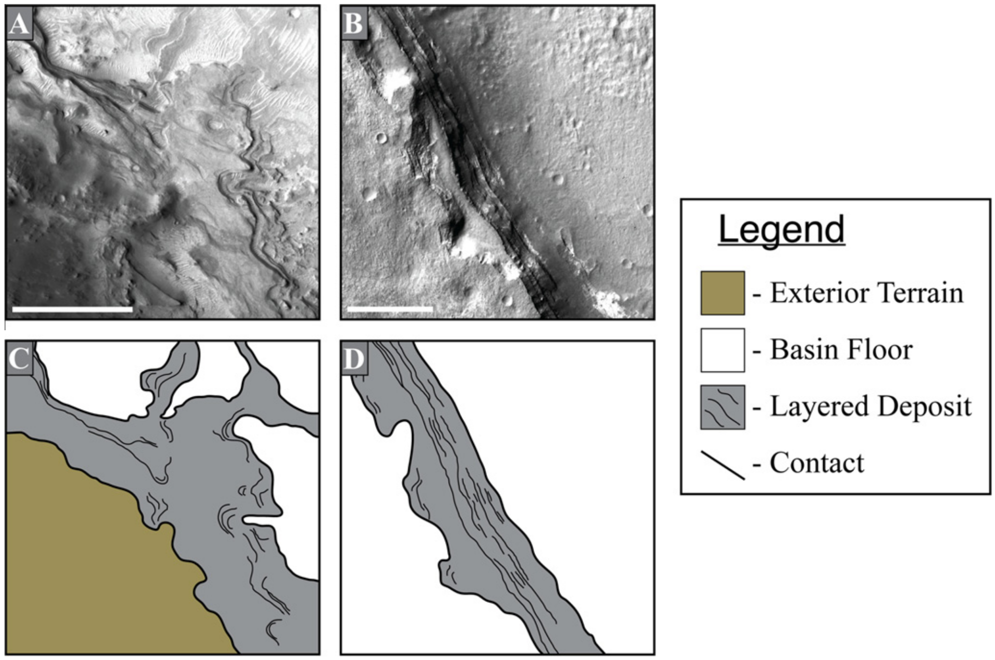

Fig. 2. Examples of various types of layered deposits observed in open-basin lakes. Scale bars are 2 km. (A) Layered deposit at 26.98°N, 74.17°E. CTX image P17_007490_2095_XN_29N286 W. (B) Layered deposit in Terby Crater, 28.25°S, 73.68°E (Wilson et al., 2007). CTX image P15_007042_1519_XI_28S286 W. (C and D) Geologic sketch maps of the layered deposits in parts (A and B) respectively. Legend at right indicates contact and unit types.

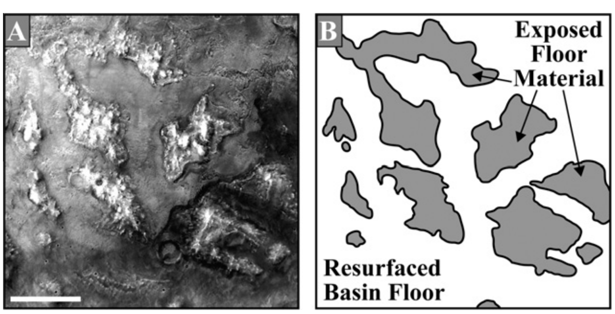

Fig. 3. (A) Exposed floor material of likely lacustrine origin at 4.37°S, 1.71°W. Scale bar is 2 km. Note the light-toned, knobby appearance of the exposed floor material, which is being embayed by the darker, volcanic resurfacing unit on the basin floor. CTX image P13_006214_1765_XN_03S001 W. (B) Geologic sketch map of the exposed floor material in part (A).

materials, it is possible that some portion of these deposits are unrelated to lacustrine activity. In identifying exposed floor materials, care was taken to ensure that exposed central peak and/or peak ring material was not confused with exposed floor material in open-basin lakes defined by ancient impact craters.

2.2. Resurfacing units

In addition to identifying the presence or absence of exposed sedimentary deposits, each open-basin lake was classified as to the presence of modifying and resurfacing units that were deposited subsequent to the lacustrine activity within the basin. The type of resurfacing process that has most recently affected the basin was also identified where such an identification and classification were possible, with the main processes described below.

2.2.1. Volcanic resurfacing

Volcanically resurfaced open-basin lakes were identified based on the presence of several distinct morphologies that indicate resurfacing by volcanic flows (Fig. 4). First, volcanically resurfaced open-basin lakes contain smooth floor deposits with high crater retention, especially at small crater sizes, suggesting a competent material (Fassett and Head, 2008a). Additionally, these basins commonly have wrinkle ridges on their floors, a morphology regularly observed in volcanic plains across the surface of Mars (Watters, 1991) (Fig. 4). Furthermore, these basins typically have lobate margins that appear to embay the open-basin lake perimeter (typically crater walls) and any older floor material or exposed sedimentary deposits that may be present (Figs. 3A and 4). Finally, many of these basins exhibit a "moat" morphology at their edges, which is typical of volcanically flooded basins and is thought to be caused by the subsidence of volcanic fill material (e.g. Leverington and Maxwell, 2004) or the flow stopping at the base of a rise at the margin of the crater wall (Fig. 4A).

2.2.2. Glacial resurfacing

Glacially modified and resurfaced craters, such as those containing concentric crater fill (Levy et al., 2010; Dickson et al., 2010, 2011), show flow patterns, features and structures that can be used as guides for the identification of glacial resurfacing processes. Open-basin lakes classified as being glacially resurfaced exhibit such features, typically lobate floor texture and lobate ridges (Fig. 5), indicative of material deposition by glacial processes (e.g. Head et al., 2008). These ridges are distinguished from paleoshorelines based on their lobate morphology that is not constrained by or following pre-existing topography, as would be expected for shorelines (Parker et al., 1993; Head et al., 1998). Glacially resurfaced open-basin lakes also typically exhibit ring-mold craters, which provide evidence for current or past subsurface ice deposits (Mangold, 2003; Kress and Head, 2008) (Fig. 5).

2.2.3. Resurfacing of unknown origin

Several open-basin lakes show evidence for resurfacing and/or modification across parts of their basin floors with no single process clearly evident as the cause for resurfacing (Fig. 6). The evidence for resurfacing in these basins is: (1) the heavy erosion