

BEATY BIODIVERSITY MUSEUM  
**ANNUAL REPORT**  
2016-2017

*A world where biodiversity is better understood, valued, and protected.*



THE UNIVERSITY OF BRITISH COLUMBIA

**Faculty of Science**



BEATY BIODIVERSITY MUSEUM 2016-2017

**38,168 VISITORS**

*161 EDUCATION VOLUNTEERS*

**10,234 PROGRAM PARTICIPANTS**

*13,332 NEW SPECIMENS*

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

## Making Connections

In this annual report, I emphasize the Beaty Biodiversity Museum's (BBM) efforts to extend our reach and make connections in celebrating biodiversity and biodiversity research. When speaking of "making connections", the term is often used to refer to efforts to "engage with a community", an expression that has been criticized as often being simply a marketing ploy rather than a sincere effort to fulfill the mission of a museum. In an interesting blog written by Nina Simon<sup>1</sup>, much of the effort at "connecting with a community" was likened to museum folks running around with "a heat-seeking metal detector on the hunt for a miscellaneous batch of folks" who could be stunned "into connection". Ouch!

Simon then outlines several key efforts that should underlie attempts at connecting with the diverse museum-going, and in our case, biodiversity community. I read on with some trepidation about how the BBM would fare when evaluating our efforts against Simon's suggestions. I am, however, very pleased to report that the work of folks at the BBM seems to hit all or most of the key aspects of making the BBM more than just a "third place" (home and work being places one and two). For instance, our policy of free entrance to students, faculty, and staff at UBC and our efforts at encouraging diverse visitors with reduced rates hits the "Be free, nearly free, often free, or free to locals" tip. Second, our surveys of visitors have helped us to define who we attract and where we could grow, and hit the "Pick a community (or two)" suggestion. Our *Nocturnal* program (when the museum is open late one Thursday of the month and features a special event such as the popular "Hops" night) is a good example of Simon's tip to "Be open at times when your community is likely to come"—a move that increases the chances of a BBM visit being part of "evening recreational time". Importantly, the BBM curatorial staff is very active in

meeting with visitors, either by giving tours, workshops, or talks, which Simon suggested as a way to "Make time for staff to hang out with visitors". Finally, our "Sneak-a-peek" events for members is a good example of Simon's plea to find ways to "Appreciate regulars". The BBM's work at making connections also included receipt of three dinosaur "trackways", reproduced in cast form by the Peace River Palaeontology Research Centre (PRPRC) in north-central British Columbia. These trackways, when complete, will help connect visitors with life forms that existed between 90 and 140 million years ago, as well as connecting the work of two institutions (the BBM and the PRPRC) in diverse areas of British Columbia. Finally, we at the BBM are very pleased with the success of the Beaty Box program (see the Education and Outreach report) which has been very successful at connecting our specimens and biodiversity science with children in schools across the Lower Mainland. Clearly, the BBM is making connections across diverse communities.

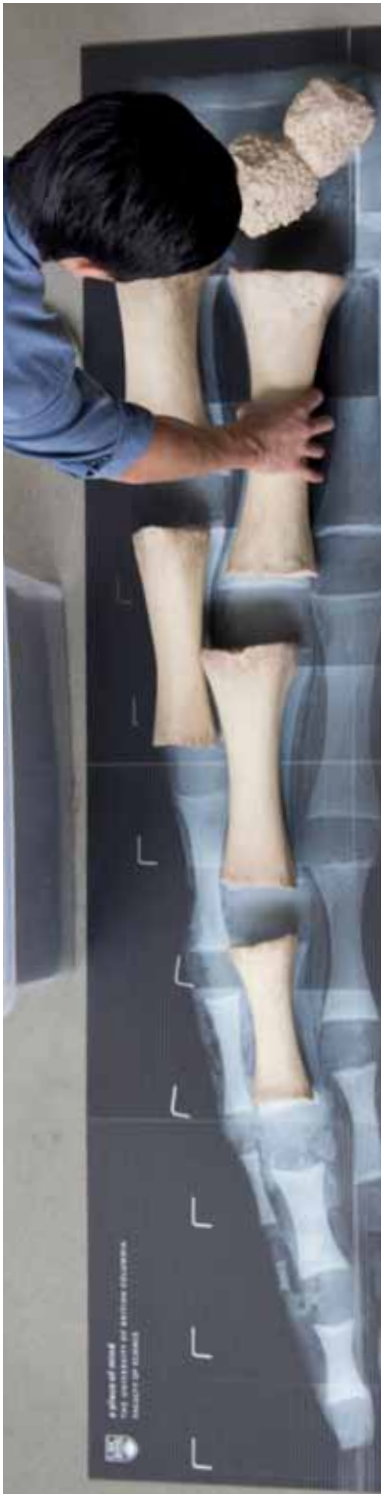
In closing, I appreciate all the visitors who chose to make the BBM part of their day this past year. Their visits benefited from all the work of our dedicated volunteers (over 160!), work-learn students, staff and faculty, and our donors. I appreciate and marvel at your commitment to the BBM. Of course, and on behalf of all at the BBM, the positive experiences of visiting and working at the BBM would not be possible without the tremendous support that we receive from all those at the Faculty of Science, led by our Dean, Dr. Simon Peacock. Our work is also aided greatly by Drs. Lacey Samuels and Sean Graham (former and current Heads, respectively, Department of Botany), and Bob Shadwick (Head, Department of Zoology). Thank you for that support.

