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**Engage with scientific reviewing:
understanding and contributing to
the peer-review process**

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1

Constructive reviews of your peer's science is at the heart of the scientific enterprise. It also sharpens your critical thinking skills and expands your network as a scientist. But it can also be intimidating. When are you ready for this and how do you do it. Let's peel back the layers of a science review to make it more accessible to everyone.

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Learning objectives



Define your role as a reviewer

Apply different types of review

- Science
- Line or copy edit
- Proofread

Decide how to respond to reviews

This is the talk's outline in the form of learning objectives.

You've got mail



Invitation to peer-review

- Colleague (draft)
- Boss (policy paper)
- Journal editor (manuscript)
- Student (thesis)
- Grant agency (proposal)

What do you do?

1. Have enough time?
2. Within expertise?
3. Conflict of interest?

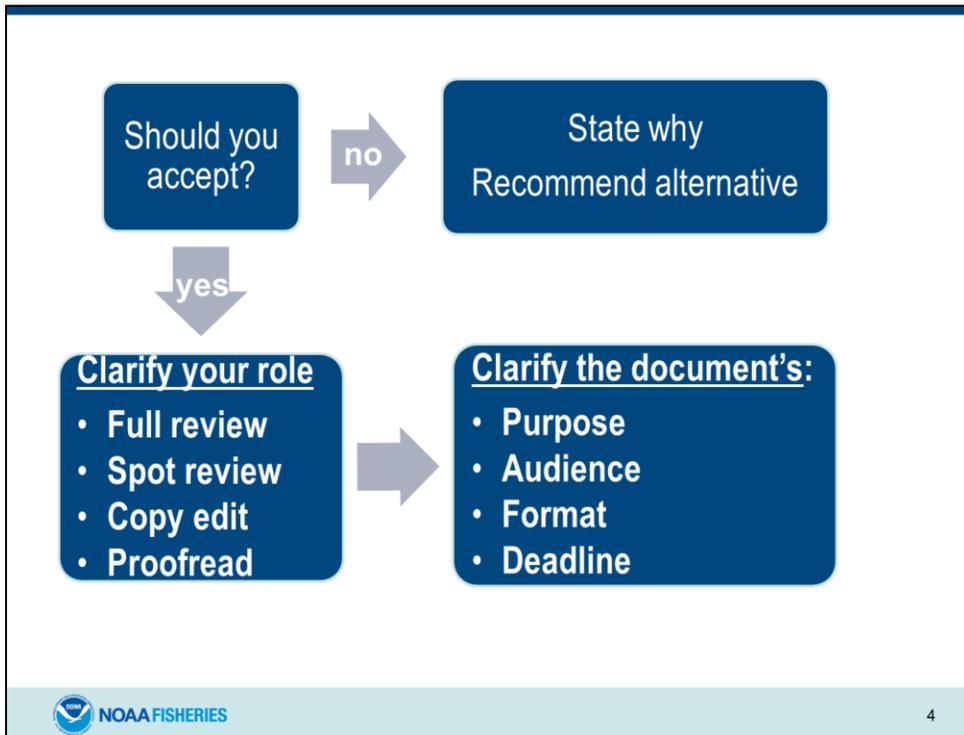
An invitation to review may come from many different sources.

These 3 questions are always relevant.

Don't worry about:

?How much will they pay me (peer-review is typically [although not always] a volunteer activity)

But I am only a graduate student (if you are ready for this, go ahead and ask the 3 questions).



No? State why: time, conflict, expertise (so they don't hit you up too soon with another manuscript that you cannot help with) It is helpful if you recommend someone else

- Some of this may seem obvious, and need no clarification, but if not, go ahead and ask (for example)
- Do they want me to read the entire or just part of the document? (How much time should you spend)
 - Who is the target audience? (How important is this or what level should the background and terminology be at?)
 - What is the deadline, and is this hard or soft?

Your role as a constructive critic is typically a dual one:

- 1) To improve the quality of the manuscript as it goes through further revision.
- 2) To advise an editor or grant program manager (or some other gatekeeper) whether this is worth going forward. You may step up as an advocate for a particular paper that is worthy even if it does not shine for some reason.

