We thank the reviewer for the detailed consideration of our manuscript. We believe that the glaciological perspective emphasized in the review complements our (mainly) speleological one and the revised manuscript (in accordance with the comments) clarifies the contended issues.
We have entirely rewritten the “methods” section, added new information under “results” (including several new figures) and expanded the “discussions” section. Detailed responses, including the modifications of the manuscript can be found in the attached file (RC comments in red, AC in black).

Overview of the manuscript
This manuscript investigates the changes of ice thickness of five ice-filled caves (Scarisoara, Chionotrypa-Falakro, Chionotrypa-Olympus, Crna Ledenica and Velika ledena jama v Paradani), as well as the area changes of two mountain glaciers (Snezhnika and Basnki Suhodol), all of them in Eastern Europe, during the hydrological year 2018-2019. The relatively large changes observed are associated to an anomaly in the weather (both summer and winter weather). The observations of ice changes are carried out based on in situ length measurements for the ice within caves, and with a drone for the two mountain glaciers. Weather parameters are obtained from the following datasets: E-OBS (Cornes et al., 2018), NCEP/NCAR (Kalnay et al., 1996) and MODIS/Terra Snow Cover Monthly L3 Global (Hall et al., 2006).
The manuscript is well-written and illustrates that changes in weather have also effects on ice within caves. However, in my opinion, there are some major flaws that need to be improved before this manuscript is suited for publication. Below a list of general comments and specific comments for the authors in order to improve the manuscript:

General comments:
1 – Weather vs climate:
The abstract, introduction, discussion and conclusions manuscript refer in numerous occasions to “climate”. This, in my opinion, is not correct, since a study of one-year length does not reflect climate variability, and contains the high-frequency effects of the weather. Similarly, it is also erroneous to associate the observed changes of one year to climate. To “filter” the weather from the climate, the study should span minimum 10 years (e.g. Marzeion et al., 2014). Through the manuscript this should be clarified, and the word “climate” should be used minimally.
In most of the cases, the usage of the word ”climate” instead of “weather” is a carryover from loose oral communication. Where this was the case, we made the necessary amendments. In some cases, though, we kept the word climate” as we referred to “climate”. We did so in parts of the introduction and discussions/conclusions, where we placed the observations of interactions between weather and glacial processes (cave and surface) during 2019 into a long-term, context (“climate”). We also make a point here on surface *vs.* cave weather/climate: given the particular conditions in caves – long-term stability of air temperature, reduced exchange with the external atmosphere (mainly through conduction and with minimal convection/advection etc), caves do not exhibit variability of meteorological elements that could be defined as „weather”, they only have climate. This has important implications for the dynamics of glacial processes in caves, with external outside extreme events (like the ones investigated in this paper) playing an outsized role in both the mass and volume changes of perennial ice accumulations. We have explained this better in our revised manuscript, both in the introduction and in the discussions.
To “filter” the weather from the climate, the study should span minimum 10 years (e.g. Marzeion et al., 2014).
This is something we were doing for a while now for selected ice caves and started for the surface glaciers. However, the focus of this paper is not to discuss the long-term changes of cave ice mass and volume, but to present and discuss the role of extreme precipitation events on ice mass/volume changes and how short-term weather variability can impact small glaciers (as opposed to long-term climate variability). We introduced a new paragraph to better convey this and also expanded the discussion accordingly:
Whereas ice loss in surface glaciers is mostly due to melting related to rising temperatures (e.g., Marzeion et al., 2014), cave ice ablation is primarily due to drip water delivering heat to the ice (Luetscher et al., 2005; Persoiu et al., 2011a; Colucci et al., 2016). Therefore, whereas the projected increase in air temperature in mountain areas would result in enhanced mass loss for surface glaciers, the same rising temperatures might only marginally affect ice mass balance in caves. Monitoring studies in ice caves has been done sporadically since the mid 20th century (Racovita, 1994; Luetscher et al., 2005; Persoiu and Pazdur, 2011; Kern and Persoiu, 2013), the results showing that reduction of winter precipitation and increase of winter temperatures are the main factors behind loss of ice, with summer temperatures having a negligible role.

