

The background of the slide is a close-up photograph of a dark, greyish-brown sedimentary rock matrix. Embedded throughout the matrix are numerous fossilized shells of marine organisms, likely brachiopods or bryozoans. The fossils are light-colored, ranging from off-white to light tan, and show various shapes, including circular, oval, and elongated forms. Some fossils are clearly visible as cross-sections, showing internal structures like brachidia or zooecial tubes. The overall texture is granular and slightly uneven.

EPICC TCN

CHRISTINE GARCIA, TCN PROJECT COORDINATOR, CALIFORNIA ACADEMY OF SCIENCES (CAS)
CHARLES MARSHALL, PI; ASHLEY DINEEN, PROJECT MANAGER
UNIVERSITY OF CALIFORNIA MUSEUM OF PALEONTOLOGY (UCMP)

Eastern Pacific Invertebrate Communities of the Cenozoic

Goal: Digitize **1.6** million marine invertebrate fossils (i.e., crustaceans, bivalves, echinoderms, and gastropods) from the Cenozoic of the Pacific Coast



| Era | Period | Epoch (start mya) | | |
|----------|------------|-------------------|-----------|------|
| Cenozoic | Quaternary | Holocene | 0.01 | |
| | | Pleistocene | 2.6 | |
| | Tertiary | Neogene | Pliocene | 5.3 |
| | | | Miocene | 23.0 |
| | | Paleogene | Oligocene | 33.9 |
| | Eocene | | 55.8 | |
| | | Paleocene | 65.5 | |



Collaborators

A map of North America is shown with several logos overlaid, indicating collaborative institutions. The logos include:

- UNIVERSITY OF ALASKA MUSEUM OF THE NORTH** (top left)
- Burke MUSEUM** (center)
- PALEONTOLOGICAL RESEARCH INSTITUTION** (right)
- UCMP** (middle left)
- MUSEUM OF NATURAL AND CULTURAL HISTORY** (middle left)
- UCRIVERSIDE UNIVERSITY OF CALIFORNIA** (bottom left)
- CALIFORNIA ACADEMY OF SCIENCES** (bottom left)
- NATURAL HISTORY MUSEUM LOS ANGELES COUNTY** (bottom center)
- Smithsonian National Museum of Natural History** (bottom right)
- the nat | SAN DIEGO NATURAL HISTORY MUSEUM** (bottom left)
- THE COOPER CENTER** (bottom center)
- The Academy of Natural Sciences of DREXEL UNIVERSITY** (far right)

Goals met

- *Specimens digitized:*
1.94 million (122% of goal)
- *Available in iDigBio:*
1.79 million (113%)
- *Specimens photographed:*
137,200 (164%)
- *Localities georeferenced:*
48,000 (136%) and counting...

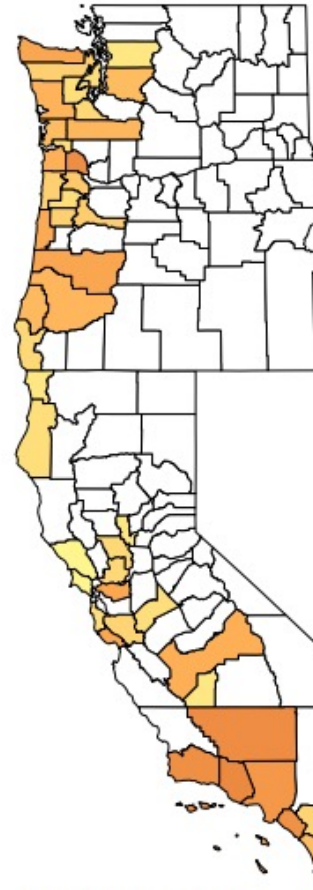


Fundamental Advance

TCN enabled us to reveal the dark data in our museum collections –
**furthering the second digital
 revolution in paleontology**

