**Detailed response to anonymous reviewer:**

We thank the anonymous reviewer for the careful review and helpful comments. We largely agree with the points raised and have incorporated most of them in the revised version of the manuscript. In the following, we will first address the seven main concerns highlighted by this anonymous reviewer. Our changes are listed next to the points raised in bold font. All the changes in the text are highlighted by the blue underlining and red strikeout lines.

1. “*Response to first review: “We improve the interpretation on Figure 5A (Figure 6A in the last version) and correct the thrust direction on the north of the Jimani thrust. We don’t see any wrong interpretation on the south side of the Jimani thrust.”*

*I am still not convinced by the interpretations. A thrust is by definition an uplifted structure with a reverse fault on its basement. If there is no reverse fault, it is just a fold. Here, on the southern side of the Jimani structure, you put a thrust in Fig. 5A (which should uplift the southern flat part of the lake), then on Fig. 5B there is no fault between the Jimani structure and the flat part, and then on Fig. 5C there is a thrust in the right direction at the base of the thrust. So there is no coherence between the two chirp profiles and the cross-section.*

*Moreover, you compare the Jimani thrust with the Léogâne blind thrust, but these two faults do not have the same scale. You do not discuss this point regarding to the seismic hazard.*”

**Figure 5B in the last version does have the reverse fault on the south side of the fold. We add the thrust fault and its label in the updated figure. In the revised version, we added th three more chirp profiles showing EPGFZ in greater detail on the southern part of the lake. Their locations are indicated in Figure 2B.**

**As for the scale differences between the Jimani and Léogâne thrusts, we modified the vertical exaggeration of Figure 3A (Léogâne thrust) to 1:1, which is same as Figure 6E (showing the Jimani thrust). While the size of the faults may different, our main point is show the similar spatial relationship of the en echelon relation between the thrusts and the EPGFZ.**

1. “*Response to first review: “We do not agree with the reviewer on this point. We still think our interpretation in Figure 8 is correct. The two major normal faults are the on cross-section M1 (Figure 8B). Both of the normal faults are shown in the cross-section. The location of the Line M1 is also shown in Figure 7B, and so are the locations of the faults. We think they are evident and well observable to see from our cross-section in Figure 8B.”*

*I do not agree with your arguments. The two major normal faults are not “evident and well observable”. How you can explain that the “major” fault in the northern side of the line M1 does not produce any deformation in the sediments? You should add enlargements to show that this is well a rupture.*

*Moreover, on the map 7B, the other normal fault crosscuts the line M1 in the middle. Why it is not in the middle of the sonar profile?*

*Then, you say line 491 that the most recent rupture in the lake is buried by about 0.5 meter of sediment. Please add enlargements of the rupture so that we can see the sediments layers and the discontinuities. Otherwise it is really hard to thrust this argument.*

*Finally, how you can explain that the normal faults are not SW-NE oriented as expected for a pull-apart basin between two E-W strike-slip strand faults? The SW-NE orientation is visible in the bathymetry but your faults completely crosscut the isolines.*”

**There are two normal faults on the north side of Line M1. We add an enlargement to Figure 8B as the reviewer suggested. The enlargement includes the fault located at the northern end of the chirp line. The other normal fault is more prominent so there was no need to add a more detailed enlargement.**

**We thank the reviewer for pointing out this error in the location of the fault on the map vs. what is shown on the cross section. We corrected the fault location in Figure 7B.**

**We also added two enlargements of the most recent fault ruptures to both Figure 8B and C.**

**The margins of the lake especially to the north and east are shallow and marshy so sedimentary infilling as influenced the lake in addition to faulting. Sedimentation may be one explanation for the orientations differing orientations of faults and bathymetric contours.**

1. “*Lines 55 to 57 you say: “EPGFZ that forms a major, plate boundary between the Caribbean plate to the south and the Gonâve microplate to the north”.*

*Then lines 194 to 203 you say: “In addition, (authors) suggest a strong, southwestward backthrusting of the Gonâve microplate, in southern Hispaniola in Haiti and Dominican Republic to the southwest onto the Caribbean plate. Southwestward backthrusting of Hispaniola is manifested by the accretionary wedges present along the Muerto trench south of the Dominican Republic and along the southern margin of Haiti (South Haiti accretionary prism)”.*

*It seems that you are totally confusing the microplate boundaries assumed for geodynamical models as GPS block models and the real geological and tectonic boundaries.*

*If the EPGFZ is the boundary between Gonâve and Caribbean plates and the Gonâve microplate backthrusts onto the Caribbean plate, then the EPGFZ is a thrust... Or this is not the case.*

*Moreover, if you look at your fig. 1, the MuertoS trench is the boundary between the Hispaniola Microplate and the Caribbean plate. Also the South Haiti accretionary prism belongs to the Caribbean plate.*

*Finally, in the Fig. 10, you say that “black arrows show southwest direction of the Gonâve microplate relative to the Caribbean plate”, but the black arrows are in majority in the southern Peninsula of Haiti, south of EPGFZ so on the Caribbean plate.*

