Bi-Monthly Progress Reports To iDigBio Submitted By Active Thematic Collections Networks (TCNs)

May 2019

CONTENTS:

- Google Analytics across ADBC
- Reports from the following **active** TCNs:

☒ CAP	☐ InvertEBase	☒ oVert
☒ Cretaceous World	☒ LepNet/SCAN	☒ PCC
☒ Endless Forms	☒ MAM	☒ SERNEC
☒ EPICC	☐ MHC	☒ SoRo
☐ FIC	☒ MiCC	

- Reports from the following **retired** TCNs are no longer included:

~~GLI~~	~~MaCC~~	~~TTD~~
~~InvertNet~~	~~NEVP~~	~~VACS~~
~~LBCC~~	~~Paleoniches~~	

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

Submission #1531

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by EPICC
Friday, April 19, 2019 - 13:52
128.32.154.17

TCN Name:
Documenting Fossil Marine Invertebrate Communities of the Eastern Pacific - Faunal Responses to Environmental Change over the last 66 million years

Person completing the report:
aadineen@berkeley.edu

Progress in Digitization Efforts:
As of 04/10/19, the TCN has fully curated and computer cataloged 1,670,333 specimens (103% of goal) and made 574,359 of these specimens (34% of goal) available in the iDigBio portal. The TCN has photographed 119,501 specimens (143% of goal thanks in large part to a large-scale digitization project at the Smithsonian) and georeferenced 25,256 localities (77% of goal). UCMP is in the process of uploading a backlog of photographs taken last fall and early spring. CAS has completed the taxon tree created by LACM and CAS, which will allow the TCN to begin analyzing the taxonomic coverage of EPICC-relevant taxa digitized against expected occurrences. Smithsonian reports that they have finished processing the data for almost all of their 44,137 records and are currently finalizing those updates into their collections information system. They are also working on updating their taxonomy through a script that references the EPICC Taxonomic Dictionary, which looks for updates to the currently accepted name.

Share and Identify Best Practices and Standards (including Lessons Learned):
At UCMP, onboarding of the new TCN project manager (Ashley Dineen) has been going smoothly, mostly due to excellent digital documentation of procedures and workflows by the prior manager (Erica Clites). We recommend that all institutions keep workflows and progress reports up-to-date and easily accessible to all (e.g., Google Drive, DropBox).

Identify Gaps in Digitization Areas and Technology:
UO reports that the main computer dedicated to EPICC died suddenly, so they had to develop workarounds while it was being replaced. This resulted in a month-long slowdown in their digitization and photography. At UCMP, the departure of the prior project manager, Erica Clites, has caused a delay in the imaging process. Likewise, UCR (PEN) reports that progress has slowed as they are in the process of bringing on a new collection manager (the position was vacant for 4 months).

Share and Identify Opportunities to Enhance Training Efforts:

UCMP has hired and begun training two new graduate student workers who will be photographing specimens over the summer. UCR has also recruited two undergraduates to assist with their digitization goals this summer, additionally reporting that while these students don't plan to go in to the natural history museum field as a career, they have voiced an appreciation for the role museums play in science and society.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
UO continues to georeference other member localities, going above and beyond their institutional goals. The Burke has made available to the TCN some important digitized publications related to Washington state invertebrates.

Share and Identify Opportunities and Strategies for Sustainability:
LACM has been working on large-scale, detailed drawer-level inventory to identify the quantity and quality of their fossil material. This provides knowledge for future conservation needs and potential value/efficiency/issues if the specimens are to be incorporated into the EPICC-TCN workflow. UCMP continues to update and add new fields to their database as needed, to streamline future digitization.

Share and Identify Education and Outreach (E&O) Activities:
LACM developed several public displays describing the Cenozoic fossil invertebrate biodiversity of Southern California. LACM's digitization efforts were also presented at their own Nature Fest (03/2019). UCMP took part in CalDay at UC-Berkeley April 13th, showcasing EPICC-related invertebrate specimens from the Miocene Calaveras Dam locality. Lisa White (UCMP) gave a talk at the iDigBio-sponsored 5th Life Discovery conference in Gainesville, FL (March 21-23, 2019) highlighting the virtual field experiences (VFEs) created with other members of the TCN.

Google Analytics

Other Progress (that doesn't fit into the above categories):
UCMP hired Dr. Ashley Dineen as the new Senior Museum Scientist of Invertebrate Paleontology in March 2019. She has replaced Erica Clites as the new EPICC project manager. UC-Riverside (TCN PEN) also finished the search for a collections manager, hiring Dr. Lauren English to their Museum Scientist position. UCR is in the process of adding Dr. English as a co-PI on their EPICC PEN.

Attachment 1

Attachment 2

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

Submission #1533

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by neilscobb
Friday, April 26, 2019 - 23:43
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_April_2019.docx

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1533

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

Submission #1534

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by neilscobb
Friday, April 26, 2019 - 23:44
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:
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_April_2019.docx

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1534

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

April 25, 2019
Neil Cobb

Progress in Digitization Efforts:

This is a joint report for the two networks 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 http://symbiota4.acis.ufl.edu/scan/portal/index.php , which depending on the context we refer to as the SCAN-LepNet database or the LepNet-SCAN database. All data presented here were accessed on April 24, 2019. **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.

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
Specimen Records	19,285,565	16,661,942	2,623,623
# Georeferenced	16,059,299	13,948,913	2,110,386
# Imaged	2,489,523	2,370,375	119,148
# Identified to species	10,259,635	7,782,010	2,477,625

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 26 ADBC funded museums and one non-funded museum (Oklahoma State University). Twenty-six museums comprise the NSF-ADBC LepNet and all have established a collection on the LepNet Portal and are serving data directly to iDgiBio 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. There are 194 collections set up on SCAN, 23 collections have not entered any data in the portal and

LepNet - The LepNet ADBC-funded museums are still on target to meet goals for records and images. An additional 32 collaborators (non-ADBC funded museums that use our data portal to serve their data) have also provided additional records for Lepidoptera. There are 26 collections (referred to as added-value) that have allowed us to harvest their data via IPT to serve lepidopteran records. **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 96% 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 80% 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.

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	876,286	766,372	501,200	429,843
Noctuidae	442,278	379,924	332,532	289,476
Pieridae	344,709	279,972	257,297	201,824
Erebidae	317,430	268,105	201,600	159,668
Geometridae	309,418	259,456	209,614	168,837
Hesperiidae	309,369	248,733	228,775	175,146
Lycaenidae	301,677	248,407	168,327	143,996
Papilionidae	181,470	138,063	92,900	65,255
Crambidae	122,438	100,554	75,864	55,863
Sphingidae	86,827	67,676	54,604	39,593

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 sponsored one successful Partners to Existing Networks project through the University of Texas- El Paso that will start digitizing ants from the McKay ant collection. We have a new PEN with The Field Museum, focusing on several ground-dwelling coleopteran 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.lep-net.org/ . We will expand this to incorporate material from the SCAN drupal project website.

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	1,156,902	1,041,895	651,520	578,399
Carabidae	610,806	494,372	405,675	326,357
Araneae	240,161	194,945	207,216	167,543
Acrididae	237,605	178,888	200,957	146,258
Tenebrionidae	185,060	161,427	113,947	99,484

We share best practices on the LepNet project website http://www.lep-net.org/ . Most of these are also relevant to SCAN.

Standardization of Images for Research - We developed a consensus for criteria that would make images the most useful for research. We defined criteria that would make images good for computer vision identification (LepSnap) and for ImageJ, a software program designed to quantify pixel qualities http://www.lep-net.org/?p=383 .

Identify Gaps in Digitization Areas and Technology: 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 191 collections, we continue to add one collection per month.

Share and Identify Opportunities and Strategies for Sustainability: Two museums in SCAN have sustainability plans (CSU and UC-Boulder).

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 one new collections since the last update.

GBIF Registration - There are 34 Live collections on SCAN that are now registered with GBIF and 29 other entomology collections from the United States that have institutional collection data sets on GBIF. (**Figure 1**).

Taxonomy Tables - We added the complete taxon table provided by Pohl, Patterson, and Pelham (2016) into the LepNet taxonomy tables and shared a csv version with LepNet collaborators using other

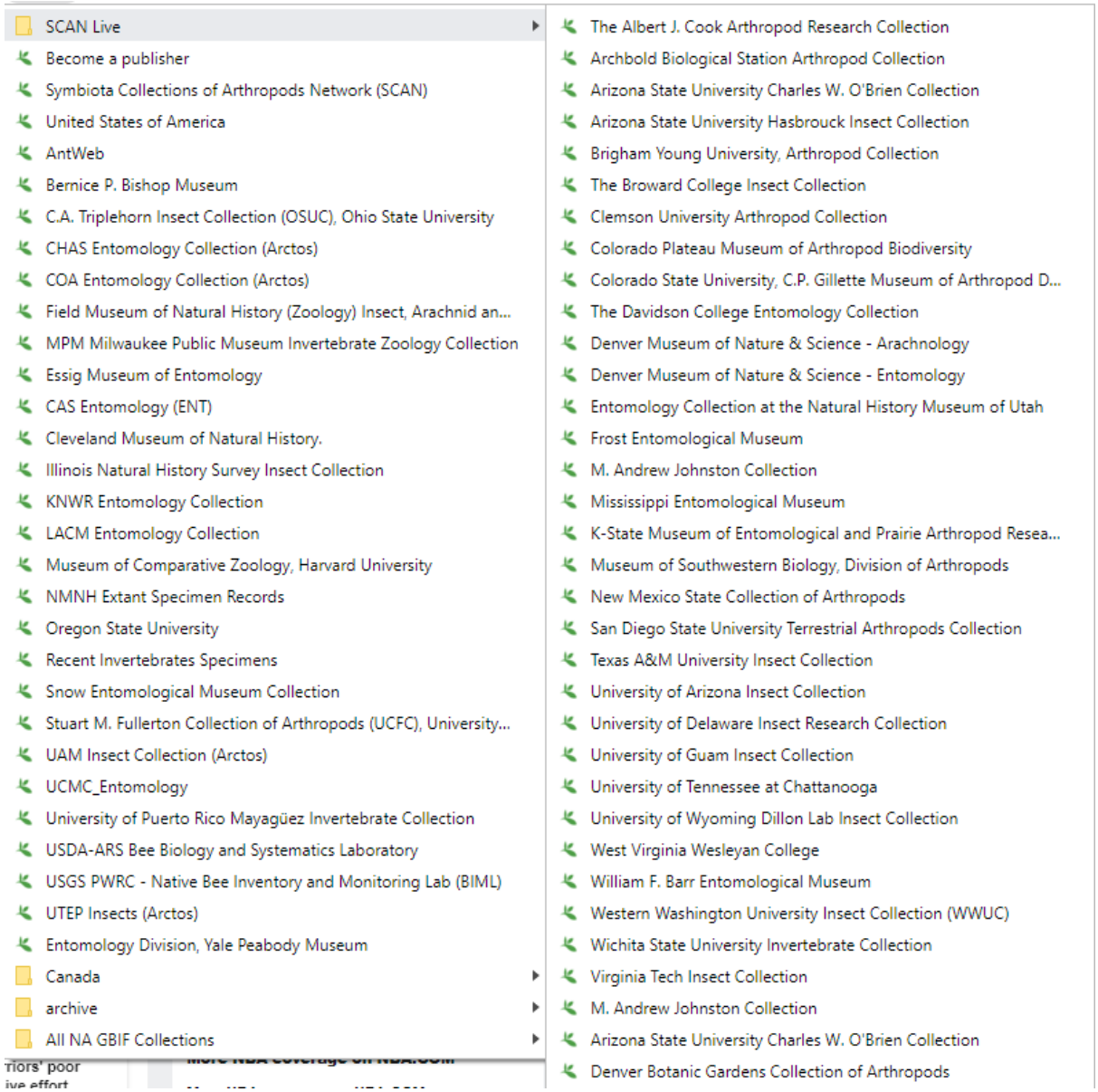

Figure 1. Arthropod collections that are registered with GBIF.

databases (Specify, Emu, Arctos).

LepNet Research Advisory Board - We have created a LepNet research advisory board (RAB), which is a subgroup of the LepNet TCN's CoPIs charged with developing guidelines for research projects and grant proposals that are requesting digitized specimen data ahead of online publication. LepNet is receiving requests for Lepidoptera on a regular basis, including requests for student research projects

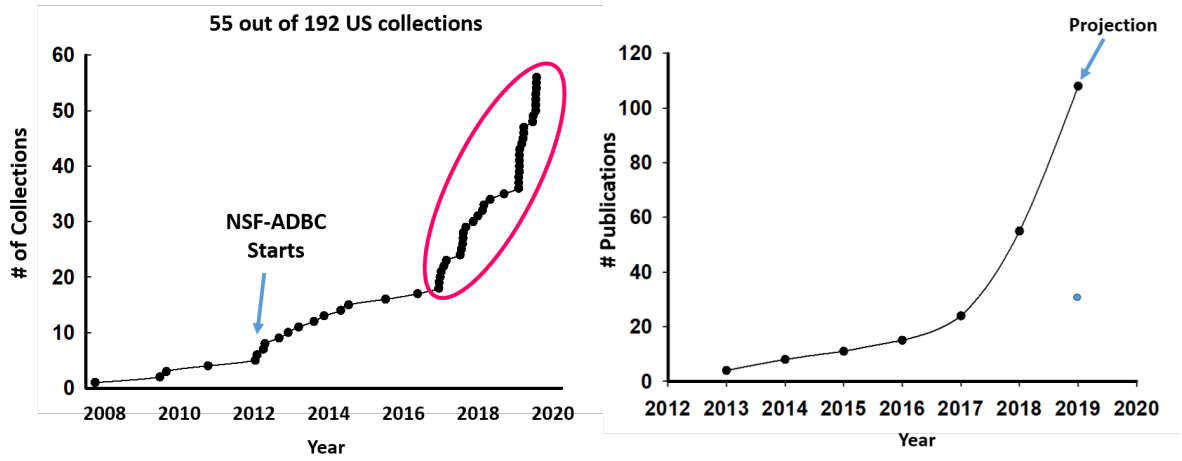

Figure 3. Registration of US arthropod collections with GBIF (left panel). Since 2017 we have made a concerted effort to add collections with the help of GBIF. The right panel shows number of publications that use US arthropod collection data for their research . The blue dot show the number of publications as of April 13, 2109 and we show the expected number by the end of 2019 as a projection.

and conservation projects that include sensitive data. Thus, the goal of the RAB is to establish a process that maximizes efficiency of digitization for LepNet, opportunity for collaboration, and publications for those involved (as appropriate). We are tracking LepNet's collaborative research projects online and engaging in regular discussions with PIs and at RAB monthly meetings. While project tracking will help our TCN become more organized, we also hope this new pipeline will generate even more energy and excitement for research that uses digitized collections data. The initial project that precipitated the creation of a research advisory board was the Poweshiek Skipperling project, which was so successful in terms of soliciting participation by museums, we wanted to expand the projects program. We hope that we can ensure that participants are provided attribution (e.g. authorship in checklist publications) and project leads let participants know exactly what they need.

We have identified nine projects to date, each one is described below.

