Authorship Guidelines for the WHONDRS "Crowdsourced Understanding of Global River Organic Matter Composition through the Lens of Ecological Theory" Collection

This document is meant to be a recommendation from the WHONDRS crowdsourced collection leadership team for how authorship should be assigned for each manuscript in the collection. In the document below, we provide guidelines on how to use the CRediT system and rank coauthors, however we are ultimately leaving these decisions up to the corresponding author(s) of each manuscript.

Collection leadership statement on authorship

Authorship is an important and sometimes challenging topic that requires open, honest communication among a project team. There are many strategies that can be taken to determine who is included as an author and the order in which authors are listed. The leadership team for this crowdsourced collection feels that the approach to authorship is best defined individually for each manuscript team and research topic. The reason is that each research team has different nuances in their needs and dynamics. The leadership team is not in a position to deeply understand those dynamics and, as such, is leaving the authorship approach and associated decisions to each research team. The leadership team is, however, providing guidance and tools associated with authorship best practices so that each team has the tools they need to make authorship decisions that are transparent, equitable, ethical, and mutually agreed upon by all members of the team. This approach is not a 'top down' approach in which the leadership team provides a set of definitive authorship rules, but rather a 'bottom up' approach in which each team agrees on a policy. However, the leadership team will always be available to help make decisions on a team-by-team basis, with the acknowledgement that decisions are likely to vary across teams due to context dependencies. If any research team would like the leadership team to engage more deeply with authorship considerations, please reach out to us.

Across all manuscripts there are different types of author contributions and levels of author investment, and crowdsourced manuscripts can introduce complexities that typical manuscripts lack. We encourage **each manuscript team** to decide on and document your authorship criteria now and verify that your whole team agrees. Below we outline criteria that can be adopted by the manuscript teams (sections *Adoption of CRediT* and *Outline of contributions by each coauthor*). If a team prefers to adhere to a different set of criteria for authorship than the one outlined below, the team should outline their criteria in a text document and (if applicable) a modified author contribution tracking spreadsheet or other related document. For example, the points system used in the OutlineOfContributions table (discussed below) may be modified, or a completely different system may be used. If any changes are made, the associated text, spreadsheet, table, etc. documents should be posted within the team's public GitHub by December 17th, 2021. Manuscript teams that wish to use the criteria outlined here can post this document and the OutlineOfContributions table in their public GitHub by December 17th.

It can be helpful to have a clear delineation of the minimum level of effort to qualify as an author. If you feel you have contributed a lot of time and energy into a manuscript, it can be frustrating near the end of the process to see people listed as authors who you feel did not contribute as much. It is helpful to have an agreed upon system of separating people who may have contributed less than others but are still co-authors versus those who did not meet the minimum requirement. We strongly encourage creating space for authors with different levels of engagement in the manuscript. We also encourage you to keep an eye on your author lists and make sure people do not add themselves without contributing anything and without the other authors knowing.

Adoption of CRediT

This crowdsourced manuscript collection leadership team recommends (but does not require) the use of CRediT - "Contributor Roles Taxonomy" - to describe each author's individual contributions to the work. From their website: "[CRediT] has been refined by Consortia Advancing Standards in Research Administration (CASRAI) and National Information Standards Organization (NISO). It is in adoption by

Cell Press, PLOS and many other publishers, and has been integrated into some submission and peer review systems and research workflow tools." Below describes a ranking system for authors by the CRediT system that may be adopted by each manuscript team if they feel it suits their needs for assigning authorship.

CRediT recognizes **14 Contributor Roles**, listed alphabetically below, as warranting authorship OR acknowledgement:

Contributor Role	Role Definition
Conceptualization	**Study**- formulation or evolution of overarching research goals and aims, including guiding overarching study design and methodology. **Specific research question**-posing unique question of existing study data.
Data Curation	Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later reuse.
Formal Analysis	Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data.
Funding Acquisition	Acquisition of the financial support for the project leading to this publication.
Methodology	Development or design of methodology; design of data collection instruments (e.g. survey items or observation protocols); creation of models
Project Administration	Management and coordination responsibility for the research activity planning and execution.
Resources	Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.
Software	Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.
Supervision	Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.
Validation	Verification, whether as a part of the activity or separate, of the overall replication/reproducibility of results/experiments and other research outputs.
Visualization	Preparation, creation and/or presentation of the published work, specifically visualization/data presentation.
Writing – Original Draft Preparation	Creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).
Writing – Review & Editing	Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.

There is no universally accepted criteria for what is required for authorship vs. acknowledgement.

Recommendation: To qualify for authorship on crowdsourced manuscript collection, a person must be 1) involved in at least 2 of these categories, as listed in the OutlineOfContributions submitted by each coauthor, 2) agree to be accountable for their portion of the work, and 3) approve the final version to be published **within 2 weeks after receiving.**

Any individual who has met these three criteria, independent of their rank, status, or affiliation, should be named as an author. Any individual who has not met these three criteria, independent of their rank, status, or affiliation, should not be named as an author. An individual who knowingly publishes the intellectual work of another without giving appropriate credit has committed plagiarism.

Outline of contributions by each coauthor

Any individual who is actively contributing in the areas of CRediT described above should keep track of their contributions throughout the manuscript generation progress using the OutlineOfContributions table. This table will be submitted before authorship assignment to each corresponding author. Contributions will be scored and authorship order will be determined based on the score of each co-author with the highest score being the first author, the second highest score being the second author, and so on. Corresponding authors can choose whether they prefer to be listed last or based on the rank they were given with the authorship score. Note "Investigation" is not included on the list of CRediT as data collection was done prior to this crowdsourced manuscript effort.

This document was adapted from 2 sources: the IsoGenie Project Authorship Guidelines, and the "Team Science Article Contributor Agreement" from Jeni Cross, Director of The Institute for Research in the Social Sciences at Colorado State University. It is intended to be a mostly static document with changes vetted by group consensus.