Attendee Handbook

Thanks to our Sponsors

We would like to acknowledge and thank the department of University Studies & Environmental Technology Department, Marketing and Communications, Keyano College, Tim Hortons, Starbucks, and Fort McMurray Matters Mix 103.7 for supporting this event.

General Conference Information

We're pleased you'll join us for the 2nd Climate Change Conference, which will be held on Saturday, March 25, 2023, virtually and in person at Keyano College, Fort McMurray, Alberta, Canada, in CC-283, Hyflex classroom. We hope this handbook will provide all the information you need for the conference. If you have any further questions, contact us via climate.change@keyano.ca. The conference will begin at 9 am and ends at about 2:30 pm, closely following the agenda.

Why Attend?

This event offers an opportunity for participants to learn about topics related to climate change from experts in the field and network.

Registration

Please register online.

Registration includes access to the virtual or in-person event. If you registered to attend virtually, use the Zoom link to connect to the conference. If you registered to attend in person, you are responsible for your arrangements for the conference, which will be in room CC 283, Keyano College.

Conference Attendance

Conference attendees are eligible for a confirmation of attendance certificate. Please submit a formal request to climate.change@keyano.ca for your certificate.

We respectfully acknowledge that we are on Treaty No. 8 Territory, the traditional meeting grounds and gathering places of our First Nations, Métis, and Inuit peoples.

About Keyano College

Keyano College, located in Fort McMurray, Alberta, is a comprehensive community institution providing higher education throughout the Regional Municipality of Wood Buffalo since 1965. The Regional Municipality of Wood Buffalo (RMWB) stretches over the northeast corner of Alberta, bordering Saskatchewan and the Northwest Territories while covering 63,637 square kilometres.

Keyano comes from the Cree language, which translates to 'sharing' consistent with the mission of the College to provide local access to education. Keyano officially became a college in 1978 and has grown into a modern series of buildings on three campuses and two learning centres that serve students annually. Keyano serves students through its Clearwater Campus and Suncor Energy Industrial Centre in Fort McMurray, Fort Chipewyan Campus, and our Learning Centres in Fort McKay and Gregoire Lake.

The College meets the training and skills acquisition needs of industry and the personal enrichment and cultural needs in the Wood Buffalo community. Keyano provides opportunities for lifelong, relevant, and practical learning and is committed to increasing access to post-secondary programs through several certificates, diplomas, university transfers, apprenticeships, academic upgrading, and collaboration with other post-secondary institutions. Keyano encourages and supports the development of professional knowledge and skills in several relevant fields, including energy, construction, business, health and safety, arts, sciences, education, human services, and transportation. A wide range of corporate training options are available to client companies, Aboriginal Education, and Regional Stewardship programming focused on improving access to learning opportunities and creating a safe, positive, and inclusive environment for all learners. Through applied research, professional development, and scholarly activities, faculty aim to improve their expertise and increase knowledge to facilitate and create a learning environment to meet the demands of the 21st-century workplace and environment.

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1.0 About the Conference

Our 2nd climate change conference comes at an opportune time to share the latest commitments to address the impact of climate change to bolster resiliency and adaptation in communities locally and internationally. Below is the overall goal and an outline of what we hope participants will take away from the conference.

The overall goal of this conference is to bring together a diverse group of scientists, leaders, organizations, and many other participants as local and international partners in learning to share new knowledge about the impact of climate change in a variety of fields and communities and identify emerging policies, strategies, and measures used to adapt, mitigate, and combat them.

By the end of the conference, we hope that participants will:

- enhance their understanding of climate change in the past, present, and future.
- understand the effects of climate change on our communities.
- identify methods and strategies used by various communities to adapt, build, and enhance their climate change resilience.

To achieve these objectives, participants will be engaged in a diverse range of oral presentations from several leaders in climate change around the globe and poster presentations from our student members. The presentations will cover three major themes: i) climate change perspectives, ii) climate impact, and iii) education, policy, and resilience programs.

