# Response to Committee comments 9/27/15

## Bodo’s comments:

* In the abstract or elsewhere you will need to point out WHEN the human disturbance was generated (e.g., what year was the quarry build). This is important as it has temporal implications. Along the same lines, you will need to discuss the implications of ‘steady state’.
  + Line 205: The quarry has been in continuous operation since the 1960's by advancing into the steep hillside to quarry the underlying basalt formation (Latinis et al., 1996).
* you will need to show and argue that the natural (or undisturbed) catchment is in steady state (or some form of it). That is important, because non-human affected catchments can greatly increase their sediment load by natural process, e.g., landsliding, debris flows or floods (see also Perroy et al., 2012 - attached, although it’s a different setting). discussion about steady state, or landscape/erosion trajectories could easily be weaved in in the Introduction.
  + Line 67-74??
  + Line 126-128
* I also suggest looking at some of the ‘more classic’ geomorph literature that covers vegetation-erosion interactions, for example by Schumm, Langbein, Leopold, and Wolman. There is also recent work that analysis the effect of wild fires on sediment flux. The key point here is that briefly after the disturbance is caused, there is a very high increase in sediment flux - but this is lowered during the consecutive years as the geomorphic system moves into a more balanced system.
  + Line 931-932, end of Discussion. Mining is different in that the surface is continually disturbed and acts more like the construction phase of urbanization
* I am also pointing to another study by a former student of mine (Hendrik Wulf in Wulf et al., 2010; 2012). We have shown that natural variations in climate can have a large impact on sediment flux. I am aware of similar studies in the Chilean Andes that show similar impacts during ENSO years. Please look at Wolman and Miller (1960).
  + Ok. Not sure what to do about this one. Even if SSY was increased, we measured upstream and noted it varied in some years…
  + Line 67-74??
  + Line 124-125
* Shouldn’t the 2nd or third section be titled: Land cover and Land use?  
  You start out by introduce the land cover, only the third or fourth paragraph talks about land use.
  + Changed from “Land Use” to “Land Cover and Land Use”
* I am wondering if you would want to have one larger ‘Geographic Setting’ chapter that introduces climate, land cover, land use, etc. This is then followed by a Method section.
  + Kept it as “Study Area”
* Strongly suggest to shorten the data collection and result sections:
  + Ok; removed Stage-Q and T-SSC figures, shortened and summarized methods
* I am a little confused by the Method section and what is part of the methods. You start out by describing a method, then move to relationship of sediment load to sediment budget, which contain elements of result and discussion and then you go back to Quantifying SSY from disturbed and undisturbed catchments’. I suggest to be more clear about the difference between methods, results, interpretation, and discussion (this also holds true for some later parts of your manuscript). The method section on predicting event suspended sediment yields is neat and important.
  + Reorganized and shorted Methods.
* Your Data Collection section again is neat and important. But it certainly contains many elements of results and discussion. I either suggest to rename that section from ‘Data Collection’ to Data Collection and Results or clearly differentiate between these.
  + Reorganized and shorted Methods.
* I don’t think USLE-based models are appropriate for this setting. The USLE or RUSLE approach has been mostly designed for gentle to moderate hillslopes in the midwest and for agricultural purposes and not for steep, tropical catchments.
  + Agreed; I included a ref to it since it could be used by a manager and indeed USDA NRCS uses it on-island
* The conclusion section contains information about managment respond that probably should go into the introduction (basically the entire last paragraph). You want to repeat the key points and ‘numbers’ of your study. You have a great dataset, but I don’t see the Conclusion pointing this out again.
  + OK, removed management in Conclusion. It’s in the Study Area section anyway
* Figure comments:  
  Figure 1: It’s not clear what is upper and lower watershed. Use colors to denote different compartments in the caption (in addition to FG labels).
  + They’re colored, labeled, and described by points in the stream network….
* Please add a dashed grid to the figures. That will make it much easier to interpret and read these. This will also help to distinguish between log and normal-scale figures. This grid should be in the background and dashed.
  + Trent told me not to do grids
* The journal sounds fine to me. You may want to consider HESS (Hydrological Earth System Science), because JoH usually doesn’t have that much sediment transport studies (but yours would still fit well).

## Response to Allen’s comments 10/5/15

I think Bodo has made a number of excellent points that will strengthen the manuscript for publication.  I also agree with his assessment that this is a very good study and I am impressed by the way you used a variety of tools in combination with field data collection to cobble together an investigation that yields meaningful results in a very challenging environment.  Here are a few suggestions/comments for you to consider and some are just stated to reinforce Bodo's comments:

1. Yes, the study definitely needs to be shortened to achieve better focus and organization. Keeping the introduction to the problem and the description of the approach separate from results would allow you to bring more focus to the methodological contribution of this study.  **While the results you present are a significant contribution, I also think your methodology is innovative for work in these remote and data-poor environments**. A bit **more attention to this overall challenge** and the usual errors in making these assessments should be illuminated in the introduction.

* Lines 86-89 adds a little bit. I think it’s mostly in the Discussion Lines 685-706, and Conclusion lines 828-834

2. Given that the manuscript deals with disturbance to a natural system, it would be helpful to concisely say something about the processes that control the "background" sediment delivery, including the hydrological processes in these forested catchments (e.g., Horton vs Hewlett, infiltration characteristics).  While you describe the climate and land use, there is very little information on the soils, litter etc. (critical variables to help understand the natural processes).

* Maybe add this to the sediment budget section??

3. The way storm events were determined troubles me a bit (maybe I missed something?).  Since you were recording stage height, identifying the start of the event is not an issue, the problem is always to determine when the recession limb crosses from stormflow to baseflow. While hydrograph separation techniques may be arbitrary (e.g., projecting a straight line of constant flow rate from the start of the event until it intersects the recession limb), this is no more arbitrary than the method you employed.  It is widely used in stormflow studies in hydrology and you would not lose the small events. On p. 8 you allude to these small events producing sediment and high SSC but they were not considered because they did not meet the event definition.  When this approach is used in stormflow studies, you generally get a good relationship between peak flow rates and total stormflow volume, which may help explain some of your results. I wonder how different the results may have been if you used a different method to identify the events?

* Lines 256-278 Changed to baseflow separation method

4. You need to review your statistical terminology (e.g., testing a null hypothesis vs using a test "to show .....").

* Changed the text describing results of Kruskall Wallis and Mann Whitney tests on SSC grab sample means

5. The whole USLE bit can be removed given the study location.

* Remove all references to USLE? There is no analysis using the USLE

6. The conclusion should say something more about the methodological approach for future studies in similar environments.

* This is addressed in the Discussion. Move to Conclusion? Or repeat in Conclusion?

I have a number of smaller items to consider (mainly for a journal submission) and it would probably be more efficient for me to relay them to you in a meeting.

Again, congratulations on completing and documenting a neat study.

* Thanks