Lecture 13
Peer review and response to comments

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The peer review process

- Peer review is a central part of the scientific publishing process.

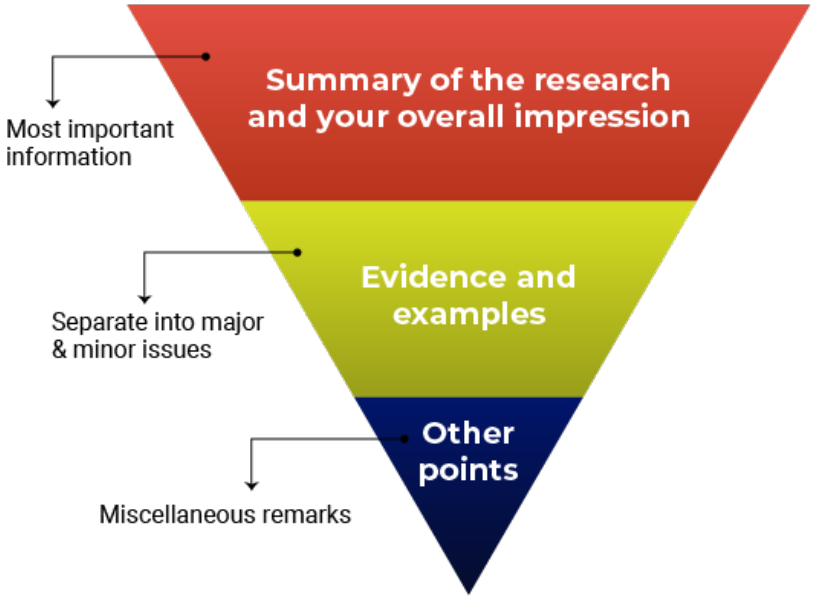
(Figure from Wiley Author Service)

Peer review

- Peer review is the foundation of scientific publishing. It validates academic work and helps to improve the quality of published research.
- The Philosophical Transactions of the Royal Society is thought to be the first journal to formalize the peer review process under the editorship of Henry Oldenburg.
- Peer review takes many forms:
  - Single anonymous review
  - Double anonymous review
  - Open review

Structure of a full peer review

- Summary of major findings, contributions and significance;
- Major points of concerns;
- Minor issues;
- Line to line comments;



What's in a peer review?

- Peer review usually encompass three aspects of a paper
  - Scientific merit and significance
  - Technical soundness
  - Clarify of presentation

- Journals may have specific guidelines for reviewers. Make sure you follow the journal's guideline when performing the review. For example, many open access journal ask reviewers to only evaluate the technical soundness and not the scientific significance.

Example of a peer review

- The reviewer starts with a summary of the major findings of the paper and then present the potential significance of the paper.

The authors use an inverse modeling approach to estimate the temperature sensitivity of whole–ecosystem GPP and ER from a large and diverse set of streams. Daily estimates of activation energies varied widely, but the median values were consistent with estimates based on bottle incubations and temperature gradients. The differential sensitivity of GPP and ER varied with both temperature and with GPP/ER. Using daily metabolism estimates from published studies, the authors show that stream metabolic balance is likely to converge with increasing temperatures, and that this warming effect will be stronger in productive, warm streams.

Metabolic balance is an important determinant of the ecological function of streams and their role in the global C cycle. The temperature sensitivity of those estimates is potentially important for understanding how stream ecosystems will respond to climate change. Because of the novelty of the approach and scope of the data, the findings of this paper would be of wide and significant interest in the limnological and global change communities.

Example of a peer review

- The reviewer then present his major concern of the manuscript.

The authors use GPP/ER as their measure of metabolic balance, and I understand the rationale for this in terms of its analytical tractability. But the actual exchange of CO_2 with the atmosphere depends on NEP. I suggest the authors 1) evaluate the co-variation of GPP and ER within and across their streams, 2) include the absolute as well as relative rates of GPP and ER in their analysis of what influences temperature sensitivity, and 3) consider revising their analysis of convergence to account for effects of absolute rates, if any.

- The reviewer then proceed with detailed comments

In section E, I suggest discussion of plausible mechanisms that would create the observed patterns, and discussion of how other global change responses could counteract (or amplify) these patterns.

The paper is well-set within and well-motivated by the current literature on the temperature dependence of metabolic rates. The paper is very clearly written and well- motivated, so I only have a few minor editorial comments. See attached file.

Use constructive language

- Peer review is a professional activity. We should use professional language. Impolite or insulting words should not appear in the review.

(×) The manuscript is fatally flawed.

(✓) The study does not appear to be sound.

(×) The technical details don't make sense

(✓) The technical details should be expanded and clarified to ensure that readers understand exactly what the researchers studied.

