BEATY BIODIVERSITY MUSEUM

ANNUAL REPORT
2022–2023

THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Science

Squid
Cephalopoda
Joseph Bauer Collection

Luka Lukic deBakker

CONTENTS

Andy Wright
from *Preventing Extinctions*

BEATY BIODIVERSITY MUSEUM 2023–2024

44,991 VISITORS

8,817 VOLUNTEER HOURS

7,082 PROGRAM PARTICIPANTS

694,292 DIGITIZED SPECIMEN RECORDS

DIRECTOR'S REPORT

Director's message

This has been a year of tremendous success for the museum by any metric. We are now fully out from under the shadow of the coronavirus pandemic. Our visitor foot traffic is breaking records, and schools in the Lower Mainland are engaging with us, and visiting, in unprecedented numbers. There is a good feeling that comes from playing an important role in the province's education at all levels, from primary to university. Less visibly, but just as importantly, this has been a year of committees and planning for our expansion. Site preparation has started for an extension to the building, to help the museum (and the Biodiversity Research Centre) accommodate our increased activities. The expansion will be disruptive over the coming year, but equally it comes as a great relief, as we have been desperate for more space in our "behind the scenes" areas (the areas used for curation and research, as well as exhibit and teaching preparation). Happily, the increased activity that requires the extension is a further sign of the museum's success.

One activity that has expanded this year is digitization. Not content with physical visitors, we are extending our virtual footprint and public access to our collections online. Hard work by museum staff secured us a major grant from the Museums Assistance Program (MAP) of the Department of Canadian Heritage under the "Digital Access to Heritage" component. This program fosters "improved access to heritage collections through collections digitization and digital content development, as well as activities that build capacity in these areas". As such, it is perfectly aligned with our wish to digitally "open the treasure chest" of our collections. The MAP grant gave us the capacity to make a big move forward, and allowed us to increase staffing on a temporary basis to meet our aspirations. The collections stored in the museum represent an extraordinary record of a century of environmental change, but if the data stay as typewritten or handwritten labels, they can't be readily used. On the other hand, data that is digitized can be mobilized to national and international databases such as Canadensys and the Global Biodiversity Information Facility (GBIF) and be aggregated, for use by researchers and policy makers.

The museum has an estimated 2 million specimens of which 750,000 have digital records, so we have a good starting point, but a long way to go. The MAP grant is helpful, but not enough, so we are being creative in seeking other funding and calling on the help of volunteers and students. Even artificial intelligence to read the handwriting of long-dead collectors has a role to play.

Digital records demand a database that is fit for purpose. When I became Director back in 2020, staff told me that database issues were a major concern. It was blindingly clear that staff were doing an amazing job despite old database systems that were no longer meeting acceptable modern standards for the museum sector. I made this my number one priority but the disruptions of the pandemic made any immediate solutions impossible. However, we are now sorting this out. We have appointed a Collections Curator of Biodiversity Informatics, a position which all comparable museums have in some form or other. This is rendered essential by the fact that, in the modern museum, big data—and its collection, storage, integrity, mobilization, and analysis—occupies a central position alongside the specimens themselves. We went through a rigorous process of assessing available systems, and finally chose Specify7 from the Specify Collections Consortium at the University of Kansas. It is an open-source, cloud-based solution that fully meets our needs and modern standards of museum collection management. The arduous but important work of data migration is now proceeding. This marks a new era for the Beaty Biodiversity Museum.

Dr. Quentin Cronk
Director, Beaty Biodiversity Museum
Professor, Department of Botany
quentin.cronk@ubc.ca

STANDING AND SPECIAL COMMITTEES

MEMBERSHIP TO COMMITTEES IS OPEN AND FLEXIBLE AND IS INTENDED TO REPRESENT ALL MUSEUM FUNCTIONS AND STAFF GROUPS

Local Safety Team (LST)

- Chris Stinson (Co-Chair/Collections/CUPE116)
- Jackie Chambers (Co-Chair/Teaching & Learning/AAPS)
- Katie Beall (BRC/AAPS)
- Catherine Ouellet-Martin (Operations/AAPS)
- Vincent Sayson (Teaching & Learning/CUPE 116)
- Deepti Arya (Visitor Services/ CUPE 2950)

The Workers Compensation Act requires that most Employers in the province have a Joint Occupational Health and Safety Committee (JOHSC).

Each UBC Department has a variety of work groups and workplaces within its portfolio which have a diverse set of functions and related hazard potential. The Beaty Biodiversity Museum Local Safety Team provides assistance to the Faculty of Science Joint Occupational Health and Safety Committee on local safety issues.

Strategic Planning Committee

- Catherine Ouellet-Martin (Chair/Operations/AAPS)
- Dr. Quentin Cronk, (Museum Director/Faculty)
- Chris Stinson (Collections/CUPE 116)
- Dale Gintner (Communication, Marketing & Events/AAPS)
- Linda Jennings (Collections /AAPS)
- Derek Tan (Exhibits/AAPS)
- Jackie Chambers (Teaching & Learning/AAPS)

Working with UBC Strategy and Decision Support (SDS), the Strategic Planning Committee developed the strategic plan in 2019 through a consultative and collaborative process that included broad participation from the Faculty of Science, Departments, and Community Partners through interviews facilitated by SDS. Each year, the Strategic Planning Committee assesses progress against priorities set by the 2019–2024 Strategic Plan and updates priorities to include in the Annual Operations Plan for Collections, Curation & Research, Teaching & Learning, Exhibitry, Community Engagement, and People & Places. The committee is preparing for a new round of Strategic Planning to start in January 2024 to replace the current plan, now in its final year.

Beaty Biodiversity Centre Expansion Museum Working Group

- Catherine Ouellet-Martin (Chair/Operations/AAPS)
- Chris Stinson(Collections/CUPE 116)
- Linda Jennings(Collections /AAPS)
- Nicole Balsdon (Teaching & Learning/AAPS)
- Jackie Chambers(Teaching & Learning/AAPS)
- Dr. Rick Taylor (Collections/Faculty)
- Derek Tan (Exhibits/AAPS)

The Beaty Biodiversity Centre and Museum are expanding. Construction started in April 2023 and is scheduled to be completed in 2025. The expansion will be a 4,430 square metre, six-story laboratory and office addition to the existing building that will provide space for researchers, museum collections and supporting functions, and meeting and gathering spaces. Throughout the year, the museum working group dedicated many hours to completing the design of the new facilities and preparing for the construction years ahead.

Interpreter Vincent shows off the dinosaur trackways.

David Weng

Justice Equity Diversity Decolonization Inclusion & Indigenization (JEDDII)

The JEDDII committee is a long-term, ongoing group drawn from throughout the museum, that continues to infuse meaningful changes into the museum's daily work, while providing a monthly venue for open discussion, accountability, and responsibility.

Some achievements this year have included:

- UBC's 2020 Indigenous Strategic Plan (ISP) outlines eight goals and 43 actions the university will collectively take to advance its vision of UBC as a leading university globally in the implementation of Indigenous peoples' human rights. The work of implementing the ISP aligns with the goals and activities set out in the museum's Strategic Plan. This year the Beaty Biodiversity Museum was one of the first units within the Faculty of Science to begin the process of reflecting on its work and how it can support and uplift the ISP. Working through the ISP Self-assessment Tool gave the team the opportunity to reflect and discuss the museum's role at UBC within the context of Indigenous engagement.
- Improvements to visitor comfort by providing readily-available folding stools throughout the main collections spaces.
- Increasing access to museum content and contemporary biodiversity research through educator resources, virtual exhibitions and archives, and the *Researchers Revealed* project. All are available for free, anywhere around the world, from any device connected to the internet—without the need for apps or other downloads.

Luna Mortenson

Jason Woolman, Musqueam Archivist, carries a sturgeon harpoon into the museum with Derek Tan, Manager of Exhibitions, and Jasmine Wilson, Musqueam Assistant Archivist.

- Staff training and workshops relevant to specific individuals and departments including: First Nations Principles of OCAP, Trauma-informed approaches to education, Land Acknowledgements @UBC, Autism in the Workplace, Positive Space: Foundations, and many conferences and webinars that bridge JEDDII and our museum work.
- Participation in an accessibility assessment carried out by Spinal Cord Injury BC, in partnership with Destination BC. The accessible features of the museum were updated on our HelloBC.com listing.

Throughout this annual report, you will find additional projects that have JEDDII values embedded, such as the *Sturgeon Harpoon Knowledge Web* in partnership with Musqueam (page 12), reducing barriers for program access through partnerships in Teaching & Learning (page 6), launching the MAKING CONNECTIONS project (page 6), improving the museum's databases, and providing access to research collections (page 28).

