High Resolution Stereo Satellite Elevation Mapping Service Confirmed Proof of Accuracy

Case History Asmara, Eritrea

One meter contours produced by geophysical processing of stereo satellite photos over an area of 200 square kilometers.

Elevation accuracy of better than 50 centimeters RMSE as determined by over 10,000 conventionally established elevation check points.

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The one meter contours and a 2 meter square grid of elevation values, covering an area of 200 square kilometers, were produced for the Asmara Project of Sunridge Gold in Eritrea [TSX.V:SGC]. The one meter contours and elevation grid were constructed using geophysical processing of stereo satellite photos taken by the high resolution GeoEye IKONOS satellite. The stereo satellite elevations were referenced to the same benchmark as over 10,000 previously established accurately surveyed gravity survey stations.

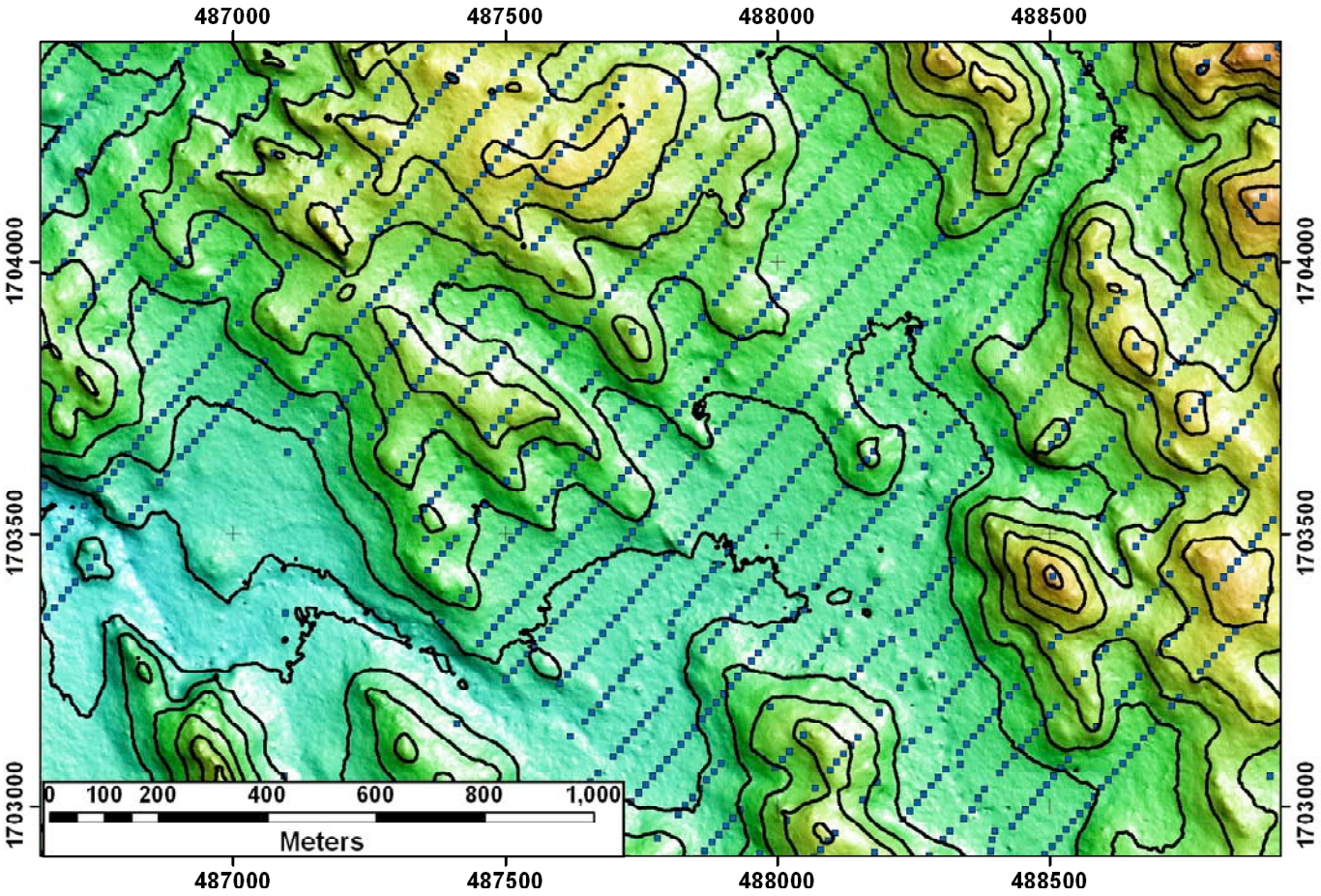

FIGURE 1
Stereo satellite elevation map with 10m contours showing some of the 10,081 check points used to determine the elevation mapping accuracy of better than 50cm Root Mean Squared Error [RMSE] on the Sunridge Gold Asmara Project. For more information on the Sunridge Gold Asmara Project please consult the Sunridge Gold website: www.Sunridgegold.com/s/Asmara.asp

FIGURE 2
Asmara Project, Eritrea. MWH Geo-Surveys differential GPS survey crew and equipment. Over 45,000 gravity stations were surveyed from 2004 through 2008 using differential GPS instruments from Magellan. All the GPS positions were surveyed in Real Time Kinematic [RTK] mode with accuracies of 2cm or better. 10,081 of these gravity survey stations were used as elevation check points for the stereo satellite elevation mapping accuracy assessment. The Magellan RTK GPS base with a **ProMark**™ 500 GPS rover are shown in this photo.

