Tools for Municipal Adaptation Planning:
ClimateData.ca

March 15, 2022

ClimateWest
Building Prairie Resilience

Today's Agenda

1. Who is ClimateWest
2. The Climate Data Guide
3. Speaker Introductions
4. Introduction to ClimateData.ca
5. Case Study: Associated Engineering
6. Q&A
7. Closing Remarks

Housekeeping

- This webinar is being recorded.
- Have a question during the session? Drop it in the chat box and we'll do our best to address it during the Q&A period.
- An email will be sent out after the webinar with links to the session recording, presentation slides, and helpful resources!

Meet ClimateWest

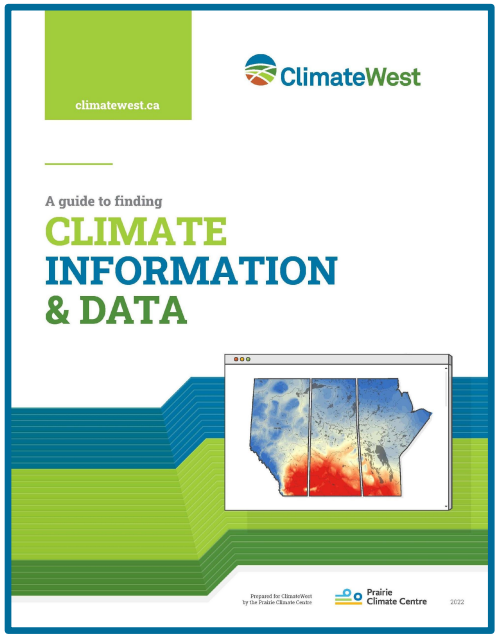
A network-based, non-profit and regional hub for climate services in Manitoba, Saskatchewan and Alberta.

Our mission is to empower people, communities, businesses and governments to address climate risk through planning and action across the Prairie region.

ClimateWest is comprised of 3 founding partners:

- Prairie Adaptation Research Collaborative (PARC)
- Prairie Climate Centre (PCC)
- International Institute for Sustainable Development (IISD)

The Climate Data Guide



- Overview of credible resources that offer free access to climate data about the future
- Prairie-focused
- Provides the basics for how climate information and data can be used in risk management and adaptation planning
- Includes cheat sheets to help you determine your data needs

Poll

Please go to www.menti.com and
use the code: 73 32 17 9

Elaine Barrow

Elaine joined the Canadian Centre for Climate Services as Senior Climate Advisor in 2019. She has since been involved in the development of ClimateData.ca as well as developing and delivering training materials to help decision-makers understand how to use climate information.

Elaine has a PhD in Environmental Sciences and over thirty years of experience in climate change research. She started her career in the Climatic Research Unit, University of East Anglia (UK), moved to Canada in 1999, and has since worked mainly as a consultant undertaking climate change research with a focus on the prairies.

Jeff O’Driscoll

P.Eng., IRP

Jeff is a professional engineer and the Infrastructure Division Manager for Associated Engineering’s Winnipeg office. He has over 30 years of experience in consulting engineering including current roles as an associate for the Climate Risk Institute and a member of the Engineers and Geoscientist of Manitoba Sustainable Development Task Group.

Jeff graduated from the University of Manitoba and has spent his career in Winnipeg. In recent years, Jeff has become a leader in assessing climate change resilience on infrastructure and has shared this knowledge across Canada and internationally. He holds the designation of Infrastructure Resiliency Professional (IRP).

