

Reply to RC1

"Quantifying Retrogressive Thaw Slump Mass Wasting and Carbon Mobilisation on the Qinghai-Tibet Plateau Using Multi-Modal Remote Sensing" by Maier et al. is the first study to quantify the impact of RTS on erosion, soil carbon mobilization, and ground ice loss across the entire QTP. The methods and analyses are well designed and the results represent a meaningful contribution to our current understanding of RTS. The authors have done an excellent job of addressing my comments and concerns from the first round of review and I am satisfied with the scientific rigor and overall quality of the manuscript. Below I have listed a few remaining comments, all related to minor wording changes, that I think would help polish the presentation.

We thank the reviewer for their thoughtful and precise work that have helped us improve the quality of our manuscript during the review process. We have followed all of the reviewer's suggestions and have made the following changes to the manuscript:

L15 "mobilised" would be better as "mobilisation of"

Changed accordingly.

L16 "1.20+-0.01 and 1.30+-0.01" should be "1.20+-0.01 to 1.30+-0.01"

Changed accordingly.

L55 As far as I'm aware, "senescence" only applies to living organisms and is not an appropriate term for RTS. In the context of this sentence, I'm not sure what you were going for, but I would suggest adding "recovery" instead. L55 I'd suggest ending the sentence before "which" and starting the next sentence with "RTS can reactivate...".

Changed accordingly.

L62 I'd suggest editing "though similar" to "although these are similar".

Changed accordingly.

L64 I'd suggest removing "However" and starting the paragraph with "Due".

Changed accordingly.

L90 I'd suggest adjusting the word order from "used instead of OLS and orthogonal distance regression (OGR)" to "used an orthogonal distance regression (OGR) instead of OLS."

Changed accordingly.

L122 "each 400 km²" would be better as "400 km² each"

Changed accordingly.

L213 I'd suggest "if the depth d is deeper than the ALT" to avoid any ambiguity about whether "higher" means vertically higher. Alternately, you could use "greater than".

Changed accordingly to "greater than".

L274-275 "However, the fit is slightly noisier and manifests itself in a lower confidence ($R^2_{\text{ODR}} = 0.75$, $R^2_{\text{OLS}} = 0.77$). I think you can cut "and manifests itself in a lower confidence". Although the reader can infer that the lower R^2 value is probably the one associated with Axia, it would be better to specify which R^2 value is which within the parenthetical.

Changed accordingly: "However, the fit is slightly noisier ($R^2 = 0.75$ for ODR and $R^2 = 0.77$ for OLS)."

L287 "the volume distribution per RTS was highest in the northeast QTP" would be clearer as "individual RTS in the QTP eroded a larger volume of material on average."

Changed accordingly.

L314 I found the "<" confusing here. Does this mean that the lower limit is approximately 10^3 or is lower than 10^3 ? It might be clearer to frame this as "We found that RTS monitoring using TanDEM-X can only identify RTS larger than $\sim 10^3 \text{ m}^2$."

Changed accordingly.

L359 "factor-two increase" isn't a phrase that is used. Typically, something "increases by a factor of two", but that could be too wordy and awkward here. Maybe "doubling" could work?

Changed accordingly to "doubling".

L389 I would remove "Setting into context" from the section title, as it's not really necessary and just sounds a bit awkward to me.

Changed accordingly.

L427-428 "Compared to rates on the QTP, RTS on the Taymyr Peninsula mobilised a similar amount of material on individual RTS level prior to the heatwave yet already 14 times more SOC." I'm not sure what exactly this means since it seems to be missing a word or have some grammatical errors. Please revise.

Changed accordingly: Individual RTS on the Taymyr Peninsula mobilised on average a similar a material volume, yet 14 times more SOC compared to the RTS on the QTP prior to the heatwave. The heatwave triggered a surge in RTS activity, including a 17-fold increase in new initiations, a 2.3-fold increase in the average volume change rate, and a 28-fold increase in SOC mobilisation, resulting in quantities far exceeding those observed on the QTP."

L440 "can" should be "could"

Changed accordingly.

L456 "until 2022, only 59 new RTS were detected on the PlanetScope images." Do you mean between 2020 and 2022? I would also use "in" instead of "on".

Changed accordingly: "Between 2020 and 2022, only 59 new RTS were detected in the PlanetScope images."

L464 "DEM" should be plural

Changed accordingly.

L477-478 "across large but even local scales". This sounds a bit awkward. I think you mean "at both local and broad scales"?

Changed accordingly.