

Scientific Writing Basics: An Editor's Advice and Perspective

Todd Wills

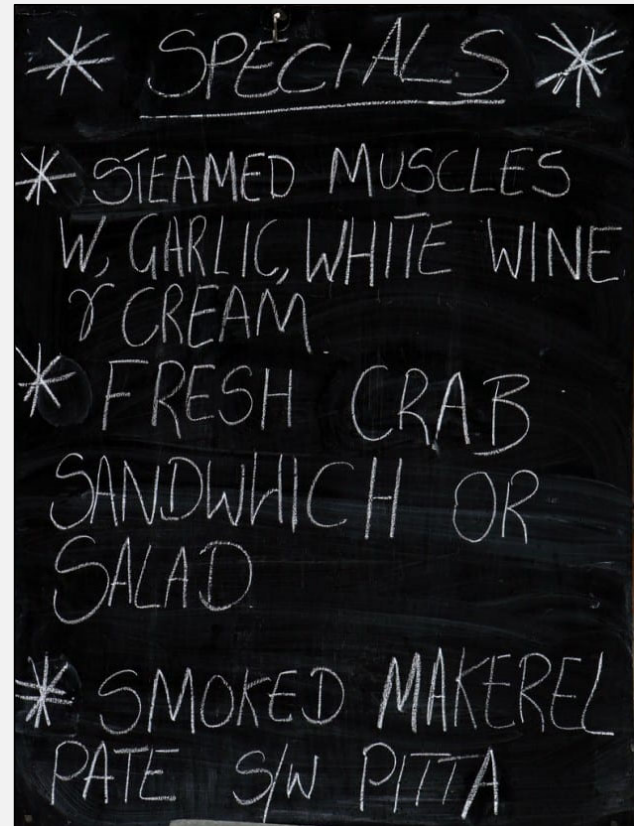
Michigan Department of Natural Resources

Fisheries Division

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Who is this guy?

- Associate Editor, North American Journal of Fisheries Management, 10+ years
- Reviewer for multiple journals, 25+ years
- 40+ professional publications
- Numerous popular articles
- Editor of other random things



<https://honestcooking.com/10-signs-restaurant-is-bad/>

I must confess...

I can be a better writer.

I am guilty of bad writing habits.

Many of the ideas presented aren't mine.

A lot of the content is obvious.

Disclaimer:

*The content of this presentation may
not reflect the views of the journals that
I edit or review for.*



Writing rules to live by

Common writing errors

Writer improvement

Minimizing peer review pain



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Three rules of science communication:



Know your audience



Tell a story



Less is more

Courtesy of Dr. Brittney Borowiec, McMaster University

Rule #1: Know your audience!



Fellow scientists?



Work colleagues?



Informed
stakeholders?



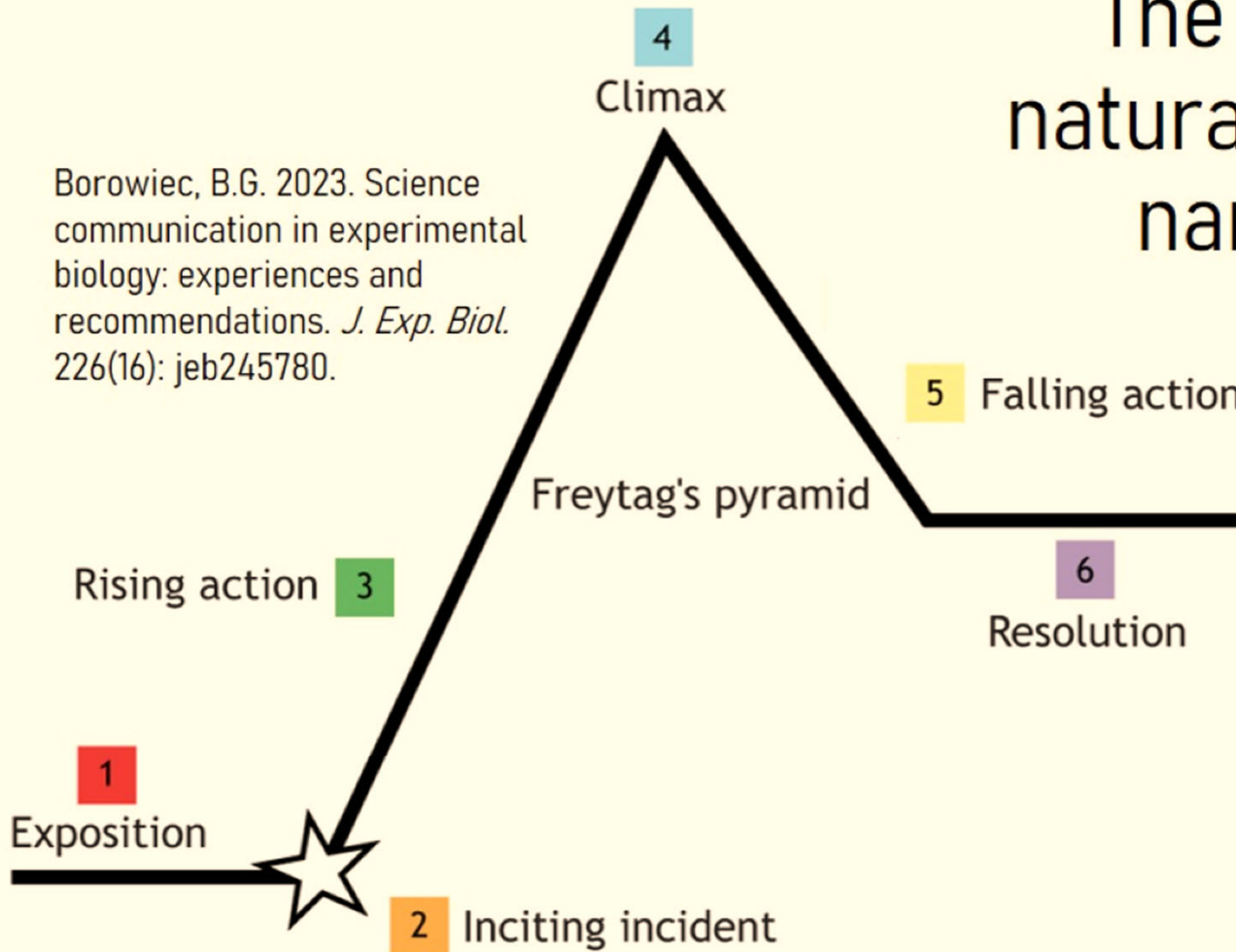
General public?