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Platinum member

Climate

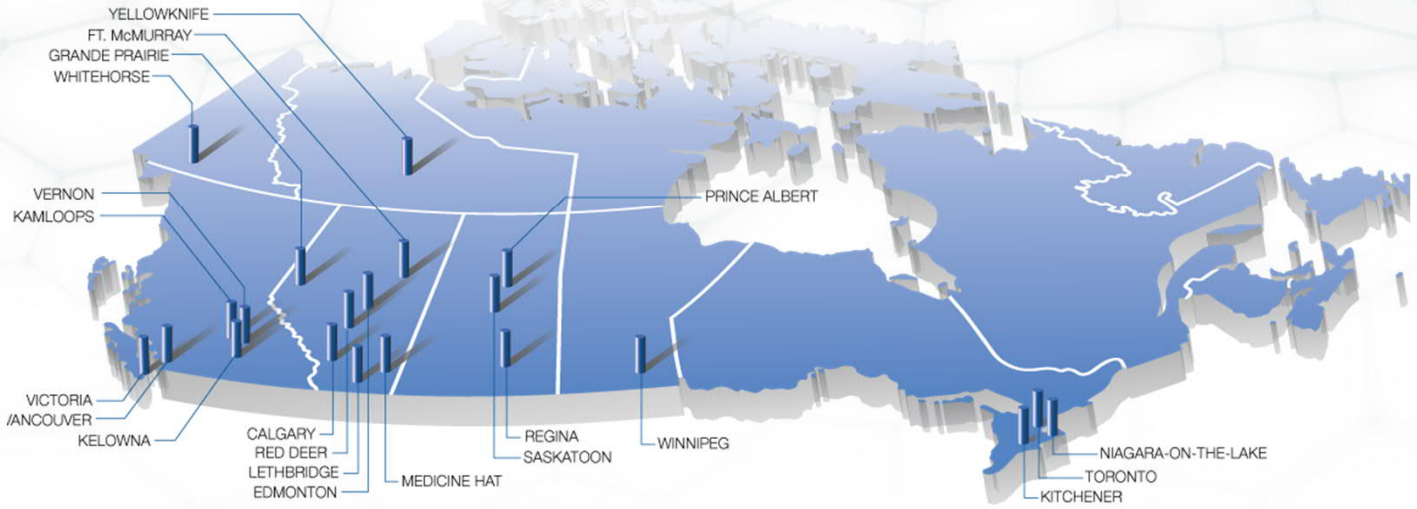
ClimateWest

Tools for Municipal Adaptation Planning Using CliamteData.ca

Jeff O'Driscoll, P.Eng., IRP

March 15, 2022

AE's Core Expertise



carbon neutral since 2009

Strategic Advisory Services

Transportation

Infrastructure

Environmental

Water

Energy

Buildings

Building Better Communities

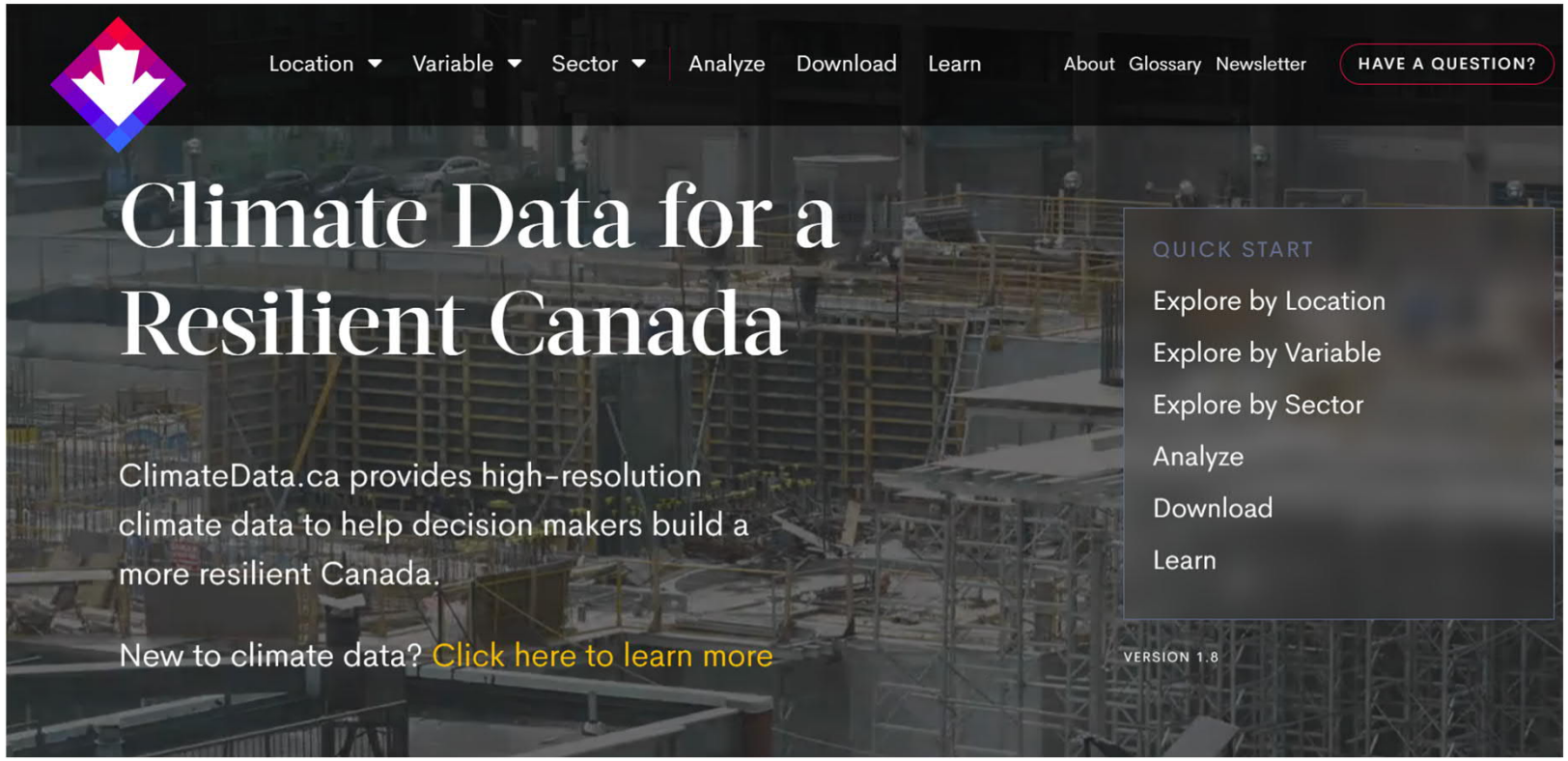