- *23x that of the PBDB*
- *Next: how does taxonomic coverage measure up?*

(a) literature database



(b) museum collections

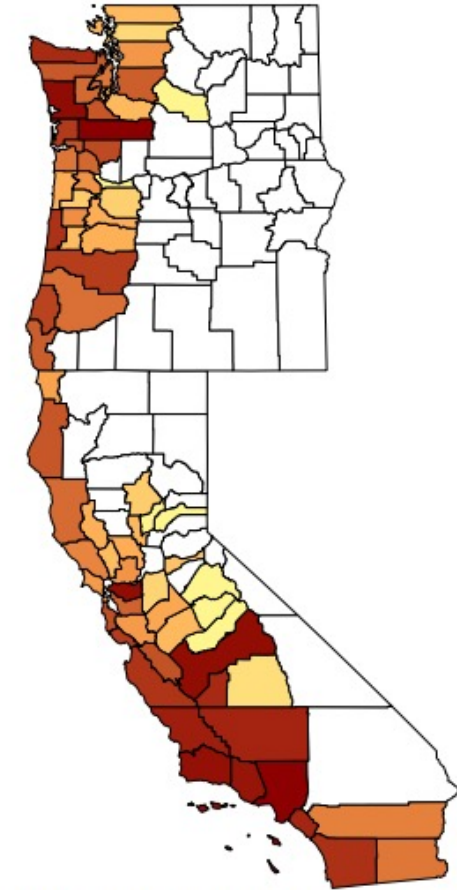
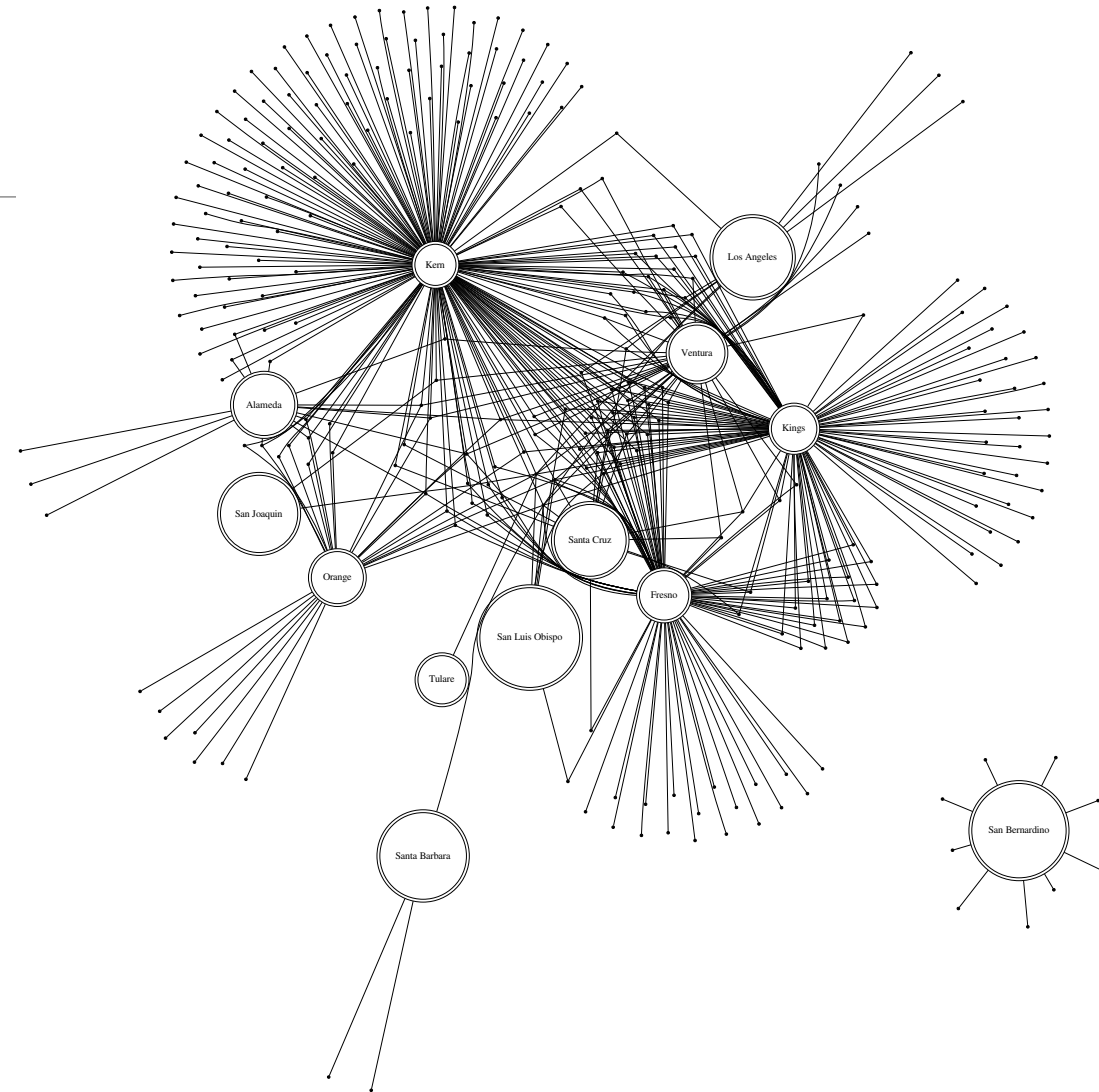


Figure 1. Visualization of the 23-fold increase in digitally accessible Cenozoic marine invertebrate palaeontological collection sites (26 059) from museum collections compared with the number of collection sites (1139) from literature data currently entered into the PBDB (<https://paleobiodb.org/>) for California, Oregon and Washington. (a) Number of sites per county currently included in the PBDB (<https://paleobiodb.org/>); (b) number of sites per county now digitally mobilized across nine institutions of the EPICC TCN (<https://epicc.berkeley.edu/>). The number of sites per county for each map are provided in the Supplemental_Data.csv file deposited in the Dryad data repository (doi:10.5061/dryad.j0r8127) [11].