TEACHING AND LEARNING

BEATY BOXES IN CIRCULATION: 10 | NUMBER OF WEEKS OF RENTALS: 53
PARTICIPANTS IN PROGRAMS: 7,082 | TOTAL GROUPS: 62

The Teaching & Learning team share the stories of the research collections through school programs, public tours, activities, special events, and partnerships. Fiscal Year 2022–2023 was the first full year of in-person learning on campus following pandemic closures and the first full year for our new series of curriculum-based tours and programs.

Later in the fiscal year, we saw in-person programming numbers approach pre-pandemic levels. For group programs, March 2023 was one of our busiest months of all time! High attendance numbers for Nature Club and Spring Break also demonstrate the popularity of in-person programming. This was the 7th year of our successful Beaty Box specimen loan program. Our programming and outreach kits continue to be key revenue generators for the museum.

Virtual tours continue to play an important role in outreach. What began as a quick pivot to online programming at the start of the pandemic has continued to be successful in expanding our audience and meets access needs for a number of schools and groups. For example, as a result of our virtual programming series we were invited to become a Connected North partner, providing interactive virtual learning experiences and access to educational resources for students and teachers in remote Indigenous communities.

By continuing to offer a selection of online and in-person programming and resources, we were able to maintain our high-quality school programming and support teachers. We continued to offer hybrid events, hosting a hybrid Educator Open House, welcoming teachers from the lower mainland and across the province to join in person and online.

Volunteer Julia presents an owl activity to museum visitors.

Jackie Chambers
Teaching and Learning Manager

Nicole Balsdon
Teaching and Learning Coordinator

Dr. Bridgette Clarkston
Teaching & Learning Honorary Associate in Undergraduate Education

Nancy Lee
Sunny (Yingxin) Zhang
Vincent Sayson
Jerlyn Brutas
Paige Smallman
Museum Interpreters

New Undergraduate Course

This fall we successfully secured a UBC Teaching & Learning Enhancement Fund (TLEF) grant to support student-driven development of units that will shape a new undergraduate course focused on natural history collections. Named the MAKING CONNECTIONS Project, this will be a collaboration between the Beaty Biodiversity Museum and faculty from Forestry; Botany; Zoology; and Earth, Ocean and Atmospheric Sciences. Based at the museum and working in collaboration with students, researchers, and museum professionals, the MAKING CONNECTIONS Project is an exciting cross-departmental undertaking and project with work starting in fiscal year 2023–2024.

VOLUNTEERS

VOLUNTEER HOURS: 3,274
ACTIVE VOLUNTEERS: 87

This year marked the first full year of in-person volunteering and we have begun to rebuild our volunteer corps. Education volunteers support us in sharing the stories of the research collections.

Along with other members of the museum team, education volunteers are identifiable in their red vests and are ready to answer questions and share stories with visitors. Volunteers also assist with events and special programming such as twice-daily hands-on programming and Spring Break drop-in activities, public lectures, exhibit openings, and membership events. Volunteers are supported with learning opportunities on a weekly basis and given in-depth workshops regularly. Behind-the-scenes, dedicated collections volunteers work to support specimen preparation and digitization, ensuring safe-keeping of specimens and the critical data they hold.

Beaty Museum volunteers come from all walks of life, many different countries, and range from high school and post-secondary students to working and retired professionals. Our dedicated volunteers have an understanding and an enthusiasm for the museum, which they readily share with visitors; this team of knowledgeable and friendly people adds a personal touch to the visitor experience and strengthens the connections between the museum, the collections, and the community.

Volunteer Hailey checks in event attendees.

Volunteer Rory demonstrates how to touch specimens in the Discovery Lab.

EVALUATIONS

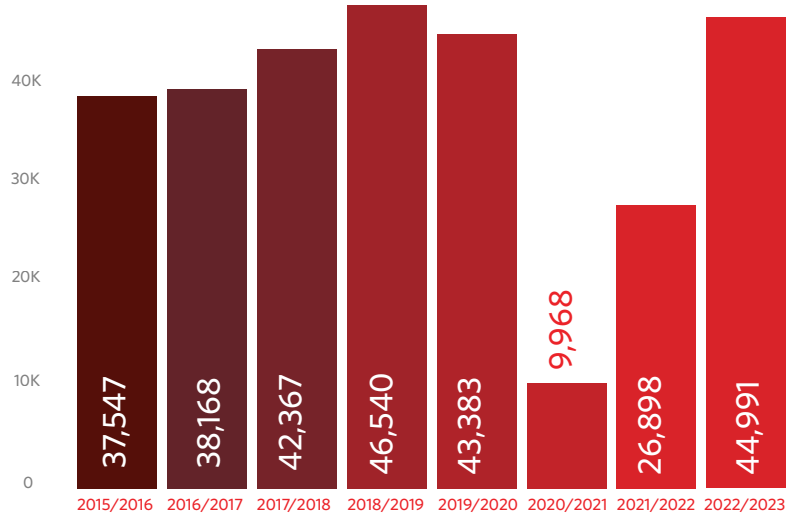
NUMBER OF SOCIAL MEDIA FOLLOWERS: 52,784
NUMBER OF MEMBERS: 253

We use a variety of evaluation and assessment techniques—from 'post-it notes' and drawing stations at Nature Club, to surveying our own team of staff and faculty on important topics such as the UBC Indigenous Strategic Plan, to working with Computer Science researchers exploring peoples' understanding of deep time by observing user interactions with physical and digital exhibits at the museum. This information, combined with the extensive booking data and feedback from students and teachers collected by the museum over the past years, allows us to better understand what our staff, faculty, and visitors value, learn, and explore while at the museum.

Data collection also allows us to compare numbers over the years, demonstrating a growing demand for our school programming and the return to pre-pandemic attendance numbers. As we see the return to in-person school and public programming we are committed to collaboration with our audiences, to continue listening and learning how to best serve both our online and in-person guests.

Volunteer Jasmine at the Whale Station.

TOTAL MUSEUM VISITORS



Nearly 2,000 undergraduate and graduate students from UBC and other post-secondary institutions visited the museum as part of a course. We continue to strengthen our role supporting undergraduate teaching by collaborating with the Faculty of Science in developing and delivering both online and in-person sessions. In addition to the numerous courses supported by the collections, we also supported BOTA 547, a graduate-level directed studies course on a project linked to museum Teaching & Learning. We continued our role in the education of educators by hosting teacher candidates, research and practicum students, and leading sessions for the Faculty of Education.

Virtual, hybrid, and in-person collaborations, both within UBC (BRC Biodiversity Lecture Series, Vancouver Summer Program, C+CP Kids Take Over Day, Homecoming Weekend, Zoology Graduate Students Association, CTLT II, Skylight, Pacific Museum of Earth, and MOA) and off campus (Vancouver School Board Scientist in Residence Program, NSERC Science Literacy Week & Science Odyssey, Science Rendezvous, Surrey Teachers' Association, BC Science Teachers' Association, Ocean Wise, Connected North) continue to strengthen our reputation as a teaching and learning space.

These opportunities help to move the museum beyond its four walls and allow us to make new connections and broader recognition of our skills and expertise. Through support and funding from UBC Campus + Community Planning and work with Earth, Ocean and Atmospheric Sciences' Pacific Museum of Earth (PME), and Let's Talk Science's Lessons in Evolution and Ecology FUNdamentals (LEEF) graduate student group we continued to offer our monthly Nature Club to families on campus. Funding from Wheaton Precious Metals donation supported the creation of the *Walk Through Time*—physical exhibits exploring geological and biological changes over time, linking us to PME, and enhancing the virtual and onsite learning opportunities at the museum.

The Timeline in the *Walk Through Time* in front of the Earth Sciences Building.

THIS YEAR THE BEATY MUSEUM PARTNERED WITH...

