

Lecture 7

Choosing a Title and Writing the Abstract

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October 26, 2023

Importance of the title

Many people read the title. Fewer read the abstract. Even fewer read the entire manuscript. **Title often determines whether a paper gets read.**



Tip 2 - Title and abstract: sell your paper!

Importance of the title

Indexing services depend heavily on the title to retrieve articles. Thus, the title has substantial impact on whether the paper reaches its intended audience.

A good title should be:

- informative
- concise
- specific

What is in a title?

Title could describe the content or subject of the work.

Control of nitrogen export from watershed by headwater streams

Quantifying heterogeneity in a meta-analysis

Quantifying global soil carbon losses in response to warming

Title could describe the findings of the work.

Global convergence in temperature sensitivity of respiration at ecosystem level

Emergence of nutrient co-limitation through movement in stoichiometric meta-ecosystems

Temperature response of soil respiration largely unaltered with experimental warming

Temperature-associated increases in the global soil respiration record

Format of the title

Conventionally, the title of a paper is a label, not a complete sentence.

Declarative title is suitable for papers that address a specific question and present a non-complex answer.

- × Effects of added calcium on salinity tolerance of tomato
- ✓ Calcium addition improves salinity tolerance of tomato.

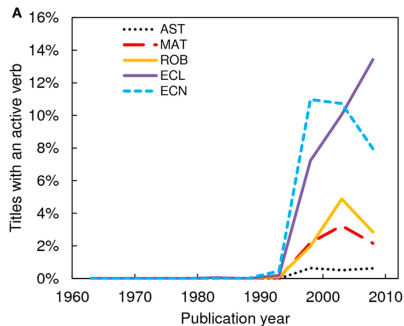
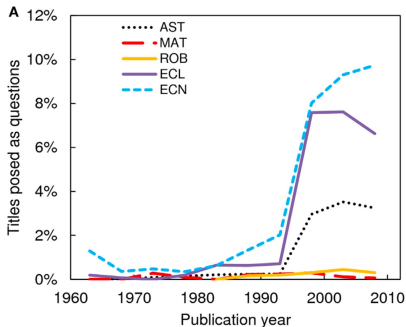
Title posed as a question can be effective when the question is complex or itself is intriguing.

What happens to allochthonous materials that falls into streams? A synthesis of new and published information from Coweeta

Is the river a chemostat? Scale versus land use controls on nitrate concentration-discharge dynamics in the upper Mississippi River Basin

Format of the title

Declarative title and **title posed as a question** become increasingly common over time.



(Milojević 2017, Frontiers in Research Metrics and Analytics)

Format of the title

Hanging title is often used to indicate the subject of the study or the type of study.

Terrestrial carbon inputs to inland waters: A current synthesis of estimates and uncertainty

Soil microbes and their response to experimental warming over time: A meta-analysis of field studies

It can also be used to connect distinct ideas or concepts in the title.

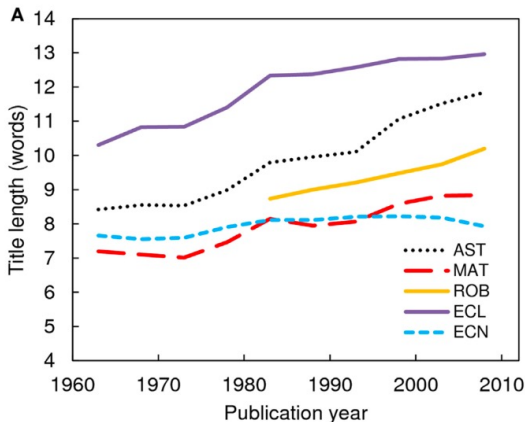
Transitions in the Arctic ecosystems: Ecological implications of a changing hydrological regime

Tracer Additions for Spiraling Curve Characterization (TASCC): Quantifying stream nutrient uptake kinetics from ambient to saturation

Catchment chemostasis revisited: Water quality responds differently to variations in weather and climate

