

CNH Lakes Manuscript¹ Authorship Guidelines v.6.0

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Note: These guidelines were adapted from the CSI-Limnology Project² Authorship Guidelines, which were originally developed in 2011.

The objective of this document is to facilitate conversation about authorship for a diverse range of products that evolve as part of the CNH Lakes project. This document provides guiding principles for all CNH Lakes manuscripts, where we use the term “manuscript” to refer to the range of scholarly contributions that may emanate from the CNH Lakes project (e.g., journal articles, reports, posters, presentations, published data sets, webinars, software, blogs, etc.). These guidelines continue to apply to manuscripts produced by the project after the grant’s official project period.

These guidelines are a living document that will change over time to reflect dynamics in team membership, CNH Lakes project goals, strategies for managing collaboration, and recognition of the diverse contributions of team members. These guidelines will be discussed and revised as necessary throughout the project. The leadership team will place these guidelines as a discussion item on a team teleconference at least twice a year for the duration of the project. We encourage team members to contact the CNH Lakes Steering Committee if they would like additional discussion of these guidelines in project meetings.

Our team philosophy is to be inclusive, transparent, and communicative about authorship throughout the development of manuscripts. To that end, these guidelines establish a framework for initiating communication about authorship when manuscripts are conceived, as well as guidelines to ensure ongoing communication about authorship throughout manuscript development and publication.

Our authorship policy is founded on three principles:

- 1) the team will be proactive in identifying manuscripts expected from research activities and notifying other team members when new manuscript opportunities arise so that all interested individuals have an opportunity to participate;
- 2) upon initiation of a manuscript, the lead author(s) will contact **all** CNH Lakes team members by email to identify potential co-authors who wish to be actively involved in manuscript development; and
- 3) co-authors work with lead author(s) to track their contributions to the manuscript throughout the research activity.

We will use our CNH Lakes Google Groups email list (cnh-lakes@googlegroups.com) to communicate about all potential manuscripts, track manuscript development, and specify co-author contributions. This process will ensure transparency in manuscript development and communication of ongoing manuscript activities to the entire CNH Lakes team, regardless of co-authorship status. Using the team email list will ensure that throughout manuscript development a written record is kept of co-authorship and authorship ordering for the final, published manuscript. We encourage lead author(s) to initiate a dialogue with co-authors about the ordering of authors on manuscripts early in manuscript development and to facilitate ongoing discussion of ordering as author contributions evolve. Note: the Organic Data Science (ODS) system may be used in conjunction with the email list to track manuscript progress; it is not expected that draft manuscripts will be posted on the ODS system.

1) Contacting potential co-authors

We have appended to this document a draft co-authorship invitation memo from the lead author(s) of a manuscript that is to be adapted as necessary and emailed to **all** CNH Lakes team members at the beginning of a new research activity that is expected to lead to one or more manuscripts. Early notification of a research activity to the entire team ensures complete information about:

- a) what research is being conducted,
- b) which team members are leading and/or participating in the research, and
- c) all parties interested in co-authorship are identified early in the process of manuscript development.

This process facilitates the conversation about author responsibilities and potential author ordering from the outset of a new manuscript. This memo is especially important within the CNH Lakes team because our project includes personnel from multiple institutions, disciplines, and career stages.

2) Identifying manuscript type

The project is likely to generate a range of manuscript types that require different approaches to managing the workflow and engaging potential coauthors. The co-authorship invitation memo appended to this document should be used to identify the manuscript type. We encourage the lead(s) of a manuscript to begin discussing how the nature of the manuscript affects coauthor involvement at the outset of manuscript development. Examples of manuscript types, among other possibilities, include:

- a) disciplinary research;
- b) graduate student thesis or dissertation;
- c) interdisciplinary research;
- d) essay, conceptual, or commentary; or
- e) data or methods manuscript.³

If the nature of a manuscript changes during manuscript development, the manuscript lead(s) should update **all** CNH Lakes team members with an update memo.

Among the manuscript types listed above, student theses and dissertations in particular often require unique workflow and co-authorship arrangements. These manuscripts should be discussed with the team on a case-by-case basis. It is important to note that theses and dissertations may be viewed differently among disciplines in terms of the expected role of the student relative to coauthors. This extends to include issues related to the development and execution of the manuscript, the need to demonstrate disciplinary competence, and the expected number of coauthors. In some instances, a collaborative manuscript may be absorbed into a thesis or dissertation. This should be made explicit in the authorship memo and agreed upon by all coauthors. It may be the case that the inclusion of certain manuscripts within a thesis or dissertation changes as a student progresses. In this case, an update memo should be circulated to **all** CNH Lakes team members at the time that the nature of the manuscript changes.

Published data sets will require complete and detailed metadata documentation. Anyone on the team interested in being a co-author on a data set should have the opportunity to review and contribute to these metadata, in addition to contributing to the data set itself, similar to project manuscripts. Co-authors should also have the opportunity to provide input on appropriate data curation websites/services to which the data set may be submitted.

