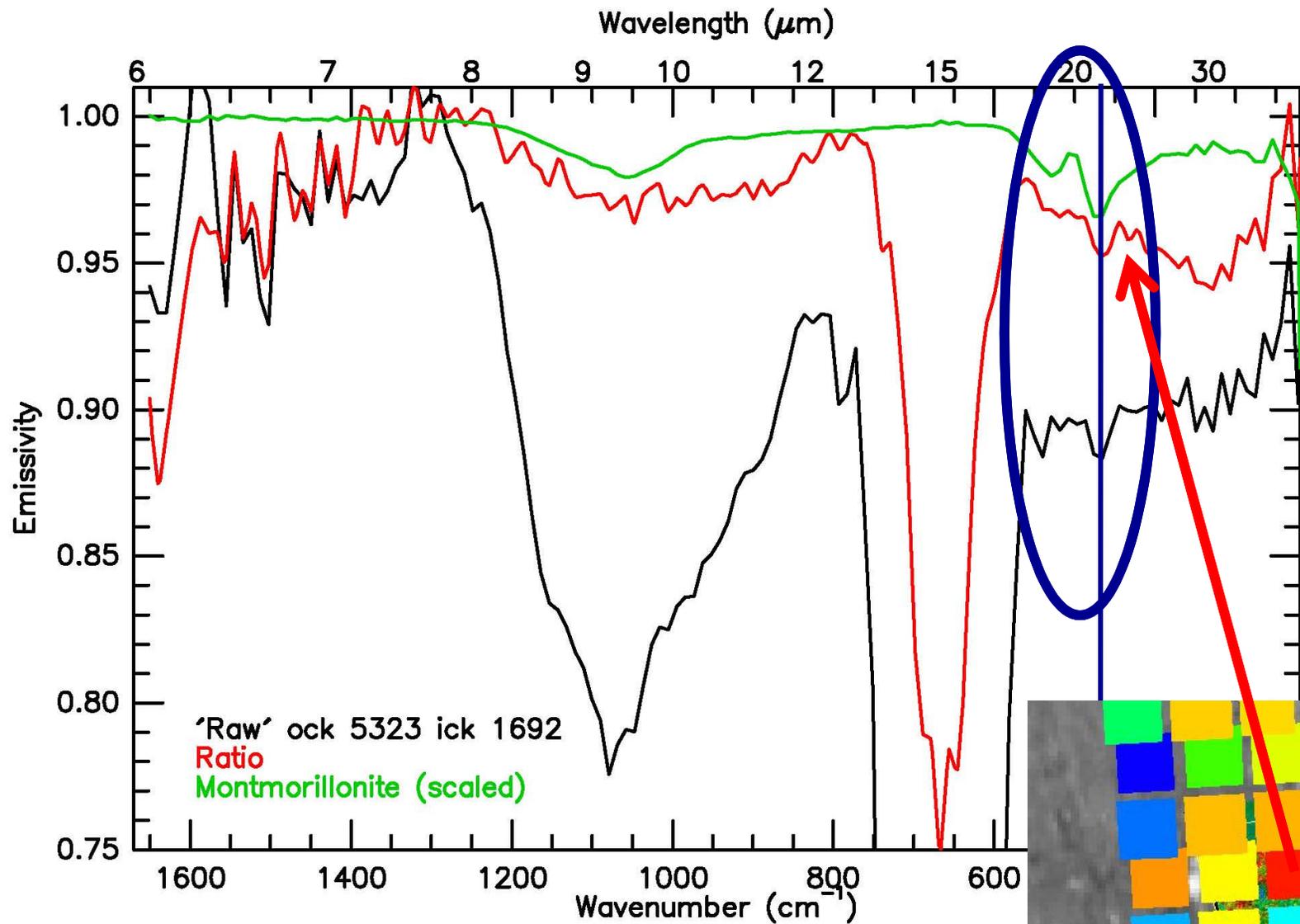
CRISM BD2300 Fe/Mg Phyllosilicates Index

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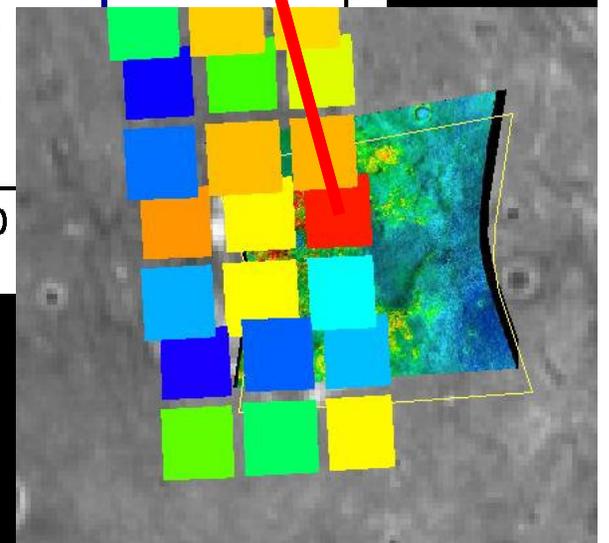
Phyllosilicate-bearing Unit