Spot review: for example, to only read the Methods section, or to make sure that the citations in the text and the reference section agree.

Be sensitive to author or manuscript constraints. For example, if there is an immediate deadline, then the author is not ready to receive a lot of comments about restructuring the discussion. If it works,

then let some of that sit. Revision of several paragraphs is likely to create new editorial issues that you may not have time to spot with a short deadline.

Differing review scenarios



At the Captain Kidd, Woods Hole



Formal

Informal

Many journals – but not all – have a copy editor, who will be well versed in the particular format style of the journal. In such a case, copy editing is not a primary need of the journal. Nonetheless, if you see something, say something.

There is no one type of review. Try to adapt your review to the situation. If the situation is informal, say a colleague has asked for a friendly review, you might approach it this way. After you read the manuscript and have assembled some notes, go out to lunch or for a beverage, and discuss your thoughts and seek more input from the author before writing up your review.

A full science review



Read critically

- Form, style, content

Prioritize your criticism

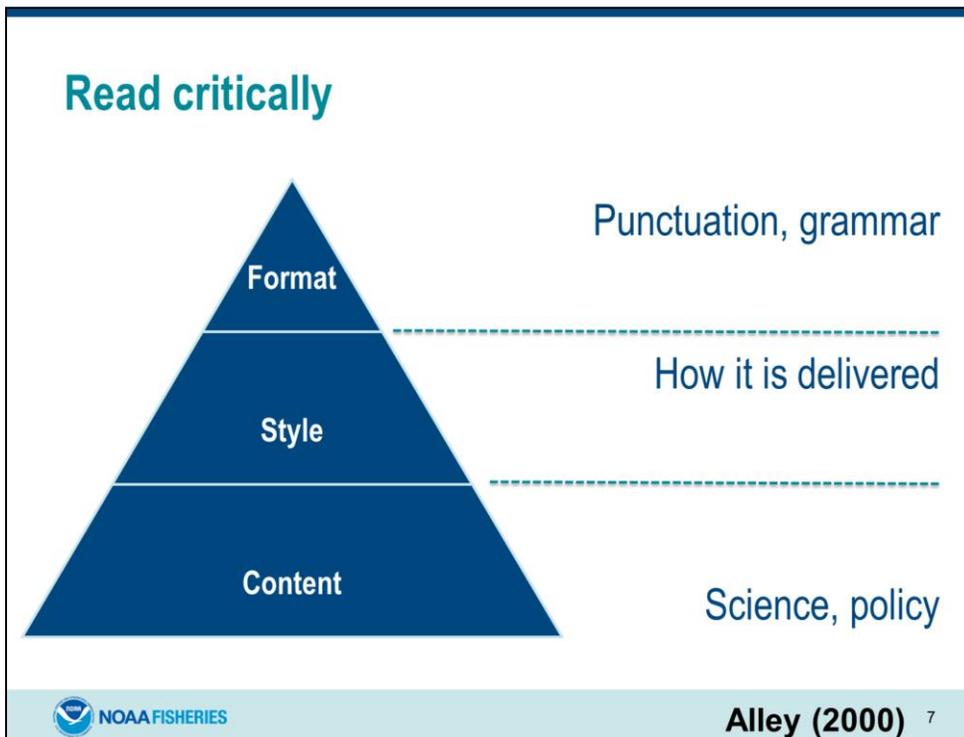
- You need not fix everything

Communicate your criticism

- Summary, major, and minor comments

Let's go through different aspects of a full science review.

https://en.wikipedia.org/wiki/Peer_review



Act as a subject matter expert to provide value to the author, editor, and ultimately the reader.

Content (as the pyramid indicates, spend most of your time here)

- One coherent topic, as reflected in the title, abstract, and thesis or claim
- The topic is relevant to the journal or funding program
- The topic is important to basic or applied science
- Identify content that is missing but needed
- Identify content that is extraneous and can be cut

Style

- How the topic is framed
- How the sections are organized
- How the topic sentences are used
- Does the Intro. need more background or is the Disc. long-winded

Format

- Is the verb tense consistent and fitting?
- Is the taxonomic nomenclature up to date?
- Are the mathematical formula correct
- Are terms defined, professional, and used consistently

In particular, focus on issues outside the journal's familiarity
(such as their specific formatting requirements, general grammar usage, etc.)