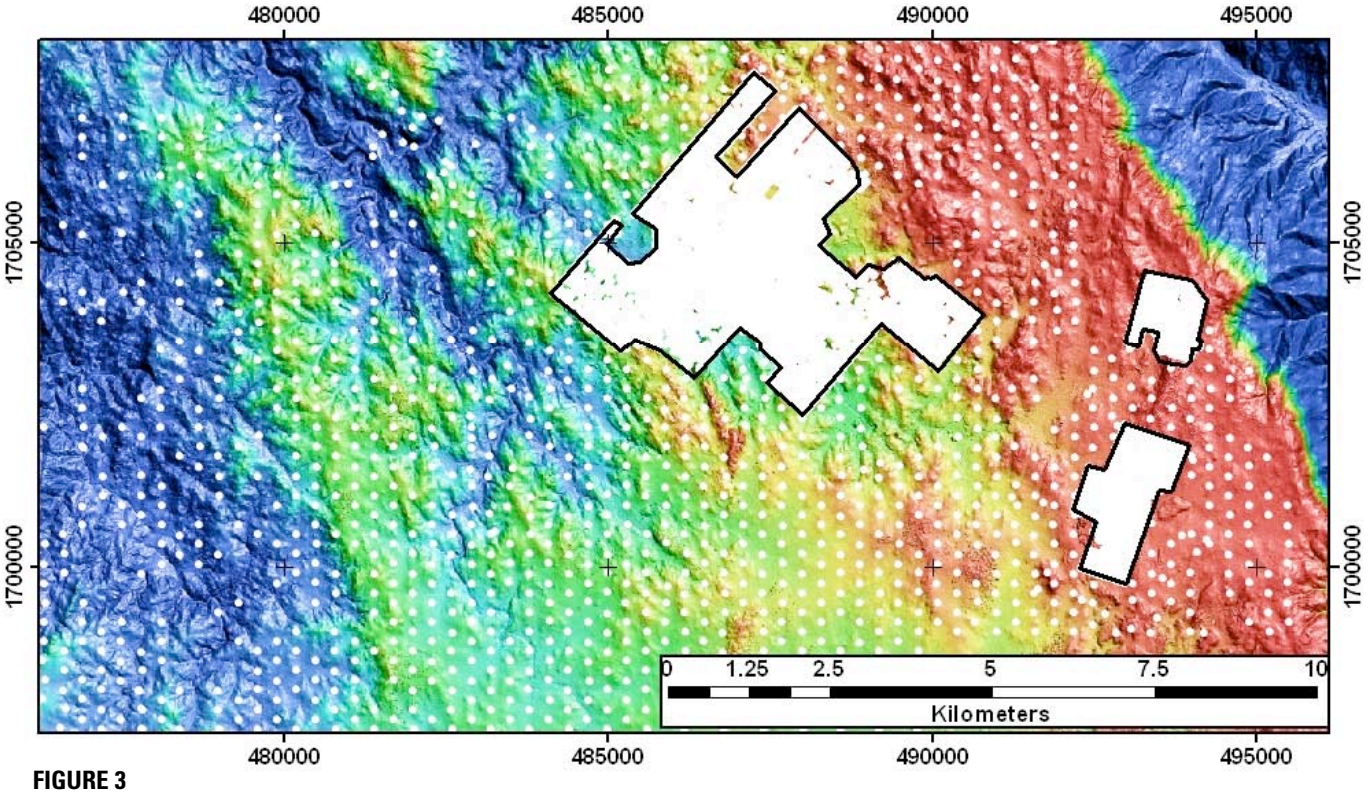

FIGURE 3
Map showing the 10,081 gravity survey stations used as elevation survey check points to determine the accuracy of the stereo satellite elevation mapping. The survey check points have an elevation range of 490m, from 2,003m to 2,493m above sea level. The black polygons outline areas with 20m by 100m grids of elevation check points. These closely spaced elevation check points confirm that the 2m square grid of elevation values from the stereo satellite elevation mapping accurately represent the fine topographic detail on the ground, as can be seen in **figure 1** and **figure 6**.

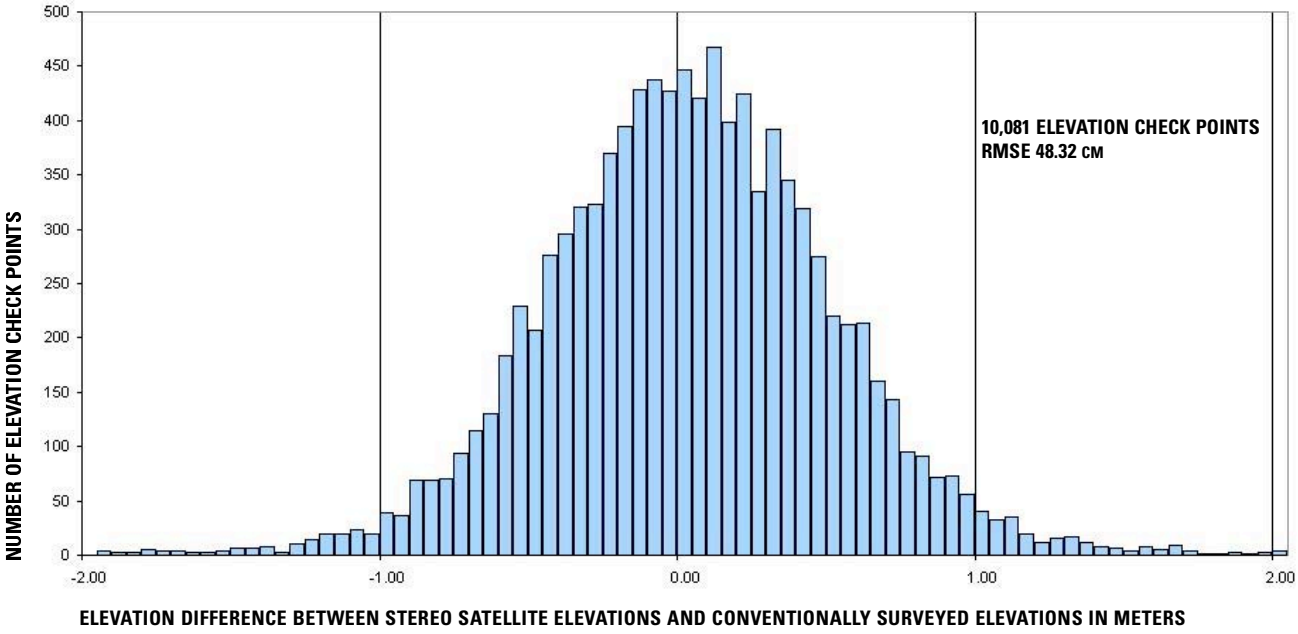

FIGURE 4
Histogram of the elevation differences between the stereo satellite elevations and the elevation check points showing an RMSE of better than 50cm for 10,081 elevation check points. The satellite elevation mapping was tied to a single benchmark by an identical linear shift to the entire 2m square grid of stereo satellite elevation points and then compared to the 10,081 elevation check points. There were absolutely no other adjustments to the satellite elevation data, such as stretching or fitting to multiple ground survey control points. As recommended in the *Guidelines for Digital Elevation Data* of the US National Digital Elevation Program (NDEP), the elevation check points are not beside buildings, on topographic ridges nor in areas with slopes of greater than 20% grade.

