

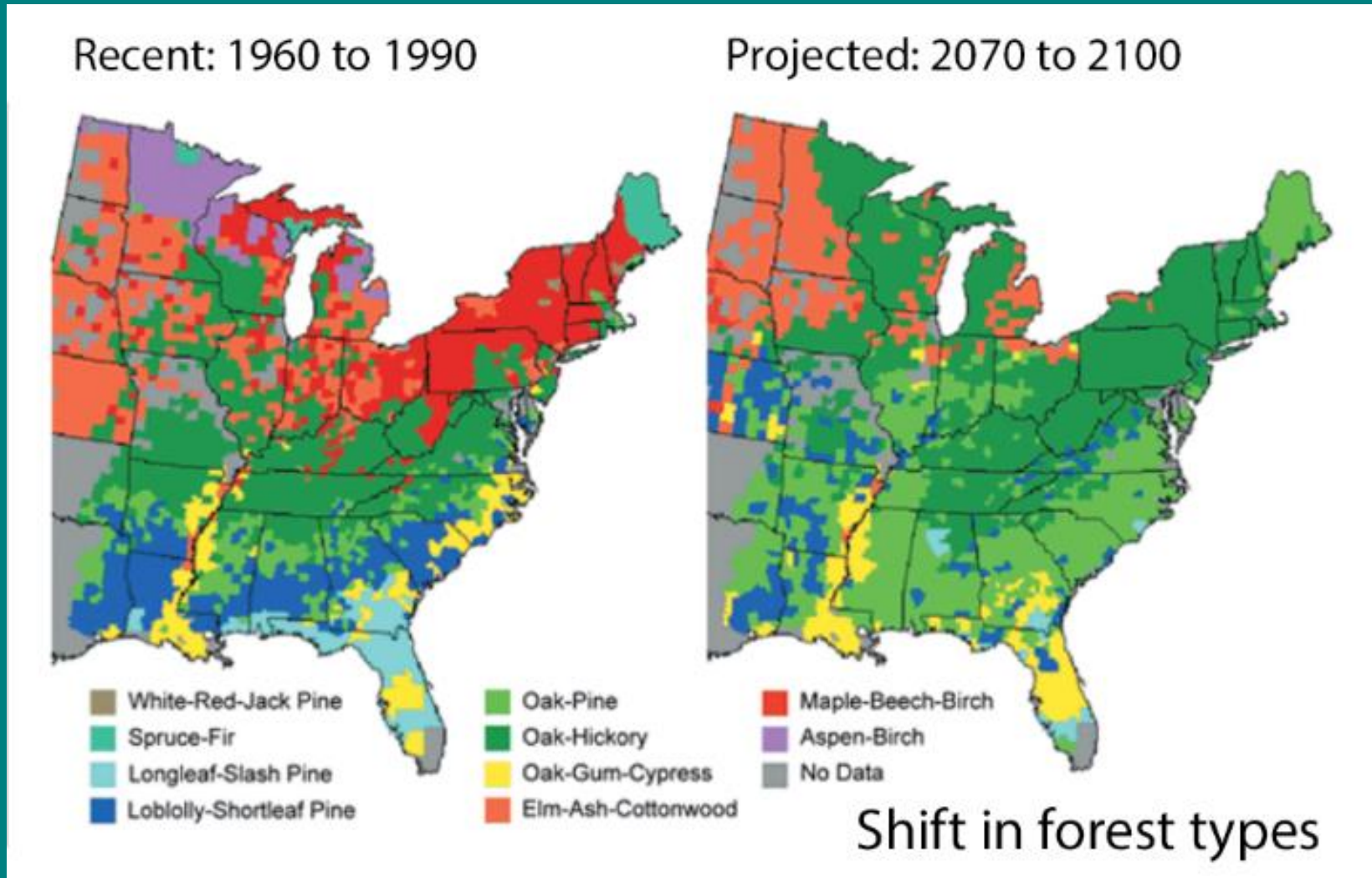
# Improving provenance data in natural history collection databases

