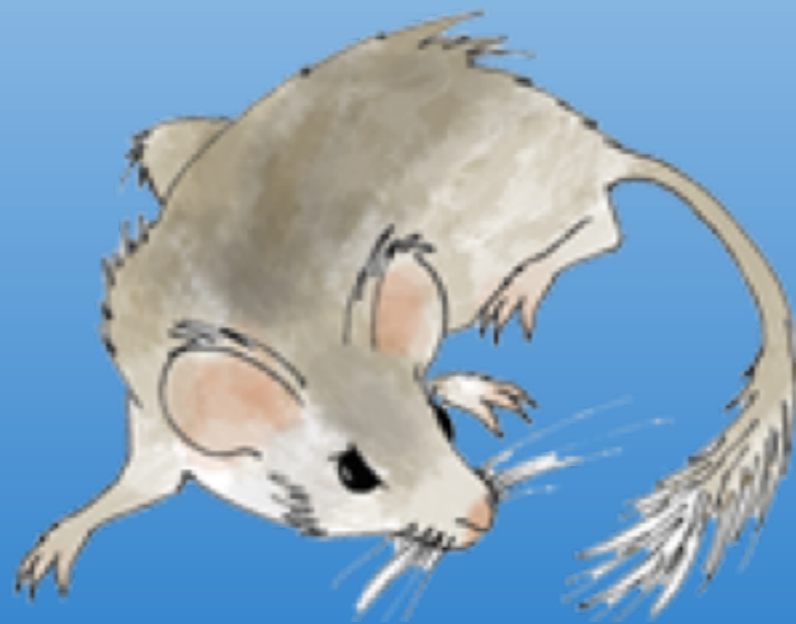


Integrating Paleontological and Neontological Data Across Time and Space



Paleobiology
Database



Neotoma
Database



iDigBio

Paleobiology Database

What is the Paleobiology Database?

The **Paleobiology Database** (or **PBDB**) is an open resource dedicated to documenting all fossil occurrences on the planet, along with associated bibliographic, contextual, and taxonomic data.

PBDB data are freely accessible under a **CC BY** license, which requires only attribution for use.

paleobiodb.org

Paleobiology Database

Summary Statistics

as of March 26, 2017

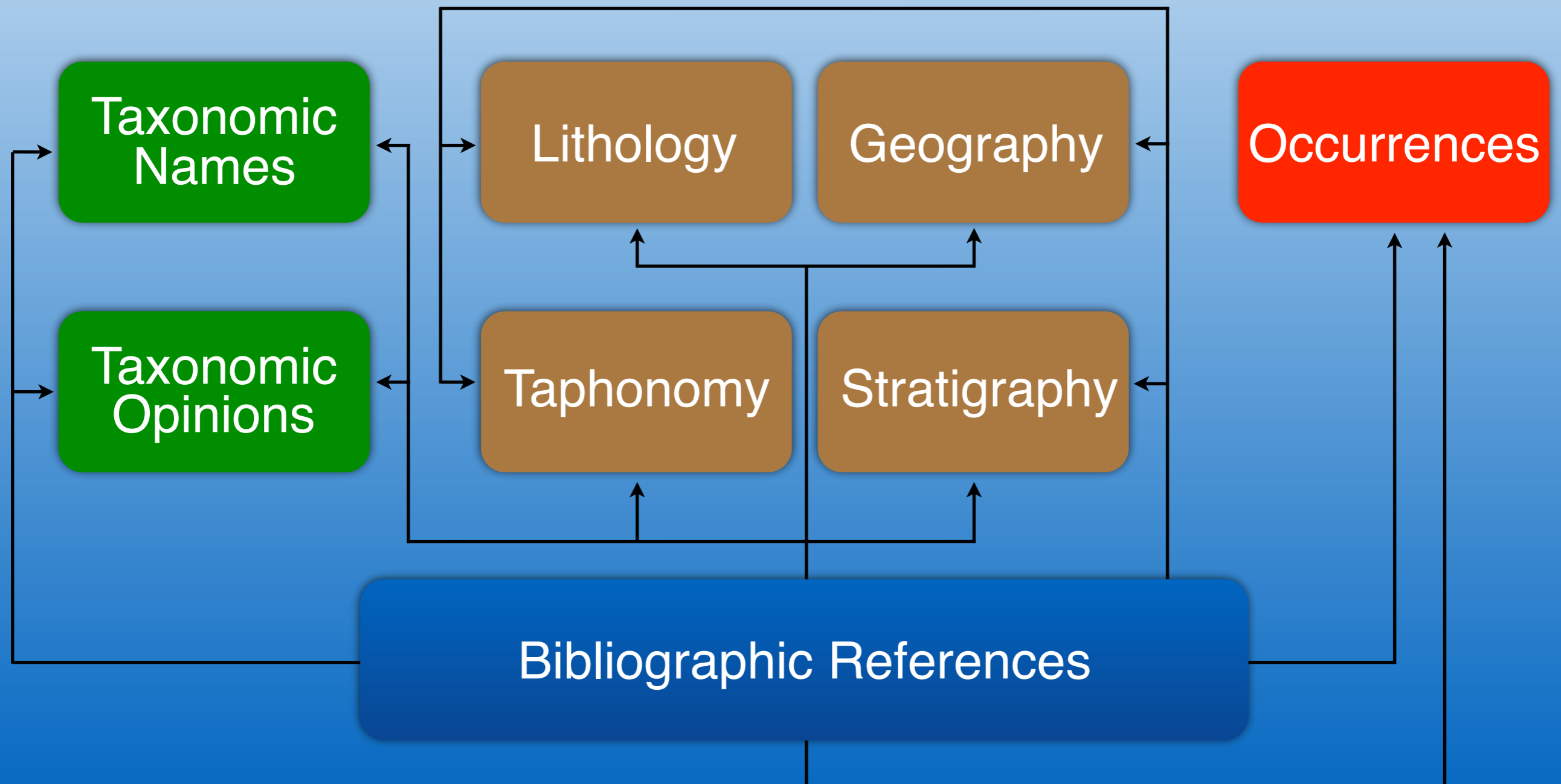
- 61,8— references
- 351,000 taxa
- 628,500 opinions
- 184,600 collections
- 1,327,500 occurrences
- 410 researchers



