



The Analyst's Notebook: Providing Context for Landed Operations and Adding Value to Mission Archives

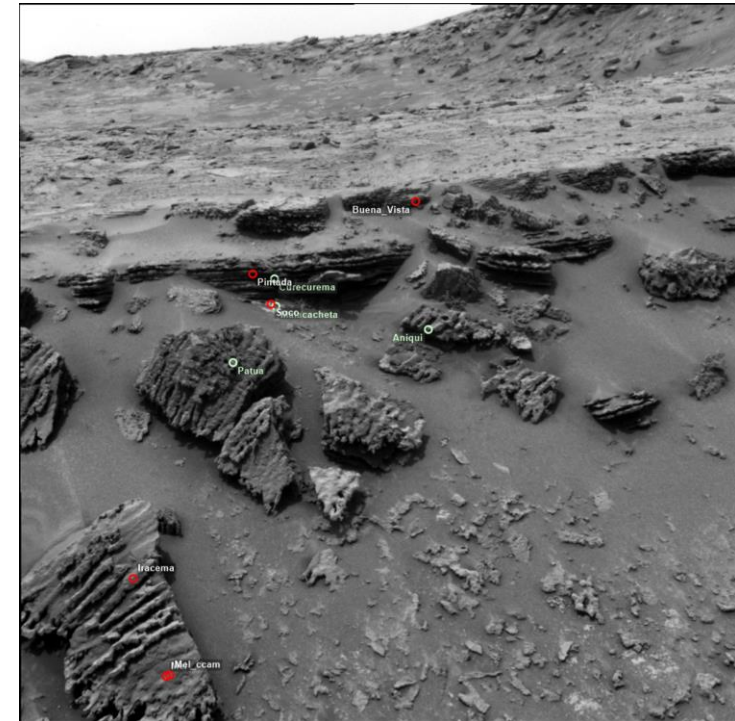
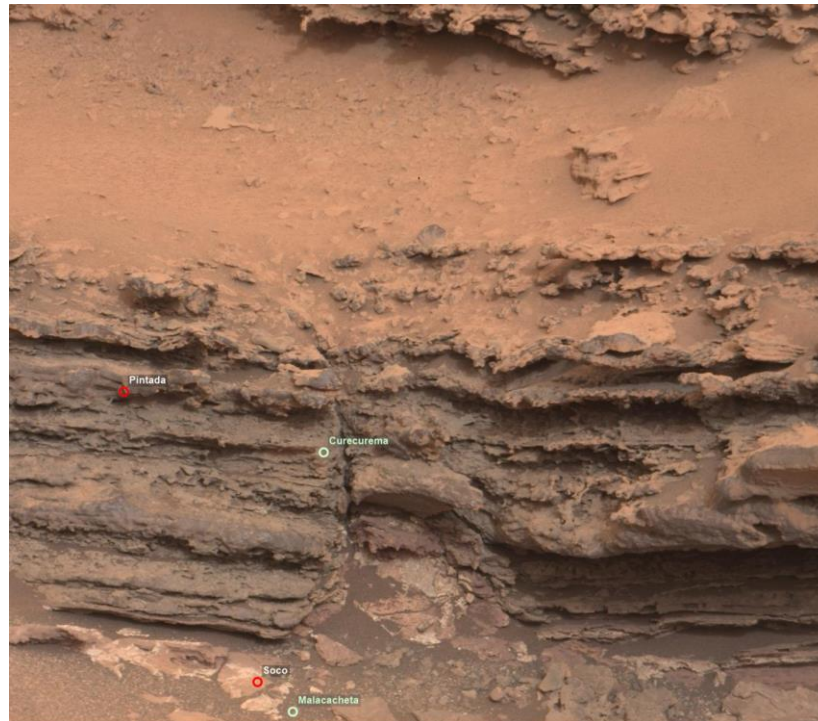
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PDS Geosciences Node
Washington University in St. Louis

PV2023: Adding value (to) and preserving Scientific & Technical data
2023-0502

Planetary data archives of surface missions contain data from numerous hosted instruments. Because of the nondeterministic nature of surface missions, it is not possible to assess the data without understanding the context in which they were collected.





PDS Geosciences Node

Washington University in St. Louis

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Scheduled Maintenance

This site may be down on **Thursdays** between 7:00 and 9:30 pm Central Time for maintenance.

Mars Science Laboratory (MSL)

March 21, 2023. SAM EDR data for sols 3548-3644 have been added to the [SAM EDR safed data set](#).

March 16, 2023. MSL Release 32 includes new raw and derived data from sols 3548-3644.

February 7, 2023. New data have been added to the [ChemCam Passive Surface Spectra](#) bundle.

The Mars Science Laboratory (MSL) rover, Curiosity, landed on Mars and began operations on August 6, 2012. On June 25, 2014, the rover marked one Mars year (687 Earth days) of operations on the surface.

Science data from Curiosity's suite of instruments is released by PDS three times a year. See the complete [release schedule](#) below.

Instruments and Archives

Instrument	PDS Archives
<i>Follow links to instrument team web sites</i>	
APXS - Alpha Particle X-ray Spectrometer	APXS Archive
ChemCam - Laser-Induced Breakdown Spectrometer (LIBS) and Remote Micro-Imager (RMI)	ChemCam Archive
ChelMin - Chemistry and Mineralogy	ChelMin Archive
DAN - Dynamic Albedo of Neutrons	DAN Archive
Engineering Cameras - Hazard Avoidance Cameras and Navigation Cameras	Engineering Camera Archives at the PDS Imaging Node
MAHLI - Mars Hand Lens Imager	MAHLI, MARDI, and Mastcam Archives at the PDS Imaging Node
MARDI - Mars Descent Imager	
Mastcam - Mast Camera	
PLACES - Maps and rover localization data	PLACES Archive at the PDS Imaging Node
RAD - Radiation Assessment Detector	RAD Archive at the PDS PPI Node
REMS - Rover Environmental Monitoring Station	REMS Archive at the PDS Atmospheres Node
SAM - Sample Analysis at Mars	SAM Archive
SPICE - Spacecraft, Planet, Instrument, Pointing C-Matrix, and Event Kernels	SPICE Archive at the NAIF Node

Derived Products from Individual Investigators

Investigator / Program	PDS Archives
Jeff Johnson / MSL	Mastcam Photometry Cubes (PDS4)
Jeff Johnson /	ChemCam Passive Surface Spectra

What's New

March 21, 2023. SAM EDR data for sols 3548-3644 have been added to the [SAM EDR safed data set](#).

March 16, 2023. MSL Release 32 includes new raw and derived data from sols 3548-3644.

February 7, 2023. New data have been added to the [ChemCam Passive Surface Spectra](#) bundle.

December 9, 2022. SAM EDR data for sols 3424-3547 have been added to the [SAM EDR safed data set](#).

December 5, 2022. MSL Release 31 includes new raw and derived data from sols 3424-3547.

August 24, 2022. The [MSL Mastcam Photometry bundle](#) from Jeff Johnson is released.

August 3, 2022. SAM EDR data for sols 3290-3423 have been added to the [SAM EDR safed data set](#).

August 1, 2022. MSL Release 30 includes new raw and derived data from sols 3290-3423.