Gary Rosenberg

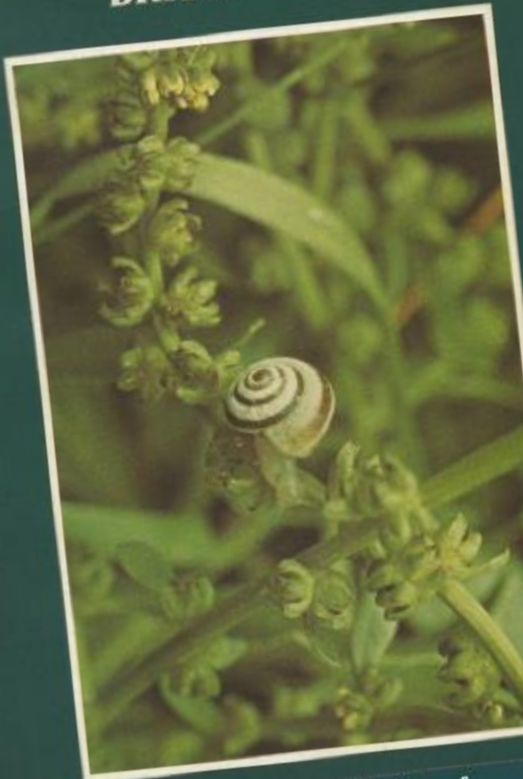
Academy of Natural Sciences of Philadelphia, Drexel  
University, 1900 Benjamin Franklin Parkway, Philadelphia,  
PA 19103; [gr347@drexel.edu](mailto:gr347@drexel.edu)

Department of Biodiversity, Earth & Environmental Science,  
Drexel University, Philadelphia, PA 19104

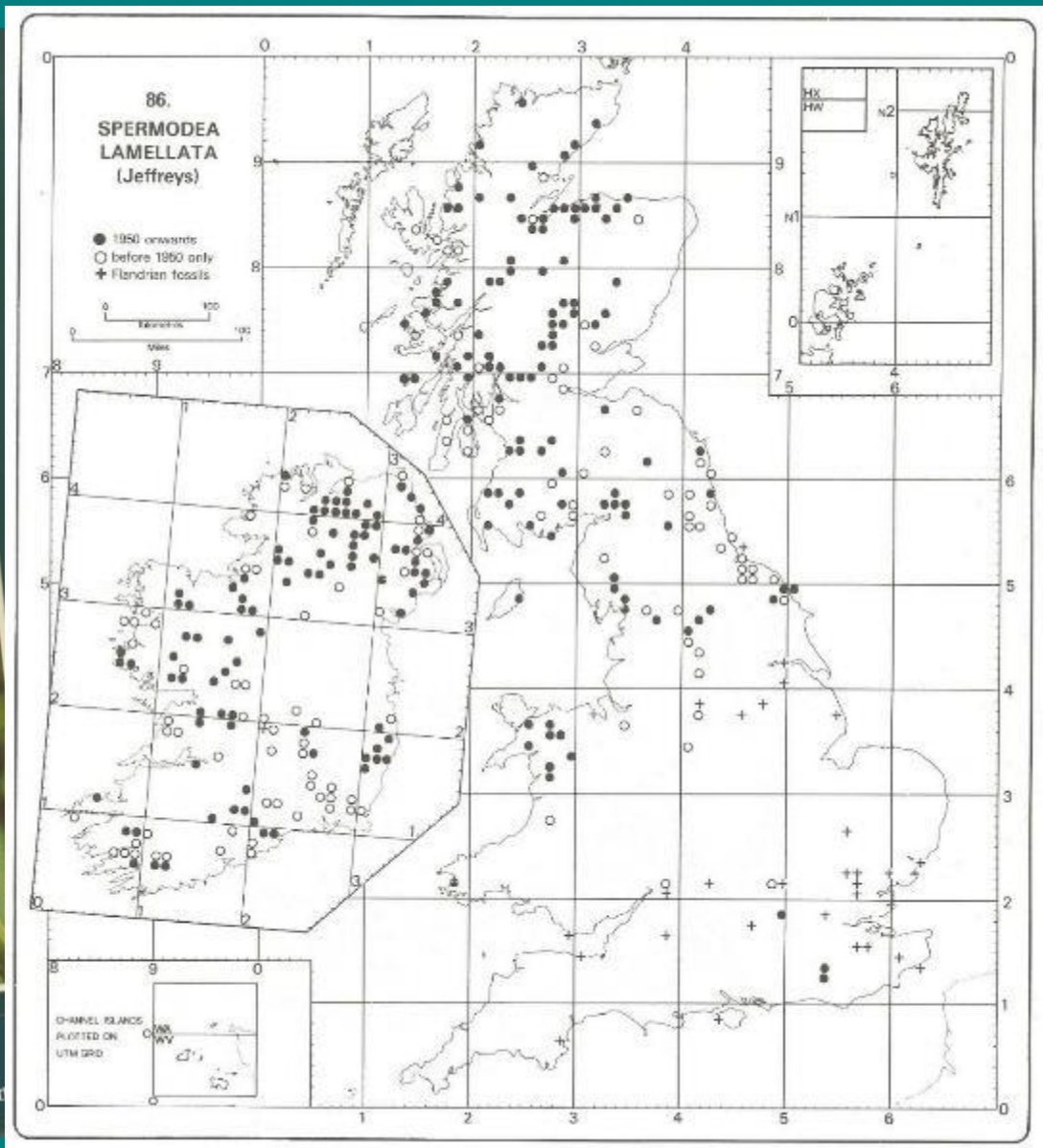
# Dated baselines needed for projections



