From: "Randolph Williams" <rtwilliams@wisc.edu>

To: "Jessie Thompson Jobe" <jjobe@usgs.gov>,

Subject: [Seismica] Editor Decision

Dear Jessie Thompson Jobe, Rich Briggs, Stephen Hughes, James Joyce, Ryan Gold, Shannon Mahan, Harrison Gray, Laura Strickland:

I hope this email finds you well. I have reached a decision regarding your submission to Seismica, "Neotectonic Mapping of Puerto Rico". Thank you once again for submitting your work to Seismica.

We have now received two reviews for your manuscript. In general, both reviewers are positive about the the work and its suitability for Seismica. Both indicate that their primary concerns are related to matters of generally presentation clarity and quality. In general, I agree with that assessment. As such, I think your manuscript should be suitable for publication following some minor revisions. Please pay particular attention to the reviewers' comments related to presentation clarity and organization below. As of now, I do not intend to send the revised manuscript out for additional peer review. Thank you again for chosing Seismica for your work, and I look forward to working with you further to see this work through to publication.

When you are ready to resubmit the revised version of your manuscript, please upload:

- A 'cleaned' version of the revised manuscript, without any markup/changes highlighted.
- A pdf version of the revised manuscript clearly highlighting changes/markup/edits.
- A 'response-to-reviewers' letter that shows your response to each of the reviewers' points, together with a summary of the resulting changes made to the manuscript.

If you deem it appropriate, please check that the revised version of your manuscript recognises the work of the reviewers in the Acknowledgements section.

Please note that Seismica does not have any strict deadlines for submitting revisions, but naturally, it is likely to be in your best interest to submit these fairly promptly, and please let me know of any expected delays.

I wish you the best with working on the revisions. Please don't hesitate to contact me with any questions or comments about your submission, or if you have any feedback about your experience with Seismica.

Kind regards,

Randy Williams Handling Editor

Comments of Reviewer #1

The ongoing seismic sequence in Puerto Rico has highlighted how the seismic hazard posed by faults in the region remains to be well characterized, as well as the need for an up-to-date map of Quaternary faults on the island. Thompson-Jobe et al. use a combination of newly collected lidar data, historical imagery, field mapping, outcrop documentation, and geochronology to identify active faults onshore Puerto Rico. Their manuscript also contributes a thorough review of the pre-existing literature and data available on faults on the island. Together, the compilation of new and old observations and slip rates provide a foundation for an updated map of Quaternary active faults in Puerto Rico. This is an excellent contribution to Seismica and I recommend publication. My very minor comments and suggestions are provided below, with a focus of trying to use observations from the ongoing earthquake sequence in the island to disambiguate the kinematics of the faults mapped in this study.

Lines 105-106 - Doesn't the 2019-present seismic sequence also support active deformation focused on the SW corner of the island? Seems worth mentioning here.

Line 117 - Highly generalized? Not sure what this means. Do you mean coarsely mapped? Simplified?

Line 123 - Link to lidar data does not work (tried on both Chrome and Safari)

Figure 7

Why are the OSL dates listed in the figure but not the radiocarbon dates? I think either have both or none, for consistency. ***Returning to this comment after seeing that most C14 ages are modern. I think it makes sense to not have them on the figure then, but this could be stated in the caption.

Line 266 - Why not say 0.2-0.6mm/yr instead of picking the arbitrary value of 10ka, using the full range of vertical separation rate allowed by the ages?

Can the focal mechanisms from the Puerto Rico sequence be used to help disambiguate the lateral and vertical components, as well as right-lateral vs left-lateral motion, of the faults in the south part of the island? While most of the seismicity was offshore, it looks like some of the onshore FMS overlap with the Salinas fault. It seems worth taking at least a quick look at how the FMS and the mapped fault compare. Blasweiler et al. compiled both modern and historical moment tensors (Figure 1):

Blasweiler, M., Herman, M. W., Houtsma, F., & Govers, R. (2022). Tectonic context and possible triggering of the 2019–2020 Puerto Rico earthquake sequence. *Seismological Society of America*, *93*(2A), 584-593.

Because a lot of the observations are remote and not field-verified, the authors ought to be cautious with assumptions of oblique motion/a strong vertical component for the faults documented here. This caution is guaranteed especially for the faults located a few kilometers off the range fault, consistent with the vertical component being minor. Small changes in the orientation of strike-slip faults can cause vertical motion such as that observed. For example, the post-earthquake lidar data

for Landers or Ridgecrest have scarps with substantial vertical offsets, yet the events and the faults are dominantly strike-slip.

Can we place error bounds on the recurring 10 ka deposits?

Line 509 - post-Holocene?

Line 569 - and the 2019-present sequence

How do the locations of relocated events in the south and southwest of the island in Yoon et al. (2023) (ref below) compare to the scarps mapped here? In general, the geophysical data (focal mechanisms, earthquake hypocenters) for the onshore portion of the 2019-present sequence could help constrain the locations and kinematics of the faults identified in this study.

Yoon, C. E., Cochran, E. S., Vanacore, E. A., Huerfano, V., Báez-Sánchez, G., Wilding, J. D., & Smith, J. (2023). A detailed view of the 2020–2023 Southwestern Puerto Rico seismic sequence with deep learning. *Bull Seismol Soc Am*.

The authors provide a detailed and simplified map (Figures 23 and 24). I would appreciate some brief discussion of what applications should rely on each of those maps. For example, the detailed map is well suited for identifying locations for future paleoseismic trenching. The simplified map is useful for hazard estimates (Mmax etc).

Could not check the shapefiles because the repository is not published yet but all remaining data is available in the supplement and in readable and usable format, including the R code.

Last, I was not able to find a single typo in this manuscript. I commend the authors for their thoroughness.

Comments of Reviewer #2

This is a straightforward manuscript that reports on new neotectonic mapping of onshore faults of Puerto Rico combined with previous compilations of active fault maps for the area. It uses newly available topographic data along with field and lab work to further characterize active faulting for the region. While it does feel like a mapping report, it is of interest to the community due to the relative dearth of knowledge on active faulting within Puerto Rico. It feels suitable for Seismica based on that reason.

I appreciate the authors focusing their efforts on compiling an active fault map of Puerto Rico for inclusion in a National Seismic Hazard Map update as well as identifying locations where more work is needed, making it easier for other workers to study the region.

Outstanding errors for the manuscript include grammatical and labelling issues that are listed below as both overall and line by line/figure comments. One addition that would improve the manuscript greatly is the inclusion of a map in the Supplemental Material that shows the locations of all the figure locations for site specific figures (Figure 4 onwards).

It is my opinion that this manuscript be accepted after minor revisions.

Line by line comments:

Line 53-55: I am not sure if the Lajas needs to be explicitly described here in the non-technical summary compared to the abstract? It feels like a specific detail that should either be also in the abstract or not included.
Additionally, “In addition, we describe…” sounds like an eighth fault is being described.

Line 73: I think this should say 2019 and not 2017 for lidar availability.

