

# Scientific Writing for Manuscripts

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# Renewed challenges in digital era

## The facts and Keys

- Journal Selection
- Manuscript Quality, and
- Innovations

# Journal Selection

- **Impact factor (IF)** dominates the decision making for many scholars
- **Institutional needs**, associated policies, publishing speed, etc.
- **Readership** and long-term impacts have more influence

Dear Dr. Jiquan Chen,

We are delighted to announce that the new 2022 Impact Factor of [REDACTED] is 3.4, and the CiteScore has increased to 5.5.

May I know if you receive paper invitation from the Guest Editor Prof.

Dr. [REDACTED]? We would like to invite you to contribute a paper to this Special Issue as the corresponding author and the deadline for manuscript submissions: 31 August 2023  
We will provide you a 100% special discount.

Once you decide to contribute, please let us know, and send us the following information of the manuscripts within 7 days.

# Manuscript Quality

- **Manuscript quality** is not necessarily higher than it was in the pre-digital era.
- **Details** are lacking or not formulated with high standards.
- **Common shortfalls** include use of vague terms, inconsistent terminology, units, citation/reference bias and imprecision, low quality illustrations and captions, plagiarism, and poor prose.

# Innovations

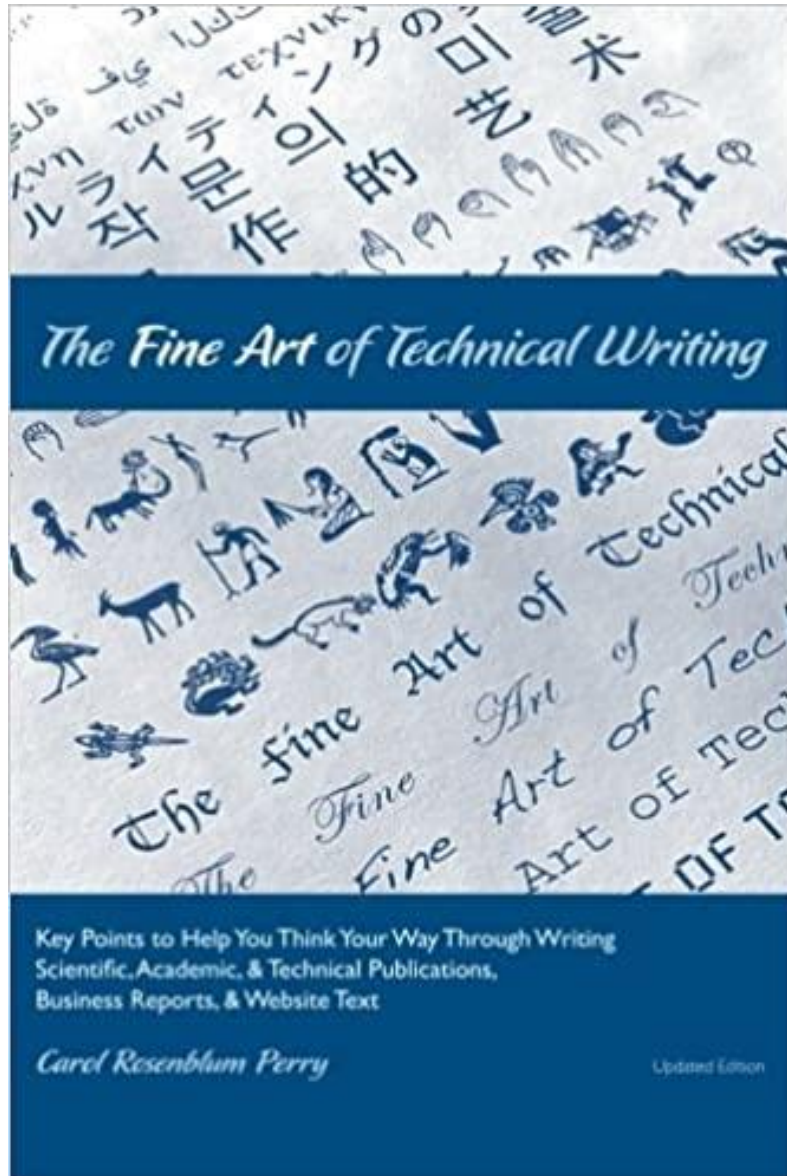
- A scientific publication should feature some **new discoveries**, not just technical reports and/or replications of previous work in new landscapes (or of new subjects).
- A **common problem** found in initial submissions is that the statistical analysis does not match the experimental design.
- **Descriptive manuscripts** are less favored by reviewers, editors, and journals

