

Reviewer comments are provided in bold-faced type. All line and page numbers refer to manuscript version with changes accepted.

Author responses are italicized

REVEIWER 2: Jinyu Zhang

General comments:

My main concern is about the role of sea-level change. We know it is important for the formation of deltas (Stanley and Warne, 1994, which was cited in this work). I think (1) the range of sea-level change rate of past 26 years might be too limited to influence the delta likelihood; (2) the mapped deltas initiated way before 26 years – most of them formed around 7 ky. So it is worth being more careful when discussing the sea-level change, even though I notice the authors emphasized ‘RECENT’ sea-level change in abstract and conclusion.

We certainly agree with this point, and as the reviewer points out, we made sure to refer to ‘recent’ sea level change so that this point is always in the reader’s mind. The sea level change estimates are far from what we would prefer but because it is such a crucial control on delta formation we wanted to use the best data we have.

Section 2.1 provides good criteria to recognize delta. However, I’m not sure how authors map them. Are they mapped manually or processed by some programs? If it is processed by programs, how reliable is it?

We map the deltas manually because defining the presence of a depositional body is not straightforward. This leads to some subjectivity, but we are willing to accept some ambiguity to complete the global task.

It might be beyond the scope of this study but some sensitivity analysis should be useful when discussing the relative importance of each parameter. The effect in equation 1 (0.000524, 4.77, - 0.952,-0.175) shows the Qw is the least important parameter.

The reviewer is correct that a sensitivity analysis is important. We have already provided something akin to that in section 4.1 Either way, it is important to note that the variables in equation 1 are dimensional so that the size of the coefficients cannot be compared without taking into account the variables of each unit. So while the coefficient on Qw is the smallest, Qw typically is the largest numerical value.

I believe before Galloway ternary classification, people used constructive system and destructive systems, at least for ancient deltas (See William Fisher, 1969, GCAGS). When talking about constructive and destructive forces, it might be good to acknowledge them.

We thank the reviewer for this suggestion and we added this reference, along with others by reviewer 3, into a more complete discussion of this point that duly notes this “constructive vs destructive” idea has been around for a while. Please see P14L10-25 for the new discussion.

Detailed comments:

Page 8 Line 12 Yes, the range here is fairly limited. The rate of Cenozoic eustatic sea-level change went over three order of magnitude. It might be worth comparing the range of eustatic sea level change rate of past 7000 years (when most of the deltas formed) and the past 26 years data here.

Indeed this is a good idea that was also mentioned by another reviewer. We conducted an additional analysis using sea level change rates from 22 kyr ago to present from Ice6G_C model results. We now mention this brief effort in the methods on P9L4-7 and comment on how it does not increase the success of predicting delta formation.

Page 8 Line 20 – Page 9 Line 3 Using numbers instead of ‘high’ and ‘low’ when describing delta density

This is a fair point, but we opted for the qualitative descriptions here because it is easier to read and digest quickly. The quantitative data are in the figure.

Page 12 Line 21 A typo ‘.4.77’ before Qs

Thank you for catching this.

Table 1 There is a mistake for the unit of sea-level change rate, should be L/T (mm/s?), instead of ‘m’ Also please check the unit for Qs and sediment concentration. Sediment discharge refers to sediment transport mass per unit time. Unit is commonly Mt/yr?? Unit for sediment concentration is commonly mg/l?? I guess these units will influence the log odds relationship?

Thank you for catching these issues. Sediment discharge can be reported a number of ways. The dimensions will affect the logistic regression only in the size of the coefficient, but not in the effect of Qs on delta formation.