Line 96: Change have to has. “Oblique collision of the Bahaman carbonate platform with Hispaniola has…”

Line 124: Table S1 is unit descriptions, not derivative topographic products. I do think including a table (supplemental is fine) describing derivative products that are used is a great idea and should be included in the manuscript. It could be used in conjunction with comments I have below at line 142.

Line 139-140: I suggest more explanation for how the correlative surfaces are defined for the vertical separation measurement. Are they programmatically defined (via something along the lines of the Scarp_VS code in DuRoss et al., 2019) or defined through some other method?

Line 140-143: The sentence beginning with “These fault-related features were…” is an awkward sentence for me to try to understand. I suggest rewording/reorganizing the sentence or splitting it up into multiple sentences where it is more apparent which criteria applies to pre-Q and Q faults for fault categorization.

Line 142: I suggest using different terminology than “lidar data” when it comes to describing observations made from the available high-resolution topography. Unless the actual point clouds are being used to look for displacements, make measurements, etc., I prefer referring to the derived products. As an example, I would likely look for visibly displaced Quaternary deposits on a hillshade, not in the lidar point cloud itself. In the case of line 142, I suggest either explicitly saying which product(s) were used (hillshade, slopeshade, etc.), or say that these displacements are visible in derivative visualizations from the lidar-derived DEM. I recognize that either approach is much wordier, but I think that it is good practice to be explicit about the exact product that is being used. This helps with reproducibility, as it makes it easier for others to explore what has been identified in the landscape. Having a table to reference for the product(s) used (see line 124) could simplify matters. I reference this explanation for suggestions for other line changes (line 179, 189, etc.) but will likely miss some.

Line 153: Clarify which tables/reports in the Supplemental Material are those that contain the OSL and radiocarbon information.

Line 161: Need a comma after “(e.g., Piety et al., 2018; Styron et al., 2020),”

Line 163: See line 142. I think “lidar derived topographic products” would be acceptable to use here.

Line 165: I think subsections for individual faults/fault zones should be labelled as “4.1 South Lajas fault” and not just “4.1 South Lajas.” Both fault zones are labelled as fault zones in their subsection headers (e.g., “Great Northern Puerto Rico fault zone” and not “Great Nothern Puerto Rico”), so for the sake of consistency and more clear subsection headers, all subsections should be labelled the same way.

Line 179: See line 142 for “visible in the lidar” comments.

Line 189: See line 142 for “lidar data” comments.

Line 190-191: It would be interesting to see an explanation or speculation as to why there is a difference in the sense of motion between GPR profiles and lidar mapped scarps. Is there a preferred sense of motion?

Line 202: Figure 6 likely should be referenced somewhere in this section (4.1.1). It is not referenced anywhere in the main body of the manuscript.

Line 202: It can be confusing to tell if fault being referenced in this subsection is called the Guanabanas fault, or if this is an exposure of the South Lajas fault on Guanabanas Road.

Line 203: This is an awkward sentence. One suggestion for improvement is moving the second clause to the start of the sentence “The South Lajas fault is visible in outcrop where one of the scarps associated with the fault intersects a road.”

Line 209: There are only 4 units, not 5, that are shown in Figure 7 and described in the text, Table 2, and Supplementary Material. Five units should be changed to four.

Line 212-213: The contact between Units 1 and 2 separates them. A suggested change is “Unit 2 and Unit 1 are separated by a smooth, continuous contact.”

Line 222-223: This appears to be a run-on sentence. I suggest changing to something along the lines of “It is dark brown, only moderately hard, and has more silt with uncommon pebbles.”

Line 243: lowercase s in “see Supplementary Material”

Line 268: Comma after “Boqueron trench and,” is not necessary.

Line 270: See Line 165 comment for subsection headers.

Line 272: Should say “Figure 1B” and not “Figure 1A”

Line 276: I suggest including what the dimension the 0.9-m is referring to for the graben.

Line 279: See line 142 for “mapping on lidar data” comments.

Line 288: See line 142 for “lidar data” comments.

Line 294: See line 142 for mapping on lidar data comments.

Line 297: Either the s in “site A” should be capitalized here, or the s for sites B and C in lines 303 and 307 should be lowercase.

Line 316: See Line 165 comment for subsection headers.

Line 338: See line 142 for “lidar topography” comments.

Line 341-342: Check your figure callouts, they appear to be reversed here. Figure 11D in Line 341 should be 11C. Figure 11C in Line 342 should be 11D.

Line 344: Similar to the above comment, there appears to be a figure callout mistake here. There is no prominent vegetation lineament visible in Figure 12. There is one in Figure 11. I suspect this should be referencing Figure 11B.

Line 356: “isn’t” -> “is not”

Line 356: The scarp vertical separation shown is 1.4 m in Figure 12, not 1.5 m. I suggest changing either the number used in line 356 (and subsequent calculation in lines 358) or Figure 12 to reflect the maximum scarp height that is observed, whether that is 1.4 m or 1.5.

Line 357: I suggest changing the figure callout here to Figure 12D because that is the scarp measurement/profile being used for this calculation.

Line 362: See Line 165 comment for subsection headers.

Line 368: “hasn’t” -> “has not”

Line 369: See line 142 for “mapping on lidar” comments.

Line 370-373: The sentence beginning with “Dated offset stratigraphy in a paleoseimic trench…” is slightly confusing to read, based on the placement of commas and switching the order of event timing constraints (penultimate then most recent for OSL and most recent then penultimate for radiocarbon). I suggest changing it to something along the lines of: “Dated offset stratigraphy in a paleoseismic trench suggests at least two events: based on OSL ages, the penultimate event occurred between 10.4 and 2.04 ka and the most recent event occurred between 2.04 and 2.66 ka (Piety et al., 2018). Based on conflicting 14C ages, the penultimate event occurred >14 ka and the most recent event occurred 8–14 ka.”

Line 381: See line 142 for “lidar topography” comments.

Line 381-383: I think the sentence starting with “On the lidar data,” is a run on sentence. I suggest breaking it up into two sentences.

Line 391: “isn’t” -> “is not”

Line 392: See line 142 for “as measured from lidar” comments.

Line 396-398: The sentence starting with “Based on the presence of scarps” is hard to read because of the many sections to the sentence. I suggest changing it to something along the lines of: “We suggest that the Salinas fault is 23-28 km long with a primarily normal sense of movement, based on the presence of scarps as well as tonal and topographic lineaments with a clear down-to-the-south displacement that are consistent with gravity data.” Another suggestion would be to break this up into two sentences, where the first is the suggestion (Salinas fault characteristics) and the second is the reasoning behind the suggestion.

Line 399: Remove comma after “2m”, both the separations and assumed age are what is being used to estimate the slip rate.

Line 401: Referring to this trench (I’m assuming it is the same trench from Piety et al., 2018 that is referenced in line 371) as “the trench” as opposed to “a paleoseismic trench” from line 371 is confusing. I suggest trying to be a little clearer while using definite articles to refer to “the trench” especially when that trench has not been mentioned for 3 paragraphs.

