

A POSSIBLE IMPACT CRATER STRUCTURE IN SOUTHERN MONGOLIA. G. Komatsu, Lunar and Planetary Laboratory, University of Arizona, Tucson AZ 85721, J. W. Olsen, Department of Anthropology, University of Arizona, Tucson AZ 85721, V. R. Baker, Department of Hydrology and Water Resources, University of Arizona, Tucson AZ 85721.

We report here a possible impact structure (Fig. 1) in southern Mongolia, in the transitional region between the Gobi Desert and the Altai Mountain Range. The coordinates for this possible impact structure are approximately 43°37'N, 98°22'E. The location is at the southeastern edge of NW-SE trending mountain range, the Edrengeyn Nuruu. This structure is not included in the most updated terrestrial impact crater lists [1][2]. The region is dominated by the Altai Mountain Ranges which are primarily Paleozoic island-arc and continental platform assemblages [3], and basin fills which are mostly Mesozoic and Quaternary sediments. The mountain ranges are bounded by left-lateral strike-slip and thrust faults, and they are tectonically uplifted [3]. The region is semi-arid under the current climate; however, it seems to have experienced major climate changes throughout the Quaternary period. Paleo-hydrological mapping, though very coarse at this stage, has revealed ample evidence of paleo-lake systems in the basins [4]. The joint Russian-Mongolian-American expedition has reported Paleolithic human occupations in the region during the late Pleistocene [5]. The possible impact structure was discovered during the examination of RADARSAT standard mode image (HH polarization, 25 meter resolution) of the region for paleoenvironmental reconstruction.

The structure is located on a basin fill which is gently dipping to the south. The structure's (Figures 2) diameter is about 3.2 kilometers, and it is surrounded by a raised rim and relatively well-preserved ejecta blanket-like materials. At

this point, we can not dismiss the possibility that the structure has a volcanic origin, but the structure has features characteristic of impact craters. Part of the northern section of the rim/ejecta is missing, implying dissection by fluvial activity from the north. A recent alluvial fan deposit covers the gap. Fluvial dissections are common on the southern part of the rim and ejecta materials. The most prominent ones are associated with radar-dark fans south of the structure. One possible explanation is that the structure held ponded water at one point in its history, and spillover drained the water and sediments. The radar-dark signature can be attributed to the smooth surface of the fans due to fine-grained lake sediments. It is possible that pre-historic humans settled near the lake or used its water.

We plan to visit the site this coming summer season and confirm or reject the above hypotheses. The RADARSAT images were acquired through NASA on a grant to P.I. Victor Baker.

References: [1] Grieve R. A. F. (1997) <http://203.230.169.10:1024/solarsys/crater.htm>. [2] Pilkington M. and Grieve R. A. F. (1992) *Reviews of Geophysics*, 30, 161-181. [3] Cunningham, W. D. et al. (1997) *Tectonophysics*, 277, 285-306. [4] Atlas of the Mongolian People's Republic (1990) Moscow. [5] Olsen J. W. ed. (1996) Novosibirsk.

POSSIBLE CRATER IN MONGOLIA: G. Komatsu et al.



Fig. 1. RADARSAT image of possible impact structure in southern Mongolia.

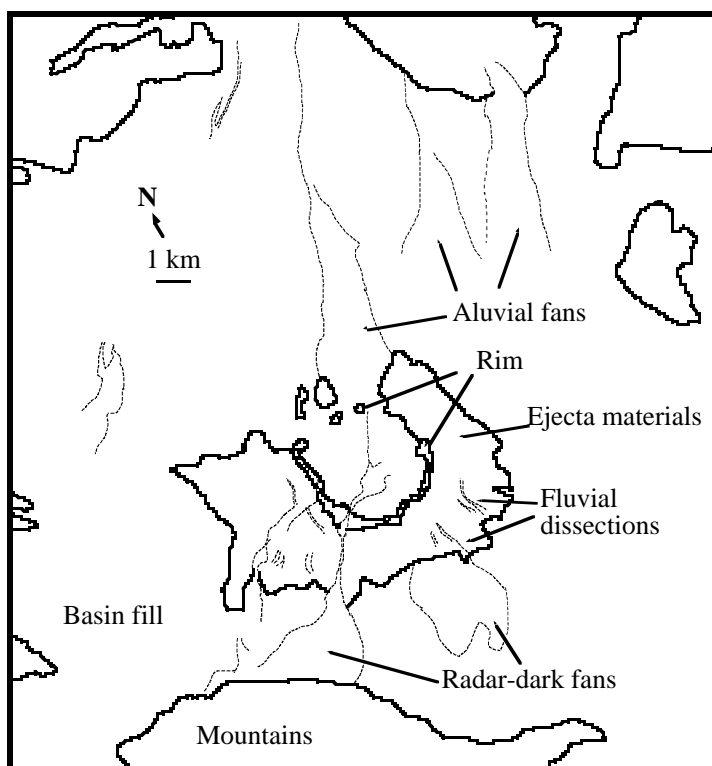


Fig. 2. Geomorphological interpretation of possible impact structure.