The Prairies Adaptation Bulletin

PRAC
Prairies Regional Adaptation Collaborative

Issue 4 / Summer 2016

Western Canada Climate Change Strategies Highlighted at Adaptation Canada 2016

"It is long past time for Canada to tackle climate change" was Environment and Climate Change Minister Catherine McKenna's message to open Adaptation Canada 2016, held in Ottawa in March. Her address marked the beginning of an informative and interactive event involving more than 600 participants who gathered at the first national conference on climate change adaptation held in 11 years.

The conference brought together a diverse group of experts and practitioners, offering a chance to build bridges between qualitative and quantitative researchers; public and private sectors; and those working at municipal, provincial, national and international levels. The event provided an opportunity to discuss common approaches to the risks posed by climate change and climate variability. It showcased more than 250 presentation and panel discussions highlighting climate change adaptation projects from across Canada focusing on progress, tools and experiences to further the development and implementation of practical solutions to climate change.

Adaptation experts from Western Canada were well-represented among their national colleagues, with several presenting at the session "Levers to Mainstream Adaptation Effectively: Lessons and Best Practices from Western Canada." The session provided an opportunity for adaptation practitioners active in Western Canada to share their efforts to understand and prepare for the impacts of climate change, and to discuss opportunities for greater collaboration and new institutional models for coordination.

The session chair, Henry David Venema (International Institute for Sustainable Development) opened the discussion by highlighting the launch of the Prairie Climate Centre (see p.3 of this issue). He also emphasised the need for a pro-active climate change adaptation strategy that will scrutinize major government expenditures for climate resiliency, with a robust cost-benefit analysis that takes the projected range of key climate impacts into consideration.

The Prairie Climate Centre's Scientific Director, Danny Blair (University of Winnipeg), sketched out the climate challenges facing the Prairie provinces based on the Centre's data analysis. Under both high-emission and low-emission scenarios, Blair said that the Prairie provinces will need to prepare for a wide range of impacts including shifting extremes of hot and cold temperatures, longer frost-free periods, dramatic changes in precipitation and increased risk of both floods and droughts.

Provincial adaptation strategies are urgently needed to respond to these projected changes, and this will involve broadening awareness of climate change on the Prairies and engaging priority sectors. For the agriculture sector, Dave Sauchyn (University of Regina) emphasized the importance of the former Prairie Farm Rehabilitation Administration (PFRA), a branch under Agriculture and Agri-Food Canada that delivered programs and services to help rural clients with activities that contribute to rural renewal, adaptation, and sustainable development. Prior

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Freedom To Create. Spirit To Achieve.
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Manitoba

Workshop Engages Building Asset Professionals in Climate Risk Management

Institutional building assets, such as schools, hospitals and prisons, are increasingly experiencing weather-related impacts that have led to loss of utility and closures. In Manitoba this has led to greater interest by building asset managers in understanding how to increase resilience to climate risks.

The Prairies Regional Adaptation Collaborative (PRAC) responded by organizing a workshop focused on enhancing the resiliency of buildings infrastructure, Managing Climate Impacts: A Workshop for Building Asset Professionals, held in January 2016 at the University of Winnipeg. The workshop aimed to build awareness and capacity among key building infrastructure decision makers and stakeholders, enhance knowledge on planning processes and decision support tools, and discuss opportunities for furthering the resiliency of buildings infrastructure to a changing climate in Manitoba. It brought together representatives from different provincial government departments, academia and the private sector.

(Photo credit: Roger Rempel)

The one-day workshop was facilitated by Roger Rempel, P. Eng. FEC (Climate Resilient Systems, WSP), an Environmental Engineer specializing in climate vulnerability assessment and resiliency planning for critical public infrastructure. A series of seven presentations provided participants with insights regarding the interactions between emerging climate risk and building infrastructure, different risk assessment tools and planning processes to enhance the resiliency of buildings, and best practices and examples. These were followed by small group sessions in which participants discussed what kind of data, tools and guidance would help them and other stakeholders address emerging climate risks to Manitoba's buildings.

