Eastern Margaritifer Terra Site
Eastern Margaritifer Terra Site - with constraints
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
Phyllosilicate-bearing Unit

CRISM BD2300 Fe/Mg Phyllosilicates Index

Red = High Abundance
Blue = Low Abundance
Phyllosilicate-bearing Unit

CRISM BD2300 Fe/Mg Phyllosilicates Index

Red = High Abundance
Blue = Low Abundance

2.5 km
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
Basalt
Fe/Mg Phyllosilicates (Smectites)
Chlorides
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