



# ANNUAL REPORT

## 2017-2018



THE UNIVERSITY OF BRITISH COLUMBIA

Faculty of Science



BEATY BIODIVERSITY MUSEUM 2017-2018

***42,367 VISITORS***

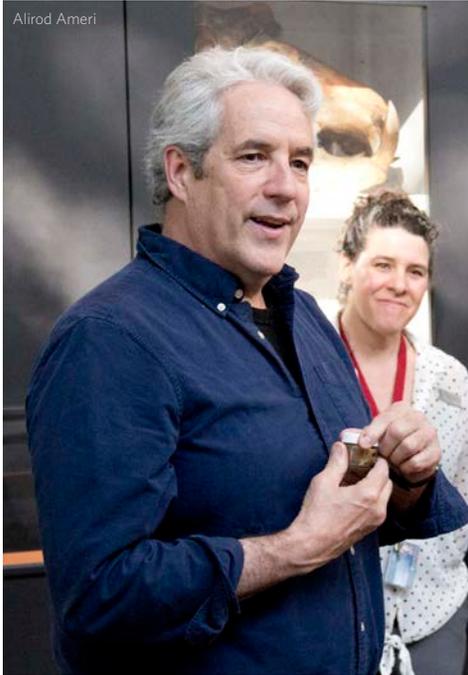
***186 EDUCATION VOLUNTEERS***

***10,144 PROGRAM PARTICIPANTS***

***18,328 NEW SPECIMENS***



2	Director's Report
3	Education and Outreach
5	Volunteers
6	Partnerships
8	Marketing, Communications, and Events
9	Exhibits and Design
11	Evaluations
12	Collections and Research
12	Cowan Tetrapod Collection
14	Marine Invertebrate Collection
15	Herbarium
17	Spencer Entomological Collection
18	Fish Collection
19	Fossil Collection
20	Administration
21	Operations
22	Donors



**Dr. Eric Taylor**  
Director, Beaty Biodiversity Museum  
Professor, Department of Zoology  
Director, Fish Collection

## A Year of Successes

The past year has been a truly remarkable one in the relatively short history of the Beaty Biodiversity Museum (BBM). I say this because the BBM was fortunate enough to realize a number of successes or advancements that significantly extend our reach and impact. Below, I highlight a few of these important activities.

The first involved two exhibit openings, one temporary (*Life in Colour*) and the second permanent (*Dinosaur Trackways*). I link these two exhibits because they both represent our drive to make the contents of the BBM more interactive and engaging. *Life in Colour* came alive with the colouring contributions on the exhibit by our visitors. The *Dinosaur Trackways* bring ‘tactility to our exhibitry’; visitors, especially the little ones, love to touch the dinosaur tracks which represent biodiversity that existed millions of years ago. We are particularly proud of the *Dinosaur Trackways* exhibit, which opened in March 2018, because it represented several years of work and great interactions with researchers and technicians of the Peace Region Palaeontology Research Centre in Tumbler Ridge, British Columbia. Special thanks to my colleague Darren Irwin who initiated this partnership several years ago.

Next, the BBM made significant progress in our efforts to include Indigenous perspectives on biodiversity. Here, we partnered with the Museum of Anthropology (MOA) and six First Nations cultural centres to help develop *Culture at the Centre*, a set of exhibits that highlight how Indigenous-run cultural centres and museums in BC are celebrating their culture (including that involving biodiversity), history, and language.

The BBM also made great strides in obtaining external funding and grants in support of our mission. The largest of these was a very generous donation of \$2 million by Wheaton Precious Metals, to be shared equally between

the BBM and the Pacific Museum of Earth (PME). Much of this funding will be directed toward the *Walk Through Time* exhibit that will provide an interpretive walkway of Earth history and biodiversity from the PME to the BBM across Main Mall. The BBM received an additional ~\$400,000 in funding from the BC | Canada 150 Grant program, the Virtual Museum of Canada initiative, the Museums Assistance Program, and the Faculty of Science in support of enhanced exhibits, education, and curation. At least some of this funding was motivated, in part, by visitor feedback and our evaluations program to help improve our visitors’ experience at the BBM. Further, I am pleased to report that our evaluations program provided good evidence that visitors to the BBM leave the BBM with an enhanced understanding and appreciation of biodiversity (see the Evaluations report for more details). Finally, we had our highest attendance since the BBM opened in 2010; more than 42,000 people visited our museum in 2017–2018.

These various successes of the BBM are to some extent due to our continuing good fortune, including the support of our donors, members, and volunteers. As Bobby Unser (three-time winner of the Indianapolis 500) said, however, “success is where preparation and opportunity meet.” I congratulate the staff and faculty of the BBM on the successes that they engineered.

Finally, the BBM has prospered under the guidance and support provided by Drs. Simon Peacock (Dean, Faculty of Science), Bob Shadwick (Head, Department of Zoology), and Sean Graham (Head, Department of Botany) for which we are all grateful. Drs. Peacock and Shadwick will be retiring from their respective administrative positions as of July 1, 2018, and all at the BBM wish them the best as they move forward in their careers.

# EDUCATION AND OUTREACH

NUMBER OF UBC GROUPS BOOKED: 113 | TOTAL NUMBER OF PROGRAMS BOOKED: 400

NUMBER OF WAY COOL TALKS: 12 | WAY COOL TALK VISITORS: 453



Education & Outreach team share the stories of the research collections through school programs, public tours, activities, special events, and partnerships. Direct connections are made between biodiversity researchers and the public at our Way Cool and Nocturnal events—allowing visitors to meet the people behind the important research at the Biodiversity Research Centre and similar institutions.

This year we offered 22 different bookable experiences, 14 of which were programmed specifically for elementary and secondary students and aligned to meet the new BC curriculum. This includes the successful Earth Experience, a full-day school program run in collaboration with the Pacific Museum of Earth.

This was the second year of our successful Beaty Box specimen loan program and we launched two ‘Forest’-themed boxes available to teachers, educators and community groups. We are pleased to see them being used by a variety of schools, libraries, camps, and art galleries. Additional Beaty Boxes are being developed thanks to a generous private donation.

School bookings and Beaty Boxes continue to be key revenue generators for the museum and we continued to provide support for several low-income and inner-city schools to ensure students from across Vancouver have access to the museum and to our Beaty Boxes.

Jackie Chambers  
Education and Outreach Manager

Nicole Balsdon  
Education and Outreach Coordinator

Nancy Lee  
Kashifa Hafeez  
Sheila Byers  
Alison Porter  
Vincent Sayson  
Museum Interpreters



**NICOLE BALSdon,  
EDUCATION AND OUTREACH  
COORDINATOR, RECEIVED A 2017  
DEAN OF SCIENCE EXCELLENCE  
IN SERVICE AWARD**



# VOLUNTEERS

VOLUNTEER HOURS: 10,000

ACTIVE VOLUNTEERS: 186



Over 180 active education volunteers support us in sharing the stories of the research collections. This year we invested in volunteer management software, Better Impact, in order to accommodate our growing volunteer numbers. Along with other members of the museum team, 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 once monthly.

Beatty Museum volunteers come from all walks of life, ranging 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.

## PARTNERSHIPS



Over 3,300 undergraduate and graduate students from UBC and other post-secondary institutions visited the museum as part of a course. We hosted two pre-service teachers on Community Field Experience practicum, and delivered two sessions on successful field trip planning for pre-service teachers, providing opportunities for future professionals to gain hands-on experience.

