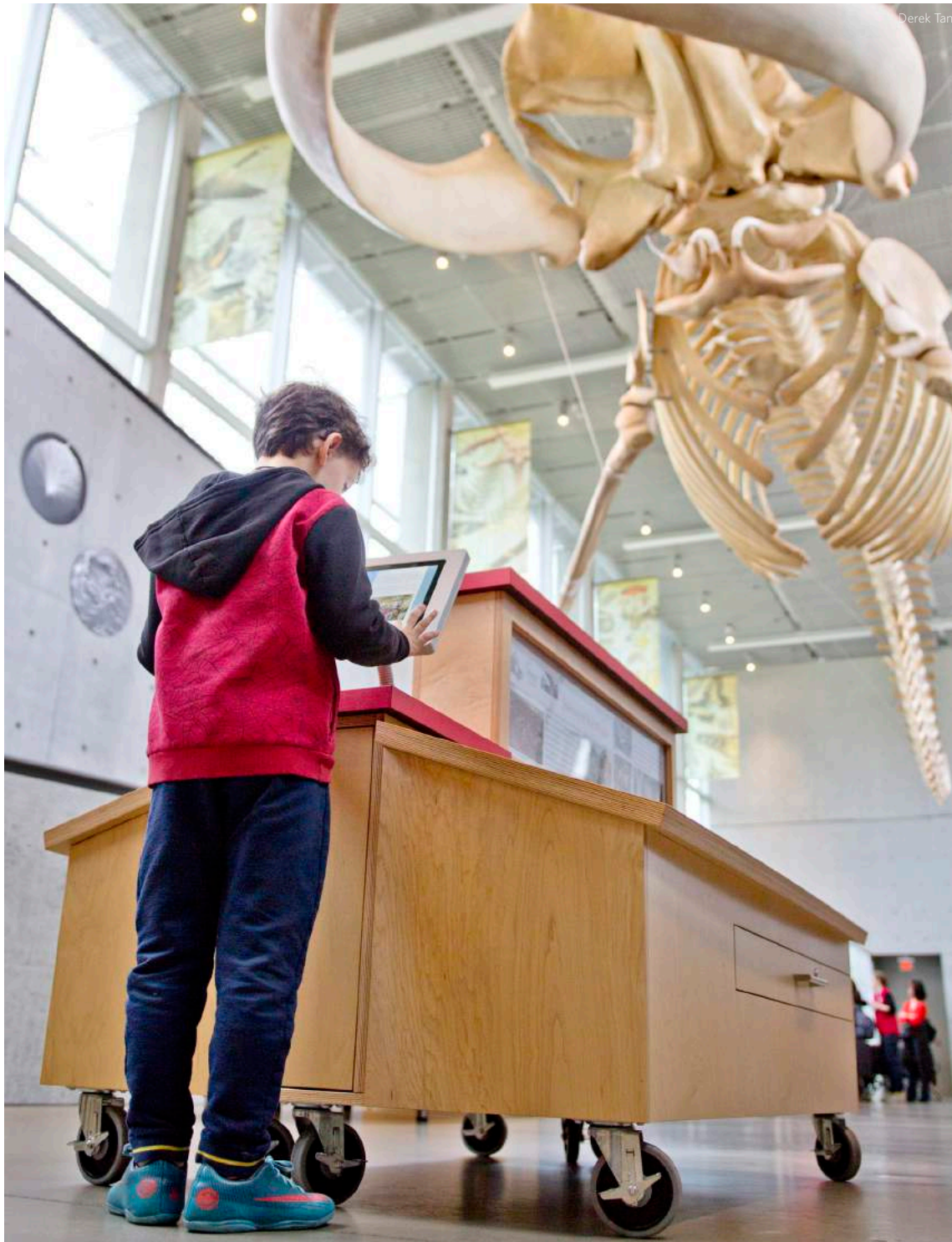


# ANNUAL REPORT

## 2019-2020





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BEATY BIODIVERSITY MUSEUM 2019-2020

**43,383 VISITORS**

**184 EDUCATION VOLUNTEERS**

**9,255 PROGRAM PARTICIPANTS**

**14,400 NEW SPECIMENS**

## Director's message

The past year at the Beaty Biodiversity Museum (BBM) has seen several significant advances in support of our mission to make biodiversity better understood, valued, and protected. These developments are, of course, in addition to our continued success in attracting and engaging visitors to the BBM both in-person and online (see below) whether they be visiting researchers, university students, K–12 students, and/or the general public. We also continue to build the BBM's specimen holdings, and design and host enticing exhibitions. I wanted to highlight three advances in particular. First, as detailed in the Education and Outreach, and the Exhibits and Design reports, the BBM began to better represent Indigenous views of biodiversity by partnering with several First Nations, especially the Musqueam First Nation, participating in the *Culture at the Centre* project (housed largely at UBC's Museum of Anthropology) and implementing the online *Perspectives on Biodiversity: Sturgeon Harpoon Knowledge Web* exhibit. The exhibit resulting from the latter partnership was honoured with two awards: a Governor General's Award for Excellence in Museums: History Alive! and a 2019 British Columbia Museums Association Innovation Award. Second, the collections made great strides to increase the presence of our extensive databases for online access and searching. The Cowan Tetrapod Collection is notable in this regard and the BBM collections curators as a group finalized a common online search engine for all specimens (try it out here: <https://bridge.botany.ubc.ca/herbarium/index.php>). Finally, less 'exciting', but still critical, the BBM completed a new strategic plan (2019–2024) that

will guide the museum's aspirations and activities through the next five years.

As I write this report, the BBM is, with the rest of the world, dealing with the COVID-19 pandemic and has been closed to the public (and our staff!) since mid-March. I wanted to express how proud I am of all members of the BBM community for their very rapid shift to working at home and for their ingenuity in using the opportunity to focus on increasing our online presence in the face of increasing demand (the popular Beaty@Home Live and virtual tours are great examples). The reduced connection to our visitors, fellow staff and, of course, the collections themselves, as well as "Zoom fatigue" (see second last page) have been difficult, but everybody has responded in the characteristically positive BBM way! As we work towards a gradual reopening, I fully expect the BBM's enthusiasm for our 'normal' work to be at an especially high titer!

Finally, this will be my last report as Director. After 6.5 years, I feel strongly that it is time for some fresh eyes "at the top", and my term will expire June 30, 2020. It has been an immense pleasure to work with all our skilled and dedicated staff, faculty, volunteers, and visitors. At the risk of some indulgence, I take particular pride in two things. First, each-and-every collection now has at least one (and sometimes more) highly skilled collections' curator or curatorial assistant working on and curating our specimens. Second, the BBM remains a very desirable place to work and as a result our staff just keeps getting better and better.

I am especially thankful for the continued support from the Faculty of Science and from the two Deans



Dr. Eric Taylor

Director, Beaty Biodiversity Museum  
Professor, Department of Zoology  
Director, Fish Collection

under whom I have served (formerly S. Peacock and currently M. Aronson). Further, the former (L. Samuels and R. Shadwick) and current (S. Graham and V. Auld) heads of Botany and Zoology, respectively, as well as former (S. Otto) and current (L. Rieseberg) directors of the Biodiversity Research Centre have also greatly supported the work of the BBM. The continued enthusiasm of the Beaty family for our endeavors at the BBM has also been inspiring. In closing, I look forward to remaining as the Director of the Fish Collection and supporting the new Director, Quentin Cronk of the Department of Botany, towards the continued growth and success of the BBM.



# EDUCATION AND OUTREACH

NUMBER OF PROGRAM PARTICIPANTS: 9,255 | TOTAL NUMBER OF PROGRAMS BOOKED: 352

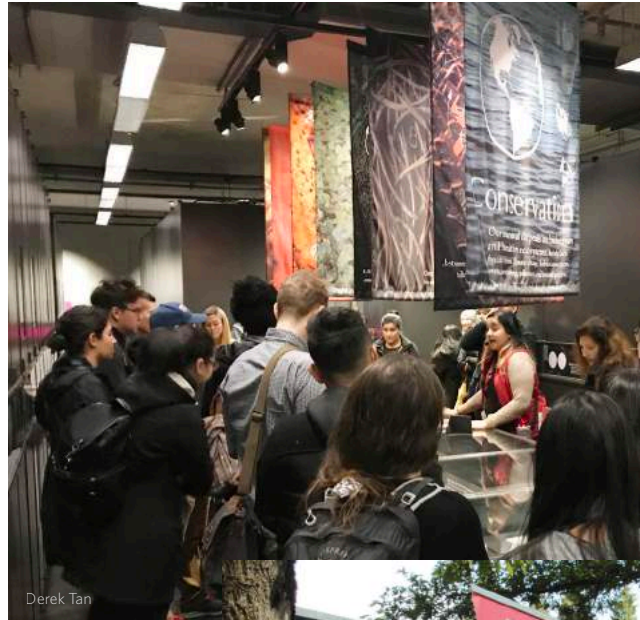
NUMBER OF WAY COOL TALKS: 12 | WAY COOL TALK VISITORS: 475

The Education and 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.