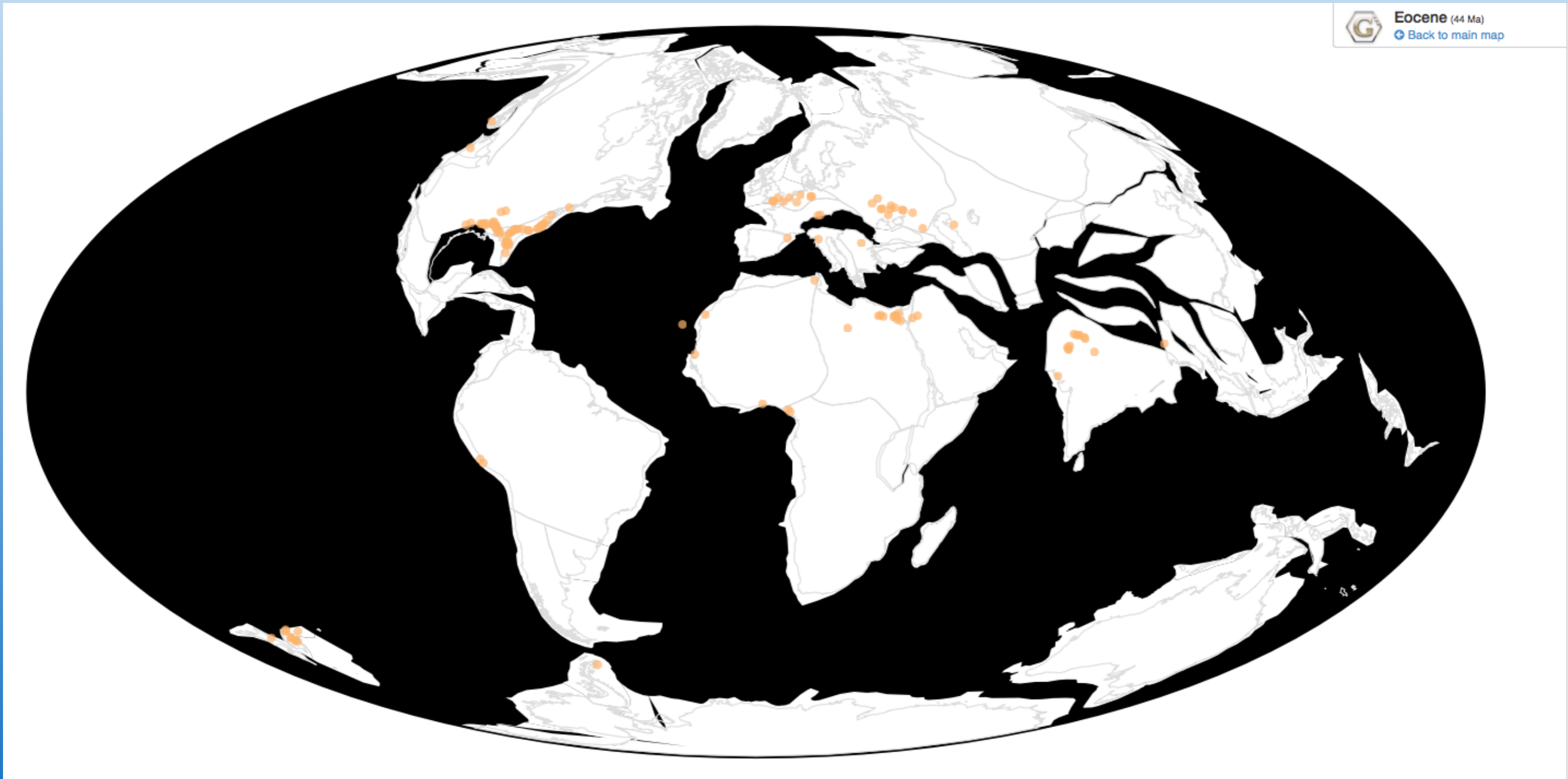
Paleobiology Database

Primary Data Types

Bibliographic, Taxonomic, Geologic & Geographic, Occurrence

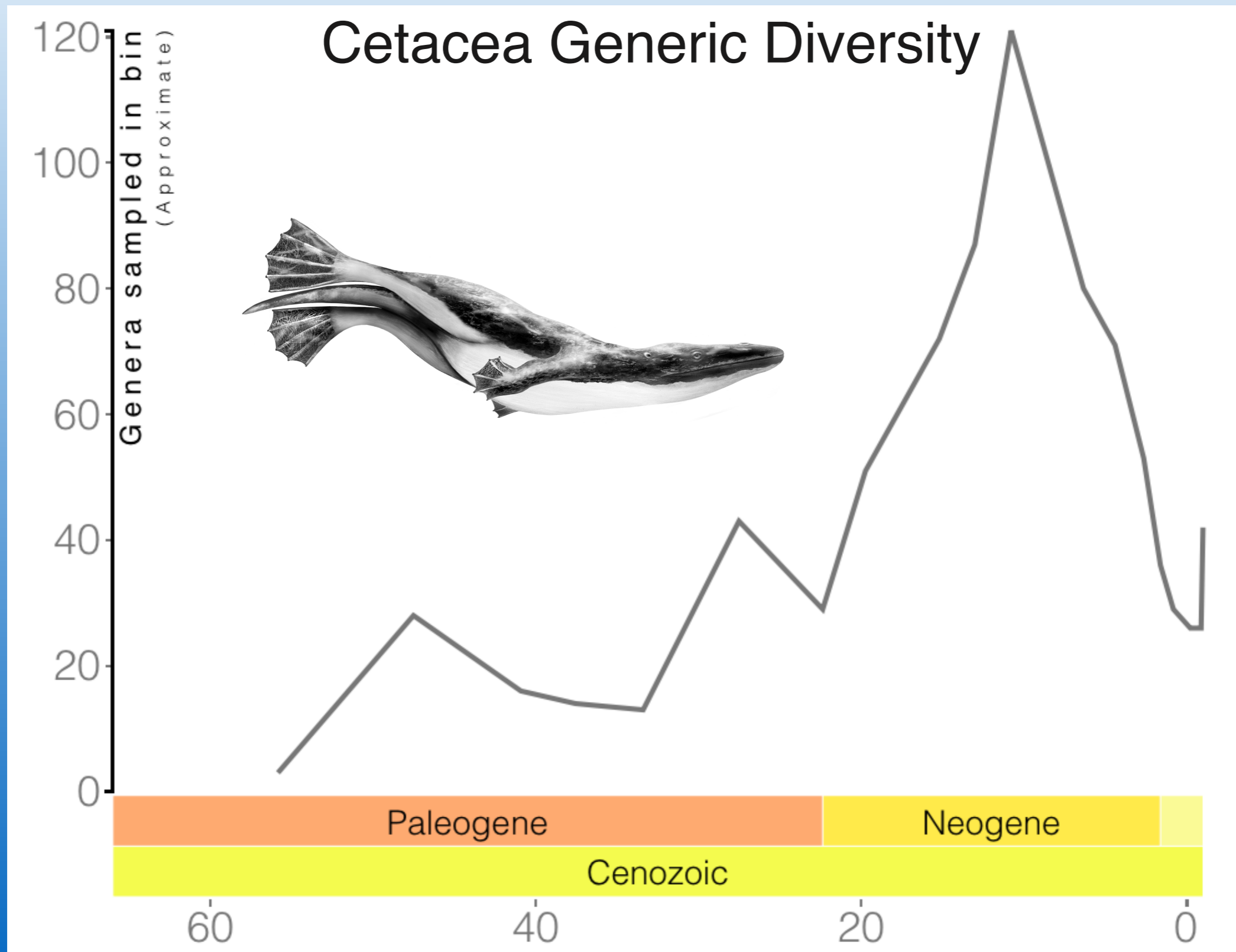


Paleobiology Database



Eocene Cetacea

