GUBIC authorship and collaboration guidelines

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GUBIC background

The Global Urban Biological Invasions Consortium (GUBIC) was created to oversee a network of projects and collaborations to determine the magnitude of invasion economic and ecosystem impacts in cities around the world. The reasons why this work is so critical at this juncture is fourfold: 1) Greater numbers of people live in cities than at any other time in our history and so the well-being of cities directly impacts the health and happiness of people; 2) trade and the movement of people in and out of cities has resulted in unprecedented movement of species to urban areas outside of their native ranges; 3) pest outbreaks and species invasions have resulted in massive economic costs and environmental degradation; and 4) there is currently widespread misunderstanding of the potential threats invasive species pose and that existing invasive species management frameworks are not well suited to managing invasive species in urban areas, where human perception, well-being and culture influence what kinds of species persist. The main objectives of this consortium are: **1) to assess the influence of urban to rural gradients in human impact, economics, and environment within cities on invasive species population sizes and diversity; 2) to determine how political, economic, trade, and environmental differences among cities influence the invasibility of cities; 3) to quantify ecosystem service and disservice provided by non-native species within and among cities; and 4) to evaluate invasive species urban policy and management decision triggers in different socio-economic conditions**.

The global consortium

GUBIC includes collaborators from more than 20 countries, and includes academic and non-academic partners. The value of collaborative network is that individuals contribute unique perspectives informed by the specific locations in which they study and live and by the disciplines they are trained in, but also, they bring with them different datasets and local management frameworks and connections with municipal management agencies and NGOs.

GUBIC is overseen by a Director and a Science Oversight Committee (SOC). This group facilitates collaboration and applications for funding to facilitate research activities. At present, Marc Cadotte is the founder of GUBIC and Director. The SOC includes four members (listed on the website) who are overseeing funded components or active projects. Every two years, the Director will replace two members of the SOC to ensure opportunity for others to be involved.

Acknowledgment statement

All papers resulting from GUBIC resources, including the use of data, attending funded meetings and working groups, and including authors that are funded by GUBIC funding (e.g., postdocs) are required to include the following statement in the acknowledgement section (will be updated as new funding is secured):

Funding for this collaborative project was provided by the Connaught Global Challenges Award, the Office of the Vice-President International, the School of Graduate Studies and the HKU-U of T Strategic Partnership Fund at the University of Toronto, the Office of the Vice-Principal Research at the University of Toronto Scarborough and the working group 'sGUBIK' kindly supported by sDiv, the Synthesis Centre of the German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig.

Collaborative model

GUBIC members are expected to engage in transparent and inclusive collaboration, and in return have access to GUBIC resources. GUBIC resources include curated urban invasion data sets (referred to as 'curated data'), data collected directly for GUBIC (referred to as 'collected data'), travel and networking funds, and a network of collaborators that are willing to collect data, collaborate and share ideas. GUBIC members are those that request or agree to be included as a member, but participation is voluntary.

Two types of data/two sets of rules

GUBIC is curating global urban datasets and providing this curated and searchable data to GUBIC members. Further, GUBIC will be organizing global data collection efforts that is implemented by members. The curated data will be available to all, as will collected data, but data collectors will be given priority to the collected data. In both cases, we will follow an 'opt-in' model for collaboration and authorship, which all papers arising from GUBIC data (curated or collected) will include an opportunity for GUBIC members to collaborate on the preparation of manuscript. Below are the guidelines for authorship, which is administered and enforced by the Director and the Science Oversight Committee (SOC).

Authorship guidelines

1. Author(s) using data curated or collected data are required to submit a proposal (using google form found at https://cubes-labs.com/gubic/) to the Director or network coordinator, which will be reviewed by the SOC for approval. The proposal should include a title, short summary, data that will be used, planned analyses, and expected timeline.
2. GUBIC members will have access to GUBIC collected data, but GUBIC members that contributed or collected data for GUBIC will: a) be given priority for submitted proposals; and b) should be invited as co-authors for resulting publications, though contributions beyond just collecting data are required for authorship (see Authorship contribution requirements, below)
3. Upon approval, the author(s) will send the proposal to the whole GUBIC e-mail group with a call for opting in. Opting in authors will be recorded in a spreadsheet (ideally on Google sheets) where co-authors can indicate addresses for their affiliation and list their contributions.
4. Author order will be determined by the authors that submitted the original proposal, but they are encouraged to have an open and transparent discussion about author order

philosophies (see Author order philosophies, below).