We also saw an increase in collaborations with organizations and events both within UBC (courses, professors, and TAs, Belkin Museum, and MOA) and off campus (participating in Science Literacy Week, VSB Scientist in Residence Program and presenting at the BC Museums Association Conference). These conferences and collaborations help to move the museum beyond its four walls and allow our skills, expertise, and reputation to gain broader recognition. Through support and funding from UBC Campus + Community Planning and work with the PME, and MEED graduate student group, we continued to offer our monthly Nature Club to families on campus. Funding from the BC | Canada 150 grant allowed us to enhance our learning and social spaces in the museum. Special events this year included: Hands-On Biodiversity during spring break, continuing to work with researchers to lead our Way Cool series, and the launch of a suite of new activities exploring evolution, extinction, and dinosaurs complementing the new *Dinosaur Trackways* exhibit.

# THIS YEAR THE BEATY MUSEUM PARTNERED WITH...

Conservation Data Centre of British Columbia

**UBC Museum of Anthropology**

Big Rock Brewing

**French-Ameri-Can Talks - Oceans**

Exploring by the Seat of Your Pants

**Royal British Columbia Museum**

Campus Culture Challenge

Haida Heritage Centre at Ʒay Llnagaay

**Duke University Herbarium**

Museum of Vancouver

**Canadensys**

Nature Vancouver

Nisga'a Museum

Angela Gooliaff

UBC Alumni Centre **Ohio State University**

British Columbia Museums Association

Drs. Rich McCrea and Lisa Buckley

**UBC SEEDS**

UBC Development

**Emily Carr University of Art and Design**

UBC Department of Earth, Ocean and Atmospheric Sciences

Vancouver Convention Centre

**Squamish-Lil'wat Cultural Centre**

Hemlock Printers

**Pacific Museum of Earth**

UBC Centre for Teaching, Learning and Technology: Indigenous Initiatives

**Textile Association of America**

David Ng

David Ellingsen

UBC Botanical Garden

Norma Rose Point School

NGX Interactive

**Missouri Botanical Garden**

Lorraine Roy

Haida Gwaii Museum

**Embassy of France in Canada**

ABC Photo

UBC Homecoming

**New York Botanical Garden**

MOA Native Youth Program Ontario Arts Council

Musqueam Cultural Education Centre

**Global Biodiversity Information Facility**

UBC Chapman and Innovation Grant

**US Fish and Wildlife Service**

White Rock Museum & Archives

UBC Peter A. Allard School of Law

Fraser River Discovery Centre

Capture Photography Festival



# MARKETING, COMMUNICATIONS, AND EVENTS

ACTIVE MEMBERSHIPS: 211

TWITTER FOLLOWERS: 3,454 | FACEBOOK FOLLOWERS: 3,070

INSTAGRAM FOLLOWERS: 2,301

Through Marketing, Communications, and Events, we are able to connect a larger audience to our museum collection, whether they are visiting the museum in person or learning from us online.

We launched our new *Dinosaur Trackways* exhibition with an evening event on March 29 and a Way Cool Talk on April 1. While both events were well attended and very well received, the March 29 event stands out as the most-attended evening event in the museum's history with over 130 people listening to a talk about dinosaur research. Many of the attendees for both of these events were young families who live near campus. This exhibit has allowed us to better connect with this key demographic and we will be exploring ways to further activate it in the future.

In May, we conducted our first membership survey with all current and expired members to evaluate satisfaction with the program. Some key findings are that 82% of respondents are "Satisfied" or "Very Satisfied" with their membership and 91% think that membership is worth the cost. This survey was used to adjust the membership events for the rest of the year and will be used to revitalize the membership program and benefits later this year.

Making our annual Guided Mushroom Walk with Mary Berbee a members-only event was one of these changes. Despite restricting attendance, the event was still at capacity and many attendees purchased a membership solely to attend this event. Going forward, we will continue to offer this event and other hands-on collections-based experiences for our members.



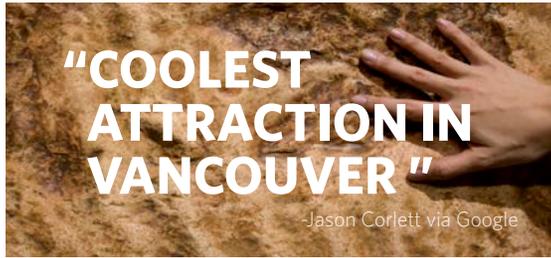
Amy Gibson  
Marketing, Communications,  
and Events Coordinator

## The Beaty Biodiversity Museum held partner events with:

Big Rock Brewing	April 20: Nocturnal – Hops
Exploring by the Seat of Your Pants	May 23: North America-wide Google Hangout
Campus Culture Challenge	September 1–October 14
UBC Homecoming	September 16
UBC Development	October 13: Donor Event
Biodiversity Research Centre	November 7: Biodiversity Lecture Series
Embassy of France in Canada	November 17: FACT-O Conference
UBC Alumni Centre	December: Tree Decorating
Science Slam and UBC Kung Fu Club	February 15: Nocturnal
Drs. Rich McCrea and Lisa Buckley	March 29 and April 1: Dinosaur Trackways

## Presentations:

- Vancouver Attractions Group: Amy Gibson joined the Board of Directors in May 2017
- BC Museums Association (Victoria, October 2–6): *Moving from the Inside Out: Museums and Environmental Education*. Amy Gibson, Jackie Chambers, and Nicole Balsdon
- Association of Registrars and Collections Specialists (Vancouver, November 3–5): *"To Tweet or not to Tweet" and other Social Media Questions from the Collections Point of View*. Amy Gibson (BBM) Bianca Ruthven (The Metropolitan Museum of Art), Travis Puterbaugh (World Golf Hall of Fame and Museum), Erin Robin (Delaware Art Museum), and Danielle Currie (Vancouver Art Gallery)



## EXHIBITS AND DESIGN

SPECIAL EXHIBITIONS: 8  
NEW RESEARCHERS REVEALED EXHIBITS: 5

Yukiko Stranger-Galey  
Exhibits and Design Manager

Derek Tan  
Digital Media Specialist

Lesha Koop  
Museum Artifact Technician

The new *Dinosaur Trackways: Footprints in Time* permanent exhibit opened to a full house with talks by palaeontologists from Tumbler Ridge. The exhibit showcases a trio of dinosaur footprint casts from BC in an engaging and interactive display. A substantial grant from the Virtual Museum of Canada will fund an online, bilingual exhibit by the same name.

The prominent and popular large mammals cabinet was redesigned and now includes many stunning specimens, including a musk ox, jaguar, and a barbary sheep.

A redeveloped Whale Station incorporating a digital touchscreen and real, touchable specimens was unveiled this year, thanks to a BC | Canada 150 Grant. Highlights include a drone video that flies visitors through our blue whale skeleton and an interactive blue whale flipper bone puzzle.

Eight special exhibitions engaged our thousands of visitors in our vision of a world where biodiversity is better understood, valued, and protected. These exhibitions include the award-winning *Life in Colour*, the 2018 Capture Photography Festival-featured *Life: As We've Known It*, and the ground-breaking *Culture at the Centre*.

Two new forest-themed Beaty Boxes have joined the ranks of our rentable outreach kits. The incredible care and attention to detail in the creation of these boxes was featured on the Webby Award-winning Tumblr site, *Things Organized Neatly*.

