

DATA PROGRESS SEE TABLES BELOW

- 1) Share and Identify Best Practices and Standards (including Lessons**
- 2) Identify Gaps in Digitization Areas and Technology**
- 3) Share and Identify Opportunities to Enhance Training Efforts**
- 4) Share and Identify Collaborations with other TCNs, Institutions, and Organizations**
- 5) Share and Identify Opportunities and Strategies for Sustainability**
- 6) Other Progress (that doesn't fit into the above categories)**
 - Three of our TCN participants (Ken Cameron, Rich Rabeler, and Aaron Goldberg attended the iDigBio summit in Chatanooga, TN). A brief presentation was made.
 - Ken Cameron, Anna Monfils, and Andrea Miller attended the Upper Midwest Invasive Species Conference in La Crosse, WI. Oct 17-19. Two presentations were made.
 - A PEN proposal was submitted by the Milwaukee Public Museum to join our TCN.
 - The Learning Center team in collaboration with staff from the Morton Arboretum drafted the experience box activity guide consisting of an introduction, content background, three activities, student resources, and museum connections. Activities in the guide are recommended for grades 9-12 but can be adapted for use in grades 6-8. After undergoing a content review by scientific staff at the Morton Arboretum and an instructional design review by education staff at The Field Museum. These teams recommended revisions to the guide, and these have since been incorporated into the current version. In quarter one of 2017, the team plans to test the activities with an advisory group of educators who will make further recommendations, and these will be incorporated into the final draft before the experience box launch. The specimens that will be included in the box have been procured and mounted. Final treatments for educational use and experience box assembly will take place in 2017.
 - An updated report from the Michigan Consortium of Small Herbaria (Anna Monfils, reporting): “We can proudly point to the midwestherbaria.org portal and say the small collections in Michigan contributed 63,113 records to date, with over 22,000 transcribed labels providing valuable data to our ability to study Michigan's biodiversity. In addition, we can show 9 small herbaria in Michigan have been able to contribute over 10,000 records to a national effort to

describe invasive species in the Great Lakes region. Thanks to the combined and concerted effort of big and small collections.”

Additional items to note:

This relates to the value of the small collections and specifically detailed the TCN and MSHI:

Monfils, A.K. 2015. The role of small herbaria in documenting biodiversity through time and space: A vital link in understanding patterns of diversity in invasive macrophytes. 6th Annual Meeting of the Michigan Consortium of Botanists, Eastern Michigan University, Ypsilanti, MI.

Deb Linton, Libby Ellwood, Molly Phillips and I have been leading an effort to promote collections in undergraduate education. As an extension of AIM-UP, we were invited to present on some module using NHC data. This effort was funded by BCoN (with some travel money for Molly Phillips and Deb Linton from iDigBio and CMU respectively).

T. Barbaro, D. Bloom, J. Cook, S. Donovan, E. Ellwood, D. Linton, A.K. Monfils, M. Phillips, and J. Whorley 2016. Incorporating Digitized Natural History Collections Data into the Classroom. 2016 National Academies Special Topics Summer Institute on Quantitative Biology “Lowering the Activation Energy: Making Quantitative Biology More Accessible.” Raleigh, NC. (Resource Session and Poster Presentation).

As a product of the 2016 National Academies Special Topics Summer Institute on Quantitative Biology, a working group titled Biodiversity to Explore Applied Statistical: BEAST was formed. This group is working specifically to develop a biodiversity case study with data from the aquatics TCN to teach students basic statistical concepts (e.g. means, variance, t-tests, regression, etc.) and tools (Excel, R, etc.). So far the group has met twice outside the meeting and the module has been implemented at one institution.

In addition, the ScienceLive video that references the TCN is now posted on the AIM-UP! website: <http://aimup.unm.edu/about/videos.html>. It is the Aquatic Invasive Plants: Follow the Data video.

The CollectionsEducation.org group has given several presentations on the educational materials developed and the Aquatics TCN is recognized in each of these presentations (So is SERNAC so I made sure to include the Aquatics TCN). We are writing this up now for a manuscript with a plan to submit to Systematic Botany.

Krimmel, E.R., D.L. Linton, T.D. Marsico, A.K. Monfils, A.B. Morris, and B.R. Ruhfel. 2016. CollectionsEducation.org: Connecting students to citizen science and curated collections. Botany 2016 (Affiliated with Botanical Society of America and American Society of Plant Taxonomists). Savannah, GA. (Poster Presentation)

Krimmel, E.R., D.L. Linton, T.D. Marsico, A.K. Monfils, A.B. Morris, and B.R. Ruhfel. 2016. CollectionsEducation.org: Connecting students to citizen science and curated collections. 31st

Annual meeting of the Society for the Preservation of Natural History Collections, Berlin, Germany. (Poster Presentation)

- Krimmel, E.R., D.L. Linton, T.D. Marsico, A.K. Monfils, A.B. Morris, and B.R. Ruhfel. 2015. Connecting students to citizen science and curated collections. Botany 2015 (Affiliated with Botanical Society of America and American Society of Plant Taxonomists). Edmonton, Alberta, Canada.
- Krimmel, E.R., A.B. Morris, T.D. Marsico, A.K. Monfils, B.R. Ruhfel, and D.L. Linton. 2015. Connecting students to citizen science and curated collections: www.collectionseducation.org. 30th Annual meeting of the Society for the Preservation of Natural History Collections, Gainesville, FL.
- Krimmel, E.R., D.L. Linton, T.D. Marsico, A.K. Monfils, A.B. Morris and B.R. Ruhfel. 2015. Connecting students to citizen science and curated collections. Association of Southeastern Biologist 2015 Annual Meeting, Chattanooga, TN.

