

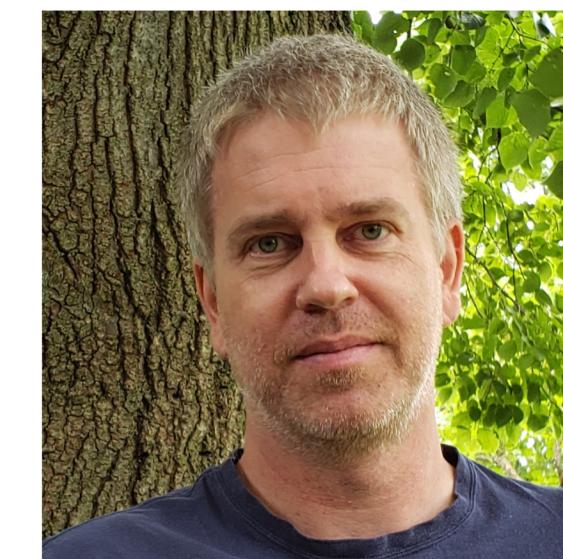
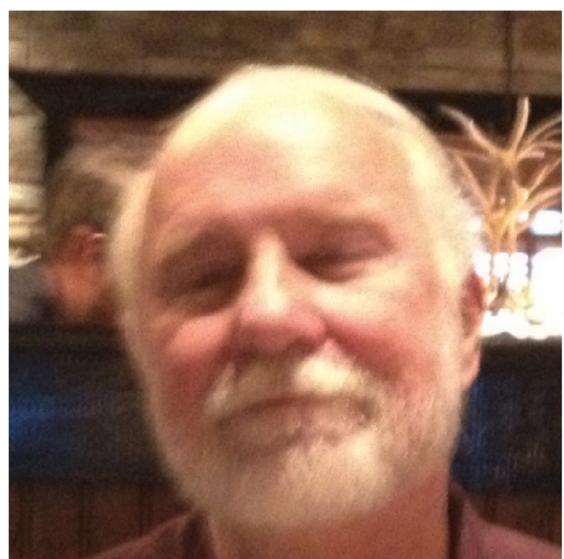
The handoff: Taking responsibility for the bicameral natural history specimen

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SPNCH 2023

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Many
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Special Thanks

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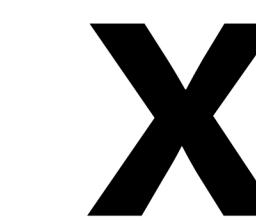
Learn more: <https://speciesfilegroup.org>

The handoff

Context

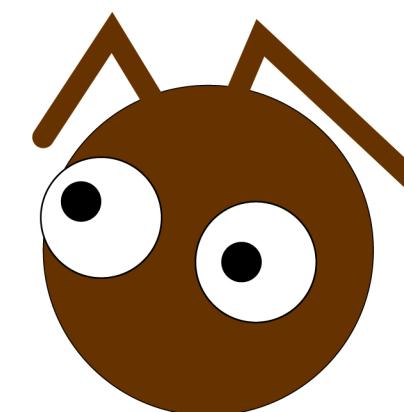
The point in time at which a collection manager takes responsibility for an accession.

Practice

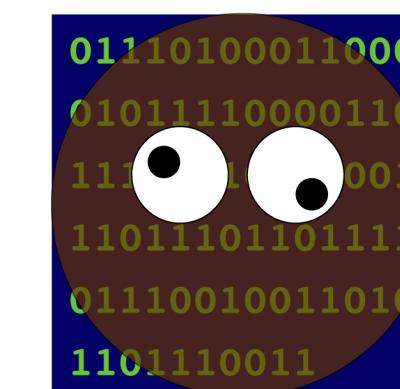


Policy

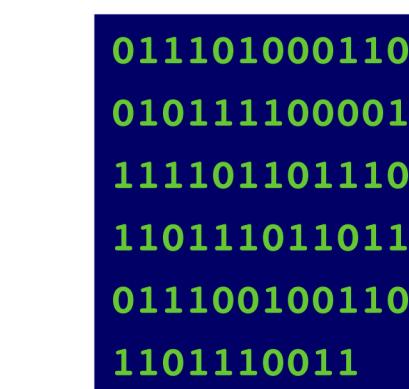
Only physical



Bicameral



Only digital

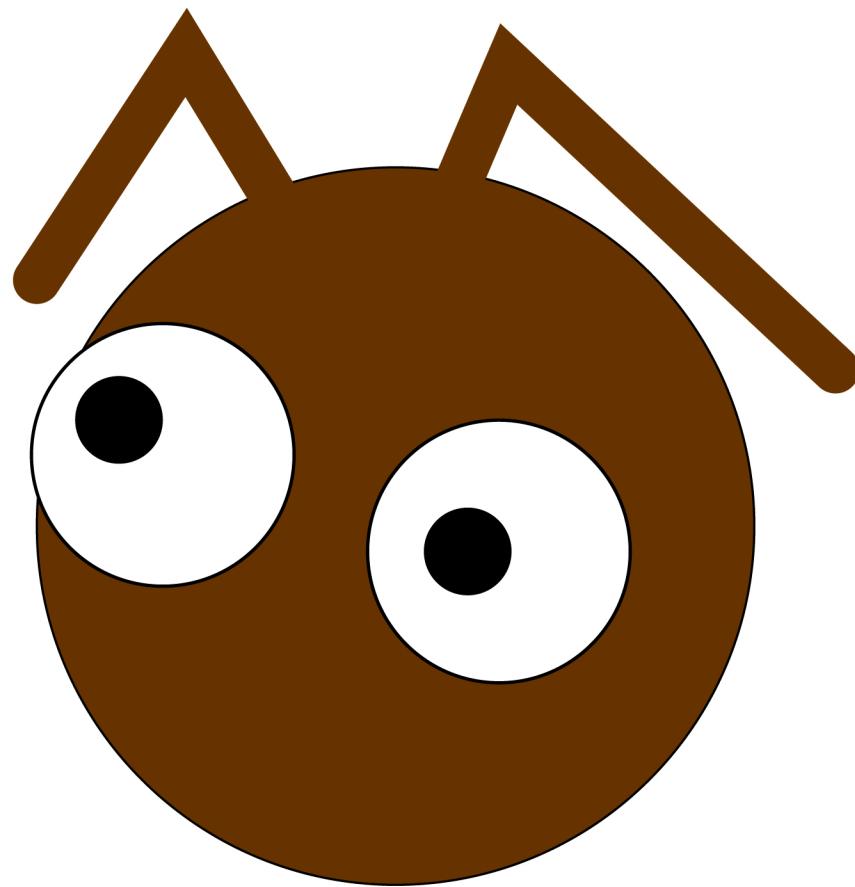


Accountability

Help! <https://tinyurl.com/bicameral2023>

Physical beginnings

Just the specimen and physical data (labels, notes), nothing digital.