Paleobiology Database

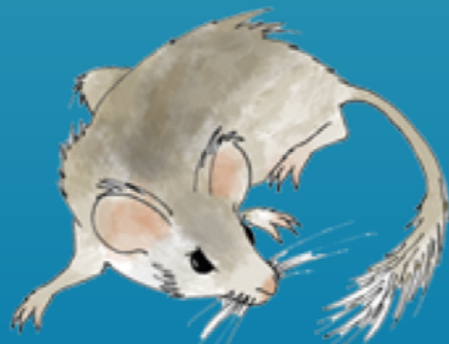




EARTH CUBE
TRANSFORMING GEOSCIENCES RESEARCH



EarthLife
Consortium

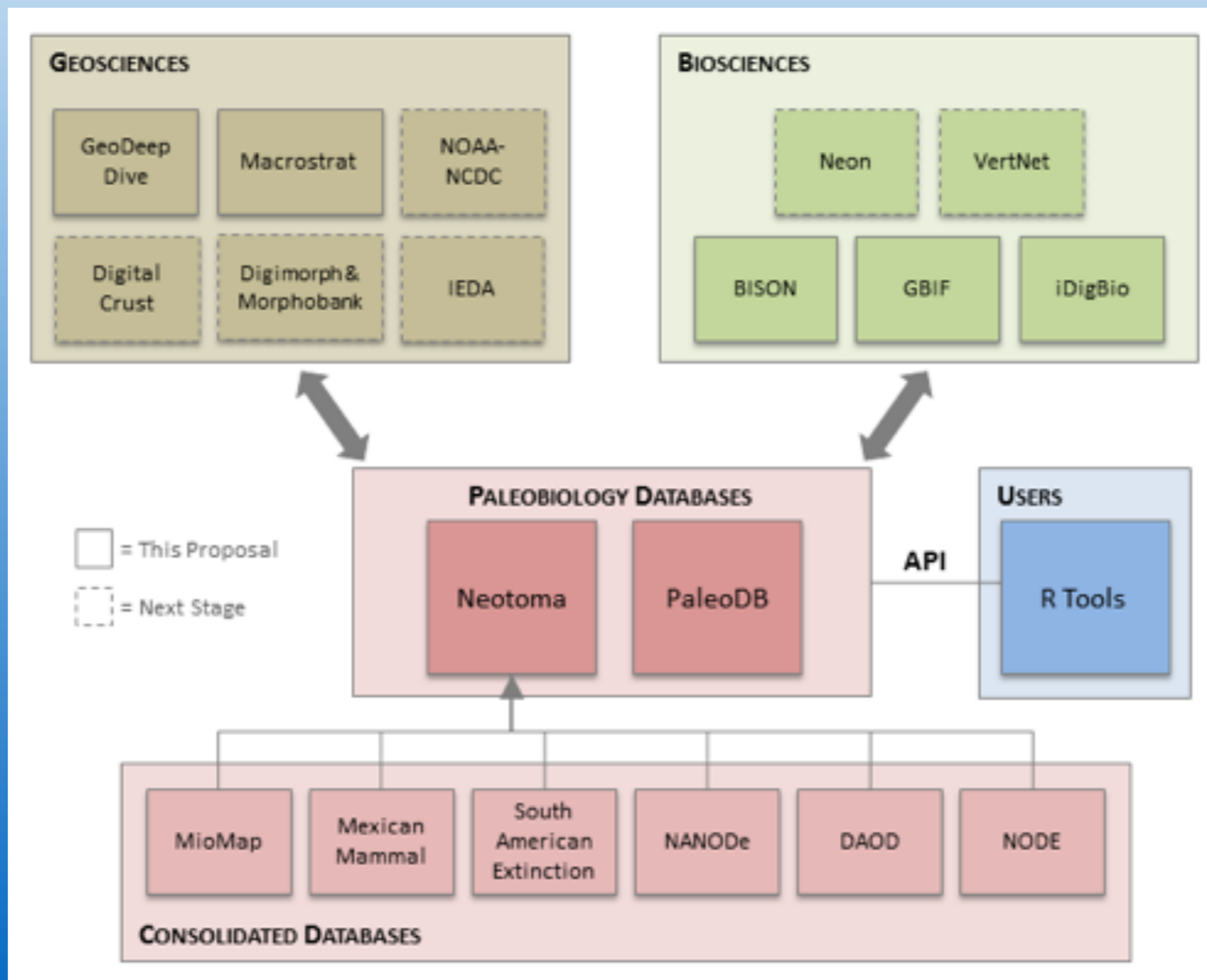


ePANDDA



The goal of both projects is to make data more accessible.

