Geophysical Research Letters

Supporting Information for

Periodic Bedrock Ridges at the ExoMars 2022 landing site: Evidence for a Changing Wind Regime

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Additional Supporting Information (Files uploaded separately)

Introduction

Supplementary material includes one table (Table S1) and four images complementing the method section in the main manuscript (Figures S1 to S4). Figures S5 to S11 complement the result section in the manuscript providing further details on the morphology and occurrence of TARs/miniTARs and ridges.

Supplemental Figures

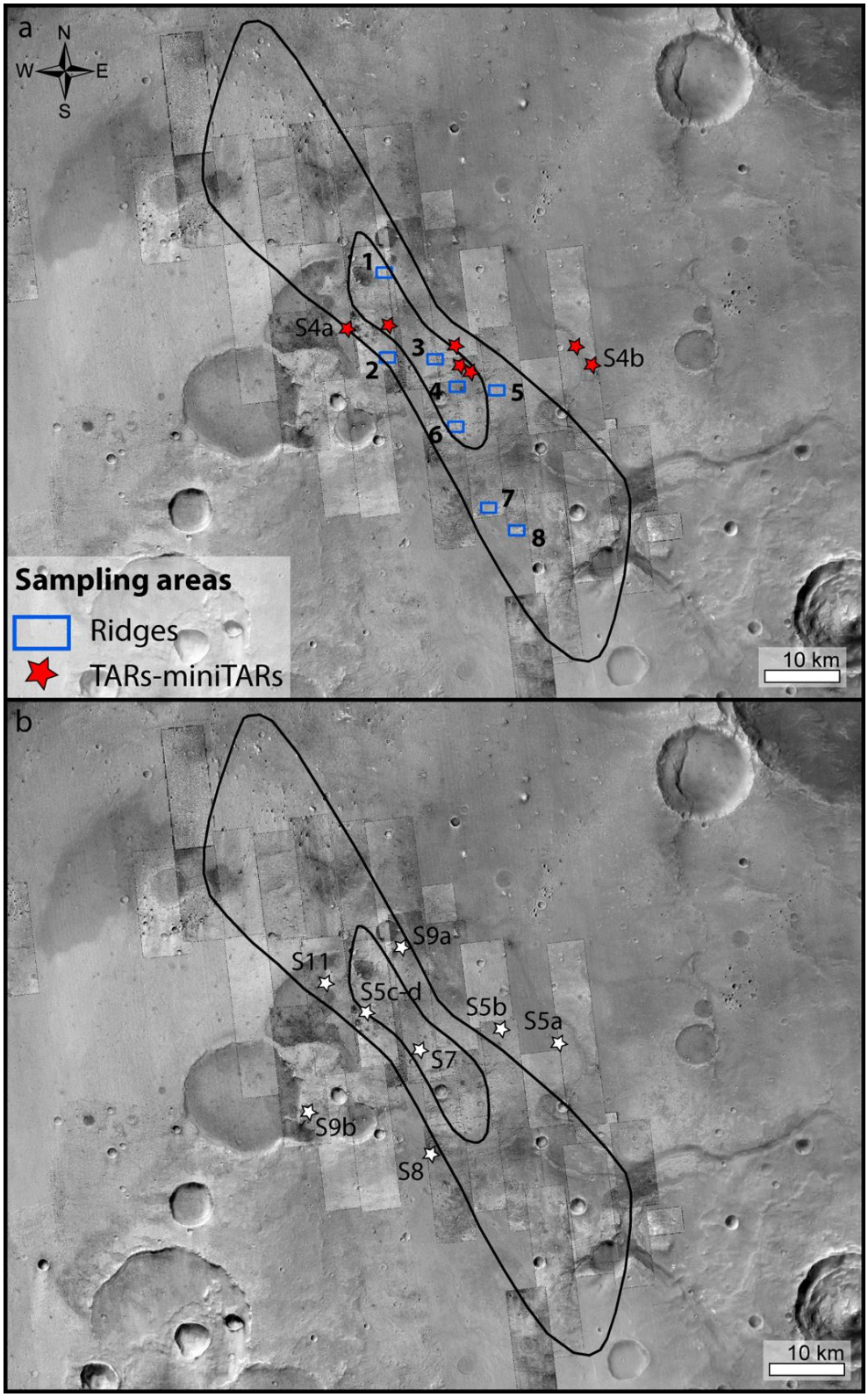
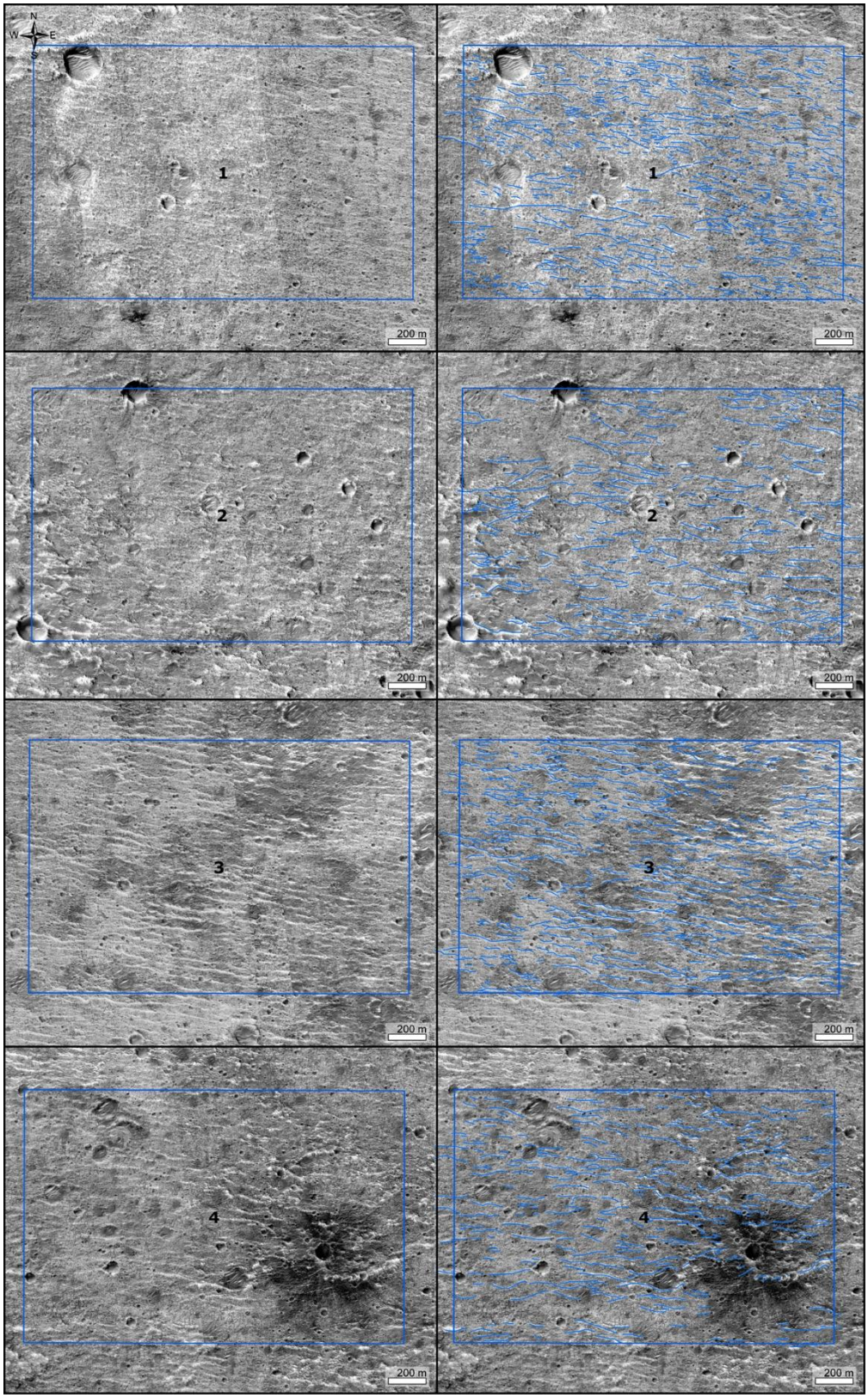