# ATLAS OF THE NON-MARINE MOLLUSCA OF THE BRITISH ISLES



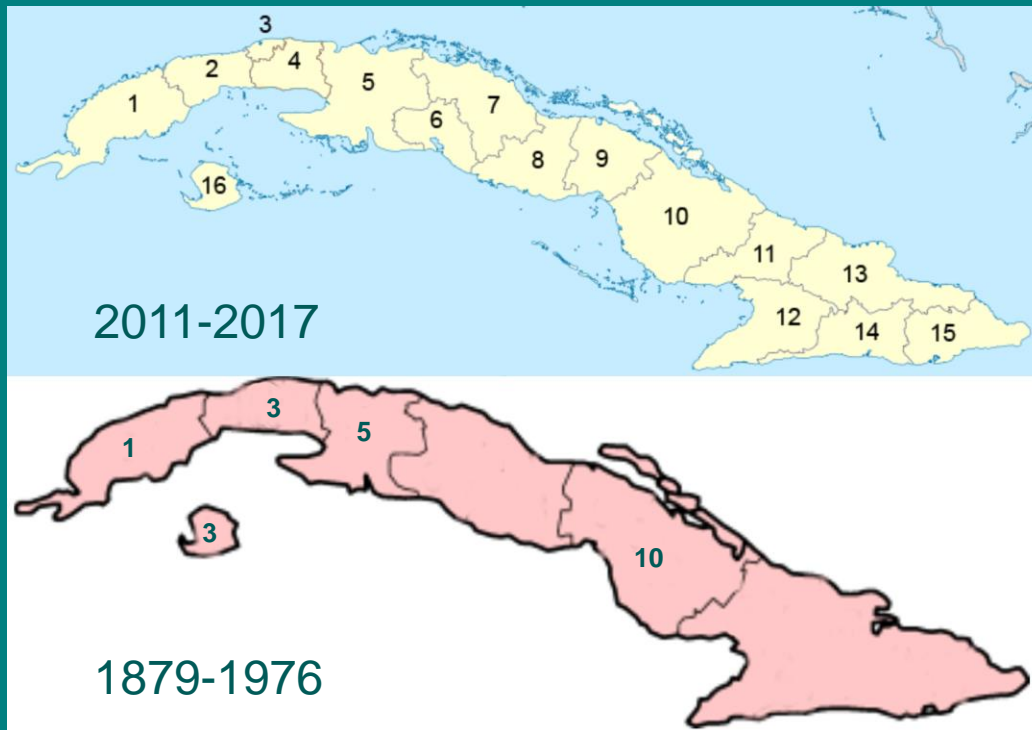
Conchological Society of  
Great Britain and Ireland  
Natural Environment Research Council



● 1950 onwards; ○ before 1950; + fossil

# Mapping distributional changes

- Requires georeferenced data
- Requires collecting dates or bounded proxies thereof
  - Directly for time axis
  - Because places change boundaries over time

