

Peer Review Comments

The Need for Complementary Hydraulic Analysis in Post-Restoration Monitoring of River Restoration Projects (T.E. Endreny and M.M. Soulman)

General Comments

The authors address the topic of performance monitoring of river ‘restoration’ projects. This is indeed an area of active interest for the restoration community and in great need of scientific contributions such as this case study. The paper identifies that monitoring data can be used to inform the reliability of design methods by comparing predicted behavior vs. measured (actual) behavior. In many instances, the design methods are qualitative in nature and no explicit predictions of performance metrics are provided to serve as the basis for post-project monitoring evaluations. In cases where qualitative design methods are employed (such as Natural Channel Design), field data can be used to ‘benchmark’ these design methods.

Natural Channel Design, for example, does not rely on channel velocity distribution for channel configuration, so the post-project monitoring field data and numerical analyses performed by the authors would need to show the correlation between the monitoring metrics and the design-based metrics. As an example, Rosgen¹ (1996) states that “Natural stream channel stability is achieved by allowing the river to develop a stable dimension, pattern, and profile such that over time, channel features are maintained and the stream system neither aggrades nor degrades.” Did the designers of this restoration project project a timeline (starting from completion of restoration) identifying ‘when’ the restored reach would be stable?

Although the paper focuses on the benefits of hydraulic modeling during post-project monitoring, it implies that the Natural Channel Design is insufficient in predicting ‘actual’ behavior of the stream and additional analyses are required (such as hydraulic modeling) to more reliably configure the restoration project. This implies that establishing performance metrics, as well as performance predictions, at the onset of the project can greatly aid interpretation of monitoring results.

Overall, this is an important contribution to the restoration community.

Review

1. Does the paper address relevant scientific questions within the scope of HESS?

Yes, the paper addresses substantial scientific questions within the scope of HESS, such as project performance monitoring (does predicted performance agree with observed performance) and validation monitoring (is the method (or methods) externally (generalizable) and internally (replicable) valid).

2. Does the paper present novel concepts, ideas, tools, or data?

New data is presented that contributes towards both Performance Monitoring and Validation Monitoring.

¹ Rosgen, Dave. *Applied River Morphology*. Minneapolis: Printed Media Companies. 1996.

3. Are substantial conclusions reached?

The paper's substantial conclusions include:

- One important finding involves cross-vane arm horizontal angles; if too small they may inadequately steer flow and initiate aggradation and avulsions in the downstream sections;
- ... coupling of regular post-restoration monitoring with informed hydraulic and sediment analysis so project teams can motivate preventative maintenance operations and extend project lifetimes; and
- Below cross-vanes in the project aggradation may have caused subsequent point bar avulsions during a flood event, which led to more serious water quality impacts. *Note: this implies that the goal of the restoration project to reduce turbidity was not achieved.*

4. Are the scientific methods and assumptions valid and clearly outlined?

Generally. It was unclear if the numerical modeling runs were field calibrated for the project reach or if the input values were used to independent of field calibration.

5. Are the results sufficient to support the interpretations and conclusions?

Generally. The Summary indicates "This study examined a Natural Channel Design river restoration project intended to control erosion from entering the NYC drinking water supply" but there was no discussion of the monitoring observations and how they explicitly relate to turbidity or sediment loading of the drinking water supply.

6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)?

The methods presented are sufficiently complete to allow for replication, however, the input data used was not presented. Thus, should replication be desired, it would not be possible due to the lack of access to the survey data used in the analyses (width/depth ratios, numerical modeling efforts).

7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution?

Yes.

8. Does the title clearly reflect the contents of the paper?

The title is appropriate and reflects the contents of the paper.

9. Does the abstract provide a concise and complete summary?

The abstract could be improved by restructuring to remove 'introductory' type information and focus on the contribution, methods, and results of the paper. Abstract guidelines are attached to

this review. The abstract also introduces concepts that are not directly addressed in the paper. These concepts should be moved to the introduction portion of the paper (“j-hook vanes were installed to protect against bank erosion and maintain scour pools for fish habitat” but no explicit discussion was presented on these two projects ‘goals’).