Project Name	**Name, Affiliation (contacts)**
Puerto Rico Hurricane Project	Catherine Hulshof
Woolly bear tymbal morphology Project	Nick Dowdy
Colias eurytheme Project	Matt Nielsen,
Agriculturally significant Lepidoptera (In Prep)	Crystal Klem, Jen Zaspel, Bledsoe, Neil Cobb,

Pieris biocontrol Project	JJ Weis
Mimallonid biogeography	Ryan St Laurent
Collection patterns of North American Lepidoptera	Erica Fisher & Anthony Cognato
Catocala	Akito Kawahara, Larry Gall
Poweshiek skipperling Project – Published BDJ	Anna Monofils

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). We are finishing a draft manuscript reviewing North American entomology collections.

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).

Google Analytics: Below (**Figure 4**) is the summary graphical stats for the period since our last report January 24, 2019 to April 24, 2019) for the SCAN portal, http://scan-bugs.org/portal/index.php . Most people use the SCAN portal to enter and edit Lepidoptera data, but some people use the LepNet skin. **Figure 5** summarizes user activity for the LepNet data portal http://symbiota4.acis.ufl.edu/scan/lepnet/portal/index.php. The LepNet data portal actually shares the same underlying database with SCAN and so some people that only participate in LepNet still enter, annotate, and review Lepidoptera data from the SCAN portal. We also have a WordPress site http://www.lep-net.org/ that features LepNet but also provides SCAN updates. There was a slight decreasing trend in use from May to July that likely corresponds to the field season and travel to collecting sites.

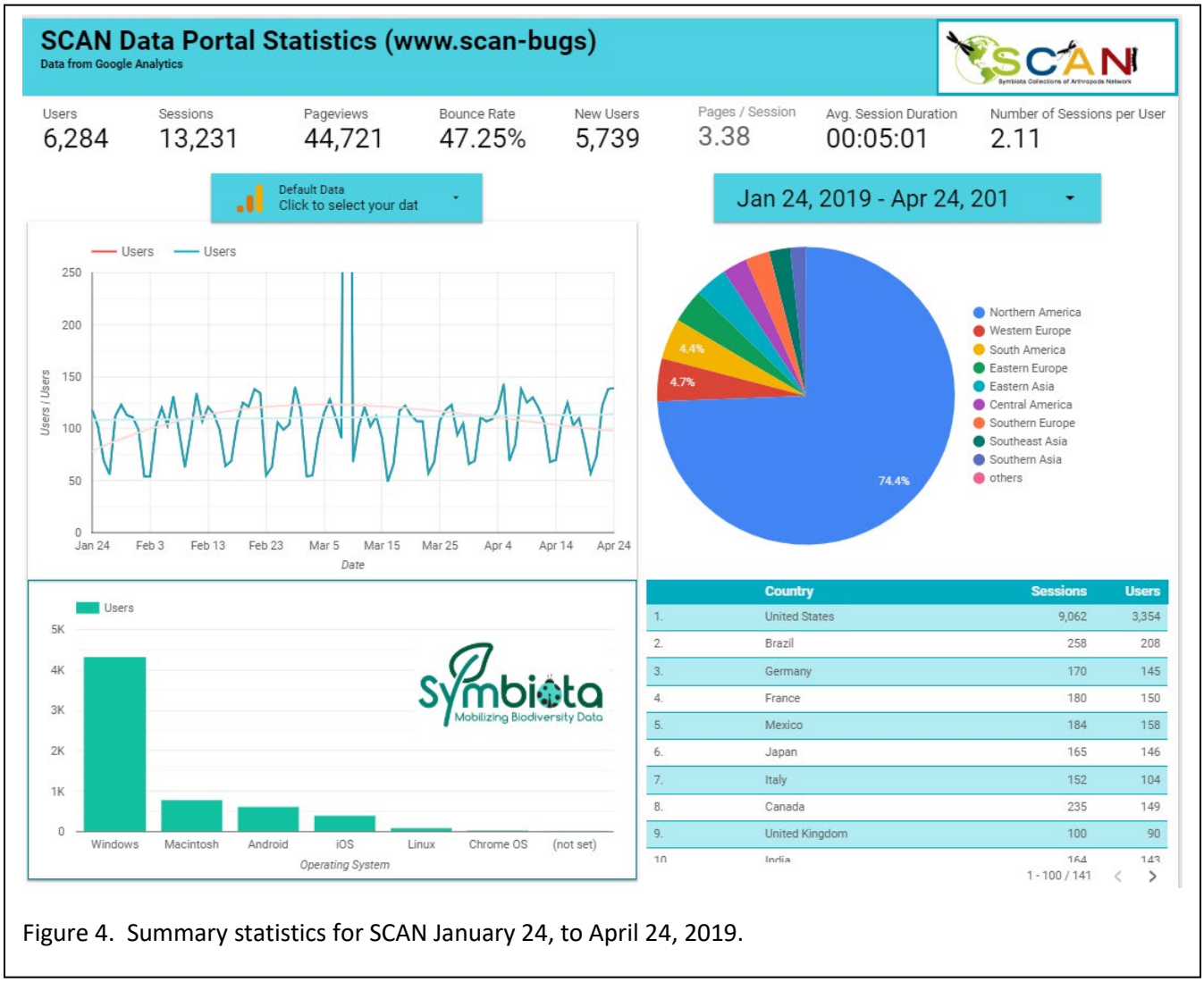

Figure 4. Summary statistics for SCAN January 24, to April 24, 2019.

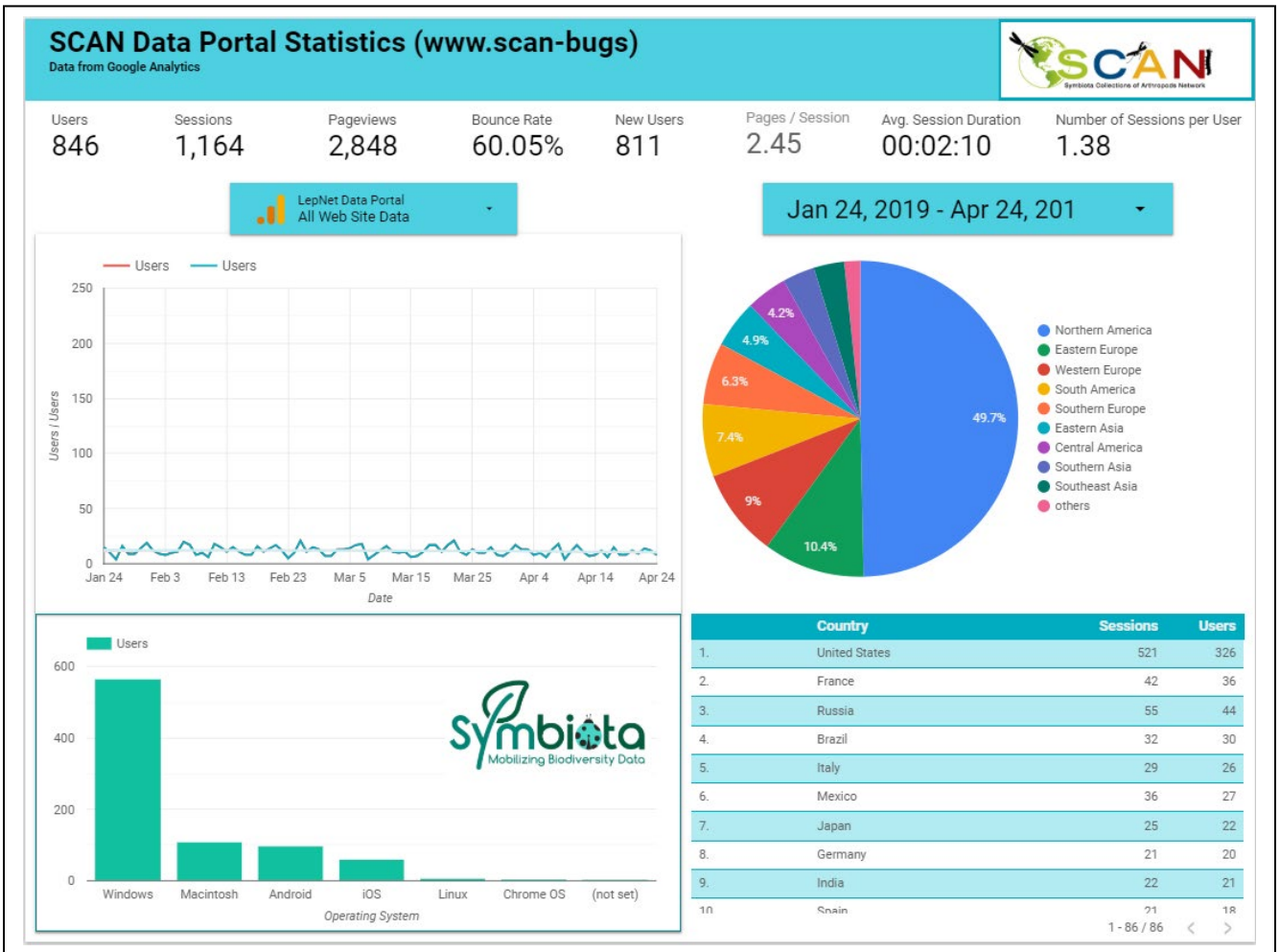

Figure 5. Summary statistics for LepNet January 24, to April 24, 2019.

Submission #1535

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by BruceL
Saturday, April 27, 2019 - 11:40
24.225.98.220

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 Julien Kimmig (JK), we have databased 83,227 fossil specimens total, with 31,514 specimens databased since the last reporting period. 74,424 of these specimen records are also georeferenced. In addition, we have georeferenced 544 localities since the last reporting period and have now georeferenced a total of 7,490 localities associated with this project. We also generated 400 new images.

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

They have databased 1,520 Cretaceous specimens total, with 166 databased since the last reporting period. 1,166 of these specimen records are also georeferenced. In addition, we have georeferenced 131 localities since the last reporting period and now georeferenced a total of 309 Cretaceous localities associated with this project.

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

they have databased 44,852 Cretaceous specimens (3,504) total, with 11,927 (842 lots) databased since the last reporting period (January 25 - April 21, 2019). 41,995 of these specimen records (3,232 lots) are also georeferenced, with an additional 420 (6 lots) being evaluated for georeferencing. Of the remainder: 1867 (190 lots) have locality numbers but are missing locality data, 115 (16 lots) have locality information that is too vague to make georeferencing meaningful, 29 (9 lots) have erroneous locality data, and 425 (50 lots) have no locality information. In addition, they have georeferenced a total of 581 Cretaceous localities associated with this project (492 of these georeferenced localities are associated with collection objects, the remaining 89 georeferenced

localities are in the database but not yet linked to a specimen record).

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

in staffing news, the SUNY Geneseo undergraduate who helped produce nearly 240 3D photogrammetry models last summer will be returning this summer to continue her work, focusing this time on “scanning” specimens on display at PRI’s Museum of the Earth public venue. Additionally, beginning in June, a PRI staff member will switch from her current project to working on the Cretaceous World TCN full-time through at least the end of the calendar year. She will focus on adding species to the Cretaceous Atlas of Ancient Life and also developing content for the Digital Encyclopedia of Ancient Life.

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

their present count of employed and volunteering students is: 1 graduate and 1 undergraduate employees, and 2 high school volunteers. The high school volunteers have begun learning the fossil identification process.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
Regarding the University of Kansas portion of the project, led by PI Bruce S. Lieberman (BSL) and with major involvement from collections manager Julien Kimmig (JK),

some of the material we have databased was also examined as part of a collections visit from a curator at the Science Museum of Minnesota who came to study our Cretaceous collections, especially gastropods and arthropods. It is possible to directly trace this visit to the increased knowledge about our collections by the broader community, due to our activities with the Cretaceous World grant.

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) and with major involvement from collections manager Julien Kimmig (JK),

BSL is working on the next chapter of the Digital Encyclopedia of Ancient Life (DEAL) along with Jon Hendricks from the Paleontological Research Institution (PRI) (discussed also as part of the PRI update). The chapter focuses on “Evolution and the Fossil Record”.

In addition, BSL has created a blog along with Niles Eldredge called “Macroevolutionaries” that highlights topics in macroevolution and paleobiology for a non-technical audience: https://bronze-

sheep-29mh.squarespace.com . Our first post, https://bronze-sheep-29mh.squarespace.com/blog/2018/9/1/survival-of-the-laziest-or-how-we-learned-to-stop-worrying-and-love-the-nap , featured research supported by NSF-ADBC funding.

We also have had quite a bit of outreach. In particular, graduate and undergraduate students, faculty, and staff participated in the 4-day Kansas City Gem & Mineral Show (in Kansas City, Missouri) where we were stationed at a large booth to provide activities for children and adults including a poster about our Cretaceous World project. We also had an exhibit on our Cretaceous fossils at the show; each of these was designed and created by JK. We also handed out information about the Digital Atlas of Ancient Life website and app and Kansas fossils. In total we interacted with and provided information to ~ 500 visitors. JK, graduate, and undergraduate students also organized and provided information at a small exhibit on fossils as part of a larger KU Natural History Museum outreach event held on the KU campus.

In addition, BSL and JK have been working with exhibit staff at the KU Natural History Museum to create a new exhibit on ammonites and how they ate. The exhibit features a large set of ammonite jaws in our collections from the Cretaceous chalk of western Kansas.

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

since the last report, efforts have continued to focus on development of outreach products related to the Digital Atlas of Ancient Life project (homepage: https://www.digitalatlasofancientlife.org/).

The online, open access Digital Encyclopedia of Ancient Life (DEAL) paleontology textbook continues to grow and there are several noteworthy additions since the last update:

First, PRI Research Scientist Dr. Elizabeth Hermsen—as part of her NSF-supported research—is developing DEAL chapters on modern plant structure and development, as well as paleobotany. Three of the pages that she has developed are now finished (or, nearly finished):
• The Land Plant Life Cycle: https://www.digitalatlasofancientlife.org/learn/embryophytes/life_cycle/
• Introduction to Angiosperms:
https://www.digitalatlasofancientlife.org/learn/embryophytes/angiosperms/
• Angiosperm Pollination:
https://www.digitalatlasofancientlife.org/learn/embryophytes/angiosperms/angiosperm_pollination/

Second, page about tabulate corals has been added to the “under construction” Cnidarian chapter of DEAL: https://www.digitalatlasofancientlife.org/learn/cnidaria/anthozoa/tabulata/.

Finally, PI’s Hendricks and Lieberman (University of Kansas) are continuing to work on the “Evolution & The Fossil Record” chapter of DEAL. It is now ~80% finished (including completed sections on natural selection, species and species concepts, speciation, and punctuated equilibria and stasis) and we expect that the entire chapter will be ready to share by the time of the next report.

An additional major activity at PRI since the last report has been the development of curated “Virtual Collections” of specimens derived from the 3D photogrammetry models of PRI specimens that we produced last summer. We envision these Virtual Collections to being akin to the physical drawers of specimens that an instructor might place on a bench during a paleontology laboratory exercise. Not all instructors have access to such physical collections, however, and we see these virtual equivalents as the next best thing. They can also be used in online courses and students can additionally use them to study at home. The Virtual Collections that are currently online (including Fossil Preservation, Phylum Arthropoda, Phylum Mollusca, and Devonian Fossils of New York) may

be accessed at: https://www.digitalatlasofancientlife.org/vc/. PI Hendricks will be speaking about the teaching utility of such Virtual Collections at the NAPC meeting this summer at Riverside, California.

