Integrating Augmented OCR and Georeferencing in Natural History Collection (NHC) Digitization

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SPNHC Symposium: Introduction to Digitization and Dissemination of Natural History Data: iDigBio, BISON and other initiatives

Thursday 20 June 2013

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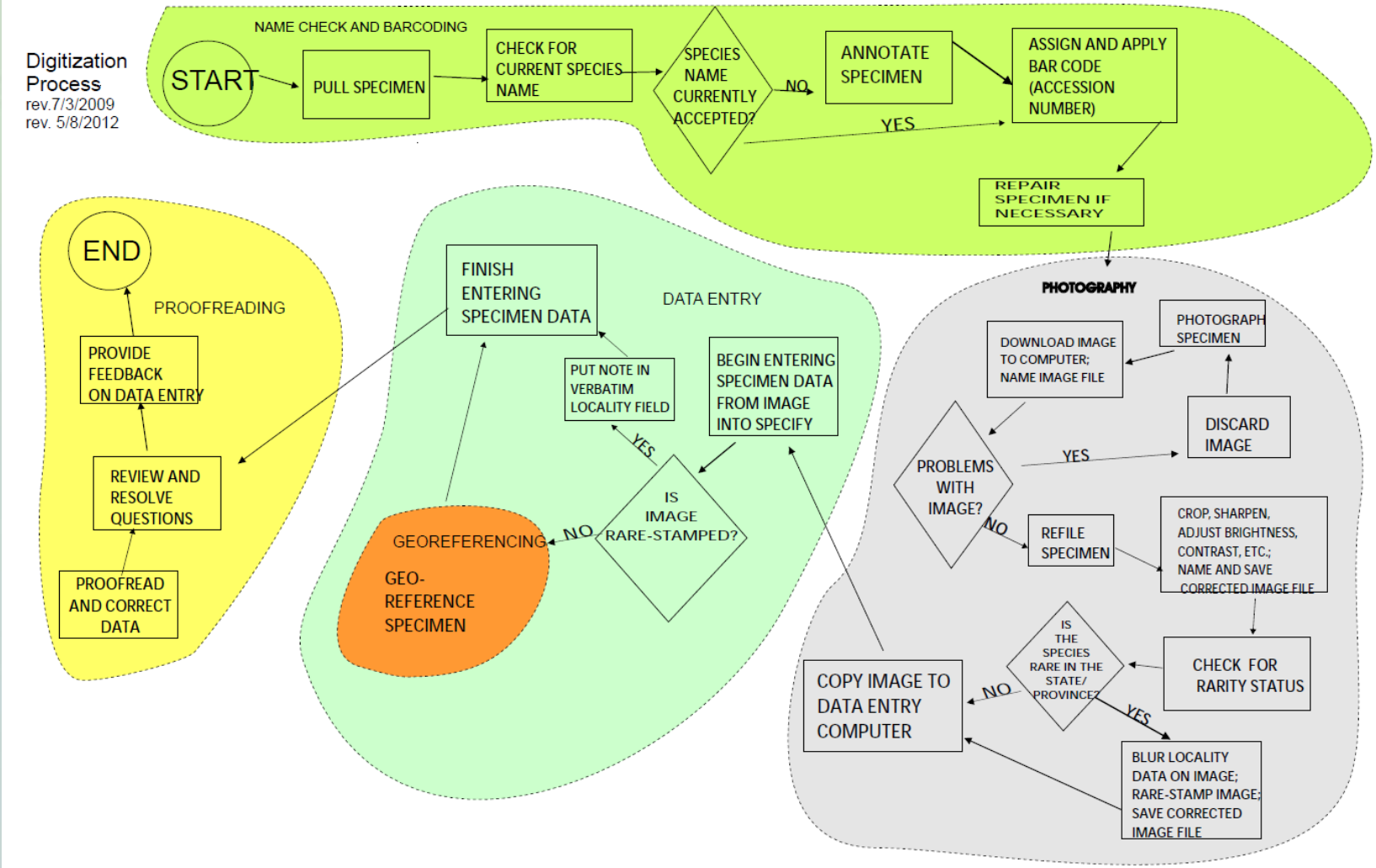
iDigBio
Integrated Digitized Biocollections