2.0 Agenda

Time (MDT)	Agenda Items
9:00 – 9:15	Registration and Refreshments
9:20 – 9:30	Welcome and Opening Remarks Jay Notay (President & CEO, Keyano College)
9: 35 – 9:45	Introduction and Further Remarks Tamar Richards-Thomas (Instructor, Keyano College)
9:50 – 10:15	Climate Change and Arctic Border Security Heather Nicol (Director of the School for the Study of Canada, Trent University)
10:15 – 10:40	High Latitude Dust Sources and their Increasing Role in Climate Change Pavla Dagsson-Waldhauserová (Researcher, University of Iceland)
10:40 – 11:05	Effects of Retrogressive Thaw Slumping on Particulate Organic Carbon Dynamics in the Northwest Territories, Canada Sarah Shakil (Post-Doctoral Fellow, Uppsala University)
11:05 – 11:30	Climatological Context of the Mid-November 2021 Floods in British Columbia Tamar Richards-Thomas (Instructor, Keyano College)
11:30 – 11:55	Environmental Non-Governmental Organizations (ENGO's) Role in Public Policy Tara Russell (Program Director, CPAWS Northern Alberta)
12:00 – 1:00	Lunch Break
1:00 – 1:25	Enhancing Climate Change Education Through Environmental Photography in Nigeria Benjamin Anabaraonye (Researcher, University of Nigeria)
1:25 – 1:50	Syncrude's Greenhouse Gas Program Karen Whalen (GHG Compliance Advisor) Sol Cifuentes (GHG Strategy & Program Lead), Syncrude
1:50 – 2:00	Student Posters
2:00 – 2:10	Summary and Closing Remarks Marie-France Jones (Chair, University Studies & Environmental Technology, Keyano College)

3.0 Climate Change: A Brief Introduction

Over the course of the past few decades the science behind climate change has become increasingly clear – our climate is changing in a way that is unlike any other time in Earth's history. The Intergovernmental Panel on Climate Change (IPCC), the leading international body for the assessment of climate change, states that the degree of warming that the Earth has experienced since the 1950s is unequivocal, and many of the changes are unprecedented over decades to millennia. The evidence of this warming as all around us: the atmosphere and oceans have warmed, snow and ice cover have diminished, sea levels have risen, and the concentration of greenhouse gas emissions (GHGs) has increased (IPCC, 2013).

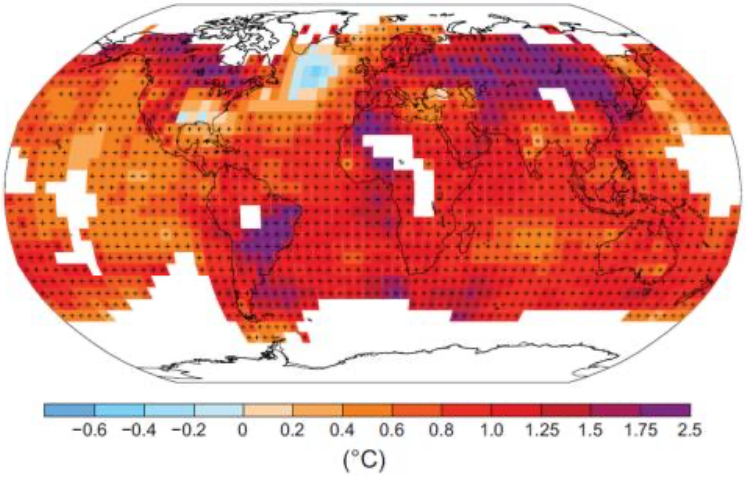

Figure 1: Observed change in global surface temperature 1901-2012 (source: IPCC, 2013).

The globally averaged combined land and ocean surface temperature shows a warming of 0.85 °C from 1880 to 2012 (Figure 1). Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850 and in the Northern Hemisphere, from 1983 to 2012 was likely the warmest 30-year period of the last 1,400 years (IPCC, 2013). The IPCC states that it is *extremely likely* that human influence has been the dominant cause of the observed warming since the mid-20th century, particularly through carbon dioxide (CO_2) emissions. If we continue along the path that we are currently on (e.g., no significant effort is made to reduce our consumption of fossil fuels), global surface temperature could rise by another 4.8 °C by 2100 (IPCC, 2013). In 2020, there were warmer-than-average temperatures across most regions globally, as shown by the high annual temperatures measured over the land and ocean surfaces (NOAA, 2020). The land and ocean surfaces included Europe, Asia, southern North America, South America, and parts of the Atlantic, Indian, and Pacific oceans. National Oceanic and Atmospheric Administration (2020) found that most land and ocean areas recorded cold that year.

Earth's average temperature is 1.1 °C, warmer than those observed around 1850 during industrialization, but similar to those recorded around 125,000 years ago, before the most recent ice age (IPCC, 2022). This warming is also more significant in the northmost areas globally such as North America. The rise in global surface temperature has led to the rapid melting glaciers, rising sea levels, and increasing incidence of catastrophic extreme weather events (IPCC, 2022). There is evidence of its effects on our ecosystems and society in which society will need to cope with these changes (IPCC, 2022). Scientific evidence has also shown that climate adaptation is happening, but it is too slow, although several measures are implemented on a small scale to address major climate challenges (IPCC, 2022).