June 20, 2022. Corrupted data products found in the [ChemCam Passive Surface Spectra](#) bundle have been re-delivered.

March 22, 2022. SAM EDR data for sols 3193-3289 have been added to the [SAM EDR safed data set](#).

March 16, 2022. MSL Release 29 includes new raw and derived data from sols 3193-3289.

February 10, 2022. New data have been added to the [ChemCam Passive Surface Spectra](#) bundle.

December 8, 2021. SAM EDR data for sols 3069-3192 have been added to the [SAM EDR safed data set](#).

December 6, 2021. MSL

pds-geosciences.wustl.edu - /msl/msl-m-chemcam-v1/mslccm_1xxx/data/sol03641/

[To Parent Directory]

```

2/10/2023 11:37 AM 3005691 c15_720715624ccs_f0980144ccm0164i03.csv
2/10/2023 11:37 AM 28110 c15_720715624ccs_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 2241731 c15_720715624ccs_f0980144ccm0164i03.csv
2/10/2023 11:37 AM 28302 c15_720715624ccs_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 3005416 c15_720715704ccs_f0980144ccm0164i03.csv
2/10/2023 11:37 AM 28150 c15_720715704ccs_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 2241762 c15_720715704ccs_f0980144ccm0164i03.csv
2/10/2023 11:37 AM 28342 c15_720715704ccs_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 3004881 c15_720715778ccs_f0980144ccm0164i03.csv
2/10/2023 11:37 AM 28141 c15_720715778ccs_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 2241815 c15_720715778ccs_f0980144ccm0164i03.csv
2/10/2023 11:37 AM 28333 c15_720715778ccs_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 3005957 c15_720715853ccs_f0980144ccm0164i03.csv
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2/10/2023 11:37 AM 28337 c15_720715853ccs_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 3005857 c15_720715928ccs_f0980144ccm0164i03.csv
2/10/2023 11:37 AM 28146 c15_720715928ccs_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 2241467 c15_720715928ccs_f0980144ccm0164i03.csv
2/10/2023 11:37 AM 28338 c15_720715928ccs_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 16797 c19_720715671nsv_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 284812 c19_720715671nsv_f0980144ccm0164i03.tab
2/10/2023 11:37 AM 16795 c19_720715750nsv_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 284812 c19_720715750nsv_f0980144ccm0164i03.tab
2/10/2023 11:37 AM 16792 c19_720715750nsv_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 284812 c19_720715750nsv_f0980144ccm0164i03.tab
2/10/2023 11:37 AM 16792 c19_720716107nsv_f0980144ccm0164i03.tbl
2/10/2023 11:37 AM 284812 c19_720716107nsv_f0980144ccm0164i03.tab
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2/10/2023 11:37 AM 2899638 c19_720715463nrc_f0980144ccm0164i11.tif
2/10/2023 11:37 AM 16203 c19_720716130nrc_f0980144ccm0164i11.tbl
2/10/2023 11:37 AM 2899638 c19_720716130nrc_f0980144ccm0164i11.tif
    
```

Data discovery



PDS Imaging Node: Data Archive

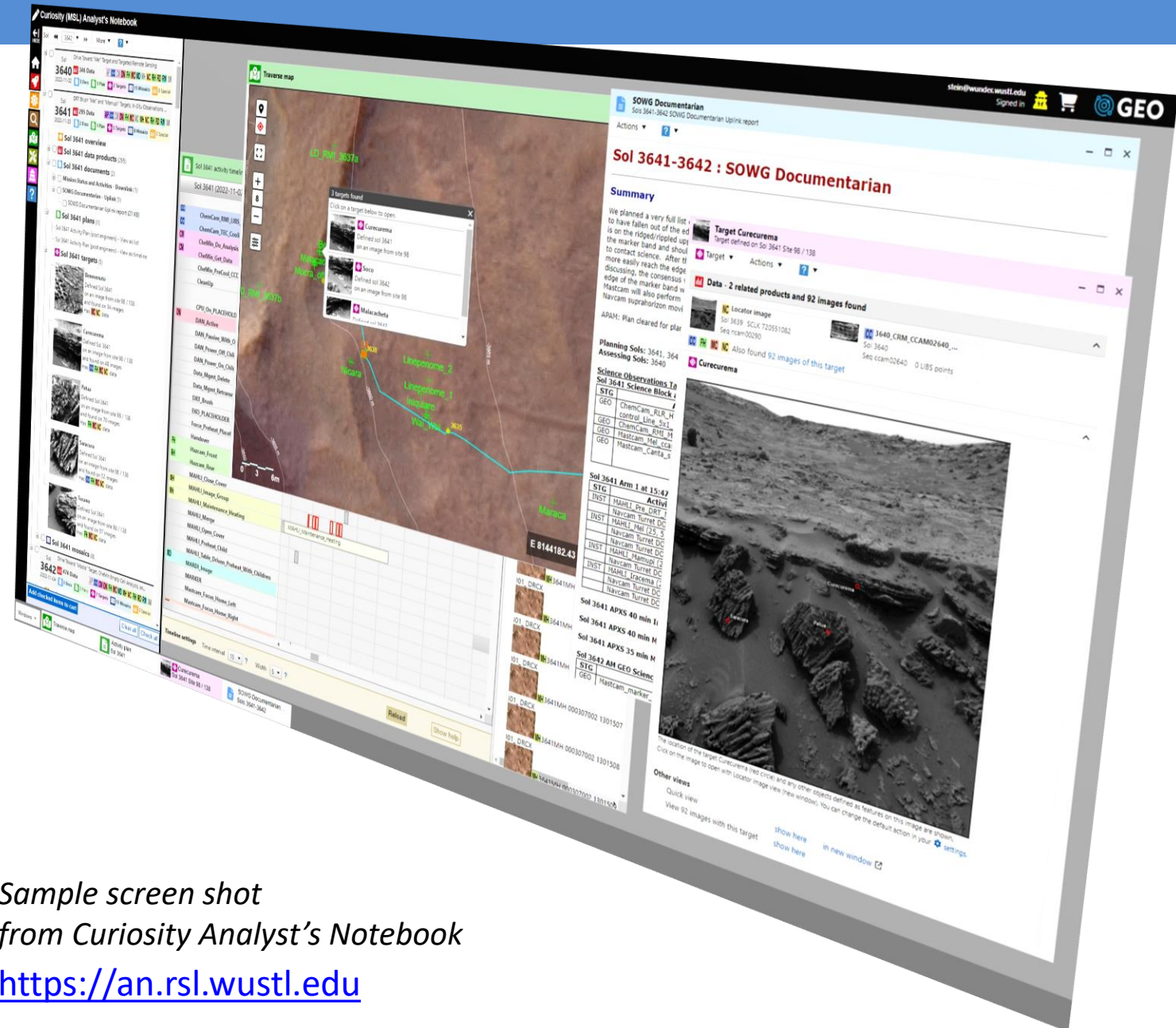
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<input type="checkbox"/> NRB_720733468RADLT0980144NCAM00200M1.IMG	2023-02-15 07:34	49K	
<input type="checkbox"/> NRB_720733468RADLT0980144NCAM00200M1.LBL	2023-02-15 07:34	25K	
<input type="checkbox"/> NRB_720733468RAD_T0980144NCAM00200M1.IMG	2023-02-15 07:34	2.0M	
<input type="checkbox"/> NRB_720733468RAD_T0980144NCAM00200M1.LBL	2023-02-15 07:34	26K	
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<input type="checkbox"/> NRB_720733468RASLT0980144NCAM00200M1.IMG	2023-02-15 07:34	49K	
<input type="checkbox"/> NRB_720733468RASLT0980144NCAM00200M1.LBL	2023-02-15 07:34	25K	

Analyst's Notebook

The Analyst's Notebook supports data discoverability and access for landed missions by integrating sequence information, engineering and science data, observation planning and targeting, and documentation into a web-based application.