In staffing news, the SUNY Geneseo undergraduate who helped produce nearly 240 3D photogrammetry models last summer will be returning this summer to continue her work, focusing this time on “scanning” specimens on display at PRI’s Museum of the Earth public venue. Additionally, beginning in June, a PRI staff member will switch from her current project to working on the Cretaceous World TCN full-time through at least the end of the calendar year. She will focus on adding species to the Cretaceous Atlas of Ancient Life and also developing content for the Digital Encyclopedia of Ancient Life.

Social media numbers:
• The Digital Atlas Twitter account (@PaleoDigAtlas) currently has 1,132 followers and has produced 955 tweets.
• The new Digital Atlas Facebook account (@PaleoDigAtlas) currently has 99 follows.

Google Analytics

Other Progress (that doesn’t fit into the above categories):
Regarding the University of Kansas portion of the project, led by PI Bruce S. Lieberman (BSL) and with major involvement from collections manager Julien Kimmig (JK), one of BSL’s graduate students, Steven Byrum, presented a poster on his research into phylogenetic and biogeographic patterns in Cretaceous echinoids from the Western Interior Seaway at the Geological Society of America Joint South-Central/North-Central meeting in Manhattan, Kansas:

Byrum, S., and B. S. Lieberman. 2019. Phylogenetic and biogeographic patterns in spatangoid echinoids from the Cretaceous Western Interior Seaway. Geological Society of America Joint South-Central/North-Central/Rocky Mountain Meeting, Manhattan, KS, Abstracts with Programs, https://gsa.confex.com/gsa/2019SC/webprogram/Paper326851.html .
This work utilized collections from several institutions including TCN representatives KU and the University of Texas. Moreover, as part of this work, several echinoid specimens were donated to the KU museum and these have been identified and databased.

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

they have one new paper in press related to their work on the grant: Freymueller, N., J. M. Moore, and C. E. Myers. 2019. An analysis of the impacts of Cretaceous oceanic anoxic events on global molluscan diversity dynamics. Paleobiology.

Attachment 1

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1535

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

Submission #1536

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by kds15e
Monday, April 29, 2019 - 19:06
141.126.84.87

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

Person completing the report:
katelin.d.pearson24@gmail.com

Progress in Digitization Efforts:
All institutions are now imaging specimens with the exception of two institutions (CHSC, UCR) that have experienced delays in acquiring imaging equipment. The project manager is actively working with the latter institutions to fast-track their progress and troubleshoot setup issues. RSA is currently imaging BSCA specimens and should be finished within several weeks. Figure 1 shows the distribution of unprocessed, barcoded/processed, and imaged target specimens per institution. Extensive pre-curation of specimens (e.g., resolving pest damage; creating annotations) was necessary at some institutions (CSUSB, MACF, SDSU), which temporarily postponed imaging. Despite this, significant progress is still being made.
Katie Pearson (project manager; PM), Jason Alexander (data manager; DM), Jenn Yost (lead PI) and Ed Gilbert (Symbiota developer) have weekly video conferences related to portal development and data migration. The DM has finished merging georeference data from previous CCH projects with occurrence data in CCH2. The DM has also been consistently updating the taxonomic thesaurus of CCH2.

Share and Identify Best Practices and Standards (including Lessons Learned):
The PM continues to monitor created images, solicit feedback from member institutions, and adjust recommendations as necessary to create the best possible images.
The lead PI and PM met with developers of the Plant Phenology Ontology (who are also members of the phenological standards advisory committee) on 3 April 2019 to discuss codifying phenological data in the CCH2 portal. A draft of the CCH2 phenological data format has been developed. The topic of phenological data standards will be discussed at a CAP TCN-led workshop at Botany 2019 in Tucson, AZ.
In collaboration with Patrick Sweeney at Yale, Symbiota developer Ed Gilbert has finished a beta version of the phenology Attribute Mining Tool, which will enable phenological scoring of specimen images in the CCH2 portal.

Identify Gaps in Digitization Areas and Technology:

Web-hosting images remains the primary technological obstacle for this project. The PM has been uploading and linking specimen images for 11 of the 22 collaborating institutions due to the non-functionality of the iDigBio Media Ingestion Appliance at these institutions; however, because iDigBio recently revealed that they will no longer be accepting images through the Appliance as of 2020, we are seeking an alternative solution involving CyVerse.
At some institutions, student/volunteer turnover has presented challenges for rapid progress. Additional training videos and documentation are being developed to decrease the burden of training.
Linking a skeletal barcoded image record to the database record with the old stamped accession number is doubling the time it takes to fully digitize the specimen. If there were a program that could identify the stamped number and automatically link the image to the existing record, it would save us a lot of time.

Share and Identify Opportunities to Enhance Training Efforts:
The PM surveyed collaborators for updates in mid-March, and, along with the lead PI, responded to questions, requests, and suggestions made by each institution. For example, UCSB suggested that an introductory course about the CAP TCN be developed, which the PM is now pursuing.
Collaborators who attended the California Botanical Society Graduate Research Symposium at lead institution Cal Poly, San Luis Obispo were invited to a CAP collaborators' luncheon. Collaborators were able to meet one another and discuss progress at their respective institutions. The lead PI and PM led a tour of the herbarium and the imaging facility and demonstrated the newly-launched Notes from Nature expedition featuring specimen images created through the CAP project (see E&O activities).
Two webinars were conducted in March 2019 and April 2019. The first described how to enter data into the CCH2 portal, and the second demonstrated data cleaning tools in CCH2. Recordings of these webinars are posted on the CAP TCN website (capturingcaliforniasflowers.org). Future webinars will address the topics of collection management tools and georeferencing.
The website has been updated with the latest digitization protocols and new training resources. The PM produced two training videos: one to demonstrate how to link images to their respective records in CCH2, and the other (per a collaborator's request) to demonstrate how to print specimen labels in CCH2. An initial draft of the comprehensive digitization manual was posted on the website and contains a project overview, workflow, setup description, all protocols, and other necessary information.
The lead PI and PM will attend Botany 2019 in late July, where they will be able to meet and discuss pertinent topics with collaborators.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
Collection data from the California Academy of Sciences are now imported via IPT into the CCH2 portal and are publically available for viewing and downloading. Occurrence data for the herbaria at BLM Redding Field Office, Klamath National Forest, Huntington Botanical Gardens, and Sierra Pacific Industries-Forestry have also been important into CCH2. Both the DM and PM have reached out to 20 additional herbaria that have previously supplied data to the Consortium of California Herbaria. These herbaria are being encouraged to share data and perhaps even manage it live in CCH2.
As described above, the lead PI and PM met with developers of the Plant Phenology Ontology (who are also members of the phenological standards advisory committee) to discuss codifying phenological data in the CCH2 portal.
With the rollout of the first Notes from Nature citizen science expedition (see last section), the PM has reached out to relevant chapters of the California Native Plant Society (Orange County chapter, San Gabriel Mountains chapter, LA/Santa Monica chapter, South Coast chapter) and the Master Gardeners of Los Angeles and San Bernardino for solicit participation. Collaboration on this front is ongoing.
See next section for cyberinfrastructure collaborations.

Share and Identify Opportunities and Strategies for Sustainability:
In wake of the rollback of cyberinfrastructure support from iDigBio, Arizona State University has offered to host the Symbiota instance of the CAP TCN data portal, CCH2. Migration of the portal to ASU servers is scheduled for early summer.
As previously described, the CAP TCN is also seeking a new web-host for specimen images. Given the success of the SERNEC TCN with hosting images on CyVerse, as well as a positive response from CyVerse personnel upon inquiry, we are pursuing this option.

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).
The first Notes from Nature (NfN) expedition, which engages citizen scientists and other volunteers to transcribe specimen data from images of specimens, was launched in early April and consists of 1983 specimen images from Cal State Long Beach and Cal State Los Angeles. As of April 23, 2019, this expedition was over 20% complete. The PM is engaged with online volunteers through NfN Talk to clarify transcription questions and further develop the tutorial and help text. A Zooniverse blog post was published to introduce this expedition: https://blog.notesfromnature.org/2019/04/05/consortium-of-california-herbaria-on-nfn/. The PM is engaging California Native Plant Society chapters and Master Gardener communities for participation in this and future NfN expeditions. Cal Poly SLO hosted a Citizen Science Day event on 13 April 2019 in which 20+ students helped transcribe specimen data in Notes from Nature. Similar events are planned for the summer and fall.
CSU Fullerton, Cal Poly SLO, and CSU Northridge were each featured in institutional news stories about herbarium digitization (https://www.capturingcaliforniasflowers.org/public-media.html). The news story about CSU Fullerton included an introductory video: https://youtu.be/7Gp9s4HbKns. An article about the CAP TCN project at UC Davis was published in the Davis Botanical Society newsletter, Lasthenia.
The PM and lead PI have finished one round of revisions of a scholarly article that summarizes the CAP project and sent the draft to all collaborators for review. The tentative final submission date is scheduled for May.
Presentations and/or introductions of the project were also given (or are planned to be given) on these occasions by faculty, staff, and students at collaborating institutions:
• Herbarium staff at BSCA shared about the project with Anza-Borrego Desert State Park Botany Society volunteers.
• San Diego State University herbarium faculty and staff represented the herbarium to approximately 100 community members at the SDSU Science and Engineering Sampler on 23 March 2019.
• UC Irvine staff introduced the project at the Orange County California Native Plant Society “Botanical Bites” meeting in March 2019.
• The student supervisor for the Cal Poly herbarium presented CAP TCN poster at the California Botanical Society Graduate Student Symposium on 6 April 2019.
• Lead institution Cal Poly SLO held an open house and demonstrated herbarium specimen digitization for 60+ adults and prospective students on 12 April 2019.
• Staff at San Jose State University demonstrated herbarium imaging to junior high and high school students as part of the MESA Schools Program
• UC Davis collaborators will represent the project at the UC Davis Spring Internship and Career Fair.
• Student curators at Cal State LA will present a poster about herbarium digitization at their end-of-the-year BioBash event.

Google Analytics

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

Attachment 1
May2019QuarterlyReport.pdf

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1536

CALIFORNIA PHENOLOGY TCN – QUARTERLY REPORT – MAY 2019

Assembled by Katie Pearson and Jenn Yost, April 29,2019

The CAP TCN is a network of 22 institutions that is creating nearly 1 million images of flowering plant specimens and capturing phenological data of the specimens. The goal is to be able to understand flowering time shifts in California's biodiversity hotspot.

Progress in Digitization Efforts:

All institutions are now imaging specimens with the exception of two institutions (CHSC, UCR) that have experienced delays in acquiring imaging equipment. The project manager is actively working with the latter institutions to fast-track their progress and troubleshoot setup issues. RSA is currently imaging BSCA specimens and should be finished within several weeks. Figure 1 shows the distribution of unprocessed, barcoded/processed, and imaged target specimens per institution.

Figure 1. Barcoding and imaging progress of CAP TCN institutions as of April 29, 2019. Each colored bar represents the total number of specimens targeted as part of the project. Red portions of each bar below the x-axis represent numbers of specimens that have not been processed. Yellow portions of each bar show numbers of specimens that have been barcoded or otherwise made ready for imaging but have not yet been imaged. Green portions of each bar represent numbers of specimens that have been imaged. The proportions of imaged specimens that have been fully processed (converted into JPEG and DNG format, uploaded to server, made available online, linked to existing records, and archived) are not represented in this figure.

Extensive pre-curation of specimens (e.g., resolving pest damage; creating annotations) was necessary at some institutions (CSUSB, MACF, SDSU), which temporarily postponed imaging. Despite this, significant progress is still being made.

Katie Pearson (project manager; PM), Jason Alexander (data manager; DM), Jenn Yost (lead PI) and Ed Gilbert (Symbiota developer) have weekly video conferences related to portal development and data migration. The DM has finished merging georeference data from previous CCH projects with occurrence data in CCH2. The DM has also been consistently updating the taxonomic thesaurus of CCH2.

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

The PM continues to monitor created images, solicit feedback from member institutions, and adjust recommendations as necessary to create the best possible images.

The lead PI and PM met with developers of the Plant Phenology Ontology (who are also members of the phenological standards advisory committee) on 3 April 2019 to discuss codifying phenological data in the CCH2 portal. A draft of the CCH2 phenological data format has been developed. The topic of phenological data standards will be discussed at a CAP TCN-led workshop at Botany 2019 in Tucson, AZ.

In collaboration with Patrick Sweeney at Yale, Symbiota developer Ed Gilbert has finished a beta version of the phenology Attribute Mining Tool, which will enable phenological scoring of specimen images in the CCH2 portal.

Identify Gaps in Digitization Areas and Technology:

Web-hosting images remains the primary technological obstacle for this project. The PM has been uploading and linking specimen images for 11 of the 22 collaborating institutions due to the non-functionality of the iDigBio Media Ingestion Appliance at these institutions; however, because iDigBio recently revealed that they will no longer be accepting images through the Appliance as of 2020, we are seeking an alternative solution involving CyVerse.

At some institutions, student/volunteer turnover has presented challenges for rapid progress. Additional training videos and documentation are being developed to decrease the burden of training.

Linking a skeletal barcoded image record to the database record with the old stamped accession number is doubling the time it takes to fully digitize the specimen. If there were a program that could identify the stamped number and automatically link the image to the existing record, it would save us a lot of time.

Share and Identify Opportunities to Enhance Training Efforts:

The PM surveyed collaborators for updates in mid-March, and, along with the lead PI, responded to questions, requests, and suggestions made by each institution. For example, UCSB suggested that an introductory course about the CAP TCN be developed, which the PM is now pursuing.

Collaborators who attended the California Botanical Society Graduate Research Symposium at lead institution Cal Poly, San Luis Obispo were invited to a CAP collaborators' luncheon. Collaborators were able to meet one another and discuss progress at their respective institutions. The lead PI and PM led a tour of the herbarium and the imaging facility and demonstrated the newly-launched Notes from Nature expedition featuring specimen images created through the CAP project (see E&O activities).

Two webinars were conducted in March 2019 and April 2019. The first described how to enter data into the CCH2 portal, and the second demonstrated data cleaning tools in CCH2. Recordings of these webinars are posted on the CAP TCN website (capturingcaliforniasflowers.org). Future webinars will address the topics of collection management tools and georeferencing.

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The lead PI and PM will attend Botany 2019 in late July, where they will be able to meet and discuss pertinent topics with collaborators.

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With the rollout of the first Notes from Nature citizen science expedition (see last section), the PM has reached out to relevant chapters of the California Native Plant Society (Orange County chapter, San Gabriel Mountains chapter, LA/Santa Monica chapter, South Coast chapter) and the Master Gardeners of Los Angeles and San Bernardino for solicit participation. Collaboration on this front is ongoing.