Education and Outreach offered 22 different bookable experiences, 16 of which link directly to the BC curriculum for K–12 students. This includes the successful Earth Experience, a full-day school program run in collaboration with the Pacific Museum of Earth. This year, a focus on sharing Indigenous knowledge at the museum and making links with *Culture at the Centre* and *Sturgeon Harpoon Knowledge Web* exhibits with BC curriculum for schools and teachers. We introduced a new section to our Educator Resources Page on First Peoples knowledge and perspectives on biodiversity.

This was the fourth year of our successful Beaty Box specimen loan program and we launched two ‘Marine Life’-themed boxes available to teachers, educators, and community groups. Organisms and lesson plans in the Marine Life boxes focus on food chains and the impact of environmental change. This is in response to feedback from teachers looking for scientific information and resources on teaching and learning about climate change. With the launch of the two Marine Life boxes, we now have 10 boxes in circulation.

Our programming and outreach kits continue to be key revenue generators for the museum and ensure we are able to provide support for several low-income and inner-city schools to ensure students from across Vancouver have access to the museum.



Derek Tan



Derek Tan

Jackie Chambers  
Education and Outreach Manager

Nicole Balsdon  
Education and Outreach Coordinator

Nancy Lee  
Kashifa Hafeez  
Sheila Byers  
Vincent Sayson  
Angela Liu  
Museum Interpreters

# VOLUNTEERS

VOLUNTEER HOURS: 9,977

ACTIVE VOLUNTEERS: 184



Over 180 active education volunteers and over 30 collections volunteers support us in sharing the stories of the research collections, preparing, and organizing specimens behind-the-scenes. 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 once monthly. This year we have harmonized our record-keeping practices by aggregating all volunteers onto the same software platform.

Beatty Museum volunteers come from 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. One of our long-time volunteers, Lia, reached the incredible milestone of 1,000 hours this fiscal year. Our volunteer hours continue to climb, and we are grateful for all of their contributions.





## PARTNERSHIPS



Over 3,000 undergraduate and graduate students from UBC and other post-secondary institutions, including SFU, Emily Carr, Quest University, Kwantlen, and others, visited the museum as part of a course. We hosted pre-service teachers on Community Field Experience practicum from UBC, SFU, and hosted a practicum student from Queens University, providing opportunities for future professionals to gain hands-on experience. We delivered sessions on successful field trip planning for pre-service teachers, and a class for Master of Museum Education students on curriculum and teaching in museums.

We also saw an increase in collaborations with organizations and events both within UBC (courses, professors, and teaching assistants, Faculty of Science 'Science Rendezvous', Experience Science Day, International Society of Education Through the Arts -INSEA 2019, UBC Kids Take Over Day, Homecoming, UBC STEM Collective) and off-campus (participating in Science Odyssey, Science Literacy Week, VSB Scientist in Residence Program, Lower Mainland Museum Educator's conference, BC-wide Symbiosis Learning Ecosystem, Science Slam, InWithForward).

These opportunities help to move the museum beyond its four walls and allow us to make new connections and broaden the recognition of our skills and expertise. Through support and funding from UBC Campus + Community Planning and work with the Pacific Museum of Earth and LEEF graduate student group we continued to offer our monthly Nature Club to families on campus. Funding from a Virtual Museum of Canada grant and a Wheaton Precious Metals donation allowed us to begin planning to enhance our virtual and onsite learning opportunities at the museum.

# THIS YEAR THE BEATY MUSEUM PARTNERED WITH...

UBC Welcome Centre Université de Bourgogne Christopher Marley Fisheries and Oceans Canada **Science Odyssey** UBC Project Services  
**British Columbia Institute of Technology** Kwantlen Polytechnic University Lower Mainland Curatorial Group Canadian Museum of History  
 Museum of Vertebrate Zoology at Berkeley PWL Landscape Architects **BC Ministry of Agriculture** Colleen McLaughlin Barlow iDigBio  
 New York Botanical Garden Asher Jay Canadian Museum of Nature UBC Grant for Catalyzing Genome Canada Museum of Vancouver  
 InWithForward **Lynn Valley Nature Centre** Cetacea Contracting Research Clusters **UBC iSchool School of Information Sciences**  
 Environment Canada US Fish and Wildlife Service Musqueam First Nation Sibéal Foyle Weasel Fest UBC Campus Culture Challenge  
 Lord Kitchener Elementary School NSERC and L'Oreal-UNESCO Science World British Columbia **Science Borealis** Freshwater Fisheries  
 (Women in Science Award) **ABC Photo** Peace Region Palaeontological Society of British Columbia  
**Reaktion Books** Whistler Naturalists **UBC STEM Collective** National University of Singapore  
 Julia Hajnoczky **Genome BC** Missouri Botanical Garden BC Science Outreach Workshop Vancouver School Board  
 Friends of the UBC Royal British Columbia Museum Lorraine Simms **Kidsworld** Scientist in Residence  
 Botanical Garden Oshy Parasol Kelowna Museums **Queen's University** Jude Griebel Global Biodiversity Information Facility  
 UBC Childcare Services **E-Flora BC** BC Nature Trust **BC Hydro** UBC Institute for Critical Indigenous Studies  
**Project SNOWstorm** CBC The Nature of Things Metro Vancouver Parks Wheaton Precious Metals  
 UBC Museum of Anthropology St. Margaret's School Eszter Burghardt **Canadensys** University of Manitoba  
 Camosun College UBC Energy **University of Victoria** **Katrina Vera Wong** City of Vancouver Quest University  
**Science Literacy Week** Lower Mainland Museum Educators Nature Vancouver Lorraine Roy Young Canada Works  
 Shanghai International Studies University Catherine M. Stewart Society for the Preservation of Natural History Collections Mary Jenson  
**Djavad Mowafaghian Foundation** Symbiosis: a STEAM National Museum of Natural Science, Taiwan Science Slam Vancouver  
 Learning Ecosystem for BC **UBC Department of Botany** tə məməhəs?ewtxw, The Children's House  
 David Suzuki Foundation BC Ministry of Forests, Lands, Natural Consortium of Pacific Northwest Herbaria  
 Pacific Museum of Earth **Environment Yukon** Resource Operations, and Rural Development Global Biodiversity Information Facility  
**Flora of North America** Richmond Art Gallery Musqueam Cultural Education Centre UBC Department of Earth, Ocean **NGX Interactive**  
 Emily Carr University of Art + Design UBC Campus and Community Planning and Atmospheric Sciences UBC Botanical Garden  
 Stanley Park Ecology Society **LEEF - Let's Talk Science** UBC Biodiversity Research Centre Burke Museum Duke University Herbarium  
 UTown@UBC Virtual Museum of Canada Simon Fraser University UBC SCIE300 Science Communication Yukon Conservation Data Centre





# MARKETING, COMMUNICATIONS, AND EVENTS

SOCIAL MEDIA REACH: 1,150,659

TWITTER FOLLOWERS: 4,143 | FACEBOOK FOLLOWERS: 4,914

INSTAGRAM FOLLOWERS: 3,174

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.

This year saw a significant increase in the number of followers on our social media channels, especially on Instagram, where we noticed much higher engagement with younger audiences under 30. For the first time we offered an Instagram Giveaway for Valentine's Day, which resulted in 54 new followers, 260 likes and 160 comments with one single giveaway post. On YouTube we had a good number of viewers for the 'Researchers Revealed' series.

More recently, due to the social distancing imposed by COVID-19, we quickly adapted to the new circumstances and developed several online initiatives, to still allow us to perform our Education and Outreach function and to present our exhibits to the public. We uploaded relevant content to our website and social media, such as online exhibits, educational activities, and livestreamed weekly interactive presentations called Beaty@Home. Recorded sessions are available on our Facebook page. These online initiatives have been shown to work very well and help us reach our strategic goal of increasing engagement with different target groups.

Another recent successful online initiative was the Online Museum Collections Tour for schools and groups. In a very short time frame, Marketing and Education and Outreach prepared content and established booking procedures and online payment forms for guided online tours with museum interpreters. We are very excited about this new way of reaching our varied audiences.

We also had a significant increase in visitors for the monthly Nature Club and Nocturnal events, exhibit openings and two Indigenous-focused events with UBC's Institute for Critical Indigenous Studies.

Dale Louise Gintner  
Marketing, Communications,  
and Events Coordinator

We held our 100<sup>th</sup> Way Cool in July 2019! This milestone event was celebrated with cake, watermelon, and six special guest speakers. The Way Cool series began in 2011 and has been connecting biodiversity researchers with our museum audience through monthly family-friendly talks, exploring everything from ecosystems to microbes.

Daniel Justice, Ildiko Szabo, Margery Fee, and Rachel Poliquin (left to right), UBC-affiliated Reaktion Animal Series authors standing in front of their book covers during a Nocturnal event.



## EVALUATIONS

NUMBER OF SOCIAL MEDIA FOLLOWERS: 15,161

NUMBER OF MEMBERS: 232

In 2019–2020, we explored evaluation with other organizations. The Beaty holds a position on the Evaluation and Asset Mapping working group of Symbiosis, and worked together with Science World, Ocean Wise, and Metro Vancouver Parks on a Critical Appraisal project which was presented at the Lower Mainland Museum Educator's annual conference in January.

