

2021 Annual Report



ENGAGING COMMUNITIES SINCE 1967

Table of Contents

<i>Museum Overview</i>	1
Vision Statement	1
Mission Statement	1
History	1
Role in Science.....	1
Authority.....	2
Advisory Body	3
Board Members	3
Programs and Tours	4
<i>Year in Review</i>	5
Outreach.....	5
Exhibits and Projects.....	6
Ongoing Exhibit Descriptions:.....	7
<i>Gold Scale Revival</i>	7
<i>Laboratory of Life Exhibit</i>	7
<i>Reimer Family Gallery</i>	8
<i>GGR Outreach – Travelling Exhibit</i>	8
<i>Tyrannosaurus Rex Exhibit – Revised</i>	9
Ongoing Project Descriptions:.....	9
<i>Photographing the Collection</i>	9
<i>Online Collection Database</i>	9
Postponed Exhibits or Projects:	10
Acquisitions.....	10
Student, Employee and Volunteer Support	10
Volunteer Support	11
Student Support.....	11
<i>Full-time and Part-time cooperative students:</i>	11
<i>Photos and their quotes about themselves or working at the museum</i>	11
Madison MacGillivray – 2 nd year Environmental Science – Geoscience	11
Madison Curtis – 2 nd year Earth Sciences – Geology	11
Tamara Koletic – 2 nd year Physics and Astronomy	12
Kian Drew – 4 th year Earth Sciences - Geology	12
Crystal Czarniecki – 3 rd year Earth Sciences – Geology	12

<i>Part-time work-study students:</i>	13
Quinn Worthington – Graduate Student	13
Website.....	14
Visitor Data.....	16

Museum Overview

Vision Statement

Bringing the science of planet Earth into the lives and careers of all by sharing knowledge and raising awareness of the Earth, its history, its resources, and the environmental issues facing society.

Mission Statement

The museum, through its collections, displays and programs, aims to foster a broad and diverse appreciation for all features and processes of planet Earth for all ages both within and outside the university community.

History

The Earth Sciences Museum started as a Centennial Project in 1967 together with what was called the Earth Sciences-Biology Museum. By the mid-1990s, the biology part of the museum ceased its activities, which left only the Earth sciences part of the museum, henceforth being referred to as the Earth Sciences Museum. The Earth Sciences Museum moved from its original location in the Biology 1

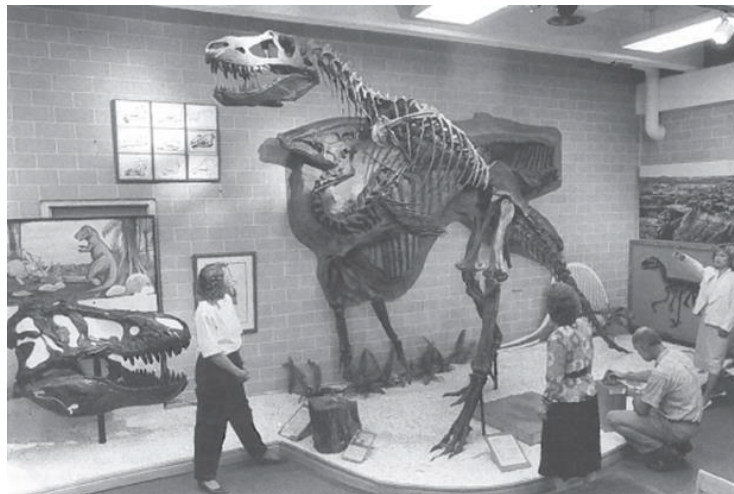


Photo: 1982 Earth Sciences Museum in Biology 1, Room 370

Building and was relocated in 2002 to its present position in the new EIT (Centre for Environmental and Informational Technology) Building. The Peter Russell Rock Garden was added in 1982 to commemorate the 25th anniversary of the University of Waterloo and as an outdoor extension to the indoor collections in the Museum. Over the years, the Earth Sciences Museum continued to expand its collections that are primarily on display for educational purposes and for the general public.

Role in Science

The Earth Sciences Museum is the longest standing science outreach initiative at the University of Waterloo. Over the last 53 years the museum has grown in relevance, educational importance, reputation and its capacity to engage and educate our local and greater community.