Throughout the day, Roger Rempel provided workshop participants with a three-part presentation on managing climate impacts to public infrastructure. He stressed the challenges climate change poses to infrastructure, the key elements of adaptation planning, a variety of adaptation options in response to changes in specific hazards, and explored in detail the PIEVC Risk Framework, an assessment protocol to assess and prioritize climate vulnerabilities for critical public infrastructure. Among the lessons learned from these presentations was that identifying the highly vulnerable components of infrastructure to climate change impacts enables cost-effective engineering and operations solutions to be developed.

The workshop's first guest speaker, Dr. Danny Blair, a climatologist from the University of Winnipeg, introduced participants to the Prairie Climate Atlas, a project that seeks to detect and characterize climate variability and change on the Canadian Prairies with the goal to generate the data decision makers need to inform planning processes. One of the key messages that advanced from the presentation was that all current climate projections indicate that changes to codes and insurance will be required as the climate changes. These changes will also oblige us to incorporate climate change considerations into policies and procedures.

To enhance knowledge about real life examples and lessons learned around climate change impacts assessment and risk reduction planning for buildings, two presenters spoke about applying climate resiliency planning and emerging best practices. David Lapp, P. Eng. FEC, from Engineers Canada highlighted the growing risk that climate change poses for infrastructure and engineers, and how his organization is responding. He introduced attendees to scenario planning and adaptive management, concluding that a blend of both is the most effective approach for decision makers and asset managers.

Scott Armstrong from WSP Global described two case studies outlining how design standards were determined and met based on site conditions for a new building and an existing one. Importantly, he stressed the fact that both cases represent examples of voluntary and proactive behaviour by building asset owners, who undertook risk reduction measures in light of lessons observed through past extreme weather experiences.

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Prairie Climate Centre Opens its Doors

Climate change is increasingly evident across the Canadian Prairies, with climate models indicating substantial changes for the region in the coming decades. These changes put at risk communities and economics activities across Manitoba, Saskatchewan and Alberta.

Yet adaptation planning and implementation across the Prairies has been limited compared to other regions of Canada. Action has been impeded in part by the absence of effective knowledge communication tools and coordination of the expertise that exists across the Prairies.

The Prairie Climate Centre aims to address this gap. A new joint initiative of the University of Winnipeg and the International Institute for Sustainable Development, the Centre seeks to provide stakeholders across the Prairies with up-to-date climate data and impact information, and help governments, businesses and community members identify and anticipate risks, take advantage of emerging opportunities, build capacity, and enhance economic and environmental resilience to climate change.

Dr. Annette Trimbee, President and Vice-Chancellor, University of Winnipeg, stated at the time of its launch in October 2015 that "The Prairie Climate Centre is creating data and knowledge that is easy to understand and accessible to all. We call this knowledge mobilization: it is about building capacity in our community."

As a first step, the Centre is undertaking an engagement strategy that seeks input from public and private sector stakeholders to clearly understand end-user's needs and provide a coordinated approach. Through this process it has become evident that there is a crucial need for a central direction on adaptation planning and systematic use of best available science.

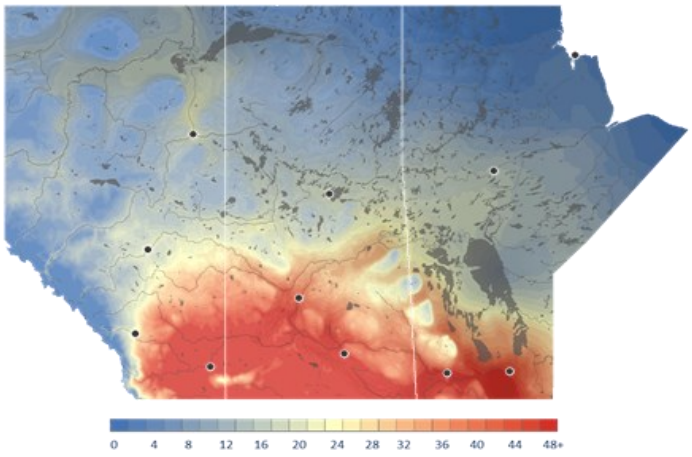
The **Prairie Climate Atlas** is one of the first products developed by the Prairie Climate Centre and strives to provide high-quality and up-to-date visualizations of current and future climate conditions across the Prairie Provinces. The multi-media website provides important resources that citizens, planners and policymakers need to transition from risk to resilience. The Atlas offers high resolution information about changes to temperature, precipitation and the growing season across the Canadian Prairies. It allows everyone from farmers and First Peoples to government policy analysts and emergency responders to anticipate and prepare for the changes ahead. It includes maps of historical trends in temperature and precipitation conditions that show how the climate of the Prairies has already changed over the past 65 years. Importantly, it also includes maps of how our current climate is expected to change in the coming decades—with the capacity to pull this information specifically for different rural municipalities across the southern Prairies.

