

A new look at Bust: Google Earth™ and archaeological sites in Afghanistan

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Introduction

Since its launch in 2005, archaeologists have been quick to integrate the freely available Google Earth images into their PowerPoint presentations. Few, however, have explored the analytical as well as the aesthetic potential of Google Earth (Jason Ur is one of the exceptions). The Archaeological Sites of Afghanistan in Google Earth (ASAGE) project is using Google Earth images to collate new information about the archaeological remains of southern Afghanistan, where fieldwork opportunities are currently limited (Fig. 1 - below).



Fig. 1: Bust

Extensive medieval Islamic remains have survived in southern Afghanistan, despite the ravages of war and encroaching agriculture and urban sprawl. The tenth to twelfth century Ghaznavid dynasty's winter capital of Bust / Lashkari Bazar, for example, stretches for over seven kilometres along the Helmand river. French archaeologists worked at the site from 1949-1952 but despite their impressive achievements, large areas remain unsurveyed due to the sheer scale of the remains and the meagre resources at their disposal.

Google Earth- methodology

Given the scale of Bust and the detail visible in the Google Earth images, the most practical approach to remote surveying was to 'capture' overlapping images of parts of the site and then to 'stitch' the images together using ArcSoft Panorama Maker. Consistency was ensured by zooming in to 100 m scale, so that each image covers ca 400 x 250 m. The high resolution images were exported and stitched together in north-south strips. Plans of the extant archaeological remains were then digitised in Adobe Illustrator.

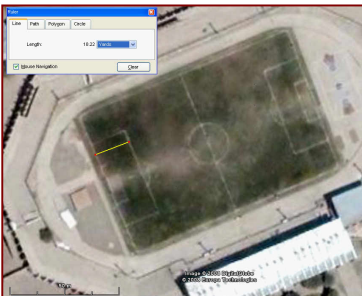


Fig. 2 (left): Accurate measurements?

Satellite images are prone to distortion, while the measurement tools available in Google Earth are potentially misleading in their apparent accuracy. One way to check the level of accuracy is to measure features of known dimensions, such as tennis courts and '18 yard boxes' on soccer fields.

We measured these regular and readily identifiable features on six continents, and found their measurements to be usually within +/- 1 to 2% of the expected values. Consequently, while it would be unwise to attempt to draw precise plans from Google Earth images, they can be used to generate detailed, scaled sketch plans of sites.

Benefits of using Google Earth at Bust

The aerial perspective enables archaeologists to identify the remnants of structures and canals not visible on the ground. The ASAGE plans provide Afghan archaeologists with the framework on which to base large area surveys and to undertake more detailed, localised studies. They will also enable local authorities to monitor the encroachment of agriculture and urban areas.



Fig. 4: The citadel at Bust

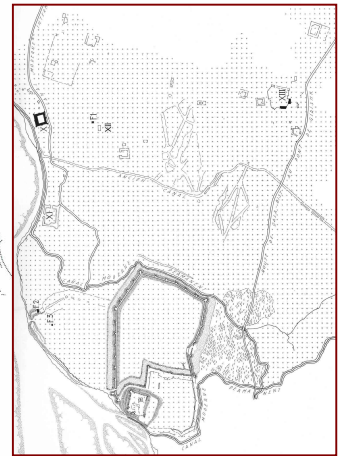


Fig. 3: A new plan of Bust

The plan of Bust (above) was published by Schlumberger in 1978. Our plan (left and below) has added to it significantly, particularly in the fortified mound and citadel area (see also Fig. 4).

Conclusions

The potential for further research using Google Earth images is huge, particularly as the areas covered by high resolution images increase. Many of the 1,200 sites listed in Ball's *Archaeological Gazetteer of Afghanistan* lack basic, let alone detailed, plans and measurements. We are currently in the process of compiling a gazetteer of the forty-nine medieval sites listed by Ball which fall in high resolution areas. Further research (with Dr Fiona Kidd, University of Sydney, and Suzanna Nikolovski, La Trobe University) has located hundreds of 'nomad' sites in a virtually unexplored 75 x 17 km strip of the Registan desert to the east of the Helmand.

Google Earth has the potential to offer archaeologists far more than aesthetic images.

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