



CANADIAN MUSEUM OF NATURE

SCIENCE REVIEW 2024-2025

Canada

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This Science Review summarizes the Canadian Museum of Nature’s accomplishments and contributions to science through research, collection curation, development and access, and leadership in the natural sciences in 2024-25.

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Cover photo: Base camp in the Moose Creek Valley, B.C., during August 2024 fieldwork by members of the museum’s mineralogy section at the Ice River Alkaline Complex. Photo: Pierre Poirier.

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LAND ACKNOWLEDGEMENT

The Canadian Museum of Nature resides on the traditional and unceded territory of the Anishinābe Algonquin people who have stewarded this Land for thousands of years. We acknowledge that the museum’s scientific research occurs in, and that the national natural-history collection originates from, the territories of the Métis and First Nations people and in Inuit Nunangat. We pay respect to Knowledge Keepers, both young and old, as we continue the important journey of Reconciliation.

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AT A GLANCE

The Canadian Museum of Nature is Canada's national museum of natural history and natural sciences. The museum's galleries and programs are located at the Victoria Memorial Museum Building, a National Historic Site of Canada, in Ottawa, Ont., while its research and collections activities are based at the Natural Heritage Campus in Gatineau, Que.

The museum's scientific work is focused on:

Curating, developing, and mobilizing the national natural history collection.

Generating new knowledge and understanding about biodiversity and geodiversity through research and discovery.

Promoting science through outreach, education, and service.

This report summarizes the museum's activities in these areas in 2024-25.

THE NATIONAL COLLECTION: A RECORD OF BIODIVERSITY AND GEODIVERSITY OVER TIME AND SPACE

Sharing collection data in support of Open Science:

As of 12 May 2025, the museum had mobilized **1,009,439 occurrence records** via the Global Biodiversity Information Facility (GBIF) and **56,283 algal records** via the museum's National Phycology Collection of Canada Database. The global community downloaded museum collection records from GBIF more than **1.3 billion times**.

Progress in digitizing the museum's collections:

The museum added **91,560 catalogue records** to its collection management system. These include more than 8,191 records from the **Hudson Bay Lowlands** and adjacent areas, as part of a project supported by **Parks Canada**.

Collection growth: The museum added **23,408 specimens or specimen lots** to the national collection.

Transfer of Geological Survey of Canada collections to the museum: The museum focused on rehousing, photographing, and physically integrating the Geological Survey of Canada's portion of the **National Mineral Collection** into the museum's collections, while reorganizing existing specimens to accommodate the new ones. So far, the museum has incorporated more than 8000 specimens, including more than 200 type specimens, from the Survey into its collections.

Preserving the rare book collection:

Building on the rare book collection conservation assessment conducted in 2023-24, the museum completed conservation treatments on **77 publications**. The conservation team also tested 35 volumes for toxic pigments such as arsenic and mercury, improving our knowledge around contaminants in collections.

Collection loans: The museum processed **65 outgoing loans**, comprising 8,371 specimens or specimen lots, to 25 institutions in Canada and 17 institutions in eight other countries.

Collection visitors: Over **240 people** visited the Natural Heritage Campus to access the national collection.

Scientific studies that cite museum specimens: External researchers cited the museum's specimens in over **95 peer-reviewed publications**.

Scientific studies enabled by museum data mobilized via the Global Biodiversity Information Facility: Hundreds of publications by authors from **around the world** used the museum's data mobilized via GBIF to address a variety of research questions about biodiversity.

RESEARCH AND DISCOVERY: CREATING NEW KNOWLEDGE ABOUT BIODIVERSITY AND GEODIVERSITY

Research programs: The museum supported **22 multi-year research programs** focused on advancing our understanding of biodiversity and geodiversity.

Fieldwork: Museum staff spent more than 453 person-days working in the field across Canada in **nine provinces and territories**—including 218 person-days in the **Canadian Arctic**—and 114 person-days in the field in other countries. Fieldwork focused on minerals and biodiversity in multiple groups of organisms, including microscopic algae, beetles, dinosaurs, fishes, fossil fishes, fossil mammals, lichens, mosses, freshwater mussels, seaweeds, small mammals, and vascular plants.

Publications: Museum staff published **56 peer-reviewed articles** on a variety of topics related to biological and geological diversity. Museum research associates published 29 peer-reviewed articles.

Conference presentations: Museum researchers delivered or co-authored **43 presentations** reporting research progress at scientific conferences and workshops.

Collaborators: The museum’s research and collections staff worked with collaborators at more than **130 organizations** from across Canada and around the world, including universities, research institutes, museums, government departments and agencies, and private sector organizations, on a range of research- and collections-related initiatives.



The Canadian Museum of Nature’s Natural Heritage Campus in Gatineau, Quebec serves as the primary hub for its collections, research laboratories, and administrative functions. The facility is surrounded by 56-hectares of forest, which the museum stewards. Photo: Pierre Poirier.

PROMOTING SCIENCE THROUGH OUTREACH, EDUCATION, AND SERVICE

Presentations: Museum staff delivered outreach and educational presentations, workshops, and lectures to more than **37 organizations**.

Collection tours: Museum staff delivered tours of its collections and research facilities to more than **200 guests** from more than 18 organizations.

Open House at the Natural Heritage Campus: The museum welcomed **1,926 visitors** to its annual Open House event at the Natural Heritage Campus. This once-a-year event provides an opportunity for the public to visit the museum's research facility and the collections of plants, animals, fossils, and minerals and to meet with the science experts who care for and study the collection.

Participation on Northern expeditions as educators and science experts: Museum staff took part in **three educational, ship-**

based expeditions in summer 2024. One was led by the Innu Nation of Labrador, and two were led by the Students on Ice Foundation.

Science blog: The museum published **11 posts** on its science blog, taking readers behind the scenes at the museum, from the laboratory to the field.

Student training: Museum staff provided training for, supervised, or mentored **57 students** affiliated with 15 Canadian institutions in five provinces and three international institutions.

Service to professional communities: Museum staff served on boards, councils, and committees of **35 national and international scientific and museological societies** and on the editorial boards of 15 peer-reviewed scientific journals and related publications.



Cassandra Robillard, right, a natural heritage botanist with Ontario's Natural Heritage Information Centre and research associate with the museum, examines a moss specimen during a bryophyte identification workshop she co-led with Jennifer Doubt, curator of the museum's botany collection. The event took place in October 2024 at the Queen's University Biological Station, north of Kingston in southeastern Ontario. Photo: Jennifer Doubt.

Alan McDonald, senior collection technician, demonstrating a Triceratops skull during the museum's Natural Heritage Campus Open House event on 5 October 2024. Photo: Diego Steed.



INTRODUCTION

The Canadian Museum of Nature is Canada's national museum of natural history and natural sciences. The museum's galleries and programs take place at the Victoria Memorial Museum Building, a National Historic Site of Canada, in Ottawa, Ont. The museum bases its research and collections activities and programs at the Natural Heritage Campus in Gatineau, Que.

Our Science

The museum's scientific work is focused on:

Curating, developing, and mobilizing the national natural history collection.

Generating new knowledge and understanding about biodiversity and geodiversity through research and discovery.

Providing natural sciences leadership, education, and engagement.

CANADA'S NATIONAL NATURAL HISTORY COLLECTION

Natural history collections enable scientific research and discovery at local, regional, national, and international levels. They are central to understanding and advancing knowledge of the past, present, and future of biological and geological diversity and the public understanding of science.

For over 150 years, the Canadian Museum of Nature—and its predecessors, the Geological Survey of Canada, the National Museum of Canada, and the National Museum of Natural Sciences—has been developing a collection of natural history specimens and generating and sharing knowledge about Canada's natural heritage.

The museum's natural history collection comprises more than 15 million specimens spanning the tree of life and four billion years of Earth's history. It is a world-class resource that enables global research and discovery about nature and how it is changing. The museum's National Biodiversity Cryobank of Canada—a biorepository of frozen tissues and samples from across Canada and abroad—is a source of material for genomic research. The museum also houses extensive holdings of books and periodicals, archival records, nature art, and mixed media.

THE ROLE OF NATURAL HISTORY COLLECTIONS IN UNDERSTANDING THE NATURAL WORLD

Natural history collections are permanent scientific archives comprising biological and geological specimens, with contextual information about their provenance. These collections are foundational to advancing scientific knowledge, informing policy decisions, and enriching education at all levels. Much of the knowledge and information about the world's biological and geological diversity derives from natural history collections. They are a rich source of data covering broad spatial and deep temporal scales. Like time capsules, they allow us to reconstruct past environments and biodiversity, providing critical insights that guide our understanding of the present and help shape decisions for a sustainable future.

UNDERSTANDING LIFE ON EARTH

Natural history collections inform our understanding of life on Earth. They are essential to our systems of scientific naming and provide the physical evidence needed to describe species. They document biodiversity across time and geography—locally, nationally, and globally—revealing how species and ecosystems have changed due to natural forces and human activity. Historical specimens allow us to reconstruct past distributions, including those of endangered or extinct species, and they inform conservation strategies.

They also support tracking invasive species, conducting wildlife forensics, and assessing ecosystems. Specimen labels offer cultural and historical insights, while agricultural pest collections contribute to food security. Today, these collections are essential for studying pathogen hosts, predicting pandemics, and monitoring contaminants like mercury. Researchers use stable isotopes from specimens to uncover past diets and habitats, and collection data to analyze biodiversity trends, seasonal shifts, and species interactions under climate change—across landscapes, continents, and the planet.

Natural history collections are also vast, largely untapped libraries of the planet’s genomic diversity. Advances in DNA sequencing and bioinformatics now allow researchers to recover large amounts of genetic data—even whole genomes—from specimens collected decades or even centuries ago. Collections thus enable cutting-edge studies in evolutionary biology, systematics, conservation genomics, and population genetics. They provide the raw material to reconstruct historical phenotypes and genotypes, assess extinction risks, trace the origins of invasive species, and compare ancient and modern genomes—offering powerful insights into biodiversity across time.

UNDERSTANDING EARTH’S HISTORY

Natural history collections are essential for documenting Earth’s physical history. They include geological materials such as fossils, rocks, cores, sediments, and minerals, which together provide a deep-time record of life and planetary processes. Fossil collections reveal the evolution of life—from microscopic organisms to large vertebrates—while rock and mineral collections serve as reference libraries of the planet’s physical diversity. These resources help scientists reconstruct ancient environments and understand interactions between biological and geological systems over millions of years. They also support practical applications, including hazard assessment, resource exploration, and climate research. As analytical technologies advance, these collections will continue to unlock new insights into Earth’s dynamic history.

A GROWING RESOURCE FOR GLOBAL DISCOVERY

Natural history collections are expanding their relevance across disciplines—from ecology and climate science to public health and social sciences—helping answer questions that early collectors could never have imagined. Technological advances continue to unlock new insights from these collections, deepening our understanding of biodiversity and geodiversity across time and space. With more than three billion specimens housed globally, these collections offer unparalleled potential to illuminate the natural world and address pressing global challenges.

As the natural world undergoes rapid change, it is essential to continue building a collections-based record that documents biodiversity and geodiversity across time and space. At the same time, we must accelerate efforts to digitize and mobilize these collections, transforming them into accessible, data-rich resources that fuel scientific discovery, education, and evidence-based decision-making.

The Canadian Museum of Nature curates approximately 30 percent of the estimated 50 million specimens housed in natural history collections across Canada. This nationally significant collection, held in trust for current and future generations, is part of Canada’s cultural and scientific heritage. As an irreplaceable research infrastructure, it supports and enables scientific inquiry into the natural world—both within Canada and globally.

THE MUSEUM'S SCIENTIFIC RESEARCH

The museum sustains an established, productive, and internationally recognized research program that generates new knowledge and insight into biodiversity and geodiversity. Its collection-based research focus distinguishes it from other organizations in Canada that study the natural world.

The museum's scientists conduct research in laboratories and in the field across Canada and internationally. Over the past century, they have published thousands of peer-reviewed papers, books, and other scholarly and popular works.

The wealth of information generated by the museum's research and made possible by the national collection has substantially advanced our knowledge and understanding of the natural world. This knowledge informs decision-making related to the preservation, protection, and sustainable use of our natural heritage.

LEADERSHIP, EDUCATION, AND ENGAGEMENT

The museum's research and collections experts are leaders in their fields. They contribute to national and international scientific and museological communities through professional service. They foster expertise in collections-based research and natural history collections management by training and mentoring the next generation of biodiversity and geodiversity scientists. Through outreach activities, they raise the profile of the museum and its scientific work, and they support museum programming that educates and engages the public about the natural world and the threats it faces.

CENTRES OF EXCELLENCE

Two centres of excellence concentrate the museum's scientific activities: the Beaty Centre for Species Discovery and the Centre for Arctic Knowledge and Exploration. Although each centre has a distinct focus, they share the goals of positioning the museum as a global leader in the storage, preservation, and digitization of natural history collections, and as a national leader in inspiring engagement with nature—both on-site and off-site.

BEATY CENTRE FOR SPECIES DISCOVERY

The museum's collection-based science expertise in biodiversity and geodiversity anchors the Beaty Centre for Species Discovery. The centre connects the core functions of the museum—research, collections, and education programs—to advance and enhance their impact and reach.

CENTRE FOR ARCTIC KNOWLEDGE AND EXPLORATION

The Centre for Arctic Knowledge and Exploration brings together the museum's Arctic expertise, resources, programs, and activities. The centre builds on the museum's 100-plus years of experience creating knowledge about the Arctic through research and discovery and using that base of information to transform people's understanding of the Arctic and its importance to Canada. Core centre activities are research, collection development, and sharing knowledge—all related to Arctic biodiversity and geodiversity.



THE NATIONAL NATURAL HISTORY COLLECTION

The national natural history collection is the foundation of the museum's scientific work on biodiversity and geodiversity and a resource that enables global research and discovery about the natural world and how it is changing.

The national collection includes 26 major collections, comprising more than three million accessioned specimens or specimen lots (Table 1). Because a single lot may contain anywhere from a few to hundreds of individual organisms, the museum estimates the total collection holds over 15 million specimens.

SHARING COLLECTION DATA IN SUPPORT OF OPEN SCIENCE

MORE THAN ONE MILLION COLLECTION RECORDS MOBILIZED ONLINE

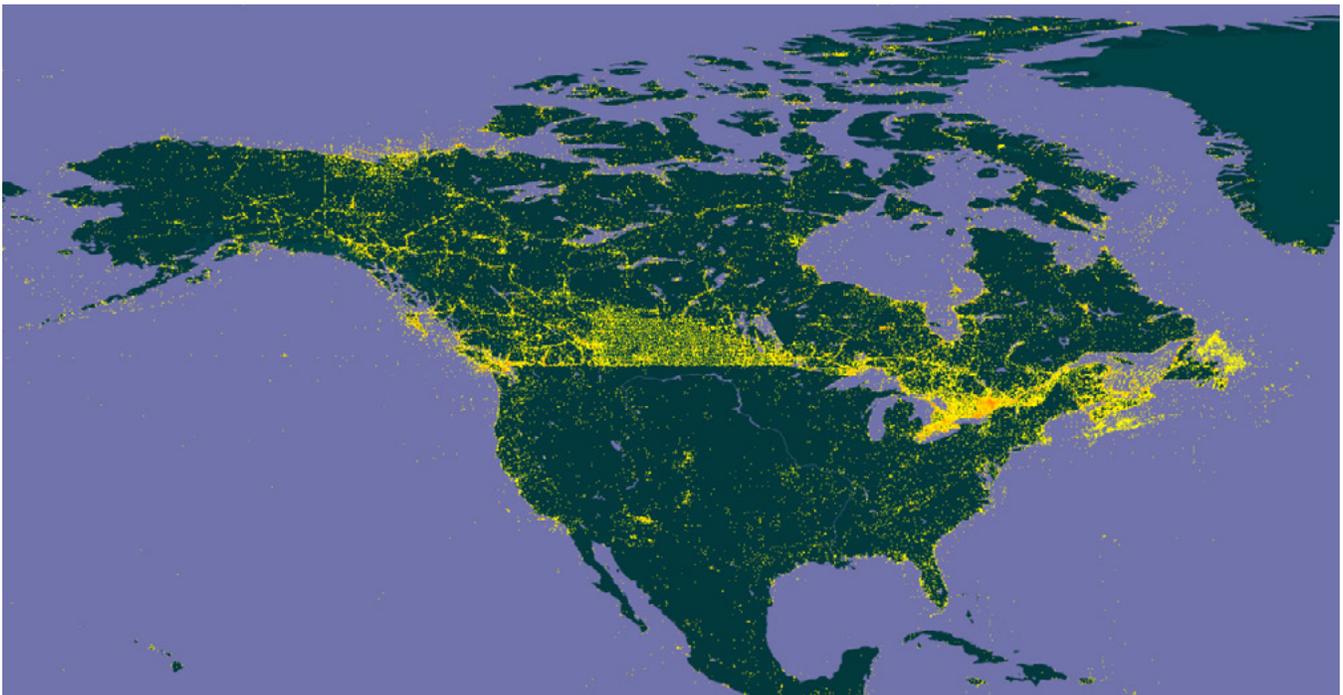
As of 12 May 2025, the museum had mobilized 1,009,439 records through the Global Biodiversity Information Facility (GBIF) and 56,283 algae records through the museum's National Phycology Collection of Canada database. Of the algal records, 13,504 are available on both platforms.

GLOBAL DOWNLOADS OF THE MUSEUM'S COLLECTION DATA

In 2024–25, the global community downloaded the museum's records mobilized through the Global Biodiversity Information Facility (GBIF) more than 1.3 billion times.

OVERVIEW OF DIGITALLY CATALOGUED RECORDS

The table that follows provides an overview of the museum's collections, including the number of physical specimens or specimen lots; records digitized and mobilized online; mobilized records with geographic coordinates; and mobilized records with associated images. The museum hosts its digital resources using an Integrated Publishing Toolkit (<http://ipt.nature.ca>). Unless otherwise noted, data are mediated by GBIF. The information summarized here was captured on 12 May 2025.



Map of North American occurrence records from the Canadian Museum of Nature's collections, published via the Global Biodiversity Information Facility on 24 November 2025. The map includes 743,737 records, each corresponding to a specimen or specimen lot in the museum's national natural history collection. Source : [Global Biodiversity Information Facility](https://www.gbif.org/).

Collection	Subcollection	Number of specimens or lots ¹	Number (%) of catalogue records digitized and mobilized online	Number (%) of mobilized records with geographical coordinates	Number (%) of mobilized records with one or more specimen images
BOTANY	Herbarium (Bryophytes, Lichens, Vascular plants)	1,091,091	413,636 (38)	293,659 (71)	249,024 (60)
	Algae	170,623	56,283 (33) ²	45,746 (81) ²	14,882 (26) ²
VERTEBRATE ZOOLOGY	Bird	120,300	105,381 (88)	94,607 (90)	411 (0.39)
	Fish	76,172	63,604 (84)	59,121 (93)	595 (1)
	Mammal	59,758	59,688 (100)	44,475 (75)	110 (0.18)
	Amphibian and Reptile	37,883	37,667 (99)	32,502 (86)	279 (1)
INVERTEBRATE ZOOLOGY	Crustacea	80,646	87,123 (108) ³	83,388 (96)	24 (0.03)
	Mollusc	133,012	57,175 (43)	44,370 (78)	217 (0.38)
	Faunal Assemblage	109,858	—	—	—
	Insect	1,108,778	35,159 (3)	22,195 (63)	16 (0.05)
	General Invertebrate and Annelid	46,120	38,572 (84)	35,342 (92)	2 (0.01)
	Parasite	18,781	15,699 (84)	13,748 (88)	3 (0.02)
FOSSILS	Palynology	14,569	14,566 (100)	— ⁴	2 (0.01)
	Palaeobotany	4,882	4,872 (100)	— ⁴	1 (0.02)
	Fossil Invertebrate	4,652	3,358 (72)	— ⁴	5 (0.15)
	Fossil Vertebrate	54,863	51,261 (93)	— ⁴	331 (1)
GEOLOGY	Mineral	51,587	— ⁵	— ⁵	— ⁵
	National Biodiversity Cryobank of Canada	5,756 ⁶	8,174 ⁶	6,594 (81)	n/a
	Total	3,189,331	1,052,518 (33)	775,747 (74)	265,902 (25)

¹ These numbers are estimates and include only accessioned material.

² Mobilized via <https://www.nature-cana.ca/databases/index.php>. 13,504 of the algal records are also mobilized by GBIF. They are counted only once in the total to avoid duplication.

³ Digital record creation outpaced base specimen estimates as staff processed historic lots. The base specimen estimate will be adjusted in 2025-26.

⁴ The museum only shares locality information for palaeobiology collections or species at risk upon request.

⁵ The museum mobilizes the mineral collection through local hosting that is currently being rebuilt. Information can be accessed upon request.

⁶ Formal acquisition of collections as separate objects is set to begin in 2025-26. Digital collection growth represents subsampling of voucher specimens during the acquisition process.

NEW DIGITAL RECORDS ADDED TO THE MUSEUM'S COLLECTIONS DATABASE

The museum added 91,560 catalogue records to its collections database in 2024-25.

These new records include approximately 518 lots of invertebrate specimens—primarily clams, snails, and crustaceans—and more than 7,693 records of bryophytes, vascular plants, and lichens from the Hudson Bay Lowlands. The museum digitized these as part of a project launched in late 2022 with support from Parks Canada. The resulting data will help Indigenous partners from the Mushkegowuk Council and Parks Canada better understand biodiversity in the region, providing the accurate, georeferenced information needed to model species distributions, identify biodiversity “hotspots,” and prioritize conservation areas within the ecozone. Over the past two years, the museum has digitized and mobilized more than 53,000 records from the Hudson Bay Lowlands and adjacent areas

LIBRARY, ARCHIVES AND SPECIAL COLLECTIONS

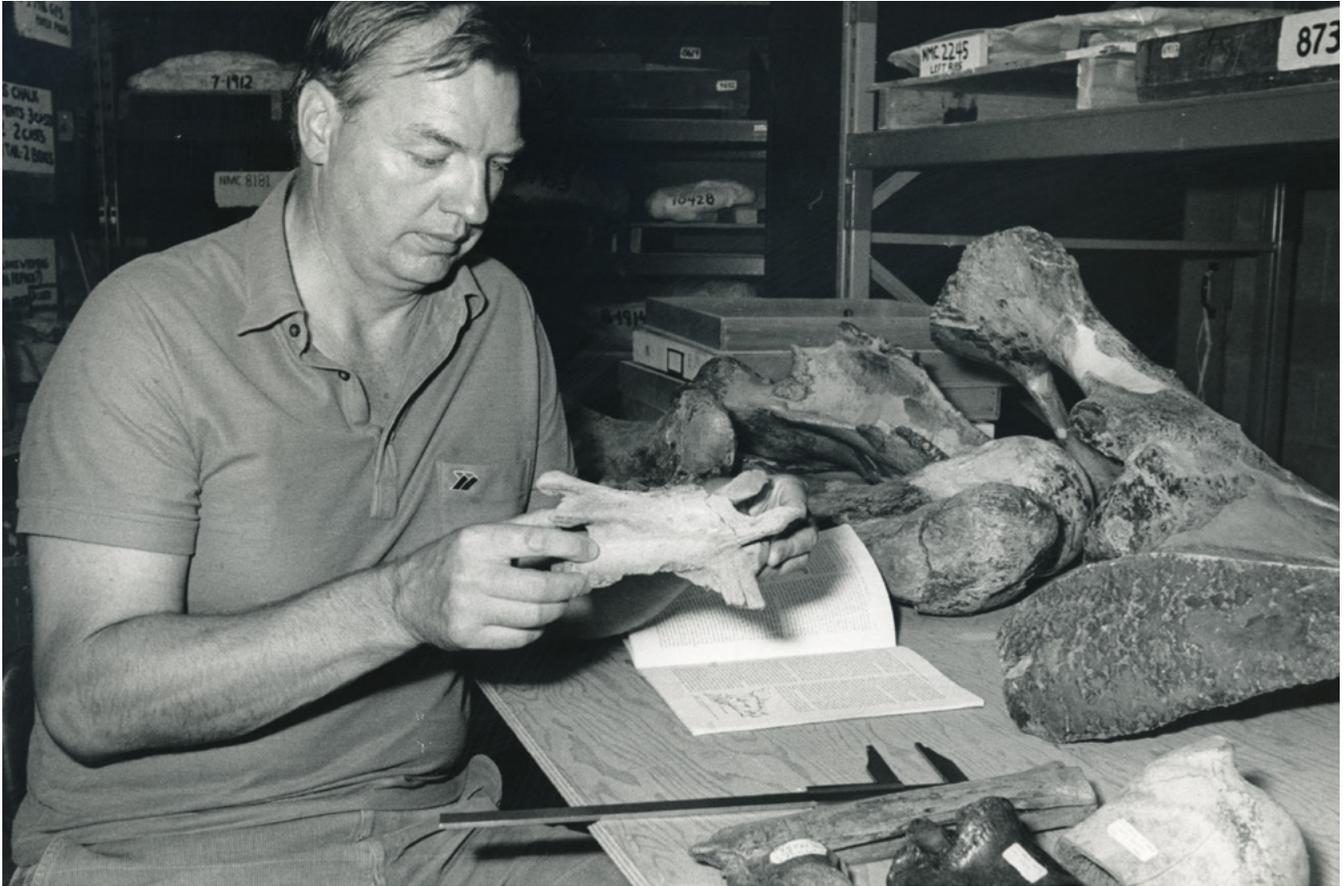
Biodiversity Heritage Library: The museum contributes content to the [Biodiversity Heritage Library](#), a platform that makes literature about biodiversity openly available to the world as part of a global biodiversity community. The museum's digitized literature is also available via the [Internet Archive](#). In 2024-25, the museum contributed 198 items to the library, including books and various journal and newsletter issues and volumes. Highlights of this newly digitized content include:

- [Biome](#), a popular publication produced by the National Museum of Natural Sciences and later the Canadian Museum of Nature in the 1980s and early 1990s
- Multiple volumes of the [Bulletin of the National Museum of Canada](#)
- A.E. Porsild's [Field journal of an expedition through Alaska, Yukon and the Mackenzie District, 1926-1928](#)
- National Museum of Canada Natural History Papers [v.1](#) (1958-1965) and [v.2](#)

Library catalogue: The museum acquired 36 new books and more than 120 issues of scientific journals, which support ongoing research and collection activities. Lauren Wong (University of British Columbia, Master of Library and Information Studies program) added barcodes to more than 640 rare books as part of her studies. She worked with the library team to migrate the bibliographical data revealed by the recent rare book collection survey towards the Integrated Library System (ILS). This migration has made it possible to synchronize the collection with the large catalog Worldcat. The University of British Columbia recognized Lauren's work with the 2023/24 iSchool MLIS Co-op Student of the Year award.

Conservation: The Library and Conservation teams continued work to conserve 12 heavily damaged rare books in the museum's collection. This project aims to make these delicate publications available once again for use and research. The conservation team treated 65 publications for red rot and stabilized another 433 titles through treatments and rehousing. The team also tested 35 volumes for toxic pigments such as arsenic and mercury, improving our knowledge around contaminants in collections.

Archives: The museum processed 69 boxes comprising 700 files of archival materials and digitized more than 1000 files from its archival collection. Work in 2024-25 focused on describing and processing the Dr. Charles Richard “Dick” Harington fonds and inventorying and digitization of the museum’s archival poster collection. This collection contains posters for the museum’s exhibitions, collaborative exhibitions, events, and programs between 1939 and 1996.



The image shows Harington examining a specimen in the museum’s fossil collection. Photo: Canadian Museum of Nature.

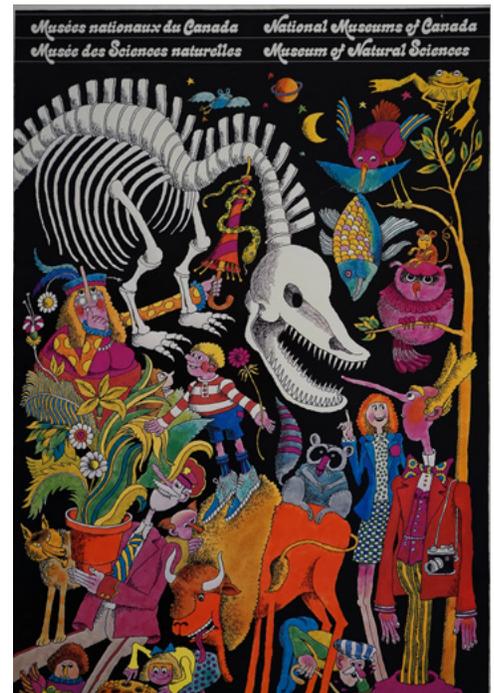
Dick Harington was appointed Curator of Quaternary Zoology at the National Museums of Canada (now the Canadian Museum of Nature) in 1965 and later served as Chief of the Palaeobiology Division from 1982 to 1991. His research focused on Ice Age fauna in the Yukon—particularly in the unglaciated regions near Dawson and Old Crow—and on Pliocene vertebrates and environments of Ellesmere Island, Nunavut. He led many field seasons at the Beaver Pond site near Strathcona Fiord, a unique four-million-year-old fossil locality on Ellesmere Island. Harington authored or contributed to more than 300 scientific papers, publications, and reports.



Examples of recently digitized posters produced by the National Museum of Natural Sciences (now the Canadian Museum of Nature) about exhibitions, events, and programs held in the museum's collections.

Photo Collection: The museum imaged more than 3,000 photo negatives held in the collection, which contains photographs created by important natural science researchers in Canada, such as Percy Taverner, Charles Sternberg and sons, Lawrence Lambe, Edward Bousfield, and Earl Godfrey.

NatureArt Collection: The museum catalogued more than 1,800 pieces in its NatureArt collection. In 2024-25, efforts focused on cataloguing and processing materials by Tom Reaume, consisting of pen and pencil drawings created for his 2009 book *620 Wild Plants of North America: Fully Illustrated*. Reaume donated the artwork to the museum in 2014. These materials had previously been imaged and are available on the museum's [Google Arts and Culture](#) page.



COLLECTION GROWTH

In 2024–25, the museum added 23,408 specimens or specimen lots to the national collection. These additions originated from donation (58.3%), staff field research (19.0%), donation for tax receipt purposes (21.4%), transfer of materials from another museum work unit to the archives (0.9%), subsampling of specimens already in the national collection (0.2%), purchase (0.1%), and exchange with other institutions (0.1%).

Collection	Subcollection	New specimens/lots
BOTANY	Algae	415
	Bryophyte	2,747
	Lichen	3,188
	Vascular plant	6,395
GEOLOGY	Mineral	612
LIBRARY, ARCHIVES AND SPECIAL COLLECTIONS	Archives	28
	Nature Photo	10
	Nature Art	148
PALAEOBIOLOGY	Fossil Plant	1
	Fossil Invertebrate	10
	Fossil Vertebrate	49
ZOOLOGY	Annelid	3,919
	Bird	175
	Crustacean	2
	Fish	827
	General Invertebrate	25
	Insect	4,830
	Mammal	55
	Mollusc	20
	Parasite	7

COLLECTION GROWTH HIGHLIGHTS

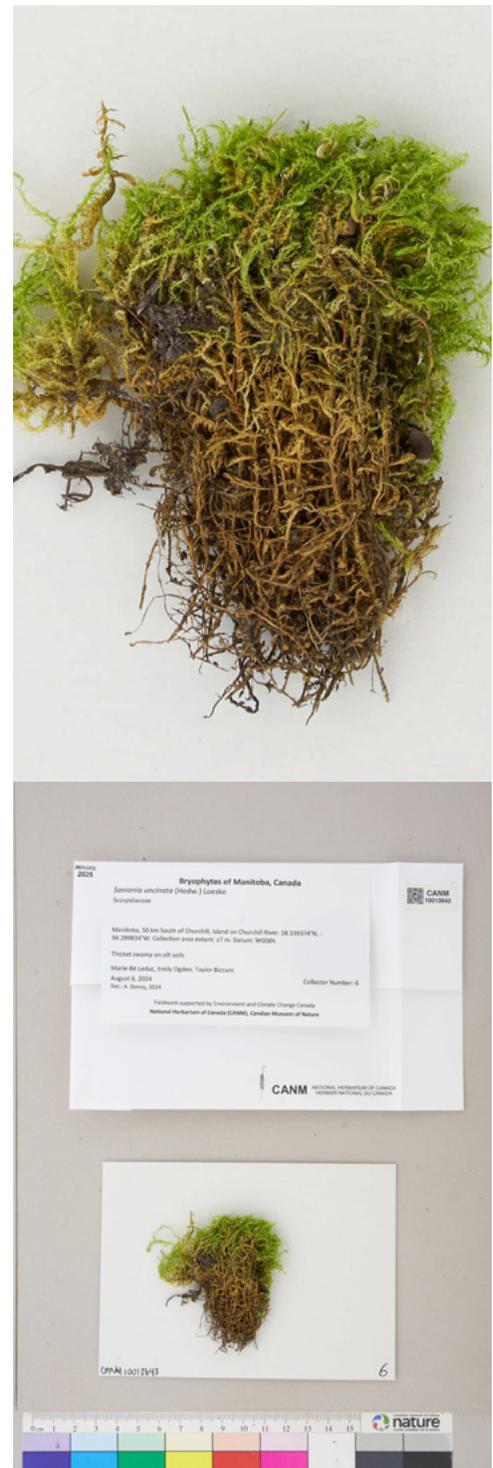
Botany

Algae Collection

- **One hundred and eighteen specimens of macroalgae from Cranberry Cove and Kejimikujik, N.S., collected by Museum Research Scientist Dr. Amanda Savoie.** These specimens support Savoie's research program and will serve clients of the museum's phycology collection, while also increasing the representation of Canadian macroalgal species in the national collection.
- **Six specimens of diatoms from the Republic of Malawi, donated by Dr. Elena Jovanovska, Senckenberg Research Institute, Germany.** The specimens consist of microscope slides of type material representing new diatom species in the genus *Diploneis* (Bacillariophyceae), discovered in Lake Malawi, one of the ancient East African Rift lakes renowned for its unique biodiversity. These additions strengthen the museum's globally significant algal collection.
- **Forty-nine specimens of epiphytic diatoms from the Hudson Bay Lowlands that were subsampled from bryophyte specimens in the museum's collection.** Collaborative research by members of the museum's botany section led to the development of a protocol for non-destructive sampling of bryophytes for epiphytic diatoms.

Bryophyte Collection

- **Five hundred and eighteen specimens from Alberta, British Columbia, and Montana, collected in August 1965 by bryologist Dr. Robert Ireland.** These specimens and their duplicates had remained part of an almost 60-year backlog awaiting identification and processing. During the pandemic, retired museum bryologist Linda Ley studied and identified them. Most of the specimens originate from Jasper and Banff national parks.
- **Four hundred and seven specimens from Wapusk National Park, Man., collected by Dr. Serguei Ponomarenko and associates.** These specimens strengthen the collection by filling geographical gaps and adding underrepresented species to the bryophyte holdings. Adam Storey, collections technician in the museum's botany section, identified them as part of the museum's Hudson Bay Lowlands digitization project, conducted in collaboration with Parks Canada.
- **Fifty-eight specimens from Bigwind Lake Provincial Park, Ont., collected during a survey by Jennifer Doubt, curator of the museum's botany collection, in collaboration with staff from the Ontario Natural Heritage Information Centre.** The survey supported efforts to transition Bigwind Lake from a non-operating to an operating provincial park. The site lies in a region facing imminent environmental change.
- **Fifty-six specimens from Kettle Island Nature Reserve in the Ottawa River, Que., collected by Jennifer Doubt, curator of the museum's botany collection.** These specimens were collected during the museum's 2023 Environmental Field School, which included participants from the Algonquins of Pikwakanagan First Nation, Ont., and Kitigan Zibi Anishinabeg, Que. Several of the recorded species are rare in Quebec.
- **Ten specimens from northern Manitoba, donated by Environment and Climate Change Canada.** Researchers Marie-Bé Leduc, Emily Ogden, and Taylor Biccum collected the specimens during fieldwork in the Hudson Bay Lowlands in 2024.



Sickle-leaved hook-moss (*Sanionia uncinata*), one of the bryophytes from northern Manitoba that the museum recently acquired. Environment and Climate Change Canada researchers Marie-Bé Leduc, Emily Ogden, and Taylor Biccum collected this specimen on 6 August 2024, on an island on the Churchill River, 50 km south of Churchill. (CANM 10013643) Photo: Kim Madge.

Lichen Collection

- **Forty-four specimens from Mingan Archipelago National Park Reserve, Que., collected by Museum Research Scientist Dr. Troy McMullin.** The park contains the largest concentration of erosion monoliths in Canada, creating a unique habitat for lichen species. These specimens help fill taxonomic and geographic gaps in the museum's lichen collection, which includes few specimens from this region of Quebec. The batch contains several notable species, including *Hypogymnia pulverata*, which is rare in North America.
- **One hundred and twenty-six specimens from Forks of the Credit Provincial Park and Belfountain Conservation Area, Ont., collected by Museum Research Scientist Dr. Troy McMullin.** These specimens represent some of the first lichen collections from this densely populated but under-collected region of Ontario and help fill a geographic gap in the museum's lichen collection. McMullin collected them during an Ontario BioBlitz event. The collections document species occurrences, support conservation data on lichen diversity and distribution at multiple scales (regional, provincial, national) and contribute to collaborative Canadian Museum of Nature research.
- **Three hundred and sixty-five specimens from Sleeping Giant Provincial Park, Ont., donated by Hannah Dorval, Lakehead University.** Museum Research Scientist Dr. Troy McMullin and other North American lichenologists collected these specimens during the 28th Tuckerman Workshop. They contribute to documenting species diversity in Ontario and its protected areas.
- **Two hundred and thirty-three specimens from Canada and the United States collected by Dr. Irwin Brodo, researcher emeritus at the museum.** Brodo has been identifying material in his backlog and making his expertly collected and identified specimens available to strengthen the museum's lichen collection, a key component of the museum's National Herbarium of Canada.
- **Six hundred and fifty-six specimens from Sleeping Giant Provincial Park, Ont., collected by Museum Research Scientist Dr. Troy McMullin and colleagues in 2018 and 2019.** These specimens document an inventory of



Sugared sunburst lichen (*Xanthoria sorediata*), one of the specimens from Sleeping Giant Provincial Park, Ont., that the museum recently acquired. Troy McMullin collected the specimen (CANL 10020915) in the park along Ravine Lake Trail on 17 October 2018. Photo: Lyndsey Sharp.

lichen species in the park, a unique habitat for lichen communities in Ontario. The acquisition includes many species new to Ontario, Canada, and even North America, as well as numerous range extensions.