# Renewed challenges in digital era

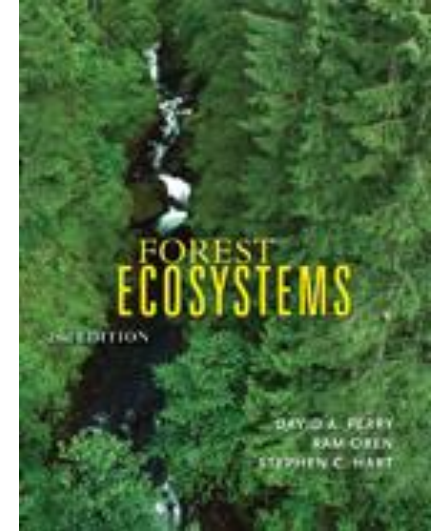
## Common Issues on submitted manuscripts

- 1) Descriptive
- 2) Based on correlation analysis
- 3) Violations of assumptions
- 4) Mismatches between the experimental design and the analysis
- 5) Inaccurate in concept, terminology, unit, etc.
- 6) Lack any conceptual foundations
- 7) others

# Textbook



The Fine Art of Technical Writing: Key Points to Help You Think Your Way Through Writing Scientific, Academic, and Technical Publications, Business Reports, and Website Text

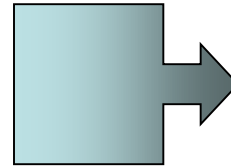


## About Carol

- BS in communication (English)
- MS in environmental science
- Editor for many well-known ecologists (Franklin, Waring, Harmon, etc.)
- Jiquan: 1990 – 2006?

# Structure

- Title, Author(s), Affiliations
  - Abstract
- Introduction
  - Methods
  - Results
  - Discussion
  - Conclusions
- Acknowledgements
  - References
- Appendix/supplements
- Links to online information



Results &  
Discussion



# How do you start, proceed, and complete?

- If you have a good story to tell;
- A paper is written for readers, not for yourself;
- Keep it simple stupid (KISS) model;
- Is there any new knowledge or study is unique?
- Who are your audience and what's the appropriate journal?
- Who are your coauthor(s)?

Be confident, persistent, and professional!

## Have a title, author list, affiliations, target journal, and possibly potential reviewers

- Who has contributed to the study?
- Who should be the corresponding author (again, be very professional)? Keep in mind that the first author will do most of the work!
- Develop a memorandum so that all involved parties agree!
- Ask your coauthors be critical and constructive (i.e., not only raise questions and make suggestions, but also provide solutions).
- Get a copy of the instructions for authors!
- Set up a timetable and deadlines!

## An example used in the LEES Lab

Hi all,

Attached is a draft abstract for a potential manuscript, entitled “xxx”. The objective of this study is to (concise sentence on study objectives). I am planning to make this my major effort for (timeframe); my hope is to submit it to (name of journal) by (date).

I would like to invite you to be a coauthor of this manuscript, given your expertise and knowledge. If you are willing and able to make a **significant intellectual contribution** to this manuscript, please send me an email stating that you would like to be included as coauthor by (date – give people at least 2 weeks to respond). If you are unable to make this deadline or would prefer not to be included as a co-author, please let me know. I look forward to hearing and collaborating with you through this manuscript.

Sincerely

name

## State the study objectives, necessary hypothesis, and justifications.

- A list of scientific questions would be of great help!
- This paragraph is usually the last one in the introduction section of a manuscript.
- Statement of attractive, testable **hypothesis** is a plausible way. Later you can echo your results and discussion.

## Develop illustrations (figures, tables, photos, etc.)

- Illustrations should be VERY high quality and follow journal requirements (e.g., units, spacing, lines, labeling). You want to impress the reviewers with quality artworks.
- Remember that **MORE** is not **BETTER**. I don't recommend to have more than 15 illustrations.
- All illustrations should be synthetic and easy-to-read.
- Eliminate any extra space, duplicated text.

