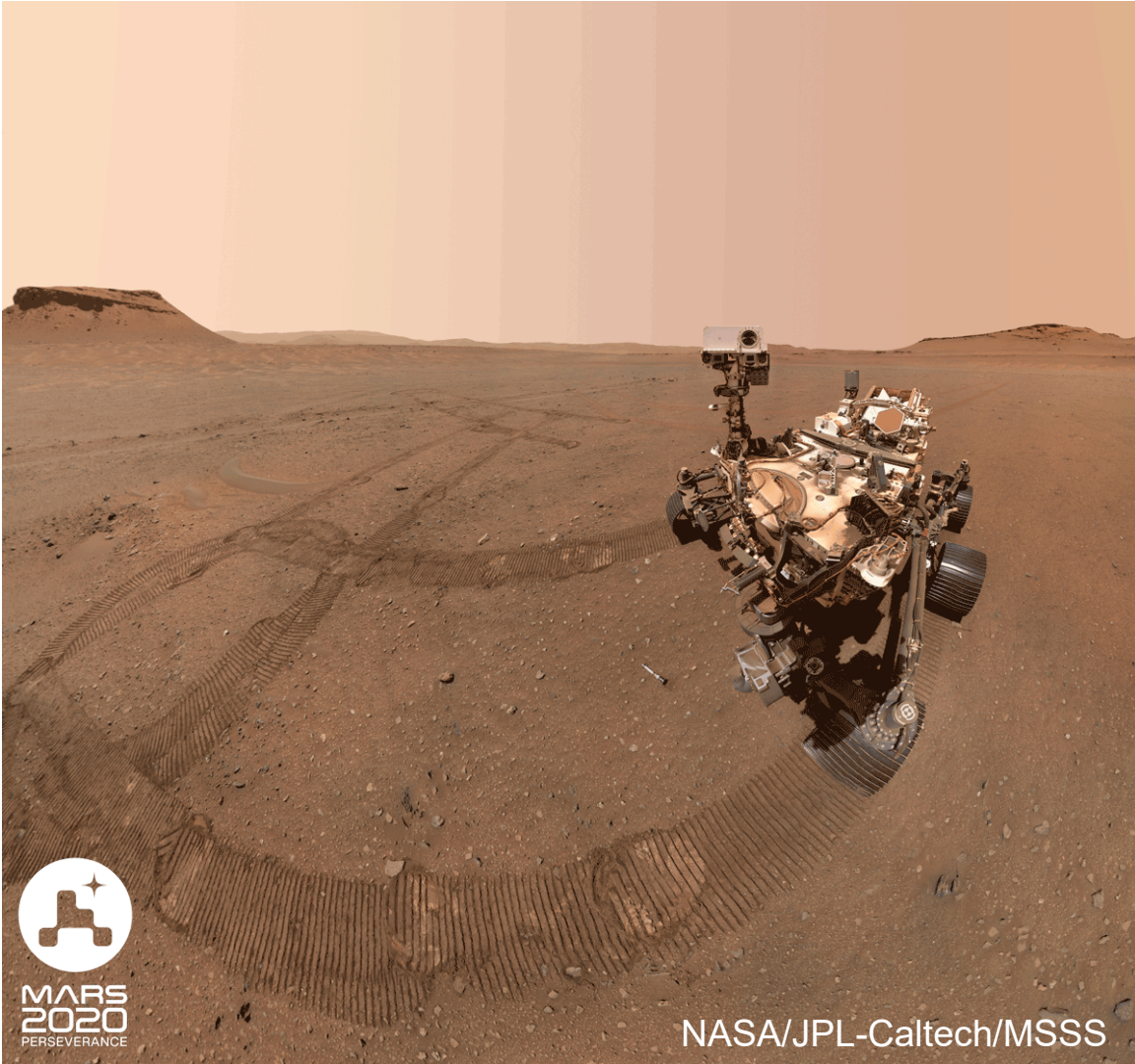




Science Campaigns of the Mars 2020 Perseverance rover

Mars 2020 Science Team

Prepared by: Katie Stack-Morgan, Project Scientist