1. Simon, N. 2009. "Eight other ways to 'connect with community'". *Museum 2.0*, [museumtwo.blogspot.ca/2009/08/eight-other-ways-to-connect-with.html](http://museumtwo.blogspot.ca/2009/08/eight-other-ways-to-connect-with.html)

# EDUCATION AND OUTREACH

NUMBER OF UBC GROUPS BOOKED: 73 | TOTAL NUMBER OF PROGRAMS BOOKED: 404

NUMBER OF WAY COOL TALKS: 12 | WAY COOL TALK VISITORS: 283



Jackie Chambers  
Education and Outreach Manager

Nicole Balsdon  
Education and Outreach Coordinator

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

The Education & Outreach team shares 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 changing BC curriculum. This includes the successful Earth Experience, a full-day school program run in collaboration with the Pacific Museum of Earth. We are pleased to report an overall increase in school program bookings and an increase in afternoon booking times after adjusting our start times in response to teacher feedback.

This year was the official launch of our Beaty Box specimen loan program, with two 'Inquiry' themed boxes and a 'Blue Whale Flipper' box available to teachers, educators, and community groups. These boxes have met with great success and the boxes have been fully booked since launching. 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.

This increase in programming, both on and offsite has resulted in an increase in revenue generated by the department 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.

# VOLUNTEERS

VOLUNTEER HOURS: 9,836.5

ACTIVE VOLUNTEERS: 161



Over 160 active education volunteers support us in sharing the stories of the research collections. 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 hands-on noon hour 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.

Beaty 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.



WHAT DID YOU LIKE BEST ABOUT YOUR VISIT?

**"THE AWESOME VOLUNTEERS! SO ENGAGING AND ENTHUSIASTIC, INVOLVED THE CHILDREN AND LET THEM LEAD TOO."**

-visitor comment card

## PARTNERSHIPS



Over 2,600 undergraduate and graduate students from UBC and other post-secondary institutions visited the museum as part of classes. We hosted a pre-service teacher 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 teaching assistants, Belkin Museum, and SEEDS) and off campus (participating in Science Literacy Week, partnering with Parks Canada, Vancouver School Board 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 Pacific Museum of Earth and Modules in Ecology and Evolution Development (MEED) graduate student group, we continued to offer our monthly Nature Club to families on campus. Special events this year included: Hands-On Biodiversity during spring break, and FestEVOLVE—our annual celebration of Charles Darwin and evolution.





# MEMBERSHIP AND COMMUNITY

ACTIVE MEMBERSHIPS: 398

TWITTER FOLLOWERS: 2,454 | FACEBOOK FOLLOWERS: 3,052

INSTAGRAM FOLLOWERS: 2,022

## Membership

A Beaty Biodiversity Museum membership means joining and supporting a lively community of people inspired by biodiversity, engaged with the natural world, and dedicated to conservation.

Members were invited to special events associated with our museum exhibitions *From Meadows Woodlands Far and Near* and *Ecosystems in Play*. Additionally, membership benefits have been extended to our monthly *Nocturnal* events, including offering free drink tickets whenever these evenings have been licensed.

Amy Gibson

Marketing, Communications, and Events Coordinator



## Community Outreach

We strive to communicate what biodiversity is and why it is important at community outreach events at the museum and around Vancouver, dreaming of a world where it is better understood, valued, and protected. This year, we got to share biodiversity at: West 4th Ave. Khatsahlano Street Party, UBC Imagine Day, UBC Welcome Back Staff BBQ, Wesbrook Village Festival, and Night Quest with Metro Vancouver Regional Parks.

This year also saw the launch of a new evening program in September: *Nocturnal*. Every month on the third Thursday, we keep the museum open late with admission by donation. *Nocturnal* was launched as a way for working families to more easily visit the museum during the week. What has resulted has been some really exciting events and partnerships. Already we have been able to offer exhibit lectures, film screenings, and music performances during *Nocturnal* events. Thank you to the groups we have already partnered with: Redshift Music Society, Canadian Museum of Nature, UBC SEEDS, and Big Rock Brewery.

"...BIOLOGICAL SEEDS GREW IN MY BRAIN AS I WANDER PAST EACH EXHIBIT. MESMERIZING."

— visitor comment card

***From Meadows Woodlands Far and Near***, March 10–September 4, 2016

Brigitte Potter-Mael's delicate watercolours and striking woodcuts were inspired by plants from the landscapes of the Lone Valley, Germany and British Columbia. The exhibition also featured *Proverbial Botany*, a collaborative piece with sound artist Andreas Kahre.

***Finding Place: Collecting Home Through Field Journal Art***, April 8–August 28, 2016

Plant ecologist and artist, Lyn Baldwin, captured her home province of British Columbia through detailed botanical field journals and paintings, while searching for what it means to belong to a place and find stories of home.

***100 Years, 100 Treasures***, May 28, 2016–April 30, 2017

Building on the previous *100 Years, 100 Treasures* exhibit, this extension revealed the top ten treasures of the museum, as voted for by the public. To mark UBC's centennial year, visitors explored the history of the museum collections intertwined with the history of the university.

***Ecosystems in Play: Exploring Biodiversity Through Gaming***, September 17, 2016–August 20, 2017

Visitors stepped inside the Phylo game to see how life within an ecosystem is connected. The game was created by UBC geneticist and science educator, David Ng, to inspire children to learn about the natural world in a way that is fun and familiar.