Science Slam Vancouver
UBC Welcome Centre
UBC Infrastructure Development
NatureServe Canada
Bernice Pauahi Bishop Museum Digitization Centre
Wilson School of Design
Kwantlen Polytechnic University
Science Odyssey Canada
Museums Assistance Program
Morris and Helen Belkin Art Gallery
IK Barber Learning Centre
UBC Institute of Oceans and Fisheries
Digital Museums Canada
Science World
Tourism Vancouver
PUBLIC Architecture
UBC Biodiversity Research Centre
Young Canada Works
Notes from Nature
EcoCanada
Muséum National d'Histoire Naturelle
Parks Canada
Musqueam Indian Band
UBC Properties Trust
Terra Nova Park
Yukon Conservation Data Centre
Royal British Columbia Museum
Soapbox Science Vancouver
Royal Alberta Museum
NGX Interactive
ETRO Construction
University of Alberta
Environment and Climate Change Canada
Canada Post
Development Team, UBC Faculty of Science
American Museum of Natural History
Richmond Nature Park
BC Hydro
BC Parks
BC Ministry of Forests
BC Ministry of Tourism, Arts, Culture and Sport
UBC Museum of Anthropology
TelusTV
Smithsonian Tropical Research Institute
University of Kansas Biodiversity Institute and Natural History Museum
VanPass – Vancouver Attractions
UBC Community Engagement
UBC Film & Events
Ohio State University
Kidsworld
Peter Wall Institute for Advanced Studies
Canadian Centre for DNA Barcoding at the University of Guelph
Destination Vancouver
UBC Robert H. Lee Alumni Centre
UBC Work Learn Program
Let's Talk Science Outreach at UBC
BC Ministry of Water, Land and Resource Stewardship
UBC Pacific Museum of Earth
UBC Botanical Garden
Destination BC
Canadian Museum of Nature
UBC Celebrate Learning Week
UBC UTown

MARKETING, COMMUNICATIONS, AND EVENTS

SOCIAL MEDIA FOLLOWERS: 52,784
TWITTER FOLLOWERS: 4,622 | FACEBOOK FOLLOWERS: 5,445
INSTAGRAM FOLLOWERS: 5,069
YOUTUBE VIEWS: 25,160,773

Dale Louise Gintner
Marketing, Communications, and Events Coordinator

The marketing department has been developing strategies to increase the museum's visibility, both within the local community and to the general public, through social media, newsletters, events, publications, and partnerships.

Our marketing coordinator represented the museum in meetings with BC's tourism organizations, such as the roundtable promoted by the Ministry of Tourism, Arts, Culture and Sport to discuss the future of tourism in the province.

The museum hosted notable events related to the scientific community in the last year. To name some of these events, we had a donor's celebration for Bill Merilees' Mollusc Collection donation, our annual Biodiversity Lecture Series with Dr. Dolph Schluter, the screening of the film *Last of the Right Whales*, followed by a panel with Dr. Andrew Trites, and the 2022 Canada Post Stamp Launch, when the new line of stamps meant to raise awareness of five endangered species of whales was unveiled.

For the museum's monthly Beaty Nocturnals, we invited guest speakers, authors, and film producers, and events such as Spring Break, Kids Take Over UBC, and the Educator Open House brought thousands of visitors to the museum.

The museum's social media channels' numbers are still on the rise, with a total of over 52,700 followers on Instagram, Facebook, Twitter, LinkedIn, and YouTube. The current number of views on the museum's YouTube channel is 25,160,773.

The marketing department will continue to support all of Beaty Biodiversity Museum's departments in order to reach an even bigger audience in the future.

Specimens exhibited as part of the Educator Open House.

Visitors during Kids Take Over Day.

EXHIBITS AND DESIGN

HIGHLIGHT UBC RESEARCH: 16 VIDEOS
NEW PERMANENT EXHIBITS: 2

Derek Tan
Manager of Exhibitions

Evan Craig
Digital Producer

Lesha Koop
Exhibits Fabricator

Exhibitions at the Beaty Biodiversity Museum looked at the personal, cultural, and evolutionary past, with hope for a future in which biodiversity plays a larger role. While there will always be a place for in-person engagement with exhibits, digital exhibit elements are increasingly important for accessing a variety of types of content and distributing information to a wider audience.

This year saw the departure of long-serving Manager of Exhibitions, Yukiko Stranger-Galey, who returned to the UK. Taking over the role of Manager is Derek Tan, formerly Digital Producer, who has been working at the museum for over 14 years. Evan Craig, who had been a project-based technician, has joined the permanent staff as the new Digital Producer. Lesha Koop continues to find creative solutions to the museum's mount-making challenges in her role as Exhibits Fabricator.

Wheaton Walk Through Time

Largely completed this year, the *Wheaton Walk Through Time* exhibit links the Pacific Museum of Earth and the Beaty Biodiversity Museum through an exploration of geological and evolutionary time. In front of the Beaty, a ring of present-day organisms is arranged in a phylogenetic sequence along metal arcs embedded in the entrance plaza, with the branches of the underlying tree made visible through the exhibit's digital companion.

The Tree of Life in the *Walk Through Time* exhibit.

Derek Tan

Sturgeon Harpoon Knowledge Web

UBC's Community University Engagement Support (CUES) funding has allowed the museum to develop a version of the *Sturgeon Harpoon Knowledge Web* digital exhibit customized for display and use in the Musqueam community. We are tremendously honoured that the Musqueam First Nation has loaned the sturgeon harpoon to the Beaty Biodiversity Museum, where it is being prepared to go on exhibit. This loan was facilitated by CUES and the Partnership Recognition Fund.

Researchers Revealed

This initiative to highlight UBC biodiversity research was supported by the Grants for Catalyzing Research Clusters. Videos were developed showing a range of topics, from studying the recovery of intertidal organisms from the 2021 Heat Dome, to preserving large mammal and bird population data from the Serengeti, to a BioBlitz investigating the diversity of organisms found in False Creek. These videos are shared on multiple platforms and populate an online exhibit.

Climate and Nature Emergency

The Peter Wall Institute for Advanced Studies at UBC put together a university-wide group of students, staff, faculty, and artists to respond to the Climate and Nature Emergency. The Beaty Biodiversity Museum was represented by Derek Tan as a staff leader on the Campus Synergy Group.

Support for UBC courses:

- SCIE 300 - Communicating Science, Dr. Reinhard Jetter: Designing exhibits, 66 students.
- BIOL 420N - Science and Digital Media, Dr. Robin Young: Messaging, evaluating impact, and the possibilities of digital media, 25 students.
- BIOL 541 - Techniques for the Visual Display of Biological Data, Dr. Doug Altshuler: Introduction to Illustrator for biological graphics, 4 students.

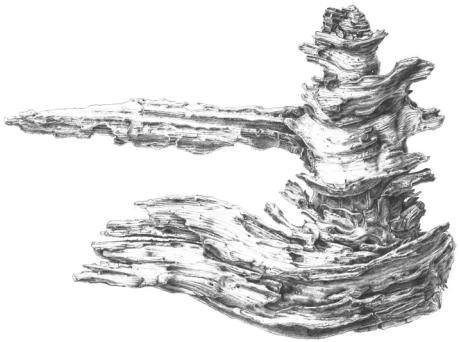
Temporary Exhibits:

Drift: from the forest to the sea by Bettina Harvey presented the artist's drawings of driftwood as a metaphor for memory, connection, and environmental change.

Preventing Extinctions: architecting the Accretocene by Island Conservation with Andy Wright showed a hopeful vision of the future where removing invasive species and rewilding island ecosystems could lead to a restoration of biodiversity.

Researchers Revealed: Francisco Henao Díaz.

Researchers Revealed: Amelia Hesketh.
Visit *explore.beatymuseum.ubc.ca/researchers-revealed* to watch the videos.



Drift

Bettina Harvey

BEATY BIODIVERSITY MUSEUM

COWAN TETRAPOD COLLECTION

NUMBER OF SPECIMENS: 45,313 | ACCESSIONED THIS YEAR: 222
SPECIMENS IMAGED: 12,578 | IMAGED THIS YEAR: 1,173
NUMBER OF UBC STUDENTS SUPPORTED: 41 | VOLUNTEER HOURS: 2,130
CTC SPECIMENS WITH CITATIONS: 11.1%

Dr. Darren Irwin
Director (from March 2023)

Dr. Jill Jankowski
Director (from April 2023)

Ildiko Szabo
Collections Curator

Chris Stinson
Lead Curatorial Assistant

Expanding the CTC Digital Journey

The digital journey for each specimen at the Cowan Tetrapod Collection (CTC) is complex and unique. Specimen images are curios unless they contain data. Data is everything. Knowing where, when, and by whom it was collected is closely scrutinized by both curious citizen scientists and researchers deciding whether or not to spend their valuable time and resources doing genomic testing or other analysis.

Henry W. Henshaw collected and prepared this Hawaiian 'i'iwi in 1899 (BBM_CTC B012841). His avian field guide was expanded and republished by National Georgrapic founding the series that still exists today. Due to his lobbying effers, Henshaw was selected to hand US President Woodrow Wilson the pen which signed the migratory Bird Act into Law (1913).