Prairie Climate Centre
From Risk to Resilience

The aim is to produce relevant information that is accessible to, and understandable by, anyone interested in future climate scenarios for the Prairies. The Prairie Climate Atlas is expected to play an important role in informing decision-making processes across the Prairies.

"The Prairies is on the frontlines of climate change, it's a highly vulnerable region, yet adaptation and resilience is part of our culture and history," says Ian Mauro, Communications Director for the Prairie Climate Centre. "Our Atlas is a wakeup call, it helps us visualize the enormity of the challenge, and is a practical tool to develop solutions."

Initial funding of $250,000 for Centre was generously donated by Great-West Life, which was followed by funding of $400,000 from the Province of Manitoba. The Prairie Climate Centre will be hosted by the Richardson College for the Environment at the University of Winnipeg. ●



2051-2080 Annual number of days ≥ 30°C under RCP 8.5 (high emission) scenario

New Study Sheds Light on Energy Sector's Responses to Extreme Weather Events

How was the energy sector in Canada affected by recent extreme weather events? How prepared was the sector to address these impacts? These questions were the focus of a recent case study examining risks related to extreme climate events faced by the energy sector: "Risks to the Energy Sector related to Extreme Climate Events: Case studies of adaptation actions focusing on the Upper and Lower Souris River watershed in both Saskatchewan and Manitoba." The study looked to gain a better understanding of the energy sector's exposure, sensitivity, and responses to extreme weather events, with the goal of informing industry and government efforts to integrate climate variability into current and future risk management strategies.

The study consisted of two interrelated components. The first examined the risks to the energy sector from historic, current, and future extreme climate events in the basin. The second identified adaptation actions taken up by the sector, including their drivers, risk and opportunities, and lessons learned to improve future actions.

The energy sector has long been an important part of the economy of the Souris River basin, located at the intersection of southeastern Saskatchewan, southwestern Manitoba, and North Dakota. Activity in the sector expanded significantly in recent decades when specialized technology made it possible for companies to access oil located in the impermeable shale beds of the Bakken Formation and high oil prices made this exploration economically viable. However, in recent decades, the basin has also experienced a number of extreme weather events, ranging from droughts to excessive moisture and flood conditions.

Analysis undertaken through the study documented that precipitation levels in the region are highly variable on a yearly, seasonal and daily basis. The region experienced multiple extreme drought years in the 1930s, late 1950s, 1960s and 1980s, including an extended dry period between 1988 and 2001. More recently, the region has experienced a wet period marked by the unprecedented spring flood of 2011 that affected large parts of Saskatchewan and Manitoba. This was followed by significant summer flooding in 2014. These types of multi-year events typically have more impacts on a society than single-year events, and thus require different levels and types of response measures to be taken.

Analysis undertaken as part of the case study suggests that the Souris River basin's climate will change significantly in the coming decades, which could pose significant challenges for the local energy sector. On average it is projected that the region will be warmer for all seasons and that precipitation levels will increase except during the summer—with the greatest increases expected in the spring. In terms of projected extremes, the number of hot days in the summer months (those with temperatures greater than 30°C) will potentially increase by 140 per cent (more than six days) to more than 250 per cent (more than 15 days) compared to past decades by the period of 2051 to 2080. On the precipitation side, the number of 1-, 3- and 7-day precipitation extremes will also increase, likely by as much as 5 to 12 per cent by the same time period.

Historic weather and climate events can be motivators of change in industries, as they pose potential risks to the workforce and result in lost revenue. Key stakeholder interviews with energy sector professionals active in the region revealed that their main source of concern was the impact of extreme weather events on infrastructure (e.g. accessing operation sites), preventing environmental risks and ensuring the supply of power to customers after it has been generated (such as via transmission lines).