The operation of the Earth Sciences Museum is aligned with the University of Waterloo's mission statement. It also aims to achieve many of the current goals and objectives set by the University and the Faculty of Science 5-year Strategic Plan:

- To advance learning and knowledge through teaching, research, and scholarship, nationally and internationally, in an environment of free expression and inquiry (UW's mission)
- Intentionally develop programming to inspire collaboration for shared research, teaching, learning and community building opportunities among our students, faculty, staff and alumni. (one of UW's objectives under the third themed area)
- Broaden our understanding and engagement of communities on our campuses and with our alumni, external partners, regional, national and international communities. (one of UW's objectives under the third themed area)
- Educate global citizens for the future of work and learning to thrive in an age of rapid change by putting learners at the center of everything we do. (one of UW's goals under the third themed area)
- Find new ways to work together and remove barriers to collaboration, interdisciplinarity and the integration of knowledge. (one of UW's objectives under the third themed area)
- Increase visibility for our academic programs in order to attract the highest quality students by increasing involvement of faculty and students in on and off campus academic events and outreach activities, and by strengthening ties to high schools to support undergraduate recruitment (Science Strategic Goal 6: Visibility and Reputation)
- To foster meaningful relationships and a strong track record of engagement with alumni, on-campus partners and external stakeholders. (Science Strategic Goal 7: Community and Engagement and UW's Primary goal)

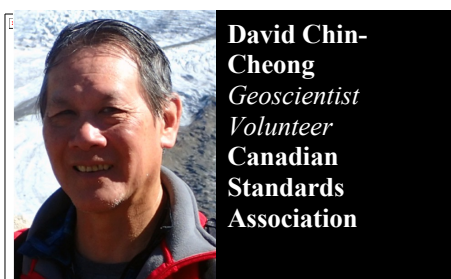
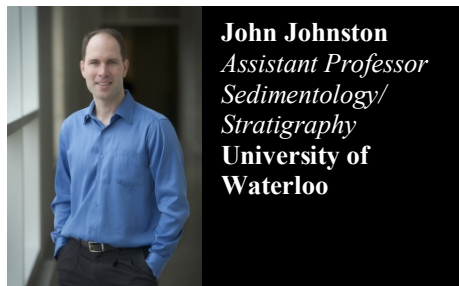
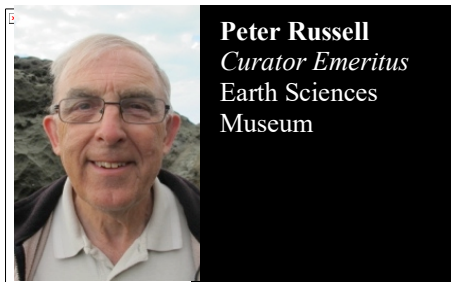
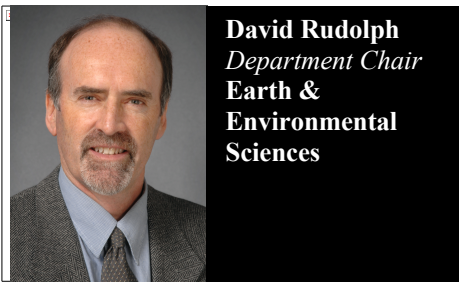
Authority

The Earth Sciences Museum is a component of the Department of Earth and Environmental Sciences within the Faculty of Science and the University of Waterloo. It operates as a unit reporting directly to the Department of Earth and Environmental Sciences and the Faculty of Science. The Earth Sciences Museum has an advisory board whose primary role is to give advice and assistance to ensure programs, exhibits, policies and research remain relevant and effective. The Department of Earth and Environmental Sciences employs a curator to manage the operation and day-to-day maintenance of the museum. The Chair of the Department of Earth and Environmental Sciences attends the museum's advisory board. Both the department chair and the museum coordinator are responsible for communications between the museum's advisory board and the Department of Earth and Environmental Sciences. The curator organizes and maintains relations with subcommittees, volunteers and paid staff of the Earth Sciences Museum.

