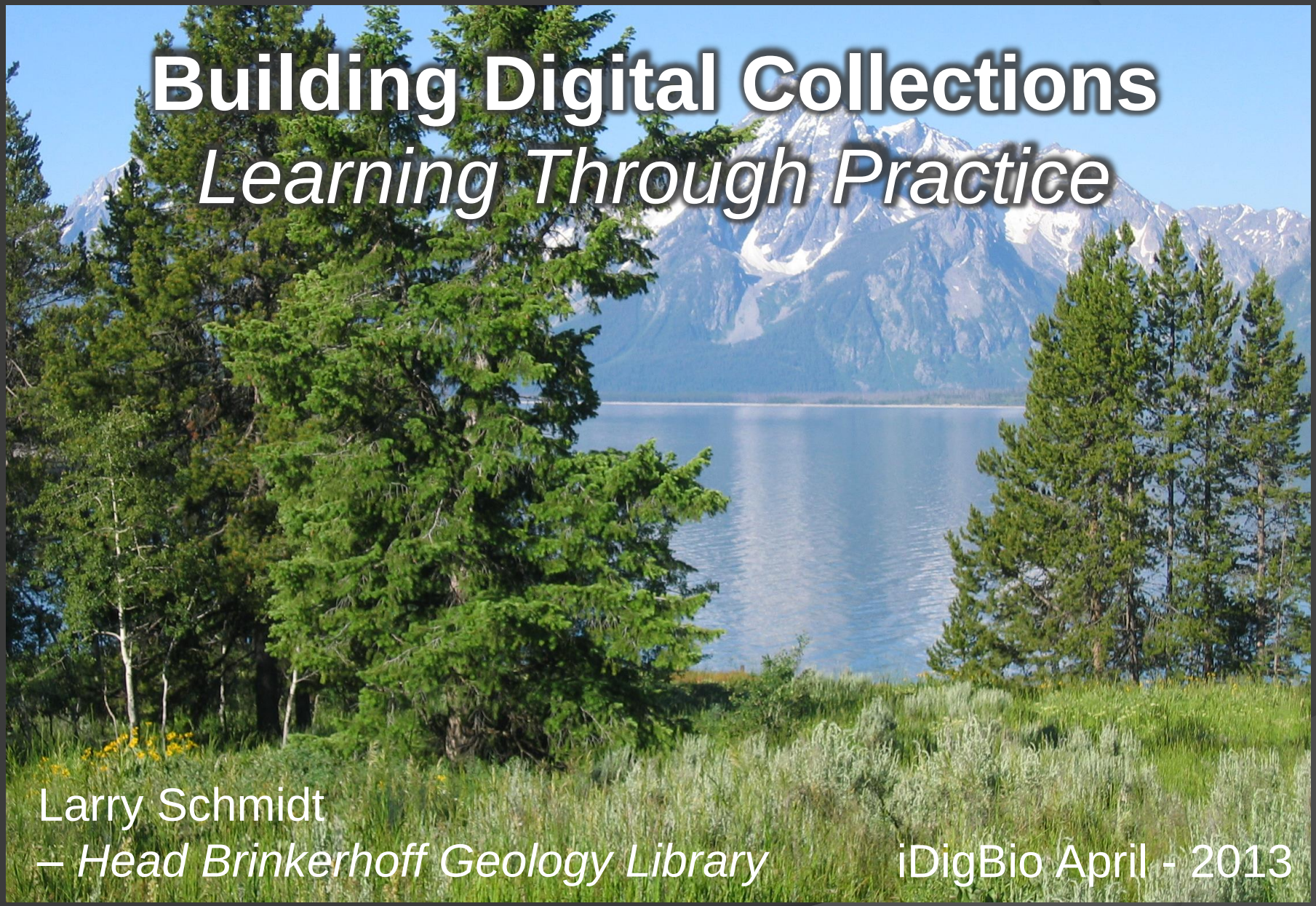
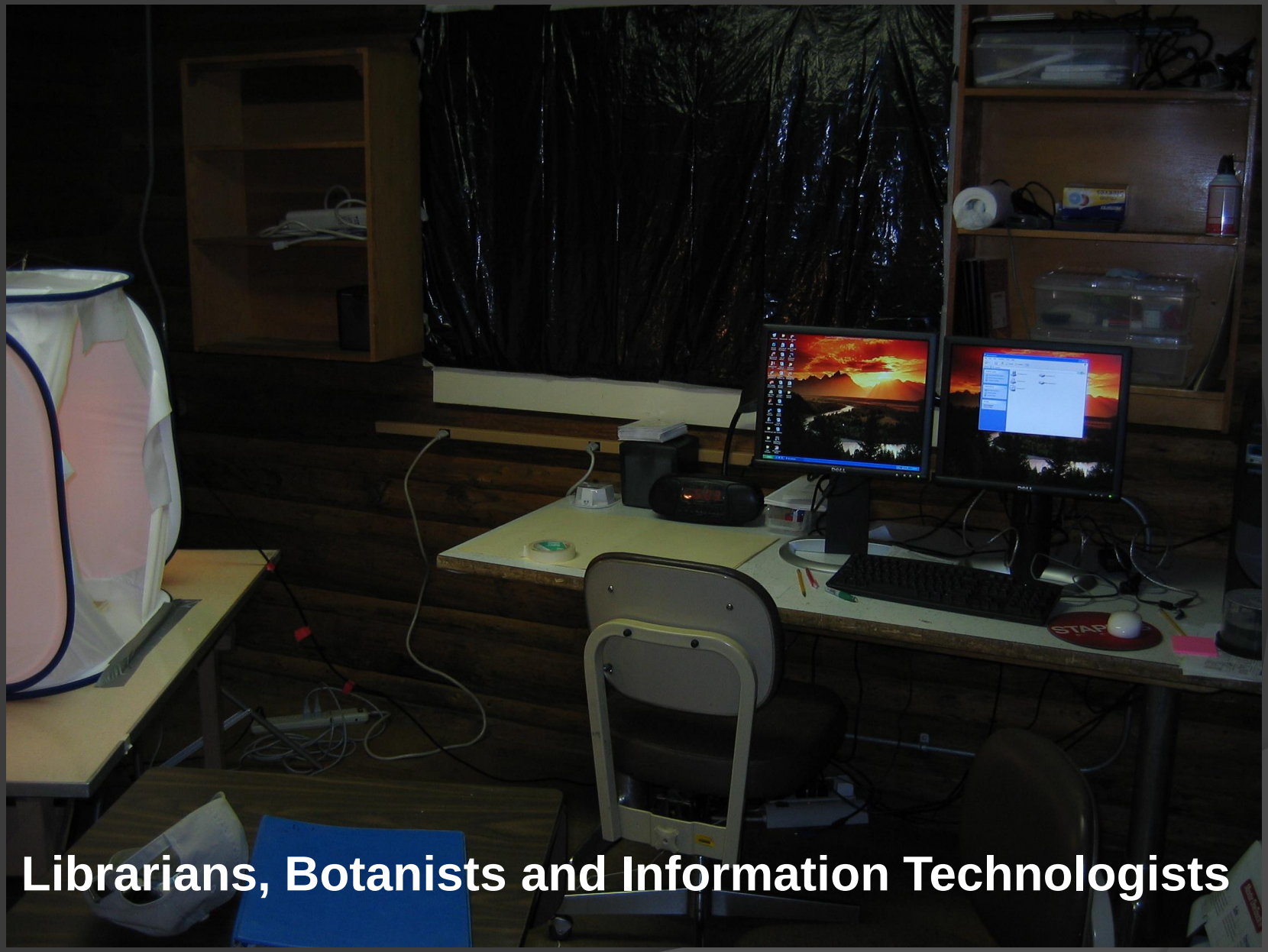


Building Digital Collections

Learning Through Practice

Larry Schmidt
– *Head Brinkerhoff Geology Library*

iDigBio April - 2013


Librarians, Botanists and Information Technologists

What is a *Herbarium*?

