Quarterly Progress Reports To iDigBio Submitted By Active Thematic Collections Networks (TCNs)

August 2020

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- ~~Google Analytics across ADBC~~
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- Reports from the following **retired** TCNs are no longer included:

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iDigBio is funded by a grant from the National Science Foundation's Advancing Digitization of Biodiversity Collections Program (Cooperative Agreement EF-1115210). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Published on *iDigBio* (https://www.idigbio.org)

Submission #1646

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by kds15e
Wednesday, August 12, 2020 - 11:32
75.128.64.143

TCN Name:
Capturing California's Flowers: Using Digital Images to Investigate Phenological Change in a Biodiversity Hotspot

Person completing the report:
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Progress in Digitization Efforts:
see attached report

Share and Identify Best Practices and Standards (including Lessons Learned):
see attached report

Identify Gaps in Digitization Areas and Technology:
see attached report

Share and Identify Opportunities to Enhance Training Efforts:
see attached report

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
see attached report

Share and Identify Opportunities and Strategies for Sustainability:
see attached report

Share and Identify Education and Outreach (E&O) Activities:
see attached report

Google Analytics

Other Progress (that doesn't fit into the above categories):

Attachment 1
August2020QuarterlyReport.pdf

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1646

CALIFORNIA PHENOLOGY TCN – QUARTERLY REPORT – AUGUST 2020

Assembled by Katie Pearson, 6 August 2020

PROGRESS IN DIGITIZATION EFFORTS:

Figure 1 shows our progress in imaging, transcribing, georeferencing, and phenologically scoring the target specimens for our project, explained more in detail in the following sections.

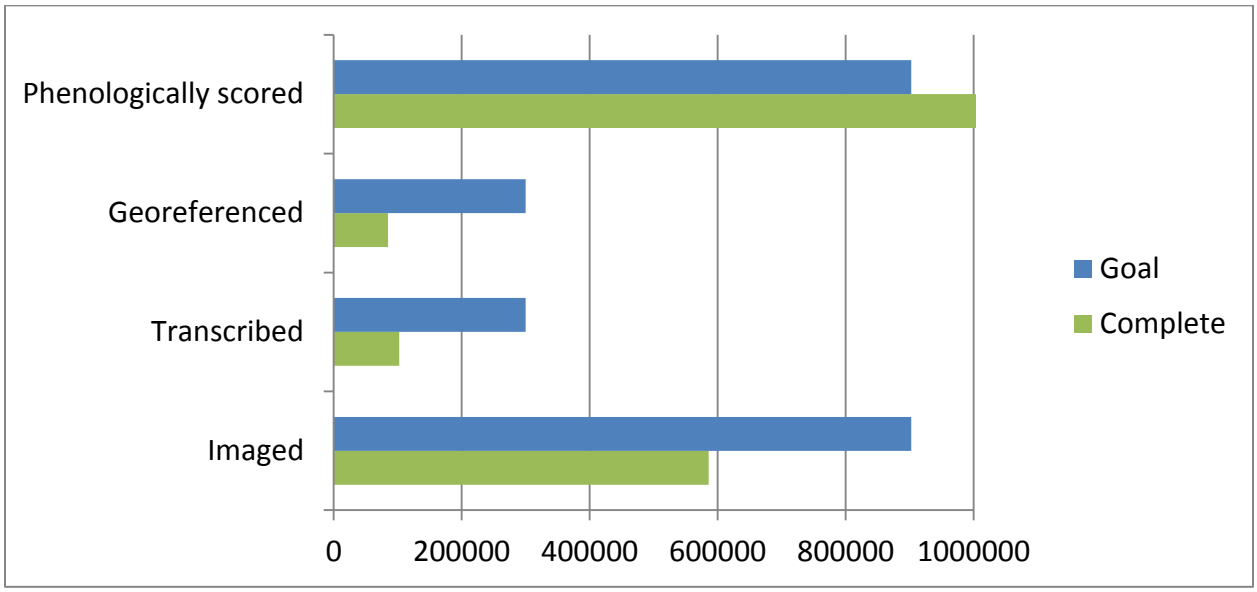

Figure 1

TRANSCRIPTION

An estimated 102,000 specimen records have been transcribed across the CAP Network since July 2019. This is approximately 34% of the goal number of transcriptions to be produced by this project.

GEOREFERENCING

The estimated number of georeferenced specimens reported in the May quarterly report was in error. We now estimate that we have georeferenced 85,000 specimen records, which is 28% of our goal.

IMAGING

Eight of our 22 herbaria (36%) have completed their imaging goals (Figure 2). Of the remaining herbaria, 25% have been able to resume imaging after the California shelter-at-home order in March. The other herbaria have used this time offsite to process images, georeference specimens, and transcribe specimens. As a result, our numbers of imaged, transcribed, and georeferenced specimens have continued to increase. Figure 2 shows the current state of CAP imaging as of August 1, 2020.

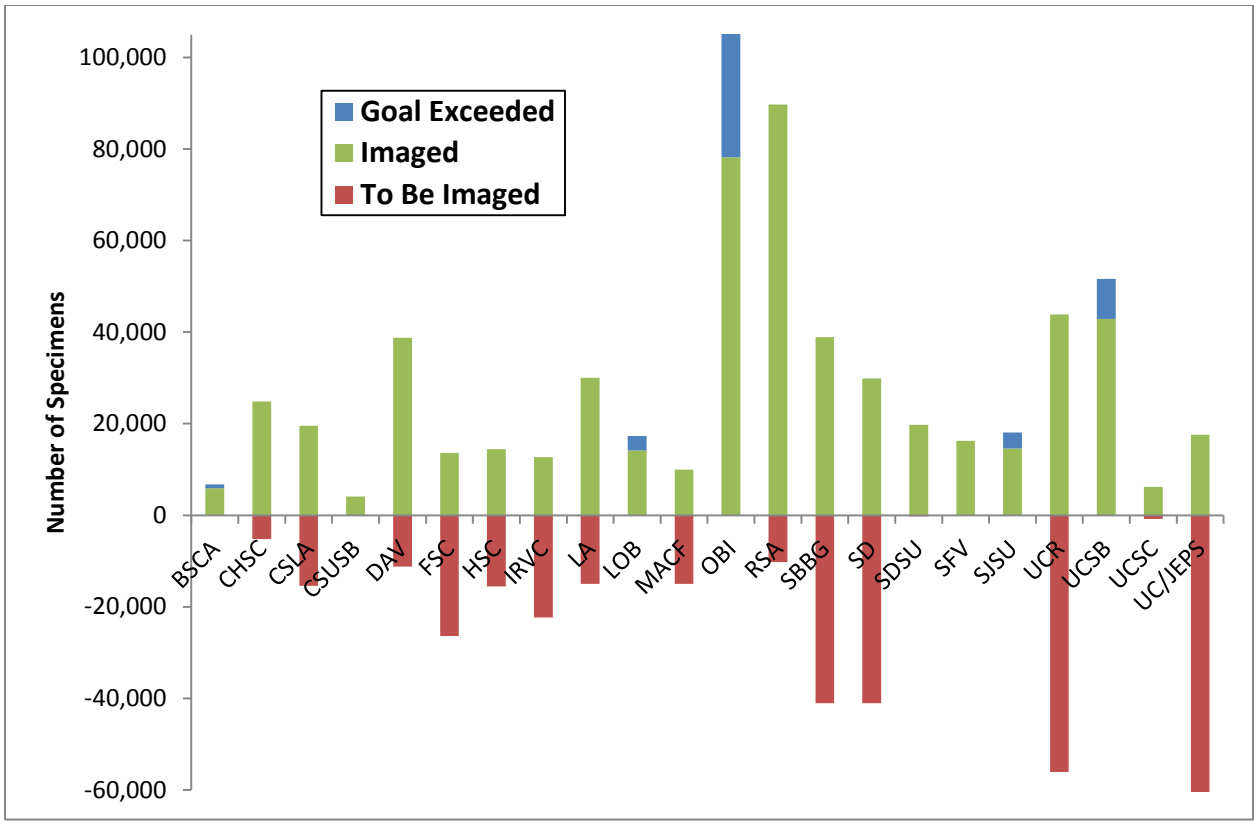

Figure 2. Herbarium specimen imaging progress. Green portions represent the number of specimens that have been imaged, while blue portions represent the number of specimens that have been imaged beyond the expected target specimens. Red bars below the zero line indicate the number of target specimens that have not yet been imaged.

SHARE AND IDENTIFY BEST PRACTICES AND STANDARDS (INCLUDING LESSONS LEARNED)

The project manager continues to host weekly Zoom co-working hours; however, attendance at these virtual hours has significantly declined, likely due to summer vacation. We are now strategizing ways of recruiting remote volunteer georeferencers.

On May 22, 2020, we met with our Data Advisory Committee to demonstrate the new phenological scoring tools and standards. There was broad agreement that a potential next step would be to create a phenology extension for the Darwin Core. We will continue to pursue this possibility.

IDENTIFY GAPS IN DIGITIZATION AREAS AND TECHNOLOGY

We are continuing to develop the functionality of our CCH2 data portal. Currently, we lack a way to search by, download, and visualize specimens' phenological scorings, though these data currently exist. We are also developing a way to track who downloads our data and for what purpose.

SHARE AND IDENTIFY OPPORTUNITIES TO ENHANCE TRAINING EFFORTS

We developed a complete online georeferencing course including training videos and quizzes for four modules: https://www.capturingcaliforniasflowers.org/georeferencingcourse.html. By doing this, we hope to recruit georeferencing volunteers continuously rather than having to build up a critical mass of potential trainees to conduct a virtual training. The separation of training materials into four modules will hopefully decrease the incidence of volunteers becoming overwhelmed with new information, which we experienced with one potential volunteer. Volunteers can take training at their own pace, with encouragement from the PM.

We held a CAP collaborators' meeting on June 8, 2020 to discuss how institutions are adapting to COVID-19 precautions, how annual reports will be drafted, the possibility of no-cost extensions, the status of the project so far, what training resources exists, and our plan for recruiting georeferencing volunteers.

We are updating documentation and protocols with the latest best practices in preparation of onboarding new partner institutions (see next section).

SHARE AND IDENTIFY COLLABORATIONS WITH OTHER TCNS, INSTITUTIONS, AND ORGANIZATIONS

Due to momentum from the June 2020 CAP conference call, the Consortium of California Herbaria was able to meet virtually in July 2020 to discuss issues of CCH administration and data sharing, such as with Calflora. The newly formed CCH Administrative Committee plans to come to an agreement with Calflora about data sharing that hopefully addresses concerns of data integrity and attribution.

Specimen data from the Eagle Lake Field Office Herbarium (ELH) was incorporated into CCH2 in July 2020, and this collection is now managed live in CCH2. The PM is also working with the Sequoia and Kings Canyon National Parks Herbarium (THRI) to manage their collection live in CCH2 as well.

The lead PI and PM are participating in the BIOME Institute (an event sponsored by BioQuest and QUBES) to further develop the course-based undergraduate research experience (CURE) we implemented in spring 2020 (see Education and Outreach section). This institute consists of two launch weeks and a semester-long agenda of development through fall 2020.

The PM is also involved in the Biological Collections in Ecology and Evolution Network (BCEENET) as a collaborating developer.

The PM presented on the CAP CURE at the Botany 2020 meeting and received several inquiries for further development and use of these resources. We have been in directly contact with faculty at Northeastern State University, Ashland University, and Oklahoma University.

The PM presented a poster and an INSPIRE presentation at the Ecological Society of America 2020 meeting. Both presentations aimed to alert ecologists of the phenological data available for research

and education in the CCH2 data portal. The INSPIRE talk was part of a session organized by the U.S. National Phenology Network and the National Ecological Observatory Network.

A PEN grant titled Expanding and enhancing the California Phenology TCN was funded in late July. Led by Dr. Aaron Liston at Oregon State University, this PEN will enlarge the CAP digitization network to include six additional herbaria at the following institutions: Oregon State University (OSC), California Department of Food and Agriculture (CDA), Pacific Union College (PUA), San Francisco State University (SFSU), CSU Stanislaus (SHTC), and University of Nevada, Las Vegas (UNLV). The PEN also includes funds to digitize Baja California specimens at the San Diego Natural History Museum Herbarium (SD). In sum, the PEN aims to digitize over 150,000 herbarium specimens from 2020-2023. By expanding the geographic scope to encompass Oregon and the northern Baja California peninsula, the CAP TCN will now cover the entire California Floristic Province. The PM is now working with PI Liston to develop an onboarding strategy for the new partner institutions, and we are updating our documentation and protocols with the newest best practices.

SHARE AND IDENTIFY OPPORTUNITIES AND STRATEGIES FOR SUSTAINABILITY:

We are continuing to develop training videos to reduce the need for in-person trainings, which will enable training of new students and technicians past the conclusion of the CAP grant.

SHARE AND IDENTIFY EDUCATION AND OUTREACH (E&O) ACTIVITIES:

The PM shares updates on the project and phenology-related news via the network Twitter account (@CalPhenologyTCN). All presentations from Botany 2020 and ESA 2020 were posted to the CAP YouTube channel for maximum visibility.

Three Notes from Nature expeditions were completed in May, June, and July 2020, resulting in 4,763 specimens from three institutions (CSLA, FSC, IRVC) being fully transcribed and their data imported into CCH2. We launched two additional expeditions for two institutions (CSLA, FSC) in June.

Five blog posts were written and published to the CAP website: https://www.capturingcaliforniasflowers.org/blog-recap.

The CAP Network, specifically lead PI Jenn Yost, was featured in the summer 2020 California Native Plant Society (CNPS) newsletter *Flora*. The article described the project and featured many images of herbarium specimens newly digitized by this project.

The UC Irvine herbarium was featured in the eNews of the Orange County CNPS Chapter. The article interviewed collections manager Rebecca Crowe and discussed how CNPS members can get involved in specimen transcription from home using Notes from Nature.

The CAP CURE concluded in June 2020. Student feedback and the results of post-course assessments are positive. All 19 students completed research projects that used herbarium specimens to examine phenological trends of California plants. The students summarized their results in scientific posters.

Students reported significant improvements in their understanding of key topics such as reading primary scientific literature and designing an experiment or analysis to answer a scientific question. Students also reported that they were now more comfortable practicing research skills like manipulating and cleaning data, analyzing data using linear regression, working with herbarium specimen data, and creating a scientific poster. An overview and description of the results of the project can be viewed in our Botany 2020 presentation here: https://youtu.be/Le1zewbdOXs or read in our blog post here: https://www.capturingcaliforniasflowers.org/blog-recap/cap-launches-new-research-course-at-cal-poly-with-stunning-success). A Cal Poly News article was also published about the course: https://www.calpoly.edu/news/botany-students-study-effects-climate-change-using-100-year-old-plants. We are now working to improve this course in collaboration with PI Susan Mazer at UC Santa Barbara and with momentum from the BIOME 2020 Institute (see Collaborations section).

Published on *iDigBio* (https://www.idigbio.org)

Submission #1636

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by BruceL
Friday, August 7, 2020 - 13:23
140.186.130.137

TCN Name:
The Cretaceous World: Digitizing Fossils to Reconstruct Evolving Ecosystems in the Western Interior Seaway

Person completing the report:
blieber@ku.edu

Progress in Digitization Efforts:
Regarding the University of Kansas portion of the project, led by PI Bruce S. Lieberman (BSL) and with major involvement from collections manager Natalia Lopez Carranza (NLC), we have databased 136,476 fossil specimens total. 110,742 of these specimen records are also georeferenced. In addition, we have georeferenced 524 localities since the last reporting period and have now georeferenced a total of ~ 9,824 localities associated with this project (the results presented here use the query associated with the web version of Specify due to COVID-19, and seem to be not quite as accurate as what we could report if we used the desktop version of Specify). This work has been performed by NLC and undergraduate Wade Leibach. All KU data have been shared with iDigBio and GBIF. One of the tasks that NLC has also been focusing on is checking our data quality flags and cleaning our data and thus far she has resolved > 80% of all data flags on GBIF.

Regarding the Fort Hays State University portion of the project, led by PI Laura Wilson:

Since their last update, collection staff spent their time editing and uploading images (that were already captured and recorded in previous updates), cleaning up Cretaceous-related data in the database, and creating web-based content on the Sternberg's WIS collection.

Regarding the University of Texas portion of the project, led by Rowan Martindale and Lisa Boucher with major participation from Liath Appleton

They have 24,433 Cretaceous cataloged records, representing ~80,000 specimens total, with 0 new records databased since the last report April 16, 2020. Of the total number of

specimen records, 24,166 have been georeferenced.
In addition, they have now georeferenced a total of 5,804 Cretaceous localities (out of 5,827 associated with this project 0 localities georeferenced since our last report). They generated 943 new images since our last report. The total number of images attached to our Specify database is 10,610.

Regarding the Yale University portion of the project, led by PI Susan Butts

They have databased 110,143 specimen lots cataloged (164K+ specimens) Cretaceous specimens total, with 2,596 databased since the last reporting period. 104,406 of these specimen records are also georeferenced. In addition, they have georeferenced 1 locality since the last reporting period and now georeferenced a total of 2,449 (of 2601 total) Cretaceous localities associated with this project.

Regarding the University of Colorado portion of the project, led by PI Talia Karim (TK):

They have databased 20,827 Cretaceous specimens total, with 2 databased since the last reporting period. 13,460 of these specimen records are also georeferenced.

In addition, they have georeferenced no new localities since the last reporting period and now georeferenced a total of 895 Cretaceous localities associated with this project. They have been working remotely on transcribing locality data over the summer and have plans to train and hire a new student this fall to complete the remaining georeferencing. Several other collections on campus also plan to have students georeference remotely in the fall and they are tentatively planning some joint training sessions for these students via Zoom.

They also generated 1,234 new images in June, and likely a similar number for July (I have not been able to go in to the collection and check). One of their digitization assistants was granted campus access for essential research and has been able to come in most of June and July 2020 to continue imaging.

