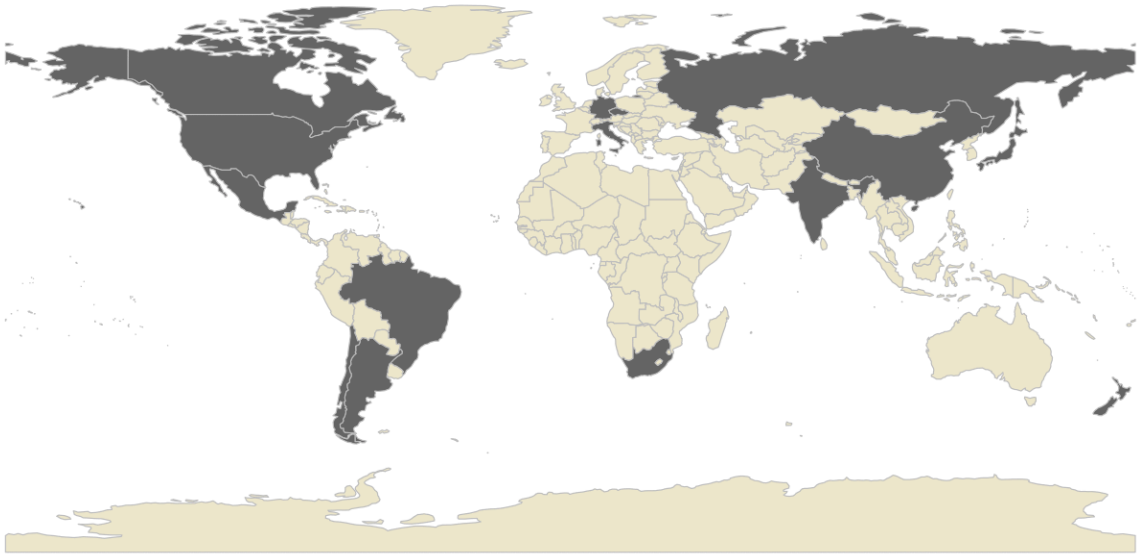
June 2019 GUBIC Symposium recap

June 17th – 22nd, 2019

We had a successful Global Urban Biological Invasions Consortium symposium and training workshop at the University of Toronto Scarborough, June 17-22, 2019. In total, 73 people attended and participated in the symposium, including 37 traveling from abroad. We had attendees from 15 different countries, and all continents except Antarctica. There we a series of informative talks, ranging from urban invasions in different countries to how to manage invasions in urban settings from Rafael Zenni, Mirijam Gaertner, Emily Minor, Anibal Pauchard and Inderjit (available in the GIBIC Google Drive folder -see end of document).



The goals of the symposium were: 1) to network and develop global collaborations; 2) to establish working groups to tackle high priority research questions; 3) to compile and summarize available data; and 4) develop a plan for a global consortium that will provide and data and develop a set of standardized protocols for a global study. We made major headway on all four objectives. This document provides a summary of where GUBIC is at, of the advances from the meeting and how GUBIC will move forward.

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 –take for example the impacts of the emerald ash borer and dog strangling vine in Toronto; 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**.

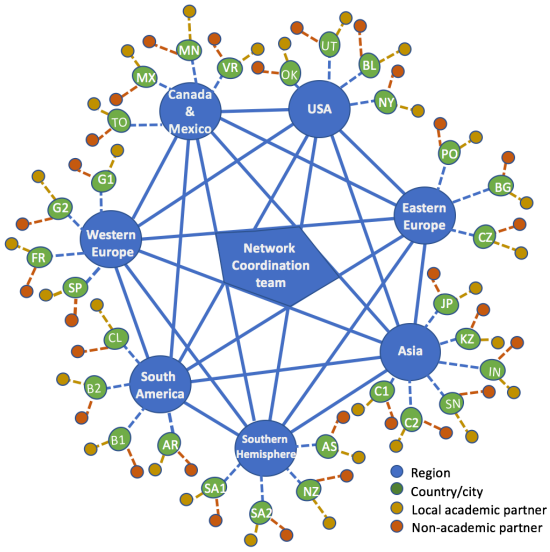
The global consortium

GUBIC includes collaborators from more than 30 different cities, in about 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. We've clustered cities into regional hubs and for each hub, we have a single person acting as a member of the scientific oversight committee (SOC). The make-up of the SOC will be discussed below with the conclusions from the meeting.