Length of the title

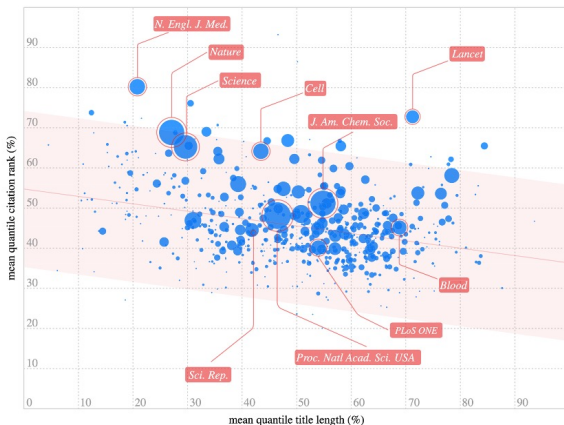
Authors should strive to write a title as **concise** as possible. **Avoid waste words** such as “studies on” “investigations on” or “observations on”.



(Milojević 2017, Frontiers in Research Metrics and Analytics)

Length of the title

Shorter titles appear to be associated with more citations when analyzed across journals.



(Letchford et al 2015, Royal Society Open Science)

Title should be specific

Title should give **concrete and specific** information about the paper. Avoid titles that are too general to be informative.

Example: Imagine an experiment on the effects of root exudates of 15 cruciferous plant species on food consumption by one species of caterpillar, *Helicoverpa armigera*, an important pest globally. Which of the following titles is the most appropriate?

The effects of chemicals of plant origin on caterpillars

The effects of 15 plant species on the larvae of *Helicoverpa armigera*

The effect of root exudates of 15 cruciferous plant species on the growth of *Helicoverpa armigera* larvae

Inhibition of growth in *Helicoverpa armigera* larvae by root exudates of 15 cruciferous plant species

Abbreviation and jargon

Titles should almost never contain abbreviations, chemical formulas, proprietary names, jargon, and the like.

An exception to this rule is the widely known and used abbreviations, such as DNA, RNA, or PCR. But one should be careful in what is considered as widely known.

Importance of syntax

A very common grammatical error in titles is **faulty word order**.

Example: While the meaning can be obvious, the word order in the following example may cause unintended misunderstanding.

Mechanism of suppression of nontransmissible pneumonia in mice induced by Newcastle Disease virus

Multiple infections among newborns resulting from implantation with *Staphylococcus aureus* 502A

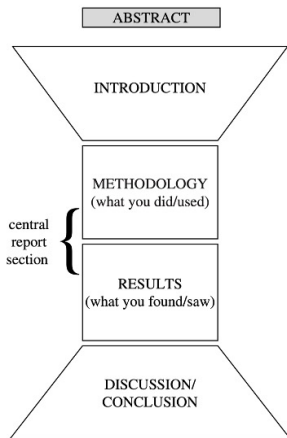
Changing the word order can fix the issue:

Mechanism of suppression of nontransmissible pneumonia induced in mice by Newcastle Disease virus

Multiple infections resulting from implantation with *Staphylococcus aureus* 502A among newborns

What is the abstract for?

An abstract is a miniature version of the paper and provides a **brief summary** of each main section of the paper. The abstract usually determines whether a manuscript gets sent out for review.



Elements of the abstract

Abstract should be **concise**. Most journals have strict word limit on abstract.

The abstract should provide a brief summary of each main section of the paper: introduction, methods, results, and discussions/conclusions.

The abstract typically should:

- state the principal objectives and scope of the study;
- describe methods employed;
- summarize major findings;
- state the principal conclusions.

A model for the abstract

The abstract is usually structured similarly to a paper because it is a miniature version of the paper.

Length	Content
1–2 sentences	Provide the general background
2–3 sentences	More specific background and research question
1–2 sentences	Summary of work being done
2–3 sentences	Summary of major results of the paper
1–2 sentences	State the significance/implications of the paper

An example abstract

This abstract is clearly structured. It contains general background (sentence 1), specific research question (sentence 2), summary of work done (sentence 3), major findings (sentence 4–5) and its implications (sentence 6).