Updated commensurate with scheduled public archive releases.

InSight release 17	30 Jun 2023
Mars 2020 release 7	27 Jul 2023
MSL release 33	01 Aug 2023



Sample screen shot
from Curiosity Analyst's Notebook

<https://an.rsl.wustl.edu>

Adding value to the PDS archives

Standard PDS Release

Archived Data

- Standard EDR and RDR data products

Documentation

- Software Interface Specification
- Spacecraft and instrument reports

Calibration Data

- Calibration reports and data

Additional data and tools in the Notebook

Special Products

- Additional products of interest
- Science team supplemental products

Documentation

- Daily operations reports
- Science team reports
- Historical reports

Resources

- Historical mission overview
- Science paper references
- Links to additional resources

Value Added Elements



Suite of tools and data representations that enhance archive use

- Faceted search
- Interactive maps
- Image measurement
- Integrated plans / timeline
- Data transformation
- Cross instrument data browsing
- Context mosaics

Planetary data archives are enhanced by incorporating higher order products and external resources into the AN.

Measurement tools

Drawing

- Line, arrow, rectangle, ellipse, polygon, polyline, and text.

Location

- Find a location from known coordinates
 - Provide (x, y) or (x, y, z) values in Site, Rover, or Local frame.
 - Provide map coordinates as easting and northing.
- Location metadata
 - Image pixel coordinate
 - Ground location in local, rover, or site frame
 - Distance from rover frame origin
 - Azimuth and elevation relative to head frame.

Distance

- Between two points or along a polyline.

Elevation profile

- Between two points or along polyline.

Measurements use archive XYZ products.

NC Rad-corrected absolute radiance units, integer
Sol 3543 NL8_712027444RADLF0961036NCCAM00285M1

Product Group Actions ?

File Draw Measure Targets Mosaic ?

DRAWING (0)

LOCATION (2)

DISTANCE (1)

Dist #	Segment #	From Loc #	To Loc #	Dist (m)	Bearing (deg)	Ave slope (deg)
1	1	1	2	18.68	78.86	3.94

Add new distance

PROFILE (0)

Prof #	Segment #	From Loc #	To Loc #	Dist (m)	Bearing (deg)	Ave slope (deg)
No profiles						

Add new profile

Click on the ▲ icon in the table above to show the elevation profile chart.

TARGET (3)

Target	Position ?	Rover dist (m)	Visibility
Hororabo	known	3.33	☑ ☑
Maloquinha	approx	3.72	☑ ☑
Merume	approx	10.26	☑ ☑

Cursor position
Sample 43, Line 28

18.68 m

Merume+

Maloquinha+

Hororabo+

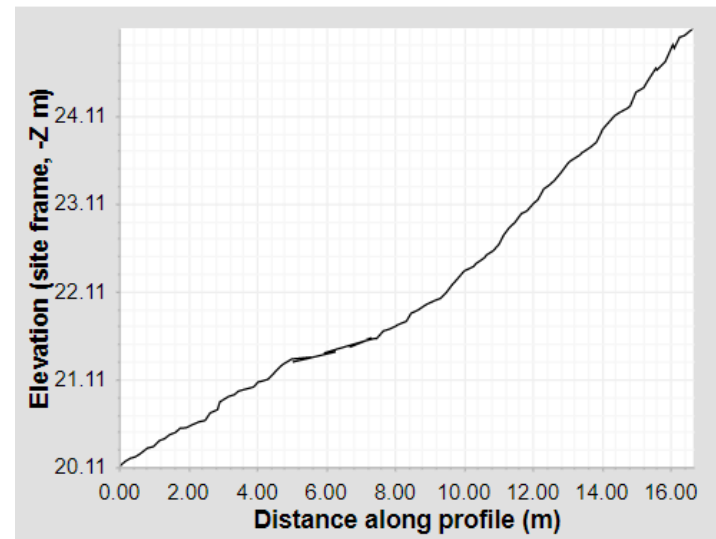
Profile tool

Elevation profile between two points or along polyline.

Elevations calculated along a path as if it were "dropped on the ground" between the two points.

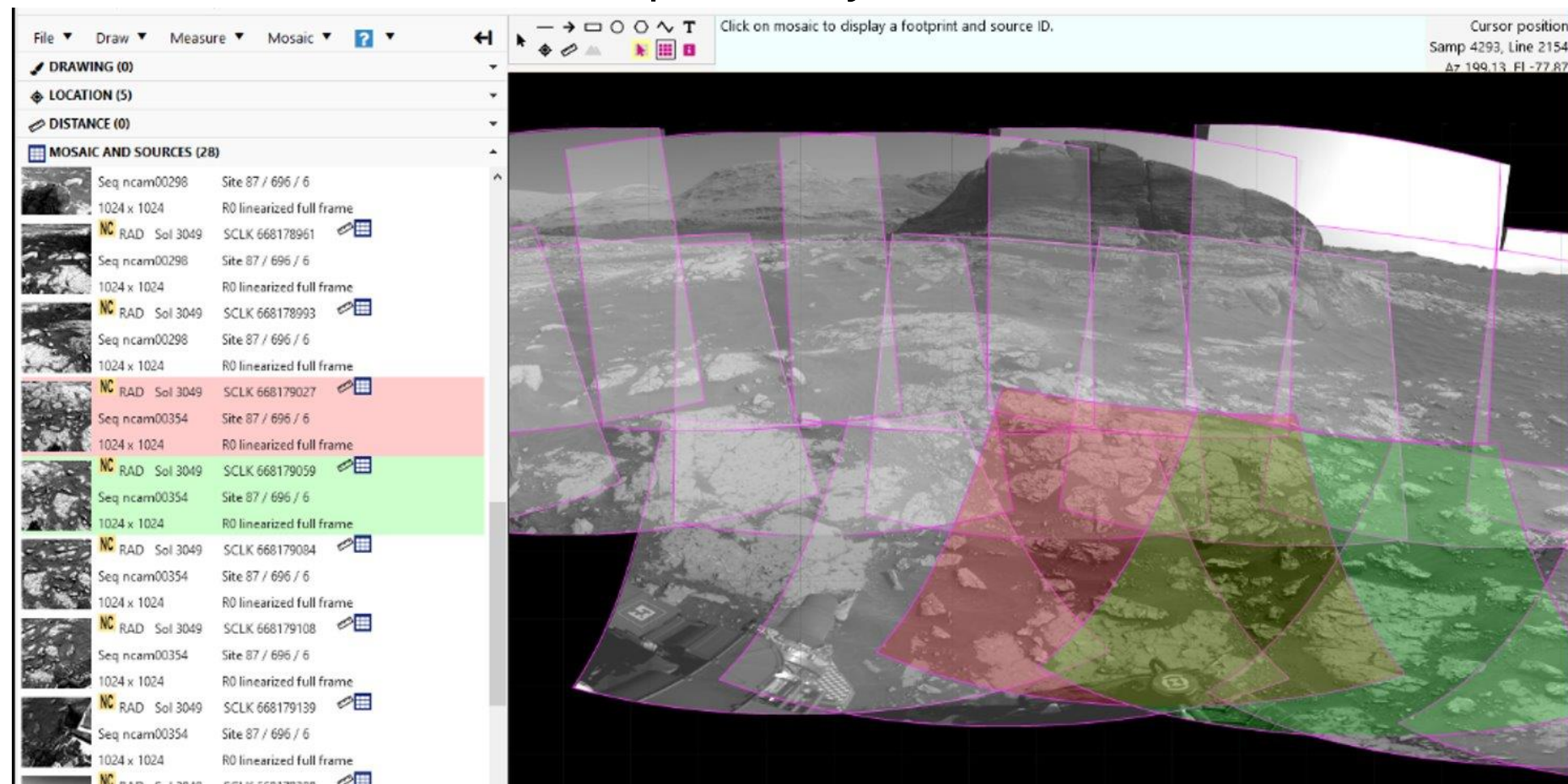
The profile is not simply the elevation values of the image pixels under the straight line drawn on the image.