Vascular Plant Collection

- **Seventy-four specimens from Melville Island, Nunavut, collected by Dr. Zoe Panchen, a research associate with the museum.** Panchen collected these specimens as part of her research on how the timing of life history events (phenology) in Arctic plants is shifting in response to climate change.
- **Two hundred specimens from the Hudson Bay Lowlands, Ont., collected by Environment and Climate Change Canada (ECCC) researchers Emily Dyer, Shelby Asch-Jones, and colleagues.** The ECCC team collected these specimens during an ecological survey in remote, poorly sampled habitats accessed primarily by helicopter. The specimens document the flora of a difficult-to-access and ecologically significant region.
- **One thousand one hundred and ninety-two specimens from the McGill Arctic Research Station on Axel Heiberg Island, Nunavut, donated by Queen's University.** These specimens document ongoing research at the station and will support the museum's work on the biodiversity of Arctic plants in Canada.
- **Three thousand six hundred and ninety-nine specimens from Gros Morne National Park, N.L., donated by Parks Canada.** Preserved in the Gros Morne National Park herbarium over the past 50 years, these specimens were transferred to the National Herbarium of Canada to ensure their long-term preservation and accessibility.



Small-flowered woodrush (*Luzula parviflora*), one of the specimens from Gros Morne National Park donated to the museum by Parks Canada. André Bouchard and Stuart G. Hay collected this specimen (CAN 10197379) on the north slope of Gros Morne Mountain near its summit on 6 July 1973. Photo: Galyna Vakulenko.

Geology

Mineral Collection

- **Forty specimens of stilbite, heulandite, and quartz from the Arlington Quarry in Kings Co., N.S., collected by members of the museum’s mineralogy section.** Michael Bainbridge, Dr. Inna Lykova, and Glenn Poirier collected this material during fieldwork in June 2023. The specimens represent unusual habits for the species and show evidence of unusual processes in their formation and subsequent alteration.
- **Eleven suites of minerals from near Cobalt, Ont., donated by Reiner Mielke.** The museum did not have any specimens from the localities represented in these suites. The specimens represent interesting mineralogical assemblages and geological environments not typically captured in specimens from the Cobalt area.
- **Eleven suites of minerals from New Hampshire, USA, and various alkaline intrusions, donated by Peter Tarassoff.** These comprehensive locality suites significantly enhance the representation of these important mineral locations in the museum’s mineral collection.
- **Eighty specimens from the Dunbrack Mine, N.S., donated by Robert Beckett.** This suite of minerals represents several firsts for Canada and is part of a comprehensive review of the mineralogy of the deposit that Museum Research Scientist Dr. Inna Lykova is conducting.
- **One hundred and thirty-three specimens from Mont Saint-Hilaire, Que., donated by Peter Tarassoff.** These specimens complement the museum’s existing material from Mont Saint-Hilaire.
- **Fifty-one specimens from British Columbia, Nunavut, Northwest Territories, and Ontario, donated by Brad Wilson.** The material includes faceted garnets from Kimmirut, Nunavut; amazonite from the South Bay occurrence, Ont.; a suite of minerals, including hambergite, from O’Grady Lake, N.W.T.; and suites of minerals from Atlin, Cassiar, and Ash Mountain, B.C. Much of this material is related to joint projects by Brad Wilson and museum staff.

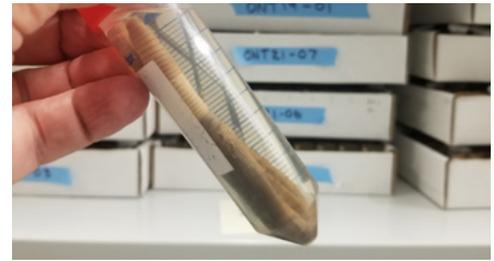


Hambergite (CMNMC 92824), one of the specimens the museum recently acquired. Brad Wilson collected the specimen in the Sapper Range of the Mackenzie Mts., N.W.T. Photo: CMN.

Zoology

Annelid Collection

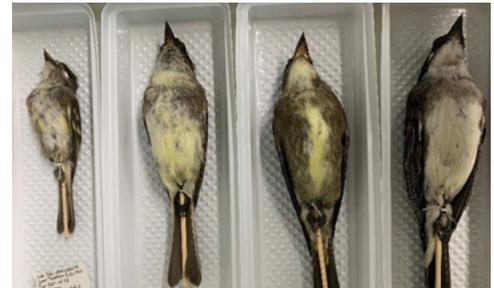
- **Two thousand and ninety-three specimens of earthworms, donated by the University of Guelph's Biodiversity Genomics Centre.** This important addition to the museum's invertebrate collection fills taxonomic and geographic gaps and documents natural diversity in recent times and locations. Most records are associated with publications by the collector, Marie Eugénie Maggia.



One of earthworm specimens recently donated to the museum. The material—21 trays of vials ranging from cryovials to large centrifuge vials (as in the photo)—awaits processing. Photo: Jean-Marc Gagnon.

Bird Collection

- **One hundred and eighty-three bird specimens from Ottawa, donated by Safe Wings Ottawa.** All these birds died from window collisions in Ottawa. The donation includes uncommon species and species for which the museum has few recent specimens, limited representation from Canada's National Capital Region, and few or no tissue samples in the National Biodiversity Cryobank of Canada.



(Left to right) Specimens of Least Flycatcher (*Empidonax minimus*), Eastern Phoebe (*Sayornis phoebe*), Olive-sided Flycatcher (*Contopus cooperi*), and Eastern Kingbird (*Tyrannus tyrannus*) donated to the museum by Safe Wings Ottawa in 2024. Photo: Greg Rand.

Bird specimens donated to the museum by Safe Wings Ottawa in 2024. Bottom, Indigo Bunting (*Passerina cyanea*); middle, Baltimore Oriole (*Icterus galbula*). Photo: Greg Rand.



Fish Collection

- **Seventy specimen lots comprising 546 specimens from Gatineau Park, Que., collected by museum researchers.** These specimens were collected as part of a research project investigating the introduction of piscivorous predators and their impact on native fish and mussel diversity. Members of the museum’s zoology section collected the fishes from Lac Kidder, Lac Carman, Otter Lake, and Lac Kingsmere. The specimens are preserved as fluid-preserved whole specimens, with associated frozen tissue samples stored in the museum’s National Biodiversity Cryobank of Canada.
- **Thirty-eight specimen lots from Cambridge Bay, Nunavut, collected by Museum Research Scientist Dr. Katriina Ilves and colleagues.** The researchers collected these Arctic fish specimens in 2024, year two of an ongoing project to survey marine and freshwater fishes in the Cambridge Bay area that the museum is undertaking in collaboration with Polar Knowledge Canada.

Shorthorn sculpin (*Myoxocephalus scorpius*), one of the specimens collected during the museum’s fish biodiversity surveys in the vicinity of Cambridge Bay, Nunavut, in August 2024 (CMNFI 2025-0008). Photo: Kevin Burke.



Some of the recently acquired fish collections that museum researchers collected in Gatineau Park, Que. Photo: Marie-Hélène Hubert.



Banded gunnel (*Pholis fasciata*), one of the specimens collected during the museum’s fish biodiversity surveys in the vicinity of Cambridge Bay, Nunavut, in August 2024 (CMNFI 2025-0010). Photo: Kevin Burke.



General Invertebrate Collection

- **Twenty specimens of cold-water corals collected off the east coast of Canada by Fisheries and Oceans Canada, St. John's, N.L.** These deep-water specimens were primarily collected using a remotely operated vehicle (ROV), contributing to the documentation of Canada's deep-sea biodiversity.
- **One thousand eight hundred and twenty-six samples of miscellaneous marine invertebrates, mostly from Canada, donated by the Centre for Biodiversity Genomics, University of Guelph, Ont.** Fifty percent of the collection is identified to species and the remainder to genus, family, or general invertebrate group. The collection includes 184 echinoderm tissue samples, which the museum will curate in the National Biodiversity Cryobank of Canada. Publicly available DNA barcode data exist for the whole collection.

Insect Collection

- **Four thousand five hundred and seventy-five beetle specimens, primarily from Canada, Cuba, and the United States, collected by Dr. Andrew Smith.** These specimens help fill both taxonomic and geographic gaps in the museum's collection, which is among the most comprehensive beetle collections from North, Central, and South America. The donation includes specimens of several recently described species, as well as a reference collection of Canadian scarab beetles. Smith assembled this collection about 10 years ago as part of his ongoing *Scarabs of Canada* project. Many of the specimens originate from underrepresented regions in the museum's holdings, including central and western Canada.
- **Two hundred and fifty-five specimens of the rare weevil genus *Eupholus*, donated by Stéphane Le Tirant.** These specimens represent a substantial portion of the known global diversity within the genus. The donor has published multiple papers on *Eupholus* weevils.

Mollusc Collection

- **Ten specimens of mussels from the Mississagi River, Ont., donated by Fisheries and Oceans Canada.** The specimens document several species of freshwater mussels (Hickorynut, Black Sandshell, Flutedshell, and Lake Floater) in this locality.
- **Ten specimens of zebra mussels from Shirleys Bay on the Ottawa River, Ont., collected by Noel Alfonso, a research associate with the museum.** This collection is notable for representing one of the few documented occurrences of zebra mussels in a soft or low-alkalinity water environment. The specimens support ongoing research by Alfonso and Museum Research Scientist Dr. André Martel.

Parasite Collection

- **Two specimens of *Ixodes scapularis*, or deer tick, from the museum's Natural Heritage Campus in Gatineau, Que.** These specimens are valuable additions to the museum's parasite collection, since this tick species, known for transmitting Lyme disease, is rapidly expanding its distribution.
- **Six specimens (mostly ticks) from Saskatchewan collected by museum entomologist Dr. Andrew Smith while conducting fieldwork in 2023 and 2024.** These specimens fill gaps in the museum's parasite collection.

Fossil Vertebrate Collection

- **Forty-four fish fossils from the Anderson River, N.W.T., collected by Museum Research Scientist Dr. Tetsuto Miyashita.** This is the second batch of specimens collected during Miyashita's expedition to this locality in 2023. The material comprises diverse fossils dating to Emsian times (408–393 million years ago) of the Early Devonian. It includes several possible new taxa and numerous well-preserved elements not well represented in the museum's fossil collection and documents an important period of evolution within the vertebrate lineage.



Skull of the porolepiform lobe-finned fish *Heimenia* being exposed in the Heavy Dry Preparation Laboratory, one of several important finds made by Tetsuto Miyashita during his 2023 fieldwork along the Anderson River, N.W.T. Photo: Scott Rufolo.

Fossil Plant Collection

- **One section of a fossilized tree bole, donated by Mary Bush, Ottawa.** This donation involves a nicely preserved section (27 cm × 16 cm × 15 cm) of the trunk of a pinopsid tree belonging to the family Cupressaceae and likely representing a species not currently present in the museum's fossil collection. The well-preserved specimen was collected in the 1930s near Steveville, Alta.

Fossil Invertebrate Collection

- **Six specimens from Ordovician-age deposits in Manitoba, donated by Lynn Beckett.** The donor and her family collected these cephalopod and gastropod fossils near the town of Gillam, Man., in 1974. The museum has only one other fossil invertebrate specimen from Manitoba, a coral of similar age. These specimens thus expand representation of the Ordovician fauna from Manitoba in the museum's collections.



Orthocone nautiloid shell fossil from Ordovician-age strata in Manitoba, part of a donation made to the museum by Lynn Beckett of Ottawa. Photo: Scott Rufolo.



Section of fossilized tree trunk from a member of the cypress family of conifers dating to the Cretaceous Period, donated to the museum. Photo: Scott Rufolo.

National Biodiversity Cryobank of Canada

The museum's cryobank provides curated storage of DNA, tissue, and phenotype vouchers, stored at -180C, for use in research. Material deposited in the facility is collected by museum researchers and donated by biodiversity researchers from Canada and abroad. Additions to the cryobank in 2024-25 included:

- Nine vascular plant tissue samples from Brunei, collected by Museum Research Scientist Dr. Lynn Gillespie
- One hundred and nine beetle tissue samples from Cuba, collected by museum entomologist Dr. Andrew Smith in 2023
- One hundred and eighty-one beetle tissue samples from Saskatchewan and elsewhere, collected by museum entomologist Dr. Andrew Smith in 2023
- One thousand one hundred and thirty-nine tissue samples from Arctic seabirds. The National Wildlife Research Centre (Environment and Climate Change Canada) donated the multi-organ tissues, collected in 1998 from Pikialasorsuaq (North Water Polynya), located in the northern part of Baffin Bay
- Five hundred and sixty-four tissue samples from ringed seals from Grise Fiord, Nunavut, and Qaanaaq, Greenland. The National Wildlife Research Centre (Environment and Climate Change Canada) donated the multi-organ tissues, collected in 1998
- Forty-nine vascular plant samples from the UBC Botanical Garden. Researchers collected these large-volume samples for a genome sequencing project funded by Botanic Gardens Conservation International and the Global Genome Initiative for Gardens
- Fifteen genomic vouchers of Great Lakes under-ice algae donated by Dr. Andrew Bramburger, a research scientist with Environment and Climate Change Canada
- A sediment core from Crawford Lake, Ont.

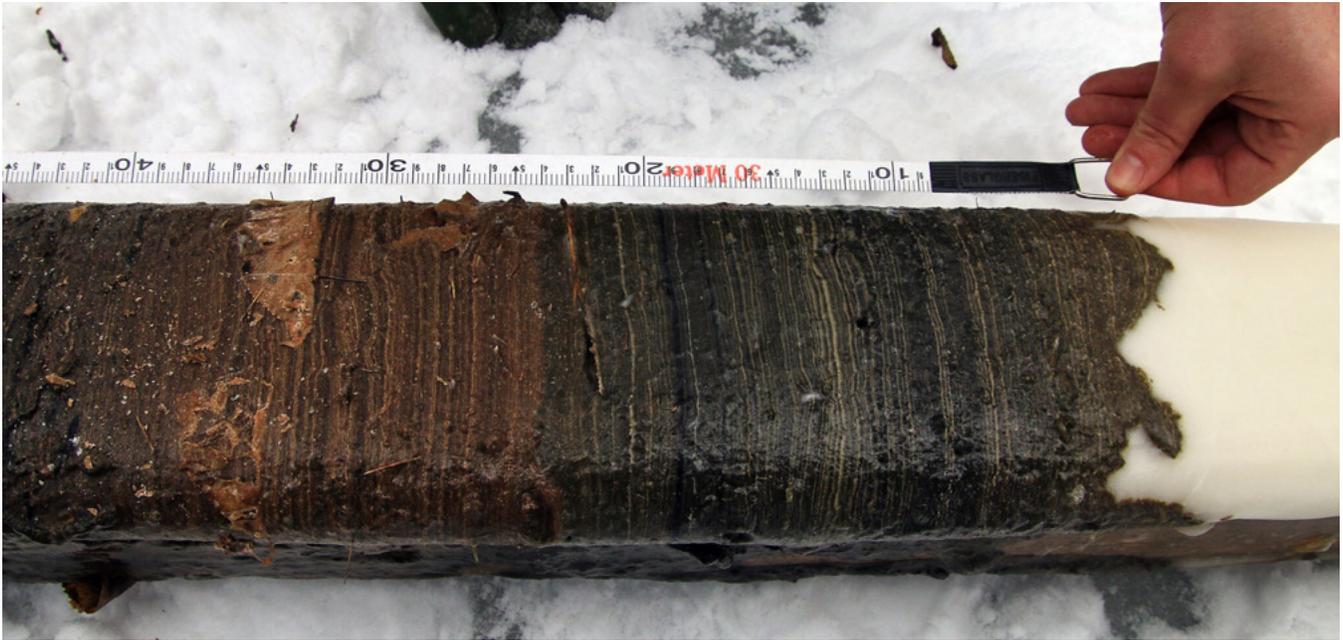
The Crawford Lake Sediment Core

In 2023, an international group of researchers selected Crawford Lake in Milton, Ont., as the site that could formally define the start of the Anthropocene, a proposed new epoch shaped by the significant global impacts of recent human activity. Under the leadership of researchers from Brock University and Carleton University, a multi-institutional team of experts based mainly in Canada—including Paul Hamilton with the Canadian Museum of Nature—has been studying well-preserved sediment found on the bottom of this deep lake to uncover evidence of the “Great Acceleration,” a period of intense resource use, population growth, and environmental impact in the mid-20th century.

With well-preserved layers in the bottom of the lake that scientists can read like tree rings, laboratory analysis of the lake's sediment cores revealed a mid-20th-century “plutonium fallout signal” related to nuclear weapons testing that occurred in the Pacific Ocean from the 1950s through 1963, consistent with other samples collected worldwide. This plutonium signature coincides with the “Great Acceleration” and is the primary marker proposed to identify the start of the Anthropocene epoch.

Additional biological and environmental indicators found in the cores, including microscopic diatoms and chrysophytes as well as chemical markers, show evidence of large-scale changes in Earth's atmosphere and other systems since 1950, supporting the lake as the candidate site to define the start of the proposed Anthropocene.

In April 2024, one of the freeze cores extracted from Crawford Lake arrived at the museum's National Biodiversity Cryobank of Canada. The museum will curate the core as a permanent marker of human impacts on the environment, accessible to researchers around the world. The core also has significant symbolic and cultural value, given the sacred nature of Crawford Lake for Indigenous Peoples.



A sediment core from Crawford Lake, Ont., showing the annual layers deposited on the lakebed. Photo: Tim Patterson, Carleton University.



Paul Hamilton and students examine a core freshly extracted from Crawford Lake, Ont., in spring 2023. Photo: Tim Patterson, Carleton University.

Library, Archives, and Special Collections

- **The museum’s botany section transferred materials related to the creation of *Lichens of the Ottawa Region* by Dr. Irwin M. Brodo, published in 1988 by the National Museum of Natural Sciences, to the Archives and Nature Art collections.** The archival materials include documentation of the older paste-up method used in the museum’s internal publishing process prior to the digital era. The Nature Art materials include 84 original black-and-white line drawings by Susan Laurie-Bourque, who illustrated various museum publications based on specimens from the national collection.

NatureArt

- **A stone carving of two birds by Inuit artist Henry Napartuk (1932–1985), known for his naturalistic depictions of hunters and animals.** Liz Kennedy donated the piece to the museum. The carving showcases the fauna of Nunavik as portrayed by Inuit artists. It enriches the collection by addressing the underrepresentation of Inuit art and works originating from Nunavik.
- **“Tundra Wolf,” a woodcut print created in 2019 by Quvianaqtuk Pudlat; “Man Changing into a Wolf,” a silkscreen print created in 1974 by Art Thompson; and “Painted Paddle of Wolf,” a painted paddle created by Dean Ottawa in 2024.** The museum displayed these three pieces in *Wolves: Shapeshifters in a Changing World*, an exhibit that ran from 2023 to 2024.



“Man Changing into a Wolf,” 56 cm × 38 cm (P 1579), a silkscreen print created in 1974 by Art Thompson, which the museum recently acquired as part of its Nature Art collection. Supernatural wolves were important in Nootkan legends and rituals. In the print, we see the transformation from man to wolf. The wolf’s face is evolving from the man’s eye. Photo: CMN.

Archives

- **Eleven documents from the Canadian Society of Zoologists.** The files include correspondence, minutes, reports, by-laws, membership lists, conference plans, and financial reports. These documents add to the historical documents of the society. The Canadian Museum of Nature became its official repository in 1995.

TRANSFER OF THE GEOLOGICAL SURVEY OF CANADA COLLECTIONS TO THE MUSEUM

The museum continued to work closely with Natural Resources Canada's Lands and Mineral Sector to transfer selected portions of the National Geological Reference Collection and associated records to the museum. The project aims to rehouse the specimens according to best practices, to retain their scientific integrity and improve their accessibility according to the Government of Canada Open Science/Open Data policy.

In 2024-25, the museum's focus was on rehousing, photographing, and physically integrating the Geological Survey of Canada's portion of the National Mineral Collection into the museum's collections, while reorganizing existing specimens to accommodate the new ones. So far, the museum has incorporated 8000+ specimens, including 200+ type specimens, from the Survey.

COLLECTION LOANS

The museum has an active collection loan program. The museum lends specimens to other institutions for research and education, while its researchers and exhibitions borrow materials from other institutions. The museum receives information generated from study of specimens sent out on loan through publication and annotations on the specimens. The number of borrowers and their geographies represent one way of characterizing the scientific research network engaged with the museum.

In 2024-25, the museum processed 65 outgoing loan transactions (44 national, 21 international) comprising 8,371 specimens or specimen lots. The museum lent specimens to

- 25 institutions in seven Canadian provinces (Alberta, British Columbia, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario, and Quebec)
- 17 institutions in eight other countries (Czech Republic, France, Germany, Japan, Sweden, The Netherlands, the United States of America, and the United Kingdom)

COLLECTION VISITORS

The museum welcomed over 240 visitors to the Natural Heritage Campus from Canada, the U.S., and abroad, to consult or learn about the national collection in 2024-25. These visitors included university professors, government researchers, postdoctoral researchers, independent researchers, writers, doctoral students, master's students, undergraduate students, college students, high school students and teachers, filmmakers, museum professionals, artists, and members of the public.

VISITORS FROM ACROSS CANADA

ALBERTA

Royal Tyrrell Museum of Palaeontology, Drumheller
University of Alberta,
Edmonton

BRITISH COLUMBIA

Parks Canada, Field
Ministry of Forests, Victoria
Royal BC Museum, Victoria
Tsay Keh Dene First Nation

NEW BRUNSWICK

University of New Brunswick, Fredericton

NEWFOUNDLAND AND LABRADOR

Atlantic Forestry Centre,
Canadian Forestry Service,
Corner Brook
Innu Nation of Labrador,
Natuashish and Sheshatshiu
Memorial University, St.
John's

NORTHWEST TERRITORIES

Government of the Northwest Territories,
Yellowknife

ONTARIO

African Lion Safari, Hamilton
Canada Wildlife Survey,
Environment and Climate Change Canada, Ottawa
Canadian Conservation Institute, Ottawa
Canadian Food Inspection Agency, Ottawa
Canadian Wildlife Federation, Ottawa
Carleton University, Ottawa
Department of Canadian Heritage, Ottawa

Geological Survey of Canada, Ottawa
Ingenium, Ottawa
National Capital Commission, Ottawa
North Grenville Historical Society, Kemptville
Ottawa Society of Botanical Artists, Ottawa
St-Laurent Academy,
Ottawa
University of Ottawa,
Ottawa
Ontario Ministry of Natural Resources, Peterborough
Kenneth M. Molson Foundation, Toronto
NatureServe, Toronto
Walker Mineral Club,
Toronto
York University, Toronto
Fleming College

QUEBEC

Canadian Museum of History, Gatineau
Cégep de l'Outaouais,
Gatineau
Direction de la gestion de la faune de l'Outaouais,
Gatineau
Kitigan Zibi Anishinabeg McGill University, Montreal
Parks Canada, Montreal
Université de Montréal,
Montreal
Université du Québec en Outaouais, Gatineau
Ministère de l'Environnement, de la Lutte aux changements climatiques, de la Faune et des Parcs

SASKATCHEWAN

University of Saskatchewan,
Regina

YUKON

Government of Yukon,
Whitehorse

VISITORS FROM AROUND THE WORLD

CHINA

Peking University

CUBA

Havana University

CZECHIA

Charles University

GERMANY

Senckenberg Natural History Museum

JAPAN

Kanagawa University

Okinawa Institute of Science and Technology

LATVIA

University of Latvia

NETHERLANDS

University of Groningen

NORWAY

Norwegian University of Science and Technology

SOUTH AFRICA

Albany Museum

SWEDEN

Uppsala University

SWITZERLAND

University of Zurich

UNITED STATES OF AMERICA

Duke University, North Carolina

New York Institute of Technology, New York

Rhode Island School of Design, Rhode Island

State University of New York at Brockport,
New York

University of Colorado Museum of Natural History, Colorado

Western Michigan University, Michigan

RECIPIENTS OF STEWART AND JARMILA PECK VISITING-SCIENTIST AWARDS IN ENTOMOLOGY

Made possible by a generous gift from Drs. Stewart Peck and Jarmila Peck of Ottawa, Canada, these travel grants facilitate research in the study of beetle systematics and fossil insects in the museum's world-class beetle and palaeoentomology collections. The museum welcomed two awardees in 2024-25:

- Dr. Gabriela Molina Hernández, Havana University, Cuba. "Review of the genus *Phyllophaga* (Coleoptera: Melolonthinae) in Cuba."
- Dr. Jan Růžička, Czech University of Life Sciences. Prague, Czechia. "Taxonomy and distribution of carrion beetles in the Neotropical Realm (Coleoptera: Staphylinidae: Silphinae)."

SUPPORTING GLOBAL SCIENCE: RESEARCH BY EXTERNAL SCIENTISTS ENABLED BY THE MUSEUM'S COLLECTIONS

The museum's national natural history collection supports and enables research by scientists from across Canada and around the world. External scientists engage with the collection through on-site visits, specimen loans, data requests, and by accessing digitized collection records available online.

Researchers from around the world reference specimens in the museum's collection and use its digital collection data mediated by the Global Biodiversity Information Facility.

SCIENTIFIC STUDIES THAT CITE CANADIAN MUSEUM OF NATURE SPECIMENS

In calendar year 2024, external researchers cited one or more Canadian Museum of Nature specimens in 95+ published papers, as listed in Appendix 1. These papers focus on

- invertebrates, including beetles, corals, leeches, parasites, and wasps;
- vertebrates, including amphibians, fishes, mammals, and reptiles;
- algae, bryophytes, lichens, and vascular plants;
- fossil invertebrates, fossil fishes, fossil mammals, and fossil reptiles, including dinosaurs.

Authors of several of these studies deposited specimens associated with the work in the museum's collections.

SCIENTIFIC STUDIES ENABLED BY CANADIAN MUSEUM OF NATURE COLLECTIONS DATA MOBILIZED VIA THE GLOBAL BIODIVERSITY INFORMATION FACILITY

The Global Biodiversity Information Facility (GBIF) identified 533 publications from the 2024 calendar year that reference GBIF datasets containing data from the museum. Because datasets of occurrence records downloaded from GBIF often undergo substantial processing—such as the removal of records lacking coordinates or containing erroneous ones—not all downloaded records are necessarily used in subsequent analyses. Nevertheless, the high number of publications referencing the museum's data suggests that a significant proportion of these studies incorporated the data into their research.

The articles summarized below provide examples of how the international scientific community used the museum's collection data mediated by GBIF to address a variety of research questions in 2024.

PALAEARCTIC FLEA BEETLE *PHYLLOTRETA OCHRIPIES* (CURTIS) (COLEOPTERA, CHRYSOMELIDAE, GALERUCINAE), HERBIVORE OF *ALLIARIA PETIOLATA* (GARLIC MUSTARD), NEW TO NORTH AMERICA.

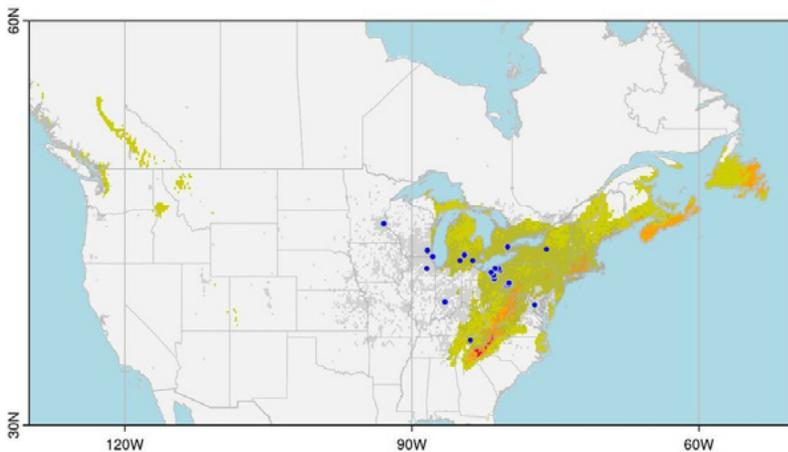
Douglas, H.B., G. Hammond, T.W. Smith, J. Mutz and A.S. Konstantinov. 2024.

Biodiversity Data Journal 12: e135576.

<https://doi.org/10.3897/BDJ.12.e135576>

This study documents the first North American records of the leaf beetle *Phyllotreta ochripes* from several northeastern states and Ontario, Canada. Native to the Palearctic Region, from Japan to Western Europe, *P. ochripes* breeds on invasive garlic mustard (*Alliaria petiolata*) and other Brassicaceae species.

A species distribution model for the beetle and its host plant, garlic mustard, suggests that the beetle's most suitable habitat lies in humid regions of eastern North America. However, most of the known North American records of the beetle occur in areas that the model projects to have low habitat suitability. **The authors determined the range of garlic mustard based on records mediated by the Global Biodiversity Information Facility, including several specimens curated in the Canadian Museum of Nature's botany collection.**



Habitat suitability map for *Phyllotreta ochripes* in North America. Blue points show known occurrences. Colouring indicates habitat suitability values: dark/red areas are the highest suitability, medium/orange areas are moderate suitability, and pale/olive areas are low suitability. Gray shading indicates GBIF records for the host plant, garlic mustard. Source: Douglas et al. (2024), available under the terms of the [CCO Public Domain Dedication](#)



Morphology of *Phyllotreta ochripes*. Illustrations: K. Savard. Source: Douglas et al. (2024), available under the terms of the [CCO Public Domain Dedication](#).



Phyllotreta ochripes on garlic mustard in Michigan, USA. Photo: R. Davenport, May 2017. Source: Douglas et al. (2024), available under the terms of the [CCO Public Domain Dedication](#).

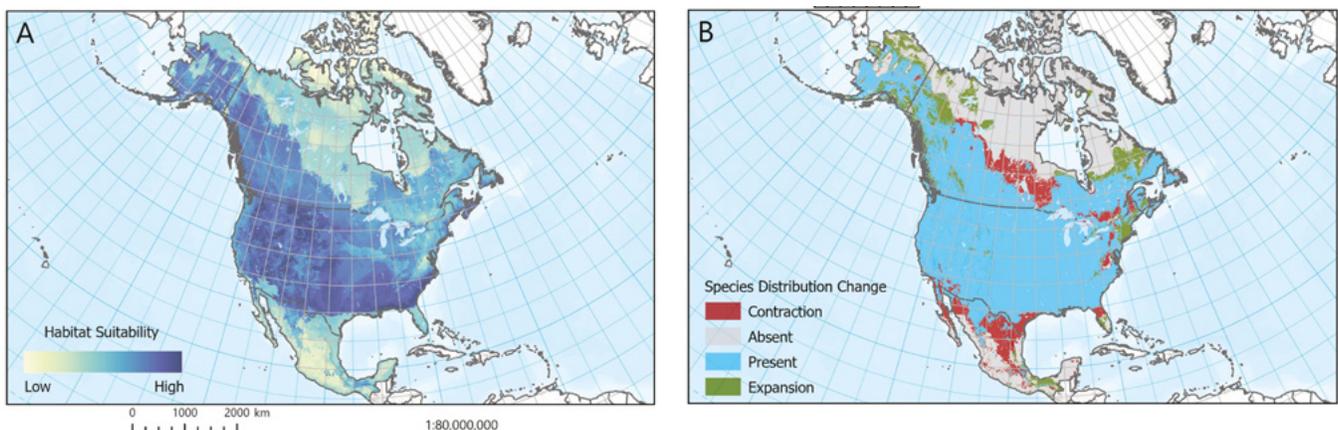
SPECIES DISTRIBUTION MODELING OF NORTH AMERICAN BEAVERS FROM THE LATE PLIOCENE INTO THE FUTURE.

Lubbers, K.E., J.X. Samuels and T.A. Joyner. 2024.

Journal of Mammalogy 106: 39–50. <https://doi.org/10.1093/jmammal/gyae131>

Beavers (*Castor canadensis*) have occurred in North America since at least 7 million years ago, yet their historical distribution across the continent remains poorly understood. This study modelled beaver distributions in the late Pliocene (3.3 million years ago), Pleistocene (130 thousand years ago and 21 thousand years ago), and recent Holocene (1970 to 2000) to understand their dispersal across North America, predict their future distributions, and predict their possible response to future climate and habitat changes.

The researchers used occurrence data from the Global Biodiversity Information Facility, including more than 75 records from the Canadian Museum of Nature’s mammal collection. The projected distribution model for 2081 to 2100 indicates increased habitat suitability in coastal and central regions of North America and lower habitat suitability in southern regions compared to their present distribution.



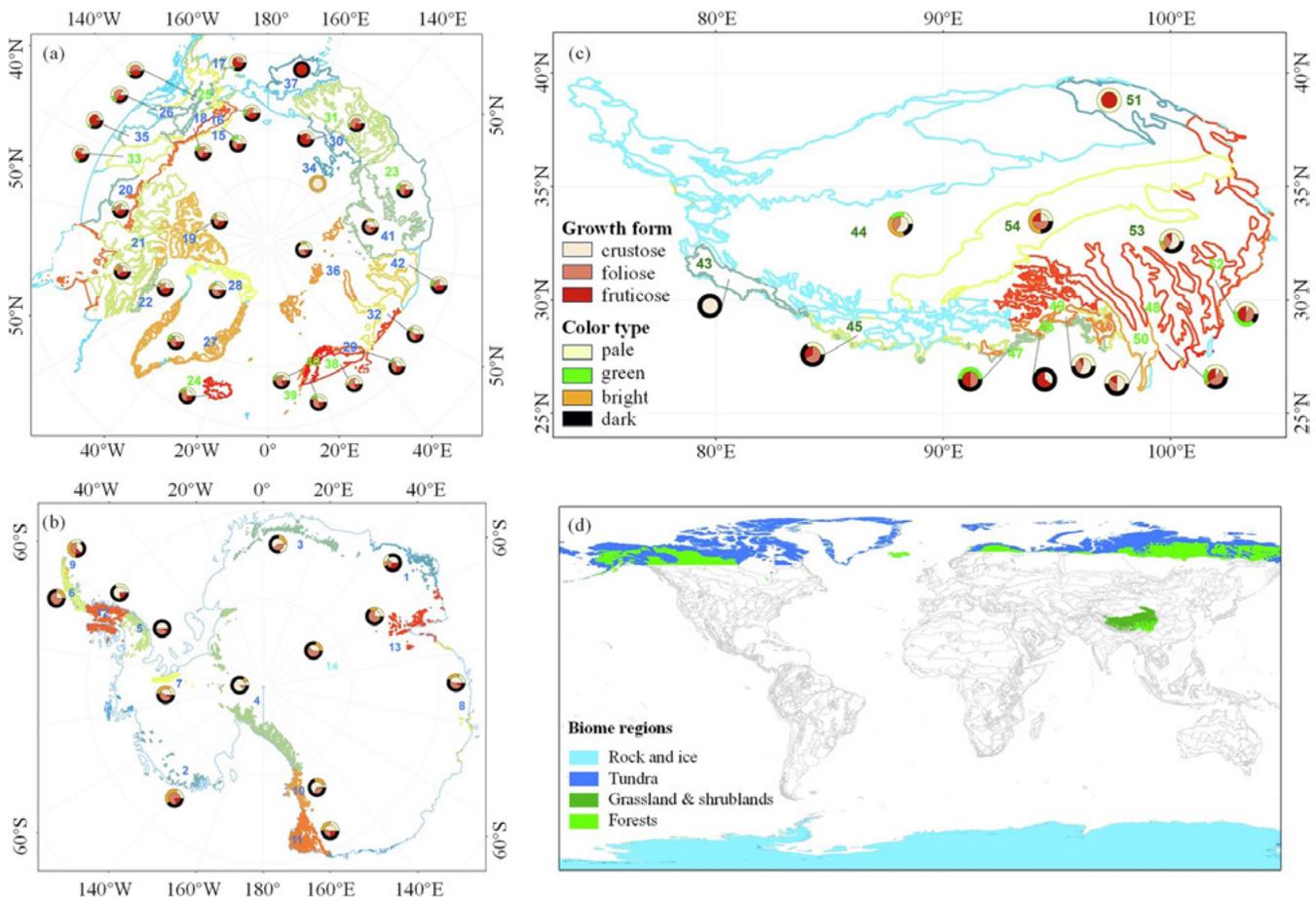
(A) Future (2081 to 2100) projected distribution model for beaver. Darker areas represent a higher probability of species occurrence, while lighter areas represent a lower occurrence probability. (B) Predicted change of beaver distribution from the present to the future (2081 to 2100). Source: Lubbers et al. (2024).

A GEOSPATIAL DATASET OF LICHEN KEY ATTRIBUTES IN THE EARTH'S THREE POLES.

