TEMPLATE[1] for creating an **Authorship Policy** for a team or collaborative project

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Authorship policy for: *Insert project name, team-name, or group of individuals who the policy will apply to. Insert names of all individuals who have contributed to drafting the policy.*

Update Date: *Insert date of most recent update to the policy*

Goals for the policy: *Describe the goals of the policy document. These could include a statement about providing general guidelines for a team or lab regarding authorship, providing a more specific authorship policy related to a particular team or lab product (e.g., manuscript, proposal), etc.*

Guiding principles of authorship:

This section should describe the principles or values that the group is trying uphold with the policy. There are many competing values that play into authorship and many factors to consider. Some examples might include: ensuring that only authors who have made significant intellectual contributions are included as authors (and what 'significant' might entail), open and transparent communication, professional development of early career team members, considering issues of power and status, and others.

General strategy for assigning authorship in multi-authors publications[2]:

Describe the general steps (numbered) that individuals on the project or in the group should take to initiate a manuscript; expectations regarding communication with the project or team (how, when); expectations about working together, expectations about approval of final manuscript; how authorship order will be assigned; conflict resolution steps; etc.

Steps to drafting an author contribution paragraph:

It is strongly recommended that an author-contribution paragraph is drafted for all manuscripts early in the writing process, that it is

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[1] This document is based on the authorship policy developed from the project ***MSB: A macrosystems ecology framework for continental-scale prediction and understanding of lakes***, 2016-2021. PI's: *P.A. Soranno, K.S. Cheruvelil, C. Gries, E.M. Hanks, N.R. Lottig, E.M. Schliep, E.H. Stanley, P.-N. Tan, T.Wagner, J. Zhou.* https://lagoslakes.files.wordpress.com/2019/01/Cont-Limno-Policy-Authorship_DEC18.pdf

[2] This document is written with manuscripts or journal articles in mind. However, it may be helpful to use it for other scholarly efforts such as grant proposals.

1

revised throughout the writing process, and that it is published as part of the manuscript.

Description of the type of manuscripts that the group/project is expected to produce and whether there are any special circumstances related to article type:

It is helpful to discuss the variety of article types that are likely in advance and how authorship practices may differ depending on the article type (and discipline). Examples include: disciplinary research articles (for each discipline in the group); commentary/essay articles; review papers; data papers; papers in which graduate students are the lead author and which the paper is part of their thesis/dissertation; etc...

Strategy for file-sharing, data-sharing, and code-sharing during and after the manuscript:

It is advisable to talk about how the coauthors will share files, data, and code during the writing process and at publication stage before the writing begins. This discussion might include where the files will be stored, how they will be named, versioning systems, final repository location, etc...

Table that provides a list of possible author contributions for any manuscript:

It is recommended that you create a comprehensive list of the many ways that individuals can contribute to a manuscript. It is recommended that you include all possible contributions for as many different types of articles as you expect on your team. Contributions that you may want to consider include: (a) conception of idea; (b) outlining the manuscript; (c) data creation; compiling data; (d) writing code; (e) performing analyses; developing novel method; (f) critical results interpretation; (g) drafting figures and tables; (h) mentoring of a student; (i) procuring funds; etc. You may want to consult this website for further ideas: https://casrai.org/credit/ or look at an existing authorship policy.

A statement that describes the degree of contributions from the above table that warrant authorship:

Although it is not always possible to decide who should be an author in advance, it should be decided whether a certain number of contributions or a level of importance of contributions are needed to warrant coauthorship.

For further information, please also see "**Strategies for effective collaborative manuscript development in interdisciplinary science teams**" by Oliver et al. in Ecosphere (2018) *https://doi.org/10.1002/ecs2.2206*

*Continental-Limnology Team -- **Authorship Policy***

MSB: A macrosystems ecology framework for continental-scale prediction and understanding of lakes, 2016-2021
PI's: *P.A. Soranno, K.S. Cheruvelil, C. Gries, E.M. Hanks, N.R. Lottig, E.M. Schliep, E.H. Stanley, P.-N. Tan, T. Wagner, J. Zhou.* EF-1638679; EF-1638554; EF-1638539; EF-1638550

Manuscript title:	Insert title
Co-author list:	Insert names
Author lead/co-leads:	Insert names
Target journal(s) (tentative):	Insert journal names

Manuscript type: Select from these options, or add other: *(A) Disciplinary research article, (B) Multidisciplinary article, (C) Essay or commentary, (D) Data/Database paper, (E) Graduate-student led article, (F) Other (please specify)*