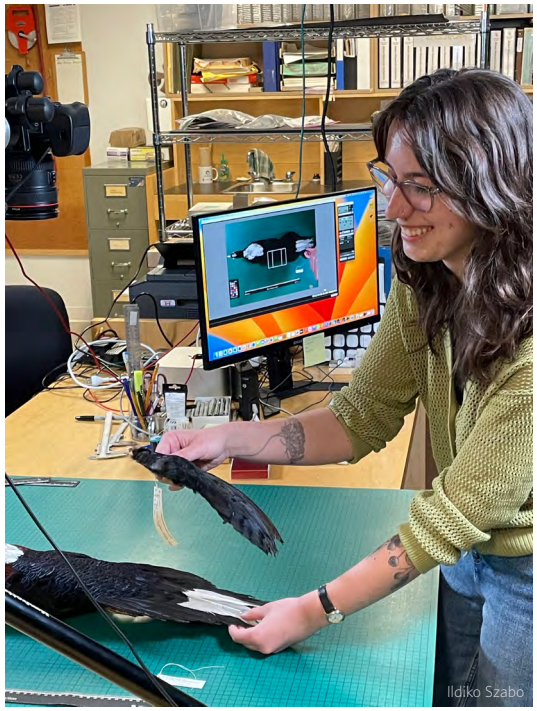
Currently the global photo digitization standard for vertebrates is two-dimensional images. Due to the inherent nature of birds, mammals, reptiles, and amphibians, a minimum of three images of each individual is required. A camera cannot capture a clear image of the data on the labels unless they are removed. The focus of each image must be perfect.

In the decades to come, the CTC staff anticipate that 3D images will become the norm. It's time to get started! In our digitizing room, we use both 3D photogrammetry and a 3D scanner. Our 3D desktop SOL PRO scanner is the most accurate affordable model available plus it has automatic calibration software and meshing processing capabilities.

Fostering relationships is how the CTC obtains specimens. We were exceptionally happy to rekindle a relationship with the Wildlife Enforcement Directorate, at Environment and Climate Change Canada. They kindly donated 60 customs seizure specimens. From the Royal British Columbia Museum, we were gifted over 500 birds, mammals, and reptiles from Atlantic Canada and around the world. As our digital skills are expanding so is the breath of the biodiversity housed at the CTC.

Conventional museum images of skulls such as this rock hyrax (M010882) miss important aspects of skull shape compared to 3D images our new SOL PRO scanner is capable of producing.

COWAN TETRAPOD COLLECTION



Work Learn Student Nola Morey during the digitization of this Swinhoe pheasant (B019077) donated to the CTC by the Royal British Columbia Museum.

Just an ordinary day at the museum! Spencer Goyette and Christopher Stinson taking delivery of two of the 60 specimens donated to the museum by the Wildlife Enforcement Directorate, Environment and Climate Change Canada.

Graduate students assisted:

- Altshuler Lab: Francesca Ciocca, Extensor Metacarpi Radialis project (Part II-non-passerines).
- Benson-Amram Lab: Coyote Health Study with an emphasis on diet and parasite prevalence in urban populations.
- WildCo (Burton) Lab: Camera-trap photo species identifications for: Jacqueline Sunderland-Groves, Research Scientistl; Katie Tjaden-McClement, MSc student; Tazarve Gharajehdaghipour, PhD student; Laura Stewart, MSc student .
- Irwin Lab: Vouchered specimens for Dr. Elizabeth Natola's PhD thesis: Reproductive isolation among *Sphyrapicus* sapsuckers.
- Speller Lab, Doris Fogarty, PhD student: UBC Archeology ZooMS (Zooarchaeology by Mass Spectrometry), provided samples of beaked whale specimens to create a library of collagen sequences.
- Beaty Biodiversity Museum Marine Invertebrate Collection: The search for adult trematode parasites in diving ducks, shorebirds, and wading birds that have larval stages in marine bivalves, barnacles, etc. project.

Assistance provided to other museums and institutions:

Royal British Columbia Museum: As part of the RBCM re-organization, over 500 prepared specimens collected outside of BC were donated to the Cowan Tetrapod Collection. The RBCM Board of Directors deemed it important that though these specimens do not fall under the RBCM mandate, they should be available to BC citizen scientists and researchers. Some of the highlights of this transfer/donation are:

- 17 walruses, six polar bears, three Arctic foxes, two South American foxes (undetermined species), a platypus, a European robin from 1884, African elephant tusks, narwhal tusks, a beluga, a shoulder-mounted pronghorn, and two anhingas prepared in 1877 by one of the founders of Yellowstone and Glacier National Park, George Bird Grinnell.

Support for UBC courses:

- BIOL 427 - Ornithology (and Herpetology), Dr. Darren Irwin: helped with ID labs, 48 students.
- FRST 395 - Forest Wildlife Ecology and Management, Dr. Cole Burton: helped with ID labs, 165 students.

UBC Courses, Clubs, and Outreach:

- UBC Anatomy and Dissection Club.
- Organized and developed eggs and nests for educational use. This will be the first time in the memory of the CTC that such educational material will be available. Two sets were created:
  - For undergrads: three drawers of eggs plus three drawers of nests filling one whole large green metal cabinet.
  - For elementary students (~Grade 4/5): two Cornell boxes of nests and eggs.
- ENVR 400: Consulted with Bat Project at UBC Farm and the School of Journalism.

Major Cowan Tetrapod Collection events:

- Hosted a necropsy session for the BC Ministry of Forests, Environment and Climate Change Canada and the BC Ministry of Agriculture to investigate:
  - Cause-of-death and gut analysis of Haida Gwaii blue-listed northern saw-whet owls and northern goshawks.
  - Cause-of-death determinations of the steeply declining BC western screech owl.
  - Cause-of-death and ocean plastics investigation of albatross family and other oceanic birds found in BC waters.
- Hosted multiple necropsy sessions for the BC Ministry of Forests to investigate:
  - General health of mustelids trapped in BC including difficult-to-obtain specimens from the Chilcotin.

Assistance provided to other universities and institutions:

- Environment and Climate Change Canada, Wildlife Enforcement Directorate: Permanent loan of 60 confiscated mammal, reptile, and avian specimens or artifacts. Many are mounted specimens, skulls, or fabricated from parts of CITES species (Convention on International Trade in Endangered Species of Wild Fauna and Flora) illegally imported into Canada.
- Royal British Columbia Museum: Donation of 469 prepared bird skins, skeletons and eggs, monitors, plus difficult-to-obtain frozen BC fishers (Mustelids).
- Environment and Climate Change Canada (ECCC) and BC Water, Land and Resource Stewardship (WLRS: Surrey): archived tissues and feathers from local blue-listed subspecies of great blue heron feeding studies of salvaged birds, ongoing.
- BC Ministry of Forests (Nanaimo): provided 200 new frozen specimens of ermine, martens, mink, and otter from central and northern BC.

COWAN TETRAPOD COLLECTION

Ian McTaggart Cowan with Kenneth Racey canoeing at Chezacut Lake in British Columbia (1931).

- BC Ministry of Forests, and Colella Lab, University of Kansas Biodiversity Institute and Natural History Museum: participated and obtained tissue and skeleton specimens at marten necropsies held both at the Beaty Biodiversity Museum and Nanaimo Ministry of Forests Lab.
- American Museum of Natural History: Open Wings Project - Phylogeny of all bird species based on DNA sequence data; American Museum of Natural History; contributed two samples of forest buzzard *Buteo trizonatus*. The CTC houses globally the most recently collected museum specimens despite them being collected in 1908. We have 3/5 of the only museum specimens in existence.
- Ohio State University, Andreas Chavez, Ecology and Organismal Biology Core Faculty/Translational Data Analytics Institute: 43 *Tamiasciurus* squirrel skulls.
- Canadian Museum of Nature: sampled guard hair for atlas and key to the hair of Canadian mammals—harbour seals, pronghorn, bighorn sheep.
- Richmond Nature Park and Terra Nova Park: they donated many articulated skeletons, a toucan mount, and a small 1963 Mitlenatch Island rodent specimen collection with excellent measurements and location data .
- Wilson School of Design: DEPD 4720 – Transformative Thinking, Project Transformed by Nature, guest lecturer.

MARINE INVERTEBRATE COLLECTION

SPECIMENS: OVER 600,000 | ACCESSIONED THIS YEAR: 10
NUMBER OF EXCEL DATABASED RECORDS: 9,000

Dr. Chris Harley
Director

Sheila Byers
Curatorial Assistant


Cim McDonald

Merilees Celebratory Event:
Bill Merilees on far left.

The Marine Invertebrate Collection (MIC) made some significant steps over the past year. William (Bill) Merilees, donor of a large mollusc collection in 2021, was duly celebrated at an event hosted by the museum in October 2022. The majority of the Merilees shell specimens are from BC, but additional world-wide "spine-free" marine organisms are included: all unpacked and incorporated into cabinets. Work continues to better organize this important research collection while incorporating archival materials and methods to ensure long-term archival management.

Over the past year, volunteer Alyana Lalani, assisted with compilation of an inventory of specimens in the MIC collection. In a new position as a Work Learn Collection Assistant, Aly is continuing with the reorganization, archiving, and documentation, particularly of the Merilees Collection.

Lauren Gill is finalizing her Living Data Project with the Canadian Institute of Ecology and Evolution. Lauren is 'scraping' the Merilees Collection field notes from Word documents to migrate the data into an Excel spreadsheet: 9,000 Excel records have been transposed. The project facilitates the migration of Merilees' data into the Specify software from where data will become publicly available. Several publications highlighting the Merilees Collection are in progress.

