

HIGH-RESOLUTION STEREO SATELLITE ELEVATION MAPPING SERVICE

Confirmed Proof of Accuracy, Case History, WorldView-2 Stereo Photos, Asmara, Eritrea

A one-metre square grid of elevations was produced by geophysical processing of WorldView-2 stereo satellite photos over an area of 400 square kilometers.

The elevation accuracy is better than 30cm RMSE as determined by 21,944 conventionally established elevation checkpoints.

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A 1 m² grid of elevation values, covering an area of 400 square kilometres, was produced for the Asmara Project of Sunridge Gold in Eritrea (TSX.V:SGC). The elevation grid was constructed using geophysical processing of 50 cm ground resolution stereo satellite photos taken by the DigitalGlobe WorldView-2 satellite. The stereo satellite elevations were referenced to the same benchmark as over 20,000 previously established accurately surveyed gravity survey stations.

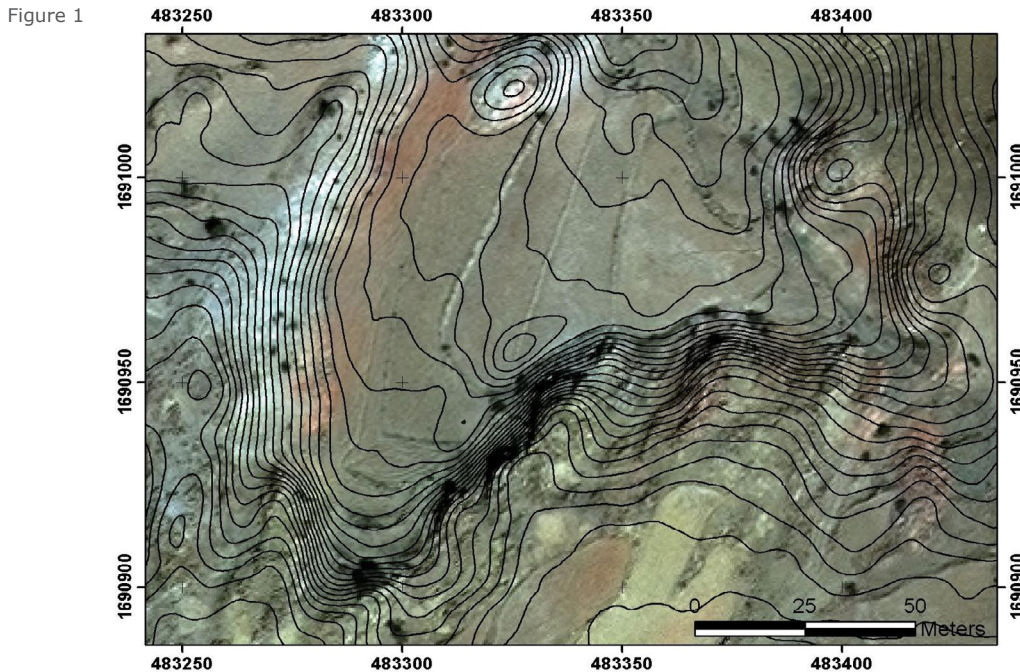


Figure 1

Figure 1:
WorldView-2 color image with 50cm contours from the stereo WorldView-2 elevation mapping for the Sunridge Gold Asmara Project. For more information about the Sunridge Gold Asmara Project, please consult the Sunridge Gold website: www.Sunridgegold.com/s/Asmara.asp



Figure 2

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 of the GPS positions were surveyed in Real Time Kinematic (RTK) mode with accuracies of 2cm or better. In fact, 21,944 of these gravity survey stations were used as elevation checkpoints for the WorldView-2 stereo satellite elevation mapping accuracy assessment. The Magellan RTK base with a ProMarkTM 500 GPS rover are shown in this photo.

Figure 3



Figure 3:
The entire 400 square kilometer Asmara, Eritrea WorldView-2 stereo satellite elevation mapping project was tied to two ground control points, one of which is shown in this photo. The accuracy of the stereo satellite elevation mapping of better than 30 cm RMSE was determined using 21,944 independent elevation checkpoints.

