

## **Integrated Project Summary report YEAR ONE (July 2014 – June 2015).**

Digitization TCN Collaborative Research:  
DOCUMENTING THE OCCURRENCE THROUGH SPACE & TIME  
OF AQUATIC NON-INDIGENOUS FISH, MOLLUSKS, ALGAE, & PLANTS  
THREATENING NORTH AMERICA'S GREAT LAKES (= "Great Lakes Invasives TCN [GLI]")

### **ACCOMPLISHMENTS**

The overall goals of the Great Lakes Invasives TCN project are:

- (1) To digitize ca. 1.73 million specimens from 2,550 species in 101 genera, specifically:
  - 1a) >637,000 plant specimens +
  - 1b) >102,000 fish lots (containing >681,000 fish specimens) +
  - 1c) >44,000 mollusk lots (containing >408,000 mollusk specimens)
- (2) To harvest & organize significant data associated with collections using Symbiota portal software
- (3) To share specimen images and data with the greater scientific community using project-specific Symbiota portal(s) and the iDigBio National Resource
- (4) To promote cross-collection efforts in the study of aquatic/invasive species among at least 18 herbaria + 8 zoological museums from 7 states + Canada
- (5) To promote the use of collections data by educators and the public

Activities in Year One:

- At least six representatives of the GLI TCN attended the iDigBio Annual Summit Meeting in Gainesville, FL on Oct 27, 2014. Most importantly, these included Co-PIs who are overseeing the fish and mollusk imaging. An oral presentation was made by PI Cameron to showcase the new TCN.
- At their own expense 20 GLI TCN participants from MN, WI, IL, MI, & OH traveled to the Field Museum in Chicago on December 15, 2014 for a day-long project workshop in order to discuss workflows and best practices. Presentations given.
- New digitization equipment was purchased by institutions who included this in their budgets, especially by those who are not members of established TCNs. Their data collection is now underway.
- A portable digitization workstation was loaned to UW-Milwaukee, where staff and student workers received training in plant digitization. Data collection is underway.

- One Co-PI (Rabeler) delivered a presentation and represented the GLI-TCN an iDigBio Herbarium Workflows workshop at Valdosta State University, 26-30 January 2015.
- Several representatives attended the annual Society of the Preservation of Natural History Collections Meeting (SPNHC) in Gainesville, FL in late-May, where one participant (Toll) delivered an oral presentation highlighting the project.
- PI Cameron prepared four bi-monthly progress reports for iDigBio and participated in regularly scheduled bi-monthly TCN web conferences.

Specimen Digitization Year One:

**PLANTS**

Specimens Barcoded Only = **50,604**

Barcoded and Imaged to Date = **163,804**

Databased to Date = **182,653**

Uploaded to iDigBio, the GLI Portal or to another Symbiota Portal = **130,826**

\*Note that the new 'Consortium of Midwest Herbaria' Symbiota portal, which is directly related to this TCN, now has 782,296 occurrence records available from 21 herbaria. Only a subset of these records represent the target taxa for the GLI-TCN, but all of these will eventually be ingested by iDigBio.

**FISH**

Lots Barcoded Only = **976**

Barcoded and Imaged to Date = **1,259**

Databased to Date = **109,938**

Uploaded to iDigBio, the GLI Portal &/or another Symbiota Portal = **28,286**

**MOLLUSKS**

Lots Barcoded and Imaged to Date = **3,045**

Databased to Date = **13,461**

Uploaded to iDigBio, the GLI Portal or another Symbiota Portal = **3,404**

**PARTICIPANTS**

Approximately 60 individuals from the 20 primary institutions funded by this effort have been engaged in the GLI-TCN during year one. These represent faculty, curators, permanent and temporary staff, graduate and undergraduate students. Additional participants will join the effort in year two as originally scheduled.

## PUBLICATIONS AND PRODUCTS

- A GLI-TCN project website has been created as a place to share manuals, reports, presentations, press releases, and other information:  
<http://herbarium.wisc.edu/GreatLakes.htm>
- A new collaborative Symbiota portal has been created for herbaria in the Upper Midwest, most of whom are participants in the GLI-TCN; it is the primary site for data processing of plant collections: <http://midwestherbaria.org/portal/>
- A new collaborative Great Lakes Invasives Symbiota portal has been created specifically for this GLI-TCN; it is the primary site for data processing of animal collections:  
<http://greatlakesinvasives.org>
- A customized java 'app' has been created that allows for the creation of skeletal records of imaged data before uploading into Symbiota in order to accelerate the transcription process. It is available to downloading on our project website together with installation and use instructions.
- Alternative digitization methods have been considered, tested, refined, and implemented for processing liquid preserved animal specimens (e.g., fish). An inexpensive, vertical, glass, squeeze tank, long used by ichthyologists to photograph specimens in the field, works well for specimens up to 10cm in length and a student worker can photograph 20 specimens per hour. New paper labels, scale rulers, and color cards are mounted dry on the exterior of the tank so that only the specimen, itself, needs to be transferred into and out of the ethanol-filled jar.
- A second alternative for fish digitization is also being employed by some institutions, specifically photography from above by submerging the specimen in an ethanol-filled glass pan that is suspended approximately one foot above the stage of a camera stand illuminated by two fluorescent lamps. The digitization process is smoothest when two students are working simultaneously; one student prepares the specimens and labels for imaging while the other operates the camera, scans the barcode, enters label information, and checks the quality of the photograph.
- Our TCN has been promoted in the popular press. For example:
  - **UW-Madison News**: Project prepares collection for 21st-century challenge of invasive species: *Sept 12, 2014*
  - **GL Echo - Inviting invasives to the digital world**: *Nov 13, 2014*
  - **CNS - Invasives caught on screen for all to see**: *Nov 14, 2014*
  - The Environment **Report** / MI Public Radio: *Nov 20, 2014*