Bauer wet specimens: *Balanus* barnacle

Sheila Byers

Other important "spine-free" invertebrates added to the collection include sunflower stars - important representatives associated with climate change research. Collection growth continues with specimens from the Joe Bauer Collection such as sponges, octopuses, worms, prawns, and crabs.

Thank you to the generosity of donors such as Bill Merilees and Joe Bauer, and the continuing long-term relationship of Kelly Norton, the scientific and educational value of the Marine Invertebrate Collection holds immense opportunities in serving the public.

VASCULAR AND ALGAE COLLECTION, UBC HERBARIUM

SPECIMENS: 349,000 | NEW THIS YEAR: 1,650
NUMBER OF IMAGED SPECIMENS: 2,000 | NEW THIS YEAR: 2,000
DATABASED RECORDS: 270,000

We house the largest collection of vascular plants in western Canada and one of the largest macro red algae collections and second-largest assemblage of coralline specimens in North America.

Our Digital Journey: Increasing Access to Our Collections for Everyone

This was a pivotal year for digitizing the vascular and algae collections with a generous influx of funds from the Museums Assistance Program, Digital Access to Heritage. For the first time we initiated imaging the macro algae collection while greatly increasing our overall specimen imaging quality and at a much faster speed. Our goal is for everyone to be able to download all the specimen images for any species found in our collection. We know more access to the collection increases our shared knowledge to better understand how best to protect our flora, including our unique coastlines.

We also continued our highly successful undergraduate engagement activity—Collection BioBlitz. We had over 300 UBC undergraduate students participate either virtually using Notes from Nature or in the museum to help us find non-inventoried specimens in our collection. In turn, the undergraduates learn about how to use collections in research and how their work will help increase awareness and access to our collections. This activity has a wide range of topics for any UBC class to connect to their curriculum including; detecting global climate change, speciation events, documenting and mapping biodiversity, and how collections are used in research and teaching.

We are also always grateful for all our skilled and passionate botanists and phycologists who brought us thousands of vascular and algae specimen donations. Many are from British Columbia, Canada, and the United States but also from wide-reaching floras of the world such as the Amazon Basin and St. Helena. These new collections are precious documents to continue our understanding of the world's flora today, to help us better predict how to protect biodiversity in the future.

Luna Mortenson

Algae Collections from the Herbarium.

Algae specimens being processed during a student BioBlitz.


Luna Mortenson

Dr. Jeannette Whitton
Director

Linda Jennings
Collections Curator

Spencer Goyette
Curatorial Assistant

Amanda Leslie
Geomatics Technician

Dr. Sandra Lindstrom
Curator of Algae

Dr. Patrick Martone
Curator of Coralline Algae

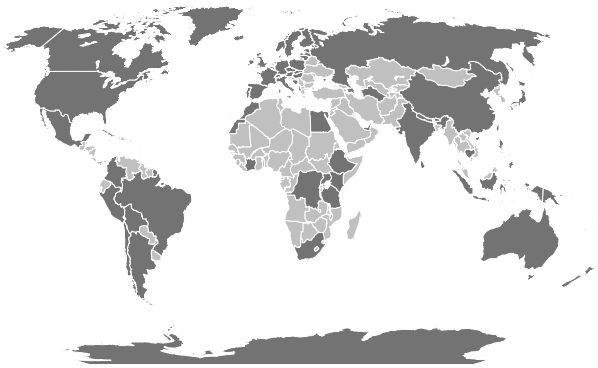
Dr. Quentin Cronk
Curator of Eudicots

Dr. Sean Graham
Curator of Monocots and Basal Angiosperms

BRYOPHYTES, LICHENS, & FUNGI, UBC HERBARIUM

DATABASED RECORDS: 326,118 | NEW THIS YEAR: 16,522
NUMBER OF IMAGED SPECIMENS: 1,285
UBC STUDENTS SUPPORTED: 69

There were many exciting developments in the Bryophytes, Lichens, and Fungi division of the UBC Herbarium in 2022–2023. Foremost, we received a donation of more than 19,000 named bryophyte specimens from the collections of Dr. Diana G. Horton and Dr. David W. Jamieson from Diana's sister, Patricia Webb, and accompanying funds to process them. Diana was a meticulous and prolific collector who exchanged specimens with colleagues throughout the world. The specimens represent the diversity of bryophytes found on every continent.



Global representation of specimens in the Dr. Diana G. Horton and Dr. David W. Jamieson Collection *(in dark grey)*. Specimens were collected from more than 80 countries and territories, including Antarctica.

Support for UBC courses:

- BIOL 321: Morphology & Evolution of Bryophytes
- BIOL 323: Structure & Reproduction of Fungi

The donation greatly expanded the taxonomical, geographical, and historical representation of the UBC bryophyte collection, and the accompanying funds provided employment and training opportunities for collections staff and student workers. Ongoing digitization of the Horton-Jamieson specimen data immediately attracted the attention of taxonomists and conservation organizations, including the Yukon Conservation Centre and NatureServe Canada, which provided additional funds to rapidly digitize Diana's collections from Yukon, the Northwest Territories, and Nunavut.

Field work this year in the Bryophyte, Lichen and Fungi division included participation in the Whistler BioBlitz by undergraduate students Connor Wardrop and Edward Sun, and retired UBC Collections Manager of Bryophytes, Lichens, and Fungi Olivia Lee. Among other finds, they added the hornwort *Anthoceros fusiformis* to the regional species list.

Betty Pang, refolding Horton-Jamieson specimen packets to fit UBC Herbarium storage trays.

Dr. Jeannette Whitton
Director

Dr. G. Karen Golinski
Collections Curator

Spencer Goyette
Curatorial Assistant

Dr. Mary Berbee
Curator of Fungi

Trevor Goward
Co-Curator of Lichens

Curtis Björk
Co-Curator of Lichens

Yun Ting (Betty) Pang
Herbarium Assistant

Dr. Emma Harrower
Mycologist-in-Residence

BRYOPHYTES, LICHENS & FUNGI, UBC HERBARIUM

Anthoceros fusiformis

UBCs Co-Curators of Lichens—Trevor Goward and Curtis Björk—continued to shine in their ongoing dedication to describing lichen biodiversity and conserving exceptional ecosystems. Trevor and international collaborators described four species "new to science", including *Dendriscosticta gelida* Ant.Simon, Goward & T.Sprib., *Sticta arenosella* Di Meglio & Goward, *Sticta fasciculata* Di Meglio & Goward, and *Sticta gretae* Goward & Di Meglio, and Curtis conducted several inventories of plants and lichens in provincial and national parks. Among other conservation successes, their collaboration with the Valhalla Wilderness Society has helped secure legal protection for the upper Incomappleux drainage, and their work with Dr. Darwyn Coxson of the University of Northern BC has contributed to legal protection a portion of the Hungary Creek drainage as a corridor connecting Ancient Forest/ Chun T'oh Whudujut and Sugarbowl-Grizzly Den Provincial Parks.

In November we welcomed the Herbarium's first Mycologist-in-Residence, Dr. Emma Harrower, an expert in the family Cortinareaceae. Emma reviewed close to 2,000 specimens of *Cortinarius* held by UBC and updated identifications based on modern taxonomic concepts. We are extremely grateful for a multi-year annual donation that made Emma's position possible.

Mycologist-in-Residence: Dr. Emma Harrower.

This year we were saddened by the loss of Victoria mycologist Oluna Ceska, who along with her husband, Dr. Adolf Ceska, spent more than a decade tracking mushroom diversity at Observatory Hill on Vancouver Island. Close to a third of all fungal specimens held by UBC were contributed by Oluna, and we are currently accessioning thousands of additional specimens recently donated by Adolf.

Oluna and Adolf Ceska

SPENCER ENTOMOLOGICAL COLLECTION

SPECIMENS: 655,000 | ACCESSIONED THIS YEAR: 2,000
DATABASED RECORDS: 138,575 | NEW THIS YEAR: 2,575
IMAGES OF SPECIMENS: 43,750 | NEW THIS YEAR: 300
IDENTIFICATIONS FOR THE PUBLIC: 500

Dr. Wayne Maddison
Director

Karen Needham
Collections Curator

Whistler, BC, June 2022
Left to right: Scott Gilmore, Savi Raghuraman, Adam Braz, Karen Needham.

The Spencer Entomological Collection (SEC) is the second-largest collection of insects and other arthropods in western Canada.

Databasing and photography of our specimens continued, with our retired imaging technician, Don Griffiths, generously donating his time to train Work Learn students and volunteers on our complex photography set-up. Photos of all species new to the collection, either as new identifications (thanks to loans and visiting researchers) or as newly acquired species (thanks to BioBlitz efforts and donations), have been added to our collection's website. A museum-wide MAP grant funded one of our Winter Work Learn positions with a focus on digitization. Once again, Yukon specimens in our collection were databased with support from the Yukon Conservation Data Centre and NatureServe Canada.

