EPICC TCN

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Eastern

Pacific

Invertebrate

Communities of the

Cenozoic

66 million years of marine invertebrate evolution in the Pacific

Collaborators

2018-2020
PEN

Progress

- Specimen data digitized:

  1.52M/1.61M records 95%

  but only 15% to iDigBio
- Localities georeferenced: 22k/32.6k -- 67%
- Specimens photographed: 114k/83k -- 140%

Additional Products at epicctcn.org

Protocols:

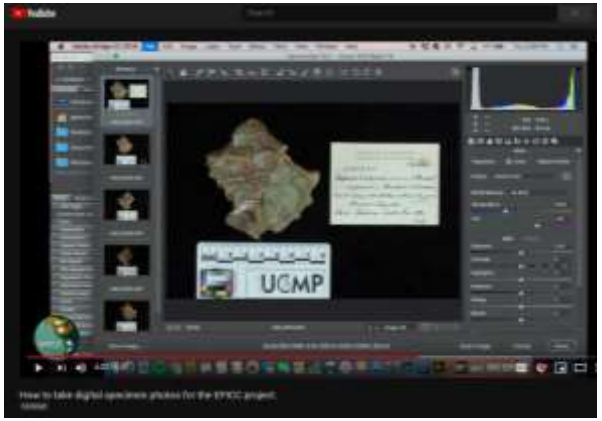
How to take digital photos for the EPICC project [YouTube]

StackShot Method for photographing fossil specimens [PDF]

Standard views of invertebrates for photography [PDF]

Standard methods of labeling marine invertebrates [PDF]

Using GEOLocate for Collaborative Georeferencing [PDF]



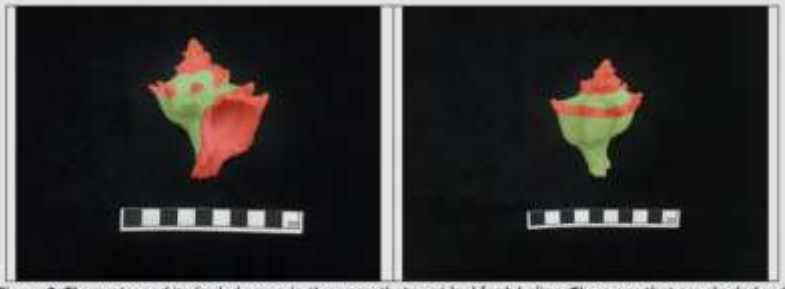


Figure 2. The gastropod is shaded green in the areas that are ideal for labeling. The areas that are shaded red should be avoided when labeling if possible.

For sharing training across network and with new PENs
Sufficiently general for use across many types of collections
Written by students doing the work

Virtual Field Experiences launch

Lesson learned:

Your data won't be what you think they are

UCMP ≠ 

Flag: image replaced

Ammonoidea

Ammozoides

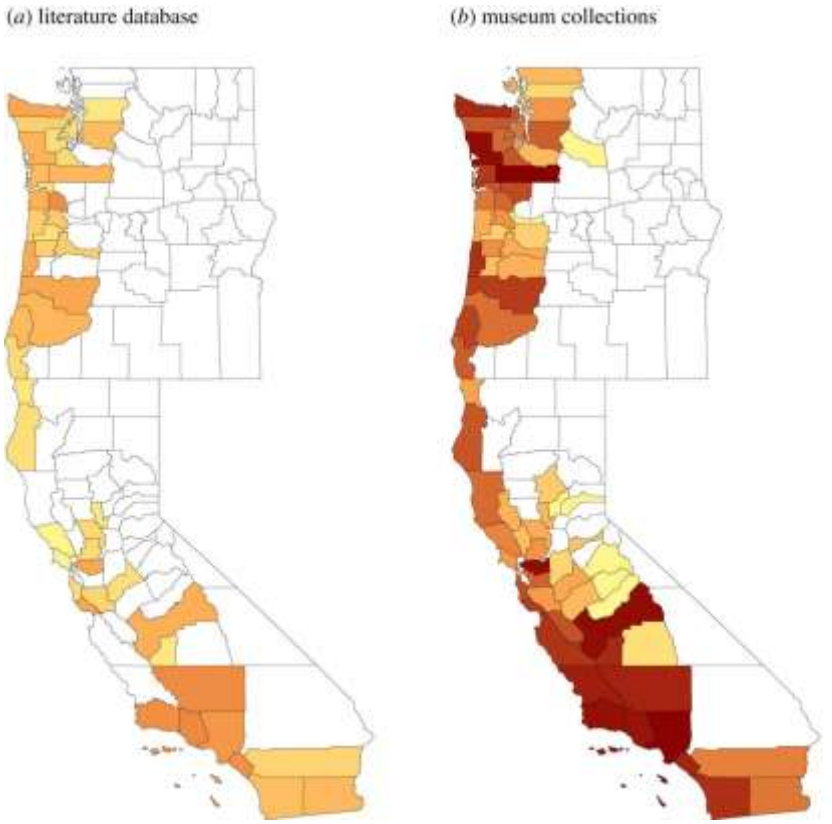
- Data cleaning is mostly a good thing.
- Aggregator data cleaning has not always been.
  - Filling in of taxonomic ranks can create fake occurrence data and muddied results
  - Taxonomic backbones will never be complete or as current as museum data may be