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In wake of the rollback of cyberinfrastructure support from iDigBio, Arizona State University has offered to host the Symbiota instance of the CAP TCN data portal, CCH2. Migration of the portal to ASU servers is scheduled for early summer.

As previously described, the CAP TCN is also seeking a new web-host for specimen images. Given the success of the SERNEC TCN with hosting images on CyVerse, as well as a positive response from CyVerse personnel upon inquiry, we are pursuing this option.

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- UC Davis collaborators will represent the project at the UC Davis Spring Internship and Career Fair.
- Student curators at Cal State LA will present a poster about herbarium digitization at their end-of-the-year BioBash event.

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

Submission #1537

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by djbarroso
Tuesday, April 30, 2019 - 19:04
192.17.34.169

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:
diego.barroso@yahoo.com

Progress in Digitization Efforts:
• During this quarter, 2130 ISC specimens were digitized, represented by 2130 newly-created records and 3310 images.

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:
• Nothing new to report.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
• Due to arising difficulties in using the U of Florida FTP server for ingesting images into the Symbiota portals, we at MyCoPortal have begun providing help to other institutions (e.g., ARIZ, ISC, GAM) who are still contributing images to iDigBio. (February 2019).

• Utah State University – Intermountain Herbarium (USU:UTC) published its data to GBIF, via MyCoPortal (February 6th, 2019).

• Geocoordinates for 324,000 U.S. National Fungarium records were added to the BPI collection, increasing the percentage georeferenced from less than 1% to 42% (total number of records is 772,582). Auto-georeferencing was done by Nelson Rios using the GeoLocate Python script (February 8th, 2019).

• Recordsets for PDD (New Zealand Fungarium) and ICMP (International Collection of Microorganisms from Plants) were updated, via IPT, to latest versions (February 14th, 2019). For PDD, 1834 new occurrences, 2500 georeferences, and 1000 images were added; and, for ICMP,

450 new occurrences, 1000 georeferences, and 700 images were added.

• A virtual training session was held – in collaboration with U of Arizona personnel – for Teresa Clements, a citizen scientist who deposits her specimens at U of A. She was taught how to use Symbiota, link her ARIZ occurrences from MyCoPortal directly to Mushroom Observer, and also how to link them to GenBank (February 19th, 2019).

• Presence created for the Slovenian Fungal Database (LJF), with 158,690 observation-based records added (February 28th, 2019).

• A new presence was created for the fungus collections of the National Herbarium of Mexico (MEXU), with 12,472 new records added (March 11th, 2019).

• 50,444 lichen records from Oregon State University (OSC) were imported from the Consortium of North American Lichen Herbaria portal (lichenportal.org) (March 15th, 2019).

• Data from MyCoPortal is now being shared with and utilized by the Islands of the Californias Biodiversity Information System (calIBIS) portal (see http://www.cal-ibis.org/collections/misc/collprofiles.php?collid=4)

• MyCoPortal is a collaborating partner on a National Geographic proposal led by Professor M. Catherine Aime at Purdue University, who is P.I. The proposal is titled, “Citizen Science-Powered Mycoflora for North America” (see https://drive.google.com/file/d/11G9_OndM0zyFprf1nQ5jJV9RGXG99qFC/view), and includes $31,000 for one continental online foray.

• MyCoPortal is now engaged in a collaboration with Denver Botanic Gardens (DBG), who have secured funding and staff for the imaging of the DBG fungal collection. Images for 19,000 specimens will be provided to iDigBio (see also Education and Outreach section).

• Brown University Herbarium has published its data to GBIF, via the MyCoPortal (March 21st, 2019).

• The data snapshot of iNaturalist records was updated, adding 139,166 records to MyCoPortal (March 29th, 2019).

• A presence was created for the Herbarium Senckenbergianum (FR), with 102,438 new occurrence records added (April 24th, 2019)

• 44,697 lichen records from the University of Michigan (MICH) were imported into MyCoPortal, from the Consortium of North American Lichen Herbaria portal (lichenportal.org). Another 135 lichen records and 683 fungus records were imported into MyCoPortal from the MICH IPT, bringing the total number of MICH records up to 319,060. (April 29th, 2019)

• Geocoordinates for 39,925 records were added to the CUP collection, increasing the percentage georeferenced to 56% (total number of records is 176,692). Auto-georeferencing was done locally by Diego Barroso using Nelon Rios’s GeoLocate Python script (April 30th, 2019).

• MyCoPortal continues to assist researchers at the University of Arkansas (Steven Stephenson and Richard Stauffacher at UARK) in the extraction of Myxomycetes data from the portal, in the course of preparing a manuscripts for publication.

Share and Identify Opportunities and Strategies for Sustainability:

• Phil Anders from MyCoPortal has been backing up data and images locally in preparation for the “sunsetting” of the iDigBio servers at the end of this year. A cloud-based solution is at the ready, and we anticipate MyCoPortal to emerge unscathed from the “sunsetting” event and to live on. This has been communicated to our user base to allay any possible fear, uncertainty, or doubt (FUD).

Share and Identify Education and Outreach (E&O) Activities:
• Denver Botanic Gardens (DBG) has created a seasonal position dedicated to digitization. It is supported by funds raised for or allocated to the Freyer – Newman Center. The Center is a new facility that is currently being built to house the Gardens’ non-living collections as well as education, art and research programs. About $14,000 was allocated for this seasonal position to ensure a digital record exists for every specimen, mainly for insurance purposes.

• Scott Bates, a professor at Purdue University Northwest and collaborator of MyCoPortal gave a presentation showcasing MyCoPortal:
Valparaiso University Biology Seminar Series, Valparaiso, IN; entitled “Microbial Diversity in Terrestrial Ecosystems: Adventures in Documenting 'Species' in North America” (March 2019).

Google Analytics
MyCoPortal_Data_Portal_Statistics-2019-May.pdf

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

• Summary of MyCoPortal Statistics (April 30th, 2019):
I. Specimen-based records
4,393,487 occurrence records
2,071,005 (47%) georeferenced
1,764,709 (40%) imaged
3,324,132 (76%) identified to species
1,811 families
8,532 genera
117,035 species
123,826 total taxa (including subsp. and var.)

II. Observation-based records
781,061 occurrence records
605,606 (78%) georeferenced
371,894 (48%) imaged
715,493 (92%) identified to species
494 families
2,825 genera
20,019 species
21,038 total taxa (including subsp. and var.)
• Publications citing MyCoPortal:

Pietras, M. and M. Kolanowska. 2019. Predicted potential occurrence of the North American false truffle Rhizopogon salebrosus in Europe. Fungal Ecology 39: 225–230. doi: 10.1016/j.funeco.2018.12.002

Stephenson, S. L., R. W. Stauffacher, and C. Rojas. 201-. Myxomycetes collected in the eastern United States and the relative abundance of particular species. Journal of Biogeography (in prep.)

Attachment 1
Second_quarter_2019-SUBMITTED-APRIL-30TH.docx

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1537

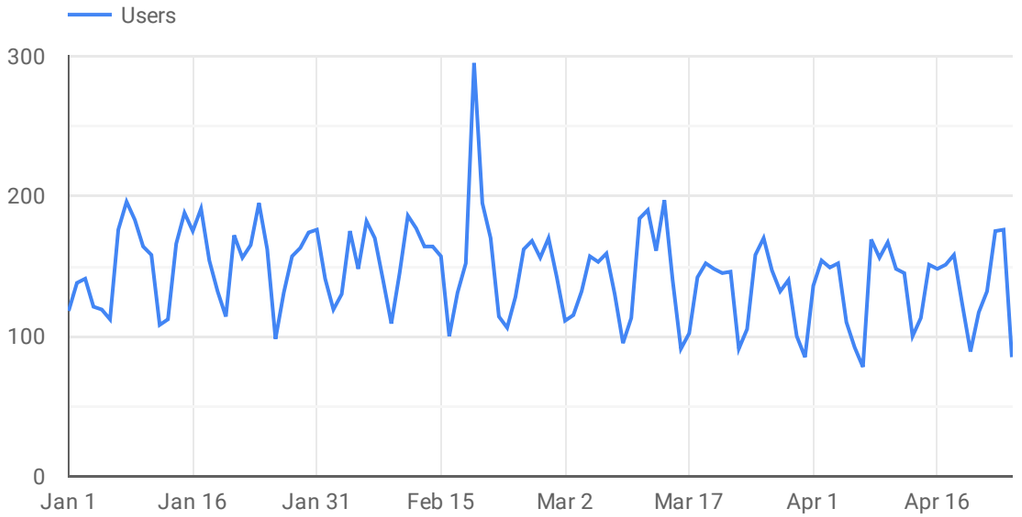
MyCoPortal Data Portal Statistics

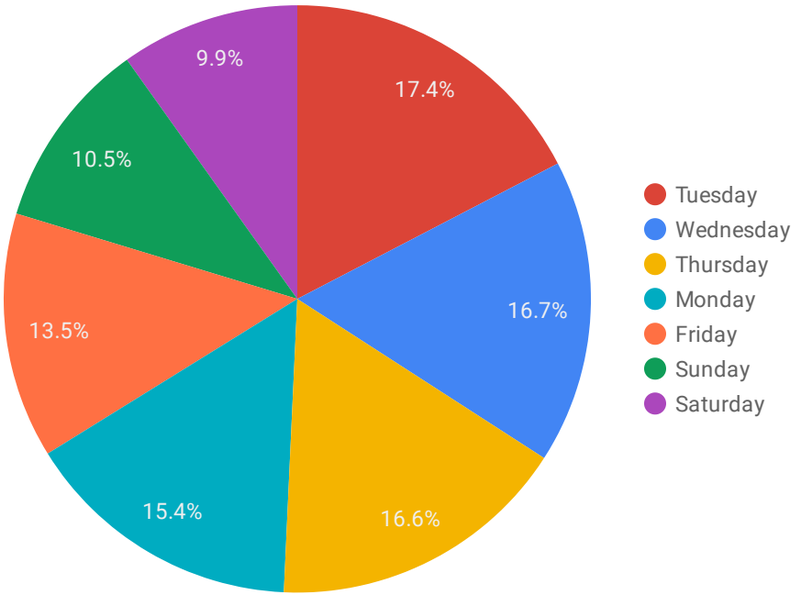
www.mycoportal.org

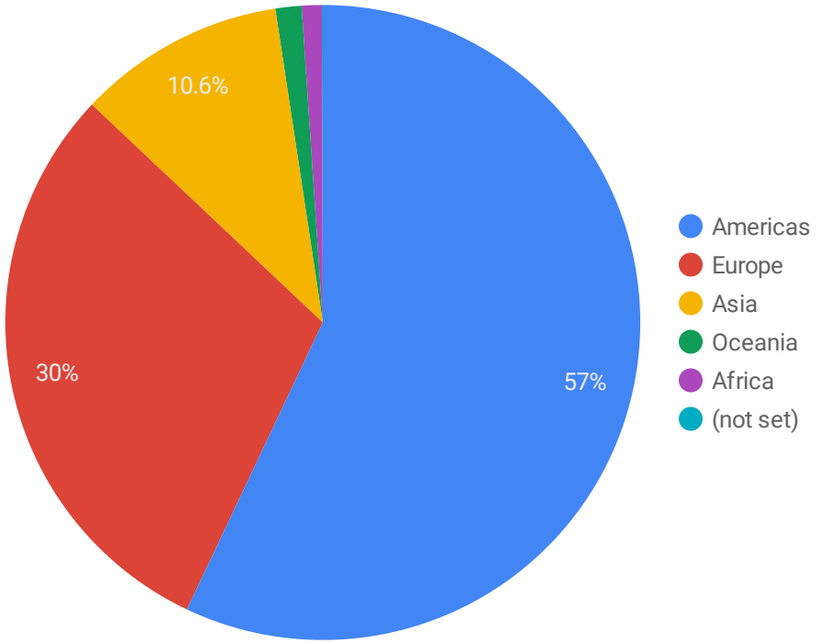
Data from Google Analytics

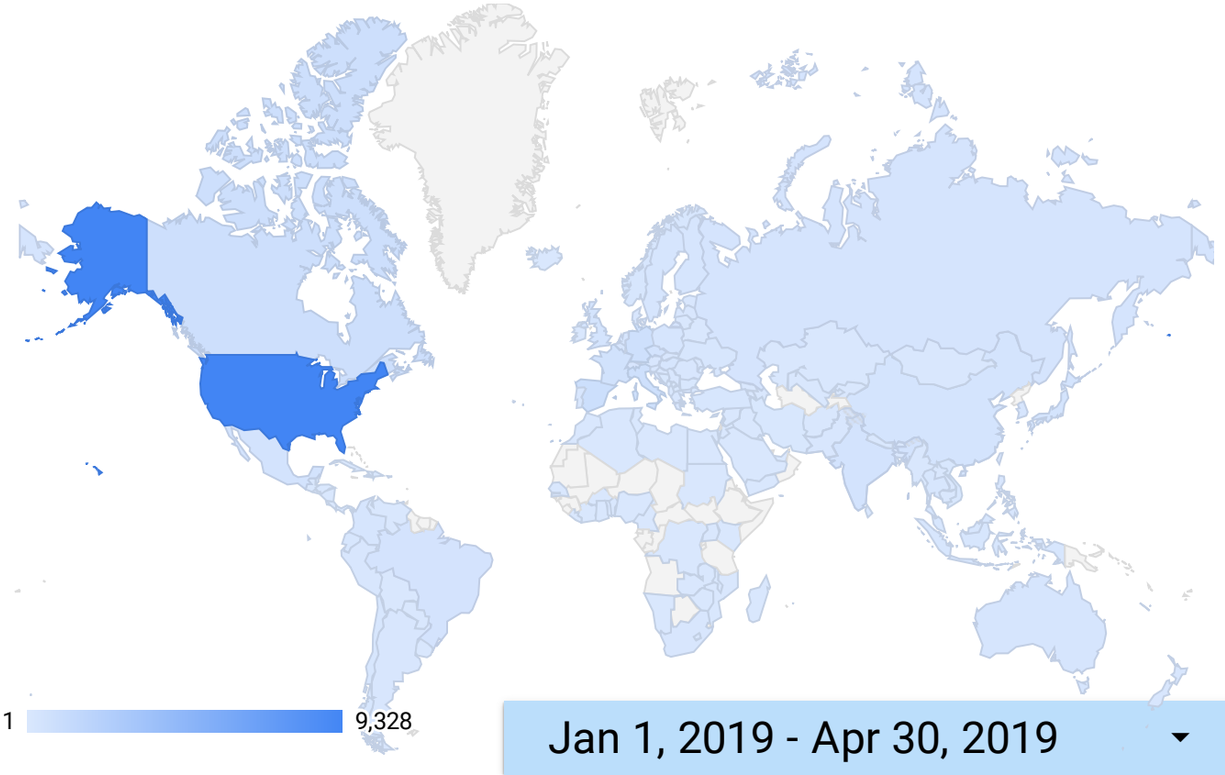
MYCOLOGY COLLECTIONS PORTAL

Users	New Users	Sessions	Number of Sessions per User	Pageviews	Pages / Session	Avg. Session Duration	Bounce Rate
10,185	9,059	20,009	1.96	54,263	2.71	00:03:12	57.08%









Jan 1, 2019 - Apr 30, 2019

First Quarter 2019 – February, March, April. **Submitted April 30th, 2019.**

Progress in Digitization Efforts

- During this quarter, 2130 ISC specimens were digitized, represented by 2130 newly-created records and 3310 images.