EarthLife Consortium concept map



Consolidate databases with Neotoma

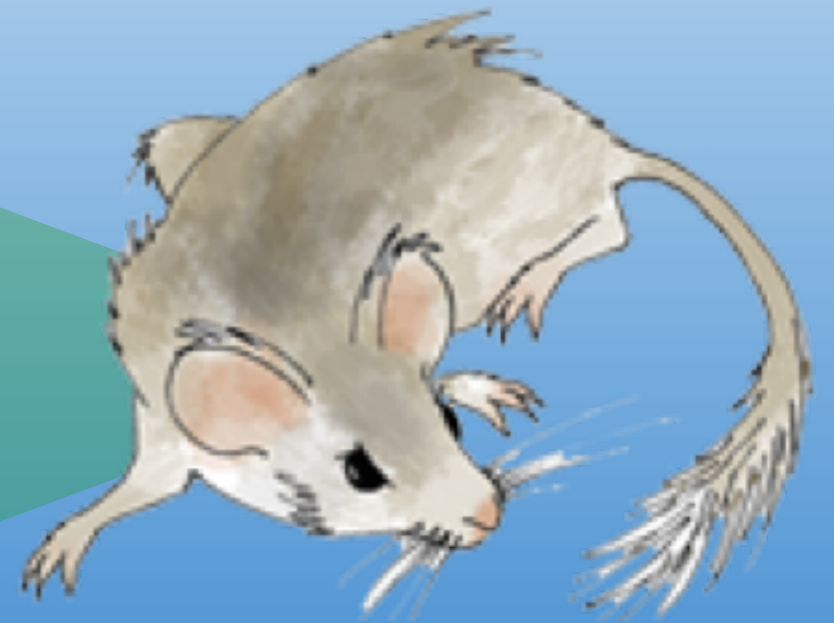
MioMap

Mexican Quaternary
Mammal Database

North American Nonmarine
Ostracode Database

Delorme Autecological
Ostracode Database

Nonmarine Ostracode
Database in Europe



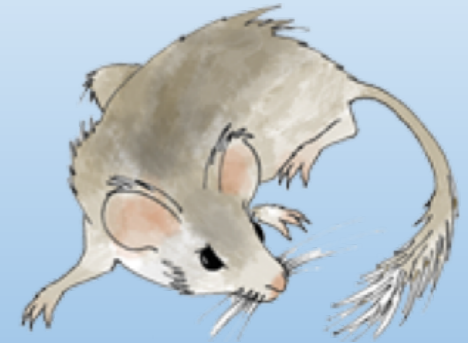
Neotoma

Upload data to GBIF



PBDB

Data Field Crosswalk



Neotoma

PaleoBioDB	Block	PaleoBioDB field name	GBIF field name	Output table	GBIF Term Link	DWC Term Link	Neotoma Variable Name	Neotoma Table	Choice of DwC	Comments
occurrence	basic	occurrence_no	occurrenceID	occurrences, identificatio	http://tools.gbif.org	http://terms.tdwg.org	AnalysisUnitID + TaxonID	AnalysisUnits	occurrenceID	Combinatio
occurrence	basic	record_type: "Occurrence"	type	occurrences	http://tools.gbif.org	http://terms.tdwg.org	"Dataset" or "Occurrence"		dcterms:type	Check PBD
occurrence	basic	collection_no	collectionID	occurrences	http://tools.gbif.org	http://terms.tdwg.org	AnalysisUnitID	AnalysisUnits	datasetID	Some poter
			datasetID	occurrences	http://tools.gbif.org	http://terms.tdwg.org	DatasetID			
			associatedTaxa	occurrences	http://tools.gbif.org	http://terms.tdwg.org			associatedTaxa	This can be
occurrence	basic	accepted_name	scientificName	occurrences	http://tools.gbif.org	http://terms.tdwg.org	TaxonName	Taxa	ScientificName	Neotoma d
occurrence	basic	accepted_rank	taxonRank	occurrences	http://tools.gbif.org	http://terms.tdwg.org	n/e			
occurrence	basic	accepted_no	taxonConceptID	occurrences	http://tools.gbif.org	http://terms.tdwg.org	n/e			
occurrence	basic	accepted_attr	scientificNameAuthorship	occurrences	http://tools.gbif.org	http://terms.tdwg.org	Author	Taxa		
occurrence	basic	reid_no	identificationID	identifications	http://tools.gbif.org	http://terms.tdwg.org	n/e			No Neotom
occurrence	basic	identified_name	scientificName	identifications	http://tools.gbif.org	http://terms.tdwg.org	TaxonName	Taxa	scientificName	
occurrence	basic	identified_rank	taxonRank	identifications	http://tools.gbif.org	http://terms.tdwg.org	n/e			Many morp
occurrence	basic	identified_no	taxonID	identifications	http://tools.gbif.org	http://terms.tdwg.org	TaxonID	Taxa	scientificNameID	
occurrence	basic	early_interval	earliestAgeOrLowestStage	occurrences	http://tools.gbif.org	http://terms.tdwg.org	CalAgeOlder	RelativeAges	earliestAgeOrLowestStage	
occurrence	basic	late_interval	latestAgeOrHighestStage	occurrences	http://tools.gbif.org	http://terms.tdwg.org	CalAgeYounger	RelativeAges	latestAgeOrHighestStage	
occurrence	basic	early_age	no corresponding field		http://tools.gbif.org		AgeOlder	SampleAges	earliestAgeOrLo	Changed fr
occurrence	basic	late_age	no corresponding field		http://tools.gbif.org		AgeYounger	SampleAges	latestAgeOrHigh	Changed fr
occurrence	basic	ref_author	recordedBy	occurrences	http://tools.gbif.org		ContactName	Contacts		This can be



GBIF

PaleoAPI

PaleoAPI

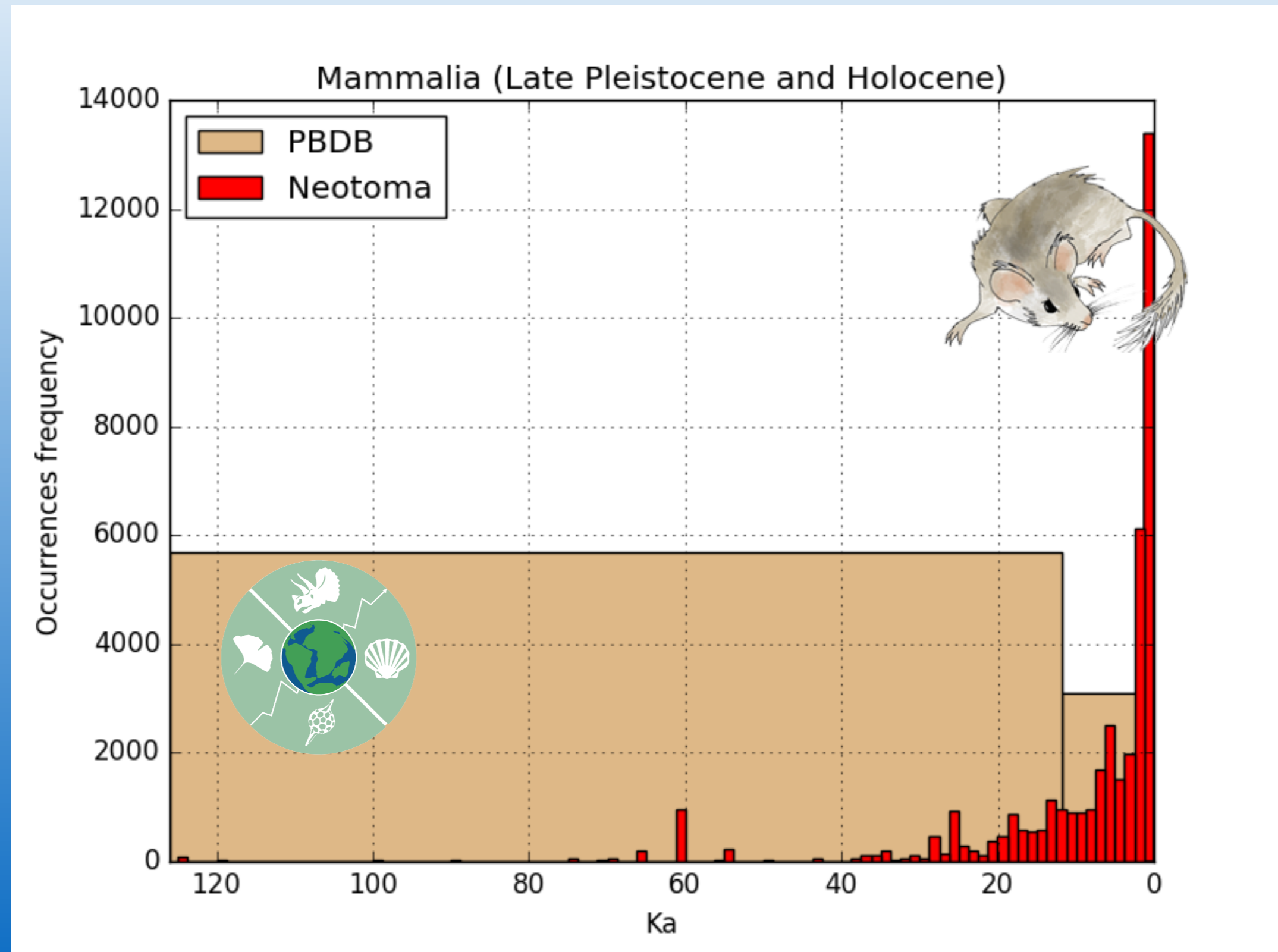
Development of a common application programming interface to enable the simultaneous searching of all paleobiological databases. To explore a preliminary version of this data service, please enter a taxonomic name in the field below and choose to display the raw results on the screen or to download a CSV file suitable for use in a spreadsheet. The resulting data file will include all occurrences from the Paleobiology database followed by occurrences retrieved from the Neotoma Paleocology Database distinguished by the "Database" field. Age ranges may be specified in a selected time unit or left blank to return all occurrences for a given taxon.

