ARCTOS FOR PALEONTOLOGY COLLECTIONS

EXAMPLES FROM THE UNIVERSITY OF ALASKA MUSEUM EARTH SCIENCES COLLECTION DIGITIZATION PROJECT

Julie Rousseau\textsuperscript{a}, Patrick S. Druckenmiller\textsuperscript{a,b}, and Dusty McDonald\textsuperscript{a}

\textsuperscript{a} University of Alaska Museum of the North, 907 Yukon Drive, Fairbanks AK 99775.
\textsuperscript{b} Department of Geology and Geophysics, University of Alaska Fairbanks
WHAT IS ARCTOS?

• Comprehensive, multidisciplinary collection management information system

• Serves data on over 3M natural history museum records

• Standardization of biodiversity data online

• Arctos community = 2 clones with parallel development
ARCTOS

As of today, 1,786,124 specimens

67 collections

17 museums/organizations

Media hosted at Texas Advanced Computing Center
THE UAM:ES COLLECTION

- >60,000 specimens
  Paleontology & Geology
- Digitization project from 2011
  NSF-BRC funding + NPS, BLM, USFWS
  Focus on vertebrates
- 2 years later:
  All accession cards digitized
  All vertebrate and most invertebrate locality cards digitized
  >31,500 databased specimens (>26,000 vertebrates)
  >40,600 specimen images online (85% of vertebrate specimens)
ARCTOS IMPLEMENTATION

• Minimum requirements:
  ✔ Computer with Internet access
  ✔ Collection metadata
  ✔ Financial support to move your data

• Our project:
  + Contribution to operational costs
  + Barcodes and scanners
  + Imaging station
ENTERING DATA

Migrate existing data → Bulkloader

Enter new specimens → “Green Screen”

Shared nodes

Collection-specific attributes

Specimen vs. parts

Required fields
UAMES PALEOIMAGER

“Shortcut” system designed for us
Barcode, database, photograph
1) accession cards
2) locality cards
3) specimens
7 miles East of Cape Thompson on the Chukchi Sea
North America, United States, Alaska, Point Hope Quad
1959 (1959-09-21 - 1959-10-04)
Plant fossil

UAM Earth Science 17188
UAM:ES

Plantae

*<A Return to results
get a DOI

no specific locality recorded
do not have a higher geography recorded
before 2011-10-27 (1800-01-01 - 2011-10-27)

Part

Locality

Node

is

identified

by

unknown

Nature of Ed field

Determination Type: accepted place of collection

assigned by unknown on 2011-10-28

Higher Geography: no higher geography recorded

Verbatim Locality: no verbatim locality recorded

Specific Locality: no specific locality recorded

Collecting Source: wild caught

Event Date: before 2011-10-27 (1800-01-01 - 2011-10-27)

Verification Status: unverified

Event Coordinate: 70.8966693687/-151.6343333333

Datum: unknown

Original Coordinate Format: decimal degrees

Georeference Source: locality card

Georeference Protocol: not recorded

Stage/AGE: Maastrichtian

formation: Prince Creek Formation

Collectors

unknown

Accession

1994 P030

original identifier: AK-308-V-003

Part Name: stem

Condition: unchecked

Displacement: in collection

# Label: ES60125

Remarks: Tree stems

Entered By: Todd Jacobs on 2011-10-27

Last Edited By: UAM on 2012-08-29

Image

Location

Media Details

UAM ES AK-308-V-003: Plantae

UAM ES AK-308-V-003: Plantae

UAM ES AK-308-V-003: Plantae

UAM ES AK-308-V-003: Plantae

UAM ES AK-308-V-003: Plantae

UAM ES AK-308-V-003: Plantae

UAM ES AK-308-V-003: Plantae
VERTEBRATE FOSSIL

UAM Earth Science 12505
UMAP: University of California Museum of Paleontology: V154453
original identifier: AK-83-V-390

Identification
Tyrannosauridae

Remains: Tyrannosaur tooth crown; published as Figure 1A in Erickson 1995: "Split canines on tyrannosaurid teeth and implications for that development," JVP vol 15 #2, p. 269-274. Current location (as of 3/10/2011): Collections in the process of being researched; case, UAM Earth Science Lab, drawer 1.

