

## Supplement S2

### Figure Source Data Product Identifiers

#### Extraformational sediment recycling on Mars

**Kenneth S. Edgett, Steven G. Banham, Kristen A. Bennett, Lauren A. Edgar, Christopher S. Edwards, Alberto G. Fairén, Christopher M. Fedo, Deirdra M. Fey, James B. Garvin, John P. Grotzinger, Sanjeev Gupta, Marie J. Henderson, Christopher H. House, Nicolas Mangold, Scott M. McLennan, Horton E. Newsom, Scott K. Rowland, Kirsten L. Siebach, Lucy Thompson, Scott J. VanBommel, Roger C. Wiens, Rebecca M. E. Williams, and R. Aileen Yingst**

#### FIGURE SOURCE ARCHIVAL DATA PRODUCT IDENTIFIERS

Rover and orbiter data are available from the archives of the National Aeronautics and Space Administration's (NASA) Planetary Data System (PDS; <https://pds.nasa.gov/>, accessed June 2020). The one India Mars Orbiter Mission (MOM) image studied here was shared by the Indian Space Research Organisation (ISRO) through The Planetary Society ([https://planetary.s3.amazonaws.com/data/mom/mom\\_mcc.html](https://planetary.s3.amazonaws.com/data/mom/mom_mcc.html), accessed June 2020).

The following list provides the essential information to locate the data or data product from which each figure was created.

**Figure 1.** Artwork by the authors. Portrayal of clasts inspired by Figure 2-1 of Pettijohn et al. (1987).

**Figure 2A.** MGS MOLA elevation map product (e.g., Smith et al., 2001).

**Figure 2B.** Mosaic of MRO CTX images produced by Malin Space Science Systems. Individual images in the mosaic can be identified by searching the NASA archives as a function of landform center latitude and longitude.

**Figure 2C.** Mosaic of MRO HiRISE and CTX images produced by Calef and Parker (2016).

**Figure 2D.** December 2019 version of the composite stratigraphic column maintained by the MSL Sedimentology/Stratigraphy Working Group.

**Figure 3A.** Portion of a Sol 1451 Mastcam-34 white-balanced mosaic produced from imaging sequence mcam07184 by Malin Space Science Systems.

**Figure 3B.** Portion of MAHLI image 2224MH0001970010803230C00.

**Figure 3C.** Portion of MAHLI onboard focus merge product 1793MH0007020000700848R00.

**Figure 3D.** Portion of MAHLI onboard focus merge product 1242MH0005740000403709R00.

**Figure 3E.** Portion of MAHLI image 1277MH0001970010404560C00.

**Figure 3F.** Portion of a Sol 1647 Mastcam-34 white-balanced mosaic produced from imaging sequence mcam08525 by Malin Space Science Systems.

**Figure 3G.** Portion of MAHLI image 1692MH0002970010604029C00.

**Figure 3H.** Portion of a composite of Sol 1407 Mastcam-34 and Mastcam-100 white-balanced mosaics produced from imaging sequence mcam06889 by Malin Space Science Systems. Conglomeratic boulder includes ChemCam targets named Seeheim, Wilhelmstal, Bungo, and Cabamba (Wiens et al., 2020); sandstone boulder in the foreground contains ChemCam and APXS targets Sonneblom and Zambesi (Wiens et al., 2020).

**Figure 3I.** Portion of Mastcam-100 image 0027MR0001290050100755E01.

**Figure 4A.** Portion of MRO HiRISE image PSP\_009294\_1750.

**Figure 4B.** Portion of a mosaic of Sol 1031 Mastcam-100 images 1031MR0045070010503891C00, 1031MR0045070020503892C00, 1031MR0045070030503893C00, 1031MR0045070100503900C00, 1031MR0045070110503901C00, and 1031MR0045070120503902C00 (sequence mcam04507).

**Figure 4C.** Portion of a mosaic of MAHLI onboard focus merge products 1032MH0001700000400199R00, 1032MH0001700000400201R00, and 1032MH0001700000400203R00.

**Figure 4D.** Artwork by the authors.

**Figure 4E.** Portion of MAHLI onboard focus merge product 1031MH0004540000400109R00.

**Figure 5A.** Portion of a Sol 995 Mastcam-34 white-balanced mosaic produced from imaging sequence mcam04403 by Malin Space Science Systems.