Advisory Body

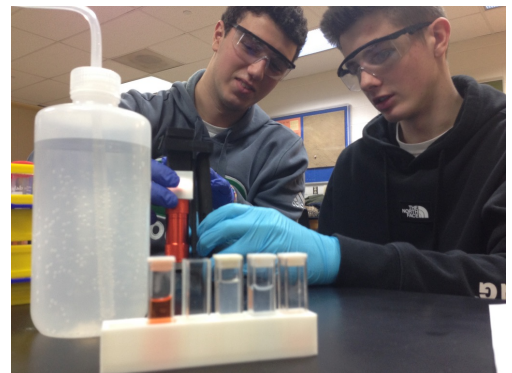
The Earth Sciences Museum advisory board is composed of persons who are associated with or have expertise in various disciplines of Earth and Environmental sciences or museology. Board members are non-paid and oversee the museum's functions and provide expertise and insight towards the museum's development.

Board Members



Programs and Tours

The museum typically offers curriculum-based programming to elementary and high school level classes at the museum but also in the classroom. The museum is temporarily unable to provide in-person programming because the museum is closed and is unable to provide virtual programming until staff have been able to create such programming.



Year in Review

Outreach

All outreach mentioned below have been cancelled or postponed for 2021 due to the pandemic and the closure of the museum to the public under the University of Waterloo policies.

Date	Event
January 15	Campus Life Fair
February 8	Waterloo Royal Canadian Institute for Science
March 4-5	PDAC— Mining Matters
April 6-7	Brantford Gem & Mineral Show
April 29— May 2	Whitefish First Nations
May 4	KW Gem and Mineral Show
May 5	Jane's walk-rock around Kitchener
May 24—30	Waterloo-Wellington Children's Groundwater Festival
May 31	Curiosity Fair
July 19-21	Sudbury Gem and Mineral Show
September 15	Geology talk
September 18	Campus Life Fair
September 21-22	Scarborough Gem Show
October 4-6	Ancaster Gem Show
October 9-12	Detroit Gem Show
October 25-26	Waterloo Gem and Mineral Show and Science Open House
November 16-17	London Gem Show
December 1	PhysiXX- Girls Matter

Exhibits and Projects

<i>Start Date</i>	<i>Estimated Completion Date</i>	<i>Completion Date</i>	<i>Project</i>
May 2012	Apr. 2013	May 2013	Interactive Groundwater Driven Mineralization Exhibit
Nov. 2012	Apr. 30 th , 2013	May 2013	Mistaken Point Cast Exhibit
Nov. 2012	May 2014	Oct. 2014	GGR Outreach Project
June 2013	Jan. 2014	Apr. 2014	Copper Display Project
Jan. 2013	Mar. 2014	Sept. 2014	Augmented Reality Mastodon Exhibit
Mar. 2013	Feb. 2015	Nov. 2015	Petrified Wood Exhibit
Dec. 2014	Feb. 2015	Feb. 2015	We Use That Much – Display Revision
Dec. 2014	Feb. 2015	Sept. 2015	Great Lakes Travel Display
Jan. 2015	May 2015	July 2015	Jade Display Update
May 2015	Oct. 2015	Dec. 2015	Refurbished display cases
Mar. 2015	Oct. 2015	July 2016	New Velociraptor
June 2016	Dec. 2016	Sept. 2016	Rapid Fossilization – Santana Display
June 2015	Jan. 2016	Sept. 2016	Eocene Display
Jan. 2015	Jan. 2018	Aug. 2018	Beyond Walls Exhibits
Dec. 2016	Dec. 2017	Dec. 2018	Projector Installation Project
Apr. 2017	May 2018	May 2018	UW Blueprint – WWCGF App Project
June 2017	May 2018	May 2018	Digital Watershed Sandbox – Reconstruction Exhibit
Oct. 2017	Jan. 2018	Apr. 2018	Porosity & Permeability Display Project
Mar. 2018	Oct. 2018	Nov. 2018	Mastodon App Online project
June 2018	Sept. 2018	Sept. 2018	Women in Geology poster project
July 2018	Oct. 2018	Oct. 2018	Revised Victoria Park/Petrified Wood project
Jan. 2018	Jan. 2020	May 2019	Museum Security project
Nov. 2017	Postponed to 2022	TBD	Peter Rocks – Around the Museum Project
Nov. 2017	Postponed to 2022	TBD	Volcano! Exhibit
Aug. 2013	Postponed to 2022	TBD	Interactive Mine Tunnel Exhibit
Oct. 2018	Postponed to 2022	TBD	Peter Russell Rock Garden Signage Update project