A herbarium is analogous to a **library**.
In place of books on shelves, it contains carefully prepared specimens of plants housed in cabinets.

What is a *Virtual Herbariu*m?

It can be considered to be a herbarium in digital form. Increases the availability to a wider audience.

Digitization of Herbarium Specimens

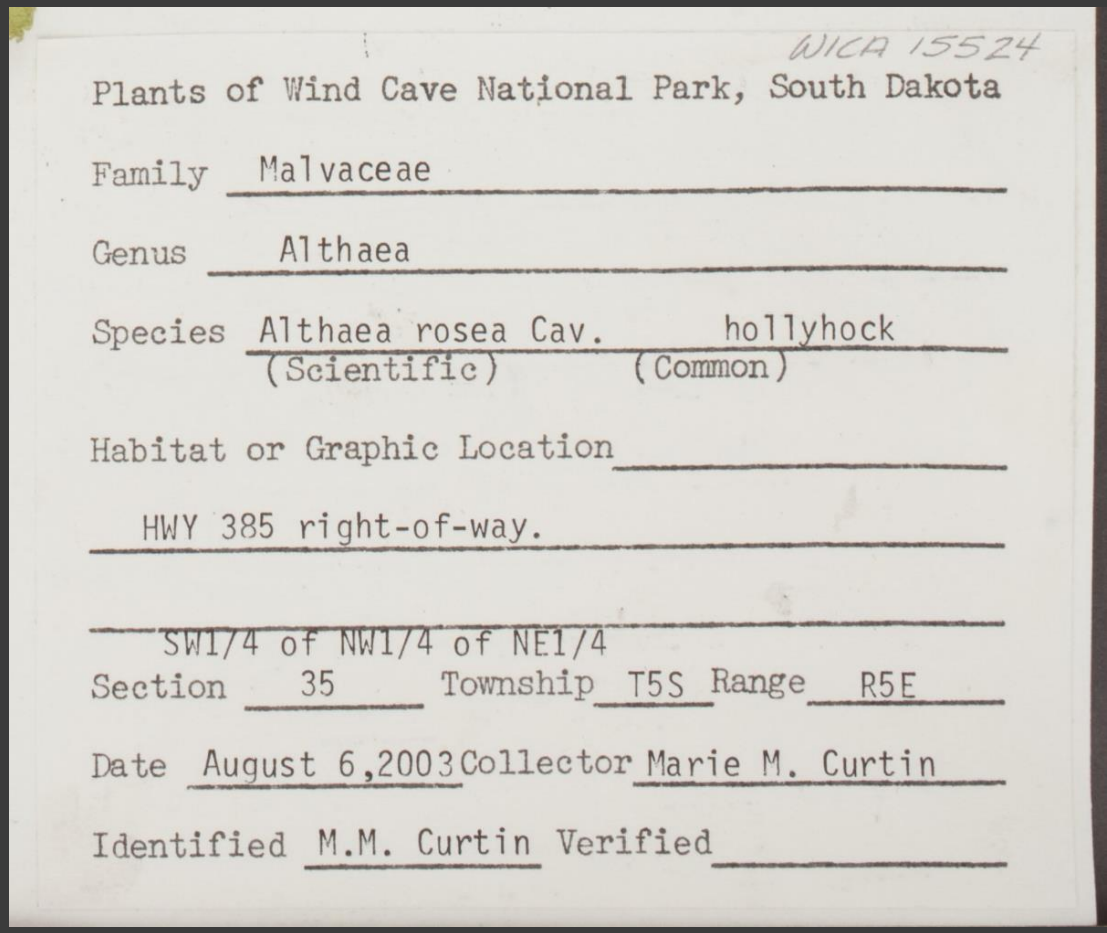
a Collaborative Project

Grand Teton National Park

Iliamna rivularis

Wild Hollyhock

Specimen Information



WICA 15524

Plants of Wind Cave National Park, South Dakota

Family Malvaceae

Genus Althaea

Species Althaea rosea Cav. (Scientific) hollyhock (Common)

Habitat or Graphic Location

HWY 385 right-of-way.

SW1/4 of NW1/4 of NE1/4
Section 35 Township T5S Range R5E

Date August 6,2003 Collector Marie M. Curtin

Identified M.M. Curtin Verified

Herbarium Data

Scientific name

Specimen No.

