

GEOLOGIC MAPPING IN MARGARITIFER TERRA: FACILITATING SCIENTIFIC INVESTIGATIONS INTO THE HISTORY OF AQUEOUS ACTIVITY ON MARS

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ABSTRACT

The Margaritifer Terra region on Mars preserves a suite of fluvial landforms including the highest density of valley networks on the planet, the Uzboi-Ladon-Morava meso-scale outflow system, and younger alluvial fans within numerous craters [e.g., 1-10]. This newly funded project, with an expected completion date of 2023, will map Mars Transverse Mercator (MTM) quadrangles -20022, -25022, -20017, and -25012 in Margaritifer Terra (-17.5°N to -27.5°N between 335°E and 345°E) (Fig. 1). The map encompasses the medial to distal portions of the Samara-Himera and Paraná-Loire valley network systems, two of the largest and best integrated valley systems on Mars [11], whose trunk valleys integrate much of the drainage coming from mapped areas to the east and west.

Mapping at a scale of 1:1,000,000, these four MTM quads will connect the gap between existing maps to the east, west, and north to provide a complete regional product of a landscape that records a long history of aqueous processes. Mapping this gap in coverage will provide the scientific community with a crucial dataset to understand the morphologic and morphometric investigations of valleys and fluvial/alluvial deposits, the timing of fluvial activity for climate models, and may inform efforts related to understanding the history of Martian habitability. Expected completion of this map is 2023.

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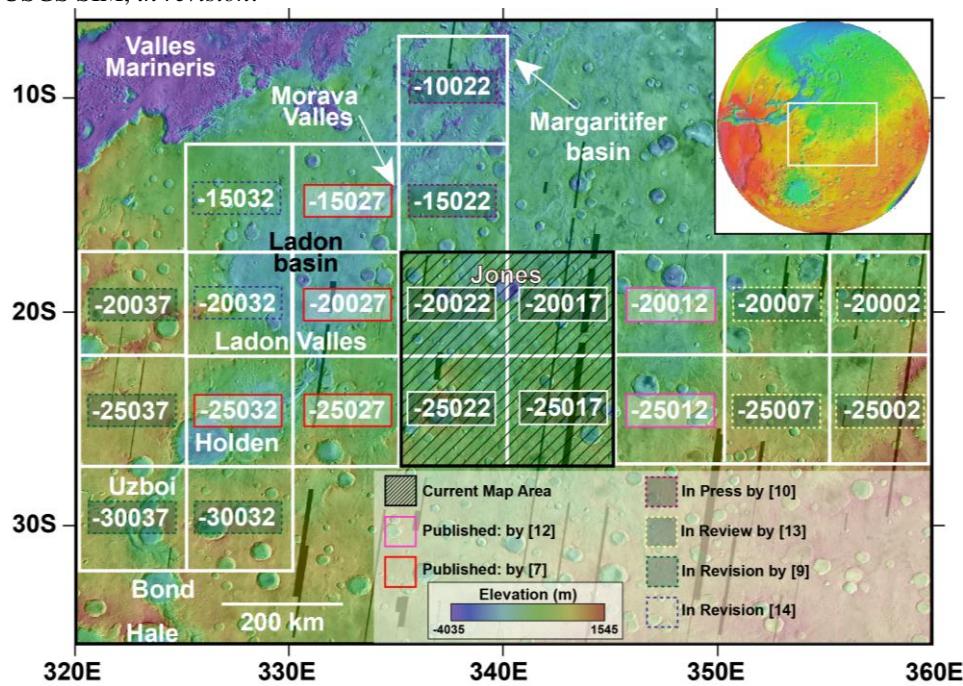


Figure 1. Margaritifer and Noachis Terra on Mars showing location of MTM quadrangles -20022, -25022, -20017, and -25012 for mapping at 1:1,000,000 scale (black hatched area). This map connects existing published maps at similar map scales to the east (MTM quads -20012 and -25012 [12]), west (MTM quads -15027, -20027, -25027 [7]), and north (-15022 and -10022 [10]). MTM quads -20037, -25037, -30037, -30032 [9], -20007, -25007, -20002, -25002 [13] -15032 and -20032 [14] are in

revision. Inset shows general location of the region between Argyre basin in the south and Arabia Terra to the north. Map base is MOLA over THEMIS daytime infrared mosaic. North is toward the top.