MS management strategy: To the degree that you know, select from these options or add other: *(A) Lone Wolf; (B) Dynamic Duo; (C) Board of Directors; (D) Round Table; (E) Organized Chaos; (F) Other (please specify) *As described in Oliver et al. in review, Ecosphere*

This document is intended to foster an open dialog on authorship that starts at the very beginning phase of a manuscript and carries through until manuscript submission and acceptance. We ask that all co-authors describe their contributions in the table below as a way to clearly define each co-author's responsibilities and accomplishments throughout the effort. We ask that in the early phases, you consider what components of the research effort you would like to contribute to; then, in the middle of the effort, to revisit your contributions; and finally, at the time of manuscript submission, we ask all co-authors to assess the contributions that they did. Using this information, the author-contribution statement will be written and reviewed by all authors.

Instructions: Please add your initials in the cell next to the contribution. Please also add a short-description of the activity. As a starting point, we recommend that co-authors participate in at least a single activity in 2 of the 4 major categories in the following table AND participate in a total of 3 activities combined; although, we expect there to be exceptions as well, some of which are identified below.

Activities	Author contributions
Category 1: CONCEPT AND DESIGN	
a) **Conceived of the MS idea/concept**– individually or collectively, helped to frame the overall idea for the MS, research questions, or scope; drafted conceptual figures or tables	
b) **Designed/outlined the MS** – individually or collectively helped to determine structure and content of the MS	
c) **Supervised co-authors and MS progress** – oversaw the MS progress	
d) **Other -**	
Category 2: DATA/ANALYSIS/MODELING *Note that papers led by graduate students may have fewer contributions from co-authors in this category because the students should have primary responsibility for these activities*	
e) **Compiled or synthesized data**	
f) **Wrote code (or performed analysis) for an analysis or model for widely-used and cited methods** – provided code for an analysis for a fairly standard model, requiring a relatively small amount of time & intellectual investment	
g) **Developed code (or performed analysis) for a NOVEL analysis or model** – developed code and novel method/analysis, requiring a large amount of time & intellectual investment. *For ecology paper, this contribution by a computer	

science/stats scholar is typically sufficient to be a co-author, regardless of other contributions (although we expect frequent participation in MS development)	
h) **Provided critical ecological interpretations related to either of the above analytical methods** *For computer science/statistics paper, this contribution by an ecology scholar is typically sufficient to be a co-author, regardless of other contributions (although we expect frequent participation in MS development)*	
i) **Interpreted results** – individually or collectively helped to interpret meaning of results	
j) **Drafted figures or tables**	
k) **Other -**	
Category 3: WRITING	
l) **Wrote sections of text** - even if eventually these sections were not included in final version	
m) **Other:**	
Category 4: Supervising and mentoring	
o) **Student or post-doc mentoring** - Served as advisor/supervisor to the lead author of the manuscript throughout their career on the project and through the development of the manuscript effort. *Generally assumed to be a co-author, although we expect frequent participation in MS development and other contributions above.*	
Category 5: Other	
p) Other contributions not listed above (e.g., person has a light-bulb moment that completely changes scope/slant of project), please specify	

All authors are expected to perform a critical review of the manuscript at least once for intellectual context (i.e., not just spelling/grammatical edits, and not only comments that suggest revisions, but rather making the actual revisions).

Overview of Strategies and Guiding Principles for Authorship on Manuscripts[1]

This document is meant to provide guiding principles and a strategy for ensuring transparent and fair authorship assignment for manuscripts that originate from team-based, data-intensive research projects. Our goal is to recognize many varied contributions to a manuscript, while also ensuring that all co-authors are contributing sufficiently to warrant co-authorship—**which we define as contributions that substantially enhance the direction or quality of the manuscript or analysis.** Although not all manuscripts may fit these guidelines exactly, this document should be used to start the conversation about authorship. Included in this document is a memo that a lead author on a research effort (i.e. a proposed manuscript) should send to ALL project team members during the early phase of the effort. Early notification of a research effort to the entire team ensures that everyone knows what research is being conducted and by whom, and that all interested contributors are identified early in the research process. Once co-authors are identified, and research continues, the memo is re-sent to only those participants who have signed on as co-authors. Then, when research is in the final stages (i.e. the manuscript is close to submission), the memo is re-sent to co-authors for updating as part of the process of writing an author contribution paragraph. This iterative process facilitates open conversations about author responsibilities and potential author-order of the manuscript. This document and the strategy described can be especially important when the project in question includes personnel from multiple institution types and different universities, disciplines, and career stages. Please see *Cheruvelil et al. 2014* for more information on this, as well as other team policies. This policy document was first drafted by participants of the CSI-Limnology Project (www.csilimnology.org) during 2011 and has been subsequently revised to reflect the needs and perspectives of the team. This policy should be viewed as a living document that changes over time to reflect changing team membership, project goals, and effective strategies for managing co-authorship.