Collector

Collection Date

Habitat description

Geographic location

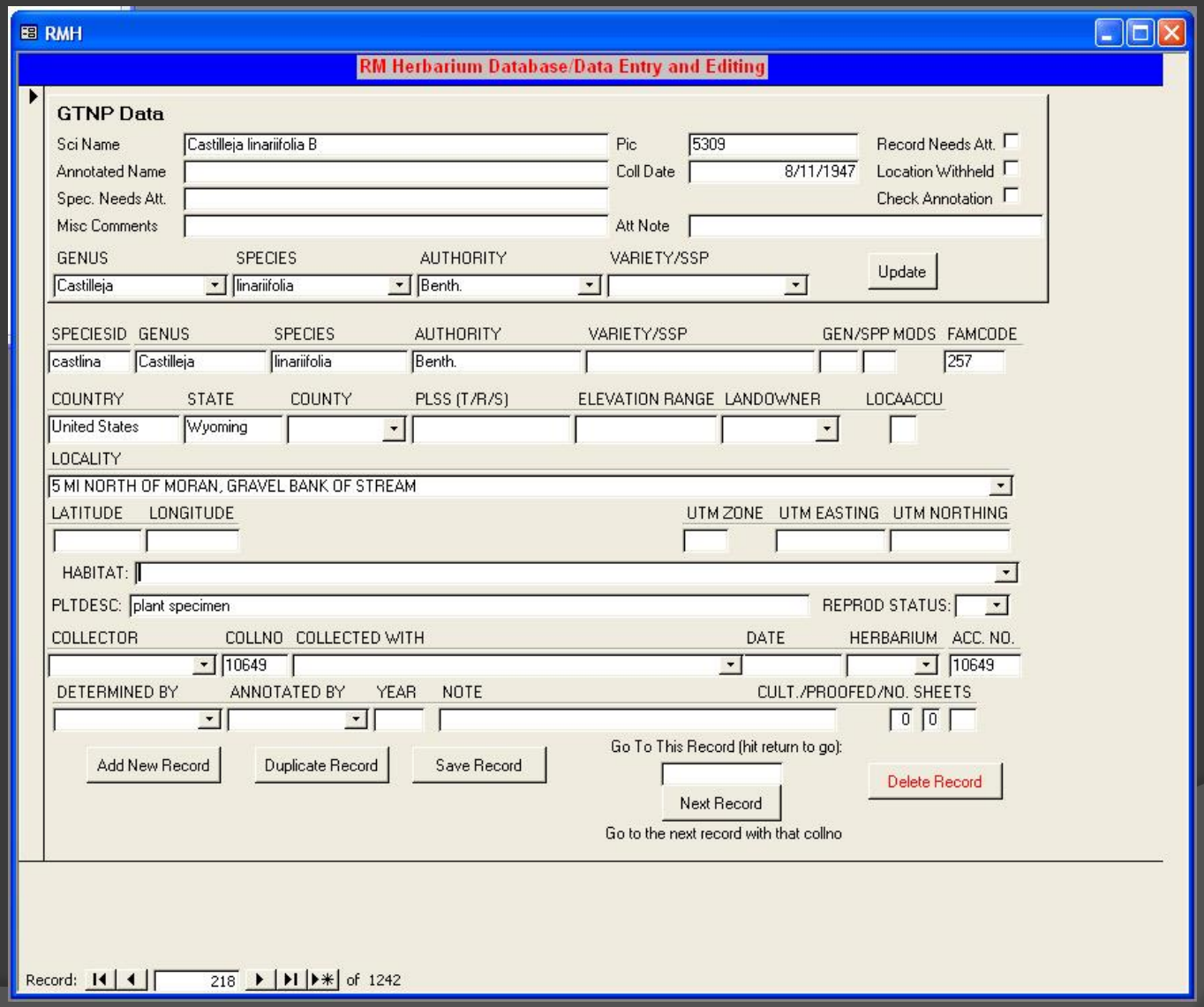
Annotated

Controlled Vocabulary
Physical Curation

Natural History Collections

- Card Catalog (Physical)
  - Local
- Database (Digital)
  - Local
- Web portal (Digital)
  - Regional / Global

Rocky Mountain Herbarium Database



GTNP Excel Spreadsheet

	A	B	C	D	E	F	G	H	I	J	K
1	Catalog	Class	Class	Class 3	Class 4	Sci. Name	Genus [Sci. Name,	Description	Locality	Collection Da	Change Da
5440	GRTE 11293	BIOLOGY	PLANTAE	LILIOPSI	CYPERACE	Carex paysonis Clokey	Carex pays	plant specimen	AMPHITHEATER CIRQUE	7/10/1962	1/7/1999
5441	GRTE 11294	BIOLOGY	PLANTAE	LILIOPSI	JUNCACEA	Luzula piperi (Cov.) Jone	Luzula pip	plant specimen	RIDGE NORTH OF AMPHITHEATER LAKE	6/28/1961	1/7/1999
5442	GRTE 11295	BIOLOGY	PLANTAE	LILIOPSI	ORCHIDAC	Corallorhiza maculata Raf	Corallorhi	plant specimen	ONE MILE UP INDIAN PAINTBRUSH CANYON TRAIL	7/7/1966	1/7/1999
5443	GRTE 11296	BIOLOGY	PLANTAE	LILIOPSI	ORCHIDAC	Corallorhiza maculata Raf	Corallorhi	plant specimen	ON TRAIL FROM SQUARE G RANCH TO LEIGH LAKE	7/7/1956	1/7/1999
5444	GRTE 11297	BIOLOGY	PLANTAE	LILIOPSI	ORCHIDAC	Corallorhiza mertensiana	Corallorhi	plant specimen	WEST OF COLTER BAY AMPHITHEATER	7/16/1967	1/7/1999
5445	GRTE 11298	BIOLOGY	PLANTAE	LILIOPSI	ORCHIDAC	Corallorhiza striata Lind	Corallorhi	plant specimen, rare at site	NEAR THE BRIDGE AT BRADLEY LAKE	7/6/1967	1/7/1999
5446	GRTE 11299	BIOLOGY	PLANTAE	LILIOPSI	ORCHIDAC	Listera caurina Piper	Listera ca	plant specimen	ON TRAIL TWO MILES UP INDIAN PAINTBRUSH CNAYON	7/7/1966	1/7/1999
5447	GRTE 2721	Biology	Thallophy	Eumycete		Peridermium coloradense	Peridermiu	Fungi specimen on Picea National catalog Note: 8/2001: Ther	Hobach Canyon 0.5 miles South East mouth Cliff 640		8/9/2001
5448	GRTE 2722	Biology	Thallophy	Eumycete		Stagonospora foliicola	Stagonospo	Fungi specimen on Graminae National catalog Note: 8/2001: T	2 miles North Jackson Lake Lodge Junction 6780'		8/9/2001
5449	GRTE 2724	Biology	Thallophy	Eumtcete		Thelephora terrestris	Thelephora	Fungi specimen on rotting conifer log National catalog Note	Signal mountain Lodge, GRTE		8/9/2001
5450	GRTE 4988	BIOLOGY	PLANTAE	MAGNOLIO	APIACEAE	CYMOPTERIS LONGIPES S. WA	CYMOPTERIS	3 INCOMPLETE PRESSED SPECIMENS WITHOUT ROOTS	RENDEZVOUS PEAK, 1/4 MILE SOUTH OF TRAM	28-Jul-78	/ /
5451	GRTE 4989	BIOLOGY	PLANTAE	MAGNOLIO	ASTERACE	CHRYSOTHAMNUS NAUSEOSUS (	CHRYSOTHAM	1 INCOMPLETE SPECIMENT WITH NUMEROUS FLOWERS BUT NO	1/2 MI. WEST OF EAST BOUNDARY ON ROAD WHICH PARALL	9-Jul-79	/ /
5452	GRTE 4990	BIOLOGY	PLANTAE	MAGNOLIO	POLEMONI	LINANTHUS HARKNESSII (CUR	LINANTHUS	NATIONAL CATALOG NOTE 9/2001: CONDITION: COM/EX,	SOUTH SIDE OF RIBBON FALLS ON TEEWINOT MOUNTAIN	26-Jun-79	/ /
5453	GRTE 4991	BIOLOGY	PLANTAE	MAGNOLIO	SCROPHUL	CORDYLANTHUS RAMOSUS NUTT	CORDYLANTH	3 COMPLETE PRESSED SPECIMENS,	1/2 MILE WEST OF EAST BOUNDARY ON ELK RANCH ROAD	9-Jul-79	/ /
5454	GRTE 4992	BIOLOGY	PLANTAE	MAGNOLIO	HYDROPHY	NEMOPHILA BREVIFLORA	NEMOPHILA	5 INCOMPLETE PRESSED SPECIMENS WITHOUT ROOTS -	FIRST SWITCHBACK GLACIER TRAIL 500 YDS., ABOVE BRA	7-Jul-79	/ /
5455	GRTE 4997	BIOLOGY	PLANTAE	MAGNOLIO	RANUNCUL	THALICTRUM FENDLERI ENGEL	THALICTRUM	2 COMPLETE PRESSED SPECIMENS,	COTTONWOOD CREEK BANK, HIGHLANDS RESIDENTIAL AREA	17-Jul-78	/ /

