Comments on

Title: Changes in Imja Tsho in the Mt. Everest region of Nepal

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<General comments>

This paper reported that the lake depth measurement using sonar at the Imja Glacial Lake and thickness measurement using ground penetrating radar at the Imja-Lhotse Shar Glacier. They compared their resulted with past measured data at the lake. The purpose is simple and clear, but, several information are not enough to analyze.

  The interpolation for data blank area looks nice in Fig.4. But, authors should describe why the result at the Tasman glacier can be applied to the Imja Glacial Lake.

    Please, check the following specific comments.

<Specific comments>

2378 L26   1962 -> 1992

2380 L4-6   The sonar has GPS system? There is no information on the horizontal accuracy of the instrument, sonar. Further, the explanation on the sensor of sonar is not enough.

2379 L17-20   'To fill .....until the measured points are reached.' There is no robust reason here. There are a lot of case to satisfy the condition of slope, which was reported by Robertson et al. (2012). This condition is one of the case to satisfy the conditions (Robertson et al., 2012). Further, authors should write why the result at the Tasman glacier (Robertson et al. (2012)) can be applied to the Imja Glacial Lake.

  Fortunately, I have depth data in Fig.4 in 1992 and 2002 (along with longitudinal cross section of the lake). So, I have calculated the slope in front of the glacier terminus at Imja Glacial Lake in 1992, 2002. The maximum slope was larger than 30 degree (Figure 1), which is the maximum degree of your assumption.

  The degree of slope in front of the glacier terminus is important information to judge whether the bottom ice is covered with debris layer (gentle) or expose (steep) (if there is ice at the lake bottom). Those conditions would affect on the calving process. So, please treat carefully.

2379 L21-22   Authors should show the location of 'Three transects' in Fig. 3 or other

detail figure.

3280 L5 ' For points in areas deeper than 100m that were interpolated, maximum and minimum depth values were calculated on 5m raster files,' There is no explanation on the maximum and minimum depth at the interpolated area. Those max and min were calculated from the error of sonar ?

2.1 Bathymetric survey
  Method on the interpolation at the data blank area (ice berg blocked area) is written in this section. In order to interpolate, the shoreline has significant role. Information on the location adjustment between the site of sonar data and shore line data is necessary here. Are there some benchmarks near the observed site.?
  There is no description on the shore line in this section. Lake area calculation section should locate before this section.

2381 L17-23 In order to prevent miss-classification between debris-covered iceberg and debris-covered glacier ice, I recommend to compare with other images taken in 2012.

2.3 Calving retreat of Imja-Lhotse Shar Glacier
Calving rate is defined the mechanical loss of ice (ice separation) from glaciers. Here, authors analyzed expansion rate of glacial lake, not calving rate. If glacier ice is flowing, calving rate should include not only expansion rate of the lake but also glacier ice flow speed at the terminus.

Fig.3   The interpolated area and estimated zone (deeper than 100 m) should be hatched or the contour should be drawn by dotted line.

Fig.4   Estimated zone should be drawn by dotted line.

2383 L15 'Elevation within the 100-contour' => This description may be misunderstood. Area with deeper than 100 m would be appropriate.

3.1 Bathymetric survey
Figure 4 can be depicted by assuming that the lake surface has not changed since 1992. Authors have to mention the reason of the assumption.

Table 1　The error of maximum depth 0.25 m in Table 1 would be induced from the instrument. If the maximum depth was measured by sonar, it is OK. But, actual maximum depth could not measured since the measurement range was less than 100 m. The error should be larger. Please, revise the maximum depth in 2012 in the text.

Fig. 6　I can not find Yamada and Sharma (1993) data (rhombic mark) in the figure.