3.1 Climate Change in Canada

The Government of Canada reported that the year 2020 was a year of destructive and impactful weather with up to nine costly weather events. One of Canada's top 10 weather events was the unusually warm temperatures across the central and eastern Canada in May 2020. Eastern Canada's summer 2020 was the warmest summer since 2012 and ranked among the top five warm summer in the nation's 73-year record. For instance, Montreal had a maximum temperature of 36.6°C (97.9°F) on May 27, 2020, that marked the hottest May temperature. This temperature is the second highest ever recorded for Montreal and the first with a temperature of 37.7 °C (99.9 °F) set on August 1, 1975, was the hottest. In addition, many records were set during the months of June and July.

However, in a recent news release by Environment and Climate Change Canada (ECCC), Canada experienced further catastrophic, destructive, and unprecedented weather in several forms of devastating flooding, wildfires, relentless heatwaves, and powerful tornadoes in 2021. The Government of Canada reported that western Canada was significantly affected by extreme weather events in 2021, with the top two events centred in British Columbia. Topping ECCC's 2021 list is "Record Heat Under the Dome" about the heat wave that hit the province in June 2021 and was called the deadliest weather event in Canadian history. On June 29, 2021, a record-breaking high temperature of 49.6 °C was recorded in Lytton, British Columbia. A day later, 90 % of the village was lost to wildfires, resulting in two fatalities and displacing 1200 residents.

In second place is "British Columbia's Flood of Floods". On November 13, while nearly 200 countries agreed to the Glasgow Climate Pact at COP26, an enormous storm struck the south coast of British Columbia. A total of seven atmospheric rivers or "rivers in the sky", and three "weather bombs" in November created devastating floods. The rain-flood storm led to the tragic loss of at least six lives and thousands of evacuations. It also resulted in the destruction of critical infrastructure and property damage throughout the region, which are expected to cost billions to restore.

Interestingly, extreme weather conditions were not confined to the west in 2021. For instance, the other top weather event is the "Year of the EF2 Tornado". Canada experienced a series of tornadoes that ranked as a 2 on the Enhanced Fujita (EF) scale, characterized by wind speeds of between 180 and 220 km/h. These tornadoes included the deadly twister in Québec in June 2021, and the series of EF2s on July 15, 2021, in Ontario, including the devastating Barrie tornado.

As these severe weather events show, climate change is real, and Canadians are already feeling its effects. The cost of inaction is enormous, which is why the Government of Canada is developing Canada's first National Adaptation Strategy in collaboration with provinces, territories, municipalities, and Indigenous peoples. These severe weather events also underscore why the Government of Canada has already begun investing billions in targeted federal adaptation programs, developing climate-resilient building and infrastructure codes, and advancing nature-based climate solutions like tree-planting, shoreline restoration, and preserving and expanding marshlands and wetlands. The Government of Canada committed more than $1.9 billion through the Disaster Mitigation and Adaptation Fund, for 69 large-scale infrastructure projects that will help protect communities across the country from the threats of climate change, including coastal erosion (ECCC, 2021).