3,270,330 *Specimen Records*

391,312 *Media Records*

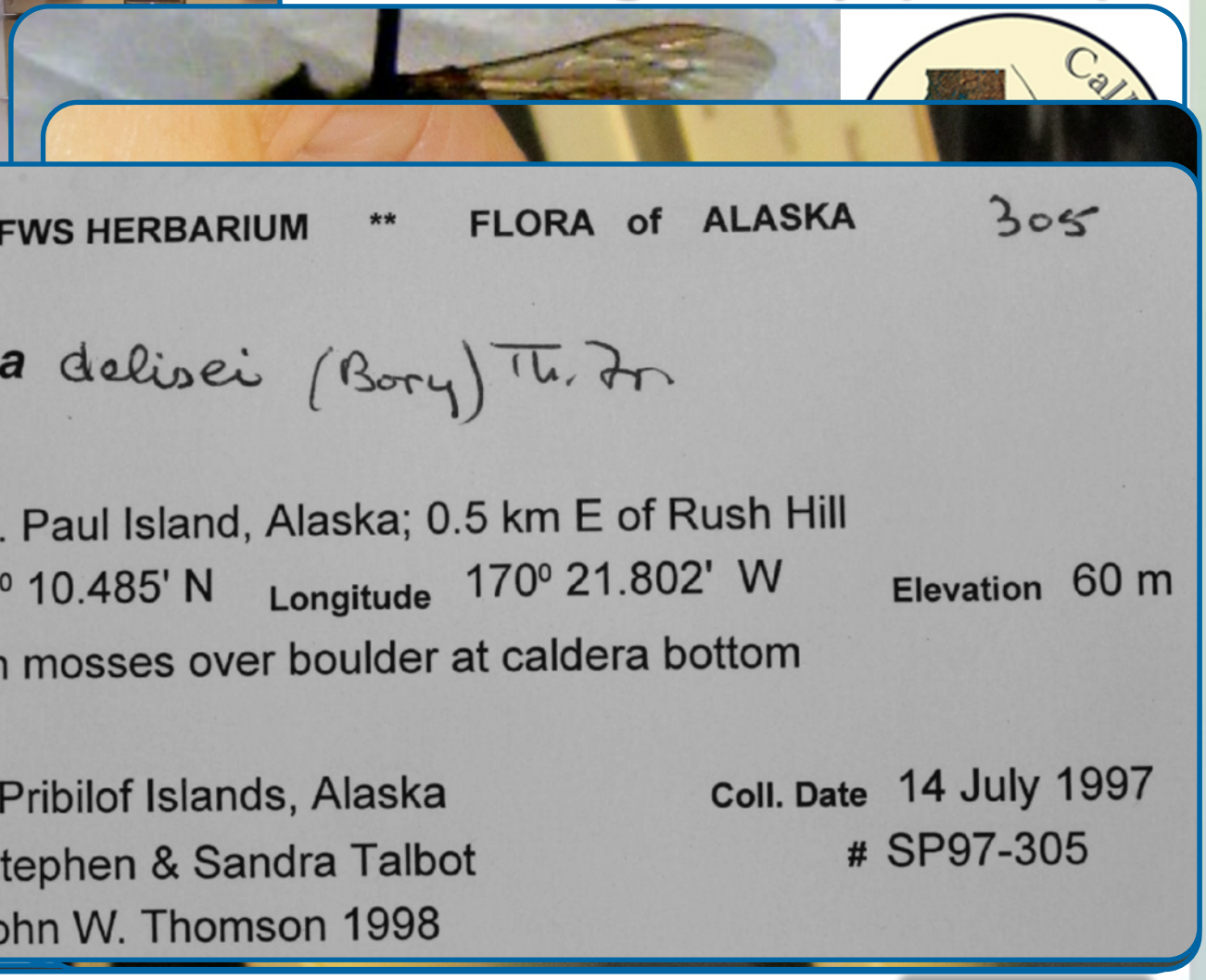
80 *Recordsets*

Making data and images of millions of biological specimens



iDigBio
Integrated Digitized Biocollections

Augmenting OCR Working Group (aOCR)



AKFWS HERBARIUM ** FLORA of ALASKA 305

Cetraria delisei (Bory) Th. Fr.

Location St. Paul Island, Alaska; 0.5 km E of Rush Hill

Latitude 57° 10.485' N Longitude 170° 21.802' W Elevation 60 m

Habitat On mosses over boulder at caldera bottom

Quad. Map Pribilof Islands, Alaska Coll. Date 14 July 1997

Collector Stephen & Sandra Talbot # SP97-305

Det. John W. Thomson 1998

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APIARY PROJECT

Apiary Workflow

apiary.brit.org/drupal/modules/apiary_project/workflow/index.php?workflow_id

ANALYZE SPECIMEN | TRANSCRIBE TEXT | PARSE TEXT | GETTING STARTED | ?

PLANTS OF TEXAS

COLLECTED UNDER THE AUSPICES OF SOUTHERN METHODIST UNIVERSITY
AND THE BUREAU OF PLANT INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE

Triodanis Holzingeri McVaugh

Roadside bank near post-oak woods
about 2 miles west of Decatur, Wise Co.

ROGERS MCVAUGH, No. 7197 June 19, 1945

ROI Type:Undefined Edit
Transcription:Undefined
Parsing:Undefined
Delete ROI

ROI Type:Annotation/Other Edit
Transcription:Undefined
Parsing:Undefined
Delete ROI

ROI Type:Annotation/Other Edit
Transcription:Undefined
Parsing:Undefined
Delete ROI

ROI Type:Primary Label Edit
Transcription:Undefined
Parsing:Undefined
Delete ROI

ROI Type:Barcode Edit
Transcription:Undefined
Parsing:Undefined
Delete ROI

My Queue Summary + ?
5 specimens
5 ROIs
open queue

ap-specimen:Specimen-794 - Analyzing ?
No roi currently selected
Status: not started
Add specimen note

ROI Legend ?
- Primary Label
- Annotation/Other
- Barcode
- Undefined

BRIT Plant to planet.

iDigBio Integrated Digitized Biocollections

Symbiota

Promoting Bio-Collaboration

Occurrence Data | Determination History | Images | Admin

Collector Info

Catalog Number | Occurrence ID | Collector | Number | Date

1281887

Dupes

Associated Collectors | Other Catalog Numbers

Latest Identification

Scientific Name: | Author:

ID Qualifier: | Family:

Identified By: | Date Identified:

Locality

Country | State/Province | County | Municipality

Locality:

Locality Security

Latitude | Longitude | Uncertainty | Datum | Elevation in Meters | Verbatim Elevation

Tools | ft.