Also, the areas of interest are located at really large distances within each other (up to 1000 km apart), and it is almost certain that each area of interest will have a different response to weather and climate. It can be expected that the glacier changes are not simply explained from pressure and temperature anomalies. For example, the two studied glaciers are still existing likely due to their elevation range, slope and aspect.
Our analyses of weather conditions have shown that the extreme events of 2019 had a consistent behavior over the entire investigated area (encompassed by a circle with a radius of about 400 km). While we do not expect that the investigated phenomena occurred simultaneously, they did occur *in all* studied places, with *similar characteristics* (intensity, duration) and affected *all* investigated caves. Abrupt reduction of ice levels (likely indicating negative mass balance) has also been

documented by us in several other caves in the region with anomalous weather conditions. Contrary, ice caves outside this area did not exhibit similar reductions in ice level/mass. However, in the absence of precise and accurate measurements, we did not include these observations in our analyses. Next, we did not explain the glacier changes as resulting from pressure and temperature anomalies, but as a result of massive addition of warm waters directly to the ice bodies. These high amounts of water delivered in a short time (coupled with the high specific heat of water) were responsible for the massive loss of ice in 2019 and one of our main messages is that extreme hydrological events have and will have an important role in the future evolution of (especially) small perennial surface and cave glaciers. This point has been strengthened in our text by referencing similar observations from both cave and surface glaciers throughout Europe. We also note that our work concentrates on the loss of ice during 2019 melt season, and we present weather data from the previous winter only to introduce a wider context for the ablation processes on which our manuscript focuses.

2 – Surface vs cave glacier:
The manuscript shows observations on two glaciarized systems: mountain glaciers and ice within caves. These two categories are rather blurry throughout the manuscript. Each type of ice is measured with different methods, but throughout the manuscript there is no distinction of them, and all the results and discussion are presented regardless of this difference. A distinction between both types of ice would make, in my opinion, a cleaner section of methods and results, showing (1) changes in ice within caves, with its associated method and (2) changes in mountain glaciers from UAV. Finally, in connection to the general comment nr1, the two glaciarized systems will likely have different responses to weather and should not be discussed without taking this into account.
Well, the surface and cave glaciers analyzed here are more similar to each other, than dissimilar. First, all cave glaciers are located below the cave entrances where external weather has a strong impact on ice behavior. This is valid mostly for precipitation and not so for air temperature (see also our comment on "general comment 1" above): snowfall and liquid precipitation directly reaches the ice and snow masses in caves. To illustrate this point, we have added a new figure with cross sections of the studied caves showing the relationship between underground ice/snow and outside environment. It is evident that the surface and cave ice accumulations have similar positions with respect to water input and thus are expected to respond similarly. Nevertheless, in our presentation of the results, we have clearly separated the analyses and we only discussed surface and cave glaciers together when their common behavior made such an analyses meaningful. In the revised manuscript we have clarified this point, by identifying the similarities and differences in the response of surface glacierets and cave glaciers to weather and climate variability before analyzing these for the particular conditions in 2019.

3 – Data collected:
The manuscript uses two main kinds of observations collected in situ: (1) distance measurement between benchmarks and the ice, to measure relative changes in the level of ice in caves, and (2) comparison of UAV-based surveys. These observations lack on specific description of how they are carried out. See specific comments on questions that arise when reading the manuscript. In general, since there are rather limited studies of ice within caves, it would be worth adding some paragraphs, even some photographic material, on how these measurements are conducted.
Thank you for this point. We have developed some of the techniques to identify the different components of ice level changes in caves (surface vs. basal etc) and we sometimes overlook explaining these in detail, thus limiting the understanding of data. We have a new paragraph (complete with graphic illustration) detailing these methods.

The temporal resolution of the data collected in caves is also not clear. Are the measurements done only once a year? In this case, the temporal resolution of the data collected does not allow making statements regarding the seasonal variability of the ice, as is stated throughout the discussion.
A table showing an overview of the data collected would be really beneficial for the reader to understand the amount and main characteristics of observations done in this study.
We have clarified this in the revised version of the manuscript, by adding information on the temporal resolution of measurements for each caves (for some, this has already been mentioned in the text). Second, these caves have been monitored for quite a long time (e.g., 70+ yrs for Scărișoara) and we know (within weeks) the periods of ice level minima and maxima. Subsequently, we are visiting the caves several times/year near these thresholds moments and record the changes. We are clarifying this in the "methods" section. A table with the observations was also added to the article.