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

- Nothing new to report.

Collaboration with other TCNS, Institutions, and Organizations

- Due to arising difficulties in using the U of Florida FTP server for ingesting images into the Symbiota portals, we at MyCoPortal have begun providing help to other institutions (e.g., ARIZ, ISC, GAM) who are still contributing images to iDigBio. (February 2019).

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- A virtual training session was held – in collaboration with U of Arizona personnel – for Teresa Clements, a citizen scientist who deposits her specimens at U of A. She was taught how to use Symbiota, link her ARIZ occurrences from MyCoPortal directly to Mushroom Observer, and also how to link them to GenBank (February 19th, 2019).

- Presence created for the Slovenian Fungal Database (LJF), with 158,690 observation-based records added (February 28th, 2019).

- A new presence was created for the fungus collections of the National Herbarium of Mexico (MEXU), with 12,472 new records added (March 11th, 2019).

- 50,444 lichen records from Oregon State University (OSC) were imported from the Consortium of North American Lichen Herbaria portal (lichenportal.org) (March 15th, 2019).

- Data from MyCoPortal is now being shared with and utilized by the Islands of the Californias Biodiversity Information System (calIBIS) portal (see http://www.cal-ibis.org/collections/misc/collprofiles.php?collid=4)

- MyCoPortal is a collaborating partner on a National Geographic proposal led by Professor M. Catherine Aime at Purdue University, who is P.I. The proposal is titled, "Citizen Science-Powered Mycoflora for North America" (see https://drive.google.com/file/d/11G9_OndM0zyFprf1nQ5jJV9RGXG99qFC/view), and includes $31,000 for one continental online foray.

- MyCoPortal is now engaged in a collaboration with Denver Botanic Gardens (DBG), who have secured funding and staff for the imaging of the DBG fungal collection. Images for 19,000 specimens will be provided to iDigBio (see also Education and Outreach section).

- Brown University Herbarium has published its data to GBIF, via the MyCoPortal (March 21st, 2019).

- The data snapshot of iNaturalist records was updated, adding 139,166 records to MyCoPortal (March 29th, 2019).

- A presence was created for the Herbarium Senckenbergianum (FR), with 102,438 new occurrence records added (April 24th, 2019)

- 44,697 lichen records from the University of Michigan (MICH) were imported into MyCoPortal, from the Consortium of North American Lichen Herbaria portal (lichenportal.org). Another 135 lichen records and 683 fungus records were imported into MyCoPortal from the MICH IPT, bringing the total number of MICH records up to 319,060. (April 29th, 2019)

- Geocoordinates for 39,925 records were added to the CUP collection, increasing the percentage georeferenced to 56% (total number of records is 176,692). Auto-georeferencing was done locally by Diego Barroso using Nelon Rios's GeoLocate Python script (April 30th, 2019).

- MyCoPortal continues to assist researchers at the University of Arkansas (Steven Stephenson and Richard Stauffacher at UARK) in the extraction of Myxomycetes data from the portal, in the course of preparing a manuscripts for publication.

Opportunities and Strategies for Sustainability

- Phil Anders from MyCoPortal has been backing up data and images locally in preparation for the "sunsetting" of the iDigBio servers at the end of this year. A cloud-based solution is at the ready, and we anticipate MyCoPortal to emerge unscathed from the "sunsetting" event and to live on. This has been communicated to our user base to allay any possible fear, uncertainty, or doubt (FUD).

Education and Outreach Activities

- Denver Botanic Gardens (DBG) has created a seasonal position dedicated to digitization. It is supported by funds raised for or allocated to the Freyer – Newman Center. The Center is a new facility that is currently being built to house the Gardens' non-living collections as well as education, art and research programs. About $14,000 was allocated for this seasonal position to ensure a digital record exists for every specimen, mainly for insurance purposes.

- Scott Bates, a professor at Purdue University Northwest and collaborator of MyCoPortal gave a presentation showcasing MyCoPortal: *Valparaiso University Biology Seminar Series*, Valparaiso, IN; entitled "*Microbial Diversity in Terrestrial Ecosystems: Adventures in Documenting 'Species' in North America*" (March 2019).

Other Progress

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

- Summary of MyCoPortal Statistics (April 30th, 2019):

I. Specimen-based records

4,393,487 occurrence records

2,071,005 (47%) georeferenced

1,764,709 (40%) imaged

3,324,132 (76%) identified to species

1,811 families

8,532 genera

117,035 species

123,826 total taxa (including subsp. and var.)

II. Observation-based records

781,061 occurrence records

605,606 (78%) georeferenced

371,894 (48%) imaged

715,493 (92%) identified to species

494 families

2,825 genera

20,019 species

21,038 total taxa (including subsp. and var.)

- Publications citing MyCoPortal:

Pietras, M. and M. Kolanowska. 2019. Predicted potential occurrence of the North American false truffle *Rhizopogon salebrosus* in Europe. Fungal Ecology 39: 225–230. doi: 10.1016/j.funeco.2018.12.002

Stephenson, S. L., R. W. Stauffacher, and C. Rojas. 201-. Myxomycetes collected in the eastern United States and the relative abundance of particular species. Journal of Biogeography (in prep.)

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

Submission #1538

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by mpace
Wednesday, May 1, 2019 - 10:02
69.74.186.251

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

Person completing the report:
mpace@nybg.org

Progress in Digitization Efforts:
419,977 total specimens across all participants have thus far been digitized; 255,995 specimens have been imaged; 285,283 have been fully transcribed; 60,153 have been georeferenced.

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

Identify Gaps in Digitization Areas and Technology:
none yet

Share and Identify Opportunities to Enhance Training Efforts:
none yet

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
None yet

Share and Identify Opportunities and Strategies for Sustainability:
None yet

Share and Identify Education and Outreach (E&O) Activities:
Endless Forms website launched: http://sweetgum.nybg.org/science/projects/endlessforms/

NY: In the process of developing a conservation internship for 5 NYC high school students. Currently writing the curriculum, and testing the process. Will share with the group when completed. EF project highlighted in the "Garden News", sent to all Members and Patron of NYBG.

PH: Not specifically an outreach event for this project, but Teisher mentioned volunteer transcription opportunities at a public lecture series on Extreme Plants designed in part as a parallel for EF. He will collect email addresses at the last class.

CAS: Tour for members and donors included demonstration of imaging and explanation of project for 38 guests; Research Open House - featured imaging demonstration and informational poster about Endless Forms for 80 guests; Tour for a donor and her Garden Club included a discussion of Endless Forms and digitization efforts.

WIS: held an open house on Saturday April 6 for the public. More than 50 parents and children to tour the collection, watch our digitization process, and learn about our online databases. On April 26, WIS' director, Ken Cameron, gave a public presentation on the UW-Madison campus about the Virtual Wisconsin Flora, which showcased the Endless Forms TCN and the various Symbiota portals that have resulted from past TCN efforts.

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/1538

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

Submission #1539

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by cskema
Wednesday, May 1, 2019 - 11:17
165.123.74.113

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
2019_05_MAM_Quarterly_Progress_Summary.pdf

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1539

Mid-Atlantic Megalopolis TCN
Quarterly Progress Report[1]
February – April 2019

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 are shown in Table 1 and Figure 2. MOAR is still finishing up the process of reviewing all the images and transcriptions for SIM to improve the quality, hence the continued swings in counts per processing status category from this institution.

Share and Identify Best Practices and Standards: See MAM meeting/symposium/workshop summary under Other Progress.

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

Share and Identify Opportunities to Enhance Training Efforts: MOAR created a training video (https://youtu.be/qkbnrsAq-bo) for how to do volunteer transcription of herbarium specimens in the crowd sourcing module in Symbiota. (A special thanks to technician Michelle Mancini for all her hard work on creating it!) The video has already been of use in course-related student transcription efforts and technician training for various MAM collaborators. PH trained five new student co-operatives for the work session (April to September 2019) on the MAM Project. Also see MAM meeting/symposium/workshop summary under Other Progress.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations: At the MAM events on 30 March (see summary under Other Progress for more details), invited speakers and workshop organizers included Patrick Sweeney and Emily Meineke, both of whom were involved in the New England Vascular Plants TCN, Matthew Von Konrat, the organizer of the highly successful community science outreach intiative Microplants, as well as Richard Alomar of the Department of Landscape Architecture of Rutgers and Rutgers undergraduate student Ameen Lofti.

Share and Identify Opportunities and Strategies for Sustainability: See MAM meeting/symposium/workshop summary under Other Progress.

Share and Identify Education and Outreach Activities: Lead PI Skema from MOAR gave a talk entitled "Studying the flora of the Mid-Atlantic Megalopolis… one plant specimen at a time" at Bowman's Hill Wildflower Preserve in New Hope, PA on Sunday 24 February 2019 to an audience of about 50 people. Staff at CHRB conducted herbarium tours for Rutgers School of Environmental and Biological Sciences faculty and staff and the Hunderton County Master Gardeners. The Master Gardeners group has expressed an interest in helping CHRB with transcription and are currently looking into ways to grant credit for such work within their program. Also see MAM meeting/symposium/workshop summary under Other Progress.

[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

Other Progress: MAM hosted its last official in-person event at Rutgers University on 29-30 March 2019, including a business meeting, student research poster session, research symposium and workshops. Participants numbered about 60 for the events, with roughly 40 members of the public and 20 MAM collaborators in attendance. Please see https://www.idigbio.org/content/plants-city-mam-project-explores-virtual-herbaria-and-their-uses for a summary of the events. A big thanks to Myla Aronson, Megan King and Lena Struwe at CHRB for hosting and organizing this successful series of events!

Figure 1. Progress over time for MAM Project.

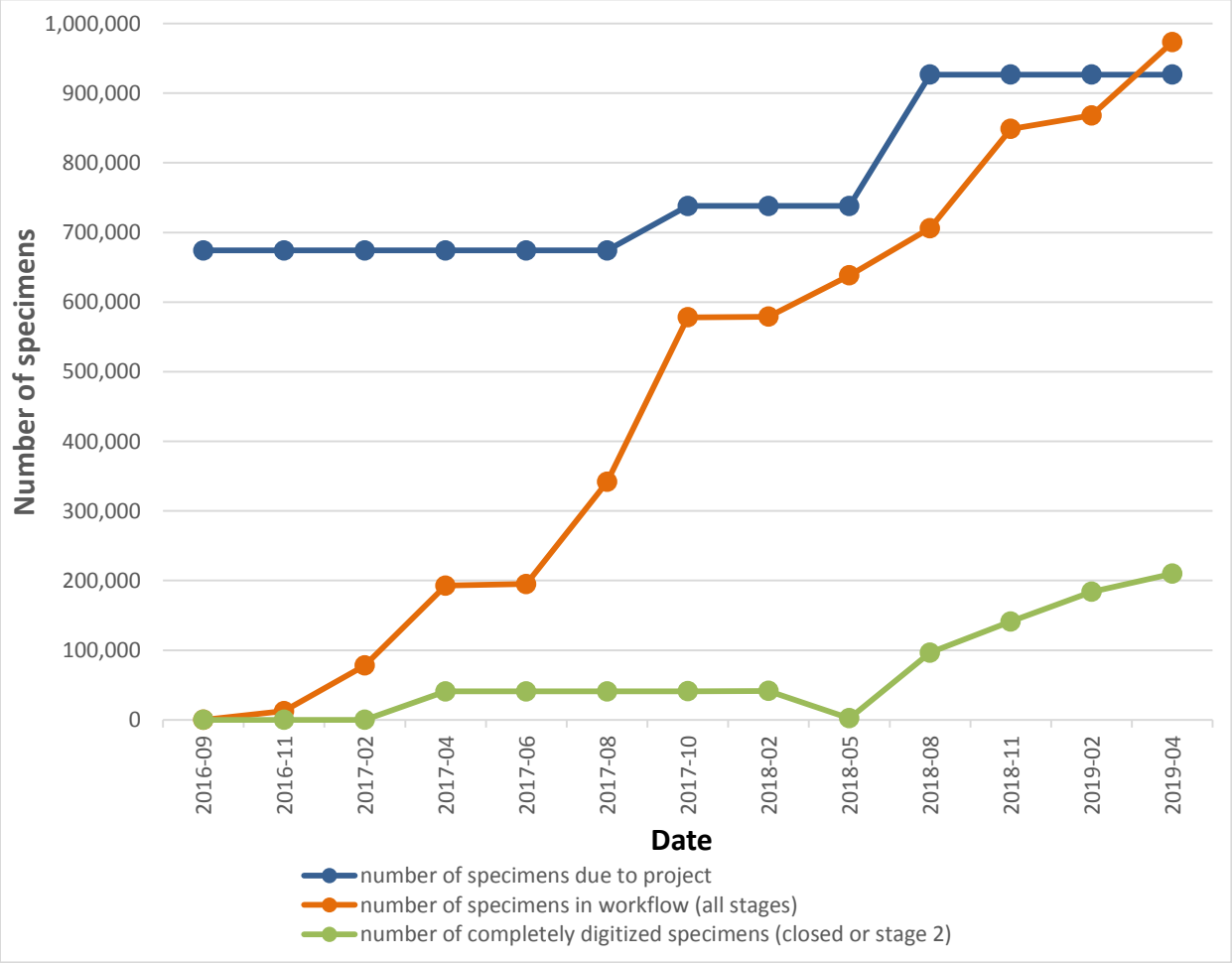
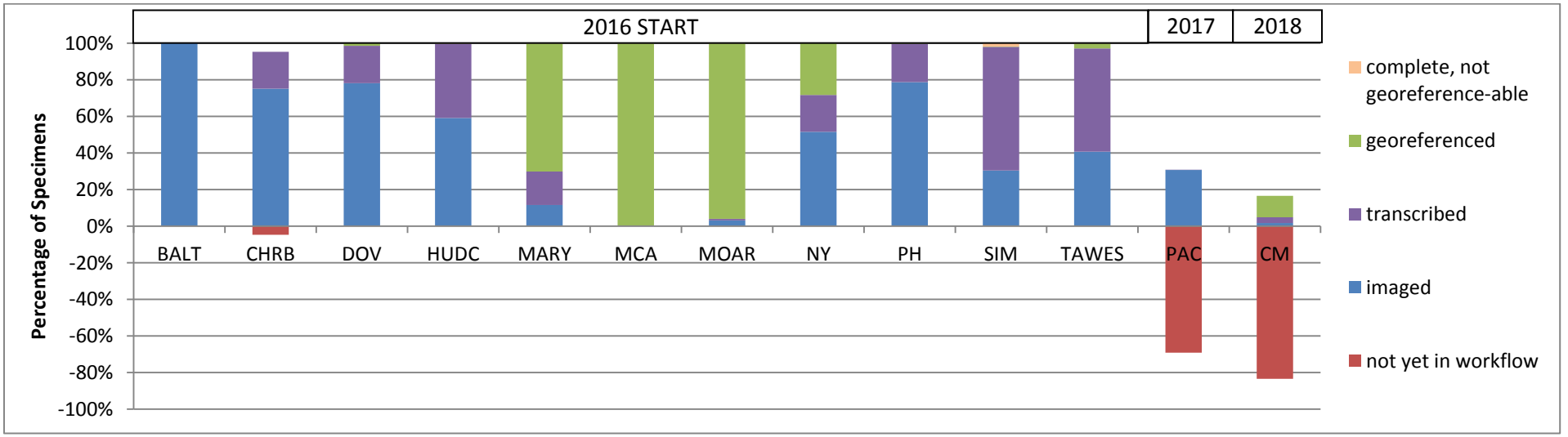


Table 1. Digitization of specimens by stage of completion and herbarium for MAM TCN.