Types of Metadata

Descriptive

Author
Collector
Identifier

Keywords
Location
GPS
Abstract

Accession
Barcode
URL

Technical
Structural

File Type
Hardware
Camera Info
Geodetic Datum

Interoperability
Pagination

XML

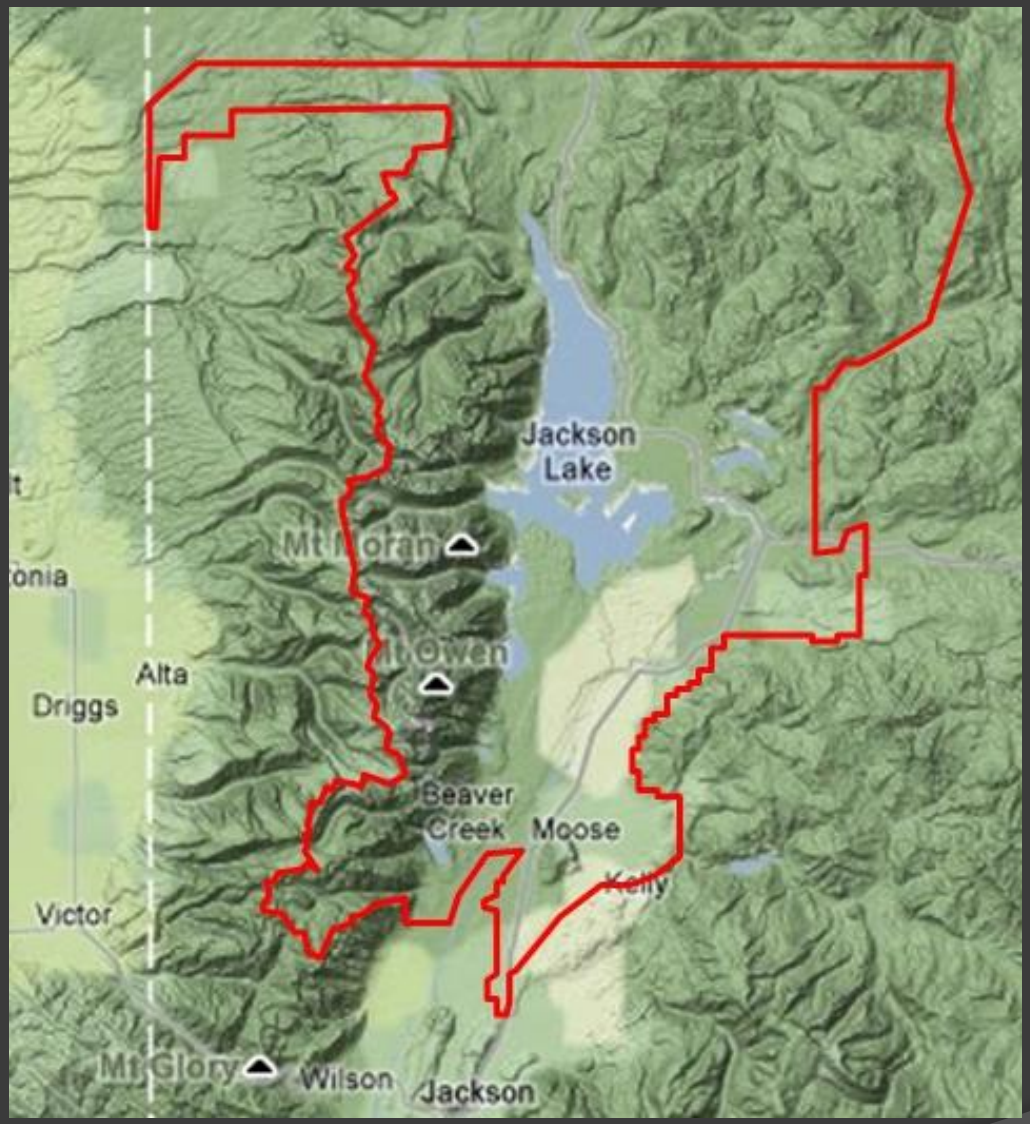
Administrative

Property Rights
Copy Right

Preservation
Archive

Access


DayBook


Jackson
Lake
Alta
Driggs
Beaver
Creek
Moose
Victor
Wilson
Jackson

Location

Map Viewer Code

```
# gmaptilerv02.py:
#
# Loops through images within a specified directory and creates tiles for each image for use in the GMaps Image Viewer.
# Tiles are named according to the template z_c_r.jpg where z = zoom level, c = column, r = row
# Tiles are either concatenated into a single physical file (.tls file), or are stored as separate image files.
# If tiles are stored in a single .tls file:
#    A text file is generated that contains image metadata and a list of tile byte locations and lengths within the .tls file.
#    The .tls file simply contains all the tiles bytes concatenated back-to-back in the order they are created (see code below).
#    An extraction script (tile.php or equivalent) is needed to pull individual tiles from the .tls file when requested by the GMaps Image Viewer.
# If tiles are stored as separate image files:
#    A text file is generated that contains image metadata.
#    Tile image files are saved according to the naming convention described above.
#    The GMaps Image Viewer will simply request the static tiles; no extraction script is required.
# see README.txt for a description of the .tls and metadata file structures.

#
# Author: Ben Legler, University of Wyoming Libraries
# 12/8/2009
#
#
# Requirements:
#  1) Python (tested with version 2.6)
#         (http://www.python.org/)
#  1) Python Image Library (PIL) (tested with version 1.1.6)
#     (http://www.pythonware.com/products/pil/)
#  2) ImageMagick, installed somewhere on the computer (tested with version 6.5.6-Q16).
#     (note: if PIL can open all your images then this dependency can be removed; to do so, edit lines 81-96)
#     (http://www.imagemagick.org/script/download.php)
#
#
# Example Windows command-line usage:
# C:\Python26\python.exe C:\wamp\www\gmapviewer\gmaptilerv02.py


# CONFIGURATION:

# Path to ImageMagick "convert" executable:
imageMagick_convert_path = "C:\\wamp\\ImageMagick-6.5.6-Q16\\convert.exe";

# List of file types that will be sent to the image tiler:
# (This script should be able to handle any image file type recognized by ImageMagick)
# (This list is case-insensitive)
fileTypes = "\.(jpg|jpeg|bmp|png|gif|tif|tiff)$"
```


Collections
Online Data
Research
Resources
Blog
Results
RM Herbarium Specimen Database. Accessing 764,794 specimen records.
Download:
10 specimens displayed.
Map
Satellite
Terrain
List
Details
Sort
Scientific Name
1-10
Lilliaceae
U.S.A., Wyoming, Teton County: Grand Teton National Park and Vicinity: Jackson Hole: Jackson Lake shore at Spalding Bay, ca 12 air mi N of Moose; ca 9 air mi W of Moran.
David Scott 151, 6/8/2006.
with B. E. Nelson, Nancy Bockino
Accession: RM 834307, Barcode: RM0011983
U.S.A., Wyoming, Teton County: Grand Teton National Park and Vicinity: Teton Range: east slope of Teewinot Mountain, ca 6 air mi NW of Moose; ca 14.5 air mi SW of Moran.
David Scott 278, 6/9/2006.
with B. E. Nelson, Nancy Bockino
Accession: RM 834305, Barcode: RM0011981
U.S.A., Wyoming, Teton County: Grand Teton National Park and Vicinity: Teton Range: mouth of Open Canyon, ca 5.5 air mi W of Moose; ca 12 air mi NNW of Jackson.
David Scott 326, 6/10/2006.
with Nancy Bockino
Accession: RM 834304, Barcode: RM0011980
Adding value