10. Is the overall presentation well structured and clear?

Yes.

11. Is the language fluent and precise?

Yes.

12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used?

Yes.

13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated?

These are recommended textual edits:

- Pg 2611: Falk et al² (2006) indicates that restoration has been occurring for centuries. Please provide additional citation/documentation to substantiate that “river restoration has evolved from a niche field practiced by specialists to an expansive enterprise undertaken by government agencies, private industry, and the academic community.”
- Pg 2612: I would create a new paragraph at line 4, starting with “According to Malakoff ...”
- Pg 2619: Recommend deleting lines 1 through 6 and starting with “This study examined...” These lines provide general commentary that is not explicitly discussed in the paper. Perhaps this can be moved to the introduction to highlight the contribution of the work?

14. Are the number and quality of references appropriate?

Yes.

15. Is the amount and quality of supplementary material appropriate?

Yes.

² Falk, Donald A., Margaret A. Palmer, and Joy B. Zedler. Foundations of Restoration Ecology. Society for Ecological Restoration International. Washington D.C.: Island Press. 2006.

Endreny, T.A. and M.M. Soulman. “The need for complementary hydraulic analysis in post-restoration monitoring of river restoration projects.” HESS. Pp 2609-2626.

GEOLOGICAL NOTES

A SCRUTINY OF THE ABSTRACT, II¹

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ABSTRACT

A partial biography of the writer is given. The inadequate abstract is discussed. What should be covered by an abstract is considered. The importance of the abstract is described. Dictionary definitions of "abstract" are quoted. At the conclusion a revised abstract is presented.

For many years I have been annoyed by the inadequate abstract. This became acute while I was serving a term as editor of the *Bulletin* of The American Association of Petroleum Geologists. In addition to returning manuscripts to authors for rewriting of abstracts, I also took 30 minutes in which to lower my ire by writing, "A Scrutiny of the Abstract."¹ This little squib has had a fantastic distribution. If only one of my scientific outpourings would do as well! Now the editorial board of the Association has requested a revision. This is it.

The inadequate abstract is illustrated at the top of the page. The passive voice is positively screaming at the reader! It is an outline, with each item in the outline expanded into a sentence. The reader is told what the paper is about, but not what it contributes. Such abstracts are merely overgrown titles. They are produced by writers who are either (1) beginners, (2) lazy, or (3) have not written the paper yet.

To many writers the preparation of an abstract is an unwanted chore required at the last minute by an editor or insisted upon even before the paper has been written by a deadline-bedeveled program chairman. However, in terms of market reached, the abstract is *the most important part of the paper*. For every individual who reads or

listens to your entire paper, from 10 to 500 will read the abstract.

If you are presenting a paper before a learned society, the abstract alone may appear in a pre-convention issue of the society journal as well as in the convention program; it may also be run by trade journals. The abstract which accompanies a published paper will most certainly reappear in abstract journals in various languages, and perhaps in company internal circulars as well. It is much better to please than to antagonize this great audience. Papers written for oral presentation should be *completed prior to the deadline for the abstract*, so that the abstract can be prepared from the written paper and not from raw ideas gestating in the writer's mind.

My dictionary describes an abstract as "a summary of a statement, document, speech, etc. . . . and that which concentrates in itself the essential information of a paper or article. The definition I prefer has been set in italics. May all writers learn the art (it is not easy) of preparing an abstract containing the *essential information* in their compositions. With this goal in mind, append an abstract that should be an improvement over the one appearing at the beginning of this discussion.

ABSTRACT

The abstract is of utmost importance, for it is read by 10 to 500 times more people than hear or read the entire article. It should not be a mere recital of the subjects covered. Expressions such as "is discussed" and "is described" should *never* be included! The abstract should be a condensation and concentration of the *essential information* in the paper.

¹ Revised from K. K. Landes' "A Scrutiny of the Abstract," first published in the *Bulletin* in 1951 (*Bulletin*, v. 35, no. 7, p. 1660). Manuscript received, June 3, 1966; accepted, June 10, 1966.