Oilfield equipment pumping water during the 2011 flood in Weyburn, SK. (Photo credit: D. Pattyson)

Energy sector companies appear to have weathered recent extreme climate events by applying a number of strategies and adjusting policies to build their adaptive capacity. The sector undertakes activities relevant to climate change adaptation, including asset management, internal risk assessment, updating

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Adaptation Canada 2016 (continued)

to its elimination under the previous federal government, PFRA provided farmers with the single coordinating entity needed to support policies and programs that promote resilience to the greater oscillations between wet and dry expected to occur on the Prairies.

Other sectors at risk include energy and forestry. Virginia Wittrock (Saskatchewan Research Council) presented findings from a recent case study examining risks related to extreme weather events faced by the energy sector increasingly exposed to either too much or too little water. Mark Johnston (Saskatchewan Research Council) highlighted lessons from the forestry sector in mainstreaming climate change into 20 year planning cycles. He noted the importance of tools developed by the Canadian Council of Forest Ministers to help forest managers undertake vulnerability assessments and adaptation planning. He further emphasized the important role of the forest community of practice in promoting knowledge sharing.

Approaches to adaptation have advanced more quickly in British Columbia. Dirk Nyland (BC Ministry of Transportation and Infrastructure) showed innovative adaptation measures in BC's transportation sector—including the use of climate vulnerability screening tools. In addition, he highlighted the necessity to have a universal understanding of concepts, principles and language related to adaptation and risk analysis when building multidisciplinary teams comprised of qualified professionals from diverse disciplines.

Emily MacNair (BC Agriculture Climate Action Initiative) presented on approaches used by the BC agricultural sector, an early driver in advancing adaptation. In 2012-13, the government piloted three regional adaptation strategies that enabled discussions and gained traction within the sector. Further support was provided for on-farm adaptation plans to create momentum and leadership within the community itself.

Session participants both at this event and others noted that climate change adaptation requires immediate and concerted collaboration between policy-makers, researchers and economic sectors. The task at hand is challenging, but Adaptation Canada 2016 showed that the necessary action on adaptation is possible given the wealth of existing approaches, the opportunities for building partnerships, and the obvious appetite for science-driven decision making that exists across the country. ●

New study sheds light (continued)

health and safety plans and policies, and infrastructure upgrades. Additionally, industry representatives identified gaps in information and resources they would find valuable and useful for informing their internal decision-making processes. For instance, governments could support industry adaptation efforts by ensuring practitioners have access to the quality climate data and floodplain maps they need to better integrate climate risks into their planning processes.

Rural municipalities in the basin were hard hit by recent extreme climate events, namely the floods of 2011 and 2014, when roads and bridges were damaged and closed, and culverts were washed out. The study showed that rural municipalities within the Souris River basin require additional resources, tools and information to build their capabilities to response to and prepare for extreme weather events and climate change. Importantly, oil and gas sector operations depend in part on community infrastructure—including electricity, water, transport-ation, and communication systems—to ensure their continued operations. The potential consequences of more frequent and severe extreme weather events due to climate change will exacerbate the already challenging job of sustaining communities in a tight fiscal environment.

Responding to this risk will require greater cooperation with other jurisdictions, notably the provincial and federal governments. There is a need for improved climate projections and greater access to land use planning information for decision making and to allow for better adaptation planning in the face of the changing risks associated with extreme weather events.

The final reports by the Saskatchewan Research Council and the International Institute for Sustainable Development were published in March 2016. Funding was provided by Natural Resources Canada. In-kind funding was provided by the Saskatchewan Research Council, Environmental Systems Assessment Canada Ltd, SaskPower, the Governments of Manitoba and Saskatchewan, IISD and other project partners. ●

PRAC Interprovincial Meeting March 2016

On March 21 and 22, 2016, representatives from all three provincial governments of Alberta, Manitoba and Saskatchewan, along with Indigenous and community organizations, gathered at the Inn at The Forks in Winnipeg for an inter-provincial meeting to conclude the second phase of the Prairies Regional Adaptation Collaborative (PRAC).

The intent of the meeting was to enhance the ability of Prairie decision-makers and stakeholders to increase the resiliency of identified sectors to the impacts of climate change. Through further engagement and capacity-building, the event aimed to expand participants understanding of current initiatives and provide support for identifying collaborative opportunities going forward.