Research enabled by TCN

1. Latitudinal and temporal change in functional diversity and food web structure at key climatic intervals
2. Paleocommunity reconstructions and investigations into paleoecology, biogeography of myriad taxa
3. Sampling biases of invertebrate vs. vertebrate localities
4. Biogeographic history of Alaskan terranes
5. Unravelling Cenozoic formations of CA, WA, OR



Virtual Field Experience (VFE)

- Four exceptional fossil deposits
- Immersive teaching aids: **from the field to museum to research discoveries**




A virtual field experience

Explore Fossils - Past lives of the Kettleman Hills


Fossils of the Amnicola Zone

The fossils on view in photograph 4, to the right, are all shells of the snail *Amnicola* from the museum collections at UC Berkeley. The shells are abundant in many of the sandy layers of the formation and a hand sample of the sandy layer is shown in photograph 5 below.

Look closely at shells of *Amnicola* and other small shells show in photograph 6 below. How do these shells compare with fossil snails you viewed in the Etchegoin Formation? Before you move to the final section, see Lisa White describe fossils from the Amnicola Zone in this video clip.




Amnicola Zone, photograph 5



A Story Map

Explore fossils from the Central California Coast - Tales from two beaches

Visit most any beach in the world and you'll find some common features. As you examine the photos to the right and below, describe some things you notice that are typical of beaches?



sea-3565636_1920.jpg



Lessons Learned

1. Regular and *open* communication key
2. Leverage institutional strengths, uniqueness (collections *and* expertise)
3. Good data > “perfect” data
4. Make room for professional growth (early career, student)
5. Be flexible!

STANDARD VIEWS OF MARINE INVERTEBRATES FOR PHOTOGRAPHY
A basic guide to imaging EPICC specimens
Version II: 3/29/2016

MUSEUM NATURAL CULTURAL HISTORY EPICC

Using GEOLocate for Collaborative Georeferencing
By Eva M. Biedron and Nicholas A. Famoso

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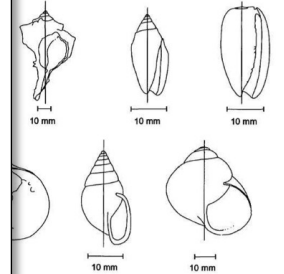
University of Oregon
Museum of Natural and Cultural History
3 December 2016

This is a collection of workflows for using the GEOLocate's online collaborative georeferencing portal developed by Nelson Riese <nriese@tulane.edu> at the Tulane University Biodiversity Institute. Product produced for the EPICC TCN.

aid the technician in capturing the most diagnostic views of marine invertebrates, a uniform approach to specimen imaging across institutions of the exhaustive, and depending on the nature of their use, many invertebrate additional diagnostic views (see references herein). Furthermore, this is a list of additional views that will be made throughout the progression of this grant.

Some Common EPICC Taxa

For aperture parallel to the lens (to avoid distortion of shape), the anterior end at bottom of image. The axis of coiling should be vertically centered in the image. The axis of coiling should be vertically centered in the image.



Osseleur and Grosjean, 2000

TCN, and was primarily produced by Vicki Deng and Christine Garcia of the California Academy of Sciences. Comments or questions? Please direct them to vgarcia@calacademy.org



Unexpected Impacts

1. **New museum positions**
2. **Increased visibility of collections at some institutions** (including returned overhead)
3. **New coordination to resolve difficult data** (formation use, taxonomic assignments, TDWG representation)
4. **Proven workflows, impacts leveraged for further funding of collections** (internal, external)

PaleoBios 35:1–20, January 12, 2018

PaleoBios

OFFICIAL PUBLICATION OF THE UNIVERSITY OF CALIFORNIA MUSEUM OF PALEONTOLOGY



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

Cover photo: Pysht Formation strata exposed along the Strait of Juan de Fuca, Washington State. Photo taken by Ruth A. Martin.
Citation: Nesbitt, E.A. 2018. Cenozoic Marine Formations of Washington and Oregon: an annotated catalogue. *PaleoBios*, 35. ucmp_paleo-bios_37565.



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