Share and Identify Best Practices and Standards (including Lessons Learned):
N/A

Identify Gaps in Digitization Areas and Technology:
N/A

Share and Identify Opportunities to Enhance Training Efforts:
Regarding the University of Kansas portion of the project, led by PI Bruce S. Lieberman (BSL), undergrad Wade Leibach, who spent several years databasing and georeferencing for us has graduated and finished up his work on the project and will be attending graduate school in paleontology at the University of Missouri. We have also recruited a new graduate student (female) for the coming year to focus on imaging our collection and using fossil specimens to perform morphometric research analyses.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
N/A

Share and Identify Opportunities and Strategies for Sustainability:
N/A

Share and Identify Education and Outreach (E&O) Activities:
Regarding the University of Kansas portion of the project, led by PI Bruce S. Lieberman (BSL), one of the key outreach products associated with the project has also been completed. In particular, BSL and Rod and Zach Spears released the 2nd App: the "Digital Atlas Identify" App. It allows fossil collectors to take pictures of fossils and send to scientists (currently BSL) for identification. The App connects directly with the Digital Atlas App so they can learn about fossils. It is available for free on the Apple App store and works for iPhone; since being released ~ 1 month ago it already has > 640 downloads. The top 5 countries for downloads are: U.S.A; U.K.; Canada; Australia; and Denmark. Already identifications have been provided on several hundred fossils submitted by ~ 100 users.

In the month of July the Digital Atlas of Ancient Life received more than 8,000 clicks with 797,000 impressions on the web and the Cretaceous Atlas received more than 650 clicks with 31,500 impressions on the web.

Regarding the South Dakota School of Mines & Technology portion of the project, led by co-PI Laurie Anderson:

In the last period they developed two curricular materials for K-12 students that are shared via the Digital Atlas of Ancient Life.

Regarding the Paleontological Research Institution portion of the project, led by PI Jonathan Hendricks

As of June 30, 2020, all funds at the Paleontological Research Institution (PRI; PI Hendricks) related to the Cretaceous World TCN have been exhausted. They have concluded their work and will not be providing future updates. While major work on the project at PRI is now concluded, there are a few new accomplishments to report related to the project, most of which pertain to the Digital Encyclopedia of Ancient Life (DEAL) and Virtual Collection.

New Digital Encyclopedia of Ancient Life Resources

The most notable accomplishment since the time of the previous report was the completion of a multi-page Digital Encyclopedia of Ancient Life chapter about modern and fossil echinoderms by PRI staff members Jaleigh Pier and Dr. Jansen Smith. This chapter can be explored at: http://www.digitalatlasofancientlife.org/learn/echinodermata/.

Further, Dr. Smith made great headway on development of a DEAL chapter about modern and fossil arthropods. This chapter requires a bit of additional work, which will be completed by PI Hendricks during the next month or two (Dr. Smith will soon be moving on to another position). Completion of this chapter will mean that the DEAL has provided coverage of nearly all major groups of fossil macroinvertebrates, along with coverage of modern and fossil plants (pages developed by Dr. Elizabeth Hermsen) and conceptual topics including geologic time, paleoecology, conservation paleobiology, systematics, and macroevolution. In total, the Digital Encyclopedia is currently represented by 16 chapters,

most of which are now fully developed. Explore the current contents at: https://www.digitalatlasofancientlife.org/learn/.

Virtual Collection

During the spring 2020 COVID pandemic, many college-level instructors found themselves needing to rapidly shift their in-person, specimen-based paleontology lab courses to an online format. The Digital Atlas of Ancient Life Virtual Collection of over 500 online, interactive 3D models (https://www.digitalatlasofancientlife.org/vc/) provided a much needed resource during this interval. A common piece of feedback that we received from instructors, however, is that using the existing models for assessment was challenging because the taxonomic assignments of specimens (e.g. “Trilobite”) appeared in the names of the models, giving away the answers for some types of questions (unfortunately, there is no inexpensive option in Sketchfab for hiding this information).

To remedy this and make the collection more valuable to instructors moving forward, PRI is funding the development of a collection of 50-75 additional models that will be part of a “test sample collection,” akin to a group of specimens that an instructor might only display during laboratory practical exams. This test collection will be shared on Sketchfab (which hosts our 3D models), but will be hidden from public view (a link will be needed to access the models) and model names will not include any identifying information. We hope to share this new collection of test specimens with the community by the end of August 2020 in time for the fall 2020 semester.

On June 11, PI Hendricks shared a very brief overview of the Digital Atlas project as a panelist at the SPNHC Educational Materials Share Session. PRI staff member Jaleigh Pier, who will soon begin a Ph.D. graduate program at Cornell University, will be leading a virtual talk at the Geological Society of American meeting this fall on the Virtual Collection and its use in online learning. Finally, Hendricks will be presenting a talk at PRI’s 2020 Summer Symposium (devoted this year to the important topic of Diversity, Equity, and Inclusion in Paleontology) on “Free Resources for Teaching Paleontology Online,” which will be focused on Digital Atlas products.

Social Media

Social media numbers:
• The Digital Atlas Twitter account (@PaleoDigAtlas) currently has 1,482 followers (up from 1,454).
• The Digital Atlas Facebook account (@PaleoDigAtlas) currently has 282 followers (up from 1,454).
• The Digital Atlas Sketchfab account has 597 models posted (up from 524) and 592 followers (up from 465).

Regarding the University of Colorado portion of the project, led by PI Talia Karim (TK): They have posted several Cretaceous invertebrate images on their instagram (@CUMNH_invertpaleo) for #fossilfriday during the reporting period and have written up several object of the month posts for the CU Museum Website based on specimens digitized for this project.

Google Analytics

Other Progress (that doesn't fit into the above categories):
Regarding the University of Kansas portion of the project, led by PI BSL, we have submitted two papers describing the results from research. The first, with former graduate student Erin Saupe, who is now an associate professor at Oxford University and former post-doc Michelle Casey, who is now an associate professor at Towson University, focuses on the relationship between macroevolutionary rates of speciation and extinction and the geographic range and abundance of species. We actually found that at certain times abundance appears to be a better predictor of extinction resistance than geographic range, but this seems to be associated with distinctive environmental conditions. The second, with former post-doc Luke Strotz, who is now a post-doc based in Australia, looks at patterns of ecological stability in the fossil record and considers to what extent species assemblages are stable over long intervals of time. We found that the precise taxonomic composition of assemblages does not appear to be stable and instead varies. However, total diversity levels, which vary across different environments, do happen to show stability over very long intervals of time.

We requested and received a no cost extension from NSF for the project, meaning we will now conclude in June of 2021. Lastly, because PI BSL will be starting his work as a rotating program officer at NSF-DEB effective August 3rd he has stepped down as the PI and a new PI has been appointed: Chris Beard, who was formerly a co-PI and is curator in vertebrate paleontology here at KU; this change has been approved by NSF.

Regarding the Fort Hays State University portion of the project, led by PI Laura Wilson:

They have concluded their work on the project and will not be submitting future updates.

Regarding the South Dakota School of Mines & Technology portion of the project, led by co-PI Laurie Anderson:

They have concluded their work on the project and will not be submitting future updates.

Regarding the University of Texas portion of the project, led by Rowan Martindale and Lisa Boucher with major participation from Liath Appleton

They also requested and received a no cost extension from NSF for the project so they will be continuing on for another year.

COVID-19 impacts: The graduate student working with them during spring semester, Stacie Skwarcan, was not able to image new specimens when their university was closed due to the pandemic (mid-March). However, she was able to continue some digitizing efforts remotely, such as editing and attaching existing images to Specify and updating records. They were able to reopen their collection in a limited capacity in early June following their university's restart plan for labs. Their collection reopening, as well as the grant no-cost extension, has made it possible for Stacie to continue digitizing our Cretaceous records this summer. However, their volunteer georeferencers have not been able to return to their collection yet due to university restrictions on number of

people/space, and the few remaining Cretaceous localities left are challenging and those that may be resolved require access to physical records.

Regarding the Paleontological Research Institution portion of the project, led by PI Jonathan Hendricks

They have concluded their work and will not be providing future updates.

Regarding the Yale University portion of the project, led by PI Susan Butts:

They have concluded their work on the project and will not be submitting future updates.

Regarding the University of Colorado portion of the project, led by PI Talia Karim (TK):

they requested and received a no cost extension from NSF for the project, so they will be continuing on.

Regarding the University of New Mexico (UNM) portion of the project, led by PI Cori Myers (CM):

They have completed all of their aims associated with the project and finished up and will not be providing any future updates.

Attachment 1

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1636

Published on *iDigBio* (https://www.idigbio.org)

Submission #1639

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by mpace
Tuesday, August 11, 2020 - 13:41
66.232.49.62

TCN Name:
Digitizing "Endless Forms": Facilitating Research on Imperiled Plants with Extreme Morphologies

Person completing the report:
mpace@nybg.org

Progress in Digitization Efforts:
-Major progress has been made with 91% of the promised specimens barcoded, 52% digitized.

-Five institutions (33%) over delivered on digitized specimens, i.e., they barcoded or imaged more specimen than promised.

-The majority of participants in the TCN are undergraduate students or recent graduates who gained significant work place experience working in major natural history museums.

-546 online volunteers / citizen scientists help transcribe specimen records on Digivol and/or Notes from Nature.

Share and Identify Best Practices and Standards (including Lessons Learned):
none

Identify Gaps in Digitization Areas and Technology:
none

Share and Identify Opportunities to Enhance Training Efforts:
none

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
none

Share and Identify Opportunities and Strategies for Sustainability:
none

Share and Identify Education and Outreach (E&O) Activities:
45 students (primarily undergraduate, but also including high school and recent college graduates) have received some form of training and professional development across all institutions. This includes training in GIS analysis, specimen digitization and data curation, and general work place culture.

Several partner institutions are opening direct communications with hobbyist groups that focus on the included plant groups, to help spread awareness of the importance of natural history collections, and to help recruit volunteers to augment digitization efforts.

Partner institutions created bilingual displays (BRIT), or held tours / science open houses (many institutions) that highlighted the groups featured in this TCN, and/or directly discussed this TCN directly.

Many partner institutions held Zoom webinars, and/or WeDigBio webinars, and/or Notes from Nature and/or Digivol transcriptions expeditions focusing on the taxa included in this TCN, or the TCN itself.

Google Analytics

Other Progress (that doesn't fit into the above categories):

Attachment 1
EndlessForms_TCN_annual_report_2019_SUMMARY.pdf

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1639

NSF Project Reporting Format

This document has been developed to provide Principal Investigators (PIs), co-PIs, and research organizations with:

- a listing of the questions that will be asked in the new NSF project reporting format;
- assistance in planning for the submission of the report; and
- a tool to help PIs collaborate with other contributors in answering these questions, if needed.

The project reporting service on Research.gov and the associated help documentation provides more detailed instructions and contextual assistance.

Note: NSF project reports are not cumulative and should always be prepared for the specific project reporting period only.

PIs should NOT complete and upload this document to Research.gov in order to meet your reporting requirement. You are required to enter text in the text boxes available

Accomplishments

You have the option of selecting “nothing to report” in this section.

What are the major goals of the project?

Digitize and make publicly accessible online 2,000,000 collections of epiphytic, carnivorous, and succulent plants housed at 14 participating U.S. herbaria, universities, and botanical gardens. Engage with the hobbyist communities who have interests in these taxa. Train a diverse range of students in museum specimen digitization, and species conservation assessment. Engage the Natural History Community in a dialog about how location data of sensitive species are shared digitally.

What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?

Major Activities:

-Major progress has been made with 91% of the promised specimens barcoded, 52% digitized.

-Five institutions (33%) over delivered on digitized specimens, i.e., they barcoded or imaged more specimen than promised.

-The majority of participants in the TCN are undergraduate students or recent graduates who gained significant work place experience working in major natural history museums.

-546 online volunteers / citizen scientists help transcribe specimen records on Digivol and/or Notes from Nature.

-Several outreach events have taken place, in particular virtual transcription of specimen data by citizen scientists and hobbyists.

Specific Objectives:

SUMMARY FOR ALL INSTITUTIONS		
Items digitized	**Total Costs (total years 1 & 2)**	**Average Cost/Specimen**
1,046,638	$742,739.90	$0.71

	ALL INSTITUTIONS, INDIVIDUAL		
Institution	**Items digitized**	**Total Costs ($) (Year 2)**	**Average Cost/Specimen ($)**
New York Botanical Garden	177338	83430	0.35
Botanical Research Institute of Texas	32519	12878	0.96
California Academy of Sciences	62091	49200	1.64
Field Museum	134453	117392	1.04
Harvard University	31328	64853	2.07
Illinois Natural History Survey	41486	14884	0.44
Marie Selby Botanical Garden	48266	15881	0.55
Missouri Botanical Garden	56696	18460	0.33
Philadelphia Academy of Science	33721	6523	0.61
University of California	10512	5385	0.56
University of Massachusetts	10587	1286	0.12
University of Michigan	20278	11926	0.98
University of Minnesota	10459	6229	0.43
University of Texas	26958	11826	0.44
University of Wisconsin Madison	56276	46119	0.87

SUMMARY FOR ALL INSTITUTIONS			
ACTIVITY	**OBJECTIVE**	**COMPLETED TO DATE**	**% TOTAL COMPLETED**
Imaging	1,428,227	694,081	49%
Bar coding	1,042,955	814,898	78%
Data Entry	1,160,560	596,067	51%
Geo-Ref	1,002,883	154,916	15%

Note: Please do not upload this document to Research.gov in order to meet your reporting requirement. You are required to enter text in the text boxes available online.

	ALL INSTITUTIONS, INDIVIDUAL * = number delivered higher than objective											
Institution	Objective	to barcode	# barcoded	to image	# imaged	# data entry	to geo-ref	# geo-ref	% barcoded	% imaged	% data entry	%geo-ref
New York Botanical Garden	190892	166389	177338 *	190892	138578	41272	202689	7236	107 *	72.5	24.8	4.3
Botanical Research Institute of Texas	62796	61673	32519	43022	34147	24264	18009	8266	52.7	79	39	46
California Academy of Sciences	70000	70884	62091	83436	41879	70884	33582	15522	89	51	89	25
Field Museum	132620	132620	134453 *	132620	113312	134453 *	35000	36506 *	101 *	85	101 *	104 *
Harvard University	261403	261403	167900	276549	137548	167900	310541	9192	64.2	49.7	64.2	3
Illinois Natural History Survey	47968	49272	41486	49272	34361	34180	49272	2474	84	69	69	5.7
Marie Selby Botanical Garden	53455	18614	28731 *	49998	28731	13692	45137	10013	154.3 *	57.5	25.6	22.2
Missouri Botanical Garden	49088	49088	16017	302217	40148	16017	105279	12273	32.6	13.3	32.6	11.7
Philadelphia Academy of Science	35000	35000	33721	35000	33721	33721	35000	8510	96	96	96	24
University of California	85326	77022	10512	85326	9607	5244	4038	4038	13.6	11.3	6.8	100
University of Massachusetts	11788	7787	7721	7787	4606	8466	11778	8466	99.1	59.1	71.8	71.9
University of Michigan	69500	51100	20278	64700	12955	5384	57500	5384	39.7	31.3	7.7	9.4
University of Minnesota	20679	10459	16255 *	20679	14441	2097	15509	6586	155 *	70	20	42
University of Texas	49980	18476	26958	41414	3000	26938	40649	1000	145.8	7.2	53.9	2.5
University of Wisconsin Madison	46913	33168	56276	45315	47047	28893	38900	19450	170 *	104 *	62	50

Significant Results:

- 52% of the promised specimens were digitized within the first two years of this project across all institutions

- 546 citizen scientists / online volunteers helped to transcribe records, gaining insight to the importance of natural history specimens.

-33% of institutions delivered more digitized specimens than initially promised.

Key outcomes or other achievements:

32 tours or open houses across the included institutions discussed or otherwise highlighted this TCN. The project was discussed in the context of national digitization efforts, the conservation threats of the included species were presented, and engagement via potential volunteering was encouraged.

Note: Please do not upload this document to Research.gov in order to meet your reporting requirement. You are required to enter text in the text boxes available online.

What opportunities for training and professional development has the project provided?

45 students (primarily undergraduate, but also including high school and recent college graduates) have received some form of training and professional development across all institutions. This includes training in GIS analysis, specimen digitization and data curation, and general work place culture.

How have the results been disseminated to communities of interest?

Several partner institutions are opening direct communications with hobbyist groups that focus on the included plant groups, to help spread awareness of the importance of natural history collections, and to help recruit volunteers to augment digitization efforts.

Partner institutions created bilingual displays (BRIT), or held tours / science open houses (many institutions) that highlighted the groups featured in this TCN, and/or directly discussed this TCN directly.

Many partner institutions held Zoom webinars, and/or WeDigBio webinars, and/or Notes from Nature and/or Digivol transcriptions expeditions focusing on the taxa included in this TCN, or the TCN itself.

What do you plan to do during the next reporting period to accomplish the goals?

The COVID-19 Coronavirus pandemic has significantly affected progress on this TCN for multiple participating institutions. Most significantly, the Sensitive Data Sharing Symposium, which was planned for the in-person SPNHC 2020 meeting, had to be postponed. Five speakers were actively working on presentations, and we are pursuing alternatives to either present as a stand-alone virtual webinar, or possibly host the symposium at the 2021 SPNHC meeting (assuming it will be held).
At least two institutions, Illinois Natural History Survey and the University of Minnesota, had to stop work completely from April to June and did not have access to their institutional database from home. Nearly all other participating institutions experienced some sort of shut down or major reduction in staff numbers (e.g., student interns suddenly leaving campus at the University participants, or staff hours being reduced to part time) or staff access (e.g., staff not being allowed on site at NYBG Harvard, Field Museum, Missouri BG, BRIT, and many others). Imaging essentially stopped in mid-March due to these restrictions. As campuses and museums reopen, we anticipate work flows will still be interrupted due to reduced staff numbers, social distancing requirements, intermittent periods of working from home, and staggered work schedules. Fortunately, 91% of the specimens have been barcoded, and several of the biggest participating institutions have made significant progress in imaging prior to the shutdowns (e.g., NYBG, Harvard, Field Museum).

Note: Please do not upload this document to Research.gov in order to meet your reporting requirement. You are required to enter text in the text boxes available online.

We will continue to make inroads and form partnerships with hobbyist groups, via emails, and in-person discussions.

Train any additional participants who may join the project.

NOTE: You may upload PDF files with images, tables, charts, or other graphics in support of the Accomplishments section. You may upload up to 4 PDF files with a maximum file size of 5 MB each.

Products

You have the option of selecting "nothing to report" in this section. There are no limitations to the number of entries you submit and you can also pull information directly from Thomson Search when using the online tool on Research.gov.

Within the Products section, you can list any products resulting from your project during the specified reporting period, such as:

Journals: nothing to report

Books: nothing to report

Book Chapters: nothing to report

Thesis/Dissertations: nothing to report

Conference Papers and Presentations: Singer, R. A., R. K. Rabeler, E. M. Tucker, and G. Holman. 2020. Digital Workflows using Specify at the University of Michigan. SPNHC 2020 virtual meeting, June 11, 2020.