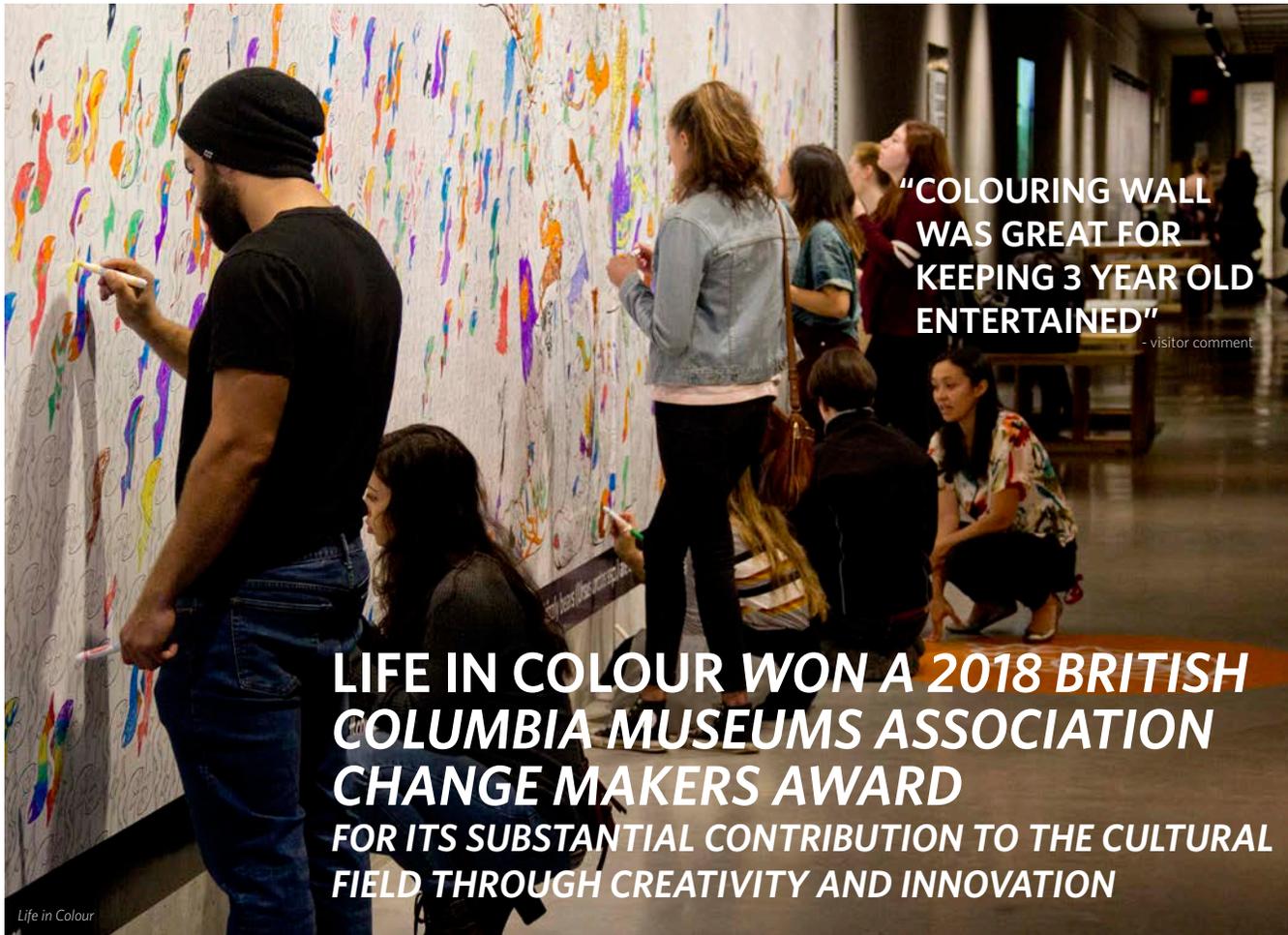
Our commitment to communicating the excitement and value of the biodiversity research at UBC continued with five new exhibits in our *Researchers Revealed* series. These include the naming of a new species of jumping spider *Pellenes canadensis*, in honour of Canada's 150<sup>th</sup> Birthday, and a survey of the insect life supported by the green roof of the Vancouver Convention Centre. The museum also collaborated with Dr. Mary Berbee, curator of fungi, in developing a mobile-optimized website listing commonly misidentified poisonous mushrooms in the Pacific northwest. This project is supported by the Department of Botany and the Peter Wall Institute for Advanced Studies.



### Presentations and Publications:

Royal British Columbia Museum and British Columbia Museums Association professional development series webinar (May 16, 2018): *Activate Your Exhibition*. Yukiko Stranger-Galey and Derek Tan.

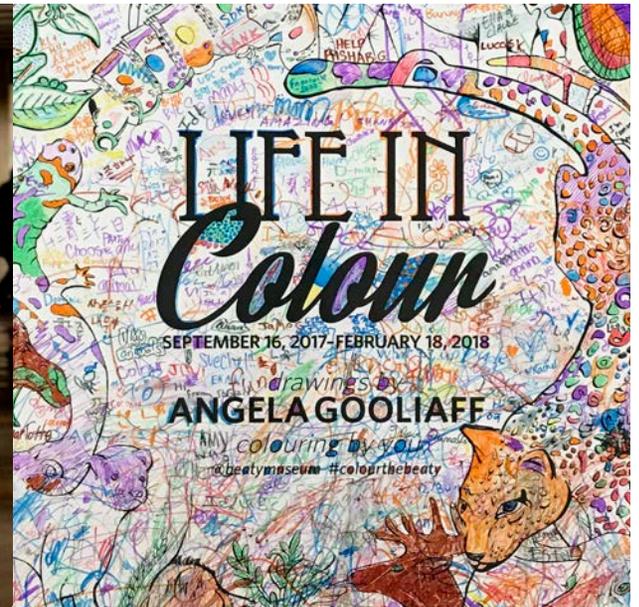
"Life in Colour: Exploring the Natural World through Exhibition." 2018. Yukiko Stranger-Galey, Angela Gooliaff, Derek Tan, Lesha Koop, Haseenah Molumo. *Roundup*, issue 271.



**"COLOURING WALL WAS GREAT FOR KEEPING 3 YEAR OLD ENTERTAINED"**  
- visitor comment

**LIFE IN COLOUR WON A 2018 BRITISH COLUMBIA MUSEUMS ASSOCIATION CHANGE MAKERS AWARD FOR ITS SUBSTANTIAL CONTRIBUTION TO THE CULTURAL FIELD THROUGH CREATIVITY AND INNOVATION**

Life in Colour



**SATELLITE EXHIBITION**

**MUSQUEAM  
SQUAMISH  
LIL'WAT  
HEILTSUK  
HAIDA  
NISGA'A**

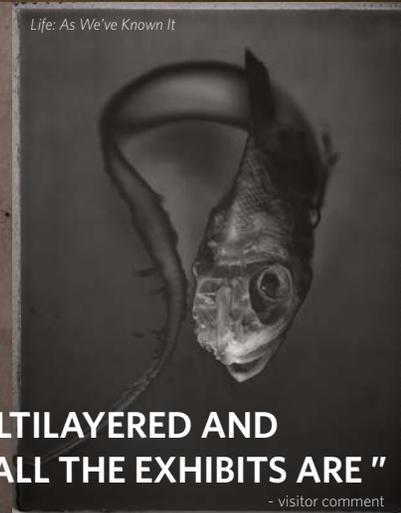
**CULTURE  
AT THE CENTRE**

**NATURE VANCOUVER  
PHOTOGRAPHY EXHIBITION  
2017**

May 7<sup>th</sup> - November 19<sup>th</sup> 2017  
This exhibition features the winners from Nature Vancouver's annual members' photography competition.