Figure 4

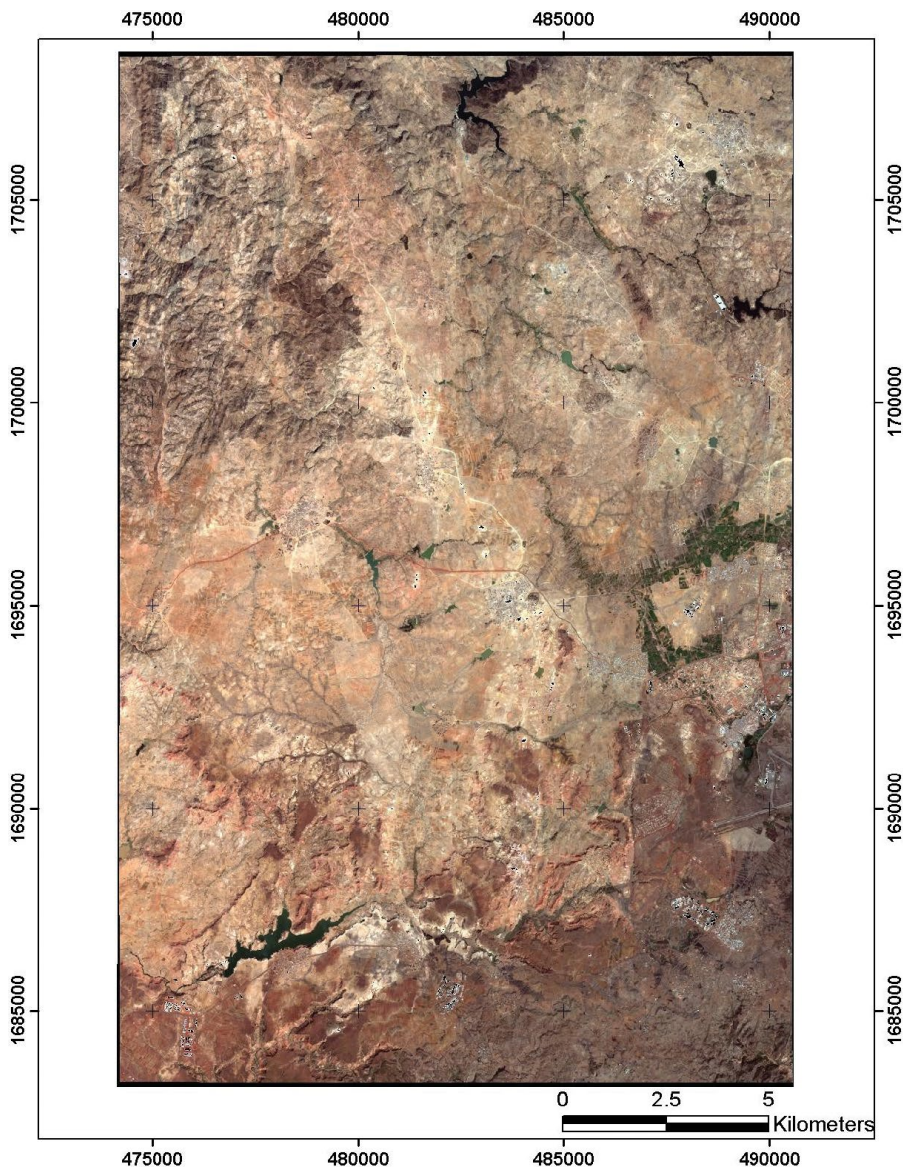


Figure 4:
Asmara, Eritrea.