We continued our provincial and territorial biodiversity surveys with five trips in 2022. We made trips to Whistler in early June and late July as part of the 11th annual Whistler BioBlitz, organized and sponsored by the Whistler Naturalists. The focus was on high-alpine sites for the 4th year in a row. Our 6th annual trip to Yukon took us to the Beaver Creek/Koidern area in the southwest, where wetlands abound. This year's BioBlitz, organized and sponsored by Environment Yukon, saw the largest number of total species and new species added to the territorial list of any BioBlitz to date. Finally, in collaboration with the Ministry of Environment, we surveyed insects in Manning Park in June and September, with a large wildfire making the June trip especially challenging.

SPENCER ENTOMOLOGICAL COLLECTION

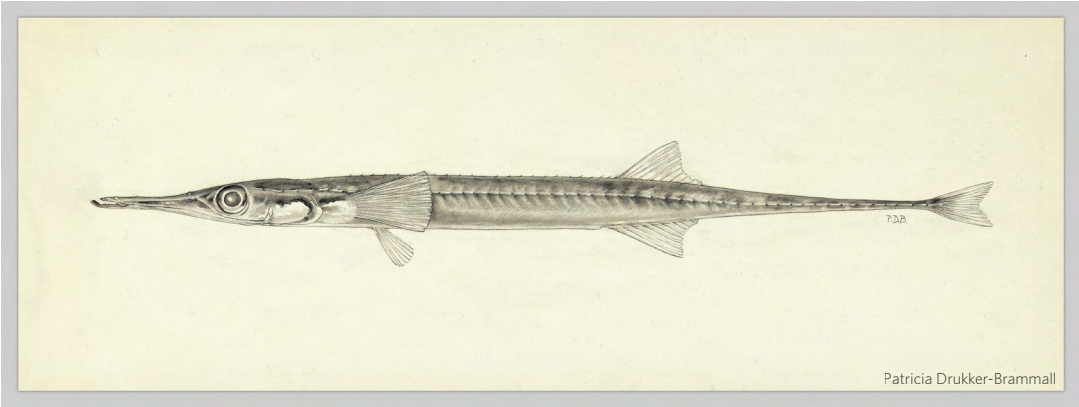
A small field trip to Cypress Hills, Alberta, yielded more specimens of an undescribed *Pellenes* jumping spider. This allowed genomic data to be gathered, as well as fresh specimens for description. If males can be collected this year, this will become the type locality of the species, which ranges south to Oaxaca.

This year's major jumping spider publication described a new genus, *Kelawakaju*, hiding in plain sight in South and Southeast Asia. Almost all of the species are new, even though they live in major cities like Singapore.

Donations:

A BC butterfly donation from Mr. Neil Brett-Davis of North Vancouver added many valuable specimens to our collection, including the last known record of one species and vouchers of several rare species. Spanning fifty years and reaching all corners of the province, his donation represents a lifetime spent documenting BC butterfly fauna. Work also continued on the Scudder legacy project, incorporating Dr. Geoff Scudder's BC, Yukon, and Alaska material into our collection, and disseminating the remainder of his specimens to museums around the world. Dr. Scudder was the director of the Spencer Entomological Collection from 1958–1999, and continued both his local and global systematics work until the onset of ill health in 2021.

Beaver Creek, Yukon, July 2022, a dragonfly (*Libellula quadrimaculata*) on fireweed *(above left)*, Chris Stinson on the White River *(left)*, and fritillaries on common yarrow *(right)*.



Tube-snout (*Aulorhynchus flavidus*) drawn by Patricia Drukker-Brammall between 1965 and 1974.

FISH COLLECTION

SPECIMENS: 352,750
NUMBER OF RECORDS WITH GEOCOORDINATES: 49,000
NUMBER OF UBC STUDENTS SUPPORTED: 2

Dr. Eric B. Taylor
Director

Dr. Nicolas Bailly
Curatorial Assistant

The Fish Collection is the third-largest ichthyological collection in Canada and a major provincial, national, and international resource.

First presented in the 2019 report, the scanning of 129 drawings commissioned by N.J. Wilimovsky, a previous curator and professor of Zoology, was finally achieved under the British Columbia History Digitization Program with the UBC Digitization Centre. Also, 470 x-ray plates were scanned, which allowed their digital preservation while 75 others were in too poor a condition to digitize. All scans are available at the UBC Open Library.

As part of the Museums Assistance Program (MAP) digitization project, a complete inventory of the Fish Collection is in progress (currently halfway through the 288 cabinets), thanks to Yuli Mukohyama and Leah Isfeld. The collection database has been updated accordingly. The number of specimens per jar has been corrected or is now better estimated where there were too many of them (e.g., juveniles, small species) in previous assessments.

As part of the MAP project, the collection database is being prepared to be moved into a new system (Specify), which was also the occasion to increase the level of standardization and correct and complete some metadata.

In partnership with Dr. Patrick Martone, we released a new version of *Fish Sorter*, a phone app developed to identify BC's freshwater fishes.

Two notable donations enriched the Fish Collection this year:

- Joseph G. Bauer: As a fisherman in Steveston, he collected specimens from 1950 to 1960, mainly from British Columbia (around 260 specimens in 206 lots, 100 species). Thanks to Bud (his executor) and Helen Sakamoto for their help.
- Royal British Columbia Museum (RBCM): Gavin Hanke, the fish collection curator in the RBCM, sent us around 2,600 specimens in 443 lots (148 species, of which 74 are new to our collection), mainly deep-sea mesopelagic fishes from the Northwest Pacific. Thanks to Gavin who sent us the proper metadata ready for our database.

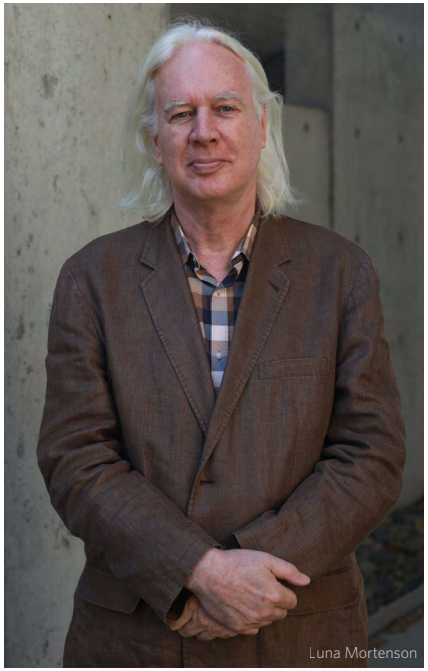
Nicolas Bailly participated in various international biodiversity informatics initiatives' regular and annual meetings as a member of their steering committees: FishBase/SeaLifeBase (FishBase Consortium member, Taxonomy Coordinator), Catalogue of Life (COL: Vice-Chair of the Global Team), World Register of Marine Species (WoRMS: Steering Committee member, Fish Taxonomy Editor).

FOSSIL COLLECTION

SPECIMENS: 30,000
DATABASED RECORDS: 7,496

Dr. Kendra Chritz
Director

Dr. Bruce Archibald
Collections Curator



Collections Curator, Bruce Archibald.

The lower jaw from a mammoth.

The Fossil Collection has over 30,000 specimens that range from recent shells to early traces of cyanobacteria, called stromatolites that represent some of the oldest evidence of life on Earth. The collection includes several of British Columbia's earliest natural history records and represents a comprehensive survey of BC's paleontological heritage.

This year, Dr. Bruce Archibald visited the Royal BC Museum and the Burke Museum (Seattle) and had discussions of specimens and collections management with curators at the Geological Survey of Canada (GSC: Ottawa and Vancouver), and the Canadian Museum of Nature. Dr. James Haggart (GSC) is assisting in identifying a large number of Cretaceous molluscs in the Beaty collections. Bruce has worked closely with Dr. Rolf Mathewes of Simon Fraser University, writing with him and with scientists at the American Museum of Natural History, the Smithsonian National Museum of Natural History, the Royal BC Museum, the US National Parks Service, the Sichuan Agricultural University (China), the University of Florida, Arizona State University, Georgia State University, Museum Mors (Denmark), Natural History Museum of Denmark, the Fur Museum (Denmark), and the Natural History Museum Aarhus (Denmark). Bruce was also an applicant for NSERC funds with Dr. Joel Saylor, Dr. Rachel White, Dr. Lindsey Heagy, and Dr. Kendra Chritz of EOAS. Outreach to regional museums in Princeton, BC and Republic, Washington is described on the following page.

A partial fossil of the mouthparts of *Anomalocaris*, a marine animal from the Cambrian Explosion.