The respiratory release of carbon dioxide (CO_2) from the land surface is a major flux in the global carbon cycle, antipodal to photosynthetic CO_2 uptake. Understanding the sensitivity of respiratory process to temperature is central for quantifying the climate–carbon cycle feedback. We approximated the sensitivity of terrestrial ecosystem respiration to air temperature (Q_{10}) across 60 FLUXNET sites with the use of a methodology that circumvents confounding effects. Contrary to previous findings, our results suggest that Q_{10} is independent of mean annual temperature, does not differ among biomes, and is confined to values around 1.4 ± 0.1 . The strong relation between photosynthesis and respiration, by contrast, is highly variable among sites. The results may partly explain a less pronounced climate–carbon cycle feedback than suggested by current carbon cycle climate models

(Mahecha et al 2010, Science)

Writing style: general guidelines

Because an abstract is often reproduced separately from the full paper, it has to be self-explanatory. A few general rules for writing the abstract:

- Abbreviations or special terminology only explained in the paper should be avoided;
- No references to tables or figures in the abstract;
- No citations in the abstract in general.

Writing style: format

Most abstract is written as a single paragraph, but there are variations in the form of the abstract:

- Structured abstract consisting of bullet point summary or sections such as: background, methods, results, conclusions;
- Graphic abstract, i.e., a figure that summarize the main study question and/or findings.

Abstract

Purpose Grasslands are facing the threat of climate change and intensive land use. Soil respiration (R_s) in grassland ecosystems can be potentially altered by changes in precipitation and land use. We aimed to quantify the impact of changes in precipitation and common land use practices in an Inner Mongolia grassland, i.e., mowing and grazing, on soil respiration.

Methods We performed an *in situ* experiment with altered precipitation (+50%, ambient, and -50%) and land use (control or fencing, mowing, and grazing) to explore their impacts on soil respiration and its autotrophic (R_a) and heterotrophic (R_h) components.

Results Altered precipitation had stronger impacts on abiotic and biotic drivers than land use, leading to stronger impacts on R_s and its components. Over

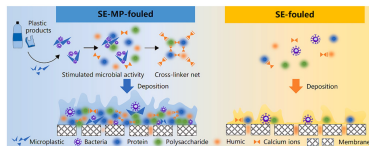
the 3-year experiment, R_s , R_a , and R_h decreased by 36%, 42% and 33% with reduced precipitation and increased by 29%, 36% and 25% with increased precipitation, respectively. Grazing and mowing caused relatively small decreases in R_s compared to fencing (generally <10%). However, precipitation and land use interactively impacted abiotic and biotic drivers and thus R_s . The decrease in R_s with reduced precipitation was greater with grazing (38%) and mowing (37%) than with fencing (32%).

Conclusions R_s and its components may decrease under the projected decrease in precipitation and may further decrease with grazing and mowing compared to fencing. Therefore, land use should be considered when predicting grassland carbon cycling in response to future precipitation changes.

Keywords Climatic change · Climate-carbon model · Heterotrophic respiration · Autotrophic respiration · Inner Mongolian grassland

Responsible Editor: Feike A. Dijkstra.

GRAPHICAL ABSTRACT



Structured abstract in the journal *Plant and Soil* (left) and graphic abstract in the journal *Science of the Total Environment* (right)

Writing style: format

Journals usually list their specific guidelines for abstract. The authors should consult the guidelines from their target journal when writing the abstract.

For example, Journal of Ecology has the following guidelines for the abstract:

Abstract: no more than 350 words and listing the main results and conclusions, using simple, factual, **numbered statements**. The final point should be headed 'Synthesis', and should sum up the paper's key message in generic terms that can be understood by non-specialists, indicating clearly how this study has advanced ecological understanding. (Translated abstracts in any language can be published alongside our articles)

Writing style: tense

As the abstract is basically a condensed paper, authors should use different tenses for different part of the abstract.

Use **present tense** when

- stating the general research problem;
- stating the scope or purpose of the study;
- stating the significance of the study.

Use **past tense** when

- describing the methodology of the study;
- stating the results of the study

Keywords

Keywords serve to assist those who use various databases and search engines to find your paper;

An effective keyword is a word with a specific meaning or significance; words such as study, change, or experiment are not effective words in this context;

In keywords, do not include words that are already contained in the title.