Line 403: Remove comma after “we suggest that” -> “However, we suggest that within a …”

Line 412: I suggest clarifying the age of these alluvial deposits. I am not sure what they are older than because no other deposits have been described in the section (4.5).

Line 413: The GSPRFZ initialism has not been introduced anywhere. Introduce it at line 406. This explains what it means. “Great Southern Puerto Rico fault zone” can also be replaced with “GSPRFZ” in line 409 by introducing the initialism in line 406.

Line 417: See line 142 for “lidar topography” comments.

Line 449: See Line 165 comment for subsection headers.

Line 453: Please clarify that “down-to-the-south” is referring to displacement. “with down-to-the-south displacement in Oligocene bedrock.”

Line 459: “hasn’t” -> “has not”

Line 466: See line 142 for “data” comments.

Line 476: See Line 165 comment for subsection headers.

Line 479: See line 142 for “lidar data” comments.

Line 510: Please see line 413 comments and establish what GNPRFZ stands for in line 507 before using it.

Line 519: See line 142 for “lidar data” comments.

Line 530: “hasn’t” -> “has not”

Line 531: “don’t” -> “do not”

Line 562-563: I suggest including a citation here for the Cenozoic activity of the GSPRFZ.

Line 574: I think it could be useful to also include a website link for the Quaternary fault and fold database besides the Crone and Wheeler (2000) citation as not all readers will be familiar with the QFFD.

Line 581, Table 4, & Figure 24: There are two, not one, Class C faults listed. Further, the San Francisco fault is not listed or described elsewhere in the manuscript. Its existence needs to be cited. It does not appear in Figure 1A, which uses Piety et al., 2018 and Styron et al., 2020, but those are the only two references besides this manuscript cited for Figure 24. The source of information on the San Francisco faults needs to be addressed.

Line 616: “is” -> “are”

General figure comments:

I suggest including an overview map in the Supplemental Material that includes bounding boxes for all figures that include maps. It can be confusing when attempting to figure out where a given location is in reference to Puerto Rico as a whole, especially when that location is multiple overview maps deep (e.g., Figure 18’s location is referenced on Figure 13, which itself is referenced on Figure 2). A single map with location bounding boxes available somewhere, even in the Supplemental Material, will go a long way in reducing confusion.

All figures with fault and other symbology should have that symbology noted. This includes Figures 4, 5, 6, 9, 10, 11, 14, 15, 17, 18, 19, 20, and 22. As an example, Figure 5 uses fault scarp symbology but does not denote it.

Topographic profile comments:
1) I suggest including vertical exaggeration, as the profiles are not 1:1 and change exaggeration between profiles.
2) I suggest orienting similarly oriented profiles the same direction. As an examples, profiles p1, p2, and p3 (Figures 4, 5, and 6) are all NW/SE trending profiles, but p1 is from NW->SE and p2/p3 are from SE -> NW. This is also seen between p6 and p7, which are both on Figure 11.
3) Some topographic profiles (Figures 10, 11, and 18) have red arrows apparently denoting where it appears the profile crosses the mapped scarp. Other profiles (Figures 4, 5, 6, 11, 12, 15, 16, 17, and 21) do not have red arrows. It is not explained in any of the figure captions what the red arrows mean. Symbols on plots should be explained, especially in instances like Figure 11, where the 11C profile does not have a red arrow but the 11D profile does.
4) There should be consistency between figures as to whether topographic profiles are included as insets or get their own subfigure callout. As an example, Figure 5 has a topographic profile as 5D, but Figure 17 has a topographic profile as an inset. I suggest changing Figures 16 and 17 (and others where this is the case) to match the rest of the manuscript where topographic profiles are labelled.

Individual figure comments:

Figure 1: 2020 is hard to read on 1A and should be modified to for easier reading. I also suggest clarifying that the seismic catalog is also shown in 1B. Symbology used on 1A (e.g., thrust fault symbology used for trenches/troughs) should be denoted in a key. Please include a scale bar on 1A. I suggest clarifying for 1B that the background is a hillshade (or similar product) derived from the 10-m National Elevation Dataset dem. Align A and B figure indicators to the same part of the rectangle (A is currently in the upper left, B is in the upper right).

Figure 2: Clarify for that the background is a hillshade (or similar product) derived from the 10-m National Elevation Dataset dem.

Figure 3: Change the tonal lineament to a different color, it is very hard to see on the gray background even when zooming in.

Figure 5: Missing tick at 140m in 5D.

Figure 6: I cannot find where figure 6 is referenced in the main text of the manuscript. The location is boxed in Figure 2 and it is called out in Figure 7, but that appears to be it. It should be referenced in section 4.1.1 (line 202).
The fault exposure is called the “South Lajas fault exposure” here but referred to as the “Guanabanas road exposure” in Figure 7. I suggest clarifying by labelling “South Lajas fault exposure at Guanabanas road (Figure 7)”.

Figure 7: Clarify that this road exposure is on the South Lajas fault in the caption. Clarify that the radiocarbon ages are in Table 2 and OSL ages are in Table 3. The caption states that OSL ages are in Table 2 and neglects to mention radiocarbon ages.
The scale bar in 7B is useful but scaled axes along the length of the mosaic would be more useful.
Clarify that the image being shown in 7A is from structure-from-motion. It is currently being described as a photo, which implies it being from a singular photograph.
This may be a technical issue with regards to allowed file sizes, but a higher resolution version of 7A would be greatly appreciated.

Figure 8: E should be lowercase in “Guanabanas Exposure” and T should be lowercase for “Boqueron Trench”.

Figure 9: It appears there are mapped scarps missing near site A in 9B. There are NW/SE oriented scarps mapped in 10B that should show up in that location in 9B.

Figure 10: Clarify what the brown lines in 10B denote.

Figure 23 & 24: Clarify that the background is a hillshade (or similar product) derived from the 10-m National Elevation Dataset dem.

Figures 19, 20, and 21: I suggest consolidating these figures and including the applicable topographic profiles and field photos from Figure 21 in Figure 19 and applicable field photo from Figure 21 in Figure 20. I recognize that they might be separated for page spacing issues. If this is the

case, I suggest attempting to reconfigure the subfigures in such a way as to make things fit, especially to make this set of figures consistent with the other site-specific figures (e.g., Figure 4).

Author Response to Reviewers

Dear Editor,

Thank you for your helpful assessment of our manuscript “Neotectonic Mapping of Puerto Rico”.

We carefully considered the comments from the two reviewers and the Editor, and revised and uploaded our manuscript to the Seismica website. In response to these comments, major changes include:

· We added a new short section to describe observations and existing knowledge on the San Francisco fault, which Reviewer 2 mentioned was missing from the text.

· We carefully revised the figures and text following suggestions from the reviewers, including checking for proper terminology for the lidar-derived datasets, adding legends and vertical exaggeration for topographic profiles, and adding clarification around some of the methods for mapping and measuring vertical separation, in addition to grammatical edits and rewording sentences for clarity.