***Turning Heads***, November 17, 2016–April 2, 2017

This exhibition highlighted the work of editorial cartoonist, Grahame Arnould. The works in this display attempted to raise awareness of biodiversity and threats to the environment. Visitors could also get involved by writing their own caption for a funny gag cartoon.

***A Discovery at UBC: the British Columbia Rose***, February 15, 2017–ongoing

This offsite exhibit at the UBC Robert Lee Alumni Centre explores the discovery of a rose hybrid new to science found within our collections.

## EXHIBITS AND DESIGN

SPECIAL EXHIBITIONS: 6 | NUMBER OF EXHIBIT 'LIKES' ON INSTAGRAM: 5,225  
NUMBER OF SPECIMENS MOUNTED FOR EXHIBITION OR TEACHING: 172



Yukiko Stranger-Galey  
Exhibits and Design Manager

Luc Desmarais  
Interim Exhibits and  
Design Manager

Derek Tan  
Digital Media Specialist

Lesha Koop  
Museum Artifact Technician

Three casts of dinosaur trackways were received at the museum from the Peace Region Palaeontology Research Centre in Tumbler Ridge, BC. The integration of these into an engaging and interactive exhibit as part of our permanent displays is currently ongoing.

Work on one of our major permanent exhibits, the mammals cabinet, commenced with a redesign of the display and introduction of impressive new specimens such as a muskox and a jaguar.

*Researchers Revealed*, our series that highlights the work of the Biodiversity Research Centre researchers, continued to be displayed in the museum.



**DEREK TAN, DIGITAL MEDIA SPECIALIST,  
WAS AWARDED THE 2016 UBC  
PRESIDENT'S STAFF AWARD FOR  
CREATIVITY AND INNOVATION.**

Ecosystems in Play



UBC Ceremonies



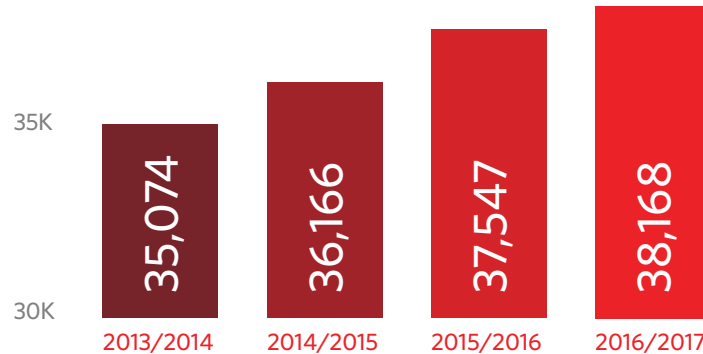
**100 YEARS, 100 TREASURES  
WAS NOMINATED FOR THE 2016  
BRITISH COLUMBIA MUSEUMS  
ASSOCIATION AWARD FOR  
OUTSTANDING ACHIEVEMENT.**

100 Years, 100 Treasures

# EVALUATIONS

PROPORTION OF PEOPLE VISITING WITH THEIR FAMILIES: 54%  
PIECES OF ORIGAMI MADE AS PART OF MEADOWS EXHIBITION: 4,430  
PROPORTION OF PEOPLE ON RETURN VISITS: 20%

## TOTAL VISITORS



## WE ASKED OUR VISITORS "WHAT DID YOU LIKE BEST ABOUT YOUR VISIT TODAY?"

"ALWAYS ENJOY ALL. KATE IN DISCOVERY LAB WAS AMAZING WITH MY CHILDREN. OPENED FOSSIL CABINET WHEN [SHE] HEARD THE BOYS WANT TO BE PALEONTOLOGISTS."

"OVERALL LAYOUT AND DESIGN OF THE SPACE. EVOLUTIONARY TIMELINE AND THE EXHIBITS THAT ARE "CHILD" HEIGHT. HOPEFULLY YOU ARE INSPIRING THE NEXT GENERATION"

**"WOW. IT IS TRULY FASCINATING. I STAYED AGES LOOKING AT THE INCREDIBLE CREATURES OF OUR WONDERFUL WORLD. THANK YOU."**

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

In 2016–2017, we worked on:

- Visitor surveys and feedback forms
- Comment cards
- Demographic data and postal code collection
- Presenting and sharing our results with other institutions at conferences

This information is used to make better decisions in the museum, and has already improved our exhibition design, marketing efforts, school programs, participatory stations, activities, and tours.



# COWAN TETRAPOD COLLECTION

NUMBER OF SPECIMENS: 43,229 | ACCESSIONED THIS YEAR: 314

SPECIMENS IMAGED: 9,800 | IMAGED THIS YEAR: 2,300

NUMBER OF COUNTRIES ACCESSING SPECIMENS THROUGH VERTNET: 17

VOLUNTEER HOURS: 1,024

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

## Exhibition Renewals

Adding a full-sized muskox and a black jaguar this year to the Americas section of the large mammal exhibit has nabbed visitor attention. Adding three Asian mountain sheep and an aoudad to complete the installation is bound to evoke a similar response. This exhibit showcases some of the largest specimens in the Cowan Tetrapod mammal collection while revealing compelling stories of their adaptations. It has been a work in progress for three years and we are looking forward to its completion this summer.