Misc

Habitat:

Associated Taxa:

Description:

Notes:

Curation

Type Status: | Disposition:

Reproductive Condition: | Establishment Means: | Cultivated

Owner Code: | Basis of Record: PreservedSpecimen | Language:

Label Processing

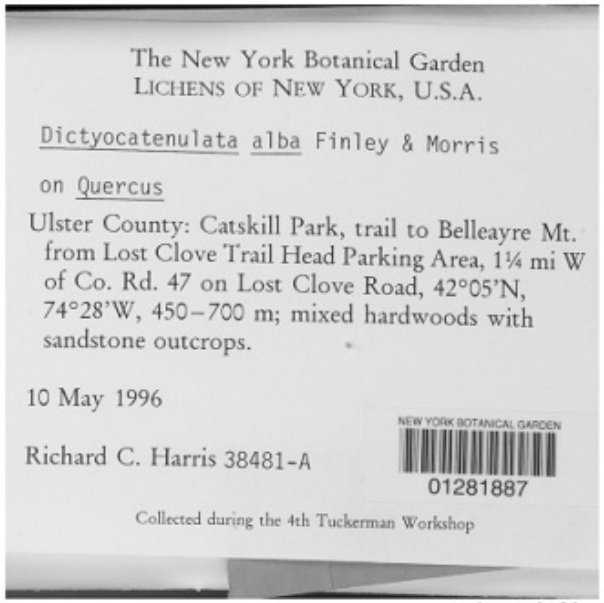

Image 1 of 1

```
The New York Botanical Garden
LICHENS of NEW YORK, U.S.A.
Dictyocatenulata alba Finley & Morris
On QUERCUS
Ulster County: Catskill Park, trail to Belleayre
Mt.
from Lost Clove Trail Head Parking Area, 1â€™/1
mi W
of Co. Rd. 47 on Lost Clove Road, 42Â°05â€™N,
74Â°28â€™X/, 450-700 rn; mixed hardwoods with
sandstone outcrops. -
1 O May 1 99 6
NEW VOHK BOTANICAL GAâ€¢IDEN
Richard C. Harris 38481-/-
01281887
Collected during the 4th Tuckerman Workshop
```

iDigBio Integrated Digitized Biocollections

Symbiota

Promoting Bio-Collaboration

Image 1 of 1

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The herbaria at the Royal Botanic Garden Edinburgh (RBGE) and The New York Botanical Garden (NY) use a similar recently developed workflow:

1. Capture **minimal data** for each specimen
   - (e.g. barcode, geographic region, and the taxon name on the specimen folder).
2. Capture **high quality digital images** of each specimen
3. Process images with ABBYY® **OCR software**
4. Develop and/or use software tools to **search OCR text** output and **sort the images/data** based on principal data elements (e.g. by collector and country)
5. Sort image/data to enable **faster data capture** & **higher accuracy** by data transcriptionists, including **duplicate record matching**.

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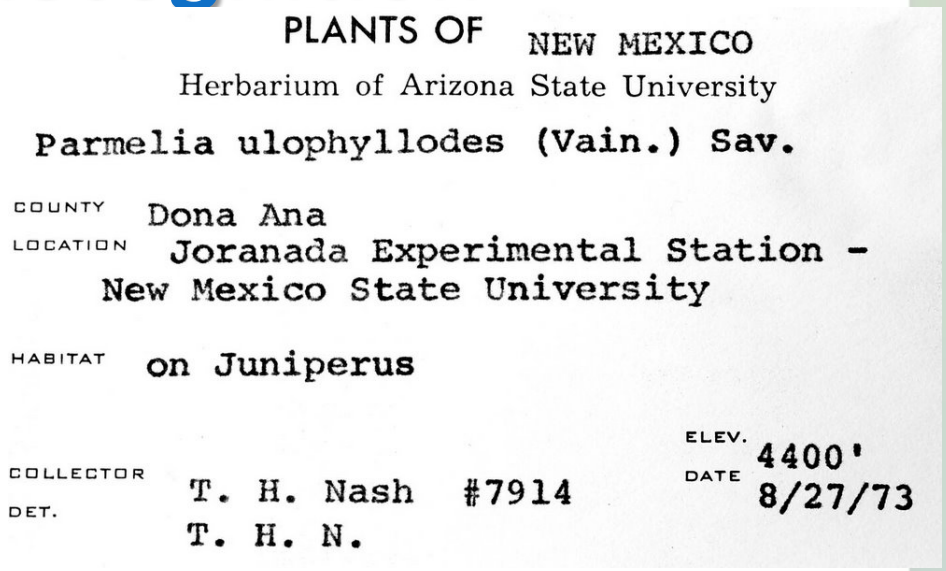
Integrated Digitized Biocollections

Optical Character Recognition

- Tesseract V3
- Dual cycle
  - Automatic
  - Manual review
- Expected hurdles
  - Handwritten labels
  - Old fonts
  - Faded labels
  - Form labels
- Adjustable image variables


PLANTS OF NEW MEXICO
Herbarium of Arizona State University

Parmelia ulophyllodes (Vain.) Sav.