Taxonomic Name:

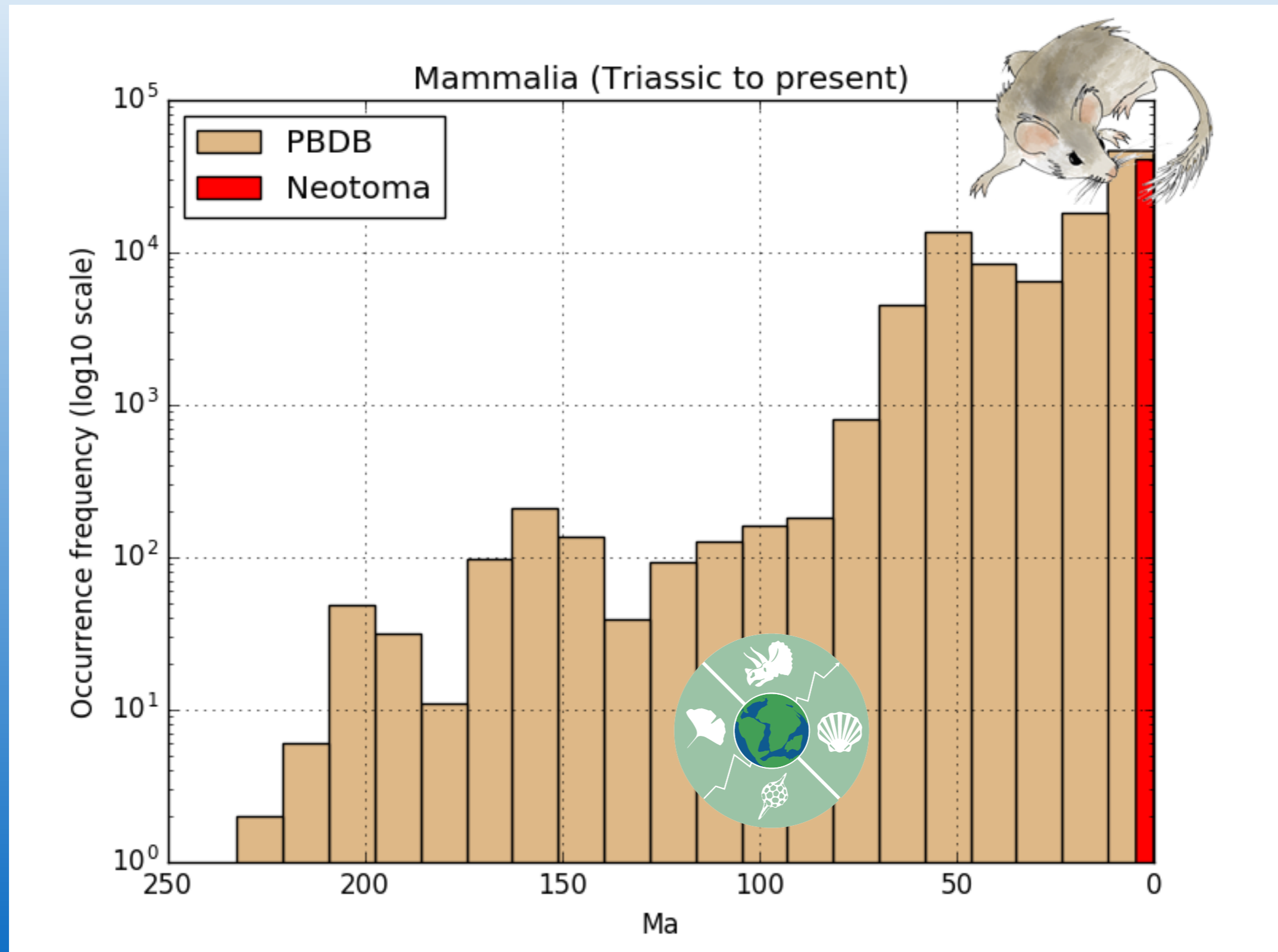
Min Age: Max Age: Units:

query Neotoma and PBDB simultaneously @
earthlifeconsortium.org

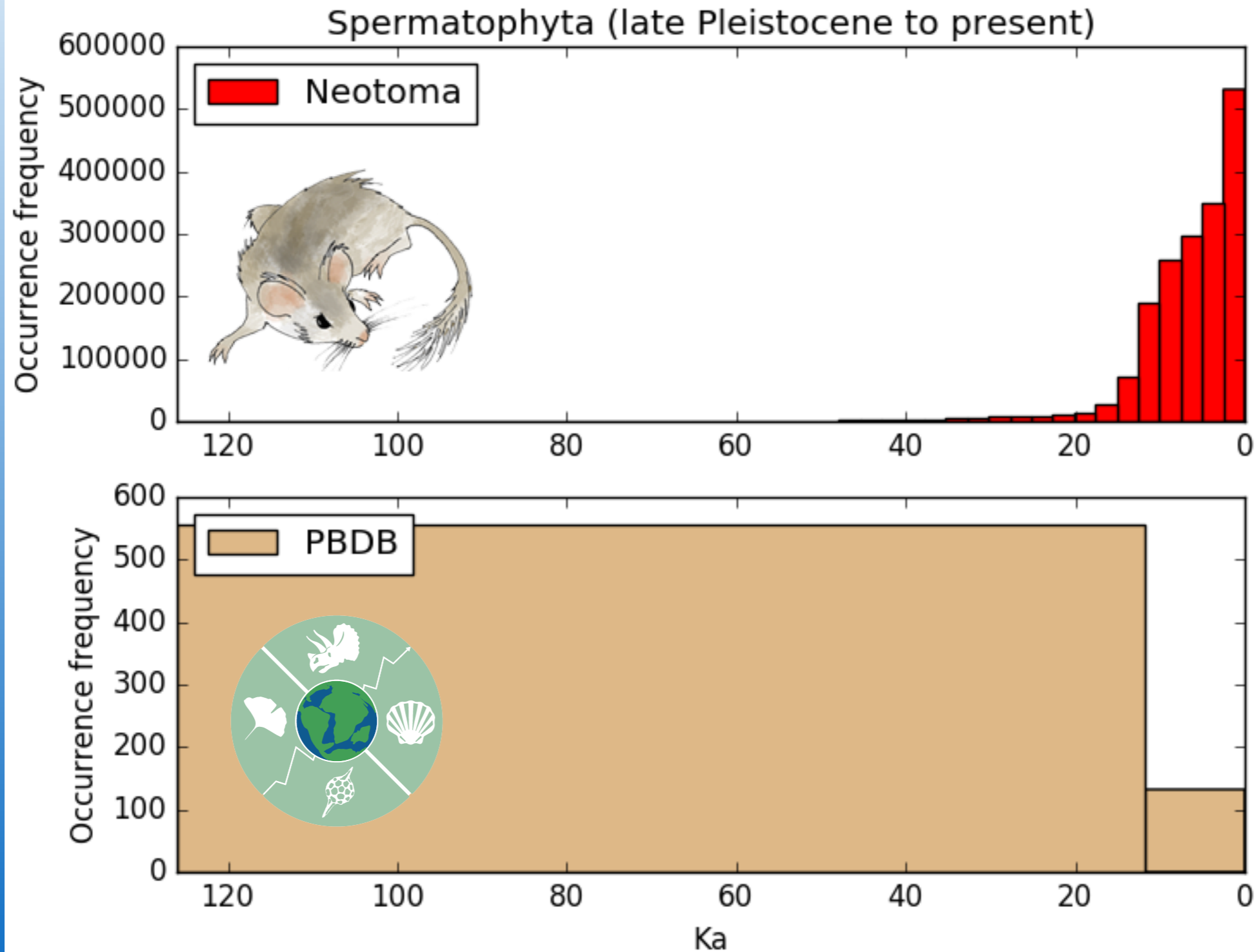
Mammalia, Quaternary focus



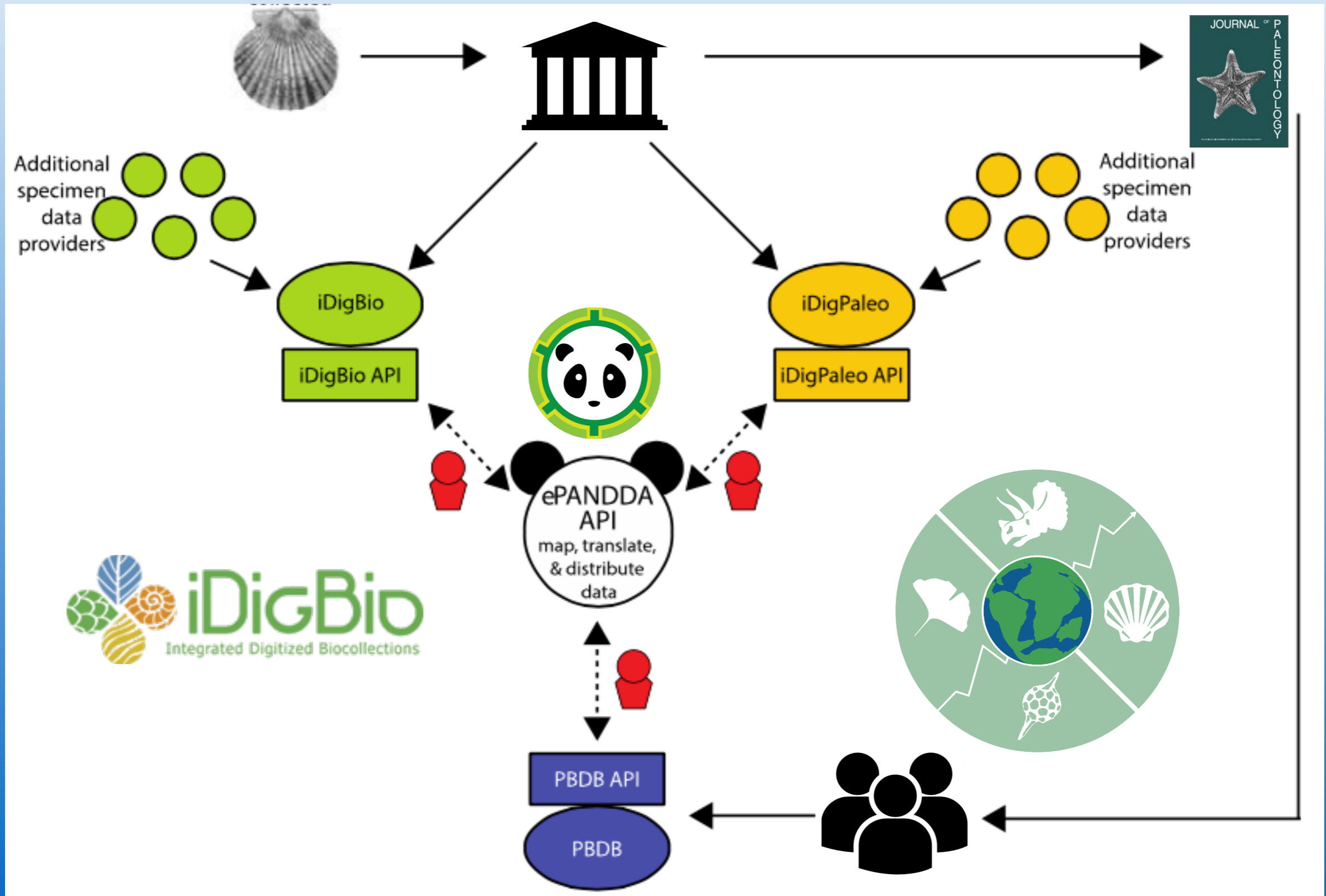
Mammalia, Phanerozoic focus



Spermatophyta



ePANDDDA concept map





iDigBio
Integrated Digitized Biocollections

occurrence
data

specimen
data

PBDB
data

specimen
data

add specimen
fields

compare
data records



Specimen Data Sharing



PBDB

Data Field Crosswalk



iDigBio

PaleoBioDB	Block	PaleoBioDB field name	GBIF field name	Output table	GBIF Term Link	DWC Term Link	Neotoma Variable Name	Neotoma Table	Choice of DwC	Comments
occurrence	basic	occurrence_no	occurrenceID	occurrences, identificatio	http://tools.gbif.org	http://terms.tdwg.org	AnalysisUnitID + TaxonID	AnalysisUnits	occurrenceID	Combinatio
occurrence	basic	record_type: "Occurrence"	type	occurrences	http://tools.gbif.org	http://terms.tdwg.org	"Dataset" or "Occurrence"		dcterms:type	Check PBD
occurrence	basic	collection_no	collectionID	occurrences	http://tools.gbif.org	http://terms.tdwg.org	AnalysisUnitID	AnalysisUnits	datasetID	Some poter
			datasetID	occurrences	http://tools.gbif.org	http://terms.tdwg.org	DatasetID			
			associatedTaxa	occurrences	http://tools.gbif.org	http://terms.tdwg.org			associatedTaxa	This can be
occurrence	basic	accepted_name	scientificName	occurrences	http://tools.gbif.org	http://terms.tdwg.org	TaxonName	Taxa	ScientificName	Neotoma d
occurrence	basic	accepted_rank	taxonRank	occurrences	http://tools.gbif.org	http://terms.tdwg.org	n/e			
occurrence	basic	accepted_no	taxonConceptID	occurrences	http://tools.gbif.org	http://terms.tdwg.org	n/e			
occurrence	basic	accepted_attr	scientificNameAuthorship	occurrences	http://tools.gbif.org	http://terms.tdwg.org	Author	Taxa		
occurrence	basic	reid_no	identificationID	identifications	http://tools.gbif.org	http://terms.tdwg.org	n/e			No Neotom
occurrence	basic	identified_name	scientificName	identifications	http://tools.gbif.org	http://terms.tdwg.org	TaxonName	Taxa	scientificName	
occurrence	basic	identified_rank	taxonRank	identifications	http://tools.gbif.org	http://terms.tdwg.org	n/e			Many morp
occurrence	basic	identified_no	taxonID	identifications	http://tools.gbif.org	http://terms.tdwg.org	TaxonID	Taxa	scientificNameID	
occurrence	basic	early_interval	earliestAgeOrLowestStage	occurrences	http://tools.gbif.org	http://terms.tdwg.org	CalAgeOlder	RelativeAges	earliestAgeOrLowestStage	
occurrence	basic	late_interval	latestAgeOrHighestStage	occurrences	http://tools.gbif.org	http://terms.tdwg.org	CalAgeYounger	RelativeAges	latestAgeOrHighestStage	
occurrence	basic	early_age	no corresponding field		http://tools.gbif.org		AgeOlder	SampleAges	earliestAgeOrLo	Changed fr
occurrence	basic	late_age	no corresponding field		http://tools.gbif.org		AgeYounger	SampleAges	latestAgeOrHigh	Changed fr
occurrence	basic	ref_author	recordedBy	occurrences	http://tools.gbif.org		ContactName	Contacts		This can be



ePANDDA

Enhancing Paleontological and Neontological Data Discovery API

1,489,838 records
API status: OK
Updated: 04 Feb 2017 09:34:22

ABOUT

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SANDBOX

EXAMPLES



ePANDDA Participants Congregate in Boulder (link)

ePANDDA is a collaboration by members of The American Museum of Natural History, Florida State University, George Mason University, STEPPE – Geological Society of America, University of Wisconsin – Madison, and the Yale Peabody Museum of Natural History.