# These are NOT acceptable!

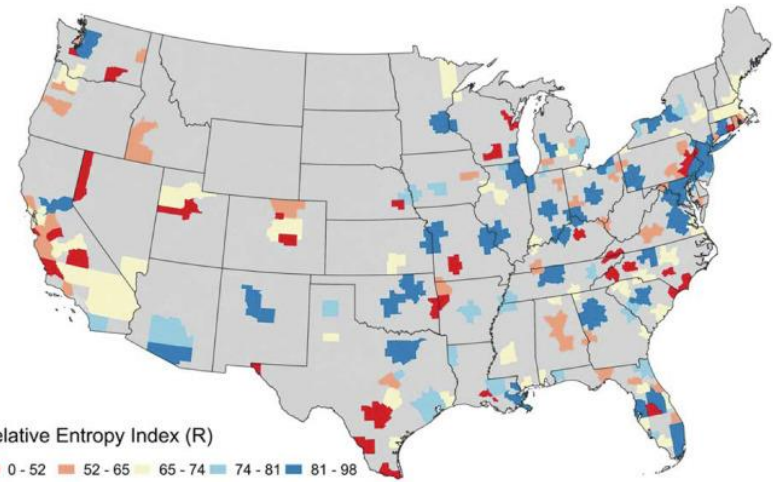
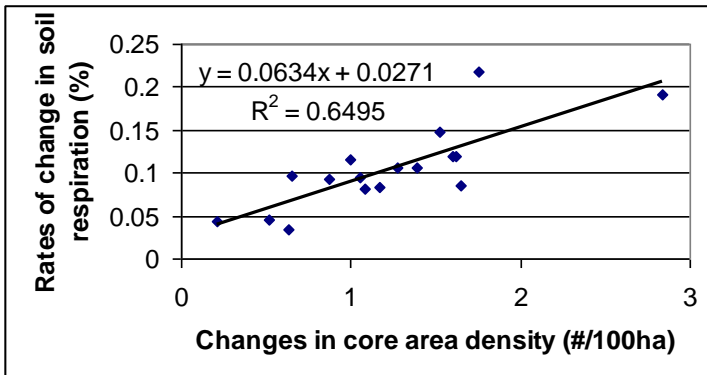
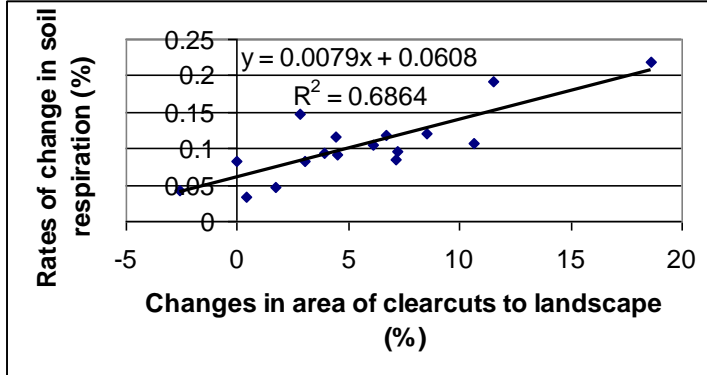
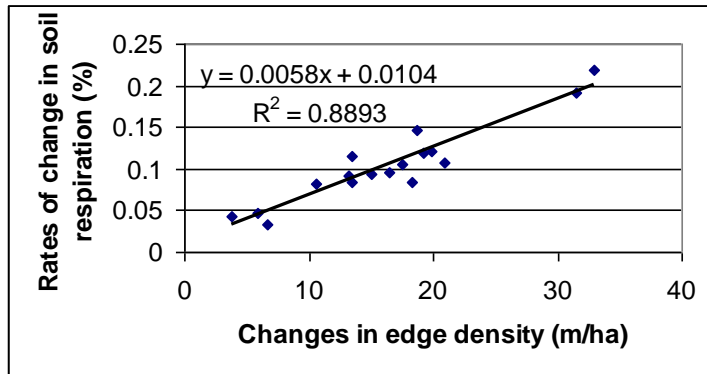


Fig. 3. Intra-metro diversity of clusters (relative entropy index scores per CBSA)

Scale?  
N arrow?  
Name of  
the map?  
etc.?

Applied Geography

<https://www.sciencedirect.com/science/article/pii/S0143622821001971#fig2>

## Develop illustrations (figures, tables, photos, etc.)

- Figures should be easy-to-read. For example, do not use too many lines in one figure.
- Do not use color unless it's necessary (cost, copy, etc.)
- Do not duplicate in tables and figures.
- Most importantly, a detailed, self explanatory caption is needed. Many readers are lay and do not have time to read your manuscript carefully. S/he should get the messages by reading your figures and captions. **This is the place that you should not worry about duplications.**

## Results: state your scientific discoveries objectively, i.e., no comments, citation, or speculations!

- Tape your illustrations on the wall (to see) and directly, objectively describe each figure/table.
- Do not cite any reference. If you have any text relating to other studies, move it to the discussion.
- Start a paragraph with a topic sentence (most important) – a comprehensive sentence summarizing the results of the entire paragraph. If a read can get the messages by ONLY reading the topic sentences of the manuscript, you succeed! (see example later followed by an exercise)
- Make sure your statements are backed by statistics (evidences)!