· We added a few sentences addressing fault kinematics from the 2019-ongoing southwest Puerto Rico seismic sequence, where relevant.

· The manuscript also underwent internal review at USGS. These changes are incorporated into the revised manuscript as well. A separate “response to reviews” document for the internal review is available upon request. This revised manuscript has USGS Bureau Approval to be published, if accepted.

· This manuscript cites a companion manuscript that is currently in review (resubmitted following revisions after an initial decision of major revisions) with the journal Seismological Research Letters. This manuscript is available upon request, and has USGS Bureau Approval.

The attached Response to Reviewers letter describes the changes and responses to comments. The original comments appear in plain text, and our response can be found below each comment in Italics with line numbers referencing the changes in the revised manuscript.

We prepared USGS ScienceBase Data Releases to host the datasets associated with this study. The DOIs are now cited in the manuscript, and will be made live shortly.

We look forward to hearing from you regarding the re-appraisal of our work, and please reach out with any questions or concerns.

Sincerely,

Jessica Thompson Jobe and coauthors

Reviewer #1: Anonymous

The ongoing seismic sequence in Puerto Rico has highlighted how the seismic hazard posed by faults in the region remains to be well characterized, as well as the need for an up-to-date map of Quaternary faults on the island. Thompson-Jobe et al. use a combination of newly collected lidar data, historical imagery, field mapping, outcrop documentation, and geochronology to identify active faults onshore Puerto Rico. Their manuscript also contributes a thorough review of the pre-existing literature and data available on faults on the island. Together, the compilation of new and old observations and slip rates provide a foundation for an updated map of Quaternary active faults in Puerto Rico. This is an excellent contribution to Seismica and I recommend publication. My very minor comments and suggestions are provided below, with a focus of trying to use observations from the ongoing earthquake sequence in the island to disambiguate the kinematics of the faults mapped in this study.

> *We thank the reviewer for their thorough and thoughtful review. The comments help place this study into context and clarify our assumptions.*

Lines 105-106 - Doesn't the 2019-present seismic sequence also support active deformation focused on the SW corner of the island? Seems worth mentioning here.

> *Addressed. We added a sentence stating that the 2019-ongoing southwest Puerto Rico seismic sequence supports this interpretation (e.g., Blasweiler et al., 2022; Yoon et al., 2023). L105-107.*

Line 117 - Highly generalized? Not sure what this means. Do you mean coarsely mapped? Simplified?

> *Addressed. We changed "generalized" to "simplified". L118.*

Line 123 - Link to lidar data does not work (tried on both Chrome and Safari)

> *Addressed. Thanks for catching this broken link – it is now updated in the manuscript. L125.*

Figure 7: Why are the OSL dates listed in the figure but not the radiocarbon dates? I think either have both or none, for consistency. ***Returning to this comment after seeing that most C14 ages are modern. I think it makes sense to not have them on the figure then, but this could be stated in the caption.

Addressed. We added that radiocarbon ages are not shown on the figure because they are all modern and reference the reader to Table 2.

Line 266 - Why not say 0.2-0.6mm/yr instead of picking the arbitrary value of 10ka, using the full range of vertical separation rate allowed by the ages?

Addressed. We added a statement that clarifies that "Using the maximum and minimum possible ages yields a range of vertical slip rates between 0.2 and 0.6 mm/yr". L286-287.

Can the focal mechanisms from the Puerto Rico sequence be used to help disambiguate the lateral and vertical components, as well as right-lateral vs left-lateral motion, of the faults in the south part of the island? While most of the seismicity was offshore, it looks like some of the onshore FMS overlap with the Salinas fault. It seems worth taking at least a quick look at how the FMS and the mapped fault compare. Blasweiler et al. compiled both modern and historical moment tensors (Figure 1):

Blasweiler, M., Herman, M. W., Houtsma, F., & Govers, R. (2022). Tectonic context and possible triggering of the 2019–2020 Puerto Rico earthquake sequence. Seismological Society of America, 93(2A), 584-593.

Not addressed. This is a great suggestion, but the spatial extent of the seismicity is mostly confined to the Punta Montalva fault. There is some seismicity that overlaps with the San Marcos and Salinas faults, but attributing these smaller events to a specific fault involves a lot of assumptions. Moreover, this study is based on geomorphic observations from the landscape and deriving fault locations and possible slip rates and kinematics from these datasets, integrating a longer timescale than what may occur during a single seismic sequence. We do hope to pursue a better comparison between modern seismicity and potentially active faults in future studies.

Because a lot of the observations are remote and not field-verified, the authors ought to be cautious with assumptions of oblique motion/a strong vertical component for the faults documented here. This caution is guaranteed especially for the faults located a few kilometers off the range fault, consistent with the vertical component being minor. Small changes in the orientation of strike-slip faults can cause vertical motion such as that observed. For example, the post-earthquake lidar data for Landers or Ridgecrest have scarps with substantial vertical offsets, yet the events and the faults are dominantly strike-slip.

Addressed. We agree with these statements, and we added a few sentences to the methods section to clarify these assumptions (L143-151). Importantly, more work is needed to better define fault kinematics. We hope this study provides a first step towards that goal.

Can we place error bounds on the recurring 10 ka deposits?

Not addressed. We use 10 ka as a round number assumed age for Holocene deposits for slip rate estimates, and given that this number is already an estimate, we prefer not to place uncertainty on it. We hope to have more geochronology in the future to better date some of these deposits and place better constraints on fault slip rates.

Line 509 - post-Holocene?

Addressed. This has been changed to "Holocene".

Line 569 - and the 2019-present sequence

Addressed. We added "and the 2019-present seismic sequence" to this sentence. L614.

How do the locations of relocated events in the south and southwest of the island in Yoon et al. (2023) (ref below) compare to the scarps mapped here? In general, the geophysical data (focal mechanisms, earthquake hypocenters) for the onshore portion of the 2019-present sequence could help constrain the locations and kinematics of the faults identified in this study.

Yoon, C. E., Cochran, E. S., Vanacore, E. A., Huerfano, V., Báez-Sánchez, G., Wilding, J. D., & Smith, J. (2023). A detailed view of the 2020–2023 Southwestern Puerto Rico seismic sequence with deep learning. Bull Seismol Soc Am.

Addressed. Analysis of seismicity suggests that deformation across the island is overall right-oblique transtension, which is consistent with our mapping fault of fault kinematics from the landscape. A detailed comparison of focal mechanisms with exact faults is beyond the scope of this study. However, we did add a sentence to the section on Punta Montalva that mentions that the fault location and kinematics observed in the landscape agree with seismicity observed during the 2019-ongoing seismic sequence (e.g., Blasweiler et al., 2022; Yoon et al., 2023). L335-337.

The authors provide a detailed and simplified map (Figures 23 and 24). I would appreciate some brief discussion of what applications should rely on each of those maps. For example, the detailed map is well suited for identifying locations for future paleoseismic trenching. The simplified map is useful for hazard estimates (Mmax etc).