Alatan, Z., W. Wu, X. Li, L. Zhao, H. Guo, J. Li and C. Hao. 2024.

Scientific Data 11: 1248. <https://doi.org/10.1038/s41597-024-04072-8>

Lichens are key components of ecosystems and important pioneer species in harsh environments such as the Antarctic, Arctic, and Tibetan Plateau. Despite their ecological significance, broad-scale studies of lichen attribute distribution have been limited by a lack of comprehensive datasets. To address this gap, researchers developed a geospatial dataset that includes key lichen traits—such as colour type and growth form—for more than 2,800 species and 170,000 occurrence records. **The dataset in this study draws on GBIF-mediated data, including numerous Canadian Arctic lichen records from the Canadian Museum of Nature’s botany collection.** Using this dataset, the authors created a distribution map that reveals spatial patterns in lichen attributes across latitudes and longitudes.



Relative proportions of lichen colour types and growth form by ecoregion: (a) Arctic, (b) Antarctic, and (c) Tibetan Plateau. In each panel, concentric circles show growth forms in the inner circle and colour types in the outer circle. Numbers represent ecoregion numbers, with colours corresponding to biome regions in (d). Source: Alatan et al. (2024), available under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

HERBARIUM COLLECTIONS REMAIN ESSENTIAL IN THE AGE OF COMMUNITY SCIENCE.

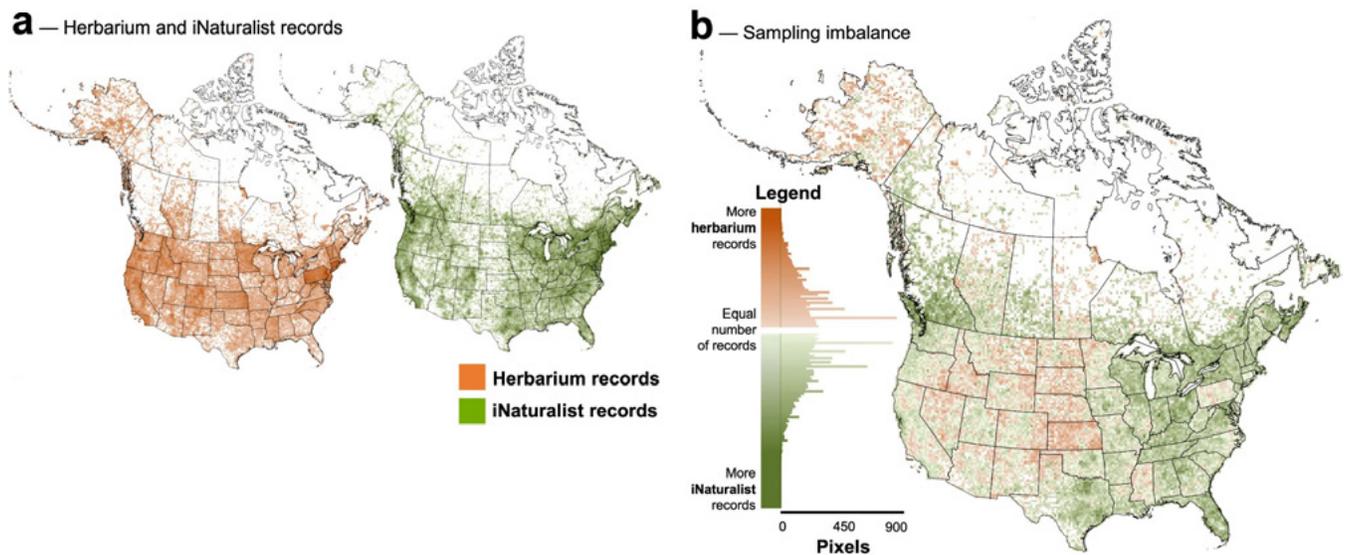
Eckert, I., A. Bruneau, D.A. Metsger, S. Joly, T.A. Dickinson and L.J. Pollock. 2024.

Nature Communications 15: 7586. <https://doi.org/10.1038/s41467-024-51899-1>

In the last 10 years, people participating in community science projects like iNaturalist have collected more biodiversity data than scientists did in the previous 100 years. Despite the promise of these rapidly accumulating data to address numerous biological questions, a huge amount of valuable information remains locked away in undigitized museum and herbarium collections.

This study compared how well community science (iNaturalist) observations and digitized herbarium specimens—including more than 150 thousand records from the Canadian Museum of Nature’s botany collection—represent the diversity, distribution, and modelling needs of vascular plants in Canada. Results show that, despite having only a third as many digital records, herbarium specimens capture more taxonomic, phylogenetic, and functional diversity and more efficiently capture species’ environmental niches compared to iNaturalist observations.

As such, the digitization of Canada’s 7.3 million remaining specimens has the potential to more than quintuple our ability to model biodiversity. In contrast, it would require over 27 million more iNaturalist observations to produce similar benefits.



Maps of the log density of herbarium and iNaturalist records (a) at 25km² resolution for Canadian vascular plants across Canada and the United States. These maps were combined to generate a map of sampling imbalance (b) where orange pixels indicate more herbarium records and green pixels indicate more iNaturalist records. The distribution of sampling imbalance is visualized next to the legend. Source: Eckert et al. (2024), available under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

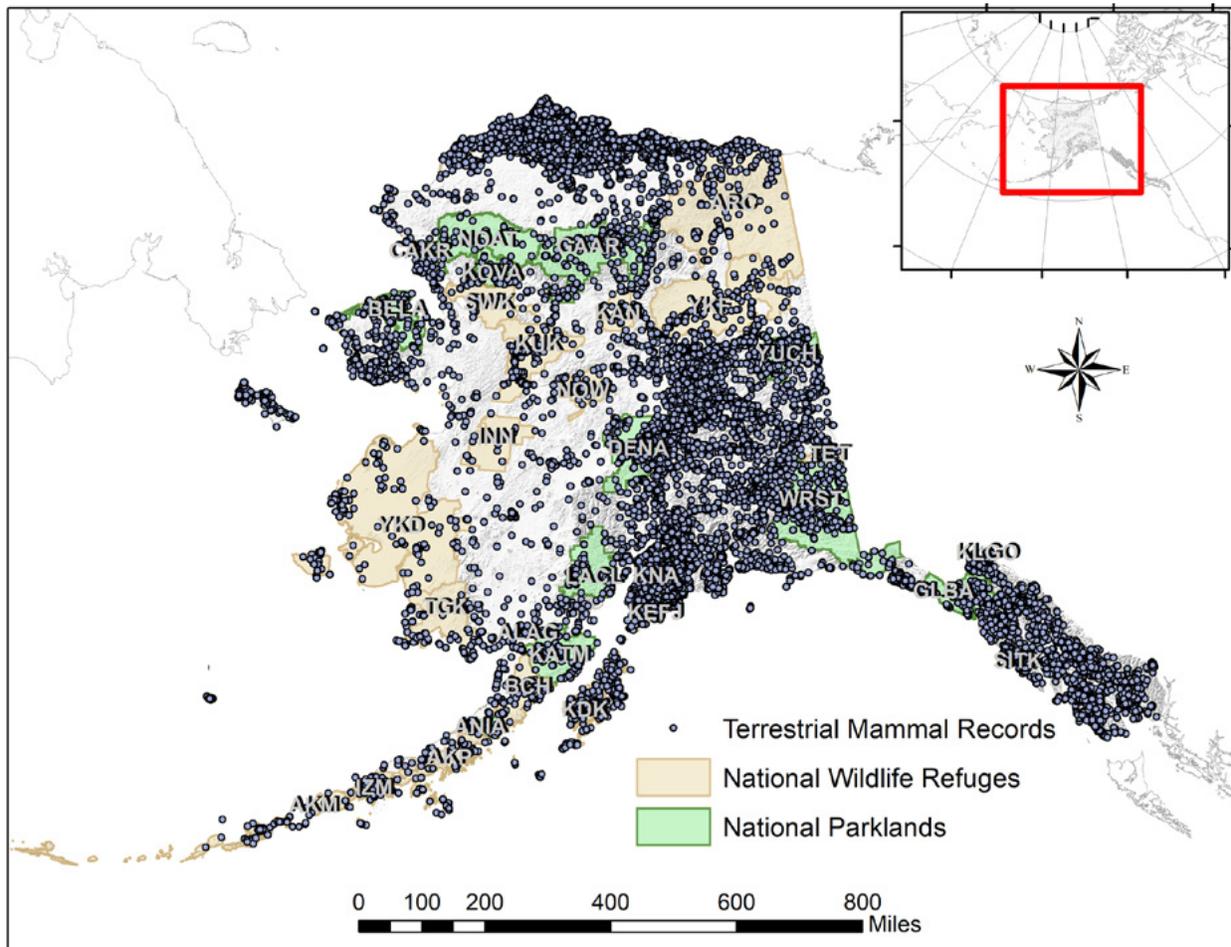
EXTRALIMITAL TERRESTRIALS: A REASSESSMENT OF RANGE LIMITS IN ALASKA'S LAND MAMMALS.

Baltensperger, A.P., H.C. Lanier and L.E. Olson. 2024.

PLOS ONE 19: e0294376. <https://doi.org/10.1371/journal.pone.0294376>

To understand and reduce the impact of human-caused climate change on wildlife, scientists need to track how animals are shifting where they live over time. This is especially important in northern regions, like the Arctic, where climate change is happening faster than elsewhere. In North America, the geographic ranges of many mammals reach their northernmost extent in Alaska, making it a key area to watch for climate-induced changes in where species occur.

This study compared occurrence records from the Global Biodiversity Information Facility—including many from the Canadian Museum of Nature's mammal collection—for 61 terrestrial mammal species native to mainland Alaska against commonly referenced range maps. It evaluated potential extralimital records and developed repeatable baseline range maps. The study identified extralimital records for 39 of 61 (63.9%) terrestrial mainland Alaskan species.



Map of Alaska showing all records of native, terrestrial mammals downloaded from the Global Biodiversity Information Facility in relation to land units managed by the U.S. National Park Service and U.S. Fish and Wildlife Service. Source: Baltensperger et al. (2024), available under a Creative Commons Attribution 4.0 International license.

EXPOSURE AND SENSITIVITY OF TERRESTRIAL VERTEBRATES TO BIOLOGICAL INVASIONS WORLDWIDE.

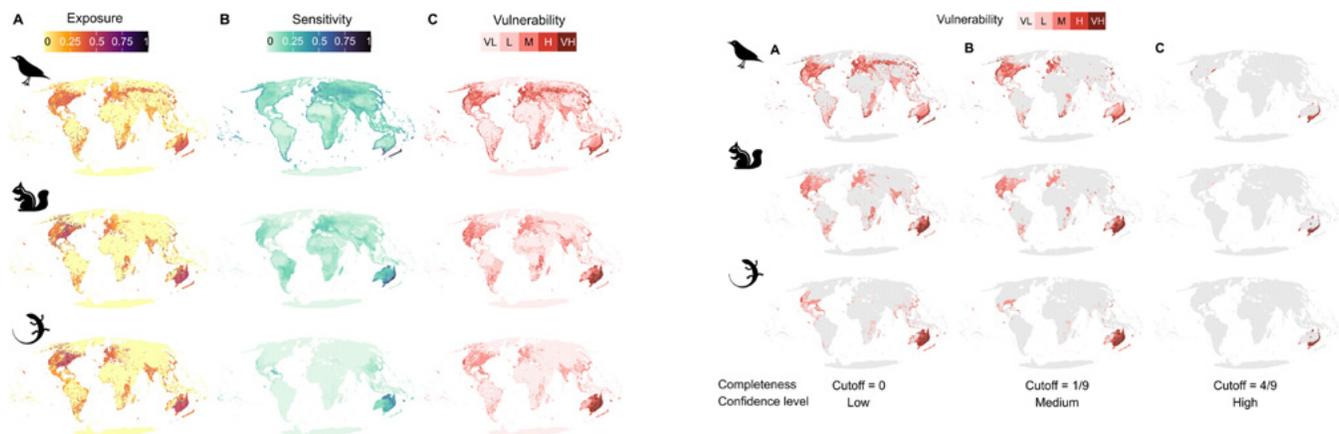
Marino, C., B. Leroy, G. Latombe and C. Bellard. 2024.

Global Change Biology 30: e17607. <https://doi.org/10.1111/gcb.17607>

Invasive alien species—animals or plants that are not native and cause harm—are a big threat to biodiversity. Most studies only look at where these species occur, but not how native animals react to them. This study looked at vertebrates' vulnerability to biological invasions, combining measures of both where invasive species occur (304 species) and how sensitive 1,600 native species of animals are to them (1,600 species of vertebrates, like mammals, birds, reptiles, and amphibians).

The researchers used threat data from the International Union for Conservation of Nature (IUCN) Red List and occurrence data of native birds, mammals, and reptiles from the Global Biodiversity Information Facility—including records from the Canadian Museum of Nature's animal collections.

They found that 38% of land on Earth is exposed to biological invasions and most of the world hosts native species sensitive to biological invasions. They identified high-risk areas where both exposure and sensitivity are high. These include Australia and parts of North America, with a high confidence level, and the Pacific islands, South America, Western Europe, Southern Africa, Eastern Asia, and New Zealand, with a medium confidence level. They also found that some areas we think are safe might be at risk of biological invasion, but we don't have enough data to be sure. These areas often overlap with places rich in biodiversity. We need better data to fully understand and protect native species from invasive threats.



Actual (A) exposure, (B) realized sensitivity, and (C) vulnerability of terrestrial vertebrates to biological invasions. Each row corresponds to the taxonomic class of native species (from top to bottom: birds, mammals, and reptiles). Source: Marino et al. (2024), available under a [Creative Commons Attribution-NonCommercial 4.0 International license](https://creativecommons.org/licenses/by-nc/4.0/).

Vulnerability of terrestrial vertebrates to biological invasions, by confidence level. Vulnerability ranges from very low (light red) to very high (dark red), shown with three levels of confidence: (A) low, (B) medium, and (C) high. Gradations of red indicate areas where data completeness exceeds the threshold for both exposure and sensitivity. Grey cells represent areas with either no exposure or sensitivity, or where data completeness falls below the threshold for one or both components. Source: Marino et al. (2024), available under a [Creative Commons Attribution-NonCommercial 4.0 International license](https://creativecommons.org/licenses/by-nc/4.0/)

SPATIAL AND TEMPORAL REPRESENTATION OF MARINE FISH OCCURRENCES AVAILABLE ONLINE.

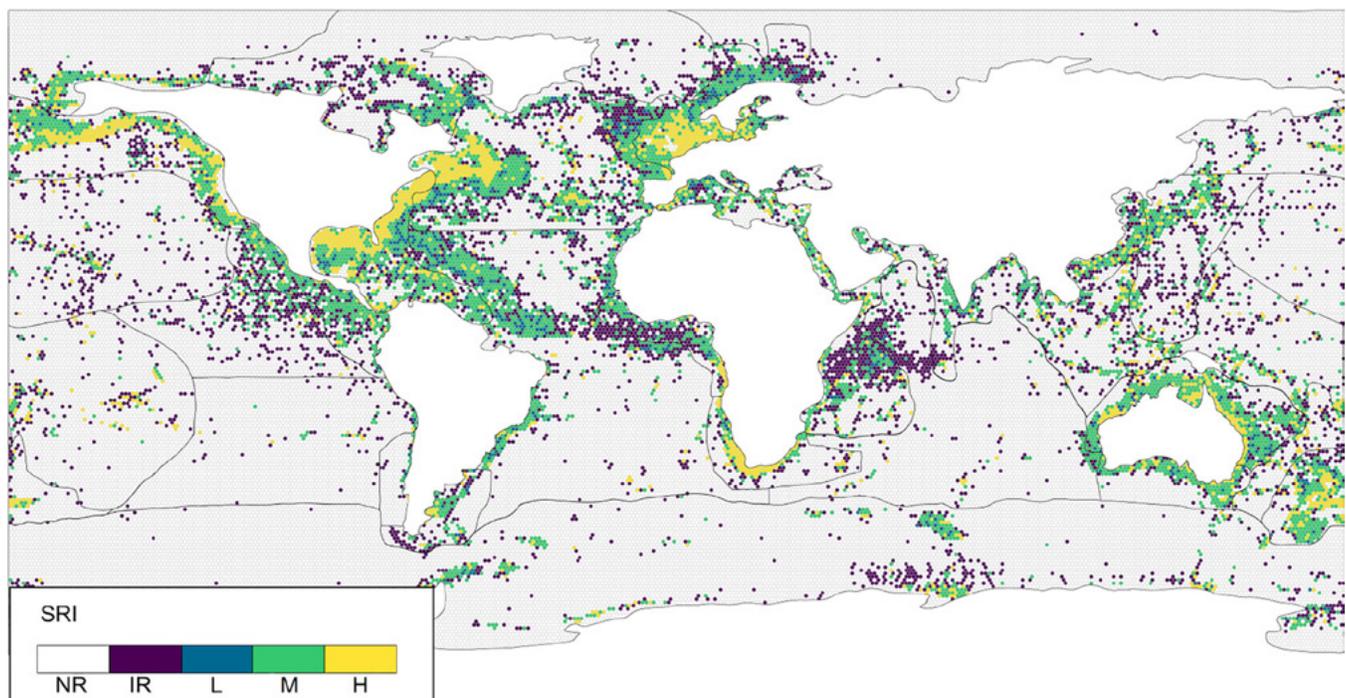
Pizarro, V., A.G. Castillo, A. Piñones and H. Samaniego. 2024.

Ecological Informatics 79: 102403. <https://doi.org/10.1016/j.ecoinf.2023.102403>

Although scientists have identified about 243,000 marine species, we still don't fully understand the variety of life in the ocean. This lack of knowledge could have serious consequences, especially as climate change and human activities continue to affect marine ecosystems. Recently, researchers have created many online databases—like FishBase, the Global Biodiversity Information Facility (GBIF) and the Ocean Biodiversity Information System (OBIS)—to collect and share information about marine species. These databases contain many records, but not all of them are useful or add new insights about where species live or how many exist.

In this study, researchers looked at data on marine fish (specifically bony fish) from GBIF—including thousands of occurrence records from the Canadian Museum of Nature's fish collection—and OBIS to see how well these records represent the real world. They used a method that divides the ocean into hexagon-shaped areas to estimate how many species live in each.

They found that only a small portion of the data (just 1.14%) helped understand global fish diversity. Most of the data came from coastal areas, especially near wealthy countries and places with a lot of fishing. The best-documented species were small fish that live in shallow waters and are important for fishing or culture. The study also showed that researchers have poorly studied many parts of the ocean, especially areas far from shore or in less developed regions. This means we still have a lot to learn, and we need better data to understand and protect marine life effectively.



Spatial Representativeness Index (SRI) in a 1° hexagonal lattice. Cells are categorized based on their representativeness of species richness: H = High representativeness; M = Medium representativeness; L = Low representativeness (not representative of species richness); IR = Insufficient records to evaluate representativeness; NR = No records. The SRI helps identify areas where species richness is well represented in biodiversity data and where data gaps remain. Source: Pizarro et al. (2024), available under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International](https://creativecommons.org/licenses/by-nc-nd/4.0/) license.

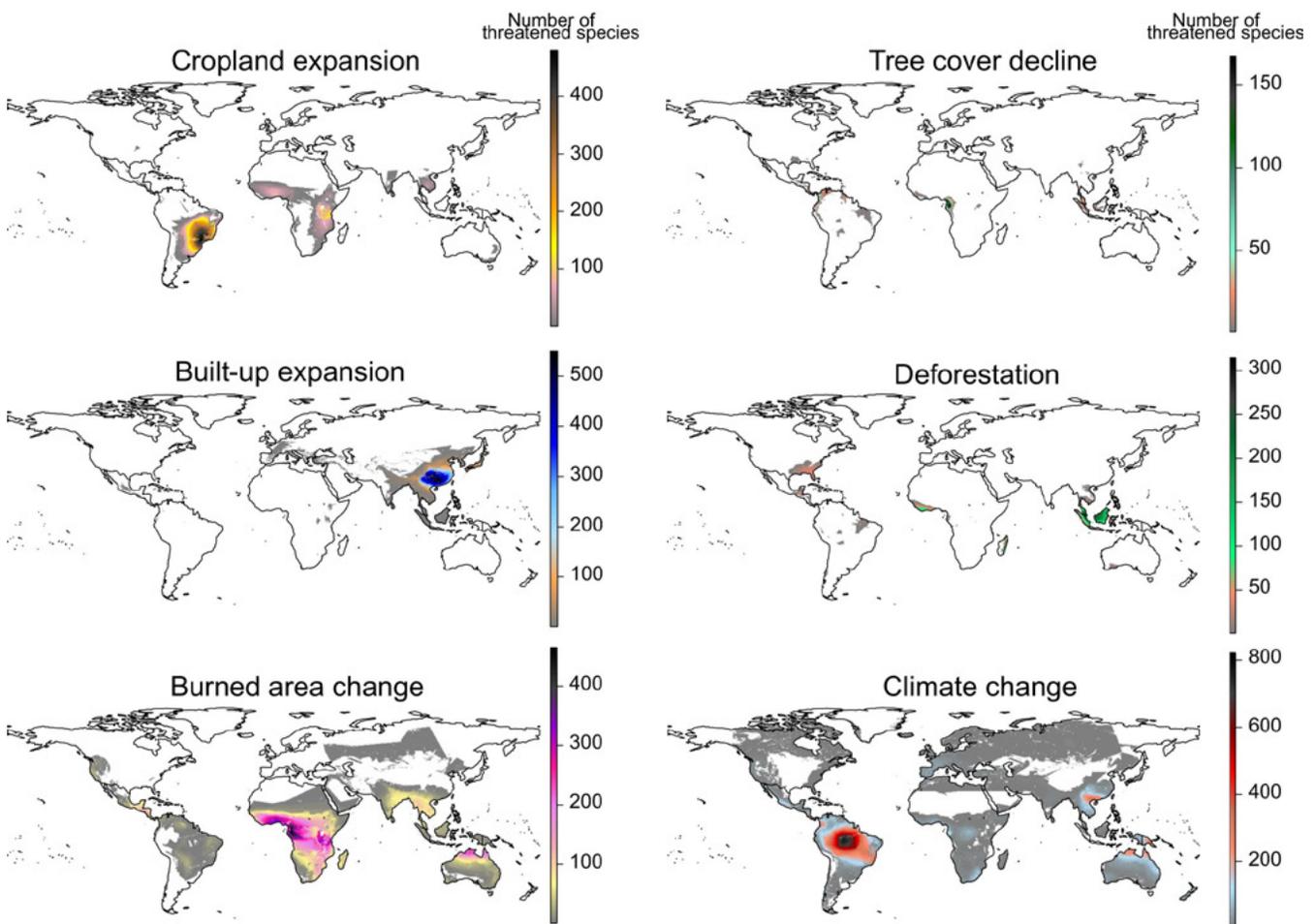
MORE THAN 17,000 TREE SPECIES ARE AT RISK FROM RAPID GLOBAL CHANGE.

Boonman, C.C.F., J.M. Serra-Diaz, S. Hoeks, W.-Y. Guo, B.J. Enquist, B. Maitner, Y. Malhi, C. Merow, R. Buitenwerf and J.-C. Svenning. 2024.

Nature Communications 15: 166. <https://doi.org/10.1038/s41467-023-44321-9>

Trees are important for nature and for people, but they're under growing threat from human activities and environmental changes. To protect them better, we need to know which tree species are at risk of extinction. In this study, scientists looked at how 32,090 tree species have responded to six major human-caused threats over the past 20 years. **The researchers obtained species occurrence records from five publicly available sources, including more than ten thousand records from the Canadian Museum of Nature's botany collection, mediated by the Global Biodiversity Information Facility.**

The researchers found that more than half of these species (54.2%) are facing increasing threats. However, only a small portion (8.7%) is listed as threatened on the IUCN Red List. This means that current assessments may be underestimating how many tree species are in danger. The researchers also created maps showing where the most threatened tree species live around the world. Their approach can help experts decide which species need to be re-evaluated first, making conservation efforts more focused and effective.



Hotspots of tree species highly exposed to six major human-caused threats: cropland expansion, built-up expansion, burned area change, tree cover decline, deforestation, and climate change. Source: Boonman et al. (2024), available under a [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/).

Roger Bull collecting seaweeds west of Cambridge Bay, Nunavut, in 2024. Photo: Amanda Savoie.



RESEARCH AND DISCOVERY: CREATING NEW KNOWLEDGE ABOUT BIODIVERSITY AND GEODIVERSITY

Through collections-based research and discovery, the museum's scientists contribute to deepening our understanding and appreciation of life and geological diversity on our planet, both past and present.

They conduct their research in the field and in the laboratory, working closely with a broad network of collaborators across Canada and around the world. They disseminate their new findings to the scientific community by publishing articles in peer-reviewed articles and books and by presenting at scientific conferences.

THE MUSEUM'S RESEARCH PROGRAMS

The museum supported 22 multi-year research programs in 2024-25:

BOTANY

- **Biodiversity of the Canadian Arctic flora: vascular plants and lichens** | Principal Investigators: Drs. Lynn Gillespie, R. Troy McMullin, and Jeffery Saarela
- **The biogeography, ecology, and taxonomy of Canadian lichens** | Principal Investigator: Dr. R. Troy McMullin
- **Bryophytes of Canada** | Principal Investigator: Jennifer Doubt
- **Freshwater micro-organism diversity and environment: multi-proxy approach to systematics, global biodiversity, Arctic toxicology, impact assessment and environmental/climate change using conventional and genetic markers** | Principal Investigator: Paul Hamilton
- **Phylogenetic and molecular systematics of flowering plants with a focus on grasses and spurge: species discovery and evolutionary history** | Principal Investigator: Dr. Lynn Gillespie
- **Species diversity, biogeography, and taxonomy of seaweeds, with a focus on red algae** | Principal Investigator: Dr. Amanda Savoie
- **Taxonomy and phylogenetics of grasses (Poaceae) and their relatives** | Principal Investigator: Dr. Jeffery Saarela

MINERALOGY

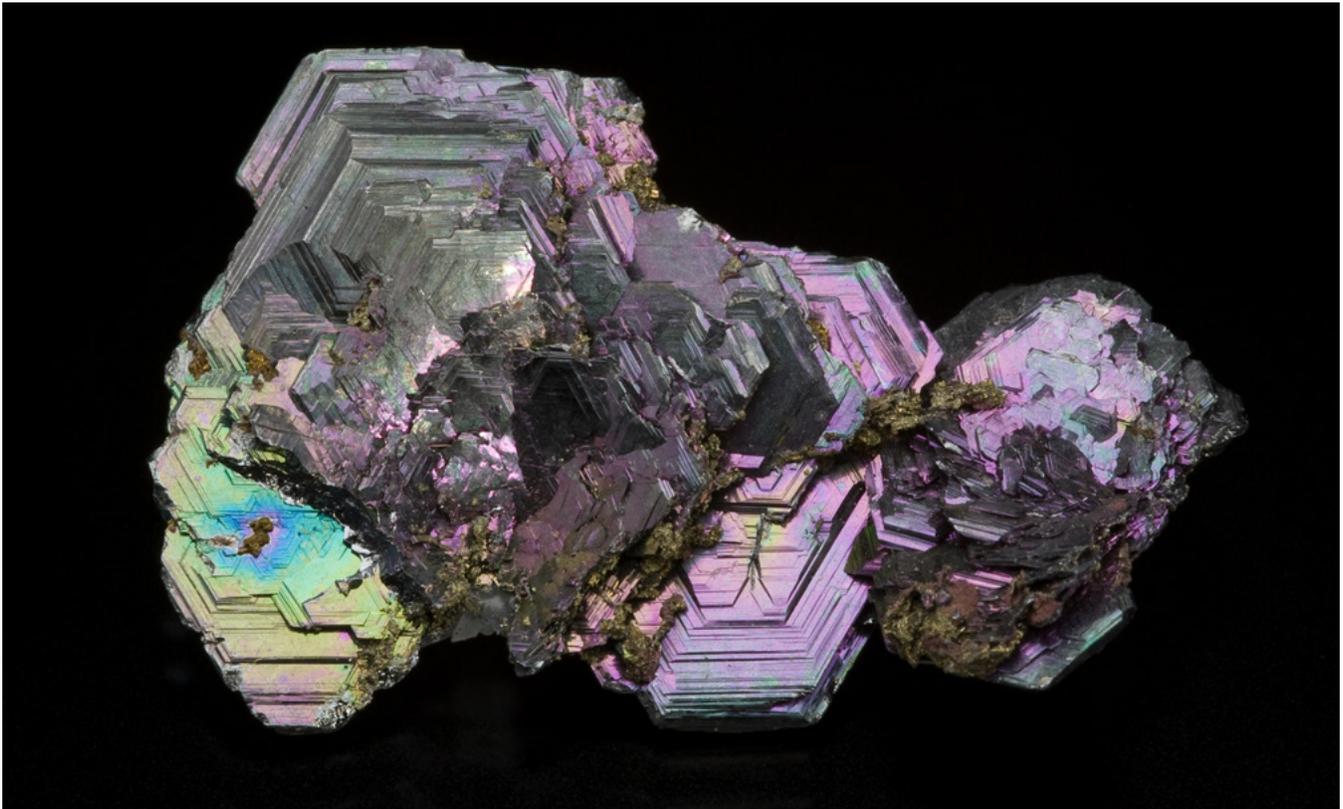
- **Processes in mineral growth and stability: investigations into nanomineral behaviour and mechanisms of compositional zoning** | Principal Investigator: Dr. Aaron Lussier
- **The speciation and evolution of alkaline environments: trace elements, accessory minerals, and magma** | Principal Investigator: Dr. Paula Piilonen
- **Structural and chemical solid-state transformations in late-stage hydrothermal and supergene minerals** | Principal Investigator: Dr. Inna Lykova

PALAEOBIOLOGY

- **A multi-faceted exploration for the ancestry and early evolution of fishes** | Principal Investigator: Dr. Tetsuto Miyashita
- **Enhancing the research potential and scientific value of the Canadian Museum of Nature fossil collections** | Principal Investigator: Dr. Scott Rufolo
- **Species coexistence and change during the Late Cretaceous of North America** | Principal Investigator: Dr. Jordan Mallon
- **Study on the Mesozoic reptiles (mainly diapsids) from China and North America** | Principal Investigator: Dr. Xiao-Chun Wu
- **Using an eco-evolutionary framework to study Cenozoic (66 Ma–Present) mammal responses to abiotic and biotic perturbation** | Principal Investigator: Dr. Danielle Fraser

ZOOLOGY

- **Comparative morphology, ecology, and conservation biology of a declining Canadian fauna: freshwater mussels** | Principal Investigator: Dr. André Martel
- **Ecology and taxonomy of Northwest Atlantic/Arctic/Northeast Pacific marine benthic invertebrate species** | Principal Investigator: Dr. Jean-Marc Gagnon
- **Elucidating biogeographic processes in fishes of the Holarctic, Gulf of Mexico, and Caribbean using genomic, specimen and collection-based tools** | Principal Investigator: Dr. Katriina Ilves
- **Morphogenetic characterizations of large carnivores and implications for their conservation in Canada** | Principal Investigator: Dr. Khamal Khidas
- **Population dynamics, trophic relationships, and comparative morphology of Arctic micromammals** | Principal Investigator: Dr. Dominique Fauteux
- **Survey and inventory of the scarab beetles of Canada** | Principal Investigator: Dr. Andrew Smith
- **Systematics and biodiversity of weevils (Coleoptera: Curculionidae)** | Principal Investigator: Dr. Robert Anderson



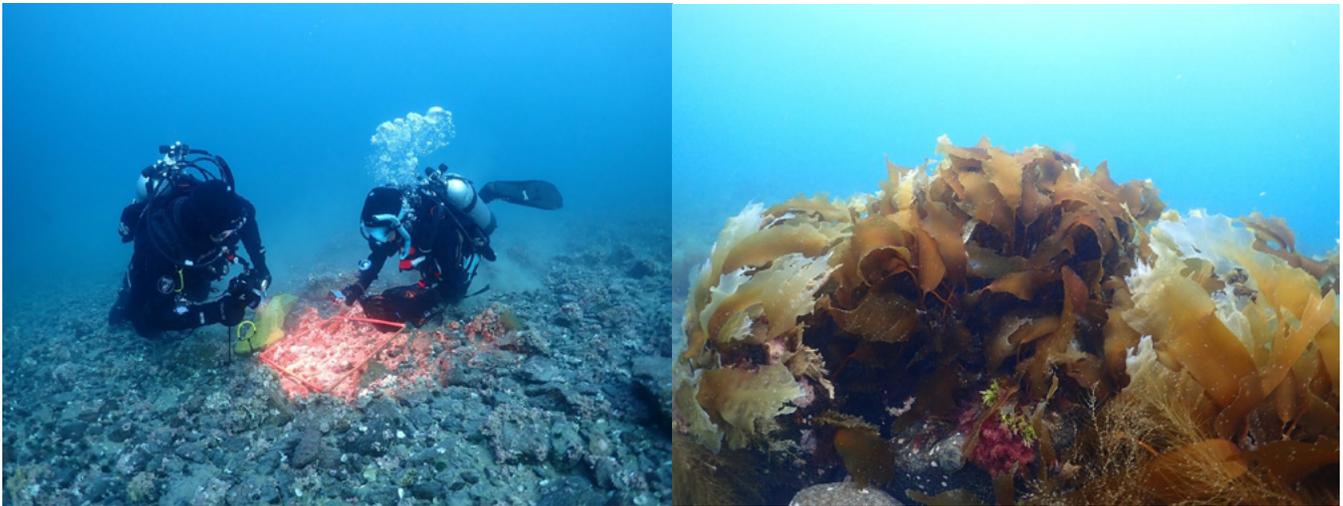
Polybasite from Husky Mine, Mayo mining district, Yukon, 3 × 2 × 1 cm (CMNMC 48444). Photo: Michael Bainbridge.

FIELDWORK

Since its inception over a century ago, fieldwork has been an important part of the museum’s scientific activities.

In 2024-25, museum staff spent more than 453 person-days working in the field across Canada in nine provinces and territories—including 218 person-days in the Canadian Arctic—and 114 person-days in the field in other countries. This fieldwork focused on mineral diversity and biodiversity in multiple groups of organisms, including microscopic algae, beetles, dinosaurs, fishes, fossil fishes, fossil mammals, lichens, mosses, freshwater mussels, seaweeds, small mammals, and vascular plants. Major 2024-25 field expeditions are listed below.

FIELDWORK ACROSS CANADA



(Left) Roger Bull and Camille Lavoie (Laval University) sampling invertebrate biomass using a quadrat near the Finlayson Islands in Dease Strait, Nunavut, approximately 37 km west of Cambridge Bay. (Right) A site rich in marine biodiversity in the Finlayson Islands. Photos: Amanda Savoie.

ARCTIC KELP FORESTS AND SEAWEED BIODIVERSITY IN CAMBRIDGE BAY

Locality: Cambridge Bay, Nunavut | Principal Investigator: Dr. Amanda Savoie

Baseline biodiversity information and ongoing monitoring of seaweed diversity and distribution in Canada’s Arctic are necessary to determine the impacts of climate change on the coastal ecosystem. Marine macroalgae provide habitat for many fish and invertebrates that northern communities value and consume. Understanding how shifts in seaweed distribution and abundance may affect these associated species is therefore a key research priority.

In 2024, Museum Research Scientist Amanda Savoie returned to Cambridge Bay, Nunavut, to continue her multi-year project surveying seaweed biodiversity, characterizing seaweed and invertebrate biomass, and mapping kelp forests. The research team—including Roger Bull, head of operations for the museum’s molecular biodiversity program, and researchers from Laval University—sampled sites near Cambridge Bay as well as more distant locations in Dease Strait and Queen Maud Gulf. Savoie is conducting this research in collaboration with Polar Knowledge Canada.



(Left) Savoie sampling seaweed while SCUBA diving. (Right) A large underwater kelp forest of the species *Saccharina latissima*. Photos: Roger Bull (left), SOI Foundation (right).

SEAWEED BIODIVERSITY IN NORTHERN LABRADOR

Locality: Innu Nation Natuashish and Sheshatshiu marine zones of Northern Labrador, N.L. |

Principal Investigator: Dr. Amanda Savoie

As part of a ship-based research expedition led by the Innu Nation of Labrador, Museum Research Scientist Amanda Savoie, assisted by Roger Bull, head of operations for the museum's molecular biodiversity program, surveyed seaweed biodiversity by collecting voucher specimens for the museum's herbarium and cryobank. Many of the sites visited during the Innu Nation Uinipeku Expedition had never been surveyed for benthic biodiversity. The specimens collected will help the Innu Nation make conservation and management decisions for their marine zones.



Ilves and Steele sampling fish diversity with minnow traps, left, and Feddes traps, right. Photos: Amanda Savoie.

DIVERSITY OF MARINE AND FRESHWATER FISHES OF THE CAMBRIDGE BAY REGION

Locality: Cambridge Bay, Nunavut | Principal Investigator: Dr. Katriina Ilves

Museum Research Scientist Katriina Ilves, along with Research Assistant Dr. Sarah Steele and University of Toronto collaborator and museum Research Associate Dr. Nathan Lovejoy, continued research on the diversity of marine and freshwater fishes near Cambridge Bay, Nunavut, in August 2024, based at the Canadian High Arctic Research Station (CHARS).

This multi-year project aims to advance baseline biodiversity knowledge for the Canadian Arctic by producing a molecular- and morphology-based inventory of fish diversity in the region. The data and infrastructure generated will add new knowledge about the range of Arctic fishes, document changes over time, and enable detection of species range shifts and invasive species, both of which are likely to increase because of climate change. The project also aims to improve understanding of forage fishes, on which larger, economically important fishery species, such as Arctic Char, depend. This was the third year of the project, conducted in collaboration with Polar Knowledge Canada.