COUNTY Dona Ana
LOCATION Joranada Experimental Station -
New Mexico State University

HABITAT on Juniperus

ELEV. 4400'
COLLECTOR T. H. Nash #7914 DATE 8/27/73
DET. T. H. N.

PLANTS OF NEW r~1Exlco
Herbarium of Arizona State University
Parmelia ulophyllodes (Vain.) Sav.
COUNTY â€œÂ°â€ â€œâ€œ
Joranada Experimental Station -
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T. H. N.

aOCR Working Group

- Bryan Heidorn, Director, School of Information Resources and Library Science, University of Arizona
- Robert Anglin, LBCC TCN Developer
- Reed Beaman, iDigBio Senior Personnel, FLMNH
- Jason Best, Director Bioinformatics, Botanical Research Institute of Texas
- Renato Figueiredo, iDigBio IT
- Edward Gilbert, Symbiota Developer, LBCC and SCAN TCNs
- Nathan Gnanasambandam, Xerox
- Stephen Gottschalk, Curatorial Assistant, NYBG
- Peter Lang, Pre Sales Engineer, ABBYY
- Deborah Paul, iDigBio User Services
- Elspeth Haston, Royal Botanic Garden, Edinburgh
- John Mignault, New York Botanical Garden
- Anna Saltmarsh, Royal Botanic Gardens, KEW
- Nahil Sobh, Developer, InvertNet
- Alex Thompson, iDigBio Developer
- William Ulate, Biodiversity Heritage Library (BHL), MOBOT
- Kimberly Watson, Curatorial Assistant, NYBG
- Qianjin Zhang, Graduate Student, University of Arizona

aOCR Highlights

- faster and more efficient data transcription, image analysis
- share what's possible: Wiki, Publications, Meetings, Workshops, Hackathons
  - Publications - see **http://idigbio.org/biblio**
  - The SALIX Method: A semi-automated workflow for herbarium specimen digitization. June 2013 Taxon 62(3):581-590 A Barber, D Lafferty, L Landrum
  - aOCR overlap with Public Participation Working Group and DROID working Groups
- POST-DOC! New post-doc position at iDigBio
  - Public Participation in Digitization of Biodiversity Collections
  - data standards, tool integration & enhancement planning
  - New programmer position
- Public Participation tools
  - Symbiota / LBCC TCN
  - Notes From Nature

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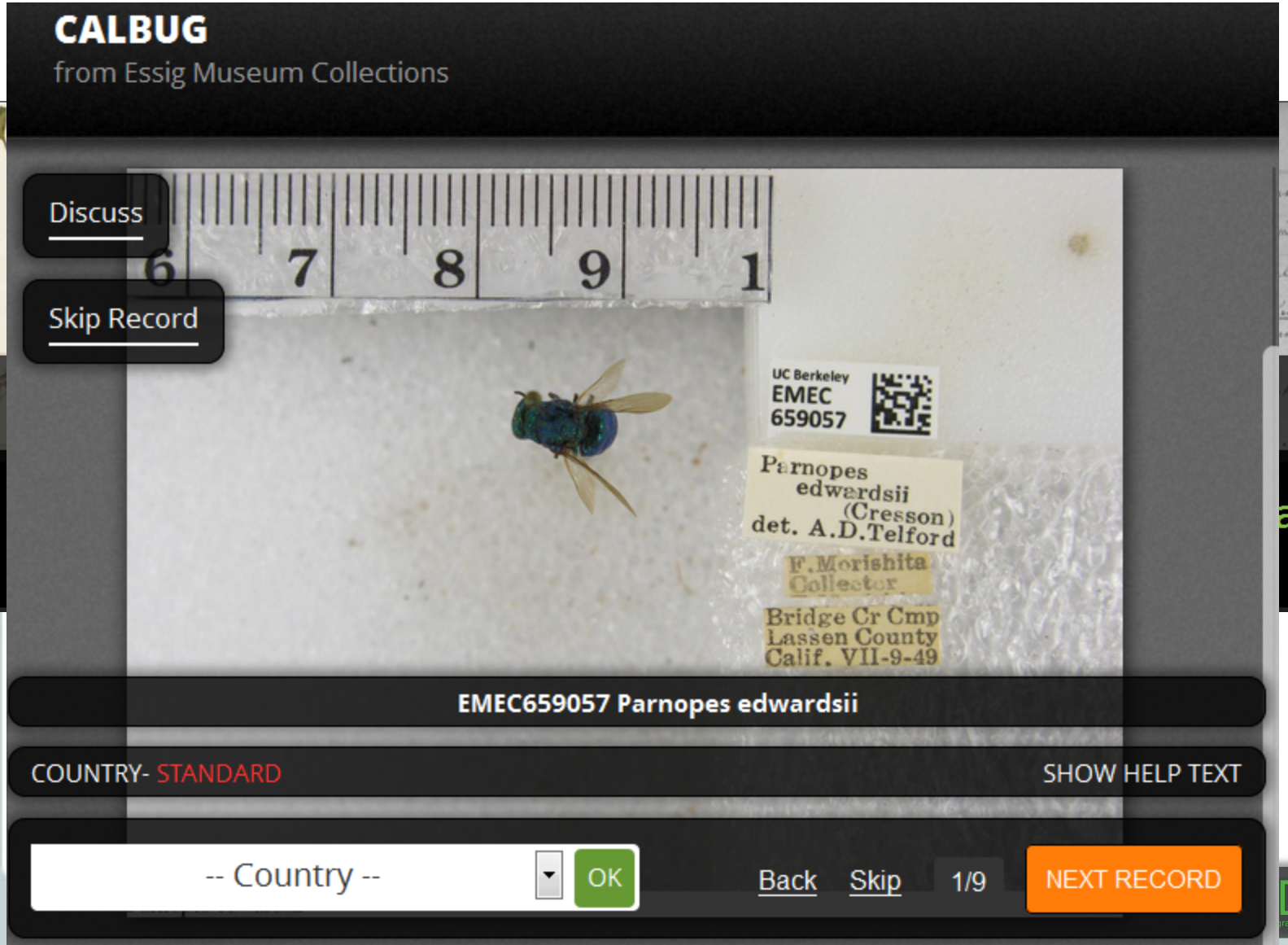
Notes from Nature .