The first day consisted of presentations and discussions outlining the adaptive initiatives taking place in each province. The Prairie Climate Centre representative (see page 3) provided an overview of the Centre and presented first outputs of the Prairie Climate Atlas that is being developed to spatially depict what the future climate may look like in the Prairies. The end of day one concluded with Dr. Richard Boyd providing participants with an overview of the pilot implementation of the Climate Resilience Express Project, a joint initiative of All One Sky Foundation and Alberta Municipal Climate Change Action Centre.

The teachings of Elder Dave Courchene on the sacredness of Mother Earth, water and our place within it set the stage for the second day of the meeting, which focused on Indigenous challenges and opportunities. Also known as Nii Gaani Aki Inini or Leading Earth Man, Elder Courchene spoke about an upcoming Summit event called Onjisay-Aki, which means The Changing of the Earth. The event is planned for June 2017 at the Turtle Lodge, located about 120 kilometres northeast of Winnipeg Manitoba. This First Peoples Summit will bring together leaders chosen among the human family across Canada and beyond to help shape a vision for collective action on climate change.

Members of Black River First Nation, including Chief Sheldon Kent, and Elder Earnest McPherson spoke about their perspectives on climate change and highlighted the outcomes of the federally funded 3-year climate risk assessment project undertaken in their community.

Throughout the meeting, participants asked questions and discussed information shared and potential opportunities going forward. These included capacity building and further engagement with Indigenous communities and continued attention towards enhancing the resiliency of infrastructure to climate change and associated extreme events. The full report is available on the PRAC website. ●

Workshop Engages Building Asset Professionals (continued)

Participants learned about the new Prairie Climate Centre, a joint initiative between the University of Winnipeg and the International Institute for Sustainable Development, which aims to help governments, businesses and community members identify and anticipate risks, take advantage of emerging opportunities, build capacity, and enhance economic and environmental resilience to climate change. The new Centre will be a resource for climate change impact information and seeks to provide hands-on assistance for municipalities and other organizations implementing climate resiliency initiatives.

Key messages that emerged from the small group discussions highlighted needs such as increasing the awareness among high-level management and decision-makers, better data and maps to inform planning and design processes, and an inventory of critical infrastructure. Groups also emphasized the need to undertake cost-benefit analysis of adaptation options and to better understand the cost of doing nothing. It was broadly acknowledged that risk assessment planning should be included in infrastructure design and planning processes. ●

In the News:

Fort McMurray fire could cost insurers $9B, BMO predicts

In the days immediately following the Fort McMurray wildfires an analyst at Bank of Montreal Capital Markets estimated that insured property losses could be between $2.6 billion and $4.7 billion if one-quarter to half of all the city's buildings needed to be re-built; and $9.0 billion if all of its buildings needed to be re-built. According to the Insurance Bureau of Canada, prior to this fire, the 1998 ice storm in Quebec at $1.9 billion had been the most expensive insurance event in Canada.

Insurance Bureau of Canada warns municipalities about allowing developments where disasters happen

Don Ferguson, president and CEO of the Insurance Bureau of Canada said decision-makers across Canada need to turn down proposed developments in floodplains and near fire-prone boreal forests. He emphasized the need for municipalities to take appropriate steps to mitigate or diminish the risks before allowing new developments to take place. He added more people are put at risk by stretching aging infrastructure due to new developments. Funding needs to be channeled into smart and green infrastructure projects that help communities prepare for climate change and reduce disaster-relief payments.

America's first 'climate refugees': Entire community to be relocated as Louisiana island 'sinks' into the sea

At the beginning of the year, the U.S. Department of Housing and Urban Development provided grants in the amount of USD 1 billion to help communities adapt to climate change in 13 states. For the first time, USD 48 million of this funding will finance a resettlement plan for 60 people to be accomplished by 2022. The community of Isle de Jean Charles in Louisiana has been struggling with the impacts of environmental change since 1955, leading to more than 90 per cent of the island's land mass being washed away. While channels cut by loggers and oil companies, flood-control efforts, and hurricanes have eroded much of the island, climate change is the final threat pushing members of this Native American community from its traditional lands. The State of Louisiana has experienced some of the fastest land loss in the world. In response the state has developed a master plan that envisions a giant wall of levees and flood walls along the coast that would cost tens of billions of dollars and leave island communities unprotected.