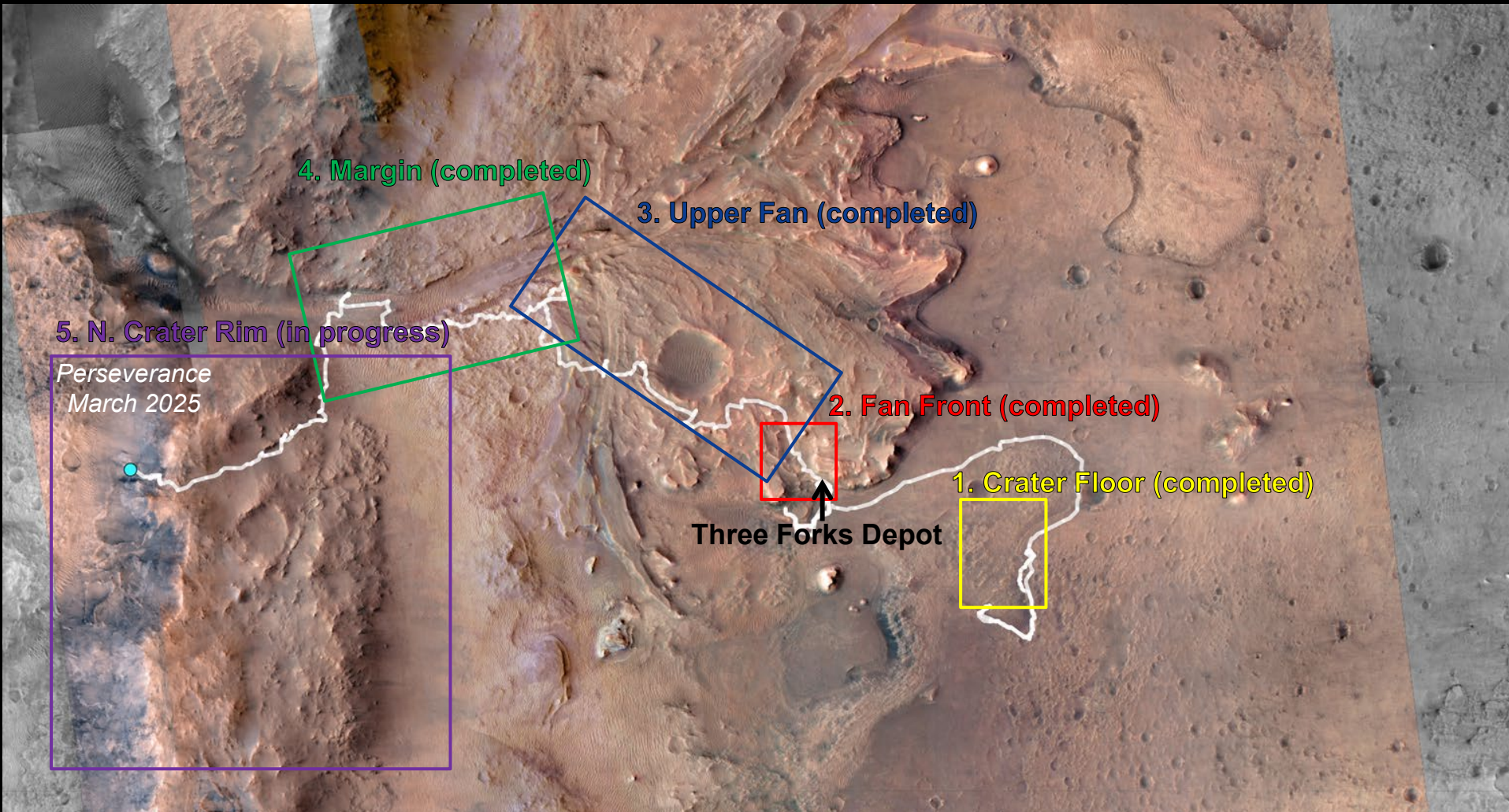


Jet Propulsion Laboratory
California Institute of Technology



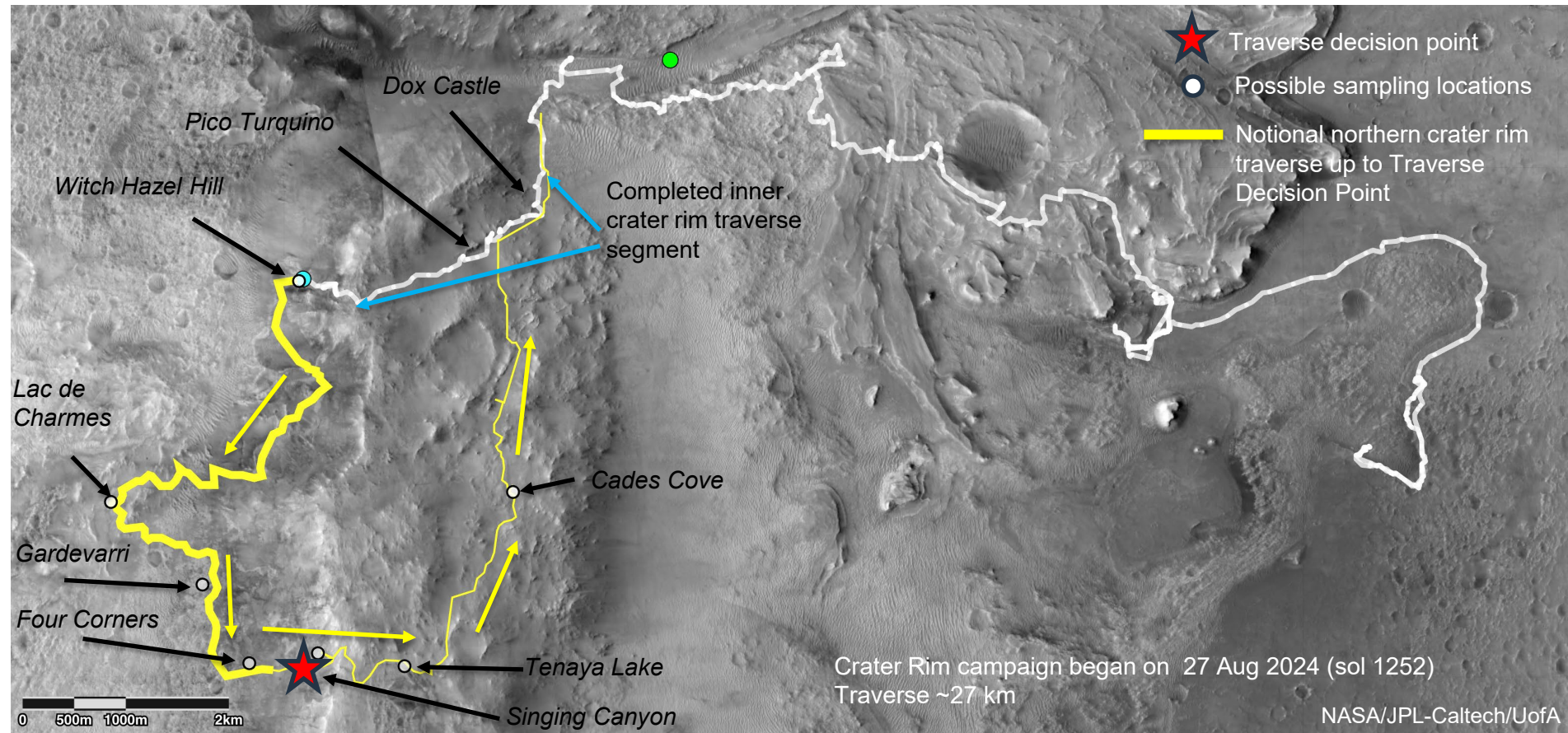
**MARS
2020**
PERSEVERANCE