Science to Art (START): Pollinators

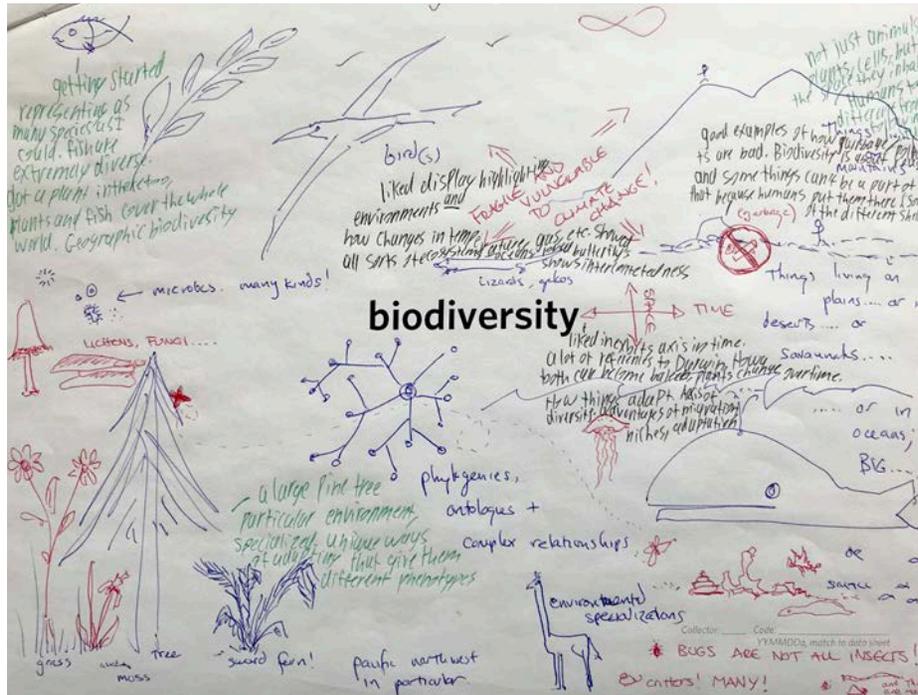


Life: As We've Known It

**"LOVE HOW MULTILAYERED AND THOUGHTFUL ALL THE EXHIBITS ARE "**  
- visitor comment

# EVALUATIONS

**INCREASE IN VISITORSHIP OVER PREVIOUS YEAR: 11.5%**  
**PERCENTAGE OF VISITORS WHO TALK TO A VOLUNTEER: 57%**



Visitor-drawn map. Green and blue ink are pre-visit, red and black ink are post-visit.

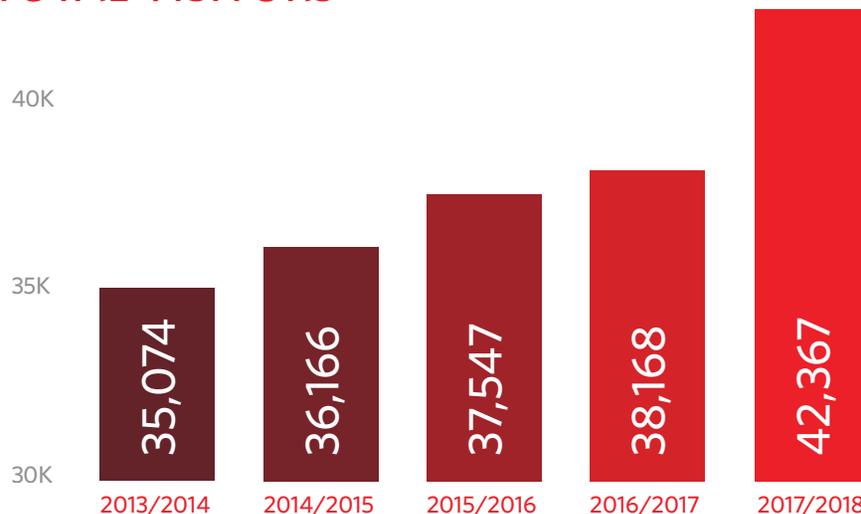
The Museum Evaluation & Assessment Working Group, led by Education, brings together all departments to discuss visitor studies.

This year, the goal was to investigate our visitors' understanding and appreciation of biodiversity pre- and post-visit. Interviews were conducted in which visitors drew a map of what biodiversity meant to them before visiting the museum. This map was added to after their visit to see how the meaning had changed.

Of 23 completed maps, all visitors added new categories of understanding to their maps. All but one map expanded on prior knowledge, with notable areas of knowledge growth in algae and protists, fossils, fungi, and extinction.

Going forward, we hope to add to our visitors' sense of valuing and protecting biodiversity by adding actionable prompts to our public programming.

## TOTAL VISITORS



**“WHEN I THINK OF BIODIVERSITY, I THINK ‘EXOTIC’, BUT EVEN WITHIN CANADA THERE ARE MANY DIFFERENT SPECIES. I WAS KIND OF SURPRISED.”** -visitor evaluation study



Alfred Ameri

The Cowan Tetrapod Collection (CTC) is the second-largest scientific collection of birds, mammals, reptiles, and amphibians in British Columbia.

On the museum floor, the refurbished large mammal cabinet has garnered attention, as did a new exhibit of the first specimen of a house swift, *Apus nipalensis*, ever recorded in the Americas. Numerous specimens were prepared by staff and added to the teaching and research collection. The most notable of these was a false killer whale, demoiselle crane, and the sandhill crane “Mister” who is the founding father of the sandhill crane population that opted to stop migrating and become year-round residents of the Lower Mainland.

Word is spreading that our curation staff can assist with current research projects by graduate students. Cowan Tetrapod Collection (CTC) staff helped physiology graduate students and postdoctoral researchers procure and process specimens for wing morphing and feather material properties experiments. This involved preparing wings for wind tunnel and range of motion testing and the extraction of individual feathers for torsion and vibrometer analysis. They also aided genomic students with studies on northern goshawks and sapsucker hybrid studies.

Further afield, the CTC curatorial staff helped researchers from multiple universities with morphological measurements of museum specimens, destructive sampling for genetic studies, and the fabrication of decoy mounts out of bird carcasses for use in field studies (Simon Fraser University, University of Northern British Columbia, Gonzaga University (Washington State), Central Washington University (Washington State), and Dexter University (Pennsylvania)).



Alfred Ameri

# COWAN TETRAPOD COLLECTION

NUMBER OF SPECIMENS: 44,067 | ACCESSIONED THIS YEAR: 498

SPECIMENS IMAGED: 12,190 | IMAGED THIS YEAR: 1,577

NUMBER OF UBC STUDENTS SUPPORTED: 205

VOLUNTEER HOURS: 732

Dr. Darren Irwin  
Director and Curator

Ildiko Szabo  
Assistant Curator of Birds

Chris Stinson  
Curatorial Assistant of Mammals,  
Reptiles, and Amphibians



Gull wing mounted on the wall of University of Toronto wing tunnel prior to wing morphing experiments. Wings for Christina Harvey's master's thesis project were prepared in the museum lab with the help of CTC staff.

Christina Harvey

# COWAN TETRAPOD COLLECTION

## The CTC partnered with:

UBC Museum of Anthropology  
UBC Department of Anthropology

*Amazonia: Rights of Nature* Exhibit  
Jessica Metcalfe Banting, Postdoctoral research  
and Teaching Fellow: hair samples for Utah  
archaeological site comparison and collaborator on  
SSHRC Insight Development Grant application

## Graduate students assisted:

- Kenny Askelson, MSc candidate, Irwin Lab: Genomic Differentiation of Northern Goshawks in Coastal British Columbia
- Christina Harvey, MSc candidate, Altshuler Lab: Effect of Wing Morphing on Gull Aerodynamic Stability
- Jasmin Wong, PhD candidate, Altshuler Lab: Aeroelastic Flutter of Flight Feathers
- Vikram Baliga: Postdoctoral Fellow, Altshuler Lab: Capabilities and Limitations of Musculoskeletal Morphing in the Avian Wing

