

RECENT DEVELOPMENTS IN THE SEARCH FOR THE SITE OF THE 780,000 YEAR OLD SOUTHEAST ASIA IMPACT. C. C. Schnetzler¹, P. S. Fiske², J. B. Garvin³, J. J. Frawley⁴, ¹SSAI at NASA's Goddard Space Flight Center, Greenbelt MD 20771 USA, cschnetz@ltpmail.gsfc.nasa.gov, ²Physics and Space Technology Directorate, L-45, Lawrence Livermore National Laboratory, Livermore, CA 94550, ³Code 921, Goddard Space Flight Center, ⁴Herring Bay Geophysics at NASA's Goddard Space Flight Center.

Introduction: The australasian tektite strewn field covers approximately 15% of the Earth's surface. Despite the young age and large size of the field, no source crater has yet been found. It has long been suspected that the source was somewhere in or near Indochina [1, 2]. Several recent studies strongly support this hypothesis.

Field Studies: In the early '90's, a literature compilation of all tektite sites in Indochina, suggested there was a region of central Indochina where no splash-form (i.e., aerodynamically shaped) tektites occurred, but a number of the more primitive layered (Muong Nong) tektites were reported in this area [3]. Since that time there have been four field expeditions to portions of this area, and each has confirmed that while thousands of layered tektites are reported, not a single splash form sample has been found within an area of about 50,000 km² [4]. Moreover, this area seems to encompass most of the larger samples of layered tektites (>1 kg). Recently, in a study of mineral inclusions in layered tektites from Indochina, a sample from this "layered only" area had the greatest concentration of inclusions, by over an order of magnitude, compared to the highest values outside the area [5]. This unusual area runs from NE Thailand, through central Laos and into central Vietnam, essentially the same source region indicated by the variation in concentration of microtektites in ocean cores [6]. On the basis of these lines of evidence, the source crater should lie nearby.

Off-Shore Structure: Over 10 years ago, Seasat derived sea surface height measurements were used to search for off-shore structures which might be the result of ocean impact in the continental shelf around Indochina [7]. An approximately 100 km circular anomaly was noted off the coast of Vietnam, with a sea surface (i.e., gravity) magnitude commensurate with an impact crater. However, Seasat had an exact repeat orbit which left big gaps between orbits - on the order of 100 to 125 km. Geosat data has since become declassified and, with a drifting orbit, it had much denser coverage. We have applied essentially the same procedures to the Geosat data as was applied to the Seasat data, with similar results. Again, a large circular feature has been identified centered at 13.6°N/110.5°E. The maximum sea-surface depression is about 1.5 meters. This structure is about 600 to 700 km to the

ESE of the center of the "layered tektite only" region discussed above.

Summary: Although the source crater has not been identified, work over the past decade has narrowed the search area considerably. Presently there are two interesting prospects: somewhere in the 50,000 sq km area where layered tektites are ubiquitous and are the only type found, and a large gravity/topography structure off the coast of Vietnam in the South China Sea. Possible next steps in the search will be discussed.

References: [1] Cohen A. (1962) *Space Res.*, 3, 959-973. [2] Stauffer P. (1978) In *Proc. 3rd Regional Conf on Geology and Mineral Resource of SE Asia*, 285-289. [3] Schnetzler C (1992) *Meteoritics*, 27, 154-163. [4] Fiske P et al. (1999) *Meteoritics & Planet. Sci.*, in press. [5] Dass J and Glass B (1999) *Proc. LPSC XXV*. [6] Glass B and Pizzuto J (1994) *J. Geophys. Res.*, 99, 19075-19081. [7] Schnetzler C, Walter L and Marsh B (1988) *Geophys. Res. Lett.*, 15, 357-360.