Practice

Procedures for specimen preparation, pest removal (freezing).

Policy

What physical labels/field-notes/permits are required for accession?

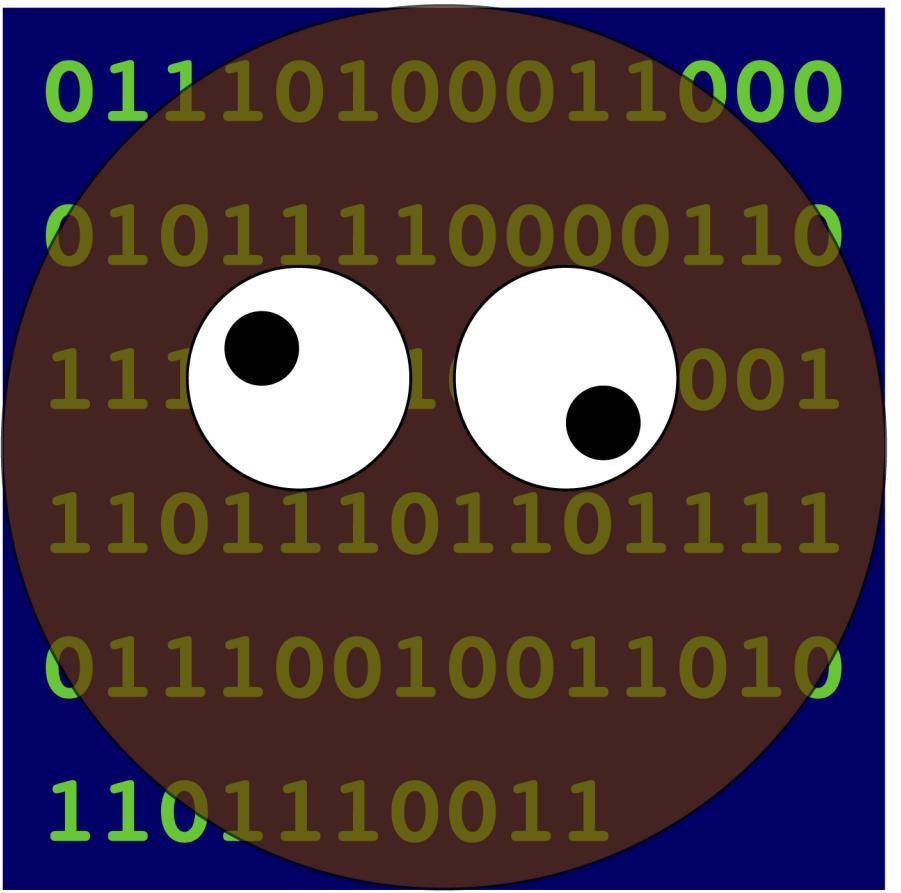
Accountability

How is the specimen protected over time (e.g. humidity, pest control)?

Who here accesses "new" specimens and without any accompanying digital meta-data

Bicameral beginnings

The physical specimen comes with digital meta data.



Practice

How do you confirm that the physical and digital align,
e.g. the number of spreadsheet rows equals the number of specimens?

Policy

Must all specimens incoming with digital data have physical catalog numbers?

Accountability

If one "half" is destroyed are you still accountable for the other?

Who here requires that digital meta-data be provided alongside physical specimens?

Digital beginnings

Accession without physical specimen in-hand.

01110100011000
01011110000110
11110110111001
11011101101111
01110010011010
1101110011

Practice

What are the procedures that are used to coordinate the arrival of the physical specimen with its digital twin?

Policy

Are digital-only objects allowed?

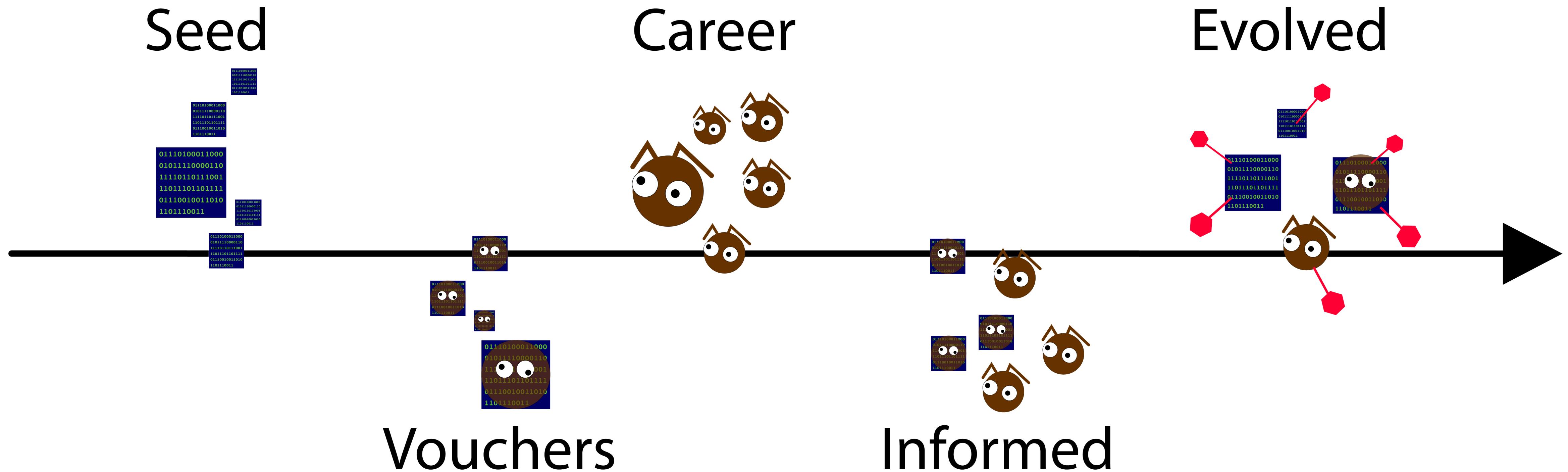
Accountability

Who is responsible for ensuring the critical digital data have physical twins, and vice versa?