Bony plates from Devonian armoured fish preserved in a block from the Fram Formation on the Simmons Peninsula of Ellesmere Island, Nunavut Photo: Scott Rufolo.

View towards Goose Fiord on southern Ellesmere Island, Nunavut, looking over exposures of Devonian-age rock rich in fossil fish remains. Photo: Scott Rufolo.

LATE DEVONIAN VERTEBRATES OF ELLESMERE ISLAND

Locality: Ellesmere Island, Nunavut | Principal investigators: Dr. Neil Shubin (University of Chicago), Dr. Ted Daeschler (Academy of Natural Sciences of Drexel University). CMN participant: Dr. Scott Rufolo

Between 1999 and 2014, researchers from the University of Chicago and the Academy of Natural Sciences of Drexel University conducted fieldwork on Ellesmere Island. They identified over 70 palaeontological sites that document life during the Late Devonian (382 to 359 million years ago). Of great importance are the discovery of abundant remains of jawless fishes (agnathans), armoured fishes (placoderms) and a variety of lobe-finned fishes (sarcopterygians) at these sites, including fossils of *Tiktaalik roseae*. *Tiktaalik* is a genus of tetrapodomorph vertebrate that represents a transitional evolutionary form bridging the gap between fish and amphibians, representing a significant addition to our knowledge of the emergence onto land of four-limbed animals.

In 2024, Scott Rufolo, curator of the museum's fossil collection, joined the scientists who discovered *Tiktaalik* in a search for additional fossils of this animal on the Simmons Peninsula of southern Ellesmere Island. The goal: find an example with well-preserved bones of the pelvis and hind fins, a region of the anatomy not well represented in the existing specimens. The result: a beautifully preserved specimen containing the bones of the back half of the animal. This is an exceptionally important find that will allow us to understand more fully the pattern of evolutionary changes in the sarcopterygian fin that lead to the development of limbs designed for terrestrial locomotion.



Members of the PoLAR-FIT team during their High Arctic fieldwork in the summer of 2024. Photos: Mathew Brenning.

EVOLUTION OF ARCTIC LIFE AND LANDSCAPE—POLAR-FIT2024

Locality: Ellesmere and Axel Heiberg islands, Nunavut | Principal investigator: Dr. Danielle Fraser

Museum Research Scientist Danielle Fraser coordinated an international team of researchers—members of the “Pliocene Landscapes and Arctic Remains—Frozen in Time (PoLAR-FIT)” working group—on an expedition to fossil mammal sites in the High Arctic, on Ellesmere and Axel Heiberg islands, Nunavut. As part of the PoLAR-FIT program, the team aims to understand the biodiversity and climate of the High Arctic during the Pliocene (~5 Ma).

The team, including former mayor of Grise Fiord Jarloo Kiguktak, visited the Beaver Pond, Fyles Leaf Bed, and Horse sites on Ellesmere Island and the Geodetic Hills site on Axel Heiberg Island. During these trips, the team collected two potentially important fossils and took numerous samples for ancient environmental DNA analysis. They are now hard at work processing the various environmental samples in Copenhagen, Denmark, which are already yielding exciting results.



(Left) Cléa Frapin and Research and Collections Assistant Ariane Bisson work to determine the sex of a collared lemming near Cambridge Bay, Nunavut. (Right) A close-up of the collared lemming in Frapin's hands. Photos: Elise Imbeau, Polar Knowledge Canada.

SMALL MAMMAL POPULATION DYNAMICS IN THE CANADIAN ARCTIC

Localities: Bylot Island, Nunavut; Salluit, Que.; Cambridge Bay, Nunavut | Principal Investigator: Dr. Dominique Fauteux

Museum Research Scientist Dominique Fauteux is leading a multi-year project to monitor small mammal population health at three sites in the Canadian Arctic. His research aims to characterize the biodiversity, population dynamics, and abundance cycles of lemmings, voles, ermine, and other small rodents. New knowledge gained through this research will allow us to understand better wildlife dynamics in the Canadian Arctic, as small mammal cycles are central to most terrestrial Arctic vertebrate food webs. Work in 2024 took place in Cambridge Bay, Nunavut, on Bylot Island, Nunavut, and in Salluit, Que. Fauteux is conducting this research in collaboration with Polar Knowledge Canada.



An enclosure on Bylot Island, Nunavut, where Fauteux is studying small mammals. The research team uses the devices in the enclosure to study male and female lemming anti-predatory behaviour and their daily movements. Photo: Dominique Fauteux.



Sean Desjardins mapping the extent of a cache feature on Igloodik Island, Nunavut, using a Differential Global Positioning System. Photo: Shyong En Pan.

TRACES: TRACKING LONG-TERM RESILIENCE IN ARCTIC SOCIOCULTURAL-ECOLOGICAL SYSTEMS

Localities: Islands around Igloodik, Nunavut | Principal Investigator: Dr. Sean Desjardin (University of Groningen, Netherlands)

Shyong En Pan, a research assistant in the museum's palaeobiology section, joined an archaeological research expedition led by Sean Desjardins (University of Groningen, The Netherlands, and a research associate with the museum). The expedition included community engagement in Igloodik and surveys of archaeological sites on several islands in the Foxe Basin. Pan contributed his expertise on zooarchaeology and 3D scanning to the team.

This was the first year of the five-year TRACES (Tracking Long-term Resilience in Arctic Sociocultural-Ecological Systems) project. The initiative aims to deepen understanding of the differences between Western scientific approaches to sustainability and conservation and Inuit traditional knowledge related to environmental health and human–animal relationships.



The fieldwork included fish surveys via electrofishing, demonstrated by undergraduate field technician Alexia Landry and Benjamin Aubrey (Right photo, top left), and seining (bottom right), shown by undergraduate field technician Madison Empey, Benjamin Aubrey, and Alexia Landry, and mussel observation and survey (Sarah Steele; right photo, top right). Photos: Sarah Steele, Benjamin Aubrey, and Katriina Ilves.

FISH DIVERSITY IN THE OTTAWA RIVER WATERSHED

Localities: Ottawa River watershed, including Gatineau Park, Que. | Principal Investigator: Dr. Katriina Ilves

The museum's aquatic zoology team, comprising Museum Research Scientists Dr. Katriina Ilves and Dr. André Martel, Research Assistant Dr. Sarah Steele, and Carleton University MSc student Benjamin Aubrey, is documenting changes in fish and mussel diversity in the Ottawa River watershed.

Work in 2024 focused on studying the effects of introduced Largemouth Bass (*Micropterus nigricans*; left photo, top) on the fish and mussel communities in Lac Kingsmere in Gatineau Park, Que. Since discovering this introduction in 2021, the team has documented reduced fish diversity in the lake. Two fish species—Largemouth Bass and Pumpkinseed (*Lepomis gibbosus*; left photo, second from top)—now dominate Lac Kingsmere, with low abundance of two other species, Brook Trout (*Salvelinus fontinalis*; left photo, second from bottom) and White Sucker (*Catostomus commersonii*; left photo, bottom), and with native minnow species (family Leuciscidae) undetected.



Two interesting bryophyte species—both considered rare in Ontario—that Jennifer Doubt documented in Eastern Ontario in 2024. (A) Hemispheric liverwort (*Reboulia hemisphaeric*). (B) Fan moss (*Forsstroemia trichomitria*). Photos: Jennifer Doubt.

BRYOPHYTE INVENTORIES AND RARE SPECIES SURVEYS IN EASTERN ONTARIO AND WESTERN QUEBEC

Localities: Various sites in Ontario and Quebec | Principal Investigator: Jennifer Doubt

Bryophytes provide all the ecosystem services that plants provide worldwide, while also filling unique roles specific to their distinctive size and biological traits. Researchers have yet to study bryophytes in detail in most parts of Canada, creating knowledge gaps and opportunities for research almost everywhere—even close to home.

Jennifer Doubt, curator of the museum’s botany collection and an expert in bryophytes, conducted fieldwork in 2024 to document bryophyte species occurrence. She also identified many specimens collected in previous years, making data and specimens newly available. The new information represented by her collections will help researchers to build better information on species abundance and distribution, which, in turn, will support better conservation decision-making.



Field school participants Leo Lightbody (left) and Madden Benoit (right), from Algonquins of Pikwakanagan First Nation, examine freshwater biodiversity along the shore of Kettle Island, Que., in the Ottawa River, August 2024. Photo: Jeff Saarela.



Field school participant Chris Landry (Algonquins of Pikwakanagan First Nation) (left) and Museum Research Scientist André Martel (right) sample aquatic invertebrates on Upper Duck Island, Ont., in the Ottawa River, August 2024. Photo: Jeff Saarela.

ENVIRONMENTAL FIELD SCHOOL—WEAVING WESTERN SCIENCE AND INDIGENOUS WAYS OF KNOWING

Localities: Kettle Island, Que.; Upper and Lower Duck islands, Ont. | Principal Investigators: Drs. André Martel and Jeff Saarela

The museum, with Public Services and Procurement Canada, hosted an environmental field school for participants from Algonquins of Pikwàkanagàn First Nation, Ont., and Kitigan Zibi Anishinabeg, Que., in August 2024. This was the third year of the field school.

Youth, Elders, and Knowledge Keepers from both nations—including representatives from their Indigenous Guardians initiatives—joined museum science experts for a three-day exploration of freshwater and terrestrial biodiversity on Kettle Island, Que., and Upper and Lower Duck Islands, Ont., in the Ottawa River, within Canada’s National Capital Region. The field school was an opportunity to bring together Indigenous ways of knowing and Western science. Participants also visited the Ottawa River House and spent a day at the museum’s Natural Heritage Campus, exploring the collections, laboratories, and examining specimens.



(Top left) Jessica Allen photographing Lichen Agaric (*Lichenomphalia ericetorum*) in Capilano River Regional Park in North Vancouver, B.C. Inset: The Lichen Agaric (*Lichenomphalia ericetorum*) that Allen is photographing in the picture. (Top right) Powdered Orange Bush Lichen (*Teloschistes flavicans*) in San Bruno Mountain State and County Park near San Francisco. (Bottom left) Lace Lichen (*Ramalina menziesii*) in Golden Gate Park, San Francisco. (Bottom right) McMullin searching for lichens in San Bruno Mountain State and County Park near San Francisco. Photos: Troy McMullin (top left, top right, bottom left), Jessica Allen (bottom right).

URBAN LICHENS OF THE PACIFIC NORTHWEST

Localities: Vancouver, B.C.; San Francisco, Calif. | Principal Investigator: Dr. Troy McMullin

People often overlook urban biodiversity, but city parks are important refugia for many organisms, such as lichens. To help city dwellers in Western North America appreciate and understand the rich lichen diversity in their urban parks, Museum Research Scientist Troy McMullin partnered with Dr. Jessica Allen (University of California, San Diego) to produce a field guide. The book, “Urban Lichens West: A field guide to lichens of coastal Western North America,” will provide a detailed introduction to lichens in western North American cities from Alaska to San Diego, Calif. In 2024, they completed fieldwork for the book in San Francisco and Vancouver.



(Left) Brier Island field team. From left to right: Frances Anderson, Fiona Brooks, Troy McMullin, James Churchill, and Katrina Cruickshanks. (Right) McMullin's Loop Lichen (*Hypotrachyna mcmulliniana*), a species that researchers named in 2020 in honour of McMullin, which the research team discovered on Brier Island — the first record of this species in Canada. Photos: Troy McMullin

LICHENS OF BRIER ISLAND, NOVA SCOTIA

Locality: Brier Island, N.S. | Principal Investigator: Dr. Troy McMullin

Brier Island, in southwestern Nova Scotia at the mouth of the Bay of Fundy, is renowned as an important site for vascular plant and bird biodiversity. A few historical lichen collections from the island suggested that it might also be interesting for lichens. Therefore, museum researchers Troy McMullin and Katrina Cruickshanks collaborated with several experts to survey the lichens and allied fungi of Brier Island. The research team included Frances Anderson (Nova Scotia Museum Research Associate), Alain Belliveau (E.C. Smith Herbarium, Acadia University), Fiona Brooks (Atlantic Canada Conservation Data Centre), James Churchill (Lobaria Consulting), and Kendra Driscoll (New Brunswick Museum).

They conducted their research in partnership with, or with financial support from, the Nature Conservancy of Canada, the Nova Scotia Department of Natural Resources, and the Nova Scotia Museum. While specimen identification is still ongoing, preliminary results include species new to Canada and Nova Scotia, as well as more than 20 species of conservation concern in the province.



(Left) Philip Bell-Doyon, Steven Selva, and Troy McMullin in front of the tallest monolith in the Mingan Archipelago National Park Reserve on Île Nue de Mingan, Que. (Right) Powdered Wrinkle-Lichen (*Tuckermannopsis chlorophylla*) discovered on Île Nue de Mingan in the Mingan Archipelago National Park Reserve—the first confirmed report for the species in eastern North America. Photos: Troy McMullin.

LICHENS OF THE MINGAN ARCHIPELAGO NATIONAL PARK RESERVE, QUEBEC

Locality: Mingan Archipelago National Park Reserve, Que. | Principal Investigator: Dr. Troy McMullin

The Mingan Archipelago National Park Reserve, located on Quebec's North Shore, is known for its striking limestone islands, which contain the largest concentration of monoliths in Canada. The area's calcareous environment, frequent fog, and old, intact forests provide ideal habitat for a rich diversity of lichens — including many Arctic disjuncts and rare species.

Philip Bell-Doyon (PhD candidate, Laval University) has been studying the lichens of the Archipelago for several years. Dr. Steven Selva (Professor Emeritus, University of Maine) and Museum Research Scientist Troy McMullin helped him identify some specimens, and in 2023, they described a new species known only from the Archipelago, *Chaenothecopsis minganensis* Bell-Doyon, Selva, and McMullin. In 2024, the trio returned to the islands to continue surveying for lichens.



Lichens on Quadra Island, B.C. (Left) Fairy Puke or Candy Lichen (*Imadophila ericetorum*). (Right) Ancient Coral Lichen (*Sphaerophorus venerabilis*). Photos: Troy McMullin.

LICHENS OF QUADRA ISLAND, BRITISH COLUMBIA

Locality: Quadra Island, B.C. | Principal Investigator: Dr. Troy McMullin

The Hakai Institute conducts long-term scientific research at remote locations on the coastal margin of British Columbia. In 2024, the institute hosted a week-long terrestrial bioblitz on Quadra Island. Several local naturalists from Vancouver Island, along with Dr. Jessica Allen (University of California, San Diego) and Museum Research Scientist Troy McMullin, studied the lichens.



Paula Piilonen collecting minerals at the Ice River Alkaline Complex base, August 2024. Photo: Pierre Poirier.



The blue-coloured mineral is sodalite, which contains sodium, aluminum, and silicon. Photo: Pierre Poirier.

MINERALOGY OF THE ICE RIVER ALKALINE COMPLEX, BRITISH COLUMBIA

Locality: near Golden, B.C. | Principal Investigators: Drs. Paula Piilonen and Aaron Lussier

Museum Research Scientists Dr. Paula Piilonen and Dr. Aaron Lussier are studying the mineralogy of the late-stage pegmatite dikes in the Ice River Alkaline Complex, and the behaviour and mobility of high-field-strength elements, such as titanium, niobium, and rare-earth elements, within hydrothermal, alkaline environments. The Ice River Alkaline Complex, 40 km south of Field, B.C., is the largest in Canada and contains potential (sub-economic) deposits of rare earth and strategic elements.



The small mammal monitoring team at Kenauk. (Left to right) Ariane Bisson, David Bolduc, Pierre Fugère, and Dominique Fauteux. Photo: Mara Bouse.



An ermine that one of the automated subnivean cameras photographed at Kenauk.

POPULATION DYNAMICS OF SMALL MAMMALS AT KENAUK, QUEBEC

Locality: Kenauk, near Montebello, Que. | Principal Investigator: Dr. Dominique Fauteux

In September 2024, Museum Research Scientist Dominique Fauteux, along with Research and Collections Assistant Ariane Bisson and students David Bolduc and Pierre Fugère, both from Laval University, conducted live trapping of small mammals at Kenauk, Que. The fieldwork was part of their annual small mammal monitoring across a northern gradient, from Kenauk to Bylot Island, Nunavut. They found that the small mammal populations at Kenauk were low compared to other years. They also started monitoring mustelids using 25 automatic cameras that will work year-round, including under the snow in winter.

Results so far show that ermines, martens, and fishers populate the Kenauk study area. Over the next few years, the research team aims to improve our understanding of the seasonal phenology of the predator-prey interactions between mustelids and their small mammal prey in this area.



The Gun Claim occurrence in Yukon, with the research team's 2024 field camp at the bottom of the cirque.
Photo: Inna Lykova.

POST-CRYSTALLIZATION TRANSFORMATIONS IN THE MINERAL ASSEMBLAGE OF THE GUN CLAIM OCCURRENCE, YUKON

Locality: Gun Claim, near Wilson Lake, Itsi Mountain, Y.T. | Principal Investigator: Dr. Inna Lykova

Museum Research Scientist Inna Lykova, along with Assistant Collection Manager Michael Bainbridge and collaborator Robert Beckett, collected mineral samples and documented outcrops at the Gun Claim occurrence in Yukon in August 2024. This was the first year of a multi-year project that aims to study how an unusual late-stage barium-rich mineral assemblage at the occurrence formed.



Sifting beetles from debris from Black-tailed prairie dog burrows in Grasslands National Park, S.K. Photo: Andrew Smith.



V-shaped flight intercept trap collecting beetles in the Elbow Dunes of Douglas Provincial Park, S.K. Photo: Andrew Smith.



An active dune at the Great Sand Hills Ecological Reserve, S.K., where Smith surveyed for scarab beetles. Photo: Andrew Smith.



Attracting beetles to a mercury-vapour light in Cypress Hills Interprovincial Park, S.K. Photo: Andrew Smith.

SURVEY AND INVENTORY OF THE SCARAB BEETLES OF CANADA

Localities: Grasslands National Park, Danielson and Douglas Provincial parks, Great Sand Hills Reserve, and Cypress Hills Interprovincial Park, S.K. | Principal Investigator: Dr. Andrew Smith

Scarab beetles from Saskatchewan remain underrepresented in entomology collections, and numerous species that occur in neighbouring provinces or states likely also occur in Saskatchewan, but researchers have not yet recorded them there. Museum entomologist Andrew Smith is working to fill these gaps in our knowledge of Canadian beetle biodiversity.

The 2024 expedition found 25 species of scarab beetles, including one species recorded from Canada for the first time. Smith found the new Canadian species in the burrows of black-tailed prairie dogs, a species listed as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The work is part of Smith’s ongoing effort to survey and inventory all scarab beetles in Canada and Alaska.



Two species of freshwater mussels captured along the southern shore of Kettle Island, Quebec, in August 2024: eastern lampmussel (*Lampsilis radiata*; top) and eastern elliptio (*Elliptio complanata*; bottom). Photo: Kathy Klein.



Two species of freshwater mussels captured along the southern shore of Kettle Island, Quebec, in August 2024: fragile papershell (*Potamilus fragilis*; top) and pink heelsplitter (*Potamilus alatus*; Bottom). Photo: André L. Martel.

UNIONID BIODIVERSITY OF THE NATIONAL CAPITAL REGION

Locality: Lac Philippe, Que.; Upper Ottawa River, Que. | Principal Investigator: Dr. André Martel

Fifty-five species of native freshwater mussels occur in Canada. These mussels provide important ecological services, such as serving as natural filters of rivers and lakes as they feed on planktonic particles, including coliform bacteria. Native freshwater mussels are the second most at-risk and declining animal group in North America. Museum Research Scientist Andre Martel’s research program focuses on the taxonomy and conservation biology of Canada’s native freshwater mussels, one of Canada’s most at-risk faunas.

Martel, in collaboration with Rosanne VanSchie of the Kebaowek First Nation in western Quebec, organized a research expedition in August 2024 to study the distribution of the endangered freshwater mussel Hickorynut (*Obovaria olivaria*) in the upper Ottawa River. The targeted survey area was between Chalk River and Oiseau Rock, downstream of Deep River, Ont. The team collected numerous voucher specimens of native freshwater mussels—many from locations that researchers had never sampled before. This effort not only expanded scientific knowledge of the region’s mussel populations but also strengthened the museum’s collaboration with local First Nations communities. In July 2024, Martel also delivered a workshop on freshwater mussel identification and taxonomy to the Nagadjitòdjig Aki Guardians of Kitigan Zibi Anishinabeg First Nation, Que.

Martel led a field trip in October 2024 to Lac Philippe in Gatineau Park, Que., to determine the status of Triangle Floater mussel, *Alasmidonta undulata*, a species listed as special concern in Quebec, in the lake. In 2004, Martel discovered a significant population of this species in Lac Philippe. Unfortunately, the team did not find any individuals during their SCUBA dives in 2024.

FIELDWORK AROUND THE WORLD



A trail through the palmetto woodlands in Palmetto State Park, Texas, a habitat in which Robert Anderson and colleagues surveyed for weevils. Photo: Robert Anderson.



Maple Trail in Lost Maples State Natural Area, Texas. Anderson surveyed weevils in the deep leaf litter along this trail. This is where he discovered various new weevil species during his expeditions in the 1980s. Photo: Robert Anderson.

BIODIVERSITY OF WEEVILS IN TEXAS

Localities: various sites in Texas, USA | Principal Investigator: Dr. Robert Anderson

Many insect species occur in the United States only in extreme southern Texas, and some of these are rare, only showing up in collections every few years, if at all. In May 2024, Museum Research Scientist Robert Anderson and colleagues undertook fieldwork to collect and document the presence of some of these taxa along the southern Texas border and to document beetle host-plant associations. They will use the new information in an upcoming book about the genera of beetles of Canada and the USA, and the fresh specimens will support molecular analysis. During their trip, the team collected specimens of one new genus and species and discovered its host plant association. They also explored known localities for other species but did not find them. The researchers suspect that these species are only active in autumn, and they will try again to find them in September 2025.



A member of the research team descending a deep ravine to collect leaf litter—an important habitat for weevils—in the Philippines, Mindanao. Photo: Robert Anderson.



Accessing good habitats in Mindanao, Philippines, proved difficult, so several sites where the research team collected beetles were alongside the road. Photo: Robert Anderson.

SAMPLING WEEVILS IN SOUTHEAST ASIA

Localities: various sites in the Philippines and Vietnam | Principal Investigator: Dr. Robert Anderson

The museum—which houses a globally important collection of beetles—recently acquired numerous interesting weevils from the Philippines and Vietnam. Museum Research Scientist Robert Anderson had an opportunity, following the International Congress of Entomology, in Kyoto, Japan, to carry out some collecting in these countries with colleagues. He was particularly interested in sampling the soil and leaf litter, as researchers have rarely collected in this way in these areas, and he was hopeful the research team would find numerous new taxa. The research team was not disappointed, as they collected numerous specimens, including several new-to-science genera and species. This work also opened the doors for future collaborations with the national museums in both countries.



A team of palaeontologists gather to record new findings during fieldwork at the Altan Uul locality in the Gobi Desert, Mongolia. Photo: Tetsuto Miyashita.

A herd of camels traverses the terrain, with dinosaur-bearing Cretaceous sandstone in the background, in Mongolia. Photo: Tetsuto Miyashita.

FIELD RECONNAISSANCE TO THE CRETACEOUS TERRESTRIAL VERTEBRATE FAUNAS OF MONGOLIA

Locality: Gobi Desert, Mongolia | Museum participant: Dr. Tetsuto Miyashita

Museum Research Scientist Tetsuto Miyashita joined an international team of palaeontologists led by Dr. Frederico Fanti (University of Bologna) to Tsagaan Khushu, Mongolia, and another by Drs. Philip Currie and Eva Koppelhus (University of Alberta) to Nemegt and Altan Uul, Mongolia. These renowned Late Cretaceous dinosaur localities are world-famous. In Tsagaan Khushu, the team tracked the strata leading up to and across the extinction of dinosaurs, and in that process uncovered an articulated neck of a sauropod dinosaur. In Nemegt and Altan Uul, the team visited historically important sites where Miyashita found an articulated fish—a rare occurrence in this otherwise dinosaur-dominated locality.



A view of Central Sayr, Nemegt, Mongolia, to the north, with the skull of a mountain sheep for scale. Late Cretaceous dinosaurs occur in this locality. Photo: Tetsuto Miyashita.



The Mars Desert Research Station, a Mars-simulation campus set in a Martian planetary analogue in southern Utah. Photo: Paul Sokoloff.

VASCULAR PLANT AND LICHEN BIODIVERSITY SURROUNDING THE MARS DESERT RESEARCH STATION, UTAH

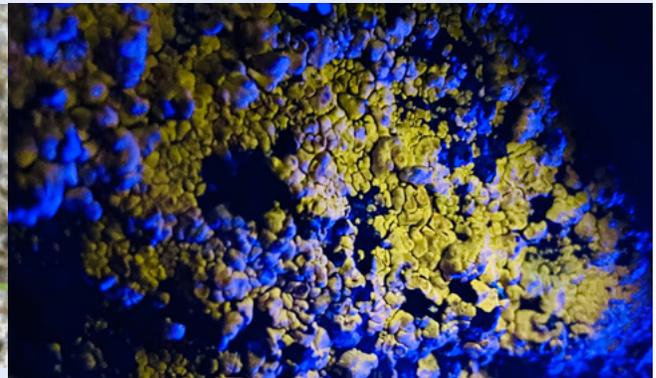
Locality: near Hanksville, Utah | Principal Investigator: Paul Sokoloff

From June 3 to 10, 2024, the fourth and final iteration of the Martian Biology program documented the environment of the Mars Desert Research Station, continuing a series of missions that began in 2019. This program is a Mars Society-sponsored non-simulation effort to improve our understanding of this unique desert region's ecology. Paul Sokoloff (senior research assistant in the museum's botany section) and Dr. Shannon Rupert (director emeritus of the Mars Desert Research Station) co-lead the team, which included specialists from the University of Chicago, University of California Irvine, and Rockefeller University.

This project aimed to understand the ecology of the Mars Desert Research Station and its surrounding area, and to continue the team's ongoing effort to catalogue the vascular plant biodiversity of the station. The crew collected 80 vascular plant specimens, including recollections of species previously documented for the area—which help document the continued existence of a population or fluctuations within a species through time—and species newly encountered within the study region. Additionally, the research team subsampled leaf tissue from each specimen for high-quality DNA preservation. These samples will be curated in the museum's National Biodiversity Cryobank of Canada and available for future genomics projects.



Spotted locoweed (*Astragalus lentiginosus*), one of several plant taxa documented in 2024 at the Mars Desert Research Station. Photo: Paul Sokoloff.



The deserts surrounding the Mars Desert Research Station are home to numerous lichen species, such as the Yellow Cobblestone Lichen, which fluoresces bright yellow under ultraviolet light. Photo: Paul Sokoloff.

COMMUNICATING RESEARCH RESULTS

PEER-REVIEWED PUBLICATIONS

In 2024-25, the museum's scientific staff authored or co-authored 56 peer-reviewed articles focused on a variety of topics related to biological and geological diversity, as listed in Appendix 2. Museum research associates authored or co-authored 29 peer-reviewed articles, as listed in Appendix 3.

SUMMARIES OF SELECTED ARTICLES AUTHORED BY MUSEUM STAFF AND RESEARCH ASSOCIATES

MINERALOGY

MONT SAINT-HILAIRE: A NATIONAL TREASURE: A NEW EXHIBIT AT THE CANADIAN MUSEUM OF NATURE.

Piilonen, P.C. and **I. Lykova.** 2024.

Rocks & Minerals 99: 530–543.

<https://doi.org/10.1080/00357529.2024.2377001>

Mont Saint-Hilaire in Quebec, Canada, is renowned among mineral collectors and scientists for its rich diversity of minerals. Over 440 mineral species have been discovered at the locality. Due to its unique geology and evolution, it is one of the most mineralogically diverse sites in the world.

Mont Saint-Hilaire and the Canadian Museum of Nature have a long-standing association. Many of the museum's mineralogy staff over the last four decades have studied Mont Saint-Hilaire minerals. Together with collaborators, they have described 37 new minerals from the locality. Museum mineralogists co-authored a comprehensive book on the history, geology, and mineralogy of Mont Saint-Hilaire in 2019. Gilles Haineault, a collector from Saint-Mathieu-de-Beloeil, Quebec, built the finest collection of minerals from Mont Saint-Hilaire, including many rare specimens. His collection has been invaluable for research, and specimens he collected are curated in many private and institutional collections—including the Canadian Museum of Nature. In 2019, the museum added 2,400 specimens from the Haineault collection to the museum's national mineral collection and 5,500 specimens to the locality and research collections.



One of many drawers of research material from the Haineault collection, now in the museum's national mineral collection. Photo: CMN. Source: Piilonen and Lykova (2024).



Carletonite (9 cm × 6 cm × 4.5 cm) from Mont Saint-Hilaire (CMNMC 87519). Photo: Gilles Haineault. Source: Piilonen and Lykova (2024).

In 2024, the museum opened a new, permanent exhibit showcasing the Mont Saint-Hilaire collection. **In this paper, Museum Research Scientists Dr. Paula Piilonen and Dr. Inna Lykova provide an overview of this new exhibit, highlighting many of the remarkable mineral specimens that are now on public display.**



Pyrophanite and aegirine (5 cm × 3 cm × 1.5 cm) from Mont Saint-Hilaire (CMNMC 87529). Photo: Gilles Haieault. Source: Piilonen and Lykova (2024).



The main, permanent display case in the Mont Saint-Hilaire exhibit at the Canadian Museum of Nature in Ottawa, Ont. Photo: Canadian Museum of Nature.



The new Mont Saint-Hilaire exhibit at the Canadian Museum of Nature in Ottawa, Ont. Photo: Canadian Museum of Nature.

THE FIRST (AND SECOND) KNOWN OCCURRENCES OF BAZZITE IN CANADA—THE QUADEVILLE ROSE QUARTZ QUARRY, ONTARIO, AND THE BUGABOO CASTLES AQUAMARINE DEPOSIT, BRITISH COLUMBIA—DESCRIPTION AND CRYSTAL STRUCTURE.

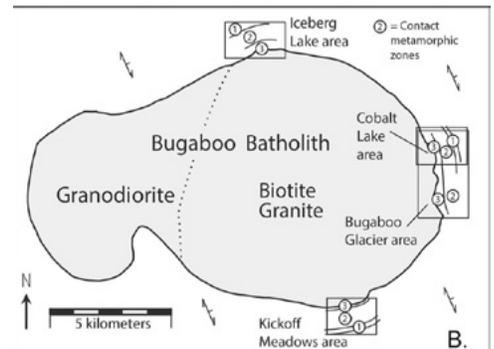
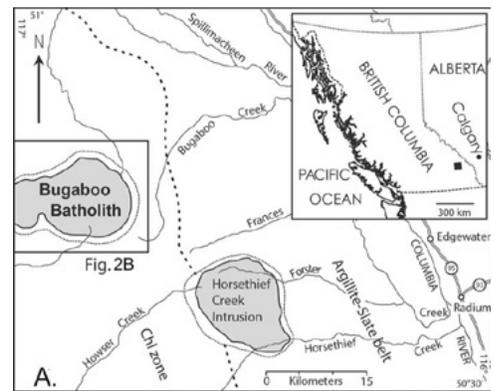
Piilonen, P.C., R. Rowe, G. Poirier, H. Friis, C. Robak and M. Bainbridge. 2024.

The Canadian Journal of Mineralogy and Petrology 62: 457–478. <https://doi.org/10.3749/2300035>

As part of a larger field-based mineralogy research program in British Columbia, museum mineralogists spent a week at the Bugaboo Castles beryl var. aquamarine deposit in the Bugaboo Batholith, Purcell Mountains. The purpose of the work was to document and describe the mineralogy, crystal chemistry, and conditions of the formation of the gem pegmatite deposit. **This paper documents the discovery, crystal chemistry and paragenesis of the rare mineral bazzite, the Sc-dominant analogue of beryl, at Bugaboo Castles and at a genetically similar gem pegmatite, the Quadeville Rose Quartz quarry in Ontario.**

This is the first time bazzite has been described from Canada. The research team compared the crystal chemistry and structure of their two samples and compared them with bazzite from known international occurrences. The bazzite samples from both Canadian pegmatite localities have low aluminum (Al), manganese (Mn), calcium (Ca), and cesium (Cs) contents and are compositionally more similar to bazzite from alpine fissures and orogenic pegmatites than that from more common anorogenic NYF pegmatites.

Bazzite is a late-stage mineral, the product of the breakdown of beryl and/or bertrandite and a scandium(Sc)-bearing mineral. It is one of only 22 minerals known to contain essential Sc, an element in high demand in the aerospace and automotive industry. The processes that mobilize and concentrate Sc to form bazzite and other Sc species are poorly understood. This study helps to shed light on these processes. At both Bugaboo Castles and the Rose Quartz quarry, researchers believe that Sc-OH and Be-OH complexes in the late-stage fluids are responsible for the mobilization of Sc from precursor phases, including Sc-enriched spessartine garnet, augite, and columbite-tantalite group minerals.



Location of the Bugaboo Batholith in southeastern British Columbia, Canada. Source: Piilonen et al. (2024).



Colourless, prismatic crystals of bazzite from the Quadeville Rose Quartz pegmatite. Associated phases include blocky, colourless, vitreous bertrandite, orange-brown clay with hematite, and micaceous black hematite. Field of view 1.25 mm. Source: Piilonen et al. (2024).

***ISOETES SALISHENSIS*, SP. NOV. (ISOETACEAE - LYCOPODIOPSIDA), AN ENDEMIC QUILLWORT OF COASTAL BRITISH COLUMBIA, CANADA.**

Brunton, D.F. and **P.C. Sokoloff**. 2024.

American Fern Journal 114: 111-126. <https://doi.org/10.1640/0002-8444-114.2.111>

DISCOVERY OF AN EXTANT POPULATION OF *ISOETES SALISHENSIS*.

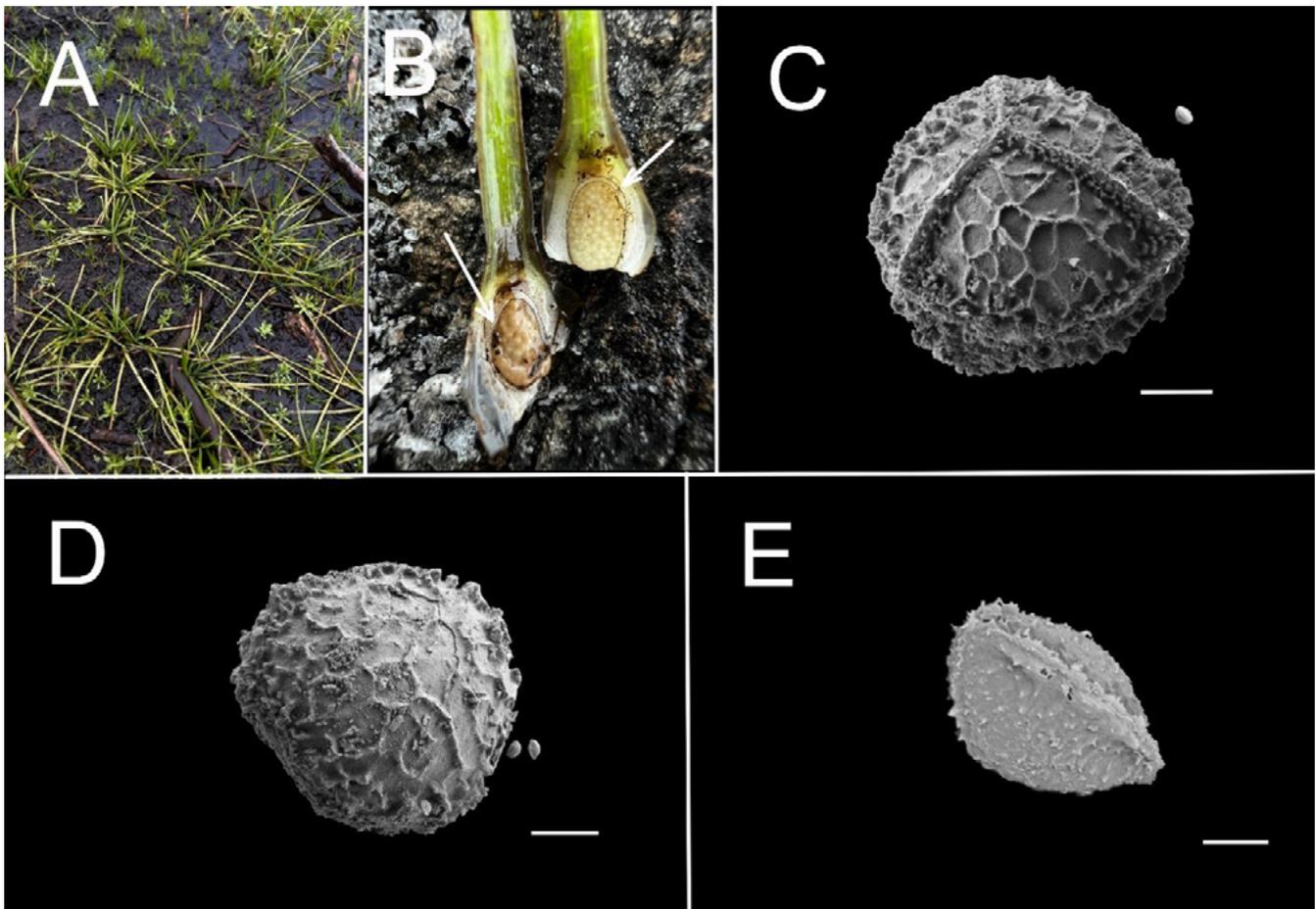
Brunton, D.F., R. Batten and **P.C. Sokoloff**. 2025.