Figure S1: Context image showing a) the location of the crestline sampling areas and b) the locations of other supplementary images.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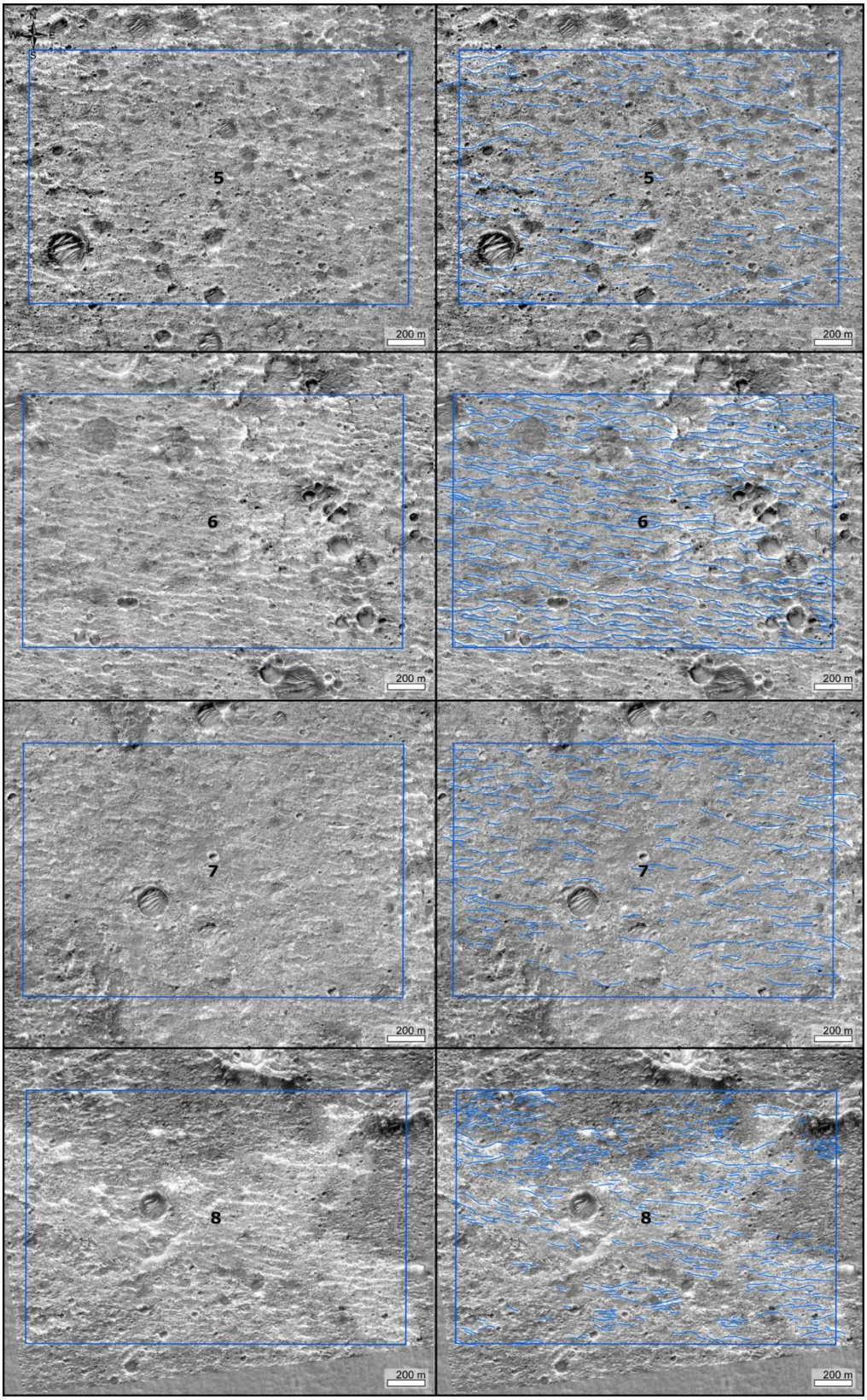