Climate Resiliency

- Building capacity and knowledge
- Climate science and services

ClimateData.ca

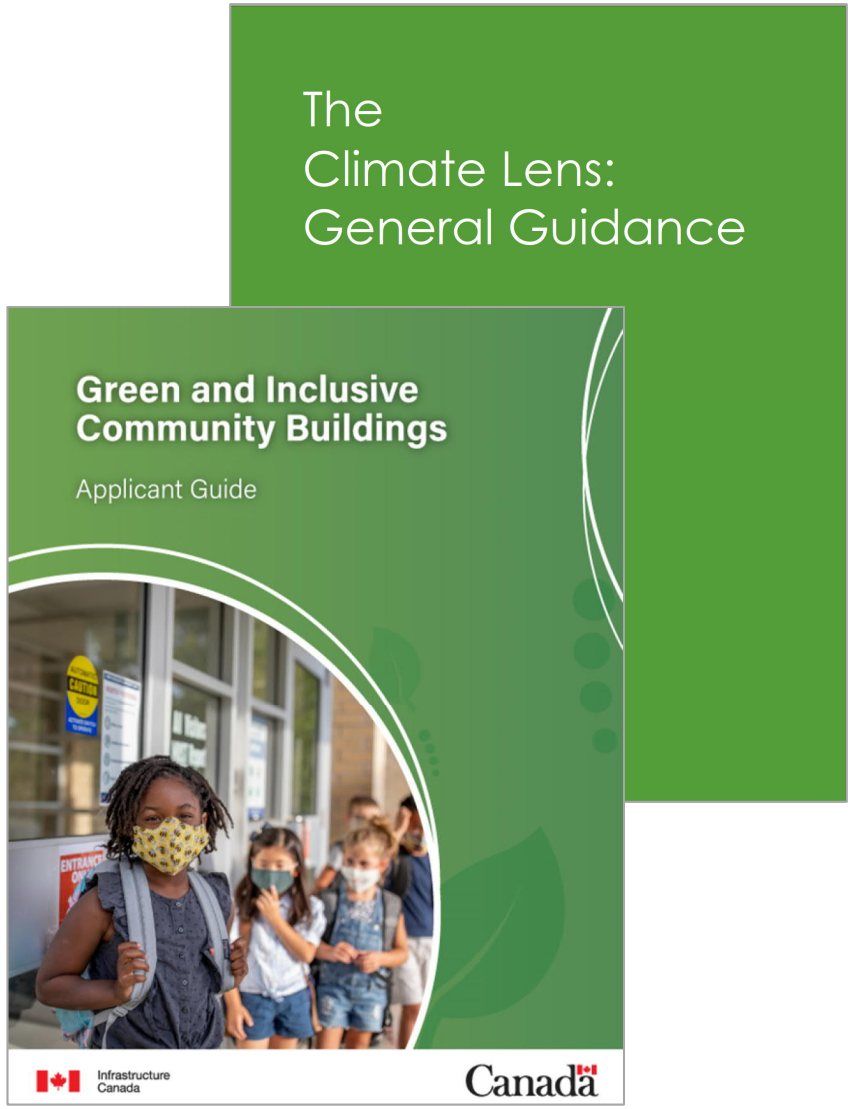
ClimateData.ca

- Examples
  - Climate Change Resilience Assessments (CCRA)



Climate Change Resilience Assessment

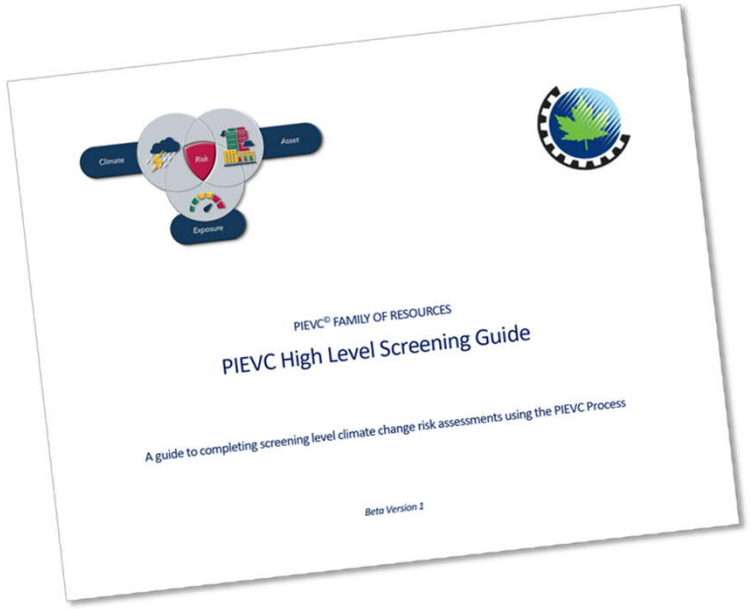
Risk management approach to anticipate, prevent, withstand, respond to, and recover from a climate change related disruption or impact.

