Catalyzing Collections Digitization & Research Using Comprehensive Specimen Inventories

Lindsay Walker, Austin Hendy, & Katy Estes-Smargiassi
Natural History Museum of Los Angeles County
Invertebrate Paleontology (LACMIP)
March 28, 2017
LACMIP 2015-19

Current
1. EPICC
2. CSBR

Pending
3. Fossil Insect PEN
4. ePANDDA (test case)
LACMIP 2015-19

Current

1. EPICC
   - ~4,000,000 spms
   - 828,000 spms (digitize)
2. CSBR
   - ~1,200,000 spms (rehouse)
   - 126,000 spms (digitize) from “Cretaceous Seas”

Pending

3. Fossil Insect PEN ~17,000 spms (digitize)
Goals

1. Document/quantify collections
2. Improve digitization efficiency
3. Facilitate potential research
A CURATORIAL ASSESSMENT FOR STRATIGRAPHIC COLLECTIONS TO DETERMINE SUITABILITY FOR INCORPORATION INTO A SYSTEMATIC COLLECTION

SUSAN H. BUTTS, JESSICA A. BAZELEY, AND DEREK E. G. BRIGGS

1Division of Invertebrate Paleontology, Peabody Museum of Natural History, Yale University, 170 Whitney Avenue, PO Box 208118, New Haven, CT 06520-8118
2Department of Geology and Geophysics, Yale University, 210 Whitney Avenue, PO Box 208109, New Haven, CT 06520-8109

Abstract.—The Schuchert Collection of the Yale Peabody Museum, Division of Invertebrate Paleontology (YPM-IP) Schuchert Brachiopod Collection is one of the largest brachiopod collections in North America and is the most heavily used collection in the division. A recently completed project involved the incorporation of large portions of the YPM-IP stratigraphic collection into our systematic collection, including cataloging, georeferencing, photography, and improvement of long-term storage conditions. A significant development in this project was the creation of a curatorial assessment to inventory and prioritize those components of the collection better suited for incorporation into the division’s systematic collection and to create a hierarchy for removal of this component.

The following factors were considered: presence/absence of specimen data (locality or accession), bulk content (graded on a continuum with 1.0 representing individual fossils free from matrix and 0 representing bulk rock), percentage brachiopods, percentage of specimens with taxonomic determinations, and percentage with specific locality information. The output of the survey rates individual drawers with scores ranging from 0 to 100: 100 represents drawers that were ideal candidates for incorporation into the systematic collection, and 0 represents material more suited to a stratigraphic arrangement. Although the equation was developed specifically for the particular needs of this project and the collection strengths of the YPM-IP division, it is easily customized for a wide range of cross-disciplinary and highly specific collection applications.

Butts et al., 2010, Collection Forum
staff
interns
volunteers
Whole-Drawer Data

Physical location

Curation status

Geologic context

Accession origin(s)

<table>
<thead>
<tr>
<th>Category</th>
<th>Sample Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection Area</td>
<td>Cretaceous</td>
</tr>
<tr>
<td>Cabinet</td>
<td>181</td>
</tr>
<tr>
<td>Drawer</td>
<td>1-12</td>
</tr>
<tr>
<td>New Curation</td>
<td>Y</td>
</tr>
<tr>
<td>Age</td>
<td>Albian</td>
</tr>
<tr>
<td>Country</td>
<td>United States</td>
</tr>
<tr>
<td>State</td>
<td>California</td>
</tr>
<tr>
<td>County</td>
<td>Shasta, Lake</td>
</tr>
<tr>
<td>Unit</td>
<td>Budden Canyon, Paskenta</td>
</tr>
<tr>
<td>Accn</td>
<td>LACMIP, UCLA, CIT, CSUN</td>
</tr>
<tr>
<td>Loc. #</td>
<td>LACMIP 30095, 30096; UCLA 4370</td>
</tr>
<tr>
<td>Coll. Type</td>
<td>ST</td>
</tr>
</tbody>
</table>
Whole-Drawer Data

Counting

# Lots
  cataloged
  uncataloged
  loaned

# Specimens

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SAMPLE ENTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lots</td>
<td>#</td>
</tr>
<tr>
<td>Cat Lots</td>
<td>#</td>
</tr>
<tr>
<td>Loan Lots</td>
<td>#</td>
</tr>
<tr>
<td>Spms</td>
<td>#</td>
</tr>
</tbody>
</table>

1 lot = 1 box, vial, slide, or gel cap
Whole-Drawer Data

Scoring 1-10 (10=ideal)

- % bulk (sampling bias)
- % with LACM loc. #
- % sorting by taxon
- % identified
- % cataloged
- % photo-worthy

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SAMPLE ENTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk</td>
<td>1-10</td>
</tr>
<tr>
<td>Loc</td>
<td>0-10</td>
</tr>
<tr>
<td>Sorted</td>
<td>0-10</td>
</tr>
<tr>
<td>ID'd</td>
<td>0-10</td>
</tr>
<tr>
<td>Cat</td>
<td>0-10</td>
</tr>
<tr>
<td>Photo</td>
<td>0-10</td>
</tr>
</tbody>
</table>
### Whole-Drawer Data