5. Papers arising from GUBIC collaborations that **do not** use GUBIC data (e.g., conceptual or synthesis papers) **are not** required to request opt-in authorship from the full GUBIC group. However, it would still be preferred that such collaborations are as inclusive as possible, and author(s) should communicate opportunities to collaborate to the entire GUBIC group or selected members.
6. GUBIC members opting in for paper authorship are required to meet minimum authorship contributions (see Authorship contribution requirements, below) to ultimately be listed as a co-author. Authors will only include those that opt-in and failure to satisfy the authorship contribution requirements will result in demotion to the acknowledgement section of the resulting paper.
7. Author(s) will then communicate directly with co-authors as manuscript drafts develop. Author(s) should communicate clear deadlines for contributions and should provide ample time for co-authors to contribute. Co-authors can withdraw their request for authorship at any time if they feel they have not or are unable to fully contribute.
8. Disagreements about authorship must be sent in writing to the GUBIC Director, and the SOC will determine the resolution of a disagreement, which could include requesting authors to compromise, providing new opportunities to contribute to paper, or requiring the addition or removal of an author (as a last resort). SOC members that are coauthors of the disputed paper under consideration will not be involved in the deliberations or voting on a decision. If the majority of SOC members are co-authors on the disputed study, then other GUBIC members will be asked to serve in this ad hoc role for this one decision.

Authorship contribution requirements

There are a number of ways that collaborators can contribute to the preparation of a paper that is deserving of authorship. With so many potential collaborators, it is not feasible for all co-authors to be intimately involved in all aspects of manuscript preparation.

We follow an amended version of CRediT (Contributor Roles Taxonomy; see: https://credit.niso.org/) to better fit the nature of GUBIC research. Below is a table of possible manuscript contributions and authorship requiring that **a minimum of two** of these contributions types are satisfied.

Contribution	Example
Conceptualization	Originating and framing research or paper idea.
Organize group activity	Framing and leading discussions in a working group and coordinating collaborative work on a study.
Methodology	Design and implement research methodologies.
Sampling/data collection	For projects that require primary data/sample collection, those that performed this task.
Contribute data	Supply one of the core datasets and which must have been collected by the co-author (e.g., downloading and supply a third-party dataset does not count).
Prepare data	Combine and format multiple datasets so that they are useable for analyses (e.g., merging plot data with traits collated from other sources, standardizing GPS coordinates and taxonomic names, etc.)
Analyze data	Program and run statistical models, prepare figures, etc.
Visualization	Creating figures, tables, or data presentations.
Writing – Original Draft	Compose a portion of the text.
Writing – Review & Editing	Provide detailed feedback and suggestions on text.

What **does not qualify** as sufficient for authorship includes: 1) only providing data; 2) being the head/director/administrator of a lab or institute of a GUBIC member contributor to a paper; 3) paying the salary of a GUBIC member contributor; or 4) only attending a meeting where ideas were discussed. That said, GUBIC authorship should be as inclusive as possible, and people indicating a desire to be a co-author should be given ample opportunity to contribute.

We strongly encourage project leaders to create a Google sheet (or some other cloud spreadsheet) with columns as: name, email, affiliation, and the 10 contribution types to keep track of coauthors and their involvement.

Author order philosophy

Authors need to be cognizant and respectful of the fact that there are multiple author order philosophies and that they are not all viewed as equally fair nor rewarded equally. Author order philosophy varies geographically and by discipline and sub-discipline, and GUBIC strives to be diverse and inclusive and so must be transparent and inclusive in author order decisions.