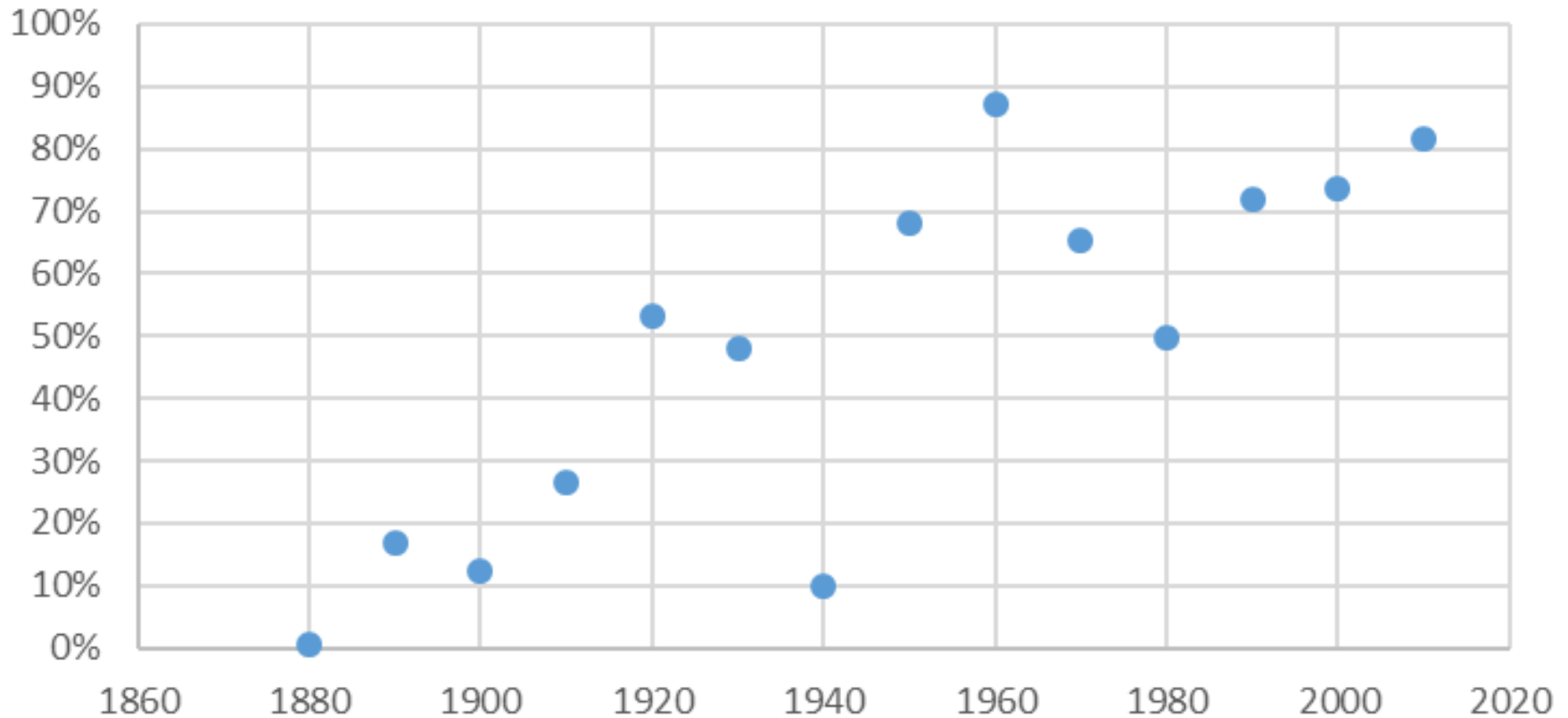


## Provinces of Cuba

1. Pinar del Rio
3. La Habana
5. Matanzas
10. Camagüey

Four have the same name as in 1879, but only Matanzas has same boundaries

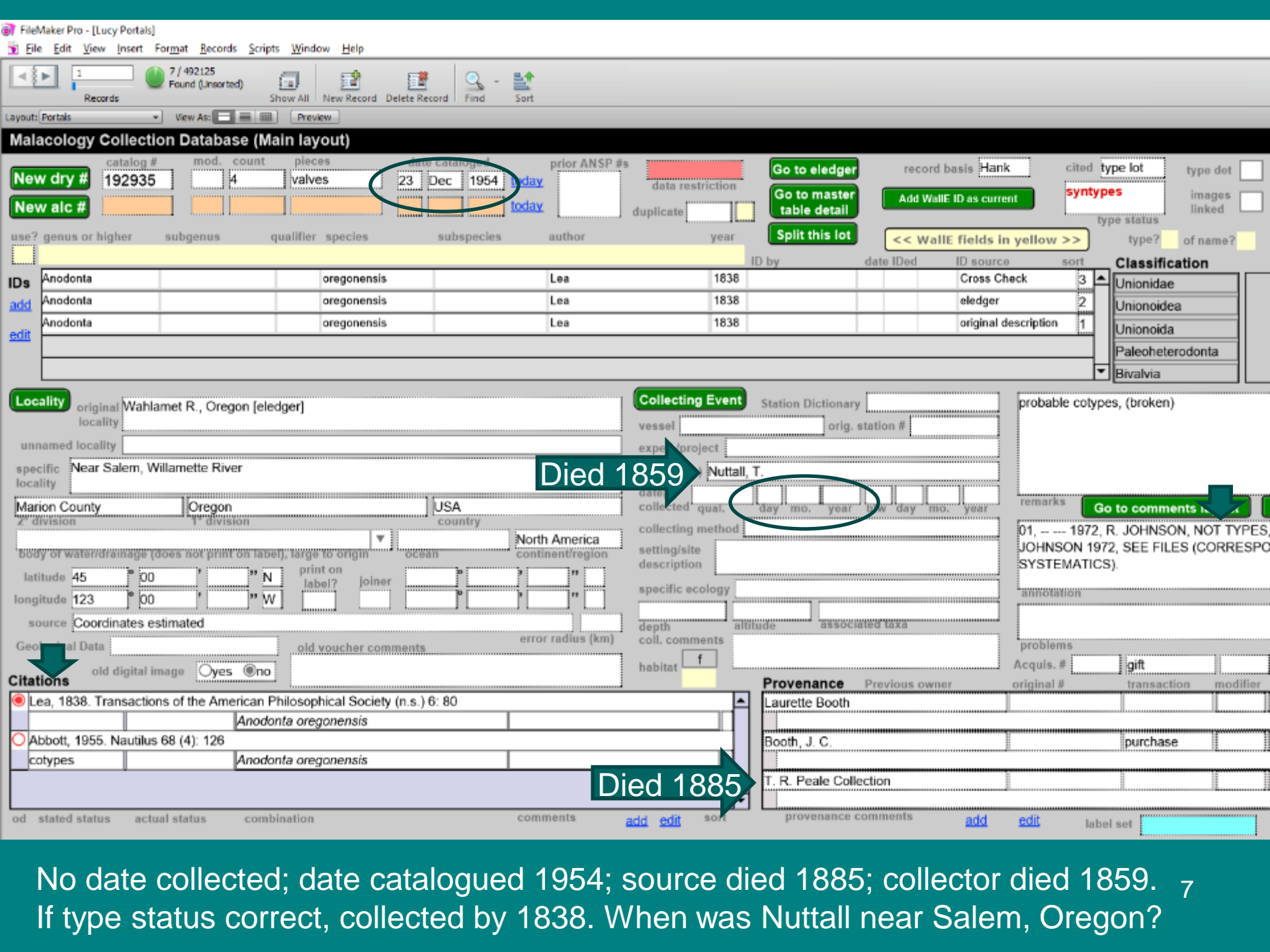
## Percent ANSP lots with date of collecting, by decade catalogued (or acquired before 1890)



55% of 490,000 mollusk records have at least year collected. Need proxies for that date for other sources.

# Finding proxies for collecting date

- Dates of birth and death of collectors and dates of death of previous owners provide bounds
- Dates of other significant events
  - Accession records
  - Field notes
  - Correspondence
  - Obituaries, biographical notices
  - Genealogical records
- Original labels (dates often not transcribed)
  - Handwriting analysis where source of label unknown
  - Vintage of names on labels (taxonomic & geographic)



New dry #  
New alc #

catalog # 192935  
mod. count 4  
pieces valves  
date cataloged 23 Dec 1954 today

Go to edger  
Go to master table detail  
Split this lot  
record basis Hank  
Add WALLIE ID as current  
cited type lot  
syntypes  
type status  
type det  
images linked  
type? of name?

IDs	genus or higher	subgenus	qualifier	species	subspecies	author	year	ID by	date IDed	ID source	sort
	Anodonta			oregonensis		Lea	1838			Cross Check	3
<a href="#">add</a>	Anodonta			oregonensis		Lea	1838			edger	2
<a href="#">edit</a>	Anodonta			oregonensis		Lea	1838			original description	1

- Classification**
- Unionidae
  - Unionoidea
  - Unionoida
  - Paleoheterodonta
  - Bivalvia

**Locality**  
original locality Wahlamet R., Oregon [edger]  
unnamed locality  
specific locality Near Salem, Willamette River  
Marion County Oregon USA  
2<sup>nd</sup> division division country  
body of water/drainage (does not print on label), large to origin ocean continent/region North America  
latitude 45 00 " N  
longitude 123 00 " W  
source Coordinates estimated  
Geo Data old voucher comments error radius (km)  
old digital image  yes  no