Figure S2: Ridge crestlines mapped in the study area (See Fig. S1 for locations)

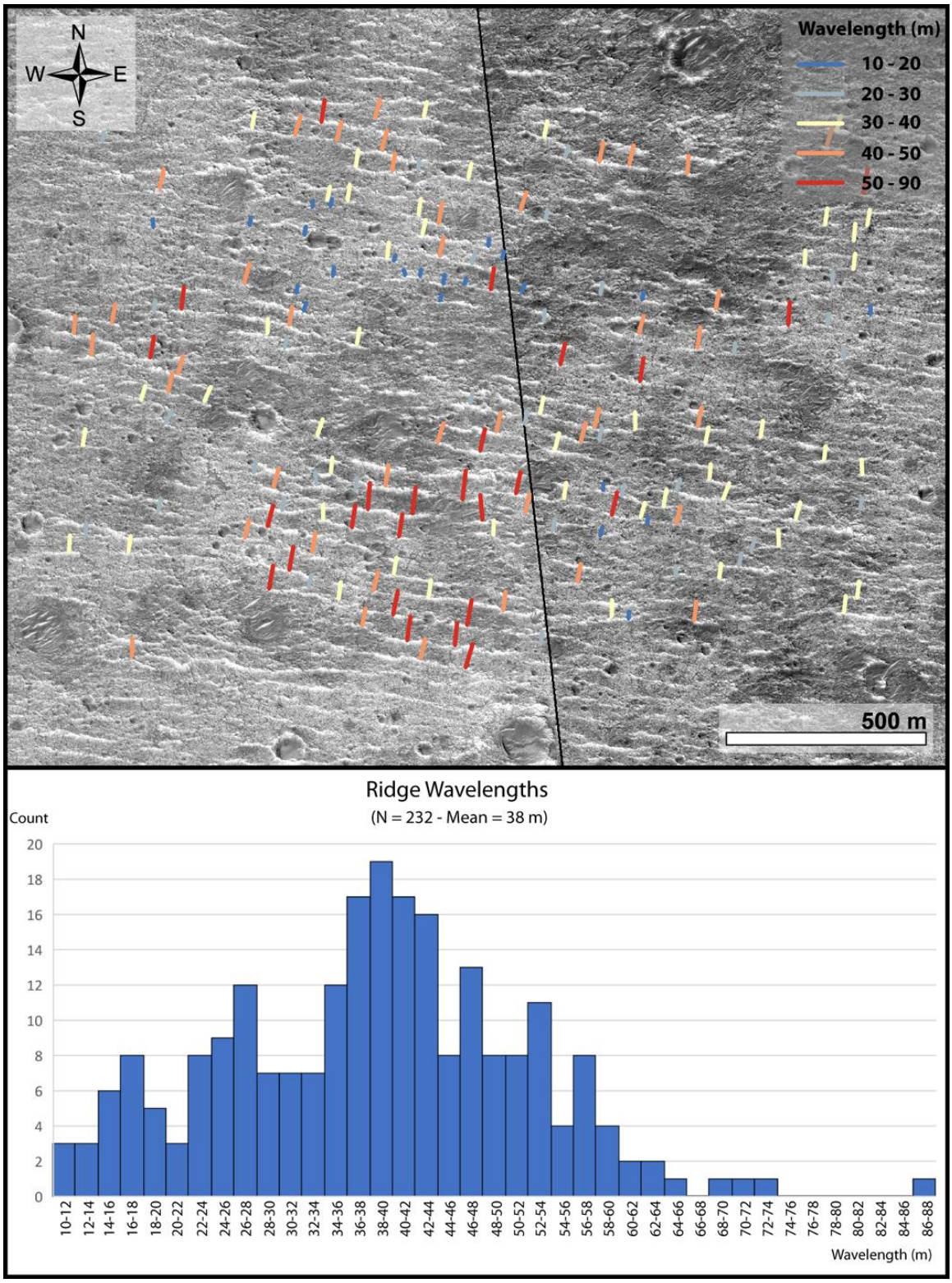

Figure S3. Mapping of the ridge wavelengths. The wavelengths were computed by manually tracing the perpendicular line connecting subsequent ripple crestlines in ArcMap®.

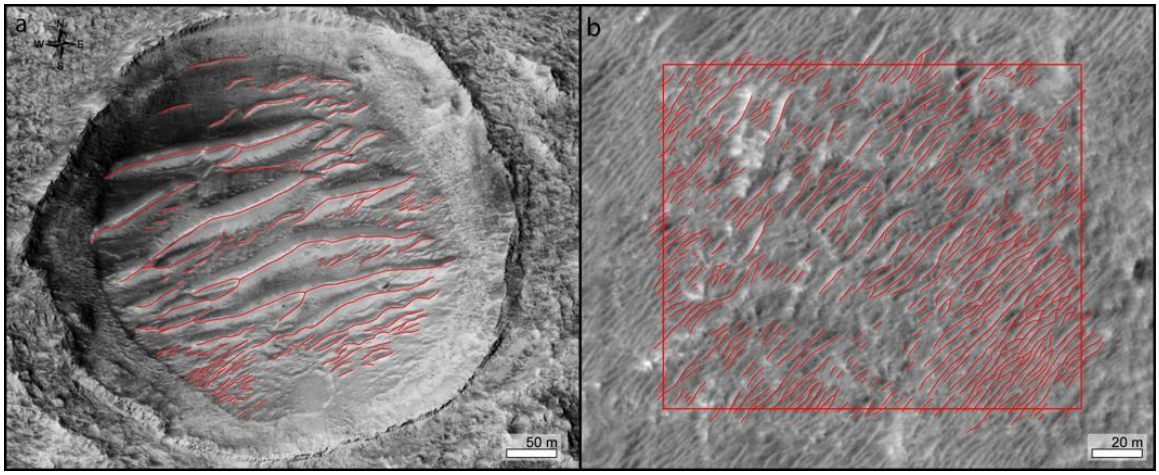

Figure S4. Mapping of the a) TARs and b) miniTARs computed by manually tracing the crestlines in ArcMap®.