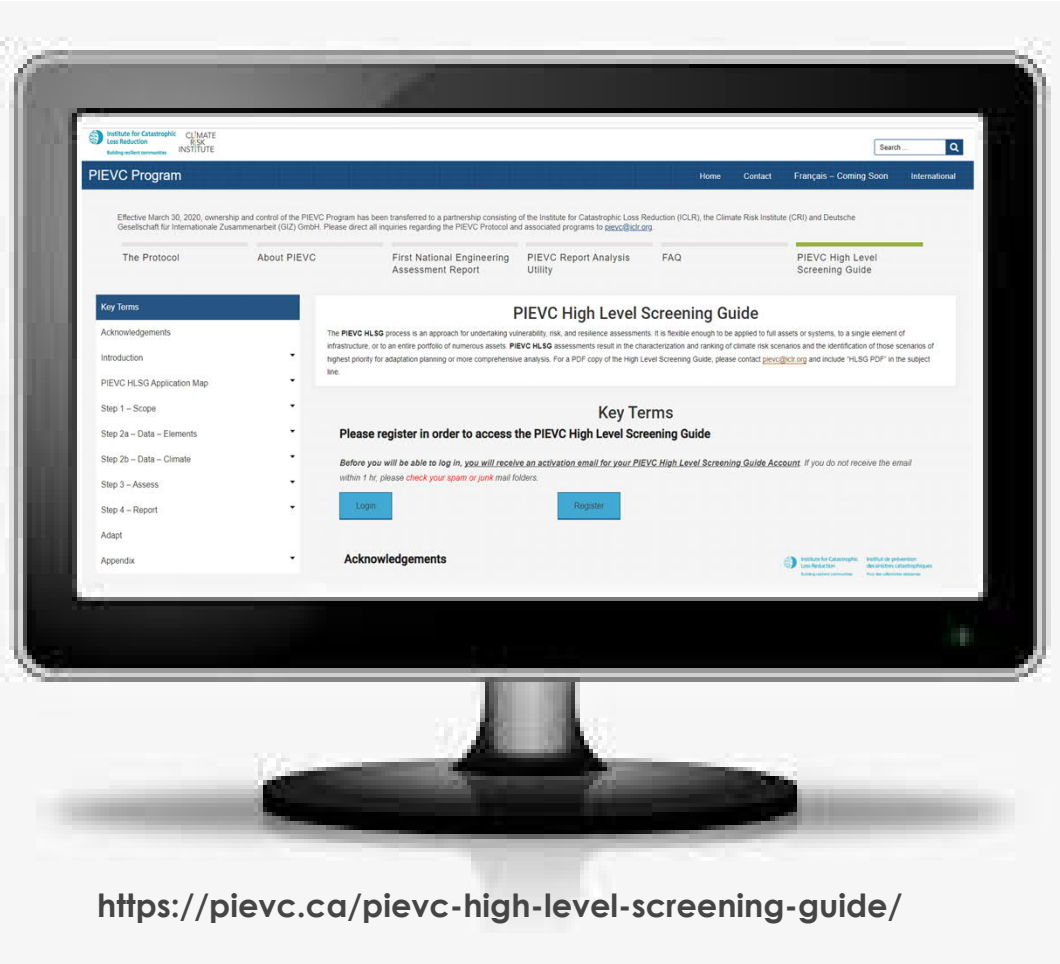


Climate Change Resilience Assessment

Methodology

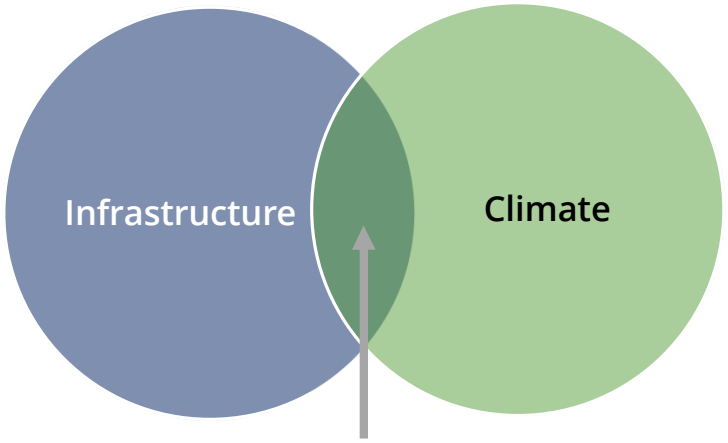
- PIEVC





https://pievc.ca/pievc-high-level-screening-guide/

Risk Assessment



Risk = Likelihood X Consequence

	CONSEQUENCE							
5		Catastrophic	0					25
4		Major	0	4	8	12	16	20
3		Moderate	0	3	6	9	12	15
2		Minor	0	2	4	6	8	10
1		Insignificant	0	1	2	3	4	5
0		No Effect	0	0	0	0	0	0
			Negligible Not Applicable	Highly Unlikely Improbable	Remotely Possible	Possible Occasional	Somewhat Likely Normal	Likely Frequent
			LIKELIHOOD					
			0	1	2	3	4	5

