Interactive comment on "The Potential of Integrating Landscape, Geochemical and Economical Indices to Analyze Watershed Ecological Environment" *by* Huan Yu et al.

Anonymous Referee #2

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This paper attempts to characterize the ecological status of a watershed by relating landscape characteristics, heavy metal concentrations, and economical indices in correlation analyses. While I admire the attempt to treat a river basin as an integrated social-economical-ecological system, and in a transdisciplinary way, this paper has some fundamental problems, which I outline below. 1. There is no theoretical basis for relating the chosen variables to one another. For example: why should heavy metal concentration be related to landscape characteristics, e.g. "CONTAG" and others? 2. Why are heavy metals chosen for this analysis? Nutrient concentrations might be a more logical choice, unless industry or mining is dominant. This however is not explained. 3. The sampling for heavy metals was done at 9 sites, but no information

about sampling frequency or rationale for sampling sites is given. Furthermore, there is an interpolation exercise to derive data for a total 30 points; however, given the size of this basin, I doubt that interpolation is a valid approach. 4. How was autocorrelation among variables accounted for? 5. I miss a description of the main economic activities in the basin, which would allow me to understand the context for the variables chosen. Do people make their living mostly by agricultural means? Or industry? Or..? 6. Use of the word "ecological status" is not defined. Usually this means that some measure or indicators of ecological function are included. (e.g. Biodiversity, intact natural land e.g. parks, nutrient or water retention etc.) How is this used here? 7. Correlation is not causation (e.g. Table 5, use of the phrase "Functional Relationship" means correlation only.) 8. Speaking of Table 5: nearly ever relationship has a p value of <0.05, i.e. is significant. Yet, the discussion suggests others that are not significant. Correlations should be done on the basis of hypothesis testing: Why should certain variables be related? It should not be done in such a way that correlations are developed between every possible combination, as spurious correlations are likely. 9. Finally, work on reducing substantial wordiness. There are many places where the paper is redundant, and contains information that is text-book level. This needs to be reduced, and the higher-level integration, trans-disciplinary literature needs to be presented.

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