**Figure 5B.** Portion of Mastcam-34 image 0995ML0044030050404928C00.

**Figure 5C.** Portion of Mastcam-100 image Mastcam 0997MR0044150020503454E01.

**Figure 5D.** Portion of MAHLI onboard focus merge product 1032MH0001700000400195R00.

**Figure 5E.** Portion of stereo anaglyph (red/blue) created from MAHLI onboard focus merge products 1032MH0001700000400197R00 and 1032MH0001700000400195R00.

**Figure 6A.** Portion of a mosaic of MRO HiRISE color images produced by Calef and Parker (2016).

**Figure 6B.** Portion of MRO HiRISE image PSP\_009716\_1755.

**Figure 6C.** Portion of Sol 1402 Mastcam-34 white-balanced mosaic produced from imaging sequence mcam06870 by Malin Space Science Systems.

**Figure 6D.** Portion of a mosaic of Sol 1405 Navcam Left-B camera images

NLB\_522233603ILTLF0560000NCAM00353M1,  
NLB\_522233635ILTLF0560000NCAM00353M1,  
NLB\_522234307ILTLF0560000NCAM07753M1,  
NLB\_522234369ILTLF0560000NCAM07753M1,  
NLB\_522234401ILTLF0560000NCAM07753M1,  
NLB\_522234590ILTLF0560000NCAM00654M1,  
NLB\_522234624ILTLF0560000NCAM00654M1, and  
NLB\_522234657ILTLF0560000NCAM00654M1.

**Figure 7A.** Portion of MAHLI onboard focus merge product 1411MH0005840000502998R00.

**Figure 7B.** Mosaic composed of portions of Sol 1407 Mastcam-100 and Mastcam-34 white-balanced mosaics produced from imaging sequence mcam06889 by Malin Space Science Systems and Sol 1405 Navcam Left-B products

NLB\_522233635ILTLF0560000NCAM00353M1 and  
NLB\_522234657ILTLF0560000NCAM00654M1.

**Figure 7C.** Portion of MAHLI onboard focus merge product 1411MH0005840000502998R00.

**Figure 7D.** Portion of MAHLI image 1407MH0006270010502776C00.

**Figure 8A.** Portion of a mosaic of MAHLI images 1407MH0006270010502774C00 and 1407MH0006270010502776C00.

**Figure 8B.** Portion of MAHLI image 1407MH0006270010502774C00.

**Figure 8C.** Portion of MAHLI onboard focus merge product 1411MH0005840000503006R00.

**Figure 9A.** Portion of a Sol 1408 Mastcam-100 white-balanced mosaic produced from imaging sequence mcam06898 by Malin Space Science Systems.

**Figure 9B.** Portion of Sol 1408 ChemCam RMI image composite product 1408\_crm\_ccam05407\_balombo.

**Figure 10A.** Portion of MAHLI onboard focus merge product 1411MH0005840000503006R00.

**Figure 10B.** Portion of stereo pair anaglyph produced from MAHLI onboard focus merge products 1411MH0005840000503006R00 and 1411MH0005840000503010R00.

**Figure 10C.** Portion of MAHLI onboard focus merge product 1411MH0005840000503006R00.

**Figure 10D.** Portion of Structure from Motion (SfM) quantitative relief map product, produced via methods of Garvin et al. (2017), created from overlapping MAHLI images 1409MH0003200010502867C00, 1409MH0003200010502888C00, 1409MH0003200010502909C00, and 1409MH0003200010502930C00. The point cloud data product used to produce this relief map are presented in **Supplement S6**.

**Figure 10E.** Surface relief profile derived from quantitative relief map product shown in **Fig. 10D**.

**Figure 11A.** Portion of MRO HiRISE image ESP\_034572\_1755.

**Figure 11B.** Portion of Sol 440 Mastcam-100 white-balanced mosaic produced from imaging sequence mcam01795 by Malin Space Science Systems.

**Figure 11C.** Portion of MAHLI onboard focus merge product 0443MH0003290000200185R00.

**Figure 11D.** Portion of mosaic of MAHLI onboard focus merge products 0443MH0003290000200191R00 and 0443MH0003290000200193R00.