Other Publications: nothing to report

Technologies or Techniques: nothing to report

Patents: nothing to report

Inventions: nothing to report

Licenses: nothing to report

Websites: Project Website: **http://sweetgum.nybg.org/science/projects/endlessforms/**

Other Products:

NOTE: You may upload PDF files with images, tables, charts, or other graphics in support of the Products section. You may upload up to 4 PDF files with a maximum file size of 5 MB each.

What other organizations have been involved as partners?

The online service will also ask you for additional information such as:

- Type of Partner Organization
- Name

- Location
- Partner's contribution to the project

Have other collaborators or contacts been involved? No

Impacts

You have the option of selecting "nothing to report" in this section.

What is the impact on the development of the principal discipline(s) of the project?

nothing to report

What is the impact on other disciplines?

nothing to report

What is the impact on the development of human resources?

nothing to report

What is the impact on physical resources that form infrastructure?

nothing to report

What is the impact on institutional resources that form infrastructure?

nothing to report

What is the impact on information resources that form infrastructure?

nothing to report

What is the impact on technology transfer?

nothing to report

What is the impact on society beyond science and technology?

nothing to report

Changes / Problems

If not previously reported in writing to the agency through other mechanisms, provide the following additional information or state, "Nothing to Report", if applicable.

Changes in approach and reason for change:

nothing to report

Actual or Anticipated problems or delays and actions or plans to resolve them:

The COVID-19 Coronavirus pandemic has significantly affected progress on this TCN for multiple participating institutions. Most significantly, the Sensitive Data Sharing Symposium, which was planned for the in-person SPNHC 2020 meeting, had to be postponed. Five speakers were actively working on presentations, and we are pursuing alternatives to either present as a stand-alone virtual webinar, or possibly host the symposium at the 2021 SPNHC meeting (assuming it will be held).
At least two institutions, Illinois Natural History Survey and the University of Minnesota, had to stop work completely from April to June and did not have access to their institutional database from home. Nearly all other participating institutions experienced some sort of shut down or major reduction in staff numbers (e.g., student interns suddenly leaving campus at the University participants, or staff hours being reduced to part time) or staff access (e.g., staff not being allowed on site at NYBG Harvard, Field Museum, Missouri BG, BRIT, and many others). Imaging essentially stopped in mid-March due to these restrictions. As campuses and museums reopen, we anticipate work flows will still be interrupted due to reduced staff numbers, social distancing requirements, intermittent periods of working from home, and staggered work schedules. Fortunately, 91% of the specimens have been barcoded, and several of the biggest

participating institutions have made significant progress in imaging prior to the shutdowns (e.g., NYBG, Harvard, Field Museum).

Although we do not anticipate being able to return to pre-shut down imaging rates due to continued shutdowns, staff reductions, and social distancing requirements, we have taken the period between March and July to shift our focus to data transcription and georeferncing, and many institutions also took this opportunity to greatly expanded virtual citizen science outreach and transcription through the Notes from Nature and DIGIVOL sites.

Changes that have a significant impact on expenditures:

nothing to report

Significant changes in use or care of human subjects:

nothing to report

Significant changes in use or care of vertebrate animals: nothing to report

Significant changes in use or care of biohazards: nothing to report

Special Requirements

This report section is only available when Special Requirements are specifically noted in the solicitation and approved by the Office of Management and Budget.

NOTE: You may upload PDF files in support of the Special Requirements section. You may upload PDF files with a maximum file size of 10 MB each. There is no limit to the number of files uploaded.

Published on *iDigBio* (https://www.idigbio.org)

Submission #1642

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by psierwald
Tuesday, August 11, 2020 - 18:30
24.14.162.251

TCN Name:
InvertEBase: Reaching Back to See the Future: Species-rich Invertebrate Faunas Document Causes and Consequences of Biodiversity Shifts

Person completing the report:
psierwald@fieldmuseum.org

Progress in Digitization Efforts:
FMNH: 2nd year no cost extension
FMNH Invertebrates: Digitization (includes data cleaning):
Georeferencing US land and freshwater mollusks for the US states Colorado (493 localities), Ar-izona (1757 localities) and Utah (1092 localities, georeferencing in progress)
FMNH Insects: Digitization: taxonomy upload for beetle subfamily Pselaphinae, 400images of North American Buprestidae images of type specimens edited and uploaded, total of 2356 mul-timedia files uploaded to FMNH Emu database
Digitization (includes data cleaning): 3877 North American Tenebrionidae (darkling beetle rec-ords) entered, pselaphine and buprestid type specimen data digitized (200 records)
Significant data cleanup during work from home due to Covid-19:
163,209 Catalog records updated, 90 duplicate bulk sample records deleted, 4,598 duplicate records deleted. 52,822 Collection Event records updated.
9, 103 Site records updated, 7,053 duplicate sites records deleted, 143 party records (collector, previous owner) updated.
UMMZ, Michigan, Invertebrates (grant ended 2019, final report submitted): UMMZ mol-lusk specimen digitization efforts continued as part of the new PILSBRy TCN since August 2019. About 4,600 lands snail lots (21,278 specimens) have been newly cataloged in database and migrated to national portals via an IPT server. Currently, a total of 164,380 mollusk specimen records is available in iDigBio (the last update was August 8th 2019) and 188,613 in GBIF. UMMZ, Michigan Insects: Since August 2019, records from the UMMZ Insect Collection data-base have continued to be shared via an IPT server to data aggregators. Currently iDigBio has 287,300 specimen records, SCAN has 315,996 specimen records, and GBIF has 319,274 speci-men records from the UMMZ Insect Collection.
DMNH (2nd year of no-cost extension): In the second no-cost extension year, DMNH has

fo-cused mostly on georeferencing and improving data quality within the Specify database. We have also established the Mollusk collection in GBIF and are now serving all our data on GBIF (DOI: 10.15568/lfwzak). Since the 2019 Annual Report, DMNH has added 2,391 new records to our Specify database. We now are serving 78,482 records on the Symbiota website InvertE-Base. Of these, over 50% are georeferenced and 62% are identified to species. These records rep-resent 5,838 species, with an average of 13 records per species.
online data service on SCAN Symbiota, iDigBio and GBIF portals

CMNH (2nd year, no-cost extension):
A total of 131,371 specimens have been digitized to date and include over 4,318 new records for the period 1 Oct 2019-31 Dec 2019. Digitization of our Lepidoptera collection was completed in early December with the final count of 55,251 specimens, housed in 864 drawers and 42 cabinets digitized. Digitization of the Coleoptera commenced in mid-November, and included retraining participants on updated handling and digitization procedures. An additional ~600 label images have been taken and are either transcribed to be entered or awaiting transcription (partially digit-ized). Georeferencing for new localities continues.
Online service: All records are available online using OSU data portal (Hymenoptera online) and currently 126,703 specimen records are mirrored on global aggregators (GBIF, SCAN etc)
Auburn (grant ended 2019, final report submitted):
Frost (grant ended 2019, final report submitted):

PEN grant 16-01700 (grant ended, final report submitted): please report on ongoing relevant activities that were initiated by the grant, even if current activities are not funded by the grant.
Report on progress in online service of invertebrate data on InvertEBase iDigBio and GBIF por-tals:

PEN grant 17-01842 (grant ongoing): Museum of Northern Arizona: Biodiversity of the Colorado Plateau, start date: 15 April 2018: MNA
MNA is providing summer employment for one undergraduate student and one post-MS po-sition through this grant and through its MOU with Northern Arizona University to conduct data entry, quality control, digitization, georeferencing, and photo-imaging of Colorado Plateau region invertebrate specimens. MNA directly added or updated an additional 2,429 invertebrate speci-men records this quarter, including many species-level identification of Odonata, Hemiptera, Coleoptera, Lepidoptera, aculeate Hymenoptera specimens, as well as many other taxa. In addi-tion, we continue to update taxonomic information on several thousand additional specimens through review of the Integrated Taxonomic Information System (ITIS). At present, we have 118,425 batches of specimens in the database, including 180,318 individual specimens and with 63,837 identified to the species level, and 79,660 specimens identified to genus level.
Image sorting and labeling is being uploaded to the MNA database. Dr. Alpert coordinated three staff and several MNA volunteers, and is overseeing image capture and information man-agement. He, his assistants, and MNA volunteers have imaged 670 specimens from in and on the periphery of Grand Canyon National Park, and another 300 specimens from Walnut Canyon Na-tional Monument, in the southern Grand Canyon ecoregion. With nearly 1,000 specimens im-aged, he and Dr. Stevens are approaching the project quota of specimen images. His images are being uploaded into MNABIO database, and then into SCAN, and non-insect specimen images will be uploaded into CFM InvertEBase. Also, in collaboration with Dugway Proving Ground, Dr. Alpert has uploaded another 700 imaged

specimens into SCAN. All specimen images are high resolution, with up to three view angles/specimen and the labels imaged as well.
Closure of MNA due to the Coronovirus has created challenges for additional progress on this project; however, Dr. Stevens, Dr. Alpert, Ms. Ledbetter, Ms. Poore, and Mr. Ragan have continued to work remotely, and specimen data entry is proceeding. Closure of our imaging lab had temporarily halted specimen photography, but the MNA Center for Biocultural Diversity has partially re-opened, allowing us to approach completion of the imaging portion of the project.

Share and Identify Best Practices and Standards (including Lessons Learned):
FMNH: nothing to report
UMMZ, Michigan (grant ended 2019, final report submitted):
DMNH: The georeferencing workflow has improved with the addition of a single, part-time cas-ual, employee hired specifically to do georeferencing. After the first few weeks, her rate of georeferencing has been steady and we do not have to spend any additional time training
CMNH: Digitization of our Coleoptera collection commenced in mid-November. The collection suffers from over-crowding (often with multiple species per unit tray), outdated nomenclature and over all poor organization. We refined our digitization protocol to improve curation, limit double handling of specimens and potential mis-association of specimens with determinations. A master list of species in our collection is being compiled from the taxon tree in our database that will be used to print new headers once digitization of each family is complete, these headers will include synonyms previously in use in our collection.
Auburn (grant ended 2019, final report submitted):
Frost (grant ended 2019, final report submitted):
PEN grant 16-01700: Chicago Academy of Sciences (grant ended 2019, final report submit-ted):
PEN grant 17-01842: Museum of Northern Arizona: Biodiversity of the Colorado Plateau, start date: 15 April 2018:
MNA Stevens has continued to collaborate with many experts regarding verification of taxo-nomic identification of various taxa, including tiger beetles, Mollusca, Odonata, and other groups. More than 800 Mollusca specimens were identified by Dr. Stephanie Clark in late 2019, and have been re-integrated into the MNA collection. We logged a paratype of a new tineid cave moth from lower Grand Canyon, which is being described by Dr. Don Davis at the National Mu-seum of Natural History. When the US National Museum staff return and the institution reopens we will submit paratype specimens of the newly described Efferia tapeats Scarbrough et al. from central Grand Canyon. We received a batch of Phymata (Hemiptera: Reduviidae) from Dr. Paul Masonick at the University of California Riverside Weirauch Heteropteran Systematics Laborato-ry, and we are preparing a shipment of dryopoid beetles for identification by Dr. Bill Shepard at University of California Berkeley. We recently completed a book on the Odonata of the Grand Canyon Region (to be pubslished as Museum of Northern Arizona Bulletin 68), and we are com-pleting manuscripts on the Trichoptera of the Colorado River basin with several co-authors, and we are continuing to work on with Warren Steiner at NMNH on the Arizona Tenebrionidae. In addition, we have shared locality data with collaborating experts, and are updating our georeferencing technology (below) using our newly-developed, fast-track labeling system that compiles collection locality data from downloaded state, county, land unit, collection date, elevation, and collectors data.

Identify Gaps in Digitization Areas and Technology:
FMNH Insects/Invertebrates: nothing to report

UMMZ, Michigan (grant ended 2019, final report submitted)
DMNH: We would like to add new categories of data to the mollusk dataset that are not found in DwC. In particular, whether the specimen was collected live or dead with supporting evi-dence. Although we can find a place for the data within the Specify schema, we are not sure how to get this information forwarded to InvertEBase/iDigBio as it is not a DwC field.
CMNH: nothing to report
Auburn (grant ended 2019, submitted):
Frost (grant ended 2019, final report submitted)
PEN grant 16-01700: Chicago Academy of Sciences CAS/PNNM (grant ended 2019, final report submitted):
PEN grant 17-01842: Museum of Northern Arizona: Biodiversity of the Colorado Plateau, start date: 15 April 2018:
MNA digitization requires georeferencing locality and specimen identification, the accuracy of which were common problems reported and discussed at the IDigBio conference in October 2018. MNA is transitioning its Microsoft Access relational database developed by J.D. Ledbetter to manage specimen data, shifting that Access database system to an in-house web mapping tool named BIOMNA, developed by Ben Brandt and J.D. Ledbetter. BIOMNA will be published from a geodatabase on our newly upgraded server. The geodatabase is linked to the Access data-base by a common location identifier. The mapping application includes a 30-m DEM used to verify elevations and update mistakes between English and metric elevation reports. Users switch between several basemaps, including USA Topo Maps, aerial imagery, and the USGS National Map. This application has search capabilities for locations or coordinates, and also can be used with ArcGIS Collector with disconnected editing to log collection sites in remote field locations. We occasionally use Geo-Locate (GeoLocate.org), which has better search capabilities for road junctions and stream confluences. We completed development of VBA code to auto-generate state, county, elevation, and land ownership values for georeferenced locations. This post hoc geographic verification allows us to backcheck data previously entered into the database, and to identify elevation errors. L.E. Stevens and J.D. Ledbetter, both intimately familiar with the geog-raphy of the Colorado Plateau, have nearly completed georeferencing of the more obscure collec-tion localities. However, historic specimens (e.g., those collected prior to 1974) in the MNA col-lection, often cannot be associated with precise localities (e.g., the locality is listed as “N AZ” or “Grand Canyon”). Those specimens are being assigned a lower level of spatial accuracy.
The BIOMNA database will be a Symbiota-based system that solves several vexing prob-lems, such as taxonomic spelling accuracy, identification of incorrect taxonomic or collection lo-cality errors, and calculation of databasing rates. BIOMNA achieves the former by matching the ITIS taxonomic list (where taxa are included in ITIS) with our database list, and correcting flagged errors. PhD candidate Gerald Nowak extracted all invertebrate taxonomic names from ITIS through the subspecies level, including taxon authorship, and we are using that list to check spelling in our species list. This also allows us to review the taxonomy of the MNA invertebrate database. This process allows us to detect misspelling mistakes; however, another problem has been a lack of taxonomic resolution on several higher levels of taxonomy in ITIS (e.g., among the Annelida, some aculeate Hymenoptera taxa). In some cases, ITIS has not been updated with con-temporary invertebrate taxonomy.
Taxon imagery is being uploaded into BIOMNA and unidentified specimens are uploaded to BugGuide.net for crowd-shared taxonomic resolution. Insect images also are being uploaded into SCAN; however, we note that misspelled taxonomic names appear difficult to correct in SCAN. MNA continues to monitor the gross rate of specimen records databased, to better estimate the amount of work required to complete the project.

Share and Identify Opportunities to Enhance Training Efforts:
FMNH Invertebrates/Insects: nothing to report
DMNH: We have continued our collaboration with Widener University serving as co-advisors for two independent study students, and now as co-faculty for the Bio350 class,“Natural History Collections”. In the first half of the semester, students are being taught the skills (E.g., data car-pentry, georeferencing) so they can complete a short, independent research project within the Xenophora mollusk collection.
UMMZ, Michigan (grant ended 2019, final report submitted)
CMNH: nothing to report
Auburn (grant ended 2019, final report submitted)
Frost (grant ended, final report submitted)
PEN grant 16-01700: Chicago Academy of Sciences (grant ended 2019, final report submit-ted):
PEN grant 17-01842: Museum of Northern Arizona: Biodiversity of the Colorado Plateau, start date: 15 April 2018: nothing to report

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
FMNH Insects/Invertebrates: nothing to report
UMMZ, Michigan, Invertebrates grant ended 2019, final report submitted):
DMNH: With Widener University, DMNH has secured a 1-year NSF grant to develop a network of ecology faculty and natural history professionals who would like to develop a CURE (course-based undergraduate research experience). This network, called BCEENET, will collaborate with iDigBio, BLUE, and other NSF networks (e.g., CURES, CCURI, QBES) to develop the re-sources necessary to implement a natural history related CURE.
CMNH: nothing to report
Auburn (grant ended 2019, final report submitted):
Frost (grant ended 2019, final report submitted):
PEN grant 16-01700: Chicago Academy of Sciences grant ended 2019, final report submit-ted):
PEN grant 17-01842: Museum of Northern Arizona: Biodiversity of the Colorado Plateau, start date: 15 April 2018 (one-year no cost extension):
MNA collaborates through ongoing networking connections, Bug Guide, and SCAN with a wide array of researchers across the USA. Although retarded by Covid-19 work restrictions, dur-ing the past quarter, this has included collaborative specimen identification with the Smithsonian Institution (Davis, Steiner, Tikow, and others), the University of Arizona (W. Moore, E Hall, C. Olson), Arizona State University, Brigham Young University (S. Clark), UC-Riverside (Mason-ick), researchers in the U.S. Geological Survey (T. Kennedy), and several private retired ento-mologists (R. Bailowitz, D. Danforth, P. Price, and B. Knisely).