Profile 1 (from location 1 to 2)



Working with mosaics

- Location and distance tools are available for mosaics made from source frames with XYZ data.
- Footprint overlays show boundaries and help identify source frames.



Science targets table

Curiosity (MSL) Analyst's Notebook

stein@wunder.wustl.edu Signed in

MISSION SUMMARIES

The mission summaries provide an overview of the Curiosity surface operations. Information is derived from a variety of sources, including the mission science and instrument team reports.

Historical overview

The mission is summarized in a [mission overview table](#) with brief entries for each day's activity.

Time table

Timekeeping values for each sol of the mission's landed operations are listed in the [time table](#).

Science targets

A sortable, searchable list of [science targets](#) created by the science team.

Science targets

MSL Curiosity science targets

File Reset table

The list of targets is taken from the mission planning endeavors. Names have been assigned to areographic features by the Mars Science Laboratory (MSL) team for planning and operations purposes. The names are not formally recognized by the International Astronomical Union.

Click on a sol to go to the Sol Summary for that sol. Click on a target to see details. Click on to sort or filter the values in a column.

Sol	Target	Easting, m	Northing, m	Elevation, m	X local, m	Y local, m	Z local, m
3644	Mocra	8144132.5	-282214.9	-3859.66	1.73	-1.73	-0.82
3644	Mocra_offset	8144132.5	-282214.9	-3859.66	1.73	-1.75	-0.83
3643	Aniqui	8144133.9	-282212.9	-3859.66	3.76	-0.40	-0.57
3643	LD_Marker_Bed_364	8144227.5	-282109.1	-3859.66	107.49	93.24	2.53
3643	Malacacheta	8144133.4	-282213.2	-3859.66	3.38	-0.88	-0.67
3643	Mixiguana_ccam	8144132.6	-282214.6	-3859.66	2.04	-1.63	-0.92
3643	Mocra_ccam	8144132.5	-282214.9	-3859.66	1.74	-1.72	-0.82
3643	Saubu	8144142.5	-282215.2	-3859.66	1.45	8.23	1.39
3642	Buena_Vista	8144133.2	-282212.4	-3860.25	2.93	-3.39	-1.53
3642	Iracema	8144134.3	-282214.2	-3860.25	1.15	-2.28	-0.87
3642	Mamupi	8144135.2	-282213.8	-3860.25	1.57	-1.37	-0.47
3642	Mel	8144134.5	-282214.2	-3860.25	1.13	-2.05	-0.71

Page size: 25 7175 items

Windows Science targets

Science target links

Curiosity (MSL) Analyst's Notebook

sol 3642

3640 346 Data

3641 295 Data

Sol 3641 overview

Sol 3641 data products (295)

Sol 3641 documents (2)

Mission Status and Activities - Downlink (1)

SOWG Documentarian - Uplink (1)

Sol 3641 plans (1)

Sol 3641 Activity Plan (post engineers) - View as list

Sol 3641 Activity Plan (post engineers) - View as timeline

Sol 3641 targets (5)

Benevenuto
Defined Sol 3641
on an image from site 98 / 138
and found on 34 images
Has MC, NC data

Curecurema
Defined Sol 3641
on an image from site 98 / 138
and found on 48 images
Has CC, FH, MC, NC data

Patua
Defined Sol 3641
on an image from site 98 / 138
and found on 70 images
Has FH, MC, NC data

Saracura
Defined Sol 3641
on an image from site 98 / 138
and found on 52 images
Has CC, FH, MC, NC data

Tucano
Defined Sol 3641
on an image from site 98 / 138
and found on 57 images
Has FH, MC, NC data

Sol 3641 mosaics (8)

Drive Toward "Mel" Target and Targeted Remote Sensing

3642 474 Data

Traverse map

3 targets found

- Curecurema
Defined sol 3641
on an image from site 98
- Soco
Defined sol 3642
on an image from site 98
- Malacacheta
Defined sol 3642

ChemCam_RMI_LIBS
ChemCam_TEC_Cooli
CheMin_Do_Analysis
CheMin_Get_Data
CheMin_PreCool_CCC
CleanUp

CPU_On_PLACEHOLD
DAN_Active
DAN_Passive_With_O
DAN_Power_Off_Chil
DAN_Power_On_Chik
Data_Mgmt_Delete
Data_Mgmt_Retransr
DRT_Brush
EKO_PLACEHOLDER
Force_Preheat_Placet
Handover
Hazcam_Front
Hazcam_Rear

MAHLI_Close_Cover
MAHLI_Image_Group
MAHLI_Maintenance_Heating
MAHLI_Merge
MAHLI_Open_Cover
MAHLI_Preheat_Child
MAHLI_Table_Driven_Preheat_With_Children
MARDI_Image
MARKER
Mastcam_Focus_Home_Left
Mastcam_Focus_Home_Right

MAHLI_000307002_1301507
MAHLI_000307002_1301508
MAHLI_000307002_1301509

SOWG Documentarian

Sols 3641-3642 SOWG Documentarian Uplink report

Sol 3641-3642 : SOWG Documentarian

Summary

We planned a very full list to have fallen out of the ed is on the ridged/rippled up the marker band and shoul to contact science. After tl more easily reach the edge discussing, the consensus i edge of the marker band w Mastcam will also perform. Navcam suprahorizon movi

APAM: Plan cleared for pla

Planning Sols: 3641, 364
Assessing Sols: 3640

Science Observations To Sol 3641 Science Block

STG	Inst	Target
GEO	ChemCam_RLR_H	control_Line_5x1
GEO	ChemCam_RMI_M	Mastcam_Mel_cca
GEO	Mastcam_Canta_s	