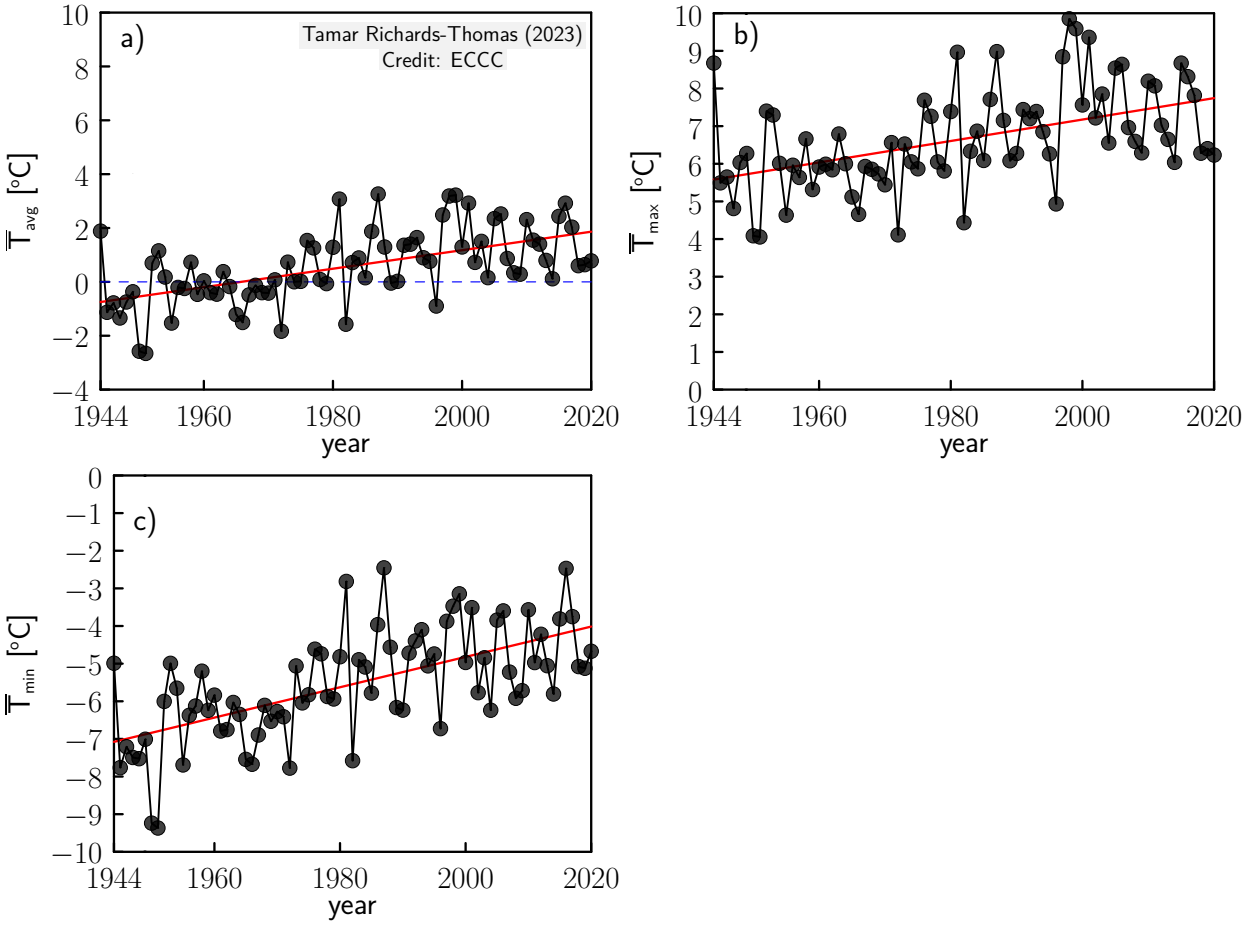

Figure 2: The average annual a) mean ($\bar{T}_{avg}$), b) maximum ($\bar{T}_{max}$), and c) minimum ($\bar{T}_{min}$) temperatures recorded in Fort McMurray from 1944 to 2020. The red solid and blue dashed horizontal lines depict the linear relationship and 0 °C, respectively.

3.2 Climate Change in Fort McMurray

The province as predicted that climate change will continue over the rest of the century as temperature continues to rise with an increase up to 3 °C (Hayhoe and Stoner, 2019). Between 1944 and 2020, Fort McMurray experienced an average annual mean temperature increase of 2.7 °C from 1944 to 2020 (Fig. 1a). One of the many impacts of warming climate is changes in precipitation patterns. Fort McMurray experienced a decrease of 46 mm in the annual total precipitation from 1944 to 2020 (Fig. 3d), although the temporal trends show a decrease in the annual total precipitation of 13 mm from 1944 to 2007 (Fig. 2a), indicating an approximate decrease of 2 mm over 13 years. There is an increase in the annual total rainfall of 28 mm and decrease in annual total snowfall of 13 mm from 1944 to 2007. Due to lack of data availability the measured datasets for precipitation either as snowfall or rainfall are missing for the period 2008 to 2020, although the measured total precipitation datasets are provided.