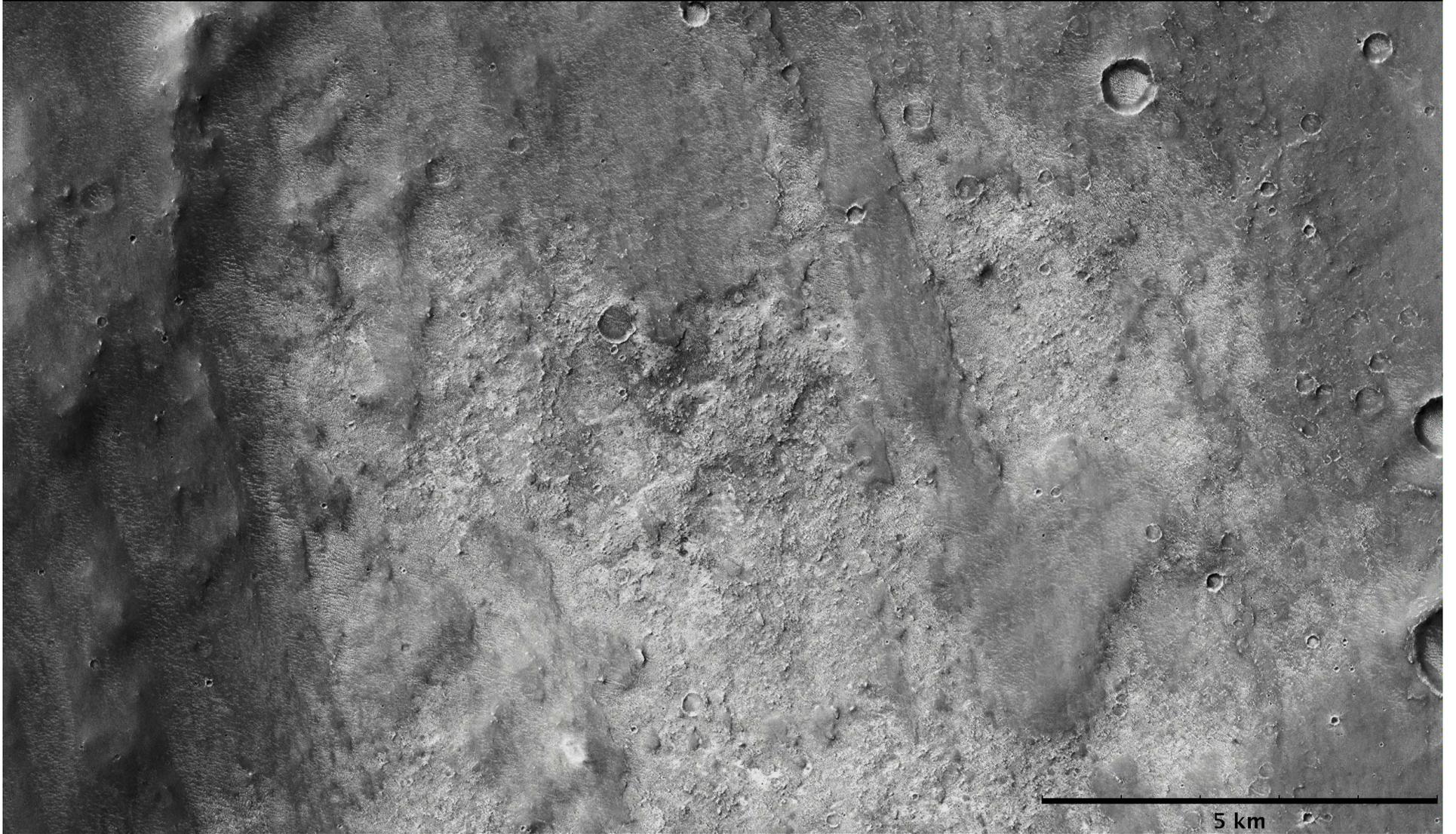




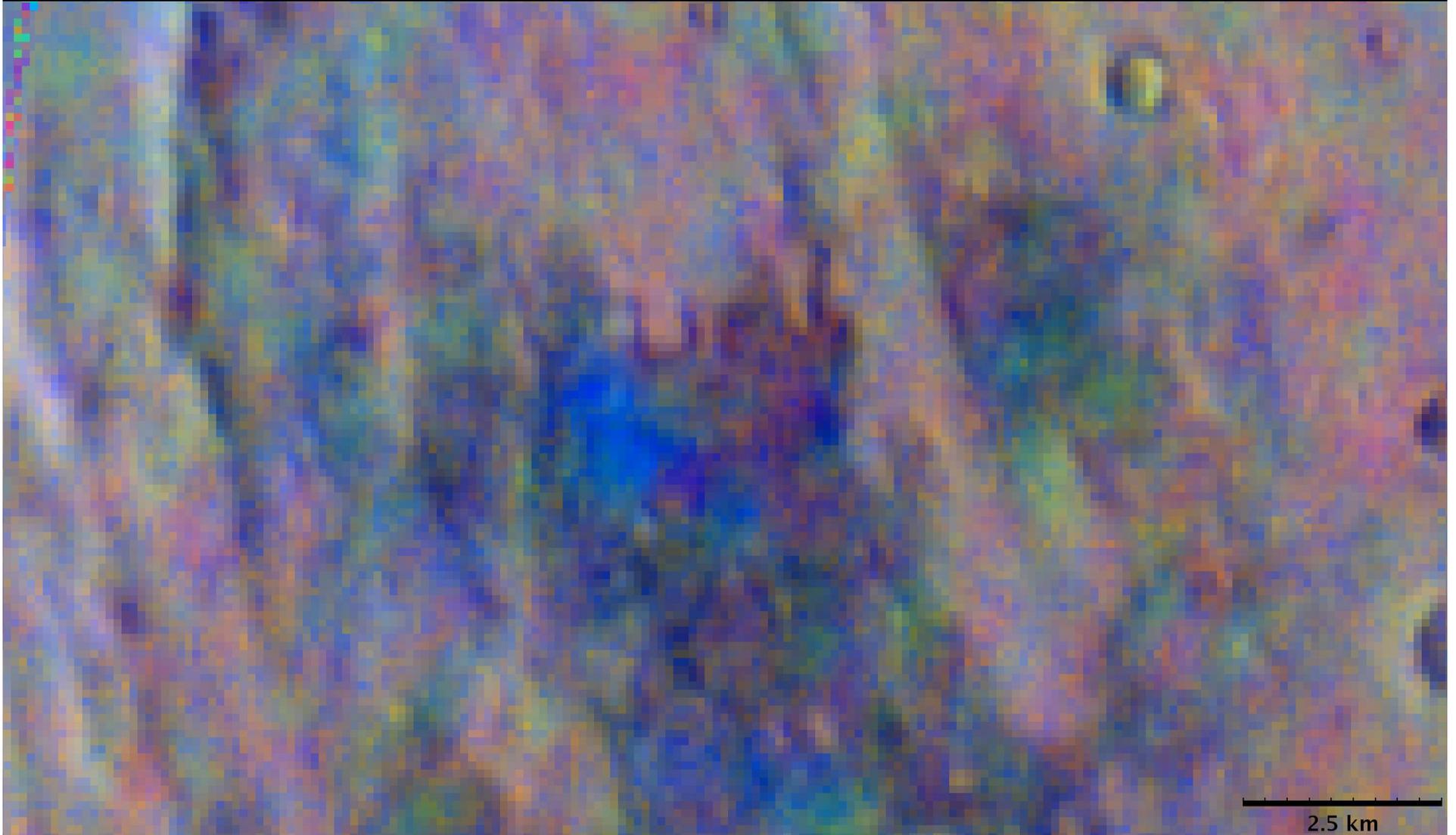


TES also shows a strong phyllosilicate signature