University Libraries
Digital Collections

The Collection
- Digital Home
- WySR
- UW Libraries
- Exhibits
- Digital Herbaria
- American Heritage Center (AHC)

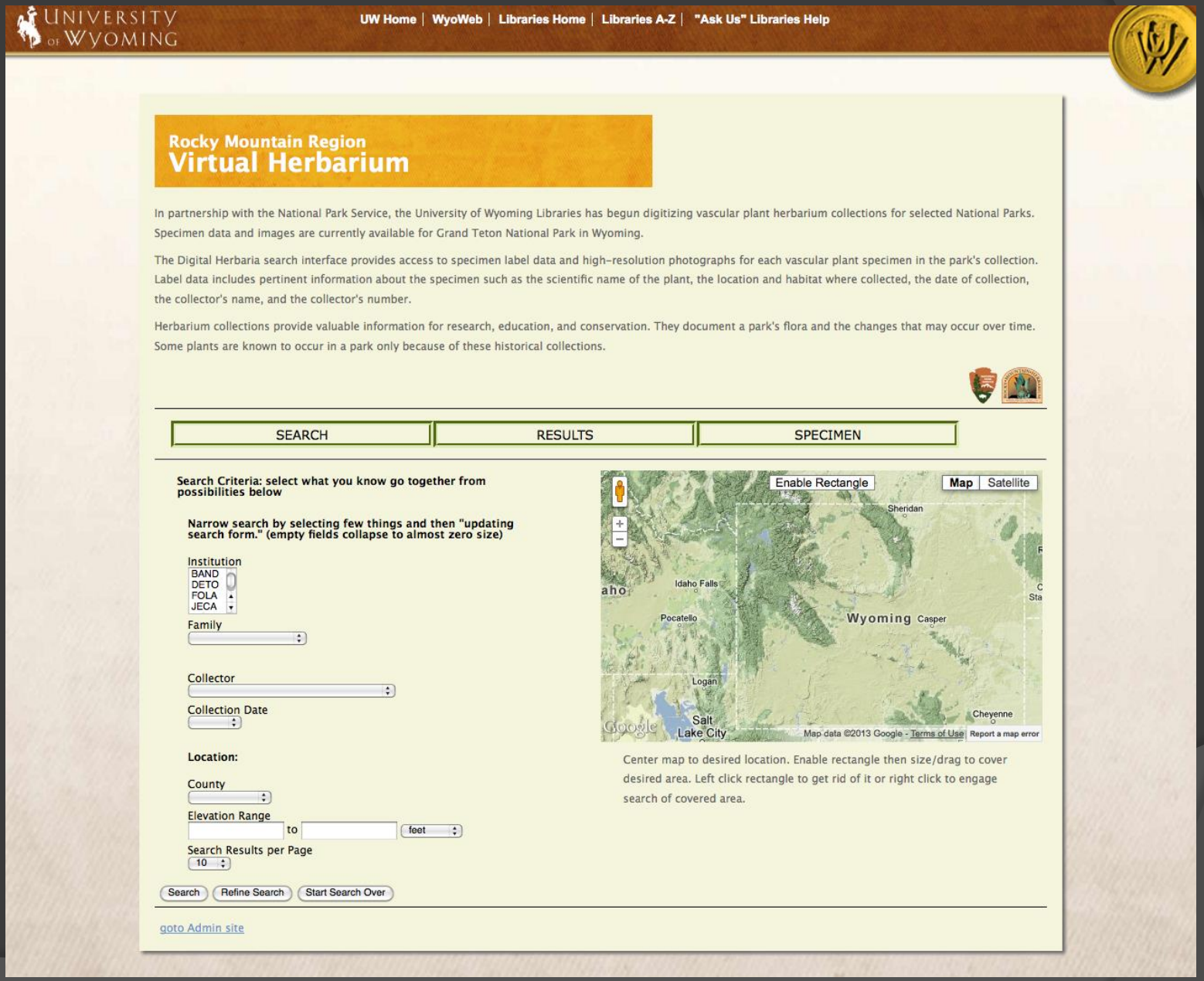
Digital Research Collections at UW

WySR – Our New Wyoming Scholars Repository

Wyoming Scholars Repository (WySR) is a University of Wyoming Libraries service dedicated to preserving and providing open access to the scholarly and creative works of the University of Wyoming. WySR provides open access to works produced by University of Wyoming faculty, researchers, and students. The goals of WySR are to increase the visibility of UW's scholarship, encourage collaboration and innovation, and contribute to the ongoing development of new knowledge.

UW Libraries will work in partnership with university departments, programs, centers, and individual faculty members to select, submit, and manage repository content. Members of the academic community are invited to contribute their completed scholarship for long-term preservation and worldwide electronic accessibility. Archiving content in WySR is free and allowed by many publishers. Faculty and researchers may also choose to create a SelectedWorks homepage to highlight and share their scholarship with colleagues.

https://www-lib.uwyo.edu/digitalherbaria/



SEARCH | RESULTS | SPECIMEN

Search Criteria: select what you know go together from possibilities below

Narrow search by selecting few things and then "updating search form." (empty fields collapse to almost zero size)

Institution
BAND

Family
Liliaceae

Scientific Name:

Genus
Streptopus

Specific Epithet

Species Authority

Subspecies

Subspecies Authority

Collector

Collection Date

Center map to desired location. Enable rectangle then size/drag to cover desired area. Left click rectangle to get rid of it or right click to engage search of covered area.

ocky Mountain Region
irtual Herbarium

rtnership with the National Park Service, the University of Wyoming Libraries has begun digitizing vascular plant herbarium collections for selected National Par
imen data and images are currently available for Grand Teton National Park in Wyoming.

Digital Herbaria search interface provides access to specimen label data and high-resolution photographs for each vascular plant specimen in the park's collecti
l data includes pertinent information about the specimen such as the scientific name of the plant, the location and habitat where collected, the date of collectio
ollector's name, and the collector's number.

arium collections provide valuable information for research, education, and conservation. They document a park's flora and the changes that may occur over tir
e plants are known to occur in a park only because of these historical collections.

SEARCH | RESULTS | SPECIMEN

l Number of Rows: 1

nge number of rows per page: :Currently Showing 10 rows per page

LIST | MAP

INSTITUTION	SCIENTIFIC NAME	COMMON NAME	ELEVATION	COLLECTOR	COLLECTION#	IMAGE
BAND	Streptopus amplexifolium	Not Given	0	B. Jacobs	6035	

o Admin site

Catalog Information:

Database ID: 4725
Created By:
Created Date:
Modified By: mlux1
Modified Date: Feb 11 2013 12:39:01:00
Institution: Bandelier National Monu
Institution Code: BAND
Barcode: BAND1151
Catalog Number: 15579
Accession Number: 0

Scientific Name:

Family: Liliaceae
Genus: Lilium
Specific Epithet: philadelphicum
Species Authority: L.
Subspecies:
Subspecies Authority:
Variety:
Variety Authority:
Infraspecific Rank:
Infraspecific Epithet:
Annotation:
Phenology: Flower
Common Name: Wood Lily
Type Status:

Collection:

Collector: B. Jacobs & E. Perkins
First name: Brian
Middle Name: F.
Last name: Jacobs
Associated Collector: E. Perkins
Collection Number: 003695
Collection Date (ending in yyyy): 29-Jun-1987
Land Owner:

BIG ENTRIES

Picture

Check Field Book

Habitat: Canyon bottom, under open Ponderosa pine in moist area.

