Enhancements in the Processing of GPR Data at Maax Na, Belize, Central America

Julie Aitken*
University of Calgary, Calgary, Alberta, Canada
jaitken@ucalgary.ca

and

Robert Stewart and John Bancroft
University of Calgary, Calgary, Alberta

Abstract

The University of Calgary has been inv olved in geophys ical research at the Maax Na archaeological site in Beliz e for the last four years. A number of 2- D and 3-D ground-penetrating radar (GPR) surveys have been acquired using the 250 MHz Noggin Smart-Cart. Continued enhancements in the processing flow, and the application of creative algorithms have resulted in a dramatic improvement in the GPR image. The most successful processing flow to date consists of a static tim e shift and setting equidistant tr aces, the application of a "dew ow" low-cut filter, gain function, Q-filter and running aver age spatial filter, follo wed by a diffraction stack migration and a bandpass filter.

Interpolation issues r elating to a lack of r egularly sampled data continues to plague ground-penetrating radar. Although the results of using Kirchoff time migrati on as an interpolat or looked promising on the Maax Na data, it was rec ognized that a mo re finely sampled dataset would be advantageous in the developm ent of a successful application. With this in mind, the University of Calgary recently shot a small su rvey on a property east of Fish Creek Park to counter questions regarding interpolation. In this particular surv ey, line separation was r educed to 20 cm (compared to 50 cm at Maax Na), with trace interval set at 5 cm. Questions perta ining to lin e separation distance and spatial resolution, suitable trace intervals, and the importance of acquisition direction were addressed. Interpolation using the full datas et and subsets of the dat aset highlighted best practices in terms of parameter selection. This resea rch will be used to im prove our acquis ition parameters and how we acquire the data when we return to Belize in the 2006/2007 field season.