COLLECTIONS ABOUT DISCUSS BLOG

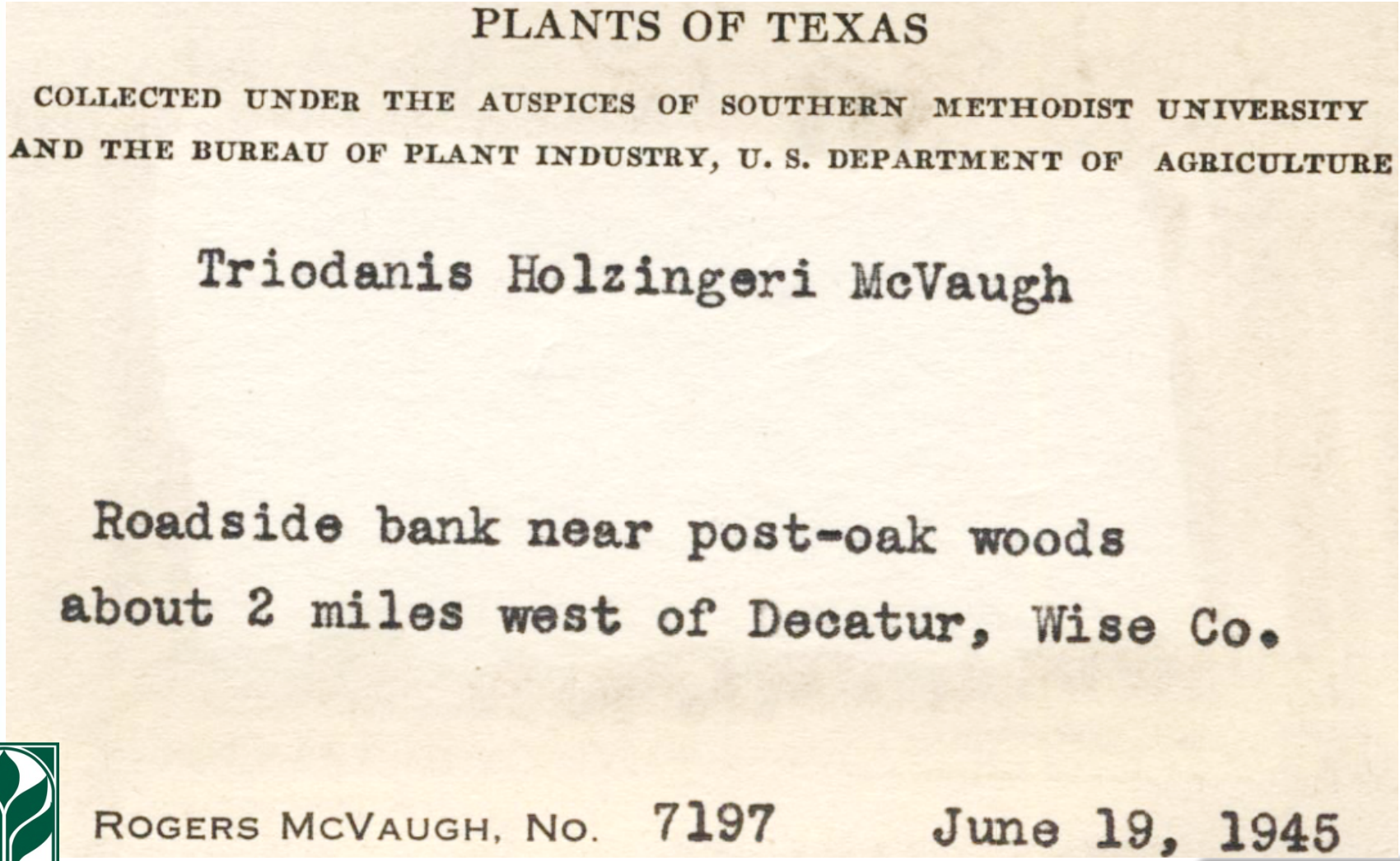
http://www.notesfromnature.org/

2 collections available




and now for something a bit different…

iDigBio Georeferencing Working Group (GWG)