FOOD

Climate Change

FLOOD

Adaptation

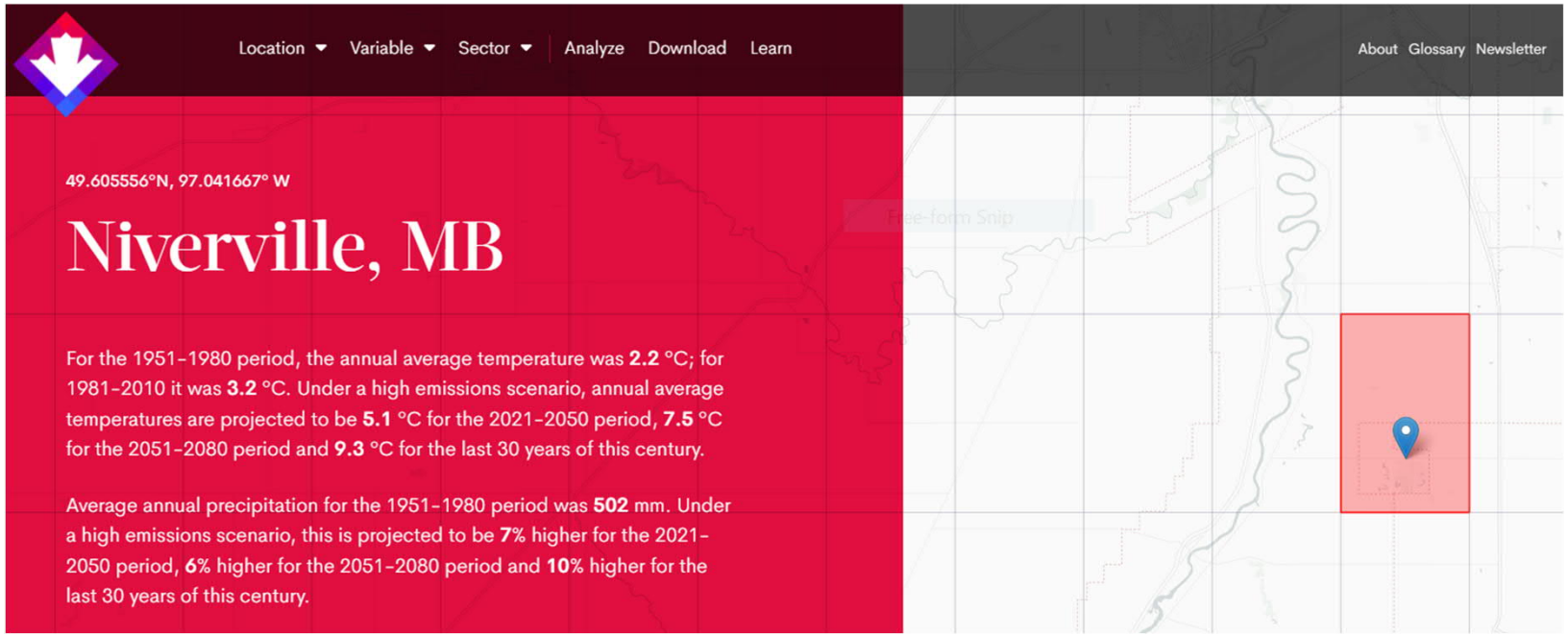
FLOOD

ClimateData.ca - Examples

RSR Wastewater Cooperative

The Climate Lens: General Guidance

- ICIP Application
  - Climate Lens



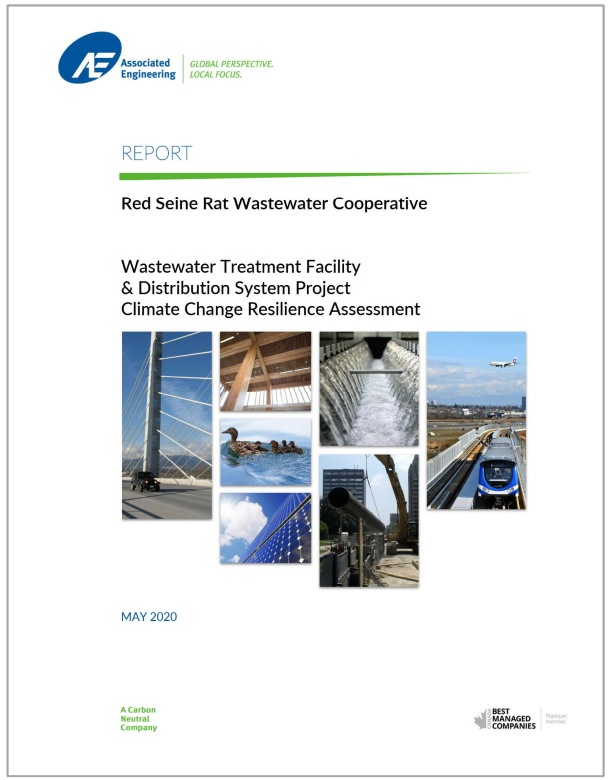
RSR Wastewater Cooperative

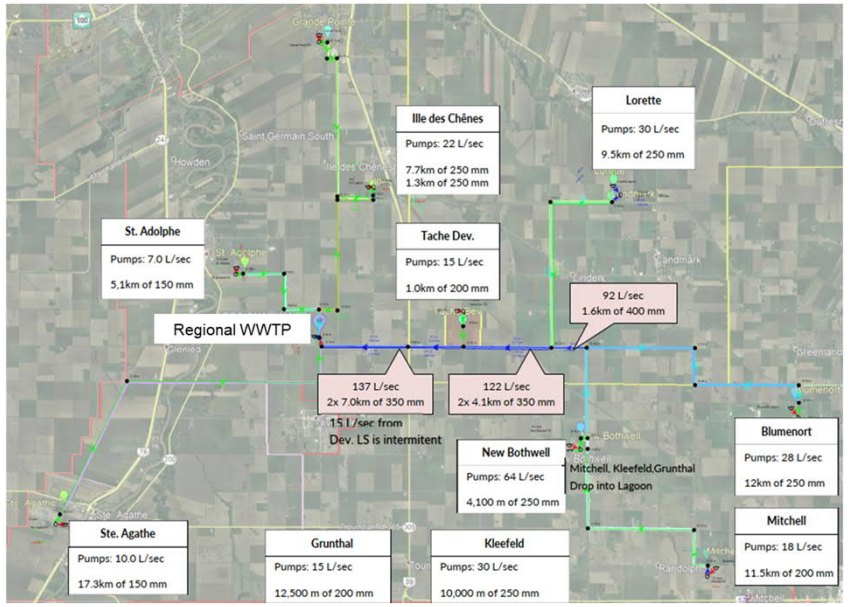
Consequence Score

0 - No Effect
1 - Insignificant
2 - Minor
3 - Moderate
4 - Major
5 - Catastrophic