Who here stubs digital specimen records without a physical specimen in their hands?

Latency

The time between an input and an output. The time between events in your collections.



Events in a collection over time X



TaxonWorks

A digital seed

```
01110100011000  
01011110000110  
1110101011001  
1101110101111  
01110010011010  
1101110011
```

Event(s)

```
01110100011000  
01011110000110  
11110110111001  
11011101101111  
01110010011010  
1101110011
```

A collecting event in a far-off land is documented with a digital photo.

Specimens are stubbed from the event.

```
01110100011000  
01011110000110  
1110101011001  
1101110101111  
01110010011010  
1101110011
```

Outcomes

```
01110100011000  
01011110000110  
111101010111001  
11011101011111  
01110010011010  
1101110011
```

Many digital specimens awaiting their physical counterparts.



TaxonWorks v0.32.3 Issues Project Administration Account Sign Out

Create collection objects

Edit collecting event

Number to create: 1

Label: None

Identifier: Namespace

19 object(s) are already associated with this collecting event

Existing

ID	Identifier	Determination
1104671	f74c90c1-8500-47d1-95a2-df02babd1440 INHS Insect Collection 844889	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
1104672	37af5e4c-fe12-4bca-9ce2-dc1c012dbc8d INHS Insect Collection 844890	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
1104673	5a1fce59-972e-4c26-b5b8-b684e9ae7801 INHS Insect Collection 844891	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
1104674	afb0aa1b-fba7-4fa0-b25a-c42b82961318 INHS Insect Collection 844892	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
	INHS Insect Collection 844893 b8840b43-18af-4146-b084-754419e1dd76	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
	a4ae35ad-3a0f-4834-83b7-5f94da9158da INHS Insect Collection 844894	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
	INHS Insect Collection 844895 fea38a67-cedc-46ce-9fc3-304b92a7574c	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
	INHS Insect Collection 844896 f3ef7975-b764-4ce4-a4b0-b5cba743e146	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
	f9f1a263-18dc-4be6-80a3-1f1338c45cf1 INHS Insect Collection 844897	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
	c0e2d4d6-5fa8-4705-9976-b50000000000 INHS Insect Collection 844898	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
	INHS Insect Collection 844899 a212832d-ca21-453c-b0f3-300000000000	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
	11514db2-dd43-4fa4-bbd3-b8fc20a42a6a INHS Insect Collection 844900	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
	d525d694-1101-4d6e-b42b-3e092f29cd45 INHS Insect Collection 844901	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020
	f7804554-1f13-4dba-8320-0a0439099492 INHS Insect Collection 844902	det. Coleoptera Linnaeus, 1758 ✓ on 2019 det. Hydrophilidae Latreille, 1802 ✓ by McElrath on 2020

Map

Depictions

Filter: Quick, Recent, Pinboard, New

Image

Is data: false, Click to edit

Label: Click to edit

Caption: Click to edit

Pinboard

Documentation

Protocol relationships

Confidences

Verifiers

Identifiers

Tags

Citations

Depictions

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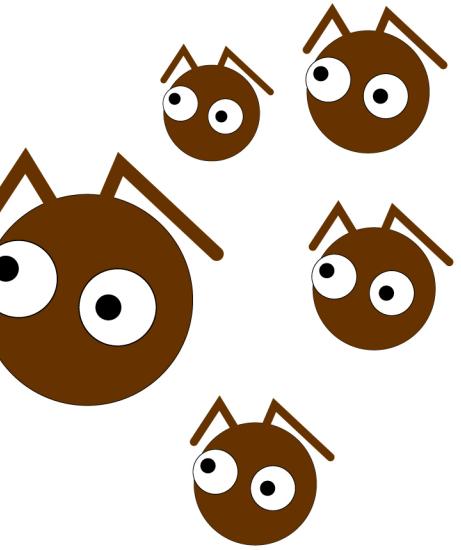
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<p

A career ends



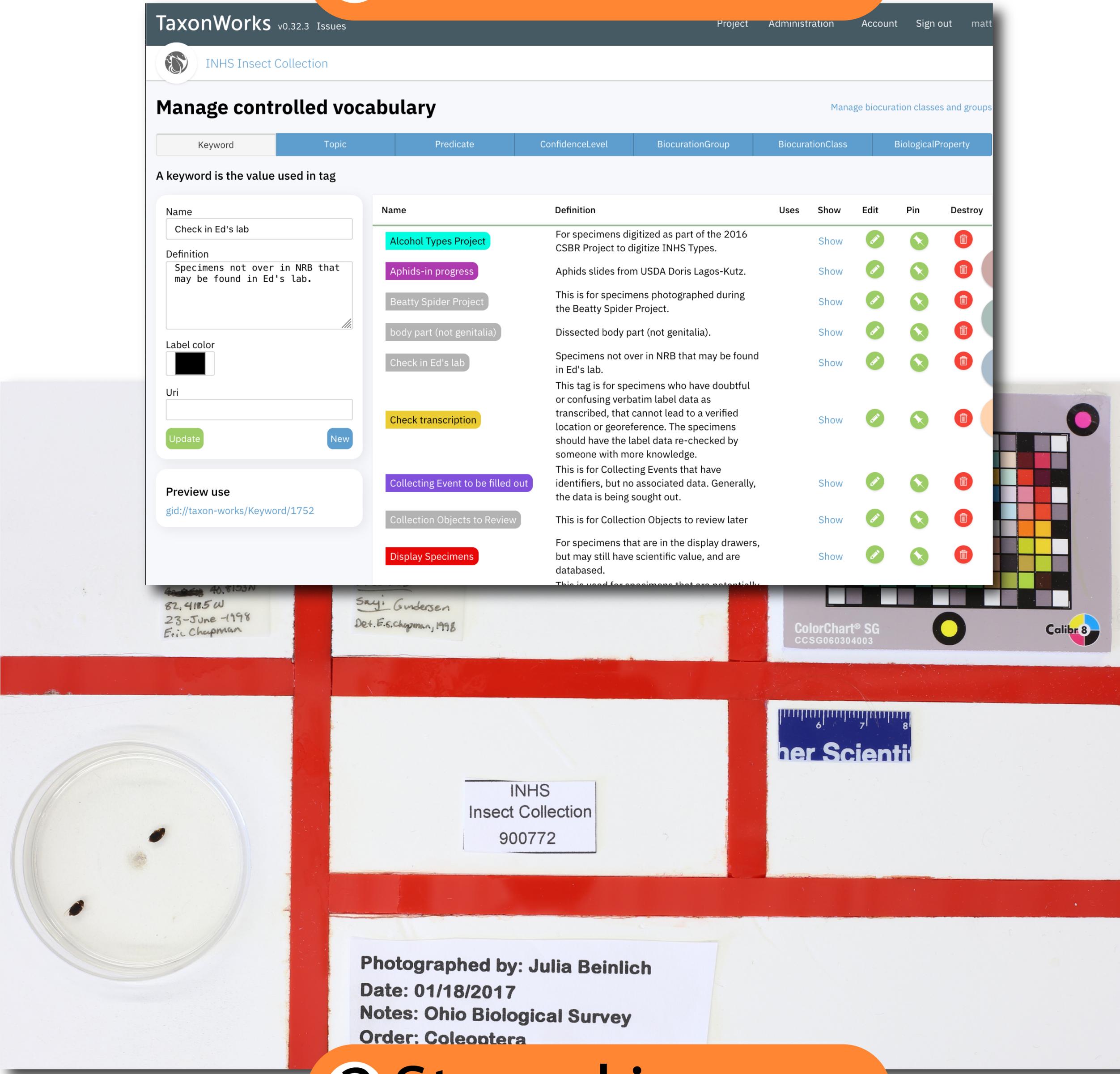
Event(s)