Accession
1987-0032

Location Data

Image

Media

Authors

Add Media
VERTEBRATE FOSSIL

UAM Earth Science 2414

Ilikpuk River
North America, United States, Alaska

Mammuth americanum

Ammonia Chordata Mammalia Proboscidea Mammutidae Mammuth americanum
American mastodon; mastodon
sensu Rohland et al. 2007
Identified by Paul Mathews
Nature of ID: expert
Remarks: Personal communication

Mammuth americanum

Ammosuchus Chordata Mammalia Proboscidea Mammutidae Mammuth americanum
American mastodon; mastodon
sensu Form et al. 2013
Identified by Grant O. Zazula
Nature of ID: expert
Remarks: Personal communication

Citations
basis of illustration of *Mammuth americanum*, page 3 in Rohland et al. 2007
basis of illustration of *Mammuth* in Mann et al. 2013

Determination Type: accepted place of collection
accepted by Amanda Hanson (2009-07-06)

Higher Geography: North America, United States, Alaska
Verbatim Locality: Collected as float along the Ilikpuk River on the North Slope of Alaska
Specific Locality: Ilikpuk River
Collecting Source: wild caught
Event Date: 01-Jul-1999 (1999-07-01 - 1999-07-31)
Verification Status: unverified
Event Coordinates: 70.81975441, 154.3096281
Datum: North American Datum 1983
Original Coordinate Format: decimal degrees
Error: 42 km
Georeference Source: GeoBaseManager
Georeference Protocol: GeoBaseManager

Stage/Age: Pleistocene

Collectors
Bureau of Land Management
TRACE FOSSIL

UAM Earth Science 3352

Colville River near Uluskrak Bluff
North America, United States, Alaska, Harrison Bay Quad

Theropoda

Animalia Chordata Reptilia Saurischia Theropoda
Identified by Patrick Druckenmiller
Nature of ID: field

Taxa  Access  Locality  Agents  Parts  PartLocs  Attributes  OtherIDs  Media  Encumbrances

Identifiers

collector number: KCM CR09-05

Part Name  Condition  Disposition  #  Label  Remarks

trace fossil  single track  in collection  1  ES 012004  peel
trace fossil  single track  being processed  1  ES 012004  natural cast

Entered By: Amanda Hanson on 2009-10-01
Last Edited By: HMOR on 2013-05-07
Encumbrances: mask coordinates by Patrick Druckenmiller on 17 Dec 2009. Expires to be determined.

Accession
2009.014.ESCI

Media

UAM:ES: 3352: Theropoda

Collectors
Patrick Druckenmiller, Kevin C. May
INVERTEBRATE FOSSIL

UAM Earth Science 2016

Otoites pauper cf.
North America, United States, Alaska, Talkeetna Mts. Quad
Aug 2008 (2006-08-13)

Cameron Pass

Determinations:
- accepted place of collection
- Higher Geography: North America, United States, Alaska, Talkeetna Mts. Quad
- Specific Locality: Cameron Pass
- Locality Remarks: Tuxedni ichthyosaur and invertebrates
- Collecting Source: wild caught
- Event Date: Aug 2008 (2006-08-13)
- Verification Status: unverified
- Datum: North American Datum 1927
- Original Coordinate Format: degrees, decimals
- Source: USGS Topo Map 1:63,360, Talkeetna Mts. A-1
- Georeference Protocol: BioGeoMancer
- Series: Middle Jurassic
- Determined by: unknown
- Invertebrates: Tuxedni Formation
- Identified by: Julie Rousseau
- Nature of ID: expert
- Identified by: Patrick Drucker
- Nature of ID: expert
- Remarks: ammonites