## Non-UBC courses and organizations supported:

- Quest University: two-day workshop
- University of Alberta, Andrew Cook, PhD Candidate, Proctor Lab: supplied European starlings for ectoparasite research
- Simon Fraser University, Dan Peach, PhD Candidate, Gries Lab: mosquito attraction to mallard wings
- Central Washington University, Patrick Lubinski, Professor: even-toed ungulates (artiodactyl) comparative morphology of stylohyoid bones
- University of Northern British Columbia, Brittney Walroth, Undergraduate, Rea Lab: hair samples for black bear diet
- Burke Museum, University of Washington, Audra Richter, PhD Candidate, Barton Lab: herpetofauna successional patterns in response to ancient megafloods using herpetological skeletal material
- Gonzaga University, John Orcutt, Lecturer: comparative morphology of marsupial humeri
- Trinity Western University, Darcy Kehler: Vertebrate Zoology tour
- Emily Carr University, Beth Howe: Drawing 208

## UBC courses and organizations supported:

- BIOL 427 - Ornithology and Herpetology
- PORT 405 - Studies in Portuguese and Brazilian Culture
- VISA 321 - Intermediate Drawing II
- FRST 395 - Forest Wildlife Ecology and Management
- BIOL 371 (UBCO) - Flora of British Columbia
- UBCO Explores Club

## In the community:

- Assisted with bioblitzes held in Kluane National Park and Reserve (Yukon), Mossum Creek (Port Moody), Whistler, Pender Island (Parks Canada), Stanley Park (Stanley Park Ecology Society)
- Joined project SNOWstorm: tracking snowy owls
- Nature Vancouver:
  - CTC specimens provided for table talk display at the monthly meetings. Birds specimens complemented that evening's lecture.
  - February meeting: was the guest lecturer (topic: *Amazonia & The Rights of Nature*)
- Stanley Park Ecology Society: led three *You Otter See Beavers* night walks

## Notable publications:

Szabo, I., Walters K., Rourke, J., Irwin, D.E. 2017. First record of House Swift (*Apus nipalensis*) in the Americas. *Wilson Journal of Ornithology* 129: 411–416.

Kearns, A.M., Restani, M., Szabo I., Schøder-Nielsen, A., Kim, J.A., Richardson, H.M., Marzluff, J.M., Fleischer, R.C., Johnsen, A., Omland, K.E. 2018. Genomic evidence of speciation reversal in ravens. *Nature Communication* DOI: 10.1038/s41467-03294-w.

Min, I. 2017. "A Feathered Foray into Forensics". *MOA Magazine* Issue 04, Fall 2017.

# MARINE INVERTEBRATE COLLECTION

SPECIMENS: OVER 500,000

ESTIMATED NUMBER OF SPECIES: 50,000

Marine animals without backbones are housed in our Marine Invertebrate Collection. The collection contains thousands of specimens representing the major lineages of animals, such as cnidarians, molluscs, annelids, crustaceans, echinoderms, and sponges. These creatures have a tremendous variety of colours and forms.

Dr. Chris Harley  
Director

The Marine Invertebrate Collection has strong ties to undergraduate teaching and research. Undergraduate invertebrate biology classes access the collection for teaching purposes, and recent honours theses have added material to the collection.

We thank several donors for providing us with specimens ranging from corals to cowries to a giant clam shell that requires two people to lift. Special thanks are due to Kelly Norton for her continuing relationship with the Marine Invertebrate Collection.

We are also pleased to announce the launching of the “Carefoot Marine Invertebrate Image Collection.” The collection is based on the thousands of images of the spectacular world of marine invertebrates that retired professor Dr. Thomas Carefoot took and assembled throughout his career at UBC. The collection will be available very soon. We thank Cindy Young of Mousetrap Multimedia for creating this great resource.



Thomas Carefoot

A feeding polychaete tubeworm, *Serpula vermicularis*.  
The photo was taken in Barkley Sound, BC in  
September, 1992 by Dr. Thomas Carefoot.



Octopus  
Octopoda

# HERBARIUM

SPECIMENS: OVER 706,600 | DATABASSED RECORDS: 551,700 | NEW RECORDS THIS YEAR: 12,800  
IMAGED SPECIMENS: 33,000 | NEW IMAGES THIS YEAR: 1,000  
LOANS: 1035 | VOLUNTEER HOURS: 320  
NUMBER OF NEW SPECIES ADDED TO COLLECTION: 60

The Herbarium comprises several collections including the algae, bryophytes (mosses and relatives), vascular plants, fungi, and lichens.

The UBC Herbarium is ranked in the top 100 largest herbaria in the world.

### British Columbia Forest Fires threatened precious lichen collection.

Dr. Trevor Goward and Curtis Björk, co-curators of UBC's lichen collection, maintain one of the largest and most important personal lichen collections in North America, with over 20,000 specimens, including more than 100 species new to science. This year's record-breaking BC wildfire season put this unique and precious collection at risk of being lost forever. Many people helped with packing, transporting, and delivering over 20,000 lichen specimens to the BBM. This collection is now protected for long-term research.

### Museum Collection BioBlitz!

#### Incorporating research collections and novel teaching techniques in first year UBC undergraduate learning

- For the first time, UBC Herbarium invited 260 first-year undergraduate students to interact with our research specimens in a Collection BioBlitz! Science One (SCIE 001), an innovative first-year multidisciplinary program, and students from Genetics, Evolution and Ecology (BIOL 121) learned about species diversity and natural history collections. In return, the students inventoried parts of our collections that are known to be inaccurate or remain un-digitized, with both parties benefiting greatly. This novel teaching project was awarded by UBC Scholarship of Teaching and Learning Seeds Program (SoTL) and was picked as a community partner for UBC's Environmental Research Project in Environmental Science (ENVR 400) to study the impacts of collections-based teaching and learning.

Dr. Jeannette Whitton  
Director

Linda Jennings  
Assistant Curator and Manager

Olivia Lee  
Collections Manager

Erin Fenneman  
Collections Assistant

Dr. Sandra Lindstrom  
Curator of Algae

Dr. Patrick Martone  
Curator of Coralline Algae

Dr. Judith Harpel  
Curator of Bryophytes

Dr. Quentin Cronk  
Curator of Eudicots

Dr. Sean Graham  
Curator of Monocots and Basal Angiosperms

Dr. Mary Berbee  
Curator of Fungi

Trevor Goward  
Co-Curator of Lichens

Curtis Björk  
Co-Curator of Lichens



## Field Collecting BioBlitz!

### Invaluable collecting of British Columbia's Biodiversity

- To celebrate Canada's 150<sup>th</sup> Anniversary, Collections Manager, Oliva Lee participated in BioBlitzes in British Columbia including Government House in Victoria, Stanley Park in Vancouver, and Mossom Creek in Port Moody. She ran the eighth annual 'Schofield Bryophyte and Lichen Foray' in Manning Provincial Park and also participated in her 30<sup>th</sup> year of 'Botany BC' held in Cathedral Provincial Park and attended her first fungus foray at Whistler's 'Fungus Among Us'.



Linda Jennings leads a group in the Stanley Park BioBlitz.



The first collection ever of *Triquetrella californica* in Canada. First found on Galiano Island by Steve Joya and Olivia Lee during the first Galiano BioBlitz.

## Notable Publications:

Maria L. Kuzmina, Thomas W. A. Braukmann, Aron J. Fazekas, **Sean W. Graham**, Stephanie L. Dewaard, Anuar Rodrigues, Bruce A. Bennett, Timothy A. Dickinson, Jeffery M. Saarela, Paul M. Catling, Steven G. Newmaster, Diana M. Percy, Erin Fenneman, Aurélien Lauron-Moreau, Bruce Ford, Lynn Gillespie, Ragupathy Subramanyam, **Jeannette Whitton**, **Linda Jennings**, Deborah Metsger, Connor P. Warne, Allison Brown, Elizabeth Sears, Jeremy R. Dewaard, Evgeny V. Zakharov, and Paul D.N. Hebert. Using Herbarium-Derived DNAs to Assemble a Large-Scale DNA Barcode Library for the Vascular Plants of Canada. *Applications in Plant Sciences*, 5(12).

