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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Landscape scale remediation reduces concentrations of suspended sediment and associated nutrients in alluvial gullies of a Great Barrier Reef catchment: evidence from a novel intensive monitoring approach" *by* Nicholas J. C. Doriean et al.

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GENERAL COMMENTS FROM REFEREE 3:

General Comments 1. "GENERAL REMARKS The reviewed manuscript refers to the interesting topic on remediation measures used to decrease the negative impact of gully erosion. Such studies are highly needed, especially when they are carried out in one of the most valuable area around the world as the Great Barrier Reef. I appreciate

that Authors tested different monitoring methods and evaluated them. These findings may be useful in other areas characterized by dispersive soils and intense short rainfall events. In my opinion this manuscript fits to the scope of Hydrology and Earth System Sciences journal. The methods are clearly presented (some minor remarks are marked below). The results and conclusions are generally clear, concise, and well-structured. Although, I think that this section can be improved. It would be great to see some comparison of remediation measures used in this study with studies from other regions. The figures are readable, and they correspond well with the data presented in supplement. In order to improve the quality of the paper, I include below some minor remarks."

RESPONSE: Acknowledge.

The authors acknowledge this positive comment and have undertaken specific reconsideration to address the other key points raised by the Referee (see below).

SPECIFIC COMMENTS FROM REFEREE 3:

Specific Comment 1. " Lines 1-4 Please, consider shortening the title."

RESPONSE: Accept.

Note, Referee 1 also commented on shortening the title. The authors will revise the title to be more concise.

Specific Comment 2. "Lines 20-21 I suggest to include some information on methods to the abstract. Now you just wrote that novel monitoring network was used without any details."

RESPONSE: Accept.

The authors agree with the Referee's comment and will include a more detailed description of the water quality monitoring network in the Abstract.

Specific Comment 3. "Can you refer also to the studies on remediation measures in

other areas, not only in the GBR catchments?"

RESPONSE: Accept.

Referee 1 also comments on the need for more gully remediation examples, from areas outside of the Great Barrier Reef Catchment, in the Introduction. The authors agree that addition of such examples will give the manuscript more of a global context and will include them in the revised version.

Specific Comment 4. "Line 54 Slacking or slaking?"

RESPONSE: Clarify.

The authors thank the Referee for pointing out this oversight. We believe the correct term is slaking sediments. This will be corrected in the revised manuscript.

Specific Comment 5. "Line 95 I'm confused. You wrote in the text that you used two gullies in the study, whereas in Figure 1 you marked three remediated gully catchments and one control gully catchment. Were these three gully catchments treated as one? Can you mark them together for instance with the same colour line or somehow marked them as one site?"

RESPONSE: Clarify/Accept.

The study focused on two gullies and their respective catchments. The catchment of the remediated gully is characterised by three separate sub-catchments that flow into the gully at three distinct locations. In contrast, the majority of catchment drainage into the Control gully occurs at one location and thus, represents one catchment. The authors will revise the catchment boundaries in Figure one to reflect this statement. Commentary regarding this will also be noted in the Figure caption.

Specific Comment 6. "Lines 120-129 I suggest to include some photos from the study area. I know that you present several photos in the supplement, but I think that some of them should be in the manuscript, e.g.., control gully, remediated gully before and

after remediation."

RESPONSE: Accept.

Referee's 1 and 2 also commented on the need for before and after photos of the remediated gully to be included as a figure in the manuscript. The authors agree with the Referee's comments and will include before and after photos in the revised manuscript.

Specific Comment 7. "Lines 187-192 Did you analyse the whole soil profiles or did you only take samples from the topsoil/subsoils? At which depth did you take samples? Why did you put this subsection (2.4.3. Soil sampling and analysis) into section 2.4. Monitoring methods? I suppose that you did these analyses only once and PSD in soils wasn't monitored."

RESPONSE: Acknowledge/Clarify.

Whole soil samples were analysed for particle size distribution using hydrometer techniques. Soil samples were collected from the face the gully (i.e., the areas undergoing erosion) at depths ranging from the surface to 1 m. The soil sampling and analysis section was written as a separate section because these analyses were only conducted once and the authors thought it best not to group it under the water quality monitoring methods section. The authors will include a more detailed description of the soil sampling methods in the revised manuscript.

Specific Comment 8. "Line 194 Which samples? I suppose that suspended sediments, but it should be clarified."

RESPONSE: Accept/clarify.

The authors thank the Referee for pointing out this oversight. The sentence will state the following in the revised manuscript "Water samples collected from the Remediated and Control gullies were analysed for suspended sediment concentration (ASTM standard method D 3977-97), and particle size distribution using laser diffraction spec-

troscopy (Malvern Mastersizer 3000, Malvern Instruments)."

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