The 'What am I?' window continues to be popular and has featured Morris, the last survivor of the exotic feral crested myna population extirpated in the Pacific Northwest in 2007, a northern elephant seal skull, and an ethno-ornithological display in partnership with a current show at UBC Museum of Anthropology.

Dr. Darren Irwin  
Director and Curator

Ildiko Szabo  
Assistant Curator of Birds

Chris Stinson  
Curatorial Assistant of Mammals,  
Reptiles, and Amphibians



Muskox  
*Ovibos moschatus*



Crested myna  
*Acridotheres cristatellus*

## Research Collaboration

Multi-level government owl research collaborations switched this year from snowy owls to the blue-listed endemic Haida Gwaii saw-whet owl plus an exploration into the declining BC populations of western screech-owls. The CTC is the proud repository of this set of blue-listed owls which, with the help of volunteers and students, are in the process of being prepared as avian round skins and skeleton specimens. Ongoing studies on this set of owls include gut and trophic level analysis using strontium isotopes. Participating researchers and partners on this project are: BC Ministry of Forests, Lands, and Natural Resource Operations (FLNR); Canadian Wildlife Service; BC Ministry of Agriculture; University of Royal Roads; University of Northern British Columbia; Parks Canada; and several independent consultants.

## Databasing and Online Resources

Catalogued holdings in the CTC went up by 2,955 this past year—a combination of database wizardry by Christopher Stinson and 314 new specimens accessioned. Digitally imaging the bird and mammal specimens for the database is progressing on schedule, with 4,500 new images taken this year. The limited statistics from VertNet this year suggested we would surpass our search and download numbers from 2016, but alas they are incomplete and will no longer be available.

## Donations

A tiger pelt, a black jaguar taxidermy mount, and a rug composed of three snow leopard pelts were donated this year. Research is needed to determine if the albino Townsend's vole recently received is the first record of albinism for British Columbia or for North America. Several specimens were recovered from the Biological Sciences Building renovation including a flying fox.

Due to the previously mentioned owl collaborations, many new frozen specimens were received from Haida Gwaii. Amongst them is a short-eared owl which further research may show is a new species for this archipelago. This donation includes several passerines, plus sets of northern goshawks and sharp-shinned hawks. Tissue samples from these extremely hard-to-come-by diurnal raptors have been distributed to graduate students at UBC and the Drexel University Academy of Natural Sciences (Philadelphia) for sub-species research.

The Ministry of Forests, Lands, and Natural Resource Operations donated a “spurred owl”. This is an extremely rare hybrid between the red-listed spotted owl and a barred owl.



## Notable presentations:

Wildlife Rehabilitators Network of BC (March 4–6, 2016, Burnaby): “Keeping Wildlife Rehabilitation Personnel Safe: A first responder’s resource to avian mortalities.” (**Ildiko Szabo**).

North American Ornithological Conference (August 16–29, 2016, Washington, DC): “The challenges of effectively using social media and web-based outreach collections-based activities.” Panel Leaders: Paul Sweet, James Marley, **Ildiko Szabo** (in) ‘Issues in Collections Management and Museum Science Symposium.’

BC Museums Association (October 12–14, 2016, Whistler):

1. “The Marten Chronicles.” Speed Science talk (**Christopher Stinson**)
2. “It’s a Match! What is Forensic Ornithology?” Speed Science talk (**Ildiko Szabo**)
3. “Back to Basics: Scratching the Five-Year Itch.” Panel member: (**Christopher Stinson**)

Raptor Research Foundation 50th Anniversary Conference (October 16–19, 2016, Cape May, New Jersey): “Keeping Raptor Banders & Volunteers Safe: A first responder’s resource to avian mortalities.” (**Ildiko Szabo**)  
[raptorresearchfoundation.org/files/2016/11/2016\\_conference\\_program.pdf](http://raptorresearchfoundation.org/files/2016/11/2016_conference_program.pdf)

# MARINE INVERTEBRATE COLLECTION

SPECIMENS: OVER 500,000 | DATABASED THIS YEAR: 4,020

ESTIMATED NUMBER OF SPECIES: 50,000

Dr. Chris Harley  
Director



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.

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. Ongoing research includes the work of postdoctoral researcher Dr. Alyssa Gehman, who is funded by a US National Science Foundation Collections-Based Postdoctoral Fellowship. Dr. Gehman is working on the cyanobacteria that bore into mussel shells, which can in some cases cause significant erosion and lead to the death of the mussel. She investigates how cyanobacterial infestation intensity changes in space and time, and what implications climate change may have for the cyanobacteria and their mussel hosts.

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.



# HERBARIUM

SPECIMENS: OVER 695,000 | DATABASSED RECORDS: 542,000 | NEW RECORDS THIS YEAR: 10,000  
IMAGED SPECIMENS: 32,000 | NEW IMAGES THIS YEAR: 2,500  
LOANS: 42 | VOLUNTEER HOURS: 294  
NUMBER OF NEW SPECIES ADDED TO COLLECTION: 50

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

## Collecting for future research

- Our collections were used by researchers to better understand the evolutionary relationship in a keystone lichen, *Bryoria*, that provides the sole winter food for mountain caribou. This study gave us a better understanding of taxon identity and evolutionary relationships therefore impacting the protection of essential habitat for a Canadian species at risk.

Myllys, L., Velmala, S., Holien, H., Wang, L.S., Goward, T. 2016.  
Phylogeny of the genus *Bryoria*. *The Lichenologist* 43(6): 617–638.