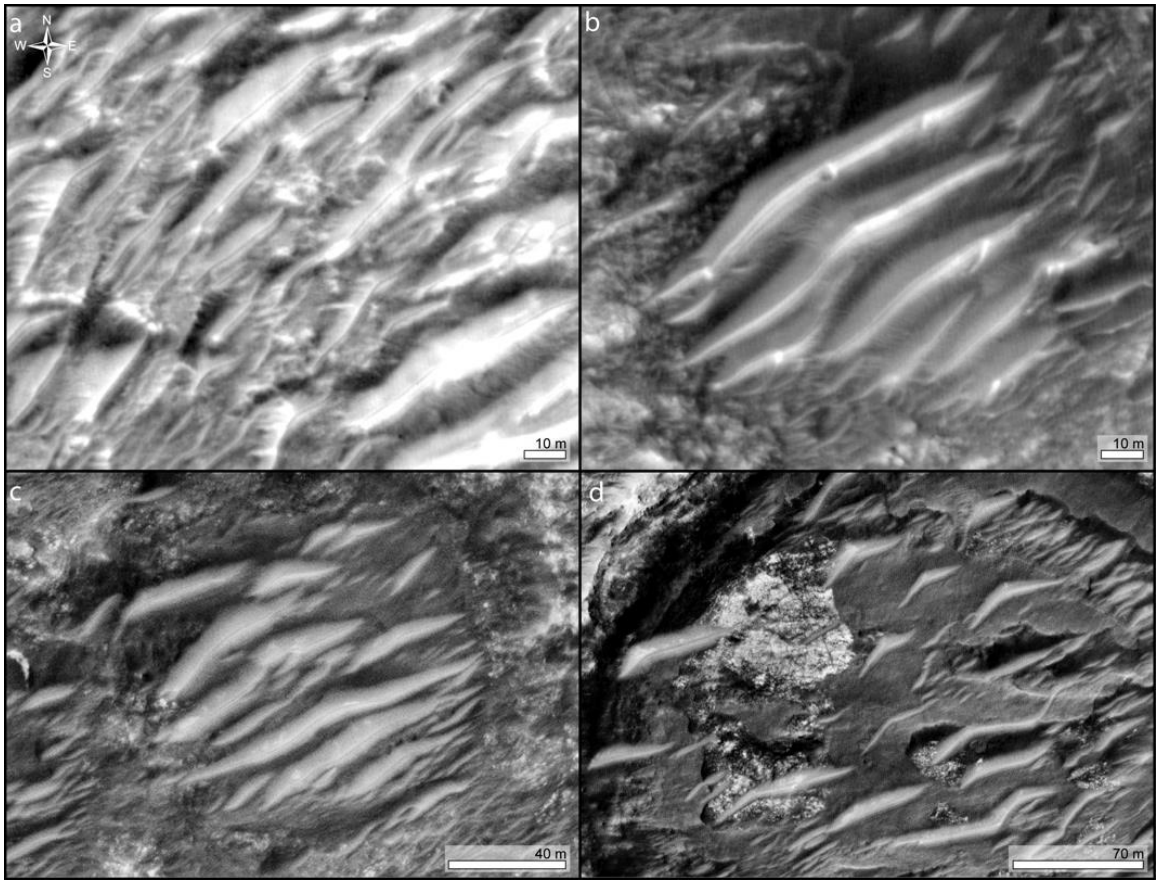

Figure S5. Exposed cross beds visible over the TAR slopes suggesting formative winds from the SE. Note the superimposed crater over TARs in panel b).

Figure S6. Cross beds within a megaripple are exposed at the stoss side (left) and by an impact crater that hit the megaripple in Meridiani Planum. Formative winds blew from the left to right of the image (Arvidson et al., 2011; Golombek et al., 2010). Opportunity Navigation Camera image acquired on sol 1852.

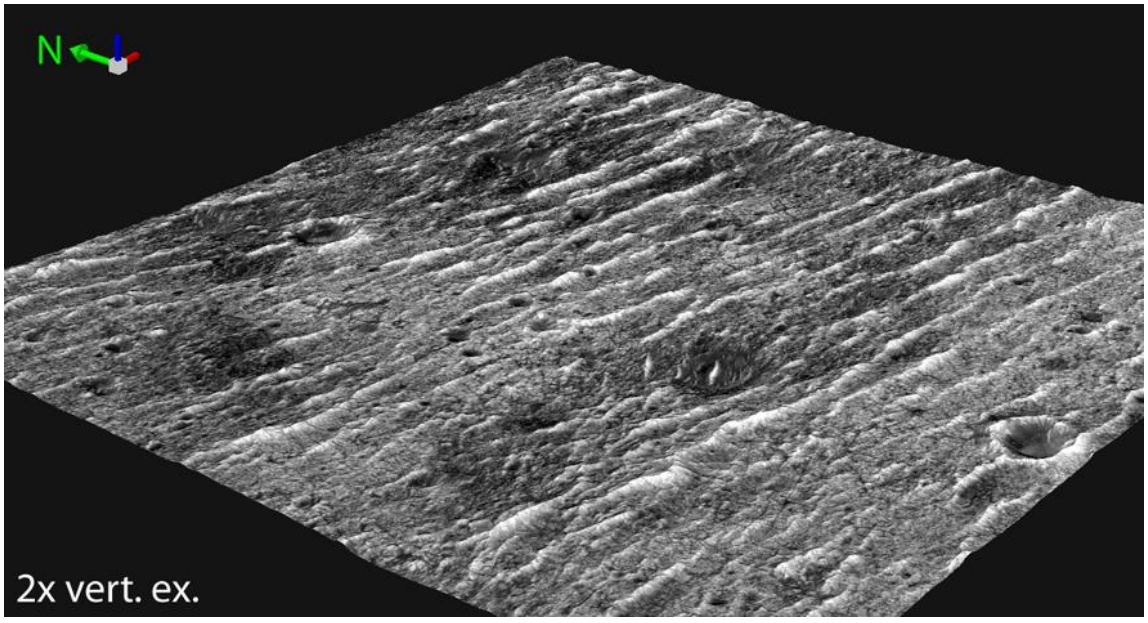

Figure S7. HiRISE perspective view of the ridge unit.

