INVERTED CHANNEL DEPOSITS AND ALTERED BASAL DEPOSITS IN THE RIM OF ISIDIS BASIN WITH IMPLICATIONS FOR THE DEPOSITS IN THE MIYAMOTO CRATER CANDIDATE LANDING SITE. H. E. Newsom[1], N. L. Lanza[1], A. M. Ollila[1], [1]Univ. of New Mexico, Inst. of Meteoritics, MSC03-2050, Albuquerque, NM 87131, USA, (newsom@unm.edu).

Introduction: Inverted channels often occur in impact craters, including Eberswalde, and Miyamoto [e.g., 1, 2]. By themselves, the inverted channels are important sedimentary targets, but underlying the inverted channels in some cases are polygonal fractured material that contains hydrous minerals and clay. One possibility is that this material represents fine-grained altered lake sediments and therefore represents a good astrobiology target for future missions.

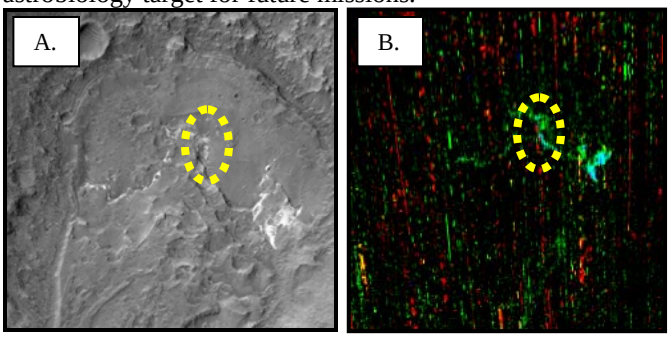

Fig. 1. Inverted channel complex in an erosional basin in a breached 60 km diameter crater on the edge of Isidis. (A.) Cropped CRISM (FRT0000B0CB_07_IF165S) visible image and (B.) IR image which show the Al-phyllosilicate signature (BD2210) of the underlying light toned material. Location of Fig. 2 is circled. Image ~ 3 km across.

Impact crater deposits: The southern rim of the Isidis basin includes evidence for fluvial erosion. A large 60 km diameter impact crater on this rim was proposed by Newsom [3] as a landing site for the canceled 2003 Mars lander. The crater is breached on the northern side with evidence for fluvial transport into Isidis. Recent CRISM and HiRISE images shows dramatic evidence in the center of the rim breach for the presence of an eroded basin. This 4.6 km long basin was filled with sedimentary deposits including polygonal fractured basal material that contains signatures of phyllosilicates and water, and an overlying inverted channel deposit (**Fig. 1, 2**). The stratigraphy and location of these deposits strongly suggests that the lower polygonal fractured rocks were deposited during or after a massive flood that created the rim breach from the release of a lake in the 60 km diameter crater. These geological constraints suggest that this lower phyllosilicate bearing material may consist of fine-grained lacustrine sediments, subsequently buried by the inverted channel deposit. Subsequent aeolian and/or fluvial activity has exposed the lower material.

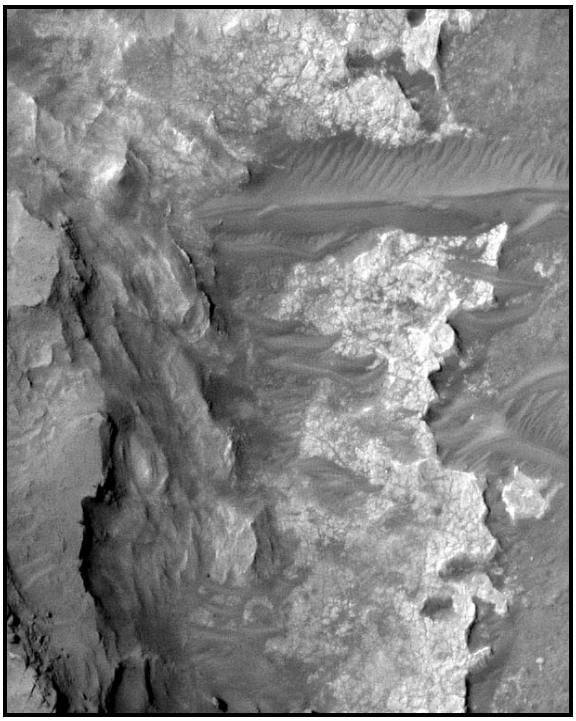

Fig. 2. Cropped HiRISE image (PSP_007727_1830) of the polygonal fractured phyllosilicate-bearing light toned layer below the inverted channel deposits on the left side of the image. Region shown is ~ 170 m across.

Implications for the Miyamoto Crater inverted channel and phyllosilicate-bearing deposits: The floor of Miyamoto crater has been proposed as a possible landing site for MSL [4, 5]. Miyamoto contains surprisingly similar, but more extensive, inverted channel deposits overlaying polygonal fractured light-toned phyllosilicate-bearing material with a high thermal inertia. Based on the evidence from Isidis, the Miyamoto material may also represent altered lake deposits, which could be a high priority target in the search for environments that preserve organic materials on Mars.

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