Sept. 2015	Ongoing	Ongoing	Photographing the Collection Project
Jan. 2018	Ongoing	Ongoing	Online Collection Database project
Sept. 2020	Ongoing	Ongoing	Virtual Tour
Mar. 2013	June 2022	TBD	Gold Scale exhibit - Revised
May 2014	May 2023	TBD	Laboratory of Life Exhibit *
Aug. 2017	May 2023	TBD	Reimer Family Gallery *
Sept. 2017	Sept. 2024	TBD	GGR Outreach – Travelling Exhibit *
Apr. 2018	Feb. 2022	TBD	Tyrannosaurus Rex exhibit - Revised

Complete Exhibits and Projects

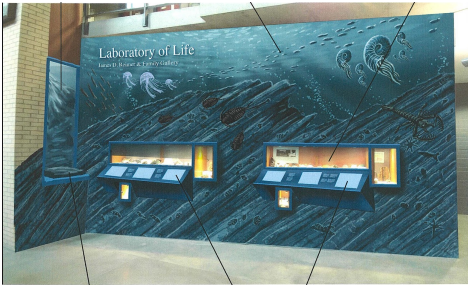
Ongoing Exhibit Descriptions:

Gold Scale Revival



Sometimes it is less expensive to get two things done at the same time. Because a glass case is being installed around our revised T-rex skeleton, it will be less costly to get a glass case installed around the gold scale at the same time. The gold scale has been on display for decades but has not been on display with all of its parts. This is due to the fact that the parts could easily walk away. With the glass case installed the gold scale will now be able to show off the scales, its weights and a few ‘gold bars’.

Laboratory of Life Exhibit



A part of the Reimer Family Gallery project (below) - this exhibit will move through early life on the Planet with a focus on Burgess Shale type deposits in Canada and worldwide. Elements will include; 3 touch screen displays representing early life pre 508 MY, the earths tectonic plates and what they looked like between 3.8 BY and 508 MY ago and then information about Burgess Shale type fossil deposits. The exhibit will also house real and 3D printed fossils from the Burgess shale and Marble canyon sites and a piece of the Burgess Shale rock for visitors to touch.

Back in 2014, Manuel Arab, a 4th year Earth and Environmental Sciences student, was able to experience a paleontological dig at the new Burgess Shale site in Kootenay National Park, BC. The dig was led by Royal Ontario Museum curator Dr. Jean-Bernard Caron. The shale is a famous fossil bed known for its preservation of soft bodied animals dating back to the Cambrian Explosion about 505 million years ago. UW alumnus Jim Reimer supported the museum making it possible to send Manuel on this expedition. Jim's support will also contribute to a new permanent display that will showcase the various Burgess Shale sites, fossil specimens and field techniques.

Manuel Arab's field expedition at the Burgess Shale was documented in the UW Bulletin on December 12th, 2014. The article is titled "*Field experience unearthed life-long passion*" and can be found at www.bulletin.uwaterloo.ca in the Dec. 12th archives.

Reimer Family Gallery

The Reimer Family has been a major donor to the Earth Sciences Museum over the years, with contributions of support, mineral specimens, and display units. The gallery space will involve 4 wall



spaces in the museum; Wall 1 will focus on groundwater mineralization, Wall 2 will be a complete exhibit on the Laboratory of Life (see above), Wall 3 will focus on fossilized plants and Wall 4 will display minerals collected by Jim and his father. This past year saw the installation of new mineral display units for the gallery space. This year and the next will be focused on the design and installation of signage to accompany the display units as well as the Laboratory of Life exhibit.

GGR Outreach – Travelling Exhibit

The Groundwater Geochemistry and Remediation (GGR) group applied for an Ontario Research Fund in 2017. As a portion of the grant 1% of the total funds were to be directed towards Outreach. The Museum was approached to fulfill that Outreach and provided an Outreach plan for the submitted proposal. The plan outlines the collaborative creation of a travelling exhibit between Carleton University, Mining Matters and the Earth Sciences Museum. The GGR group received the grant and the museum was notified this past year. Over the next year all participants will define the project goals and assign tasks.