First Ministers and Prime Minister sign declaration on climate change

During the First Minister's summit in March, Prime Minister Justin Trudeau and Canada's Premiers agreed on the Vancouver Declaration, which outlines the vision and principles that will guide governments to move towards sustainable and clean economic growth. The declaration on clean growth and climate change endorses the need for a "carbon pricing mechanism" that could be adapted to each province's and territory's specific circumstances. The premiers agreed to work out the details over the next six months in four different working groups, including the establishment of a working group on adaptation and climate resilience. The four working groups will report back to ministers who will then provide their recommendations to the premiers by October 2016.

Prime Minister announces significant new investments in climate resilience

In March, at GLOBE 2016 in Vancouver, the Government of Canada announced funding for two new climate resilience initiatives. The Federation of Canadian Municipalities will receive $75 million in new funding to help local governments reduce emissions and adapt to a changing climate, while the government will also invest an additional $50 million to make buildings more resilient and upgrade infrastructure codes across Canada.

Signing of Paris Agreement kicks off race to ratify

A high-level ceremony took place on April 22 as a first step to implement the Paris Agreement countries adopted in Paris last December. The Agreement is open for signature in New York until April 17, 2017. U.S. President Barack Obama and Chinese President Xi Jinping signed the agreement to lead by example and urged other countries to do the same. Prime Minister Justin Trudeau joined 175 other world leaders and put his signature to the Paris agreement. Signing the Paris Agreement signals a country's intention to formally ratify the agreement and enable it to enter into effect in 2020. The timing for ratification by each country will largely be determined by domestic political circumstances and legislative requirements for international agreements. According to the White House at least 34 countries, representing 49% of greenhouse gas emissions, have already formally ratified the Paris Agreement.

Interesting Reads:

Spring 2016 Reports to the Commissioner of the Environment and Sustainable Development – Report 2: Mitigating the Impacts of Severe Weather

This report describes findings from an audit of the federal government's actions to support Canada's long-term efforts to mitigate the growing impacts of extreme weather events. It also examined whether the federal government is meeting its responsibilities to make Canada's infrastructure more resilient against severe weather events.

The Commissioner found that the federal government has not done enough to help mitigate the anticipated impacts of severe weather. Among the concerns identified is an insufficient availability of the information and tools needed by decision-makers, such as floodplains maps. It also found that the federal government is not encouraging provincial and territorial governments to make appropriate investments in projects that will reduce the impacts of severe weather.

Extreme weather will cost Ottawa almost $1-billion yearly: PBO report

According to a new report released by the Parliamentary Budget Officer, the federal government is expected to pay almost one billion dollars in disaster relief for extreme weather events across the country annually over the next five years. In contrast, the Public Safety Department has been budgeting $100 million annually. The PBO report states that the largest damage from floods is expected to occur in the Prairie Provinces. The Insurance Bureau of Canada released a statement confirming the damaging impact climate change has already has, costing governments hundreds of millions every year.

Upcoming Events:

North American Symposium on Climate Change Adaptation
August 16-18, 2016 (New York, United States)

The North American Symposium on Climate Change Adaptation will showcase experiences from research, field projects and best practices in climate change adaptation and resilience among countries in the region. The aims of the symposium is to provide researchers with an opportunity to display and present their works in the field of climate change adaptation; to foster the exchange of information, ideas and experiences acquired in the execution of climate change adaptation projects; discuss methodological approaches and experiences deriving from case studies and projects; and to network the participants and provide a platform so they can explore possibilities for cooperation.

Indigenous Peoples Summit
June 2017 (Winnipeg and Turtle Lodge, MB)

Onjisay-Aki, the changing of the earth, is the meaning of the Indigenous Peoples Climate Change Summit planned for June 2017 at Winnipeg and the Turtle Lodge in Manitoba. The Summit will be a three day event, with two days of summit meetings of Indigenous Peoples at the Turtle Lodge, approximately 120 kilometers north east of Winnipeg. The event will focus on climate change and community responses to confront climate change impacts. It will bring people together to confront climate change, share language and culture, and create a coast to coast dialogue on climate change and sustainability.

Acknowledgement

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