	Herbarium													
Specimen Stage	BALT	CHRB	CM	DOV	HUDC	MARY	MCA	MOAR	NY*	PAC	PH	SIM	TAWES	**Totals**
# specimens imaged[1]	13,656	17,455	3,200	14,708	100	0	0	0	0	4,921	9,126	0	0	**63,166**
# specimens as above and uploaded to Symbiota along with skeletal data; transcription/review may be in progress[2]	2,619	20,869	0	25,753	2,862	5,109	0	26	149,761	14,752	276,791	2,989	1,006	**502,537**
# specimens as above + completely transcribed and transcription reviewed[3]	0	10,276	5,915	10,550	2,063	8,239	0	183	58,423	100	76,318	16,620	2,448	**191,135**
# specimens as above + georeferenced[4]	0	0	22,122	782	2	31,560	51,009	20,236	81,995	0	1,272	4	113	**209,095**
# specimens that need special attention, e.g. go back to sheet[5]	241	0	12	0	41	124	2	635	0	0	299	4,469	754	**6,577**
# specimens imaged, uploaded, transcribed BUT not able to be georeferenced[6]	0	0	0	0	10	102	52	41	0	0	6	477	10	**698**
Totals	**16,516**	**48,600**	**31,249**	**51,793**	**5,078**	**45,134**	**51,063**	**21,121**	**290,179**	**19,773**	**363,812**	**24,559**	**4,331**	**973,208**

*NY only uploads to the MAM Portal periodically, after georeferencing is complete.
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

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.



Submission #1540

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by dcblackburn
Wednesday, May 1, 2019 - 12:26
10.243.21.179

TCN Name:
oVert: Open Exploration of Vertebrate Diversity in 3D

Person completing the report:
david.c.blackburn@gmail.com

Progress in Digitization Efforts:
Since 1 September 2017 (when our TCN officially began), we have added more than 5,400 media files representing >3,100 specimens to MorphoSource as part of the oVert TCN. We have CT-scanned >7,100 fluid-preserved specimens approaching 2,900 genera of amphibians (80% of all genera), reptiles (60%), fishes (31%), mammals (25%), and birds (10%) representing approximately half of all vertebrate families, including specimens from across more than 30 US institutions. To date, the media files on MorphoSource have been viewed >123,000 times and downloaded >2,600 times (~60% for research in a broad range of biological fields). Among the Top Ten species that have the most downloaded oVert-generated media files on MorphoSource are three primate genera (Lemur, Pan), five crocodylians (Alligator, Crocodylus, Gavialis), one lizard (Egernia), and one fish (Barbus).

While scanning is on-going at institutions across the TCN, we have developed priority lists of target species using iDigBio specimen data. We have shared lists for fishes, reptiles, and mammals, and birds such that different institutions can begin prioritizing and mobilizing specimens in their collections for imaging.

Share and Identify Best Practices and Standards (including Lessons Learned):
We continue to work closely with staff at both iDigBio (Kevin Love) and MorphoSource (Doug Boyer, Julie Winchester) on issues related to the oVert TCN. Building on our recent work to integrating specimen data from iDigBio into MorphoSource, we continue to work on strategies to allow institutions to ingest metadata for media files into their own institutional databases and IPT. We have recently outlined a strategy to achieve better integration between MorphoSource and local Specify databases and plan to create a demonstration of this integration using the FLMNH Specify databases.

Previously reported efforts to achieve standardization in CT-scanning workflows are on-going. With a new oVert postdoctoral scientist, Dr. Catherine Early, beginning at UF in May 2019, we will push forward with written and video on-line tutorials related to imaging, downstream analysis, and data sharing. Scripts developed by oVert for different parts of our workflow are hosted on GitHub and

updated as needed.
https://github.com/FLMNH/MorphoSourceRSSDownloader
https://github.com/nsvitek/CT_tools/tree/master/morphosource_batch_convert

We continue to work on text that institutions can use for their policy for digital data ownership. We are working with MorphoSource and local IT departments at each institution to accomplish this task.

Zach Randall (UF) has worked with participating oVert institutions ANSP (PI Sabaj) and YPM (CoPI Watkins-Colwell) to improve workflows related to specimen packaging and scanning. This workflow reduces the amount of time spent unpacking and repacking specimens loaned from institutions; Randall recently presented this work at the ToSCA North America conference in Gainesville, FL.

Halfway through Year 2 (of 4 years), we will soon be turning our attention to bettering workflows for contrast-enhanced CT-scanning. At UF, we recently experimented with using cost-effective research MRI machines at the UF McKnight Brain Institute as an option for soft-tissue imaging of rare or larger specimens. While unlikely to be an important part of oVert, this will likely enable us to generate data for some taxa that would otherwise be impossible due to concerns about the specimen integrity. We have generated contrast-enhanced scans throughout the past 1.5 years, but we will be more seriously be pursuing higher throughput workflows during the last half of Year 2.

Identify Gaps in Digitization Areas and Technology:
We continue to deal with challenges of long-term data storage for the project, since scanning produces large amounts of 3D data. We are working with institutions to repatriate raw projection data from scanning events that will be archived at those institutions. In addition, we are participating in efforts led by MorphoSource to create a workflow where institutions can manage their CT data in that on-line depository (as opposed to local databases) by “containerizing” MorphoSource for specific institutions.

Share and Identify Opportunities to Enhance Training Efforts:
In Year 2, we have been continuing to focus on best practices and training. In addition to our on-site training workshop for imaging staff in late 2018, we continue with bi-weekly calls to discuss issues in the imaging workflow.

The oVert team continues to develop digital media (both PDFs and short videos) that provide background information about CT-scanning as well as guides on creating, sharing, and using media generated by the oVert TCN. Files are available via the oVert iDigBio wiki and videos are available on the MorphoSource YouTube page (https://www.youtube.com/channel/UCusG--ELmxbSHNuTIcVL5mQ). Creation of tutorials and detailed workflows is a top priority for new oVert postdoctoral scientist Dr. Catherine Early as she starts at UF in May 2019. Several institutions have undergraduate and doctoral students working as grant-funded technicians, which provides an opportunity for training students in CT research methods. ANSP has involved high school students from the Women in Natural Sciences program in working with CT data generated by oVert. Scripps Institution of Oceanography recently highlighted oVert in a new display at the Birch Aquarium. Similarly, images and 3D prints of oVert-related specimens will appear in an upcoming exhibit in the Reynolds Gallery at the Memorial Student Center at Texas A&M University.

We continue to support opportunities for training in CT-scanning at Friday Harbor Labs as part of the Broader Impacts of the oVert TCN (http://bit.ly/ScanWithoVert). While at scientific conferences, we are disseminating this advertisement to solicit applications from undergrad and graduate students as well as professionals.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
Almost as soon as the oVert TCN began in September 2017, there was wide interest from colleagues and institutions in the US and internationally in participating in or collaborating with our

project. We have been working with unfunded US-based institutions at which we will CT-scan selected high-value specimens representing key taxa that are otherwise not available in oVert-participating institutions. This will be a particular priority for fluid-preserved birds as several large collections are not oVert-participating institutions, including the Carnegie Museum of Natural History and the Smithsonian National Museum of Natural History. We are discussing opportunities to work with other institutions that have ongoing collaborations with oVert-participating institutions, such as scanning large marine mammal specimens through connections at Texas A&M-Galveston. The oVert PEN oMEGA (led by Leif Tapanila, Idaho State University) is underway and several major imaging events of large mammals will be happening during the summer of 2019. The oMEGA PEN uses light-based scanning to image individual skeletal elements of large vertebrates (e.g., whales) that would otherwise not be included within oVert due to size limitations of CT-scanning. Two other PEN proposals associated with oVert were submitted to NSF in October 2018 and these are still pending. These PENs involve the CT group at the University of Texas – Austin (UTCT) to mobilize via MorphoSource legacy data in UTCT and DigiMorph as well as the University of New Mexico to image skeletons of small mammals, especially rodents.

Share and Identify Opportunities and Strategies for Sustainability:
The oVert TCN builds on existing resources by adding media files to an existing database platform, MorphoSource (supported by Duke University and the US National Science Foundation), and each institution is individually responsible for long-term storage of original media files if they choose to do so.

The University of Florida has entered into a licensing agreement to share CT scans generated using UF funds (i.e., not funded by NSF) with Interspectral (http://www.interspectral.com/). Revenue generated through licensing CT datasets from UF specimens will be used to support curation, research, and education at FLMNH. While not directly funded by oVert, this strategy of licensing media files for commercial use may provide funds that sustain data storage and museum curation into the future.

Share and Identify Education and Outreach (E&O) Activities:
We are preparing for our first hands-on workshop with teachers in June 2019 via the Summer Science Institute based at the UF Center for Precollegiate Education and Training (https://www.cpet.ufl.edu/teachers/ssi/ssi-2019/).
Guided by work with one high school teacher in the summer of 2018, this workshop will involve six high school and two middle school teachers from Florida. Teachers will work with oVert PIs and students based at UF to create learning exercises using digital models on-line (via MorphoSource and/or Sketchfab) or 3D-printed models. All of these exercises and models will be made freely available, and PI Blackburn and collaborator Julie Bokor (UF CPET) will present this work at the National Association of Biology Teachers meeting in Chicago in the fall of 2019.

Information about products from the oVert TCN are regularly communicated on social media (https://twitter.com/hashtag/overttcn). Social media coming from oVert is received well on-line and often used by the US National Science Foundation in their social media feeds.

Google Analytics

Other Progress (that doesn't fit into the above categories):
As of this report, there are at least fourteen scientific publications citing one of the 16 oVert TCN Awards. In addition, there have been more than 19 presentations at professional meetings related to oVert, including recent presentations at both the Society for Integrative and Comparative Biology (Tampa, FL) and the North America ToSCa meeting (Gainesville, FL). Publications and presentations are detailed on the oVert iDigBio wiki page: (https://www.idigbio.org/wiki/index.php/OVert:_Open_Exploration_of_Vertebrate_Diversity_in_3D).

The oVert TCN is regularly highlighted in publications by those not directly associated with our project. For example, Hipsley & Sheratt (2019; Scientific Data) listed oVert (and only oVert!) as a project that can “fully realize the potential of open digital morphology.” Similarly, the promise of data from oVert was also highlighted in recent work by Harmon et al. (2019; Frontiers in Ecology & the Environment) in their discussion of using museum collections to track pathogens and parasites.

Attachment 1

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1540

Submission #1542

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by jrallen99
Wednesday, May 1, 2019 - 13:12
128.138.130.234

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 February 2019 through April of 2019 we have entered 28,247 new records into databases, barcoded 108,774 new specimens, imaged 113,690 new specimens and georeferenced 13,477 records.

In aggregate the project has now produced 160,374 new database records, 590,720 newly barcoded specimens, 581,601 new images and 40,099 new georeferences.

The balance of the project focus continues to shift away from the imaging process with more effort being placed on transcription of specimen records and georeferencing.

Share and Identify Best Practices and Standards (including Lessons Learned):
Harvard: To fill in missing data from previously minimally captured labels (estimated 60,000), our Biodiversity Informatics Director pushed the latest version of the transcription app to production and two of our full time digitizers will start using this tool in the week of April 29, 2019. The tool is designed to filter out records of U.S. states that are part of the SoRo project. Once filtered from all other U.S. and Canada records, missing data from SoRo relevant specimens can be added by using the image of the specimen label. Two full time digitizers will work each two days a week on this part until we eventually catch-up and have complete record for all databased SoRo specimens. On the remaining three work days the digitizers will continue with data entry and imaging of new specimens. We also completed the set-up of the additional three photo stations. The photo stations that were fabricated first with wooden surfaces were changed to a laminated, black surface. This eliminates the need of black foam board which can look grimy over time and is difficult to clean. NAVA has found it easiest to teach new students how to digitize by typing up a flow chart that students can reference when digitizing specimens. That way if they have questions as they go along then the flow chart will help with troubleshooting in case senior staff are not around to answer questions directly since many students work evenings or before/after work hours.
UNM went through a complete review of camera software and settings and discovered a way to improve images. Getting the settings right makes a big difference so we learned that we should

have done this as soon as we received the camera. Our focus was on making a design to mount the camera and getting the production going; in the process we missed an opportunity for better quality images. Lesson: set aside a day for camera settings or borrow the settings from someone that's done the work.

Identify Gaps in Digitization Areas and Technology:
Our collection at CSCN has been working through fixing a defective camera that has now been returned to Nikon for servicing. The camera came back from Nikon and is still having the same issues. PM Allen is going to revisit to try and get the project running again. Mikes Camera has offered to loan us a camera of the same model to help troubleshoot. I wonder if at the community we could devise a loaner program to help reduce down time when collections run into unexpected issues with equipment.
GREE has yet to upload any images to symbiota. This is largely because their database is not yet accessible in symbiota but they are working with Specify, to export all contents to symbiota. Once that happens we will begin depositing our backlog of specimen images. This is also dependent on figuring out what the future of the image server at iDigBio will be.
Harvard Biodiversity Informatics Director is currently working on finalizing a tool that will allow them to image specimens first and then database the records from images. Once completed, database efficiency should increase.
SJNM is working though removing some images that were uploaded twice.

Share and Identify Opportunities to Enhance Training Efforts:
UNM: New hires continue to miss points within the imaging flow. Expect a few hiccups with new hires. All of our student employees are on the lookout for issues with new people. Since everyone is motivated to get things right, we catch our mistakes quickly and use them to allow new employees to learn, refocus, and improve their contribution to the SoRo effort. We also use these opportunities to revisit how we do things, adding improvements and clarifying areas of confusion. Having the two light boxes side by side allows us to better train new employees and to catch it early if things go wrong.
NYBG: The Pteridological Collections Consortium TCN at NYBG has started its intern lecture series geared towards training in fern taxonomy and biology. SoRo staff and interns have had the opportunity to attend and participate in these lectures, in addition to the Garden's weekly seminar series.
WSC has been using the Data Entry Manual created at the University of Colorado to assist with the data entry process. We refer to it extensively and are developing a short check- list that provides answers to common questions our new transcribers have, or problems they encounter. We are working on developing a training system whereby our experienced transcribers play a major role in training incoming transcribers. We have found that training is a particularly time consuming process, so we hope this will alleviate that strain, and help us move forward more efficiently with our transcription efforts.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
Several institutions are collaborating with Specify to have data mapped and imported into Symbiota.
UNM continues to work with the Seeds of Success Program and have allowed the BLM offices in Santa Fe and Taos to image their specimens for this program at UNM. We are receiving requests from other BLM offices to image their specimens.
San Juan College, Ft. Lewis College, University of Colorado, Northern Arizona University, Dine College, and the Chicago Botanic Garden are collaborating on a field to digital object and herbarium curation workshop aimed at tribally-affiliated college students from 5 institutions for May 15-18th, 2019 (more below in outreach).
BHSC will also hold a workshop aimed at training Native American students collection, curation and digitizing techniques. Planning has begun for the June workshop including discussing sites, numbers of students, leaders and permission for collecting specimens on Native trust lands. The workshop will be in collaboration with Oglala Lakota College and the Center for American Indian

Research and Native Studies.
FLD continues with SJNM to help with the staffing transition. FLD been assisting them with their digitization efforts and actively exchanging duplicate specimens.