4 – Results:
The manuscript is also lacking methodological information on how some results are calculated, which limits the study's repeatability. For example, how is the change in the level of the ice converted to a volume change?
None of the presented results contains error bars. The general reader has no sense of the robustness of the measurements (also due to the lack of description in the data collected), and this, in my opinion, causes a lack in scientific rigor of the results.
We have augmented the description of the methods used in our investigation as detailed also in the comment above. For some of the methods, we considered that a description is not necessary (e.g., to convert ice level changes in volume change,

we multiplied the thickness of the melted ice by the surface of ice over which melting occurred), while for the others, detailed descriptions were inserted in the text, together with a new explanatory figure and a table with the measurement errors.

The section 4.1 (Ice mass balance changes) does not show any mass balance number. Neither volume change (presented for ice within caves) nor area changes (presented for mountain glaciers) is "mass balance" (Cogley et al., 2011).
Yes, this is a fundamental question – what is the dimension of "mass balance", mass or volume (Cogley et al., 2011)? We settled for the later, perhaps unconsciously, as in most cases ice in caves forms by the freezing of water, hence attaining maximum density with extremely limited future density changes (the average density. Thus, we have used "mass balance" to mean "volume change". We do realize that this is not always the case (for example in the upper parts of the cave ice deposits formed of compacted snow) so we have modified the text accordingly. We also emphasize that we considered "mass balance" (and now volume changes) as a sum, not a rate (i.e., change over time, as this was not the aim of our study). Further, due to the restricted space in which cave glaciers are located (rock walls), potential mass balance changes induced by ice flow (i.e, non-climate related mass balance changes) are virtually inexistent. Where ice flow and basal melting does occur though (Scărișoara ice Cave), we have explained in the "methods" section how we dealt with it and the data reported in the "results" section consider only changes at the surface (i.e, climate-related ones).

The methods show that the UAV-based surveys produced Digital Elevation Models (DEMs), but these were not included in the study. Differencing of UAV-based DEMs is a robust method to infer volume changes and mass balance (e.g. Whitehead et al., 2013, Groos et al., 2019). Analyzing area changes in mountain glaciers, as opposed to volume changes, is not optimal, since the area changes are not as closely connected to climate/weather than the volume changes (e.g. Jóhannesson et al., 1989).
We did indeed produce DEMs, but decided not to use them; instead, we presented ortophotomosaics. In the revised manuscript, we added the two DEMs, as well as two figures showing the lowering of the surface of the glacierets. The text below was also added to the manuscript.
We note thought that in the case of the two investigated glacierets, the significant loss of glacier-covered area is a clear indicator of the impact of extreme events in summer 2019. This is also in accordance with the main finding of Jóhannesson et al. (1989) cited above, showing that the response time of glaciers to changes in climate could be significantly less than the 10^2-10^3 theoretically expected years (i.e., within the time span of our observed and inferred changes).

Between 2018 and 2019 the terminus of both glacierets show significant loss of ice. The mean retreat of the terminus was 3.4 m at Snezhnika and 5.8 m at Banski Suhodol (fig. 7). Fig. 7 c and d shows the difference in the elevation of ice surface between 2018 and 2019. In general, the difference in Snezhnika ice surface elevation between 2018 and 2019 range between 0.2 and 1 m, exceeding 1.2 m only in the south-western part. On the other hand, more than half of Banski Suhodol surface has lowered with more than 1 m due to surface melting.

Specific comments
Title: "Unprecedented" is a very strong statement and the limited observations do not prove whether or not there has been any similar event in the past.
We have modified the title to better reflect our data and message: "Record summer rains in 2019 led to massive loss of surface and cave ice in SE Europe"

Title: I found confusing the term "loss of surface and cave ice". Something like "loss of ice in mountain glaciers and within caves" might be clearer.
We have modified the title to better reflect our data and message

L19-24: Half of the abstract is focused on "climate", but this manuscript does not show "climate" but "weather" (general comment nr 1).
Please see the response to general comment 1.

L26: "catastrophic and unprecedented" ... again this is a really strong statement without clear evidences of it.
The melting we have observed in 2019 is unprecedented for varying time periods (between 99 and 20 years) for the different ice bodies we have investigated. Nevertheless, the loss of ice was higher than any such loss previously recorded for all caves (for separated periods, though). This differentiation was made clear in the text and the relevant line in the abstract now reads: "Our investigation shows that extreme precipitation events occurring between May and July 2019 led to loss of ice at levels higher than any recorded for all investigated sites."