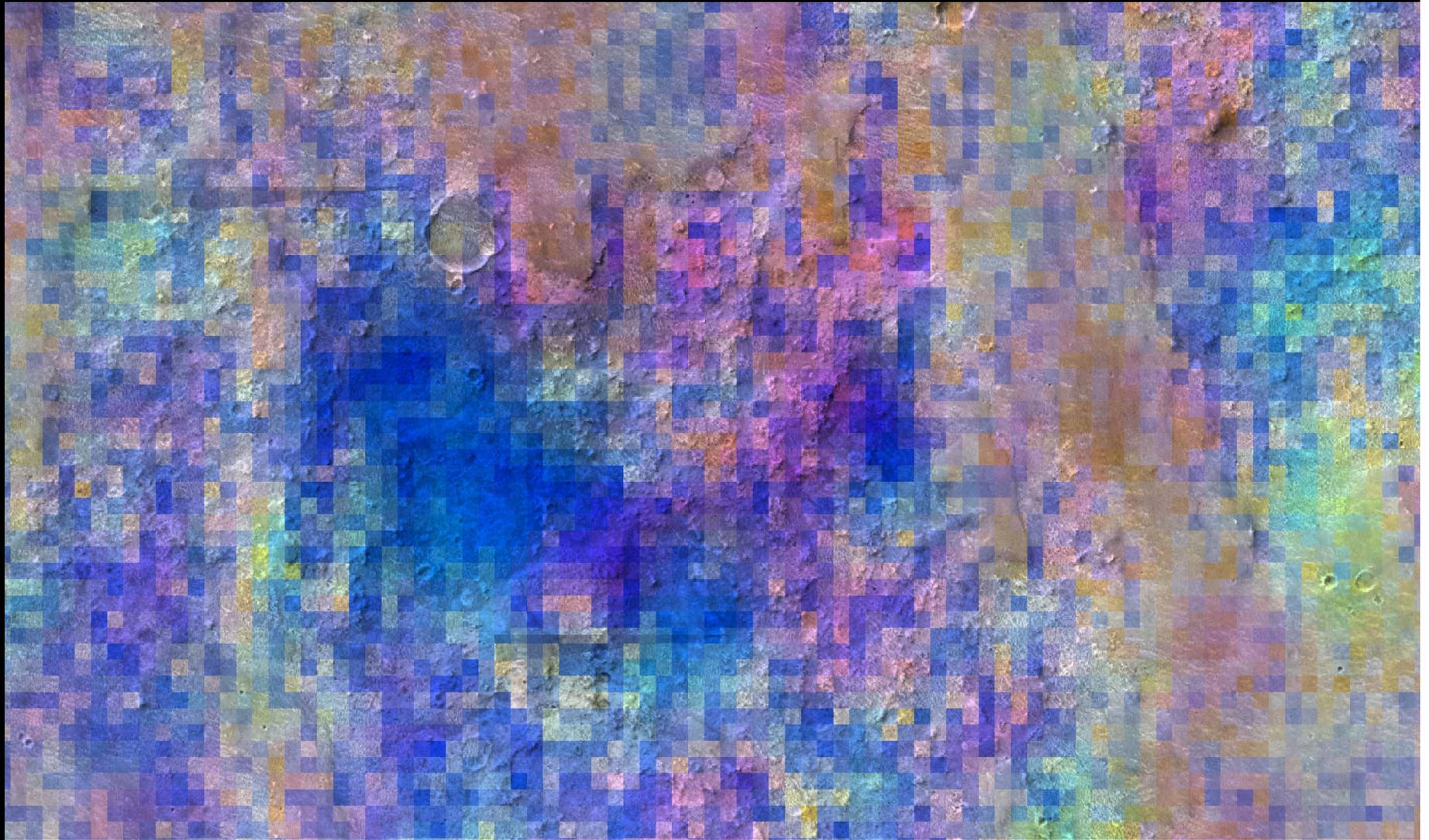


Chloride Basal Unit



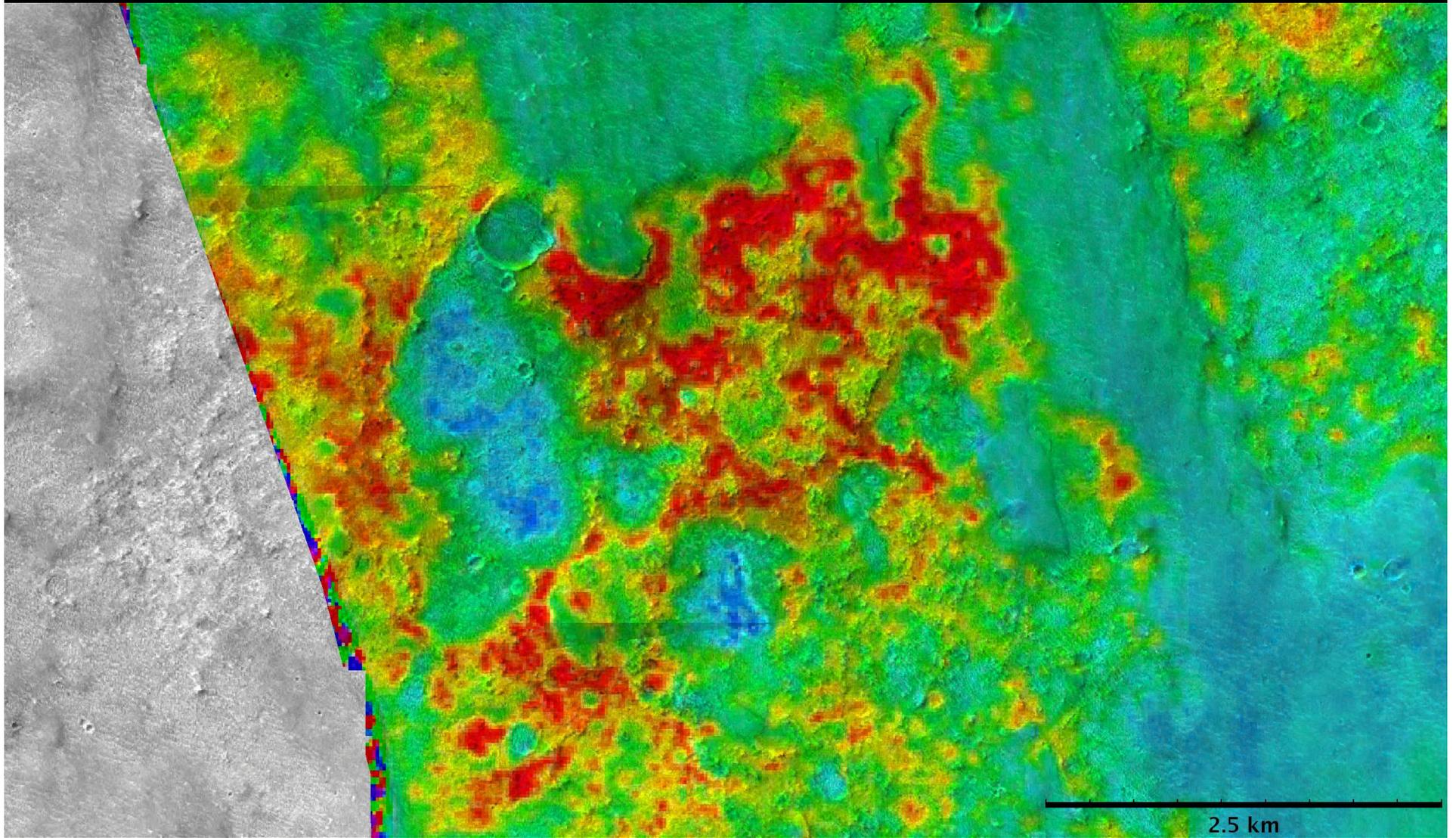
THEMIS Band 8/7/5 Multi-spectral IR

Chloride Basal Unit