Tyrannosaurus Rex Exhibit – Revised



In response to the Reimer family gallery and the changes happening to the 1st floor atrium the location of the Tyrannosaurus Rex skull will move from the 1st floor to the 2nd floor. To enhance this new location paleo-artist Mark Rehkopf created three T-rex images; one of a T-rex skeleton, one of a T-rex dinosaur with skin and one of a T-rex dinosaur with skin and feathers. The three images have been used to create a lenticular image (transition image) behind the T-rex skull. This coming year will see this exhibit installed with glass surrounding the image as well as the skull.

Ongoing Project Descriptions:

Photographing the Collection

What started as a small project to document current incoming specimens has turned into a project that has encompassed the entire Museum collection. Back in 2015 Peter and Gary were asked to take photos of many of the specimens to add and update the collection database. In 2016 Karen Fox was engaged to take photos of the Museums specimens. She takes wonderful photos and has continued to help catalogue our collection this coming year.

Online Collection Database

While photographing the collection in 2015, museum volunteers started to notice that some of the specimens on display were not catalogued and so we started to update the existing excel database. In Jan. 2018 Science IST was contacted to determine if they could create an online database for the Earth Sciences Museum with hopes it could then be applied to the rest of science later. Since then, museum staff and volunteers have been working with Science and Environment IST to create an online collection database.

With the onset of the pandemic and a significantly changed perception of how we communicate online, digital outreach has become a foundational component that is needed to engage the public.

A digital collection database and public digital collection database website (see the examples linked below for concept) for the museums in Science will provide the following benefits to the University community, Faculty of Science, and museum visitors:

1. **Clarify the size and content** of the approximately ~15,000-specimen collection across Science.
2. **Improve the organization, knowledge, understanding, and scope of specimens**, and the need to **preserve or remove** (safety, redundancy, lack of info) specimens held in storage throughout the Science Faculty (ESM, SMG and MVS).

3. Provide **public visibility and accessibility** to the Faculty's collections (many of which are donations from faculty supporters) to enable wider public appreciation of the quality and significance of collection specimens.
4. Enable wider public recognition of donor support and **encourage philanthropic interest** and potential support for the collections and/or science outreach.
5. Be a **resource for educators** at UW, other post-secondary institutions, museums, and public and private school systems locally and globally.
6. Encourage university faculty and student **research** on the specimens in the collections.
7. Bring clarity on size and value of collections for **security, insurance, and liability** purposes.
8. Improve **museum standards requirements** for the Community Museum Operating Grant and fulfil Ontario Museum Association, Collection Standards and Conservation Standards requirements.

Progress so far:

Nice front for the website (see images below), platform in place to show various info depending on filters chosen, needs to be linked to/populated with info from the database catalogue itself (about 10% complete). The extensive database, developed by Science Computing, is Faculty owned and operated and exists within SciBase which is a database used by Science faculty/staff only. Cooperative students are helping to input specimen data into the existing excel file which will then be uploaded into SciBase.

Postponed Exhibits or Projects:

Due to the pandemic, limited staff and limited access to the museum throughout the year many projects are temporarily postponed until there is more time, resources, staff and funding secured.

Acquisitions

No acquisitions were brought in this year.

Student, Employee and Volunteer Support

It is always a pleasure being part of the University of Waterloo Earth Sciences Museum but without our dedicated staff and volunteers this Museum would not be operational. 2021 brought in 6 full and part-time staff and interns and 21 volunteers from our community (both KW and UW communities). Our staff and volunteers are the ones who provide and maintain the frame for this Museum. Thank you so much for supporting the Earth Sciences Museum.

Volunteer Support

Many of the 21 volunteers are students from the Knowledge Integration program here at UWaterloo. They worked remotely to help create our virtual tour, design a component of the ORF Outreach project and create ideas for the Laboratory of Life exhibit.