Author order on papers stems from five main philosophies:

1. **First/last author priority**. The first author (or co-first authors) is/are usually the primary composer(s) of the text and has run most analyses and the last author is a PI or

supervisor that originated ideas and disproportionately guided the process of preparing the manuscript. This author order philosophy is commonly abused because reward structures that prioritize last author position can result in PIs that hold power placing their names in the last position regardless of contribution. We wish to avoid this. The last author position, if selected by authors needs to be justified, and often does not fit an authorship philosophy that is compatible with a large consortium that includes multiple collaborators of various career stages.

2. **First/corresponding**. The first author (or co-first authors) is/are the primary composer(s) of the text and has run most analyses and another author serves as the corresponding author. Some geographic regions reward the corresponding author, and the corresponding author's role should be analogous to the last author contributions above.
3. **First/alphabetical**. The first author (or co-first authors) is/are the primary composer(s) of the text and has run most analyses and the rest of the authors are simply listed alphabetically. This model is appropriate when one (or a few) author(s) does most of the work with much lower contributions from a large consortium.
4. **By contribution.** Author order is determined solely by contribution level, with author position ranked by how much they contributed to the study. The first author is the primary composer of the text and has run most analyses.
5. **First/alphabetical-contribution hybrid**. The first author (or co-first authors) is/are the primary composer(s) of the text and has run most analyses and the next several authors are ordered according and in recognition of their greater contribution. The rest of the authors are then listed alphabetically. This is the preferred authorship model for GUBIC.

Data philosophy

All GUBIC data will follow the FAIR principles (https://www.go-fair.org/fair-principles/), which ensures transparency and a commitment to the principles of open science. We require that data is made available publicly upon publication of the primary research article. The achieve this, researchers should follow the following principles as they prepare datasets:

Principle	Key Idea	What It Means in Practice
Findable	Data and metadata should be easy to locate.	Use persistent identifiers (e.g., DOIs), rich metadata, and indexing in searchable repositories.
Accessible	Once found, data should be retrievable using open, standardized protocols.	Provide clear access conditions, maintain metadata even if data are restricted or removed.
Interoperable	Data should integrate with other datasets and workflows.	Use standard vocabularies, formats, and ontologies; ensure metadata align with community standards.
Reusable	Data should be well-described so they can be reused in future studies.	Include clear licenses, detailed provenance, and high-quality metadata enabling replication and reinterpretation.

To fulfill these principles, data would need to submitted to an acceptable data respositories, and these could include:

- **Dryad** — curated datasets across biology, ecology, environmental science.
- **Figshare** — general-purpose FAIR repository; supports datasets, code, media.
- **Zenodo** — CERN-hosted, open, assigns DOIs; widely used for code + data.
- **OSF (Open Science Framework)** — reproducibility-focused repository; supports versioning.

Code philosophy

All GUBIC projects that generate code for analyses are expected to conform to open and transparent coding standards. Open and transparent coding means writing, documenting, and sharing code in ways that make analyses **reproducible, understandable, and verifiable** by others. This includes using clear, version-controlled workflows; commenting code so that analytical steps are explicit; organizing scripts so they can run on new machines with minimal setup; and providing all data, metadata, and dependencies needed to reproduce results. It also requires communicating decisions — what data were cleaned, which models were chosen, why certain parameters were used — so that analyses are auditable and scientifically trustworthy. When code and workflows are open and transparent, other researchers can reproduce findings, identify errors, build on methods, and ensure that scientific conclusions rest on robust, inspectable processes.

We strongly encourage researchers to use GitHub (https://github.com/) to create a repository for each unique project that is shared with collaborators. This allows versioning, collaboration and transparency. Upon acceptance of a research article, the repository associated with the workflow can then be committed as a release to Zenodo (https://zenodo.org/) which will be the version of record.

Disputes and deviations

Any disputes among collaborators about how to implement, or a decision to deviate from the collaboration guidelines in this document must be communicated to the Director of GUBIC prior to manuscript submission to a journal. The Director and SOC will communicate with project leader either agreement to a deviation or will require adherence to the principles outlined in this guidance document. Deviation without approval can result in GUBIC leadership requesting the journal to issue a correction or amendment.