American Fern Journal 115: 74-76. <https://doi.org/10.1640/0002-8444-115.1.74>

Isoetes, commonly known as quillworts, is the only living genus in the plant family Isoetaceae. Scientists have identified approximately 200 species of *Isoetes* worldwide, with 13 found in Canada. Species of *Isoetes* occur mostly in aquatic habitats, and many of them are rare and vulnerable to habitat destruction.

Museum Research Associate Daniel Brunton and Paul Sokoloff, a senior research assistant in the museum's botany section, recently described the new species *Isoetes salishensis* (Salish quillwort), from coastal British Columbia. A unique combination of uncommon morphological features, restricted geographic range, rare habitat, and early growth season distinguishes the new species from all known species of *Isoetes*. At the time of its description, the researchers knew the species only from historical collections gathered in 1977 and 1979 on Mitlenatch Island, in the Salish Sea between Vancouver Island and mainland Canada near Campbell River, B.C. Since then, despite repeated searches, researchers have not found any *Isoetes* plants there. As a result, the species met the International Union for Conservation of Nature (IUCN) criteria to be classified as Extinct.

Brunton et al. (2025) reported the discovery of a small, extant population of *I. salishensis* on Lasqueti Island, B.C., 82 kms (straight line) south-southeast of the Mitlenatch Island population, soon after publishing the new species. Including this new species, scientists know seven species of *Isoetes* to occur in British Columbia and 14 in Canada. *Isoetes salishensis* is one of several endemic plant and animal species found in the Salish Sea region of southwestern British Columbia and northwestern Washington State. Given its rarity, *I. salishensis* is of conservation concern. The discovery that it remains extant on the Pacific Coast of North America presents an incentive for field botanists to search for other extant populations to improve our understanding of its distribution, its biology, and any threats to its persistence.



Isoetes salishensis growing on Lasqueti Island, B.C. (A) Emergent mature plants in an open rock pool. (B) Inner face of two leaves showing narrow (c. 9%) velum coverage (arrows) over the sporangium. (C-E) Megaspores showing different types of ornamentation; scale bars = 100 μm . Photos: A, B, R. Batten; C-E, P. Sokoloff & D.F. Brunton. Source: Brunton et al. (2025).

KELP FOREST COMMUNITY STRUCTURE AND DEMOGRAPHY IN KONGSFJORDEN (SVALBARD) ACROSS 25 YEARS OF ARCTIC WARMING.

Düsedau, L., S. Fredriksen, M. Brand, P. Fischer, U. Karsten, K. Bischof, **A. Savoie** and I. Bartsch. 2024.

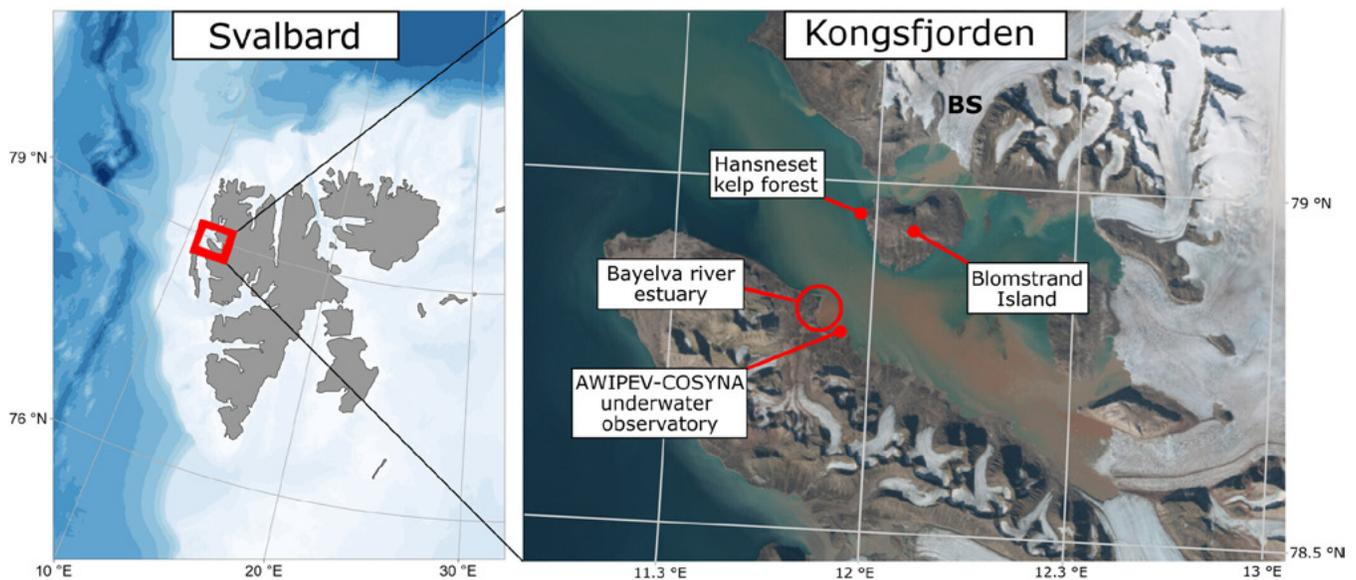
Ecology and Evolution 14: e11606. <https://doi.org/10.1002/ece3.11606>

Underwater forests, found along coastlines around the world, consist mainly of large, leafy brown seaweeds called kelps. These kelps are especially common in cooler regions, from temperate to polar areas. Kelp forests play a crucial role in producing food and oxygen, capturing carbon, and supporting coastal biodiversity. Environmental factors like sea ice and low light in the Arctic affect their growth, and due to global climate change, the Arctic Ocean is warming much faster than the rest of the world, leading to shrinking sea ice and longer open water periods.

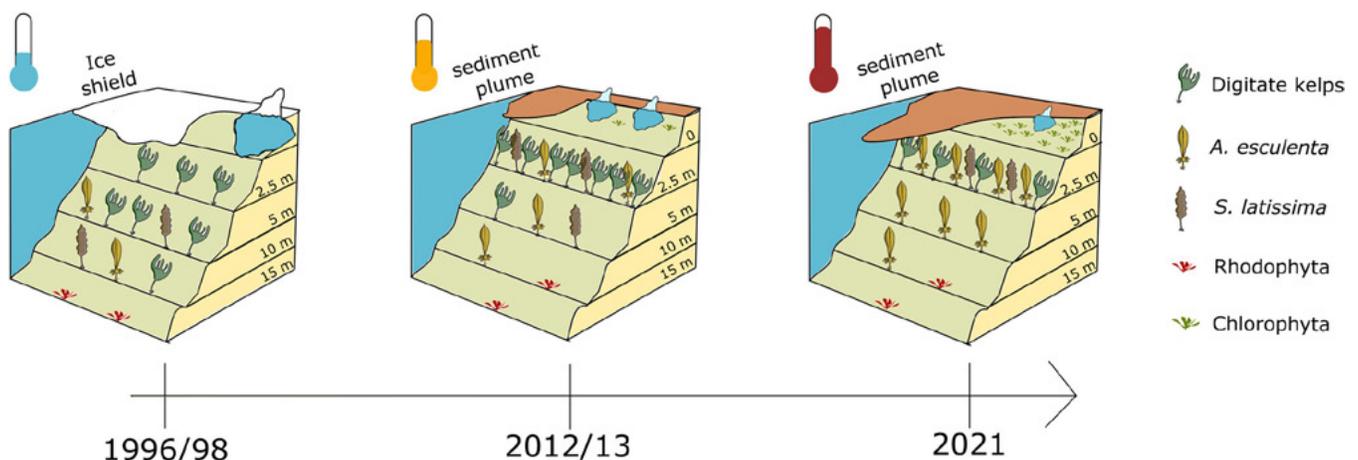
In this study, a team of researchers—including Museum Research Scientist Dr. Amanda Savoie—examined kelp forests in Kongsfjorden, Svalbard, over a 25-year period (1996–2021) to understand how they have changed in response to warming temperatures and melting glaciers. They discovered that the species composition of the kelp forests has changed. They also found that deeper parts of the kelp forest are shrinking, with fewer brown algae found at greater depths now

compared to the past. This is probably because these kelp species aren't getting enough light due to murky water from melting glaciers. However, the kelp forest biomass has increased, consistent with predictions that warming temperatures would lead to increased kelp growth.

The researchers suggest that in Arctic fiords with a lot of sediment flow into the water from melting glaciers, kelp forests will keep getting shallower because the water is getting darker, making it harder for kelp to grow in deeper areas. The loss of ice in the Arctic is changing underwater ecosystems like kelp forests in complex ways, and the long-term impact of these changes on marine ecosystems remains uncertain. This research is relevant to understanding marine ecosystems in the Canadian Arctic, where similar warming and glacial melt are occurring, and where we understand little about the long-term dynamics of kelp forests in the context of climate change.



Location of the kelp-forest study sites on Svalbard. Source: Düsedau et al. (2024), available under a Creative Commons Attribution 4.0 International license.



Shift in kelp forest biomass and depth distribution over 25 years of Arctic warming at a study site in Kongsfjorden, Svalbard. The habitat for kelp communities along Arctic fiord systems declines as the increase in glacial melt intensifies the phenomenon of coastal darkening, which prevents the depth extension of key kelp species despite elongation of the open water period. Source: Düsedau et al. (2024), available under a Creative Commons Attribution 4.0 International license.

MI'KMAW KNOWLEDGE HELPS UNCOVER A NEW AREA OF INTERESTING LICHEN BIODIVERSITY ON THE ISLAND OF NEWFOUNDLAND (KTAQMKUK).

Gillingham, D., J. Hodge, F. Skeard, C. Hanel, Y.F. Wiersma, A. Arsenault, K.E. Driscoll, H.A. Paquette and **R.T. McMullin**. 2024.

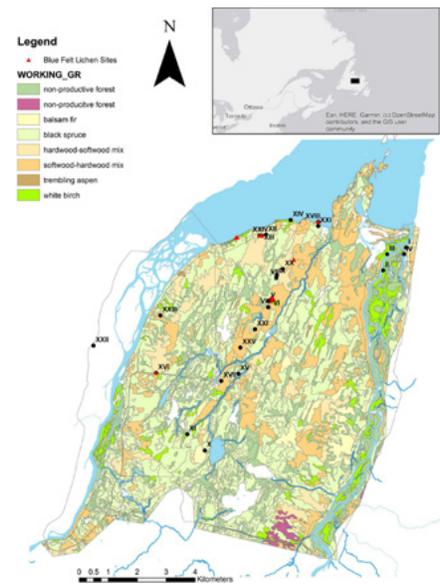
The Bryologist 127: 249–268.

<https://doi.org/10.1639/0007-2745-127.2.249>

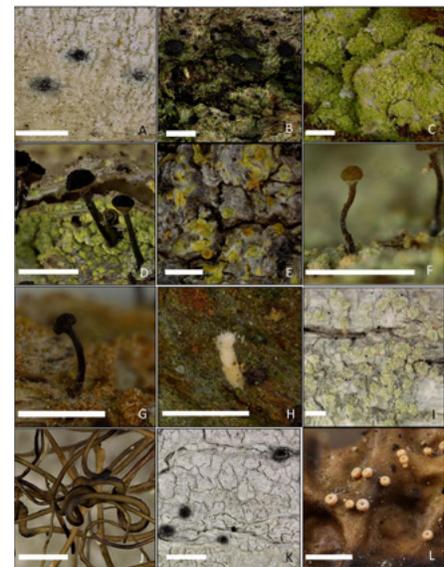
The island of Newfoundland, Canada, is known as an area with high lichen species richness; however, most of this diversity comes from coastal regions, where the ocean creates a maritime climate. The central part of the island has a more continental climate and is also the part of the province with the highest levels of industrial forest harvest and mining activities. For these reasons, it has not been an area considered to have high lichen diversity.

In this study, a team of researchers—including Museum Research Scientist Dr. Troy McMullin—demonstrated how local Mi'kmaq knowledge, in collaboration with Western scientific expertise, supported a Two-Eyed Seeing approach (Etuaptmumk) that led to the discovery of previously overlooked lichen diversity in central Newfoundland. Their surveys throughout 2023 yielded collections of 175 species of lichenized fungi and lichenicolous and allied fungi from an area known as Charlie's Place. A high proportion of the species are cyanolichens and calicioids, groups of lichens that indicate high ecological value and potential old growth/ancient forest status. The researchers also report 19 new species records for the province, two of which are new records for Canada. The study suggests that Charlie's Place should be a priority area for protection within the context of Central Newfoundland.

This work illustrates the value of research under the framework of Etuaptmumk and the benefits of combining Indigenous and Western scientific knowledge. The political, logistical, and financial support of Qalipu First Nation was key to the success of this work.



Map of the study area, known as Charlie's Place (~120 km² on the island of Newfoundland), where Troy McMullin and colleagues studied lichen diversity. Roman numerals correspond to survey locations. Source: Gillingham et al. (2024), available under a [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/) license.



New and notable species to Newfoundland and Labrador found in Charlie's Place. (A) *Arthopyrenia fallaciosa*, (B) *Bacidia schweinitzii*, (C) *Biatora pontica*, (D) *Calicium viride* (not seen in the province since the 1890s), (E) *Caloplaca chrysophthalma*, (F) *Chaenotheca stemonea*, (G) *Chaenothecopsis vainioana* (first report for Canada), (H) *Dictyocatenuata alba*, (I) *Ochrolechia gowardii* (first report for the island part of the province), (J) *Raesaenaria huuskonenii*, (K) *Stictis urceolatum*, (L) *Nectriopsis lecanodes*. White bar in all images = 1 mm, except in H = 0.5 mm. Source: Gillingham et al. (2024), available under a [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/) license.

**A NEW MARINE DIATOM (BACILLARIOPHYCEAE) SPECIES-
HALAMPHORA LOMBOKENSIS SP. NOV. AND THE FIRST
OBSERVATION FOR *H. BANZUENSIS* FROM KUTA BEACH
LOMBOK, WEST NUSA TENGGARA, INDONESIA.**

Pane, E.P., Y. Risjani, **P.B. Hamilton**, C.N. Solak, Y. Yunianta, N. Ertorun and E. Yilmaz. 2024.

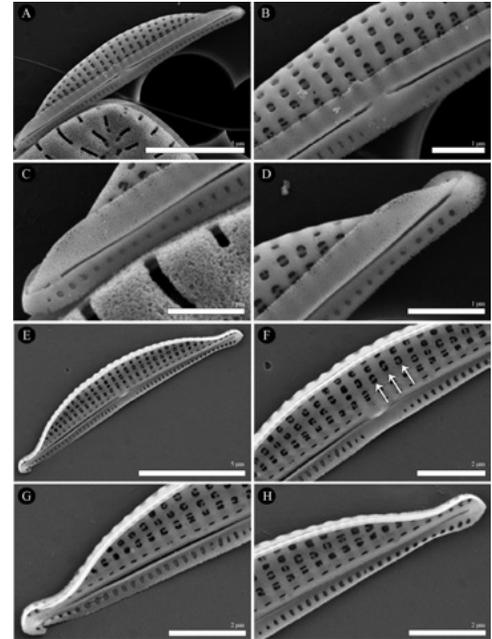
PhytoKeys 250: 165-179.

<https://doi.org/10.3897/phytokeys.250.132304>

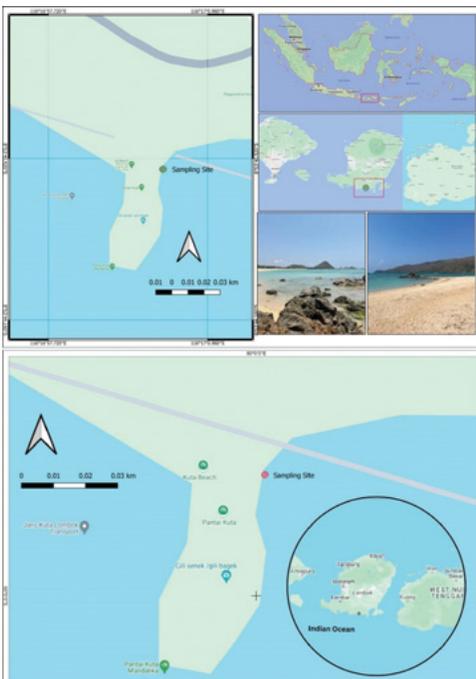
Diatoms are unicellular algae that play a crucial role in ecosystems. They are responsible for about half of global ocean photosynthesis, produce 50% of our oxygen, and serve as food for organisms like zooplankton, molluscs, and fish. Despite the ecological importance of diatoms, we still have much to learn about their biodiversity.

In this study, a team of researchers, including Paul Hamilton, a phycologist at the museum, described a new species of *Halamphora*, a globally distributed genus of marine and freshwater diatoms with more than 150 accepted species.

They discovered the new species on the island of Lombok in Indonesia in highly saline sandy environments. They named the new species for the Island of Lombok, where they found it. The authors deposited the holotype slide and material in the museum's globally important algae collection.



Scanning electron micrographs of the type specimen of the new diatom species *Halamphora lombokensis*. Scale bars: 5 μm (A, E); 2 μm (F-H); 1 μm (B-D). Source: Pane et al. (2024), available under the terms of the CC0 Public Domain Dedication.



A sampling site in Kuta Beach, Lombok Island, Indonesia, where researchers discovered the new diatom species *Halamphora lombokensis*. Source: Pane et al. (2024), available under the terms of the CC0 Public Domain Dedication.

FIRST RECORDS OF TALL BEECH FERN, *PHEGOPTERIS EXCELSIOR* N. PATEL & A.V. GILMAN (THELYPTERIDACEAE), FOR ONTARIO AND PRINCE EDWARD ISLAND.

Chapman-Lam, C., P.C. Sokoloff, J. Klymk and L. O'Connor. 2023 [2024].

Specimen 29. <https://doi.org/10.56222/28166531.2024.29>

BRANCHING BURREED (*SPARGANIUM ANDROCLADUM* (ENGELMANN) MORONG; TYPHACEAE) REDISCOVERED IN ONTARIO, BUT CONSERVATION STATUS UNCLEAR.

Chapman-Lam, C.J. and P.C. Sokoloff. 2024.

Canadian Field-Naturalist 137: 351-357. <https://doi.org/10.22621/cfn.v137i4.3151>

In these studies, Colin Chapman-Lam, a research associate with the museum, and Paul Sokoloff, a senior research assistant in the museum's botany section, uncovered new botanical records for Ontario and Prince Edward Island based largely on targeted fieldwork within the City of Ottawa.

The first study announces the first recorded occurrences of Tall Beech Fern (*Phegopteris excelsior*) in Ontario and Prince Edward Island. Experts have only recognized this fern species as distinct from two common, closely related ferns since the 1970s, with a formal description dating to 2019. The second study highlights three new records of Branching Burreed (*Sparganium androcladum*) in Ontario, which researchers had not collected in the province since 1973.

Both publications highlight the importance of continuing botanical investigations, even in urban areas where experts understand the flora well. These studies remind us that we can make interesting floristic discoveries right in our backyards.



Branching Burreed (*Sparganium androcladum*) along the Ottawa River. Photo: Paul Sokoloff.

INVERTEBRATES

A NEW SPECIES OF *EUPHOLUS* BOISDUVAL, 1835 FROM INDONESIAN NEW GUINEA WITH NOTES ON THE TAXONOMY OF THE GENUS (COLEOPTERA, CURCULIONIDAE).

Bollino, M. and **R.S. Anderson**. 2024.

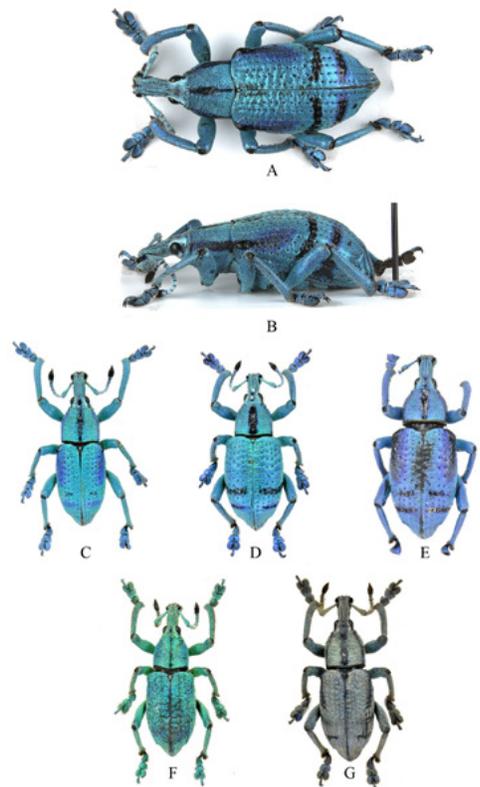
Zootaxa 5443: 431–445.

<https://doi.org/10.11646/zootaxa.5443.3.7>

Beetles play vital roles in ecosystems, such as decomposing organic matter, pollinating plants, and controlling pest populations. Studying beetles helps us appreciate biodiversity and prevent the spread of invasive species that can harm native ecosystems and economies.

Eupholus is a genus of weevils that includes some of the planet's most brightly coloured beetles. Researchers suspect that their striking colour serves as a warning to predators. The genus contains approximately 70 species, which all occur on New Guinea and neighbouring islands. Researchers have discovered about half of the known species during the last 30 years.

In this study, Museum Research Scientist Dr. Robert Anderson and his Italian colleague described another new species of *Eupholus*, from the Indonesian part of New Guinea. They deposited material of the new species in the museum's globally important beetle collection. Like other species of the genus, the new species is striking in appearance, with most individuals being a brilliant blue green. The authors observed considerable variability in the species, both among populations and within the same populations. For example, specimens from the Star Mountains exhibit an unusual grey colouration of the scales.



Specimens of *Eupholus sulisi*, a new species of weevil. The specimen pictured in A and B is deposited in the museum's beetle collection. Source: Bollino and Anderson (2024).

INTRODUCED AND INVASIVE *PTOMAPHAGUS MEDIUS* (REY) AND NATIVE *PTOMAPHAGUS BREVIOR* JEANNEL AND *PTOMAPHAGUS ULKEI* HORN IN ONTARIO AND QUEBEC, CANADA (COLEOPTERA: LEIODIDAE: CHOLEVINAE: PTOMAPHAGINI).

Peck, S.B., F. Génier and J. Cook. 2024.

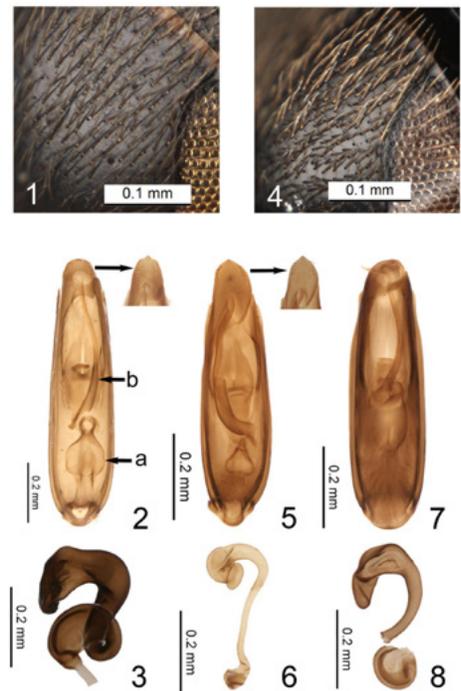
The Coleopterists Bulletin 78: 353–360.

<https://doi.org/10.1649/0010-065x-78.3.353>

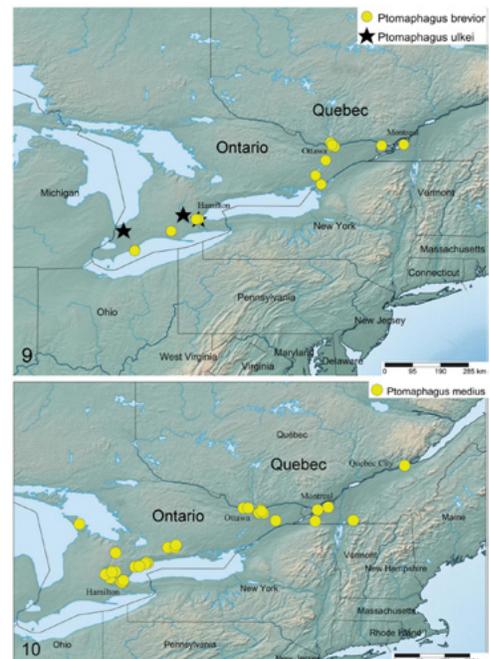
Researchers have recorded nearly 700 introduced beetle species in Canada, some of which pose significant threats to agriculture, forestry, and natural ecosystems. **This study, by Dr. Stewart Peck, a research associate with the museum, François Génier, collection manager of the museum’s insect collection, and Joyce Cook, provides new information about *Ptomaphagus medius*, a European species that occurs in Ontario and Quebec.** The study also reports the first records from Canada and Ontario for *Ptomaphagus ulkei*, a native North American species previously known from the southeastern USA and north to central New York state. *Ptomaphagus* contains about 50 described species of small carrion beetles.

The authors reviewed specimens held in several collections, including the museum’s beetle collection. Researchers first confirmed the presence of *P. medius* in southern Ontario in 2020, based on genetic data that distinguished it from the morphologically similar native species *Ptomaphagus breviar*. The earliest record in Canada dates to 1963, from Hamilton, Ont. This study expands the known distribution of *P. medius* in Canada from southern Ontario to the City of Québec, some 1,070 km eastwards.

Ptomaphagus medius has no known agricultural, forestry, or economic importance in Canada, but it may harm natural ecosystems. Habitat data suggest that *P. medius* mostly occurs in human-altered environments, but records indicate its presence in Ontario forests, potentially indicating active displacement of *P. breviar*. We need more research to understand whether the introduced species is displacing the native one.



Diagnostic morphological characters of *Ptomaphagus* species. (1-3) *Ptomaphagus breviar*, (4-6) *Ptomaphagus medius*, (7-8) *Ptomaphagus ulkei*. Source: Peck et al. (2024).



Distribution of *Ptomaphagus* species in Canada. (Top) The native species *Ptomaphagus ulkei* and *Ptomaphagus breviar*. (Bottom) The introduced species *P. medius*. Source: Peck et al. (2024).

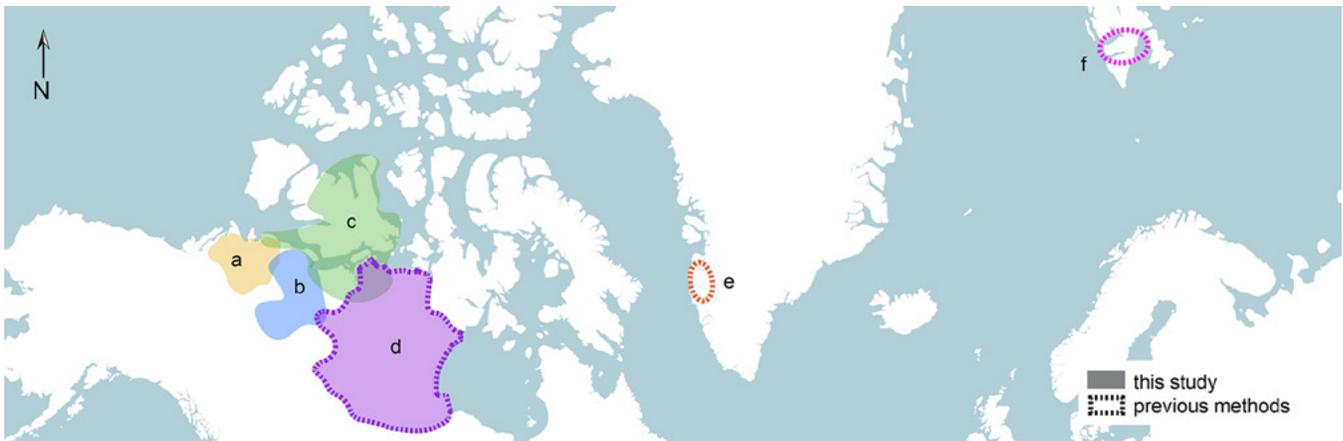
ASSESSING CURRENT VISUAL TOOTH WEAR AGE ESTIMATION METHODS FOR *RANGIFER TARANDUS* USING A KNOWN AGE SAMPLE FROM CANADA.

Kohut, G., R. Losey, S. Kutz, **K. Khidas** and T. Nomokonova. 2024.

PLOS ONE 19: e0301408. <https://doi.org/10.1371/journal.pone.0301408>

Estimating the age of animals is important for understanding their population dynamics. One common aging method is to look at tooth wear and eruption, which is non-destructive, can use photos, and does not require special training. Researchers use this approach for many species, including caribou (*Rangifer tarandus*), whose remains archaeologists find in abundance at archaeological sites beginning in the Late Pleistocene.

In this study, a Canadian research team, including Dr. Kamal Khidas, curator of the museum’s vertebrate collection, reviewed the practicality and effectiveness of three tooth wear and eruption methods developed for caribou (*Rangifer tarandus*). The study used, in part, a sample of 153 caribou mandibles from several herds in northern Canada collected by the Canadian Wildlife Services between 1966 and 1968, from individuals of known age. The museum curates these mandible specimens in its vertebrate zoology collection. The study found that all three methods have varying errors and biases, especially for older caribou. The authors suggest that additional refinement of tooth wear and eruption aging methods would benefit archaeological research on human use of reindeer and caribou in the past.



Geographic distributions of caribou and reindeer populations discussed in the study. (A) Bluenose West and (B) Bluenose East caribou herds, (C) Dolphin-Union caribou, (D) Qamanirjuaq and Beverly caribou herds, (E) Sisimiut caribou, and (F) Svalbard (Nordenskiöld Land) reindeer. Source: Kohut et al. (2024), available under a [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/) license.



Peary Caribou, unknown location and date.
Photo: Stewart D. MacDonald.

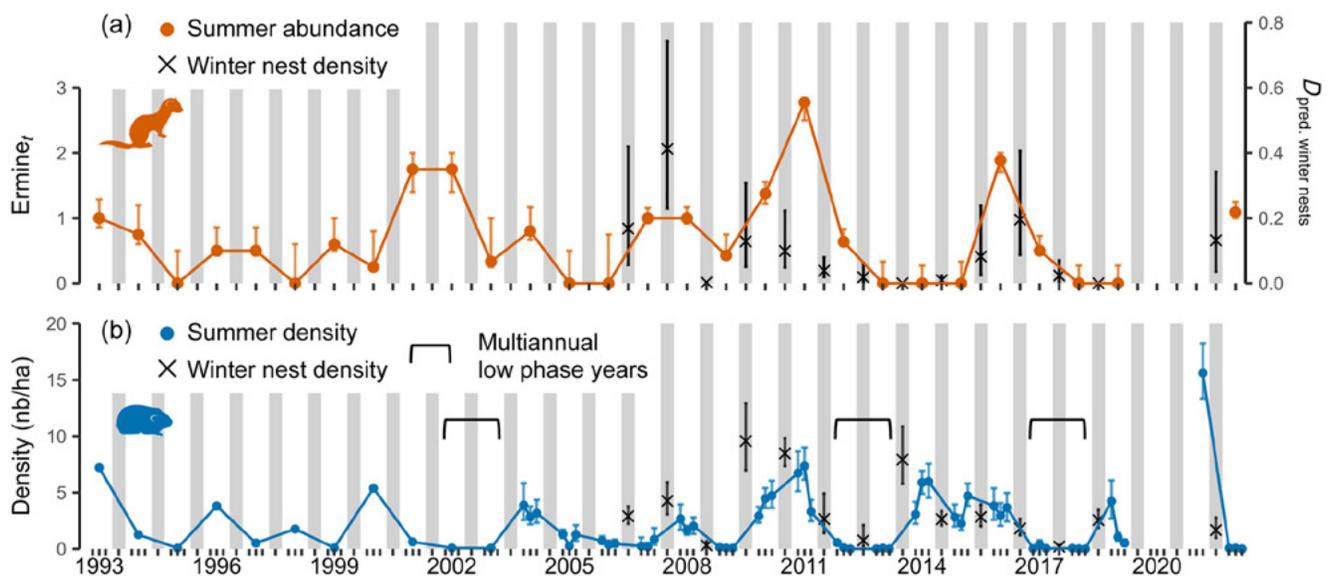
SEASONAL ROLE OF A SPECIALIST PREDATOR IN RODENT CYCLES: ERMINE-LEMMING INTERACTIONS IN THE HIGH ARCTIC.

Bolduc, D., D. Fauteux, G. Gauthier and P. Legagneux. 2025.

Ecology 106: e4512. <https://doi.org/10.1002/ecy.4512>

Scientists are still trying to understand why animal populations go through cycles of increase and decrease. One hypothesis suggests that predators like small mustelids (e.g., ermines) cause rodent cycles by responding to prey numbers with about a one-year delay. **In this study, a research team, including Museum Research Scientist Dr. Dominique Fauteux, studied ermine interactions with brown lemmings and collared lemmings in the High Arctic over many years.**

The researchers analyzed long-term monitoring data from Bylot Island, Nunavut, and found that ermines' response to lemming populations lags by one year. Their impact on lemming growth rate is small and mainly in winter. Simulations suggest that ermines do not cause rodent cycles but may prolong their duration by delaying lemming population recovery, making the cycles last longer. The study supports the idea that as lemming populations become more crowded, density-related factors lead to decreased growth. However, the delayed response of predators, such as ermines, can prolong low phases, leading to cycles of three to five years.



Seasonal time series of ermine and lemming abundance on Bylot Island, Nunavut. Shaded area represents winter. (a) Ermine relative abundance index (solid line, orange dots) in summer and density of lemming winter nests with signs of ermine predation (black crosses) and their 95% confidence intervals. (b) Habitat-weighted summer lemming density (solid line, blue dots) and density of all winter nests (grey crosses) with their 95% confidence intervals when available. Source: Bolduc et al. (2025), available under a Creative Commons Attribution 4.0 International license.



Ermine (*Mustela erminea*) in Agguttinni Territorial Park, Baffin Island, Nunavut. Photo: Geoff Levin.

FOSSILS

ESTIMATION OF MAXIMUM BODY SIZE IN FOSSIL SPECIES: A CASE STUDY USING *TYRANNOSAURUS REX*.

Mallon, J.C. and D.W.E. Hone. 2024.

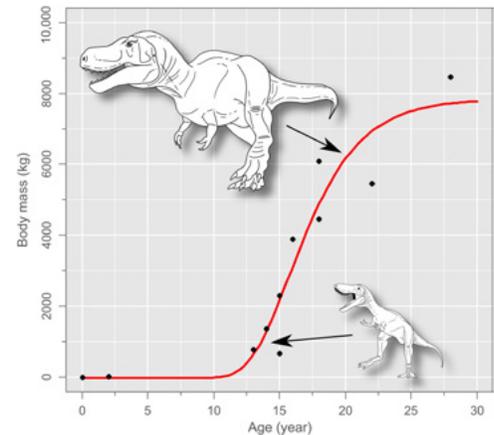
Ecology and Evolution 14: e11658.

<https://doi.org/10.1002/ece3.11658>.

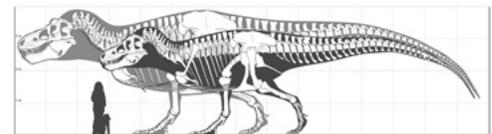
Correction: <https://doi.org/10.1002/ece3.70258>

Dinosaurs were the largest animals to have walked the earth, and people often wonder which one was the biggest. Identifying the largest dinosaur discovered is more straightforward than determining the largest one that existed. For example, palaeontologists have only discovered a minuscule fraction of the estimated 2.5 billion *Tyrannosaurus rex* individuals that lived during the ~2.4-million-year span of the species' existence. This makes it extremely unlikely that the largest one both fossilized and that palaeontologists subsequently discovered it. Knowing the maximum body size of a species helps us understand its ecological role and how natural selection might have influenced its size.

In this study, Museum Research Scientist Dr. Jordan Mallon and his colleague used *T. rex* as a model to assess the likelihood that researchers have sampled the largest examples of fossil species, to provide context on how patchy sampling impacts our understanding of the maximum size of fossil species. The results of their model indicate that researchers have likely sampled the 99th percentile of body mass in *T. rex*. They estimated that the largest *T. rex* may have weighed about 15,000 kg, which is about 70% heavier than the largest known *T. rex*, “Scotty,” curated at the Royal Saskatchewan Museum. They further estimated that a *T. rex* weighing 15,000 kg would have exceeded 15 m long, about 3 m longer than the Field Museum’s “Sue,” one of the largest and most complete *T. rex* specimens. They argue that researchers should base body size comparisons of fossil species on the different stages of an organism’s development, rather than comparing the largest known individuals, whose recovery is subject to sampling intensity.



Modelled growth curve for *Tyrannosaurus rex*. Illustrations are not to scale. Source: Mallon and Hone (2024), available under a [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/).



Comparison of FMNH PR 2081 (“Sue”) in the foreground, among the world’s largest known *Tyrannosaurus rex*, to the estimated largest-possible *T. rex* in the background. Human with dog silhouette for scale. Source: Correction to Mallon and Hone (2024), <https://doi.org/10.1002/ece3.70258a>, available under a [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/).

FUNCTIONAL STASIS AND CHANGING HABITAT PREFERENCES AMONG MAMMALIAN COMMUNITIES FROM THE PETM OF THE BIGHORN BASIN, WYOMING.