Died 1859

**Collecting Event**  
Station Dictionary  
vessel orig. station #  
exp. project  
date collected qual. day mo. year day mo. year  
Nuttall, T.  
collecting method  
setting/site description  
specific ecology  
depth altitude associated taxa  
coll. comments  
habitat f

probable cotypes, (broken)  
remarks  
Go to comments  
01, -- 1972, R. JOHNSON, NOT TYPES, JOHNSON 1972, SEE FILES (CORRESPONDENCE SYSTEMATICS).  
annotation  
problems  
Acquis. # gift

**Citations**

<input checked="" type="radio"/>	Lea, 1838. Transactions of the American Philosophical Society (n.s.) 6: 80	Anodonta oregonensis
<input type="radio"/>	Abbott, 1955. Nautilus 68 (4): 126	Anodonta oregonensis

od stated status actual status combination comments [add](#) [edit](#) [sort](#)

Died 1885

**Provenance** Previous owner original # transaction modifier

Laurette Booth			
Booth, J. C.			purchase
T. R. Peale Collection			

provenance comments [add](#) [edit](#) label set

No date collected; date catalogued 1954; source died 1885; collector died 1859. 7  
If type status correct, collected by 1838. When was Nuttall near Salem, Oregon?

# Malacology Collection Database (Main layout)

catalog #  mod.  count  pieces  date cataloged    today  prior ANSP #s   record basis  cited

today  duplicate

use?  genus or higher  subgenus  qualifier  species  subspecies  author  year

IDs	Macrochlamys	woodiana	Pfr	ID by	date IDed	ID source	sort
	Macrochlamys	woodiana	Pfr			eledger	1

original locality   Station Dictionary

unnamed locality  vessel  orig. station #

specific locality  exped./project

collector(s)  date(s)

2° division  1° division  Sri Lanka country  Asia continent/region

body of water/drainage (does not print on label), large to origin  ocean  continent/region

latitude  °  '  "  print on label?  joiner  °  '  "

longitude  °  '  "   °  '  "

source  depth  altitude  associated taxa

Geological Data  old voucher comments  error radius (km)

old digital image    habitat

**Citations**

**Provenance** Previous owner  original #

Often, donor's source erroneously listed as collector: W. G. Binney is not known to have traveled to Sri Lanka. Laborious to determine record-by-record. But provenance at accession/acquisition level also can help.



Mr. G. W. Tryon Jr., Conservator, reports as follows:—

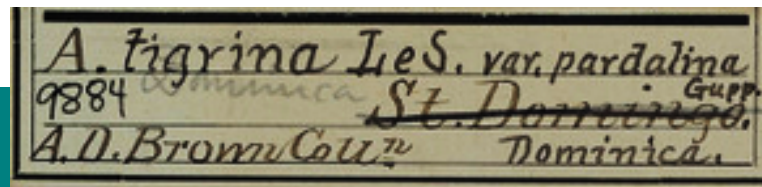
“The presentation by Mrs. Susan D. Brown of Princeton N. J., of the extensive and valuable collection of pulmoniferous land shells made by her late son Albert D. Brown is the principal event in the history of our section during the year. Mr. Brown, a well known conchologist and one of the founders of this Section, by devoting his attention to a single great group of the mollusca succeeded in amassing a collection which, for the completeness of its suites and beauty of arrangement ranked easily among the best in the world. His mother, anxious to place these treasures where they would be most useful, offered them to us subject to no restriction whatever.

- Report of the Conchological Section, *Proceedings of the Academy of Natural Sciences*, 1887, p. 420

Upon consideration of the extent and condition of the collection, your conservator decided that no portion of the mounted series should be excluded from our cases; for although we already possessed a large proportion of the species, the localities were in most cases different, and the specimens frequently much finer than ours. Hundreds of the species were, however, new to us. The mounting

and labelling of the Brown shells was confided to Mr. Frank Stout, and this duty, which has occupied his time for the major portion of the year, has been very acceptably performed. The collection numbers 5404 trays and labels, containing 19,593 specimens. Mrs.

Brown also presented the fine microscope used by her late son. A suitable inscription has been engraved upon this instrument, which is intended for the use of members of the section and conchological students generally.



Now 5716 lots (some since split), 18,878 specimens. Frank Stout died by 1891, so his handwriting on labels in other lots might constrain their collecting dates.

The most valuable cabinet of West India terrestrial shells is that of Mr. A. D. Brown, of Princeton, N. J., formerly the property of Thomas Bland. Mr. Bland's extensive correspondence in the West Indies, and especially with Prof. Poey, Dr. Gundlach, M. Sallé, R. J. Shuttleworth, &c., his own collections in St. Thomas, Jamaica and Bermuda, and his intimate relations with the late Prof. C. B. Adams, gave him extraordinary advantages and opportunities. Mr. Brown also has a large number of species of terrestrial mollusca from other countries—the whole amounting to three thousand species.