See more in: Alley M (2000) *The Craft of Editing: a guide for managers, scientists, and engineers*.
Springer, New York

**Categorize
your science criticism...**

- Originality
- Framework
- Scope
- Presentation
- Study design
- Methodology
- Analysis
- Interpretation



**... to diagnose problems
and frame your response.**

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Schramm and Miranda (2012) ⁸

Harold L. Schramm, Jr., Miranda LE (2012) Responding to peer review and editor's comments. In: Jennings CA, Lauer TE, Vondracek B (eds) Scientific Communication for Natural Resource Professionals. American Fisheries Society, Bethesda, MD, p 135-142

These header labels are from their Table 1.

These labels are suitable as keywords to use in your topic sentences as you express major concerns about a paper.

If you find problems with most or all of these categories, pick the three worst and focus on that in the major part of your review.

Prioritize your criticism (minor, major)

😊 GOOD
☹️ BAD
😡 UGLY

- Format**
 - Split infinitives versus constant misspellings
- Style**
 - A few awkward sentences vs. a series of poor topic sentences
- Contents**
 - Sample size doesn't add up vs. not reproducible
- Ethics**
 - Missing a key historic reference vs. outright plagiarism

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Your goal is not to find every misspelling or rewrite the document for the authors but to direct the revision towards improvement.

For example, I consider the split infinitive to be much ado about nothing (but some disagree, sometimes quite strongly). Often a typo or two is not big deal, but if I encounter several typos or misspellings, then this may erode my confidence in the quality behind the document.

As another example, some light copy editing may fix an awkward sentence, but a poor topic sentence may lead the reader astray for an entire paragraph, and a persistent lack of strong topic sentences may destroy the coherence of an entire section.

Sample size values are often not scrutinized, but if they disagree between the text and a figure, for example, call attention to it. Is this a typo? Do the samples in one represent a subset of the other?

On the other hand, if the methods are not reproducible, is this simply a matter of adding details to the Methods section or is there a more serious underlying problem.

Beware of common biases



Reject a paper that defies established dogma

Less scrutiny to a senior or established author(s)

Negative results need not be published

The paper needs more attention to your specialty

Reviewer biases (see also Jude, 2012; p. 164)

- 1) If a paper defies established dogma, ask: Is this truly ground breaking or over hyped? Reviewers will often be biased to not accept it (I would add to see literature on scientific revolutions).
- 2) junior or unknown scientists demand more scrutiny than senior or familiar scientists.
- 3) Negative results are not worth publishing but that may depend on the saturation of information on a topic
- 4) The paper needs expanding on a topic that is of interest to you (it really only needs to support a strong thesis) (this was added by me).

Jude DJ (2012) The essentials of reviewing a scientific manuscript. In: Jennings CA, Lauer TE, Vondracek B (eds) Scientific Communication for Natural Resource Professionals. American Fisheries Society, Bethesda, MD, p 163-172

Ennui (noun)

a feeling of utter weariness and discontent resulting from satiety or lack of interest



Vague or misleading title

- “Two fish in a pond”

Listless abstract

- “The results will be discussed.”

Weak thesis

- Lacks discovery or criteria to accept/reject

Sometimes I feel that the authors are channeling a serious case of ennui. These are red flags.

Call out an uninteresting title. The editor certainly wants titles to be specific and relevant in a way that will attract readers and create citations.

If the authors are not sure what the significance of the paper is, then perhaps you will waste your time in reading this.

If the authors did not start with a strong thesis, it is doubtful that one emerged later.

<http://www.dictionary.com/browse/ennui> (boredom)



TRAIN WRECK

Should be rare, as such manuscripts should have been rejected without review, but they slip by, too.

Don't fret: You are not expected to 'fix' any manuscript.

Regardless, provide feedback so that the editor can explain to the authors why the manuscript was deficient.