Rule #2: Tell a story

The scientific method naturally follows a classic narrative structure

Borowiec, B.G. 2023. Science communication in experimental biology: experiences and recommendations. *J. Exp. Biol.* 226(16): jeb245780.



- 1 Introduction
- 2 Research question
- 3 Experiments (Methods)
- 4 Major findings
- 5 Discussion
- 6 Conclusion

Courtesy of Dr. Brittney Borowiec, McMaster University

Freytag's inciting incident



Goals



Objectives

Specific

Measurable

Achievable/Assignable

Relevant/Realistic

Time-bound

SMART



Hypotheses

Storytelling elements

Conflict

Plot

Characters

Tone and
mood

Point of
view

Style and
diction

Setting

Theme

Courtesy of Dr. Brittney Borowiec, McMaster University

A brief aside on ethics..



Storytelling in science is not:

- Misrepresenting data
- Fitting a predetermined narrative

Rule #3: Less is more

“...and write it up they do.”

-Paul Eschmeyer

“The deliberate reduction of excess, whether in form, function, or expression, often results in a heightened sense of clarity, elegance, and impact. By consciously removing what is superfluous and unnecessary, one allows the essential elements to emerge with greater prominence, thereby creating an experience that is not only more refined but also more meaningful. In essence, restraint and simplicity, when applied with intention, can amplify effectiveness and beauty far beyond what abundance or complexity could achieve.”

Strive for brevity

The deliberate reduction of excess, whether in form, function, or expression, often results in a heightened sense of clarity, elegance, and impact. By consciously removing what is superfluous and unnecessary, one allows the essential elements to emerge with greater prominence, thereby creating an experience that is not only more refined but also more meaningful. In essence, restraint and simplicity, when applied with intention, can amplify effectiveness and beauty far beyond what abundance or complexity could achieve.



Less is more

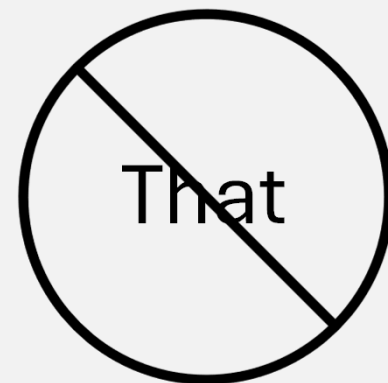
Also on brevity...

Never write a sentence with the sole purpose of citing a table, figure, or appendix.

- “A map of the study area is shown in Figure 1.”
- “Test statistics, degrees of freedom, and P-values for our statistical analysis are in Table 3.”
- “The time series of catch-per-unit-effort data by species are available in Appendix 1.”

Write in plain language

- Don't strain to be scholarly.
- Avoid jargon.
- Beware of intensifiers, vague descriptors, and filler words.



These words are overused!

Less is more for tables and figures too!