Meeting outcomes

The meeting had several important outcomes, summarized here:

1-GUBIC governance and oversight



The Science Oversight Committee (SOC) includes one member from seven geographic hubs, shown to the left. The SOC will be comprised of: Marc Cadotte (University of Toronto); Myla Aronson (Rutgers University); David Richardson (University of Stellenbosch); Ingolf Kühn (Martin-Luther University Halle-Wittenberg); Petr Pysek (Institute of Botany, Academy of Sciences of the Czech Republic); Rafael Zenni (Universidade Federal de Lavras); and Inderjit Singh (Delhi University). One will serve as the GUBIC director, M. Cadotte will serve in this role to start. The current SOC will have a term of 3 years and then a call for nominees will be sent out Jan. 2022, one for each node.

The SOC will have several responsibilities, including: 1) reviewing data-use and project proposals; 2) admitting new members to the consortium; 3) enforcing policies; 4) resolving disputes; and 5) planning meetings and workshops.

2-Establish working groups to pursue high-priority projects

During the meeting, seven working groups were formed and plans were made for pursuing collaboration to address important urban invasion questions. The six working group topics, were:

1. Traits of urban invaders -specifically, do cities share similar invaders, and if not, what drives differences? Leaders: Ben Baiser, Myla Aronson, Ingolf Kuehn, Marta Carboni.
2. Defining urban and determining if urban and rural habitats offer unique opportunities for invaders. Leaders: Rafael Zenni, Cang Hui
3. Urban invaders and their effects on human health. Leaders: Tim Bonebrake, Carlos Arnillas
4. Impact of urban invasions on ecosystem services/disservices. Leaders: Cristina Martinez-Garza and Carlos Arnillas
5. Impacts of urbanization of the perception of invasive species. Leaders: Tyler Bateman, Menilek Beyene
6. Guiding invasive species management thresholds in urban areas. Leaders: Angela Brandt, Mirijam Gaertner.
7. How urban green space influences invasions. Leaders: Scott MacIvor

These projects advanced in different ways and to different degrees, with some developing a draft of ideas and short timeline to writing a paper, and others requiring data and more thought. The leaders will communicate directly with the group as projects advance.

3-Data synthesis

So far, we have about 500 datasets in hand and are creating a summary dataset with metadata to help consortium members locate datasets and guide analyses. We will provide an updated spreadsheet of available datasets, searchable by location, scale, taxa, etc.. Leaders: Marc Cadotte, Daijiang Li.

4-Establishing a distributed network of data collection/experimental studies

We had a fruitful discussion about establishing a network of urban plots for basic data collection and about how to provide access to add-on experiments. There was a surprising degree of enthusiasm for pursing this model of collaboration, similar to Nutnet (http://www.nutnet.umn.edu/) or Miren (http://www.mountaininvasions.org/), which relies on collaborator contribution to the global project. We discussed potential plot design and add-on experiments. It was decided that we require an additional meeting to fully work out this aspect of the collaboration and we will be planning this meeting (to be held in Hong Kong) in the near future.

5-Future meetings

GUBIC has funds to facilitate more collaborative meetings and is looking to leverage locally available collaborative/meeting funds to GUBIC members to fund travel. We will likely be sending people to a workshop in Stellenbosch in the fall and will have a small group meeting in Hong Kong in the near future to develop study design protocols. Further, we will announce a call for focussed working group meeting proposals in the near future.

Information availability

All documents and meeting archives, including summaries and talks, will be available on a Google drive folder until permanently stored in a University of Toronto repository. The google drive can be found here:

https://drive.google.com/drive/folders/1hiRsiwKr9UI4ptyeqRnDpygPA6KOT3tI?usp=sharing