Guiding principles of authorship for manuscripts originating from this project
- All members of a research team should have the option to participate in most efforts.
- Agreeing to serve as co-author means that you have agreed to actively participate in the effort, and that you have the time available to ensure forward progression of the effort (i.e., you will not slow the research effort down). At any stage, if a co-author is not able to contribute to the effort in a timely manner, then it is recommended that they step down from the research effort/manuscript.
- All co-authors agree to the terms in this authorship agreement.
- Lead- or co-lead-authors should be proactive in notifying the entire team about potential manuscript ideas early in the process, and communicating with the team when they are ready to engage with potential co-authors. Lead authors also have a responsibility for setting a reasonable timeline for manuscript development, writing and submission that should be communicated with co-authors and updated as needed. If manuscripts do not seem to be making progress, then, a discussion needs to occur among co-authors about strategies to move forward that may include alternate manuscript management strategies or leaders.
- Lead- or co-lead-authors are responsible for communicating authorship guidelines to their co-authors early in the process, and throughout the process.
- Lead authors or co-lead-authors are expected to actively communicate with co-authors throughout the process so that co-authors can contribute and know where the effort stands (see additional 'best practices for lead authors' document… *to be drafted soon).*
- We do not believe in the practice of honorary authorship (i.e., gift authorship, ghost authorship, or authorship in the name of inclusion; where people are added as an author just because they are part of the project, or the lead-PI or co-PIs, to avoid team conflict, in the name of generosity, or other such reasons without significantly contributing to and participating in the effort). This practice devalues the contributions of co-authors in general and it goes against the principles and strategies outlined in this document.

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[1] This policy is based on the policy created by: NSF project (2011-2016): *The effect of cross-scale interactions on freshwater ecosystem state across space and time.* PI's: *P.A. Soranno, K.S. Cheruvelil, E.H. Stanley, J.A. Downing, N.R. Lottig, P-N. Tan NSF, Emerging Frontiers Division, Macrosystems Biology Program.* Awards: 1065786, 1065818, 1065649

- In general, data providers are not assumed to be co-authors. Providing data is not considered a contribution in-and-of-itself that is large enough to constitute co-authorship. However, during the data-sharing process, if any data-provider has expressed an interest in collaborating on specific projects, it is the team's responsibility to contact that person and explore collaboration and co-authorship. Such a person would be included as a co-author if they agree to participate following the guidelines outlined here. Note that if a team member proposes a manuscript that contains only a few lakes or a single dataset, then it is his/her responsibility to contact the data providers prior to doing so to ask permission as a courtesy.

General strategy for assigning authorship in multi-authored publications

1. **Types of contributions of co-authors.** We provide a list of common author contributions, in four main categories (see previous pages). This list is not intended to be exhaustive, and additional contributions can be added to each section.

2. **Total number of contributions that constitute co-authorship.** Although it is extremely difficult to put a number on the total contributions made by an author, we propose the following guidelines as a starting point. It is recommended that co-authors participate in at least a single activity in 2 of the 4 major categories in the following table AND participate in a total of 3 activities combined. Note that some contributions that are often relegated to the acknowledgments section are included in the table-- participants who contribute in only one or two of these activities would be placed in the acknowledgments because they have not participated in the minimum number of activities required for co-authorship.

   Additional consideration – ARTICLE TYPE: We recognize that not all manuscripts will neatly fit within this guideline and that some of these recommendations may need to be relaxed or expanded depending on the article type. Below are strategies to implement this general policy based on article type. The above table serves as a starting point for discussions.

   a. *Computer science/statistical manuscripts in which non-ecologists take the lead on manuscripts.* It will be important that the domain experts (limnologists/ecologists) be listed as co-authors even if they do not meet the above minimum requirements because they serve an important role in project conception and model interpretation.

   b. *Ecological manuscripts in which computer scientists or statisticians provide relatively novel or new analytical techniques* in the form of model structure or code to implement such models. These individuals (computer scientists/statisticians) should be listed as co-authors even if they do not meet the above minimum requirements because the use of such novel methods could not have happened otherwise.

   c. *Manuscripts that are position-pieces or commentaries*, and thus do not include analyses or rely on data and therefore do not have as many categories or activities.

   d. *Data papers* in which data providers are expected to be co-authors regardless of other contributions. These papers are unique in this regard and are designed specifically to ensure that data providers receive credit for this important part of science.

   e. *Manuscripts in which the lead author is a graduate student* (who is supervised by individuals on our team) should take more ownership over the manuscript, may not include as many authors as other team papers, or may have authors provide fewer contributions (e.g., students often do their own data analysis for their dissertation chapters). However, we advocate for a model where students lead highly collaborative manuscripts where they can benefit from the professional development gained through interpersonal skill development (e.g., facilitation).