Climate Parameter		Temperature								Precipitation as Rain												Precipitation as Snow				Ice Storm				River Flood				Wind				Eva	
		Extreme				Extreme				Frequency				Intensity				Drought Conditions				Winter Precipitation				Ice Accretion				Height				Extreme Winds					
		Very Hot Days (+30 deg C)				Very Cold Days (-30 deg C)				Heavy Precipitation Days				Five Day Max Precipitation				Dry Days				Snow				Ice Storm				Flood Stage 1:100 year				Tornado				Evap	
Infrastructure Components		Y/N	L	C	R	Y/N	L	C	R	Y/N	L	C	R	Y/N	L	C	R	Y/N	L	C	R	Y/N	L	C	R	Y/N	L	C	R	Y/N	L	C	R	Y/N	L	C	R	Y/N	L
Regional Wastewater Treatment Facility																																							
1 Operation and Maintenance	Present		2		6		2		4		3		9		3		9		3		6		3		12		3		12		3		6		3		9		3
	2050	Y	3	3	9	Y	1	2	2	Y	4	3	12	Y	4	3	12	Y	4	2	8	Y	4	4	16	Y	2	4	8	Y	5	2	10	Y	5	3	15		4
	2080		4		12		1		2		5		15		5		15		4		8		4		16		1		4		5		10		5		15		4
2 Site and Access Roads	Present		2		4		2		4		3		9		3		6		3		3		3		9		3		9		3		6		3		6		3
	2050	Y	3	2	6	Y	1	2	2	Y	4	3	12	Y	4	2	8	Y	4	1	4	Y	4	3	12	Y	2	3	6	Y	5	2	10		5	2	10		4
	2080		4		8		1		2		5		15		5		10		4		4		4		12		1		3		5		10		5		10		4
3 Building and Structures	Present		2		6		2		6		3		9		3		6		3		0		3		9		3		9		3		6		3		12		3
	2050	Y	3	3	9	Y	1	3	3	Y	4	3	12	Y	4	2	8		4		0	Y	4	3	12	Y	2	3	6	Y	5	2	10	Y	5	4	20		4
	2080		4		12		1		3		5		15		5		10		4		0		4		12		1		3		5		10		5		20		4
4 Treatment Systems	Present		2		6		2		6		3		12		3		0		3		0		3		0		3		0		3		0		3		0		3
	2050	Y	3	3	9	Y	1	3	3	Y	4	4	16		4		0		4		0		4		0		2		0		5		0		5		0	Y	4
	2080		4		12		1		3		5		20		5		0		4		0		4		0		1		0		5		0		5		0		4
5 Building HVAC	Present		2		8		2		6		3		6		3		0		3		0		3		9		3		9		3		0		3		0		3
	2050	Y	3	4	12	Y	1	3	3	Y	4	2	8		4		0		4		0	Y	4	3	12	Y	2	3	6		5		0		5		0		4