Give concrete suggestions

- One goal of peer review is to help the authors improve their manuscript. Thus, you should always strive to point out exactly what the problem is and give concrete suggestions.

(×) The writing is not adequate and contains many grammatical errors. The authors should work with a native English speaker or a editing service to improve writing.
(✓) There are many grammatical errors. For example, the use of article in lines 35, 76, and 351 is wrong. Uppercase letter should be used at the beginning of the sentence (lines 40, 56, 76, 234). I suggest the authors checking through the manuscript to correct similar mistakes.

(×) The measurements are repeated measure of the same experimental plots. Thus using ANOVA here is inappropriate.
(✓) Using ANOVA to analyze data from repeated measurements is inappropriate. I suggest using a linear mixed model here to analyze the data.

When to accept review request?

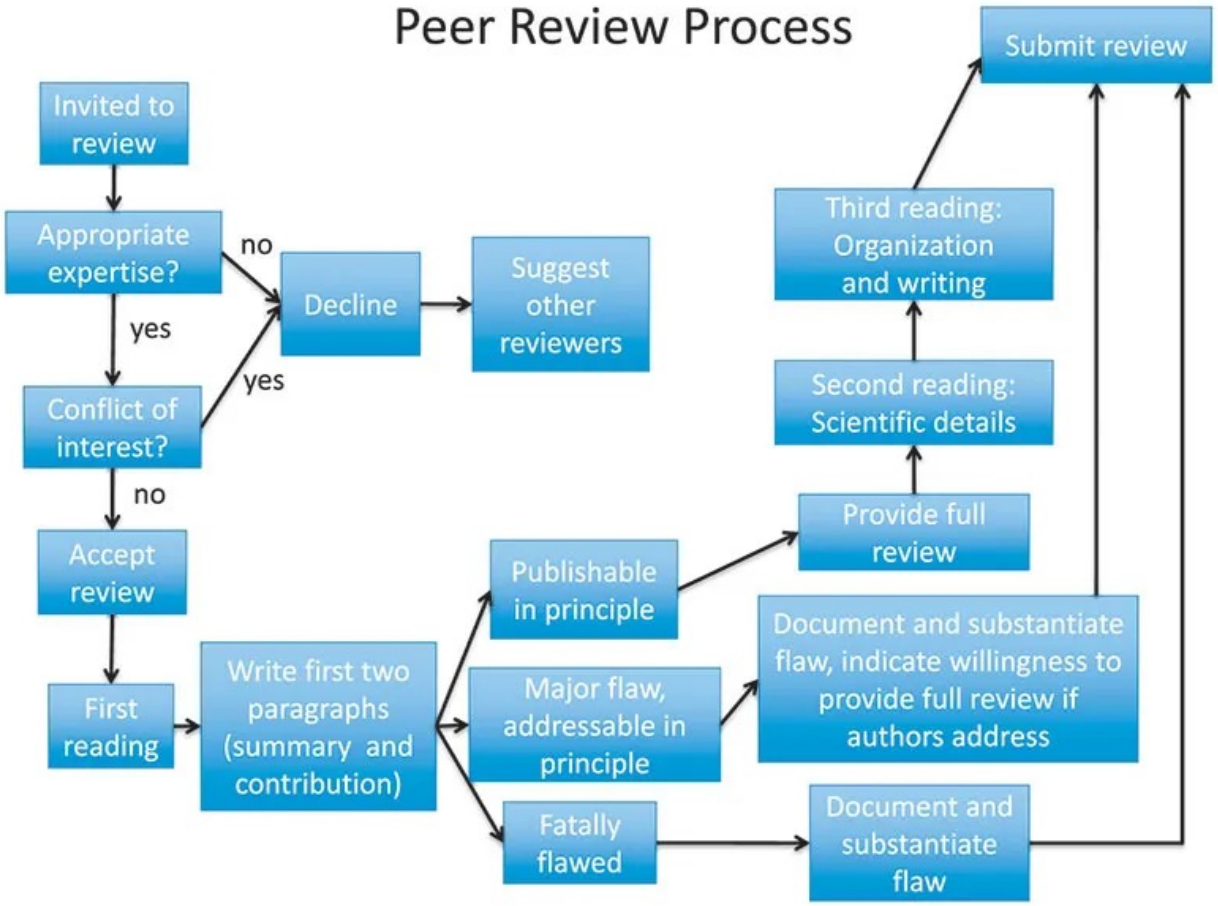
- Only accept review request if
  - You have appropriate expertise
  - You have no conflict of interests
  - You can finish the review in time

- Peer review is usually a voluntary service. I recommend performing two peer review for every paper you submit.

Ethics as a reviewer

- Peer review is confidential. You cannot disclose the manuscript under review to other people;
- You should not ask others to review for you without editor's consent;
- Do not steal ideas from the papers you review;
- Do not use the review opportunity to promote your own work.