Your strategy to prioritize your feedback will be useful here. You are not expected to write a longer review, and in fact, a short review may suffice in this case.

For example, after noting a half dozen typos found in the first 2 or so pages, you can simply say that they – collectively – are a serious problem but you stopped writing them down after this point.

Communicate your criticism to the authors



- General summaries
 - The paper's main point
 - Your main impression, put the paper in some context
 - A (or a few) key strength(s) & weakness(es)
- 2-4 major points of concern
 - Identifying remedies, too.
- Minor
 - Line-by-line editorial comments
- Date it. Sign it?

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13

This is just a suggested format

Begin with a general overview

The paper's main point (a clear statement here helps especially if your point is different than what the authors thought they presented).

Your main impression. If you are left wondering 'so what' then say so. If you think this is particularly original, or cutting edge, or comprehensive, etc., say that.

A (or a few) key strength(s) & weakness(es).

"Recognizing the worth of the author's work increases your credibility with the authors."
Alley (2000)

2-4 major points of concern

Content, style, ethics

A paragraph on each point of concern to back up your summary.

Minor

Line-by-line editorial comments

Refer to specific lines in the manuscript (assuming you are not marking a hard copy) to facilitate the author's and the editor's use as a checklist

Include citations to any reference you used. It is OK to cite your own work, when it is relevant.

Date. If you have met the journal deadline, then take credit for it.

Sign it?

You can sign it, particularly if you are willing to let the author contact you for further clarification. If you are well-known in the field, the authors may be pleased to learn that you reviewed it. However, it is unethical to let such contact lead to co-authorship on a later revision of the paper.

You may choose to not sign it, which is acceptable. This may be particularly true if you might be concerned that an honest but highly critical review may cause you trouble later from the author(s). You must not, however, hide behind anonymity to write a review with unfair or personal attacks.

I personally like the idea of anonymous reviewers, which make authors read the comments without judgements about who wrote this or that. However, I have signed a lot more of my reviews as I become more established.

Double blind reviews are becoming more common and fairly deal with this situation, too.

Communicate your criticism to the editor



Be more candid

- But don't disagree with your comments to authors

Clarify your expertise, if appropriate

- If you could not evaluate the math, for example, say so

Recommend whether to publish or not

- Add a comment about your certainty in this recommendation

Reviewers have a dual role:

to provide to the editor a well supported recommendation, while providing the authors with constructive comments to improve the manuscript.

Here you have an opportunity to be more candid. With respect to being tactful or to avoid a misunderstanding with the author, you can share your thoughts here. Perhaps, you want to advocate for the paper directly to the editor, in a way that the editor feels that you are not constrained by the author seeing your comments (e.g., 'this study approach is out of fashion but it is also very well done, a reminder that it is still useful, and it is worthy of adding to the modern literature.')

You can point out any limits to your expertise, and if you are particularly concerned, perhaps you should recommend an additional subject matter expert.

Typically there was a box to check about your recommendation (i.e., accept, accept with minor revision, etc.). Here you can state the confidence you have in your recommendation in a way that the editor can integrate with the recommendations of the other reviewers.

Respond with tact



Balance your negatives with some positives

Focus on the manuscript and not the authors

Avoid hard value judgments (e.g., NEVER do this)

- Some journals may do that!

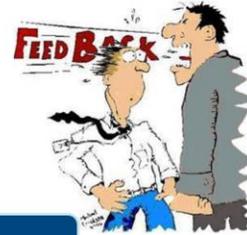
Be impartial

- But show some emotion or engagement

Be impartial, but show some emotion to let them know that you were engaged

In a friendly review, or an in-house review, you may need to be sensitive if your criticism will affect a deadline, or upset a particularly prickly author, etc.

More tips on delivery



Control tone with reason

- I recommend this, because...

Perhaps a question is best

- What are the error bars in Figures 2-5?

Give the choice back to the authors

- Figure 7 and Table 9 present the same information, so why have both?

Give yourself time to reflect and revise your review

- If only an hour, or preferably, a day or more later

If your emotion is building during the review towards frustration, try these tips to even out the nature of the review.