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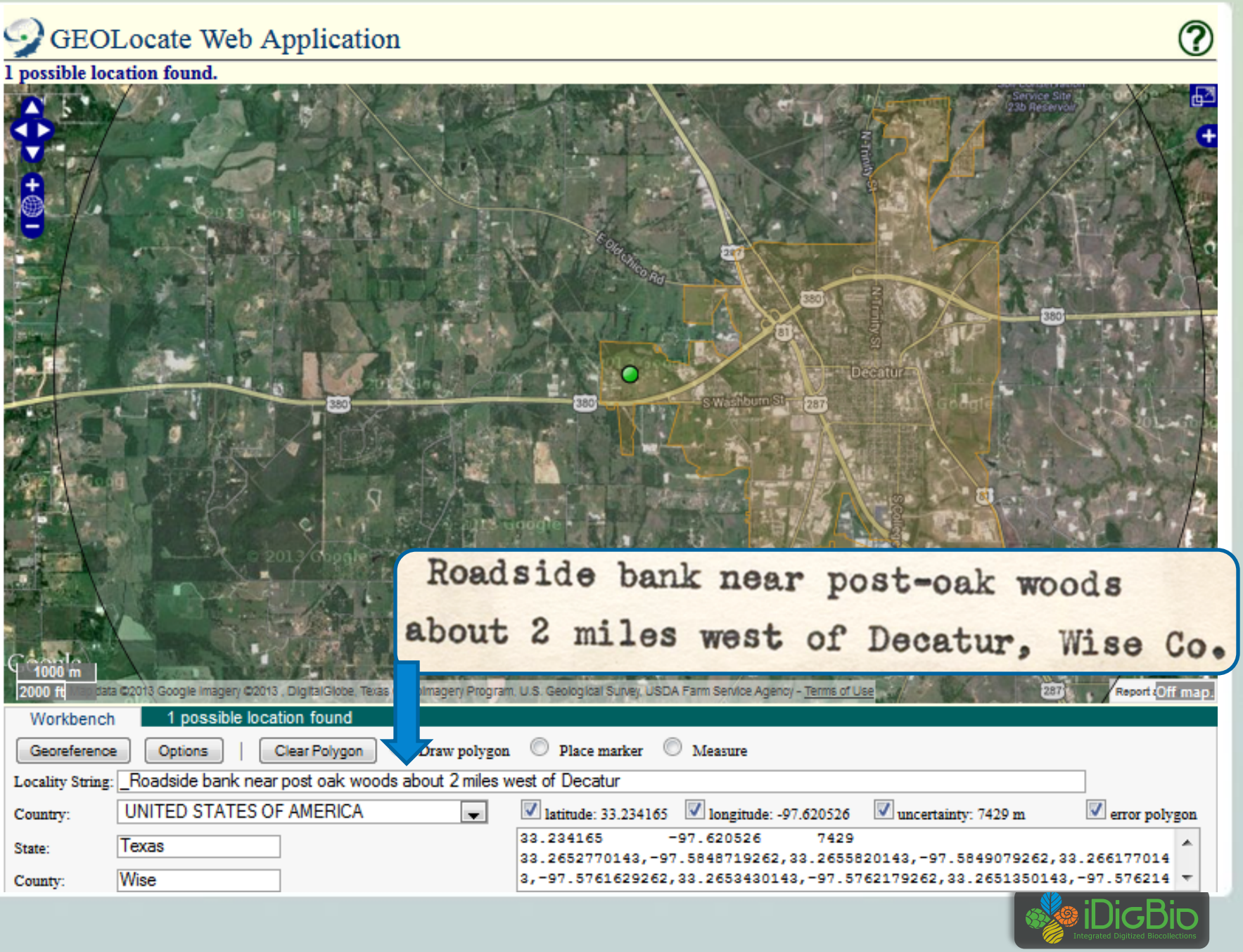
GEOLocate Web Application
1 possible location found.
Roadside bank near post-oak woods
about 2 miles west of Decatur, Wise Co.
Workbench
1 possible location found
Georeference
Options
Clear Polygon
Draw polygon
Place marker
Measure
Locality String: _Roadside bank near post oak woods about 2 miles west of Decatur
Country: UNITED STATES OF AMERICA
State: Texas
County: Wise
latitude: 33.234165
longitude: -97.620526
uncertainty: 7429 m
error polygon
33.234165 -97.620526 7429
33.2652770143,-97.5848719262,33.2655820143,-97.5849079262,33.266177014
3,-97.5761629262,33.2653430143,-97.5762179262,33.2651350143,-97.576214

Georeferencing in a workflow…

- where does georeferencing fit in my workflow?
  - as I enter data?
  - after all data is entered (usually, but not always)
  - some combination?
- what's the fastest / cheapest / most accurate method?
- do I need experts to do this?
  - who will do it?
  - how much will it cost?
  - what are the issues?

