

**DIGITIZING NORTH AMERICAN
LICHEN AND BRYOPHYTE
SPECIMENS
LBCC
(powered thru
<http://symbiota.org>)**

**Corinna Gries
Edward Gilbert
Thomas H. Nash III**

**4.0 million
specimens,
92 institutions,
4.3 years later**

LBCC TCN WEBSITE

([HTTP://LBCC1.ACIS.UFL.EDU/](http://lbcc1.acis.ufl.edu/) - OPEN SOURCE)

LBCC *Lichens, Bryophytes and Climate Change*

Home Project ▾ Digitization ▾ Data ▾ Information Volunteer ▾ Calendar

Documenting North American lichen and bryophyte collections..

2,070,444
images

4,057,402
records

News...

- ~143,000 labels were imaged this summer
- **Lichen Exsiccati** now searchable
- **Frullania Collaborative Research Network** now online
- **Harriman Alaskan Expedition** added to **bryophyte** and **lichen** volunteer pages

Get Involved...

Learn more about **volunteering to digitize bryophyte and lichen collections.**

Visit our **lichen** and **bryophyte** record sets of historic expeditions and special collections.

Go directly to the data portals for **lichens** or **bryophytes** .

Recent LBCC Blog Posts

- Label transcription
- Example label
- Some tips for data entry in Lichen and Bryophyte Portals

[More](#)

Upcoming Events

No upcoming events

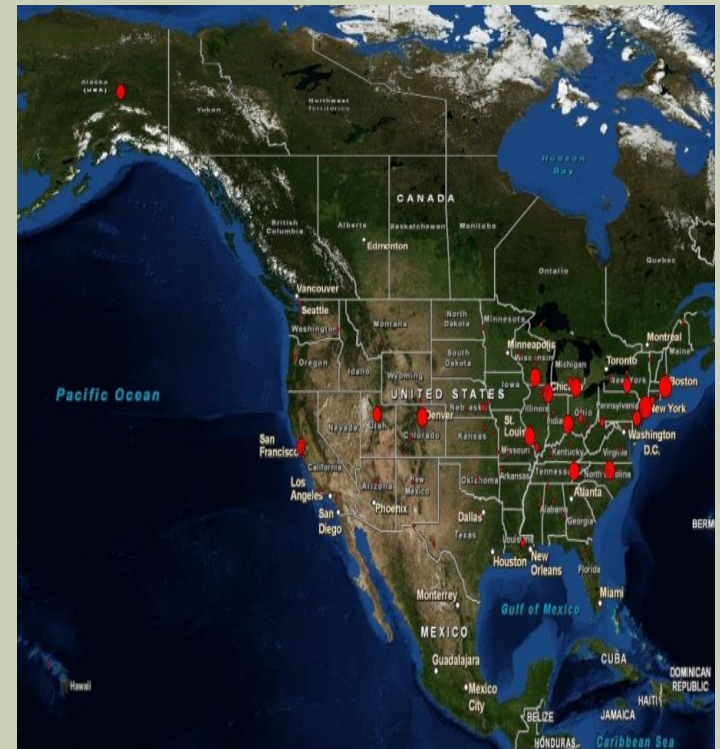
[View events calendar](#)

BRYOPHYTES AND LICHENS

- Different evolutionarily but similar in size and habitats occupied (epiphytes, soil mats, and rocks)
- Both dominate much of the arctic and northern boreal regions (lichens in upland areas and bryophytes in wet habitats.
- Both also occur commonly in many other ecosystems (deserts to tropics)
- Bryophytes, particularly in peat bogs store a major part of the worlds organic carbon
- Both are very useful in deposition monitoring

LICHENS BRYOPHYTES CLIMATE CHANGE

- Original NSF ADBC funding 2011
 - ~ 2.3 million specimen (90%)
 - 900,000 lichens
 - 1.4 million bryophytes
 - 65 non-governmental US herbaria (95%)
 - 16 digitization centers (collaborators)
 - Mobilizing additional existing digital records (25+ added so far)
- 4 PENs funded 2012, 2013 & 2014
 - Add 220,000 specimens and 5 digitization centers (CINC, COLO, FLAS, MIN, YPM – not shown).