NASA/JPL-Caltech/MSSS



N. Crater Rim Campaign

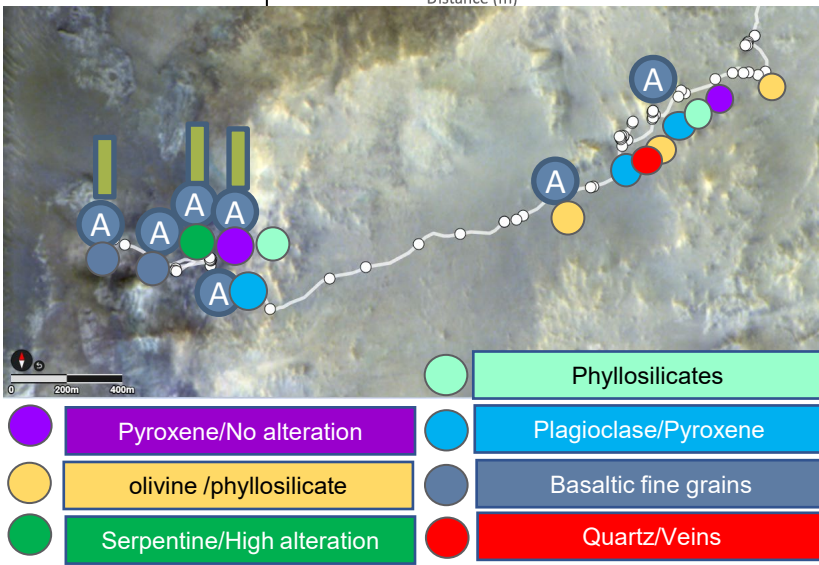
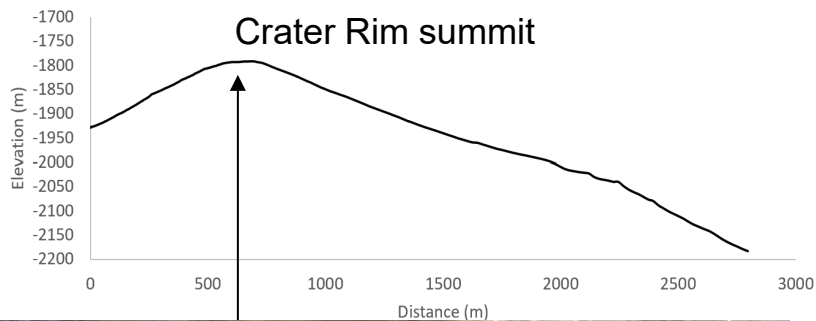
N. Crater Rim Campaign – Route Map