Share and Identify Opportunities and Strategies for Sustainability:
FMNH Insects/Invertebrates: nothing to report
UMMZ, Michigan, Invertebrates/Insects (grant ended 2019, final report submitted):
DMNH: nothing to report
CMNH: nothing to report
Auburn (grant ended 2019, final report submitted):
Frost (grant ended 2019, final report submitted):
PEN grant 16-01700: Chicago Academy of Sciences (grant ended 2019, final report submit-ted):
PEN grant 17-01842: Museum of Northern Arizona: Biodiversity of the Colorado Plateau,

start date: 15 April 2018:

Share and Identify Education and Outreach (E&O) Activities:
FMNH Invertebrates/Invertebrates: nothing to report
UMMZ, Zoological Museum, Michigan (grant ended 2019, final report submitted):
DMNH: We completed the banner exhibit, “Little Creatures, Big Data” and it is available for use by iDigBio partners. In addition, DMNH was co-author on a paper submitted to the Journal of Museum Educators about how to integrate NHCs into formal and informal educa-tional activities.
CMNH: Two new work-study students Rosana Villifan and Elizabeth Seitz started in the lab, and two work study students Annam Mostafiz and Olive Snider continued on the project. Digit-ization was highlighted in our semi-annual members behind the scenes night and we reached ~200 visitors.
Auburn: (grant ended 2019, final report submitted):
Frost (grant ended 2019, final report submitted):
PEN grant 16-01700: Chicago Academy of Sciences: (grant ended 2019, final report submit-ted):
PEN grant 17-01842: Museum of Northern Arizona: Biodiversity of the Colorado Plateau, start date: 15 April 2018:
During the past quarter, Dr. Alpert continued to prepare several “Nature Notes” on regional invertebrate taxa for presentation on National Public Radio. Previously, the MNA team co-hosted an invertebrate BioBlitz at Petrified Forest National Park, a BioBlitz for local school chil-dren at Francis Short Pond in Flagstaff, a circumnavigation of Grand Canyon,, and a bioblitz in 50 Mile Canyon in Glen Canyon National Recreation Area in southern Utah. Specimens from those bioblitzs are being compiled into theMNA Access database for migration into BIOMNA.
Dr. Alpert continues to provide public presentations on invertebrate biodiversity of the Colo-rado Plateau at various public and professional meetings. L.E. Stevens continues to provide out-reach on the project through lectures and tours through the MNA collections, workshops includ-ing identification of insects, and numerous academic or public lectures, each acknowledging this NSF PEN support. In the past month he gave an MNA online STEM talk to the public on drag-onflies, and a lecture on Gastropoda and their parasites to Marc Yeston’s blog. He and Dr. Alpert continue in collaborative preparation of manuscripts on Colorado River basin invertebrate distribution, including: Annelida, land Gastropoda, Silphidae carrion beetles, Ephemeroptera, Odonata, Bombus bumblebees, Asilidae robber flies, Trichoptera, butterflies, and Formicidae. Those papers are planned for submission in 2020. IDigBio and SCAN data will be acknowledged in each paper. MNA’s Springs Stewardship Institute also posts distribution maps and taxon im-ages of springs-dependent species on its website (www.springsdata.org).
Catherinie Bolich, Bernardo Murietta, Brandon Ragan, Zane Holditch, Tanner Carothers, and several volunteers have been trained by Dr. Alpert to image legacy insect specimens. Dr. Stevens and Dr. Alpert convene bi-weekly lab meetings to report progress, improve collaboration, and to solve any problems that arise.

Google Analytics

Other Progress (that doesn’t fit into the above categories):
FMNH: nothing to report
UMMZ, Zoological Museum, Michigan (grant ended 2019, final report submitted)
DMNH: nothing to report
CMNH: We identified a way to restore disassociated label data for specimens that only have a historical catalogue number. The specimens in question were collected during the

1920s and were assigned catalogue numbers that were recorded in accession records. Our accession books con-firmed a range of catalogue numbers assigned to specimens for a given month of field work by a former curator. With ~52% of our collection now digitized we pulled all historical catalogue rec-ords (~1450, of which 115 had missing province data) and cross-validated date and collector with the accession records and determined catalogue numbers were systematically assigned by exact date. Given the systematic assignment of catalogue numbers, we could determine exact date and collecting locality for specimens that fell within a known range of catalogue numbers, or narrow it down to 1 of 2 dates/localities. Using this method we can confidently restore data to ~75% of specimens with disassociated data, and this will increase as we digitize more of the collection. We have developed a protocol for retroactive labelling to restore this historical data.
Auburn (grant ended 2019, final report submitted):
Frost(grant ended 2019, final report submitted):
PEN grant 16-01700: Chicago Academy of Sciences(grant ended 2019, final report submit-ted):
PEN grant 17-01842: Museum of Northern Arizona: Biodiversity of the Colorado Plateau, start date: 15 April 2018:
We imaged all identified butterflies, carabids, asilids, and several other large groups of Grand Canyon region insect species, and imaged all Grand Canyon region Ammophila (Sphecidae) spe-cies listed published by L.E. Stevens and A.S. Menke. All images are being prepared for upload-ing into the MNA and CFM databases, and then into SCAN. Although not funded by this pro-ject, we are nearing release on a semi-popular book on Grand Canyon region Odonata.

No-Cost One-year Extension Approved by NSF
We requested, and were granted, a one-year, no-cost extension for this project from NSF to ensure that we can fully accomplish our goals of creating the invertebrate database and ac-complishing interactivity with it, as well as planning and executing the invertebrate exhibit for this project.

Attachment 1

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1642

Published on *iDigBio* (https://www.idigbio.org)

Submission #1644

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by neilscobb
Wednesday, August 12, 2020 - 10:44
47.215.133.118

TCN Name:
Lepidoptera of North America Network: Documenting Diversity in the Largest Clade of Herbivores

Person completing the report:
neilscobb@gmail.com

Progress in Digitization Efforts:
see attached

Share and Identify Best Practices and Standards (including Lessons Learned):
see attached

Identify Gaps in Digitization Areas and Technology:
see attached

Share and Identify Opportunities to Enhance Training Efforts:
see attached

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
see attached

Share and Identify Opportunities and Strategies for Sustainability:
see attached

Share and Identify Education and Outreach (E&O) Activities:
see attached

Google Analytics

Other Progress (that doesn't fit into the above categories):
see attached

Attachment 1

LepNet_SCAN_August_2020.docx

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1644

Published on *iDigBio* (https://www.idigbio.org)

Submission #1645

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by neilscobb
Wednesday, August 12, 2020 - 10:46
47.215.133.118

TCN Name:
Southwest Collections of Arthropods Network (SCAN): A Model for Collections Digitization to Promote Taxonomic and Ecological Research

Person completing the report:
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Progress in Digitization Efforts:
See attached

Share and Identify Best Practices and Standards (including Lessons Learned):
See attached

Identify Gaps in Digitization Areas and Technology:
See attached

Share and Identify Opportunities to Enhance Training Efforts:
See attached

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
See attached

Share and Identify Opportunities and Strategies for Sustainability:
See attached

Share and Identify Education and Outreach (E&O) Activities:
See attached

Google Analytics

Other Progress (that doesn't fit into the above categories):
See attached

Attachment 1

LepNet_SCAN_August_2020.docx

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1645

Lepidoptera of North America Network &
Symbiota Collections of Arthropods Network (SCAN)
Quarterly Report

August 9, 2020
Neil Cobb

Progress in Digitization Efforts:

This is a joint report for the two Thematic Collections Networks (TCNs) SCAN and LepNet. Many museums are involved in both SCAN and LepNet, including collections that have received funding from both TCNs, collections that are unfunded for one TCN and funded by the other, and some collections that are providing data to both and are unfunded by the ADBC program. Both TCNs share the same database https://scan-bugs.org/portal/, which depending on the context we refer to as the SCAN-LepNet database or the LepNet-SCAN database. We will also serve arthropod data for InverteBase and will serve Terrestrial Parasite Tracker TCN data when it becomes available (See TPT TCN report for details). Summary statistics presented here were compiled from data accessed on the SCAN portal, August 9, 2020. **Table 1** shows the key statistics of Lepidoptera (LepNet) and non-Lepidoptera (SCAN) records to date. These consist of all records and images, including records and images from data providers who have allowed us to post their data on the SCAN/LepNet portal. Providing data from these additional providers increases our ability to georeference, add to taxonomic tables, and more accurately assess the total digitization effort for any given taxon. We provide data specific to institutions that received direct funding from the NSF-ADBC program in the annual reports to NSF.

Table 1. Records in SCAN/LepNet database, "all data" reflects all arthropod taxa, "Non-Lep" includes all non-Lepidoptera arthropod data, and Lepidoptera includes only Lepidoptera taxa.

	All data	Non-Lep (SCAN)	Lepidoptera (LepNet)
Specimen Records	22,676,043	18,419,006	4,257,037
# Georeferenced	19,086,256	15,362,486	3,723,770
# Imaged	3,903,414	2,461,799	1,441,615
# Identified to species	13,640,873	9,554,232	4,086,641

The SCAN network started in 2012 and the TCN funding has ended, but SCAN continues to support PEN projects. The LepNet grant was initiated on July 1, 2016 and there are currently 27 ADBC funded museums and one non-funded museum (Oklahoma State University). The museums comprising the NSF-ADBC LepNet are all serving records and images on the LepNet Portal and are serving data directly to iDigBio via IPT or through DwC archives on the LepNet-SCAN portal. Twenty museums are serving DwC archives to iDigBio and six museums are serving data snapshots with the LepNet portal. We have set up the SCAN Portal to serve all arthropod data from North America as well as all data from North American arthropod collections where specimens were collected outside of North America.

LepNet - The LepNet ADBC-funded museums are still on target to meet goals for records and images. An additional 59 collaborators (non-ADBC funded museums that use our data portal to serve their data) have also provided additional records for Lepidoptera. There are 47 collections (referred to as added-value) that have allowed us to harvest their data via IPT to serve lepidopteran records. Although most of

the Lepidoptera imaged are from INaturalist, 170,854 are specimen images **Table 2** shows the top 10 families of Lepidoptera in terms of total occurrences digitized.

What is most encouraging about the lepidopteran records is that 87% of the records are identified to species, which is higher than any of the other major orders. Thus, the primary factor limiting the production of "research-ready" data is due to georeferencing. For Lepidoptera 74% of the records are research-ready (i.e., identified to species and georeferenced) and by georeferencing existing records we should increase that percentage to 90% over the next three years. We realize that many records represent misidentified specimens and we also need to seek additional non-ADBC funding to review as many specimen identifications as possible. We are sponsoring the first LepNet Partners to Existing Networks (PEN) grant with the San Diego Museum of Natural History. This PEN project will focus on the Lepidoptera of Baja California, including a large number of historical records. They have already contributed over 13,000 records.

Table 2. The number of occurrence records for the top 10 families of Lepidoptera that have been digitized.

Taxa	# Specimen Records	# Georeferenced	# Specimen Identified to species	# Georeferenced & Ided to species
Nymphalidae	866,504	794,766	853,030	785,577
Noctuidae	551,907	497,764	532,520	484,671
Erebidae	409,709	364,190	391,397	350,357
Geometridae	354,158	311,771	338,290	298,221
Hesperiidae	343,517	290,141	335,880	283,861
Pieridae	341,709	285,533	337,471	282,400
Lycaenidae	271,896	242,957	267,095	239,354
Papilionidae	170,456	142,609	168,960	141,616
Crambidae	157,158	133,565	151,543	129,497
Tortricidae	134,876	107,454	125,529	100,934

Symbiota Collections of Arthropods Network (SCAN) - We have surpassed our overall TCN/PEN goals for the network and have been very successful in supporting data mobilization for unfunded museums and cooperation by larger collections that have allowed there data to be used to help mobilize data from other museums. We are sponsoring one SCAN PEN proposal, one through the American Museum of Natural History, focusing on several ground-dwelling families. **Table 3** shows data for the five major taxa we targeted in SCAN. All five groups have enough data to produce scores of papers.

Share and Identify Opportunities to Enhance Training Efforts: We are developing resources on the WordPress site http://www.scan-all-bugs.org/ .

Share and Identify Best Practices and Standards (including Lessons Learned):

Table 3 Number of records for the five focal SCAN taxa groups.

Taxa	# Specimen Records	# Georeferenced	# Specimen Identified to species	# Georeferenced & Ided to species
Formicidae	1,191,047	1,074,097	690,977	615,852
Carabidae	622,726	507,590	391,047	323,411
Araneae	252,097	198,201	208,854	169,032
Acrididae	431,679	218,036	368,783	203,830
Tenebrionidae	192,506	167,147	113,304	99,095

We share best practices on the SCAN/LepNet project website https://scan-all-bugs.org/ .

Images for Research - We developed a new and efficient process for uploading images to the database https://scan-bugs.org/portal/profile/index.php?refurl=/portal/imagelib/imagebatch.php? .We are participating in a TDWG-sponsored working group to develop standards for specimen images, including definition of morphological traits.

Identify Gaps in Digitization Areas and Technology: We are supporting the "LightingBug" project https://lightningbug.tech/, which will exponentially increase transcription rate of labels and produce specimen images comprising 360-degree image suites. The production of images will be transformational in terms of extending our capabilities to provide automated identifications and examine morphological traits.
We continue to seek out occurrence data to better understand the biogeography of the focal SCAN taxa and Lepidoptera. For most groups there is not enough data to talk about gaps. We are meeting this need by incorporating additional collections into the SCAN-LepNet database, and harvesting observational records from iNaturalist, Pollardbase, Buguide, LepSoc inventories, and smaller observation sets provided by individual lepidopterists.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
We are primarily working with other Symbiota TCNs and other Symbiota portals. We are also generally collaborating with a variety of individuals, projects and organizations to extend the ability to mobilize biodiversity data and promote the use of data in research. We are serving data from 217 collections, we continue to add one collection per month.

Share and Identify Opportunities and Strategies for Sustainability: Nothing to report

Other Progress (that doesn't fit into the above categories):

Focus on North American Arthropods We continue to provide North American data obtained from any credible sources to increase the quantity of data available to SCAN and LepNet users. We have added three new collections since the last update.

GBIF Registration - There are 47 Live collections on SCAN that are now registered with GBIF and 87 other entomology collection datasets from the North America being served on GBIF for a total of 181 datasets. This leaves approximately 30 collections in North America that still need to register on GBIF.

Publications - We have published an overview of the LepNet project (Seltmann et al 2017), and several LepNet participants collaborated on a publication below (Belitz et al., 2018). Our review of North American entomology collections has been published in PeerJ. We are now developing a follow up review on North American arthropod data.

Belitz, M.W., Hendrick, L.K., Monfils, M.J., Cuthrell, D.L., Marshall, C.J., Kawahara, A.Y., Cobb, N.S., Zaspel, J.M., Horton, A.M., Huber, S.L. and Warren, A.D., 2018. Aggregated occurrence records of the federally endangered Poweshiek skipperling (*Oarisma poweshiek*). *Biodiversity data journal*, (6).

Cobb, N.S., L. Gall, J.M. Zaspel, L.M. McCabe, N.J. Dowdy. and A.Y. Kawahara. 2019 Assessment of North American Entomology Collections: Prospects and Challenges for Addressing Biodiversity Research. PeerJ, 7, p.e8086.

Google Analytics: Our Google Analytics data are dynamically shown https://datastudio.google.com/u/0/reporting/1VvEU4pM2LGqQXY0hVCTf98VvGmM7T_bu/page/cLZN for the SCAN portal, http://scan-bugs.org/portal/index.php .

Published on *iDigBio* (https://www.idigbio.org)

Submission #1641

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by cskema
Tuesday, August 11, 2020 - 15:47
100.34.253.49

TCN Name:
The Mid-Atlantic Megalopolis: Achieving a greater scientific understanding of our urban world

Person completing the report:
cskema@upenn.edu

Progress in Digitization Efforts:
Please see attached pdf.

Share and Identify Best Practices and Standards (including Lessons Learned):
Please see attached pdf.

Identify Gaps in Digitization Areas and Technology:
Please see attached pdf.

Share and Identify Opportunities to Enhance Training Efforts:
Please see attached pdf.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
Please see attached pdf.

Share and Identify Opportunities and Strategies for Sustainability:
Please see attached pdf.

Share and Identify Education and Outreach (E&O) Activities:
Please see attached pdf.

Google Analytics

Other Progress (that doesn't fit into the above categories):
Please see attached pdf.

Attachment 1

2020_08_MAM_Quarterly_Progress_Summary.pdf

Attachment 2
King_CHRB_Botany2020_abstract.pdf

Source URL: https://www.idigbio.org/node/564/submission/1641

Mid-Atlantic Megalopolis TCN
Quarterly Progress Report[1]
May – July 2020

Progress in Digitization Efforts: Figure 1 shows progress over time for the MAM Project by changes in the number of both specimens entered into workflow and completely digitized specimens (= imaged + transcribed + georeferenced) against the number of specimens promised to NSF for the project. The current numbers for progress of digitization efforts by specimen category for each herbarium[2] are shown in Table 1 and Figure 2.

Share and Identify Best Practices and Standards: Nothing to report.

Identify Gaps in Digitization Areas and Technology: Nothing to report.

Share and Identify Opportunities to Enhance Training Efforts: MAM ran two georeferencing training workshops online, one in May and one in June 2020. Attendees included PIs, staff, and students from BALT, CHRB, PAC, and PH. The first session was a presentation of workflows and how-to demonstrations by Michelle Mancini (MOAR), followed by a presentation of georeferencing from the perspective of research by Cindy Skema (MOAR). The second webinar was an opportunity to come back together for a Question & Answer session after each individual had gone and tried georeferencing in their collection. Also, relevant examples and further pointers were presented by Michelle Mancini and Cindy Skema. Recordings of both these sessions are available online [https://drive.google.com/drive/folders/1-Eb9m7MnUaSfnEILIpQpf_071c60jgZf?usp=sharing].

Share and Identify Collaborations with other TCNs, Institutions, and Organizations: Nothing to report.

Share and Identify Opportunities and Strategies for Sustainability: Nothing to report.

Share and Identify Education and Outreach Activities: Megan King (CHRB) presented a talk related to MAM activities at the Virtual Botany 2020 conference. The talk was entitled "How Collections-Based Undergraduate Research Adapted to a Pandemic: A Case Study of the Herbarium Army at Rutgers University" (see attached abstract).

Other Progress: Nothing to report.

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[1] Throughout this report, herbaria are referred to by their Index Herbariorum acronyms, which correspond to institutional names as follows: BALT = Towson University, CHRB = Rutgers University, CM = Carnegie Museum, DOV = Delaware State University, HUDC = Howard University, MARY = University of Maryland, MCA = Muhlenberg College, MOAR = Morris Arboretum of the University of Pennsylvania, NY = New York Botanical Garden, PAC = Pennsylvania State University, PH = The Academy of Natural Sciences of Drexel University, SIM = Staten Island Museum, TAWES = Maryland Department of Natural Resources

[2] Although updated progress for HUDC and NY are no longer included in these reports as they closed their NSF grants on the MAM Project as of 31 August 2019, their total numbers of specimens completed in the MAM Project to that date are still reported in Figure 1 and Table 1 in the interest of showing project totals.

Figure 1. Progress over time for MAM Project.

