American Fisheries Society
Student Subsection of the Education Section

How To Publish in Graduate School

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Overview

Publications are the currency of the sciences and one of the best ways to increase your marketability for jobs and graduate assistantships. Previous research has shown that the best predictor of career success in biological sciences is the number of publications a person produces before they finish graduate school (see Bioscience article). Thus, publishing while you're a student may be one of the best investments of your time and energy to better your career. Publishing is also the best way to contribute to the advancement of your field. Getting your research published is challenging and takes more than just novel research and a great idea. From writing to submitting your manuscript, the publishing process can seem somewhat daunting at first, especially when considering other student academic obligations such as teaching and assistantship assignments, studying for comprehensive exams, writing proposals, and other university requirements. In this document, we provide a quick primer to publishing in graduate school that will smooth the process for young students. We include strategies, insights, and example documents for the steps leading to an accepted publication. This primer covers, not information related to not only writing manuscript sections, but also how to select journals, write cover letters, and respond to reviewers.

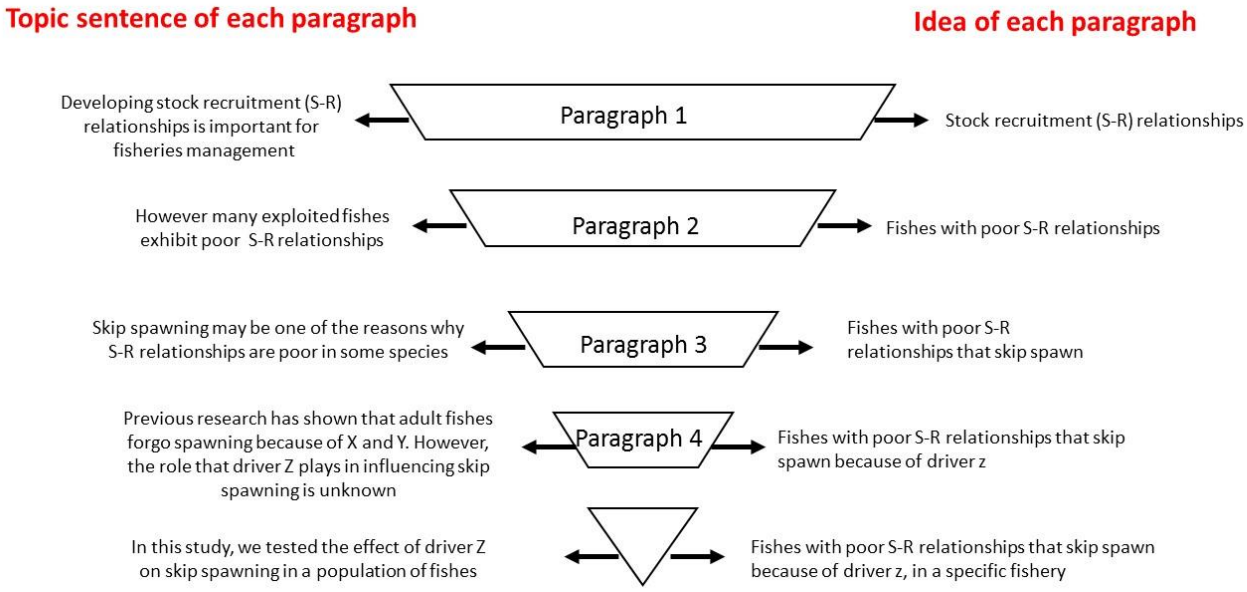
How to craft a good introduction

Introductions are usually no longer than two and half to three pages, and four to six paragraphs. Developing a good introduction is one of the most challenging and most important part of writing a manuscript. The main difficulty to writing a good introduction, especially for first time publishers, is finding that "hook" or a novel angle that makes your manuscript unique. Manuscript hooks could highlight how your results either 1) review and test new insights for widely-used concepts, 2) use novel methods or statistical approaches to identifying a pattern and process, 3) describe new information in a field, or 4) forecast risks under future scenarios.

Finding that novel angle often emerges from a deep understanding of the literature surrounding your body of research, which takes time and energy. However, a good starting place is to read a recent review in your field and think of how your results fit into that paper.

Once you have a good angle you need to structure your introduction. Generally, introductions start with broad concepts, and end with your specific research question. If you think of your introduction as a diagram, it should look like an inverted pyramid or funnel.

For instance, suppose you find an interesting new environmental driver that influences whether an adult fish spawns or forgoes spawning that year (i.e. skip spawns). Your introduction might follow a framework that looks something like this.



The first paragraph in this example highlights the core area of this work, stock recruitment relationships. The second paragraph is a bit narrower, fishes that exhibit poor stock recruitment relationships, the third even narrower, fishes that exhibit poor stock recruitment relationships that skip spawn. Fourth, even more directed, fishes that exhibit poor stock recruitment relationships that skip spawn because of the environmental driver. And last, the specifics of your study. This framework is very effective is used by most publications.

Writing Methods and Results

These sections are where you will describe the details of your study. Unlike other sections of a publication, methods and results are generally broken down into subsections to help guide the reader to specific parts of your study. Once again, you'll need to check the journal's guidelines for how to format subsections, the number of significant digits to report, and how to reference figures and tables in the text. However, a couple general guidelines apply to all journals. Methods should be written in past tense and follow a logical order, but should not be a step-by-step directive. As such, avoid using ordinal numbers and words such as "next" and

"then" when describing your study. Use first person, and don't feel obligated to use active voice. Also don't forget to include the details of any statistical analyses you used. A good general guideline is that your methods section should provide enough detail for a reader to replicate your study, but remember that not every single detail is germane to the study. For results, report descriptive statistics and the output of statistical analyses along with appropriate supporting information (p-values X^2 statistics, degrees of freedom, *etc*.). Use figures and tables to support the text as necessary.