Location: Frijoles Canyon, Upper Crossing (and vicinity) Frijoles Canyon. Along trail from Upper Crossing to HQ. About 4 miles upstream of Headquarters.

June 28, 1987 BS+EP
BNM Frijoles Canyon, along entrance road on steep downhill grade. Sandoval Co.

3683 Eragrostis
grass to 3', panicles nodding, along road at sharp curve where stone wall forms guardrail. 6350 ft.

3684 Mustard
Rosty herb to 2½ ft. with stout tap root, flowers yellow. along road at sharp curve where stone wall forms guardrail.

3685 Yellow clover
Perennial herb from woody base to < 1 ft., flowers yellow, calyx lobes narrowly lanceolate – linear, purple. with strong lemon-lime odor. on entrance road above Horse Corral.

June 29, 1987 BS+EP Frijoles Canyon
along Trail from Upper Crossing to HQ. moist canyon bottom, Sandoval Co.

3686 Galium
Herb to 2 ft., flowers white, foliage with adhering hairs, 2 miles upstream HQ, 6300 ft. under open Ponderosa forest.

3687 Compositae
Herb to 2 ft. flower purple, 2 miles upstream HQ. under open Ponderosa forest, 6300 ft.

3688 Mustard
Herb to 2', flower white, moist meadow of canyon bottom 2½ miles upstream HQ, 6400 ft.

3689 Mertensia
Herb to 4 ft, flowers sky blue, moist meadow of canyon bottom, 2½ miles upstream HQ, 6400 ft.

3690 Borage
Herb to 4 ft. flowers sky blue with white center, moist meadow of canyon bottom, 2½ miles upstream HQ, 6400 ft.

3691 Hydrophyllum
Herb to 2½ ft., main branched from base, with immature fruit, style long + persistent, moist canyon bottom 3 miles upstream HQ, 6500 ft.

3692 Geum?
Herb to 2 ft., flowers yellow, w/ immature fruits, 3 miles upstream HQ, 6500 ft., streamside in full sun.

3693 Ranunculus
Aquatic herb in shallow fast moving water and in full sun, white petals white w/ yellow base, well above water level on elongate pedicles.
3 miles upstream HQ, 6500 ft.,

3694 Clematis
Vine in shrubbery along stream, flowers white. 4 miles upstream HQ, 6800 ft.

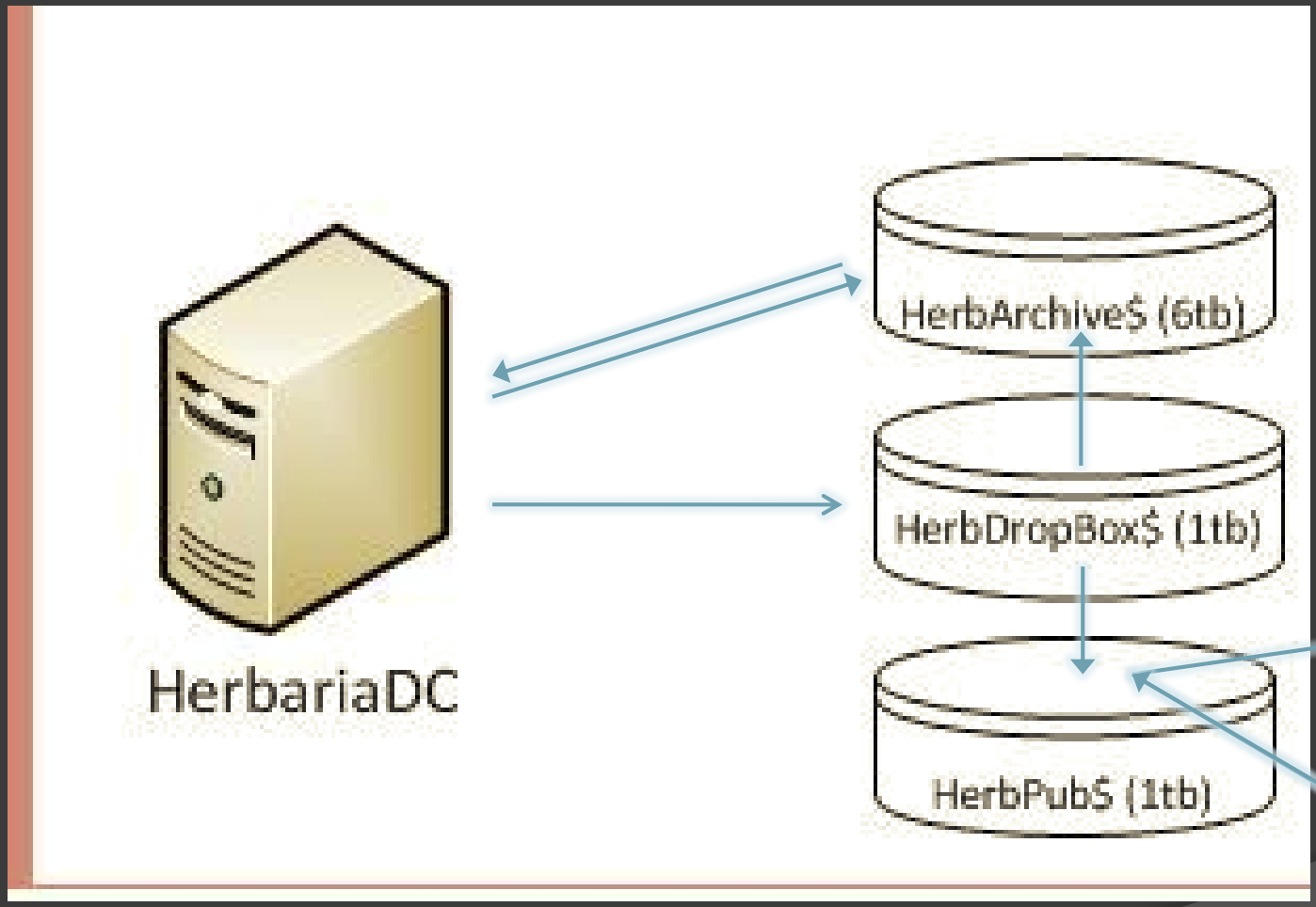
3695 Wood Lily
Herb to 2½ ft., under open Ponderosa in moist, undergrowth of bench above stream, 4 miles upstream HQ, 6800 ft. From a white bulbous rhizome at many small clustered bulbs, outer sepals orange with purple spots at base, anthers red-brown. Also sighted at ~6700 ft, 3½ miles upstream HQ and in vicinity of "forks" at Frijoles Creek, ~8000 ft.

3696 Mallow
Herb to 3½ ft, flowers white, streamside 4 miles upstream HQ, 6800 ft.

3697
Grass to 2½ ft. 4½ miles upstream HQ, dry slopes of canyon bottom in open sun.

3698 Ranunculus
Herb to 2 ft, flowers white. 4½ miles upstream HQ, moist undergrowth along stream

Simplified Diagram of Herbarium Imaging IT Processes



Library expertise can help with:

- Creation of long term repositories of digital content.
- Add value, additional features, opens new applications and can inspire new ideas.
- For current and future use by a world wide audience (scholars, historians, researchers …).