Within the museum, our Evaluation & Assessment Working Group, led by Education, brings together all functions to discuss visitor studies.

This year we focused on streamlining the data we collect and how we use these data:

- Collecting feedback on our new Audio Tour
- Visitor Surveys and Feedback Forms
- Improving educator resource webpage and tracking downloads of resources
- Comment Cards
- Data to support strategic planning process
- Presenting and sharing our results with other institutions at conferences

This information played a key role in informing the strategic planning process and is used to continue to strengthen and enhance our exhibition design, marketing efforts, school programs, participatory stations, activities, and tours.

This fiscal year, our program feedback was particularly strong, showing that groups found their educational value, interest, and engagement to be good or excellent.

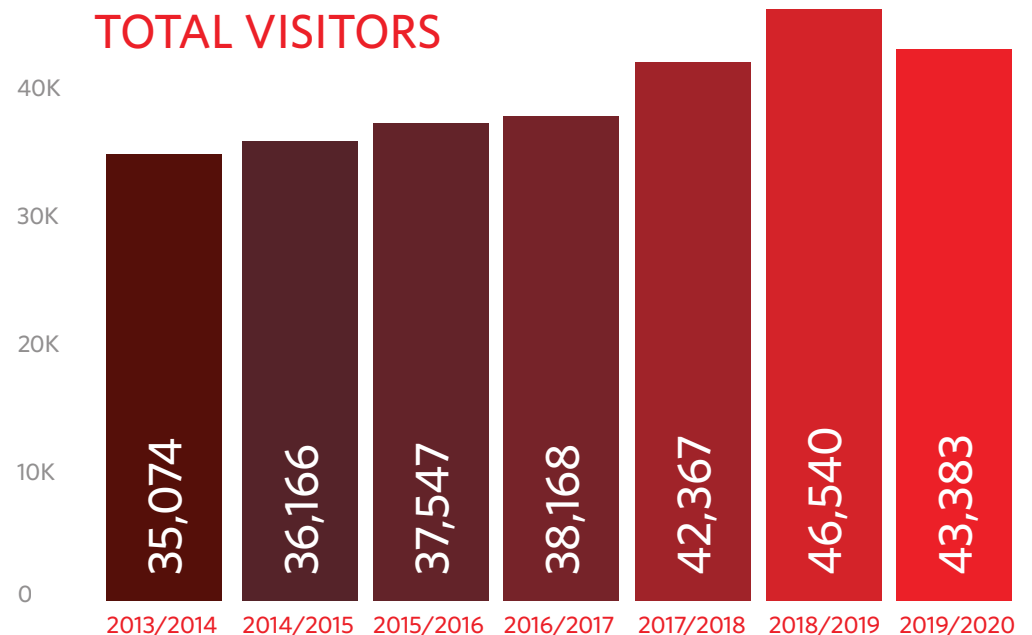
**"GREAT PLACE TO GO WITH THE FAMILY.  
IT'S VERY INTERESTING AND YOU WILL  
NEVER SEE ANYTHING LIKE IT."**

-Bella Kiss

**"AMAZING PLACE. YOU CAN SPEND  
HOURS LOOKING AROUND AND LEARN  
SOMETHING NEW AT EVERY TURN."**

-Barry Dubbin

## TOTAL VISITORS





## EXHIBITS AND DESIGN

SPECIAL EXHIBITIONS: 7 | ONLINE EXHIBITIONS: 3

NEW PERMANENT EXHIBITS: 16

Our commitment to communicating the excitement and value of biodiversity and biodiversity research has been strengthened this year with a focus on online and digital exhibitions that give context and continued richness to our core scientific perspective. Our collaborative digital exhibition with the Musqueam First Nation *Perspectives on Biodiversity: Sturgeon Harpoon Knowledge Web* was honoured with both the 2019 Governor General's Award for Excellence in Museums: History Alive! and the 2019 British Columbia Museums Association Innovation Award.

Our popular *Researchers Revealed* online exhibition showcasing UBC's Biodiversity Research Centre now houses 10 new videos with thousands of views that tell the story of our strange and wonderful natural world, and those who study it. This year also saw the launch of our Biodiversity Research Photo Competition, a visual celebration of the excitement of biodiversity research and the captivating nature of its subjects. The winning images were exhibited in a special exhibition in the museum, as well as an online gallery exhibition.

Six special exhibitions engaged our thousands of visitors in our vision of a world where biodiversity is better understood, valued and protected. These exhibitions shone a light on the enchanting world of the often overlooked, through close-up imagery of natural specimens in *Closer* and delicately constructed imagined hybrids of flowers in *Next Spring*. Explorations of more controversial topics such as the exploitation of animals for fashion in *Skin & Bones*, biodiversity loss in *The Wild Creative*, our shifting environment in *Documents of Collapse*, and the collection of insects for art in *Biophilia*, have created places for dialogue and deep discussion amongst our visitors.

**"WE WERE IMMENSELY IMPRESSED  
BY THE INTERACTIVE, INNOVATIVE,  
AND FORWARD-THINKING NATURE  
OF THE PROJECT."**

-Jack Lohman, Canadian Museums Association Board President  
on the *Sturgeon Harpoon Knowledge Web*

Yukiko Stranger-Galey  
Exhibits and Design Manager

Derek Tan  
Digital Media Specialist

Lesha Koop  
Museum Artifact Technician



Yukiko Stranger-Galey and Musqueam Knowledge Keeper, Morgan Guerin at the Lower Mainland Museum Educators Conference (*top*). Lesha Koop receives the BCMA Innovation Award from BCMA Vice-President, Catherine Ouellet-Martin (*left*), and Yukiko Stranger-Galey and Derek Tan receive the Governor General's Award from Her Excellency, Julie Payette (*below*), on behalf of the Beaty Biodiversity Museum and the Musqueam First Nation.

CHRISTOPHER MARLEY



## BIOPHILIA

A Dialogue with Art, Nature, and Science

December 12, 2019 – August 23, 2020

## CLOSER

MAY 18–NOVEMBER 10, 2019



JULYA  
HAJNOCZKY



KATRINA  
VERA WONG



## ASHER JAY THE WILD CREATIVE

NOVEMBER 24, 2018 – APRIL 28, 2019

EXAMINE BIODIVERSITY LOSS DURING THE ANTHROPOCENE –THE AGE OF MAN–  
THROUGH COMPELLING ARTWORKS AND THOUGHT-PROVOKING NARRATIVES.



NOV 21, 2019 – APR 19, 2020

Jude Griebel Lorraine Simms

## Documents of COLLAPSE

SEPTEMBER 15, 2018 – AUGUST 13, 2019

## SKIN & BONES

CATHERINE M STEWART

WITH ACCESSORIES FROM THE CLOTHING COLLECTIONS OF  
CLAUS JAHNKE AND IVAN SAYERS

## Next Spring

Katrina Vera Wong





# COWAN TETRAPOD COLLECTION

NUMBER OF SPECIMENS: 44,366 | ACCESSIONED THIS YEAR: 352

SPECIMENS IMAGED: 9,195 | IMAGED THIS YEAR: 317

NUMBER OF UBC STUDENTS SUPPORTED: 33

VOLUNTEER HOURS: 1,176

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

## Digital and online era museum:

In this new era of social distancing, the Cowan Tetrapod Collection (CTC) finds itself well on the road to becoming a virtual museum; a goal the CTC has been pursuing since 2014. To date, more than 20 per cent of the collection has been digitized. Multiple images for each specimen are available free online via the CTC database. Any image can be downloaded by researchers, citizen scientists, or students of all ages and inserted into their reports, presentations, or files. High-resolution files of specimen images taken in previous years were requested by two PhD candidates. We anticipate many more such requests in the future.

As usual, the CTC staff had their eyes and ears open for new species acquisitions. Much to our delight, an Abyssinian ground hornbill skull was donated; representing a new avian family for the collection. There are only two extant species of these turkey-sized ground dwellers. Abyssinian ground hornbills have the same breeding biology as the better-known Asian hornbills; females are incarcerated in a tree cavity using mud and fed by other family members while she broods and raises the young.

Less spectacular, but perhaps of more importance for future generations of researchers, was the acquisition of good numbers of extremely hard-to-get members of the weasel family. CTC volunteers enjoyed preparing this bonanza of fishers, badgers, and ermines.

## UBC courses and organizations supported:

- BIOL 427, Ornithology and Herpetology, Darren Irwin: Helped the teaching assistant during identification labs; taught one week of labs and was a guest lecturer.
- BIOL 372 (UBCO), Field Ornithology, John Woods: Loan for lab identification portion of course.
- FRST 395, Forest Wildlife Ecology and Management: Specimens for identification labs.
- PORT 405, Studies in Portuguese and Brazilian Culture, Alessandra Santos: Ildiko Szabo and Jennie Munoz (Jankowski lab) teamed up to present a lecture on Amazonian birds and ethno-ornithology.
- UBC Forestry Faculty, Suzie Lavallee: Teaching and Learning Enhancement Fund filming project to produce virtual course resources.