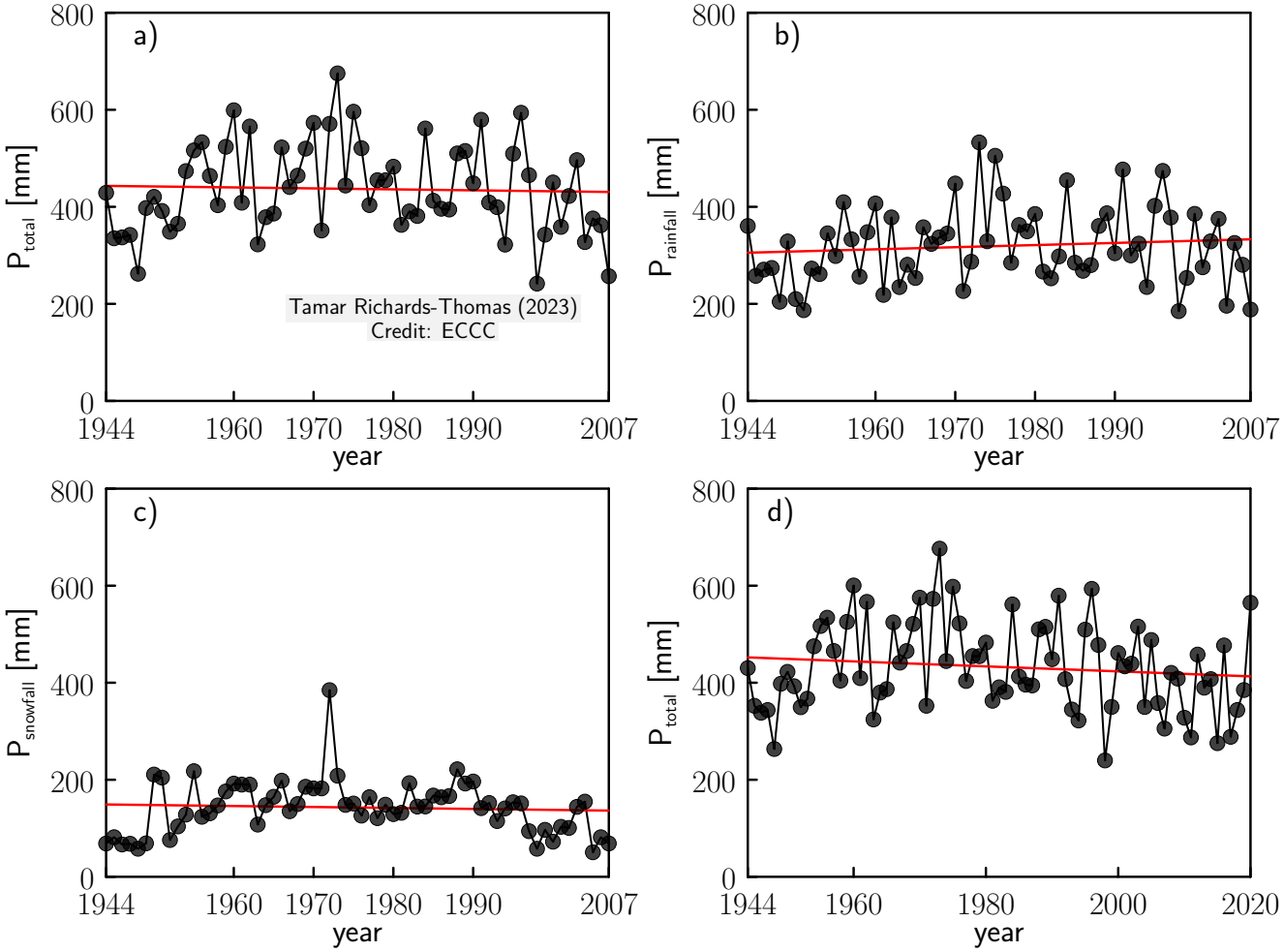

Figure 3: A time series plot of the annual a) total precipitation, b) total rainfall, and c) total snowfall recorded from 1944 to 2007 and d) the annual total precipitation from 1944 to 2020. The red solid line shows the linear trendline.

4.0 Welcome and Opening Remarks

Jay Notay, President & CEO, Keyano College

Jay Notay has been working in Canadian post-secondary for over 25 years. He brings significant experience as a college executive, president & CEO, vice-president academic, dean, associate dean, and senior leader for urban and rural post-secondary institutions in Saskatchewan, Ontario, and British Columbia. He is leaving the position of President & CEO at North West College in Battleford, Saskatchewan to join Keyano College.

In his most recent role, North West College serves a region that spans over 44,000 square kilometers in rural and northern Saskatchewan; 2 campuses; 24 program delivery locations; 23 Indigenous communities, and three Tribal Councils that represent over one-third of Saskatchewan's Indigenous population; 60% self-identified Indigenous student population.

In addition to successfully establishing training programs and initiatives in partnership with Indigenous communities, he has extensive experience in establishing and enhancing partnerships with various international post-secondary institutions as well.

Jay has significant experience leading and assisting in the development and implementation of institute-wide strategies. These include strategic plans, academic/education plans, operational plans, Indigenous and international education, trades/vocational strategy, corporate training, applied research, and government relation among other notable achievements.

Jay holds a Bachelor of Commerce from the University of British Columbia and a Master of Education from Nipissing University in North Bay, Ontario. He is currently a PhD candidate with the University of Western Ontario, nearing completion of a Doctor of Philosophy degree in Education Administration and a recent recipient of Queen Elizabeth II Platinum Jubilee Medal.

4.1 Presenters

4.2 Theme 1: Climate Change Perspectives

Heather Nicol, Director of the School for the Study of Canada, Trent University

Heather Nicol is also a Professor of Geography in the School of the Environment at Trent University. Her research is focused upon exploring the dynamics which structure the political geography of the circumpolar North, with a specific focus on the North American Arctic and Canada-US relations. Her work is focused upon cross-border relations, tensions, geopolitical narratives and mappings of power and sovereignty. She is currently exploring both the history of circumpolar geopolitics in relation to globalization, security, environment, and polar governance. Nicol is a Fulbright Scholar and was the 2015-16 Visiting Fulbright Chair to the University of Washington, at the Centre for Canadian Studies and the Henry M. Jackson School of International Studies.