Reflection will benefit everyone

The journal review:

Accept

Accept with minor revisions

Accept with major revisions

- May require re-review

Resubmit a revised manuscript

- Likely requires re-review

Reject



More than just accept or reject

Some journals like to have a list of standard questions, with points to choose from:

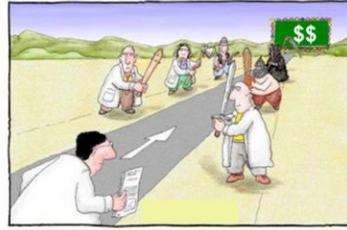
i.e.

Please rate the originality of this paper 1 2 3 4 5 (higher values mean more original)

Etc.

http://www2.latech.edu/~jenna/seminar-presentations/review_a_paper_proposal_an_article.pdf

The proposal review: To fund or not?



Relevance to the program (25%)

Technical or scientific merit (30%)

Applicant qualifications (15%)

Project costs (10%)

Outreach, education, or application (20%)



18

Importance and/or relevance and applicability of proposed project to the program goals: (25 percent): For this competition, assess (1) how well the proposed project aligns with the selected program priority; (2) how well it reflects the applicant's comprehensive understanding of the issue(s) to be addressed; and (3) how well it will contribute to our understanding and/or management.

Technical/scientific merit (30 percent): For this competition, assess (1) how clearly the proposal describes project goals and objectives; (2) how feasible, scientifically sound, and/or innovative the methods are with respect to the proposal's goals and objectives; (3) whether it demonstrates full compliance with all applicable federal, state, and local environmental laws; (4) how applicable and useable the outputs of the proposed project will be for the intended user(s); and (5) whether their data management plan is complete and sound.

Overall qualifications of applicant (15 percent): For this competition, assess the capability of the investigator(s) and collaborator(s) to complete the proposed work as evidenced by past research and science application accomplishments; previous cooperative work; and timely communication of findings, data, and other research products.

Project costs (10 percent): For this competition, assess the completeness of the budget narrative and how realistic the budget is for achieving the project's outcomes within the proposed timeframe.

Outreach/education (20 percent): For this competition, assess (1) how well the proposal identifies end users for the project's findings and outputs; (2) how engaged the identified end users are in the project planning and implementation process; (3) the effectiveness of their plan to transfer the project's findings and outputs to identified end users; (4) and how well the applicant proposes to make project findings and/or

outputs known and available to the broader resource management, scientific, and/or stakeholder community.

While it depends on the agency, NSF uses a 5-point scale:–

Excellent–Very Good–Good–Fair–Poor

Only proposals with mostly excellent and some very good ratings are likely to be funded.

Beyond the science: line or copy edits

	delete	Delete extra letters or unnecessary darling words.
	para	¶ Adds a new paragraph.
...	stet	Let it stand . (Indicates that a correction or alteration should be ignored.)
	transpose	Transpose a letter the or a word that's <u>misplaced</u> been .
#	space	Add a [*] space.
	delete and close up	This is used so the typesetter knows he sh should delete and close up the space.
^	close up	A way to remove pesky ex [^] tra spaces.
	spell out	A circled <u>1</u> or <u>2</u> or an <u>abbrev</u> means the word should be spelled out.
o	period	Dr. ^o Author omitted something small but significant. ^o Circling is also used to

What's a Line Edit?

A line edit addresses the creative content, writing style, and language use at the sentence and paragraph level. **But the purpose of a line edit is not to comb your manuscript for errors** – rather, a line edit focuses on the way you use language to communicate your story to the reader. Is your language clear, fluid, and pleasurable to read? Does it convey a sense of atmosphere, emotion, and tone? Do the words you've chosen convey a precise meaning, or are you using broad generalizations and clichés?

In That Case, What's a Copyedit?

By contrast, the goal of a copyedit is to address flaws on a very technical level – to make sure the writing that appears on the page is in accordance with industry standards. This is like an incredibly high-end proofread.