Editor's note: this abstract is published together with The Royal Society's "Guide for Preparation

and Publication of Abstracts" to give *Bulletin* authors two viewpoints on the writing of abstracts.

² Professor of geology and mineralogy, University of Michigan. Past editor of the *Bulletin*.

The Abstract Rescrutinized

It would seem that little more could be said about writing abstracts after K. K. Landes's (1951, 1966) concise classics, but an irritating new weakness seems to be creeping into manuscripts, calling for further scrutiny. I refer to the growing tendency of authors to write long, eloquent abstracts that are actually *introductions* rather than summaries. Let me reproduce one sentence (slightly disguised) that begins the "abstract" of an otherwise excellent manuscript I am currently reviewing: "The long-standing concept of the _____ region of _____ as part of the stable craton which has undergone only minor tectonism during the past several hundred million years is being modified in view of accumulating evidence for minor, but widespread Quaternary and recent activity." This preamble is followed by 1½ similar pages, which would be a good introduction but is not a good abstract.

I would like to help authors avoid this problem by adding a few refinements to Landes's maxims. First, start the abstract by telling the reader at once what the paper *is*: new data, a review of progress, a new technique, a synthesis, or whatever describes the *nature of the paper*. To be sure, this recommendation can in principle be followed by a well-designed title, such as Isachsen's (1975) "Possible evidence for contemporary doming of the Adirondack Mountains, New York, and suggested implications for regional tectonics and seismicity," almost an abstract by itself. But if the title does not make it clear what the paper is, the abstract should, preferably in the first line: "This paper reports a comparative study of digital image enhancement techniques for synthetic aperture radar (SAR) using SIR-B and Seasat images of the Canadian Shield" (Masuoka et al., 1988). This first line should not be a simple restatement of the paper's title.

A second suggestion: write the abstract in a terse, almost telegraphic style, saving your eloquence for the body of the paper. The abstract is not an introduction to the paper, but a freeze-dried version of it, so to speak, intended as a "condensation and concentration of the essential information in the paper" (Landes, 1966). It should be written for quick reading, with the assumption that interested readers can go on to (or look up) the paper itself. Unnecessary descriptive phrases ("critically placed"), qualifiers ("limited number"), and caveats ("it must be pointed out") that may be necessary for completeness in the text should be left out of the abstract if at all possible. (The examples quoted are from actual manuscripts I have recently reviewed.)

A final suggestion: pack as much specific information into the abstract as possible—locations, rock names, temperatures, pressures, anomaly values, stratigraphic thicknesses, petrologic systems, and the like. The

way to do this is to cancel temporarily the assumption of the previous paragraph, and to write the abstract as if it were all that would survive the fall of civilization. There are obviously limits to how much can be included in an abstract, especially without figures, and it may even be necessary to use phrases detested by Landes, such as "is described" or "is presented." But abstracts can be surprisingly informative and self-sufficient if properly written.

A word on timing: I suspect that many authors make the mistake of writing the abstract before the paper. I used to do this myself, until I found I was writing—yes—introductions. The way to avoid this is obviously to write the abstract after the paper is finished, when you will know exactly what you are summarizing.

Following Landes's precedent, I present an abstract of this paper.

This paper presents three suggestions for better scientific abstracts: begin the abstract by briefly describing the *nature of the paper* (new data, review, critique, etc.); write the abstract not as an introduction to the paper but as a *tersely styled summary* of its essential information; and include as much *specific information* (locations, compositions, temperatures, etc.) as possible. Write the abstract after finishing the paper, to avoid the common fault of abstracts that are good introductions but poor summaries.

