

# *README for Jezero crater mineral map*

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# Scenes Processed

The images processed as part of this effort are:

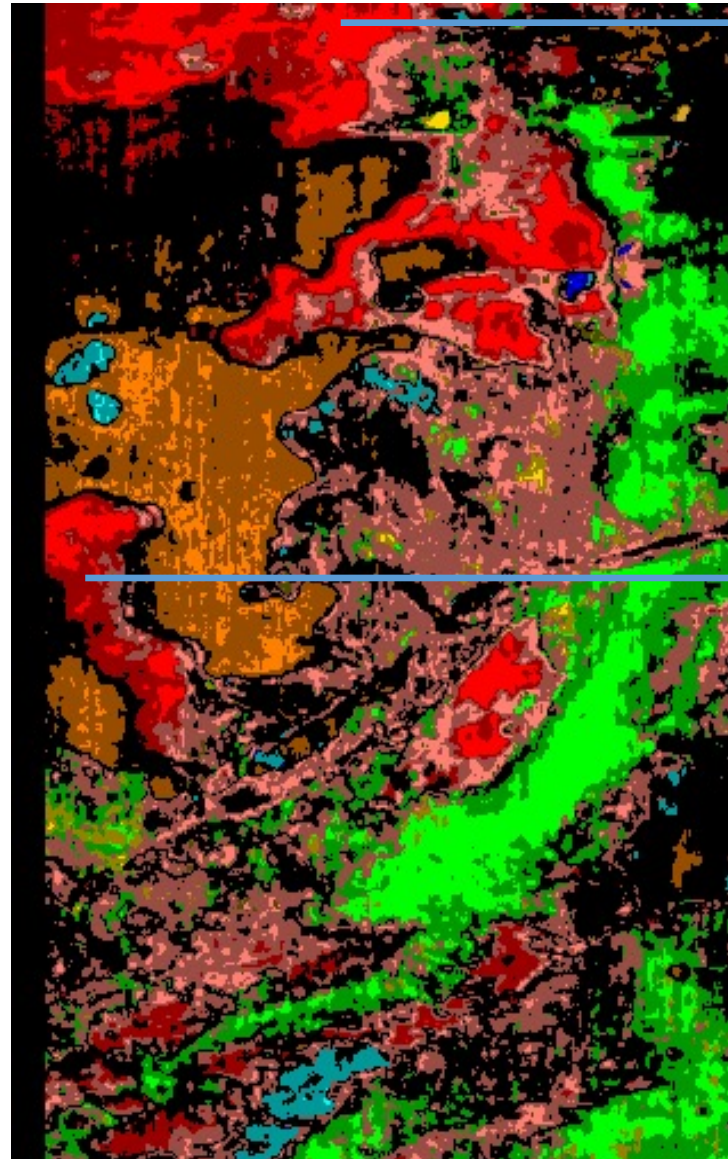
1. HRL000040FF
2. FRT000047A3
3. FRT00005C5E
4. FRS00031442

# UMass methods are described in:

- **Y. Itoh**, M. Parente (2021) A new method for atmospheric correction and de-noising of CRISM hyperspectral data, Icarus, Volume 354, 2021, 114024, ISSN 0019-1035,  
<https://doi.org/10.1016/j.icarus.2020.114024.2020>.
- **A.M. Saranathan**, M. Parente (2021) Adversarial feature learning for improved mineral mapping of CRISM data, Icarus, Volume 355, 2021, 114107, ISSN 0019-1035,  
<https://doi.org/10.1016/j.icarus.2020.114107>.

# Interpreting the Mineral Maps

- Each color in the mineral map (here only showing HRL000040FF) corresponds to the detection of a specific spectral shape.
- The ***bold tones*** indicates that the pixel spectrum is identified as being like the prototype with *very high confidence (the spectrum of the pixel will match the prototype)*
- The ***subdued tones*** indicates that the pixel spectrum is identified as being like the prototype with *high / intermediate confidence (the spectrum of the pixel will match the prototype with some minor variation)*
- The specific RGB code assigned to a pixel can be used to identify both the mineral and the confidence level with which a pixel is identified
- A pixel with black color (RGB Code: 0, 0, 0) indicates the it was not identified as any of the known prototypes.



Very High Confidence  
detection

High/ Intermediate Confidence  
detection

In ENVI the maps are best  
Viewed with 'No  
stretch'(ENVI 5) or 'Linear  
[0-255]' (ENVI Classic)

# Key for Mineral Detections

Mineral Name	Base Color	RGB Code High Confidence	RGB Code Medium Confidence
Olivine	Red	255, 0, 0	153, 0, 0
Mg-Carbonate	Green	0, 255, 0	0, 153, 0
Fe/Mg-Smectite	Cyan	0, 255, 255	0, 153, 153
Olivine+ Smectite	Salmon	255, 128, 114	153, 77, 68
Olv. Smect + 2.2μm	Olive	128, 128, 0	77, 77, 0
Carb. + 2.2μm	Gold	255, 215, 0	153, 129, 0
High Ca. Pyroxene	Orange	255, 128, 0	153, 77, 0
Low Ca. Pyroxene	Golden Rod	218, 165, 32	130, 99, 19
Kaolinite	Brown	139, 69, 19	83, 41, 11
Mg-Smectite 2	Blue	0, 0, 255	0, 0, 153

N.B. -- The mineral names assigned to the various classes are based on closest match of the prototypes to known mineral identifications, historical identification in prior publications or internal discussions among the Fandango group. Exact mineral attributions can only be verified after further analysis using techniques such as *Spectral Unmixing*, etc..