RSR Wastewater Cooperative

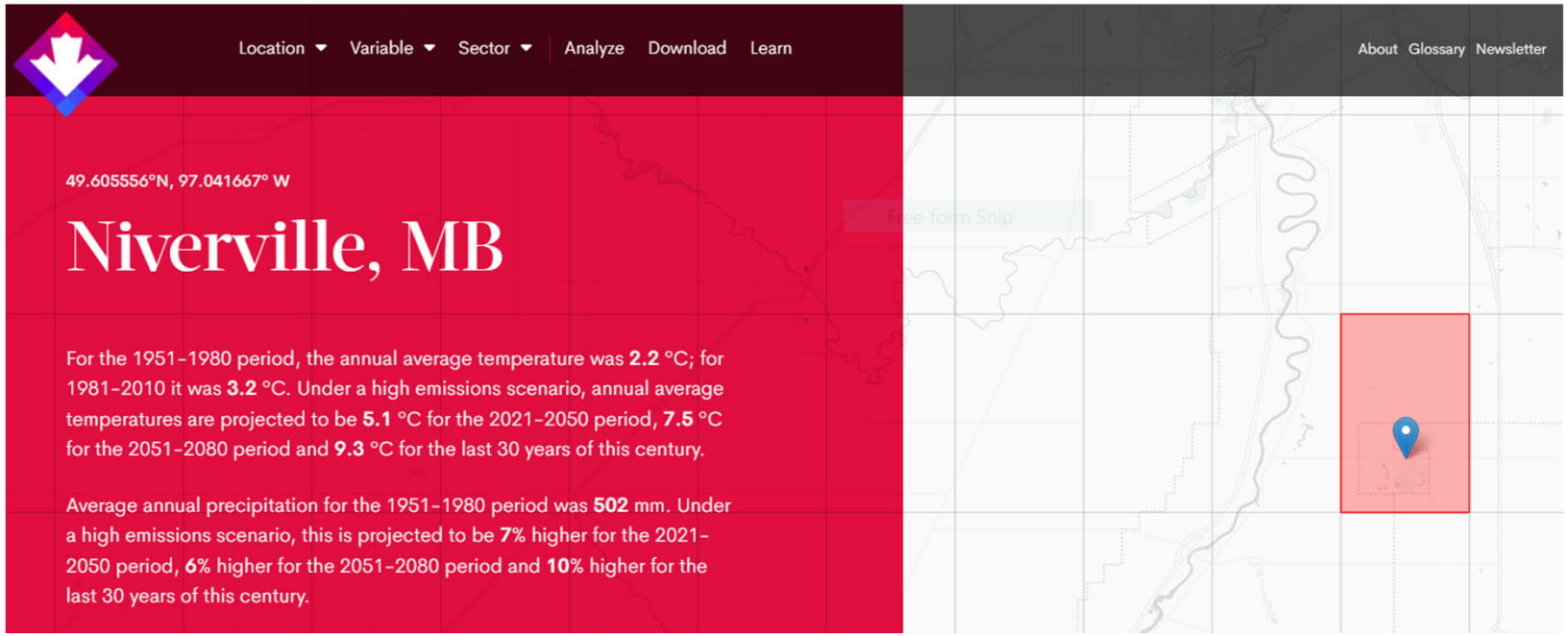




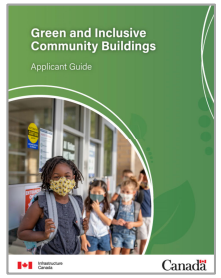
Melville Wastewater Lagoon Expansion

The Climate Lens: General Guidance

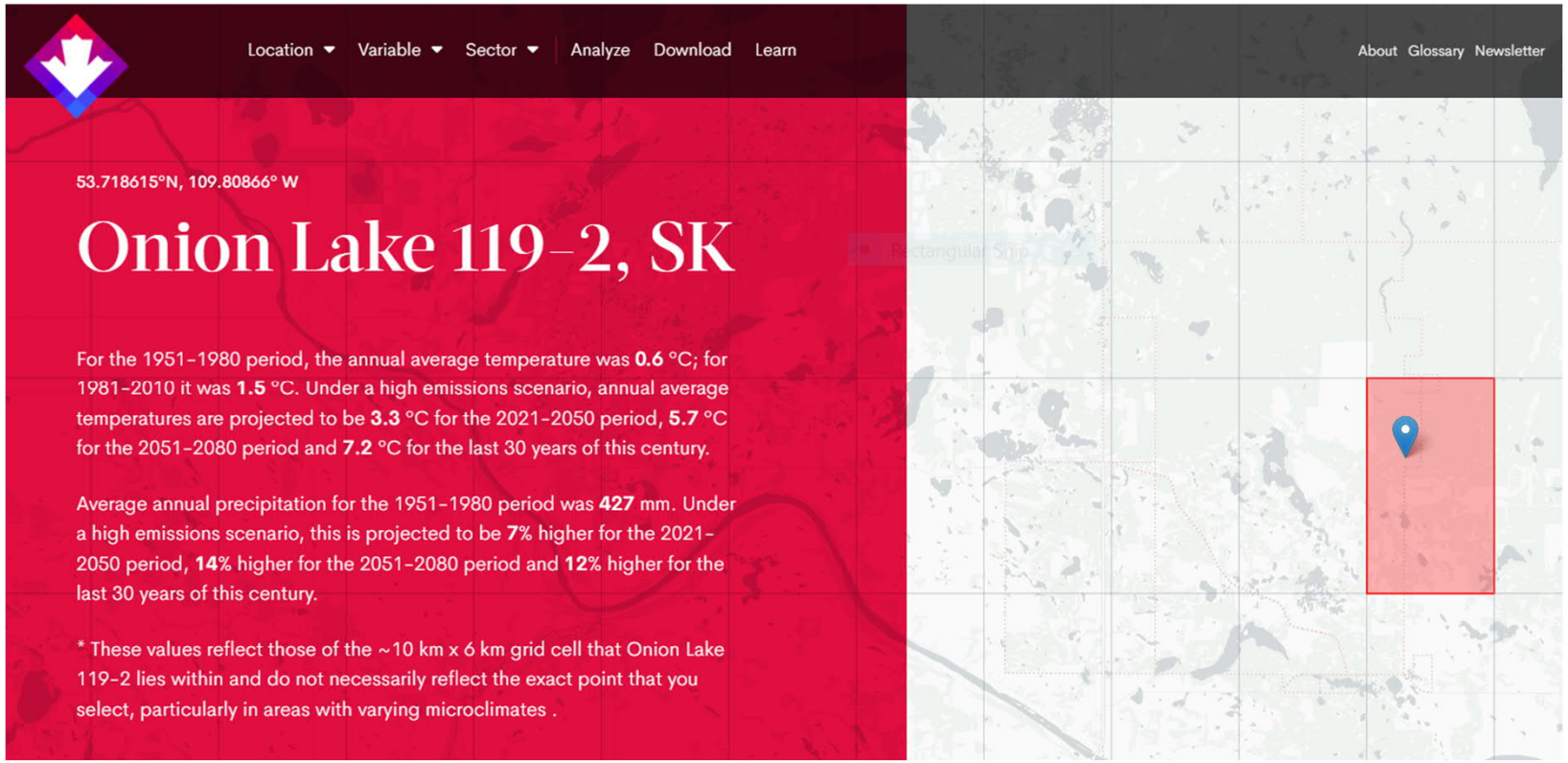
- ICIP Application
  - Climate Lens



Onion Lake Aquatics Centre



- Green and Inclusive Community Buildings Application



Onion Lake Aquatics Centre

3. Understanding Future Hazard Changes (Table 3)			
3.1 Hazard Type	**3.2 Hazard-related Climate Indices**	**3.3 Climate Information Source (location, resolution, scenario, link)**	**3.4 Qualitative or Quantitative Change in Metric Between Present and Infrastructure Lifespan**
Temperature	Very Hot Days (>30°C) (days)	Source: Climate Atlas Locations: Lethbridge (~ 50 km south) Resolution: Scenario: RCP8.5 (for assessment)/ RCP 4.5 Link: https://climateatlas.ca/	Current: 5 days 2050: 13 days 2080: 19 days Increasing number of very hot in infrastructure lifespan
	Hottest Day (°C)	Source: ClimateData.ca Locations: Onion Lake Resolution: ~10 km x 6 km grid Scenario: RCP8.5 (for assessment)/ RCP 4.5 Link: https://climatedata.ca/	Current: 30.6 °C 2050: 33.7 °C 2080: 37.3 °C Increasing hottest days value in infrastructure lifespan
	Frost Days (days)	Source: ClimateData.ca Locations: Onion Lake Resolution: ~10 km x 6 km grid Scenario: RCP8.5 (for assessment)/ RCP 4.5 Link: https://climatedata.ca/	Current: 205 days 2050: 183 days 2080: 167 days Decreasing number of frost days in infrastructure lifespan
Precipitation	Annual Precipitation (mm)	Source: ClimateData.ca Locations: Onion Lake Resolution: ~10 km x 6 km grid Scenario: RCP8.5 (for assessment)/ RCP 4.5 Link: https://climatedata.ca/	Current: 433mm 2050: 463mm 2080: 493mm Average annual precipitation for the 1951-1980 period was 433 mm. Under a high emissions scenario, this is projected to be 7% higher for the 2021-2050 period, 15% higher for the 2051-2080 period and 11% higher for the last 30 years of this century.

Onion Lake Aquatics Centre

Associated Engineering | GLOBAL PERSPECTIVE. LOCAL FOCUS.

TECHNICAL MEMORANDUM

Issue Date:	July 6, 2021	**File No.:**	
To:	Onion Lake Aquatic Centre Application	**Previous Issue Date:**	
From:	Jeff O'Driscoll, P.Eng., IRP	**Project No.:**	2021-4614
Client:	Onion Lake Cree Nation		
Project Name:	Aquatic Centre		
Subject:	Climate Resilience Assessment		

CLIMATE RESILIENCE ASSESSMENT

In accordance with funding requirements, a climate risk assessment was completed on the Onion Lake Cree Nation Aquatic Centre to identify climate change risks and to document measures mitigating medium and high risks.