L26-30: The second half of the abstract is focused on model predictions and the fate of the ice within caves, but this manuscript does not show any climate model prediction at any point. Similarly, the paleoclimatic information is only mentioned once in the introduction (L50). Since the focus of this manuscript consists of bringing observations and exploiting the weather datasets, some general results should be mentioned in the abstract.

1. The entire final paragraph of the article is a discussion of model predictions of future extreme events. In summary we argue that 1) global warming and associated Arctic amplification will 2) lead to meridional amplification and slower propagation of the Rossby waves, thus 3) further leading to increased frequency of blocking conditions finally resulting in 4) in more frequent (and possibly stronger) extreme events. We support this with relevant literature citation and indicate that in the context of our findings showing high sensitivity of cave and surface glaciers in SE Europe to extreme precipitation, the model-predicted increase in the frequency and intensity of extreme events threatens the survival of these ice bodies. This is summarized in the abstract as "As climate models predict that such extreme precipitation events are set to increase in frequency and intensity, the presence of cave glaciers in SE Europe and the paleoclimatic information they host may be lost in the near future."

2. We have added a new paragraph summarizing our specific findings, as follows:
In this context, we present here the response of cave and surface glaciers in SE Europe to the extreme precipitation events occurring between May and July 2019 in SE Europe. Surface glaciers in the northern Balkan Peninsula lost between 17 and 19 % of their total area, while cave glaciers in Croatia, Greece, Romania and Slovenia lost ice at levels higher than any recorded by instrumental observations during the past decades. The melting was likely the result of large amount of warm water delivered directly on the surface of the glaciers leading to rapid reduction of ice covered area of surface glaciers and thickness of cave ones.

L32-40: See general comment nr 1.
See our response for general comment 1.

L87-88: "Ice dynamics" typically refers to ice motion and ice deformation. As I understand this is not measured in this case.
It is ice level changes.

L125: This study does not show "mass balance changes" (general comment nr. 4)
It is ice level/volume changes (see the detailed response to general comment 4)

L127-130: How are the distance measurement carried out? With tape, total station? What's the estimated uncertainty of the measurements? (general comments nr. 3 & 4.)
We have expanded the methods section to include this information and also included a new figure to show how ice levels are measured in caves. The relevant response from the main text is below:
The first set measurements were made with a measuring tape, and the second along a metal line embedded in ice. The precision was better than 0.3 mm in both cases.

L136-142: More details are needed for the photogrammetric set up. Did you use GCPs and/or GPS? How are the results of the photogrammetric processing, for example from bundle block adjustment? What is the expected uncertainty of the orthomosaic and the DEM? What's the exact date of survey? (see suggestion of adding a table with observations). Why are the DEMs not used in the study? Measuring elevation difference and volume changes is much more representative to study glacier changes than measuring area changes, since the area changes are influenced by the response time of the glacier (general comment nr. 4).
Details of the photogrammetric studies have been added (see the text below). Also, we have added a table with the following characteristics of the digital surface models and ortophotos: Date of UAV flight, DSM resolution (cm), Ortophoto Resolution (cm), Mean error DSM (cm), Mean error Ortophoto (cm)

The drone survey was designed to cover the glaciers and their surroundings. For flight planning and mission control we used DJI Ground Station Pro software. The flight height was set at 200 m and the images were collected every three seconds along parallel lines with an overlap of 80%. Among camera locations, ground control points (GCPs) were used for both glaciers (5 for Snezhnika glacier and 8 for Banski Suhodol glacier) to georeference the digital surface models and the orthophotos. The GCPs were measured with a high accuracy Hiper V Topcon real-time kinematic (RTK) positioning system. The images were processed in Agisoft Photoscan Professional by using the following workflow: 1. Alignment and match of photos at the highest accuracy → 2. Analysing the sparse cloud → 3. Importing and setting the GCPs on each camera and the free-network bundle adjustment → 4. Generating the referenced dense cloud with medium accuracy settings and moderate depth filter → 5. Generating a mesh and textures → 6. Create the Digital Surface Model → 7. Create the Orthophoto-mosaic. Using the above-mentioned workflow, high-resolution digital surface models were created for both glacierets

L144-145: “In order to link the (. . .) parameter (. . .)” The study does not perform any robust link or correlation between parameters. Please rephrase or clarify.
We have rephrased this to read: “In order to understand the role of large scale circulation patterns in determining specific weather types, we have computed […]”

L143-154: Some information about the uncertainties of the weather parameters would also be highly valuable.
More details about the uncertainties and the parameters employed in our study have been added in the methods section.