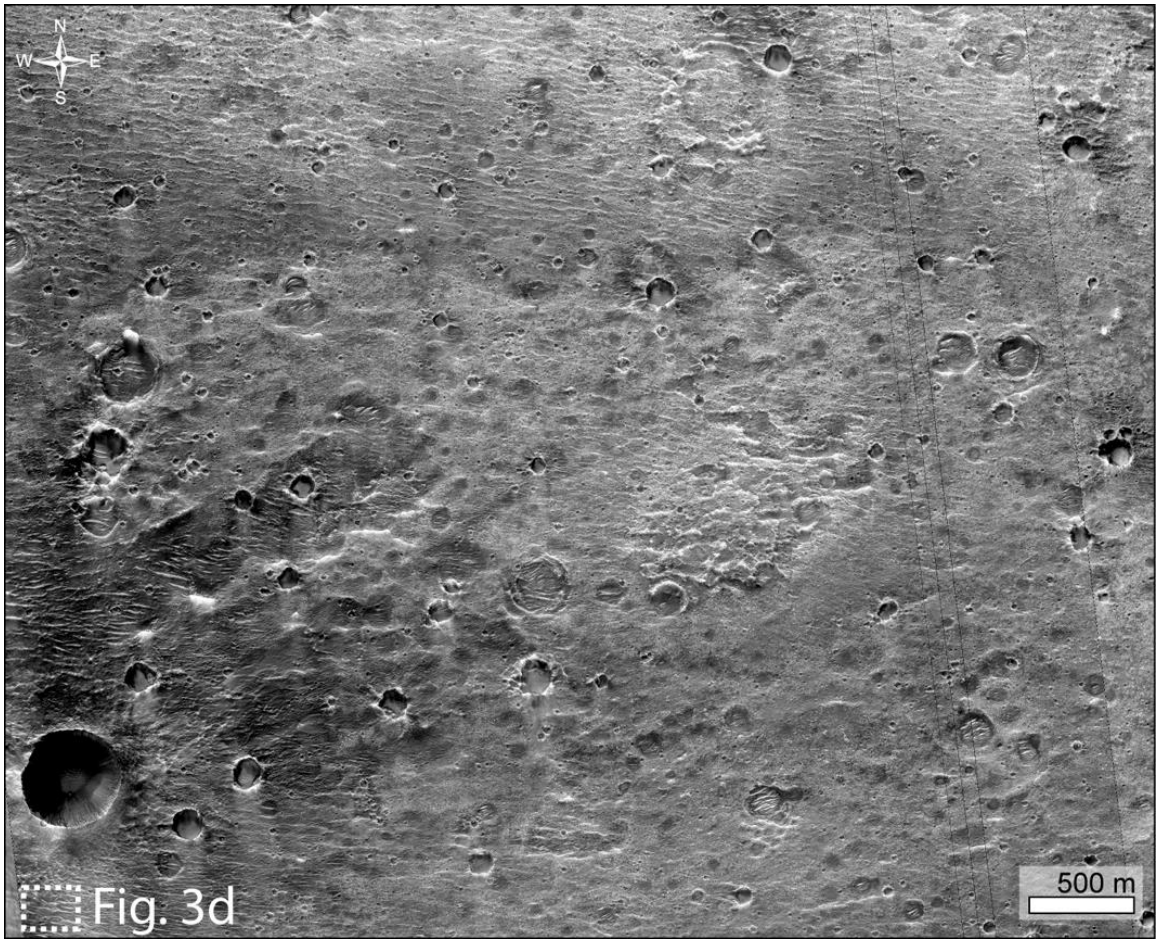

Figure S8. HiRISE image of the ridge pattern. Detailed location of Fig. 3d in the main manuscript is also provided (dashed white box).