Share and Identify Opportunities and Strategies for Sustainability:
We are collectively waiting to hear about the outcome of the image server at iDigBio to figure out what we will need to do in the future to make sure the images from the project will remain available into the future.

Share and Identify Education and Outreach (E&O) Activities:
ASC: Herbarium tours to minority students from Las Vegas featured the imaging project. They competed in groups in a scavenger hunt that required them to find images of specimens among other tasks. All the groups enjoyed the challenge, and all received posters of northern Arizona wildflowers as prizes.
San Juan College, Ft. Lewis College, University of Colorado, Northern Arizona University, Dine College, and the Chicago Botanic Garden are collaborating on a field to digital object and herbarium curation workshop aimed at tribally-affiliated college students from 5 institutions for May 15-18th, 2019. We have held 3 conference calls with representatives from the collaborators listed above. Together we have successfully recruited 22 students from each of the 5 institutions, developed a workshop agenda, and tackled logistics such as student transport to/from the workshop, food, lodging, securing classroom space at San Juan College, and supplies.
FLD: In mid-April Ross held a small outreach event in the herbarium for the general Fort Lewis community. The “Herbarium Open-house” attracted a number of people from the campus community, mostly staff and administration, who were not previously familiar with the collection. It also started an interesting dialog between myself and the director of the Environmental Studies/Environmental Sciences program regarding inclusion of some botany courses for students in those programs. Currently, botany courses can only be taken as upper-division electives following the completion of the Biology/Chemistry core thus preventing enrolment by students outside of the Biology major. With college-level support I am going to begin the process of requesting exemptions of some prerequesites allowing Environmental Studies/Science students to take at least one of these courses (e.g. Field Botany). The event also expanded my connection with the Fort Lewis College Foundation, the fundraising arm of the college. They were interested in helping me expand the community awareness of the collection and are open to helping me with fundraising efforts for basic supplies and for the acquisition of additional archival storage. With the mobilization of the large backlog and specimen exchange, our cabinet space is getting tight.
As part of a revamping of the Biology Department webpage, I was able to have the college marketing department (they oversee all web content) include a dedicated page for the herbarium. This new page (https://www.fortlewis.edu/biology/Herbarium.aspx) includes links to both the SoRo portal and the Mycoportal and finally showcases the herbarium as a major departmental resource. On the education side I submitted an abstract for a poster I will present at the Botany conference this summer in Tucson, Arizona on the use of digitized herbarium material in teaching entitled “Using digitized herbarium data for authentic research experiences in undergraduate botany courses.” This is a first step in presenting some of the ways I have been able to integrate herbarium material with coursework.

Google Analytics
SoRo Symbiota Analytics All Web Site Data Audience Overview 20190201-20190430.pdf

Other Progress (that doesn’t fit into the above categories):
Digitization efforts often creates extra associated tasks such as push collections to update taxonomy and filing systems. Many collections are also identifying specimens in need of repair and are building these repairs into the project workflows. These specimens would not be systematically located in the absence of these projects.
Harvard has posted four new positions to help with digitization efforts, which includes the SoRo

project.
UNM has recruited five new volunteers, since the last report, and inspired students to use the images available for research and expanding their understanding of the flora of the American Southwest.
NY has completed hiring year 2 interns for SoRo: McKenna Coyle and Philip Evich. The Lead Digitizer and NYBG Herbarium staff have spent time training and providing support to get the new hires trained in basic herbarium practices, overall digitization practices, and specimen imaging protocols.

Attachment 1

Attachment 2

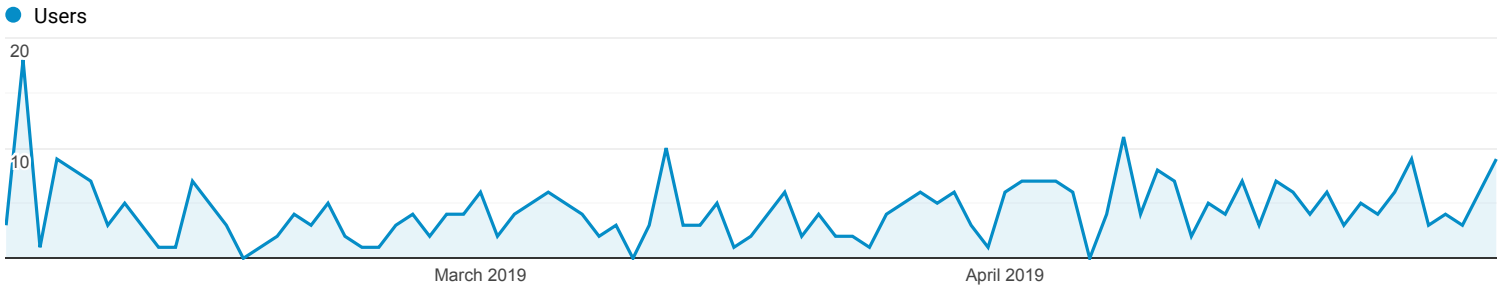
Source URL: https://www.idigbio.org/node/564/submission/1542

Audience Overview

All Users
100.00% Users

Feb 1, 2019 - Apr 30, 2019

Overview



Users
289

New Users
275

Sessions
459

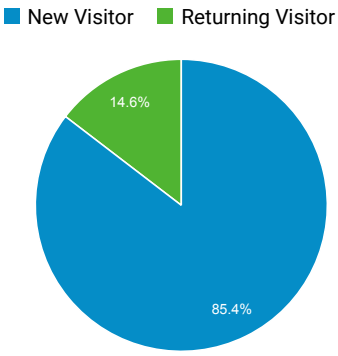
Number of Sessions per User
1.59

Pageviews
1,879

Pages / Session
4.09

Avg. Session Duration
00:06:06

Bounce Rate
57.30%



	Language	Users	% Users
1.	en-us	199	68.86%
2.	c	63	21.80%
3.	es-es	4	1.38%
4.	pt-br	3	1.04%
5.	en-gb	2	0.69%
6.	ru	2	0.69%
7.	ru-ru	2	0.69%
8.	zh-cn	2	0.69%
9.	zh-tw	2	0.69%
10.	ar	1	0.35%

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

Submission #1543

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by akasameyer
Wednesday, May 1, 2019 - 13:31
136.152.143.55

TCN Name:
The Pteridological Collections Consortium: An integrative Approach to Pteridophyte Diversity Over the Last 420 Million Years

Person completing the report:
akasameyer@berkeley.edu

Progress in Digitization Efforts:
For extant specimen progress during this reporting period, Pteridophytes Collections Consortium members have created skeletal records for 83,316 extant specimens, fully transcribed 33,697 extant specimens, imaged 61,030 extant specimens, and georeferenced 8,305 extant specimen records.

In our Pteridoportal, for extant specimens we currently have:
23 collections serving data
672,805 specimen records
231,104 (34%) georeferenced
300,875 (45%) imaged
303,861 (45%) identified to species
73 families
551 genera
14,973 species
16,212 total taxa (including subsp. and var.)

For fossil specimen progress during this reporting period, Pteridophytes Collections Consortium members have databased 2,472 fossil specimens, imaged 3,593 fossil specimens, and 412 fossil specimens records georeferenced. The total pteridophyte fossil specimen progress including work done prior to the start of the grant is 14,498 fossil specimens databased, 10,522 fossil specimens imaged, and 6,642 fossil specimen records georeferenced. These records and images have not been uploaded to the Pteridoportal yet because the Symbiota Paleo Module is still in development.

University of Michigan has pre-curated their Latin American lycophytes in advance of digitization and is setting up their fossil imaging station and protocol. New York Botanical Garden has processed all new images with OCR software and uploaded the text to specimen records to facilitate rapid data entry. The Sam Noble Museum has refined staging zones for specimens to be imaged as well as processes for moving specimens from/to storage, continued determining which rock specimens/slabs have pteridophytes to be imaged and which pteridophyte specimens will

require close-ups, begun using an Excel file of county, state/province or country with centroids coordinates to produce “county level” georeferenced specimens, and continued plans for more precise georeferencing of localities for in-house use and to full potential request for more detailed georeferences. The Denver Museum of Nature and Science has set up a second camera station for photographing pteridophytes and are rehousing and cataloging specimens as they are pulled from collections (adding foam to boxes or switching out boxes when needed, and adding a bag tag for the specimen tags). Project PI Ian Miller identifies the pteridophytes to be photographed, making it easier for digitizing technicians to pull the pteridophytes from the collections and get them to the photo stations. Additionally they continuously glue labels with the DMNH number on specimens as they are cataloged. The Field Museum has imaged all ferns derived from Asia they are currently capturing images of ferns from Europe.

Share and Identify Best Practices and Standards (including Lessons Learned):
PCC Project: The PCC Paleo group met using AdobeConnect to discuss taxonomy, digitization, and other project issues. A google drive was started to allow the group to share resources and participants have been sharing specimen images to the PCC_Paleo email list in order to get feedback from other participants.

Sam Noble Museum is still checking their detailed written museum-specific workflows for various processes of the project and they will be shared once complete. Their Lessons Learned: 1. Training multiple volunteers all at once helps to better refine procedures as more eyes and life experiences provide additional ideas and simplifications. 2. Paleo-related procedures are not a one-sized fits all procedure like herbarium procedures because of various sizes, various orientations, various lighting requirements, etc. and not everyone realizes this or truly appreciates what this means, even some who work in paleo-collections. Denver Museum of Nature and Science has workflows posted at each camera station addressing each step in the photography process which has helped their volunteers stay consistent when photographing fossils.

Identify Gaps in Digitization Areas and Technology:
PCC Project: With the planned decommissioning of the IDigBio media ingestion appliance as well as the end of virtual machine support for Symbiota portals at the end of 2019, we are investigating other options for how to host the Pteridoportal and images generated by this project. We have met with members of the CAP and SERNEC TCNs to discuss possible options. Additionally, our Symbiota developer has been busy helping deal with this development and has not had time to complete the Paleo Module for our Pteridoportal. This has prevented any of our Paleo partners from uploading specimen data or images to the Pteridoportal, which has been frustrating for them.

Rutgers University was unable to begin barcoding their specimens until the ability to label a record with a project code was added to the Add Skeletal Records tool. The Sam Noble Museum struggled with complexities with databasing as they attempt to gather and enter what will be needed for the Symbiota Portal while not having a clear idea of what will be “required” by the Paleo Module of the Symbiota Portal. Therefore, they are entering what we need for our Collection-specific database and are hoping that it will be easy to “convert” it to what will be needed.

Share and Identify Opportunities to Enhance Training Efforts:
At the New York Botanical Garden, Robbin Moran gave three lectures about ferns and lycophytes to the interns and one field trip to the NYBG greenhouses and a new full-time PCC digitization intern was trained to image specimens and work in the collections. At the University of Texas, students continue to receive about 30 minutes of tutorials per week relating to the plants they are working on at the time. At Rutgers University, two herbarium interns were trained on using the "add skeletal record" tool for barcoding. The Sam Noble Museum created and held their inaugural in-house paleobotany collection-specific training class on paleobotany fossils, photography and in collection processes and workflows for 8 new volunteers with the assistance of existing volunteers. This brings their volunteer total to 15 plus the 1 undergraduate student worker to assist with the project

at Sam Noble in both the photography, pre-digitization workflows and databasing. The Denver Museum of Nature and Science is training new volunteers on the photography process and to edit photos of fossil specimens by adding their institution number and cleaning up the background of the photo. They have also set up another photography station, and have brought in a few more volunteers to photography on that station. The Bishop Museum is training a college intern. The Botanical Research Institute of Texas held two transcription blitzes involving 22 students and teachers, who learned about skeletal specimen transcription using the Notes from Nature platform and provided a 3-hours hands-on training in our new Scanning Electron Microscope to one of the digitizers. The Field Museum began training two part-time staff members on imaging fossil ferns.

Share and Identify Collaborations with other TCNs, Institutions, and Organizations:
PCC participants are also part of the following TCNs: SoRo, MiCC, Endless Forms, CAP.

New York Botanical Garden trained new TCN digitization staff (SoRo, MiCC, Endless Forms) to image specimens. Robbin Moran presented 5 PCC seminars/activities to all NYBG TCN digitization staff (3-SoRo, 3-MiCC, 3-PCC, 3-Endless Forms) and extended the invitation to Rutgers University digitization staff. Rutgers University lead intern participated in Pteridophyte lectures offered at NYBG. The Sam Noble Museum continued working with Roger Burkhalter (at Sam Noble Museum/University of Oklahoma who is a PEN to the TCN: The Cretaceous World) to try and ensure that museum's IPT server and datasets will be able to add additional data fields as necessary/useful/required for sharing TCN-related data, that they are using as standardized as possible terms and that the Audubon Core extension will get installed/usable on our IPT server. The Denver Museum of Nature and Science are sharing photography equipment and photos with other institutions.

Share and Identify Opportunities and Strategies for Sustainability:
The Sam Noble Museum is continuing to take the opportunity of working collaboratively with both other collection staff, volunteers and their museum's IT department to improve in-house technical and collection knowledge as well as establishing in-house processes to appropriately add additional data fields to datasets being share via museum's IPT server to ensure data quality and handle updates as needed.

Share and Identify Education and Outreach (E&O) Activities:
In addition to our project Facebook Page, we now have a Facebook Group which allows any member to post content to the group. University of Michigan contributed a short article with photos for the iDigBio April Spotlight. https://www.idigbio.org/content/april-2019-biodiversity-spotlight-0#overlay-context=
Robbin Moran at the New York Botanical Garden presented to all NYBG TCN digitization staff (3-SoRo, 3-MiCC, 3-PCC, 3-Endless Forms) the first 5 (of 10 total) 2-hour-long PCC seminars/activities focused on pteridophytes, lycophytes, and botanical nomenclature; digitization staff at Rutgers University were invited to attend. Video and audio were captured with the intent to edit and share online with a wider audience. The NYBG Herbarium hosted several public and donor tours of the collections which featured the Digital Imaging Center and highlighted the TCNs, their digitization staff, and the value in preserving and digitizing natural history collections. The Denver Museum of Nature and Science has an increased amount of group tours in their Earth Sciences Workshop and Collections at this time of year and they often show off their photography stations teaching people and students about stack photography and the digitization efforts for their pteridophyte collection. As part of this grant, the Botanical Research Institute of Texas has held two transcription blitzes involving 22 students and teachers, who have learned about skeletal specimen transcription using the Notes from Nature platform. The total number of volunteer hours at BRIT has been 97. The Field Museum held a Collections Club event in April at which participants barcoded, imaged, and transcribed specimens.