*I suggest you to simply talk about the backthrusting of the southern margin of Hispaniola without mention the Gonâve microplate, which is an assumed boundary for geodynamical purposes.*”

**We thank the reviewer for pointing this out and we have corrected the sentence in line 195 as “backthrusting of the southern Hispaniola.” Also, we correct the caption in Figure 10 as “Black arrows show the southwest direction of the GPS vectors relative to the Caribbean plate.”**

1. “*Figure 6. You say “Identical sequences present on both lines suggest that the two lakes were once part of a single lake that has been recently separated by crustal movements related to the EPGFZ near the Jimani area”.*

*I do not understand why this huge assumption is not discussed in the text? “Recently separated” imply that you can estimate the age of EPGFZ and also the offset between the lakes.*”

**We agree with there is a large assumption to suggest that the two lakes once formed a single lake that were separated by the uplift of a 30 m high isthmus now separating them. To be precise, we changed as “the two lakes were once connected” and added references (Greer and Swart, 2006; Medley et al., 2007; Rios et al., 2013). In support of the assumption we do provide the comparison of Chirp lines showing the similarity in thickness and seismic character of the three units observed in both lakes. Moreover, its reasonable that such uplift of 30 m could occur in the highly transpressional setting we describe. As we have not cores or dating from Lake Azuey, this comparison is the rationale for stratigraphy in Lake Azuey. For these reasons we have chosen to leave this assumption in the caption and text.**

1. “*Response to first review: “We add the horizontal scale bars to Figure 5 A, B (Figure 6 A, B in the last version). We think our vertical scale is OK (if we divide vertical scale bar more, the figure will be busier and harder to see).”*

*No your vertical scale is not OK. The spaces between the 0, 10 and 20 are not equal.*”

**We thank the review for pointing out this error. We correct the scale in the Figure 5. The previous Figure 5B now is Figure5C.**

1. “*Response to first review: We reduce the size of the fracture line in Figure 7B. I do not see any changes between the original and the revised figures. The original comment was “Precise that there is an extensional surface fracture.”*

*You indicate the 2010 coseismic surface fracture of Prentice et al. in red. But you just put a line on the strike-slip segment of the EPGFZ. This coseismic fracture is in reality a southward extensive fracture. I suggest you to put an extensional symbol; otherwise we could think that this is a strike-slip fracture.*”

**This distinction is noted and we have added the normal fault symbol to the fractured area shown in Figure 7B**.

1. “*Response to first review: “The cross-section of the EPGFZ in Leroy et al. (2015) is seismic data, not chirp sonar. It recorded up to 6 seconds instead of less than 1 second as most of the sonar do (our shot rate was a quarter second). They are similar to the chirp sonar data because they displayed the “envelop” of the seismic data (as most of the sonar data) instead of the analytical signal. Their chirp sonar data looks quite similar to ours. Also, the upper section (about the same depth) of their seismic data is similar to our chirp data.”*

*If you read carefully the article of Leroy et al. (2015), you will see that there is a sub-bottom seismic profile crossing the EPGFZ in a marine basin. This chirp profile was recorded at 2 seconds in the frequency range of 1.8-5.6 kHz. In my knowledge it is the only other published chirp profile that crosses the EPGFZ, so I just suggested you to compare it with your data.*”

**In Leroy et al. (2015), the western part of the EPGFZ is noted to be highly transtensional, whereas the eastern part of the EPGFZ we are studying is highly transpressional – so the width of the two fault zones and their internal structure is quite different (ie, folds are rare in the west and common in the area we describe here). For this reason, we do not feel that adding a figure to show this comparison would be useful. However, we did add new chirp profiles of EPGFZ into Figure 6 (A, B, and D) to improve the case for the continuity of the fault in Lake Azuey and to show its variations in width.**

Line 58 – 63: *Maybe put the faults in red in fig. 1.*

**We tried this but found that red lines do not stand out well on a gray scale background.**

Line 109 – 111: *Please add a citation.*

**We added the reference for Mount and Suppe (1987) to Line 111.**

Line 126: *“This elongate”*

*It is strange to begin a new part by "This".*

**We change “this” to “the” in the revised version.**

Line 130: *“by the the shallow (33 m-deep)”*

*delete “the”.*

**We corrected this typo accordingly.**

Line 137: *“by the the 42.8 m-deep”*

*delete “the”.*

**We corrected this typo accordingly.**

Line 143: *“The main goal of this paper are”*

*Is*

**We corrected this typo accordingly.**

Line 145 – 146: *“aftershock”.*

*Aftershocks*

**We corrected this typo accordingly.**

Line 147: *“information”*

*Informations*

**We corrected this typo accordingly.**

Line 170: *“(Figure 1B)”*

*Delete*

**We deleted this reference accordingly.**

Line 182 – 185: *“Structures and tectonic geomorphology formed in this 250 km-wide, transpressional zone include: GPS studies [Calais et al., 2002, 2010;Hayes et al., 2010;Symithe et al., 2013;Douilly et al., 2013, 2015] reveal strain”*

