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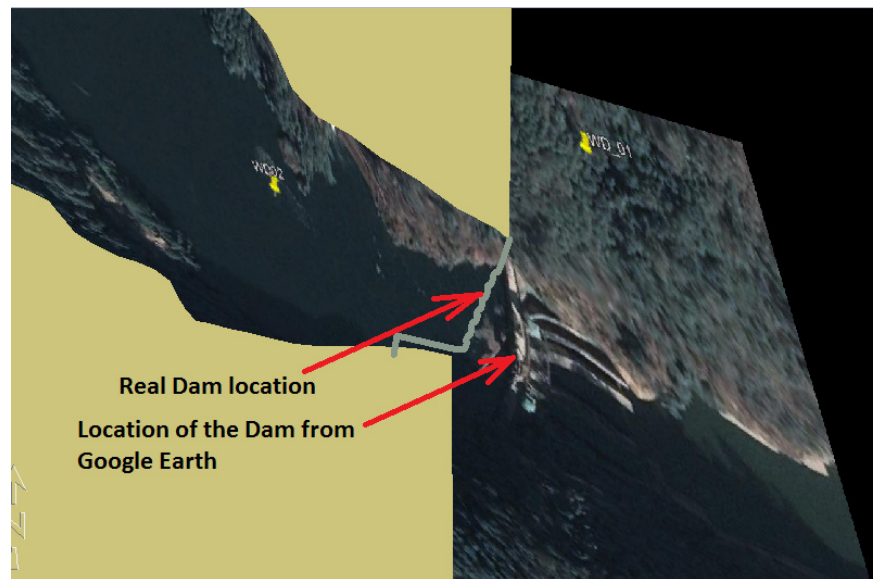
Improving Google Earth Image Georeferencing

By Ivan Izaak

Recently, I've had a chance to work in the Himalayans at 2000m altitude in Bhutan. This was the first time for me to work in the mountains using a Google Earth image as the only background available. I have learned some things that I'd like to share.

During the first attempt, the results were quite bad as seen in Figure 1

FIGURE 1. Initial Google Earth Image After Digitizing in HYPACK® IMAGE GEOREFERENCE.

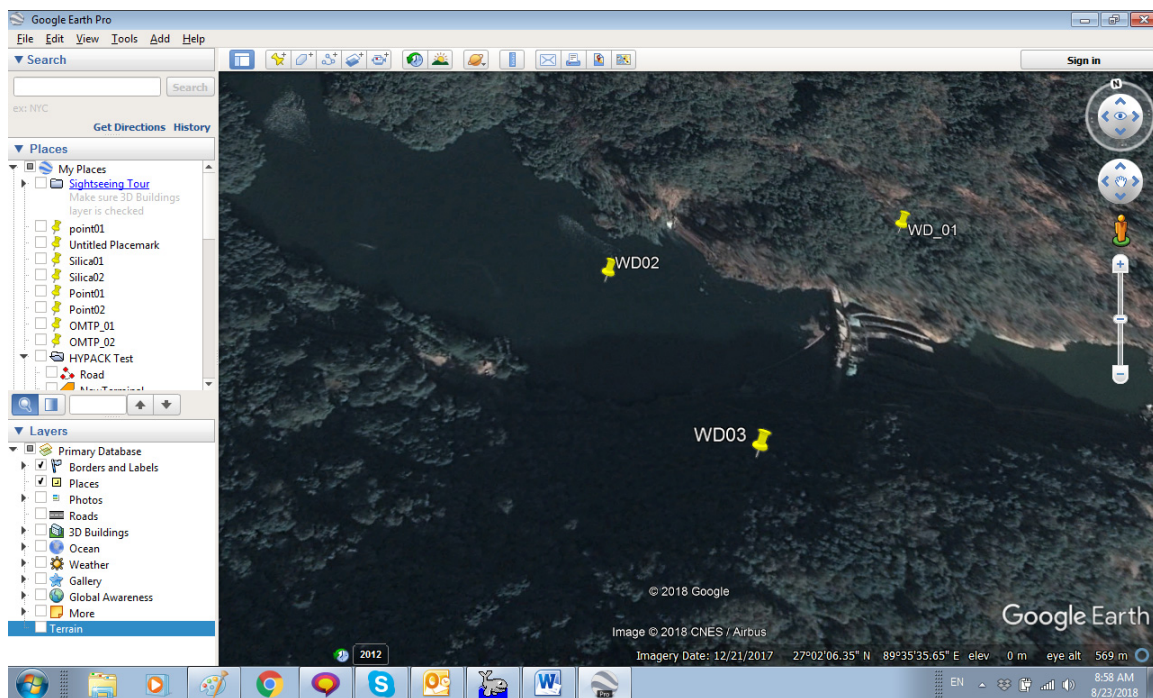


I know that Google Earth does not give very precise locations, and it may vary from 1 to 15m in different locations, but in this case, the difference was around 60m and orientation of the chart was totally wrong. Eventually, I tried deselecting the Terrain option. Figures 2 and 3 shows the difference in Google Earth program:

FIGURE 2. Google Earth Screen with the Terrain Option Checked.



FIGURE 3. Google Earth Screen with the Terrain Option Unchecked.



And now the image looks better in HYPACK® ([Figure 4](#)).

FIGURE 4. Google Earth Image Without the Terrain Option After the Digitizing Process.



Well, the difference in position is still about 10m at the southern corner and the orientation difference is about 10 degrees. It could still be better, so I searched for more ways to improve the accuracy.

In Google Earth, there is an option to browse for historical imagery as shown in [Figure 5](#). I've noticed that, at different times, the satellite images were taken from different perspectives and I found an earlier image, taken in 2012, that was from a better perspective.

FIGURE 5. Checking Historical Images in Google Earth

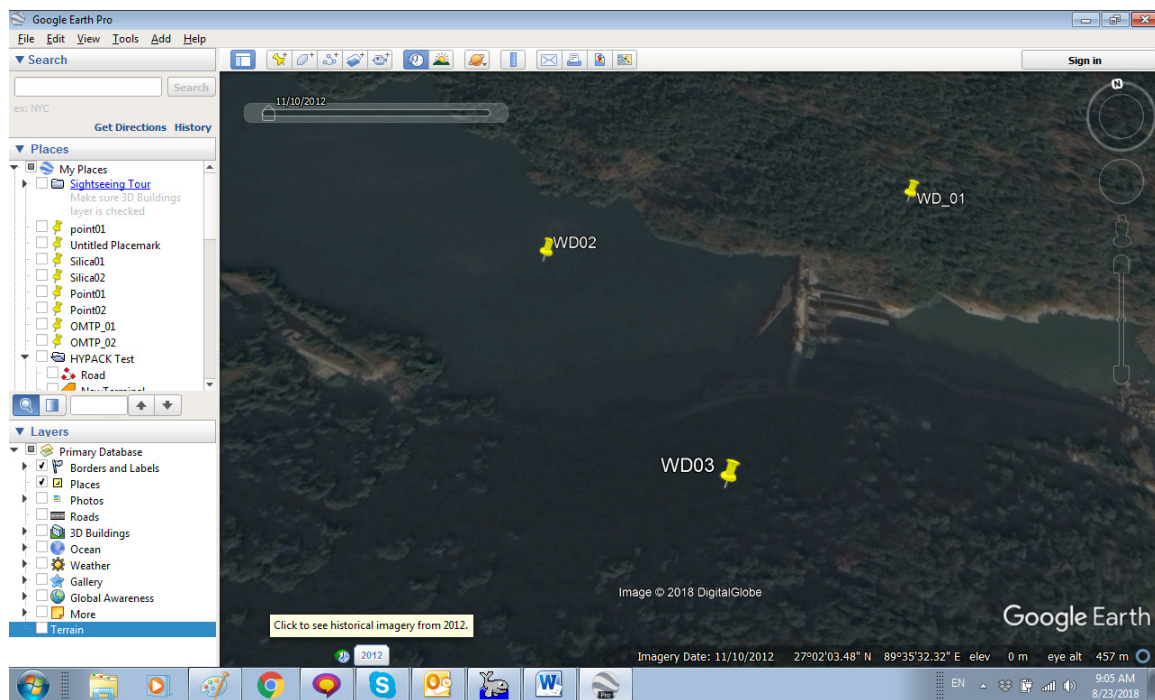


FIGURE 6. Google Earth Image from Historical Data (2012) vs Real Dam Location.



Now the Google Earth image is closer to the real location of the feature with a horizontal shift of 5m at the northern point and orientation error of 5 degrees.

In conclusion:

- Do not consider Google Earth images precise. Use them as the last resort, when there is no other source of the background image.
- Try to switch off the Terrain option.
- Check historical data for a better perspective of the image taken from the satellite.