

Review of "A century of ice retreat on Kilimanjaro: the mapping reloaded"
N.J. Cullen et al. doi.10.5194/lcd-6-4233-2012

General comments

I believe that this work is a significant and meaningful contribution to the continuing investigations of the historically well-documented recession of the glaciers on Kilimanjaro over the last 100 years. The methods and the conclusions drawn from the results of the measurements appear to be sound and the main argument presented for doing the work, i.e. consistency of mappings at each epoch, seems to me to justify the evident effort expended.

Specific comments

I believe that the statement in the abstract (p. 4234, line 4) is too assertive and should be qualified by inserting the phrase "most of the" between "remove" and "uncertainty". Clearly some (unknown and unknowable) uncertainty remains both from the "corrections" of positioning and from interpretation of ice boundaries.

The statement on p. 4236, lines 14-16 re. "the expectation...of fitting within previously published maps" does not apply to the T09FS2 mappings (see sec.2.32) which are based on independently determined control point positions determined from GPS surveys.

The wording on p.4237, line 11 is not strictly correct because, in fact, only something less than half the area depicted on the Klute map was compiled by terrestrial photogrammetric means; the remainder was produced by sketch mapping and from older maps at 1:100,000 scale by Meyer and Jaeger. It is true, however, that with the exception of the summit plateau all the ice bodies fall within the stereophotogrammetric coverage. See UEBERSICHT attached.

The UTM zone (p.4237, lines 15 and 16) should be 37S; Kilimanjaro is east of 36 degrees East.

Reasonably reliable latitude/longitude line intersections could easily be added to the Hastenrath and Greischar (1997) sketch map (p.4241, lines 25 and 26) if their orientation to North is accepted. These authors are at some pains to point out their correction of the Klute and Oehler map in that respect.

In the sentence in lines 4 and 5 on p.4242 it should be noted that the caption for Fig.1 in Thompson et al. (2002) points this out.

P.4248, line 27 "density of ice cover" should be defined; is it ice surface area/total surface area?

P.4249, line 23 is a reference for Gaussian Mixture needed?

On p.4261 the second line in the boxed legend in Fig.1, change "Revisited" to "Revised".

P.4262, Fig.2 I suggest enlarging the images at least as much as one page will allow in order to make it easier to identify smaller ice bodies. In this connection it would also help if a few of the more prominent ice bodies were labeled.

P.4265 Fig.5 add "thin" before "solid lines" in parentheses.

There are more appropriate references to the Klute and Oehler 1912 map and mapping than Klute's book, "Ergebnisse..." (1920) which does not mention the mapping at all and does not include the map. In fact, he specifically points this out in the Foreword: "Eine Beschreibung ueber die Herstellung der Karte und die Mitteilungen der Messungsergebnisse muss ich mir aus Sparsamkeitsgruenden fuer spaeter vorbehalten". The description of the stereophotogrammetric mapping is in Klute, F. 1921. Die stereophotogrammetrische Aufnahme der Hochregionen des Kilimandscharo. Zeitschrift der Gesellschaft fuer Erdkunde zu Berlin, 56, 144-151 and includes the map. The same map is also published as Plate XXX of a review of Klute's 1920 book by Hans Reck in Zeitschrift fuer Vulkanologie, 6, 198. Hastenrath and Greischar (1997) cite it as: Klute,F. and E.Oehler. 1922. Karte der Hochregionen des Kilimandscharo-Gebirges nach stereophotogrammetrischen Aufnahme[sic] 1912. Scale 1:50 000. Zeitschrift fuer Vulkanologie, 6, 198.

On the assumption that I should use your Manuscript Evaluation Criteria I "rate" the manuscript in every category that you list below:

Originality(Novelty) 2

Scientific Quality(Rigour)

A. 1

B. 1

C. 1

Significance(Impact) 2

Presentation Quality 1

The other criteria are listed by number and rated below:

- | | |
|------|-----------------------------|
| 1. 1 | 9. 1 |
| 2. 2 | 10. 1 |
| 3. 1 | 11. 1 |
| 4. 2 | 12. n/a |
| 5. 1 | 13. Enlarge images in Fig.2 |
| 6. 2 | 14. 1 |
| 7. 1 | 15. n/a |
| 8. 1 | |

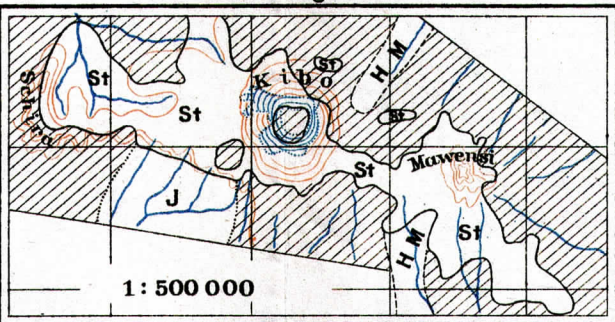
Technical corrections

p.4234,line 14 IMPLIES not imply





4235 10 CONVINCING not commanding

p.4235, line 13 critical THAT we
16 ELEVATION instead of height?
24 RESPONSES not response
4236 11 of THE SOLUTION OF this
4237 12 produced, BASED ON a modified Clark 1880 ellipsoid DATUM.
4238 13 MANJARO
4239 6 UTM37S
16 CHECK points rather than Control points?
19 COEFFICIENTS
4240 4 EASTING, NORTHING, ELEVATION instead of X,Y,Z?
4241 12 delete "to be completed"
18 REVISED not revisited
4245 14 ARE not is
4246 18 INDISPUTABLY not undisputably
4247 12 1970s delete apostrophe
23 DEBRIS-COVERED add hyphen
4248 11 the DECAY OF THE ice
4249 1 FIGURES 3b AND c
5 EAST-FACING
28 RADIATION-INDUCED add hyphen
4250 8 (Table 2 AND Fig.5)
13 delete "enough" after "sufficient"
4251 2 " " " "
14 delete "still" after "would"
21 add comma after "said"
22 SHOWS not show
24 ARE FOR not is on
4252 14 2 AND 3
4254 4 APPLIED not explored
6 INDICATES THAT
4259 2,3 in Table 1. Klute (1921)
Klute and Oehler (1922)
4260 last line of caption for Table 2. PARENTHESES not parenthesis
4263 Fig.3b label on ordinate. Is 10^{-2} correct or should it be 10^{-3} as
in 3a?
4264 as a matter of "style" and consistency, same number of
significant figures should appear in all numbers on axes, i.e.
9.660 on ordinate and 3.20 on abscissa

Übersichtsskizze der verschiedenartigen Aufnahmen.



Zeichenerklärung:

-  *Stereophotogrammetrische Aufnahmen von Klute und Oehler*
-  *Krokiert und teilweise stereophotogrammetrisch aufgenommen von Klute und Oehler*
-  *Jaegers Karte 1:100 000 entnommen*
-  *Hans Meyers Karte 1:100 000 entnommen.*