Student Support

Full-time and Part-time cooperative students:

Photos and their quotes about themselves or working at the museum

Madison MacGillivray – 2nd year Environmental Science – Geoscience



“I am a second-year student studying Environmental Science with a specialization in Geoscience. I have a strong passion for the Earth and how landscapes were formed and change around us. I hope to bring more of the Earth Science Museum online as Covid-19 persists.”

Madison Curtis – 2nd year Earth Sciences – Geology



“I am currently in my 2B term of Earth Sciences-Geology at the University of Waterloo. I enjoy seeing the world by hiking, camping, and rafting. I hope to use my interest in the geological aspects of our earth to help create a sustainable future, and to teach others about the wonders of earth science!”

Tamara Koletic – 2nd year Physics and Astronomy



“I am a second-year student in the Physics and Astronomy program. I love learning about other planets as well as going outside at night and gazing up at the stars. I look forward to sharing my love of nature by helping build the Earth Sciences Museum website this term.”

Kian Drew – 4th year Earth Sciences - Geology



“I am a fourth-year undergraduate student studying Honours Earth Science, specializing in Geology. The Earth Science Museum is such an incredible place that has taught me many different skills (even through a pandemic). I have a passion for learning about the Earth, rocks, and their histories.”

Crystal Czarniecki – 3rd year Earth Sciences – Geology



“I am a third-year student studying Earth Science with a specialization in Geology. I’ve had a passion for both the Earth and museums my entire life, and the UW Earth Sciences Museum is a fantastic example of how combining science and art can create something magical.”

Part-time work-study students:

Quinn Worthington – Graduate Student



“Hey everyone! I graduated from UW's Environmental Science - Geoscience Co-op program in Spring 2019 and then promptly began my MSc in Fall 2019. During my undergrad, I was fortunate enough to have my 8-month co-op placement at the Earth Sciences Museum and my love and appreciation for the museum quickly grew larger than ever!”

Website

Figure 1 displays data for the Earth Sciences Museum website from 2018 to 2021. This data is collected annually from January 1st to mid-December. There has been a 22% increase in Total Page Views and a 12% increase in Unique Page Views (people visiting the website for the first time) since mid-December 2020. Social media, Figure 2, has played a role in bringing the museum into the community especially during this 2nd year of remote living. Our followers for twitter and Instagram have increased and it has helped to have a regular postings and engaging content each week. We also started to create YouTube videos since the end of October 2020 which has increased significantly in 2021.