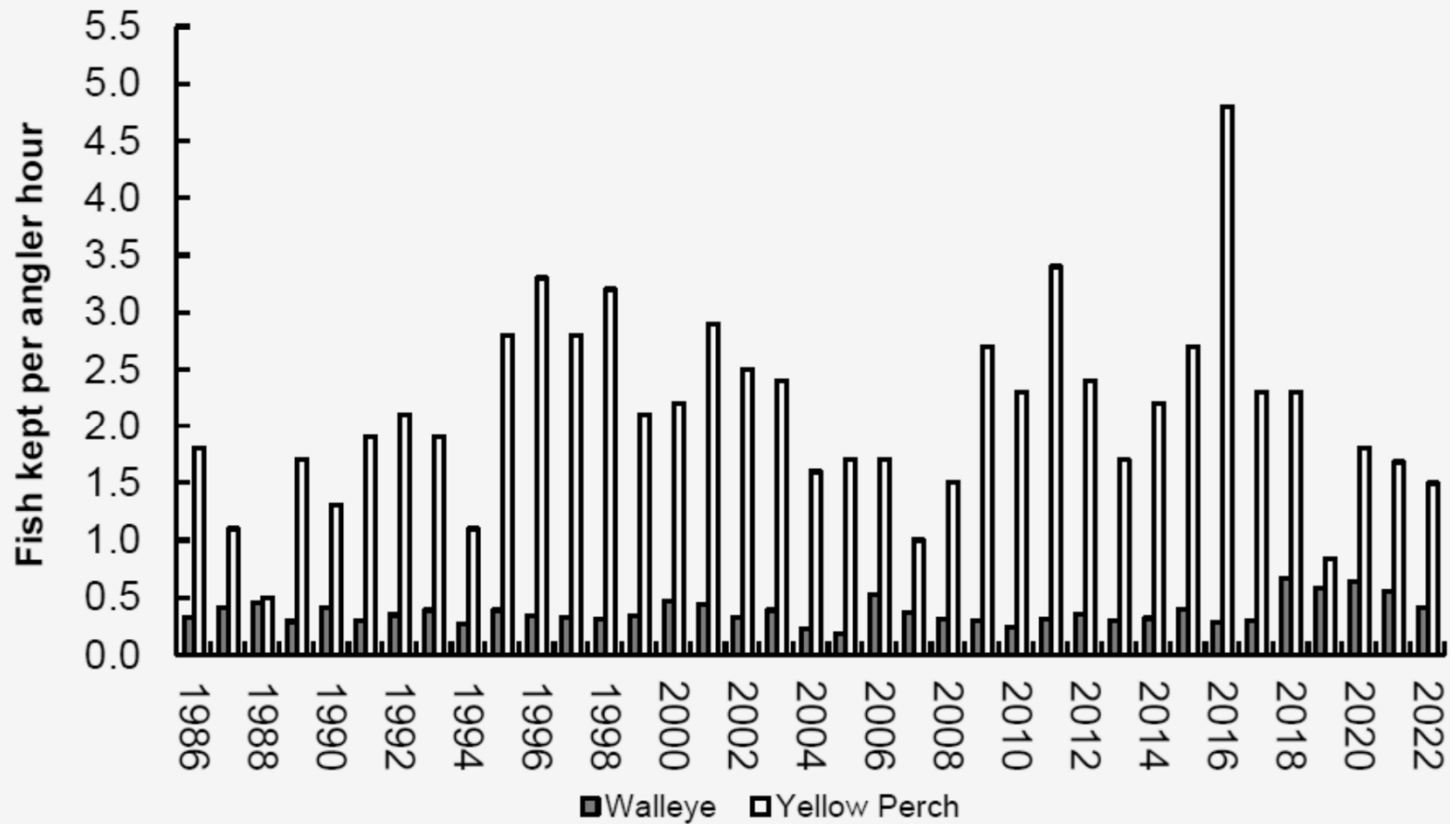
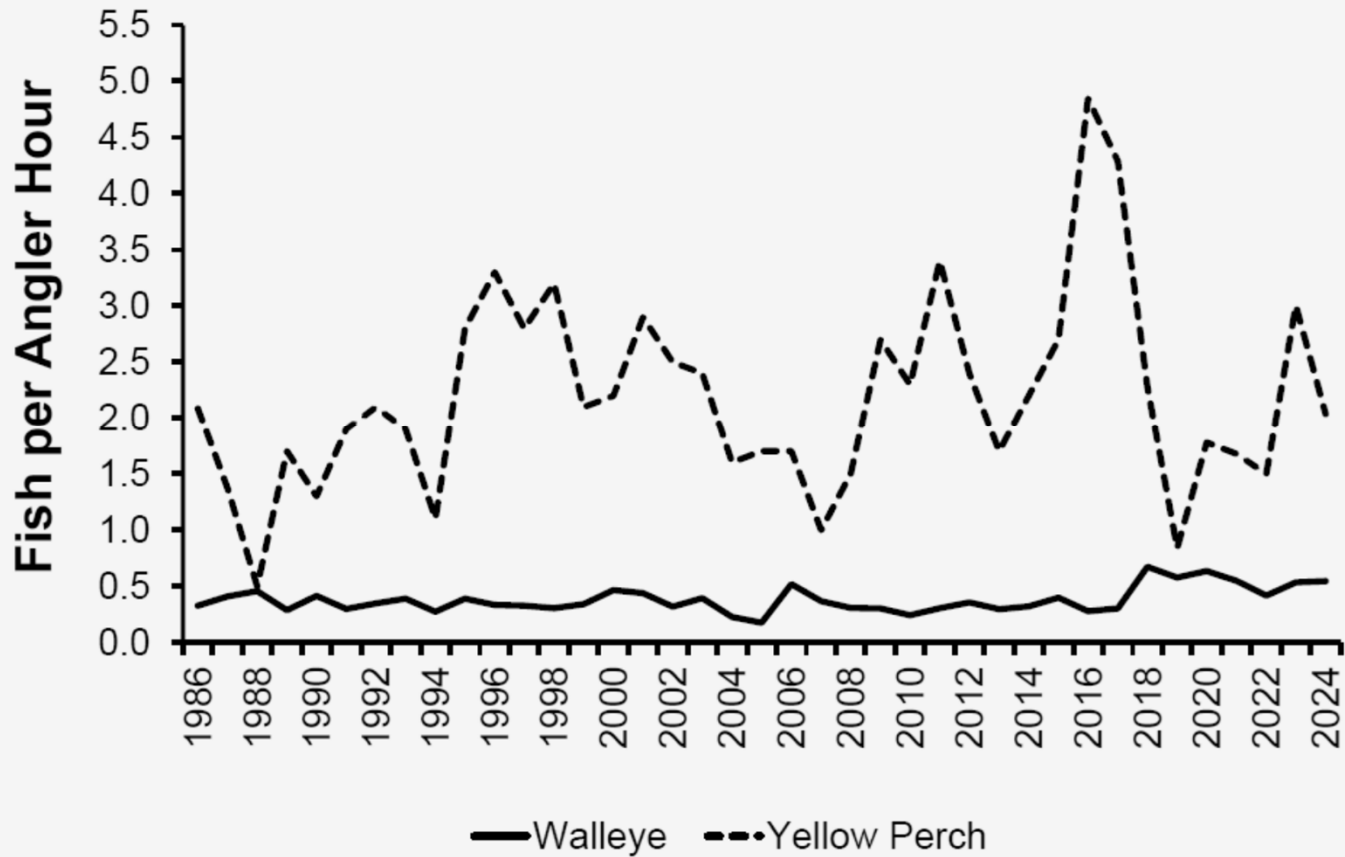
