Paleoniches
digitizing fossils to enable new syntheses in biogeography

Una Farrell, iDigBio Summit 2014
Project Aims

Create a spatial database suitable for investigating long term effects of climate change - paleo-biogeographic studies and paleo-ecological niche modeling.

Outreach component: resources for fossil identification, classroom/lab worksheets, museum displays and activities.
3 major time periods/biogeographic regions: Ordovician, Pennsylvanian, and Neogene

~546,000 invertebrate fossils
~20,000 localities
8 institutions
UT Austin-NPL PEN progress year two:

- **Ordovician**
  - 2282 records-6700 specimens
  - 1132 georeferenced

- **Carboniferous**
  - 14115 records-42000 specimens
  - 3630 georeferenced

- **Paleogene/Neogene**
  - 22000 records- 66000 specimens
  - 7100 georeferenced

- **Quaternary**
  - 12310 records- 37000 specimens
  - 3913 georeferenced

- **Images**
  - 3k attached in Specify
  - 10k imaged awaiting attachment
  - 20k (type & figured) attached in PaleoCentral.org

- **Web**
  - PaleoCentral.org with deep time mapping in beta testing
Orthida
Digital Atlas of Ancient Life

Welcome!

The Digital Atlas of Ancient Life is an online "field guide" to help you learn about and identify fossils. Start your visit via the links below.

Learn  Explore  Identify

Neogene  Pennsylvanian  Ordovician

Tweets

Paleo Digital Atlas @PaleoDigAtlas
#FossilFriday Long neck plesiosaur at the @AMNH pic.twitter.com/yybC73Imq5

Tweet to @PaleoDigAtlas
Families of Gastropoda present in the Neogene of the Southeastern United States

<table>
<thead>
<tr>
<th>Bursidae</th>
<th>Conidae</th>
<th>Fascioliariidae</th>
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<td>Ranellidae</td>
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<td>Anadara crassicosta</td>
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</table>
Acrosterigma dalli

Phylum: Mollusca
Class: Bivalvia
Family: Cardiidae
Genus: Acrosterigma
Species: Acrosterigma dalli (Heilprin, 1886)

Geological Range
Late Pliocene to Early Pleistocene; Extinct.

Paleogeographic Distribution
Southern Florida.

Stratigraphic Occurrences
- Early Pleistocene
  - Caloosahatchee Formation (S. FL)
- Late Pliocene
  - Tamiami Formation (Pinecrest Beds) (S. FL)
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Atlas in progress

113 species live! Check back frequently for updates

A tool for exploring the diversity, systematics, biogeography, and stratigraphy of Late Ordovician fossils of the Cincinnati, Ohio region

Kope through Bellevue strata, Maysville, KY

Enter the Atlas
Vinlandostrophyia annieana

Classification
- Phylum: Brachiopoda
- Class: Rhynchonellata
- Order: Orthida
- Family: Platystrophiidae
- Genus: Vinlandostrophyia
- Species: Vinlandostrophyia annieana
  (Foerste, 1910)

Taxonomic Details

Stratigraphic Occurrences

<table>
<thead>
<tr>
<th>Locality</th>
<th>Stage/FM</th>
<th>Age</th>
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<td>C6</td>
<td>Bull Fork Formation</td>
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<tr>
<td>Ellsmore</td>
<td>C5</td>
<td>Liberty</td>
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<td>Sallada</td>
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<tr>
<td>Rowland</td>
<td>C1</td>
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</table>

Paleoecology
- Extant/Extinct
- Native/Invader
- Stationary/Mobile
- Colonial/Solitary

Habitat indicated in green
Oceans of Ohio 5E Unit

Alycia L. Stigall, Ohio University

Description: Students will examine fossils and reconstruct the environment of the Cincinnati, Ohio region 450 million years ago.

Standards Targeted:
- LS4: Earth’s Living History – Using fossil evidence and living organisms to observe that suitable habitats depend on a combination of biotic and abiotic factors
- LS4: Earth’s Living History – Fossils can be compared to one another and to present day organisms according to their similarities and differences
- LS5: Interactions within Ecosystems – Organisms perform a variety of roles in an ecosystem
- LS7: Cycles of matter and flow of energy – Matter is transferred continuously between one organisms and another and between organisms and their physical environments
- LS7: Cycles of matter and flow of energy – In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors
- ESS8: Physical Earth – Evidence of the dynamic changes of Earth’s surface through time is found in the geologic record
- LS8: Species and Reproduction – Diversity of species occurs through gradual processes over many generations. Fossil records provide evidence that changes have occurred in number and types of species
- LS8: Species and Reproduction – Reproduction is necessary for the continuation of every species
- LS8: Species and Reproduction – The characteristics of an organism are a result of inherited traits received from parent(s)

Skills Targeted: Observe fossil data, classify organisms, reconstructing ancient environments
Introduction to the Trilobites: Morphology, Macroevolution and More

An undergraduate laboratory exercise by Michelle M. Casey and Bruce S. Lieberman

Cincinnati Under the Sea
Now open through Nov. 9
EVO kiosk – Yale Peabody PEN

- SciCORPS Interpreters to draw people in
  - Do you want to look at/touch some real fossils
  - Do you know what type of fossil animal it is?

- Ordovician assemblage
Hystriculina 315 Ma – 290 Ma

UTIG Plate Model,
PaleoWeb for ArcMap,
The Rothwell Group, L.P.
Acknowledgements

• PIs: Jon Hendricks (SJSU), Alycia Stigall (OU), Ann Molineux (UT), Derek Briggs (YPM)

• Jim Beach (KU), Kendall Hauer (MUGM), Roger Portell (FLMNH), Brenda Hunda (CMC), Susan Butts (YPM), Jess Utrup (YPM), Liath Appelton (UT), Michelle Casey (post doc, KU)


• iDigBio Georeferencing Working Group, iDigBio Paleodigitization group

• Theresa Miller, Andy Bentley and Specify staff

• Talk material: Michelle Casey, Jon Hendricks, Susan Butts, Ann Molineux