# Topic sentences

Case 1: Figure 2a shows the global spatial pattern for GRI.

Case 2:

## **RESULTS**

To answer these two questions, the 15-day maximum synthesis of Global Inventory Modeling and Mapping Studies normalized difference vegetation index production (GIMMS-NDVI) were used to reproduce growing process of the double season crops (Fig. S2),

Case 3:

Figure 2 presents the change in major transportation tools from 1978–2010.

**Note:** “Results” are yours, not other published materials

## Describe the methods, including study sites, data collection, statistical analysis.

- Your goal is to make sure readers have a complete understanding of the methods.
- Often, one needs go back and forth many times to refine your methods, especially the stats.
- Do not provide any details for widely used methods that one can find in major textbook (e.g., diversity index, linear regression, etc.).
- [Proper citations are needed following journal requirements.](#)

# Discussion

- This is the **most difficult section** to write.
- Think about
  - what you have discovered
  - why these discoveries are important
  - what are the major points you want to make
  - Are your results supported by the literature
  - What are the implications for science or management
  - What are the shortfalls or limitations
  - What additional (or future) efforts are needed
- References are heavily used in this section. Please make sure you do not copy published text (i.e., **plagiaries**).
- Pay attention to **TOPIC SENTENCES**

## Back to introduction

- Assume you have read a lot of relevant papers.
- Begin with the state-of-the-art of science on the topic.
- State what's missing in previous studies.
- What studies are needed on the topic.
- A reviewer will get his/her impression from this section. So make sure you can get reviewers' attention here.
- Again, a paper is written for others, not for yourself.

# Conclusions

- What are the take-home messages?
- What do scientific challenges remain?
- Do not exceed 3 paragraphs, 2 are enough!
- Do not repeat your results, but synthesis!
- Once completed, work on the abstract.

# Abstract

- 1-2 sentences on the knowledge gaps
- Brief description of the methods (often too long!)
- Highlighted major discoveries
- Pitfalls and/or importance/Implications
- Conclusions

# Complete references and conduct internal reviews

- Read the instructions very carefully
- Double check citations – references
- **Disconnect Endnotes!**
- Now you have completed your manuscript, it is very critical for your coauthors and colleagues to review it and provide CONSTRUCTIVE SUGGESTIONS. Ask a favor for an experienced scientist to HAMMER it. It's much better to receive a friendly review.

# Structure & Writing Sequence

- 1) Title, Author(s), Affiliations
- 2) Objectives (of the introduction)
- 3) Illustrations (tables/figures)
- 4) Results
- 5) Methods
- 6) Discussion
- 7) Introduction
- 8) Conclusions
- 9) Abstract
- 10) Acknowledgements
- 11) References
- 12) Appendix/supplements
- 13) Links to online information