Write a Discussion

Discussions are often the hardest sections to write, but can also be the most exciting. Adopt a reverse funnel approach. Where in the introduction you started broad and narrowed down, in the discussion you'll want to start by briefly summarizing your results in a few sentences and then continue broadening the scope of information. The discussion should reference existing literature that is relevant to your study. At a basic level, this will include a comparison of your study to similar publications. However, the best discussions pull together literature from diverse backgrounds to support novel insights about the significance of your study and inform future research directions. The content of the discussion should be decided in part by the scope of the journal to which you are submitting. Look at the journal's website to determine their focus and how to strike the right balance between empirical and theoretical. Above all, write concisely, and edit carefully to ensure every sentence contributes to your manuscript.

Choosing a Journal

There are several ways of strategizing journal selection. Overall, when selecting a journal, it is most important to pick a venue that reaches your manuscript's intended audience, rather than other factors such as deciding on a journal because of impact factor (i.e. journal ranking) or 'most likely to accept'. Ensuring that your work reaches the right professionals will increase the likelihood of your manuscript being read and cited, which is more important than journal prestige in the long run. One way to select a journal is to choose one that is most often cited from your manuscript's citation list. Another way to choose a journal is based off the purpose of your paper. For example, a manuscript submitted to *Ecology* needs a much more generalizable and theoretical backbone, whereas an article submitted to *North American Journal of Fisheries Management* maybe more methods oriented.

Publishing a manuscript costs money, which can range from 300 -1,000 $ U.S. per page, depending on the journal. Most often, open access journals are most expensive and society based journals are generally cheaper (if you are a member). Paying for publications is very difficult for students, especially if the publication is a side project or a completely student driven effort. Thus, publication costs may somewhat limit your submission options. If finances are tight, contact your target journals and see if they provide student publishing discounts. AFS journals publish student articles for free, and other journals provide considerable discounts as well.

Formatting your Manuscript, Cover letters & Reviewer Selection =

Once you have a journal in mind, it is time to format. Most Journals have unique formatting instructions for authors. This includes formatting citations, getting figures into the appropriate electronic format (e.g., .jpeg, .pdf, .tiff), and the right tone for the journal's typical audience. Most journals ask for high resolution figures (greater than 700 DPI) which power point does not do automatically. But, here is a link that tells you how to trick power point into making high resolution figures. Journal guidelines for page- and word-length of the manuscript can range widely across journals.

Before submitting the manuscript, you will need to write a cover letter intended to describe the manuscripts suitability and highpoints to the journal's editors. Here is an example of a cover letter may serve as a good guide. Cover letters should be used as your one real chance to speak directly to the journal about why this article should be considered for publication in their journal. We like to include a bulleted list of the reasons why your paper is a good fit for this journal, such that your reasoning is direct and clear.

In your cover letter, you should include the names and contact information of potential reviewers of expertise. Reviewers of interest may be those who wrote a recent review on your body of research, someone you saw give a talk on similar work to your at a conference, or someone you know that has a general expertise in that field. Choose these reviewers carefully. If you choose a rather famous scientist, chances are the review will come back to the journal late, and will be short, which could be good or bad. On the other hand, if you choose a student or a young professional as a reviewer, in my opinion they tend to be overly critical, with very long reviews. So a small background check on who you choose may be wise.

Once you submit, expect to wait 30–120 days for a response back on your manuscript. This time includes the initial screening of the manuscript by the associate editors, finding 2-3 peer-reviewers, giving 30-45 days for peer-review, and then a final screening by the associate editors and editor-in-chief. A fairly new method for making this process more efficient is using review services like Axios Review ($200 per accepted manuscript; axiosreview.org) which help both with initial peer-review feedback and determining the most appropriate journals that would accept the manuscript.

Responding to Peer Reviews

Following your submission and before the manuscript is fully accepted, you will have to address peer reviewer comments and criticism. These comments will vary from very difficult to fairly easy and includes: re-doing statistical analyses adding in unpublished data/results, revising the manuscripts paragraphs/sentences/text. Often, you will receive feedback from three to five reviewers, depending on the journal, that you will need to formally address in a separate document that includes a cover letter. You usually have 30–60 days to respond to peer-review. Once you are finished with this document it will be sent to the handling editor and he or she will make a decision to accept, reject, or send the revised manuscript back to the reviewers (see this example document at this link that you may use as a template). Sometimes reviewers are in

general agreement about the status of your manuscript, and other times you will get very different feedback from all reviews.

Before, you begin to write your reply, keep in mind that these reviewer comments (for the most part) are meant be constructive, not a personal attack on your research. Though some may be hard to stomach, try to think of ways to incorporate their feedback, because it almost always improves your work. The general rule is to make sure you agree and correct at least 90% of what the reviewers suggest. Doing less than this may lead the editor to think that you are being lazy or strong headed.

If you do not agree with the comment, you must justify why you do not agree. Usually justifications should less than 3 paragraphs and includes citations. In my experience, it is best to be as positive as possible with your justification to why you disagree. Such that you start the sentence out with

"We have considered the reviewers point however we disagree with their suggestion because of x, y, and z."

If reviewer asks you to remake a figure that you do not agree with, make their suggested figure and include it in your replies. Also, try not to use the same justification to disagree with multiple suggested corrections. Simply copying and pasting the same text to another comment is annoying for reviewers, as nobody likes to waste time reading the same thing over and over again.