The lifetime effort of a taxonomist is bequeathed to your collection, it must be removed from the lab spaces **now**.

Outcomes

Many physical specimens with no digital data awaiting triage and digitization.

1 Custom OTUs



2 Staged images

3 Grid digitizer

The screenshot shows the 'Grid digitizer' interface for the Illinois Natural History Survey Insect Collection. A grid of specimen slides is displayed, each with a unique identifier. The interface includes sections for 'Object metadata' (catalogue numbers, preparation methods, etc.) and 'Summary' (create, recent, pinboard). A summary table indicates 20 collection objects will be created and one catalogue number will be added.

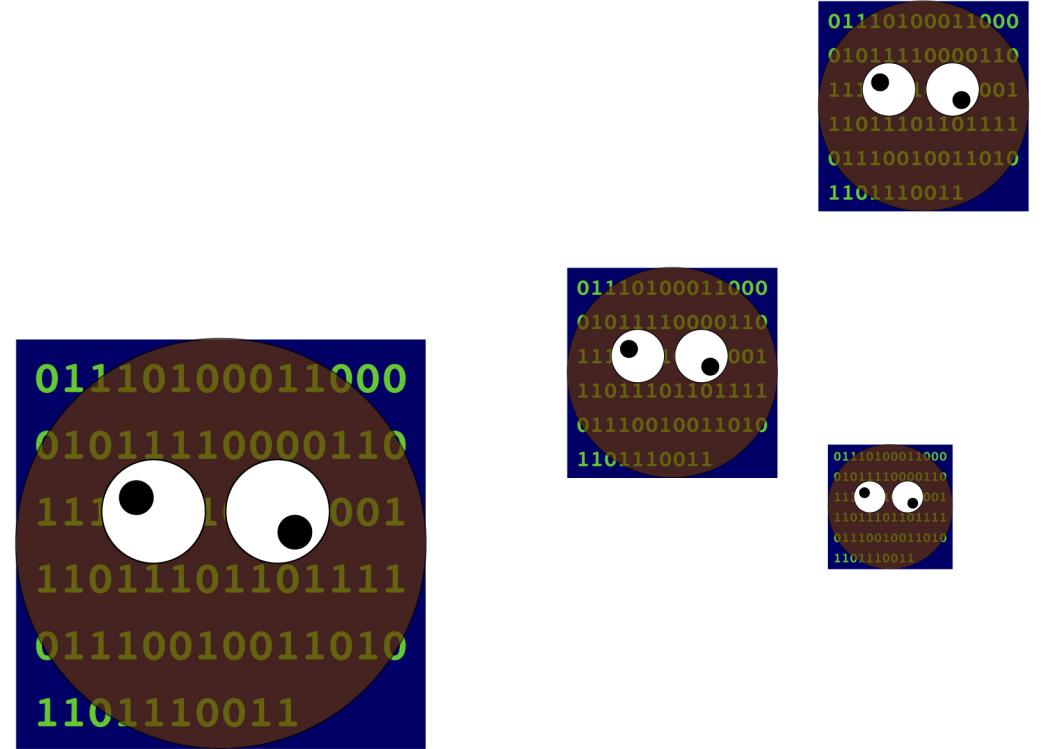
A graduate vouchers

Event(s)

A well trained ecologist hands off their vouchers, and a Darwin Core Archive as part of their thesis submission. A veterinarian student builds a interactive key to ticks referencing her observations to specimens in the collection.

Outcomes

A melding of traits/observations and museum specimen data in one place.



TaxonWorks v0.32.3 Issues

DwC-A Workbench

ticks
45 records. Reset filters

Imported: 43 | Ready: 0 | NotReady: 0 | Errored: 2 | Failed: 0 | Unsupported: 0

[Download](#)

Options	Status	occurrenceID	institutionCode	collectionCode	catalogNumber	resourceID	relat
Browse	Imported	INHS Insect Collection 1501002	INHS	Insect Collection	1501002	INHS Insect Collection 1501002	atta
Browse	Imported	INHS Insect Collection 1500988	INHS	Insect Collection	1500988	INHS Insect Collection 1500988	atta
Browse	Imported	INHS Insect Collection 1500989	INHS	Insect Collection	1500989	INHS Insect Collection 1500989	atta
Browse	Imported	INHS Insect Collection 1500986	INHS	Insect Collection	1500986	INHS Insect Collection 1500986	atta
Browse	Imported	INHS Insect Collection 1500985	INHS	Insect Collection	1500985	INHS Insect Collection 1500985	atta
Browse	Imported	INHS Insect Collection 1500964	INHS	Insect Collection	1500964	INHS Insect Collection 1500964	atta

ticks

Download original [\[trash\]](#)

DwC-A Occurrences

Status: Ready

Imported: 43

Ready: 0

NotReady: 0

Errored: 2

Failed: 0

Unsorted: 0

1 DwC Import

TaxonWorks v0.32.3 Issues

3i World Auchenorrhyncha Database

Edit observation matrix

Matrix

Name: An Interactive Key to Species of Erasmoneura and Rossmoneura

Dynamic rows

None

Rows (all)