Dr. Darren Irwin  
Director and Curator

Ildiko Szabo  
Collections Curator of Birds

Chris Stinson  
Curatorial Assistant of Mammals,  
Reptiles, and Amphibians



Abyssinian ground hornbill  
*Bucorvus abyssinicus*

# COWAN TETRAPOD COLLECTION

## Graduate students assisted:

- Kenny Askelson, PhD Candidate, Irwin Lab: Used previously captured northern screech owl images stored in the CTC database R-colour Distance Analysis.
- Anthony Lapsansky, PhD Candidate, joint collaboration between Altshuler Lab and Tobalske Lab (University of Montana): Used previously captured wing images stored in the CTC database plus additional images taken by the researcher of newly prepared CTC specimens to investigate the evolution of wing shape in aquatic birds.
- Leo Wood, MSc Candidate, Altshuler Lab: Wing ligaments and muscles: material properties of the deltoideus pars prototagialis.
- Jasmin Wong, PhD Candidate, Altshuler Lab: Aeroelastic flutter of flight feathers.
- Vikram Baliga, Post-Doctoral Fellow, Altshuler Lab: Capabilities and limitations of musculoskeletal morphing in the avian wing.
- Vikram Baliga, Post-Doctoral Fellow, Altshuler Lab: The CTC is assisting Vikram in procuring whole frozen specimens of large birds for research on mass distribution in soaring birds.
- Rachel Germain, Assistant Professor, Department of Zoology, Germain Lab: Deer fur swatches for plant seed dispersion study.

Doug Altshuler, Vikram Baliga, and Ildiko Szabo (left to right).



## Other Institutions

- BCIT birds, mammal carnivores, and ungulates loan for Wildlife Management Program.
- Melissa Todd, Nanaimo Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (FLNRORD): Mustelid specimen preparation session in Nanaimo.
- FLNRORD, BC Ministry of Agriculture, Environment Canada, National University of Singapore, and two private consulting firms: 25 people participated in a necropsy session to investigate cause of death of two endangered owl species: blue-listed Haida Gwaii northern saw-whet owl (*brooskii* subspecies) and western screech owls. Both of British Columbia's Avian Pathologists from the Ministry of Agriculture attended.
- Environment Canada, Alaksen Office (Delta): Investigation of *Trichomonas* outbreak in band-tailed pigeons. Assisted in the necropsy and procured specimens for inclusion in the CTC specimen and tissue collections.
- Museum of Vertebrate Zoology at Berkeley (Carla Cicero): Canada Jay Project ongoing: Frozen skins and tissues delivered to the Burke Museum.
- National University of Singapore (Leshon Lee): For four months, the CTC and the Spencer Entomological Collection facilitated the collection of BC bird lice for genetic analysis at the National University of Singapore.
- National Museum of Natural Science, Taiwan: Rodent osteology research for archeological applications.
- Simon Fraser University: Rodent osteology research for archeological applications.
- Attended the International European Bird Curators Conference held at the Steinhart Museum of Natural History, Tel Aviv.
- University of Manitoba: 3D imaging of badger claws for agricultural biomimicry applications.
- Environment Canada, Alaksen Office (Delta) and University of Victoria: Window Collision Project.
- University of Victoria, MSc Student, Kyle Nelson (Starzomski Lab): Sampled 26 silver-haired bats for stable isotope migration tracking.
- Université de Bourgogne, Dijon, France, Louis Arbez, PhD candidate (Montuire Lab): 3D morphometric analyses of 59 northern collared lemming skulls.



## **At UBC – Assistance provided to other museums:**

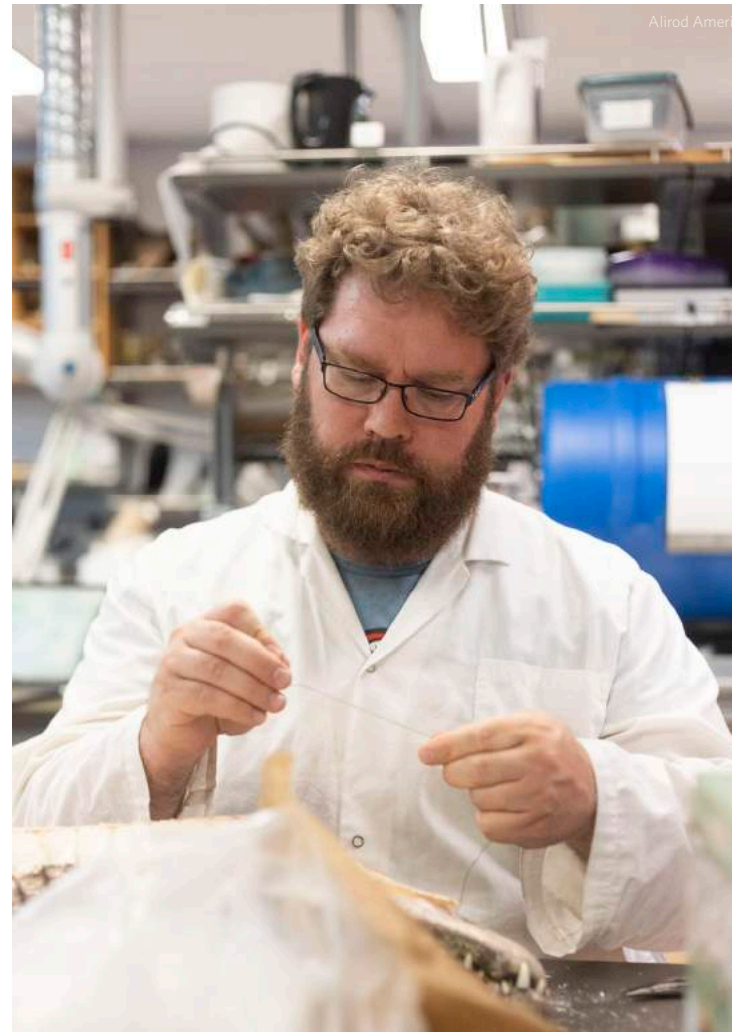
- Matthew Zeleny (Camosun College) and Michael deRoos (Cetacea Contracting): 3D scanning of blue whale pelvic bone for the Western Australian Museum blue whale skeleton project.
- Kelowna Museums: Prepared two bat specimens and loaned 10 others for an exhibit.

## **In the community:**

- BC Nature Trust: Silent Auction ‘Wing and Things’ hands-on wing preparation plus backrooms tour.
- Weasel Fest 2019: Mustelid preparation and sampling workshop co-host with Melissa Todd, FLNRORD.
- Metro Vancouver: Pika and weasels loan.
- Lynn Valley Nature Centre: Corvids loan .
- Lord Kitchener School: Nest program, skull program.
- St. Margaret’s School (Victoria): Backrooms tour.
- Friends of the UBC Botanical Gardens (FOG): Mammals in the Garden.
- Friends of the UBC Botanical Gardens (FOG): Penguins.
- Nature Vancouver: CTC specimens and curator for table-talk display at the monthly meetings.
- Stanley Park Ecology Society: You Otter See Beavers programs.
- SFU Archaeology and Museum Studies courses: Behind-the-scenes and specimen preservation tour.

## **New species added to the CTC:**

Abyssinian ground hornbill (new bird family),  
New Zealand parakeet, vernal hanging parrot, yellow-billed parrot, black buck, European wall lizard.



Chris Stinson in the preparatory lab.

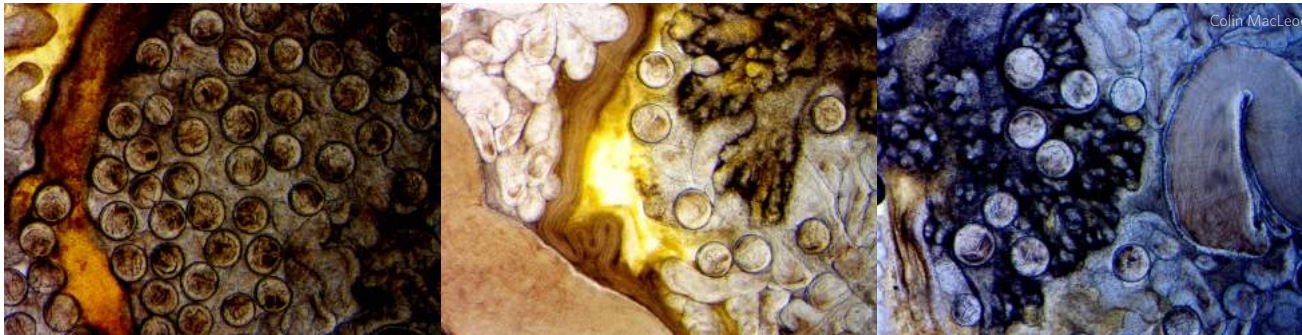
# MARINE INVERTEBRATE COLLECTION

SPECIMENS: OVER 500,000

NUMBER OF DATABASED RECORDS: 8,563

Dr. Chris Harley  
Director

Dr. Colin MacLeod  
Curatorial Assistant



Cysts of the trematode parasite, *Maritrema gratosum*, found in *Balanus glandula* collected in Burrard Inlet. Published in *Frontiers in Ecology and the Environment* to accompany the article, “A riddle, wrapped in a mystery, inside a barnacle”, MacLeod *et al.* – *in press*.