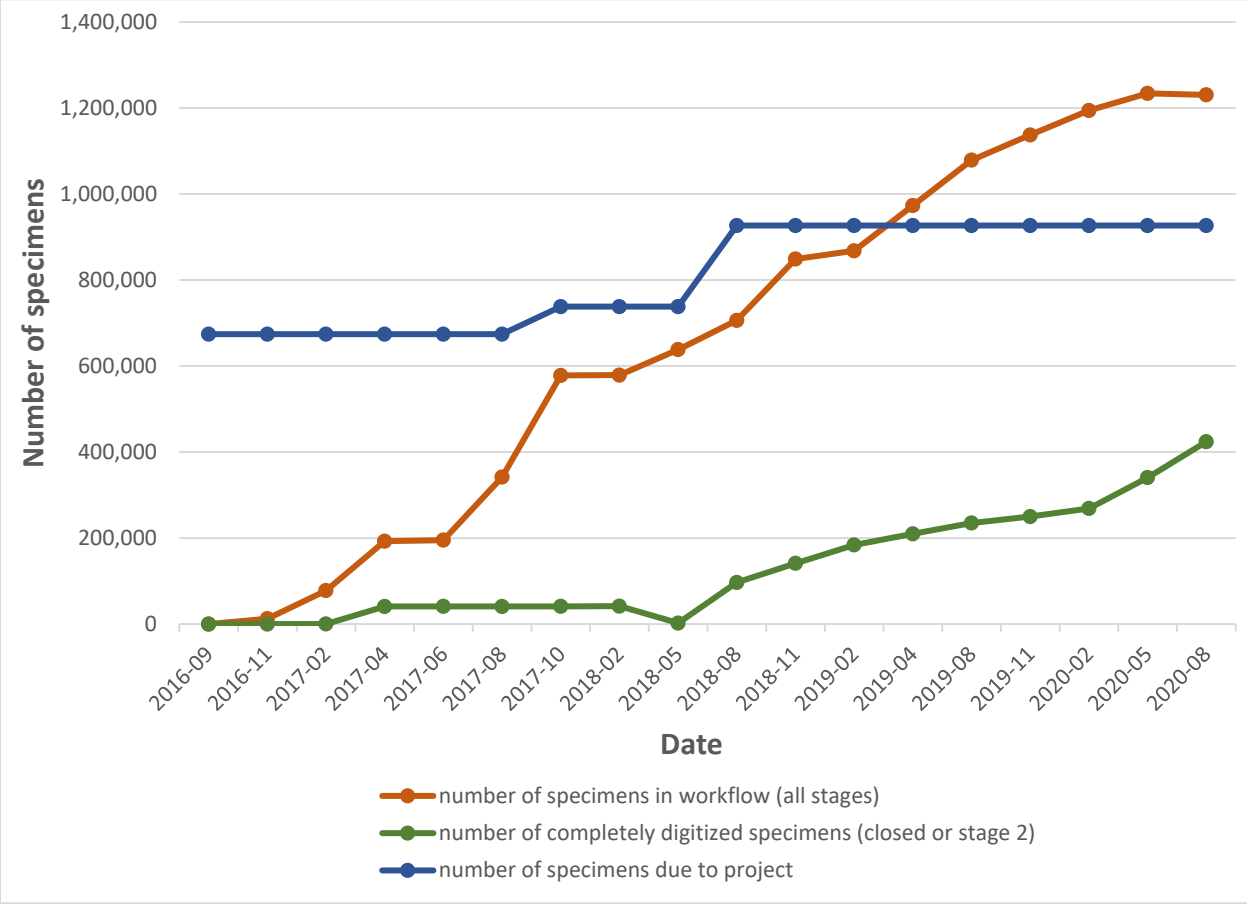
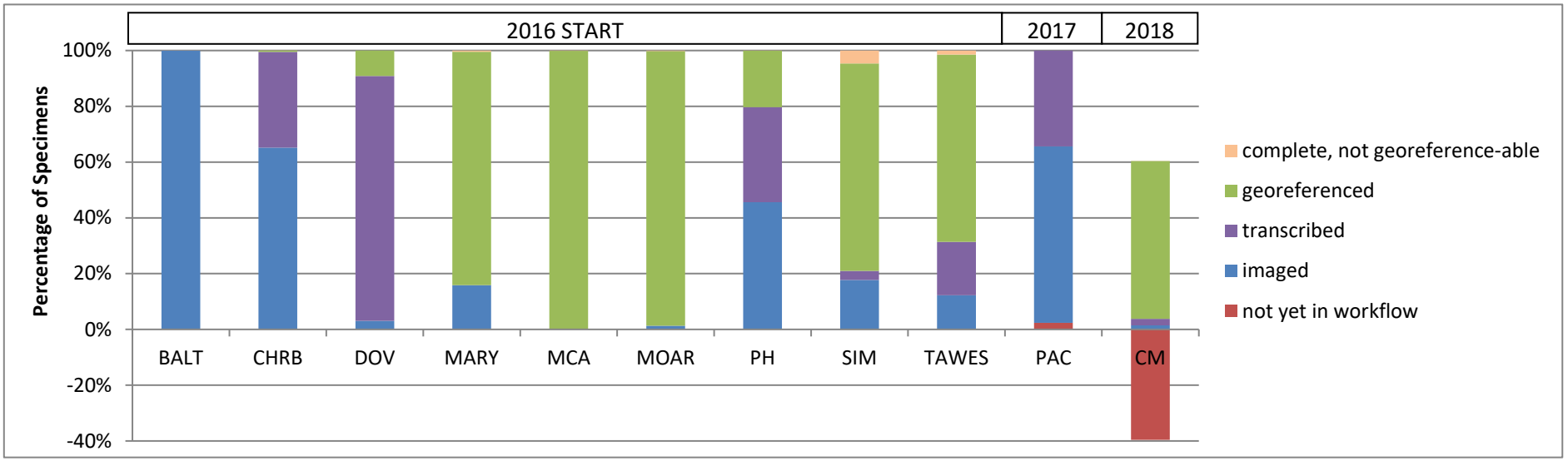


Table 1. Digitization of specimens by stage of completion and herbarium for MAM TCN.

	Herbarium											
Specimen Stage	BALT	CHRB	DOV	MARY	MCA	MOAR	PH	SIM	TAWES	PAC	CM[7]	**Totals**
# specimens imaged[1]	30,000	4,739	0	0	0	0	0	0	0	0	2,721	**37,460**
# specimens as above and uploaded to Symbiota along with skeletal data; transcription/review may be in progress[2]	6,570	37,371	1,645	7,719	0	0	206,883	0	254	42,471	0	**452,674**
# specimens as above + completely transcribed and transcription reviewed[3]	0	22,209	46,797	0	0	0	154,837	707	821	23,096	4,392	**311,329**
# specimens as above + georeferenced[4]	0	310	4,858	40,987	51,009	20,852	91,992	16,163	2,881	0	106,755	**422,198**
# specimens that need special attention, e.g. go back to sheet[5]	127	31	0	46	2	274	315	3,857	270	0	0	**5,089**
# specimens imaged, uploaded, transcribed BUT not able to be georeferenced[6]	2	1	0	226	52	47	225	1,011	61	0	12	**1,775**
Totals	**36,699**	**64,661**	**53,300**	**48,978**	**51,063**	**21,003**	**454,252**	**21,738**	**4,287**	**65,667**	**113,880**	**1,230,525**

Processing Status in the MAM Portal: [1] No stage, not in Symbiota yet; [2] Unprocessed + Expert Required + Pending Review; [3] Stage 1; [4] Stage 2; [5] Stage 3; [6] Closed
[7] CM also has 80,639 specimens that have been georeferenced and were previously transcribed, but are not yet imaged.

Figure 2. Percentage of specimens by stage of completion and herbarium for MAM TCN. With this presentation of digitization progress, the final goal for each institution is to have a mostly green column above the X axis (could potentially have orange up to roughly 10%). Specimens not yet in workflow are set as negative numbers.



Abstract Detail

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Biodiversity Informatics & Herbarium Digitization

King, Megan [1], Struwe, Lena [2].

How Collections-based Undergraduate Research Adapted to a Pandemic: A Case Study of the Herbarium Army at Rutgers University.

The herbarium collections at Chrysler Herbarium are home to over 200,000 collections of plants, fungi, and algae that have been part of many NSF-funded digitization projects during the last decade, with many still needing to be databased, imaged, and georeferenced. The School of Environmental and Biological Sciences at Rutgers University requires students to earn at least three credits in experience-based education to develop valuable career skills during hands-on learning. This had provided us with an opportunity to engage and train a number of undergraduates as herbarium and digitization assistants (92 students to date). During Spring 2020 when COVID-19 arrived in New Jersey, 16 students were working 6-10 hours a week. Within a few short weeks all in-person activity had shut down at our university, students sent home, and course instruction moved online. The same had to be done for the students of the Herbarium Army, which includes work study students, NSF-funded interns, and NSF and George H. Cook honors research projects. Despite that the herbarium was (and still Is as of June 1st, 2020) in physical lockdown, we succeeded in quickly moving digitization work to an online format transcribing imaged specimens. Due to the extraordinary external stressors caused by the pandemic and its effects on society, we reduced expectations on number of specimens to be transcribed, but otherwise kept the original workplan with written reports for graded work. The social community that the Herbarium Army students created among themselves in the herbarium were kept alive through GroupMe texts. Messages appeared about transcribing records, furry co-workers, problematic and gorgeous specimens, and offers to participating in regional georeferencing training. As a result of our quick modifications, all Herbarium Army students finished their research credits on time, (not the case for other lab- and field-based research shut down to reduce COVID-19 spread) while having gained a large set of collections-based life skills. Some of our Spring 2020 students are planning to volunteer remotely in the herbarium over the summer, along with several credit that will work remotely until the University opens the herbarium again, which is still very uncertain. For this we are planning to provide video-training and 'hangouts' with students to provide hands-on problem solving and guidance to herbarium collections and plant diversity. By moving the Herbarium to an online format, we can continue to work on NSF-funded digitization projects and add substantial amount of data to global databases for scientific research.

1 - Rutgers Chrysler Herbarium, Ecology, Evolution And Natural Resources, 14 College Farm Road, New Brunswick, NJ, 08901, United States
2 - Rutgers University, Ecology, Evolution, & Natural Resources, 237 Foran Hall, 59 Dudley Road, New Brunswick, NJ, 08901, United States

Keywords:
undergraduate
research
education
Herbarium
collections
Digitization
student engagement
Biodiversity
natural history collection.

Presentation Type: Oral Paper
Number: BIHD2003
Abstract ID:*786*
Candidate for Awards: None

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Published on *iDigBio* (https://www.idigbio.org)

Submission #1635

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by amiller
Thursday, August 6, 2020 - 17:08
192.17.34.136

TCN Name:
The Microfungi Collections Consortium: A Networked Approach to Digitizing Small Fungi with Large Impacts on the Function and Health of Ecosystems

Person completing the report:
amiller7@illinois.edu

Progress in Digitization Efforts:
• 13,872 records from EIU have been fully transcribed and uploaded to the MyCoPortal; 2593 of these records have been georeferenced.
• 203,679 records from the University of Oslo, Natural History Museum Fungarium (O) have been uploaded to the MyCoPortal
• 372,352 records from Uppsala University, Museum of Evolution (UPS-BOT) have been uploaded to the MyCoPortal.
• The MyCoPortal now contains over 7,000,000 records from 108 collections!

Share and Identify Best Practices and Standards (including Lessons Learned):
• Nothing new to report.

Identify Gaps in Digitization Areas and Technology:
• Nothing new to report.

Share and Identify Opportunities to Enhance Training Efforts:
• 4 students have been trained via Zoom to transcribe and georeference fungal records.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
• Andrew Miller discussed the annual NSF report submission process with Diego Barroso, the Project Manager for the TORCH TCN and provided him with documentation.
• The GLOBAL TCN was recently funded and will collaborate closely with the MyCoPortal, which will serve data to the GLOBAL portal.

Share and Identify Opportunities and Strategies for Sustainability:

• A new, drag-and-drop image upload system has been developed to transfer images over the internet to our servers here at INHS. Image ingestion, thumbnail creation and record linking are being developed. EIU, MISS and ARIZ are currently using this system to transfer and link images on the MyCoPortal.

Share and Identify Education and Outreach (E&O) Activities:
• Nothing new to report.

Google Analytics

Other Progress (that doesn't fit into the above categories):
• Please see MyCoPortal Data Portal Statistics generated from Google Analytics (attached).

Attachment 1
THIRD-Q-2020-REPORT.pdf

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1635

Third Quarter 2020
May, June & July

Progress in Digitization Efforts

- 13,872 records from EIU have been fully transcribed and uploaded to the MyCoPortal; 2593 of these records have been georeferenced.
- 203,679 records from the University of Oslo, Natural History Museum Fungarium (O) have been uploaded to the MyCoPortal
- 372,352 records from Uppsala University, Museum of Evolution (UPS-BOT) have been uploaded to the MyCoPortal.
- The MyCoPortal now contains over 7,000,000 records from 108 collections!

Best Practices and Standards (Lessons Learned)

- Nothing new to report.

Gaps in Digitization Areas and Technology

- Nothing new to report.

Opportunities to Enhance Training Efforts

- 4 students have been trained via Zoom to transcribe and georeference fungal records.

Collaboration with other TCNS, Institutions, and Organizations

- Andrew Miller discussed the annual NSF report submission process with Diego Barroso, the Project Manager for the TORCH TCN and provided him with documentation.
- The GLOBAL TCN was recently funded and will collaborate closely with the MyCoPortal, which will serve data to the GLOBAL portal.

Opportunities and Strategies for Sustainability

- A new, drag-and-drop image upload system has been developed to transfer images over the internet to our servers here at INHS. Image ingestion, thumbnail creation and record linking are being developed. EIU, MISS and ARIZ are currently using this system to transfer and link images on the MyCoPortal.

Education and Outreach Activities

- Nothing new to report.

Other Progress

- Please see MyCoPortal Data Portal Statistics generated from Google Analytics (attached).
-

Publications

- MyCoPortal has been cited 83 times - 26 times in 2020, in peer-reviewed journal publications.

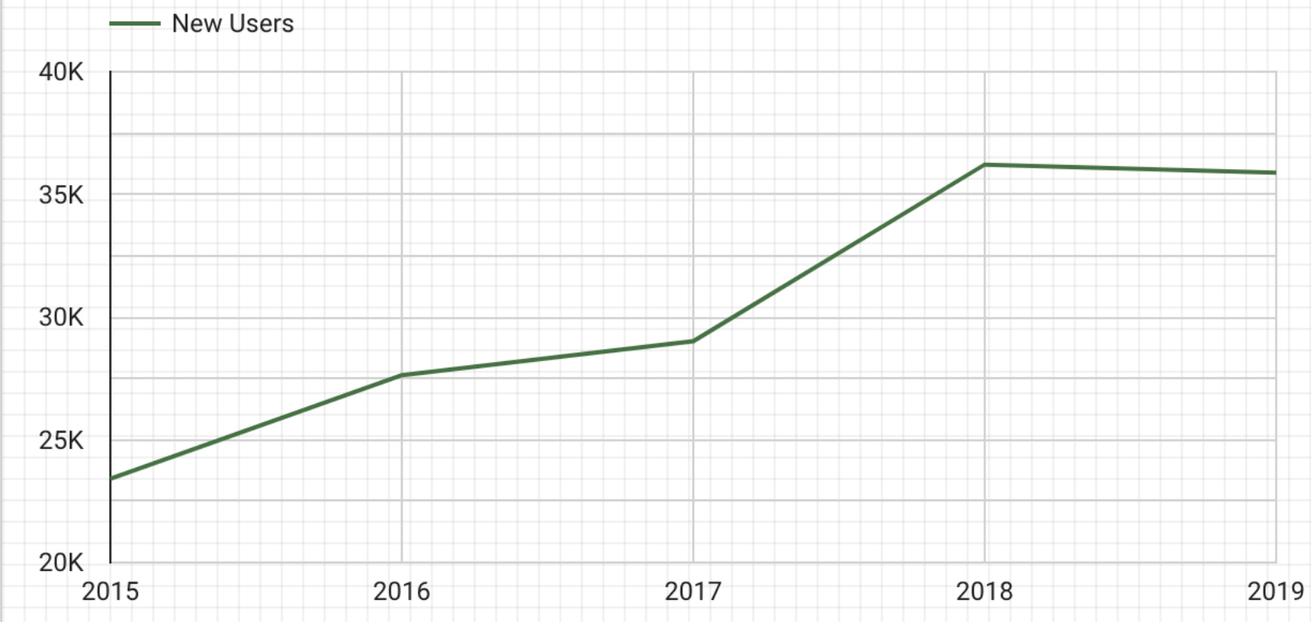
Presentations

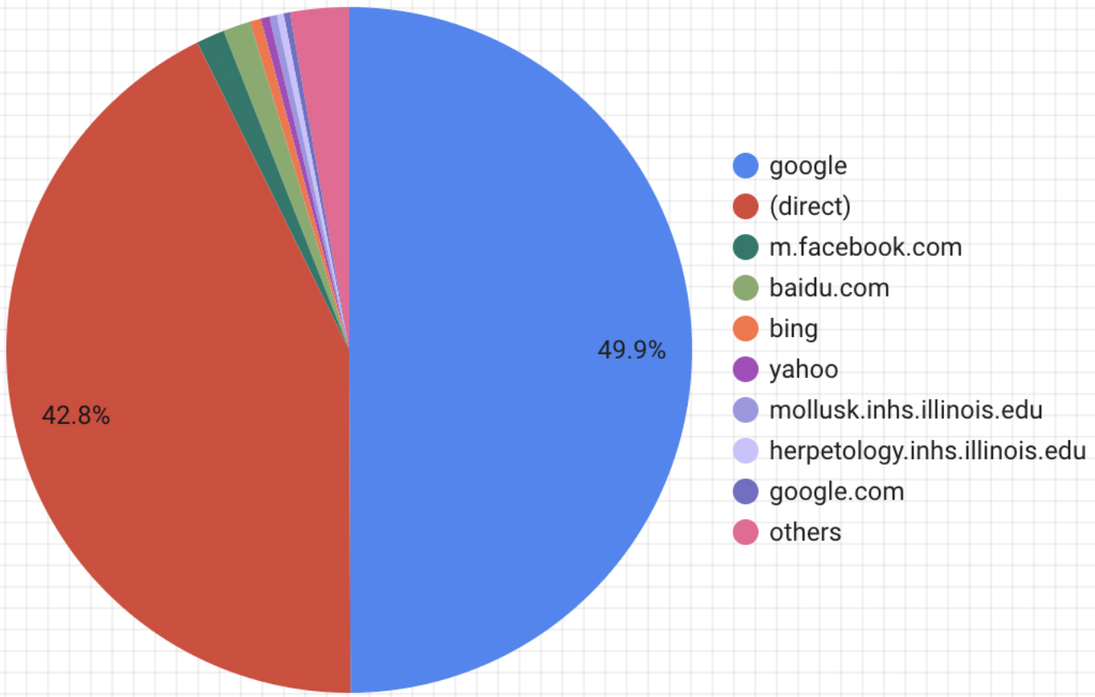
- Nothing new to report.