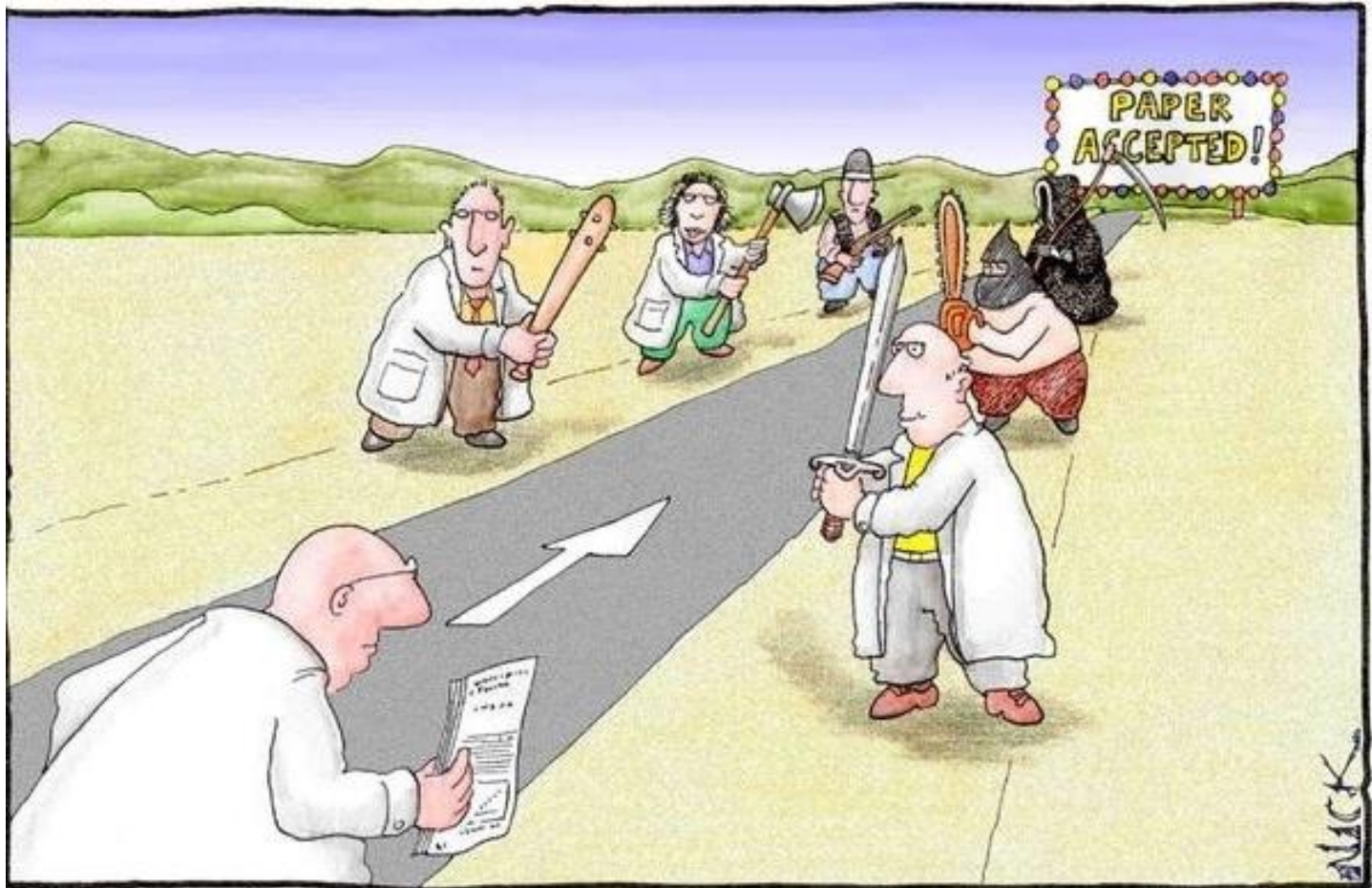
## More Tips:

- Watch for parallel structure
- Junior writers pay too much attention to their methods, however LOGIC and PHYLOSOPHY are much more important. THINK, THINK, and THINK!
- What are the take-home messages? Remember our goal?
- Use written languages! Always have someone else to read your manuscript, regardless of English as a second language.
- Take reviews, especially the negative reviews positively. NEVER TAKE IT PERSONALLY!
- Be confident. Good luck to all!

# Common Reasons for Rejection

- Poorly written/poor style
- Conclusions unjustified by data
- Flawed or poor design methods
- Faulty statistical analysis
- Hypothesis not adequately tested
- Back luck!

Jiquan's Advice: **Be Persistent, Positive, & Strong !**



Most scientists regarded the new streamlined peer-review process as 'quite an improvement.'

# Ethical Issues

- Data manipulation/falsification
- Plagiarism and self-plagiarism
- Conflicts of interest

# Before Writing the First Word

- Doing “Inner” Work
- Plagiarism is strictly prohibited!

Focus!

# Before Writing the First Word

- Think of the skeleton of writing as order
- Think of the body mass of writing as conciseness
- Think of the muscle tone of writing as vigor

# The Skeleton: Constructing a Stable Framework

## Consistency

1. Format

2. Terminology (e.g., NEP, NEE, productivity, production, flux,  $T_{CO_2}$ , etc.)

# Vigor: Empowering Your Words

## 1. SENTENCE TYPE

- Simple vs. complex sentences
- Diversity is the key
- No matter how stimulating your content may be, too many sentences of the same type, the same length, or some combination of the two make for deadly dull writing.



# Vigor: Empowering Your Words

## 2. VERB POWER

- Grammatically-correct vs emptiness
- Dynamics
- Cultural in different disciplines
- Popular words
- ?

# Vigor: Empowering Your Words

## 3. VOICE

- Text is livelier and more informative when written in the active voice (i.e., when the subject of the sentence is the doer of the action of the verb).
- When the sentence is written in the passive voice, the subject is instead the receiver of the action.

# Ending: After Writing the Last

## 2. Improving your prowess as a writer

However, nothing you can do will do more to improve your prowess as a technical writing than to **keep on writing!**