#### Other Needs (Y/N)
- archival material
- outreach applications

#### Comments
- type specimens
- *Turritella*-dominated
- original aragonite

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SAMPLE ENTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box</td>
<td>R/N/V</td>
</tr>
<tr>
<td>Arch Mat</td>
<td>Y</td>
</tr>
<tr>
<td>Label</td>
<td>Y</td>
</tr>
<tr>
<td>Cleaning</td>
<td>D/W</td>
</tr>
<tr>
<td>Damage</td>
<td>Y</td>
</tr>
<tr>
<td>Bulk</td>
<td>Y</td>
</tr>
<tr>
<td>&gt;1000 spms</td>
<td>Y</td>
</tr>
<tr>
<td>Count</td>
<td>#</td>
</tr>
<tr>
<td>Exhibit</td>
<td>Y</td>
</tr>
<tr>
<td>Comments</td>
<td></td>
</tr>
</tbody>
</table>
### Whole-Drawer Data

#### Composition %

<table>
<thead>
<tr>
<th>FORAMINIFERA</th>
<th>ANTHOZOANS (Coral)</th>
<th>BRACHIOPODA</th>
<th>ANNELEDA</th>
<th>CHILOECHITA</th>
<th>CRIRIPEDIA (BARNACLE)</th>
<th>DECAPODA (CRAB)</th>
<th>OSTRACODA</th>
<th>HEXAPODA</th>
<th>TROCHOFORMIA</th>
<th>BIVALVA</th>
<th>CEPHALOPODA</th>
<th>ASTEROIDEA</th>
<th>CRINOIDEA</th>
<th>ECHINOIDEA (URCHIN)</th>
<th>ECHINOSTEROIDEA</th>
<th>EOCRINOIDS</th>
<th>HELIOPLACOIDEA</th>
<th>HOLOTHUROIDEA</th>
<th>OPHELIOIDEA</th>
<th>RHOMBIFERA</th>
<th>GRAPTOFOSSIL</th>
<th>VERTEBRATE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Progress

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
<th>% Progress</th>
<th>Staffing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic data</td>
<td>85</td>
<td>Interns/volunteers</td>
</tr>
<tr>
<td>2</td>
<td>Compositional data</td>
<td>20</td>
<td>Staff, interns/volunteers</td>
</tr>
<tr>
<td>3</td>
<td>Drawer photography</td>
<td>2</td>
<td>Interns/volunteers</td>
</tr>
</tbody>
</table>
How many specimens?

6500 drawers (700 cabinets)

≈ 6-7 million
Digitization Efficiency

Maximize expertise

> ID backlog
> “Digi Blitz”
Digitization Efficiency
Maximize expertise
High-grading

✓ IDs
✓ Sorted
✓ Locs

$1/Lot
Digitization Efficiency

Maximize expertise
High-grading

- IDs
- Sorted
- Locs

$2/Lot
Research

REQUEST:

- Pleistocene
- Scaphopods
- Eastern Pacific

257 drawers
Research

REQUEST:

- Echinoids*
- Barnacles
- Pliocene
- Pleistocene

63 drawers

*mass accumulations
Outreach

Events

Tours

Exhibits
Outreach

Events
Tours
Exhibits
Funding

CSBR & PEN

> workflow & timeline

<table>
<thead>
<tr>
<th>Collection</th>
<th>Minimum # of Fossil Insects</th>
<th># Type &amp; Figured Specimens</th>
<th>Specimens in Computer Database</th>
<th>Insect Specimens Imaged</th>
<th>Minimum Identification Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rott</td>
<td>4259</td>
<td>899</td>
<td>899</td>
<td>17</td>
<td>2862 2131 2106 1499</td>
</tr>
<tr>
<td>Barstow</td>
<td>4934</td>
<td>257</td>
<td>257</td>
<td>2</td>
<td>9657 6504 2219 1450</td>
</tr>
<tr>
<td>RLB</td>
<td>15684</td>
<td>504</td>
<td>504</td>
<td>0</td>
<td>1917 1871 1363 329</td>
</tr>
<tr>
<td>McKittrick</td>
<td>2795b</td>
<td>92</td>
<td>83</td>
<td>1</td>
<td>3260 2590 1430 1413</td>
</tr>
<tr>
<td>Lynn Ck</td>
<td>278</td>
<td>67</td>
<td>67</td>
<td>0</td>
<td>106 80 69 68</td>
</tr>
<tr>
<td>TOTAL</td>
<td>27950</td>
<td>1819</td>
<td>1810</td>
<td>20</td>
<td>64% 47% 26% 17%</td>
</tr>
</tbody>
</table>
Funding

CSBR & PEN

Discovery tool
Funding

CSBR & PEN

Discovery tool

Conservation needs
Future

Whole-drawer inventory linked to
> photos
> barcodes
> EMu / web
collections.nhm.org
Final Thoughts

★ Accelerate data discovery ★
Acknowledgements

- NSF DBI 1503065, 1561429
- iDigBio & UCMP
- LACMIP volunteers
  Paige, Carole, Carolyn, David, Steve, Glendale C. C. students
Questions?

@FossilsofLA