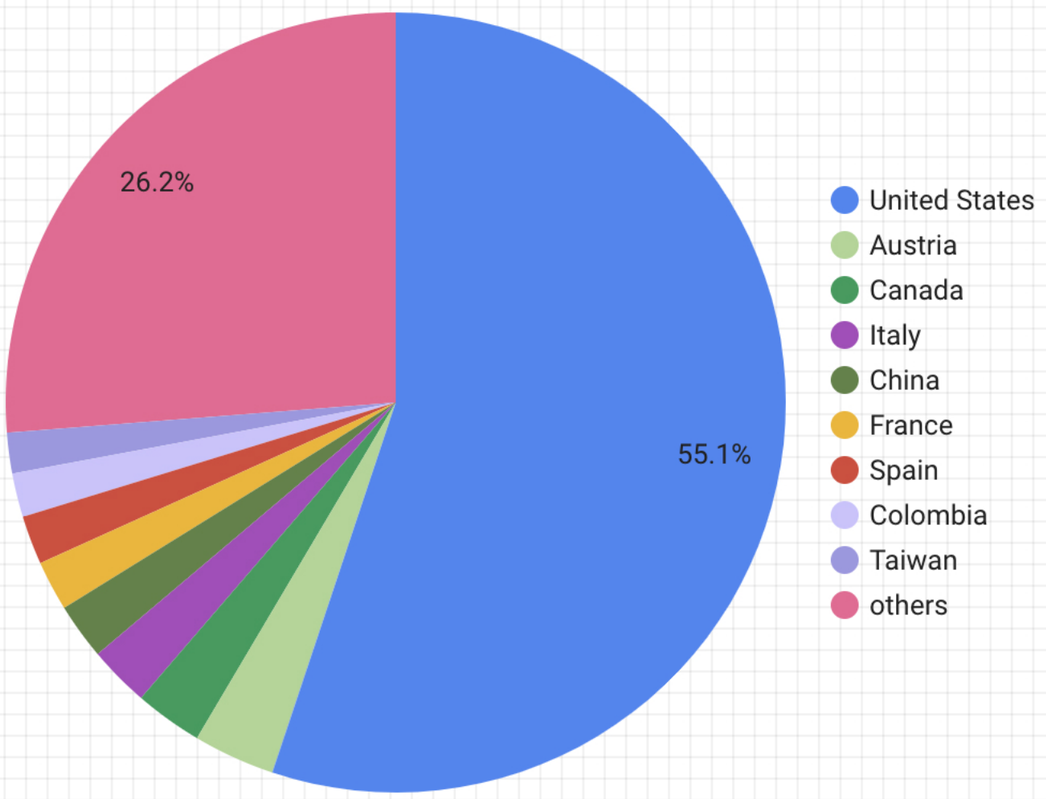
MyCoPortal Data Portal Statistics

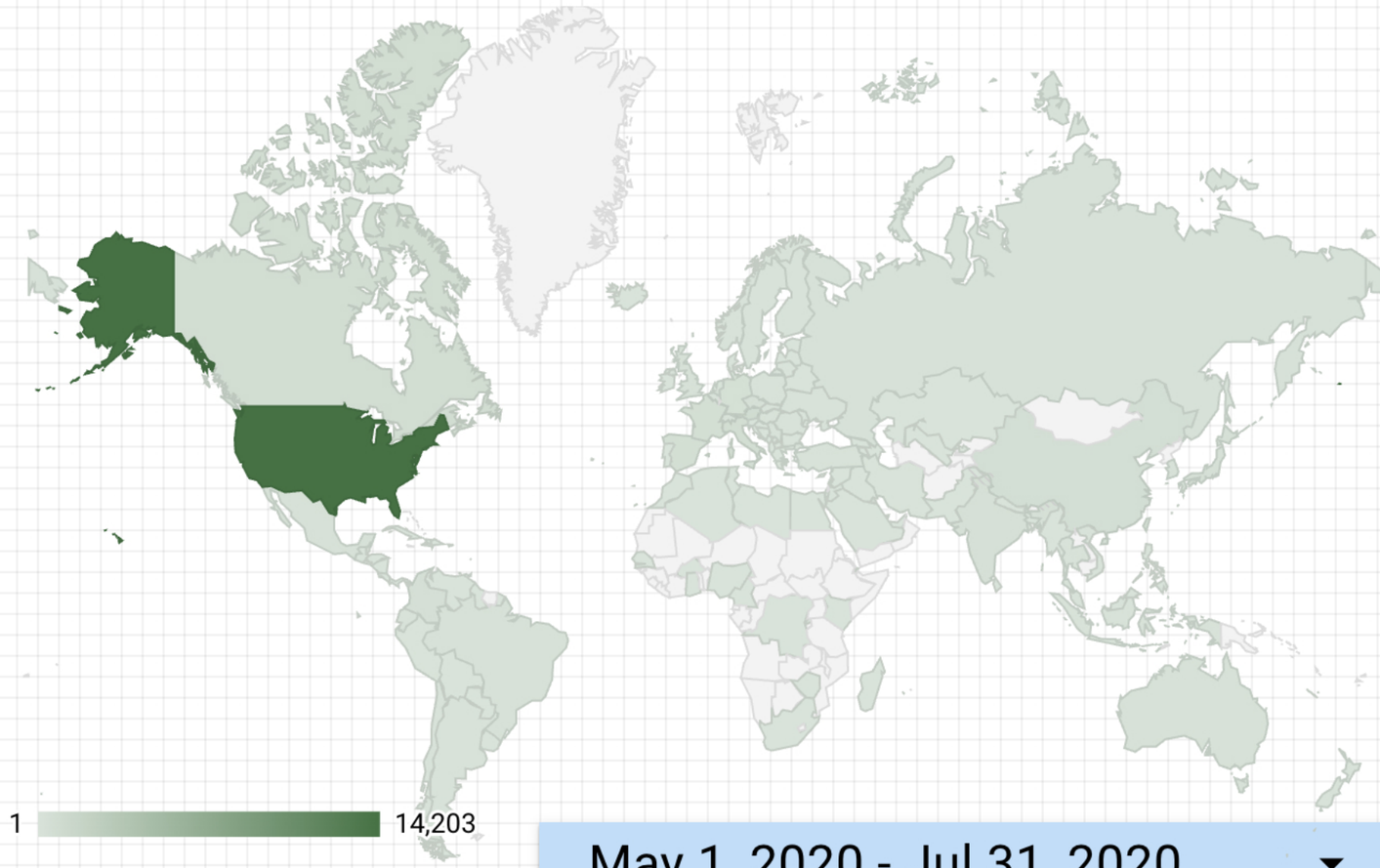
www.mycoportal.org **Data from Google Analytics**

Users	New Users	Sessions	Number of Sessions per User	Pageviews	Pages / Session	Avg. Session Duration	Bounce Rate
18,207	17,431	25,763	1.42	54,637	2.12	00:02:02	72.04%









Published on *iDigBio* (https://www.idigbio.org)

Submission #1638

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by nyeung
Monday, August 10, 2020 - 19:23
76.81.71.178

TCN Name:
PILSBRy

Person completing the report:
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Progress in Digitization Efforts:
The taxonomic authority file preliminary list currently contains 4,178 of about 5,000 species and includes references to original descriptions, type material, and type locations. Additionally, we began developing an export script for specimen record names in reference sources to import into WoRMS, MolluscaBase and ZooBank.
All primary type material in two of the six institutions have been digitized and databased. Due to the COVID19 pandemic, personnel were not able to work within the collections starting March 2020, which hampered efforts to finish digitization of type material from the other institutions.
To date, about 76,000 taxonomic records from collaborative institutions (ANSP, BPBM, FMNH, MCZ, UF, UMMZ) were consolidated and produced 119 family-group names, nearly 1,600 unique genus-group names, and over 21,000 unique species group names. Other information included authorship and classification. About 2,300 lots (~ 13,800 specimens) has been enhanced with georeferences and 513,265 entries from field notebooks and ledgers linked to specimen records. BPBM, FMNH, and ANSP has linked 453,396 entries from ledgers and field notebooks to associated specimen records. FLMNH has cataloged and georeferenced 500 lots of the Tom Iliffe Pacific Island collections. Additionally MCZ has digitized and linked 3 volumes (2,369 records) of D. Thaanum's field numbers to ledgers and online records. All historical ledgers in MCZ, BPBM, ANSP have now been scanned and linked to specimen records.

Share and Identify Best Practices and Standards (including Lessons Learned):
Due to COVID19 shutdowns, each institution has been making the best in digitizing from home which includes a lot of transcription work.

Identify Gaps in Digitization Areas and Technology:
Due to COVID19 shutdowns, each institution has been making the best in digitizing from

home which includes a lot of transcription work.

Share and Identify Opportunities to Enhance Training Efforts:
Due to COVID19 shutdowns, each institution has been making the best in digitizing from home which includes a lot of transcription work.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
As personnel are continuing to be limited in accessing collections, we are working on developing online tools for transcription and georeferencing tasks.

Share and Identify Opportunities and Strategies for Sustainability:
We will develop more online tasks that can be done remotely from the collection.

Share and Identify Education and Outreach (E&O) Activities:
We were able to recruit another postdoc in June 2020 and they will begin in September 2020 – at the start of Year 2.

More than 20 students, volunteers and technicians were recruited in Year 1 (ended August 1 2020) and trained in digitization and enhancement of records. There were 5 high school students, 10 undergraduates, 1 post-baccalaureate, 1 graduate student and six volunteers. More than half of the participants are females and three are Pacific Islanders. However, due to the COVID19 pandemic continued recruitment of personnel have been delayed since March 2020.

Google Analytics

Other Progress (that doesn't fit into the above categories):

Attachment 1

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1638

Published on *iDigBio* (https://www.idigbio.org)

Submission #1637

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by mwdenslow
Sunday, August 9, 2020 - 16:02
67.190.87.86

TCN Name:
SERNEC: The Key to the Cabinets: Building and Sustaining a Research Database for a Global Biodiversity Hotspot

Person completing the report:
michael.denslow@gmail.com

Progress in Digitization Efforts:
There are 122 collections serving data through the SERNEC portal. There are currently 5,009,266 specimen records and 472,702 (9%) of those records are georeferenced. There are currently 4,574,997 imaged specimen images available. There are currently 68 collections publishing to iDigBio.

Share and Identify Best Practices and Standards (including Lessons Learned):
The SERNEC – TCN protocols continue to be updated as needed and are posted on the SERNEC resources site (http://sernec.appstate.edu/resources).

Identify Gaps in Digitization Areas and Technology:
Nothing to report

Share and Identify Opportunities to Enhance Training Efforts:
Nothing to report

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
Nothing to report

Share and Identify Opportunities and Strategies for Sustainability:
Nothing to report

Share and Identify Education and Outreach (E&O) Activities:
SERNEC continues to have a large on active presence on Notes from Nature (https://www.notesfromnature.org/active-expeditions/Herbarium) with many expeditions running
concurrently.

We have an area of the SERNEC website dedicated to volunteer opportunities. https://herbarium.appstate.edu/sernec/volunteer-sernec

Google Analytics

Other Progress (that doesn't fit into the above categories):
All SERNEC – TCN PIs have now submitted their final reports. Appalachian State University has will remain active for an additional extension year to provide project support for data portal activities, citizen science and georeferencing.

Attachment 1

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1637

Published on *iDigBio* (https://www.idigbio.org)

Submission #1647

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by jrallen99
Wednesday, August 12, 2020 - 13:04
128.138.130.189

TCN Name:
SoRo: Using Herbarium Data to Document Plant Niches in the High Peaks and High Plains of the Southern Rockies - Past, Present, and Future

Person completing the report:
james.allen@colorado.edu

Progress in Digitization Efforts:
Collectively for the current quarter roughly May 2020-July 2020 we have entered 32,491 new records into databases, barcoded 29,237 new specimens, imaged 37,769 new specimens and georeferenced 42,638 new records.
In aggregate the project has now produced 378,764 new database records, 932,576 newly barcoded specimens, 958,059 new images and 214,358 new georeferences.
The project after ~35 months (out of 48) has completed. Total for TCN and PEN combined with last quarter in ().
Data Entry 68.6% (62.7%)
Barcodes 107.3% (103.9%)
Images 111.9% (107.5%)
Georeferences 34.8% (27.9%)

Like last quarter some of the metrics are not complete due to access issues. Some reporting from last quarter (Feb-April 2020) has carried forward and some reporting for this period is incomplete. Individual collections will continue to track this and update when they are able.

Several collections noted that it was not possible to transition staff to remote work and others noted that staff have elected to stop working rather than transition to remote work. Replacing staff has also been difficult for collections that are closed and or have limited access.

The SoRo TCN has also brought several databases online over the past year of the project that were not previously available outside of local networks. At least 50,000 pre-existing database entries have been made available for the first time from CSCN, GREE and

BHSC. This is in addition to the records reported above.
RMBL: Used residual project funds to image and update the database for specimens that were accessioned after the project started. These specimens are above the original project scope, but were funded with SoRo project money and are included in our metrics.
RMBL, NAVA and FLD have finished all digitization work involved with the project. COCO, BRU, MESA and YU have completed all imaging and data entry; georeferencing is in progress at COLO. Imaging is complete at ALAM and we are waiting on transcription work to be completed there before we can georeference at COLO. WSC is mostly complete with ~600 specimens that will be transferred to
COLO; georeferencing of available specimens is in progress at COLO. Imaging, data entry and georeferencing are ongoing at BHSC, COLO, CSCN, GREE, HUH, NY, RM, RSA, SJNM and UNM. Given delays from shutdowns we anticipate that this will not be the final year of the project. We plan to submit a no-cost extension to extend the project into a fifth year.

Share and Identify Best Practices and Standards (including Lessons Learned):
The SoRo project has been able to stay productive because we had a backlog of image specimens that had not been transcribed or georeferenced. As noted in previous updates, many collections are opting to image more specimens than were budgeted because it has proven difficult and not time effective to pull select specimens for imaging. Many collections are now facing institutional budget cuts and are unable to continue this in kind support of the project. We highly recommend that future projects, especially those digitizing in large collections, budget extra imaging resources for data discovery. Smaller and medium sized collections tend to be more geographically focused and it is often possible to image the entire collection and have most of the specimens fall into the project scope. This is another reason to include small collections while drafting projects.

Identify Gaps in Digitization Areas and Technology:
CSCN: We are storing all of our image data on two external hard drives housed in the herbarium. I will begin looking at procuring cloud space for data storage on campus in the upcoming weeks. We have yet to post images online.
SJNM: Still need to meet with our IT and SEINET experts to determine best way to link the images (that have been captured since the media appliance was decommissioned).
HUH: We have also started georeferencing, using the Geo-Locate collaborative interface. Unfortunately, a staff member noticed mid-July a data integrity issue in the CoGe software, that forced us to take a temporary break in georeferencing. Hence, those records have not been added to our database yet. The CoGe team has been responsive and we are working with them to resolve the bug.

RMBL: Over 1000 specimen images remain to be uploaded because bulk uploads via the image ingestion utility was discontinued by iDigBio. A mechanism to flag or correct inaccurate georeferences and other specimen information in other institution's databases would be helpful. Writing a comment for each error is cumbersome and may not result in a timely correction. Loss of the ability to bulk upload and link images to specimen records has led to long delays in making images available. A sustainable, consortium-wide, or national, image repository with bulk upload capabilities would help many smaller institutions get their collections digitized.

Share and Identify Opportunities to Enhance Training Efforts:
RSA: During this last quarter imaging progress came to a complete halt due to the pandemic and CA's stay at home mandate. At this time staff were switched to tasks that could be completed at home: data entry of specimens from images generated prior to the

pandemic and georeferencing records from the SoRo region. Staff had not previously been georeferencing as part of this project - in anticipation of the stay at home mandate, PI Nazaire trained all staff on georeferencing through a georeferencing workshop and a georeferencing practice worksheet before conducting the actual georeferencing. RSA's herbarium database is a snapshot of the database sent to Symbiota, and is not live online, meaning that staff have not come in to work in order to perform data entry tasks. To provide staff with specimens to database from home, Nazaire exported several thousand images that were imaged prior to the stay at home mandate to the Symbiota portal via CyVerse.
COLO has been discussing the possibility of pooling training resources with other collections at the CU Museum since many of the collections are working remotely the hope is that some training resources can be shared.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
RSA: Because the CAP project has set up a CyVerse account where we load images for that project, it is much more efficient for us to load all images to CyVerse (CAP, SoRo, and all incoming, new acquisitions) where all of the images are served in Symbiota. To date we are serving >125,000 images through the CCH2.org portal. In the last few weeks Ed Gilbert has linked our records in CCH2 to the SoRo portal, where our records have been updated and images of our specimens can now be viewed.

Share and Identify Opportunities and Strategies for Sustainability:
With budget cuts at several collections it is immediately clear that dedicated budgets and institutional support are needed for digitization projects. We are worried about what is going to happen with all of the biodiversity informatics manager and project management positions that are funded on soft money. Investments in infrastructure above the collection level may be needed if long-term funding for dedicated staff is not possible at individual institutions.

Share and Identify Education and Outreach (E&O) Activities:
FLD: Ross McCauley presented a talk at Botany 2020 on the work he has been doing creating modules using biodiversity data from SEINet in undergraduate classrooms and the challenges of moving traditionally in person lab work to remote content entitled "Teaching plant systematics online across the digital divide: perspectives from a Native American-Serving, Non-Tribal institution."
RSA: We have had a long-standing partnership with Dr. Ed Bobich at California Polytechnic Institute, Pomona to recruit undergraduate students from his Form & Function in Plants class to barcode specimens as partial fulfillment of their course objectives. Earlier in the year we had two barcoding sessions lined up with the students. We were able to have one session on March 2, and students barcoded ~700 specimens. Students were barcoding Lupinus specimens and learned about their diversity and distribution in the SoRo region. We follow up all of our barcoding sessions with a tour of the collection. We had a second session scheduled but due to stay at home mandate from the COVID-19 pandemic and California Polytechnic Institute, Pomona suspending on campus activities, we have had to cancel our second session. We had also done one barcoding session with our herbarium volunteers (about 500 specimens barcoded), prior to stay at home mandates.
RMBL: In 2019 I mentored an REU student, Karla Alvarado, in a project utilizing historical herbarium collections as a baseline for surveys to detect changes in plant community composition near RMBL. Ms. Alvarado was selected to represent the RMBL REU program at the Council for Undergraduate Research Symposium in Washington, D.C. in October 2019. In 2020, Karla was selected as a returning REU in the RMBL program. Because of

COVID-19 restrictions, she was unable to attend in person. Instead, we developed a remote project using historical herbarium collections and iNaturalist observations to examine changes in flowering phenology of several common species from the Gunnison Basin in Western Colorado. Usable data date back to the 1890's and species are typically represented by 200-300 specimens in the 13 county study area.