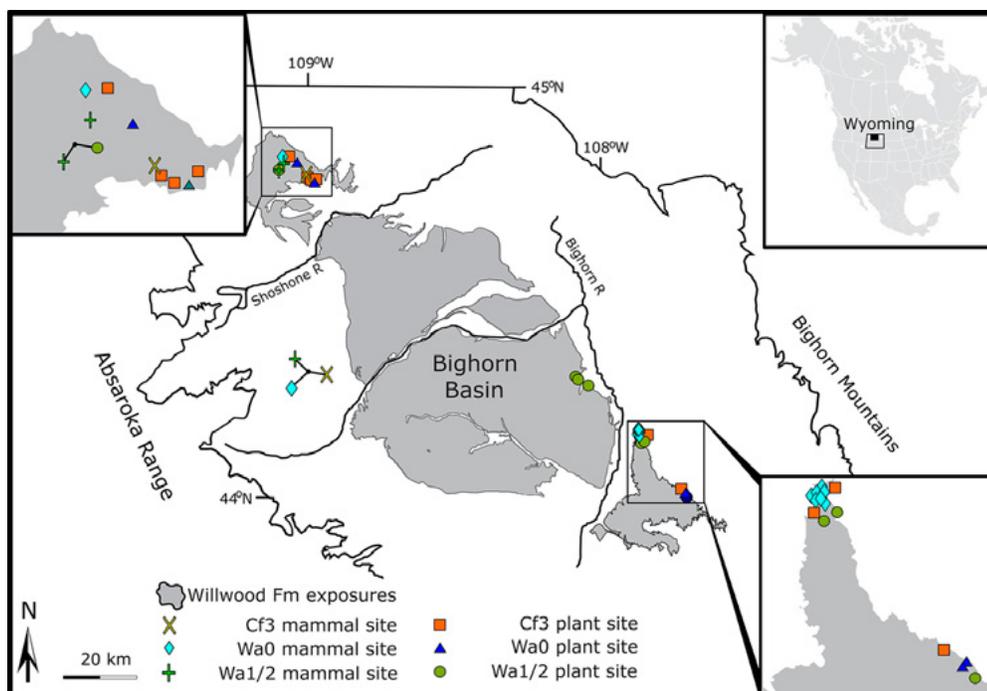
Whittingham, M.A.J.B., V.A. Korasidis and **D. Fraser**. 2024.

Cambridge Prisms: Extinction 2: e20. <https://doi.org/10.1017/ext.2024.25>

Human-caused climate change has led to big changes in species composition, often making ecosystems more like each other and resulting in a decrease in the variety of roles that species play in ecosystems. Because studies of living organisms usually cover only short periods, it's hard to see the full effects of human-caused disturbances. But by looking at the fossil record, scientists can study how ecosystems responded to similar changes in the distant past.

About 56 million years ago, Earth experienced a sudden and intense warming event called the Paleocene-Eocene Thermal Maximum (PETM). Global temperatures rose by 5 to 8° C. This warming caused big changes in the composition of plant and mammal communities in North America, including the arrival of Eurasian species. Studying this period can help us understand how today's ecosystems might respond to ongoing climate change.

In this study, a research team, including Carleton University graduate student Misha Whittingham (now Dr. M. Whittingham) and Museum Research Scientist Dr. Danielle Fraser, explored the ecological impacts of this phenomenon. They analyzed 173 mammal species from Bighorn Basin in Wyoming, USA, using fossil pollen data to understand their habitats. Bighorn Basin holds some of the best fossil evidence of the PETM. The results show that in the aftermath of climate change and the introduction of immigrant animals, habitat preferences broadened within communities and narrowed between communities. The findings are similar to observations of other modern and fossil range-shift events and may help to predict and understand how mammalian communities respond to climate change in the absence of humans.



Map of the Bighorn Basin in Wyoming showing the locations of pollen- and mammal-bearing sites used in this study. Source: Whittingham et al. (2024), available under a [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/).

A NEW CROCODYLIMORPH (PSEUDOSUCHIA, CROCODYLIMORPHA) FROM THE UPPER TRIASSIC OF TEXAS AND ITS PHYLOGENETIC RELATIONSHIPS.

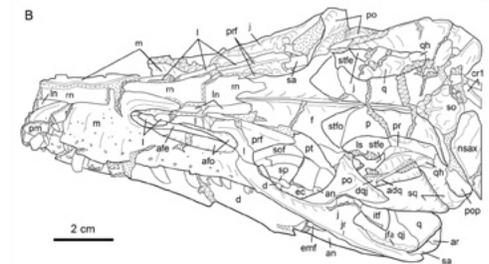
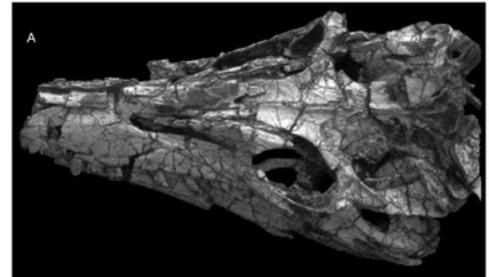
Wu, X.-C., L.M. Witmer, S. Chatterjee and D. Cunningham. 2025.

Journal of Vertebrate Paleontology. <https://doi.org/10.1080/02724634.2024.2446604>

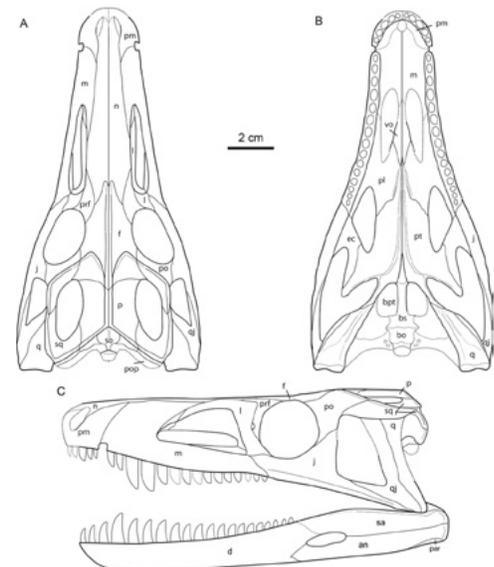
Non-crocodyliform crocodylomorphs are ancient relatives of modern crocodiles that lived before true crocodiles (Crocodyliformes) appeared. They are the earliest members of the crocodile lineage. They lived during the Late Triassic and Early Jurassic periods (over 200 million years ago) and were different from today's crocodiles. For example, they lived on land, not in water, and were small and agile, often with long legs. Studying these early crocodylomorphs helps scientists understand how crocodiles evolved from land-dwelling ancestors and the transition from fast, land-based predators to the semi-aquatic ambush hunters we see today.

In this study, Museum Research Scientist Dr. Xiao-Chun Wu and his colleagues describe a new early crocodylomorph from Texas, focusing on its morphology, taxonomy, and evolutionary affinities. A team from the Museum of Texas Tech University discovered the fossil in 2005 while exploring the bone bed of the Late Triassic reptiles in Garza County, Tex. The fossil remains, including a skull and associated partial skeleton, represent a non-crocodyliform crocodylomorph. The researchers named the new genus and species *Pattisaura gracilis*. The generic name honours Mrs. Patricia Kirkpatrick and the Kirkpatrick family, who have allowed the Texas Tech University palaeontology team to search for vertebrate fossils on their ranch for many years. The specific name refers to the species' slender and lightly built hind limbs. The fossil is curated in the Museum of Texas Tech University.

The discovery of *Pattisaura* expands the paleogeographic distribution of the non-crocodyliform crocodylomorphs to northwestern Texas during the Late Triassic and enriches our knowledge of the evolutionary relationships of crocodylomorphs.



Skull of *Pattisaura gracilis*. (A) Photograph and (B) corresponding line drawing. Source: Wu et al. (2025).



Skull restoration of *Pattisaura gracilis*. Source: Wu et al. (2025).

CONFERENCE PRESENTATIONS BY MUSEUM STAFF IN 2024-25

One way that researchers communicate the results of their research to peers in the scientific community is by presenting their work at scientific conferences. Museum researchers delivered or co-authored 43 presentations reporting research progress at scientific conferences and workshops in 2024-25, as listed in Appendix 4.

OUR COLLABORATORS

In 2024-25, the museum worked with collaborators at more than 130 organizations, including universities, research institutes, museums, government departments and agencies, and private sector organizations, on a range of research- and collections-related initiatives. A broad regional, national, and international network allows the museum to share scientific resources and expertise with others. In turn, the museum leverages the resources and expertise of its collaborators and partners, enhancing effectiveness in generating new knowledge of the natural world and connecting people with nature.

CANADA

ALBERTA

Alberta Biodiversity Monitoring Institute,
Edmonton

Northern Forestry Research Centre,
Edmonton

Royal Alberta Museum, Edmonton

Royal Tyrrell Museum of Palaeontology,
Drumheller

Silver Cove Minerals, Calgary

University of Alberta, Edmonton

University of Calgary, Calgary

BRITISH COLUMBIA

B.C. Ministry of Environment, Victoria

Chu Cho Environmental, Prince George

Royal B.C. Museum and Archives, Victoria

Thompson Rivers University, Kamloops

University of British Columbia, Vancouver

University of Victoria, Victoria

MANITOBA

University of Manitoba, Winnipeg

NEW BRUNSWICK

Huntsman Marine Science Centre,
Saint Andrews

New Brunswick Museum, Saint John

University of New Brunswick, Saint John

University of Moncton, Moncton

NEWFOUNDLAND AND LABRADOR

Memorial University, St. John's

NORTHWEST TERRITORIES

Government of Northwest Territories,
Yellowknife

NOVA SCOTIA

Acadia University, Wolfville

Fisheries and Oceans Canada, Dartmouth

Nova Scotia Museum of Natural History,
Halifax

NUNAVUT

Inuit Heritage Trust, Iqaluit

Polar Knowledge Canada, Cambridge Bay

ONTARIO

Agriculture and Agri-Food Canada, Ottawa

Algonquins of Pikwakanagan First Nation

Brock University, St. Catharines

Canadian Conservation Institute, Ottawa

Canadian Food Inspection Agency, Ottawa

Carleton University, Ottawa

Fleming College, Peterborough

Fisheries and Oceans Canada, Ottawa

Ingenium, Ottawa

Laurentien University, Sudbury

Ontario Ministry of Natural Resources,
Peterborough

Ottawa Riverkeeper, Ottawa

Queen's University, Kingston

Royal Botanical Gardens, Hamilton

Royal Canadian Geographical Society, Ottawa

Royal Ontario Museum, Toronto

Trent University, Peterborough

University of Guelph, Guelph

University of Ottawa, Ottawa

Western University, London

QUEBEC

Canadian Museum of History, Gatineau

Environment and Climate Change Canada

Kenauk Institute, Montebello

Kitigan Zibi Anishinabeg

McGill University, Montreal

**Ministère de l'Environnement, de la Lutte
contre les changements climatiques, de la
Faune et des Parcs**

Parks Canada, Gatineau

Société québécoise de bryologie

Université du Québec à Rimouski, Rimouski

Université du Québec à Trois-Rivières,
Trois-Rivières

Université Laval, Quebec

INTERNATIONAL COLLABORATORS

UNITED STATES OF AMERICA

**Academy of Natural Sciences of Philadelphia
of Drexel University**

Arizona State University

Biodiversity Heritage Library

California Academy of Sciences

California Institute of Technology

Carnegie Museum of Natural History

Florida State Collection of Arthropods

Frost Science

Hawk Mountain Sanctuary

Hopkins Marine Station, Stanford University

Lawrence Berkeley National Laboratory

Michigan State University

Montana State University

Museum of the Rockies

**National Museum of Natural History,
Smithsonian Institution**

New York State Museum

North Carolina Museum of History

Purdue University Fort Wayne

San Diego Museum of Natural History

SUNY Brockport

The Mars Society

University of Alaska

**University of California Museum of
Paleontology**

University of California San Diego

University of California, Merced

University of Chicago

University of Eastern Washington

University of Maine

University of Minnesota

University of Wyoming

OTHER

Agharkar Research Institute, India

Alfred Wegener Institute, Germany

Betriebsratsbüro Universität Salzburg, Austria

Chinese Academy of Sciences, China

Dumlupinar University, Türkiye

Estonian University of Life Sciences, Estonia

Guizhou University, China

**Institute of Agricultural & Environmental
Sciences**, Estonia

**Institute of Geology, the Academy of Sciences
of Poland**, Poland

**Institute of Vertebrate Paleontology and
Paleoanthropology, Chinese Academy of
Science**, China

**Instituto de Investigación de Recursos
Biológicos Alexander von Humboldt**,
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Masaryk University, Czech Republic

Meise Botanical Garden, Belgium

Muséum national d'Histoire naturelle, France

Namık Kemal University, Türkiye

Natural History Museum, Norway

Naturalis, Netherlands

Peking University, China

Queen Mary University of London, United
Kingdom

Royal Botanical Gardens, Kew, United
Kingdom

San Carlos University, Guatemala

**Senckenberg Research Institute and Natural
History Museum**, Germany

Southwest University, China

Technical University of Munich, Germany

University of Leon, Spain

Universidad de Oriente, Cuba

Universidad Rey Juan Carlos, Spain

**Universidade Federal do Oeste do Pará,
Instituto de Ciências e Tecnologia das Águas**,
Brazil

Universidade Federal do Paraná, Brazil

Université Savoie–Mont-Blanc, France

University of Bologna, Italy

University of Bremen, Germany

University of Groningen, Netherlands

University of London, United Kingdom

University of Mindanao, Philippines

University of Oslo, Norway

University of Pretoria, South Africa

University of Western Australia, Australia

Uppsala University, Sweden

ENVIRONMENTAL MONITORING PROGRAM

Since the late 1990s, the museum has stewarded nature on its 56-hectare Natural Heritage Campus (NHC) property, where several rare species live, and on its 8-hectare site near Osgoode, Ontario, which supports wetland biodiversity. The museum studies and documents biodiversity and assesses the environmental conditions on the properties through its Environmental Monitoring Program. Work in 2024-25 included documenting beetle biodiversity on the NHC property, with more than 500 species recorded so far, and a pilot project to remove highly invasive buckthorn from a small area in front of the NHC building. Student employees and museum staff support the Environmental Monitoring Program annually.



The red milkweed beetle (*Tetraopes tetraophthalmus*), collected during the 2024 Environmental Monitoring Program at the museum's Natural Heritage Campus. Photo: Tierney Kist and Skyler Schmitter.



A larval salamander observed at the museum's conservation property near Osgoode, Ont., during the 2024 Environmental Monitoring Program. Photo: Tierney Kist.



Museum staff and students who participated in the Environmental Monitoring Program's first annual buckthorn removal blitz at the Natural Heritage Campus in 2024. Photo: CMN.

Botany collection technician Adam Storey demonstrating the world of mosses to the public during the museum's Nature Nocturne event in November 2024. Photo: Jennifer Doubt.



PROMOTING SCIENCE THROUGH OUTREACH, EDUCATION, AND SERVICE

SCIENCE OUTREACH

The museum's research and collections experts share their knowledge broadly to inspire all to connect with nature. They do this in a variety of ways, such as through presentations, workshops, and lectures, tours of the national collection, participating in educational expeditions, and mentoring and working with students. They also provide leadership and service to the broader scientific and museum communities.

PRESENTATIONS, WORKSHOPS, LECTURES, AND MEDIA

The Museum's research and collections staff delivered outreach and educational presentations, workshops, and lectures to members of more than 37 organizations in 2024-25:

- **Acadia University**, Wolfville, N.S.
- **Agriculture and Agri-food Canada**, Ottawa, Ont.
- **ArcticNet**, Ottawa, Ont.
- **Brockville Horticultural Society**, Brockville, Ont.
- **Canada Wide Science Fair**, Ottawa, Ont.
- **Canadian Association of Micro-Mounters**, St. Catherines, Ont.
- **Canadian Student Debating Federation**, Fredericton, N.S.
- **Carleton University**, Ottawa, Ont.
- **Eagle Hill Institute**, Steuben, Maine, USA
- **Exploring by the Seat of Your Pants** [podcast]
- **Field Botanists of Ontario**, Elbow Lake Biological Station, Ont.
- **Friends of the Carp Hills**, Ont.
- **Gem & Mineral Club of Scarborough**, Scarborough, Ont.
- **Global News**, Ottawa and Toronto, Ont.
- **Gloucester Horticultural Society**, Ottawa, Ont.
- **International Symposium on Early and Lower Vertebrates**, Rimouski, Que.
- **“Just Chill” with Oliver George** [podcast]
- **Kemptville Scouts**, Kemptville, Ont.
- **Kullik Illihakvik Elementary School**, Cambridge Bay, Nunavut
- **Lakeview Elementary Public School**, Ottawa, Ont.
- **Landscape Ontario Horticultural Trade Association**, Toronto, Ont.
- **Mushkegowuk Research and Knowledge Sharing Summit**, Timmins, Ont.
- **Nova Scotia Lichen Conservation Working Group**
- **Ottawa Field-Naturalists' Club**, Ottawa, Ont.
- **Ottawa Valley Mineral Club**, Ottawa, Ont.
- **Polar Knowledge Canada**, Cambridge Bay, Nunavut.
- **Queen's University**, Kingston, Ont.
- **Richmond Hill Garden Club**, Richmond Hill, Ont.
- **Rideau Roundtable**, Smiths Falls, Ont.
- **Safe Wings Ottawa**, Ottawa, Ont.
- **Saskatchewan Prairie Conservation Action Plan**, Regina, Sask.
- **Scarborough Gem & Mineral Club**, Scarborough, Ont.
- **TVO (TV Ontario) Kids**
- **“The Last Show” with David Cooper** [podcast]
- **University of New Brunswick**, Fredericton, N.B.
- **Université du Québec à Montréal**, Montreal, Que.
- **Walker Mineralogical Club**, Toronto, Ont.

TOURS OF THE NATIONAL COLLECTION

Seeing the national natural history collection up close and personal provides an opportunity for visitors to learn about the breadth and extent of the museum's collections and learn about their significance. In 2024-25, the museum delivered tours of its collections and research facilities to more than 200 guests from multiple organizations, including:

- **AJA 50+ (Active Jewish Adults)**, Ottawa, Ont.
- **Canadian Fossil Resource Management Committee** (including participants from the Department of Canadian Heritage, Geological Survey of Canada, McGill University, Government of British Columbia, University of Ottawa, Parks Canada, Government of the Northwest Territories, Government of Alberta, Canadian Conservation Institute and Government of the Yukon)
- **Canadian Museums Association**, Ottawa, Ont.
- **Canadian Science Publishing**, Ottawa, Ont.
- **Carleton University**, Ottawa, Ont.
- **Cégep de l'Outaouais**, Gatineau, Que.
- **Club des Ornithologues de Trois-Rivières**, Trois-Rivières
- **Field Botanists of Ontario**
- **Fisheries and Oceans Canada**
- **Ingenium**, Ottawa, Ont.
- **International Symposium on Early and Lower Vertebrates** (including participants from Australia, Canada, China, Czechia, Germany, Japan, South Africa, Sweden, Switzerland, and the USA)
- **Inuit Heritage Trust**, Iqaluit, Nunavut
- **McNamara Field Naturalists' Club**, Arnprior, Ont.
- **National Capital Commission**, Ottawa, Ont.
- **Ottawa Society of Botanical Artists**, Ottawa, Ont.
- **Polar Knowledge Canada**, Ottawa, Ont.
- **Royal Ontario Museum**, Toronto, Ont.
- **TRIA-FOR** (Transformative Risk Assessment and Forest Resilience Using Genomic Tools for the Mountain Pine Beetle Outbreak)

OPEN HOUSE AT THE NATURAL HERITAGE CAMPUS

The museum welcomed 1,926 visitors to the Natural Heritage Campus Open House on 5 October 2024. This annual event provides an opportunity for the public to visit the museum's research facility and the collections of plants, animals, fossils, and minerals, and to meet with the science experts who care for and study the collection.



Collection Manager Marie-Helene Hubert demonstrates specimens from the museum's fish collection during the Natural Heritage Campus Open House in October 2024. Photo: Diego Steed.



Visitors explore the museum's fossil collection during the Natural Heritage Campus Open House in October 2024. Photo: Jeff Saarela.

Visitors explore the biodiversity of algae in one of the museum's science labs during the Natural Heritage Campus Open House in October 2024. Photo: Jeff Saarela.

PARTICIPATION ON NORTHERN EXPEDITIONS AS EDUCATORS AND SCIENCE EXPERTS

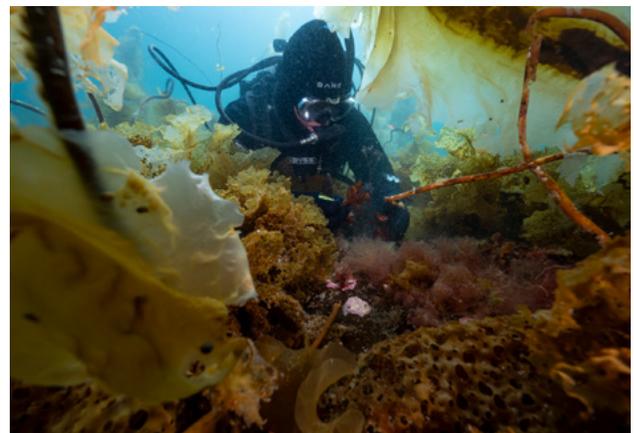
INNU NATION UINIPEK^u EXPEDITION

Dr. Amanda Savoie, research scientist and head of the museum's botany section, and Roger Bull, head of operations for the museum's molecular biodiversity program, participated in the 2024 Innu Nation Uinipek^u Expedition (1-19 July). This project, in its second year, brought together traditional Innu knowledge and Western marine science to increase knowledge of the Labrador Innu marine zones in the Labrador Sea.

The ship-based expedition convened a vibrant group of people, including Innu youth, community leaders, Indigenous Guardians, and scientists, to foster relationships with one another and with the lands and waters of Nitassinan (the Innu homeland). The expedition research team gathered data and involved Innu youth in the research process to expose them to the tools and methods used for ocean science. Savoie led work to document seaweed biodiversity in the Sheshatshiu and Natuashish marine zones, and Bull dived with Savoie to collect seaweeds and worked closely with the Innu Nation as the expedition's research program coordinator.



Seaweeds collected for student engagement art projects by Amanda Savoie and Roger Bull off the coast of Labrador during the Innu Nation-led Uinipek^u Expedition in summer 2024. Photo: SOI Foundation.



Roger Bull collecting seaweed off the coast of northern Labrador during the Innu Nation-led Uinipek^u Expedition in summer 2024. Photo: Amanda Savoie.

STUDENTS ON ICE EXPEDITIONS

The museum continued its 25-year tradition of participating in ship-based, northern expeditions led by the Students on Ice (SOI) Foundation. This organization inspires and empowers leadership for a sustainable future by connecting youth to nature and to the knowledge, people, and resources to make a difference. Through their participation, museum scientists contribute to expedition objectives related to research, collection development, and education while strengthening partnerships with other organizations and building relationships with Indigenous people. Museum staff participated in two expeditions in 2024:

- **Nunatsiavut to Nunavut Expedition:** Paul Hamilton, a senior research assistant in the museum’s botany section, joined SOL’s 2024 Nunatsiavut to Nunavut Expedition (July 22 to August 6), which brought together 22 youths and scientists, Indigenous Elders, artists, educators, and experts aboard the expedition icebreaker Oqwatnukewey Eleke’wi’ji’jit (Polar Prince). The journey spanned two regions of Inuit Nunangat, starting in Nain, Nunatsiavut, sailing north through the Torngat Mountains, and concluding in Iqaluit, Nunavut. The expedition offered a unique, hands-on learning experience, connecting youth with the history, culture, policies, and ecology of the lands and ocean in the Nunatsiavut and Nunavut regions of Canada.
- **Blue Futures Pathways Expedition 2024:** Paul Sokoloff, a senior research assistant in the museum’s botany section, joined the Blue Futures Pathways Expedition (August 3–19) for a second summer (he also participated in the 2023 expedition). This expedition connected young people (ages 18–35) from across Canada with Indigenous knowledge holders, scientists, industry professionals, and artists for a hands-on journey exploring diverse career pathways in the sustainable blue economy. Sokoloff led a collaborative plant collection and identification project as part of the expedition’s educational program. He connected with youth from Nunavut’s Qikiqtaaluk region, Nunatsiavut, and southern Canada, collaborating on science education projects. Currently, Sokoloff is collaborating with the expedition participants on a short scientific paper highlighting a new vascular plant record for Baffin Island, which will appear in Inuktitut and English.



The MV Polar Prince (Oqwatnukewey Eleke’wi’ji’jit) in Nachvak Fiord, Torngat Mountains National Park, N.L., during the Blue Futures Pathways expedition in summer 2024. Photo: Paul Sokoloff.

THE MUSEUM'S SCIENCE BLOG

The museum's [science blog](#) takes readers behind the scenes, from the laboratory to the field and everywhere between. The museum published 11 blog posts in 2024-25. Topics include the museum's Rare Book collection, the museum's contributions of scanned literature to the Biodiversity Heritage Library, ongoing work to document beetle biodiversity on the museum's Natural Heritage Campus, Arctic fossils, invasive fish and freshwater mussels, digitizing freshwater invertebrate collections, the museum's life-size model of the extinct giant beaver (*Castoroides ohioensis*), and the new Mont Saint-Hilaire display in the museum's Earth Gallery.

SCIENCE EDUCATION

An important part of the museum's work involves contributing to the development of the next generation of collection-based natural science experts. Museum staff do this by mentoring and working with students at college, undergraduate, and graduate levels; providing opportunities for students to participate in internships to fulfill educational program requirements; providing employment opportunities for students, including for students enrolled in co-operative education programs; and providing opportunities for postdoctoral researchers.

In 2024-25, the museum provided employment and training opportunities for 57 college, undergraduate and graduate students, and postdoctoral researchers affiliated with 15 Canadian institutions in five provinces and three international institutions.

STUDENT CATEGORY

Student employees: 23, including 11 co-op students

Master's students: 11

Doctor of Philosophy students: 7

Undergraduate research students: 9

Undergraduate interns: 5

Postdoctoral researchers: 2

STUDENT AFFILIATION

CANADA

Algonquin College, Ottawa, Ont.

Carleton University, Ottawa, Ont.

Cégep de l'Outaouais, Gatineau, Que.

Dalhousie University, Halifax, N.S.

Fleming College, Peterborough, Ont.

Lakehead University, Orillia, Ont.

Memorial University, St. John's, Nfld.

McGill University, Montreal, Que.

Université Laval, Quebec, Que.

Université de Sherbrooke, Sherbrooke, Que.

University of Guelph, Guelph, Ont.

University of Ottawa, Ottawa, Ont.

University of Victoria, Victoria, B.C.

University of Waterloo, Waterloo, Ont.

Western University, London, Ont.

OTHER

Agharkar Research Institute, India

Alfred Wegener Institute, Germany

University of Colorado, USA

ADJUNCT PROFESSOR APPOINTMENTS

Several Museum staff members held adjunct professor appointments with:

- **University of Ottawa**, Ottawa, Ont.
- **Carleton University**, Ottawa, Ont.
- **Université Laval**, Quebec, Que.
- **Laurentian University**, Sudbury, Ont.
- **University of Groningen**, Groningen, Netherlands

SERVING OUR PROFESSIONAL COMMUNITIES

The Museum's research and collections experts contribute leadership and service to the broader scientific and museum communities, both nationally and internationally.

SERVICE ON BOARDS, COUNCILS, AND COMMITTEES

In 2024-25, Museum staff served on boards, councils, and committees of numerous national and international scientific and museological societies and other organizations, including:

- Alliance of Natural History Museums of Canada (ANHMC)
- American Fisheries Society
- American Institute for Conservation
- American Society of Ichthyologists and Herpetologists
- Association of Registrars and Collection Specialists
- Axiell
- Bytown Museum
- Canadian Association for Conservation (CAC)
- Canadian Association for Professional Conservators (CAPC)
- Canadian Botanical Association (CBA)

- Canadian Committee for the International Union for the Conservation of Nature (CCIUCN)
- Canadian Fossil Resource Management Committee
- Canadian Society of Vertebrate Palaeontology
- Canadian Society of Zoologists
- Collège La Cité
- Committee for a Canadian Policy on International Digital Sequence Information (DSI)
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC)
- Field Botanists of Ontario
- Flora of North America Association
- Foray Newfoundland and Labrador
- Global Biodiversity Information Facility (GBIF)
- Interdepartmental Committee on Biodiversity
- Intergovernmental Commemoration Commission, Department of Heritage
- International Association of Lichenologists
- International Mineralogical Association Museums Commission
- International Society for Diatom Research
- International Union for the Conservation of Nature
- Northeast Algal Society
- Ottawa Field-Naturalists' Club
- Rideau Round Table
- Rodens et Spatium International Conference
- Society for the Preservation of Natural History Collections
- Society of Vertebrate Paleontology
- The Mars Society
- Youth Science Canada, Canada-Wide Science Fair

SERVICE ON THE EDITORIAL BOARDS OF PEER- REVIEWED JOURNALS

Museum research and collections experts served on the editorial boards of 15 peer-reviewed scientific journals and related publications in 2024-25:

- American Mineralogist
- Arctic Science
- Canadian Field-Naturalist
- Canadian Journal of Mineralogy and Petrology
- Canadian Journal of Zoology
- Collection Forum
- Facets
- Journal of Mammalian Evolution
- Journal of Phycology
- Notulae Algarum
- Peer Community in Paleontology
- Plant Press
- The Canadian Entomologist
- Vertebrate Anatomy, Morphology, Palaeontology
- Zootaxa

SERVICE AS A BOOK EDITOR

Hoebeke, E. R., J. R. LaBonte, and K. E. Loeffler. 2024. Adventive weevils recorded from North America: A review and illustrated manual for their identification (Coleoptera: Curculionoidea, excluding Scolytinae). Edited by **R.S. Anderson** and M.L. Gimmel. The Coleopterists Society Special Publication 5: 1-604.

APPENDIX 1

SCIENTIFIC STUDIES PUBLISHED IN 2024 BY NON-MUSEUM RESEARCHERS THAT CITE CANADIAN MUSEUM OF NATURE COLLECTIONS

ALGAE, BRYOPHYTES, LICHENS AND VASCULAR PLANTS

ALGAE

Parikh, H., J.R. Stone, and E. Jovanovska. 2024. Evolution and morphological diversity of the genus *Diploneis* (Bacillariophyta) in Lake Malawi, with description of six new species. *Phycologia* 63: 462–479. <https://doi.org/10.1080/00318884.2024.2390142>

Siver, P.A. 2024. *Mallomonas gigantea* sp. nov., an Eocene synurophyte possessing the largest known siliceous scales. *Fottea* 24: 261–268. <https://doi.org/10.5507/fot.2024.006>

Siver, P.A. 2024. *Ulnaria asymmetrica* sp. nov. (Bacillariophyta), a new fossil species from the Trout Creek Miocene locality, Oregon, USA. *Diatom Research* 39: 199–207. <https://doi.org/10.1080/0269249X.2024.2423676>

Siver, P.A. 2024. *Mallomonas enigmata* sp. nov. (Synurales, Chrysophyceae), an Eocene fossil species with a second and unique scale morphotype attached to its cyst. *European Journal of Phycology*, 1–10. <https://doi.org/10.1080/09670262.2024.2408296>

BRYOPHYTES

Marín, Á.M. 2024. La familia Fissidentaceae (Bryophyta) en Cuba. *Revista del Jardín Botánico Nacional* 45: 1–14.

Tubanova, D.Y., O.D. Dugarova and O.I. Kuznetsova. 2024. *Dicranum afoninae* (Dicranaceae, Bryophyta), a new species with the flagelliform branchlets from Asia. *Arctoa* 33: 31–40. <https://doi.org/10.15298/arctoa.33.05>

LICHENS

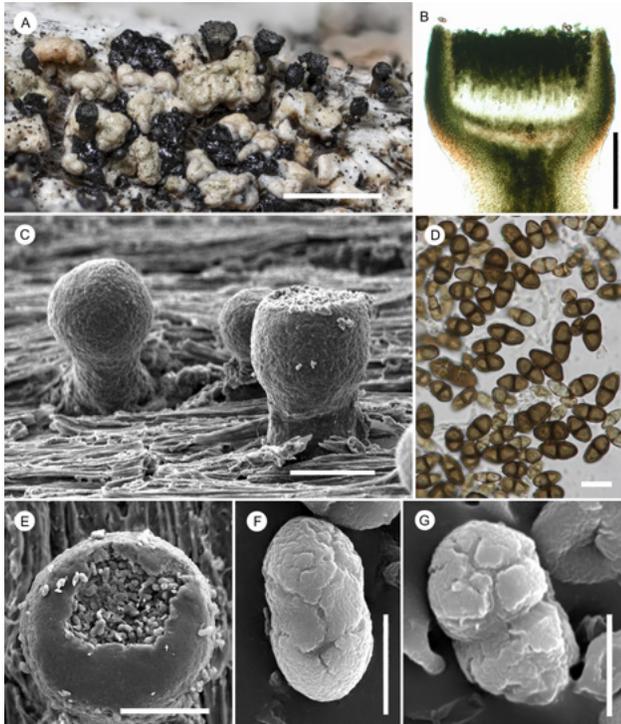
Bruce, M. and A. Teuvo. 2024. *Cladonia galindezii* and *C. andereggii*, epodetiate relatives of *C. cariosa* in western North America. *The Bryologist* 127: 465–475. <https://doi.org/10.1639/0007-2745-127.4.465>

Perlmutter, G.B. and S.A. LaGreca. 2024. Noteworthy collections of lichens and lichenicolous fungi from Piedmont Rocky River ecosystems in Central North Carolina, USA. *Evansia* 41: 47–56.

Simon, A., D. Parker, J.A. Chimal-Ballesteros, J. Orlando and B. Goffinet. 2024. The identity of the North American endemic *Dendriscoaulon intricatum* and two southern South American cyanomorphs in the Peltigerales. *The Bryologist* 127: 441–464. <https://doi.org/10.1639/0007-2745-127.4.441>

Tibell, L., S.R. Clayden, M. Prieto and M. Wedin. 2024. A new *Calicium* on *Ramboldia*. *The Lichenologist* 56: 301–307. <https://doi.org/10.1017/S0024282924000343>

Wheeler, T., J. McCarthy, B. Owe-Larsson and A. Fryday. 2024. Taxonomic innovations in Megasporaceae (lichenized Ascomycota, Pertusariales): *Antidea*, a new genus for *Aspicilia brucei*; two new species of *Aspicilia*, and new combinations in *Aspilidea* and *Lobothallia*. *The Lichenologist* 56: 273–286. <https://doi.org/10.1017/S0024282924000239>



Tibell et al. (2024) described the new fungal species *Calicium ramboldicola*, which grows on the crustose lichen *Ramboldia elabens*. They deposited an isotype specimen (*Wedin 9898*, from Sweden) in the museum's lichen collection. The new species is known from Norway, Sweden, and the eastern Canadian provinces of New Brunswick and Quebec. The image shows various morphological structures of the new species. Source: Tibell et al. (2024), available under a [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/) license.

VASCULAR PLANTS

Chapman-Lam, C. 2024. Out of the weeds: yellow-fruited sedge confirmed in the City of Ottawa. *Trail & Landscape* 58: 149–153.

Danylyk, I.M. and I.G. Olshanskyi. 2024. New combinations in *Carex* (Cyperaceae). *Phytoneuron* 2024–23: 1–2

Nichols, W.F., C.F. Barrett, J.K. Wipff, J.G. Sánchez-Ken, W.M. Knapp, E.M. Sigel, L. Kosslow and C. Cameron. 2024. Molecular and taxonomic reevaluation of the *Digitaria filiformis* complex (Poaceae), including a globally extinct, single-site endemic from New Hampshire, USA, and a new species from Mexico. *Systematic Botany* 49: 318–333. <https://doi.org/10.1600/036364424X17189138775920>

Semple, J.C. and G.H. Morton. 2024. Cytogeography of *Solidago* sect. *Argutae* (Asteraceae: Astereae). *Phytoneuron* 2024-13: 1–13.

Semple, J.C., J.G. Chmielewski, A. Bouchard and L. Brouillet. 2024. The cytogeography *Symphyotrichum lateriflorum*, *S. ontarionis*, *S. racemosum*, and *S. tradescantii* (Asteraceae: Astereae). *Phytoneuron* 2024-68: 1–20.

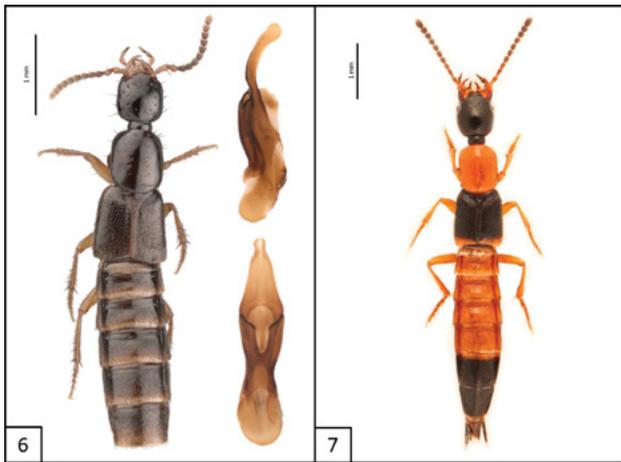
Sullivan, L.L., Z.M. Portlas, K.M. Jaeger, M. Hoffner and J.A. Hamilton. 2024. Climate and habitat type interact to influence contemporary dispersal potential in Prairie Smoke (*Geum triflorum*). *Ecology and Evolution* 14: e11231. <https://doi.org/10.1002/ece3.11231>

ANIMALS

INVERTEBRATES

BEETLES

Bédard, N., A. Brunke, P. Bloin and L. Leclerc. 2024. New records of rove beetles from the Province of Quebec, and additional provincial records in Canada (Coleoptera, Staphylinidae). *ZooKeys* 1196: 303–329. <https://doi.org/10.3897/zookeys.1196.118698>



Bédard et al. (2024), a team of researchers that included Ludovic Leclerc—who is now assistant collection manager of the museum’s entomology collection—reported 25 new records of rove beetles from Quebec. Their new record of *Gabrius amulius*, shown in the image on the left, is based on a specimen housed in the museum’s beetle collection. Francois Génier (former collection manager of the museum’s entomology collection, and now a research associate with the museum) and Serge Laplante collected the specimen in the Boucher Forest, Gatineau, Que., on 17 June 2023. Elsewhere in Canada, researchers know this native North American species only from one collection in Ontario. The species in the image on the right is *Neobisnius jucundus*. Source: Bédard et al. (2024), available under the terms of the [CCO Public Domain Dedication](#).