The aquatics TCN was introduced at the following meetings. Both of these meetings were hosted as part of a DEQ grant.

- 2014 Aquatic Invasive Species Monitoring and Management: Statewide Strategy Meeting. Michigan Department of Environmental Quality, Lansing, MI. Monfils, A.K, R. Hackett and A. Mahon. (full day meeting)
- 2014 Aquatic Invasive Species Monitoring and Management: Macrophytes Meeting. Rose Lake Wildlife Area, Michigan Department of Natural Resources, East Lansing, MI. Monfils, A.K. and R.A. Hackett. (Full day meeting)

The following partners are not yet ingested by iDigBio:

Andrews University – MI Small Herbarium Consortium **not directly funded*
Calvin College – MI Small Herbarium Consortium **not directly funded*
Hope College – MI Small Herbarium Consortium **not directly funded*
Western Michigan University – MI Small Herbarium Consortium **not directly funded*

Université de Montréal (Canadensys.net) **not directly funded. No GUIDS?*

New York State Museum *** making good progress but behind schedule*
University of Minnesota, Bell Museum of Natural History Mollusks *** behind schedule*
University of Notre Dame Herbarium *** behind schedule due to loaned equipment*
University of Wisconsin - Stevens Point Plants *** behind schedule due to retirement*
University of Wisconsin - Stevens Point Fish *** behind schedule due to retirement*

Ohio State University, Herbarium *** ?? making good progress / complete*
Ohio State University, Mollusks *** ?? making good progress / complete*
Ohio University *** ?? making good progress / complete*

Great Lakes Invasives TCN Portal Collection Statistics (*as of Dec 15, 2016*)

TARGETS: 637,000 plants + 102K fish lots + 44K mollusk lots = **783,000 “specimens”**

TOTALS FOR USA MUSEUMS: 823,019 records, of which 611,073 (74%) have been imaged
(+ *Canadensys* plant data increases the total to **945,835 records** and 625,351 images)

PLANTS – USA: 677,899 specimen records; 566,264 (84%) imaged; 189,185 (28%) georeferenced

Collection	Records	Imaged	Georeferenced
Albion College	1232	1223	16
Butler University, Friesner Herbarium	10678	5612	6
Calvin College	735	699	0
Central Michigan University	3742	3711	289
Eastern Michigan University Herbarium	2469	2345	620
Field Museum of Natural History	62462	53497	55158
Grand Valley State University	365	359	10
Hillsdale College Herbarium	344	342	15
Hope College	594	583	3
Illinois Natural History Survey	48506	23529	5334
J. F. Bell Museum of Natural History Herbarium	98505	44839	12991
Miami University, Willard Sherman Turrell Herbarium	18188	18152	3
Michigan State University	22174	22035	0
Morton Aboretum	18549	17137	1733
New York Botanical Garden	146990	141820	57213
New York State Museum, Albany	0	0	0
Ohio State University Herbarium - Plants	30395	29772	25663
Ohio University, Bartley Herbarium	4925	4904	0
Seney National Wildlife Refuge	207	207	0
University of Illinois Herbarium	21893	21795	0
University of Michigan Herbarium	75829	67808	7788
University of Notre Dame	0	0	0
University of Wisconsin-LaCrosse	6970	6948	4376
University of Wisconsin-Madison, WI State Herbarium	94351	91377	15907
University of Wisconsin-Milwaukee	7796	7570	2060
University of Wisconsin-Stevens Point	0	0	0

FISH: 98,955 specimen records; 31,822 (32%) imaged; 24,229 (24%) georeferenced

Collection	Records	Imaged	Georeferenced
Field Museum of Natural History - Fish	4855	1497	94
Illinois Natural History Survey - Fish	29905	12846	8325
J. F. Bell Museum of Natural History - Fish	15727	3533	13603
Ohio State University - Fish Division	9033	9005	0
University of Michigan - Fish	34834	643	1762
University of Wisconsin-Madison - Fish	4601	4298	445

MOLLUSKS: 46,165 specimen records; 12,987 (28%) imaged; 12,516 (27%) georeferenced

Collection	Records	Imaged	Georeferenced
Field Museum of Natural History - Mollusks	6438	0	159
Illinois Natural History Survey - Mollusks	12521	2963	11930
J. F. Bell Museum of Natural History - Mollusks	0	0	0
Ohio State University - Mollusc Division	2376	2350	0
University of Michigan Zoology- Mollusks	24299	7214	2
University of Wisconsin-Madison - Mollusks	531	460	425

PLANTS – CANADA: 122,816 records; 14,278 (12%) imaged; 57,504 (47%) georeferenced

Collection	Records	Imaged	Georeferenced
Green Plant Herbarium	18906	0	9832
Herbarium, Biodiversity Centre of Ontario	10230	10230	0
Herbier Louis-Marie (QFA)	13321	0	9895
Herbier du Québec (QUE)	504	0	504
Jardin Botanique de Montréal	1286	0	37
Marie-Victorin Herbarium	35383	394	13491
University of British Columbia Herbarium	26521	3654	14165
University of Manitoba	5745	0	5566
University of Toronto at Mississauga	10920	0	4014