Source:

<http://nybookeditors.com/2015/01/copyediting-vs-line-editing/>

A final step: Proofreading



Focus on title, abstract, and illustrations

- Not all words deserve equal attention

Put it down and come back later

- Or take it to a different setting

Read backward or out loud

- Or with 2 people

If pressed, focus on the title, abstract, and illustrations and their legends

Some words are more commonly misspelled or mistaken for their meaning, etc., and deserve more attention

Do with 2 people if this is really important (e.g., a press release)

Some printer changes may occur that you just need to leave as is (for example journal-specific formatting that you may not normally agree with such as British spelling conventions).

What's in it for you?



You review within your expertise

- Now you read a paper before it is published

Spend time researching responses

- You might learn something new

Sharpen your critical thinking skills

- Making you a better writer and scientist

It will improve tact and social skills

- A good review will expand your network

Think about it more than just your duty.

ETHICS

Yours
 Conflicts of Interest
 Confidentiality
 Contact with authors

Theirs
 Authorship
 Conflicts of interest
 Dual Publication
 Salami science
 Plagiarism
 Data falsification
 Image manipulation
 Image beautification

Predatory journals

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22

Rose KA, Fabrizio MC, Phelan BA (2012) Determining authorship: why is something that seems so simple often so difficult. In: Jennings CA, Lauer TE, Vondracek B (eds) Scientific Communication for Natural Resource Professionals. American Fisheries Society, Bethesda, MD, p 7-18

<https://www.elsevier.com/connect/10-tips-for-reviewing-scientific-manuscripts-and-5-red-flags>

https://www.publishingcampus.elsevier.com/websites/elsevier_publishingcampus/files/Guides/Brochure_Ethics_2_web.pdf

Authors may wish to contact you but it is generally a conflict of interest to accept authorship as a result of review, as you are conflating the roles.

Yours: Recuse yourself if there is a conflict that would prevent an impartial review. Although there are generally unambiguous examples of conflict, if in doubt, contact the journal or grant agency to review the situation.

Do not share the manuscript with others, and the sanctity of a proposal should be

protected in particular. A possible exception, for manuscripts, is to enlist a junior scientist to help (with your assistance) with the review, to reduce your load while giving them experience (again, check with the editor or program managers).

An author's perspective: Responding to reviews



Answer completely

- Point by point

Answer politely

- Remember they're volunteers

Answer with evidence

- Especially when you disagree



Williams (2004) 23

Remember the reviewers likely volunteered their time

Williams, H.C. (2004) How to reply to referees' comments when submitting manuscripts for publication. *Journal of the American Academy of Dermatology*. 51: 79-83. >>>Cited from (p. 139) Harold L. Schramm, Jr., Miranda LE (2012) Responding to peer review and editor's comments. In: Jennings CA, Lauer TE, Vondracek B (eds) *Scientific Communication for Natural Resource Professionals*. American Fisheries Society, Bethesda, MD, p 135-142

If you think some reviewer's comment is wrong, you still need to say so. Ignoring it will be a red flag to an editor, and if they question you about it, this could delay their decision.

If the recommendation is for minor revisions, you should focus on a prompt turn-around, to return a revised manuscript while this is still fresh in the editor's mind. You should probably just accept their comments to make this easy. You still have the prerogative to disagree, but you will want to be clear and reasoned.

Major revision will need more time. Note the deadline, and if you need more time,

request it.

If the recommendation is not something you can agree with, you can argue with the editor or choose another journal.

An author's perspective: Rejection



Put some distance on this

- You should respond or revise with a cool head

Identify the main reason

- Discern if this is fatal or not

If not flawed, revise

- Probably selecting a new journal

Read through the comments to absorb the essence of the decision, but put it aside for a while (perhaps several days), before you respond. Haste is the enemy of reason at this moment.

A fatal flaw would be something unfixable. Often, however, that is not the case.

- A manuscript that framed the problem inadequately, or rambled on, or was littered with grammatical issues that made the reviewers' confidence...these can all be corrected with revision.
- A misapplied statistical analysis can be adjusted and redone.