Partially addressed. We do provide a reference to Figure 23 in the main text when discussing how the mapping provides context for further active fault research. However, we refrain from adding more discussion on how researchers should use these data, as it is beyond the scope of this study and different researchers may use or apply different standards for their hazard calculations. We do cite our companion manuscript that describes the faults proposed for inclusion in the 2025 U.S National Seismic Hazard Model update for Puerto Rico and the U.S. Virgin Islands, which are different than those shown in Figure 24, as different standards for fault inclusion apply. To help guide the reader through these different levels of detail for the fault compilations, we added references to Figures 23 and 24 in Section 5.4 that discusses the comparison from this study to the 2025 NSHM PRVI fault sections database. L655-666.

Could not check the shapefiles because the repository is not published yet but all remaining data is available in the supplement and in readable and usable format, including the R code.

> *Addressed. The shapefiles are now available as part of a USGS ScienceBase Data Release.*

Last, I was not able to find a single typo in this manuscript. I commend the authors for their thoroughness.

> *Thank you – but we certainly found a few typos during our revision!*

Reviewer #2: Anonymous

This is a straightforward manuscript that reports on new neotectonic mapping of onshore faults of Puerto Rico combined with previous compilations of active fault maps for the area. It uses newly available topographic data along with field and lab work to further characterize active faulting for the region. While it does feel like a mapping report, it is of interest to the community due to the relative dearth of knowledge on active faulting within Puerto Rico. It feels suitable for Seismica based on that reason.

I appreciate the authors focusing their efforts on compiling an active fault map of Puerto Rico for inclusion in a National Seismic Hazard Map update as well as identifying locations where more work is needed, making it easier for other workers to study the region.

Outstanding errors for the manuscript include grammatical and labelling issues that are listed below as both overall and line by line/figure comments. One addition that would improve the manuscript greatly is the inclusion of a map in the Supplemental Material that shows the locations of all the figure locations for site specific figures (Figure 4 onwards).

It is my opinion that this manuscript be accepted after minor revisions.

> *We thank the reviewer for their very detailed and thorough review. These comments certainly improved the presentation and clarity of the study and pointed out where we had missed important information!*

Line by line comments:

Line 53-55: I am not sure if the Lajas needs to be explicitly described here in the non-technical summary compared to the abstract? It feels like a specific detail that should either be also in the abstract or not included.

Additionally, “In addition, we describe…” sounds like an eighth fault is being described.

> *Partially addressed. We describe the Lajas fault specifically because we have paleoearthquake timing on the fault, and this information is limited for faults in Puerto*

Rico. We prefer to leave this information as it is currently written. We edited the sentence to clarify that we are describing one of the already mentioned faults and not a few faults. L50-52.

Line 73: I think this should say 2019 and not 2017 for lidar availability.

Addressed. Changed to 2019. L72.

Line 96: Change have to has. “Oblique collision of the Bahaman carbonate platform with Hispaniola has…”

Addressed. Changed as suggested. L95.

Line 124: Table S1 is unit descriptions, not derivative topographic products. I do think including a table (supplemental is fine) describing derivative products that are used is a great idea and should be included in the manuscript. It could be used in conjunction with comments I have below at line 142.

Addressed. Table S1 was missed in the Supplementary Material – we added it now and updated references to the other Supplemental Tables.

Line 139-140: I suggest more explanation for how the correlative surfaces are defined for the vertical separation measurement. Are they programmatically defined (via something along the lines of the Scarp_VS code in DuRoss et al., 2019) or defined through some other method?

Partially addressed. Because this study was performed at a reconnaissance level and we focused on extracting estimated displacements at dozens of sites, we measured vertical separation through visual fitting of the upthrown and downthrown surfaces and estimated the vertical separation at the center point of the scarp. Correlative surfaces were defined by similar slopes on upthrown and downthrown sides and similar surficial characteristics from field observations. We added this information to the methods for clarity. L143-151.

Line 140-143: The sentence beginning with “These fault-related features were…” is an awkward sentence for me to try to understand. I suggest rewording/reorganizing the sentence or splitting it up into multiple sentences where it is more apparent which criteria applies to pre-Q and Q faults for fault categorization.

Addressed. We reworded this sentence for clarity. It now reads “These fault-related features were then classified into pre-Quaternary bedrock faults if we did not observe offset Quaternary deposits, and Quaternary-active faults if the fault displaces Quaternary deposits visible in the lidar-derived topography and/or Quaternary deposits shown on existing geologic and geomorphic maps.” L151-154.

Line 142: I suggest using different terminology than “lidar data” when it comes to describing observations made from the available high-resolution topography. Unless the actual point clouds are being used to look for displacements, make measurements, etc., I prefer referring to the derived products. As an example, I would likely look for visibly displaced Quaternary deposits on a hillshade, not in the lidar point cloud itself. In the case of line 142, I suggest either explicitly saying which product(s) were used (hillshade, slopeshade, etc.), or say that these displacements are visible in derivative visualizations from the lidar-derived DEM. I recognize that either approach is much wordier, but I think that it is good practice to be explicit about the exact product that is being used. This helps with reproducibility, as it makes it easier for others to explore what has been identified in the landscape. Having a table to reference for the product(s) used (see line 124) could simplify matters. I reference this explanation for suggestions for other line changes (line 179, 189, etc.) but will likely miss some.

> *Addressed. We changed this sentence to “lidar-derived topography” for this general use, and changed following instances to be more explicit about the exact derivative described, although we commonly used several derivative products to map. We do explicitly state the background images used to highlight the fault-related features in each figure for clarification.*

Line 153: Clarify which tables/reports in the Supplemental Material are those that contain the OSL and radiocarbon information.

> *Addressed. These details are now added to the text. L159-165.*

Line 161: Need a comma after “(e.g., Piety et al., 2018; Styron et al., 2020),”

> *Addressed. Changed as suggested.*

Line 163: See line 142. I think “lidar derived topographic products” would be acceptable to use here.

> *Addressed. We changed this to “lidar-derived topography”. L175.*

Line 165: I think subsections for individual faults/fault zones should be labelled as “4.1 South Lajas fault” and not just “4.1 South Lajas.” Both fault zones are labelled as fault zones in their subsection headers (e.g., “Great Northern Puerto Rico fault zone” and not “Great Nothern Puerto Rico”), so for the sake of consistency and more clear subsection headers, all subsections should be labelled the same way.

> *Addressed. We changed all subheadings to include “fault” or “fault zone” for consistency. Great suggestion!*

Line 179: See line 142 for “visible in the lidar” comments.

Addressed. We changed this phrase to "lidar-derived shaded relief and slope maps". L191.

Line 189: See line 142 for "lidar data" comments.

Addressed. We changed this phrase to "lidar-derived topography". L03.