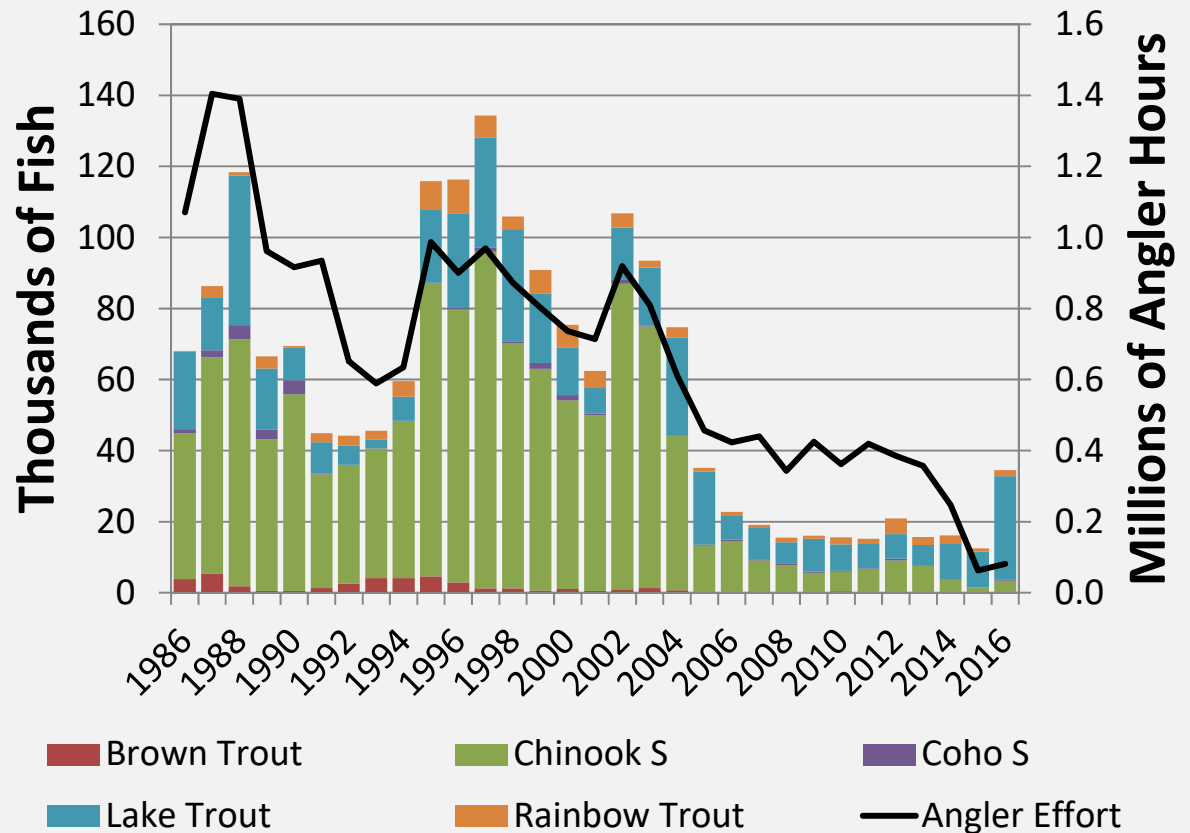