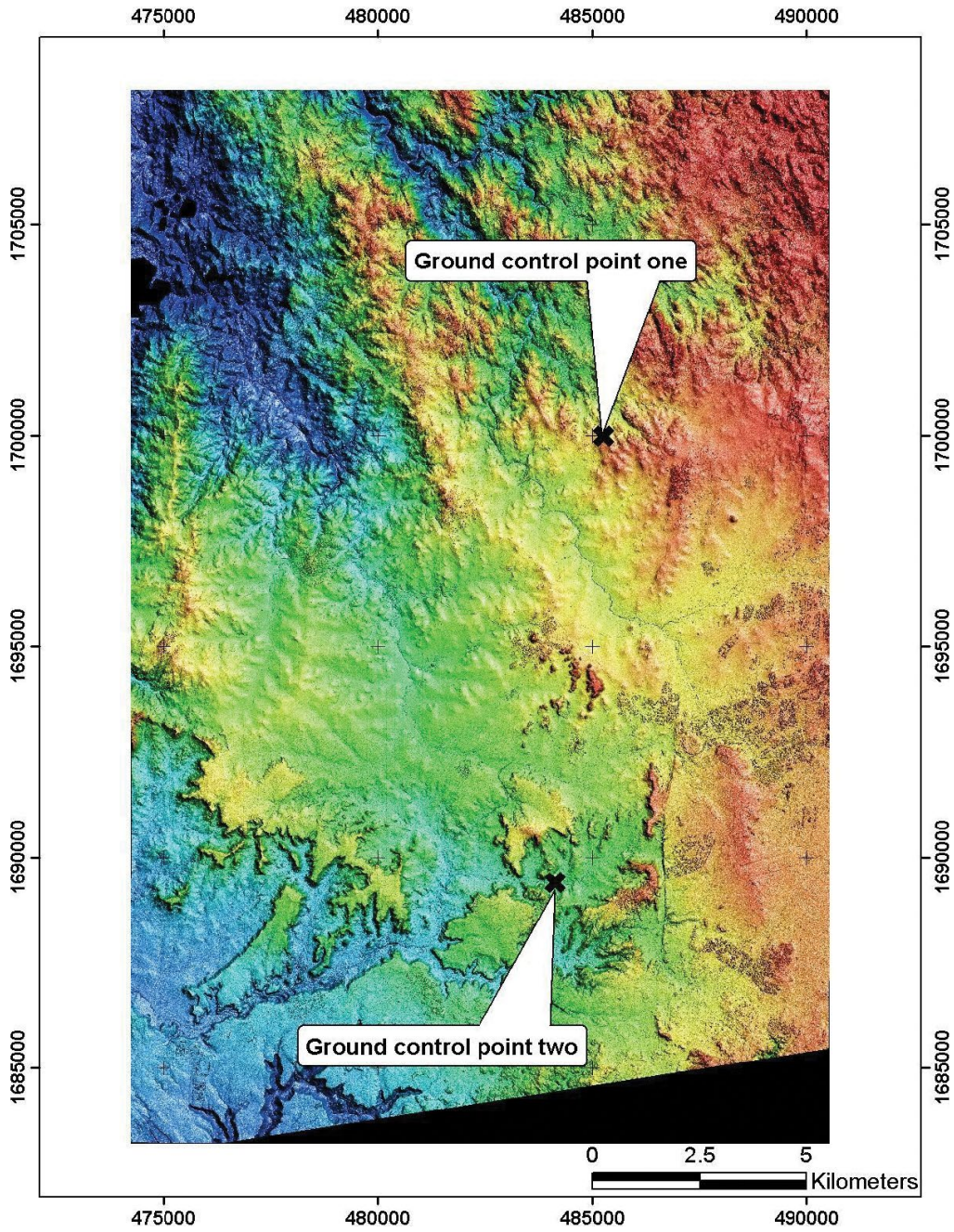


Figure 5:
Stereo WorldView-2 elevation image created from a 1 m posted DEM showing the two ground control points. Asmara, Eritrea.