EARTH SCIENCES MUSEUM WEBSITE

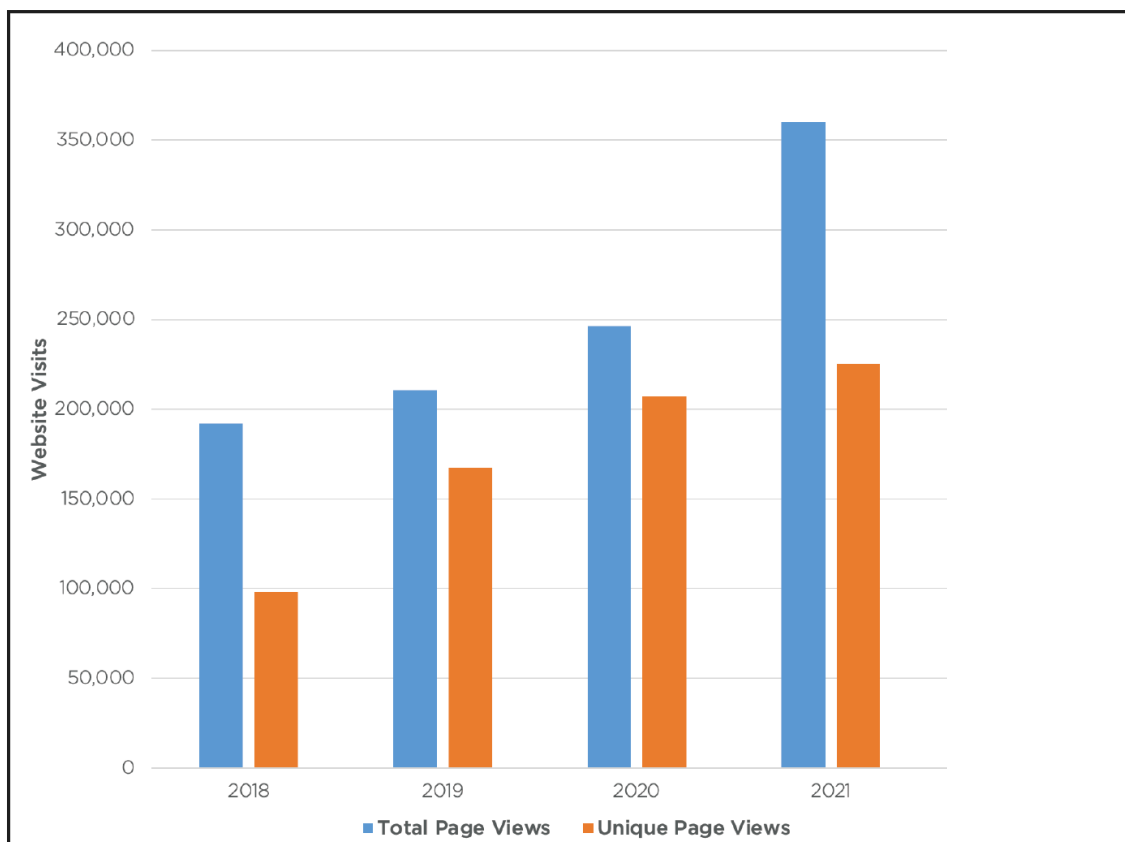


Figure 1 – Annual Earth Sciences Museum website traffic.