Figure design principles



Avoid the secondary y-axis

This is mine and I'm not proud of it.





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Missing topic sentences

“Smallmouth bass now exhibit larger population size structure, regularly reaching memorable sizes and frequently reaching trophy lengths, while fish in either category were rare in the 1970s and 1980s. These changes do not appear to be associated with changes in biomass or growth rates associated with new invasive prey species such as round goby, but rather increased survival. The average age of a smallmouth bass captured in a trap net during the 1970s or early 1980s was about 4.5 years old; by 2023, fish averaged 6.5 years old.”

Add a topic sentence...

“Substantial changes in the size structure of the smallmouth bass population of Lake St. Clair have occurred since 1972.

Smallmouth bass now exhibit larger population size structure, regularly reaching memorable sizes and frequently reaching trophy lengths, while fish in either category were rare in the 1970s and 1980s. These changes...”

Too many references

“Numerous studies have demonstrated that habitat enhancement structures succeed in concentrating fish in natural lakes...and reservoirs (Brouha 1974, Paxton and Stevenson 1979, Prince and Maughan 1979a, Brown 1986, Kayle 1986, Moring et al. 1989, Mabbott 1991, Rogers and Bergersen 1999). “



8 references. I did this too.



Pet peeve parentheticals

Parentheticals (like this) are annoying (because they interrupt flow), even at the end of a sentence (see what I mean?).

(i.e., _____)

id est

that is

(e.g., _____)

exempli gratia

for example

Tone and style tutorial

Active vs.
passive voice

We measured Brook Trout...
Brook Trout were measured...

Parallel
structure

Methods	Results
A.	→ A.
B.	→ B.
C.	→ C.

Methods	Results
A.	→ B.
B.	→ C.
C.	→ A.

Consistent
terms and tense

Backpack electrofisher
Back pack electrofisher
Backpack shocker
Back pack shocker

is vs. was
-ed vs. -ing

Capitalizing common names of fish

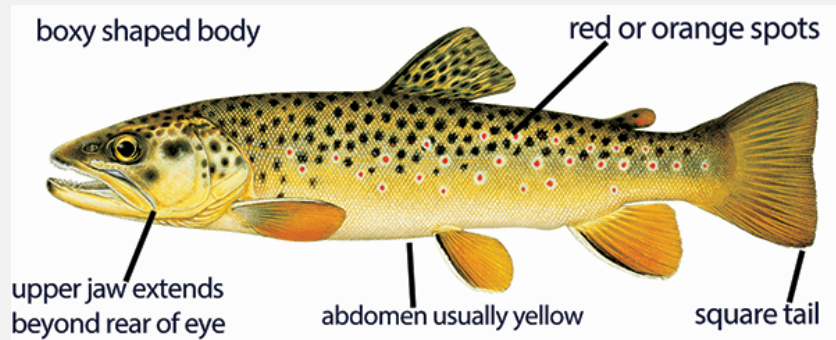
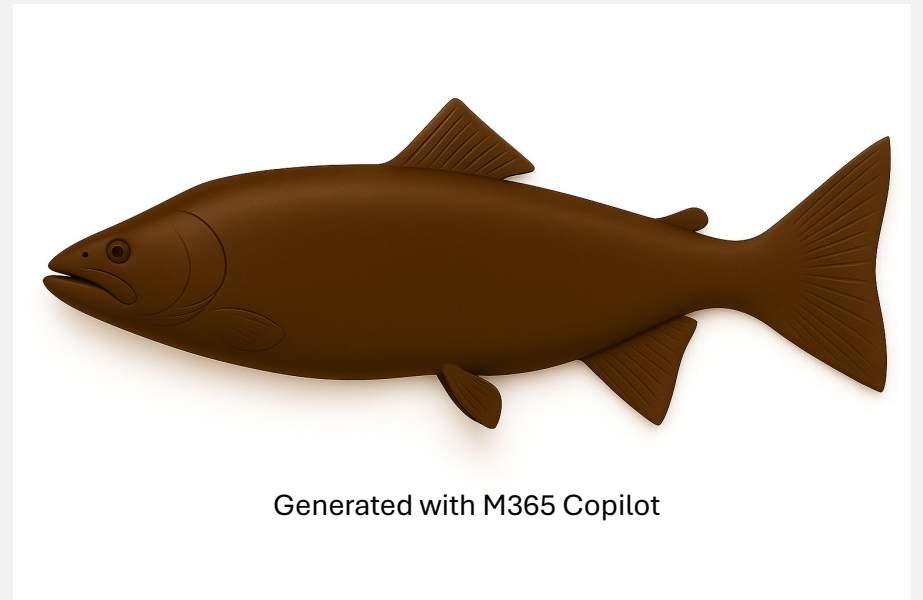


Illustration by Joseph R. Tomelleri ©

Brown Trout *Salmo trutta*



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a brown trout

Numbers and statistics



Consult a
statistician



Provide units of
measure



P-values need test
statistic and df

A random list of other errors:



- Undefined acronyms
- Beginning sentences with acronyms or numbers
- The run-on sentence and comma splice
- Comma overuse (please, stop, this)
- Rehashing results