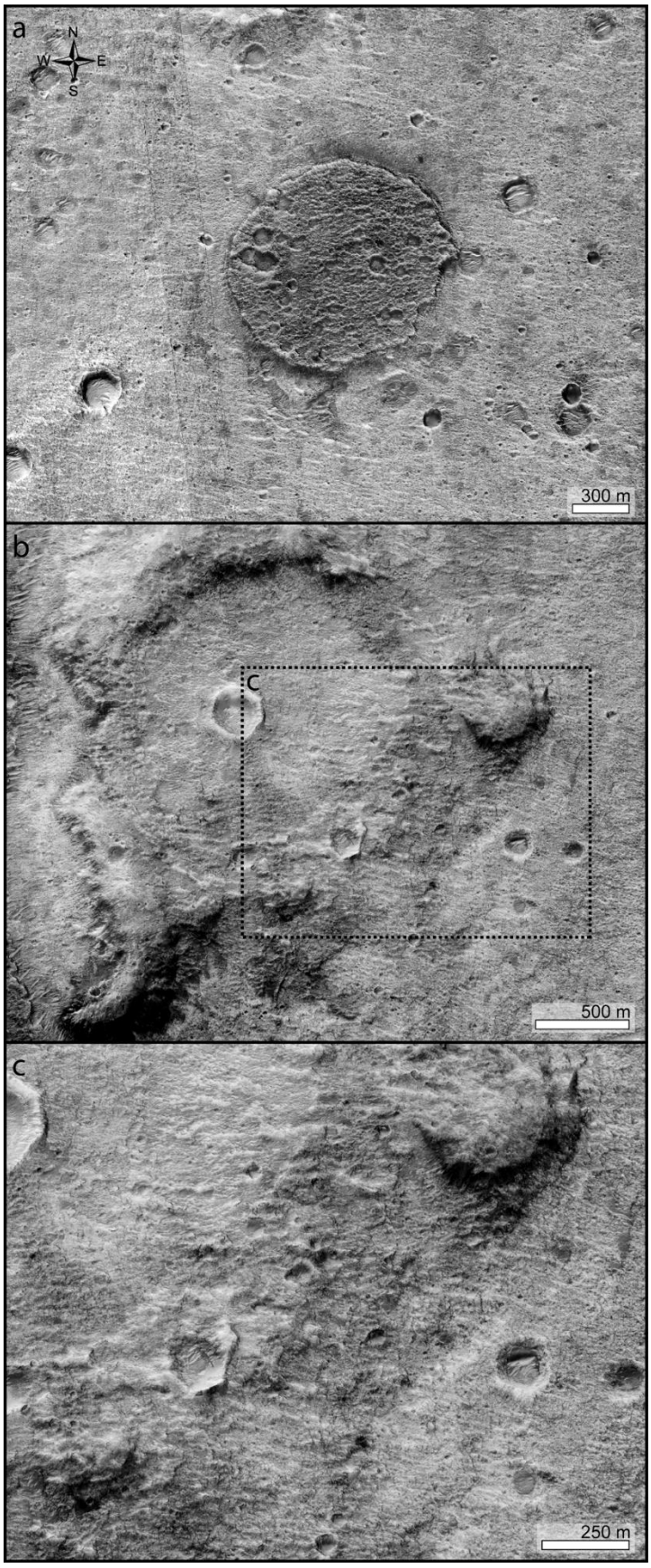

Figure S9. HiRISE images of ridges inside eroded craters. a) Like the crater in Fig. 1g, the remnant of the Amazonian dark resistant unit (Adru) originally filling the floor is visible as an inverted topography. The crater rim is completely eroded and the ridges appear continuously on the surrounding plain. Thus, the ridges should have formed after the erosion of the crater rim. b) Old eroded crater with ridges extending continuously outside the SE rim (close-up (c)).