GEOLocate: Community Edition

Collaborative Georeferencing

Welcome debpaul, user since 1/29/2012. | LOGOUT

- Home
- About Us
- Contact Us
- My Communities
- Portal Tutorial

Community: FSU

Data Sources | Members | Settings

Data source management operations

Add new community data source via CSV files

Click on an item's header to expand/collapse its content.

community-wide		
nolat	date added: Thursday, March 15, 2012	delete
labeldata	date added: Thursday, March 15, 2012	delete
Leon1	date added: Tuesday, April 24, 2012	delete
Leon2	date added: Tuesday, April 24, 2012	delete

Top of page.

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GWG Resources at iDigBio

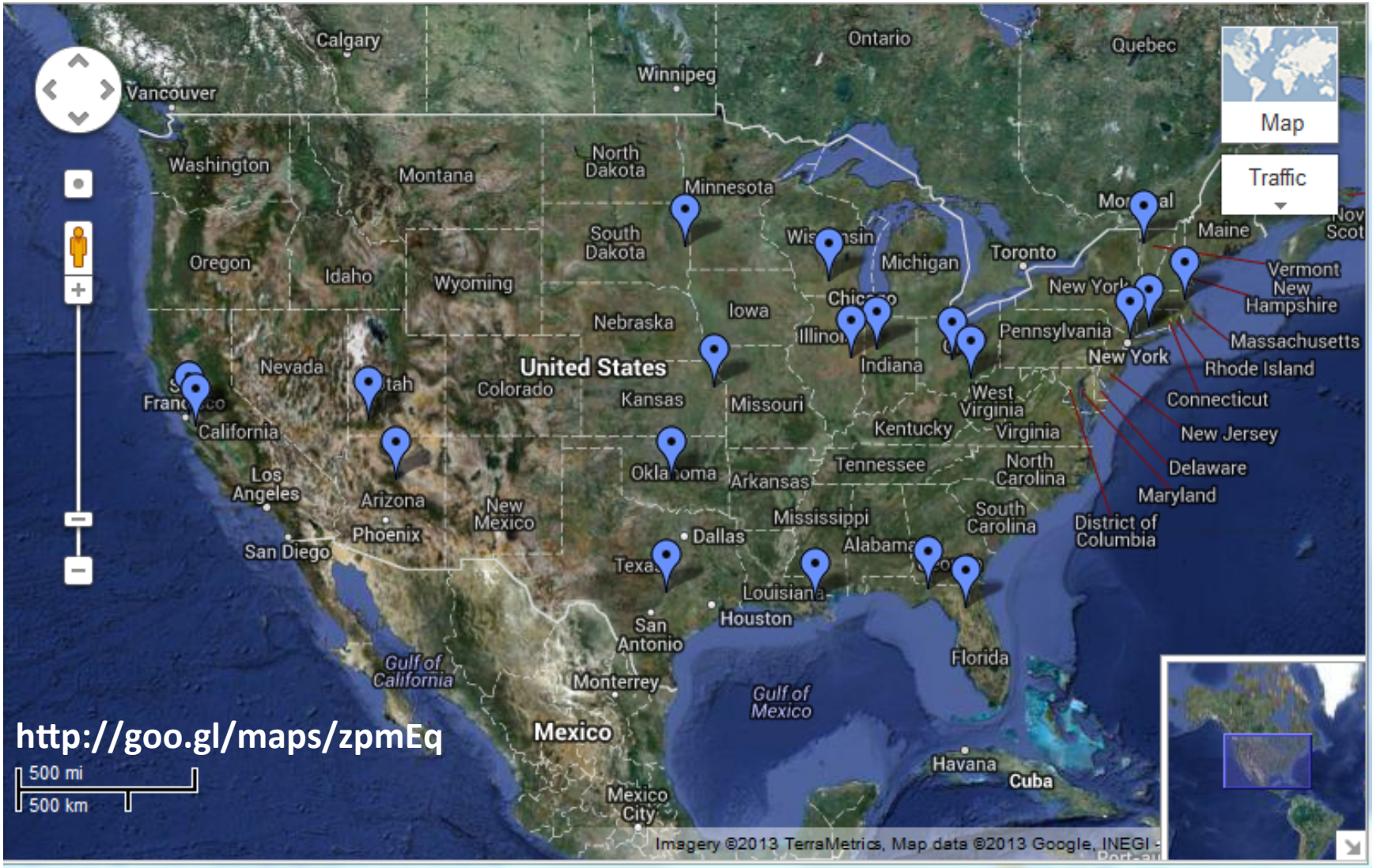
Remote Participation:

- Want to attend Train the Trainer's Workshop Remotely? Please log in the software works.