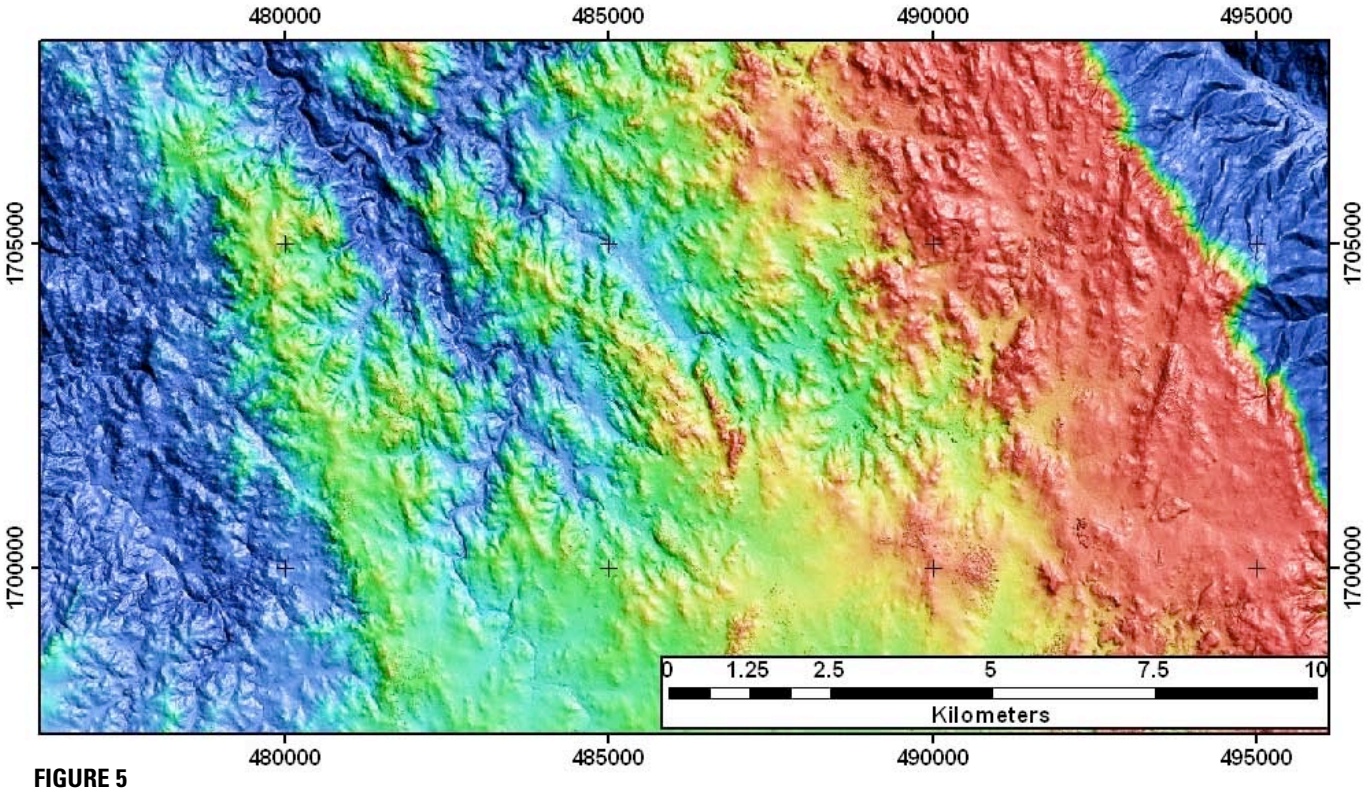

FIGURE 5
The entire area of the 200 square kilometer Asmara, Eritrea stereo satellite elevation mapping project. The elevations range from 1,533m above sea level in blue in the deep valley in the northeast corner to 2,500m above sea level in red in the high plateau.