- Erasmoneura atra (Johnson, 1935) ✓
- Erasmoneura bipentagona (Beamer, 1927) ✓
- Erasmoneura caerulea (Beamer, 1937) ✓
- Erasmoneura emeljanovi Dmitriev & Dietrich, 2007 ✓
- Erasmoneura fulmina (McAtee, 1920) ✓
- Erasmoneura latiloba Dmitriev, 2008 ✓
- Erasmoneura margaritae Dmitriev & Dietrich, 2007 ✓
- Erasmoneura mixta (Beamer, 1932) ✓
- Erasmoneura nigerrima (McAtee, 1920) ✓
- Erasmoneura nigra (Gillette, 1898) ✓
- Erasmoneura rubricata (Van Duzee, 1909) ✓

Row [\[undo\]](#) Column [\[redo\]](#)

Dynamic [\[refresh\]](#) Fixed

Rows

Keywords Pinboard Search From Another Matrix

Dynamic column

None

Columns (all)

- Ground color of dorsum
- Coloration of vertex
- Coloration of vertex midline
- Anteclypeus coloration
- Pronotum color pattern
- Color pattern of mesonotum
- Coloration of thoracic venter
- Presence of crossbands on forewings
- Presence of oblique pattern on forewings
- Presence of a brown spot in forewing inner apical cell
- Presence of distal spot in forewing apical cell ii

2 Observation matrices

TaxonWorks v0.32.3 Issues

INHS Insect Collection

Biological associations graph

Search a graph... [\[magnifying glass\]](#)

Save Sources Related [\[download\]](#) [\[refresh\]](#)

Host plant Thlaspi arvense L.

CollectionObject 1436451; INHS Insect Collection 1034000, 2efd7e72-16d5-45a6-a972-364cc55e61b8

3 Biological associations

INHS Insect Collection

Interactive key | EDS Matrix key to the hard tick nymphs of Illinois

Search a observation matrix [\[magnifying glass\]](#) Refresh only taxa Eliminate unknowns Error tolerance Identified to rank Descriptor sorting [\[refresh\]](#)

Festoons [\[apply\]](#)

Divisions on the posterior end of the tick

0.5 mm

0 festoons absent (0) 9 festoons present (1) 11 festoons present (3)

Apply

4. Anal groove

5. Length of palpal segments 2 and 3

6. Total palpal length versus basis capituli width

(1) Ixodes cookei (Packard, 1871) ✓
(1) Ixodes brunneus (Koch, 1846) ✓
(1) Ixodes dentatus Marx, 1899 ✓
(1) Ixodes matus (Banks, 1908) ✓
(1) Ixodes muris Bishop & Smith, 1937 ✓

4 Multi-entry key

An informed manager

Event(s)

A loan request is made. The curator intuitively understands that this will involve all three types of accessions.

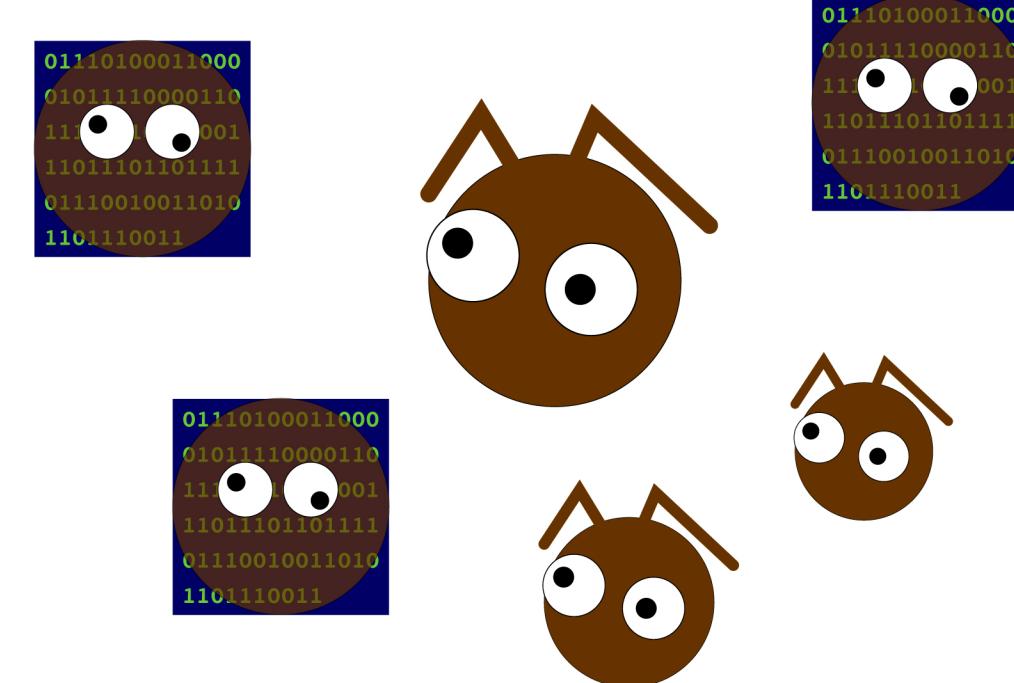
Outcomes

A loan with items enumerated at both the OTU and CollectionObject levels.