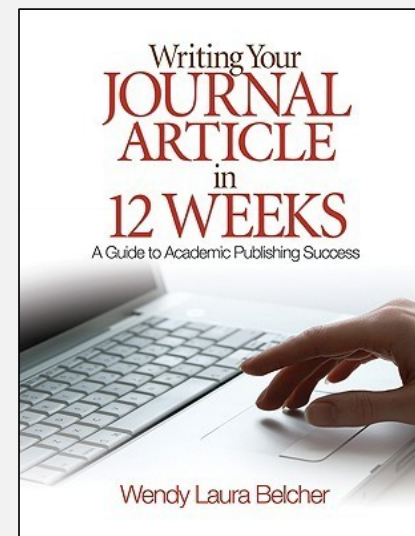
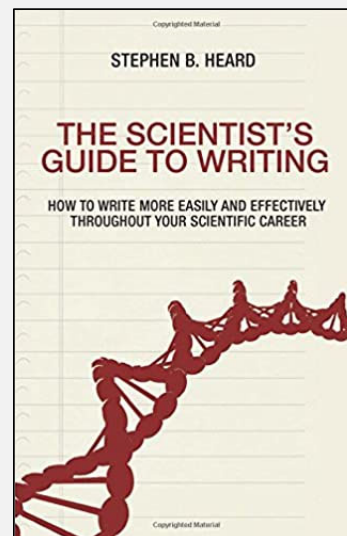
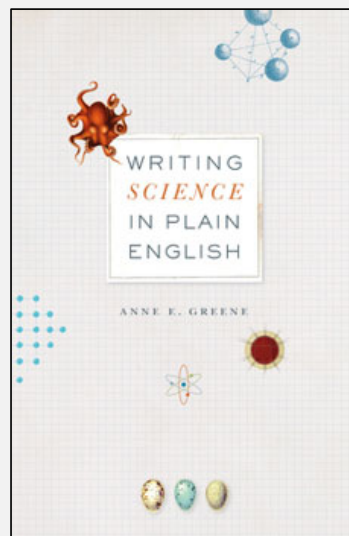
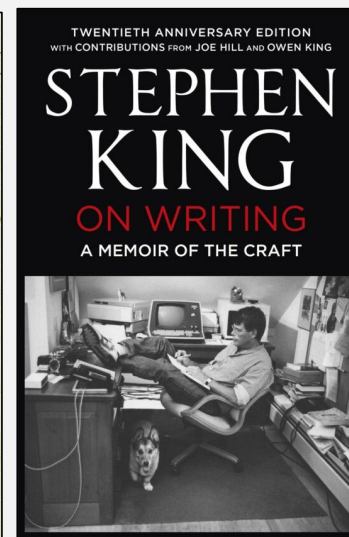
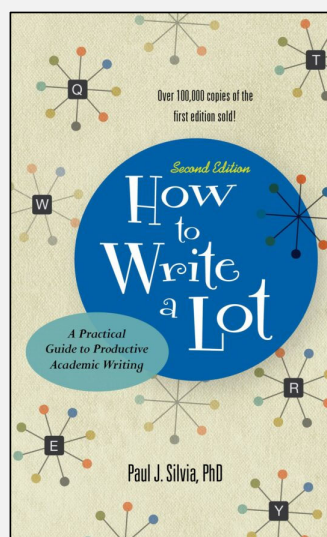
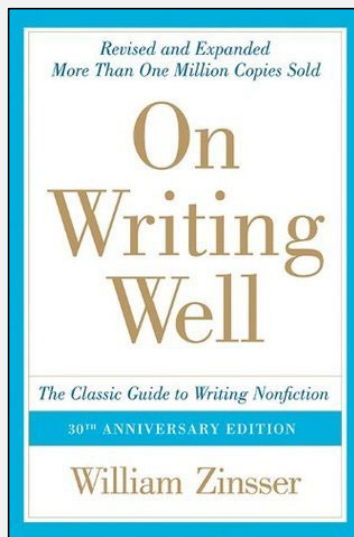
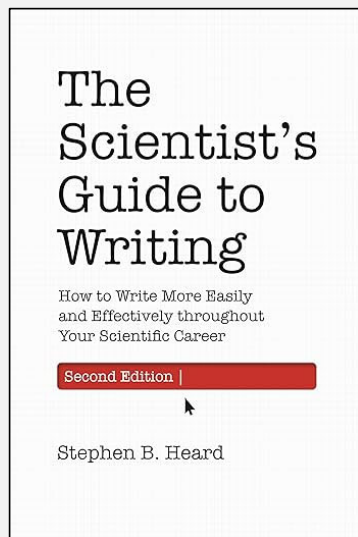
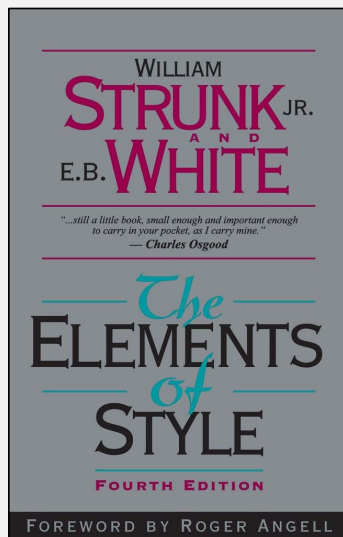
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Common writing errors