SOCIAL MEDIA FOLLOWERS

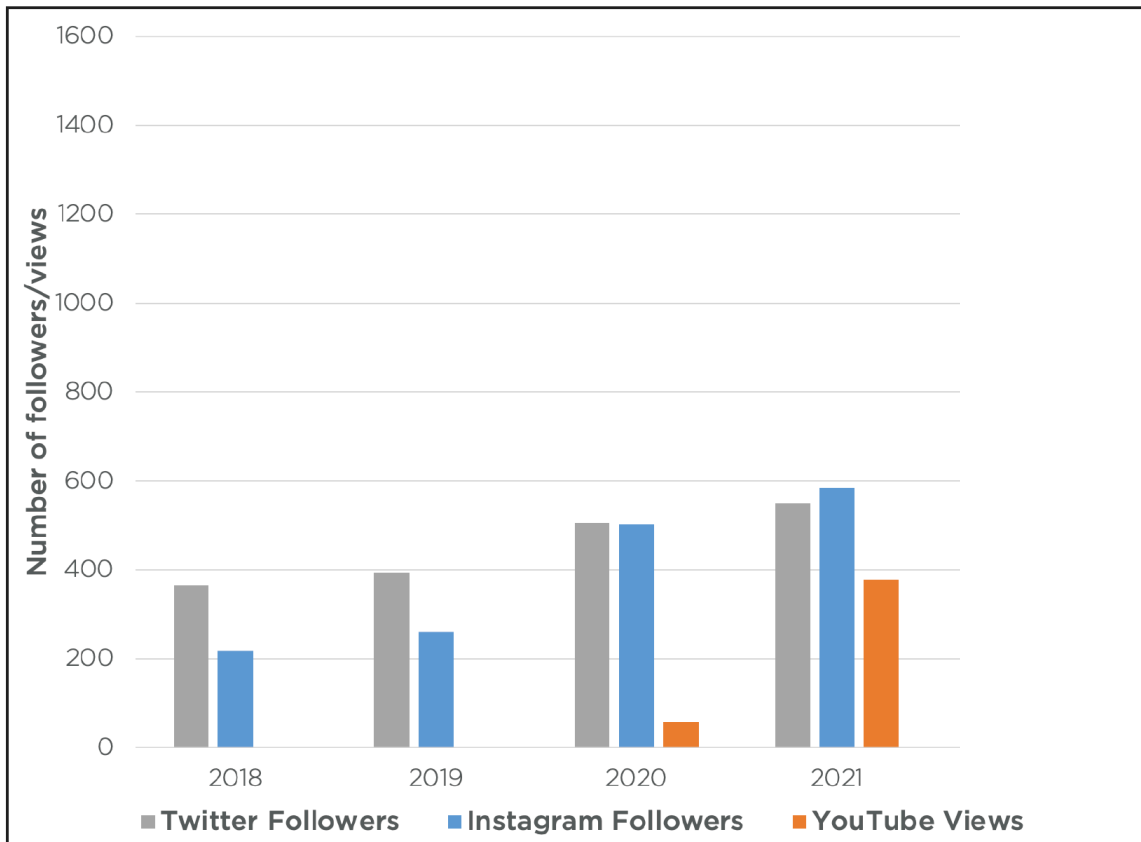


Figure 2 – Annual Earth Sciences Museum social media traffic.

Visitor Data

The Earth Sciences Museum reached around **6716** people this year. Educational programs, outreach events, campus tours and campus events between January 1 and mid-December did not happen this year. Due to lack of staff and the pandemic, total engagement has been severely affected. The museum did participate with the Waterloo Wellington Children's Groundwater Festival online this year where they reached 6716 people.

TOTAL ANNUAL ENGAGEMENT

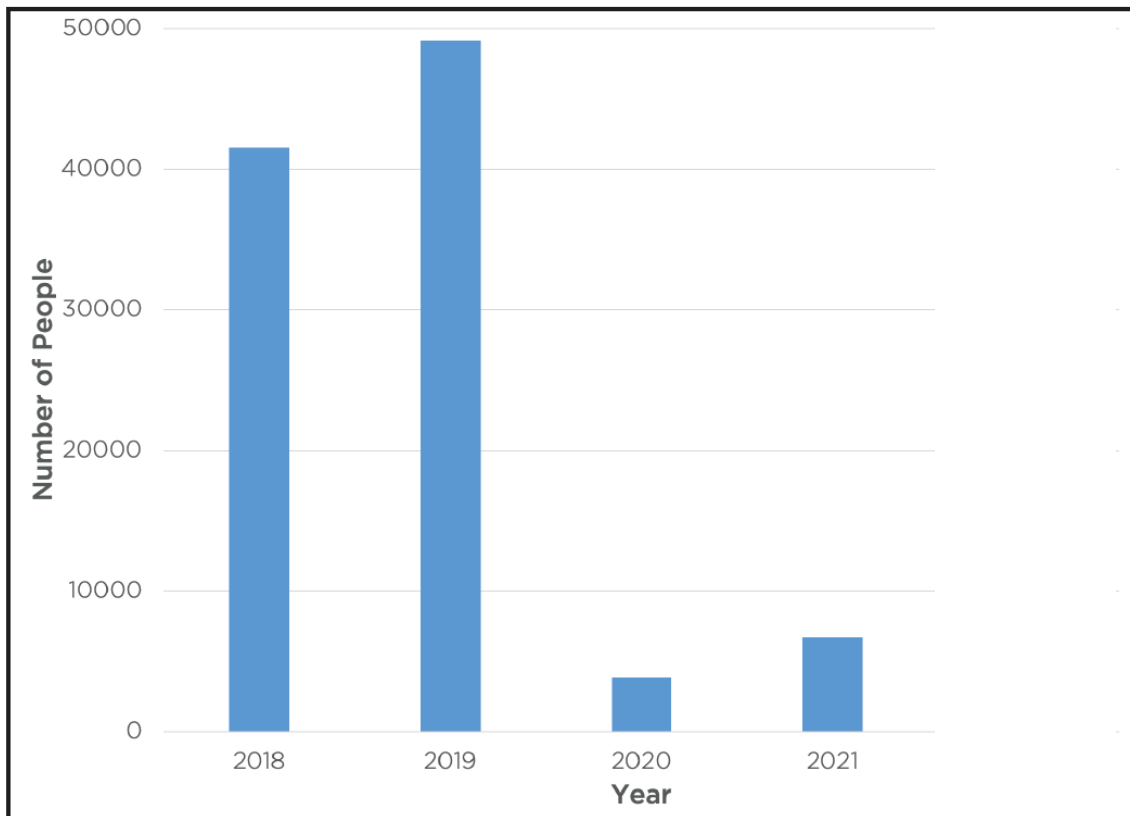


Figure 3 – Total Annual Engagement