L156: See general comment nr. 4. No mass balance changes are provided in the results. Please use more accurate terms, such as “volume changes”, “ice-level changes” or “area changes”.
We amended the text to be more specific.

L163: How is this volume calculated from the ice-level changes? What are the uncertainties? This also applies for the other caves (general comment nr. 4)
We multiplied the thickness of melted ice layer with the surface over which this occurred. The combination of cave morphology and ice accumulation and ablation processes resulted in a perfectly flat upper surface of the ice block (Perşoiu et al., 2011, Perşoiu ad Pazdur, 2011, Perşoiu, 2018 etc).
We have included a table under the “methods” section, in which all relevant information is given, including separate uncertainties for measurements and calculations.

L164-165: “a gradual decrease of the ice volume was evident since 2014, reaching a minimum in September 2019 (Fig. 3)”: This statement needs a stronger support than Fig. 3.
Unfortunately, we do not have data to offer a stronger support, but we believe that the observations taken at the end of the melting season and reflected in figure 3 are relevant.

L242-244: “(. . .) resulted in the large accumulation of snow (. . .)” . . . but this is only observed by the weather datasets, right? And these datasets do not show accumulation (snow thickness), only snow distribution. Therefore, this sentence might not be correct.
Because we focused our article on the summer ice loss, we did not include all relevant information of winter accumulation. We have now added data on snow thickness outside the caves. Because the cave ice deposits are directly fed by snowfall, this data is also relevant for the caves. Where ice forms by the freezing of water (Scărişoara ice Cave and Velika ledena jama v Paradani) we have added relevant ice level measurements.

L245: “led to the rapid melt of the surface snowpack” . . . again this is not observed, only suggested. Please rephrase acknowledging the lack of such specific observations, for example “high temperatures suggest rapid melting of the surface snowpack”.
We did observed it, actually, as we were in the field, monitoring ice level changes in the two caves referenced here, Further, figures 6f and 6i show the rapid disappearance of surface snow in February 2019 and a strong positive temperature anomaly in the same month, respectively. We believe that the combination of field observation and meteorological data supports our text. We added a line specifically mentioning field observations in Chionotrypa Olympos, Chionotrypa Falakro and Crna Ledenica and measurements data in Scărişoara Ice Cave (“Ice level measurements indicate that a 15 cm thick layer of ice was added to the upper surface of the ice block in Scărişoara Ice Cave, exceeding the mean annual growth for the 2000-2018 period (Perşoiu and Pazdur, 2011, Perşoiu, 2018)”)

L248: “resulted in rapid ice accretion in caves” ... Please rephrase acknowledging the lack of such specific observations
See above.

L250: “wet late spring and summer led to rapid cave ice ablation” . . . Please rephrase acknowledging the lack of such specific observations. Check for any other occurrences throughout the discussion.
We believe that here is a misunderstanding. This paragraph is based on the observations and measurements we have made in summer 2019 and are reporting here (data in the “results” section and in figs. 2 and 3).

L264: Break into a new paragraph, since now you start talking about mountain glaciers as opposed to ice within caves.
Perhaps the reviewer refers to line 261, where the discussion of the surface glacierets starts. Done.

L271: Please follow a logical structure of the discussion, I suggest first a discussion about ice within caves and then a discussion about mountain glaciers, but not an alternation between the two.
This paragraph was moved up to follow the discussion of ice caves.

L298: How is this prediction done? This shouldn't be stated in the conclusions without specifying any prediction of disappearance throughout the manuscript.

We added a new paragraph in the "discussions" section, where we expand our previous interpretation, see below

The dramatic increase in area loss, coupled with overall shallow thickness of these glaciers makes them especially vulnerable to rapid disintegration. The equilibrium line altitude for surface glaciers and glacierets in southeast Europe is well above the highest peaks (Hughes, 2018) so they are in a continuous ice mass loss, with extreme events like the one we have described threatening their survival. Extrapolating our data, episodes of rapid summer melt induced by similar extreme events, either heat waves (Hughes, 2008) or precipitation (this study) could result in the loss of surface ice in the coming decade. Similarly to the glacierets we investigated, perennial snow patches on Mt. Olympus, remnants of glaciers from the last glacial cycle (Styllas et al., 2018), began to disintegrate in 2019 under the prolonged heat wave. These cases mirror recent findings from SW Europe, where Moreno et al. (2020) have shown that glaciers surviving warm periods of the past 2000 years are rapidly melting, being at the risk of disappearing within the coming decade(s).