Our Marine Invertebrate Collection (MIC) houses many thousands of “spine-free” marine organisms that represent major animal lineages from around the globe, such as corals, snails, worms, crabs, sea stars, and sponges. Marine invertebrates possess a startling variety of forms, textures, and colors, and our collection contains some truly fantastic examples of this diversity.

This year, we have coordinated three important donations of specimens to the MIC: 250,000 micro-molluscs from Bill Merrilees, collected in the coastal waters of BC; an extensive collection of parasite specimens from Prof. Martin Adamson, UBC; and a unique collection of benthic marine invertebrates from the glass sponge reefs at Halkett Point, donated by the Marine Life Sanctuaries Society of BC.

We also provided specimens that were used in outreach educational programs for Indigenous communities in the Northwest Territories, and gave multiple tours to members of the public and undergraduate students who were interested to see inside the MIC cabinets.

We have increased the visibility of the MIC by participating in the *Researchers Revealed* short documentary project, the 100th Way Cool Lecture, and publishing a short description of a previously undescribed host-parasite system in Burrard Inlet, BC (“A riddle, wrapped in a mystery, inside a barnacle”—see figure above).

We began work on the MIC “in my back yard” collection, which documents marine invertebrate biodiversity in local shoreline sites around Vancouver.

Our newly established dedicated crew of volunteers that operate under the guidance of the new MIC curatorial assistant, Colin MacLeod, have worked tirelessly to process the many undocumented specimens in the collection. Special thanks are also due to Kelly Norton for her continuing relationship with the Marine Invertebrate Collection.



# HERBARIUM

SPECIMENS: OVER 713,000 | IMAGED SPECIMENS: 10,000  
DATABASED RECORDS: 550,000 | NEW RECORDS THIS YEAR: 10,000  
LOANS: 1,800

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



Olivia Lee (left) retired this year after many years of service in the Herbarium.



Ludovic Le Renard introduced museum members to different types of mushrooms on campus.

## Big Events this year

We celebrate the incredible career of Olivia Lee, who retired from her position as the Collections Curator for Bryophytes, Lichens, and Fungi, which she held for more than 37 years. We expect to continue to welcome Olivia as a contributing expert whenever she wishes to visit and pursue her passion for the bryophytes.

This year we saw our official count of specimens, which includes only the specimens that have been catalogued and added to the working collections, increase by 10,000. In addition to these formal additions, we received even more new specimens of algae, fungi, lichens, and land plants every year that still await processing. The largest of these new collections includes 9,600 mosses donated by the family of Diana Horton. This tremendous gift will greatly add to our representation of western North American bryophytes. We look forward to making these specimens available to researchers over the coming years.

As our understanding of biodiversity changes, the collections need to be updated by experts to reflect this new information—the work of curating the collections is never done. This year, the fungal collections benefitted from the attention of Ludovic Le Renard, who was funded by a UBC BRITE internship to update our inventory of the fungal collections. These short-term projects are a win-win-win that make it easier for researchers to use the collections, allow the curatorial staff to benefit from interactions with experts, and allow the experts focused time with the collections. Ludo's work also will help us better track the uses of these valuable specimens in research and teaching.

Dr. Jeannette Whitton  
Director

Linda Jennings  
Collections Curator

Olivia Lee  
Collections Curator  
(Retired in September 2019)

Jasmine Lai  
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



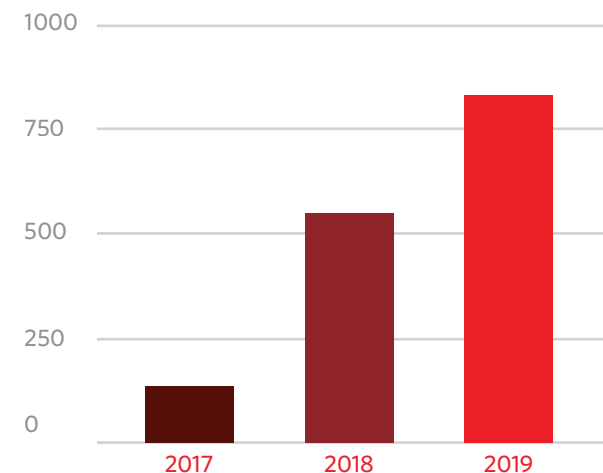
Linda Jennings (*center*), Collections Curator of Vascular Plants and Algae, received the Faculty of Science Excellence in Service Award in 2019; with Eric Taylor (*left*) and Jeannette Whitton (*right*).



For the last three years, Collections Curator Linda Jennings, and Botany faculty member Bridgette Clarkston have been running and perfecting lab exercises and activities that teach students about our collections AND provide updated valuable inventory information that we can use to improve our knowledge of what we have. As these activities have expanded, the total number of courses and students that we involve continues to rise, as does the number of specimens that they handle, which this year approached the 11,000 specimen mark, and involved more than 800 students this year.

Curator of Lichens Trevor Goward shared the spotlight with some incredible footage of lichens, narrating the film *Lichen* by Lisa Jackson, which screened at the 2020 Sundance Film Festival (<http://www.scienceandfilm.org/articles/3280/algae-and-fungi-meet-film-sundance-short-lichen>).

## UNDERGRADUATE STUDENTS INVOLVED IN COLLECTIONS-BASED RESEARCH





# SPENCER ENTOMOLOGICAL COLLECTION

SPECIMENS: 650,000 | ACCESSIONED THIS YEAR: 3,000

DATABASED RECORDS: 131,000 | NEW THIS YEAR: 6,000

IMAGES OF SPECIMENS: 43,000 | NEW THIS YEAR: 1,000

IDENTIFICATIONS FOR THE PUBLIC: 500 | VOLUNTEER HOURS: 250



Dr. Wayne Maddison  
Director

Karen Needham  
Collections Curator

Tiia Haapalainen  
Curatorial Assistant

Don Griffiths  
Imaging Volunteer

Karen Needham, Kelly Ng, Pauline Ng, Dan Peach (*left to right*) on the Whistler/ Pemberton Alpine Bioblitz on Black Tusk Mountain, BC, July 24, 2019.

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

Our Yukon trip this year was to Watson Lake in the southeast, with a side trip into northeastern BC. This area has been poorly surveyed, so not surprisingly we added at least a dozen new species to the territorial invertebrate list. We had similar results when we made a trip to several high alpine locations (above 2,000 metres) in Whistler and Pemberton. Another seldom-surveyed habitat for insects, we added a whopping 25 new species to a master list that was thought to be fairly complete after 13 years of bioblitzes in the area, but all at lower altitudes.

We also made it to Mitlenatch for a third year, and locally sampled monthly on the green roof atop the Vancouver Convention Centre and in Camosun Bog. Partnerships for these surveys included Environment Yukon, the Yukon Conservation Data Centre, Whistler Naturalists, the City of Vancouver, and Metro Vancouver Parks. We thank all of our collaborators for arranging access to such interesting and diverse habitats, both local and remote.

Thanks to funding from the Yukon Government and Environment Canada, almost 5,000 records of Yukon, Northwest Territories, Nunavut, and Alaska specimens were added to our database. Completion of this project was interrupted by campus shut-down due to the global pandemic.

Work on our website continued with species photos added for all remaining Coleoptera and Hymenoptera in our collection (mainly non-BC material) and for many of the species new to our collection, which were acquired during our own survey efforts or via loan returns from researchers at other museums. We also added species lists and photos for all of our 2018 and 2019 survey trips to our RESEARCH page. Finally of note, our identification requests doubled from last year thanks to the appearance of two different giant hornet species in BC in the spring and summer of 2019!

# SPENCER ENTOMOLOGICAL COLLECTION

Tiia Haapalainen (*right*) at Albert Creek and Karen Needham, Christopher Stinson, and Dan Peach (*below, foreground to background*) at Junkyard Lake on the Watson Lake Bioblitz, Yukon, July 13, 2019.



Wayne Maddison and student Kiran Marathe did field work sampling salticid spiders in Singapore (two weeks), southern India (two weeks), and South Africa (three weeks, Kiran only). This field work served to provide specimens for continuing work on the systematics of salticids, and for Morehouse *et al.*'s measurements of colour vision. Except for the Indian material (which is housed at the National Centre for Biological Sciences, Bengaluru), most of the material will be added to the Spencer Collection.

Two papers on systematics and taxonomy of salticid spiders were completed and published, adding three species new to science and one new genus. One of these papers is a major one, gradually built over more than four decades, that revises the classification of the familiar sitticine salticids based on both traditional morphology and target-enriched genomic data.



## Donations:

Another large mosquito donation of almost 1,000 BC specimens was acquired this year from Michael Jackson. Work continued incorporating a previous mosquito donation from Peter Belton (mainly BC material; ca. 2,000 specimens) and new mosquito material added by Dan Peach (mainly northeastern BC and Yukon material; ca. 650 specimens). We are grateful to Dr. Peach, who has been curating this ever-growing section of our collection for the past several years.