*Rephrase, this is not clear*

**We rephrased this sentence. The new sentence is heighted in line 182.**

Line 199: *“Muerto trench”*

*add it on fig 1B*

**The Muertos trench is not shown in Figure 1B. But we did add it to Figure 1A and changed the reference at line 200 to Figure 1A, B.**

Line 302: “was”

Delete

**We corrected this typo accordingly.**

Line 337: *“(Line C–C’ in Figure 3)”*

*there is no C-C' in fig 3.*

**We thank the reviewer for pointing out this error. Line C-C’ was moved to Figure 6 as Figure 6E. Since we are not discussing the cross-section in this sentence, we changed Line C—C’ in Figure 3 to Line C—C’ in Figure 2 (so show Line B—B’ in Figure 2).**

Line 374: *“form”*

*From*

**We corrected this typo accordingly.**

Line 395: *“online”*

*Onland?*

**We corrected this typo accordingly.**

Line 463: *“Tapion du Petit Goâve restraining bend 12 km to the east (Figure 7)”*

*not in fig. 7*

**We added the label of Tapion du Petit Goâve restraining bend to Figure 7B.**

Line 509: *“Lamentine fault”*

*Lamentin*

**We corrected this typo accordingly.**

Line 543: *“that”*

*Delete*

**We corrected this error accordingly.**

Line 580: *“Bains”*

*Baies*

**We corrected this error accordingly.**

Line 582: *“Bains”*

*Baies*

**We corrected this error accordingly.**

Line 587: *“this zone”*

*precise which one*

**We rewrote this sentence as: “We interpret this 10-15 km-wide, belt of late Holocene deformation in clastic basins north of the EPGFZ, with Cul-de-Sac intermontane basin in the east and the low-relief coastal plain along Port-au-Prince bay and the Canal du Sud to the west, as the accommodation of transpressional strain supported by highly-oblique GPS vectors across the study area.” The new sentence is highlighted in line 586 – 590.**

Line 591: *“Bains”*

*Baies*

**We corrected this error accordingly.**

Line 783: *“EPGFZ”*

*detail as this is the first time it appears in the figures*

**We updated the figure caption as Enriquillo-Plantain Garden fault zone (EPGFZ).**

Line 788: *“BP”*

*Delete, this is not on the map.*

**We corrected this accordingly.**

Line 796: *add TBF*

**We added Trois Baies fault as TBF accordingly.**

Line 800: *“TBFZ”*

*not on fig 1C*

**We corrected this typo and change TBFZ to Trois Baies fault in the update paper.**

Caption of Figure 2:

*“GPS vectors are from Calais et al.[2010]”*

*Really hard to find them*

**There are many elements on this figure and very few GPS vectors in this region. Since the GPS vector is not the most important element of this figure, we do not want to make them larger in order to avoid cluttering the map.**

*“NaC= Nan Cadastre thrust”*

*Where it is? Is it NFZ?*

**Yes, it is. We corrected the label in Figure 2 as NaC.**

*“showingen echelonand curvi-linear folds”*

*Show them with arrows or other symbol*

**Here, we did not want to add any symbol to block the DEM.**

**Figure 3:**

*“The Quaternary is usually yellow or beige. It is confusing in blue.”*

**We changed it to blue in the revised version.**

*“On Fig. 2, BB' profile crosses the DFZ and not the DT.”*

**We corrected this error in Figure 3.**

**Figure 4:**

*“figure 6”*

**We update the order of the figures.**

*“Identical sequences present on both lines”*

*be careful: on the enlargement of line B6 your boundary between blue and yellow unit is not parallel to the layers and cuts them.*

**We deleted this sentence in the revised version.**

**Figure 5:**

“*Figure 4*”

**We update the order of the figures.**

**Figure 6:**

*“Figure 5”*

**We update the order of the figures.**

*“2.6 mm/yr is assumed”*

*add the citation*

**We calculated this number.**

*“The quaternary is usually yellow”*

**We changed the color to yellow in Figure 6.**

**Figure 8:**

*“Add enlargements to show the ruptures buried by the sediments”*

**We added enlargements to Figure 8B and C in the revised version.**

**Figure 10:**

*“Black arrows show southwest direction of the Gonâve microplate relative to the Caribbean plate [Calais et al., 2010].”*

**We changed this sentence as: “Black arrows show the southwest direction of the GPS vectors relative to the Caribbean plate”.**

*“show”*

*Shows*

**We corrected this typo accordingly.**

**Figure 11:**

*“There is a scale problem in the inset. On the map the SAF is about in the middle of the AA' transect, but not in the inset. Please fix that.”*

**We thank the reviewer for pointing out this error. We corrected it accordingly in the revised version.**

*“Cos-seismic”*

*Co-seismic*

**We corrected this typo in the revised version.**