Overview:

Since 2011, archaeological surveys have been undertaken in northern Malawi to test hypotheses about Middle Stone Age (MBA) human mobility patterns and technological responses to climate change at the landscape scale. Data were collected over a region comprising approximately 100,000 km² to understand artifact attributes relative to different geological deposits and landscape characteristics. The 2012 and 2013 surveys consisted of a suite of surface and aerial surveys designed to provide data addressing Middle Stone Age issues, including site identification, artifact characteristics, and human-environment interactions. This paper presents a synthesis of the findings from these surveys, focusing on the landscape analysis, which is the primary focus of this contribution.

Landscape Survey:

The survey consisted of four main transects, each of varying distances and covering different water catchment areas, in order from north to south: North Rufukan, Ruwash, Remero, and Nyungwe. While walking the transects, changes in landscape and geological environment were noted and a new section number was created for each of these areas. Additionally, within each transect, regardless of landscape or geologic area, every 100 m a total surface recording was completed, in which every exposed artifact 2.5 cm in maximum dimension found in a 2 x 2 m area was recorded and then returned to its original place. During the survey, all sections were recorded, regardless of geology or landscape area, before being replaced in their original first location.

Discussion:

In previous surveys, we found that there are significant differences in raw material characteristics (material, crystal size, shape) between catchments in the study area. This is likely related to the differing geologic formations that are drained by each, leading to distinct raw material and geologic profiles for each catchment. A clear pattern emerged where quartz was both more available and more frequently sampled in the southern catchments relative to the northern catchments. This pattern suggests a highly “local” mode of raw material exploitation, with raw material selection having occurred amongst cobbles found in the immediate vicinity. A pattern of hunter-gatherer land use may be inferred from this in which local catchments were exploited along the environmental gradient leading to exploiting the flintstones of the Nyaka and Malurubu Plateaus long before the study area was lived in.

Unmanned Aerial Survey

For the 2014 survey, a Quadcopter UAV was used for aerial data collection activities. The surveyor surveyed the study area along the transects in the Karonga District, northern Malawi at a height of 300 cm from the ground. The following high resolution images of test pits and excavations within the Karonga District were captured by the UAV:

While the UAV was an excellent tool when operating as intended, the navigation software included with the device was prone to abrupt and unexplained errors which curtailed our aerial data collection activities, before the completion of the first season. Fortunately, the data already acquired from the drone was downloaded in a regular fashion and was promptly available for processing by the survey imagery.

Conclusion:

The surveys from 2012-2014 have yielded results about land use, resource availability, and landscape change over different archaeological sites that suggest further work in this vein will be fruitful. They have also guided the research methodology to a solution that is optimal for this specific context. For example, the total recordings done every 100 m were not sufficient to represent the density and diversity of raw material occurrences. Core attributes did not have any significant incremental change over the landscape, but could be detected even with a small sample from the flintstone assemblages and the alluvial plain assemblages. This hints at cores being used as an ‘on-demand’ resource for quick flake manufacture in some areas, whereas in others different approaches were applied that could not be identified. The survey also revealed new sites of potentially high significance. Ongoing surface data collection methods in these areas may result in further archaeological investigations, while maintaining more focused approaches that may be extended to include archeological settings elsewhere.