The digital curation lifecycle

Digital curation and data preservation are ongoing processes, requiring considerable thought and the investment of adequate time and resources.

You must be aware of, and undertake, actions to promote curation and preservation throughout the data lifecycle.

Local to Regional to Global

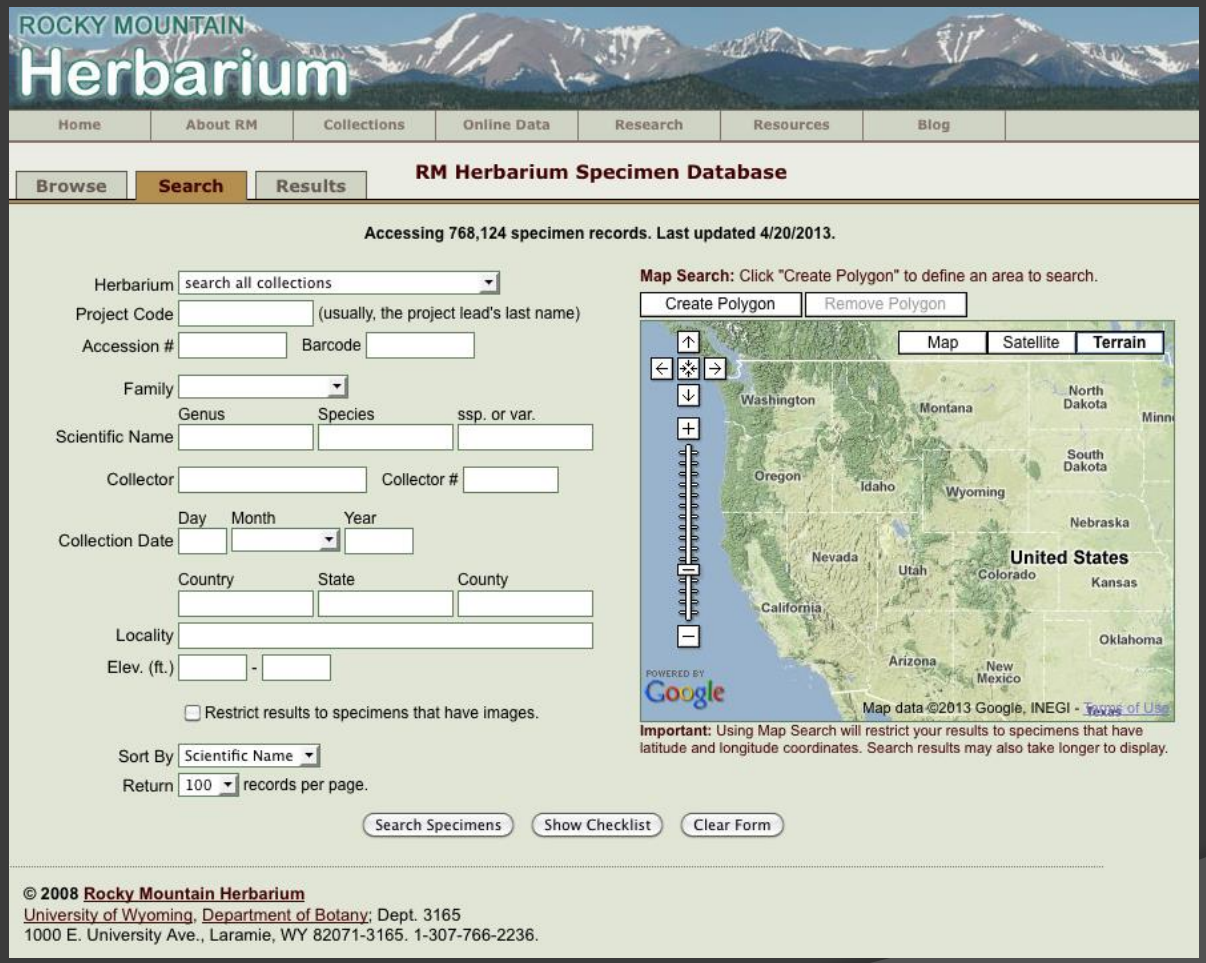
Library

- Library catalog
  - UW Libraries
- Regional catalog
  - Prospector
- OCLC - world

Herbarium

- Local collection
  - RM
- Regional collection
  - SEINet
- GBIF

It’s all about access!



SEINet Home
Search Collections
Image Library
Plant Games
Links
Flora Projects
Arizona
Colorado Plateau
New Mexico
Intermountain
NPS Flora
USFWS Flora
MABA Flora
Sonoran Desert
Teaching Checklists
Dynamic Floras
Dynamic Checklist
Dynamic Key
Sitemap

Welcome to SEINet

The Southwest Environmental Information Network was created to serve as a gateway to distributed data resources of interest to the environmental research community in Arizona and beyond. Through a common web interface, we offer tools to locate, access and work with a variety of data.

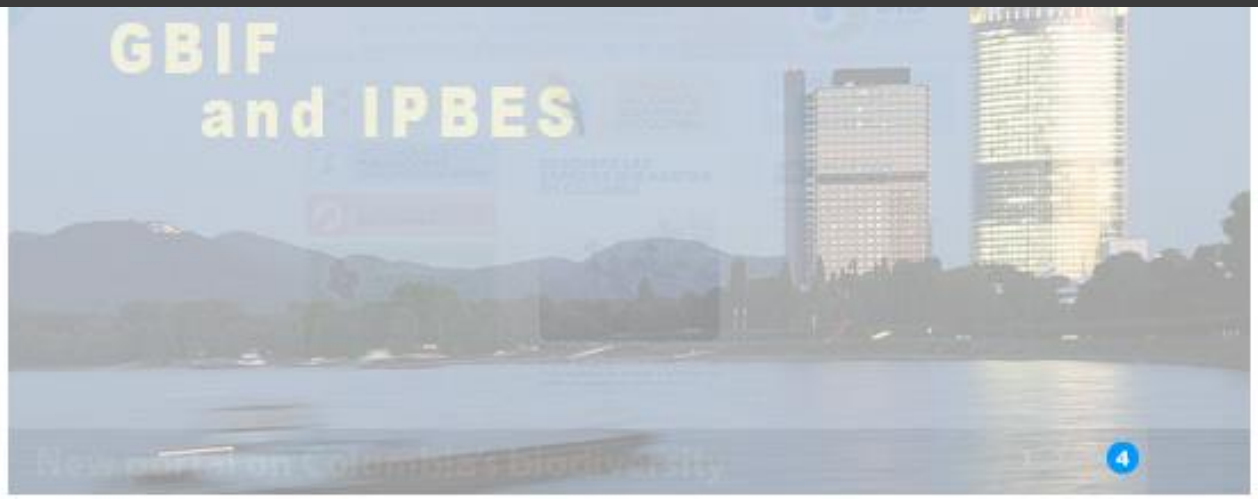
SEINet is more than just a web site - it is a suite of data access technologies and a distributed network of departments, museums and agencies that provide environmental information. Initially created to integrate databases within the Arizona State University, SEINet is growing to extend this network to other partners within the Southwest.