Figure 5

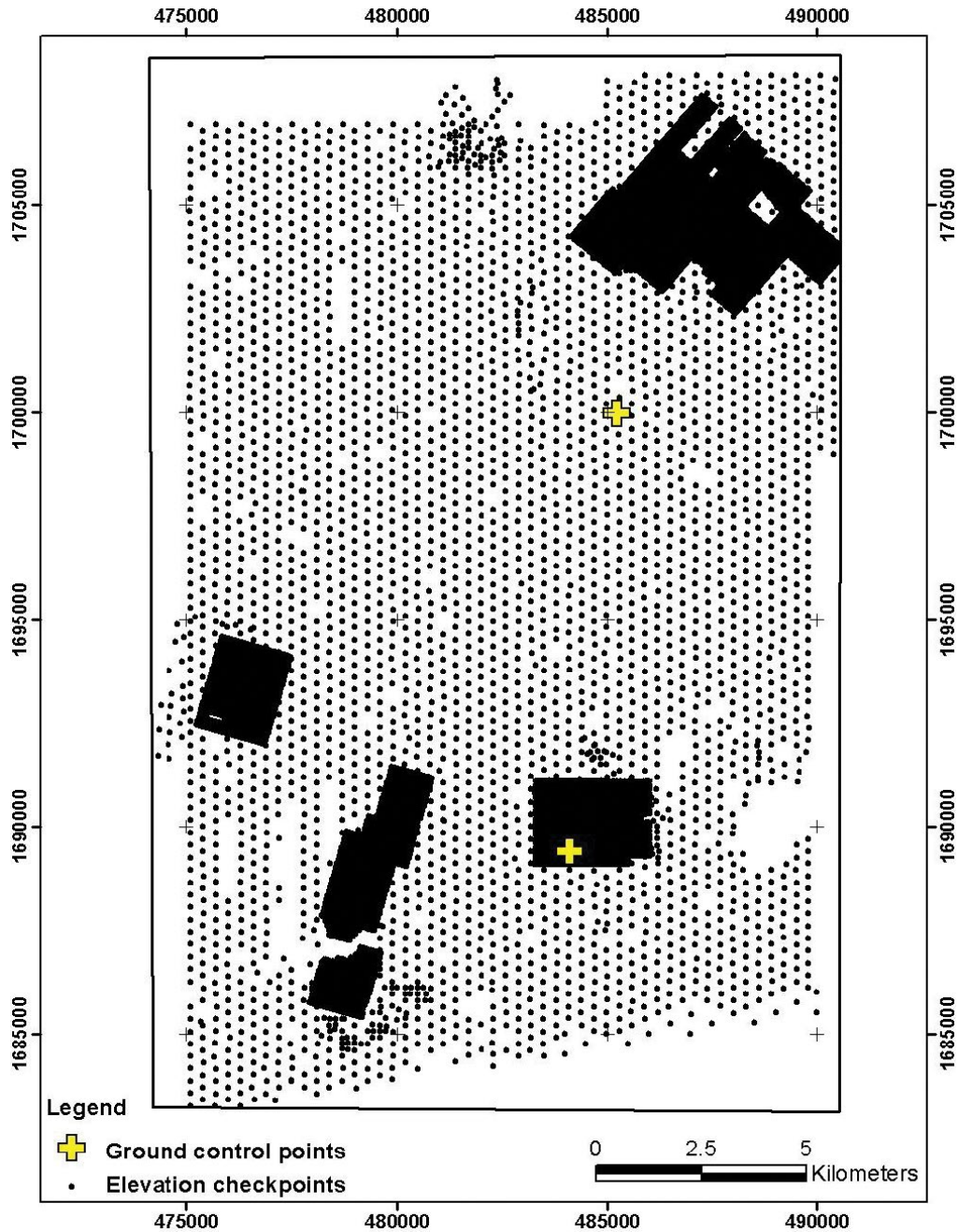


Figure 7

Figure 7:
Area of the 25 km by 16 km Eritrea Stereo WorldView-2 1 m posted DEM showing the two ground controls point and the 21,944 gravity survey stations used as elevation checkpoints to determine the accuracy of the stereo satellite elevation mapping.

Figure 8

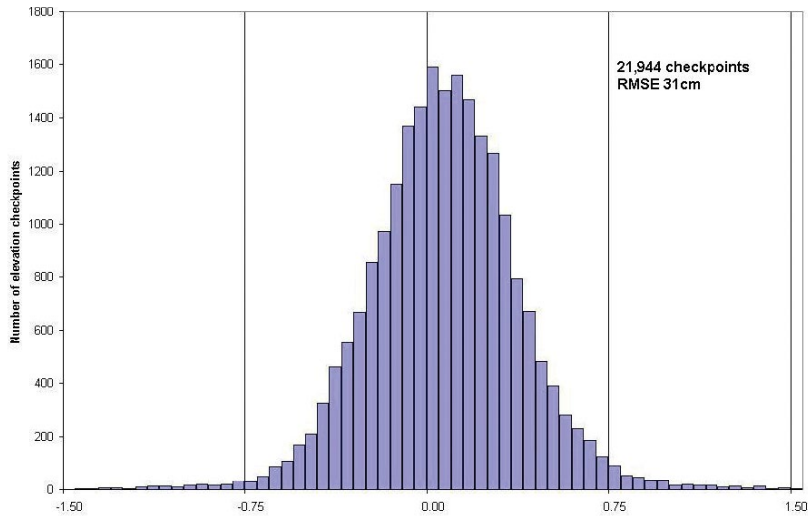


Figure 8:
The following is a histogram of the elevation differences between the WorldView-2 stereo satellite elevations for the 25 km by 16 km area and the 21,944 elevation checkpoints. RMSE 31 cm.