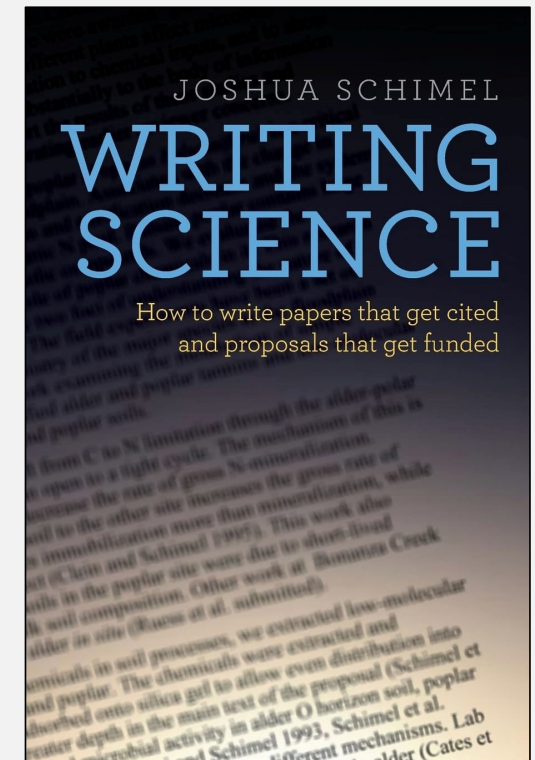
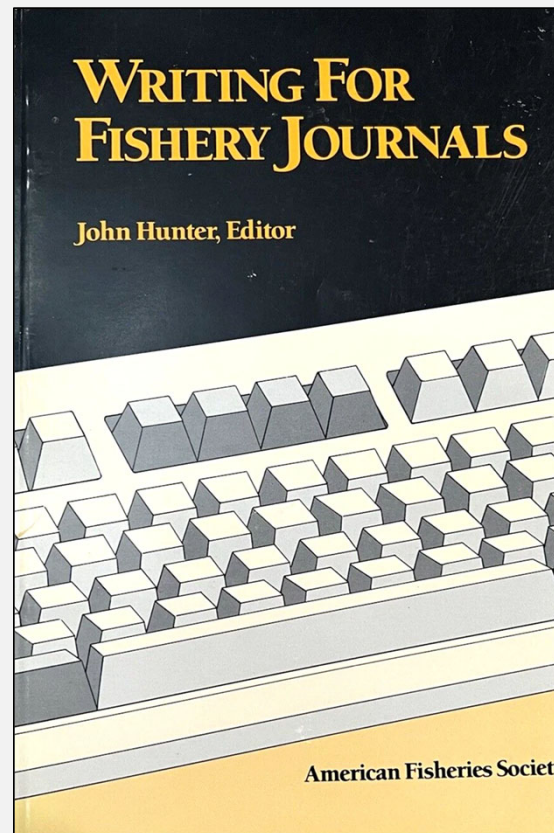
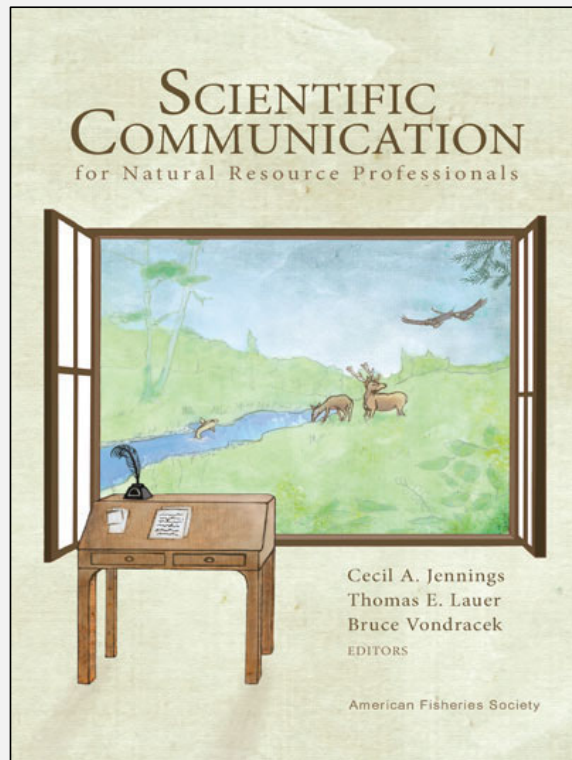


Writer improvement

Minimizing peer review pain



Helpful resources for fisheries scientists



How do I become a better writer?

- Read.
- What authors do you remember? Why?
- Read more of their work.
- Practice. Imitate their style.
- Use rules #1-#3 every day. They apply to email.
- Participate in the peer review process.
- Step outside of your comfort zone. Write a popular article.

Make science accessible!

- Know your institution's accessibility requirements
 - Font styles and sizes – avoid serif fonts
 - Alt text for photos and figures
 - Table formats (empty and merged cells)
 - Color and contrast
 - Word and PDF documents checked separately