Flow chart of peer review



(Nicholas and Gorden 2011, EOS)

Respond to reviewers' comments

- When the editor decides that your paper needs revision before it can be published, you receive the editor's decision letter and the reviewers' comments;
- You need to respond to each reviewers' comment and revise the manuscript accordingly.
- The goal of the response to reviewers' comments is to tell the reviewer **how you addressed their comments**.

Format of the response

- The response to reviewers' comments can start with a brief opening.

We appreciate the insightful and constructive comments from Drs. Robert Hall, Alison Appling and an anonymous reviewer. We have thoroughly considered the comments and revised the manuscript accordingly. Below are detailed responses to the reviewers' comments.

- The body of the response letter should list each comment and your response to it.

Comment: We recommend that the authors use "aquatic" instead of "stream" throughout the paper. This information is useful to the lake and estuary folks (even though they usually estimate gas exchange from wind speed, etc. rather than solving for it with the differential equation). Also bring in lake citations. Three we can think of are Van de Bogert L&O Methods 2007, Hanson L&O Methods 2008, and Solomon L&O 2013.

Response: We revised the manuscript to include works on metabolism in lakes and estuaries and pitched this manuscript as a general discussion of computation methods for aquatic ecosystem metabolism modeling.

Respond to positive evaluation

- When the reviewer provide a positive evaluation of the manuscript or summarize the finding, you only need to provide a very short and concise response.

Comment: This paper examine 3 solution methods for the differential equations used in metabolism modeling. The authors find that an exact method is more or less best, but strongly depends on the interpolation of physical data. That is interesting and maybe a bit unsettling for users of those methods. The Euler method (which we have used, and have further adapted as described below) is close to the exact method and, to some extent, within the range of variability of the various interpolation methods. The last method (stepwise) incorporates the measured O2 in the calculation of DO deficit and models the changes in DO between observations rather than the DO concentration trajectory. That method seriously underestimates the parameters, which matches what we have found playing with these models on a computer. The paper is easy to read and well presented. Because both of us are currently devoting huge amounts of our time to calculating metabolism from data sets of O2 that we did or did not collect, we read this paper with great interest and had a lot to say.

Response: We appreciate your thorough comments to our manuscript. We have carefully considered all of the comments and revised our manuscript accordingly.

Provide direct response to comments

- We need to directly address the reviewers' comments and point out where the revisions are made.

Comment: L89 - Why log-response ratio? Maybe worth justifying, possibly because it is arguably the most frequently used in ecological meta-analysis (See Nakagawa & Santos, 2012).

Response: We agree. We now point out that log response ratio is used because it is the most frequently use metric in ecological meta-analysis (lines 116–118).

Provide concrete evidence

- You should provide concrete evidence to back up your statement in the response.
- Empty statement without evidence is not convincing.

Comments: Does the data meet the assumption of t–test? Have the authors considered transformation of the data?

(×) **Response**: The data meet the assumption of the t-test. We thus did not perform any transformation of the data.

(✓) **Response**: We checked the normality of the data using a Shapiro–Wilk test and did not find any significant deviation from normal distributions ($p = 0.32$). We thus did not perform any data transformation prior to data analysis.

Avoid verbosity

- Response to comments should be concise and directly to the point. Do not be verbose.

Comments: Is it possible to conduct the measurements with no disturbance, likely using other portable analyzers? This may be hindered due to lacking capacity for long-term monitoring, but this type of measurements shall offer some insights for your comparisons of methods with varying degree of disturbance.
(×) **Response**: Your considerations are exactly what all those involved in soil respiration research are looking for. Soil respiration methods have evolved rapidly over the decades and the latest instruments have enabled fully automated in situ high-frequency soil respiration measurements, but as our research describes, long-term monitoring will introduce certain biases. At present, no instrument has yet been developed to enable accurate measurements to be made without any disturbance to the soil. To be clear, we explained this in the revised version as follows:

Although methods for measuring Rs have been continuously developed and refined during the past few decades, there are no instruments have yet been developed to enable accurate measurements of Rs without any disturbance to the soil. Consequently, many questions about the potential artifacts of various methodologies remain.

(✓) **Response**: We are not aware of any instrument that measures soil respiration without disturbance to soil. We clarified this point in the revised manuscript (lines 35–41).

You do not need to always agree

- You do not have agree with every suggestions the reviewer made. When you do not agree, explain why you do not in your response.

Comments: I suggest the authors changing the tile to "Long-term collar deployment leads to bias in soil respiration measurements in relation to soil physical, chemical, and biological properties."

Response: We believe the original title summarize the key finding of the paper concisely. Although we discussed how changes in soil physical, chemical, and biological properties may be responsible for the collar effects, they are speculated and not the direct finding of the paper. We thus decide not to change the title as the reviewer suggested.