Collectors:
- Patrick Drucker

Identifiers:
- collector number: PSD-08-11-08-Lot
- part name: oxoskeleton
- condition: partial
- disposition: in collection
- label: ES 012144

Part Name: oxoskeleton
Condition: partial
Disposition: in collection
Label: ES 012144

Report: | Bad Data | Earth Sciences B |
Record | prev | next | last |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Usage:
- Contributed By Project: Description of a Middle Jurassic (Bajocian) ophthalmosaur (Reptilia, Ichthyosauria) from the Tuxedni Formation, Talkeetna Mountains, Alaska.
PROJECT PAGE

Description of a Middle Jurassic (Bajocian) opthalmosaurid (Reptilia, Ichthyosaura) from the Tuxedni Formation, Talkeetna Mountains, Alaska.

Erin E. Maxwell: Principal Investigator
Patrick Druckenmiller: Principal Investigator

Description

Abstract from Druckenmiller and Maxwell, 2012. Ophthalmosauridae is a clade of derived thunniform ichthyosaurs that are best known from Callovian (late Middle Jurassic) to Cenomanian-aged (Late Cretaceous) deposits in both the Northern and Southern Hemispheres. Ophthalmosaurids arose prior to the Early-Middle Jurassic boundary, however, very little is known about their diversity and distribution in the earliest phase of their evolutionary history during the Aalenian–Bathonian (Middle Jurassic) interval. Here we describe new diagnostic ophthalmosaurid material from the Early Bajocian (Middle Jurassic) of Alaska. The specimen, UAMES 3411, is a partial disarticulated skull that was discovered in the Middle Jurassic Tuxedni Formation, which was deposited in shallow marine settings outboard of the then-acreting Wrangellia composite terrane. The new material is significant in that it is the first Jurassic ichthyosaur described from Alaska, one of the oldest ophthalmosaurids known and the only Middle Jurassic ophthalmosaurid described from the Northern Hemisphere. The new material adds to a rapidly growing data set on ophthalmosaurid diversity and suggests that the clade was geographically widespread by the Early Bajocian, very early in its evolutionary history.

Publications

This project produced 1 publications.


Specimens Contributed

- 253 UAM Earth Science Specimens  [BerkeleyMapper]
GEOREFERENCING

Locality

Higer Geography
North America, United States, Alaska, Mt. Hayes Quad

Specific Locality
Yardang Site, Ruby Creek

Locality Nickname

create GUID

Min. Depth. Max. Depth. Depth Unit

Locality Remarks
c. 29 miles south of Delta Junction

Decimal Latitude
03.525

Decimal Longitude
-145.9089

Convert to decimal degrees

Events table

Count

1

Update

Max Error Max Error Units
210

Datum
World Geodetic System 1984
g209 Referencing Source

GeoLocate

Georeference Protocol

Save Delete Clone Locality Add Collecting Event Georeference

[ Find all Collecting Events ] [ Georef Calculator ] [ lat_long h ]
SPECIMEN USAGE DATA
COLLECTION MANAGEMENT APPLICATIONS

- Loans
- Reports and collection statistics
- Permits / Accession agencies
- Tracking system using barcodes
WHY LOVE ARCTOS

- Web-based, accessibility
- Modularity, customizable
- Dynamic system
- Community of users
- External links
KEEP IN MIND...

- Crashes happen.
- Downtimes happen.
- Changes happen.

Coming soon to Arctos:
- Radiometric age as an attribute
- “Taxonomy” system for geological specimens
ACKNOWLEDGEMENTS

Special thanks to:

• iDigBio
• Chris Jordan (Texas Advanced Computing Center)
• Jessica D. Cundiff (Museum of Comparative Zoology)

More information?

• Arctos database: http://arctos.database.museum
• Arctos blog: http://arctosdb.org/
• Presentations and tutorials: http://arctosdb.org/home/outreach/
• MVZ Arctos demo (2008): http://youtu.be/1-ku5QRM8O0