- The BC Conservation Data Centre relies on our collections to track rare and endangered plant species in British Columbia. When a new population is discovered, a specimen will be deposited into our collection for research reference.
- We led the 7<sup>th</sup> annual Schofield Bryophyte and Lichen Foray in Port McNeil, northern Vancouver Island, and supported plant identification for the Whistler Bioblitz. A foray or bioblitz gives you a snapshot moment in time of an ecosystem or habitat that will be preserved for future biodiversity research.

## Teaching UBC students about collections and research

- Visiting UBC biology classes (300 level) including Plant Taxonomy, Bryology, Phytogeography, Fungi, and Plants and People. Each specialized plant class was able to learn about how plant collections are used around the world collections in research.
- We were a community partner in UBC History 490, The Environmental History of British Columbia, looking at the past 100 years of campus planning and supervised a UBC SEEDS student-led project looking at the biodiversity of UBC campus plantings.
- We are training the next generation of collections and museum students with our 2016 Canada Heritage summer Young Canada Works position. These students have the opportunity to gain real work experience in a highly active, research-focused natural history collection.

Dr. Jeannette Whitton  
Director

Linda Jennings  
Assistant Curator and Manager

Olivia Lee  
Collections Manager

Dani An  
Database Technician

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





### Sharing our collections around the world

- We openly share the 542,000 databased herbarium records and 32,000 images with local, national, and global biodiversity databases to allow remote accessibility to our collections.
- We share our day-to-day collection activities on our Instagram ([instagram.com/pressedplants](https://www.instagram.com/pressedplants)) to allow virtual visitors to have a taste of what collections are about.

### Our collections grow to answer research questions

- We received 3,000 specimen donations across all five of our collections. These collections come from all over Canada and around the world. Each year our donations increase our collections comprehension, with 50 new species to our collection added this year, and 18 new records for British Columbia!
- Many of our donations this year were collected for graduate student research including the winners of the Walter H. Lewis Award in Botany, PhD candidates, Manfred Boehm and Jamie Fenneman. Manfred Boehm surveyed and collected bird-pollinated flora of the Peruvian Andes to build a reference database to consider the consequences of destabilized climates on plant-animal dependencies and the ramifications for regional biodiversity. Jamie Fenneman used his award to collect a botanically important and underrepresented region of British Columbia, Christina Lake, east of Grand Forks. His specimens tripled our collection for this region, filled in gaps in species distributions, and included many rare and endangered species of British Columbia.
- The new Alaska algae specimens donated this past year added to the largest representation of Alaskan seaweeds in any herbarium worldwide. This comprehensive collection is used to answer such questions as: when invasive seaweeds first arrived on the west coast and by what mechanisms, and the evolution of species relationships throughout the world of algae.

### Notable Publications:

Altermann, S., Leavitt, S.D., **Goward, T.** 2016. Tidying up the genus *Letharia*: introducing *L. lupine* sp. nov. and a new circumscription for *L. columbiana*. *The Lichenologist* 48 (5): 423–439.

Arsenault, A., **Goward, T.** 2016. Macrolichen diversity as an indicator of stand age and ecosystem resilience along a precipitation gradient in humid forests of inland British Columbia, Canada. *Ecological Indicators* 69: 730–738.

**Bazzicalupo, A., Berbee, M.,** Wood, H., Voitek, M., Voitek, A. 2016. The *Russula emetica* complex in NL - preliminary report. *Omphalina* 7: 3–7.

**Bazzicalupo, A.L.,** Buyck, B., Saar, I., Vauras, J., Carmean, D., **Berbee M.L.** 2017. Troubles with mycorrhizal mushroom identification where morphological differentiation lags behind barcode sequence divergence. *Taxon*.

Holien, H., Palice, Z., **Björk, C.R., Goward, T.,** Spribille, T. 2016. *Lecidea coriacea* sp. nov., and a lichen species from old growth boreal and montane forest in Europe and North America. *Herzogia* 29 (2) Teil 1: 412–420.

Manoharan-Basil, S.S., Miadlikovska, J., **Goward, T.,** Andresson, O.S., Mio, V.P.M. 2016. *Peltigera islandica*, a new cyanolichen species in section *Peltigera* ('*P. canina* group'). *The Lichenologist* 48 (5): 451–467.



Kamiya, M., **Lindstrom, S.C.,** Nakayama, T., Yokoyama, A., Lin, S.-M., Guiry, M.D., Gurgel, C.F.D., Huisman, J.M., Kitayama, T., Suzuki, M., Cho, T.O., Frey, W. 2017. *Syllabus of Plant Families: Volume 2: Part 2: Photoautotrophic eukaryotic Algae - Rhodophyta*. Borntraeger Science Publishers, Stuttgart, 38 figs., xii + 160 pp.

**McIntosh, T.,** Blom, H.H., Kuznetsova, O.I., Ignatova, E.A. 2017. *Schistidium relictum* (Grimmiaceae, Bryophyta), a new moss species from Northwest North America and Siberia. *Phytotaxa* 299 (2): 234–235.

Molina, M.C., Divarka, P.K., **Goward, T.,** Milanes, A.M., Thorsten-Lumbsch, H., Crespo, A. 2016. Neogene diversification in the temperate lichen-forming fungal genus *Parmelia* (Parmeliaceae, Ascomycota). *Systematics and Biodiversity* 1477–2000: 1478–0933.