Line 190-191: It would be interesting to see an explanation or speculation as to why there is a difference in the sense of motion between GPR profiles and lidar mapped scarps. Is there a preferred sense of motion?

Addressed. We speculate that the difference in apparent displacement may be a result of a lateral component during recent surface-faulting events. L205-207

Line 202: Figure 6 likely should be referenced somewhere in this section (4.1.1). It is not referenced anywhere in the main body of the manuscript.

Addressed. Our mistake! Figure 6 should have been referenced in the first sentence in this section. It is now referenced in the first sentence. L222

Line 202: It can be confusing to tell if fault being referenced in this subsection is called the Guanabanas fault, or if this is an exposure of the South Lajas fault on Guanabanas Road.

Addressed. We changed the heading to be more specific and clarify this. The heading now reads "South Lajas fault – Guanabanas exposure". L220.

Line 203: This is an awkward sentence. One suggestion for improvement is moving the second clause to the start of the sentence "The South Lajas fault is visible in outcrop where one of the scarps associated with the fault intersects a road."

Addressed. Changed as suggested. L221-222.

Line 209: There are only 4 units, not 5, that are shown in Figure 7 and described in the text, Table 2, and Supplementary Material. Five units should be changed to four.

Addressed. Thank you for catching this mistake, as did other reviewers. "Five" has now been changed to "four". L227.

Line 212-213: The contact between Units 1 and 2 separates them. A suggested change is "Unit 2 and Unit 1 are separated by a smooth, continuous contact."

Addressed. Changed as suggested. L230-231.

Line 222-223: This appears to be a run-on sentence. I suggest changing to something along the lines of "It is dark brown, only moderately hard, and has more silt with uncommon pebbles."

Addressed. Changed as suggested. L241.

Line 243: lowercase s in “see Supplementary Material”

Addressed. This was changed to “refer to”. L262.

Line 268: Comma after “Boqueron trench and,” is not necessary.

Addressed. Changed as suggested. L289.

Line 270: See Line 165 comment for subsection headers.

Addressed. Changed as suggested. L291.

Line 272: Should say “Figure 1B” and not “Figure 1A”

Addressed. Changed as suggested. L293.

Line 276: I suggest including what the dimension the 0.9-m is referring to for the graben

Addressed. We added “deep” to this phrase to clarify. L297.

Line 279: See line 142 for “mapping on lidar data” comments.

Addressed. We changed this phrase to “lidar-derived topography”. L301.

Line 288: See line 142 for “lidar data” comments.

Addressed. We changed this phrase to “lidar-derived topography”. L309.

Line 294: See line 142 for mapping on lidar data comments.

Addressed. We changed this phrase to “lidar-derived topography”. L316.

Line 297: Either the s in “site A” should be capitalized here, or the s for sites B and C in lines 303 and 307 should be lowercase.

Addressed. We changed all to lowercase for consistency.

Line 316: See Line 165 comment for subsection headers.

Addressed. Changed as suggested. L339.

Line 338: See line 142 for “lidar topography” comments.

Addressed. We changed this phrase to “lidar-derived topography”. L362.

Line 341-342: Check your figure callouts, they appear to be reversed here. Figure 11D in Line 341 should be 11C. Figure 11C in Line 342 should be 11D.

Addressed. Yes, these figure callouts where reversed. We changed them to reference the correct parts of Figure 11. L365, L367.

Line 344: Similar to the above comment, there appears to be a figure callout mistake here. There is no prominent vegetation lineament visible in Figure 12. There is one in Figure 11. I suspect this should be referencing Figure 11B.

Addressed. Yes, this should be Figure 11B. L369.

Line 356: “isn’t” -> “is not”

Addressed. Changed as suggested. L381.

Line 356: The scarp vertical separation shown is 1.4 m in Figure 12, not 1.5 m. I suggest changing either the number used in line 356 (and subsequent calculation in lines 358) or Figure 12 to reflect the maximum scarp height that is observed, whether that is 1.4 m or 1.5.

Addressed. We changed this sentence to state the max vertical separation is 1.4 m, and the rate is then 0.14 mm/yr. L381-384.

Line 357: I suggest changing the figure callout here to Figure 12D because that is the scarp measurement/profile being used for this calculation.

Addressed. Changed as suggested. L382.

Line 362: See Line 165 comment for subsection headers.

Addressed. Changed as suggested. L387.

Line 368: “hasn’t” -> “has not”

Addressed. Changed as suggested. L393.

Line 369: See line 142 for “mapping on lidar” comments.

Addressed. We changed this phrase to “lidar-derived topography”. L394.

Line 370-373: The sentence beginning with “Dated offset stratigraphy in a paleoseimic trench…” is slightly confusing to read, based on the placement of commas and switching the order of event timing constraints (penultimate then most recent for OSL and most recent then

penultimate for radiocarbon). I suggest changing it to something along the lines of: “Dated offset stratigraphy in a paleoseismic trench suggests at least two events: based on OSL ages, the penultimate event occurred between 10.4 and 2.04 ka and the most recent event occurred between 2.04 and 2.66 ka (Piety et al., 2018). Based on conflicting 14C ages, the penultimate event occurred >14 ka and the most recent event occurred 8–14 ka.”

Addressed. Changed as suggested.

Line 381: See line 142 for “lidar topography” comments.

Addressed. We changed this phrase to “lidar-derived topography”. L403.

Line 381-383: I think the sentence starting with “On the lidar data,” is a run on sentence. I suggest breaking it up into two sentences.

Addressed. We broke this sentence into two sentences. L408-410.

Line 391: “isn’t” -> “is not”

Addressed. This sentence has been modified from its original text and this comment no longer applies.

Line 392: See line 142 for “as measured from lidar” comments.

Addressed. We changed this to “lidar-derived DEM”. L420.

Line 396-398: The sentence starting with “Based on the presence of scarps” is hard to read because of the many sections to the sentence. I suggest changing it to something along the lines of: “We suggest that the Salinas fault is 23-28 km long with a primarily normal sense of movement, based on the presence of scarps as well as tonal and topographic lineaments with a clear down-to-the-south displacement that are consistent with gravity data.” Another suggestion would be to break this up into two sentences, where the first is the suggestion (Salinas fault characteristics) and the second is the reasoning behind the suggestion.

Addressed. Changed as suggested. L424-426.

Line 399: Remove comma after “2m”, both the separations and assumed age are what is being used to estimate the slip rate.

Addressed. Changed as suggested. L427.

Line 401: Referring to this trench (I’m assuming it is the same trench from Piety et al., 2018 that is referenced in line 371) as “the trench” as opposed to “a paleoseismic trench” from line 371 is confusing. I suggest trying to be a little clearer while using definite articles to refer to “the trench” especially when that trench has not been mentioned for 3 paragraphs.

Addressed. We clarified to "the paleoseismic trench (Piety et al., 2018)" to remind the reader of where to find details on the trench. L426.

Line 403: Remove comma after "we suggest that" -> "However, we suggest that within a …"

Addressed. Changed as suggested. L430.