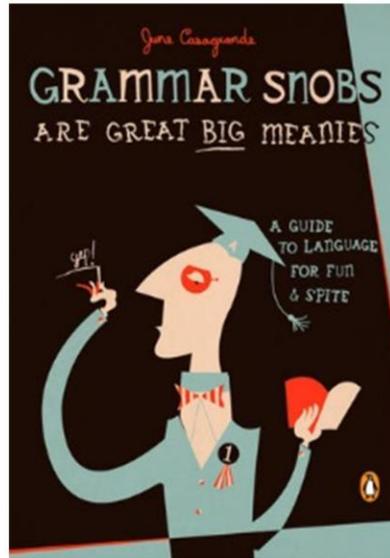
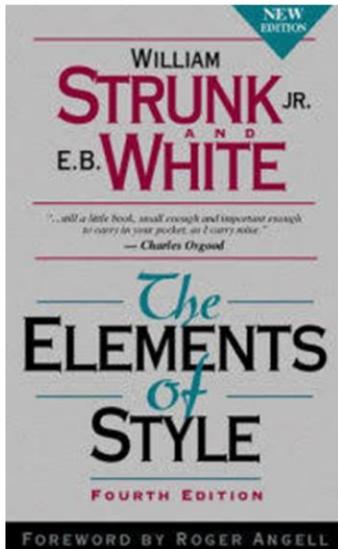
Re-submitting a revised manuscript to the same journal is possible, but Schramm and Miranda call this a 'low-yield strategy'

Even if you resubmit to a different journal, you are well advised to revise accounting for the reviewer comments. There is some likelihood that you could get at least one of the same reviewers to read the revised draft!

Harold L. Schramm, Jr., Miranda LE (2012) Responding to peer review and editor's comments. In: Jennings CA, Lauer TE, Vondracek B (eds) Scientific Communication for

Natural Resource Professionals. American Fisheries Society, Bethesda, MD, p
135-142

More general resources



Casagrande, J. 2006. Grammar Snobs are Great Big Meanies: A guide to language for fun & spite. Penguin Books, New York, NY.

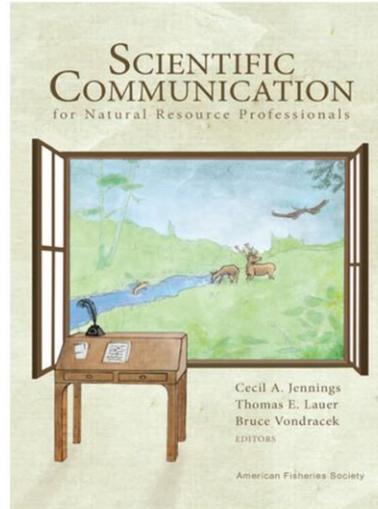
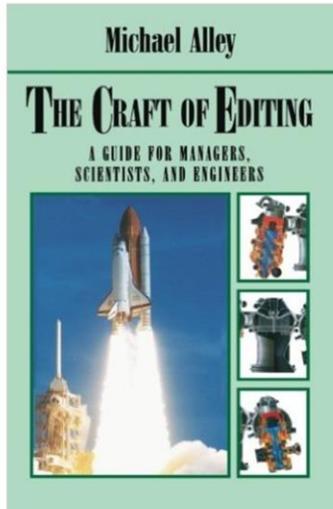
https://www.e-reading.club/bookreader.php/134089/Grammar_Snobs_Are_Great_Big_Meanies.pdf

Strunk, W., Jr. and E. B. White. 1972. The Elements of Style. 2nd edition. Macmillan Publ. Co., Inc., New York, NY.

<http://www.gutenberg.org/ebooks/37134>

<https://www.bartleby.com/141/>

More specific resources



Alley M (2000) *The Craft of Editing: a guide for managers, scientists, and engineers*. Springer, New York

Jude DJ (2012) The essentials of reviewing a scientific manuscript. In: Jennings CA, Lauer TE, Vondracek B (eds) *Scientific Communication for Natural Resource Professionals*. American Fisheries Society, Bethesda, MD, p 163-172

Harold L. Schramm, Jr., Miranda LE (2012) Responding to peer review and editor's comments. In: Jennings CA, Lauer TE, Vondracek B (eds) *Scientific Communication for Natural Resource Professionals*. American Fisheries Society, Bethesda, MD, p 135-142

<http://writing.engr.psu.edu/ce.html>

(The craft of editing)

<https://fisheries.org/bookstore/all-titles/professional-and-trade/55066p/>

On the internet, too.