Bento, M., M.L. Jameson, P. Grossi and C.R.V. da Fonseca. 2024. Revision of the Neotropical tribe Alvarengiini Frey, 1975 (Coleoptera: Scarabaeidae). *Austral Entomology* 63: 12–48. <https://doi.org/10.1111/aen.12676>

Borovec, R. 2024. Three new Entiminae species from Malawi with one new generic synonymy (Coleoptera: Curculionidae). *Studies & Reports-Taxonomical Series* 20: 297–308.

Borovec, R. and M. Meregalli. 2024. *Brevinasia*, a new genus of edaphic weevils with description of 13 new species from South Africa (Coleoptera: Curculionidae: Entiminae). *Taxonomy* 4: 368–411. <https://doi.org/10.3390/taxonomy4020019>

Bulirsch, P. and M. Hartmann. 2024. Catalogue of the Himalayan Dyschiriini (Insecta: Coleoptera: Carabidae: Scaritinae). *Biodiversität und Naturlausstattung im Himalaya* 8: 271–282.

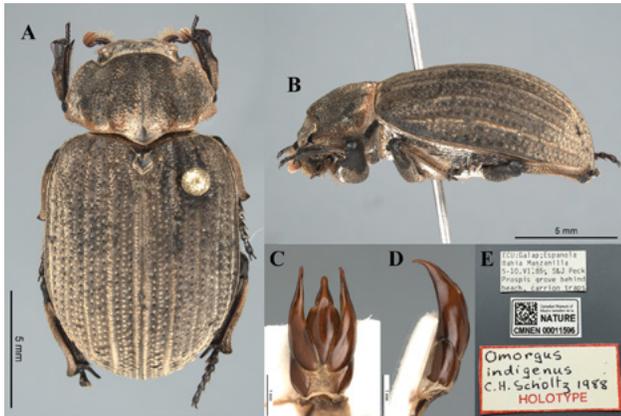
Chandler, D.S. 2024. New synonyms, species, lectotype selections, and records for Nearctic *Anthicus* Paykull (Coleoptera: Anthicidae). *The Coleopterists Bulletin* 78: 447–462. <https://doi.org/10.1649/0010-065x-78.3.447>

Charles, S.E., K. Flown and S.F. Tracy. 2024. New larval host records for three species of leaf-mining weevils in the eastern USA (Coleoptera: Curculionidae: Curculioninae), with a review of hosts and larval habits for the Genus *Tachygonus* Schönherr. *Proceedings of the Entomological Society of Washington* 126: 247–253. <https://doi.org/10.4289/0013-8797.126.2.247>

Clavijo-Bustos, J., M.I. Castro-Vargas and J.C.N. Moreno. 2024. A second species of the genus *Manodactylus* Moser, 1919 (Coleoptera, Scarabaeidae, Melolonthinae, Macroductylini) from the highlands of Colombia. *Deutsche Entomologische Zeitschrift* 71: 209–217.

Costa-Silva, V., W.P. Strümpher, P.J. Thyssen and F.Z. Vaz-de-Mello. 2024. Taxonomic revision of the South American genus *Polynoncus* Burmeister, 1876 (Coleoptera: Scarabaeoidea: Trogidae). *Journal of Natural History* 58: 14–166. <https://doi.org/10.1080/00222933.2023.2260060>

Costa-Silva, V.d., W.P. Strümpher, M.V.L. Barclay and F.Z. Vaz-de-Mello. 2024. An illustrated catalogue of South American species of *Omorgus* Erichson, 1847 (Coleoptera, Trogidae, Omorginae) including a neotype designation and taxonomical changes. *Contributions to Entomology* 74: 81-101. <https://doi.org/10.3897/contrib.entomol.74.e126799>



Da Costa-Silva et al. (2024) published a catalogue of South American species of the genus *Omorgus*. They studied specimens housed in numerous collections around the world, including the Canadian Museum of Nature. This image shows the holotype specimen of *Omorgus indigenus* Scholtz 1990 (CMNCEN 00011596), a species that they included in their catalogue, which is curated in the museum's beetle collection. Photos: François Génier. Source: Da Costa-Silva et al. (2024), available under a Creative Commons Attribution License.

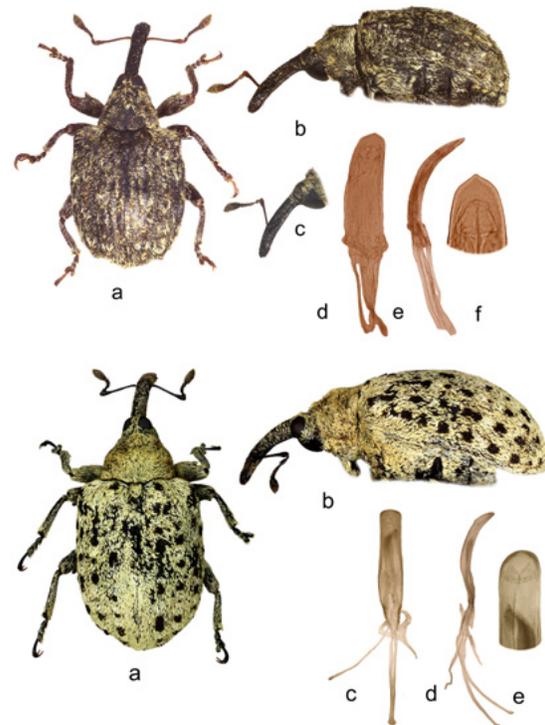
Ferreira, V.S., O. Keller, F.F. Barbosa, M.A. Ivie and J. Dupuis. 2024. Integrative systematics of *Cheguevaria* Kazantsev, 2007 (Coleoptera, Lampyridae, Cheguevariinae) identifies genetic stability in colour-polymorphic individuals and a disjoint relationship with Amydetinae. *Insect Systematics and Diversity* 8: ixae033. <https://doi.org/10.1093/isd/ixae033>

Jordal, B.H. 2024. An integrated taxonomic revision of *Ctonoxylon* (Coleoptera, Curculionidae, Scolytinae) reveals new Malagasy species originating from multiple recent colonisations of the island. *ZooKeys* 1203: 95-130. <https://doi.org/10.3897/zookeys.1203.123757>

Kirkendall, L.R. 2024. A new genus and species of Platypodini pinhole borers from South America (Coleoptera, Curculionidae, Platypodinae). *Zootaxa* 5432: 83-95. <https://doi.org/10.11646/zootaxa.5432.1.6>

Kohlmann, B., R.P. Salomão and Á. Solís. 2024. New World dung beetle (Coleoptera: Scarabaeidae: Scarabaeinae) colonization of a recent Miocene insular territory: The case of Costa Rica. *Ecology and Evolution* 14: e11436. <https://doi.org/10.1002/ece3.11436>

Koštál, M. and R. Caldara. 2024. A taxonomic revision of the genus *Cleopus* Dejean, 1821 (Coleoptera, Curculionidae), with descriptions of 13 new species. *Insects* 15: 434. <https://doi.org/10.3390/insects15060434>



Koštál and Caldara (2024) revised the weevil genus *Cleopus*, including descriptions of new species, based on their studies of specimens from collections around the world, including the Canadian Museum of Nature. They designated specimens curated in the museum's beetle collection as the holotypes of the new species *Cleopus confusus* (top), from China, and *Cleopus philippinensis* (bottom), from the Philippines. Source: Košťál and Caldara (2024), available under a Creative Commons Attribution License.

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Tang, W. and B. Dorsey. 2024. First record of the cycad weevil *Parallocorynus* (*Neocorynus*) *inexpectatus* O'Brien and Tang (Coleoptera: Belidae) in the USA with observations of its larva. *The Coleopterists Bulletin* 78: 436–438. <https://doi.org/10.1649/0010-065x-78.3.436>

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CORALS

Cruz, B.A., A. Cappelmann, H. Chutjian, J.C. Roman, M.A. Reid, J. Wright, A.D. Gonzalez, T. Keyman, K.M. Griffith, H.J. Appiah-Madson, D.L. Distel, V.E. Hayes, J. Drewery, D.T. Pettay, J.L. Staton and M.R. Brugler. 2024. Complete mitochondrial genomes of the black corals *Alternatipathes mirabilis* Opresko & Molodtsova, 2021 and *Parantipathes larix* (Esper, 1788) (Cnidaria, Anthozoa, Hexacorallia, Antipatharia, Schizopathidae). *ZooKeys* 1196: 79–93. <https://doi.org/10.3897/zookeys.1196.116837>

LEECHES

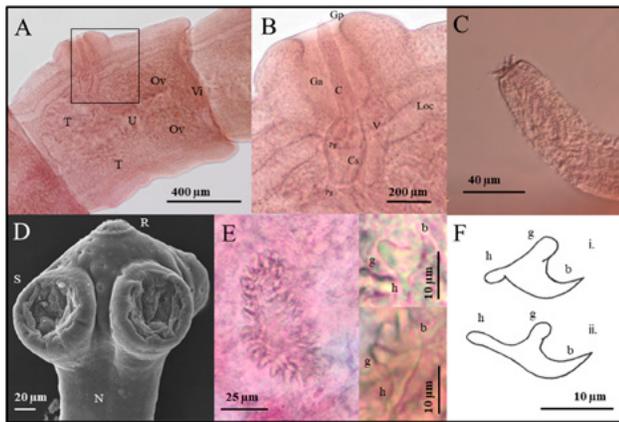
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PARASITES

Jiménez, F.A., M.L. Campbell, B. Byles, R.P. Scheibel and S.L. Gardner. 2024. Gastrointestinal helminths of opossums (Mammalia: Didelphidae) from Bolivia. *Parasitology* 151: 637–649. <https://doi.org/10.1017/S0031182024000490>

Kuchta, R., A.J. Phillips and T. Scholz. 2024. Diversity and biology of *Spirometra* tapeworms (Cestoda: Diphyllbothriidea), zoonotic parasites of wildlife: A review. *International Journal for Parasitology: Parasites and Wildlife* 24: 100947. <https://doi.org/10.1016/j.ijppaw.2024.100947>

Shanebeck, K.M., J. Bennett, S.J. Green, C. Lagrue and B. Presswell. 2024. A new species of *Versteria* (Cestoda: Taeniidae) parasitizing *Neogale vison* and *Lontra canadensis* (Carnivora: Mustelidae) from Western Canada. *Journal of Helminthology* 98: e4, 1–11. <https://doi.org/10.1017/S0022149X23000895>



Understanding the diversity and taxonomy of taeniid tapeworms in the flatworm family Taeniidae is important due to their significant impact on livestock and human health. Shanebeck et al. (2024) described the new species *Versteria rafei* from the intestines of American mink (*Neogale vison*) from Alberta and British Columbia, based on morphological and molecular data. They also report the occurrence of the new species in North American river otter (*Lontra canadensis*) and muskrat (*Ondatra zibethicus*). The researchers deposited type material of the new species in the museum's parasite collection (sntypes, CMNPA 2023-0008.1, CMNPA 2023-0008.2, CMNPA 2023-0008.3). The image shows specimens of *Versteria rafei* from the American mink from British Columbia. Source: Shanebeck et al. (2024), available under a [Creative Commons Attribution License](#).

WASPS

Román, A.C., P. Picón-Rentería, C.E. Causton, L. Betancourt-Cargua, C. Frey and H.W. Herrera. 2024. Distribution of the sand wasp *Bicyrtes variegatus* (Oliver, 1789) (Hymenoptera, Crabronidae) in the Galápagos Islands, with notes on its ecology. *Journal of Hymenoptera Research* 97: 531–539. <https://doi.org/10.3897/jhr.97.123966>

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Claeson, K.M., B.L. Sidlauskas, R. Troll, Z.M. Prescott and E.B. Davis. 2024. From sabers to spikes: A newfangled reconstruction of the ancient, giant, sexually dimorphic Pacific salmon, †*Oncorhynchus rastrosus* (Salmoninae: Salmonini). *PLOS ONE* 19: e0300252. <https://doi.org/10.1371/journal.pone.0300252>

Fricke, R., M.A.R. López and A.S.O. Rodríguez. 2024. *Fishes and Lampreys of Mexico*. CONABIO, México.

Sánchez-Jiménez, J., O. Santana-Morales, J. Ayala-Donado, M.d.I. Rosales-Melgar, E.M. Areano-Barillas, M. González-Jaramillo and J.C. Pérez-Jiménez. 2024. First record of the bluntnose sixgill shark *Hexanchus griseus* (Bonnaterre, 1788) in the Guatemalan Caribbean Sea. *Latin American Journal of Aquatic Research* 52: 307–311. <https://doi.org/10.3856/vol52-issue2-fulltext-3098>

MAMMALS

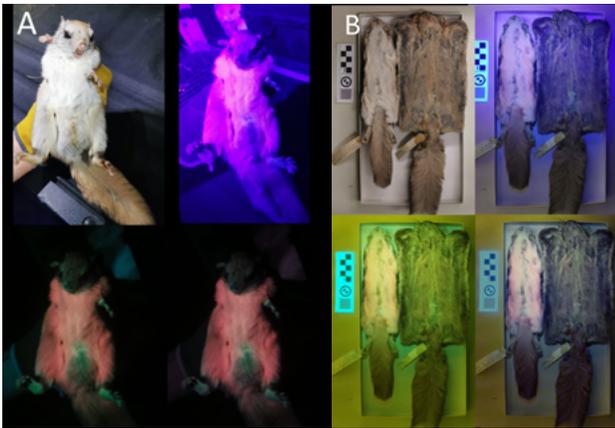
Arpin, K.E., D.A. Schmidt, B.M.F. Sjodin, A.L. Einfeldt, K. Galbreath and M.A. Russello. 2024. Evaluating genotyping-in-thousands by sequencing as a genetic monitoring tool for a climate sentinel mammal using non-invasive and archival samples. *Ecology and Evolution* 14: e10934. <https://doi.org/10.1002/ece3.10934>

Baltensperger, A.P., H.C. Lanier and L.E. Olson. 2024. Extralimital terrestrials: A reassessment of range limits in Alaska's land mammals. *PLOS ONE* 19: e0294376. <https://doi.org/10.1371/journal.pone.0294376>

Bateman, L.-P. and H.C.E. Larsson. 2024. The first *Otodus megalodon* remains from Canada and their predicted range limit. *Canadian Journal of Earth Sciences*. <https://doi.org/10.1139/cjes-2024-0110>

Mallory, F.F., M.L. Pyott and J.H. Wiersma. 2024. Sexual size dimorphism in the monogamous Canidae family: Is division of labour the primary driver? *Вестник Северо-Восточного научного центра ДВО РАН [Bulletin of the North-Eastern Scientific Center of the Far Eastern Branch of the Russian Academy of Sciences]* 2024: 88-96.

Newar, S.L., I. Schneiderová, B. Hughes and J. Bowman. 2024. Ultrasound and ultraviolet: crypsis in gliding mammals. *PeerJ* 12: e17048. <https://doi.org/10.7717/peerj.17048>



Newar et al. (2024) characterized variation in ultraviolet-induced photoluminescence in the fur of gliding mammals. They newly sampled 64 species from the mammal collections at the Canadian Museum of Nature and the Royal Ontario Museum. This image shows variation in ultraviolet-induced photoluminescence, demonstrating the variability within museum specimens and between live and preserved individuals of flying squirrels. (A) Live adult male trapped in the Kawartha Highlands in 2023. (B) Specimens from the Canadian Museum of Nature. Top left: white light; top right: ultraviolet light; bottom left: ultraviolet light and yellow gel filter; bottom right: ultraviolet light, yellow gel filter, and colour edit. Source: Newar et al. (2024), available under a [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/) license.

AMPHIBIANS AND REPTILES

Castro Bastidas, H.A. 2024. Una colección biológica regional para el estudio de los anfibios y reptiles en Sinaloa, México.

Revista Latinoamericana de Herpetología 7: e962 (171 - 186). <https://doi.org/10.22201/fc.25942158e.2024.2.962>

Castro-Bastidas, H.A. 2024. Taxonomic and geospatial review of the herpetofauna of Sinaloa, Mexico. *Bulletin of the Chicago Herpetological Society* 59: 111-118.

Khalilzadeh, P., L. Randall, D. Coltman, L. Anderson and D. Lesbarrères. 2024. Genetic assessment and monitoring of wild, captive, and reintroduced northern leopard frog populations. *Conservation Genetics* 25: 1053-1064. <https://doi.org/10.1007/s10592-024-01623-9>

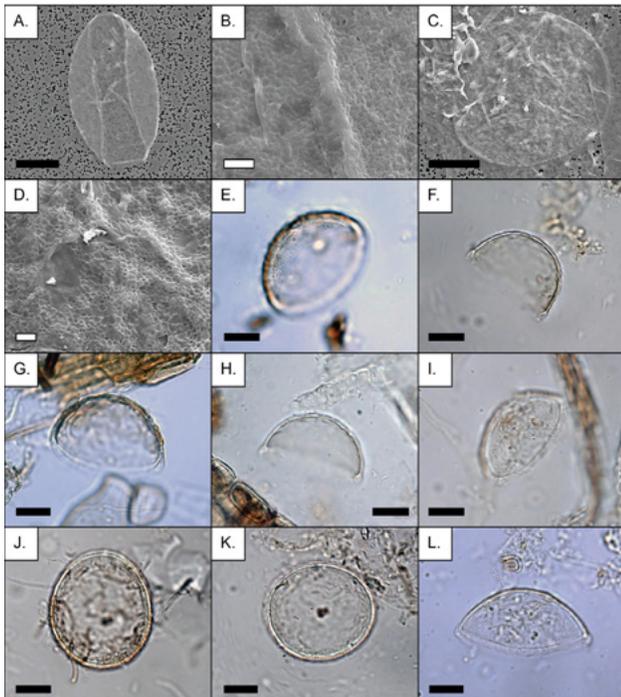
Uetz, P.H., M. Patel, Z. Gbadamosi, A. Nguyen and S. Shoope. 2024. A reference database of reptile images. *Taxonomy* 4: 723-732. <https://doi.org/10.3390/taxonomy4040038>



Uetz et al. (2024) report the results of a project to develop a reference database of more than 14,000 standardized images representing 1,045 reptile species to support research. The database is based on preserved specimens from 20 different collections, including the Canadian Museum of Nature, from which the researchers imaged 35 specimens representing 33 species. One of the images shows the head of an *Acanthosaura armata* specimen (CMNAR:30969) curated in the museum's amphibian and reptile collection. Commonly known as the armoured pricklenape or peninsular horned tree lizard, this species occurs in Asia. The image is available on MorphoBank (media number M927775). Photo: Peter Uetz, available under a [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/) license.

PROTISTS

Davies, M.A., J. Bollmann, M.J. Amesbury, S.R. Piilo, H. Zhang, M. Garneau, G.T. Swindles, J.W. McLaughlin and S.A. Finkelstein. 2024. Environmental associations and the paleoecological significance of the genus *Pyxidicula* Ehrenberg, 1838 and *Pyxidicula muskegii* sp. nov. in the Hudson and James Bay region peatlands, Canada. *Canadian Journal of Earth Sciences* 61: 1212–1226. <https://doi.org/10.1139/cjes-2024-0039>



Researchers use testate amoebae—a group of protists defined by having an external shell, or “test”—as proxies to infer environmental change in soil ecosystems over time. However, many species of protists globally remain undescribed, which may limit our ecological understanding of community dynamics. Davies et al. (2024) described *Pyxidicula muskegii*, a new species of testate amoeba that they discovered in peat cores taken across the Hudson and James Bay region of Canada, a globally important peatland complex in which researchers have long used testate amoebae to understand change over time. The authors deposited slides of the holotype and paratype specimens of the new species in the Canadian Museum of Nature’s invertebrate collection (CMNI 2024-0003; CMNI 2024-0004; CMNI 2024-0005; CMNI 2024-0006). The image shows scanning electron (A–D) and light (E–L) and microscope images of the new species. Black scale bars are 20 μm and white scale bars are 2 μm. Source: Davies et al. (2024), available under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

MINERALOGY

Galloway, J.M., T. Hadlari, K. Dewing, T. Poulton, S.E. Grasby, L. Reinhardt, M. Rogov, J. Longman and M. Vickers. 2024. The silent VOICE—searching for geochemical markers to track the impact of Late Jurassic rift tectonics. *Geochemistry, Geophysics, Geosystems* 25: e2024GC011490. <https://doi.org/10.1029/2024GC011490>

McDonald, A.M. and G.Y. Chao. 2024. Kodamaite, Na₃(Ca₅Na)₆Si₁₆O₃₆(OH)₄F₂·14–xH₂O, x = ~5, a new layered alkali-alkaline earth fluorosilicate-hydrate and member of the gyrolite supergroup, from Mont Saint-Hilaire, Quebec, Canada: description, crystal-chemical considerations, and genetic implications. *The Canadian Journal of Mineralogy and Petrology* 62: 133–152. <https://doi.org/10.3749/2300046>

PALAEOBIOLOGY

FOSSIL INVERTEBRATES

Curry, B.B. and A.C. Anderson. 2024. Midwest North American full glacial paleohydrology from freshwater ostracodes: Comparison of Clementsian and Gleasonian methodologies. *Quaternary Science Reviews* 336: 108734. <https://doi.org/10.1016/j.quascirev.2024.108734>

Prokop, J., K. Rosová, M. Pecharová, P. Sroka, A. Leipner and A. Nel. 2024. The structure of wing in the earliest Permopsocida. *Arthropod Structure & Development* 80: 101358. <https://doi.org/10.1016/j.asd.2024.101358>

Zhang, S. 2024. Ordovician conodont biostratigraphy of northwestern Baffin Island, Nunavut, Canada, with new insights into the age and diachronism of the Ship Point Formation in the Foxe Basin. *Canadian Journal of Earth Sciences* 61: 355–376. <https://doi.org/10.1139/cjes-2023-0101>

FOSSIL VERTEBRATES

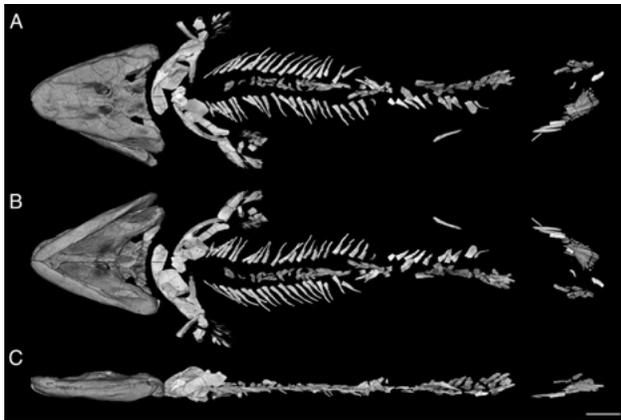
GENERAL

Wyenberg-Henzler, T.C.A., D.W. Fowler, P.J. Currie and C. Sullivan. 2024. The category-modifier system: a hierarchical classification scheme for vertebrate tooth marks. *Paleobiology*, 1-19. <https://doi.org/10.1017/pab.2024.43>

FOSSIL FISHES

Li, H., M.A. Kipp, S.L. Kim, E.R. Kast, J.J. Eberle and F.L.H. Tissot. 2024. Exploring uranium isotopes in shark teeth as a paleo-redox proxy. *Geochimica et Cosmochimica Acta* 365: 158-173. <https://doi.org/10.1016/j.gca.2023.11.034>

Stewart, T.A., J.B. Lemberg, E.J. Hillan, I. Magallanes, E.B. Daeschler and N.H. Shubin. 2024. The axial skeleton of *Tiktaalik roseae*. *Proceedings of the National Academy of Sciences* 121: e2316106121. <https://doi.org/10.1073/pnas.2316106121>



High-resolution micro-computed tomography scans of the type specimen of *Tiktaalik roseae*. This 300-million-year-old fishlike aquatic animal was a close relative of the direct ancestors of four-legged land vertebrates. Researchers discovered the fossil on Ellesmere Island, Nunavut, in 2004. The Canadian Museum of Nature curates the fossil on behalf of the Government of Nunavut.

In a new study, Stewart et al. (2024) generated new knowledge about *Tiktaalik*'s skeleton, allowing for a three-dimensional reconstruction of *Tiktaalik* and leading to new insights on the origins of its terrestrial walking behaviours. Source: Stewart et al. (2024), available under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International](https://creativecommons.org/licenses/by-nc-nd/4.0/) license.

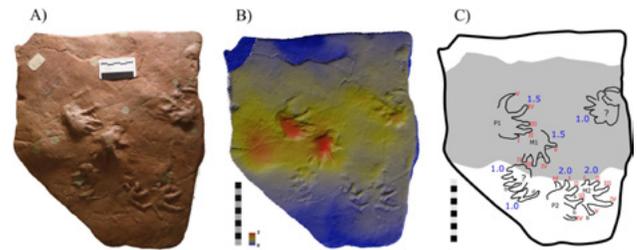
FOSSIL MAMMALS

Termes, L., G. Keddie, R. Hebda, P. Trask, V. Arbour, C. Speller, L. Paskulin, C. Ramsey and M.P. Richards. 2024. Survival of mammoths (*Mammuthus* sp.) into the Late Pleistocene in Southwestern British Columbia (Vancouver Island), Canada. *Canadian Journal of Earth Sciences* 61: 843-854. <https://doi.org/10.1139/cjes-2023-0102>

FOSSIL REPTILES

Averianov, A.O. and H.-D. Sues. A new ornithomimid theropod from the Upper Cretaceous Bissekty Formation of Uzbekistan. *Journal of Vertebrate Paleontology*: e2433759. <https://doi.org/10.1080/02724634.2024.2433759>

Bateman, L.-P., R. Cloutier and H.C.E. Larsson. 2024. Description of a tetrapod trackway from the early Carboniferous Bonaventure Formation of New Brunswick, Canada. *Canadian Journal of Earth Sciences* 61: 723-729. <https://doi.org/10.1139/cjes-2023-0119>

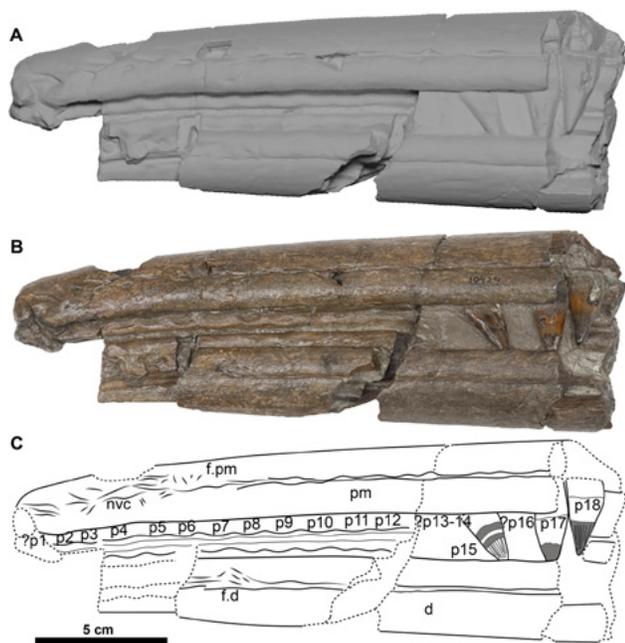


Bateman et al. (2024) described the specimen CMNFV 10013 housed in the Canadian Museum of Nature's fossil collection. The specimen is a tetrapod trackway that Robert Wheelock Ellis found on Heron Island, N.B., in 1879 while surveying for the Geological Survey of Canada. The image shows a photograph, surface model, and interpretive illustration of CMNFV 10013. Source: Bateman et al. (2024).

Caspar, K.R., C. Gutiérrez-Ibáñez, O.C. Bertrand, T. Carr, J.A.D. Colbourne, A. Erb, H. George, T.R. Holtz Jr., D. Naish, D.R. Wylie and G.R. Hurlburt. 2024. How smart was *T. rex*? Testing claims of exceptional cognition in dinosaurs and the application of neuron count estimates in palaeontological research. *The Anatomical Record* 307: 3685–3716. <https://doi.org/10.1002/ar.25459>

Coppock, C.C., M.J. Powers, J.T. Voris, H.S. Sharpe and P.J. Currie. 2024. Immature *Daspletosaurus* sp. specimens from the Dinosaur Park Formation provide insight into ontogenetically invariant tyrannosaurid cranial morphology. *Canadian Journal of Earth Sciences* 61: 1227–1239. <https://doi.org/10.1139/cjes-2024-0083>

Cortés, D. and H.C.E. Larsson. 2024. An ichthyosaur rostrum from the uppermost Albian of Saskatchewan (Canada) represents the youngest diagnosable Canadian ichthyosaur prior to their demise. *Canadian Journal of Earth Sciences*. <https://doi.org/10.1139/cjes-2024-0058>



Ichthyosaurs, large marine reptiles that lived during the Mesozoic Era, around the same time as dinosaurs, have fascinated scientists for centuries. Cortés and Larsson

(2024) described a partial ichthyosaur rostrum (a beaklike projection) based on a specimen (CMNFV 10424) from Late Cretaceous deposits in southern Saskatchewan curated in the Canadian Museum of Nature's fossil collection. Researchers affiliated with the Geological Survey of Canada collected the fossil in the 1960s, and it remained at the Canadian Museum of Nature since then without a formal description. The specimen represents the youngest ichthyosaur in Canada. The image shows (A) a 3D Surface scan, (B) a photo, and (C) an interpretative line drawing of CMNFV 10424 in left lateral view. Source: Cortés and Larsson (2024).

de Rooij, J., S.A.N. Lucassen, C. Furer, A.S. Schulp and P.M. Sander. 2024. Exploring the ceratopsid growth record: A comprehensive osteohistological analysis of *Triceratops* (Ornithischia: Ceratopsidae) and its implications for growth and ontogeny. *Cretaceous Research* 154: 105738. <https://doi.org/10.1016/j.cretres.2023.105738>

Dudgeon, T.W., G. Gallimore and D.C. Evans. 2024. Individual, ontogenetic, and phylogenetic variation in the dentition of hadrosaurids (Iguanodontia: Ornithischia). *Journal of Systematic Palaeontology* 22: 2419422. <https://doi.org/10.1080/14772019.2024.2419422>

Fiorillo, A.R., P.J. McCarthy, G. Shimer, M.B. Suarez, R. Takasaki, T. Chinzorig, Y. Kobayashi, P. O'Sullivan and E. Orphys. 2024. New dinosaur ichnological, sedimentological, and geochemical data from a cretaceous high-latitude terrestrial greenhouse ecosystem, Nanushuk Formation, North Slope, Alaska. *Geosciences* 14: 36. <https://doi.org/10.3390/geosciences14020036>

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APPENDIX 2

PEER-REVIEWED PUBLICATIONS BY MUSEUM STAFF IN 2024-25

Names of staff members are bold-faced.

ALGAE, LICHENS AND VASCULAR PLANTS

MACROALGAE

Düsedau, L., S. Fredriksen, M. Brand, P. Fischer, U. Karsten, K. Bischof, **A. Savoie** and I. Bartsch. 2024. Kelp forest community structure and demography in Kongsfjorden (Svalbard) across 25 years of Arctic warming. *Ecology and Evolution* 14: e11606. <https://doi.org/10.1002/ece3.11606>

MICROALGAE

Long, S., **P.B. Hamilton**, C. Wang, C. Li, X. Xue, Z. Zhao, P. Wu, E. Gu, M.M. Uddin, B. Li and F. Xu. 2024. Bioadsorption, bioaccumulation and biodegradation of antibiotics by algae and their association with algal physiological state and antibiotic physicochemical properties. *Journal of Hazardous Materials* 468: 133787. <https://doi.org/10.1016/j.jhazmat.2024.133787>

Nayak, P., M. Thacker, **P.B. Hamilton** and B. Karthick. 2024. *Geissleria triundulata* sp. nov., a new freshwater diatom (Cymbellaceae, Bacillariophyta) from the Mula-Mutha River Basin, India. *Phytotaxa* 661: 109–119. <https://doi.org/10.11646/phytotaxa.661.1.9>

Pane, E.P., Y. Risjani, **P.B. Hamilton**, C.N. Solak, Y. Yunianta, N. Ertorun and E. Yilmaz. 2024. A new marine diatom (Bacillariophyceae) species—*Halumphora lombokensis* sp. nov. and the first observation for *H. banzuensis* from Kuta Beach Lombok, West Nusa Tenggara, Indonesia. *PhytoKeys* 250: 165–179. <https://doi.org/10.3897/phytokeys.250.132304>

Williams, M., J. Zalasiewicz, A.D. Barnosky, R. Leinfelder, M.J. Head, C.N. Waters, F.M.G. McCarthy, A. Cearreta, D.C. Aldridge, M. McGann, **P.B. Hamilton**, C.P. Summerhayes, J. Syvitski, J. Zinke, A.B. Cundy, B. Fiałkiewicz-Kozieł, J.R. McNeill, M. Kuwae, N.L. Rose, S.D. Turner, Y. Saito, M. Wagreich, M.A. Stegner, M. Yasuhara, Y. Han, A. Wrisdale, R. Holmes and J.C. Berrio. 2024. Palaeontological signatures of the Anthropocene are distinct from those of previous epochs. *Earth-Science Reviews* 255: 104844. <https://doi.org/10.1016/j.earscirev.2024.104844>

Yao, X., Z. Song, G. Yang, M.W. Yonas, **P.B. Hamilton**, A.S. Nwankwegu, O. Adeyeye, W. Huang, X. Luo, A.M. Hassaan, G.D. Haffner and L. Zhang. 2024. How water stability relates with timing, size, and community successions of harmful algal blooms: A case study in the Three Gorges Reservoir. *Marine Pollution Bulletin* 206: 116781. <https://doi.org/10.1016/j.marpolbul.2024.116781>

Zhi, Y., C. Li, L. Liang, **P.B. Hamilton**, Y. Sun and D. Xiong. 2024. Government-industrial-research cooperation in virtual water strategy: A multi-agent evolutionary game analysis. *Water and Environment Journal* n/a: <https://doi.org/10.1111/wej.12947>

LICHENS

Brodo, I.M., J.C. Lendemer, R.C. Harris, **R.T. McMullin**, M. Eugenia, L. Silanes, N. van Miltenburg, **R. Bull**, M. Paradis and **A. Ginter**. 2024. *Xanthosyne* (Lecanoraceae), a new genus for *Lecidea varians* and related species in Europe and North America. *The Bryologist* 127: 169–219. <https://doi.org/10.1639/0007-2745-127.2.169>

Cruickshanks, K., F. Anderson, S. Clayden, M. Frison, **R.T. McMullin** and S.R. Haughian. 2024. Vertical differentiation of epiphyte communities in old-growth hemlock forests: a source of sampling bias in biodiversity inventory. *The Bryologist* 127: 413–426. <https://doi.org/10.1639/0007-2745-127.4.413>

Drotos, K., D. Larson and **R.T. McMullin**. 2024. Scientific telephone: Global lichen coverage is yet unknown. *BioScience* 74: 473–477. <https://doi.org/10.1093/biosci/biae048>

Gillingham, D., J. Hodge, F. Skeard, C. Hanel, Y.F. Wiersma, A. Arsenault, K.E. Driscoll, H. Paquette and **R.T. McMullin**. 2024. Mi'kmaq knowledge helps uncover a new area of interesting lichen biodiversity on the island of Newfoundland (Ktaqmkuk). *The Bryologist* 127: 249–268. <https://doi.org/10.1639/0007-2745-127.2.249>

Lavoie, A., J. Collin, J. Gagnon, S.R. Brinker, **I.M. Brodo**, C. Roy, F. Anderson, **R.T. McMullin** and A. Huereca. 2024. Additions to the lichens, allied fungi and lichenicolous fungi of Québec, Canada, with emphasis on the area below the 50th parallel. *Opuscula Philolichenum* 23: 82–112.

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Wiersma, Y.F., J. Hodge, D. Gillingham, B. Francis, R. Hennifent, F. Skeard and **R.T. McMullin**. 2025. A new hotspot for Blue Felt Lichen (*Pectenia plumbea*) in Atlantic Canada. *Northeastern Naturalist* 32: 103–113.