To learn more about the features and capabilities available through this site, read Making Good Use Of SEINet or visit the Symbiota Help Pages. Join SEINet as a regular visitor and please send your feedback to seinetAdmin@asu.edu. Visit the Data Usage Policy page for information on how to cite data obtained from this web resource.

Development of SEINet, Symbiota, and several of the specimen databases have been supported by National Science Foundation Grants (DBI 9983132, BRC 0237418, DBI 0743827, DBI 0847966)

Plant of the Day

What is this plant?



396,026,747 indexed records
10,004 datasets
464 publishers

Access data portal

The Global Biodiversity Information Facility (GBIF) was established by governments in 2001 to encourage free and open access to biodiversity data, via the Internet. Through a global network of countries and organizations, GBIF promotes and facilitates the mobilization, access, discovery and use of information about the occurrence of organisms over time and across the planet.

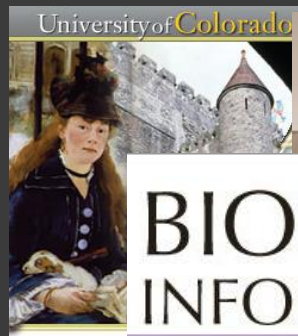
Why join GBIF?

Current Participants

Data use cases

LATEST NEWS Brazil surveys data holdings and informatics capacity

INFORMATICS	PARTICIPATION	GOVERNANCE	COMMUNICATIONS
· Publish your Data	· Participant Nodes	· Governing Board	· News and Events
· Infrastructure	· Data Publishers	· Advisory Committees	· Key Information



University of Wisconsin Digital Collections

VISIT A COLLECTION | SEARCH THE COLLECTIONS

Select a collection | search...

BIODIVERSITY INFORMATION SYSTEM

Home | Herbarium | Entomology | Educational Resources | Digital Resources | About

Home

BiodIS, K-State's Biodiversity Information System, is a collaborative project to expose information associated with the University's natural history collections to a diverse group of users. Based largely on the Herbarium and Museum of Entomological and Prairie Arthropod Research, BiodIS is a portal for users of all ages and fields who have an interest in or need for biodiversity data, including taxonomic, geographic, and ecological information, accompanied by a variety of digital resources.

BiodIS is a partnership between the Division of Biology, the Department of Entomology, and K-State Libraries, and is supported through a Targeted Excellence grant from the K-State Office of the Provost. Related funding has been provided by the National Science Foundation (NSF DBI-0544980), Kansas NSF-EPSCoR, and the Kansas Agricultural Experiment Station.

The Herbarium and Entomology databases utilize Specify 5.2.3 databasing software, and the BiodIS presentation interface utilizes SilverCollection web portal software.

News

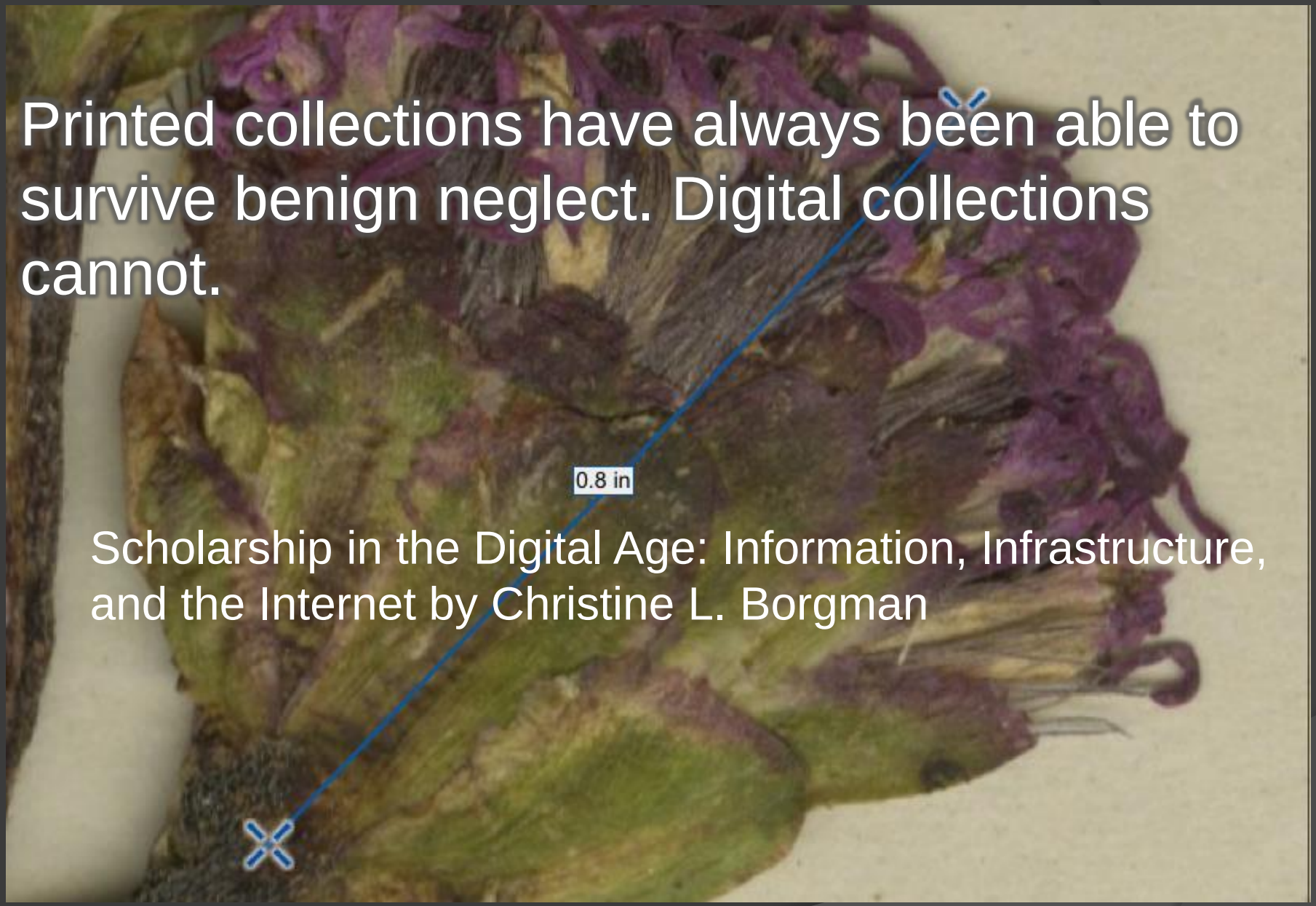
- Herbarium in the News–Carnivorous Plants
- New Web Interfaces via Specify — Herbarium
- Great Plains Systematics Symposium a success

Gallery

BiodIS is a partnership between the Division of Biology, the Department of Entomology, and K-State Libraries, and is supported through a Targeted Excellence grant from the K-State Office of the Provost. Related funding has been provided by the National Science Foundation (NSF DBI-0544980), Kansas NSF-EPSCoR, and the Kansas Agricultural Experiment Station.

BIODIS BIODIVERSITY INFORMATION SYSTEM

You are not alone ….


Printed collections have always been able to survive benign neglect. Digital collections cannot.
0.8 in
Scholarship in the Digital Age: Information, Infrastructure, and the Internet by Christine L. Borgman