2. **Mid-project addition of co-authors.** In some cases, co-authors may join the effort later than others, particularly if expertise is needed. In these cases, the new co-author is still held to the standards laid out in this document.

3. **All co-authors must approve the final version of the manuscript prior to submission.** In fact, it would be unethical to submit a manuscript in which all co-authors did not read and approve the final submitted version. This task is not included in the contributions table because all co-authors must do it.

4. **Co-authors are held accountable for the content and conclusions of the manuscript**. This idea provides an important distinction between a co-author and someone who is acknowledged. We recognize

that every co-author will not have a full working knowledge of all aspects of the research or the quantitative analysis (especially in the interdisciplinary cases described above in 2a-b); however, they need to know enough to defend the work.

5. **An author-contribution paragraph must be written for each manuscript, and submitted to the journal with the manuscript.** This step is important to ensure that all co-authors (particularly early-career individuals) get recognition for the contributions that they make to the project's highly collaborative efforts. If journals do not have the normal practice of publishing such paragraphs, we will make the paragraph available as an online supplement/appendix to the paper. We recommend that authors include the contributions that are described in the authorship table.

6. **Authorship order.** The norm in our team and in ecology in general is for the lead (or co-lead) author(s) to be listed first, and the co-authors listed thereafter. The co-authors can be listed in order of contribution or in alphabetical order. Deciding between these two options relies on a discussion that the lead- or co-lead authors should initiate. They should propose a recommendation for each manuscript that is then discussed with all co-authors. Authors may want to use alphabetical order if the contributions of co-authors were about equal; whereas, they may want to use an ordering based on contributions if there seems to be a clear and obvious ordering according to contribution level. The description of the ordering style should be noted in the author-contribution statement. An alternative model is to group coauthors in tiers, where groups of coauthors can be grouped together and their contributions described collectively (e.g, authors 2-6 contributed to data analysis and provided feedback).

7. **Conflict resolution.** If team-members do not perform the basic duties of a co-author described above, and agreed upon, then it is recommended that they step down from the research effort/manuscript at any stage. If a lead-author feels that a co-author (or vice versa) is being unresponsive, but is not stepping down, then an ad-hoc group of 3 team members will be convened to evaluate the issue (including at least one early-career individual, if possible).

Authorship management strategies and communication

1. In using this document for numerous publications of the last six years, we found that there are components of collaborative manuscript development that are not covered in a typical authorship policy document such as this. We worked collaboratively on a manuscript that describes our experiences and strategies for collaborative manuscript development that is intended to help to implement authorship policies such as this one. We recommend that authors read and discuss this manuscript when using these author guidelines:

> *Oliver*, S.K. C.E. Fergus*, N.K. Skaff*, T. Wagner, P.-N. Tan, K.S. Cheruvelil, P.A. Soranno. 2018. Strategies for effective collaborative manuscript development in interdisciplinary science. Ecosphere 9(4): e02206.* https://doi.org/10.1002/ecs2.2206 * co-lead authors

2. The **lead-authorship management strategy** (see above manuscript for full description) is one area in which we found it helpful to identify early in the manuscript writing stage so that co-authors are aware of the leadership style of the lead author(s). For example, manuscripts can be led by an individual, a pair, a small group, all authors equally, or compartmentalization of leadership. The identification of the leadership of the manuscript effort helps to better articulate expectations for co-authors and expectations of lead authors. See Oliver et al. for further details.

3. We recommend a google-folder be maintained that holds most documents for this MS (except data and code); included in this folder is a Manuscript-Logbook that is a word document that documents the MAJOR decisions for the manuscript that have been made from every zoom call or interaction in the group (so, the detailed minutes from a zoom call are not included in this document, only the final decisions and major tasks/activities). So, during every discussion of the paper with more than a couple people, this file should be open and documentation should be made to keep the whole team informed of progress. This is one area that we have suffered from in past projects and this may be a way for everyone to stay involved better when they can't make every call. It is the responsibility of the co-lead ms team to maintain this logbook.