Abstract Title: **Climate Change and Arctic Border Security**

Climate change has affected the way in which we think about security. Not only has it defined a new field of environmental security, but it has changed the way in which we think about the relationship between how traditional security is conceptualized and delivered by traditional security agencies. This presentation will speak to this issue. It argues that border security in the Arctic now being redefined as recognition of climate change is factored into the equation.

4.3 Theme 2: Climate Impact

Pavla Dagsson-Waldhauserová, Researcher, University of Iceland

Pavla Dagsson-Waldhauserova is a researcher and lecturer at the Agricultural University of Iceland and the Czech University of Life Sciences Prague. Pavla leads the Icelandic Aerosol and Dust Association (ICEDUST, https://icedustblog.wordpress.com/). Pavla is a steering committee member of the World Meteorological Organization on Sand/Dust Storm Warning Advisory, (WMO SDS-WAS, https://sds-was.aemet.es/). Pavla is physical geographer focusing on atmospheric dust and its interactions with cryosphere and other systems in circumpolar regions.

Abstract Title: **High Latitude Dust Sources and their Increasing Role in Climate Change**

Dust particles from high latitudes have a large local, regional, and global significance to climate and the environment as short-lived climate forcers, air pollutants, and nutrient sources. Two billion tons of dust are annually transported in our atmosphere all around the world. High latitudes include active desert regions with at least 5 % production of the global atmospheric dust. Active High Latitude Dust (HLD) sources cover > 1,600,000 km^2 and are located in both the Northern (Iceland, Alaska, Canada, Greenland, Svalbard, North Eurasia, and Scandinavia) and Southern (Antarctica, Patagonia, New Zealand) Hemispheres. HLD was recognized as an important climate driver in Polar Regions in the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate in 2019.

In situ dust measurements conducted in Arctic deserts of Iceland and Antarctic deserts of Eastern Antarctic Peninsula revealed some of the most severe dust storms in terms of particulate matter (PM) concentrations. Icelandic dust has impacts on atmosphere, cryosphere, marine and terrestrial environments. It decreases albedo of both glacial ice/snow as well as mixed phase clouds via reduction in supercooled water content.

HLD operational dust forecast for Icelandic dust is available at the World Meteorological Organization Sand/Dust Storm Warning Advisory and Assessment System (WMO SDS-WAS) at https://sds-was.aemet.es/forecast-products/dust-forecasts/icelandic-dust-forecast. HLD research community is growing, and Icelandic Aerosol and Dust Association (IceDust) has 100 members from 52 institutions in 21 countries (https://icedustblog.wordpress.com, including references for this abstract). IceDust is a member aerosol association of the European Aerosol Assembly.

Sarah Shakil, Post-Doctoral Fellow, Uppsala University

My name is ساره شکیل Sarah Shakil (pronounced sah-rah shah-kee-l). I conduct research in the Environmental Sciences, usually with a focus in biogeochemistry and aquatic ecology. My work stems from an interest in connections between chemical, geological, and biological processes that guide the composition of the natural environment with a particular interest in the role that water plays in facilitating these connections and creating an environment within itself. My training is specifically in biogeochemistry (biology + geology + chemistry), ecology, limnology, and the cryosphere (frozen part of the Earth system). I hope that by studying these processes we can better understand our relationship with our environment and how these systems respond to local and global change. I completed my PhD work with Suzanne Tank at the University of Alberta examining changes in the connection between terrestrial and stream ecosystems as ice-rich permafrost on the Peel Plateau thaws, and the consequences of these changes for stream systems and the regional carbon cycle. I am now working as a post-doctoral fellow at Uppsala University in Sweden with Dolly Kothawala and Nuria Catalan, examining controls on organic matter decay rates across ecosystems.

Abstract Title: **Effects of Retrogressive Thaw Slumping on Particulate Organic Carbon Dynamics in the Northwest Territories, Canada**

Rapid climate change in the glacially conditioned ice-rich terrain of the Peel Plateau, western Canada, is accelerating thaw-driven mass wasting in the form of retrogressive thaw slumps, which are increasing in area, volume, and thickness of permafrost thawed. This rapid thaw of thousands of cubic meters of terrain tends to occur along headwater streams of the Peel Plateau, fundamentally altering the connection between terrestrial and aquatic systems and mobilizing legacy stores of organic carbon, nutrients, contaminants such as mercury, and minerals. However, the mobilization of these stores is associated with the often-understudied particulate forms of these chemical constituents, thus our understanding of the consequences of these large increases on Arctic drainage networks, from stream systems to the ocean, is often limited. This presentation will focus on work I conducted during my PhD, examining the mobilization and fate of particle associated carbon from rapidly thawing permafrost. This work was done within the Gwich'in settlement region under the supervision of Dr. Suzanne Tank at the University of Alberta and in collaboration with scientists at the Northwest Territories Geological Survey, all of whom continue to explore the effects of these features on northern freshwater systems.