Lücking, R., Moncada, B., McCune, B., Farkas, E., Goffinet, B., Parker, D., Chaves, J.L., Lőkös, L., Nelson, P.R., Spribille, T., Stenroos, S., Wheeler, T., Yanez-Ayabaca, A., Dillman, K., Gockman, O.T., **Goward, T.**, Hollinger, J., Tripp, E.A., Villella, J., Álvaro-Alba, W.R., Arango, C.J., Cáceres, M.E.S., Coca, L.F., Printzen, C., Rodríguez, C., Scharnagl, K., Rozzi, R., Soto-Medina, E. & Yakovchenko, L.S. *Pseudocyphellaria crocata* (Ascomycota: Lobariaceae) in the Americas reveals to be ten species, and none of them is *Pseudocyphellaria crocata*. *The Bryologist* 120: 441-500, 2017.

Historical Flowering Phenology Across a Broad Range of Pacific Northwest Plants. Christopher W. Kopp, **Linda Jennings**, Barbara Neto-Bradley, Jas Sandhar, Siena Smith, Louisa Hsu, Taxonomic Digital Working Group (TDWG), Ottawa, Canada, Oct. 2–6, 2017.

**Dr. Mary Berbee** was requested to contribute to the Canadian Environmental Project Assessment of some fungi (myxomycetes) of Canada.

*The Meaning of Lichen*. How a self-taught naturalist unearthed hidden symbioses in the wilds of British Columbia —and helped to overturn 150 years of accepted scientific wisdom. An article on **Trevor Goward** by Erica Gies, June 2017, *ScientificAmerican.com* 53.



Allrod Arnedi

# SPENCER ENTOMOLOGICAL COLLECTION

SPECIMENS: 650,000 | ACCESSIONED THIS YEAR: 5,000  
DATABASED RECORDS: 120,000 | NEW THIS YEAR: 8,000  
IMAGES OF SPECIMENS: 40,000 | NEW THIS YEAR: 6,000  
IDENTIFICATIONS FOR THE PUBLIC: 180 | VOLUNTEER HOURS: 500

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

Canada 150 provided us with many unique survey opportunities, including the Gulf Islands National Park on Pender Island and Kluane National Park in the Yukon. In total, we participated in five bioblitz events this year, and have so far written two papers on our new finds from this work.

We also continued our monthly surveys of the green roof atop the Vancouver Convention Centre West. To date, we have recorded more than 250 arthropod species that make this unique urban habitat their home. This is the first comprehensive insect survey of a green roof in North America. Results on the project will be published shortly.

Thanks to funding from the Yukon Government and Environment Canada, over 4,200 records of Yukon, Northwest Territories, Nunavut, and Alaska specimens were added to our database. Work on our webpages continued with photos of most families in our collection and distribution maps for many of them now complete.

A month-long expedition to southern Mexico yielded many new species of *Mexigonus* jumping spiders.

Dr. Peter Belton, BC's leading mosquito expert, generously donated his personal collection of hundreds of BC mosquitoes to us, adding many new survey locations and several new species to our collection.



Dr. Wayne Maddison  
Director

Karen Needham  
Assistant Curator

Chris Ratzlaff  
Curatorial Assistant

Don Griffiths  
Imaging Volunteer

## Notable Publications:

Leduc-Robert, G. and Maddison W.P. 2018. Phylogeny with introgression in *Habronattus* jumping spiders (Araneae: Salticidae). *BMC Evolutionary Biology* 18:24. (online at <https://doi.org/10.1186/s12862-018-1137-x>).

Maddison W.P. 2017. New species of *Habronattus* and *Pellenes* jumping spiders (Araneae: Salticidae: Harmochirina). *ZooKeys* 646: 45–72.

Maddison W.P., Evans S.C., Hamilton C.A., Bond J.E., Lemmon A.R., and Lemmon E.M. 2017. A genome-wide phylogeny of jumping spiders (Araneae: Salticidae), using anchored hybrid enrichment. *ZooKeys* 695: 89–101.

Ratzlaff, C.G. 2018. New records of Hymenoptera from British Columbia and Yukon. *Journal of the Entomological Society of BC* (in press).

Redei, D., Kondorosy, E., Ishikawa, T., Aukema, B., Brialovsky, H., Carapessa, A., Deckert, J., Dellape, P., Gao, C., Henry, T.J., Jung, S., Kment, P., Malipatil, M., O'Donnell, J., Scudder, G.G.E., Tomokumi, M., and Tasi, J.F. 2017. *Metochus abbreviates* Scott, 1874 (Insecta, Heteroptera): proposed precedence over *Rhyparochromus erosus* Walker, 1872 (currently *Metochus erosus*). *Bulletin of Zoological Nomenclature* 74: 2057-2070. (online at <http://www.bioone.org/doi/abs/10.21805/bzn.v74.a008>).

# FISH COLLECTION

SPECIMENS: 853,407 | NEW THIS YEAR: 30  
DNA SAMPLES: 71,698 | NEW THIS YEAR: 750  
TISSUE COLLECTIONS: 4,369 | NEW THIS YEAR: 500

Dr. Eric Taylor  
Director

Dr. Nicolas Bailly  
Curatorial Associate  
(Volunteer)

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

Over the past year, Dr. Nicolas Bailly oversaw the update of more than 500 records in the UBC Institute of Fisheries Field Records displayed by the UBC Library (Digital Centre) (<https://open.library.ubc.ca/collections/fisheries>) which provides critical link between the digital records of the fish collection on FishBase and metadata from original field notes. Dr. Bailly also continued his important work on various biodiversity databases and initiatives such as the Catalogue of Life, FishBase, SeaLifeBase, and the World Register of Marine Species (WoRMS). In particular, some of this work is seeking to generate an integrated network of marine biodiversity information systems for people and the environment. Sometime in 2018, we will be hiring, for the first time, a Curatorial Assistant in the Fish Collection, which will improve the care of our vast holdings and allow more efficient processing of new specimens and loan requests.

## Notable Publications:

Lecaudey, L.A., Schliwen, U.K., Osinov, A.G., **Taylor, E.B.**, Bernatchez, L. and Weiss, S.J., 2018. Inferring phylogenetic structure, hybridization and divergence times within Salmoninae (Teleostei: Salmonidae) using RAD-sequencing. *Molecular Phylogenetics and Evolution* 124: 82–99.

This paper used DNA and tissue samples from the Fish Collection to provide the most robust phylogeny of salmonine fishes (salmon, trout, char) to date.

Horton, T., Gofas, S., Kroh, A., Poore, G.C.B., Read, G., Rosenberg, G., Stöhr, S., **Bailly, N.**, Boury-Esnault, N., Brandão, S.N., Costello, M.J., Decock, W., Dekeyser, S., Hernandez, F., Mees, J., Paulay, G., Vandepitte, L., Vanhoorne, B., Vranken, S. 2017. Improving nomenclatural consistency: a decade of experience in the World Register of Marine Species. *European Journal of Taxonomy* 389:1–24. doi:10.5852/ejt.2017.389

Béarez, P., Pruvost, P., Feunteun, E., Iglésias, S., Francour, P., Causse, R., De Mazieres, J., Terceire, S., **Bailly N.** 2017. Checklist of the marine fishes from metropolitan France. *Cybium* 41(4):351–371.