Collection

Approximately 30,000 fossil specimens in the Beaty fossil collection were evaluated and sorted. About half are high quality with sufficient data and will be accessioned as museum specimens (see below). These include (numbers approximate): trilobites (2 cabinets), other Paleozoic marine invertebrates (3.5 cabinets), Mesozoic marine invertebrates (3 cabinets), Cenozoic marine invertebrates (1 cabinet), mammals (1.5 cabinets), reptiles (partial cabinet), fish (1.5 cabinets), plants (Paleozoic, Mesozoic, Cenozoic: 6 cabinets).

Those without sufficient data and of low quality are grouped to general type (e.g., echinoderms, ammonites) and placed in about 150 bankers' boxes for teaching and outreach. Storage space has been rented for these. This teaching collection is already being actively used, by the PME for an exhibit, Teaching & Learning at the Beaty for development of new Beaty Boxes, the Beaty Nature Club for a grade school level program, the Marine Life Sanctuaries Society of British Columbia, and exhibition at the BC Mining Fair.

High-quality specimens that lack sufficient data constitute a small supplementary collection. These are not numbered but are accessible to researchers who might clarify their status.

Preparator Rod Bartlett repaired a broken ammonite for display at the PME.

New numbering system and database

Collection fossils will be given accession numbers in a new numbering system and entered by Dr. Bruce Archibald in the Specify database with an interface customised for fossils by the Beaty Curator of Bioinformatics, Mark Pitblado.

Major collections acquired

- The highly significant collection of Dr. Rolf Mathewes (SFU) from the early Eocene at Quilchena, BC, starting with fossil insect holotypes. This collection has so far resulted in a variety of papers on the fossil insects and plants of Quilchena and their communities and climate (see "Presentations" featuring or using fossils from the RW Mathewes collection, page 32). The Mathewes collection complements the Archibald collection described below in adding another early Eocene regional locality which also has plants, insects, and fish.
- The large Dr. Ken Naumann fossil collection, in batches. This was collected over many years and comes with his meticulous documentation. It includes fossils from British Columbia and around the world.
- When the preceeding collections are accessioned, Dr. Bruce Archibald's large collection will come in. This consists of over 4,000 insect, plant, and fish fossils from early Eocene localities of BC (Princeton, Falkland, McAbee, Horsefly River). The insects of all localities were collected in an unbiased fashion suitable for a variety of analyses. Bruce knows of no other large, unbiased insect fossil collections from any locality world-wide (apart from one that he is also organizing at Republic). This collection includes hundreds of unnamed species from two weeks' collecting at one locality for one study alone. This collection has played a large role in the great majority of over 60 papers written by Bruce to date analysing patterns of diversity and biogeography as well as describing and naming many new species and genera, a few families, and a new suborder.

People at the Stonerose Interpretive Center, Republic, Washington at a talk on Republic fossils by Bruce Archibald say "Hi, Beaty!"

Upgrading

A locked, fireproof type specimen cabinet, a Canon EOS R10 camera with macro lens and copy stand, and shelf liner foam were acquired.

Student and public involvement

Student volunteers Sasha Ubhi and Riley Jane, non-student volunteer Ken Naumann, and Work Learn student Kendra Leishman worked in collections.

Outreach

Upper Similkameen Indian Band

Bruce met with Upper Similkameen Indian Band (USIB) personnel at Hedley, BC, to discuss how the Beaty might collaborate with them in education programs. They decided on:

- A visit to the Beaty by USIB high school students.
- A class talk on regional fossils with an afternoon collecting trip and follow-up class to identify and discuss them.
- Bruce is organizing a visit by paleontology graduate student Daniel Moses of the Colville Reservation to speak to USIB students on being a First Nations scientist.

Princeton Museum, Princeton, BC

Bruce met with the Princeton Mayor and Princeton Museum personnel, discussing ways in which the Beaty might assist in upgrading exhibits, e.g., of large-picture stories that can be told using Princeton fossils (evolution, biogeography, biodiversity), wordings of exhibit texts, and creating a large mural of life in the Princeton Allenby Formation forest fifty million years ago. We also discussed upgrading collections, e.g., to a level suitable for housing type and figured specimens. Bruce is doing a talk series on regional fossils and what they tell us about biogeography, biodiversity, and the history of life (see "Presentations", page 33). Bruce's next talk will be on the *Titanomyrma* ant fossil (see "Media", below) that was discovered by a Princeton resident just outside the village limits.

Princeton is three hours' drive from Vancouver and has richly fossiliferous, easily accessible exposures of Allenby Formation lacustrine shale, coal, and the famous Princeton Chert. There is a high potential for developing a fieldtrip program to the Princeton region for UBC students in Earth, Ocean and Atmospheric Sciences courses and in the Vancouver Summer Program, perhaps in collaboration with the Upper Similkameen Indian Band and the Princeton Museum.

Stonerose Interpretive Center, Republic, Washington

Bruce met with museum personnel and held discussion topics as with the Princeton Museum.

Media

Bruce did media on the *Titanomyrma* sp. ant fossil in the Beaty collections, appearing on City TV news and Global TV and website, CKNW (*The Jill Bennett Show*), CityNews 1130, CBC radio Vancouver (*Early Edition*) and Kelowna (*Daybreak*), and nationally on Global, CBC *As it Happens* and in *Canadian Geographic*. It was covered internationally in Brazil, China, Russia, Indonesia, Spain, Arabic press, Turkey, Vietnam, Netherlands, Hungary, Romania, Ukraine, Thailand, Germany, Portugal, Bulgaria, the UK, Poland, and other countries. It ran in over 70 BC newspapers.

BIODIVERSITY INFORMATICS

IMAGES BACKED-UP: 42,000
RECORDS DIGITALLY ACCESSIBLE: 694,292
RECORDS TRANSITIONED INTO SPECIFY: 34,405
STORAGE CAPACITY ADDED: 18 TB

Dr. Quentin Cronk
Faculty Director

Mark Pitblado
Curator of Informatics

Amanda Leslie
Geomatics Technician

A new system for a new era

Biodiversity Informatics is the newest collection at Beaty, and is tasked with storing, sharing, and organizing the digital data collection within the museum. This year, the museum began the transition from our legacy collection management system to Specify, a database system produced by the Specify Collections Consortium (SCC). The Beaty Biodiversity Museum became a member of the SCC joining around 90 other member institutions from around the world. While any data migration requires a lot of careful planning, patience, and persistence, the Informatics collection is pleased to have a solid foundation on which to build on in the years ahead.

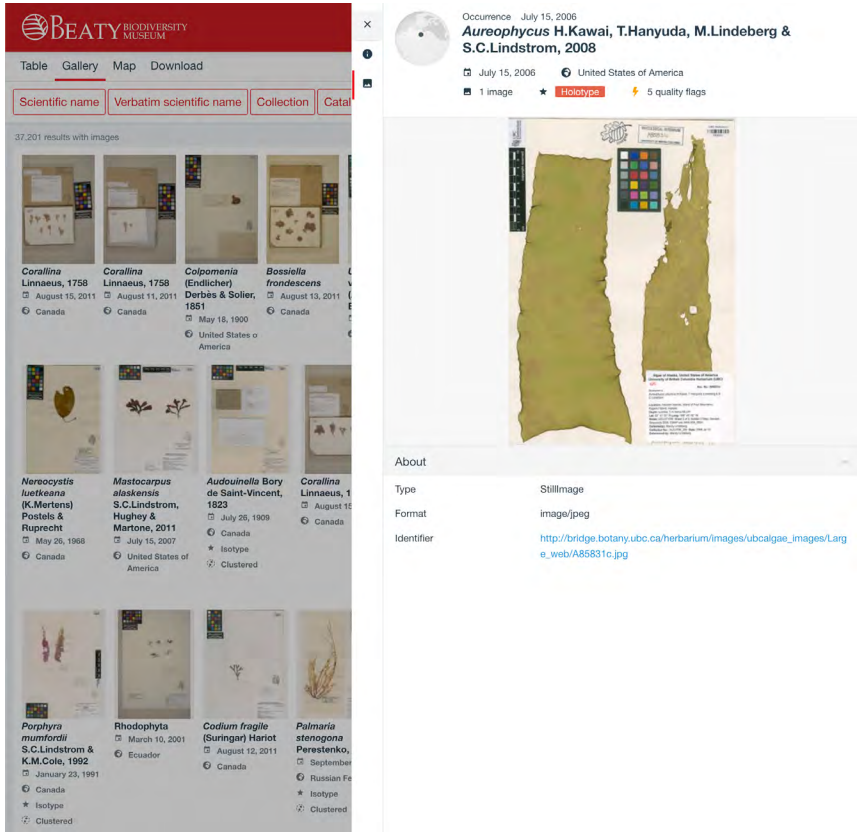
Safeguarding digital treasures

Images of specimens have become increasingly important in the digital age, where it is often more effective to share a file with collaborating researchers than to send a physical specimen. Over the past decade, curators at the museum have been imaging the treasures within their collections, and safeguarding this work is of paramount importance to the museum. Our aim is not only to preserve a digital archive of knowledge for the future, but also to share it with the world. This year, Biodiversity Informatics implemented a multi-tiered, museum-wide backup strategy for this collection of high-quality images and purchased a new server to help make them readily accessible. With the arrival of new camera equipment, images of specimens will look better than ever, but will also require much more storage space. This system will allow us to scale up to meet these increasing data storage needs securely.