Tamar Richards-Thomas, Organizer & Instructor, Keyano College

Tamar Richards-Thomas is the conference organizer and an instructor in the Environmental Technology and University Studies programs. She earned a Bachelor of Science in Physics (hons) from the University of the West Indies, a Master of Science in Earth and Atmospheric Science from the University of Alberta and completed her Doctor of Philosophy in Environmental and Life Sciences at Trent University with focus on air quality and pollution.

Abstract Title: **Climatological Context of the Mid-November 2021 Floods in British Columbia**

British Columbia (BC) experienced several large-scale, destructive flood events in recent years (2000 – 2021) that caused significant economic and social effects on the impacted communities. The most devastating event occurred in mid-November 2021 when heavy rainfall from two atmospheric rivers (ARs) and their associated high-intensity storms significantly affected southern BC. This flooding event, which triggered an immediate evacuation of up to 20,000 residences, became BC's costliest natural disaster, and highlighted the need to understand the climatology of this type of disaster. This study uses a range of climatological and human-related factors that affected the severity and impact of the mid-November 2021 floods relative to those from 2000 to 2021 to identify the key characteristics that set it apart.

This study includes 37 flood events that occurred from 2000 to 2021 and utilized information from more than 200 climatological stations across the province of BC. Eighteen floods were related to heavy rainfall, ten were associated with rain-on-snow, six were associated with an ice jam, two were associated with snowmelt, and one associated with snowmelt and ice jam. The dates of the events showed a bi-modal pattern of flood occurrences with a primary season (spring to early summer with 16 floods) and a secondary season (fall to early winter with 21 flood).

The mid-November 2021 flood illustrated distinct features. Its values of average total precipitation ($\overline{P_t}$) and Integrated water vapour transport ($\overline{IVT}$) were higher than for > 90 % of the other 28 floods related to rainfall. It is one of the only four rainfall related flood events that occurred in the secondary season with $\overline{IVT}$ > 400 kg m^{-1} s^{-1}. It also led to the largest number of injuries (up to 40), fatalities (up to five), and evacuations as compared to the other 36 floods, thereby costing BC up to $9B Canadian Dollars. These results indicate that the mid-November 2021 flood is influenced by the climatology and human-related factors associated with the flood regions.

4.4 Theme 3: Education, Policy, and Resilience

Tara Russell, Program Director

The Canadian Parks and Wilderness Society (CPAWS) Northern Alberta

Tara Russell (B. ScH.) is the Program Director of CPAWS Northern Alberta. Tara works with Canadian Parks and Wilderness Society (CPAWS) Northern Alberta since 2015. Tara leads work on caribou range planning, nature-based climate solutions, parks and protected areas, and her most recent work focuses on coal and land use planning in the eastern slopes.

Abstract Title: **Environmental Non-Governmental Organizations (ENGO's) Role in Public Policy**

In order to slow climate change and increase Alberta's resilience to climate change we need widespread evidence-based policy change. While in theory, public policy should be developed in the public's best interest, this is not always the case. Discrepancy in intent and reality can be due to value-based rather than evidence-based positions, partisanship, inaccessible scientific research, or institutionalized processes.

Policy changes at the scale needed to address the twin crisis of climate change and biodiversity loss can only be achieved by educating and empowering the public to advocate for systems-level change that is in the public interest.

Civil society groups, such as CPAWS Northern Alberta have a unique role to play in public policy development. As a non-government organization, we often act as a vehicle for public engagement with government processes and policy development by aiding in bridging the knowledge-action gap. CPAWS Northern Alberta focuses on mobilizing the public around land use change and conservation issues. This area of focus contributes to increased climate resilience of our wildlife and ecosystems and improved public understanding of climate and biodiversity related issues. Multiple factors are important in translating evidence, to evidence-based public policy.

This presentation will cover how open science improves the closing of the knowledge action gap in conservation, the role of civil society groups in public policy change, and case studies where public engagement successfully led to positive environmental policy change. It will conclude with a discussion on immediate opportunities for public policy change and other actions Alberta take to improve climate change resiliency.

Benjamin Anabaraonye, Institute of Climate Change Studies, Energy and Environment, University of Nigeria

Benjamin Anabaraonye is an associate researcher at the Institute of Climate Change Studies, Energy and Environment, University of Nigeria, Nsukka. He is also an award-winning poet, entrepreneur, and educationist. Benjamin is also the CEO of the Benjy Poetry and Music Global Concepts which has the goal of spreading joy and beauty to communities and institutions in Nigeria through poetry and music. Through the project green initiative, which is an arm of the company, He conducts research along with his team on climate change adaptation and mitigation for global sustainability. He has received trainings and awards in the field of climate change from the United Nations Institute of Training and Research (UNITAR) and Hamburg University of Applied Sciences, Germany.