Peterson E.B., **Goward, T.** 2016. *Chaenothecopsis aeruginosa* sp. nov., an overlooked calicioid in the Pacific Northwest of North America. *Herzogia* 29 (2) Teil 1: 561–565.

**Sears, C.J. and Whitton, J.** 2016. A reexamination of the North American *Crepis* agamic complex and comparison with the findings of Babcock and Stebbins' classic biosystematics monograph. *American Journal of Botany* 103: 1289–1299.

Tønsberg T., **Goward, T.** 2016. *Cliostomum spribillei* (Ramalinaceae, lichenized Ascomycetes), a new species from western North America. *North American Fungi*, Vol. 11 (5): 1–7.

Yoon, H. S., Nelson, W., **Lindstrom, S.C.,** Boo, S.M., Pueschel, C., Qui, H., Bhattacharya, D. 2016. Rhodophyta. In: J. M. Archibald et al. (eds), *Handbook of the Protists*, Springer International Publishing Switzerland, pp. 1–45.

# SPENCER ENTOMOLOGICAL COLLECTION

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

A considerable amount of time and effort has been spent this year improving our online presence ([biodiversity.ubc.ca/entomology](http://biodiversity.ubc.ca/entomology)). Distribution maps and a search function have been added, as well as photographs of Spencer's slide collection of fleas and lice thanks to a generous donation from the Entomological Society of BC. We are very close to achieving our goal of digitizing one of each species in our collection for our online photo gallery, and databasing of our specimens continues.

We surveyed many interesting BC and Yukon locations in 2016, including Pemberton, Whistler, Sidney Island, Pink Mountain, Osoyoos, and Carmacks. We also had the unique opportunity to sample the six-acre "green roof" atop the Vancouver Convention Centre once a month, and produced a preliminary insect list of over 150 species.

Research on salticid spider systematics has continued with four papers published that describe 10 new species, two of which represent distinctive new genera. One of the species, *Pellenes canadensis*, is from BC and was named in honour of Canada's 150<sup>th</sup> anniversary.

Spencer director Wayne Maddison received the Presidents' Award for lifetime achievement by the Society of Systematic Biologists.

## Notable Publications:

Klimaszewski, J., Langor, D.W., Smith, A.B.T., Hoebcke, E.R., Davies, A., Pelletier, G., Douglas, H., Webster, R.P., Bourdon, C., Borowiec, L., Scudder, G.G.E. 2017. Synopsis of adventive species of Coleoptera (Insecta) recorded from Canada. Part 4: Scarabaeoidea, Scirtoidea, Buprestoidea, Byrrhoidea, Elateroidea, Derodontoidea, Bostrichoidea, and Cleroidea. *Pensoft Series Faunistica* No. 116. Pensoft Publishers, Sofia, Bulgaria. 215 pp.

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

Maddison, W.P. 2016. *Papuaneon*, a new genus of jumping spiders from Papua New Guinea (Araneae: Salticidae: Neonini). *Zootaxa* 4200: 437–443.

Maddison, W.P. 2016. *Sumakuru*, a deeply-diverging new genus of lyssomanine jumping spiders from Ecuador (Araneae: Salticidae). *ZooKeys* 614: 87–96.

Maddison, W.P., Maddison, D.R. 2016. Two new jumping spider species of the *Habronattus clypeatus* group (Araneae: Salticidae: Harmochirina). *ZooKeys* 625: 1–10.

Ratzlaff, C.G., Needham, K.M., Scudder G.G.E. 2016. Notes on insects recently introduced to Metro Vancouver and other newly recorded species from British Columbia. *Journal of the Entomological Society of BC* 113: 79–89.

Scudder, G.G.E. 2016. *Rhyparochromus vulgaris* (Schilling) (Hemiptera: Heteroptera: Rhyparochromidae): newly discovered in the interior of British Columbia. *Journal of the Entomological Society of BC* 113: 90–91.

SPECIMENS: 650,000 | ACCESSIONED THIS YEAR: 3,000  
DATABASING RECORDS: 112,000 | NEW THIS YEAR: 7,000  
IMAGES OF SPECIMENS: 36,000 | NEW THIS YEAR: 5,700  
IDENTIFICATIONS FOR THE PUBLIC: 120 | VOLUNTEER HOURS: 500



Collecting on the VCC green roof  
Karen Needham

Dr. Wayne Maddison  
Director

Karen Needham  
Assistant Curator

Chris Ratzlaff  
Curatorial Assistant

Don Griffiths  
Imaging Technician



*Megachile rotunda*  
Chris Ratzlaff



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

The Fish Collection is very fortunate to have enlisted the volunteer services of Dr. Nicolas Bailly. Dr. Bailly is a biodiversity informatics scientist and ichthyologist in the Institute of Marine Biology, Biotechnology and Aquaculture of the Hellenic Centre for Marine Research (HCMR). He was previously in the Laboratory of Ichthyology and the Department of Systematics and Evolution at the Muséum National d'Histoire Naturelle (MNHN, Paris, France; 1992–2005). He started to collaborate with FishBase in 1996, mainly on the taxonomic and species distribution modules. He participated in the creation of the FishBase Consortium in 2000 of which he was the head for one year. He participated in many initiatives on biodiversity information systems at the international and French national levels. He organized the 3<sup>rd</sup> GBIF Governing Board meeting and the launch of the first CD of Catalogue of Life, both in Paris in 2001. Employed at WorldFish (2005–2014), he was the FishBase programme manager as the Officer in Charge of the Philippines Office (2005–2010), and then seconded to the FishBase Information and Research Group (FIN), a Philippine NGO, as the Scientific Director (still acting in that position). He is Scientific Adviser for SeaLifeBase. Under WorldFish and FIN. He is member of the Global Team of the Catalogue of Life since 2008, Taxonomic Group Chair since 2009, and the vice-Chair of the Global Team since 2011.