TEAM

PRINCIPAL INVESTIGATORS

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Admin person 3	idsfai@email.com	909.484.5895

NEWS

- <https://www.idigbio.org/content/epandda-new-api-geoscience-database-connectivity> 11 Sep 2015
- <https://steppe.org/epandda-a-new-api-for-geoscience-database-connectivity/> 08 Sep 2015

RESOURCES

- [PaleoBiology Database \(PBD\)](#)
- [iDigBio](#)
- [iDigPalaeo](#)
- [National Science Foundation EarthCube IA](#)



Funded by National Science Foundation EarthCube IA

Award Number 1540902 (Sessa, Landman)
 Award Number 1540700 (Nelson)
 Award Number 1540923 (Uhen)
 Award Number 1540904 (Norris, Butts)
 Award Number 1541028 (Park Boush)

For more information about EarthCube IA, [click here](#).

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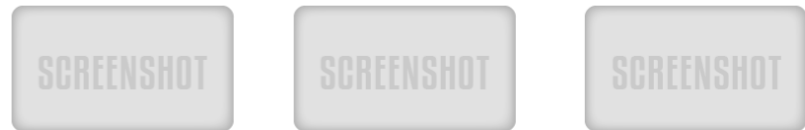
SANDBOX

EXAMPLES

The following are examples of how the ePANDDA API can be utilized to create custom widgets and applications:

Fossils in My Back Yard

Using geographic coordinates or a bounding box, easily view all fossil records for a given location, with optional filters and map component.



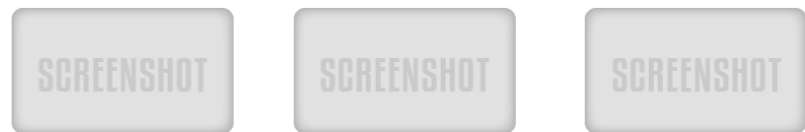
```
<sample code>
```

[HIDE CODE](#)

[COPY](#)

Any Taxon, All Images

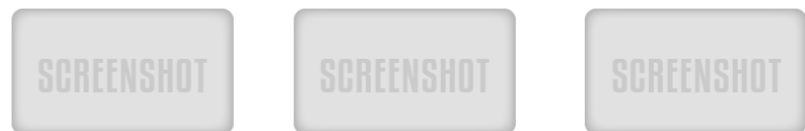
Enter any taxonomic name to access any available images related to it.



[SHOW CODE](#)

Update / Insertion Notification

Create a widget that notifies you whenever an update, deletion or insertion occurs on a collection you are interested in.



[SHOW CODE](#)



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[EXAMPLES](#)

ePANDDA is a new application programming interface (API), created as a collaboration by members of [The American Museum of Natural History](#), [Florida State University](#), [George Mason University](#), [STEPPE - Geological Society of America](#), [University of Wisconsin - Madison](#), and the [Yale Peabody Museum of Natural History](#). Its purpose is to connect The [Paleobiology Database \(PBDB\)](#), [iDigPaleo](#), and [iDigBio](#) and will allow seamless searching and data discovery among the three databases.

NOW SEARCHING:

ARTHROPOD
records

35,092

from the
JURASSIC
period

[VIEW SAMPLE](#)



ePANDDA

Enhancing Paleontological and Neontological Data Discovery API

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- EXAMPLES

ePANDDA is a new application programming interface (API), created as a collaboration by members of [The American Museum of Natural History](#), [Florida State University](#), [George Mason University](#), [STEPPE - Geological Society of America](#), [University of Wisconsin - Madison](#), and the [Yale Peabody Museum of Natural History](#). Its purpose is to connect [The Paleobiology Database \(PDB\)](#), [iDigPaleo](#), and [iDigBio](#) and will allow seamless searching and data discovery among the three databases.

NOW SEARCHING:

ARTHROPOD records **35,092** from the JURASSIC period

VIEW SAMPLE

Check out our [EXAMPLES](#) page to see how you can build applications using the ePANDDA API.



Funded by National Science Foundation EarthCube IA

- Award Number 1540902 (Sessa, Landman)
- Award Number 1540700 (Nelson)
- Award Number 1540929 (Uhen)
- Award Number 1540984 (Norris, Butts)
- Award Number 1541028 (Park Boush)

For more information about EarthCube IA, [click here](#).