Sol 3641 Arm 1 at 15:47

STG	Inst	Target
ACTIVI	MAHLI_Pre_DRT_I	Navcam Turret DC
	MAHLI_Mel (25, 5	Navcam Turret DC
	MAHLI_Mamupi (2	Navcam Turret DC
	MAHLI_Iracema (2	Navcam Turret DC
	MAHLI_Iracema (2	Navcam Turret DC
	MAHLI_Iracema (2	Navcam Turret DC

Sol 3641 APXS 40 min I

Sol 3641 APXS 40 min M

Sol 3641 APXS 35 min M

Sol 3642 AM GEO Science

STG	Inst	Target
GEO	Mastcam_marker_	

Target Curecurema
Target defined on Sol 3641 Site 98 / 138

Data - 2 related products and 92 images found

Locator image
Sol 3639 SCLK 720551082
Seq mcam00290

3640_CRM_CCAM02640,...
Sol 3640
Seq ccam02640 0 LIBS points

Also found 92 images of this target

Curecurema

The location of the target Curecurema (red circle) and any other objects defined as features on this image are shown. Click on the image to open with Locator image view (new window). You can change the default action in your settings.

Other views

Quick view [show here](#) [in new window](#)

View 92 images with this target [show here](#)

Windows

Traverse map

Activity plan
Sol 3641

Curecurema
Sol 3641 Site 98 / 138

SOWG Documentarian...
Sols 3641-3642

Mars Target Encyclopedia (MTE)

The MTE is a reference database containing compositional information about targets extracted from publications.

The AN incorporates MTE for Curiosity Rover and Phoenix Lander. An update for Spirit and Opportunity Rover targets is pending.

Target Cumberland
Target defined on Sol 185 Site 6 / 0

Target Actions ?

Data - 6 related products and 317 images found

NC Locator image Sol 173 SCLK 412866868 Seq ncam00322	AP Data product Sol 291 SCLK 423361945 Seq apxs00028	AP Data product Sol 292 SCLK 423369 Seq apxs00028
AP Data product Sol 488 SCLK 440781134 Seq apxs00028	CC 0187_CRM_CCAM01187_... Sol 187 Seq ccam01187 16 LIBS points	CC 0187_CRC_CCAM0 Sol 187 Seq ccam01187 16 LI

Literature references - 34 related references found
View 34 literature references for this target

Cumberland

The location of the target Cumberland (red circle) and any other objects defined as features on this image are shown. Click on the image to open with Locator Image view (new window). You can change the default action in your settings.

What's on this page?

The literature references below were obtained from the Mars Target Encyclopedia, which provides automatically extracted information from LPSC abstracts (2014-2016) (see Wagstaff et al. (2018) [?]). If you find an error, please [let us know](#).

Composition and properties

Elements References to elemental composition of this target, with relevant excerpts
Calcium Chlorine Cl Rich Iron Nickel Potassium Sodium Sulfur

Minerals References to mineral composition of this target, with relevant excerpts
Akaganeite Augite Basanite Ca Sulfate Chlorite Clinopyroxene Fe Smectite Feldspar Hematite Ilmenite Magnetite Olivine Orthopyroxene Phyllosilicate Plagioclase Pyroxene Pyrrhotite Saponite Smectite

Mentions in literature

Mentions A bibliography of all literature mentions found for this target.

Search links

Search Links to searching for other targets with similar compositional references.

Elements

Calcium

Jackson et al. (2015) "ChemCam Investigation Of The John Klein And Cumberland Drill Tailings" [?], Lunar and Planetary Science Conference, Abstract #2301.
"The John Klein drill tailings have an average Ca composition of 7.7 ± 1.5 weight percent and Cumberland tailings have a Ca composition of 7.5 ± 1.0 weight percent."
"While the Cumberland dump pile values are lower in both Ca and missing component; these values suggest less Casulfate features in the middle portion of the drill hole, indicating that the reason for the low silica and iron in Fig. 3c is not due to an increase in Ca-sulfate features."

Chlorine

Archer et al. (2015) "Oxychlorine Species On Mars: The Gale Crater Story" [?], Lunar and Planetary Science Conference, Abstract #2971.
"Surprisingly, the John Klein target in the Sheepbed mudstone contained nearly 3 times less Cl than the Cumberland [5]."

Berger et al. (2014) "Comparing Gale Crater And Gusev Crater Enrichments Of Fluid-Mobile Elements Measured By Alpha-Particle X-ray Spectrometers On Mars" [?], Lunar and Planetary Science Conference, Abstract #2285.
"Drill fines at the Cumberland site (sols 283-287) are also enriched in Cl (~ 1.4 wt %), however, JK drill fines ~ 2.5 m away Fig. 1: Element ratios (rock : soil, see text) of fluidmobile elements in rocks in Gale Crater sols 0-359 and selected rocks from Gusev Crater sols ~ 200-1200."

Cl Rich

Lee et al. (2014) "Linking MAHLI And APXS To Analyze Dust Coverage On Yellowknife Bay Rock Targets" [?], Lunar and Planetary Science Conference, Abstract #2144.
"be composed of a CaSO4 phase [8], and the Cl-rich target Cumberland."

Iron

Cole et al. (2014) "Similar Microtextures In Watchtower And Comanche Class Rocks At Gusev Crater" [?], Lunar and Planetary Science Conference, Abstract #1652.
"The Cumberland Ridge outcrops - Methuselah, Jibsheet, and Larry's Lookout - vary greatly in mineralogy and iron oxidation state but display a striking chemical similarity; this is consistent with aqueous alteration under low water-to-rock conditions."