N. Crater Rim Campaign – Purpose

- The geology of the crater rim records a diversity of geologic processes and includes rocks from Mars' most ancient crust and widespread units of regional significance.
- Characterization and sampling of these rocks will help us understand the earliest planetary evolution processes including crust formation and evolution, the strength and timing of the dynamo and whether its evolution drove the loss of an early atmosphere, the earliest climate and weathering, hydrothermal, and alteration processes, and potential ancient habitable environments that were not exposed in the Jezero crater floor or fan.
- The regional units will address questions related to the emplacement mechanisms and timing of these units and more broadly to the geochronology derived from crater counting.

N. Crater Rim Campaign – Science Accomplishments



Sol #	Abrasion	Sample
1257	Eremita Mesa*	NA *at beginning of campaign
1315	Ranger Falls	NA
1334	Rio Chiquito	NA
1360	Cat Arm Reservoir	2 failed attempts
1376	Blue Hill	Silver Mountain
1395	Steve's Trail	NA
1404	Serpentine Lake	Green Gardens
1441	Slants River	Main River

Major Science Accomplishments

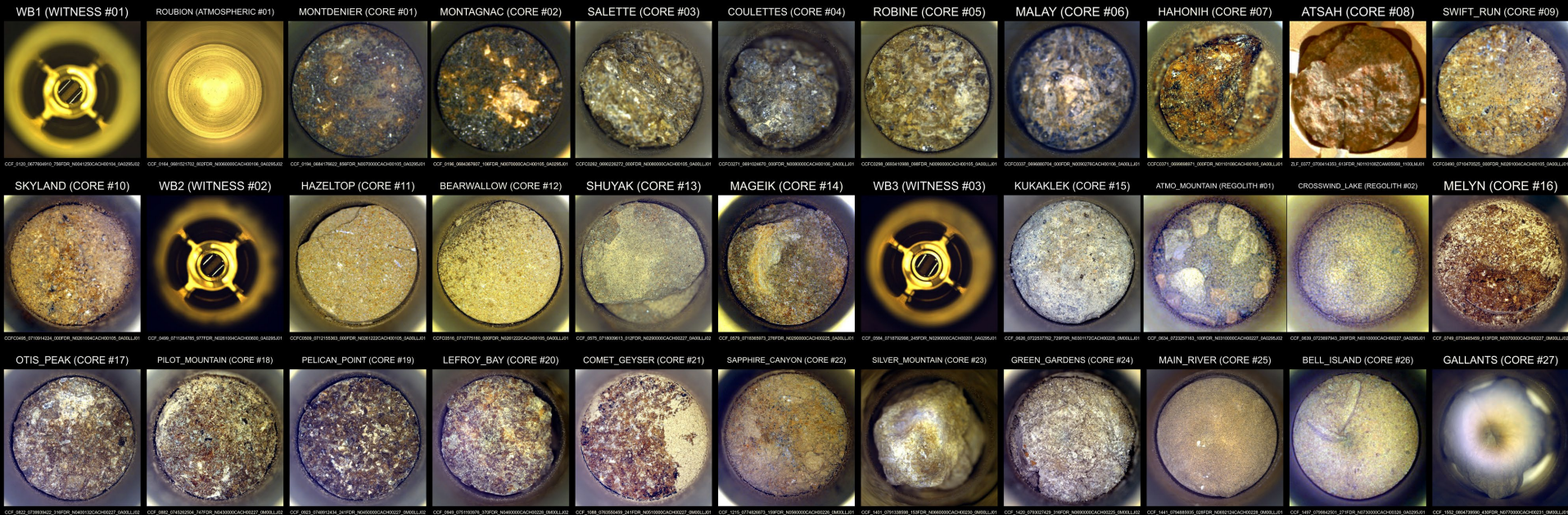
Exceptional diversity of rocks = diversity of geologic processes represented in the Noachian basement exposed by Jezero crater rim (oldest rocks ever observed in situ)

- It includes :
 - Primitive, unaltered pyroxene = crustal formation or major impact event
 - Evolved, feldspar rich = crustal evolution
 - Pure serpentine sample = alteration processes, and potential ancient habitable environments from the earliest martian times
 - Quartz rich hydrothermal veins = insight into impact-related hydrothermal cells
 - Potential silica or volcanoclastic fine grain sediments over 10s of m of stratigraphy = insight into potential pyroclastic processes

A Abrasions | Samples

Questions?