# FISH COLLECTION

SPECIMENS: 349,273 | NEW THIS YEAR: 803  
NUMBER OF RECORDS WITH GEOCOORDINATES: 48,807

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

Besides the routine work of cross-checking the databased information with vials in cabinets and the Institute of Fisheries Field Records (<https://open.library.ubc.ca/collections/fisheries>), the database has been modified to be compliant with the Darwin Core data exchange format, the international standard. An update of the database was sent to FishBase where it is has been displayed since 1996. Data were extracted for the new general collection query interface developed by D. Rowsell (<https://bridge.botany.ubc.ca/herbarium/index.php>). A poster about this interface was presented in the international conference BiodiversityNext in Leiden, Netherlands (over 700 participants from 76 countries, October 2019), an annual meeting that gathers the world specialists of biodiversity informatics. N. Bailly also authored or co-authored there three oral presentations.

Eric Taylor completed the geographic coordinates for about 100 records, besides other corrections. E. Taylor and D. Tan are finalizing Fish Sorter! a smartphone app for the identification of BC's freshwater fishes in partnership with Patrick Martone of the Department of Botany and based on the latter's successful Seaweed Sorter! app. E. Taylor and A. Geraldine continue their collaboration with BC Hydro where the fish collection's archived DNA specimens have proven invaluable to genetic studies associated with mitigation of the impacts of the Site C hydroelectric development.

Nicolas Bailly co-authored a paper (Hay *et al.*, 2020) that demonstrated the possibility of using fish collection specimens to derive length-weight relationships (LWR) for rare species. The LWRs are used for estimations of biomass when only body lengths are available. Lengths and weights of about 60 UBC specimens for 13 species were measured in this pilot study, including rare deep-sea species. We plan to estimate the LWR for additional 110 under-studied species from the UBC collection. These data are made publicly available through FishBase ([www.fishbase.ca](http://www.fishbase.ca)). A collaboration was established to analyse and publish data over 700 species from the MNHN (Paris, France) to confirm the validity of this approach.



N. Bailly at the Salmon Science Expo at the Gulf of Georgia Cannery in Richmond, BC.

Dr. Eric B. Taylor  
Director

Dr. Nicolas Bailly  
Curatorial Assistant

About 70 specimens of various groups were used or loaned to several colleagues for pictures and exhibitions. Forty of them representing seven species of Pacific salmon and trout (*Oncorhynchus* spp.) were exhibited by N. Bailly at the Salmon Science Expo (see picture) organized at and by the Gulf of Georgia Cannery Society in Steveston, Richmond, BC. Children really enjoyed touching “real” specimens.

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

# FOSSIL COLLECTION

SPECIMENS: 30,000 | NEW THIS YEAR: 776

OUTREACH EVENTS: 28



Dr. Kirsten Hodge  
Director

Daniel Gowryluk  
Curatorial Assistant



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 the fossil team contributed to 28 public outreach events. We utilized collection resources to support teaching and learning in the Department of Earth, Ocean and Atmospheric Sciences (EOAS). These initiatives include a new exhibit of hominid replica skulls (located in the Pacific Museum of Earth) that are used in two upper-level courses in EOAS. Undergraduate student Kaitie Purdue has been working on a directed studies project under the supervision of Professor Stuart Sutherland (EOAS) in the fossil collection aimed at understanding the history of the Green River Formation. EOAS Instructor Louise Longridge is using specimens from the collection for new laboratory exercises for her course EOSC 116 as part of a small TLEF-funded project (PI - Francis Jones).

Our volunteer participation has been stronger than ever this year. We have been lucky to have Kirstin Brink on our team for the past few years. Dr. Brink together with Marianne Wong have been instrumental in refreshing the research and teaching activities in the fossil lab and most recently Dr. Brink has accepted a faculty position at the University of Manitoba. We also have two new undergraduate volunteers who are helping with collection organization and specimen cleaning.

This year we have added 776 new specimens to our collection. We're currently in the middle of a significant catalogue renovations and improvements; which include future plans to digitize the entire collection.

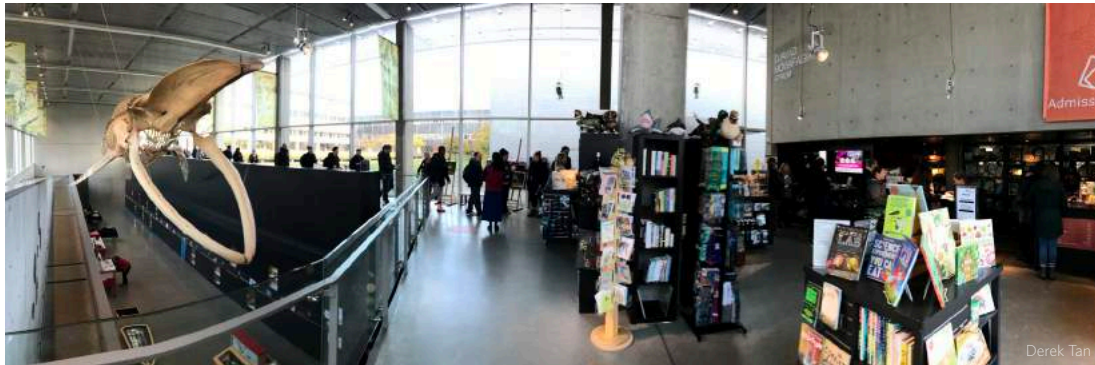


# ADMINISTRATION

TOTAL VISITORS: 43,383

REVENUES FROM PAID ADMISSION: \$224,442

REVENUES FROM MUSEUM SHOP SALES: \$25,508



## Strategic and Operational Planning

Operational planning continues to establish priorities set by the 2019–2024 Strategic Plan for its areas of focus—Collections, Curation & Research, Teaching & Learning, Exhibitory, Community Engagement and People & Places—under the themes of collaboration, leadership, innovation, sustainability and inspiring engagement with biodiversity.

## Visitor Services: Admission and Museum Shop

After three years of rapid growth, museum attendance and sales remain strong but show a slight decrease this year which we can be attributed to the impacts of COVID-19 on school program bookings, facility rentals, and special events in the last fiscal quarter of the year.

## Human Resources

The 2019–2024 Strategic Plan lists People & Places as one of its areas of focus. Success in this area is achieved by providing a respectful and collaborative environment in which to work and learn. A positive working environment is supported through inspiring facilities, recognition and growth for individuals, and sustainable operations. The development of a multi-year HR plan was identified as the first step to support this goal. Currently underway, the review of all job descriptions for the Beaty's growing team of more than 25 full- and part-time staff will be completed in Summer 2020 and will be at the basis of a new HR Plan that will also consider new positions to respond to growth and succession

planning mechanisms to better respond to retirements and staff changes. Thanks to the continued support from the departments of Zoology and Botany, the museum continues to sustain part-time Collection Technicians in all its collections and this year added a second Collections Curator in the Herbarium.

## Integrated Renewal Program

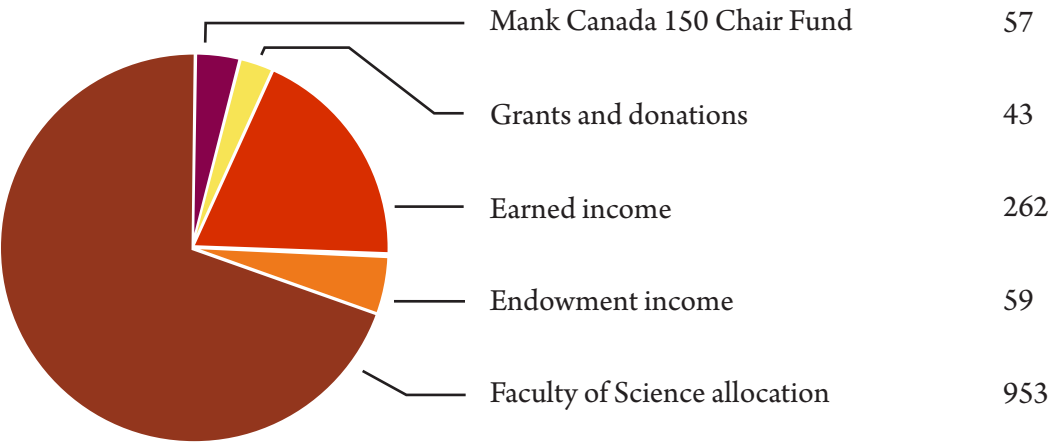
Through the Integrated Renewal Program and guidance of its Program Delivery Team, the museum is preparing to update its processes in human resources and finance management through the implementation of the new Workday management system in November 2020. For the last two years, an important number of hours have been dedicated to tasks in support of the central development of the appropriate configuration of Workday for UBC. We look forward to its implementation and more efficient and integrated processes.