Line 412: I suggest clarifying the age of these alluvial deposits. I am not sure what they are older than because no other deposits have been described in the section (4.5).

Addressed. We removed "older" because no age is given in the reference but we understand the confusion from the reviewer. L440.

Line 413: The GSPRFZ initialism has not been introduced anywhere. Introduce it at line 406. This explains what it means. "Great Southern Puerto Rico fault zone" can also be replaced with "GSPRFZ" in line 409 by introducing the initialism in line 406.

Addressed. We added the abbreviation in the first sentence of this section. L434.

Line 417: See line 142 for "lidar topography" comments.

Addressed. We changed this phrase to "lidar-derived topography". L444.

Line 449: See Line 165 comment for subsection headers.

Addressed. Changed as suggested. L476.

Line 453: Please clarify that "down-to-the-south" is referring to displacement. "with down-to-the-south displacement in Oligocene bedrock."

Addressed. Yes, the word "displacement" was missing from this sentence – it is now added. L480.

Line 459: "hasn't" -> "has not"

Addressed. Changed as suggested. L487.

Line 466: See line 142 for "data" comments.

Addressed. We changed this phrase to "lidar-derived topography". L493.

Line 476: See Line 165 comment for subsection headers.

Addressed. Changed as suggested. L504.

Line 479: See line 142 for "lidar data" comments.

Addressed. We changed this phrase to “lidar-derived topography”. L507.

Line 510: Please see line 413 comments and establish what GNPRFZ stands for in line 507 before using it.

Addressed. We added “GNPRFZ” to the first sentence in this section. L534.

Line 519: See line 142 for “lidar data” comments.

Addressed. We changed this phrase to “lidar-derived topography”. L548.

Line 530: “hasn’t” -> “has not”

Addressed. Changed as suggested. L559.

Line 531: “don’t” -> “do not”

Addressed. Changed as suggested. L560.

Line 562-563: I suggest including a citation here for the Cenozoic activity of the GSPRFZ.

Addressed. We added a reference (Glover, 1971 and Hays, 1985) for the Cenozoic activity of the GSRPFZ. L608.

Line 574: I think it could be useful to also include a website link for the Quaternary fault and fold database besides the Crone and Wheeler (2000) citation as not all readers will be familiar with the QFFD.

Addressed. We added a citation for the Quaternary fault and fold database, in addition to the Crone and Wheeler database. L622.

Line 581, Table 4, & Figure 24: There are two, not one, Class C faults listed. Further, the San Francisco fault is not listed or described elsewhere in the manuscript. Its existence needs to be cited. It does not appear in Figure 1A, which uses Piety et al., 2018 and Styron et al., 2020, but those are the only two references besides this manuscript cited for Figure 24. The source of information on the San Francisco faults needs to be addressed.

Addressed. We thank the reviewer for catching that we didn’t describe the San Francisco fault! We added a new section 4.9 to briefly describe the existing knowledge and our new observations on the San Francisco fault. L566-580.

Line 616: “is” -> “are”

Addressed. Changed as suggested. L664.

General figure comments:

I suggest including an overview map in the Supplemental Material that includes bounding boxes for all figures that include maps. It can be confusing when attempting to figure out where a given location is in reference to Puerto Rico as a whole, especially when that location is multiple overview maps deep (e.g., Figure 18's location is referenced on Figure 13, which itself is referenced on Figure 2). A single map with location bounding boxes available somewhere, even in the Supplemental Material, will go a long way in reducing confusion.

> *Not addressed. We greatly appreciate this suggestion, but we already have many maps to help the reader locate themselves throughout the island.*

All figures with fault and other symbology should have that symbology noted. This includes Figures 4, 5, 6, 9, 10, 11, 14, 15, 17, 18, 19, 20, and 22. As an example, Figure 5 uses fault scarp symbology but does not denote it.

> *Addressed. Fault and fault-related feature symbology is now included either in a figure legend or is stated in the caption for all figures.*

Topographic profile comments:

1) I suggest including vertical exaggeration, as the profiles are not 1:1 and change exaggeration between profiles.

> *Addressed. We added vertical exaggeration to every profile for clarity.*

2) I suggest orienting similarly oriented profiles the same direction. As an examples, profiles p1, p2, and p3 (Figures 4, 5, and 6) are all NW/SE trending profiles, but p1 is from NW->SE and p2/p3 are from SE -> NW. This is also seen between p6 and p7, which are both on Figure 11.

> *Addressed. We changed the orientations to be consistent on the same fault.*

3) Some topographic profiles (Figures 10, 11, and 18) have red arrows apparently denoting where it appears the profile crosses the mapped scarp. Other profiles (Figures 4, 5, 6, 11, 12, 15, 16, 17, and 21) do not have red arrows. It is not explained in any of the figure captions what the red arrows mean. Symbols on plots should be explained, especially in instances like Figure 11, where the 11C profile does not have a red arrow but the 11D profile does.

> *Addressed. We added red arrows to all profiles to mark where the approximate fault location is on each profile. We added a description to all captions on what the red arrow means.*

4) There should be consistency between figures as to whether topographic profiles are included as insets or get their own subfigure callout. As an example, Figure 5 has a topographic profile

as 5D, but Figure 17 has a topographic profile as an inset. I suggest changing Figures 16 and 17 (and others where this is the case) to match the rest of the manuscript where topographic profiles are labelled.

> *Not addressed. We appreciate this suggestion but we prefer to keep some as insets to save space on certain figures.*

Individual figure comments:

Figure 1: 2020 is hard to read on 1A and should be modified to for easier reading. I also suggest clarifying that the seismic catalog is also shown in 1B. Symbology used on 1A (e.g., thrust fault symbology used for trenches/troughs) should be denoted in a key. Please include a scale bar on 1A. I suggest clarifying for 1B that the background is a hillshade (or similar product) derived from the 10-m National Elevation Dataset dem. Align A and B figure indicators to the same part of the rectangle (A is currently in the upper left, B is in the upper right).

> *Addressed. The label for 2020 has been changed to pink. The citation for seismicity has been moved to the end of the caption and now clarifies that the catalog is shown in both panels. Fault symbology is added to Figure 1A. Background image for Figure 1B is clarified, and A and B labels are now aligned on the left side of the figure.*

Figure 2: Clarify for that the background is a hillshade (or similar product) derived from the 10-m National Elevation Dataset dem.

> *Addressed. We added that the background image is a shaded relief map derived from the 10-m National Elevation Dataset.*

Figure 3: Change the tonal lineament to a different color, it is very hard to see on the gray background even when zooming in.

> *Addressed. Tonal lineament changed to dark orange.*

Figure 5: Missing tick at 140m in 5D.

> *Addressed. Tick at 140m has been added.*

Figure 6: I cannot find where figure 6 is referenced in the main text of the manuscript. The location is boxed in Figure 2 and it is called out in Figure 7, but that appears to be it. It should be referenced in section 4.1.1 (line 202).