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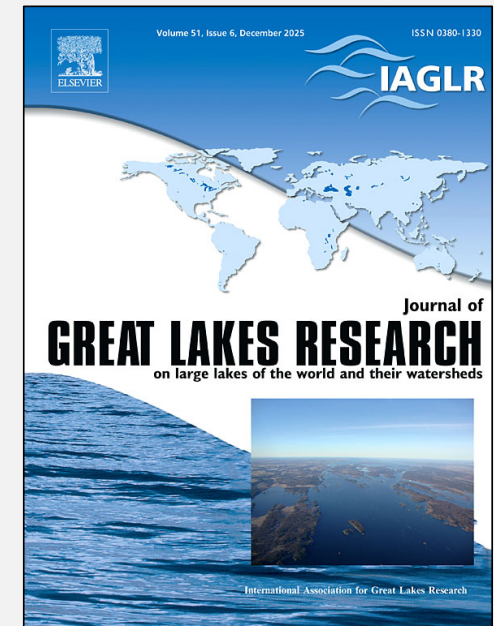
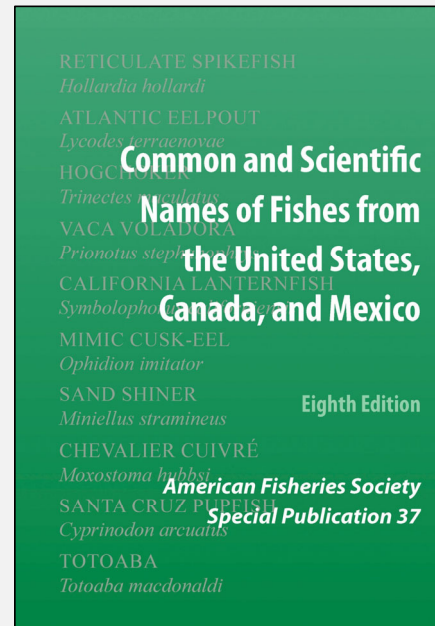
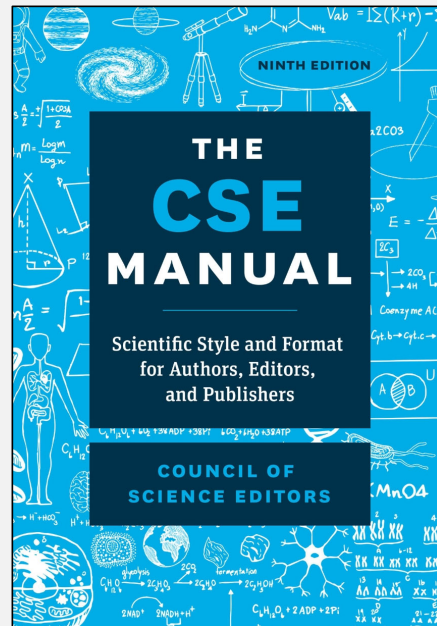
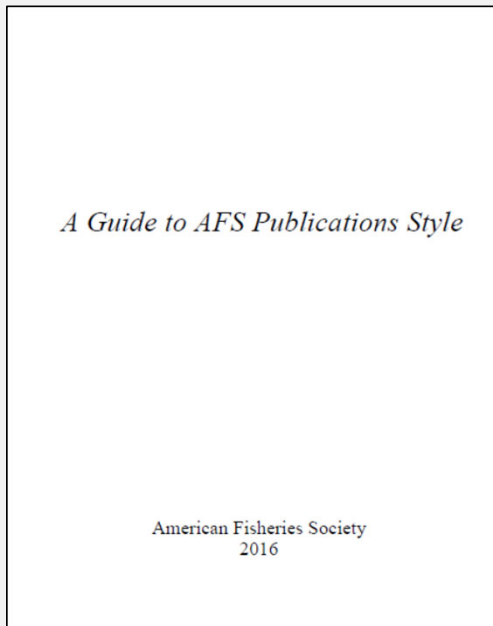
Minimizing peer review pain



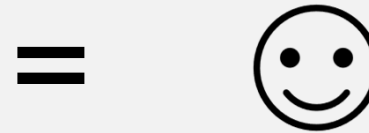
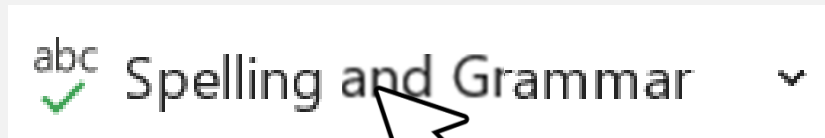
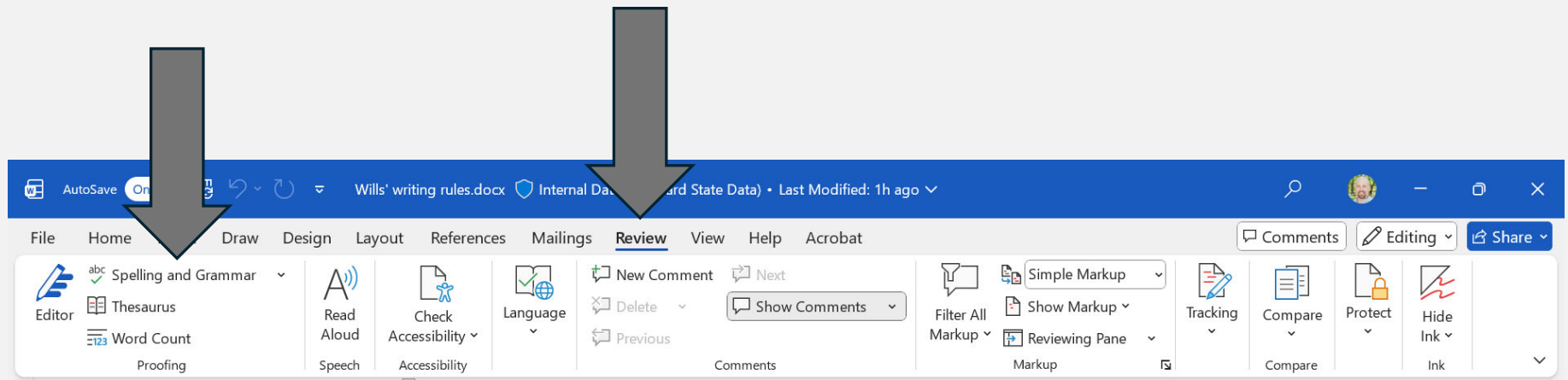
Peer review etiquette

- Make it a personal goal to peer review
- Never compromise your professionalism
- Editors will know who you are
- Be constructive
- Focus on scientific merit
- Resist the urge to copy edit

Minimizing peer review pain



Minimizing peer review pain



Editors and reviewers

Minimizing peer review pain

Proofread!

- Step 1: Wait a week then repeat
- Step 2: Ask a friend or colleague
- Step 3: Find someone completely removed



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Working with editors

- We are here to help!
 - Be patient...we have to multi-task
- Respond to review comments thoroughly
 - Arguing is different than negotiating

Thank you!