REFERENCES CITED

- Isachsen, Y.W., 1975, Possible evidence for contemporary doming of the Adirondack Mountains, New York, and suggested implications for regional tectonics and seismicity: *Tectonophysics*, v. 29, p. 169–181.
- Landes, K.K., 1951, A scrutiny of the abstract: *American Association of Petroleum Geologists Bulletin*, v. 35, p. 1660.
- 1966, A scrutiny of the abstract, II: *American Association of Petroleum Geologists Bulletin*, v. 50, p. 1992.
- Masuoka, P.M., Harris, J., Lowman, P.D., Jr., and Blodget, H.W., 1988, Digital processing of orbital radar data to enhance geologic structure: Examples from the Canadian Shield: *Photogrammetric Engineering and Remote Sensing*, v. 54, p. 621–632.

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Preferred Usage
enclousad

Jargon
enclosed herewith

critical paper, 3rd Edition, 1980

GUIDE FOR PREPARATION AND PUBLICATION OF ABSTRACTS¹THE ROYAL SOCIETY²

London, England

GENERAL

1. "Abstract" is a term adopted to describe an author's summary of a scientific paper which is published simultaneously with the paper itself after editorial scrutiny by the editor of the journal in which it is published.

2. The purpose of an abstract is not only to add to the convenience of readers of the journal in which it is published, but also to reduce the cost and to expedite the work of the abstracting journals, and thus to contribute to the general improvement of information services in the scientific field.

3. The abstract should comprise a brief and factual summary of the contents and conclusions of the paper, refer to any new information which it may contain, and give an indication of its relevance. It should enable the busy reader to decide more surely than he can from the mere title of the paper whether it merits his reading.

4. The author of every major paper (excluding notes) is therefore requested to provide also an abstract of it, in accordance with the following suggestions.

STYLE OF WRITING

5. Use complete sentences rather than a mere list of headings. Any reference to the author of the article should be in the third person. Standard rather than proprietary terms should be used. Unnecessary contractions should be avoided. It should be presumed that the reader has some knowledge of the subject but has not read the paper. The abstract should therefore be intelligible in itself without reference to the paper.

¹ Modified from The Royal Society of London's "Guide for the preparation and publication of synopses." The original article was prepared by The Royal Society in fulfillment of a recommendation of the Scientific Information Conference sponsored by the Society in 1948. The original also has been adopted and distributed by U.N.E.S.C.O. as a result of the U.N.E.S.C.O. International Conference on Science Abstracting held in 1949. Permission to publish this was granted most kindly by N. H. Robinson for The Royal Society. Manuscript received, March 1, 1966; accepted, May 16, 1966.

Editor's note: this abstract is published together with K. K. Landes' "A scrutiny of the abstract, II," to give *Bulletin* authors another viewpoint on the writing of abstracts.

² Burlington House, London, W.1.

(For example, it should not cite sections or illustrations by their numerical references in the text.)

CONTENT

6. Because the title of the paper usually is read as part of the abstract, the opening sentence should be framed accordingly so as to avoid repetition of the title. If, however, the title is not sufficiently indicative, the opening sentence should indicate the subjects covered. Usually, the beginning of an abstract should state the objects of the investigation.

7. It is sometimes valuable to indicate the treatment of the subject by words such as: brief, exhaustive, theoretical, *etc.*

8. The abstract should indicate newly observed facts, conclusions of an experiment or argument, and, if possible, the essential parts of any new theory, treatment, apparatus, technique, *etc.*

9. It should contain the names of any new compound, mineral species, *etc.*, and any new numerical data, such as physical constants; if this is not possible, it should draw attention to them. It is important to refer to new items and observations, even though some may be incidental to the main purpose of the paper; such information may otherwise be hidden although in fact it might be very useful.

10. When giving experimental results, the abstract should indicate the methods used; for new methods, the basic principle, range of operation, and degree of accuracy should be given.

REFERENCES, CITATIONS

11. If it is necessary to refer in the abstract to earlier work, the reference always should be given in the same form as in the paper; otherwise, references should be omitted.

12. Citations to scientific journals should be made in conformity with the standard practice of the journal for which the paper is written.

LENGTH

13. The abstract should be as concise as possible. Only in exceptional cases should it exceed 200 words, so as—among other things—to permit it, when printed, to be cut out and mounted on a 3 × 5-inch card.