- Tryon, G. W. 1862 (March). A sketch of the history of conchology in the United States. *American Journal of Arts and Sciences* 33:

Letter from A. D. Brown to G. W. Tryon in June 1861 stating that he has all but a dozen species of West Indian land snails in his collection. ANSP Archives collection 98, box 3, folder 2.

Princeton, N. J. June 7<sup>th</sup> 1861

Dear Sir

Yours of the 7<sup>th</sup> was received yesterday, and I forward you with this a small box of shells, from various localities

I find in looking over my duplicates, that I have but very few specimens of European shells, altho that country is well represented in my cab. and perhaps if I squeeze them a little closer I can let you have some more. At all events I will try, as soon as I get a little more time, I can let you have very few fresh-water species, as I do not collect them, but still sometimes get them in exchange.

I think however I can obtain some for you, from a friend of mine who was a resident in Ohio during many years, & a zealous collector.

I have a large quantity of land shells,

of the United States, and also quite a number of West India species, and if you desire any of those, I can let you have some.

As to exchanging if you have any fresh-water shells wh' you can let me have, I should be glad, for altho I do not collect them myself, still I have use for them in exchanging, and then I do not suppose you could let me have many species of land shells, wh' I have not already.

I am chiefly deficient in European, African & Indian species. I have every species known in the U. S. I believe, and all but about a dozen of those peculiar to the West Indies.

If you should, however, have any species from any other parts than those above mentioned, I should be glad of them, but I shall not be particular as to what you send, or whether you send any thing.

Many thanks for the book, it is very useful, and I was upon the point of ordering one, just as yours came.

Yours very truly  
G. W. Tryon Esq  
A. D. Brown

Provenance	Previous owner	original #	transaction	modifier	date acquired	
Brown, S. D.					1886	▲
						3
A. D. Brown Collection		1359				
						2
Binney, W. G.						
						1 ▼

provenance comments    [add](#)    [edit](#)    label set     sort

Provenance	Previous owner	original #	transaction	modifier	date acquired	
Cadwalader, C. M. B.			purchase		1944	▲
						4
Laurette Booth						
						3
Booth, J. C.			purchase			
						2 ▼

provenance comments    [add](#)    [edit](#)    label set     sort

One-to-many for provenance data could allow automated inference of dates associated with agents

## Kind of agent

- person
- expedition
- institution
- admin unit
- organization
- vessel

The screenshot shows the FileMaker Pro interface for a database named 'Lucy Portals'. The main window displays a record for 'Agents'. The record details are as follows:

Agent ID	1	Kind of Agent	Person
Verbatim Name	Henry Augustus Pilsbry		
Last Name	Pilsbry		
Initials	H. A.		
Other Names	Henry Augustus		
Prefix		Suffix	
Variant of			

A large teal arrow points upwards from the bottom center of the screen towards the 'Variant of' field.

Allows synonymy of agent names (e.g., Harry Pilsbry)

# Events and relationships

## Kind of record

affiliation  
acquisition  
address  
attendance  
birth  
candidate  
citizenship  
correspondence  
death  
education  
funeral  
kinship  
marriage  
occupation  
position  
recognition  
residence  
travel

## Relationship between agents

correspondent  
councillor  
editor  
employee  
friend  
leader  
member  
participant  
president  
research associate  
secretary  
student  
teacher  
treasurer  
vice-president  
volunteer  
aunt  
child  
cousin  
grandparent  
grandchild  
nephew  
niece  
parent  
sibling  
spouse  
uncle



## Shellers From the Past and the Present

Home Biography / Rosenberg 2

Last  
Name:

First  
Name:

Country:

Search



Rosenberg, Gary  
1959 -  
USA



Rosenberg, Gary D.  
United States

Incorporates dates from Coan & Kabat's *2400 Years of Malacology*



Tree



# Frida Kramer

**BIRTH** Unknown

**DEATH** 10 JAN 1967 • Winnipeg, Manitoba, Canada

wife of 1st cousin 2x removed

[LifeStory](#) [Facts](#) [Gallery](#) [Hints](#)