PARTICIPATING HERBARIA

Firefox

NTL Views | North Temperate Lakes x NTL Publications | North Temperate Lakes x Botany 2012 - Abstract Search x LBCC Participating Herbaria | LBCC - Lich... x Lichens, Bryophytes and Climate Ch... x

sweetgum.nybg.org/lbcc/lbccmap.html

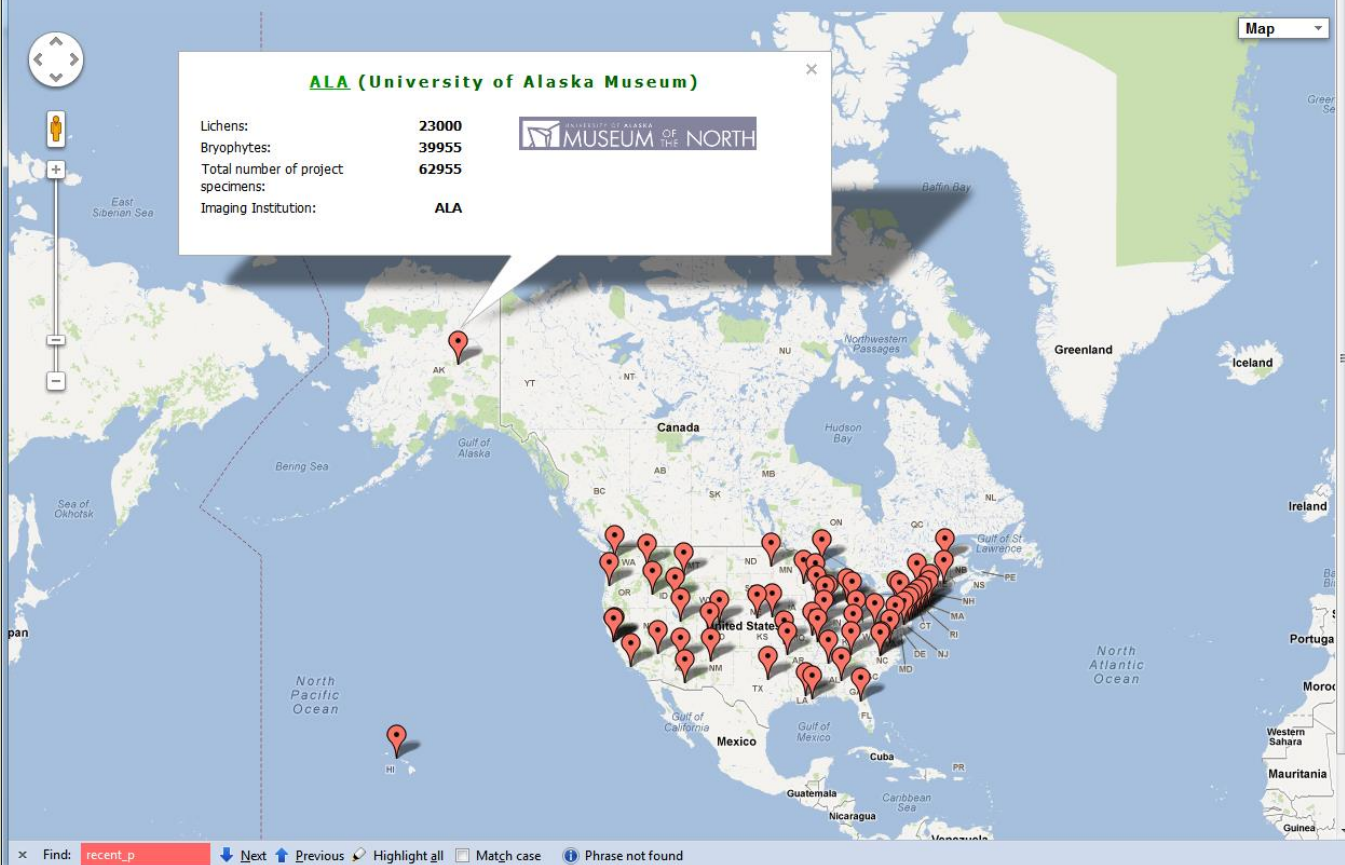

Botany 2012

Lichens, Bryophytes and Climate Change

Map

ALA (University of Alaska Museum)

Lichens:	23000
Bryophytes:	39955
Total number of project specimens:	62955
Imaging Institution:	ALA



Find: recent_p

Next Previous Highlight all Match case Phrase not found

LICHENS BRYOPHYTES CLIMATE CHANGE

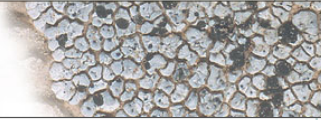
Research Questions:

- How are changes in distribution patterns of lichens and bryophytes over time correlated with man-made environmental changes?
- How accurately can we predict where specific species can be found using existing herbarium data?

