**Nunavut Research Institute**
**License No. 01 003 13R-M – Non-Technical Summary Report**
Dr. S. Brooke Milne, Department of Anthropology and Centre for Earth Observation Science (CEOS), University of Manitoba

In 2013, Drs. Brooke Milne and Mostafa Fayek (Geological Sciences, University of Manitoba) successfully executed the second of a two-year fieldwork program that aims to understand the geology characterizing the deep interior of southern Baffin Island in addition to identifying previously unknown Palaeo-Eskimo sites in the region. The goals of this fieldwork were to locate and sample bedrock outcrops bearing *in situ* deposits of chert, and to test any nearby Palaeo-Eskimo sites. Both the archaeological and geological chert samples recovered through this work will be geochemically analyzed and the results integrated into a larger provenance study investigating the diversity and distribution of chert toolstone on southern Baffin Island. Because chert is the most common type of stone used by Palaeo-Eskimo toolmakers, we can use this stone as a proxy to examine culture-historical questions relating to Palaeo-Eskimo seasonal mobility, technological organization, culture change, and land use among southern Baffin Island's inland and coastal regions.

Milne, Fayek, and one Masters student from the University of Manitoba (Landry) spent six days (July 14 – 19, 2013) investigating locations via helicopter near Mingo and Amadjuak Lakes, and along the Hone and Nuvungmiut Rivers. An important component of this work was to scan in 3D two known sites – LdFa-1 and LeDx-42 – near Mingo Lake to create precise digital records of their respective surface features and locations. Any new sites were to be similarly scanned and digitally recorded. Four new sites were identified of which two are of particular interest to this project since they are located adjacent to *in situ* outcrops of chert. These two sites are dominated by dense surface scatters of chert flake debris indicating acquisition of chert toolstone was an important activity during their use, and they are of Palaeo-Eskimo affiliation based on the identification of a single burin spall at each respective location. These locations confirm the existence of the elusive chert quarries we have been looking for over the past decade. One of these sites is located along the Hone River while the other is located at the southern extent of Amadjuak Lake.

Small random test pits were excavated at three of the four newly identified sites: the two quarry sites, and a small campsite found roughly 10 km west of LdFa-1 on the shores of an unnamed lake. Sizeable quantities of debitage were recovered from the quarry site tests, while the single test from the small campsite was entirely sterile. No other diagnostic artifacts were located at any other investigated sites.

Of the sites visited this summer, only three were digitally scanned: LdFa-1, LeDx-42, and the largest quarry site located on the Hone River. Unforeseen weather conditions hampered efforts to scan the other locations. The two sites that were not scanned, including the small camp site noted above and another larger habitation site located near the mouth of the Hone River where it drains into Amadjuak Lake, were sketched, photographed from the ground and air, and recorded using GPS.

The geological survey identified several locations where chert was found *in situ* within limestone bedrock outcrops, and limestone boulders that represent the final erosional stage of these larger outcrops. The chert that is found scattered across the landscape near Mingo and Amadjuak Lakes, and along the shorelines of the Hone and Nuvungmiut Rivers derives from *in situ* weathering of these limestone bedrock formations. These formations are visible outcropping throughout the interior; however, only some of the stratigraphic layers contained within them are chert bearing.

Numerous geological samples were collected from the outcrops and eroded boulders, and their respective geochemical signatures will be analyzed to determine if they are consistent with one formation event or if they are geochemically distinct suggesting multiple formation events. Characterizing these source

locations will make it possible for us to assess source diversity, which is essential information to have as we attempt to "match" the archaeologically derived chert to the correct source location(s). Geochemical analysis of the raw chert samples is scheduled to being in the Fall of 2013. Technological analysis of the stone artifacts recovered is planned for that time as well after which a number of them will be geochemically analyzed in an effort to link them back to their original source.

Photo 1. Example of *in situ* chert nodules embedded in a limestone outcrop near the Hone River, Southern Baffin Island, NU (photo credit: © Milne 2013).

Photo 2. An example of an eroding limestone boulder with *in situ* chert, Southern Baffin Island, NU (photo credit: © Milne 2013).

Photo 3. View of dense scatter of chert flaking debris found *in situ* at a large Palaeo-Eskimo site located on the shores of the Hone River, Southern Baffin Island, NU (photo credit: © Milne 2013).