Dr. Bailly has reorganized much of the collection and also edited the collection field records accompanying all specimens which were previously digitized in collaboration with the Digital Centre of the Irving K. Barber Learning Centre at UBC. These metadata are now available via direct links with the Fish Collection records on Fishbase ([fishbase.ca/museum/SearchFishCollections.php](http://fishbase.ca/museum/SearchFishCollections.php)).

## FISH COLLECTION

SPECIMENS: 853,377 | NEW THIS YEAR: 18  
DNA SAMPLES: 70,948 | NEW THIS YEAR: 1,694  
TISSUE COLLECTIONS: 3,869 | NEW THIS YEAR: 1,694



Dr. Eric Taylor  
Director

Dr. Nicolas Bailly  
Curatorial Associate  
(Volunteer)

### Notable Publications:

Parkinson, E.A., Perrin, C., Ramos-Espinosa, D., and Taylor, E.B. 2016. Evidence for freshwater residualism in coho salmon (*Oncorhynchus kisutch*) from a watershed on the north coast of British Columbia. *Canadian Field Naturalist* 130: 336–343.

This paper made use of voucher specimens and DNA samples from coho salmon in our Fish Collection to positively identify a rare freshwater-resident population from BC's central coast.

Halas, D., Lovejoy, N., Mandrak, N.E. 2017. Goldfish (*Carassius* spp.) diversity in North America: implications for invasive species management. In review.

This paper identified two species of exotic goldfishes that are new to North America including one, *Carassius langsdorffii*, native to Japan and which has been reported, as illicit introductions, from only two places in North America: Lake Tahoe, Nevada, and the water feature in front the of BBM! These exotic goldfish were removed from the BBM water feature and tissue samples were sent to Halas et al. which led to this novel discovery.



## FOSSIL COLLECTION

SPECIMENS: 30,000 | DATABASED THIS YEAR: 5,600  
VOLUNTEER HOURS: 320 | UBC STUDENTS SUPPORTED: 20

Dr. Kirsten Hodge  
Curator

Corinne Griffing  
Assistant Curator

The Fossil Collection has 20,000 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.

Volunteers are engaged in an ongoing project to database and better organize the collection.



## Annual Operations Planning

This year, the Beaty team engaged in an operational planning exercise that resulted in a comprehensive document detailing ongoing activities and special projects for each of the museum functions for the next fiscal year. The Operations Plan 2017–2018 is aligned with the Beaty Biodiversity Museum strategic plan and considers organizational priorities, operational needs, and available human and financial resources ensuring that all progress towards the same goals collaboratively and with strategic intent. The plan is an invaluable tool that demonstrates organizational strength and provides accountability.

## Museum Policies

A policy committee was formed and through broad consultation with staff and faculty, developed a set of policies for the museum collections, education and exhibits functions, and our important volunteer corps. These policies relate directly to the mandate of the museum and will guide decisions concerning its functions.

## Human Resources

The Beaty Biodiversity Museum continues to align organizational and staffing structures and resources with the museum's strategic goals to better position the museum as a leader in the acquisition, care, use of, and education about biological collections. Best-employer practices continue to be a priority to manage the growing team as the museum now employs over 25 full- and part-time staff, and as many part-time student staff. The museum also offers volunteer opportunities to more than 160 talented and dedicated individuals. Thanks to additional funding support from the departments of Zoology and Botany, the museum welcomed two new part-time staff members to support the important work in the Entomology and Herbarium collections.

## Visitor Services

After five years of operations, a review of BBM admission prices was in order to better align with admission rates in the Metro Vancouver cultural tourism sector and to ensure admission prices accurately reflect the value of the experience offered to BBM visitors. Following a review of admission prices at other Metro Vancouver attractions, internal consultation and approval, a modest increase to admissions and program fees was implemented September 1, 2016. The corresponding increase in revenue contributed to a 12.5% increase in earned income from sales and services during this fiscal year.

## Visitor Experience Improvement Project

This project seeks to improve the overall visitor experience at the Beaty Biodiversity Museum. Enhancing the museum visitor's learning environment will advance our mission. While the project is to be realized next fiscal year, funding was sought and secured during this reporting year. Thanks to a strong project plan that clearly laid out rationale, benefits, and feasibility of the project, funding in the amount of \$98,000 was secured. This will allow the realization of a significant portion of the project which will include:

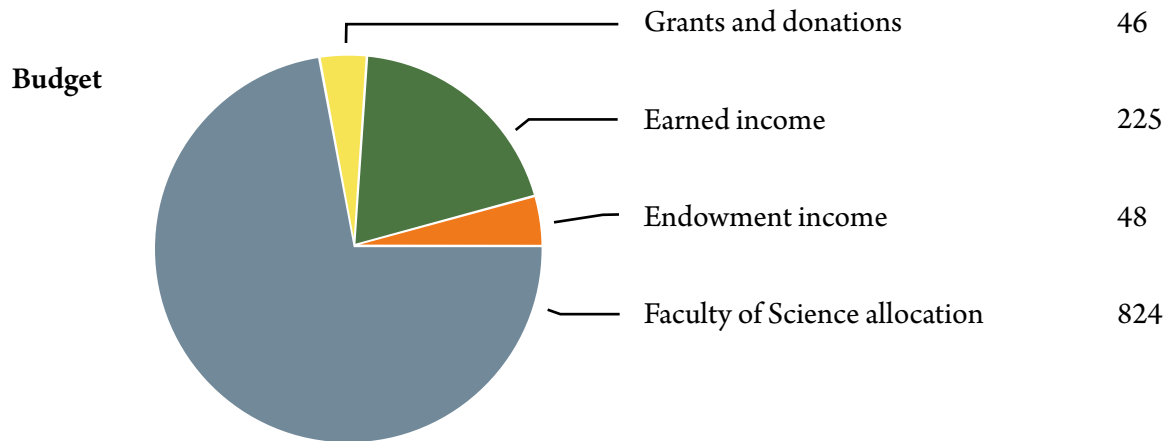
- Integrated and interactive whale station
- Improved museum gallery workspace functionality
- Incorporated digital layer across the exhibits
- Improved gallery social spaces to allow visitors a comfortable place to sit, observe, reflect, and discuss their experience

We look forward to reporting on these outcomes in next year's annual report.

Catherine Ouellet-Martin  
Administrative Manager

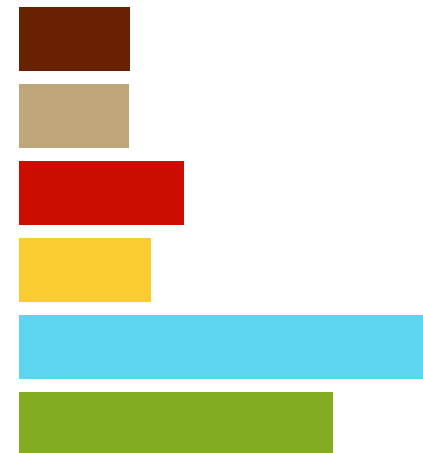
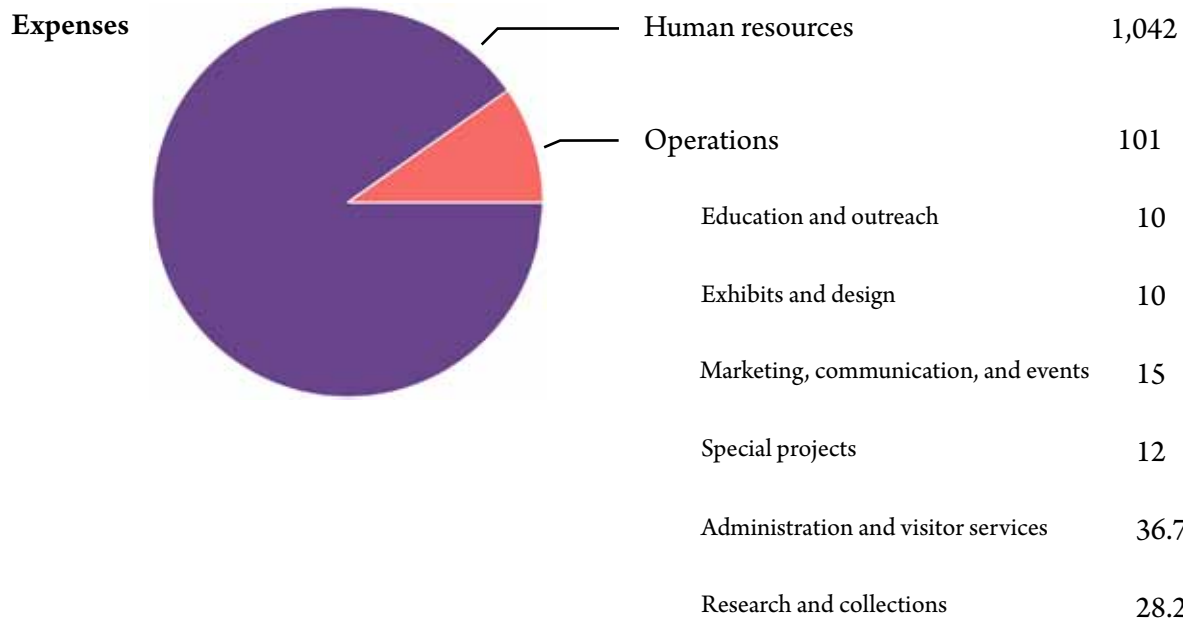
Katherine Ransom  
Charles Leung  
Daniel Daly-Grafstein  
Alison Porter  
Marguerite Descarie  
Front Counter Clerks





Through the support of the Faculty of Science, grants, donations, membership, and earned income, the museum's financial health stayed strong in fiscal year 2016–2017.

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*

Kent M. Brothers

Ian S. Burgess

Shelia Catambing

Evan Hilchey

Elsie Jang

Kirsten Johnson

Howard McAllister

Matthew Robinson

Marcia Spetch

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## Gifts in Kind

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Judith Harpel

Paul and Victoria Harrison

Dave Holden

Michael Holmwood

Paul Kroeger

Plato S. Mamo

Terry T. McIntosh

William Merilees

Kelly Norton

Bruce Bennett





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



*"A museum with a clear message. Beautiful"* - visitor comment card



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