Google Analytics

Other Progress (that doesn’t fit into the above categories):
The Executive Committee met in April to discuss the project. Portal manager Joyce Gross continues to work with individual collection managers to upload and manage their collection data to the Pteridoportal. She activated the crowdsourcing module on the Pteridoportal and the Field Museum provided a test dataset of 500 records to be crowdsourced. The test with a success with all 500 records transcribed by volunteers at the Field Museum in one weekend.

Attachment 1

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1543

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

Submission #1544

Submission information

Form: TCN Quarterly Progress Report to iDigBio
Submitted by mwdenslow
Thursday, May 2, 2019 - 18:11
76.120.67.210

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:
All SERNEC:
There are 111 collections serving data through the SERNEC portal. There are currently 4,671,567 specimens records and 409,094 (9%) of those records are georeferenced. There are currently 4,172,730 imaged specimen images available. There are currently 50 collections publishing to iDigBio.

See PDF attached for table with additional information.

Arkansas: 7 of 8 collections are reporting to iDigBio. ANHC has all images and transcribed records posted as well as 2/3 of the collection georeferenced. HXC has all images posted, and the final records are being transcribed through NfN. STAR has all images posted, and transcriptions are in progress. UAM has all images posted, and skeletal data entry is in progress through NfN. UCAC has all images posted, and transcriptions are in progress. HEND and APCR imaging ongoing without anticipated completion date.

Florida: FLAS is publishing in-house cataloged records to iDigBio at present; 96,576 records. Uncataloged records in the SERNEC portal(100,000+) still need to be served to iDigBio.

Georgia:
GA: 635 GA specimens were imaged during this time period (184,446 to date via this grant). Skeletal data (species name, state, county) for 35,185 non-Georgia specimens entered into Specify (132,619 to date).

COLG: Second set of 2,500 images posted to Notes from Nature has been fully transcribed.

GAS: 0 specimens were imaged during this time period (23,249 imaged to date; end of the previously accessioned material). 3,336 images were associated with their existing Specify record (10,701 to date). 6,175 images were uploaded to the SERNEC portal and linked to records (16,075

to date).

AASU: All 5,058 digitized specimens uploaded to the SERNEC portal.

South Carolina: 10 Collections are reporting to iDigBio, including USCH, CLEMS, NBYC, USCS, FMUH, FUGR, CONV, WINU, SALK, and SBAC. Imaging work continues at USCH and at NBYC. Work at NBYC will be complete by June 2019.

Virginia: 9 of 11 collections are reporting to iDigBio.

Share and Identify Best Practices and Standards (including Lessons Learned):
All SERNEC:
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:
All SERNEC:
Nothing to report

Arkansas: The remaining collections have not communicated effectively with state coordinators to have much progress.

Florida: FLAS: one of our biggest challenges is managing data in different systems with only the Collection Manager to wrangle with the design. Our catalog is split between multiple portals.

South Carolina: Struggle to maintain registration with Adobe Lightbox. Otherwise, nothing to report.

Virginia: LFCC curator retired in 2018. GMUF will adopt, accession and digitize this collection during AY 2019-2020.

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

Arkansas: NfN transcription workshop with Central Arkansas Master Naturalists at ANHC was hugely successful. This group has transcribed more than 20,000 transcriptions from mid-Jan through April, 1/3 of all NfN transcriptions in AR since 2016. We are setting up workshops for Arkansas Native Plant Society NfN transcription and CoGe georeferencing in fall 2019. Volunteer activity in AR is higher in winter months, so fall workshops may be strategic for training prior to volunteer availability.

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

Arkansas: On-going project with Notes from Nature, Central Arkansas Master Naturalists, Arkansas Native Plant Society, Hendrix College alumni, classroom assignments (STAR, HXC, APCR)

Florida: FLAS: we are part of the Pteridophyte Collections Consortium (PCC) TCN and pushing the rest of our Pteridophte collections into the SERNEC portal for access by the PCC project. We continue to work with WeDigFLPlants - Biospex.:

South Carolina: On-going projects with Notes from Nature.

Virginia: On-going projects with Notes from Nature, Virginia Master Naturalists, Virginia Native Plant Society, and Natural Heritage Program.

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

Arkansas: Note from Nature class assignments for vascular plant systematics, dendrology, and general botany at multiple institutions across the state are a good opportunity to have pulses of transcription activity.

Share and Identify Education and Outreach (E&O) Activities:
All SERNEC:
The TCN continues to be active on Notes from Nature with several expedition running. We recently started a new series called Spring Refresher in order to transcribe specimens from the state of Tennessee. Student from Tennessee as well as volunteers associated with the annual Wildflower Pilgrimage (http://www.wildflowerpilgrimage.org/) have been active on these expeditions.

Arkansas: Notes from Nature transcription workshop at ANHC for Central Arkansas Master Naturalists in January, 2019. On-going project with Notes from Nature.

Florida: FLAS: one UF undergraduate student designed a project set of plants from Highlands County, Florida, for cataloging by high school students in Sebring.

South Carolina: On-going projects with Notes from Nature.

Virginia: On-going projects with Notes from Nature.

Google Analytics

Other Progress (that doesn't fit into the above categories):
All SERNEC:
The TCN leadership are in the process of evaluating our final activities, deliverables and budget in order to figure out if the lead institution will be applying for a second no-cost extension.

South Carolina: We digitized a newly-created collection (SBAC, the Silver Bluff Audubon Center and Sanctuary Collection) and added it to iDigBio. The collection was created after the project began.

Virginia: Two additional Virginia herbaria have been registered with Index Herbariorum (PGC, LGBG) in order to participate in digitization efforts, which were not included in the original project. PGC has been digitized; LGBG will be digitized after herbaria from the original project are completed. A PEN was awarded to three other existing Virginia collections (ODU, WILLI and MWCW) to join the SERNEC project.

Attachment 1
SERNEC Bimonthly Report May 2019.pdf

Attachment 2

Source URL: https://www.idigbio.org/node/564/submission/1544

TCN Bi-Monthly Progress Report to iDigBio

May 2019 (covering the months of February, March and April 2019)

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

Progress in Digitization Efforts (including subcontracts, student hirings, along with numbers of specimens processed):

All SERNEC:

There are 111 collections serving data through the SERNEC portal. There are currently 4,671,567 specimens records and 409,094 (9%) of those records are georeferenced. There are currently 4,172,730 imaged specimen images available. There are currently 50 collections publishing to iDigBio.

State	Collection Name	Acronym	Published to iDigBio (Y/N)	Proposed # of specimens to digitize	Actual # of specimens digitized	Reason for difference
AR	Arkansas Natural Heritage Commission	ANHC	Y	5,946	11,741	Complete; fastest growing collection in AR - more specimens than original estimate
AR	Arkansas Tech University	APCR	Y	19,196	7,544	ongoing
AR	Henderson State University	HEND	N	45,000	2,753	Ongoing; last collection started in late 2018
AR	Hendrix College	HXC	Y	5,484	5,568	Complete; last specimens in NfN expedition to finalize transcription

AR	Arkansas State University	STAR	Y	17,500	23,836	Imaging complete; more specimens than expected
AR	Univrsiy of Arkansas Monicello Sundell Herbarium	UAM	Y	21,600	25,623	Imaging complete; more specimens than expected
AR	University of Arkansas	UARK	Y	110,458	71,218	Imaging complete; fewer AR specimens than expected
AR	University of Central Arkansas	UCAC	Y	20,768	16,139	Imaging complete; fewer AR specimens than expected
FL	University of Florida Herbarium	FLAS	Y	142,000	206,287	Some material already digitized.
FL	Florida Department of Agriculure, Division of Plant Industry	PIHG	N	11,000	12,995 (imaged, not yet uploaded due to PIHG provided database issues being worked on)	More specimens in collection than previously planned for.
SC	A.C. Moore Herbarium at the University of South Carolina	USCH	Y	72,000 (Initial estimate of SE specimens in the USCH Collection)	55,523 (77% of SE specimens)	Work is on-going.
SC	Clemson University	CLEMS	Y	63,000 (Initial estimate of SE specimens in the CLEMS Collection)	74,572 (100% of SE specimens)	Volunteer work has enabled CLEMS to image all of the SE specimens and some of the non-SE specimens in the collection.
SC	Newberry College	NBYC	Y	21,167 (100% of the Collection)	19,238 (91% of the collection)	Work will be completed by June, 2019
SC	University of South	USCS	Y	17,886 (100% of the Collection)	17,827	Statistically complete.

	Carolina Upstate					
SC	Francis Marion University	FMUH	Y	7,168 (100% of the Collection)	7,053	Statistically complete.
SC	Furman University	FUGR	Y	13,936 (100% of the Collection)	13,938	Statistically complete, based on recorded specimens. Undocumented specimens remain.
SC	Converse College	CONV	Y	6,445 (100% of the Collection)	6,438	Statistically complete.
SC	Winthrop University	WINU	Y	1,717 (100% of the Collection)	1,717	Completed.
SC	University of South Carolina Salkehatchie	SALK	Y	500 (100% of the Collection)	498	Statistically complete.
SC	Silver Bluff Audubon Center and Sanctuary	SBAC	Y	772 (100% of the Collection)	772	Completed. This collection is new, and was not included in the original proposal.

VA	Bridgewater College	BDWR	Y	3,600	2,524	ongoing
VA	City of Alexandria Herbarium	AVCH	Y	4,500	2,155	ongoing
VA	Virginia Commonwealth University	VCU	Y	11,900	18,890	complete; other resources were used to digitize the entirety of the collection
VA	James Madison University	JMUH	Y	12,600	9,341	ongoing
VA	Lord Fairfax Community College	LFCC	N	14,000	0	not yet started
VA	University of Richmond	URV	Y	14,000	22,581	complete; other resources were used to digitize the entirety of the collection

VA	Virginia Military Institute	VMIL	N	21,000	0	not yet started
VA	George Mason University	GMUF	Y	45,550	36,941	complete; fewer specimens than expected
VA	University of Lynchburg	LYN	Y	44,800	33,254	complete; fewer specimens than expected
VA	Longwood University	FARM	Y	58,650	47,319	complete; fewer specimens than expected
VA	Virginia Tech	VPI	Y	75,500	44,617	ongoing
GA	University of Georgia Herbarium	GA	Y	80,000	132,619	52,619 more specimens have been processed: continued digitization via other funds
GA	Georgia Southwestern State University	GSW	Y	13,500	13,151	349 less specimens in herbarium than estimated
GA	University of West Georgia Herbarium	WGC	Y	5,000	5,009	9 more specimens in herbarium than estimated
GA	Georgia Southern University Herbarium	GAS	Y	25,000	23,249	1,751 less accessioned specimens in herbarium than estimated
GA	Columbus State University Herbarium	COLG	N	5,500	7,258	1,758 more specimens in herbarium than estimated
GA	Armstrong Atlantic State University Herbarium	AASU	Y	6,000	5,069	931 less specimens in collection than estimated

Arkansas: 7 of 8 collections are reporting to iDigBio. ANHC has all images and transcribed records posted as well as 2/3 of the collection georeferenced. HXC has all images posted, and

the final records are being transcribed through NfN. STAR has all images posted, and transcriptions are in progress. UAM has all images posted, and skeletal data entry is in progress through NfN. UCAC has all images posted, and transcriptions are in progress. HEND and APCR imaging ongoing without anticipated completion date.

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AASU: All 5,058 digitized specimens uploaded to the SERNEC portal.

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Virginia: 9 of 11 collections are reporting to iDigBio.

Share and Identify Best Practices and Standards (including Lessons Learned) that could be shared with others (e.g., documents written, edited and where posted):

All SERNEC:

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 (please also include any impediments or challenges):

All SERNEC:

Nothing to report

Arkansas: The remaining collections have not communicated effectively with state coordinators to have much progress.

Florida: FLAS: one of our biggest challenges is managing data in different systems with only the Collection Manager to wrangle with the design. Our catalog is split between multiple portals.

South Carolina: Struggle to maintain registration with Adobe Lightbox. Otherwise, nothing to report.

Virginia: LFCC curator retired in 2018. GMUF will adopt, accession and digitize this collection during AY 2019-2020.

Share and Identify Opportunities to Enhance Training Efforts:

All SERNEC:

Nothing to report

Arkansas: NfN transcription workshop with Central Arkansas Master Naturalists at ANHC was hugely successful. This group has transcribed more than 20,000 transcriptions from mid-Jan through April, 1/3 of all NfN transcriptions in AR since 2016. We are setting up workshops for Arkansas Native Plant Society NfN transcription and CoGe georeferencing in fall 2019. Volunteer activity in AR is higher in winter months, so fall workshops may be strategic for training prior to volunteer availability.

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

All SERNEC:

Nothing to report

Arkansas: On-going project with Notes from Nature, Central Arkansas Master Naturalists, Arkansas Native Plant Society, Hendrix College alumni, classroom assignments (STAR, HXC, APCR)

Florida: FLAS: we are part of the Pteridophyte Collections Consortium (PCC) TCN and pushing the rest of our Pteridophte collections into the SERNEC portal for access by the PCC project. We continue to work with WeDigFLPlants - Biospex.*:*

South Carolina: On-going projects with Notes from Nature.

Virginia: On-going projects with Notes from Nature, Virginia Master Naturalists, Virginia Native Plant Society, and Natural Heritage Program.

Share and Identify Opportunities and Strategies for Sustainability:

All SERNEC:

Nothing to report

Arkansas: Note from Nature class assignments for vascular plant systematics, dendrology, and general botany at multiple institutions across the state are a good opportunity to have pulses of transcription activity.

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

All SERNEC:

The TCN continues to be active on Notes from Nature with several expedition running. We recently started a new series called Spring Refresher in order to transcribe specimens from the state of Tennessee. Student from Tennessee as well as volunteers associated with the annual Wildflower Pilgrimage (http://www.wildflowerpilgrimage.org/) have been active on these expeditions.

Arkansas: Notes from Nature transcription workshop at ANHC for Central Arkansas Master Naturalists in January, 2019. On-going project with Notes from Nature.

Florida: FLAS: one UF undergraduate student designed a project set of plants from Highlands County, Florida, for cataloging by high school students in Sebring.

South Carolina: On-going projects with Notes from Nature.

Virginia: On-going projects with Notes from Nature.

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

All SERNEC:

The TCN leadership are in the process of evaluating our final activities, deliverables and budget in order to figure out if the lead institution will be applying for a second no-cost extension.

South Carolina: We digitized a newly-created collection (SBAC, the Silver Bluff Audubon Center and Sanctuary Collection) and added it to iDigBio. The collection was created after the project began.

Virginia: Two additional Virginia herbaria have been registered with Index Herbariorum (PGC, LGBG) in order to participate in digitization efforts, which were not included in the original project. PGC has been digitized; LGBG will be digitized after herbaria from the original project are completed. A PEN was awarded to three other existing Virginia collections (ODU, WILLI and MWCW) to join the SERNEC project.