Abstract Title: **Enhancing Climate Change Education Through Environmental Photography in Nigeria**

Climate change Climate change poses an immediate and long-term threat to our environment, our people and our planet. The impacts of climate change can be felt across communities, cities, campuses, countries and continents of the world in a profound way. There is growing evidence that many states in Nigeria, one of the developing countries in Africa, have in recent times experienced climate disasters such as flooding, erosion, etc. that threaten the well-being of people and the environment. The resulting climate shocks and environmental changes are adversely impacting the economic livelihoods, health, water and food security of the region's most vulnerable populations. Researchers have identified climate change education as one of the promising solutions for mitigating the negative effects of climate change and promoting sustainable development in Nigeria. Education has the objective to provide learners with the knowledge, skills, values and attitudes to overcome global challenges such as that of the climate. Sustainable Development Goals (SDGs) are 17 and have 169 targets, of which SDG 4 is on quality education which is critical to this study. This is because achieving quality education will serve as an enabler and a link to the achievement of other SDGs. Though literature review and participant observation, the author identified environmental photography as one of the strategies for enhancing climate change education towards achieving sustainable development in Nigeria. It further highlighted the socio-economic and therapeutic benefits of environmental photography in Nigeria. It concluded by identifying the impacts of environmental photography towards achieving sustainable development across various communities, cities, and campuses in Nigeria.

Karen Whalen (GHG Compliance Advisor), Syncrude

Sol Cifuentes (GHG Strategy & Program Lead), Syncrude

Karen Whalen (P.Eng) is a Senior Advisor with the Environmental Affairs Team. Karen has been working in the field GHG compliance for the past 10 years. Karen joined Syncrude in 2003 from the University of Ottawa, where she studied Chemical Engineering. She also has a Bachelor's degree in Environmental Technology from the University College of Cape Breton. Karen was born and raised in Newfoundland and is now living with her family in Fort McMurray.

Sol Cifuentes (B.Eng, P.Eng) is a Senior Associate with the Process Development Team. Over the past 18 years, Sol has specialized in developing Greenhouse Gas strategies, business plans, abatement opportunities and performance metrics to help companies compete in a low carbon economy.

Sol joined Syncrude in 2018 and is currently the GHG Strategy & Program Lead working in collaboration with Operations Support, Production Planning and Research & Development to help Syncrude lower its carbon footprint. Sol developed Syncrude's GHG Strategy which at its core, leverages improvements in reliability, energy reductions and technology innovation to maintain carbon competitiveness. Sol was born in Guatemala and graduated from Toronto's Ryerson University with a B.Eng in Chemical Engineering in 2004. She calls Calgary home.

Abstract title: **Syncrude's Greenhouse Gas Program**

Syncrude's sustainability strategy reflects our commitment to responsible development of the oil sands resource now and for the future. It touches every aspect of our business – from making our operations more efficient, to researching and developing next generation technologies, to maintaining a high standard of environmental stewardship and keeping our relationships with local communities front and center.

The Oilsands industry is undergoing an energy transition. Stakeholders have raised the bar and are demanding low carbon products and action on climate change. Suncor is listening. We have committed to reducing 10 million tonnes of GHG emissions by 2030 across the Enterprise (which includes Syncrude) and we are part of the landmark industry alliance: Oilsands Pathways to Net Zero, with the aspiration to reach net zero by 2050.

4.5 Summary and Closing Remarks

Marie-France Jones

Chair, University Studies and Environmental Technology, Keyano College

Dr. Marie-France Jones joined the Keyano College faculty in 2019 and is an instructor in the Environmental Science programs (Environmental Technology and Bachelor of Science in Environmental Science). She has a Bachelor of Science in Forestry and Environmental Management and a Masters of Science in Forestry from the University of New Brunswick. She has also received her Doctorate of Philosophy in Forestry, focusing on temporally mapping the effects of heavy machinery on soil quality. Prior to teaching at Keyano, Marie-France had over ten years of research in soil hydrology and geospatial and statistical analysis. Her areas of discipline are soil science, land reclamation, and GIS.

5.0 EAS 208 Student Posters

Below is a list of student posters:

P1: The Role of Whales in a Changing Climate
by Easton Murphy

P2: The Negative Impacts of Fast Fashion on the Environment
by Andy Parsons

P3: Climate Change Impact on the Canadian Arctic Archipelago
by Youssif Shaaban

P4: Effects of Rising Sand Temperatures on Sea Turtle Survival
by Priscilla Gallagher

Posters will be available online for viewing and voting throughout the conference.

6.0 Reference

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