Google Analytics
SoRo_Analytics All Web Site Data Audience Overview 20200501-20200731.pdf

Other Progress (that doesn't fit into the above categories):
NYBG, BHSC, UNM, HUH, RM, CSCN, GREE, ASC, SJNM, COLO and ALAM are still digitizing collections. As a project, we were fortunate that collections have a backlog of images that could be transcribed and or georeferenced remotely. All of the SoRo collections actively digitizing except for two closed in March due to rising concerns of the COVID virus. As of early July most collections are either closed or on limited access. CSCN did not close, but they are in the middle of a move which can restrict access to the collection. BHSC closed from mid-March to early April. The University of Wyoming Campus essentially closed but access was continuous for the RM collection, but their volunteer program was not allowed to continue. All remaining collections closed in mid March and are either still closed or have very limited access to collections. COLO is currently limited to one staff member in the collection per day which means students/digitizers do not have access to the collection. RSA has limited access that started in mid July. The majority of collections shifted workflows to remote digitization of existing specimens. Many digitizers needed to be retrained or introduced to new tasks. In some cases this accelerated existing plans, but in others it resulted in a shift of staff resources.
HUH has directed additional non-SoRo staff resources to work on transcription. HUH regained access to their collection on July 6, 2020. Digitization staff is allowed back into the building to barcode and image new specimens and we estimate that project related work should pick-up again the week of July 27th. HUH has been tracking data entry based on new records in their database for the project and after 19,956 records were fully transcribed this quarter, 95,905/104,594 are now fully transcribed.
Given all of these headwinds the consortium has continued to be productive and keep the project on task.
All funded SoRo partners are sharing data with the SoRo portal (soroherbaria.org). iDigBio is currently restructuring their servers and is not integrating new data. All funded SoRo partners have data on iDigBio or have submitted a DarwinCore Archive that is waiting to be uploaded after the server update. All collections except for BHSC and GREE are sharing images with the SoRo/SEINet portal. SJNM is sharing images from earlier in their project, but has not been able to update with new images. These collections were caught in the transition of portals from iDigBio to Arizona State and were unable to use the iDigBio Media Ingestion Tool that was used by many of the other collections. Adding these images is a priority for the project now that the portal migration is complete.

COLO hired Alex Henrie to work on georeferencing across collections that are not georeferencing in house (ALAM, BRU, COCO, MESA, WSU and YU). Alex participated in the Field to Digital Object Workshop and the Georeferencing training last year and has been georeferencing at Northern Arizona University for the past year.

Google Analytics
Google Analytics for our SoRo site are still showing similar usage with a small increase in sessions and a small decrease in users and pageviews.

This quarter (May 1st 2020-July 31st 2020) saw 989 users over 1,568 sessions with a total of 19,851 pageviews.
Last quarter saw 1048 users over 1,566 sessions with a total of 20,881 pageviews.
We suspect that most of the data use is through the primary SEINet portal.

Attachment 1

Attachment 2

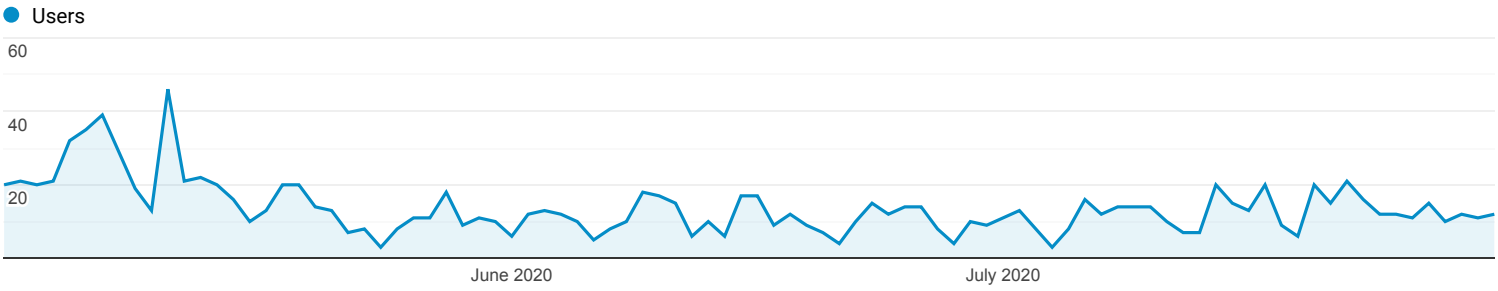
Source URL: https://www.idigbio.org/node/564/submission/1647

Audience Overview

All Users
100.00% Users

May 1, 2020 - Jul 31, 2020

Overview



Users
989

New Users
957

Sessions
1,568

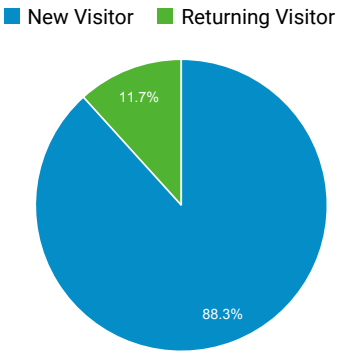
Number of Sessions per User
1.59

Pageviews
19,851

Pages / Session
12.66

Avg. Session Duration
00:17:43

Bounce Rate
50.32%



	Language	Users	% Users
1.	en-us	646	65.32%
2.	en	75	7.58%
3.	zh-cn	40	4.04%
4.	es-es	34	3.44%
5.	en-gb	28	2.83%
6.	es-419	17	1.72%
7.	ru-ru	12	1.21%
8.	fr-fr	9	0.91%
9.	pt-br	8	0.81%
10.	de	7	0.71%

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Submission #1643

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by djbarroso
Tuesday, August 11, 2020 - 19:51
12.44.89.34

TCN Name:
American Crossroads: Digitizing the Vascular Flora of the South-Central United States (TORCH TCN)

Person completing the report:
dbarroso@brit.org

Progress in Digitization Efforts:
I.- Progress in Digitization Efforts:
• Number of skeletal records created:

BRIT = 0
BAYLU = 0
HUH = 0 (no minimal capture while we could not image)
KANU = 0
MO = 0
NOSU = 0
NY = 0
OKL = 0
OKLA = 0 (all new skeletal records have been fully transcribed)
SHST = 0
TAES = 0
TAMUCC = 0 (none yet)
TEX-LL = 398
TTC = 0
UTEP = 0 (nothing new to report)

Total skeletal records created this quarter: 398

• Number of fully-transcribed records created:

BRIT = 41,653 (includes 11,762 by BRIT staff; 7,812 from Notes from Nature; and 22,079 transcribed by TEX students from May thru July)

BAYLU = 0
HUH = 8,065 (minimal records received detailed capture)
KANU = 2,437 (total fully-transcribed records from OK and TX = 23,832)
MO = 52
NOSU = 0
NY = 1,167
OKL = 317
OKLA = 322 (7 in house, 315 in Notes from Nature)
SHST = 0 (we have 23,778 fully transcribed records (cumulative), which are undergoing data curation)
TAES = 1
TAMUCC = 0 (none yet)
TEX-LL = 0 (none for TEX-LL, but 28 TEX undergraduate students transcribed 22,079 records as part of our collaboration with BRIT. For totals of TEX-LL and data providers, see Other digitization efforts, below.)
TTC = 0
UTEP = 0 (nothing new to report)

Total fully-transcribed records created this quarter: 54,014

• Number of specimens imaged:

BRIT = 7,135
BAYLU = 6,387
HUH = 0
KANU = 0
MO = 1
NOSU = 0
NY = 0
OKL = 1,006
OKLA = 3,098
SHST = 0
TAES = 2,000
TAMUCC = 0 (none yet)
TEX-LL = 398
TTC = 329
UTEP = 0 (nothing new to report)

Total number of specimens imaged this quarter: 20,354

• Number of specimens georeferenced:

BRIT = 0
BAYLU = 0
HUH = 4,923 (not yet available in data feed)
KANU = 2,485 (total georeferenced records from OK and TX = 23,554)
MO = 33
NOSU = 0
NY = 5,077
OKL = 4,188 (188 TX plus approx. 4,000 OK)
OKLA = 0

SHST = 0
TAES = 0
TAMUCC = 0 (none yet)
TEX-LL = 0 (we have not yet begun tracking the
total number of geo-referenced specimens)
TTC = 3,327
UTEP = 987

Total number of specimens georeferenced this quarter: 21,020

• Other digitization or pre-digitization efforts:

BRIT:

Significant progress has been made with regards to scheduling and digitizing provider herbarium collections (most are treated as loans-for-digitization):

• TAC: 43 boxes were transported (via U-Haul) to BRIT on July 7 and are being rotated through the BRIT freezers. Imaging, image processing, and label transcription have begun.

• TCSW: Digitization has been postponed until 2021, due to the inability of the curator to access the collection for health reasons related to the COVID-19 pandemic.

• ACU: 33 boxes are scheduled to be transported (via U-Haul) to BRIT on Aug. 3, 2020.

• HSU: BRIT is engaged in negotiations with curator Rick Hammer to access these collections. Currently limited access due to the pandemic, and staffing changes that will result in the discontinuation of Hammer's position within the year, have delayed this process.

• UNT: The hiring process has begun to engage a UNT student to begin digitizing the collection in August 2020.

• FWNC: Specimens are being digitized by TEX-LL.

Also:

◦ Hosting #TranscriptionThursdays webinars to encourage citizen scientists to use NotesFromNature to transcribe TCN specimens.

◦ We continue to address the backlog of project specimen images requiring processing, back-up to TACC servers, and linkage to Symbiota records.

◦ We continue to refine protocols and workflows, including in particular pre-digitization curation steps, and label transcription steps.

◦ Pre-digitization steps for TAC loaned specimens required some conservation work with historical collections that were especially fragile.

◦ Collaboration with TEX-LL has resulted in the transcription of specimen label data from Texas specimens in the BRIT/SMU collection, as well as in the NLU collection at BRIT. Thes transcriptions are presently in a sandbox server but will be transferred to the live

portal in the next few months.

BAYLU: Working with BRIT, developed automation method for white-balancing and JPG conversion using Perl script (adapted from the one written by Patrick Sweeney for NEVP TCN).

HUH: Staff have begun returning to the office in recent weeks and we will resume imaging and new record creation.

KANU: We have now databased all OK and TX specimens in 280 of our 350 cases (80%). Drop tags identifying OK and TX specimens were added in 10 additional cases; those specimens will be databased next. Genera in several of the large families in cases not yet checked for OK and TX specimens were the subject of earlier databasing efforts. At our current rate, we anticipate completing all of our databasing and georeferencing around the middle of September 2020.

MO: Nothing new to report.

NOSU: Nothing new to report.

NY: State Spotter -- The way we digitize on all TCN projects for maximum efficiency is that we digitize all specimens in the US folders regardless of state, and then we focus on completing records for the geographic area that is the focus of the TCN. Because TORCH is our 6th TCN to follow this procedure, we have essentially already imaged all TORCH specimens, so the trick is to find those among previously imaged specimens that are in the TORCH area. The first step in doing this is what we call State Spotter, which is a pass through the data where we only enter the state. Then, for the TORCH project, we will focus on transcribing only those for the TORCH area. During this period, state values were entered for 12,834 records by McKenna Coyle, of which about 15% are in the TORCH region. In total, all NYBG staff and crowd sourcers entered the state name for about 68,000 records, so collectively we probably added the name of the state to about 12,000 records in the TORCH region. These are now in the queue to be fully transcribed.

OKL: nothing new to report.

OKLA: Genus folders were made for Texas specimens (34 cabinets). 3272 barcodes were applied, and specimens were repaired as needed.

SHST: We are in the process of purchasing imaging equipment.

TAES: We have established a workflow for specimen imaging using the Nikon D850, Lightroom, and the Ortery light box. We have shared this workflow with PIs and subawardees. We have initiated the process of uploading our Excel database to the TORCH portal. We are working to establish a protocol for linking our images to the herbarium database using OCR of stamped accession numbers.

TAMUCC: The computer for the digitization, which was delivered recently, was set up Aug. 5. All other equipment for the digitization station is now complete. We are now ready to start taking specimen images.

TEX-LL:
Cumulative totals for TEX-LL and data providers:

Herbarium Number Databased Number Imaged
This ¼ Cumulative This ¼ Cumulative
TEX-LL 0 228,074 398 128,336
SRSC 397 20,687 397 20,673
SAT 0 38,689 0 0
HPC 329 22,897 324 3,949
TLU 1,171 6,666 0 27
PAUH 3,515 5,283 0 0
FWNC 0 1,981 0 1,981
SWT 0 0 0 0
LLC 0 0 0 0
RUNYON 0 0 0 0
LBJWFC 0 0 0 0
St. Ed's Univ. 0 0 0 0

Totals 5,412 324,277 1,119 154,966

TTC: We have imaged specimens not yet available on TORCH due to image hosting issues (see section III).

UTEP: nothing new to report.

• Comments about the digitization process:

BRIT: Provider herbarium digitization effort is grouped into the BRIT effort in the Progress in Digitization Efforts section above.

BAYLU: Because of COVID shutdown at Baylor, there was limited acess to the facility, although best practices are now implemented to increase availability.

HUH: Staff focused on completing the data capture for minimal records while imaging activities were on hold. We have also started georeferencing using the Geo-Locate collaborative interface (CoGe). However, we found a data-integrity issue with the CoGe software, so those records have not yet been added to our database. The CoGe team has been responsive and we are working with them to resolve the bug.

KANU: Digitization progress dropped of significantly around mid-March when the KU campus closed, and staff and students were prohibited from entering the herbarium. Essential staff have been allowed back in the herbarium since late June (with work restrictions); student employees are still not allowed in the building. We kept student employees on the payroll by providing a few hours of work a week, which they must do off-site. KU plans to reopen the campus in four weeks, and we hope students will be able to perform some work in the herbarium, where most of their efforts will be focused on imaging specimens. Students will not be allowed to work in teams at the imaging station, so imaging will proceed more slowly than we originally planned. We are exploring ways to allow the imaging work to proceed as safely and efficiently as possible while following all of the safety requirements put in place by the university.

MO:

The two essential elements needed to make any initial progress on this project were

ordering and installing the components for the imaging work station and securing student workers and/or employees to do the work.

At the end of February, we were just at the point of ordering the equipment for the imaging station, but it was becoming clear that cities and states were going to shut down, so we did not follow through on the ordering at that time. At that same time, we were looking to recruit and contract new student workers, but that also had to be suspended because of uncertainties within the local universities and the future personal circumstances of potential student workers.

We had also advertised an employee position to help with the management of the project, and were beginning to receive resumes, but did not get to the point of actually scheduling interviews. Our HR group is very small and the COVID-19 pandemic forced them into focusing their time and effort on other aspects of the Garden's management beyond recruiting.

The full impact of the COVID-19 pandemic in the US rapidly developed at a crucial point in the implementation of this project. The Missouri Botanical Garden was closed to the public on 16 March and within a few days it was closed to all staff, as well. Like most museum collections, the pandemic resulted in the closure of our collections to all on-site activities, forcing staff and any other potential participants to only work on what might be accessible electronically from off-site. This action severely curtailed our ability to conduct the proposed work in any meaningful way. Our science facilities, including the herbarium, remained closed to all staff until early July, when some people were allowed to return for brief periods or to work at most one or two days per week, most of whom are already committed to pre-existing activities. Access to our facilitier is strictly limited to staff, with no provision for student or volunteer participation for the foreseeable future.

Since we were, in reality, just beginning the project, we had very little in the way of "reserve" work that could be processed externally without access to the collections. This basically limited us to georeferencing existing electronic data records. We were also somewhat constrained by the need to use our Tropicos database as the project production platform, which is not compatible with Symbiota or its tools.

NOSU: Pandemics happen.

NY: Our work has continued uninterrupted during the quarantine period, although of course we can't do any work that involves touching the specimens themselves, because we are not allowed to go to the herbarium. We are soon going to run out of images to transcribe. I have requested that TORCH staff return with the first wave of staff to return to work in mid September. In the meantime, we will continue to georeference, if we run out of transcription work.

OKL: We are working on our Texas specimens, so that is much slower than doing the Oklahoma specimens, because of the time it takes to pull them and refile them.

OKLA: Imaging station came online July 14. We are still optimizing workflow and use of space in digitization studio.

SHST: Like everyone else, the pandemic has slowed down the process, as the university has made it so students are not yet allowed to be on campus to work.

TAES: Progress continues to be slowed by COVID-19. A single graduate student is working in isolation to establish workflows and conduct imaging. Once the database in available on the TORCH portal, we hope to hire undergraduate students to work remotely on georeferencing and image transcription.

TAMUCC: We have only acquired equipment so far.

TEX-LL:

TEX-LL lost its student workers to the COVID shutdown on 13 March and staff began working from home on 23 March. After 1 June, the curator and Assistant curator resumed coming in part-time. The situation at other herbaria in our data provider and sub-award group is similar to that at TEX-LL, with only minor differences. At TEX-LL, since 1 June we have focused on creating a backlog of images that students can database from who must work remotely in the fall semester.

Because our students needed to work remotely after mid-March, we entered into an agreement for our students to transcribe labels from images held by BRIT in a Symbiota sandbox. For these activities of our student workers, please see the BRIT sections of this Quarterly Report.

The data entry and imaging for the FWNC collection was completed in its entirety before the present quarter began.

TTC: Georeferencing of specimens has continued mostly unaffected by COVID19 with students working from home. Students have fixed roughly 1/5 of all georeferences, proceeding county-by-county through Texas.

UTEP: Imaging has been delayed due to Covid-19 shutdown until at least the Fall. UTEP is being cautious in reopening for volunteers and undergraduates in the research facilities.

• Number of records available in iDigBio portal (cumulative):

BRIT = 69,638 (this reflects the four collections housed at BRIT: BRIT, SMU, VDB, and NLU. Still 0 from provider TAC). NOTE: This number hasn't changed since at least 2 Feb. 2020! Do we need to ask iDigBio to update?)

BAYLU = 0

HUH = 30,125 (*Note: iDigBio has not ingested our records since Sept. 2019. We have reached out to them multiple times and they have explained that they are having issues with a database upgrade.)