Catherine Ouellet-Martin  
Senior Operations Manager

Maggie Décarie  
Visitor Services Supervisor

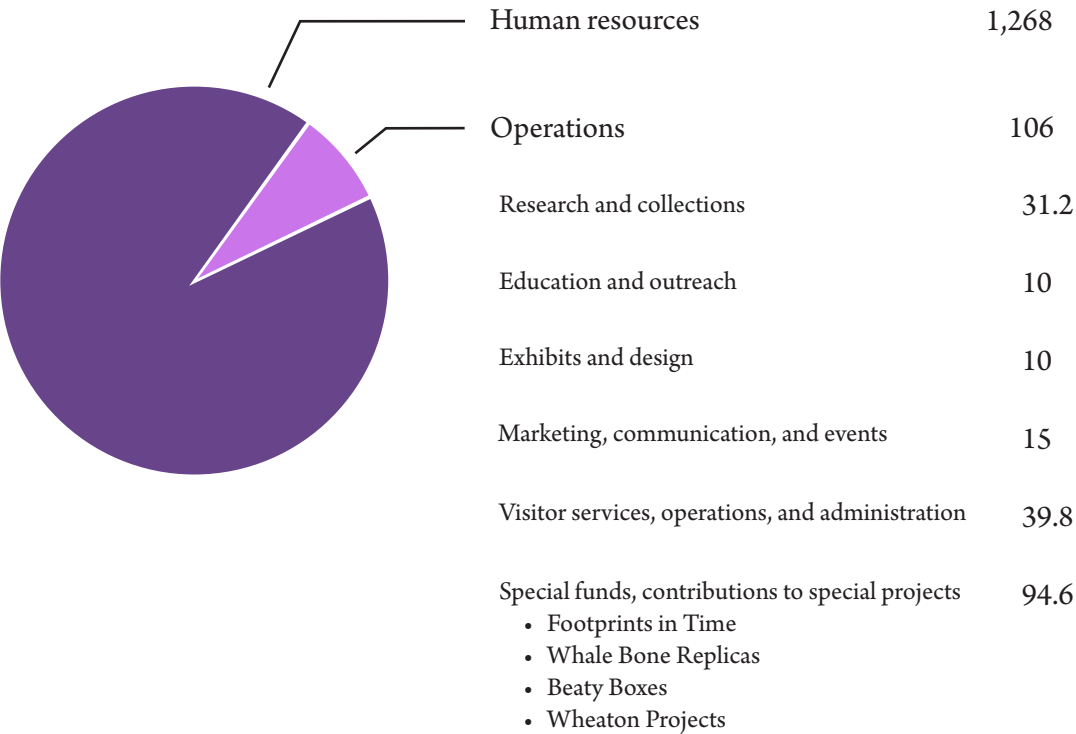
Deepti Arya  
Dru Chan  
Delia Jeong  
Charles Leung  
Natalie Shykoluk  
Sena Youn  
Visitor Services Clerks

Budget



Figures in thousands of dollars.

Expenses







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

<i>Anonymous</i>	Kirsten Johnson
Kent M. Brothers	Jungsun Lee
Sheila Catambing	Sandra Lindstrom
Kai Chan	Frank Lomer
Nathalie Djan-Chékar	Terry T. McIntosh
Carmen Durand	Barry Narod
Dave Holden	Angela Stevenson
David Holm	Michael Taylor
Kelsey Hymander	Wheaton Precious Metals Corporation

## PUBLICATIONS AND PRESENTATIONS

Arvanitidis, C. + 24 authors. 2019. The collaborative potential of research infrastructures in addressing global scientific questions. Oral presentation (Arvanitidis speaker). Abstract in *Biodiversity Information Science and Standards*. doi: 10.3897/biss.3.37289.

Bailly, N. 2019. Taxonomy and systematics in biodiversity informatics: lessons learned from ichthyology and general perspectives. Oral presentation. Abstract in *Biodiversity Information Science and Standards*. doi: 10.3897/biss.3.37657.

Bourgoin, T., Vignes-Lebbe R., **Bailly, N.** 2019. Visualisation of taxonomic knowledge: exploring and reporting taxonomic data, training students in taxonomy. Oral presentation (Bourgoin speaker). Abstract in *Biodiversity Information Science and Standards*. doi: 10.3897/biss.3.37730.

Hay, A., Xian, W., **Bailly, N.**, Liang, C., and **Pauly, D.** 2020. The why and how of determining length-weight relationships of fish from preserved museum specimens. *Journal of Applied Ichthyology* 36(3): 373–379. doi: 10.1111/jai.14014.

Koulouri, P., Gerovasileiou, V., **Bailly, N.**, and Dounas, C. 2020. Stomatopoda of Greece: an annotated checklist. *Biodiversity Data Journal*, 8[e47183]:1-13. doi: 10.3897/BDJ.8.e47183.

Roskov Y., Ower G., Orrell T., Nicolson D., **Bailly N.**, Kirk P.M., Bourgoin T., DeWalt R.E., Decock W., Nieukerken E. van, Zarucchi J., and Penev L., eds. 2019. Species 2000 & ITIS *Catalogue of Life, 2019 Annual Checklist*. Digital resource at <http://www.catalogueoflife.org/annual-checklist/2019>. Species 2000: Naturalis, Leiden. ISSN 2405-884X.

**Taylor, E.B.** 2020. *Fishes of the Salish Sea* (by Pietsch, T.W., and Orr, J.W. with illustrations by Tomelleri, J.). Heritage House Publishing, Victoria. Invited review for Transactions of the American Fisheries Society 149:419-421.

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**Rowswell, D., Jennings, L., Bailly, N.** 2019. Beaty Biodiversity Museum Collection and Observation Databases: Towards a single search interface. Poster (Bailly presenter). Abstract in *Biodiversity Information Science and Standards*. 10.3897/biss.3.37675.

**Bazzicalupo, A., Whitton, J., and Berbee, M.L.** 2019. Over the hills, but how far away? Estimates of mushroom geographic range extents. *Journal of Biogeography* 46 (7): 1547-1557. <https://doi.org/10.1111/jbi.13617>

Coxson, D., **Goward, T.**, Werner, J.R. 2019. The inland temperate rainforest and interior wetbelt biomes of western North America. *Encyclopedia of the World's Biomes*. <https://doi.org/10.1016/B978-0-12-409548-9.12055-X>.

Gauslaa, Y., **Goward, T.**, and Pypker, T. 2020. Canopy settings shape elemental composition of the epiphytic lichen *Lobaria pulmonaria* in unmanaged conifer forests. *Ecological Indicators* 113. <https://doi.org/10.1016/j.ecolind.2020.106294>.

**Hind, K.R., Starko, S., Burt, J.M., Lemay, M.A., Salomon, A.K., and Martone, P.T.** 2019. Trophic control of cryptic coralline algal diversity. *PNAS* July 23, 2019, 116 (30) 15080-15085; July 8, 2019. <https://doi.org/10.1073/pnas.1900506116>.

**Kopp, C.W., Neto-Bradley, B., Lipsen (Jennings), L.P.J., Sandhar, J., and Smith, S.** March 2020. Herbarium records indicate variation in bloom-time sensitivity to temperature across a geographically diverse region. *International Journal of Biometeorology*. <https://doi.org/10.1007/s00484-020-01877-1>.

**Le Renard, L., Firmino, A.L., Pereira, O.L., Stockey, R.A., Berbee, M.L.** 2020. Character evolution of modern fly-speck fungi and implications for interpreting thyrrothelial fossils. *American Journal of Botany*. Accepted April 2020.

**Le Renard, L., Stockey, R.A., Upchurch, G., Berbee, M.L.** 2020. A new epiphyllous fly-speck fungus from the Early Cretaceous Potomac Group of Virginia (125–112 Ma): *Protographum luttrellii*, gen. et sp. nov. *Mycologia*. In press, accepted January 2020.

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**Clarkston, B.E. and Jennings, L.** May 2019. “Partnering with the Beaty Biodiversity Museum to enhance learning experiences for first-year biology students.” Society of Natural History Collections.

**Jennings, L. and Clarkston, B.E.** May 2019. “Collection BioBlitz: Enhance and Broaden Undergraduate to Graduate Learning Experiences with University of British Columbia, Beaty Biodiversity Herbarium Specimens.” Society of Natural History Collections.

**Otto, S., Burton, C., and Whitton, J.** October 2019. “A million reasons to care: The biodiversity crisis in Canada.” Alumni UBC/Faculty of Science Event, Vancouver.



Heiss, E. and **Scudder, G.G.E.** 2019. Aradidae (Heteroptera) new to North America and Canada, with some additional provincial and state records for Canada and the USA. *Linzer biologische Beiträge* 0051-2: 821–829.

Larson, D.J. and **Scudder, G.G.E.** 2019. *Scolopostethus affinis* (Schilling) (Hemiptera: Heteroptera: Rhyparochromidae: Drymini): a new alien established in North America. *ZooKeys* 889: 17–22.

**Maddison, W.P.**, Maddison, D.R., Derkarabetian, S. and Hedin, M.C. 2020. Sitticine jumping spiders: phylogeny, classification and chromosomes (Araneae: Salticidae: Sitticini). *ZooKeys* 925: 1–54.