PORTALS

Consortium of NORTH AMERICAN LICHEN HERBARIA

Photos by F. Burgartz



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Welcome to the Consortium of North American Lichen Herbaria

The Consortium of North American Lichen Herbaria (CNALH) was created to serve as a gateway to distributed data resources of interest to the taxonomic and environmental research community in North America. Through a common web interface, we offer tools to locate, access and work with a variety of data, such as keying to species.

The CNALH data portal is more than just a web site - it is a suite of data access technologies and a distributed network of universities, botanical gardens, museums and agencies that provide taxonomic and environmental information. Initially created to integrate databases between Arizona State University and the Santa Barbara Botanical Garden, the consortium is growing to extend its network to other partners within North America.

Join the Consortium of North American Lichen Herbaria as a regular visitor and please send your feedback to CNALHadmin@asu.edu

News and Events

- [NSF Press Release 11-136](#) - US National Science Foundation awarded support to a collaboration of herbaria in order to database ca. 2.3 million North American lichen and bryophyte specimens ([NSF ADBC 1115116](#))
- **September 2011** - 543302 occurrence records integrated into data portal supplied by 15 different data providers

- Bryophyte portal
(<http://bryophyteportal.org>)
- Open source

- Lichen portal
(<http://lichenportal.org>)
- Open source

Consortium of NORTH AMERICAN BRYOPHYTE HERBARIA

Photos by M. Von Konrat



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Welcome to the Consortium of North American Bryophyte Herbaria

The Consortium of North American Bryophyte Herbaria (CNABH) was created to serve as a gateway to distributed data resources of interest to the taxonomic and environmental research community in North America. Through a common web interface, we offer tools to locate, access and work with a variety of data, starting with searching databased herbarium records.

The CNABH data portal is more than just a web site - it is a suite of data access technologies and a distributed network of universities, museums and agencies that provide taxonomic and environmental information. Initially created with financial assistance from the American Bryological and Lichenological Society, the consortium is growing to extend its network to other partners within North America.

Join the Consortium of North American Bryophyte Herbaria as a regular visitor and please send your feedback to CNABHadmin@asu.edu

News and Events

- [NSF Press Release 11-136](#) - US National Science Foundation awarded support to a collaboration of herbaria in order to database ca. 2.3 million North American bryophyte and lichen specimens ([NSF ADBC 1115116](#))
- **June 2011** - 822457 occurrence records integrated into data portal

Overall Project Workflow (data management)

- Label imaging with key metadata (searchable thereby)
 - images to HUB server (proofed by Julie Smith - WIS).
- OCR (optical character recognition) & NLP (natural language programming run on all images -coordinated by Robert Anglin
- Images and transcription pages available side by side through the two portals as powered by Symbiota.
- Transcription thru editors, students, volunteers (with a national coordinator - Mari Roberts - NY).
- Georeferencing in batches through Geolocate, including STR conversions (Robert Anglin and Julie Smith, both WIS).
- Duplicates imported or handled through exsiccati module (individual transcribers - hourly hirees or volunteers).
- **GOAL: Completed, Searchable Databases available through the Lichen and Bryophyte Portals powered by Symbiota.**

NUMBERS

■ Imaging Speed	300 to 1500+ per day
■ Institutions having already imaged	22
■ Additional institutions providing specimens to image	50
■ Total number of images generated (Oct. 2015)	2,070,000+
■ Records available on bryophyte portal	2,100,000+
■ Involving 70 institutions	
■ Records available on lichen portal	1,900,000+
■ Involving 77 institutions	
 Total specimen records in the portals	 4,057,000+
Involving 92 institutions	

OVERSIGHT & RESEARCH

- Project PI – Corinna Gries – financial including funds transfers, IT supervision, TCN overall reports & e-mail communication
- Project coPI – T.H. Nash III – database checking & barcodes & e-mail communication, over numbers evaluation, WIS supervisor
- Image checking & upload – J. Smith (WIS) & people at each imaging institution
- OCR & NLP – R. Anglin (WIS)
- Server maintenance – University of Florida IT personnel
- Geolocate – R. Anglin, students trained by J. Smith
- Transcription – everyone possible, including student trainees and volunteers
- If all else fails, call Ed Gilbert and/or HUB folks at UF or FSU
- Research – anyone of the hundreds of people using the lichen and/or bryophyte portals, which provide searching by institution, taxa, geographical location, date of collection, coordination of floristic projects, keying, photos, maps & taxa descriptions - & Duke team for North Carolina

THANK YOU NSF

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