THEMIS Band 8/7/5 Multi-spectral IR

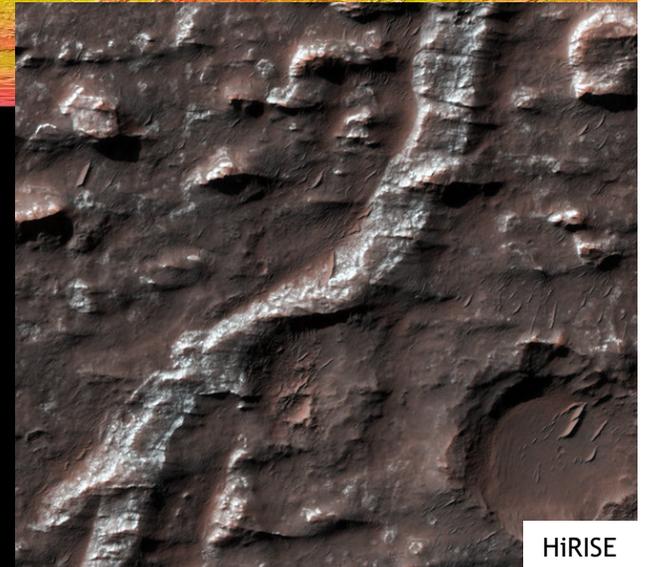
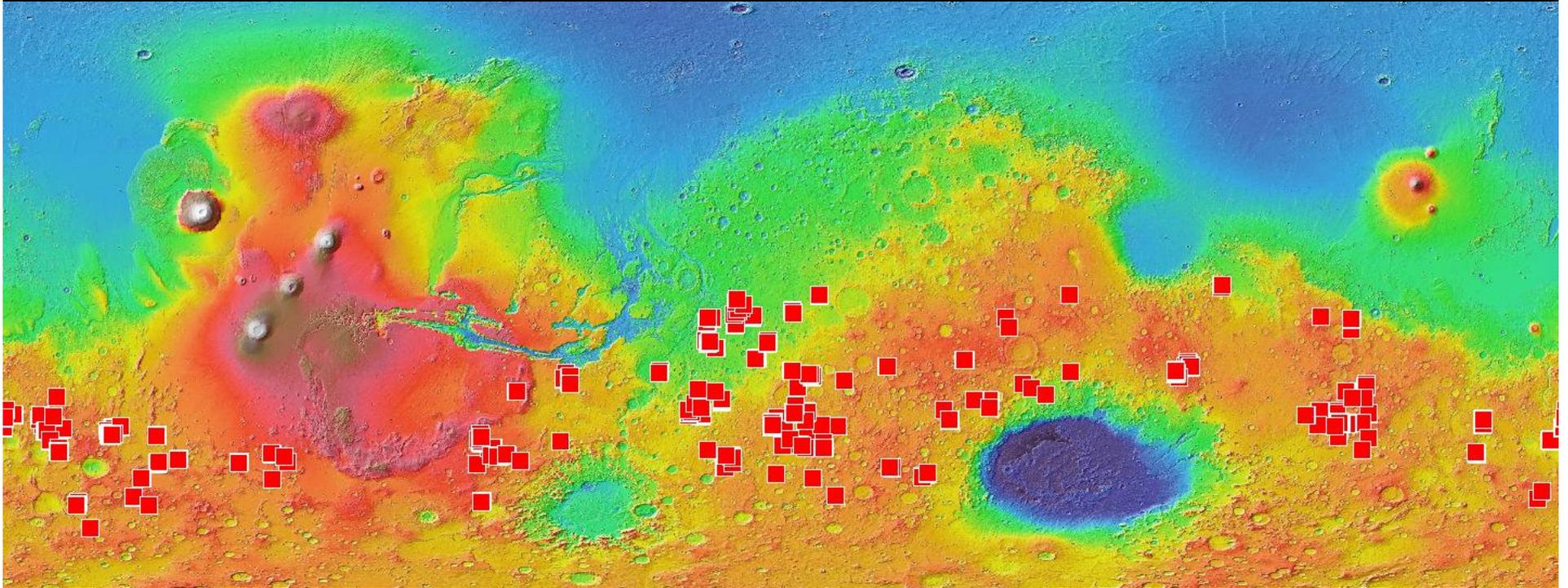
Phyllosilicate-bearing Unit