3) Tracking authorship contributions

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The CNH Lakes project uses email as the primary venue for coordinating project tasks, communicating about research activities, as well as organizing and tracking manuscript progress. Once a lead author(s) identifies a research activity expected to yield one or more manuscripts, we expect the lead author(s) to share an authorship memo (see template below) with the rest of the team via our Google Groups email list. They may also choose to create a framework for co-authorship tasks and contributions in ODS.

The authorship types outlined in the CRediT Contributor Roles Taxonomy (<https://casrai.org/credit/>) may be used as guidelines for each co-author to define their contributions to the manuscript. Authorship is dependent on accomplishing the sub-tasks each co-author identifies as contributing to the manuscript. The general expectation is that all authors should be regularly communicating via email (though in later stages of manuscript development, this will not necessarily be through the whole-team Google Groups list) about any issues that arise, especially because contributions often evolve through the manuscript development. Participating in this system ensures transparency for all team members, holds all co-authors accountable for their contributions to the manuscript, and provides a written record of progress that can be used for CNH project reporting.

We have intentionally written these guidelines to be flexible to accommodate important differences in disciplinary expectations across team members. Disciplines have different, and often unstated, norms related to manuscript production, particularly with respect to the number and ordering of authors. These norms may also differ for researchers depending on their career stage. Any special cases that arise due to disciplinary authorship expectations should be discussed, and any special authorship arrangements approved, by all team members at the beginning of manuscript development.

¹ CNH-L: Linking land-use decision making, water quality, and lake associations to understand human-natural feedbacks in lake catchments. K.M. Cobourn, C.C. Carey, K.J. Boyle, C. Duffy, P. Hanson, A. Kemanian, P. Soranno, M. Sorice, K. Weathers, J. Klug, L. Rudstam, and M. Vanni. NSF, Dynamics of Coupled Natural and Human Systems. 2016-2018. Award: 1517823.

² The effect of cross-scale interactions on freshwater ecosystem state across space and time. PIs: P.A. Soranno, K.S. Cheruvellil, E.H. Stanley, J.A. Downing, N.R. Lottig, P-N. Tan. NSF, Emerging Frontiers Division, Macrosystems Biology Program. 2011-2016. Awards: 1065786, 1065818, 1065649

³ Best practices for collaborative manuscript development in large, interdisciplinary science teams. C.E. Fergus, S. Oliver, N. Skaff, K.S. Cheruvellil, P.A. Soranno, P.N. Tan, T. Wagner. Presentation at CNH Lakes Year 2 Workshop, Madison, WI, May 31, 2017.

CNH Lakes Manuscript Authorship Invitation Memo

TO: All CNH Lakes team members

FROM: [Fill in lead author(s) names]

MANUSCRIPT TITLE: [Fill in tentative title]

MANUSCRIPT TYPE: [Fill in manuscript type: disciplinary research; graduate student thesis or dissertation; interdisciplinary research; essay, concept, or commentary; data or methods; other (please describe)]

I (We) are contacting you because you have been listed as a potential co-author on the above manuscript that is associated with the CNH Lakes project. On the next page is a list of potential contributions by co-authors on manuscripts. This list is intended to foster an open dialogue on authorship that starts at the very beginning phase of a manuscript and carries through until manuscript submission and acceptance. This document is intended to clearly define each co-author's responsibilities and accomplishments throughout the effort, as well as the overall strategy for determining co-authorship as described below.

1. **If you are interested in being a co-author on this manuscript, we ask that you describe in specific terms the ways that you will contribute to the manuscript.** Some examples of potential manuscript contributions are listed on the next page (note that this list is not exhaustive; please contact the lead author(s) if you would like to make contributions not included in the list). For each of these contributions, please be as specific as possible as to your contribution (e.g., instead of "collect data," please specify what data will be collected and how this data collection will occur); this additional step is critical for tracking the progress of this contribution, as described in the CNH Lakes Manuscript Authorship Guidelines.
2. **Addition of co-authors.** We recognize that in some cases it may be impossible to identify all co-authors at the beginning stages of a manuscript. In situations when an individual's expertise is added to a manuscript in the middle of the manuscript development process, they should be added to the author list if their contributions satisfy the conditions described below.
3. **This list of potential contributions is not intended to be a checklist: we recognize that there are many different possible types of contributions to manuscripts** throughout the initiation, development, analysis, and writing processes and that it is difficult to compare these contributions. Our goal is to be as inclusive and flexible as possible for each person who makes a substantive contribution to the manuscript. Here, we define a substantive contribution as a contribution in which the manuscript would not have been possible without it, or that it substantially enhances the breadth or quality of the manuscript. The specific contributions of each participant will be considered on a case-by-case basis and co-authorship status will be determined as the outcome of a discussion between manuscript lead(s), potential co-authors, and if necessary, the CNH Lakes Steering Team (see the note on conflict resolution below).
 - a. Some contributions may be more appropriately recognized in the acknowledgments section of a manuscript, rather than with a co-authorship. This determination will be made on a case-by-case basis via discussion between manuscript lead(s) and established co-authors. **Exceptions to this guideline:** We recognize that all manuscripts may not neatly fit within this guideline. For example:

- i. Given the interdisciplinary nature of the CNH Lakes project, this guideline will need to be flexible to accommodate domain experts who should be listed as co-authors (e.g., helped with conception and model interpretation such that the breadth or quality of the manuscript is enhanced).
 - ii. Manuscripts that are position-pieces or commentaries may need different criteria.
4. **We expect the co-authors to regularly update the lead author(s) on their progress to ensure transparency within the authorship team and enable coordination of manuscript activities.** To aid in tracking this progress, the manuscript lead(s) may choose to create a task for each co-author in ODS. Each co-author would then populate ODS with specific sub-tasks that describe their contributions to the manuscript.
5. **Author ordering will be determined on a case-by-case basis after discussions among all co-authors of the contributions of each co-author throughout the manuscript process.** In general, authorship is in order of significance of contributions by each co-author to the final manuscript. However, we recognize that some disciplinary differences exist with respect to authorship position (e.g., the last author indicates lab leadership in some scientific disciplines). It will most often be the case that the manuscript lead(s) will be listed first, followed by co-authors in order of contribution. Where different contributions cannot be compared, an alphabetical listing of co-authors is the recommended practice.
6. **In general, data provision is not assumed *a priori* to warrant co-authorship.** In many cases, providing data in and of itself is not considered a contribution significant enough to constitute co-authorship. However, there may be exceptions when significant data processing has been undertaken to make the data usable for this manuscript, the manuscript may not have been possible without the data, or the suggestion of providing the data led to enhancing the breadth or quality of the manuscript. If any data provider expresses an interest in co-authorship, it is the responsibility of the manuscript lead(s) to contact that person to confirm the data provision and other contributions justify co-authorship.
7. **All co-authors must approve the final version of the manuscript prior to submission.** It is 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 list below because all co-authors must do it.
8. **Co-authors are held accountable for the content 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 full knowledge of all aspects of the research; however, they need to know enough to defend the work.
9. **It is recommended that an author-contribution paragraph be written for each manuscript.** This step is important to ensure that all co-authors (particularly early-career team members) are recognized for the contributions that they make to the CNH Lakes project. Because many journals don't automatically publish these statements, we recommend adding it to the Acknowledgements section in the manuscript.
10. **Conflict resolution:** As noted above, it is our goal to be as inclusive as possible in the CNH Lakes project. In the event of a disagreement between contributors and manuscript lead(s) about co-authorship contributions and status, we encourage manuscript lead(s) to err on the side of being inclusive of those who view their contributions as substantive enough to warrant co-authorship. In the event of a dispute about authorship or manuscript content, the first stage in conflict resolution is for the lead(s) and the contributor in question to meet with the Steering Team (Cobourn, Carey, and Boyle) to discuss and resolve the disagreement. If the disagreement involves one or more members of the Steering Team, an ad-hoc committee of 3 CNH Lakes research

participants not participating in the manuscript will be formed to review and mediate the dispute.

Examples of Potential Co-author Contributions

Potential co-author contributions identified here are a starting point for CNH team members to think about whether their contributions to a manuscript rise to the level of co-authorship. This is by no means an exhaustive list of ways in which co-authors may contribute, and not all of these contributions may warrant co-authorship. As the project evolves and different types of manuscripts are created, the contributions made by potential co-authors are likely to vary significantly and should be evaluated on a case-by-case basis.

Examples of Concept and Design Contributions

1. Conceived or contributed to the conception of a manuscript idea/overarching topic such that input helped define the fundamental contribution of the manuscript
2. Developed or fundamentally contributed to formulating research questions
3. Designed/outlined the manuscript
4. Contributed to the conceptual/theoretical framework for the manuscript
5. Supervised and/or co-supervised authors and manuscript progress
6. Provided platform for research to occur (e.g., facilitated interactions with lake associations, created CNH Lakes infrastructure that enabled research interactions to occur, etc.)

Examples of Research Contributions

1. Collected data (e.g., lake association interviews, downloaded data from databases)
2. Compiled or synthesized data (e.g., merged data from different datasets for model activities)
3. Oversaw or led quality assurance/quality control (QA/QC) of data
4. Developed models or a part of a model
5. Calibrated models
6. Ran or estimated models
7. Integrated models
8. Developed model scenarios
9. Analyzed observed data or model output data
10. Contributed new analyses or methods
11. Interpreted results or placed results in a policy context to enhance the greater contributions of the CNH Lakes project

Examples of Writing Contributions

1. Wrote sections of text
2. Designed figures and tables
3. Performed critical reviews or substantial re-working of manuscript

Other

We welcome additional contributions and encourage a potential co-author to discuss other contributions with the lead author(s) so that they can be made explicit via email or ODS.