VIEW ON GITHUB



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- SANDBOX
- EXAMPLES

ePANDDA

Test-drive our API with an interactive query builder:

Begin typing or select field...	▼	enter search term	text	
Begin typing or select field...	▼	enter search term	integer	—
Begin typing or select field...	▼	select value	predefined values	—

+ ADD FIELD **↻ RESET SEARCH**

Output URL:

<https://search.idigbio.org/v2/search/records/?rq={%22scientificname%22%3A+%22glaucus+atlanticus%22}>



API Response:

```
{
  "itemCount": 20,
  "lastModified": "2017-02-10T14:50:40.517Z",
  "items": [
    {
      "uuid": "9765be91-751e-4574-9a86-a13ebcc5bd31",
      "type": "records",
      "etag": "c0d5c4340d86320562612979176a259de5c3f21b",
      "data": {
        "dwc:specificEpithet": "atlanticus",
        "dwc:county": "Palm Beach County",
        "dwc:recordedBy": "Bishop, M. B.",
        "dwc:order": "Nudibranchia",
        "dcterms:references":
"http://collections.peabody.yale.edu/search/Record/YPM-IZ-016076.GP",
        "dwc:individualCount": "1",
        "dwc:occurrenceID": "urn:uuid:7a5decb5-597f-4d48-b673-d0ee951f3fb3",
        "dcterms:language": "eng",
        "dwc:scientificNameAuthorship": "Forster",
        "id": "urn:uuid:7a5decb5-597f-4d48-b673-d0ee951f3fb3",
        "dwc:stateProvince": "Florida",
        "dcterms:bibliographicCitation": "Glaucus atlanticus (YPM IZ 016076.GP)",
        "dwc:eventDate": "1936-12-24",
        "dwc:institutionCode": "YPM",
        "dwc:country": "USA",
```





ePANDDA

Enhancing Paleontological and Neontological Data Discovery API

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EXAMPLES

Test-drive our API with an interactive query builder:

Begin typing or select field... text

Begin typing or select field... integer

Begin typing or select field... predefined values

[+ ADD FIELD](#) [RESET SEARCH](#)

Output URL:

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API Response:

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{
  "itemCount": 20,
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  "items": [
    {
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      "type": "records",
      "etag": "c0d5c4340d86320562612979176a259de5c3f21b",
      "data": {
        "dwc:specificEpithet": "atlanticus",
        "dwc:county": "Palm Beach County",
        "dwc:recordedBy": "Bishop, M. B.",
        "dwc:order": "Nudibranchia",
        "dcterms:references": "http://collections.peabody.yale.edu/search/Record/YPM-IZ-016076.GP",
        "dwc:individualCount": "1",
        "dwc:occurrenceID": "urn:uuid:7a5decb5-597f-4d48-b673-d0ee951f3fb3",
        "dcterms:language": "eng",
        "dwc:scientificNameAuthorship": "Forster",
        "id": "urn:uuid:7a5decb5-597f-4d48-b673-d0ee951f3fb3",
        "dwc:stateProvince": "Florida",
        "dcterms:bibliographicCitation": "Glaucus atlanticus (YPM IZ 016076.GP)",
        "dwc:eventDate": "1936-12-24",
        "dwc:institutionCode": "YPM",
        "dwc:country": "USA",
      }
    }
  ]
}
```



Want to see this code in action? Check out our [EXAMPLES](#).

Want to learn more about the API? Why not read the [REFERENCE](#) page!



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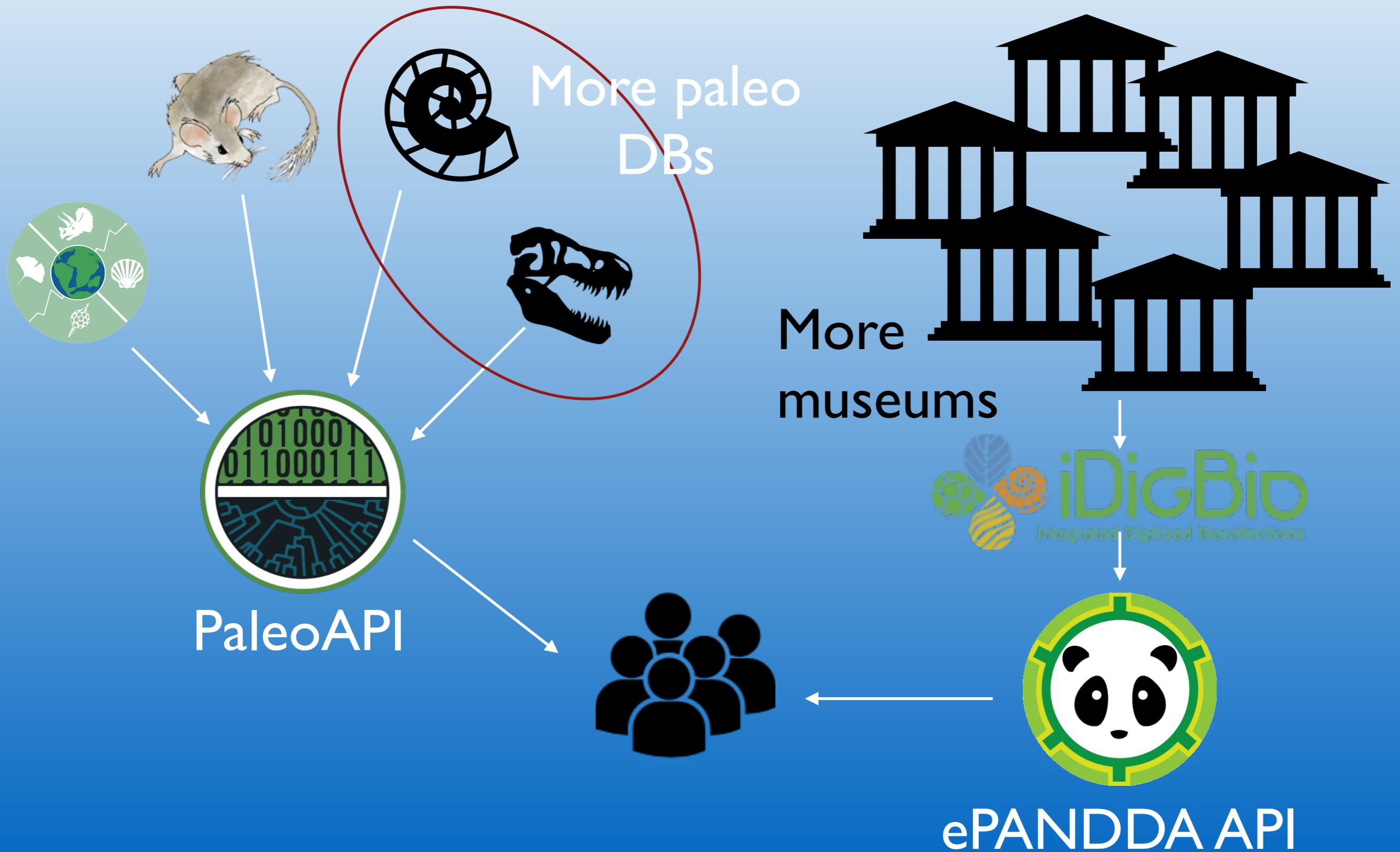
REFERENCE

SANDBOX

EXAMPLES

ePANDDA

Future Expansion



Acknowledgements



Jessica Blois
Russ Graham
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Allison Smith
Jack Williams



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Noel Heim
Julian Jenkins
Michael McClennen
Valerie Syverson



Susan Butts
Talia Karim
Gil Nelson
Christopher Norris
Jocelyn Sessa
Dena Smith



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