Figure 9

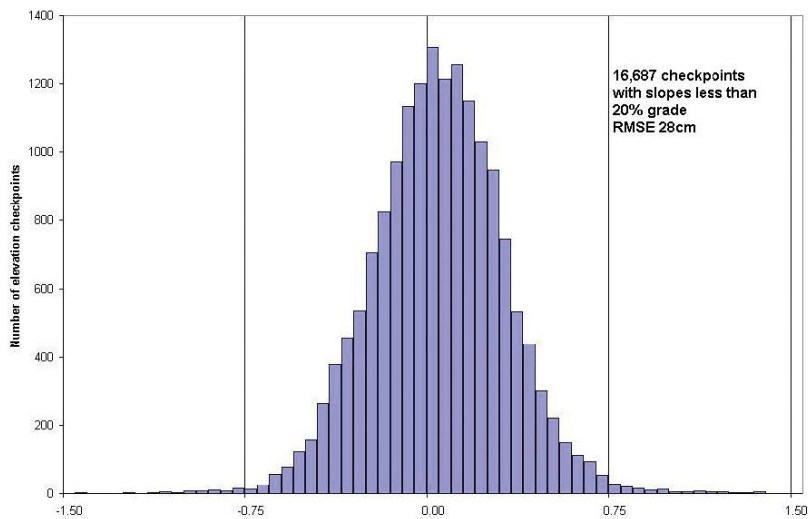


Figure 9:
The following is a histogram of the elevation differences between the WorldView-2 stereo satellite elevations for the 25 km by 16 km area and the 16,687 elevation checkpoints with slopes less than 20% grade. The Guidelines for Digital Elevation Data of the US National Digital Elevation Program (NDEP) recommends that elevation checkpoints should not be chosen in areas with slopes greater than 20% grade. RMSE 28 cm.

Figure 10

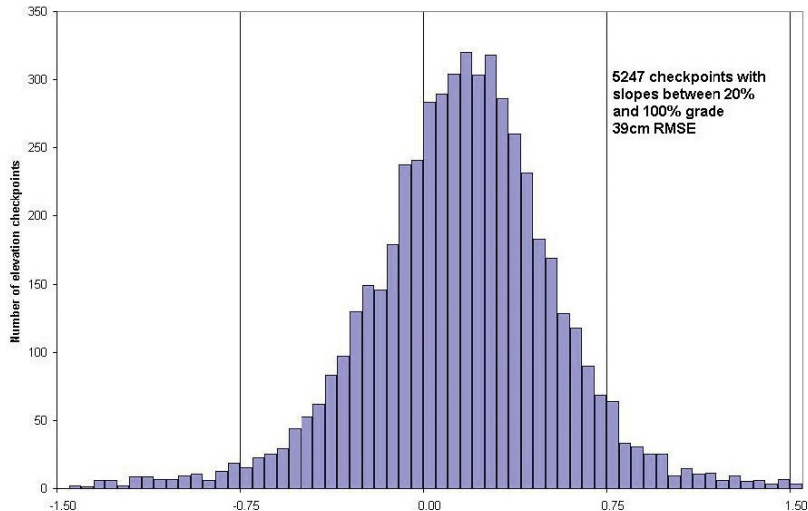


Figure 10:
The following is a histogram of the elevation differences between the WorldView-2 stereo satellite elevations for the 25 km by 16 km area and the 5,247 elevation checkpoints with slopes between 20% and 100% grade. RMSE 39 cm.

Cautionary Statement: This is an accuracy assessment for elevation mapping from a single stereo pair of WorldView-2 satellite photos. While we expect that these results will be typical for most WorldView-2 stereo photos, we cannot yet confirm that these results apply to more than this pair of stereo photos.

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