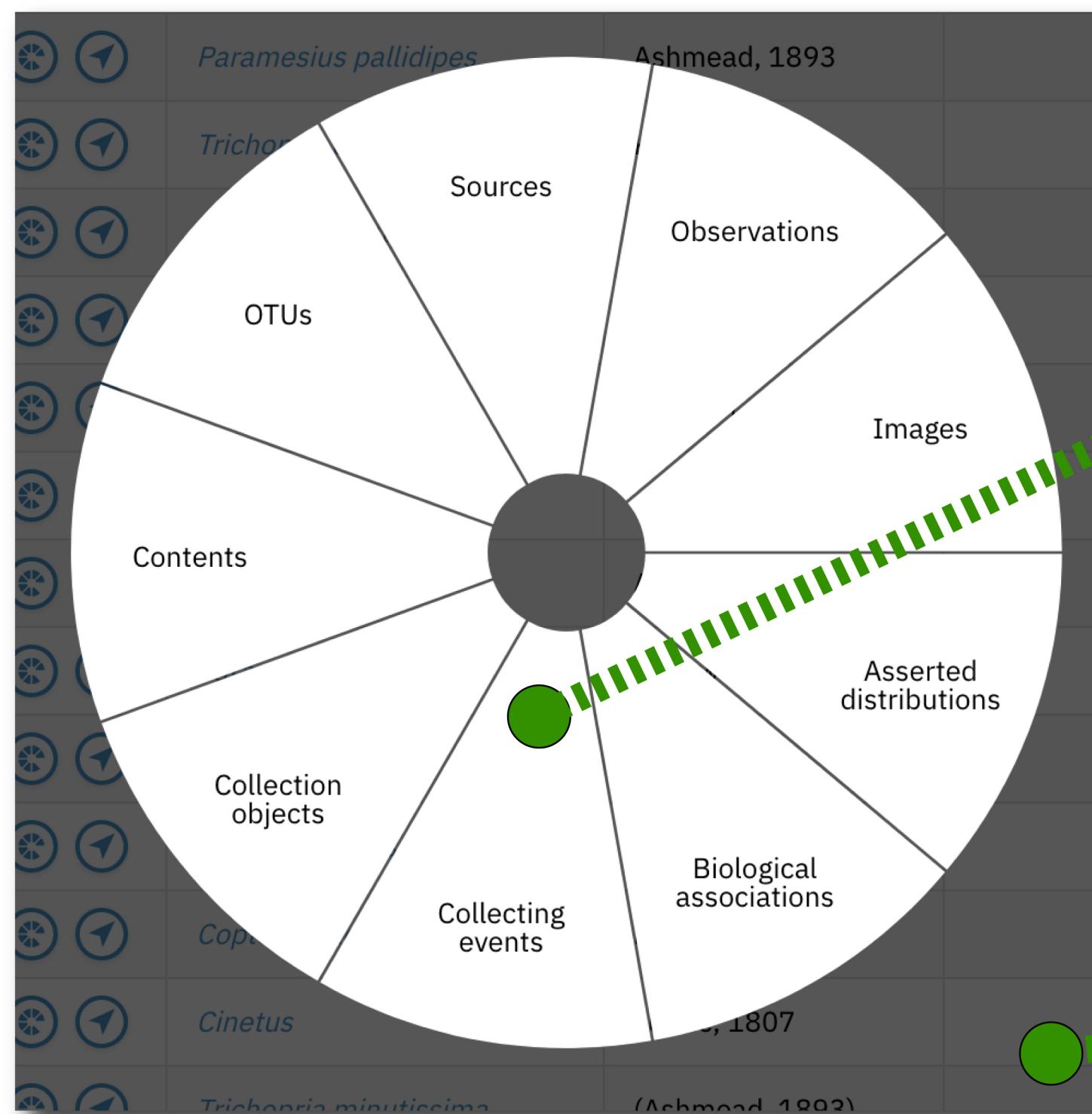
Do you also want to borrow specimens referenced in *biological associations* or extracts *originating_from* specimens?

Do you want digital references citing specimens with your loan?

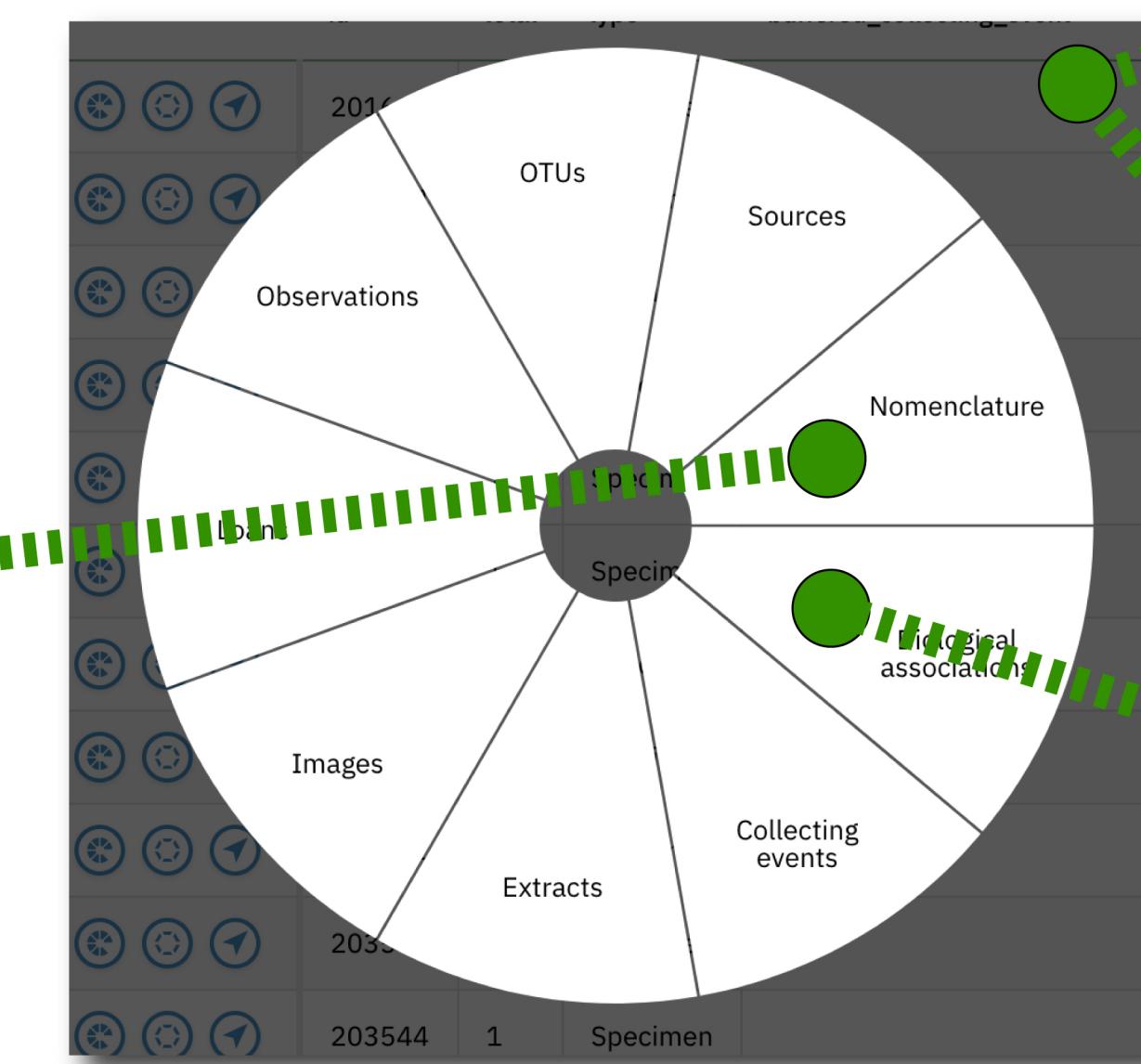
Here is a Darwin Core Archive with your loan.