Lesson learned

Lack of transparency is a key problem.

- Tens of thousands of records being modified
- No clear signals to users what they are necessarily searching
- Flags don't provide sufficient feedback on why changes made (e.g., taxon updates vs. typos; exact matches vs. fuzzy matches) to be useful to providers
- Close matches of indeterminate fossils matched to living relatives are particularly problematic (e.g., e.g., *Polinices* sp. becoming *Polinices immaculatus*,)

Quantifying "dark data"



Question: How much more is gained when we invest in collections?

Published record vs. EPICC holdings

23x more localities (faunas) in EPICC institutions than recorded in the literature

Marshall et al. 2018. Quantifying the dark data in museum fossil collections as palaeontology undergoes a second digital revolution. Biology Letters. DOI: 10.1098/rsbl.2018.0431

A popular treatment can spread to many more outlets …

Scientists quantify the vast and valuable finds stored on museum shelves

Quantifying 'dark data' in fossil collections is a call to arms; heralds a digital revolution

ScienceDaily

Your source for the latest research news

Dark Data: The Vulnerable Treasures Sitting On Museum Shelves

Discover

SCIENCE FOR THE CURIOUS

We're Hardly Using Any of Our Fossils

The vast majority are languishing in museum storage. Is it time to dig them up all over again?

Atlas Obscura

salon

NEWS & POLITICS | ECONOMY & INNOVATION | CULTURE | SCIENCE & HEALTH | FOOD

Digitizing the vast "dark data" in museum fossil collections

With a lot not on display, museums may not even know all that's in their vast holdings

The Washington Post

Democracy Dies in Darkness

Health & Science

The precious scientific artifacts that will never see the light of day

Acknowledgments

- PIs, students, staff and volunteers of EPICC
- iDigBio staff and trainings
- NSF DBI awards 1502500, 1503065, 1503545, 1503611, 1503613, 1503628 and 1503678

Sept. 2018 TCN meeting in Berkeley, Calif.

Developing Stratigraphic References

ELIZABETH A. NESBITT (2018). Cenozoic Marine Formations of Washington and Oregon: an annotated catalogue.

Building a Taxonomic Dictionary

- Existing sources of paleontological taxonomy incomplete, not intended for use as backbone
- Building dictionary based on primary literature
- Can be incorporated in GBIF backbone as checklist upon completion
- A.J.W. Hendy and C. Souto et al.; 6400 rows currently

KINGDOM	PHYLUM	CLASS	ORDER	FAMILY	GENUS	SUBGENUS	SPECIES	AUTHOR	ORIGINAL	SYNONYMS
Animalia	Mollusca	Gastropoda		Acmaeidae	*Acmaea*		*mitra*	Rathke, 1833	*Acmaea mitra*	*Acmaea mitra*
Animalia	Mollusca	Gastropoda	Cephalaspide	Acteocinidae	*Tornastra*		*cerealis*	(Gould, 1853)		*Tornastra cerealis*
Animalia	Mollusca	Gastropoda	Cephalaspide	Acteocinidae	*Tornastra*		*culcitella*	(Gould, 1853)		*Acteocina culcitella,*
Animalia	Mollusca	Gastropoda	Cephalaspide	Acteocinidae	*Acteocina*		*eximia*	(Baird, 1863)		*Acteocina eximia*
Animalia	Mollusca	Gastropoda	Cephalaspide	Acteocinidae	*Acteocina*		*harpa*	(Dall, 1871)		*Coleophysis harpa*
Animalia	Mollusca	Gastropoda	Cephalaspide	Acteocinidae	*Acteocina*		*inculta*	(Gould, 1855)		*Acteocina inculta*
Animalia	Mollusca	Gastropoda	Cephalaspide	Acteocinidae	*Tornastra*		*infrequens*	(Adams, 1852)		*Acteocina anomala*
Animalia	Mollusca	Gastropoda	Cephalaspide	Acteocinidae	*Acteocina*		*oldroydi*	Dall, 1925	*Acteocina old*	*Acteocina oldroydi*