The fault exposure is called the “South Lajas fault exposure” here but referred to as the “Guanabanas road exposure” in Figure 7. I suggest clarifying by labelling “South Lajas fault exposure at Guanabanas road (Figure 7)”.

Addressed. Figure 6 is now cited in the main text (L222). We changed the legend to state "Guanabanas road exposure of the South Lajas fault (Fig. 7)".

Figure 7: Clarify that this road exposure is on the South Lajas fault in the caption. Clarify that the radiocarbon ages are in Table 2 and OSL ages are in Table 3. The caption states that OSL ages are in Table 2 and neglects to mention radiocarbon ages.

The scale bar in 7B is useful but scaled axes along the length of the mosaic would be more useful. Clarify that the image being shown in 7A is from structure-from-motion. It is currently being described as a photo, which implies it being from a singular photograph. This may be a technical issue with regards to allowed file sizes, but a higher resolution version of 7A would be greatly appreciated.

Addressed. We added that the road exposure is part of the South Lajas fault, that radiocarbon ages are not shown but are in Table 2 and Tables S3 and S4, and that OSL ages are in Table 3. We also clarified that the photo is an orthomosaic photo derived from structure-from-motion. We choose not to add in a scaled axis along the length of the mosaic because the figure already has a lot of information. The structure-from-motion model and orthomosaic will be made available as part of a USGS ScienceBase Data Release so readers can access a higher resolution uninterpreted image.

Figure 8: E should be lowercase in "Guanabanas Exposure" and T should be lowercase for "Boqueron Trench".

Addressed. Changed as suggested.

Figure 9: It appears there are mapped scarps missing near site A in 9B. There are NW/SE oriented scarps mapped in 10B that should show up in that location in 9B.

Addressed. Yes, thanks for noticing this! Some of the fault-related features on the Punta Montalva fault were accidently removed during figure editing, including topographic lineaments as well. We added these back to the figure.

Figure 10: Clarify what the brown lines in 10B denote.

Addressed. The brown lines have been added to the figure legend.

Figure 23 & 24: Clarify that the background is a hillshade (or similar product) derived from the 10-m National Elevation Dataset dem.

Addressed. We added that the background image is a shaded relief map derived from the 10-m National Elevation Dataset.

Figures 19, 20, and 21: I suggest consolidating these figures and including the applicable topographic profiles and field photos from Figure 21 in Figure 19 and applicable field photo from Figure 21 in Figure 20. I recognize that they might be separated for page spacing issues. If this is the case, I suggest attempting to reconfigure the subfigures in such a way as to make things fit, especially to make this set of figures consistent with the other site-specific figures (e.g., Figure 4).

Not addressed. We appreciate this suggestion, but we prefer to leave these figures as they are, partly because this is the first documentation of this set of scarps that are interpreted as a fault.

Second Editor Decision Letter
From: "Randolph Williams" <randolph.williams@seismica.org>

To: "Jessie Thompson Jobe" <jjobe@usgs.gov>

Subject: [Seismica] Editor Decision

Dear Jessie Thompson Jobe, Rich Briggs, Stephen Hughes, James Joyce, Ryan Gold, Shannon Mahan, Harrison Gray, Laura Strickland:

I hope this email finds you well. I have reached a decision regarding your submission to Seismica, "Neotectonic Mapping of Puerto Rico". Thank you once again for submitting your work to Seismica.

I am satisified that you have sufficiently addressed the comments and concerns raised by the two peer reviewers. There are, however, several minor issues that I would like you to address before formal acceptance.

1) Please address the notation of uncertainty for OSL analyses per our email discussion (i.e. these should be listed as two sigma uncertainties).

2) Please correct minor grammatical and/or typographical errors on lines 149, 163, 183, and 273 of your revised manuscript.

Please note: After discussion with the broader editorial board regarding your citation to a manuscript in review at SRL, we will not be able to publish your manuscript at Seismica until we have full DOI information for an *accepted* manuscript at SRL. It seems likely that SRL will impose this same stipulation for your manuscript at Seismica. We are work with you on this issue, and to exchange DOI information with SRL if they are willing.

When you are ready to resubmit the revised version of your manuscript, please upload:

- A 'cleaned' version of the revised manuscript, without any markup/changes highlighted.
- A pdf version of the revised manuscript clearly highlighting changes/markup/edits.
- A 'response-to-reviewers' letter that shows your response to each of the reviewers' points, together with a summary of the resulting changes made to the manuscript.

Once I have read your revised manuscript and rebuttal, I will then decide whether the manuscript either needs to be sent to reviewers again, requires further minor changes, or can be accepted.

If you deem it appropriate, please check that the revised version of your manuscript recognises the work of the reviewers in the Acknowledgements section.

Please note that Seismica does not have any strict deadlines for submitting revisions, but naturally, it is likely to be in your best interest to submit these fairly promptly, and please let me know of any expected delays.

I wish you the best with working on the revisions. Please don't hesitate to contact me with any questions or comments about your submission, or if you have any feedback about your experience with Seismica.

Kind regards,

Randy Williams
randolph.williams@seismica.org

Author Response To Editor Comments

Dear Editor,

Thank you again for your careful assessment of our revised manuscript. We have addressed the remaining minor comments, and we hope you find this revised version ready for acceptance.

The citation to the “in review” manuscript at SRL remains in this revised version. We will communicate with Seismica once we know more from the SRL editors about the timeline for acceptance and publication, and open lines of communication to facilitate publication around the same time. We understand that this manuscript cannot be published until the companion manuscript at SRL is accepted and assigned a DOI.

Note that we did not upload revised Supplementary Material files because these did not change from the last resubmitted manuscript.

The Response to Comments below describes the changes and responses to comments from the Editor. The original comments appear in plain text, and our response can be found below each comment in Italics with line numbers referencing the changes in the revised manuscript.

Thank you again, and we look forward to hearing your reappraisal of our work.

Sincerely,

Jessica Thompson Jobe and coauthors

Response to Editor Comments

Please address the notation of uncertainty for OSL analyses per our email discussion (i.e. these should be listed as two sigma uncertainties).

> *Addressed. We changed 1-sigma to 2-sigma for the OSL age uncertainties. Additional details on the uncertainty calculations can be found in Mahan et al. (2024), the associated data release for the OSL analysis and ages. L163.*

Please correct minor grammatical and/or typographical errors on lines 149, 163, 183, and 273 of your revised manuscript.

> *Addressed. We edited the minor grammatical errors on lines 149, 163, 183, and 273. Please let us know if additional changes are required. These changes include:*
>
> *L149: removed “s” in results; L149 in revised manuscript.*

L163: edited these sentences to state ‘‘Additional details for the ^{14}C dating can be found in Tables S3 and S4. Additional details for the OSL sampling and dating can be found in Table S5 and Mahan et al. (2024)”, L163-165 in revised manuscript.

L183: added a space to “3-m tall”; L183 in revised manuscript.

L273: edited sentence to “the most recent earthquake likely occurred…”; L273 in revised manuscript.