How to review a paper
Peer review, your role and responsibilities

How to review manuscripts
Peer review, your role and responsibilities

Your ultimate checklist for reviewing a paper

First impressions

- Is the research original, novel and important to the field?
- Has the appropriate structure and language been used?

Abstract

- Is it really a summary?
- Does it include key findings?
- Is it an appropriate length?

Introduction

- Is it effective, clear and well organized?
- Does it really introduce and put into perspective what follows?
- Suggest changes in organization and point authors to appropriate citations.
- Be specific – don't write "the authors have done a poor job".

Methodology

- Can colleagues reproduce the experiments and get the same outcomes?
- Did the authors include paper references to previously published methodology?
- Is the description of new methodology accurate?
- Could or should the authors have included supplementary material?

Results and discussion

- Suggest improvements in the way data is shown.
- Comment on general logic and on justification of interpretations and conclusions.
- Comment on the number of figures, tables and columns.
- Write concisely and precisely which changes you recommend.
- List separate suggested changes in style, grammar and other small changes.
- Suggest additional experiments or analyses.
- Make clear the need for change/solutions.
- Ask yourself whether the manuscript should be published at all.

Conclusion

- Comment on importance, validity and generality of conclusions.
- Request listing down of quantified claims and generalizations.
- Request removal of redundancies and summaries.
- The abstract, and the conclusion, summarizes the study.

References, tables and figures

- Check accuracy, number and citation appropriateness.
- Comment on any footnotes.
- Check quality and readability.
- Assess completeness of legends, tables and axis labels.
- Check presentation consistency.
- Comment on need for colour in figures.

Editors' view: what makes a good reviewer?

- Provides a thorough and comprehensive report
- Submits the report on time
- Provides well-qualified comments for authors
- Gives constructive criticism
- Demonstrates objectivity
- Provides a clear recommendation to the editor

Comments to the editor

- Comment on novelty and significance
- Recommend whether the manuscript is suitable for publication
- Confidential comments will not be disclosed to the author(s)

Why should you review?

...critical because it

- Improves the quality of the published paper
- Encourages previous work to be acknowledged
- Determines the importance of findings
- Detects plagiarism and fraud
- Plays a central role in academic career development

...adheres to the principles that

- It is a well-understood concept
- Without it there is no control in scientific communication
- Journal editors evaluate and reject certain articles prior to external peer review

A good peer review requires disciplinary expertise, a keen and critical eye, and a diplomatic and constructive approach. Credit: dmark/Shutterstock

By Elisabeth Pain | Sep. 22, 2016, 5:00 PM

As junior scientists develop their expertise and make names for themselves, they are increasingly likely to receive invitations to review research manuscripts. It's an important skill and service to the scientific community, but the learning curve can be particularly steep. Writing a good review requires expertise in the field, an intimate knowledge of research methods, a critical mind, the ability to give fair and constructive feedback, and sensitivity to the feelings of authors on the receiving

NOAA FISHERIES <http://reviewers.plos.org/resources/#how-to-review> 27

Levine AG (2016) Reviewers Rule: Strategies for faculty advancement. Science 353(6305):1290-1294 doi:10.1126/science.opms.r1600167

<http://www.sciencemag.org/careers/2016/09/how-review-paper>

<https://www.elsevier.com/connect/how-to-review-manuscripts-your-ultimate-checklist>

'Science' covers publishing ethics as a news story in nearly every issue, and often does special features on this topic.

Larger publishers, like Elsevier, has specific resources, too.

Learning objectives



Define your role as a reviewer

Apply different types of review

- Science
- Line or copy edit
- Proofread

Decide how to respond to reviews



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<http://www.nefsc.noaa.gov/nefsc/woodshole/seminar-public.html> 28

My aim for this presentation was to improve your ability to meet these learning objectives.