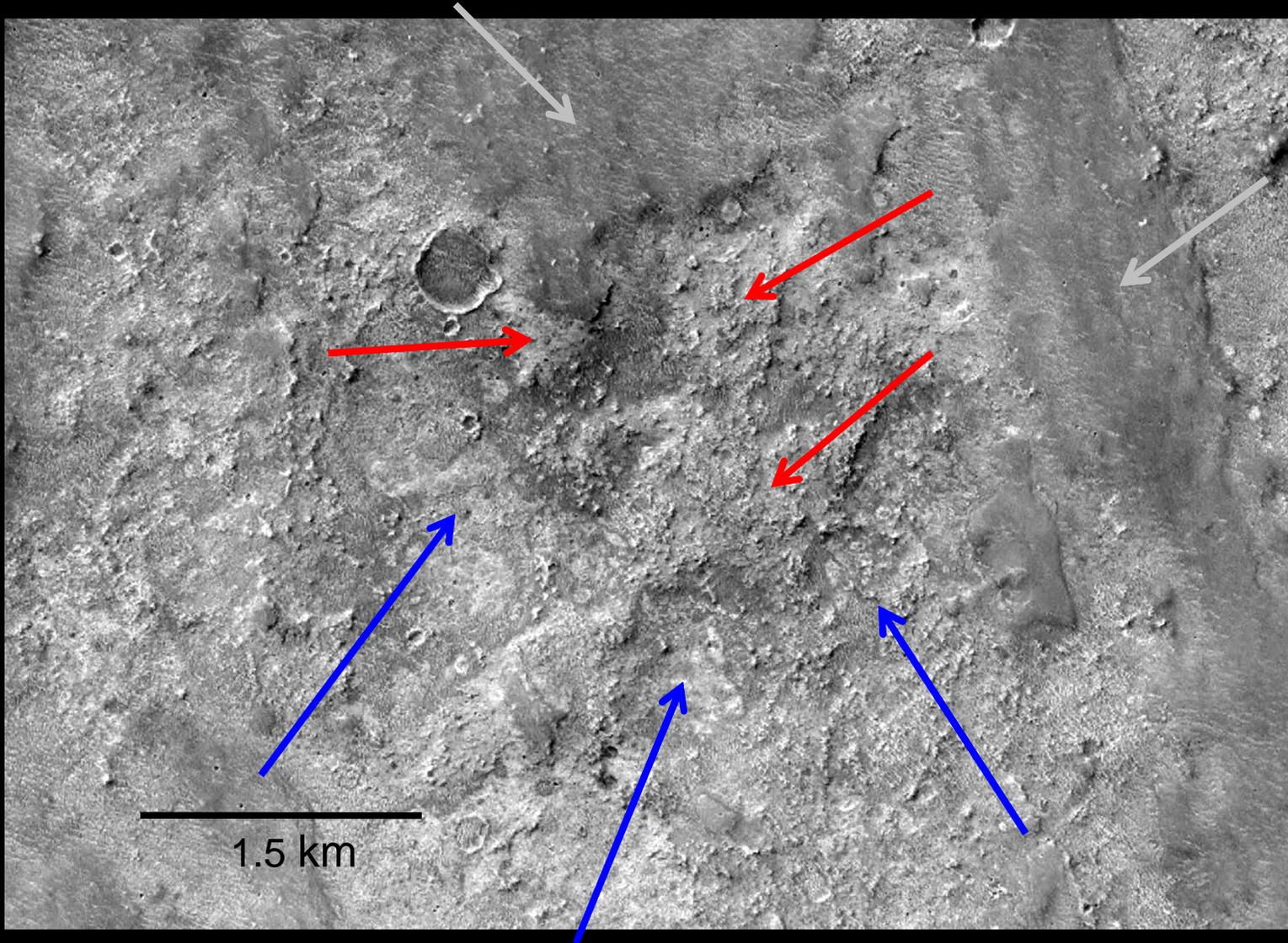


CRISM BD2300 Fe/Mg Phyllosilicates Index

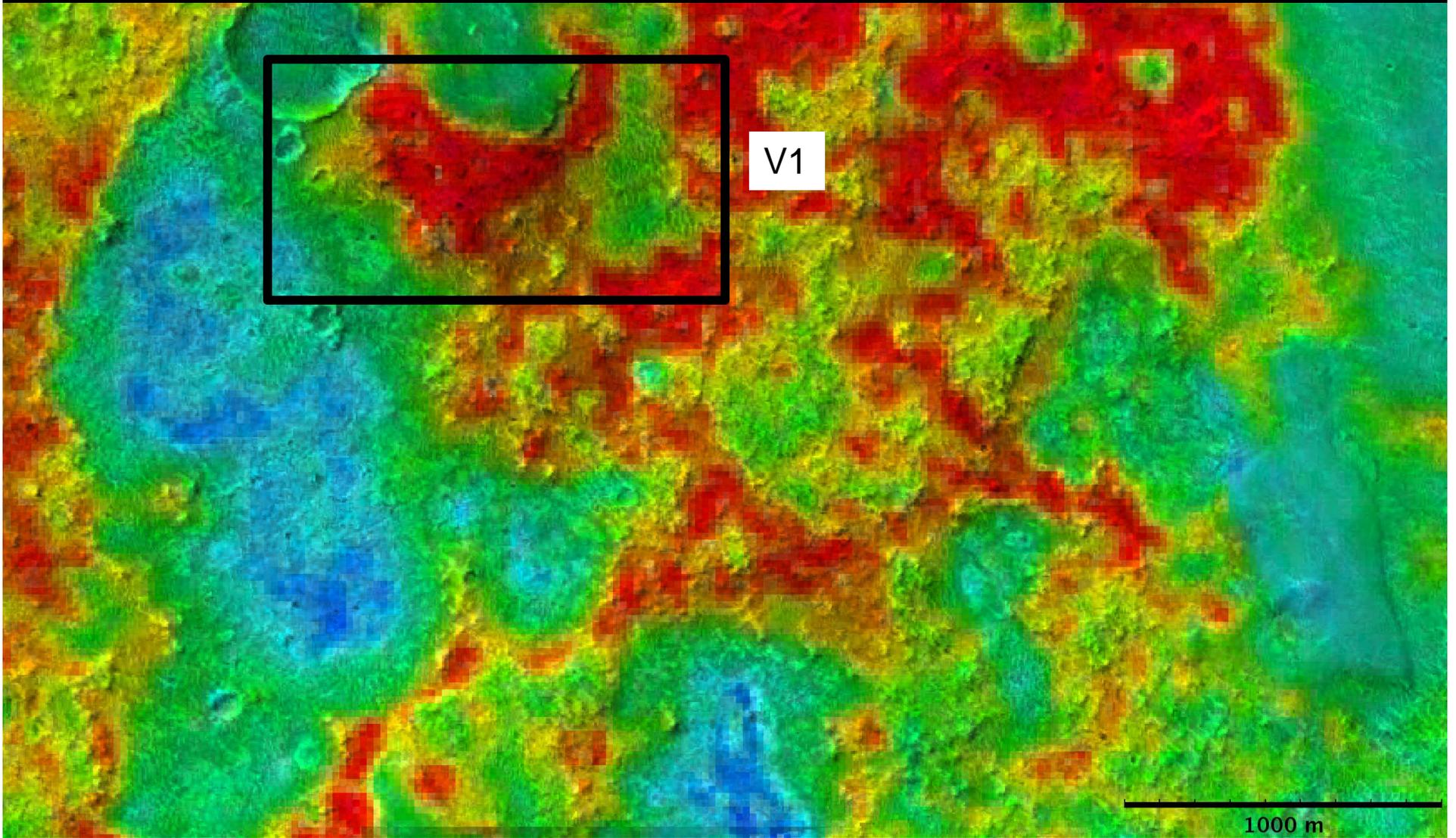
Red = High Abundance
Blue = Low Abundance