Perseverance Sample Collection



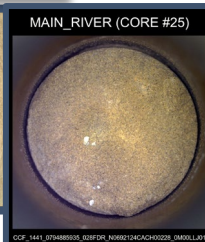
33 Tubes

N. Crater Rim Campaign – Key Results

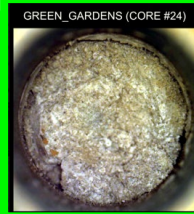
Millbrook
Abrasion: Steves Trail



Broom Point
Abrasion: Slants River
Sample: Main River

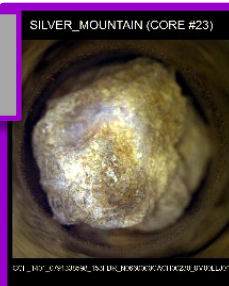


South Arm
Abrasion: Cat Arm
Reservoir
Sample: 2 failed
attempts due to
'soft' rock

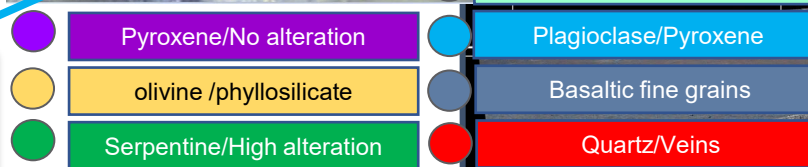
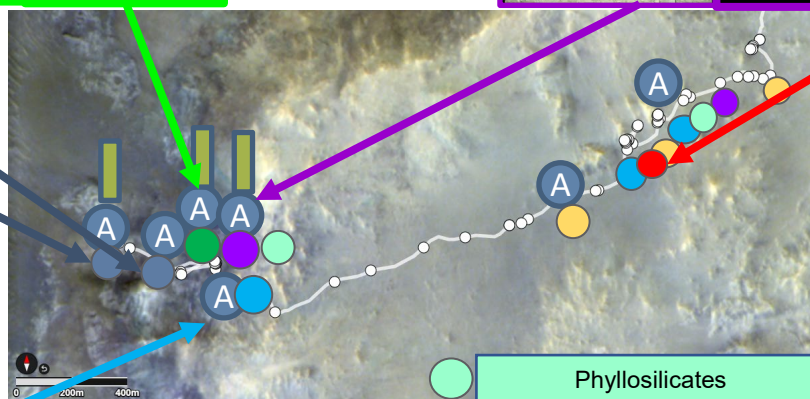


Tablelands
Abrasion:
Serpentine Lake
Sample: Green
Gardens

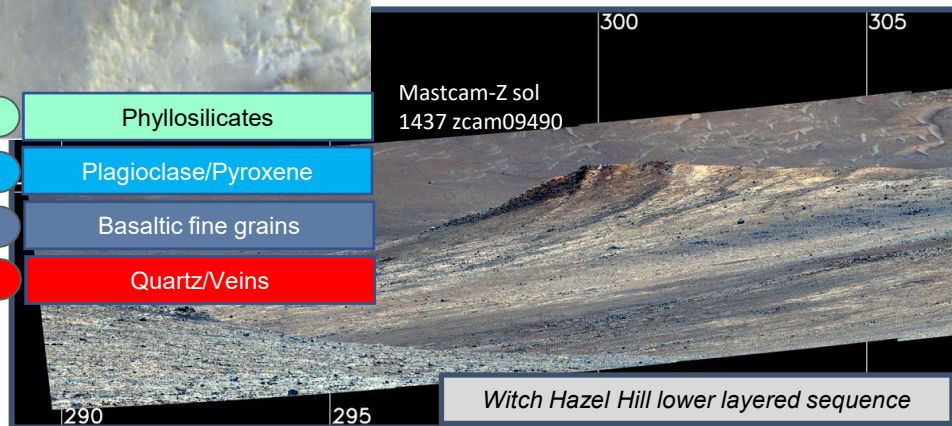
Shallow Bay
Abrasion: Blue Hill
Sample: Silver Mountain



Mist Park : Quartz rich vein



Mastcam-Z sol
1437 zcam09490



Witch Hazel Hill lower layered sequence