Reading Materials and Resources:

1. Georeferencing Quick Reference Guide
2. Guide to Best Practices for Georeferencing - Chapman, A.D. and J. W
3. iDigBio Georeferencing Wiki
4. HerpNET Georeferencing Resources
5. Pre Workshop Survey Questions iDigBio Asked
6. Group Notes - Take Workshop Notes Together Here
7. [Post - Workshop Survey Questions]
8. Got a Georeferencing Question? Post it at the iDigBio Georeferencing

A Georeferencing Trainer Near You…



http://goo.gl/maps/zpmEq

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Videos at http://vimeo.com/idigbio

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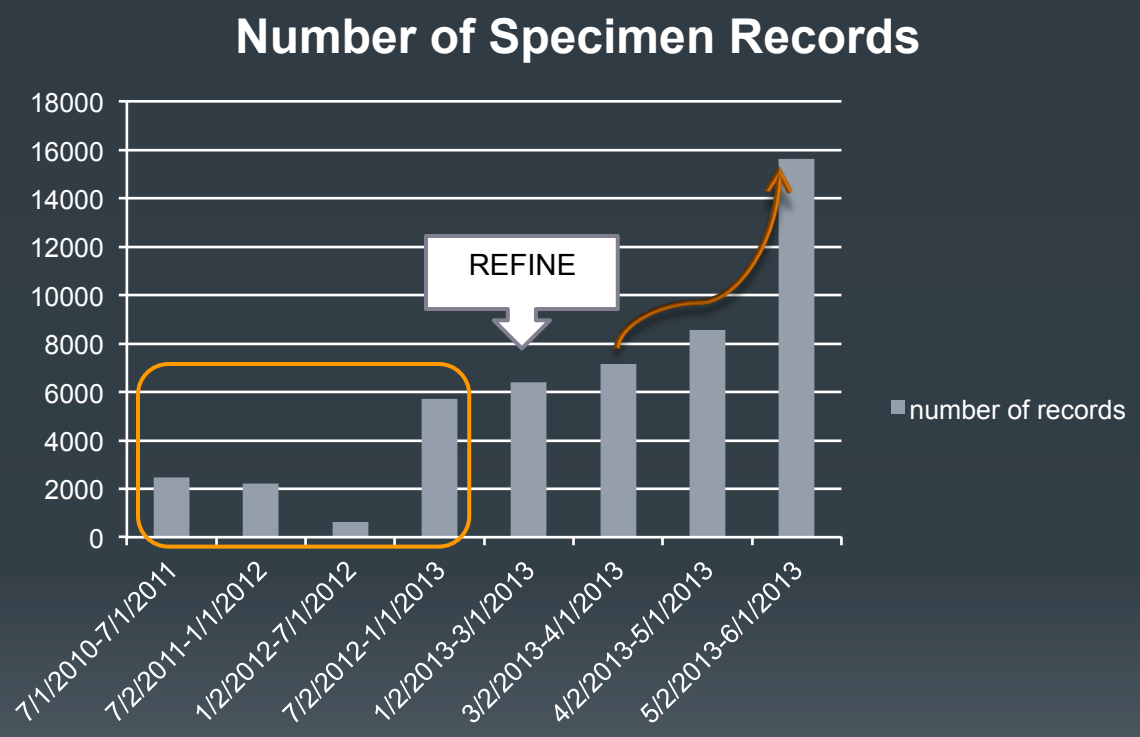
What's possible?

- **Digitization workflows: a modular approach to achieving an effective plumbing system**. Ann Molineux, Liath Appleton, Angella Thompson, Louis G. Zachos* SPNHC 2013
  - Non-vertebrate Paleontology Laboratory, Texas Natural Science Center, The University of Texas at Austin; *Department of Geology & Geological Engineering, University of Mississippi
- Common Goal: clean, enhanced, fit-for-use data
  - **openrefine.org**

Migration rate change



- iDigBio 'Train the trainers' georeferencing workshop 10/8/2012
- In-house transfer of training knowledge 11/2011
- Current Specify records 50589 [c. 161903 specimens]

Train-the-Trainers
…the model
…the numbers

- As of March 2013
  - 13 of 25 from TTT #1 (October 2012) responded to survey
  - 7 people have done one or more trainings
    - > 70 people trained
- Records georeferenced since the training (in < 5 months)
  - over 4400

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GWG News

- iDigBio's Georeferencing Working Group (GWG)
  - Train-the-Trainers 1, 2
    - remote attendance – see you there? Aug 12 - 16
  - Repatriation
  - GBIF eLearning
    - September 2013
  - georeferencing.org
- Public Participation in Science
  - georeferencing
  - GEOLocate
  - Expert or Non Expert? What's the magic number?

iDigBio GWG +

- David Bloom, VertNet Coordinator, Berkeley
- Nelson Rios, GEOLocate Developer, Tulane
- John Wieczorek, Information Architect/VertNet, Berkeley
- Carol Spencer, Staff Curator/VertNet, Berkeley
- Reed Beaman, FLMNH
- Una Farrell, Co-PI, Paleoniches TCN, Kansas
- Paul Heinrich, Co-PI, SCAN TCN, NAU
- Mary Barkworth, Utah State University
- Gil Nelson, iDigBio Digitization
- Deborah Paul, iDigBio User Services

FLORIDA MUSEUM OF NATURAL HISTORY

GEOLocate

GBIF

VertNet

BioGeomancer

Paleoniches TCN

UtahState University

SCAN TCN

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Thank you, from the aOCR and GWG!

- NSCA
- SPNHC 2013
- South Dakota Schools of Mines
- …the entire community

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