**Maddison, W.P.** 2019. A new lapsiine jumping spider from North America, with a review of Simon's *Lapsias* species (Araneae: Salticidae: Spartaeinae). *ZooKeys* 891: 17–29.

Peach, D.A.H., McCann, S. and Belton, P. 2020. The mosquitoes of the Yukon. *Canadian Journal of Arthropod Identification*. Manuscript in revision.

Peach, D.A.H. and Poirier, L.M. 2020. New distribution records of mosquitoes in northern British Columbia and the Yukon Territory. *Journal of the Entomological Society of British Columbia*. In press.

**Scudder, G.G.E.** 2019. A new species of *Kleidocerys* Stephens (Hemiptera: Heteroptera: Ischnorhynchidae) from British Columbia, Canada. *Proc. Entomol. Soc. Wash.* Submitted.

**Scudder, G.G.E.** 2019. The systematic position of *Pamera noctuabunda* Bergroth, 1907 (Hemiptera: Heteroptera: Rhyparochromidae), with a revised key to the species of *Stalaria* Harrington, 1980. *Zootaxa* 4691(3): 293–296.

**Scudder, G.G.E.** 2020. *Oxycarenus breddini* Bergroth, 1905 (Hemiptera: Heteroptera: Oxycarenidae): holotype discovery with a request to set the neotype aside. Submitted.

**Baliga, V.B., Szabo, I., and Altshuler, D.L.** 2019. Range of motion in the avian wing is strongly associated with flight behavior and body mass. *Science Advances* 5, eaaw6670. doi:10.1126/sciadv.aaw6670.

CTC specimens were subsampled for work conducted at Seattle Pacific University: Long, E.S., Courtney, K.L., Lippert, J.C., and Wall-Scheffler, C.M. 2019. Reduced body size of insular black-tailed deer is caused by slowed development. *Oecologia* 189.

**Szabo, I.** *Kingfisher*. 2019. Reaktion Books 'Animal Series'. London. 199pp.

**Beaty Biodiversity Museum Exhibitions Team** and the Musqueam First Nation. 2019 Governor's General History Award for Excellence in Museums: History Alive! for *Perspectives on Biodiversity: Sturgeon Harpoon Knowledge Web* exhibition.

**Beaty Biodiversity Museum Exhibitions Team** and the Musqueam First Nation. 2019 British Columbia Museums Association Innovation Award for *Perspectives on Biodiversity: Sturgeon Harpoon Knowledge Web* exhibition.

**Chambers, J. and Tan, D.K.** September 17, 2019. Demonstration table of *Sturgeon Harpoon Knowledge Web* website and 360 experiences, BC Field Trip Fair, Orpheum Theatre, Vancouver.

**Chambers, J. and Tan, D.K.** October 25, 2019. Demonstration table of *Sturgeon Harpoon Knowledge Web* website and 360 experiences, BBM Teacher's Open House, UBC.

**Koop, L.** 2019. "Mount Making on a Budget for Small Museums" workshop at BCMA Conference, Prince George.

**Stranger-Galey, Y. and Tan, D.K.** January 19, 2020. "Indigenous Stories, Immersive Experiences" presentation at Canada's History Maker Forum, Canadian Museum of History, Gatineau.

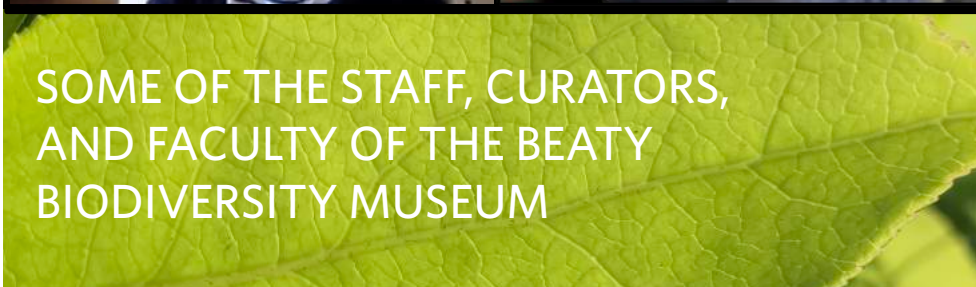
**Stranger-Galey, Y.** 2019. "Audience As Artist" presentation at Association of Academic Museums & Galleries (AAMG) Conference, Minneapolis.

**Stranger-Galey, Y., et al.** 2019. Tracking Dinosaurs: using modern technology to engage with prehistory. *Canadian Society of Vertebrate Palaeontology*, May 2019 Circular.

**Stranger-Galey, Y.** February 25, 2020. "Communicating Science: A Journey Outside Academia" seminar for the Society for Women in Science and Technology, UBC.

**Tan, D.K.** November 6, 2019. Selected as a MCN Scholar, and participation in panel presentation of *Sturgeon Harpoon Knowledge Web* centred on building technologies with Indigenous communities. Museum Computer Network Conference, San Diego.

**Tan, D.K.** March 31, 2020. Pre-conference, publicly available *Sturgeon Harpoon Knowledge Web* virtual tour targeted at museum technology professionals. Focus on collaboration and use of technologies. MuseWeb 2020.



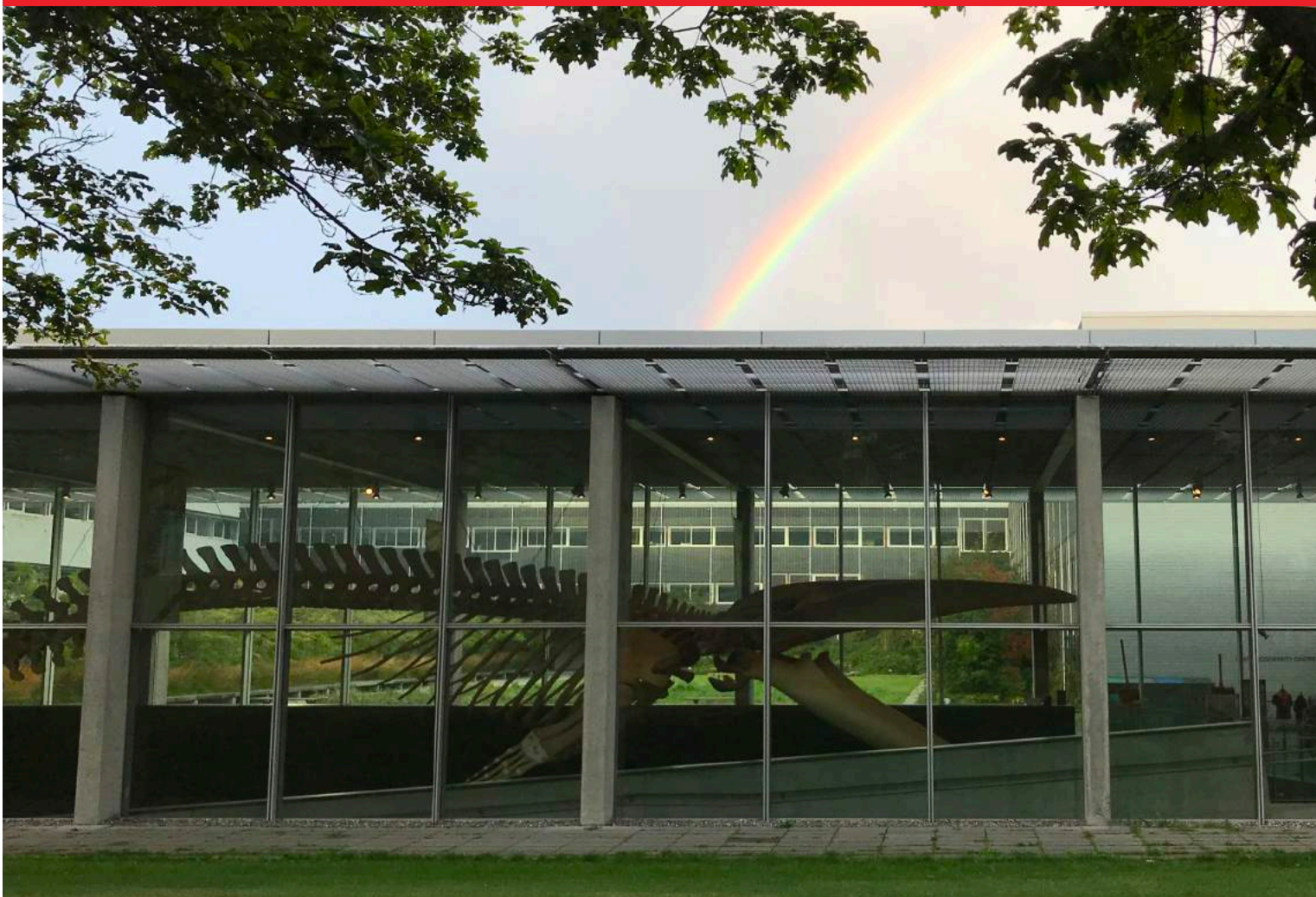


"GREAT MUSEUM, SO MUCH  
MORE THAN I EVER EXPECTED."

- Reed Eaglesham



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Cover photography by Derek Tan



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)**