**Figure 11E.** Portion of MAHLI image 0442MH0001900010200110C00.

**Figure 11F.** Portion of Sol 440 Mastcam-100 white-balanced mosaic produced from imaging sequence mcam01795 by Malin Space Science Systems.

**Figure 12A.** Portion of MRO HiRISE image ESP\_035350\_1755 acquired on MSL Sol 539 (10 February 2014) with *Curiosity* rover in the scene.

**Figure 12B.** Portion of Sol 530 Mastcam-34 white-balanced mosaic produced from imaging sequence mcam02105 by Malin Space Science Systems.

**Figure 12C.** Portion of Sol 541 Mastcam-34 white-balanced mosaic produced from imaging sequence mcam02134 by Malin Space Science Systems.

**Figure 12D.** Portion of Sol 529 Mastcam-100 white-balanced mosaic produced from imaging sequence mcam02092 by Malin Space Science Systems.

**Figure 12E.** Portion of Sol 529 Mastcam-100 white-balanced mosaic produced from imaging sequence mcam02092 by Malin Space Science Systems.

**Figure 12F.** Portion of Sol 529 Mastcam-100 white-balanced mosaic produced from imaging sequence mcam02092 by Malin Space Science Systems.

**Figure 13A.** Mosaic of MRO CTX images produced by Malin Space Science Systems. Individual images in the mosaic can be identified by searching the NASA archives as a function of landform location.

**Figure 13B.** Portion of MRO CTX image CTX T01\_000881\_1752\_XI\_04S223W.

**Figure 13C.** Portion of MRO CTX image CTX T01\_000881\_1752\_XI\_04S223W.

**Figure 13D.** Portion of MRO HiRISE image ESP\_017786\_1745.

**Figure 14.** Artwork by the authors.

**Figure 15A.** Mosaic of MRO CTX images produced by Malin Space Science Systems. Individual images in the mosaic can be identified by searching the NASA archives as a function of landform location.

**Figure 15B.** Sketch map by the authors. Some of the pre-Gale impact craters were also identified by Thomson et al. (2011) and the pre-Gale valley was identified by Irwin et al. (2005).

**Figure 16A.** Portion of India Mars Orbiter Mission (MOC) Mars Colour Camera (MCC) image acquired on orbit 48 on 02 December 2014.

**Figure 16B.** Portion of MRO HiRISE image ESP\_022322\_1735, acquired on 01 May 2011.

**Figure 17A.** Portion of MRO CTX image T01\_000836\_1739\_XN\_06S075W.

**Figure 17B.** Portion of MRO HiRISE image ESP\_026523\_1735.

**Figure 17C.** Stereo anaglyph (red/blue) produced from portions of MRO HiRISE images ESP\_025600\_1735 and ESP\_026523\_1735.

**Figure 18A.** Mosaic of MRO CTX images produced by Malin Space Science Systems. Individual images in the mosaic can be identified by searching the NASA archives as a function of landform location.

**Figure 18B.** Portion of MRO HiRISE image ESP\_039721\_1980.

**Figure 18C.** Portion of MRO HiRISE image PSP\_010573\_1755.

**Figure 19A.** Mosaic of MRO CTX images produced by Malin Space Science Systems. Individual images in the mosaic can be identified by searching the NASA archives as a function of landform location.

**Figure 19B.** Mosaic of MRO CTX images produced by Malin Space Science Systems. Individual images in the mosaic can be identified by searching the NASA archives as a function of landform location.

**Figure 19C.** Portion of MRO HiRISE image ESP\_054090\_1985.

**Figure 19D.** Portion of MRO HiRISE image PSP\_008650\_1990.

**Figure 19E.** Portion of MRO HiRISE image ESP\_055211\_1985.

**Figure 19F.** Portion of MRO HiRISE image PSP\_009650\_1755. Color inset is a portion of MAHLI onboard focus merge product 1739MH0005360000700182R00.

**Figure 19G.** Portion of MRO HiRISE image ESP\_028190\_1755. Color inset is a portion of MAHLI onboard focus merge product 0150MH0001630000101430R00.

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