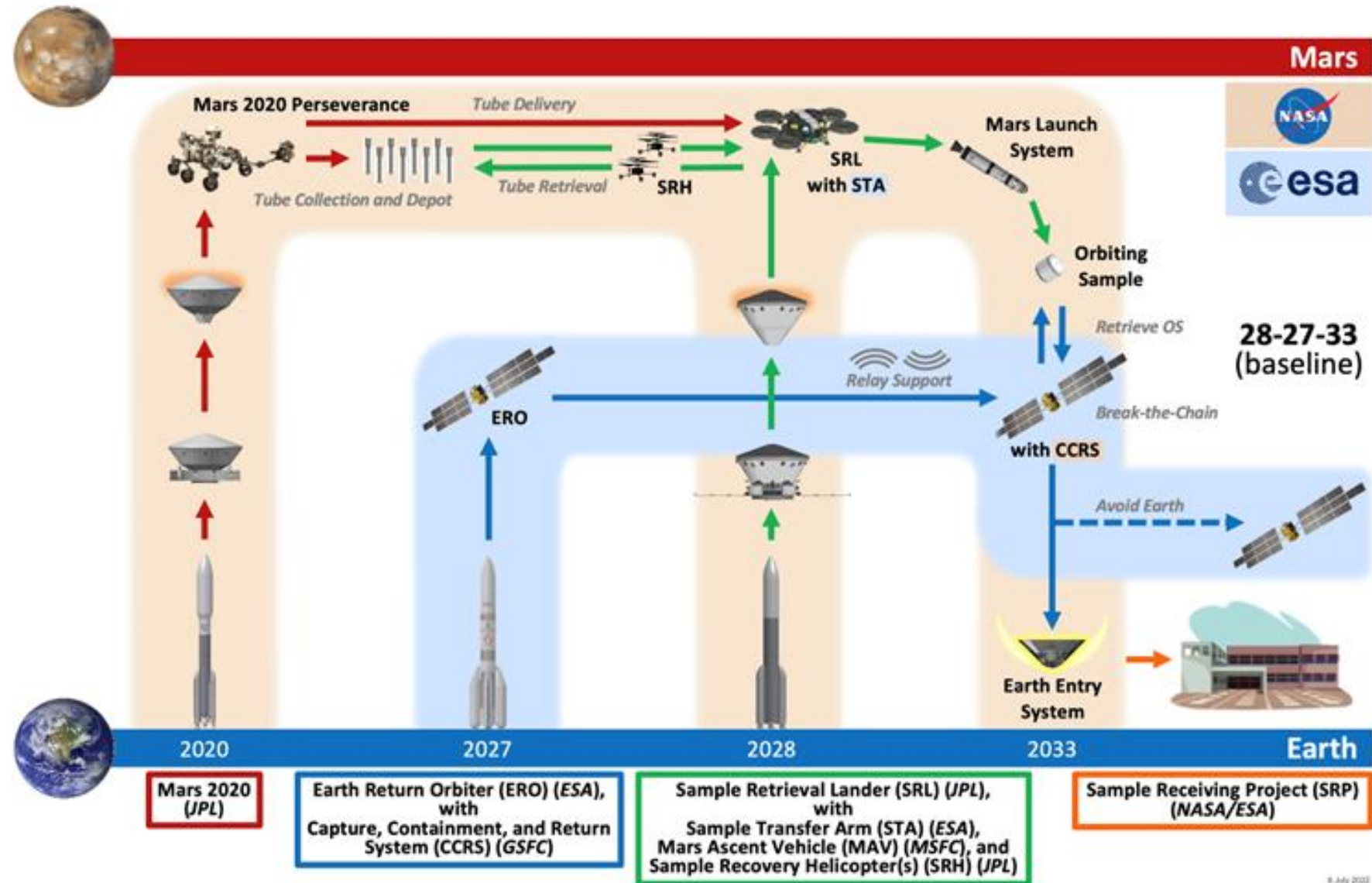
Jackson et al. (2015) "ChemCam Investigation Of The John Klein And Cumberland Drill Tailings" [?], Lunar and Planetary Science Conference, Abstract #2301.
"At Cumberland there is distinctly lower iron and silica in the dump pile, compared to the tailings."

Nickel

Gellert et al. (2015) "Chemical Evidence For An Aqueous History At Pahrump, Gale Crater, Mars, As Seen By The APXS" [?], Lunar

Mars Sample Return program

- Capture and archive operations data and contextual information
 - acquired after sample acquisition (Mars 2020)
 - during operations (MSR program and other MSR projects).
- Incorporate sample collection information into Analyst's Notebook with interoperability to JSC curations.



Mars 2020 sample science

Perseverance (Mars 2020) Analyst's Notebook

Sample science

Sample specimens are collected and cached for potential future return to Earth. Select a sample below for details and access to initial reports.

- About the Return sample science
- View Initial reports for samples 1-10
- View Initial reports for samples 11-21

BC WTA (WB1)
Sol 109 Sample 1

Roubion
Sol 164 Sample 2
Crater Floor / Séítah Thumb

Montdenier
Sol 190 Sample 3
Crater Floor / Artuby ridge

Montagnac
Sol 196 Sample 4
Crater Floor / Artuby ridge

Salette
Sol 262 Sample 5
Crater Floor / Séítah South

Couillettes
Sol 271 Sample 6
Crater Floor / Séítah South

Robine
Sol 298 Sample 7
Crater Floor / Séítah South

Malay
Sol 337 Sample 8
Crater Floor / Séítah South

Hahonih
Sol 371 Sample 9
Crater Floor / Ch'al member of Mááz formation

Atsah
Sol 377 Sample 10
Crater Floor / Ch'al member of Mááz formation

Swift Run
Sol 490 Sample 11
Delta Front / Hawksbill Gap

Skyland
Sol 495 Sample 12
Delta Front / Hawksbill Gap

WB2
Sol 499 Sample 13

Hazeltop
Sol 509 Sample 14
Delta Front / Hawksbill Gap

Bearwallow
Sol 516 Sample 15
Delta Front / Hawksbill Gap

M2020-00262-05 Salette
Sample from Crater Floor / Séítah South

Overview

M2020-00262-05 Salette (sample core 5) [View initial reports](#)

Acquisition

~8.9 cm³ material recovered Cored sol 262 Sealed sol 262

[Sol 262 activity plan](#)

Crater Floor / Séítah South

Location

Latitude 18.4340 N Longitude 77.4430 E Elevation +2569.200m [View traverse map](#)

Lithology

Medium-to coarse-grained poikilitic olivine cumulate rock. Primary minerals are olivine and pyroxene, include sulfates, carbonates and hydrated phases. Organic matter was detected.

Images

Sample-in-bit after acquisition Abrasion patch Sample in tube

Pre-release reports

Sample collection initial reports

These reports are provided by formal archive of sample docs

Shared by all samples

- Click a link to download.
- User's guide
- Sample list

Specific to sample M2020-00262-05

Summary Description

Salette and *Couillettes*, the pair of rock cores representing the third sample target of the Mars 2020 mission, were collected in the *South Séítah* region from *Brac*, a low-lying layered outcrop in the *Caillie* locality at the easternmost end of the rover's traverse into *Séítah*. *Brac* lies within a group of blocky outcrops near the crest of one of the NE-SW trending ridges that are common in *Séítah*, ~130 meters from the *Mááz-Séítah* contact at the base of *Artuby* ridge (Figures 1 and 2). *Brac* is likely to be in-place.

Séítah makes up the stratigraphically lowest rocks exposed on the floor of Jezero crater. In orbital mapping, *Séítah* corresponds to a light-toned olivine-bearing unit referred to as Crater floor-fractured-1 (CF-F-1) by Stack et al., 2020. This unit may be correlated with a regional olivine-bearing unit exposed between Syrtis Major and Nilii Fossae. The mineralogy, micro-texture, color and spectral characteristics of *Brac* and other outcrops observed throughout *Séítah* suggest that the CF-F-1 unit is mostly or entirely an igneous olivine cumulate. The horizontal to gently dipping layers observed in *Séítah* may represent primary igneous layering as seen in layered igneous bodies, though no layer-bounding mineralogical or grain-size variations were observed.