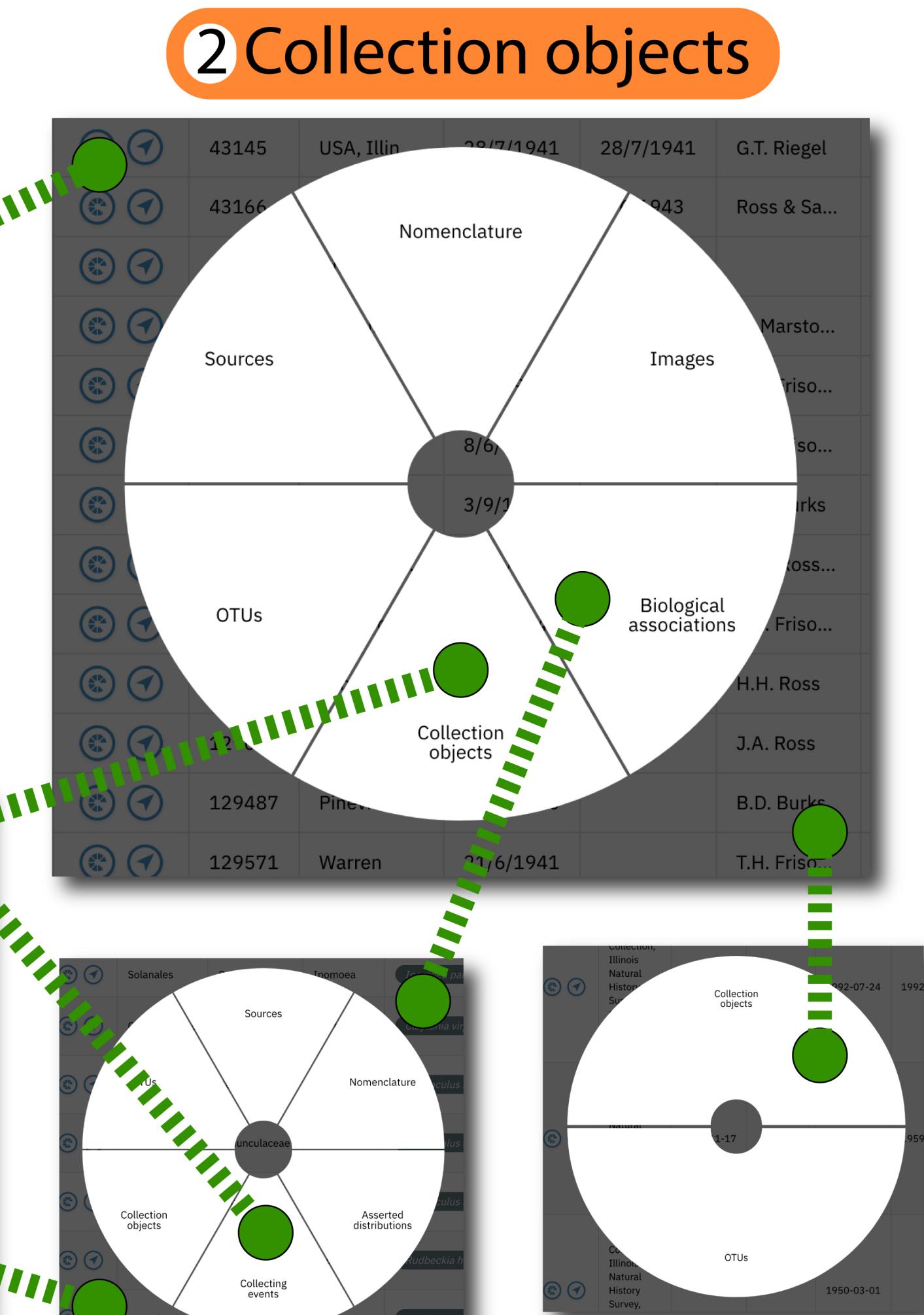
Unified filters/reports



1 Nomenclature



3 Collecting events



4 Biological associations

5 Loans

A bicameral specimen evolves

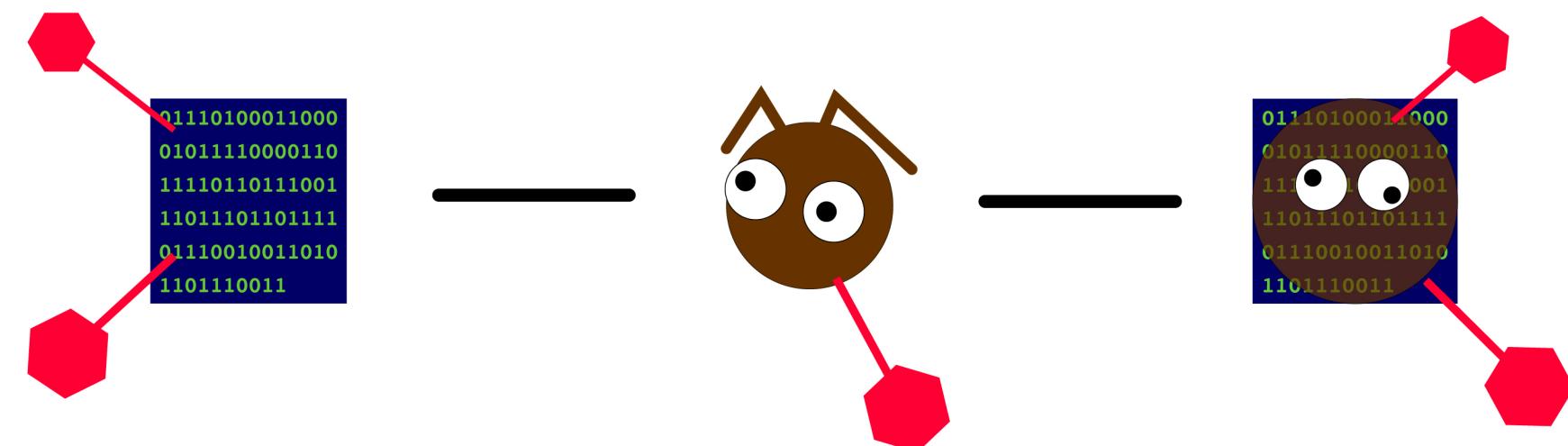
Event(s)

A collection's occurrence data are shared with GBIF and across the web. Because data are exposed, annotations, questions, and requests significantly increase.