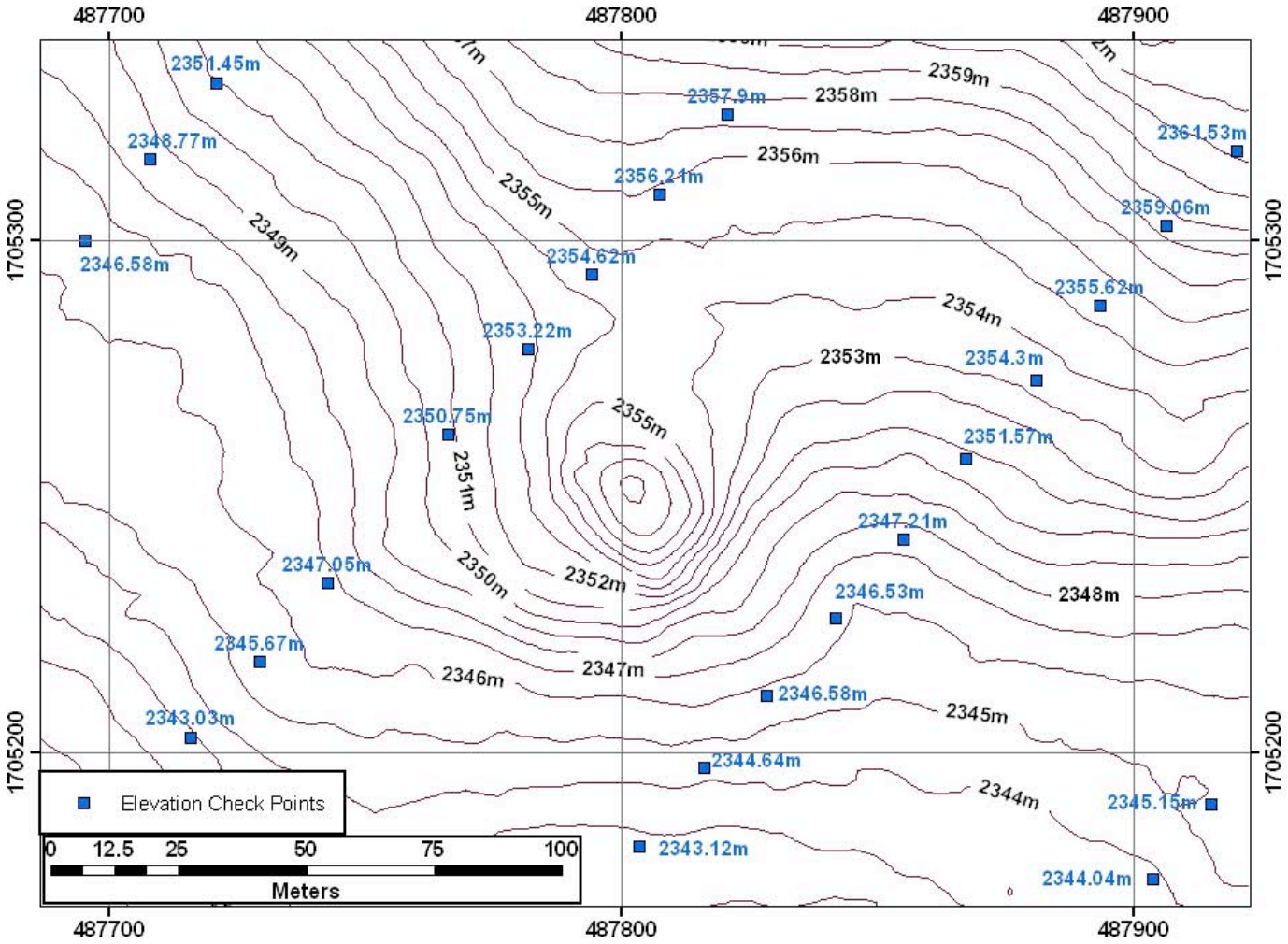

FIGURE 6
One meter contours from the stereo satellite elevation mapping showing the elevations of some of the 10,081 elevation check points used to determine the stereo satellite mapping accuracy of better than 50cm RMSE.

For Gravity Surveying and Ground Control Points
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