Example Chloride Salt Sites Identified by THEMIS



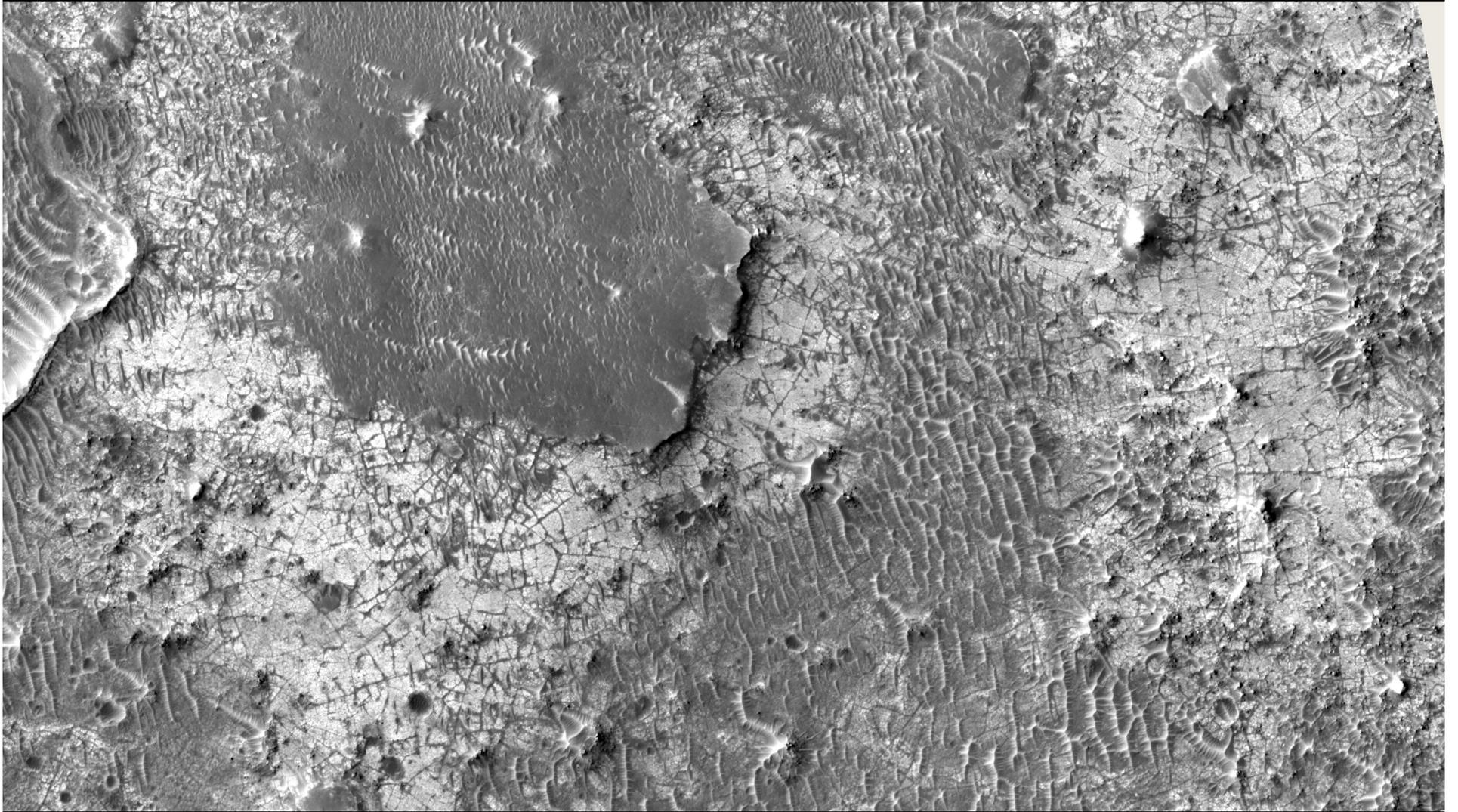


Basalt
Fe/Mg Phyllosilicates (Smectites)
Chlorides

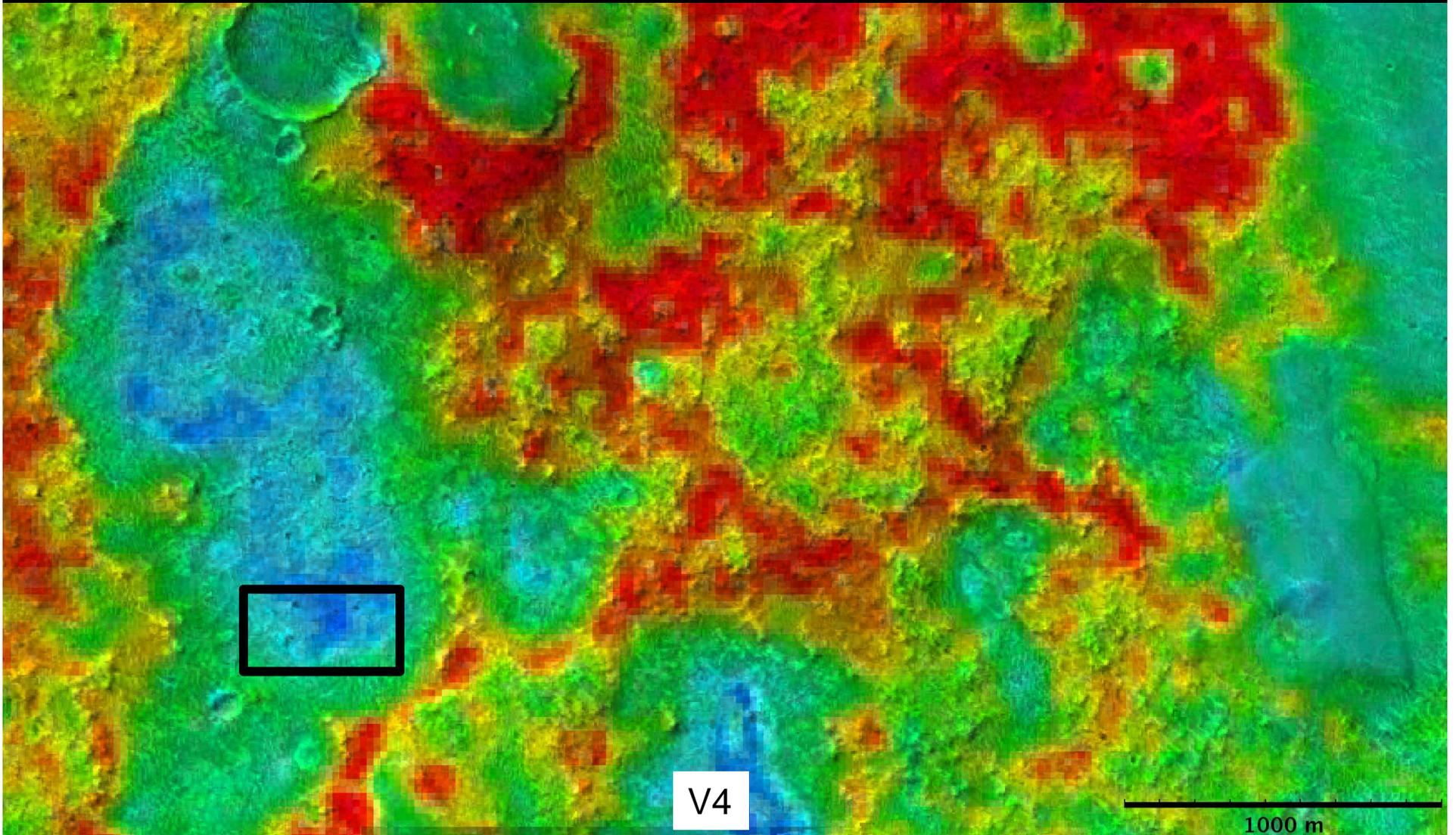


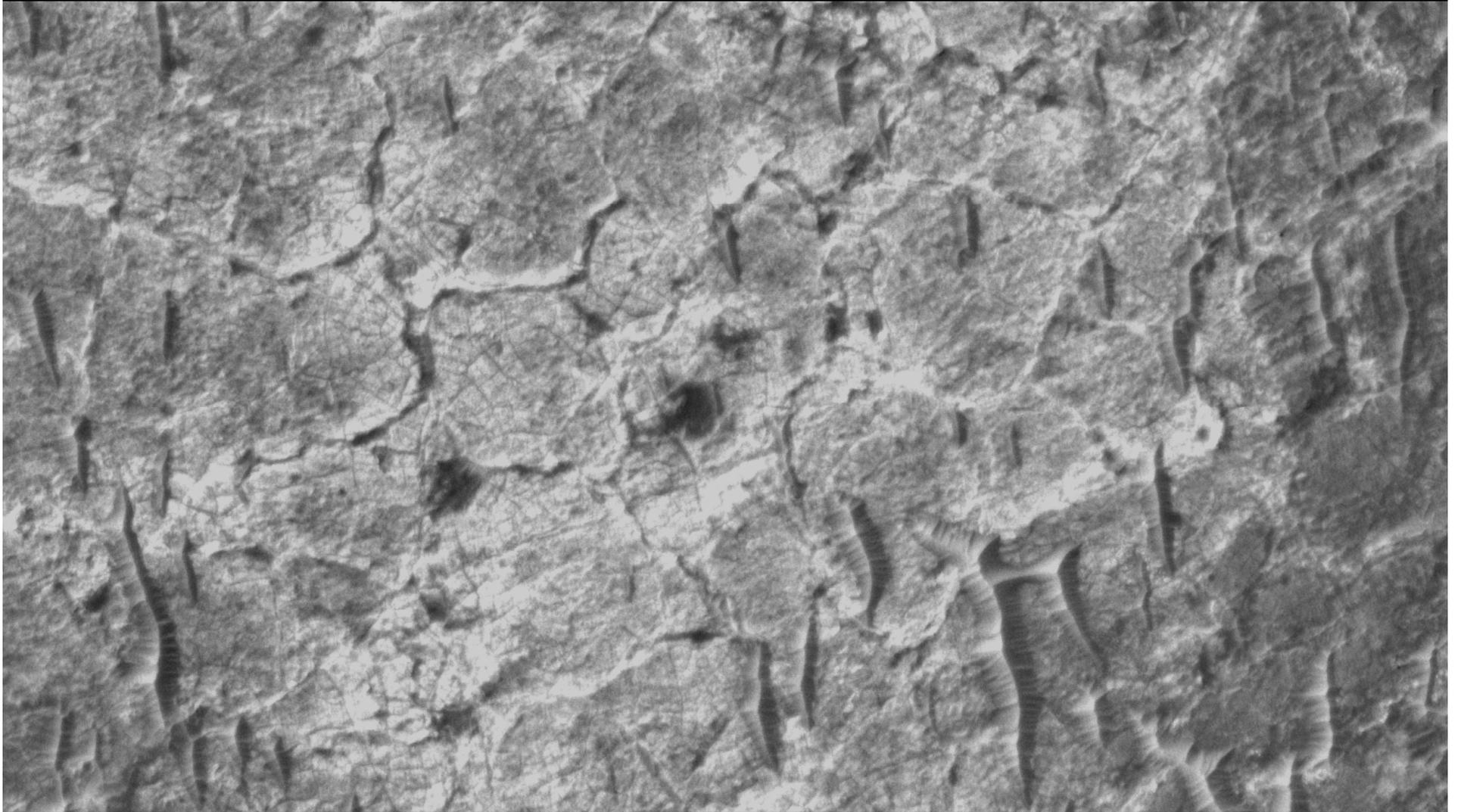
V1

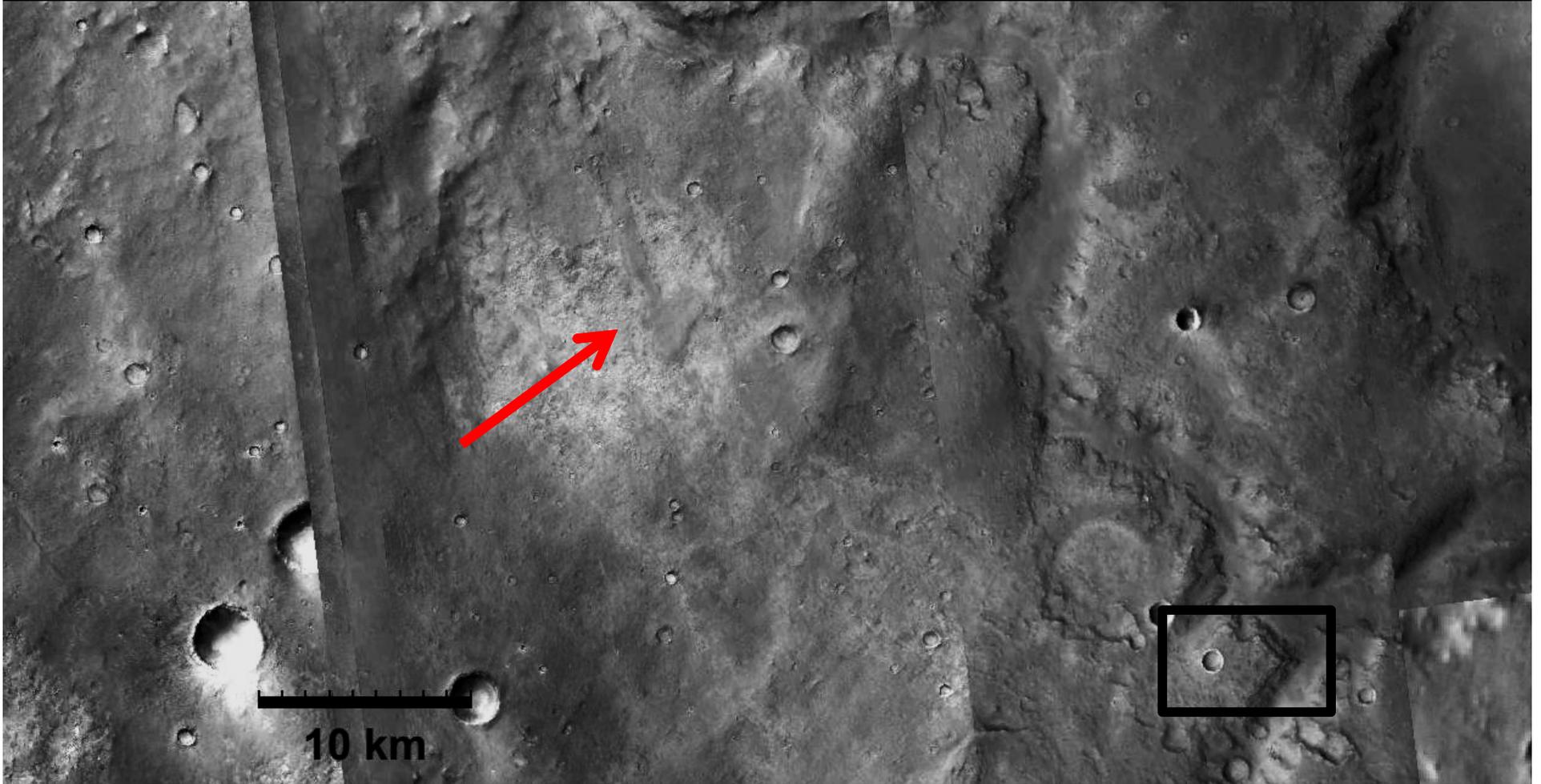