The *Dourbes* abrasion patch, acquired on *Brac*, revealed abundant ~3–5 mm euhedral to subhedral olivine grains surrounded by clinopyroxene in a poikilitic texture with minor feldspars, magnetite, and phosphates. The rock is therefore interpreted to be an igneous olivine cumulate formed by the settling of olivine in a magma body such as a sill or thick lava flow. No evidence was obtained that could distinguish between intrusive and extrusive origins. Alteration phases include sulfates (most likely Ca- or Mg-dominated), which fill voids and are thus secondary to the igneous mineralogy. Carbonate, most

Sol 262 activity timeline

View

17:00 18:00 19:00 20:00

- FHAZ (core doc) FH [2] FHAZ (core doc)
- FHAZ WS Doc (unload doc) FH [2] FHAZ WS Doc (unload doc)
- ZCAM Pre-PTI Bit Bore MZ [4] ZCAM Pre-PTI Bit Bore
- SNC Corer RSM Point Away SNC Corer RSM Point Away
- SNC Corer Percuss to Ingest A SNC Corer Percuss to Ingest A
- SNC Corer Percuss to Ingest B SNC Corer Percuss to Ingest B
- ZCAM Home Left Zoom Before PTI ZCAM Home Left Zoom Before PTI
- ZCAM home left zoom before ... ZCAM home left zoom before PTI
- Image Borehole - decisional Image Borehole - decisional
- ARM Move Joints And Image ARM Move Joints And Image
- NCAM Borehole in Workspace NC [2] NCAM Borehole in Workspace
- FHAZ Workspace Borehole - deci... FHAZ Workspace Borehole - decisional
- ARM Run Seq ARM Run Seq
- FHAZ Workspace Borehole FH [2] FHAZ Workspace Borehole
- Image Bit Image Bit
- ARM Drill Image Sampling Bit ARM Drill Image Sampling Bit
- SNC Corer Image Bit Side SNC Corer Image Bit Side
- ZCAM Coring Bit Side L0 Z34 MZ [1] ZCAM Coring Bit Side L0
- ZCAM Coring Bit Side L0 Z34 MZ [1] ZCAM Coring Bit Side L0
- ZCAM Coring Bit Side L0 Z34 MZ [1] ZCAM Coring Bit Side L0
- SNC Corer Image Bit Oblique SNC Corer Image Bit Oblique
- ZCAM Coring Bit Oblique L0 Z34 MZ [1] ZCAM Coring Bit Oblique

ZCAM Coring Bit Side L0 Z34
Sol 262 plan - Activity eb0ea54c-5ee9-4cea-aac8-4ba068f4b549

Start and end values as planned for this activity are presented as Mars Mars local mean solar time and Earth UTC when known.

Start Sol 262 17:35:44 LTST
2021-11-15 02:54:18 UTC

End Sol 262 17:36:14 LTST
2021-11-15 02:54:48 UTC

Data products associated with this activity

Click on a product for details (will open in new window).

MZL0_0262_0690212770_420
EBY_N0080000ZCAM05069_0340LMJ02

MZ De-Bayered (de-mosaicked)
Sol 262 ZL0_0262_0690212770_420EBY_N0080000ZCAM05069_0340LMJ02

Product Group Actions ?

ZL0_0262_0690212770_420EBY_N0080000ZCAM05069_0340LMJ02 Copy


Dataset DOI 10.17189/twxd-mb70

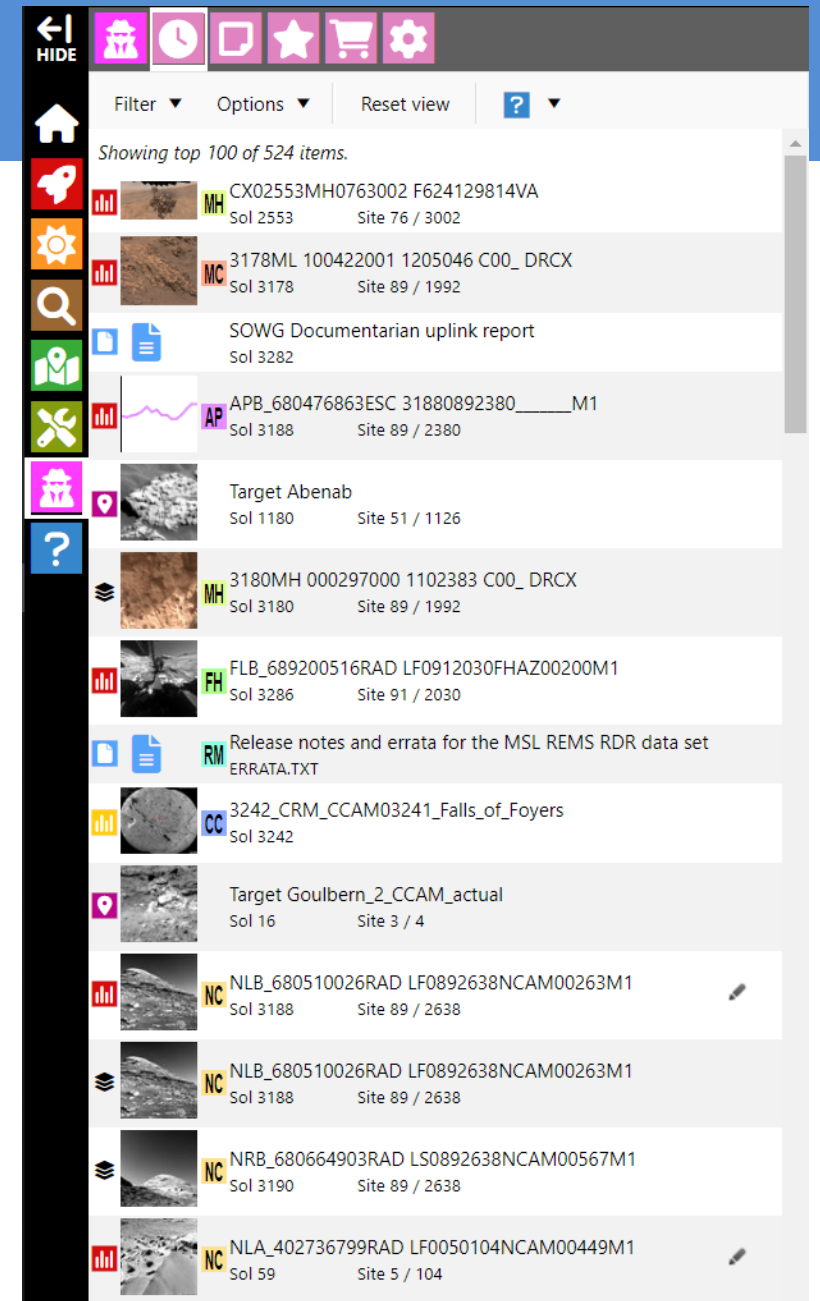
MZL0_0262_0690212770_420 EBY_N0080000ZCAM05069_0340LMJ02

Type De-Bayered (de-mosaicked)



User history

- Annotations (drawing and measurement elements) are saved when created.
- Annotations are loaded automatically when the image is subsequently opened in image viewer.
 - User must be signed in with optional account.

Annotated images are identified in the user history by the  icon.



The screenshot displays a user history interface with a dark sidebar on the left containing navigation icons (Home, Search, etc.). The main area shows a list of items under the heading "Showing top 100 of 524 items." Each item includes a small thumbnail, a color-coded icon, and text identifying the item and its location. Some items have a pencil icon, indicating they are annotated.

