SHOCK ATTENUATION CONSTRAINTS AT MANICOUAGAN: EVIDENCE FROM PLAGIOCLASE AND QUARTZ IN PROXIMITY TO SHATTER CONES. Lucy M. Thompson, Planetary and Space Science Centre, University of New Brunswick, Fredericton, New Brunswick E3B 5A3, Canada. Email: lthompso@unb.ca

Introduction: Determining the shock attenuation rate within a spatial context is important for understanding the distribution of the effects of shock compression and rarefaction, as well as helping to better constrain computer models of the impact process. As part of the Manicouagan Impact Research Program (MIRP), operated by the Planetary and Space Science Centre (PASSC) at the University of New Brunwick, mapping and sampling over a 10 year period is providing qualitative data as a start to defining shock attenuation signatures at this well-preserved crater. Field work has been complemented by access to 10 km of drill core materials held at PASSC.

Shatter Cones: The intensity of shatter cone development within intermediate gneisses of the Manicouagan impact structure increases along a transect from 27 km through to 12 km radius from the centre. Quartz and oligoclase within the shatter-coned gneisses reveal an associated increase in the intensity of recorded shock deformation from the edge of the structure towards the centre.

Quartz and Plagioclase: Quartz grains within gneisses at 27 km rarely exhibit single sets of decorated PDFs. Oligoclase exhibits minor fracturing and development of fine planar features within twins. At 15 km radius from the centre of the structure, multiple orientation, decorated PDFs are ubiquitous within quartz grains, and multiple orientation, fine scale planar features are well developed within twins in oligoclase. In thin section, the gneiss has a "cloudy" appearance, owing to the preponderance of planar features in both the plagioclase and quartz. Shatter-coned gneisses at 12 km radius, are even darker in thin section. Quartz grains exhibit high densities of multiple orientation, decorated PDFs, which give the grains a "toasted" appearance. Oligoclase grains also exhibit high densities of multiple orientation planar features within twins, and the development of extensive isotropic, glassy-looking domains.

Shatter cones from the anorthositic gneiss central uplift at Manicouagan, at 4 km radius from the centre, exhibit fractured labradorite grains. The intensity of the fracturing increases towards shatter cone surfaces. Fine scale multiple planar features within twins are only manifest in labradorite grains immediately adjacent to shatter cone surfaces.

Summary: This work summarizes the results of a Raman and FESEM investigation of oligoclase and labradorite grains from shatter cones at Manicouagan. This will allow a better understanding of the mechanisms of shatter cone formation, as well as the response of plagioclase to shock. Future work will aim to further constrain and calibrate shock in feldspar.