

Interactive comment on “Inverse isolation of dissolved inorganic nitrogen yield for individual land-uses from mosaic land-use patterns within a watershed” by Y.-T. Shih et al.

Anonymous Referee #2

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General comments This paper uses data on measured DIN concentrations and discharge to estimate land use/land cover-specific yields of N for the Danshui River in Taiwan. Data might be useful for watershed managers interested in nitrogen loading to river systems after the paper is re-written. The writing is quite awkward, making it very difficult to evaluate the merit and quality of the work. I do believe, however, much work remains to justify the analysis methods and to clearly present the results and implications. I agree with other reviewer that much work remains to make this paper acceptable for publication.

Specific comments Title: the current title is quite wordy. I suggest shortening to “In-

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verse isolation of dissolved inorganic nitrogen yield for individual land-uses within a watershed” or something to that effect. P450 Line 8: The use of “Meanwhile” as a transition here is awkward; I suggest deleting. This is a recurring issue throughout the manuscript. Lines 17- 18: Delete this sentence; I’m not sure what it means. Line 18: Delete “. . .therefore, can. . .” Lines 19 – 21: This is a very general statement; I’m also not sure this is quite correct. I think the focus needs to be on what specific management is possible from this work, and on types of watersheds these results apply. Lines 23 – 25: The opening sentence is not structured well, nor is it grammatically correct. I would suggest changing to something like: “Elevated loading of nitrogen associated with increasing population and food production causes serious water and land pollution. . .” P451 Line 1: I do not believe Downing et al. 1999 and Peterson et al. 2001 are appropriate references for this statement. Also, it’s important to remember that Rockström proposed safe operating limits for nitrogen, but did not define them based on data. Lines 1 – 5: I don’t disagree with these statements, but they seem out of place in this opening paragraph. In fact, the first paragraph doesn’t really build toward a direction of the study; it is just a series of statements about how excess nitrogen loading is a problem (which is well known). Also, change “blue-tinged blood” to “low-oxygenated blood” for more specificity. Line 7: look at the subject-verb agreement here. Line 11: Delete “Meanwhile” here and throughout the paper. It is an inappropriate transition. Line 21: Change to “evaluated first” Line 23: Delete “all kinds of” P452 Line 2: Change Harworth to Howarth Lines 7 – 10: The statement that “which has not been considered before” is not true. See Groffman et al. 2004 (Ecosystems 7:393-403), Jones et al. 2001 (Landscape Ecology 16:301-312), and many others for examples. Lines 11 – 22: I don’t see clear statement of your objectives and hypotheses here; only a list of what you did in this study. P453 Line 14: Change “Since” to “Because”. Line 29: Here and throughout, I think a more appropriate term to “buildings” is “urban development”. P454 Line 11: Here and throughout the paper, change present tense (“is”) to past tense (“was”). P455 Lines 12-15: I’m not sure why the global mean method is even considered here given the relatively high frequency of samples, and the

fact that its use is discouraged in most literature on the subject when other methods are more suitable. Why not just take the average of the LI and FW methods? Line 19-20: FG? Do you mean FW? And how do you know it's more accurate? Do you mean more realistic? P456-457 Lines 1 – 25 (both pages): This approach does not take into account spatial structure of land uses within watersheds, e.g., urban/ag lands located far away from the stream channel will have different runoff factors than those land use types immediately adjacent to the channel. The current approach might work for small watersheds, but I question the validity in applying to larger river systems. P460 Lines 9 -13: I think it is inappropriate to average the methods together. If the GM method clearly is inappropriate, then why use it? I don't think the approach of averaging all of the methods together makes sense; I think it is much more appropriate (and right) to pick the best method (probably the LI) and move forward with those calculations. P462 Discussion in general: this section needs to focus on discussing the meaning of the results, not present a mixture of discussion and results. A good portion of this section can be put in the results section. P464 Line 3: What's a bomb and tea plantation? Line 9: Need a reference here. Lines 12-13: This is a generic statement; if you're going to make it, you need to provide a little more background on what is possible for reducing fertilization given the cropping system there. P465 Lines 6-7: I have absolutely no idea what this means. This paragraph in general is hard to interpret. P466 Lines 5 – 15: You're assuming that values that you measured in Taiwan can be applied globally, which is completely unrealistic. Tables Table 3: What are the blank spaces? Table 4: What are the dashes? Figures Figure 2: Is this figure really needed? END REVIEW

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