Item ID	Location	Annotation Status
CX02553MH0763002 F624129814VA Sol 2553 Site 76 / 3002		
3178ML 100422001 1205046 C00_DRCX Sol 3178 Site 89 / 1992		
SOWG Documentarian uplink report Sol 3282		
APB_680476863ESC 31880892380____M1 Sol 3188 Site 89 / 2380		
Target Abenab Sol 1180 Site 51 / 1126		
3180MH 000297000 1102383 C00_DRCX Sol 3180 Site 89 / 1992		
FLB_689200516RAD LF0912030FHAZ00200M1 Sol 3286 Site 91 / 2030		
Release notes and errata for the MSL REMS RDR data set ERRATA.TXT		
3242_CRM_CCAM03241_Falls_of_Foyers Sol 3242		
Target Goulbern_2_CCAM_actual Sol 16 Site 3 / 4		
NLB_680510026RAD LF0892638NCAM00263M1 Sol 3188 Site 89 / 2638		
NLB_680510026RAD LF0892638NCAM00263M1 Sol 3188 Site 89 / 2638		
NRB_680664903RAD LS0892638NCAM00567M1 Sol 3190 Site 89 / 2638		
NLA_402736799RAD LF0050104NCAM00449M1 Sol 59 Site 5 / 104		

Team version for Curiosity rover

- Developed by the PDS Geosciences Node in collaboration with the MSL science team.
- Available to the team during landed operations as a non-mission critical tool.
- Content (data, plans, traverse data, and support documents) are ingested daily.
- Assists with data validation.

Team Notebook for Curiosity rover

Developed by the PDS Geosciences Node in collaboration with the MSL science team.

Available to the team during landed operations as a non-mission critical tool.

Content (data, plans, traverse data, and support documents) are ingested daily.

Assists with data validation.

Curiosity (MSL) Analyst's Notebook

Sol 3806

Sol	Activity	Data	Plans	Targets	Mosaics
3804	Rover IMU Data Collection and Remote Sensing	61 Data	0 Plans	1 Target	0 Mosaics
3805	Drive Toward "Floresta" Target, Thermal Characterization of N...	344 Data	0 Plans	5 Targets	0 Mosaics
3806	Rover IMU Data Collection and Remote Sensing	107 Data	0 Plans	1 Target	0 Mosaics
3807	DRT Brush "Floresta" Target, In-Situ Observations of "Floresta"...	216 Data	0 Plans	6 Targets	0 Mosaics
3808	Drive, APXS and SAM Atmospheric Activities, and Targeted Re...	163 Data	0 Plans	0 Targets	0 Mosaics

Traverse map

Map showing a 3D topographic view of the rover's traverse path (cyan line) across a rocky terrain. The path is marked with sol numbers: 3781, 3783, 3796, 3797, 3803, 3801, and 3805. Elevation contours are visible, ranging from approximately -3625 m to -3845 m. A scale bar indicates 0, 5, and 10 meters. The map coordinates are E 8144290.39 m, N -282560.62 m.

Team Notebook – completed missions

Contents of Public and Team versions are identical with limited exceptions.

Available to team-identified collaborators.

Team-only content may be released to others by agreement.

Goal is to maintain important non-archive components for long term.

Opportunity (MERB) Analyst's Notebook

Sol 98 Remote Sensing of Endurance Crater
2004-05-03 110 Data Products 6 Docs 1 Plan 0 Targets 0 Mosaics 2 Special

Sol 99 Remote Sensing of Endurance Crater
2004-05-04 94 Data Products 5 Docs 1 Plan 0 Targets 0 Mosaics 0 Special

Sol 99 overview

- Sol 99 data products (94)
- Sol 99 documents (5)
- Mission Manager - Downlink (2)
- SOWG Documentarian - Uplink (3)
- Sol 99 plans (1)

Sol 100 Remote Sensing and In-Situ Observations
2004-05-05 77 Data Products 5 Docs 1 Plan 0 Targets 9 Mosaics 1 Special

Sol 101 Targeted Remote Sensing in Endurance Crater
2004-05-06 265 Data Products 5 Docs 1 Plan 0 Targets 0 Mosaics 2 Special

Sol 102 Drive Around Endurance Crater and Remote Sensing
2004-05-07 55 Data Products 7 Docs 1 Plan 0 Targets 8 Mosaics 0 Special

Opportunity (MERB) Analyst's Notebook

Sol 99 Remote Sensing of Endurance Crater
2004-05-04 94 Data Products 20 Docs 1 Plan 0 Targets 0 Mosaics 0 Special

Sol 99 overview

- Sol 99 data products (94)
- Sol 99 documents (20)
 - Open Quill report viewer
 - Sol Scenario
 - SOWG Documentarian(1)
 - APXS - Uplink
 - Engineering Cameras - Uplink(1)
 - Microscopic Imager - Uplink
 - Panoramic Camera - Uplink
 - Mini-TES - Uplink
 - Moessbauer - Uplink
 - Rover Planner - Uplink
 - Tactical Activity Planner(8)
 - Tactical Uplink Lead
 - Issues for Next Sol - Uplink
 - Sequence Integration Engineer 1
 - Uplink Verification Lead 1
 - Long Term Planning(2)
 - End of Sol Science Mini-TES on Endurance Wall (Mike Wyatt) 1083786829_1063_endurance_wall.ppt20 MB
 - LTP Strategic Planning (John Grotzinger) 1083794586_2805_Sol_99_Strategic_Report.doc231 KB
 - Microscopic Imager - Downlink
 - Panoramic Camera - Downlink
 - Mini-TES - Downlink
 - Mobility / IDD - Downlink
 - Tactical Downlink Lead

Dragonfly



Development of Analyst's Notebook to support landed science of the Dragonfly mission during operations.



an.rsl.wustl.edu

PDS Analyst's Notebook
<https://an.rsl.wustl.edu/>

Notebook online help
<https://an.rsl.wustl.edu/help>

Email
Tom Stein, tstein@wustl.edu
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The Analyst's Notebook is developed under funding provided by NASA to the PDS Geosciences Node. Cooperation by mission science teams is greatly appreciated.

Additional input provided by the PDS Atmospheres, Imaging, and PPI Nodes, as well as by professional and citizen scientists from around the world.


Analyst's Notebook

Use the Analyst's Notebook to explore planetary data from NASA Mars and lunar landed missions. The Notebook is a web application that integrates sequence information, engineering and science data, and documentation.

Click on an icon below to open a Notebook, or [?](#) read the help [?](#).

	Perseverance	Analyst's Notebook for Mars 2020 <i>Mars rover data through sol 659.</i>
	Curiosity	Analyst's Notebook for MSL <i>Mars rover data through sol 3644.</i>
	InSight	Analyst's Notebook for InSight <i>Mars lander data for the entire mission.</i>
	Opportunity and Spirit	Analyst's Notebook for MER <i>Mars rover data for the entire mission.</i>
	Phoenix	Analyst's Notebook for Phoenix <i>Mars lander data for the entire mission.</i>
	LCROSS	Analyst's Notebook for LCROSS <i>Data from the entire mission.</i>
	Apollo	Analyst's Notebook for Apollo <i>Data from Apollo 11, 12, 14, 15, 16, and 17 missions.</i>

This application works best on laptops and desktops. Mobile and netbook users may experience poor performance.

 The Analyst's Notebook is produced by NASA's PDS Geosciences Node [?](#) at Washington University in St. Louis. Contact us [?](#) with comments and questions, visit our [community forum](#) [?](#), or read our [privacy policy](#) [?](#).