1000 m







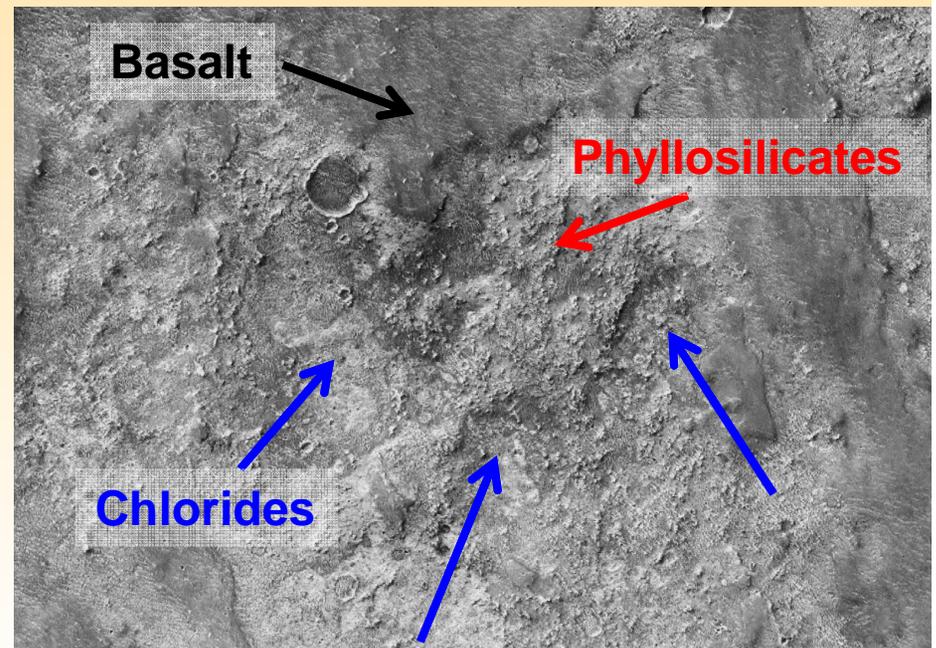


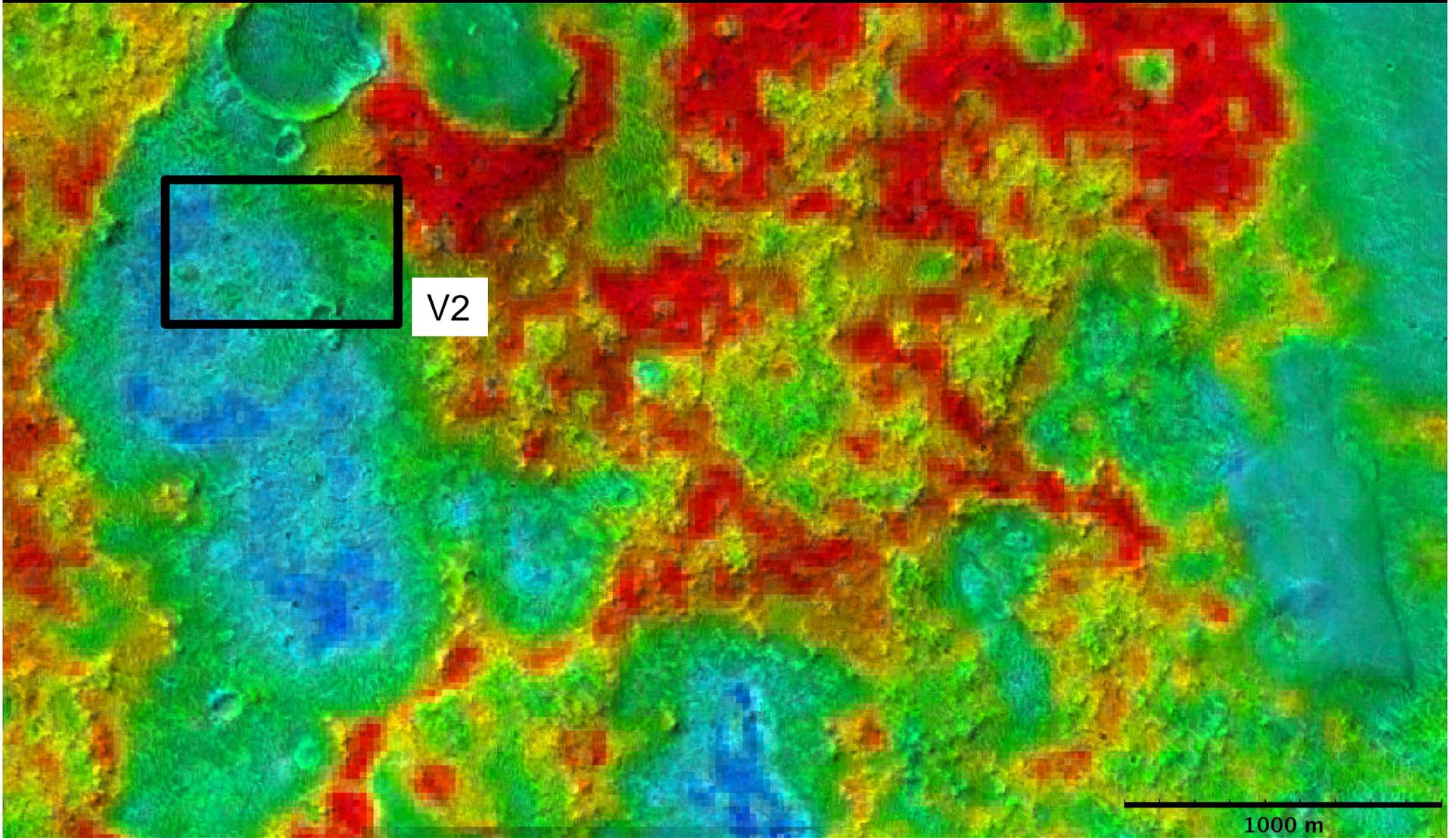




Eastern Margaritifer Terra Summary

- Equatorial (-5.6°), low elevation (-1.25 km), easily accessed site
- Stratigraphic sequence of layered, in-place, geologic units of diverse composition exposed by erosion
- In-place phyllosilicate- and chloride-bearing units of likely aqueous origin and with high organic preservation potential
- 100 m of Noachian section (and basalts) exposed in ancient channel system to north and east





V2

1000 m