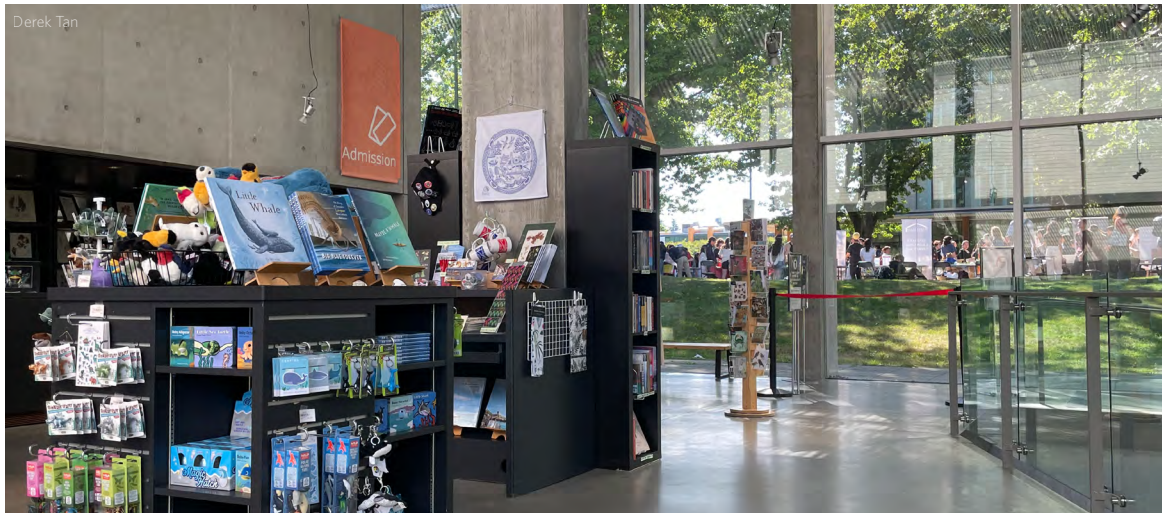
Supporting a culture of data curiosity

Biodiversity Informatics is looking forward to integrating data processes with Exhibits, Teaching & Learning, and museum volunteers, so that researchers and members of the public can experience the wonders of the Beaty no matter if they are near or far. We value a participatory, open, and collaborative framework where learning about biodiversity is interactive and fun for all, and we look forward to contributing to new and innovative solutions for knowledge delivery.

Specimens in the database interface.



ADMINISTRATION



Derek Tan

TOTAL ON-SITE VISITORS: 44,991
REVENUES FROM PAID ADMISSION: $290,000
REVENUES FROM MUSEUM SHOP SALES: $21,000

Catherine Ouellet-Martin
Senior Operations Manager

Deepti Arya
Visitor Services Supervisor

Sandra Lo
Sebastiane Seggie
Sena Youn
Christine Kerr
Heather Campbell
Rhea Josie
Mackenzie Stewart
Visitor Services Clerks

Strategic & Operational Planning

Annual operational planning continues to follow priorities set by the 2019–2024 Strategic Plan for Collections, Curation & Research, Teaching & Learning, Exhibitry, Community Engagement and People & Places. A new strategic planning exercise will start in January 2024 to replace the current plan, now in its final year.

Facilities Expansion

The Biodiversity Research Centre and the Beaty Biodiversity Museum are expanding. Construction started in April 2023 and is scheduled to be completed in 2025. The expansion will be a 4,430-square-metre six-story laboratory and office addition to the existing building that will provide space for researchers, museum collections and supporting functions, and meeting and gathering spaces. Throughout the year, the museum working group dedicated many hours to completing the design of the new facilities and preparing for the construction years ahead.

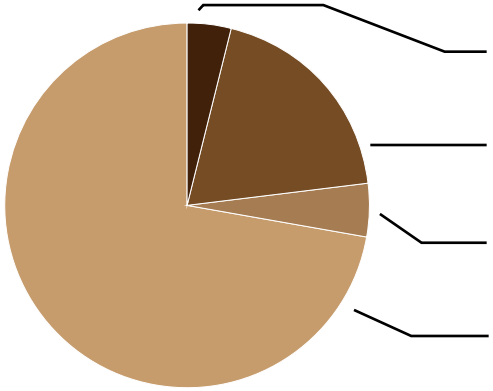
Human Resources

The museum provides a respectful and collaborative environment in which to work and learn, one supported through inspiring facilities, recognition and growth for individuals, and sustainable operations. This year, we added the new position of Curator of Biodiversity Informatics to lead the museum's ongoing and important digitization work. In support of this work, a Museums Assistance Program grant from Canadian Heritage has allowed the museum to double its levels of student hiring to create a collections digitization workforce.

OPERATIONS

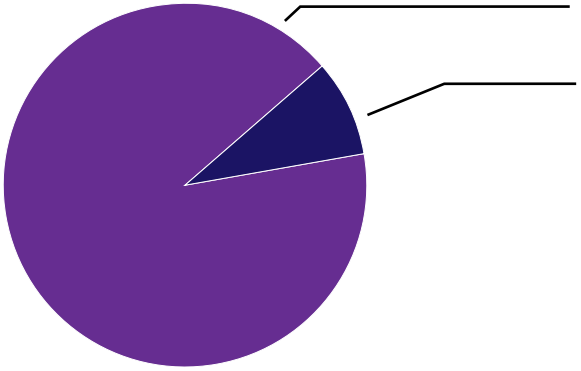
Figures in thousands of dollars.

Income



Endowment transfer	66
Earned Income	311
Grants and Donations	75
Faculty of Science Allocation	1,165

Expenses



Human resources	1,433
Non-salary expenses	137
Research and Collections	34
Teaching and Learning	10
Exhibits and Design	10
Marketing, Communication, and Events	15
Visitor services, Operations, and Administration	41
Capital Expenses	27

Special Funds Contributions to Special Projects

Footprints in Time - Funded by Digital Museums Canada	24
Digitization Project - Funded by Canadian Heritage Museums Assistance Program	128

DONORS

We are grateful to our founding donors who made essential contributions to the creation of this world-class facility for biodiversity research and community learning:

Drs. Ross and Trisha Beaty
The Djavad Mowafaghian Foundation
Dr. Allan Yap

And a heartfelt thank you to everyone who has supported us since.

Donations

Anamika Baruah
Ann and Mikkel Schau
Anonymous
Arthur Li
Barry Narod
Beverley Ramey
Christina Harley
Christopher Hale
Cornelia DeBondt
Dave Holden
David and Jennifer Wood and Family
Frank Lomer
Kelly Talayco
Lockwood Gibbs
Margery Wilke
Nathalie Djan-Chékar
Patricia Webb
Pauline Finn
Quentin Cronk
Sandra Lindstrom
Teresa Winstead
Terry McIntosh
Thomas Wells
W.S. Lorenz Bruechert
Wendy L. Noel
Yumin Qiu

Students draw from Herbarium specimens of fireweed with artist Holly Schmidt.

PUBLICATIONS AND PRESENTATIONS

Publications

Archibald, S.B., Cannings, R.A., and Greenwalt, D.E. 2022. *Kishenehna prima*, a new genus and species of darner dragonfly (Odonata, Aeshnidae, Gomphaeschninae) from the early middle Eocene Kishenehn Formation of Montana, USA. *Zootaxa*, 5099 (4): 496–500. DOI: 10.11646/zootaxa.5099.4.5

Archibald, S.B., Gu, J.-J., and Mathewes, R.W. 2022. The Palaeorehniidae (Orthoptera, Ensifera, "Zeuneropterinae"), and new taxa from the early Eocene Okanagan Highlands, western North America. *Zootaxa*, 5100 (4): 559–572. DOI: 10.11646/zootaxa.5100.4.6

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Some of the faculty, staff, and students of the Beaty Biodiversity Museum.

"EXCELLENT ORGANIZED DISPLAYS. REALLY A WORLD-CLASS BIODIVERSITY MUSEUM. OUR FAMILY REALLY ENJOYS COMING HERE."

- Attila Szamoskozi

BEATY BIODIVERSITY MUSEUM

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