## Facts

Show + Add

Name and gender

1959

**Death of Husband Aron Packer** (1882-1959)  
5 Feb 1959 • Winnipeg, Manitoba, Canada

1967

**Death**  
10 Jan 1967 • Winnipeg, Manitoba, Canada  
1 Source

**Burial**  
Hebrew Sick Benefit Cemetery, Winnipeg, Manitoba, Canada  
1 Source

**Comments**  
Packer # 154

+ Add Fact

## Sources

+ Add

Ancestry Sources

Ancestry Family Trees

JewishGen Online  
Worldwide Burial Registry (JOWBR)

Search on Ancestry

+ Add Source

+ Add Web Link

## Family

Parents

Add Father

Add Mother

Spouse

Aron Packer  
1882-1959

+ Add Family

Birth

Death

Marriage

Custom Event

**Other Facts**

Address

Adoption

Adult Christening

Also Known As

Annulment

Arrival

Baptism

Baptism (LDS)

Bar Mitzvah

Bat Mitzvah

Blessing

Burial

Caste

Cause of Death

Select an event type

Event ID

1

f\_Agent ID

1

Henry Augustus Pilsbry

f\_related\_agent\_ID

F\_supervisor\_ID

Record Kind

Birth

Relationship/Role

Role Detail

Verbatim Role

07

Dec

1862

Start qual.

day

month

year

connect

End qual.

day

month

year

Verbatim locality

On a farm near Iowa City, Johnson Co., Iowa

Event place

Near Iowa City

Secondary Division

Johnson County

Event primary division

Iowa

Event Country

USA

Continent

Island Group

Ocean

Water Body

Comments

f\_Pub\_ID

3665

pagination

143

Archive

Archive Collection No.

Event ID

6

f\_Agent ID

1

Henry Augustus Pilsbry

f\_related\_agent\_ID

5

Pinchot Expedition

F\_supervisor\_ID

Record Kind

Travel

Relationship/Role

participant

Role Detail

Verbatim Role

15

Mar

1928

to

28

Mar

1928

Start qual.

day

month

year

connect

End qual.

day

month

year

Verbatim locality

Event place

Secondary Division

Event primary division

Event Country

Panama

Continent

Island Group

Ocean

Water Body

Comments

f\_Pub\_ID

pagination

Archive

Archive Collection No.

Event ID

11

f\_Agent ID

1

Henry Augustus Pilsbry

f\_related\_agent\_ID

7

Academy of Natural Sciences of Philadelphia

F\_supervisor\_ID

8

George Washington Tryon

Record Kind

Position

Relationship/Role

employee

Role Detail

Assistant Curator

Verbatim Role

Assistant Curator under G. W. Tryon

<input type="text"/>	<input type="text"/>	<input type="text"/>	1887	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Start qual.	day	month	year	connect	End qual.	day	month	year

Verbatim locality

Event place

Philadelphia

Secondary Division

Philadelphia County

Event primary division

Pennsylvania

Event Country

USA

Continent

North America

Island Group

Ocean

Water Body

Comments

f\_Pub\_ID

3665

pagination

143

Archive

Archive Collection No.

Event ID

14

f\_Agent ID

13

Wesley M. Heilman

f\_related\_agent\_ID

F\_supervisor\_ID

Record Kind

Occupation

Relationship/Role

president

Role Detail

Gibbs Underwear Co.

Verbatim Role

president

Start qual.

day

month

year

connect

End qual.

day

month

year

Verbatim locality

Indiana Ave. & "A" St., Phila. 34, Penna.

Event place

Philadelphia

Secondary Division

Philadelphia County

Event primary division

Pennsylvania

Event Country

USA

Continent

Island Group

Ocean

Water Body

Comments

Data from business card in ANSP 240036.

f\_Pub\_ID

pagination

Archive

Archive Collection No.

# Bounding dates of collection

- 469,341 records in ANSP malacology database have at least country level locality data
- Of these, 43.4% (203,291 records) lack collecting date
- For 94.5% of these (192,089) collector, donor or prior owner is known, so date of death could improve on date of cataloguing as upper bound

# Random sample

- Of records lacking date collected, selected all with catalogue number ending in “125”, n=193.
- 124 records had both date of cataloguing and date of death; date of death earlier for 40% (49).
- For 24 records without date catalogued, date of death of collector or prior owner found
- For 7 additional records, dates of acquisition or citation were earlier than date catalogued
- Overall for 41% (80/193) date better constrained
- Further improvement possible.

# Conclusions

- Biographical and historical information on agents in natural history collections can constrain possible collecting dates
- Capturing biographical information in standard form would allow automated bounding of collecting dates.
- Collection databases need one-to-many structure for provenance data to use automated bounding.
- This capability would enhance ability to use data from collections to track faunal change over time.