KANU = We upload a new instance of our database to GBIF and iDigBio at the beginning of each month.

MO = 0 (Nothing to report)

NOSU = 0

NY = 28,935 from TX and OK. (This is a few thousand more than last time, but I'm not sure whether that means the data have been harvested, or whether I just did the search somewhat differently than last time!

OKL = 0

OKLA = 0

SHST = 27,000

TAES = 1,751

TAMUCC = 0 (none yet)

TEX-LL = 28,021 (includes TEX-LL + data providers, but not subawardee (UTEP), which is reporting separately).

TTC = 0

UTEP = 0 (nothing new to report)

• Number of records available in TORCH Symbiota portal (cumulative):

BRIT = 115,058 (this reflects the four collections housed at BRIT: BRIT, SMU, VDB, and NLU, including cultivated specimens.)

TAC = 2,224 (BRIT provider; reflects specimens from TX & OK, including cultivated)

BAYLU = ~1,500

HUH = 41,556

KANU = All KANU records uploaded to GBIF and iDigBio should be accessible via the TORCH portal.

MO = 0 (nothing to report)

NOSU = 0

NY = The total number of records for NY on SEINET (of which the TORCH portal is a part) is about 1.15 million; however, this is 287,000 more than those present in the IPT being served up by NY. We have discussed a plan to re-import the IPT de novo, which will leave approximately 863,000 records. Also, we probably need a discussion with someone from TORCH about how to link to our IPT to obtain our data – or maybe better to get it from iDigBio?

OKL = 508

OKLA = 750 Oklahoma and Texas (1822 total)

SHST = 0

TAES = 1,751

TAMUCC = 0 (none yet)

TEX-LL = 305,365 data records, of which 153,143 have images (includes TEX-LL + data providers, but not subawardee (UTEP), which is reporting separately).

TTC = 21,455

UTEP = 0 (nothing new to report)

Share and Identify Best Practices and Standards (including Lessons Learned):
II.-Best Practices and Standards (Lessons Learned):

BRIT:

• Regarding the digitization of provider herbaria:

◦ Adequate time must be given to identifying provider specimen specific protocols for pre-digitization curation, imaging, and label transcription, with active discussion with the relevant provider herbarium curator.

◦ A single individual or small, very-communicative team should be dedicated to the digitization of a provider collection to ensure consistency.

◦ Protocols developed specifically for a provider collection should be returned to that collection for their use in continuing specimen digitization at their institution.

◦ Regular updates to provider curators are beneficial.

◦ Official paperwork should be drawn up to indicate the loan of specimens from provider collections that will be transported to other locations for digitization.

BAYLU:
• Digitization technicians must be consistent when framing specimens in photobox.

• White balancing automation may need to adapt to smaller chunks (sessions) – universal white-balancing produces inconsistencies.

HUH: Nothing new to report.

KANU: Same as last report. We would have spent more time imaging specimens early on had we known that access to specimens was going to be restricted for an extended time. This would have facilitated processing of more skeletal records remotely.

MO: Nothing new to report.

NOSU: Nothing new to report.

NY: Nothing new to report.

OKL: Nothing new to report.

OKLA: Guide for transcription using Symbiota is in final steps of development (with Data Manager Clay Barrett).

SHST: Nothing new to report.

TAES: Nothing new to report.

TAMUCC: Nothing new to report.

TEX-LL: Nothing new to report.

TTC: Nothing new to report.

UTEP: nothing new to report.

Identify Gaps in Digitization Areas and Technology:
III.- Identify Gaps in Digitization Areas and Technology (issues preventing progress):

BRIT: We hope to utilize OCR to identify TORCH project specimens within a larger set of North American specimen images that already exist. Alternative methods are to manually advance through specimen images which is an inefficient and time-consuming method.

BAYLU: Need more backup and digital processing disk space. We are working on purchasing external drive (s). Baylor has recently switched its purchasing and accounting system.

HUH: Currently with the CoGe team to resolve a data integrity issue so that we can resume georeferencing activities.

KANU: Because student employees are not allowed in the herbarium, we have made no progress imaging specimens. We have focused efforts on databasing and digitizing so that most, if not all, of our OK and TX specimens will be ready for imaging when students are again allowed to perform on-site work.

MO: Nothing new to report.

NOSU: Nothing new to report.

NY: Nothing new to report.

OKL: We are waiting for equipment, so that we will be ready to work with Northeastern State University (NOSU, subawardee) and our provider institutions to digitize their collections.

OKLA: Need segmentation/OCR of accession stamp to link existing database records to images as they are obtained. Need to complete upload of OVPD/OBIS into portal—newly

imaged specimens are not in portal as they await integration with transcribed data in OVPD/OBIS.

SHST: The locations from a number of our specimens collected in Walker County have general descriptions, and not an exact address or cross reference; we are setting these aside and trying to locate field notes from the collector to get a more accurate location.

TAES: We have acquired one full imaging station, and are working to acquire a second.

TAMUCC: Nothing new to report.

TEX-LL: Nothing new to report.

TTC: We received a custom imaging station from BRIT in early June and have been successfully taking new images. However, we are currently unable to host our images, as our current host (Cyverse) has changed its uploading procedure. We are awaiting instructions from BRIT about a change to the TACC system mentioned at the iDigBio meetings.

UTEP: As per above, imaging has been delayed due to COVID-19.

Share and Identify Opportunities to Enhance Training Efforts:
IV.- Opportunities to Enhance Training Efforts; Training and Professional Development Opportunities you offered and/or participated in (e.g., webinars, student digitizer training, etc.):
BRIT: Thirteen #TranscriptionThursday events have been provided through our Armchair Botantist program – guided weekly Zoom webinars to engage the public in contributing to the Notes from Nature TORCH transcription effort. 728 participants in 7 expeditions launched since April 2020 (https://biospex.org/projects/torch-specimens-from-texas-and-oklahoma).
BAYLU:Trained graduate student in digitization and backup process.
HUH: Nothing new to report.

KANU: Nothing new to report.

MO: Nothing new to report.

NOSU: Nothing new to report.
NY: Nothing new to report.

OKL: Graduate student on grant (Leann E. Monaghan) participated in the iDigBio Digital Data 2020 online conference.

OKLA: Trained one graduate student in transcription and imaging workflows

SHST: When the semester resumes in mid-August and students are allowed on campus we will begin a bi-weekly Zoom meeting to teach students how to geo-reference specimens.

TAES: Nothing new to report.

TAMUCC: Nothing new to report.

TEX-LL: Nothing new to report.

TTC:

* We have successfully implemented remote access for herbarium specimen digitization: one student can position herbarium specimens and another can be working remotely, controlling the camera and cross-checking the specimen with our existing records on the TORCH Portal.

* Herbarium personnel (including graduate assistant Yanni Chen and director Matt Johnson) attended the May 5, 2020 iDigBio Darwin Core Hour on the future of georeferencing.

UTEP: Georeferencing training has been offered to students.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
V.- Collaboration with other TCNs, Institutions, and Organizations:
BRIT:
• Texas Master Naturalists

◦ Participants in #transcriptionthursdays with the Armchair Botanist program with BRIT (Indian Trail Master Naturalists, Cross Timbers Chapter, North Texas Chapter, Highland Lakes Chapter, South Texas Chapter).

◦ BRIT provided training in targeted plant collection to individuals, using data generated by the TORCH TCN available online, in addition to other sources, to identify gaps in species distribution. Nearly 80 collections have been deposited in the BRIT herbarium, with born-digital records entered into Symbiota for Ellis and Tarrant Counties; Symbiota checklists are being developed for the TORCH portal from these projects but, are currently unpublished.

* Project Manager Diego Barroso held virtual meetings with delegates from TAES, TTC, and SAT, to introduce them to the workflow used to upload images to the TACC image repository being used by the TORCH TCN project.

* Andrew Miller at Illinois (Microfungi TCN) provided TORCH Project Manager Diego Barroso helpful information on NSF Annual reporting guidelines.

BAYLU: BRIT assisted in development of crucial image processing automation script and implementation.

HUH: Nothing new to report.

KANU: Nothing new to report.

MO: Nothing new to report.

NOSU: Nothing new to report.

NY: We collaborate with the other TCNs we have been involved in as described above under “Other Digitization.”

OKL: Nothing new to report.

OKLA: Nothing new to report.

SHST: We have discussed the possibility of digitizing the specimens at the Natural History Museum in San Antonio, approximately 6,000 specimens.

TAES: Nothing new to report.

TAMUCC: Nothing new to report.

TEX-LL: Current data entry at PAUH (data provider) is being funded under a grant from CONTEX program of University of Texas/CONABIO to digitize resources on Tamaulipan thornscrub in U.S. and Mexico. Rest of PAUH's Texas/Oklahoma holdings will be digitized through the TORCH project.

TTC: We have communicated with BRIT (Jason Best and Ashley Bordelon) to help us set up the imaging station. We provided feedback about the construction of the imaging station and accompanying demonstration videos.

UTEP: Nothing new to report.

Share and Identify Opportunities and Strategies for Sustainability:
X.- Opportunities and Strategies for Sustainability:
BRIT: Generate documentation and make this available, including versioning history.

BAYLU: Nothing new to report.

HUH: Nothing new to report.

KANU:
• Due to the extended shutdown of the university, it became clear in late May that we would not be able to complete our work by the end of August 2020 as originally planned. Therefore, we have requested and received a no-cost extension from Oklahoma State University for our work. Our goal is to complete all of our work by the end of calendar year 2020. Meeting that goal will depend on what happens at the university during the remainder of the summer and fall.

MO: Nothing new to report.

NOSU: Nothing new to report.

NY: Nothing new to report.

OKL: Nothing new to report.

OKLA: Obtained space on local NAS for data backup and staging to TACC, running a Symbiota Sandbox on OSU's High Performance Computing Cluster.

SHST: Nothing new to report.

TAES: Nothing new to report.

TAMUCC: Nothing new to report.

TEX-LL: Nothing new to report.

TTC: Nothing new to report.

UTEP: Nothing new to report.

Share and Identify Education and Outreach (E&O) Activities:
VI.- Methods of disseminating results to communities of interest (presentations, lectures, etc.):
BRIT: Abstracts submitted were accepted for presentation at the Texas Plant Conservation Conference (Aug. 13-14, 2020; Rehman et al.) and annual Texas Master Naturalist Meeting (Oct. 14-17, 2020; Rehman et al.).

BAYLU: Nothing new to report.
HUH: Nothing new to report.

KANU: Nothing new to report.

MO: Nothing new to report.

NOSU: Nothing new to report.

NY: Nothing new to report.

OKL: Nothing new to report.

OKLA: Nothing new to report.

SHST: Nothing new to report.

TAES: Nothing new to report.

TAMUCC: Nothing new to report.

TEX-LL: Made one online presentation to a Texas Master Naturalists Chapter on the TEX-LL herbaria that included information on our TORCH efforts.

TTC: Article about the TTC Herbarium repository agreement with the Guadalupe Mountains National Park, which is a direct result of the digitization efforts of collections made at the park.

https://today.ttu.edu/posts/2020/04/Stories/50-year-old-biology-collection-enables-new-research-opportunities

UTEP: Nothing new to report.

VII.- Other Education and Outreach activities:
BRIT: #TranscriptionThursdays (see more details above)

BAYLU: Nothing new to report.

HUH: Nothing new to report.

KANU: Nothing new to report.

MO: During the closure of our facilities, there were no opportunities for outreach activities.

NOSU: Nothing new to report.

NY: Nothing new to report.

OKL: Nothing new to report.

OKLA: Nothing new to report.

SHST: Nothing new to report.

TAES: Nothing new to report.

TAMUCC: Nothing new to report.

TEX-LL: Nothing new to report.

TTC: Nothing new to report.

UTEP: nothing new to report.

Google Analytics

Other Progress (that doesn't fit into the above categories):
VIII.- Products generated (publications, conference presentations, technologies/techniques, websites, etc.):
BRIT: Nothing new to report.

BAYLU: Nothing new to report.

HUH: Nothing new to report.

KANU: Nothing new to report.

MO: Nothing new to report.

NOSU: Nothing new to report.

NY: Nothing new to report.

OKL: Nothing new to report.

OKLA: Nothing new to report.

SHST: Nothing new to report.

TAES: Nothing new to report.

TAMUCC: Nothing new to report.

TEX-LL: Nothing new to report.

TTC: The TTC herbarium was represented in several presentations at the national Botany meeting, held virtually July 27 – 31, 2020:
“On the potential of Angiosperms353 for population genomics.” Presenter: Matt Johnson, TTC Herbarium Director

“Implementing undergraduate research in an upper-level botany lab using target capture sequencing of herbarium specimens.” Presenter: Haley Hale, Johnson Lab Manager

“Characterization of the Fungal Microbiome in 50-Year-Old Plant Herbarium Specimens.” Presenter: Cassidy Coker, TTU Honors Research Scholar

“Herbaria as botanical snapshots: 50 years of land use and climate change impacts on genetics and physiology in the Guadalupe Mountains.” Presenter: Madeline Slimp, TTU Honors Research Scholar

UTEP: nothing new to report.

IX.- Participants (especially those who have newly joined the project):
BRIT:

• Ashley Bordelon, Digitization Technician; abordelon@brit.org
• Joe Lippert, Digitization Coordinator; jlippert@brit.org
• Diego Barroso, TORCH TCN Project Manager; dbarroso@brit.org
• Jessica Lane, BRIT Herbarium Assistant; jlane@brit.org
• Tiana Rehman, Collections Manager/Institutional Rep; trehman@brit.org
• Jason Best, Dir. Biodiv. Informatics/Technovator; jbest@brit.org
• Peter Fritsch, VP of Research/PI; pfritsch@brit.org

* And 28 UT-Austin student transcribers on the collaboration with TEX:

Abigail Escobar, Adrian Iramategui, Adriana Glick, Alec Dickerson, Alegria Martinez, Alejandra Rubio, Amin Singh, Asma Karedia, Chloe Luna, Christina Song, Elijah McGinley, Johari Weaver, Kaitlyn Richardson, Katherine Le, Lane Morgan, Lexis Cisneros, Luis Garza, Mariela Reyna, Mark Finley Jr., Max Reeves, Phong Le, Riddhi Ankolekar, Sheena Nguyen, Sofia Alvarez, Tushar Sharma, Wenxuan Zhou, Yuying Ma, and Zhiyao Bao.
BAYLU:
* Will Matthaeus, doctoral graduate student
HUH: Nothing new to report.

KANU:

Project participants continuing to work on the project since the previous reporting period:

• LeeAnn Bennett - dabasing

• Zoe Chan – hourly student
• Keta Ewing – hourly student
• Craig Freeman – PI
• Maeve Hilgers – hourly student
• Megan Wetherington – hourly student

We lost one hourly student due to the university shutdown (we could not provide enough hours). Our other hourly students have continued through the spring and summer with greatly reduced hours.

MO: Nothing new to report.

NOSU: Nothing new to report.

NY:

* McKenna Coyle, lead digitizer (started in November 2019).
* Alex Patrescu – intern, began June 2020.

OKL: Nothing new to report.

OKLA: Sierra Hubbard, entering graduate RA, began work as a hourly employee

SHST: Justin Williams (curator) and Will Godwin (collection manager); we will hire students when the semester begins and the new fiscal cycle starts.

TAES: Kyle Simpson, Texas A&M University PhD student.

TAMUCC: J. Rodriguez, an undergraduate student, has recently been hired to help with the image capture.

TEX-LL:
For the final quarter of Year 1, none of our undergraduate students contributed to progress at the University of Texas at Austin (TEX-LL —Lead Institution). Please see the BRIT section above for a list of students who participated as part of the joint BRIT-TEX collaboration for remote data entry.

For TEX-LL Subawardees and Data Providers:

• Saint Edward's University Herbarium, Austin TX (no acronym yet) joined as a new data provider, but operations were halted by the pandemic. The faculty contact there is William Quinn.

• Fort Worth Nature Center, Fort Worth TX (FWNC) was transferred from BRIT list of data providers, however its digitization was completed prior to the start of the reporting quarter.

• The University of Texas at El Paso (UTEP) (subawardee) is reporting separately.
The following are existing data provider institutions, each of which so far has managed its own digitization efforts (including student hires), so far without financial input from the TORCH TCN. The main contacts for each herbarium are:

• Sul Ross State University (SRSC): Mike Powell, Jackie Poole

• Angelo State University (SAT): Dianna Kresja, Bonnie Amos
• Texas State University (SWT): David Lemke
• Howard Payne University (HPC): Marilyn Mathis
• Our Lady of the Lake University (LLC): Briana Salas
• University of TX Rio Grande Valley–Edinburg (PAUH): Andy McDonald
• Texas Lutheran University (TLU): Alan Lievens
• University of TX-Rio Grande Valley–Brownsville (RUNYON): Alejandro Fierro Cabo
• Lady Bird Johnson Wildflower Center (LBJWFC): Minnette Marr

TTC:

Matt Johnson (Subaward PI)
Yanni Chen, Sarah Vaca (Herbarium Graduate Assistants, Summer 2020)
Hayden Mathews, Jennifer Mendez (Undergraduate assistants, Summer 2020)
Cassidy Coker, Madeline Slimp (TTU Honors Research Scholars, Summer 2020)

UTEP: New UTEP undergraduates Alexis Vallejo and Aparna Mangadu are new summer participants in georeferencing – trained and supervised by our collections manager Mingna “Vicky” Zhuang.

XI.- Other Progress not listed above (anything else to share):
BRIT: Nothing new to report.

BAYLU: Nothing new to report.

HUH: Nothing new to report.

KANU: Nothing new to report.

MO: Nothing new to report.

NOSU: Nothing new to report.

NY: Nothing new to report.

OKL: Nothing new to report.

OKLA: Nothing new to report.

SHST: Again, the pandemic has slowed down our efforts; this will change when the semester begins.

TAES: Nothing new to report.

TAMUCC: Nothing new to report.

TEX-LL: Participated in two TORCH Executive Committee online meetings.

TTC: Nothing new to report.

UTEP: Nothing new to report.

XII.- Questions/comments:
BRIT: Safety restrictions in response to the pandemic have prevented volunteers from returning to the BRIT building, which has impacted our progress in imaging, and pre-digitization curation. We do not see this issue being resolved in the next 6 months, but we are able to generate enough material to keep our remote employees and volunteers with specimens to be transcribed.

NY: We need to talk about getting our data on the TORCH website, whenever you are ready to do this. (see section above regarding NY's IPT)

Attachment 1
TORCH-compiled-Q3-2020-08-12-SUBMITTED.pdf

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1643