L302: "our observations show..." These are not really observations done in the study, these are results from weather datasets. To me, the observations done in this study are the ice level changes and area changes.

These are the results of our observations, measurements and data interpretation. We summarized them as "our results", see below: "While cave and surface glaciers in mountains across Europe are sensitive to increasing temperature, we showed here that extreme summer rains led to rapid melting and disintegration of ice bodies, rendering them even more sensitive to temperature changes."

L303-310: Again, this is the first time when the prediction of extreme weather is mentioned in the manuscript. This should not be presented in the conclusions.

Although not labeled as such, the following paragraph in the "discussions" section presents future changes in extreme weather in SE Europe – causes, manifestation and likely impact on glaciers.

All surface glaciers in southern Europe are out of balance with present-day climatic conditions, but the slow melting occurring at their termini results in gradual re-equilibration with local climatic conditions (Zekollari et al., 2020). However, recent rapid warming leads to an increase in the altitude of the 0 °C isotherm (Rottler et al., 2019) thus further increasing the imbalance between glaciers and climate and enhanced melting. Our results suggest that, adding to the melting under increased temperatures, heavy summer precipitation events result in enhanced melting of both cave and surface glaciers. With increasing temperatures, the altitudinal rise of the 0 °C isotherm (Rubel et al., 2017) would bring more glaciated terrain under warming conditions, and thus yet more susceptible to heat transfer during heavy summer thunderstorms and extreme summer heat waves. Accelerated warming of the Arctic (Holland and Bitz, 2003) would result in meridional amplification and slower propagation of the Rossby waves, leading to an increase in the frequency of blocking conditions and associated extreme events (Francis and Vavrus, 2012; Liu et al., 2012; Screen and Simonds, 2014). The increased frequency, duration and intensity of both heat waves (e.g., Spinoni et al., 2015) and heavy rainfall events (Púčik et al., 2017; Rädler et al., 2019) in southeast Europe would thus lead to a higher ablation rate of surface and cave glaciers than that expected from increased temperatures alone. Especially vulnerable are cave glaciers, already located in areas subject to both warming and extreme summer thunderstorms, and surface glaciers close to the 0 ° isotherm, thus resulting in the loss of ice faster than predicted by the most recent estimates (IPCC, 2019; Paul et al., 2020).

Figures

Fig. 2: Please indicate source of data in the caption.

Info added to the caption: Updated from Perșoiu and Pazdur (2011), The Cryosphere

Fig. 3: This figure showing changes in snow is heavily influenced by the seasonal differences of each picture. This needs to be properly addressed or otherwise this figure should not be presented. Comments on the caption: the figure does not show any ice. Also, the first year is 2014 and not 2016.

The pictures were taken at the end of the melting season. Depending on whether conditions, this could occur earlier or later in the year. Perhaps the resolution does not allow for ice to be visible in the photograph, but ice is there, nevertheless (check the left side of the deposit, where ice is exposed to a lesser degree in 2018 and higher in 2019, although not visible in the pictures taken in 2014 and 2016).

Fig. 4: See general comment nr. 4 about the limited use of the UAV data. Comments in the caption: "Orthomosaics showing ice surface changes (. . .)"

Caption updated. For the use of UAV data, see our response in reply to general comment 4

Fig. 5: See general comment nr. 1 and 2. The interpretation of pp change at several locations at relatively large distances and with different systems (mountain glacier vs caves with ice) is not straightforward and it can be misleading to compare them as such.
Ware sorry, but we do not understand this comment. The figure shows precipitation data at the studied locations in percentage deviation from the 1971-2000 average. The message, as conveyed by the green and brown shading, is that during summer 2019, precipitation amount values were extremely high (generally by 200 %) than the long term average. Second, the high precipitation values occurred during the period over which generally ice melting occurs in all caves (orange rectangle). Summarizing, the figure shows that in 2019 high precipitation amount were registered during the ablation period of cave and surface ice.

Fig. 6: Letters (a,b...i) are missing.
We added letters to all panels.

Fig. 8: See general comment nr. 4. Volume changes is not the same as mass balance.
The figure is an updated version of a previously published one by Kern and Perşoiu (2013) and we kept the original axes captions. We changed the vertical scale to read "cumulated ice volume loss (m3)".

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