Yahr, R., J. Allen, V. Atienza, F. Bungartz, N. Christmas, M. Dal Forno, P. Degtjarenko, Y. Ohmura, S. Pérez-Ortega, T. Randlane, R. Næsborg, D. Simijaca-Salcedo, G. von Hirschheydt, F. Anderson, A. Aptroot, E. Balderas, N. Borukhiyah, A. Chandler, M.C. Marro, P.K. Divakar, R.A. García, M.A. Herrera-Campos, N. Howe, S. Joseph, E.M. Larson, J.C. Lendemer, **R.T. McMullin**, A. Michlig, B. Moncada, J. Paulsen, F. Roa-García, R. Rosentreter, C. Scheidegger, L.B. Sparrius and D. Stone. 2024. Red listing lichenized fungi: Best practices and future prospects. *The Lichenologist* 56: 345–362. <https://doi:10.1017/S0024282924000355>

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- Cahen, D., Z.L.K. Magombo and **L.J. Gillespie**. 2024. *Tragia grandistipularis* (Euphorbiaceae), a new species from Malawi. *Kew Bulletin* 79: 535-542. <https://doi.org/10.1007/s12225-024-10197-1>
- Chapman-Lam, C.**, **P.C. Sokoloff**, J. Klymk and L. O'Connor. 2023 [2024]. First records of Tall Beech Fern, *Phegopteris excelsior* N. Patel & A.V. Gilman (Thelypteridaceae), for Ontario and Prince Edward Island. *Specimen* 29. <https://doi.org/10.56222/28166531.2024.29>
- Chapman-Lam, C.J.** and **P.C. Sokoloff**. 2024. Branching Burreed (*Sparganium androcladum* (Engelmann) Morong; Typhaceae) rediscovered in Ontario, but conservation status unclear. *Canadian Field-Naturalist* 137: 351-357. <https://doi.org/10.22621/cfn.v137i4.3151>
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- Gillespie, L.J.**, **W.M. Cardinal-McTeague** and K.J. Wurdack. 2024. Three unusual new species of *Plukenetia* (Euphorbiaceae) from Madagascar: species radiation and convergent evolution in *P.* sect. *Madagascarienses*. *Systematic Botany* 49: 192-208. <https://doi.org/10.1600/036364424X17110456120767>

- Grass Phylogeny Working Group III [including **L.J. Gillespie** and **J.M. Saarela**]. 2025. A nuclear phylogenomic tree of grasses (Poaceae) recovers current classification despite gene tree incongruence. *New Phytologist* 245: 818-834. <https://doi.org/10.1111/nph.20263> (first published 20 November 2024)

- Zhang, L., J. Starr, B. Ford, A. Reznicek, Y. Zhou, É. Léveillé-Bourret, É. Lacroix-Carignan, J. Cayouette, T.W. Smith, D. Sutherland, P. Catling, **J.M. Saarela**, H. Cui and J. Macklin. 2025. Helping authors produce FAIR taxonomic data: evaluation of an author-driven phenotype data production prototype. *Database* 2025: baae097. <https://doi.org/10.1093/database/baae097>

- Zuntini, A.R. et al. [including **W.M. Cardinal-McTeague** and **L.J. Gillespie**]. 2024. Phylogenomics and the rise of the angiosperms. *Nature* 629: 843-850. <https://doi.org/10.1038/s41586-024-07324-0>

ANIMALS

INVERTEBRATES

BEETLES

- Anderson, R.S.** 2024. A second species of the genus *Panolcus* Gerstaecker 1860 (Coleoptera: Curculionidae: Molytinae: Cryptorhynchini) from French Guiana and Suriname with taxonomic changes in Cryptorhynchini. *Zootaxa* 5437: 15-20. <https://doi.org/10.11646/zootaxa.5437.1.2>

- Bollino, M. and **R.S. Anderson**. 2024. A new species of *Eupholus* Boisduval, 1835 from Indonesian New Guinea with notes on the taxonomy of the genus (Coleoptera, Curculionidae). *Zootaxa* 5443: 431–445. <https://doi.org/10.11646/zootaxa.5443.3.7>
- Borovec, R. and **R. Anderson**. 2024. Two new *Trachyploeini* (Coleoptera; Curculionidae; Entiminae) from Laos. *Zootaxa* 5506: 145–150. <https://doi.org/10.11646/zootaxa.5506.1.11>
- Chamorro, W., A. Lopera-Toro and **F. Génier**. 2024. A new species of *Ontherus* Erichson, 1847 (Coleoptera: Scarabaeidae: Scarabaeinae: Coprini) and new distributional records of *Cryptocanthon humidus* Howden, 1973 (Coleoptera: Scarabaeidae: Scarabaeinae: Deltophilini) for Ecuador. *Zootaxa* 5471: 56–66. <https://doi.org/10.11646/zootaxa.5471.1.3>
- Cherman, M.A., D.S. Basilio, B. Clarkson, J. Mondaca, A. Bezděk, **A.B.T. Smith** and L.M. Almeida. 2025. Taxonomic revision of Chilean *Liogenys* (Coleoptera: Melolonthidae) and molecular assessment of a species complex. *Zoological Journal of the Linnean Society* 203: zlae147. <https://doi.org/10.1093/zoolinnea/zlae147>
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- Dolson, S.J., H.M. Kharouba and **R. Anderson**. 2024. The role of endemism and biodiversity hotspots in conservation: A case study with neotropical leaf litter weevils. In: J.L. León-Cortés and A. Córdoba-Aguilar (Eds.). *Insect Decline and Conservation in the Neotropics*. Springer International Publishing, Cham, pp. 263–273. https://doi.org/10.1007/978-3-031-49255-6_13
- Hernandez-May, M.A., M.P. de la Cruz, J.C. Giron, **R.S. Anderson** and J.A. Mendez-Garcia. 2024. First record of *Exophthalmus albofasciatus* (Coleoptera, Curculionidae, Entiminae) in Mexico feeding on *Coccoloba barbadensis* (Polygonaceae). *Travaux du Museum National d'Histoire Naturelle Grigore Antipa* 67. <https://doi.org/10.3897/travaux.67.e102876>
- Peck, S.B., F. Génier** and J. Cook. 2024. Introduced and invasive *Ptomaphagus medius* (Rey) and native *Ptomaphagus brevior* Jeannel and *Ptomaphagus ulkei* Horn in Ontario and Québec, Canada (Coleoptera: Leiodidae: Cholevinae: Ptomaphagini). *The Coleopterists Bulletin* 78: 353–360. <https://doi.org/10.1649/0010-065x-78.3.353>
- Rossini, M. and **F. Génier**. 2024. A new classification for the *Onthophagus clypeatus* group (Coleoptera: Scarabaeidae: Scarabaeinae) and description of a new species from western Ecuador. *The Coleopterists Bulletin* 78: 415–428. <https://doi.org/10.1649/0010-065X-78.3.415>
- Skelley, P.E. and **A.B.T. Smith**. 2025. Five unusual new species of *Rhyparus* Westwood, 1845 from Mexico and Central America (Coleoptera: Scarabaeidae: Aphodiinae: Rhyparini). *Insecta Mundi* 1091: 1–19.
- Tello, F., **F. Génier**, M. Pino, M. Rossini and J.R. Verdú. 2024. *Gomphocopriss ashworthi* gen. et sp. nov. (Coleoptera, Scarabaeinae, Homocoprini): an additional new Chilean fossil genus and species extinct at the Pleistocene-Holocene boundary. *Palaeoentomology* 7: 386–394. <https://doi.org/10.11646/palaeoentomology.7.3.8>

Yunakov, N., M. Bollino, L. Pancini and **R. Anderson**. 2024. Discovery of *Elytrurini* in Wallacea with a description of *Exophthalmida elytrodon* sp. nov. from Morotai Island (Coleoptera: Curculionidae: Entiminae). *Zootaxa* 5537: 270–280. <https://doi.org/10.11646/zootaxa.5537.2.7>

VERTEBRATES

FISHES

Jónsdóttir, G.Ó., L.-M. von Elm, F. Ingimarsson, S. Tersigni, S.S. Snorrason, A. Pálsson and **S.E. Steele**. 2024. Diversity in the internal functional feeding elements of sympatric morphs of Arctic charr (*Salvelinus alpinus*). *PLOS ONE* 19: e0300359. <https://doi.org/10.1371/journal.pone.0300359>

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Bolduc, D., **D. Fauteux**, G. Gauthier and P. Legagneux. 2025. Seasonal role of a specialist predator in rodent cycles: Ermine–lemming interactions in the High Arctic. *Ecology* 106: e4512. <https://doi.org/10.1002/ecy.4512>

Kohut, G., R. Losey, S. Kutz, **K. Khidas** and T. Nomokonova. 2024. Assessing current visual tooth wear age estimation methods for *Rangifer tarandus* using a known age sample from Canada. *PLOS ONE* 19: e0301408. <https://doi.org/10.1371/journal.pone.0301408>

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Lavoie, N. Lecomte, P. Legagneux, E. Lévesque, M.-J. Naud, M. Paquette, S. Payette, R. Pienitz, M. Rautio, A. Roy, A. Royer, M. Simard, W.F. Vincent and J. Bêty. 2024. Expert elicitation of state shifts and divergent sensitivities to climate warming across northern ecosystems. *Communications Earth & Environment* 5: 624. <https://doi.org/10.1038/s43247-024-01791-z>

Valcourt, M., **D. Fauteux**, and G. Gauthier 2024. Influence of habitat on fine-scale space use by brown lemmings (*Lemmus trimucronatus*) in the High Arctic. *Journal of Mammalogy* 105: 1141–1150. <https://doi.org/10.1093/jmammal/gyae069>

MINERALOGY

Lykova, I. 2024. Reply to the Comment on the paper on natromelansonite by Gore and McDonald (2024). *Mineralogical Magazine* 88: 626. <https://doi.org/10.1180/mgm.2024.73>

Piilonen, P.C. and **I. Lykova**. 2024. Mont Saint-Hilaire: A National Treasure: A new exhibit at the Canadian Museum of Nature. *Rocks & Minerals* 99: 530–543. <https://doi.org/10.1080/00357529.2024.2377001>

Piilonen, P.C., R. Rowe, G. Poirier, H. Friis, C. Robak and **M. Bainbridge**. 2024. The first (and second) known occurrences of bazzite in Canada—the Quadeville Rose Quartz Quarry, Ontario, and the Bugaboo Castles Aquamarine Deposit, British Columbia—description and crystal structure. *The Canadian Journal of Mineralogy and Petrology* 62: 457–478. <https://doi.org/10.3749/2300035>

PALAEOBIOLOGY

Mallon, J.C. and D.W.E. Hone. 2024. Estimation of maximum body size in fossil species: A case study using *Tyrannosaurus rex*. *Ecology and Evolution* 14: e11658. <https://doi.org/10.1002/ece3.11658>. Correction: <https://doi.org/10.1002/ece3.70258>

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Whittingham, M.A.J.B., V.A. Korasidis and **D. Fraser.** 2024. Functional stasis and changing habitat preferences among mammalian communities from the PETM of the Bighorn Basin, Wyoming. Cambridge Prisms: Extinction 2: e20. <https://doi.org/10.1017/ext.2024.25>

Wang, D. L. Xing, **J.C. Mallon, T. Miyashita,** Z. Liang, X. Zhang, Z. Ren, Z. Liang and M. Xian. 2025. First occurrence of the duck-billed dinosaur tribe Lambeosaurini (Hadrosauridae: Lambeosaurinae) in South China. Historical Biology. <https://doi.org/10.1080/08912963.2025.2454652>

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OTHER

Ruiz-Puerta, E.J., G. Jarrett, M.L. McCarthy, **S. Pan,** X. Keighley, M. Aiken, G. Zampirolo, M.J.J.E. Loonen, A.B. Gotfredsen, L.R. Howse, P. Szpak, S. Pálsson, **S. Rufolo,** H.J. Malmquist, **S.P.A. Desjardins,** M.T. Olsen and P.D. Jordan. 2024. Greenland Norse walrus exploitation deep into the Arctic. Science Advances 10: eadq4127. <https://doi.org/10.1126/sciadv.adq4127>

Wilson, S., P. Smith, E. Kenchington, M. Ballard, R. Buxton, K. Bobiwash, S.J. Marshall, E. Gilmore, É. Abergel, J. Allison, D. Arbuthnott, S. Avery-Gomm, N.C. Ban, K.F. Beazley, J.R. Bennett, E. Bennett, A.D. Binley, L.K. Blight, L.E. Bortolotti, D. Browne, E.K. Cameron, K.M.A. Chan, C. Chisholm, C. Chu, S.J. Cooke, F. Di Palma, D. Duplisea, C. Edge, B. Frei, L.W. Gomes, C. Hart, S. Hayne, M. Houde, A.L. Jacob, S. Javorek, H. Kharouba, D.R. Lapen, T.G. Martin, M. Mitchell, I. Naujokaitis-Lewis, E.A. Nyboer, M. O'Connor, A. Olive, S. Otto, B. Pickering, R. Pither, G. Pritchard, C. Raudsepp-Hearne, J. Rice, D.G. Roche, E. Rubidge, M. Ryckman, **J.M. Saarela,** K.D. Sadler, C. Shulman, I. Siboo, K.A. Solarik, F. Soulard, C. Sponarski, D. Stralberg, E. Ubalijoro, A. Ventimiglia and C.D. Ziter. 2024. Science and knowledge needs to support Canada's implementation of the Kunming-Montreal Global Biodiversity Framework. 62 pp. Available from: <https://open-science.canada.ca/handle/123456789/2215> (accessed 2025-01-27). [Also available in French.]

APPENDIX 3

PEER-REVIEWED PUBLICATIONS BY MUSEUM RESEARCH ASSOCIATES IN 2024-25

Research associates are active members of the scientific community whose honorary appointment with the Canadian Museum of Nature benefits both the museum and the researcher. Research associates are bold-faced in the citations.

VASCULAR PLANTS

Azzella, M.M., A.D. Vecchia, T. Abeli, J. Alahuhta, V.B. Amoroso, E. Ballesteros, V. Bertrin, **D. Brunton**, A.A. Bobrov, C. Caldeira, S. Ceschin, E.V. Chemeris, M. Čtvrtlíková, M. de Winton, E. Gacia, O.G. Grishutkin, D. Hofstra, D. Ivanova, M.O. Ivanova, N.K. Konotop, D.M. Larson, S. Magrini, M. Mjelde, O.A. Mochalova, G. Oliveira, O. Pedersen, J.B.d.S. Pereira, C. Ribaudó, M.I. Romero Buján, A. Troia, Y.S. Vinogradova, P.A. Volkova, D.B. Zandonadi, N.V. Zueva and R. Bolpagni. 2024. Global assessment of aquatic *Isoetes* species ecology. *Freshwater Biology* 69: 1420-1437. <https://doi.org/10.1111/fwb.14316>

Hagelstam-Renshaw, C., J.J. Ringelberg, C. Sinou, **W. Cardinal-McTeague** and A. Bruneau. 2024. Biome evolution in subfamily Cercidoideae (Leguminosae): a tropical arborescent clade with a relictual depauperate temperate lineage. *Brazilian Journal of Botany* 48: 11. <https://doi.org/10.1007/s40415-024-01058-z>

Shukla, P.K., S.K. Singh, **D.F. Brunton**, S.K. Shukla, A.P. Patil and N.K. Dubey. 2024. *Isoetes bilaspurensis* (Isoetaceae-Lycopodiopsida), new to southern India: an extended distribution and redescription. *American Fern Journal* 114: 127-139. <https://doi.org/10.1640/0002-8444-114.2.127>

ANIMALS

INVERTEBRATES

AMPHIPODS

Giulianini, P.G., C. De Broyer, **E.A. Hendrycks**, S. Greco, E. D'Agostino, S. Donato, A. Giglio, M. Gerdol, A. Pallavicini and C. Manfrin. 2024. A new Antarctic species of *Orchomenella* G.O. Sars, 1890 (Amphipoda: Lysianassoidea: Tryphosidae): is phase-contrast microtomography a mature technique for digital holotypes? *Zoological Journal of the Linnean Society* 201: zlae 075. <https://doi.org/10.1093/zoolinnea/zlae075>

BEETLES

Caron, E., M.L. Monné, V.S. Ferreira, C. Costa, M. Cupello, S. Aloquio, A.M. Linzmeier, F.Z. Vaz-de-Mello, F.W.T. Leivas, I. Souza-Gonçalves, J.R.M. Mermudes, L.M. Almeida, L.d.A. Moura, N. Ferreira Júnior, P.C. Grossi, S.A. Vanin, A. Ślipiński, A. Anichtchenko, A.F. Newton, A. Sampaio, A. Carelli, A. Puker, A.d.S. Ferreira, A.S. Fernandes, A.S. Roza, A. Cline, B.H.L. Sampaio, B. Clarkson, C.F.d. Castro, C.d.L. Bicho, C.J. Benetti, C.S. Ribeiro-Costa, C. Lopes-Andrade, D. Manfio, D. Colpani, D.S. Basílio, D.d.C. Bená, D.A. Pollock, D.d.S. Souza, D.F. Rodrigues, D.S. Chandler, E.A.d. Nascimento, E.L. Spiessberger, F.A. Agrain, F.F. Barbosa, F. Shockley, F.E.d.L. Nascimento, G. Biffi, G.S. Powell, G.E. Morse, G.E. Flores, H.

Escalona, H.Y.S. Quintino, H.L. Rainho, I.S.C.P. Maddalena, J. Hájek, J.V. McHugh, J.P. Botero, J. Fuhrmann, J.M. Churata-Salcedo, L.M. Vieira, L.F.L.d. Silveira, L.S.d. Cruz, L. Sekerka, M.A. Bologna, M.V.O. Bevilaqua, M.I. Passos, M.L. Chamorro, M.A. Cherman, M. Bento, M. Gimmel, M.O. Segura, M.A. Ivie, M.C. Thomas, M.A. Monné, N. Lord, N. Hamada, N. Degallier, P.B.d. Santos, P.R.M. Duarte, P. Gnaspini, P. Bulirsch, R. Regalin, R.A.B. Leschen, R. Constantin, R.C. Corrêa, R. Gerstmeier, S.P. Rosa, S.V.N. Campos, **S.B. Peck**, T.L. Pacheco, T.T.S. Polizej, T.C. McElrath, T.L. Grzymala, T.R. Smith, V.d. Costa-Silva, V.E. Sandoval-Gómez, W.O.d. Sousa and W. Tomaszewska. 2024. Coleoptera of Brazil: what we knew then and what we know now. Insights from the Catálogo Taxonômico da Fauna do Brasil. *Zoologia (Curitiba)* 41: e23072. <https://doi.org/10.1590/S1984-4689.v41.e23072>

BEES

Gibson, S.D., **T.M. Onuferko**, L. Myers and S.R. Colla. 2024. Determining the plant-pollinator network in a culturally significant food and medicine garden in the Great Lakes region. *PeerJ* 12: e17401. <https://doi.org/10.7717/peerj.17401>

Onuferko, T.M., M.G. Rightmyer, G.A.R. Melo and A. Roig-Alsina. 2024. A revision of the South American species of the cleptoparasitic bee genus *Triepeolus* Robertson, 1901 (Hymenoptera: Apidae). *European Journal of Taxonomy* 931: 1-50. <https://doi.org/10.5852/ejt.2024.931.2505>

OTHER

Hall, T.C.K., **T.M. Onuferko** and J.S. MacIvor. 2025. Assessing the effects of mowing intensity on the overwintering stem-dwelling insect community of *Solidago altissima* L. (Asterales: Asteraceae). *Insect Conservation and Diversity*. <https://doi.org/10.1111/icad.12821>

VERTEBRATES

BIRDS

Sutton, A.O., D. Strickland, J. Lachapelle, R.G. Young, R. Hanner, **D.F. Brunton**, J.H. Skevington, N.E. Freeman and D.R. Norris. 2024. Fecal DNA metabarcoding helps characterize the Canada jay's diet and confirms its reliance on stored food for winter survival and breeding. *PLOS ONE* 19: e0300583. <https://doi.org/10.1371/journal.pone.0300583>

FISHES

Carim, K.J., G. Auringer, M.F. Docker, **C.B. Renaud**, B.J. Clemens, M.R. Blanchard, C. Parker, and M.K. Young. 2024. Species diversity in the new lamprey genus *Occidentis*, formerly classified as western North American "Lampetra." *PLOS ONE* 19: e0313911. <https://doi.org/10.1371/journal.pone.0313911>

Macpherson, E.S.B., F.E. Hauser, A. Van Nynatten, B.S.W. Chang and **N.R. Lovejoy**. 2024. Evolution of rhodopsin in flatfishes (Pleuronectiformes) is associated with depth and migratory behavior. *Journal of Fish Biology* 105: 779-790. <https://doi.org/10.1111/jfb.15828>

Magnuson, A., M.N. Dean, J.C. Weaver, J.P. Fontenelle, **N.R. Lovejoy** and M.A. Kolmann. 2024. Independent transitions to freshwater environments promote phenotypic divergence, not convergence, in stingrays. *Integrative and Comparative Biology* 64: 1437-1453. <https://doi.org/10.1093/icb/icae023>

Riva Rossi, C., **C.B. Renaud**, P. Quiroga, C.F. Baker, C. Baigún, I.C. Potter, F.J. Neira, S.N. Morawicki, and P. Solimano. 2024a. Identification of long-preserved specimens reveals the historical geographic range of the Patagonian lamprey *Geotria macrostoma* (Burmeister, 1868) in southern South America. *Journal of Fish Biology* 104: 1990–2007. <https://doi.org/10.1111/jfb.15732>

Van Nynatten, A., R.A. Castañeda, A. Chakona, **N.R. Lovejoy**, O.L.F. Weyl and N.E. Mandrak. 2024. Environmental DNA metabarcoding in the Cape Fold aquatic ecoregion: Opportunities and challenges for eDNA uptake in an endemism hotspot. *Freshwater Biology* 69: 1627–1639. <https://doi.org/10.1111/fwb.14331>

MAMMALS

McAlpine, D.F., **H.M. Huynh** and S.A. Pavey. 2024. The extinct sea mink, *Neogale macrodon*: a putative specimen in the New Brunswick Museum, Canada, confirmed as American mink, *Neogale vison*. *Archives of Natural History* 51: 171–174. <https://doi.org/10.3366/anh.2024.0904>

CONSERVATION

Henderson, J. and **R. Waller**. 2024. Dissociation and loss: A challenge for sustainable and inclusive conservation. *Studies in Conservation* 69: 169–175. <https://doi.org/10.1080/00393630.2024.2339768>

Hirsch, J., P. Koay, C. Martin, M. Miller, **R. Waller** and A. Zavec. 2024. Promoting exhibit access and safety (PEAS): reflections on conference surveys. *Collections* 20: 268–280. <https://doi.org/10.1177/15501906241233809>

Waller, R., M. Coleman, S. Denard and E. Soane. 2024. Lessons identified from applications of the Risk Analysis Quality Test Release 1.0. *Risk Analysis* 44: 1886–1895. <https://doi.org/10.1111/risa.14292>

PALAEOBIOLOGY

Adams, G.R., B.K.A. Otoo, C.P.W. Bohus, L.M. Micucci and **H.C. Maddin**. 2025. Anatomy and revised diagnosis of the embolomere *Calligenethlon watsoni* from Joggins, Nova Scotia, based on micro-computed tomography. *Zoological Journal of the Linnean Society* 203: <https://doi.org/10.1093/zoolinnean/zlae178>

Carter, L.D., D. Christensen, D.M. Hopkins, J.V. Matthews Jr., R.E. Nelson, L.E. Ovenden, **N. Rybczynski** and T.L. Fletcher. 2024. Stratigraphy and paleontology (plant and arthropod fossils) from the Late Neogene Niguanak site, Arctic Slope, Northern Alaska. *Arctic, Antarctic, and Alpine Research* 56: 2407714. <https://doi.org/10.1080/15230430.2024.2407714>

Cocker, S.L., **G.D. Zazula**, E. Hall, C.N. Jass, J.E. Storer and D.G. Froese. 2024. Predation, reoccupation, cannibalism, and scavenging? Records of small mammals in arctic ground squirrel middens from east Beringia. *Arctic, Antarctic, and Alpine Research* 56: 2428070. <https://doi.org/10.1080/15230430.2024.2428070>

Esteban, J.M., A. Martín-Serra, A. Pérez-Ramos, **N. Rybczynski**, K. Jones and B. Figueirido. 2024. The influence of the land-to-sea macroevolutionary transition on vertebral column disparification in Pinnipedia. *Proceedings of the Royal Society B: Biological Sciences* 291: 20232752. <https://doi.org/10.1098/rspb.2023.2752>

Fukuhara, A., M. Sato, H. Ogawa, **T. Sato**, W. Sellers and A. Ishiguro. 2024. Rethinking the four-wing problem in plesiosaur swimming using bio-inspired decentralized control. *Scientific Reports* 14: 25333. <https://doi.org/10.1038/s41598-024-55805-z>

Holmes, R.B. 2024. Evaluation of the photosensory characteristics of the lateral and pineal eyes of *Plioplatecarpus* (Squamata, Mosasauridae) based on an exceptionally preserved specimen from the Bearpaw Shale (Campanian, Upper Cretaceous) of southern Alberta. *Journal of Vertebrate Paleontology* 43: e2335174. <https://doi.org/10.1080/02724634.2024.2335174>

Tanaka, T., K. Chiba, T. Ikeda and **M.J. Ryan**. 2024. A new neoceratopsian (Ornithischia, Ceratopsia) from the Lower Cretaceous Ohyamashimo Formation (Albian), southwestern Japan. *Papers in Palaeontology* 10: e1587. <https://doi.org/10.1002/spp2.1587>

Thompson, M.G., T.M. Cullen, D.C. Evans, C. Schröder-Adams and **M.J. Ryan**. 2024. Multi-proxy paleoenvironmental and paleoecological reconstruction of the Foremost Formation (Upper Cretaceous, Campanian) of Alberta. *Palaios* 39: 425-443. <https://doi.org/10.2110/palo.2022.061>

OTHER

Moraru, A., L.H. Rasmussen, F. Cali Quaglia, A. Middleton, **H.M. Huynh** and A. López-Quirós. 2024. Polar fieldwork in the 21st century: Early Career Researchers considerations regarding safety and sustainability. *PLOS Climate* 3: e0000415. <https://doi.org/10.1371/journal.pclm.0000415>

Taylor, B., M. Strüder-Kypke and F. Siemensma. 2024 [2025]. A new species of testate amoeba, *Arcella prismatica* sp. nov. (Amoebozoa: Arcellinida), from peatlands in Ontario and Quebec, Canada. *The Canadian Field-Naturalist* 138: 1-15. <https://doi.org/10.22621/cfn.v138i1.3195>

APPENDIX 4

CONFERENCE PRESENTATIONS BY MUSEUM STAFF IN 2024-25

Aktan, Y., A. Turner, **P.B. Hamilton**, C.N. Solak and H. Yildiz. 2024. Two new *Halamphora* (Amphipleuraceae: Bacillariophyta) species from Gökova Bay in the Republic of Türkiye. 15th European Diatom Symposium, Ohrid, Macedonia, 7–9 May 2024. Abstract: p. 110, <https://15edm2024.mk/>

Alibert, A.M., D. Antoniadou, **P.B. Hamilton** and R. Pienitz. 2024. The truth about applying inference models. PAL Kingston, Ont., May 2024.

Anderson, R.S. 2024. The weevils. Coleopterists Society, during the Annual Meeting of the Entomological Society of America, Phoenix, Ariz., 10–13 November 2024. (keynote speaker)

Ayanarajan, A., **J. Mallon**, A. Villaseñor and **D. Fraser**. 2024. Horncore size as an ecometric indicator? Considerations from the examination of North American Bison. Canadian Society of Vertebrate Palaeontology 11th Annual Meeting, Winnipeg, Man., 22–25 May 2024. Abstract: Vertebrate Anatomy Morphology Palaeontology 12: 10. <https://doi.org/10.18435/vamp29402>

Barinova, S., C.N. Solak, **P.B. Hamilton**, L. Peszek and F. Yedidag. Two new *Halamphora* (Amphipleuraceae: Bacillariophyta) species from Negev Desert in Israel. 15th European Diatom Symposium, Ohrid, Macedonia, 7–9 May 2024. Abstract: p. 111, <https://15edm2024.mk/>

Blades, R. and Fleischmann, S. 2025. From Tables to Trees: Importing into etaxonomy. Axiell North American User Conference, Los Angeles, California, 4–7 March 2025.

Blanchette, A.-M., **D. Fauteux**, E. Lévesque and P. Legagneux. 2024. Lemmings and their impact on Arctic willows. Congrès Société Québécoise pour l'Étude Biologique du Comportement, Université Concordia, Montréal, Que., 15–17 November 2024.

Blanchette, A.-M., **D. Fauteux**, E. Lévesque and P. Legagneux. Lemmings and their impact on Arctic willows. ArcticNet's 5th International Arctic Change Conference (AC2024), Ottawa, Ont., 9–12 December 2024.

Bohus, C.P., **T. Miyashita**, **D. Fraser** and **H.C. Maddin**. 2024. Description of the southern Illinois colosteid braincase via X-ray computed tomography. Society of Vertebrate Paleontology, Minneapolis, Minn., 29 October – 2 November 2024.

Bolduc, D., **D. Fauteux** and P. Legagneux. 2024. Boxed camera traps: Continuous monitoring of small mammal populations. ArcticNet's 5th International Arctic Change Conference (AC2024), Ottawa, Ont., 9–12 December 2024.

Bolduc, D., **D. Fauteux** and P. Legagneux. 2024. Boxed camera traps: Continuous monitoring of small mammal populations. Congrès Société Québécoise pour l'Étude Biologique du Comportement (SQÉBC), Université Concordia, Montréal, Que., 15–17 November 2024.

Bolduc, D., **D. Fauteux** and P. Legagneux. 2025. Small mammals meet big data. 45e Colloque du Centre d'Études Nordiques. Trois-Rivières, Qué., 13–14 February 2025.

- Cardinal-McTeague, W.M.**, K.J. Wurdack and **L.J. Gillespie**. 2024. A revised generic classification of Tragiinae including the subdivision of *Tragia* (Euphorbiaceae tribe Plukenetieae). XX International Botanical Congress IBC 2024, Spain, 21–27 July 2024.
- Cavallin, N. and **J. Doubt**. 2024. Community of practice for building herbarium resilience, relevance, and relationships. Plant Canada Conference, Winnipeg, Man., 7–10 July 2024.
- Fauteux, D.**, D. Bolduc and P. Legagneux. 2024. Small mammal monitoring at the Kenauk forest. Kenauk Institute conference, Montebello, Que., 8 September 2024.
- Fraser, D.** and **B. Hunter-Moffatt**. 2024. Mammal dispersal among tectonically active and quiescent regions of North America. Society of Vertebrate Paleontology, Minneapolis, Minn., 29 October – 2 November 2024.
- Gaudreau-Rousseau, C., **D. Fauteux**, G. Yannic and P. Legagneux. 2024. Open-sky laboratory: studying individual lemming behavior in the Arctic. ArcticNet’s 5th International Arctic Change Conference (AC2024), Ottawa, Ont., 9–12 December 2024.
- Gillespie, L.J.**, **P.C. Sokoloff** and **G.A. Levin**. 2024. Vascular plant biodiversity of east-central Baffin Island, Nunavut. ArcticNet’s 5th International Arctic Change Conference (AC2024), Ottawa, Ont., 9–12 December 2024.
- Gomes, A., **P.B. Hamilton**, C.N. Solak, T. Boski, D. Moura, N. Ertorum and F. Yedidag. A new diatom species—*Tetramphora* sp. nov. (Mastogloiaaceae: Bacillariophyta) – in Arade estuarine, Portugal. 15th European Diatom Symposium, Ohrid, Macedonia, 7–9 May 2024. Abstract: p. 112, <https://15edm2024.mk/>
- Grass Phylogeny Group III (Arthan, W., W.J. Baker, M.D. Barrett, R.L. Barrett, J. Bennetzen, G. Besnard, M.E. Bianconi, J.L. Birch, P. Catalán, W. Chen, M. Christenhusz, P.-A. Christin, L.G. Clark, J.T. Columbus, C. Couch, D.M. Crayn, G. Davidse, S. Dransfield, L.T. Dunning, M.R. Duvall, S.Z. Ficinski, A.E. Fisher, S. Fjellheim, F. Forest, **L.J. Gillespie**, J. Hackel, T. Haevermans, T.R. Hodkinson, C.-H. Huang, W. Huang, A.M. Humphreys, R.W. Jobson, C.J. Kayombo, E.A. Kellogg, J.M. Kimeu, I. Larridon, R. Letsara, D.-Z. Li, J.-X. Liu, X. Londoño, Q.W.R. Luke, H. Ma, T.D. Macfarlane, O. Maurin, M.R. McKain, T.G.B. McLay, M.F. Moreno-Aguilar, D.J. Murphy, O.P. Nanjarisoa, G.E. Onjalalaina, P.M. Peterson, R.A. Rakotonasolo, J. Razanatsoa, **J.M. Saarela**, L. Simpson, N.W. Snow, R.J. Soreng, M. Sosef, J.J.E. Thompson, P. Traiperm, G.A. Verboom, M.S. Vorontsova, N.G. Walsh, J.D. Washburn, T. Watcharamongkol, M. Waycott, C.A.D. Welker, M.D. Xanthos, N. Xia, L. Zhang, A. Zizka, F.O. Zuloaga and A.R. Zuntini. 2024. Nuclear phylogenomics of grasses (Poaceae) supports current classification and reveals repeated reticulation. XX International Botanical Congress IBC 2024, Spain, 21–27 July 2024.
- Hamilton, P.B.** 2025. Building the diatom (Heterokontophyta) DNA library with rare species using traditional sequencing. AquaEcomics, exploring Aquatic Ecology through Omics. Evian, France, 17–20 March 2025.
- Landry, Z., J.H. Miller, **G. Zazula**, C. Bataille, **D. Fraser**, L. Orlando and H. Tiffin. 2024. Cheek tooth morphology is not a reliable taxonomic indicator for Beringian *Equus*. Society of Vertebrate Paleontology, Minneapolis, Minn., 29 October – 2 November 2024.
- Libke, C., **H.C. Maddin** and **J.C. Mallon**. 2024. Preliminary evidence for a latitudinal size gradient in *Triceratops* (Dinosauria, Ceratopsia). Canadian Society of Vertebrate Palaeontology 11th Annual Meeting, Winnipeg, Man., 22–25 May 2024. Abstract: Vertebrate Anatomy Morphology Palaeontology 12: 24–25. <https://doi.org/10.18435/vamp29402>

- Lussier, A.J.**, I. Komendat, J. Coderre and G. Poirier. 2024. Tourmaline from the Leduc pegmatite, near Val-des-Monts, Quebec, Canada. GAC-MAC Joint Annual Meeting (Geological Association of Canada and Mineralogical Association of Canada), Brandon, Man., 11-14 May 2024.
- Lykova, I.** 2024. Tolbachik, Kamchatka—A micromounter's paradise. Annual Micromount Conference of the Northern California Mineralogical Association, El Dorado, Cal., 24-26 May 2024.
- Madge, K., G. Vakulenko and J. Doubt.** 2024. From bogs to bytes: Digitizing the flora of the Hudson Bay Lowlands ecozone. ArcticNet's 5th International Arctic Change Conference (AC2024), Ottawa, Ont., 9-12 December 2024.
- Mamanazarova, K., C.N. Solak, **P.B. Hamilton**, N. Ertorun and F. Yedidag. 2024. Two new *Halamphora* (Amphipleuraceae: Bacillariophyta) species from Aydar-Arnasay system of Lake in Uzbekistan. 15th European Diatom Symposium, Ohrid, Macedonia, 7-9 May 2024. Abstract: p. 114, <https://15edm2024.mk/>
- McMullin, R.T.**, A. Fryday, J. Allen and **P.C. Sokoloff**. 2024. Biodiversity of lichens and allied fungi in Iqalugaarjuup Nunanga Territorial Park, Rankin Inlet, Nunavut. ArcticNet's 5th International Arctic Change Conference (AC2024), Ottawa, Ont., 9-12 December 2024.
- Miyashita, T.** 2024. Comparative phylogenetics of early ray-finned fishes. Canadian Society of Zoologists 63rd Annual Meeting, Moncton, New Brunswick, 6-10 May 2024.
- Miyashita, T.**, P. Janvier, K. Tietjen and M. Coates. 2024. Evolution of extrinsic eye muscles invertebrates. Society of Vertebrate Paleontology, Minneapolis, Minn., 29 October - 2 November 2024.
- Piilonen, P.** The new Mont Saint-Hilaire exhibit at the Canadian Museum of Nature. 2024. Association of Micro-Mineral Collectors Annual Symposium, St. Catherine's, Ont., 3-5 May 2024.
- Piilonen, P., A. Lussier, G. Poirier, R. Rowe** and C. Robak. 2024. The Ice River Alkaline Complex, SE British Columbia. 2024. Association of Micro-Mineral Collectors Annual Symposium, St. Catherine's, Ont., 3-5 May 2024.
- Pino-Bodas, R., **R.T. McMullin**, M.C. Rodríguez and A.R. Burgaz. 2024. Disentangling the population structure of *Cladonia carneola* (Lecanorales, Ascomycota) in the Northern Hemisphere. XX International Botanical Congress (IBC 2024), Madrid, Spain, 21-25 July 2024.
- Rand, G.** and **D. Fauteux**. 2024. Unsuspected biodiversity near Salluit: Outstanding occurrence of several species. ArcticNet's 5th International Arctic Change Conference (AC2024), Ottawa, Ont., 9-12 December 2024.
- Saarela, J.M., E. Alekseeva, M. De Roover, G. Huckerby, S. Fleischmann, K. Lefebvre, K. Madge, A. Storey, G. Vakulenko, R. Blades, J. Doubt, P. Hamilton, P. Ste-Marie and S. Tudor.** 2024. Digitizing over a century of collections-based biodiversity data from the Hudson Bay Lowlands ecozone and adjacent areas at the Canadian Museum of Nature to support Indigenous stewardship and conservation initiatives. ArcticNet's 5th International Arctic Change Conference (AC2024), Ottawa, Ont., 9-12 December 2024.
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