SCC Manuscript Authorship Guidelines v.2.0
Last revised 2 October 2017

Note: These guidelines were adapted from the CNH-Lakes[1] Authorship Guidelines.

The objective of this document is to facilitate conversation about authorship for a diverse range of products that evolve as part of the SCC project. This document provides guiding principles for all SCC manuscripts, where we use the term "manuscript" to refer to the range of scholarly contributions that may emanate from the SCC project (e.g., journal articles, reports, posters, presentations, 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, SCC 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 once a year for the duration of the project. We encourage team members to contact the SCC 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** SCC team members via e-mail to the project listserv to identify potential co-authors who wish to be actively involved in manuscript development (see more below); and
3) co-authors work with lead author(s) to track their contributions to the manuscript throughout the research activity, which will be documented in a formal authorship contribution statement in all manuscripts.

We will use the Asana project management software to identify all potential manuscripts and track manuscript development and co-author contributions. This process will ensure transparency in manuscript development and communication of ongoing manuscript activities to the entire SCC team, regardless of co-authorship status. Using the Asana system will ensure that a written record is kept of co-authorship and authorship ordering for the final, published manuscript.

1) Contacting potential co-authors
We have appended to this document a draft coauthorship invitation memo from the lead author(s) of a manuscript that is to be adapted as necessary and emailed to the SCC listserv at the beginning of a new research activity that is expected to lead to one or more manuscripts. What constitutes the "beginning of a new research activity" varies by discipline and sub-project, so one goal of team teleconferences is to announce new research activities to solicit feedback and potential contributors. After the teleconference, the activity lead should send an adapted

coauthorship invitation memo to the SCC listserv to follow-up and ensure that team members who were unable to join the teleconference can still participate. 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.

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 coauthorship 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 one or more of the following:

    a) disciplinary research;

    b) graduate student thesis or dissertation;

    c) interdisciplinary research;

    d) essay, conceptual, or commentary; or

    e) data or methods manuscript.

If the nature of a manuscript changes during manuscript development, the manuscript lead(s) should update SCC team members. 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 invitation memo and agreed upon by all coauthors.

3) Tracking authorship contributions in the Asana system

The SCC project uses Asana as the primary system for coordinating project tasks 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 create a framework for co-authorship tasks in Asana. As an example, tasks could be organized as follows:

> *Lead author(s) create a new project for their new manuscript in Asana (e.g., "Manuscript on high-frequency data forecasting of storm effects on water quality"). Ownership for this manuscript-specific task is assigned to the lead(s) for the new manuscript. Within the manuscript task, lead author(s) and co-authors work together to specify a set of sub-tasks that define the contributions of each of the co-authors involved in manuscript development and their timeline (e.g., "QA/QC meteorological forecast by June 1", "Convert meteorological forecasts into GLM format by June 10"). The co-authors and lead then work together to update these tasks throughout the research activity.*

The lead author(s) should check in with co-authors if they are not tracking their activities with Asana. Through this system, 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 outside of Asana and within Asana's comment feature to discuss any issues that arise, especially because contributions often evolve over the course of 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 project reporting to NSF.

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.

Finally, we ask people to be reasonable and only opt-in to being a co-author on research products where they realistically feel that they can make meaningful contributions- i.e., not just proofreading a manuscript, but contribute in multiple ways as listed under "Examples of Potential Co-author Contributions" below. We especially encourage students to discuss authorship contributions with their mentors throughout the project.

[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.

Draft SCC Manuscript Authorship Invitation Memo

TO: All SCC 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 SCC 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 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 contribution, please be as specific as possible (e.g., instead of "collect data," please specify what types of data will be collected, when, and how this data collection will occur); this additional step is critical for tracking the progress of this contribution in our project management software (Asana).
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. **We encourage students and postdocs to talk with their mentors about the appropriateness of opting-in as a co-author on SCC project manuscripts.**
4. **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 and order will be determined as the outcome of a discussion between manuscript lead(s), potential co-authors, and if necessary, the SCC Steering Team (see the note on conflict resolution below).
5. **Once contributions are identified, the manuscript lead(s) and co-authors should work together to track their contributions (tasks and subtaks) and timelines within Asana.** We expect the lead author and co-authors to work together to regularly update their progress in Asana to ensure transparency with the full SCC team and enable coordination of manuscript activities within the authorship team.

6. **Author ordering will be determined by the 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.
7. **In general, data provision is not assumed *a priori* to warrant 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.
8. **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.
9. **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 listed in the acknowledgements. 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.
10. **An authorship contribution paragraph is to be included for each manuscript, as required by many journals.** This statement should naturally emerge from the contributions documented in Asana. This step is important to ensure that all co-authors (particularly early-career team members) are recognized for their contributions. Because some journals don't automatically require these statements, we recommend adding it to the Acknowledgements section in the manuscript.
11. **Conflict resolution**: 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 (Carey, Sorice, Thomas) to discuss and resolve the disagreement. If the disagreement involves one or more members of the Steering Team, an ad-hoc committee of 3 SCC research members 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 SCC 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.

<u>Examples of Concept and Design Contributions</u>
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 water utility, created SCC infrastructure that enabled research interactions to occur, etc.)

Examples of Research Contributions
1. Collected data (e.g., water utility interviews; deployed, maintained, and downloaded sensors)
2. Compiled or synthesized data (e.g., merged data from different datasets)
3. Oversaw or led quality assurance/quality control (QA/QC) of data
4. Developed or calibrated models or a part of a model
5. Analyzed observed data or model output data
6. Contributed new analyses or methods
7. Interpreted results or placed results in a policy context to enhance the greater contributions of the SCC project

Examples of Writing Contributions
1. Wrote sections of text, even if the text was not retained in the final manuscript version
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 in Asana.