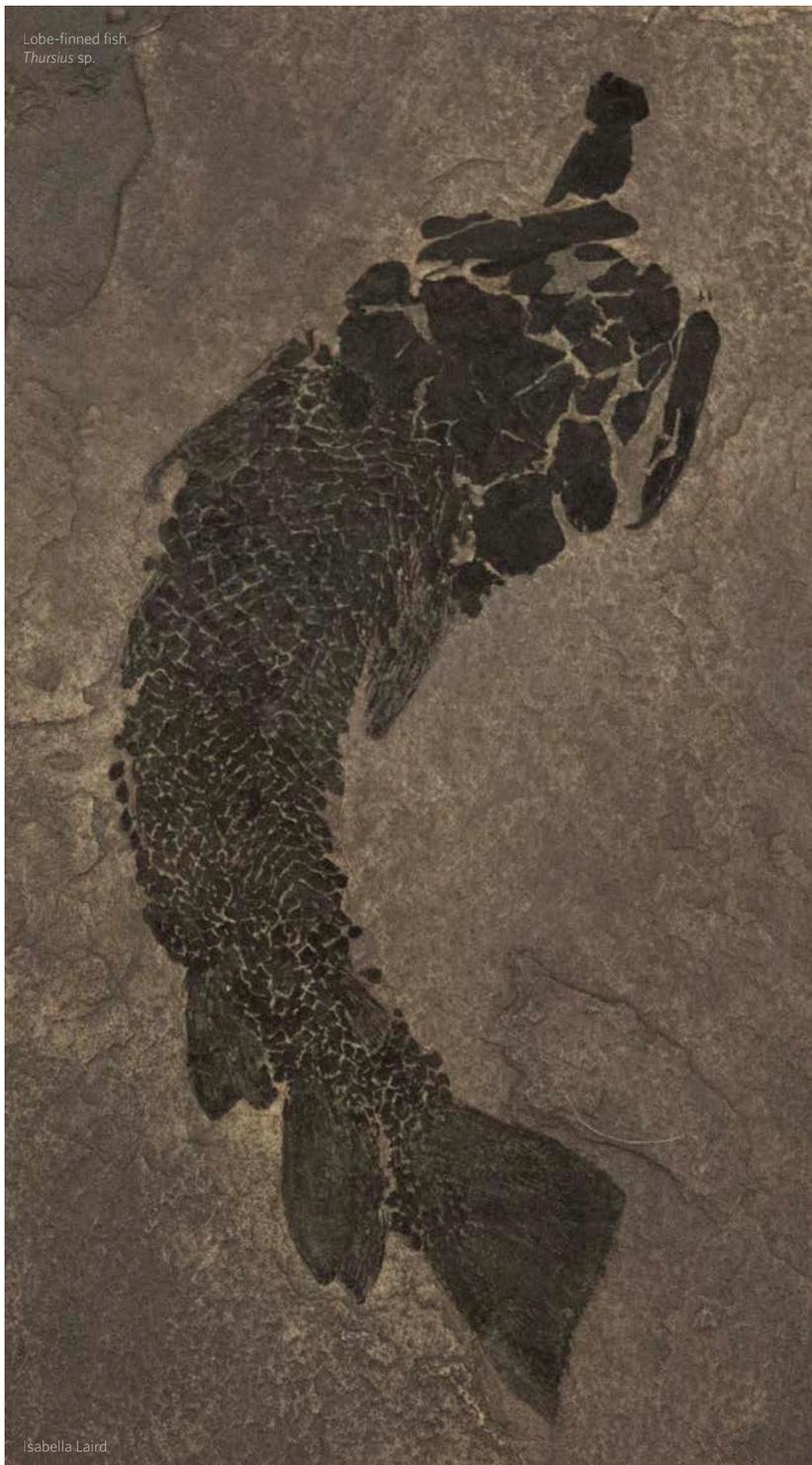
Thomson, S.A., Pyle, R.L., Ahyong, S.T., Alonso-Zarazaga, M., Ammirati, J., Araya, J.F., Ascher, J.S., Audisio, T.L., Azevedo-Santos, V.M., **Bailly, N.**, et al. (184 authors in all). 2018. Taxonomy based on science is necessary for global conservation. *PLoS Biology* 16(3), p.e2005075.

Roskov, Y., Abucay, L., Orrell, T., Nicolson, D., **Bailly, N.**, Kirk, P.M., Bourgoin, T., DeWalt, R.E., Decock, W., De Wever, A., Nieukerken, E. van, Zarucchi, J., Penev, L., eds. 2018. Species 2000 & ITIS Catalogue of Life; 2018 Annual Checklist. DVD. *Species 2000: Naturalis*; Leiden; the Netherlands. ISSN 2405-917X.

**Bailly, N.**, Stibravy, R.M., **Taylor, E.B.** 2017. “Data archaeology and rescue with FishBase: The example of the BC Institute of Fisheries Field Records and UBC Fish Collection datasets”, FishBase Symposium, September 8, 2014, Royal Museum of Central Africa, Tervuren, Belgium.



Pacific herring  
*Clupea pallasii*



## FOSSIL COLLECTION

SPECIMENS: 30,000 | DATABASSED THIS YEAR: 5,001  
VOLUNTEER HOURS: 350 | UBC STUDENTS SUPPORTED: 17

Dr. Kirsten Hodge  
Curator

Dr. Alexa Class Freeman  
Assistant Curator

The Fossil Collection has 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.

An abstract has been accepted for oral presentation at the Resources for Future Generations conference (Vancouver, June 2018). Session: Paleontological Collecting and Collections: Is There a Future for Fossils? Abstract title: *Bringing the old out for the new: The revival of UBC's Fossil Collection.*

The Fossil Collection also partnered this year with EOSC 425 - Paleontology, and the Vancouver Paleontology Society.



# ADMINISTRATION

TOTAL VISITORS: 42,367

REVENUES FROM PAID ADMISSION: \$203,113.81

REVENUES FROM MUSEUM SHOP SALES: \$45,542.45

## Annual Operations Planning

Each year, the Beaty team engages in an annual operational planning exercise that results in a comprehensive document aligned with the museum's strategic plan. The Operations Plan 2018–2019 considers organizational priorities, operational needs, and available human and financial resources. It details ongoing activities and special projects for each of the museum functions, ensuring that all at the Beaty progress towards the same goals, collaboratively and with strategic intent.

## Human Resources

The museum continues to align its staffing structures and resources with its strategic goals to better position the museum as a leader in the acquisition, care, research use of, and education about biological collections. Best-employer practices are always a priority to manage the growing team of 25 full- and part-time staff, and as many part-time student staff annually. Thanks to additional recurring funding support from the departments of Zoology and Botany in the last two years, the museum has sustained two new part-time Collection Assistants in the Entomology and Herbarium collections.

## Visitor Services

Museum attendance continues to grow and shows an 11% increase this year over last. The corresponding increase in revenue contributed to a 1.5% increase in earned income from sales and services during this fiscal year.

## Memorandum of Understanding

When the museum opened its doors in 2010, UBC's vast natural history collections were put on public display for the first time. At that time, the Botany and Zoology departments and the Beaty Biodiversity Museum entered into a Memorandum of Understanding that set out expectations for care of the collections under the new administrative structure of the museum. This year, the memorandum was reviewed and updated to better reflect the current operations and budget, and the expectations to continue accumulation, curation and maintenance to international scientific standards of the collections.