Outcomes

Rich annotations for all classes of data.

Priority prioritization.





Get data How-to Tools Community About



Login

OCCURRENCE DATASET | REGISTERED SEPTEMBER 5, 2011

Illinois Natural History Survey Insect Collection

Published by Illinois Natural History Survey
McElrath T

1,089,069 OCCURRENCES | 519 CITATIONS

The INHS Insect Collection, which comprises ca. 7 million prepared specimens as well as noninsect arthropods (e.g., arachnids and myriapods) and miscellaneous invertebrates (bryozoans), is one of the largest and oldest entomological collections in North America. The growth and wide-ranging scope of this collection can be credited to the diverse interests of the systematists who have spent all or part of their career at the Survey. Scientists such as Stephen A. Forbes, the first Director of the S... [More](#)

Orthoptera Species File

Root > Animalia > Polynoptera > Orthopterida > Orthoptera > Caelifera > Acrididae > Acridomorpha > Acridoidea > Romaleidae > Romaleinae > Romaleini > Taeniopoda > *Taeniopoda varipennis* Rehn, 1905

Species
Taeniopoda varipennis Rehn, 1905

1,089,069 Occurrences | 95% With taxon match | 64% With confidence

699,461 GEOFERENCED RECORDS

World map showing distribution of *Taeniopoda varipennis* Rehn, 1905.

Image of a *Taeniopoda varipennis* specimen.

Map of Central America and South America showing asserted distribution.

Type specimen

Syntype; male; ANSP U.S.N.M., No. 8174; deposited at: Academy of Natural Sciences of Philadelphia (ANSP)

Nomenclature (12)

Taeniopoda varipennis Rehn, 1905: 410.
Syntype; male; ANSP U.S.N.M., No. 8174; deposited at: Academy of Natural Sciences of Philadelphia (ANSP). Syntype; female; 5d3bdbb4-efaf-49ab-826a-5a20c41fc890; deposited at: National Museum of Natural History, Smithsonian Institution (USNM).

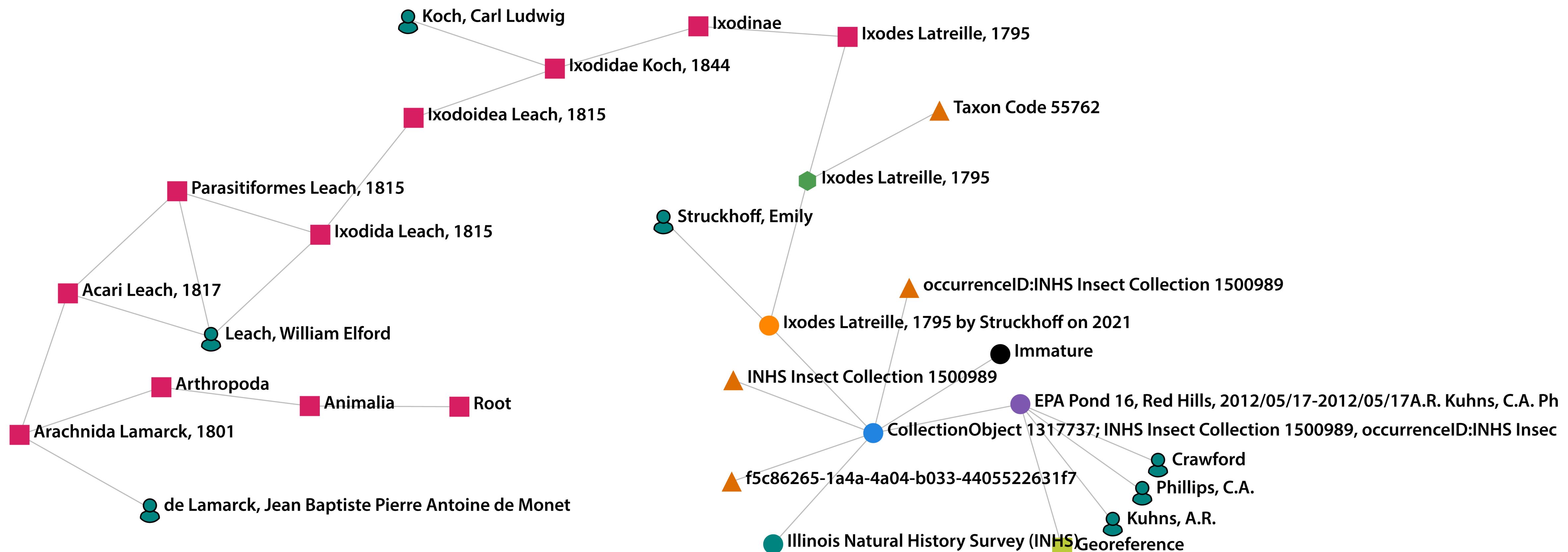
1 GBIF

2 TaxonPages

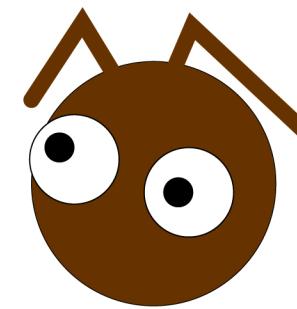


3 Annotations

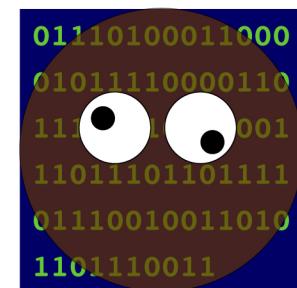
Many *things* to annotate



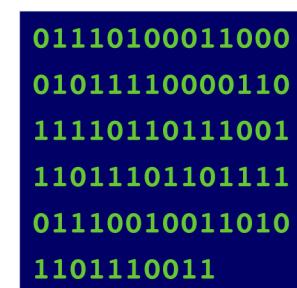
Conclusion



A collection's practices, policies, and accountability are impacted by the emergence of the bicameral specimen and its conceptual siblings.



Events in collections are impacted by latency. Exploring how those events entailing physical and digital halves occur can inform collections as to new and emerging needs.



In this context we touched on features differentiating TaxonWorks from other digitization platforms, join us to learn more!

- Observations/matrices and their multi-entry key derivatives
- Biological associations modeled
- Unified filter concepts
- Universal annotation capabilities

Individuals by year (date sent)