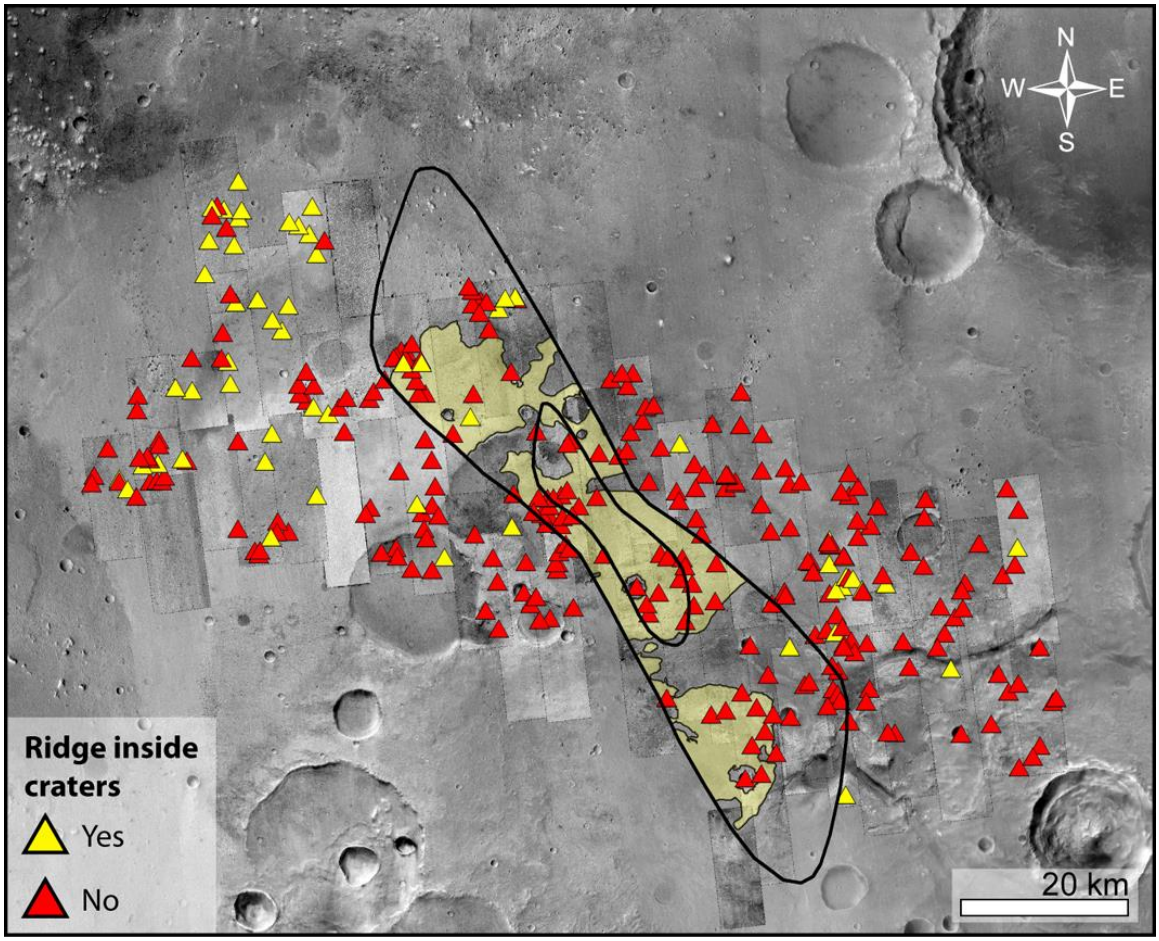

Figure S10. Ridge occurrence map for craters (> 250 m) in the study area. Ridges are only found inside degraded/old craters and never inside pristine/young craters (which are filled by younger TARs). Ridges were thus emplaced after old impacts and were static when younger impacts struck the surface.

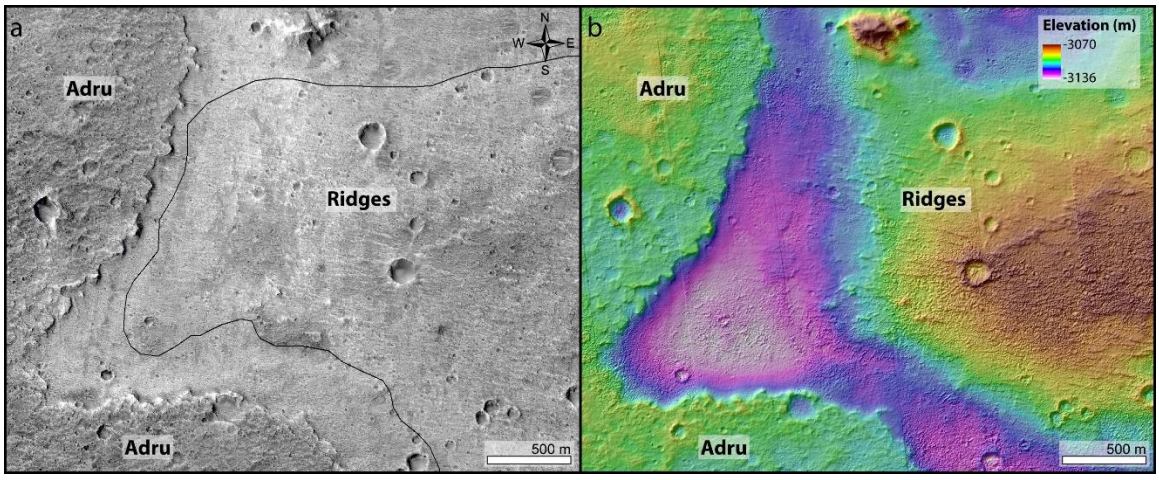

Figure S11. Ridges are visible on the bright-toned surface but are absent from the Amazonian dark resistant unit (Adru). This is particularly evident in the HiRISE DTM (right).

CenterLat	CenterLon	ProductId	ExtURL	Product	Manuscript figures
18.204	335.576	DTEEC_036925_1985_037558_1985_L01	http://www.uahirise.org/ESP_036925_1985	DTM	Figure 2c, d - base DTM
18.248	335.846	DTEEC_003195_1985_002694_1985_L01	http://www.uahirise.org/PSP_003195_1985	DTM	
18.199	335.476	DTEEC_009880_1985_009735_1985_L01	http://www.uahirise.org/PSP_009880_1985	DTM	Figure S11b
18.135	336.094	DTEEC_037070_1985_037136_1985_L01	http://www.uahirise.org/ESP_037070_1985	DTM	Figure 1c - Profile AB
18.219	335.673	DTEEC_039299_1985_047501_1985_L01	http://www.uahirise.org/ESP_039299_1985	DTM	Figures 1e - Profile CD - S7 base DTM
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18.199	335.476	PSP_009880_1985_RED_A_01_ORTHO	http://www.uahirise.org/PSP_009880_1985	Ortho	Figures S4a - S11a
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-7.034	285.907	PSP_008313_1730_RED	https://www.uahirise.org/PSP_008313_1730	Image	Figure 5c

Table S1: HiRISE products used in this work.

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