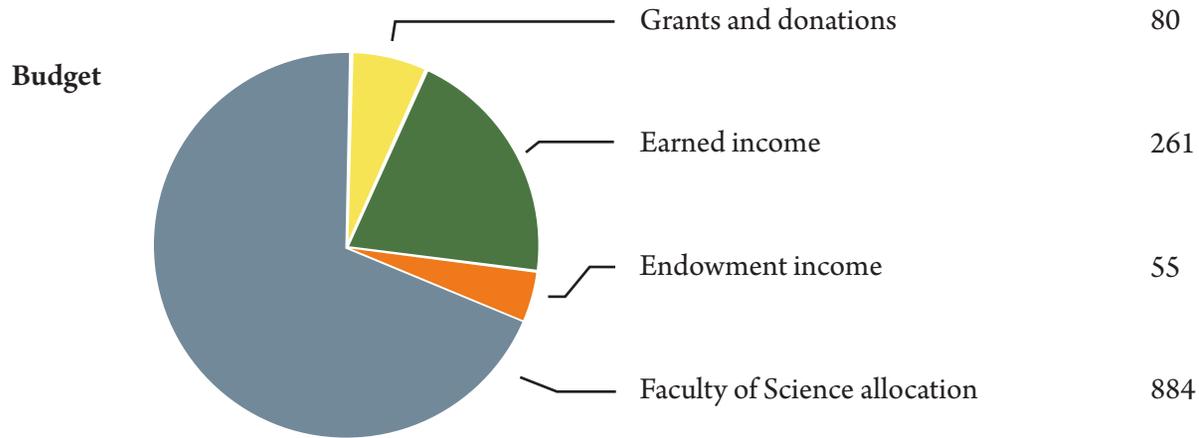
## Visitor Experience Improvement Project

This project was made possible through a BC | Canada 150 Grant and one-time additional funding from the Faculty of Science. Upgrades to the museum gallery space to enhance visitor experience included construction of interactive elements, improvement to social spaces, and the creation of mobile workstations. The research community is an important segment of our visitor-ship. Two new mobile workstations now allow researchers a more functional set up while accessing museum collections. School groups and the general public including families, are steady and regular visitors to the museum. The design and fabrication of a new interactive whale station has allowed the museum to serve visitors with different learning styles by providing experiential, tactile, and digital learning opportunities. Finally, the infrastructure improvements to the museum admission area have created a much more functional and welcoming space for all. Setting the first impression of the museum to all visitors, the admission area creates an enjoyable gathering and social space, framing the museum visit as a positive experience from the start.

Catherine Ouellet-Martin  
Administrative Manager

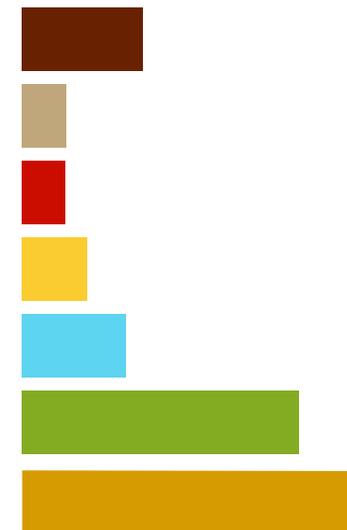
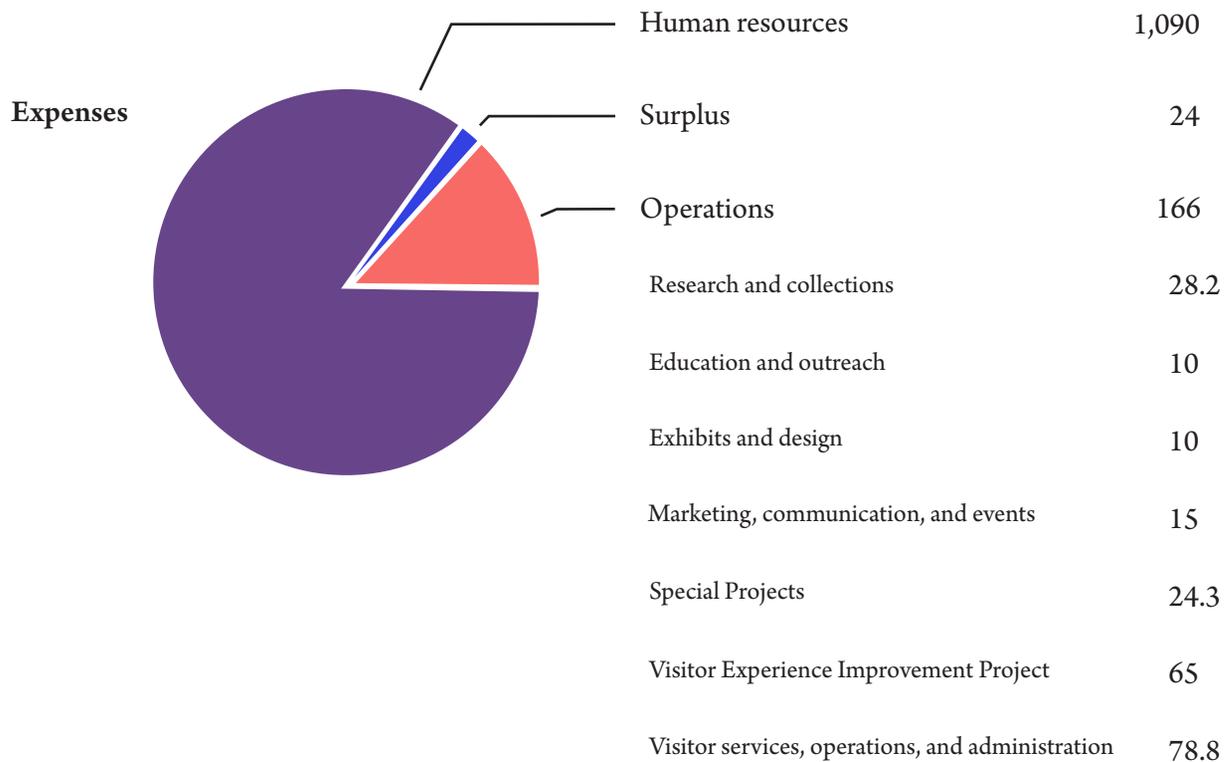
Katherine Ransom  
Kali Dumbrell  
Maggie Decarie  
Charles Leung  
Daniel Daly-Grafstein  
Alison Porter  
Bill Woods  
Gareth Leonard  
Danushka Galappathy  
Dru Chan  
Front Counter Clerks

# OPERATIONS



Through the support of the Faculty of Science, grants, donations, membership, and earned income, the museum's financial health stayed strong throughout the fiscal year. Careful management of resources along with an increase in earned income has resulted in a surplus at fiscal year-end.

Figures in thousands of dollars.



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:

Ross and Trisha Beaty

The Djavad Mowafaghian Foundation

Dr. Allan Yap

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

## Donations

*Anonymous*

Bruce Bennett

Ian Burgess

Kai Chan

Simon Cumming

Carol Irwin

Sandra Lindstrom

Rosalyn Manthorpe

Neil McEachern

Terry McIntosh

Bailey Megrian

Darlene Merkley

Patricia Murtha

Barry Narod

Donald Ourom

Pamela Shaw-Biswas

Neville West

David Williams

David and Jennifer Wood and Family

The Zacks Family Charitable Foundation



Dinosaur Trackways



SOME OF THE STAFF, CURATORS,  
FACULTY, STUDENTS, AND VOLUNTEERS  
OF THE BEATY BIODIVERSITY MUSEUM

*"Began taking my daughter here in grade school,  
...years later she's applying to volunteer at the place."*

- Benjamin Capoeman



© Beaty Biodiversity Museum  
Photography by Derek Tan,  
unless otherwise noted.



Beaty Biodiversity Museum  
2212 Main Mall  
University of British Columbia  
Vancouver, BC V6T 1Z4  
phone: 604.827.4955  
fax: 604.822.0686  
email: [info@beatymuseum.ubc.ca](mailto:info@beatymuseum.ubc.ca)  
**[beatymuseum.ubc.ca](http://beatymuseum.ubc.ca)**