The assessment followed Annex B: Climate Resilience Resources including the guidance provided in the Climate Resilience First Assessment details and worksheets. The assessment also incorporated portions of the PIEVC High Level Screening process to quantify low, medium and high level risks related to the Aquatic Centre. The Assessment was used to answer questions '54', '55', and '56' of the application. Test related to these specific questions is listed below:

Large Retrofit and New Build Projects

54. Is your project at risk of, or vulnerable to climate-influenced risks or natural hazards such as flooding, earthquakes, wildfires, permafrost melt or coastal erosion? Please provide an assessment of the current and future climate risks for the proposed project. The assessment should consider climate risks during the construction phase as well as changes during the planned operation and maintenance phases over the entire lifespan of the building or asset.
    - Using the text box, please provide an assessment of the current and future climate risks towards the project you are proposing. The assessment should consider climate risks during the construction phase as well as changes in climate risks during the planned operation and maintenance phases over the entire lifespan of the building or asset. For example, wildfires will present a risk to a community center project if it is located near a forested area that is experiencing increased occurrence of drought and increasing temperatures.
    - You may wish to consult multiple climate models to consider the range of potential future changes. Please refer to Annex B for a list of resources, including a Climate Resilience First assessment worksheet that provides a step-by-step guide for assessing climate risks. This worksheet can be used to determine the answer(s) to this question. [Character limit: 4000]

Application Text (Question '54'):

The proposed Onion Lake Aquatic Centre (Project) is resilient to climate-influenced risk including related to increased temperature, increased precipitation and extreme events. Through a resilience assessment, following the funding requirements, several medium and high level risks were identified based on current and future climate horizons

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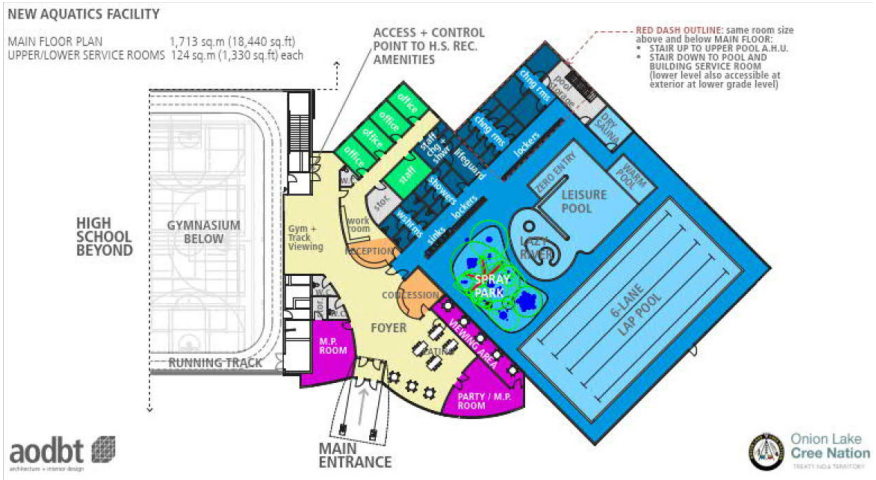
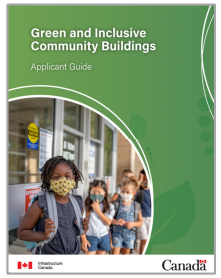
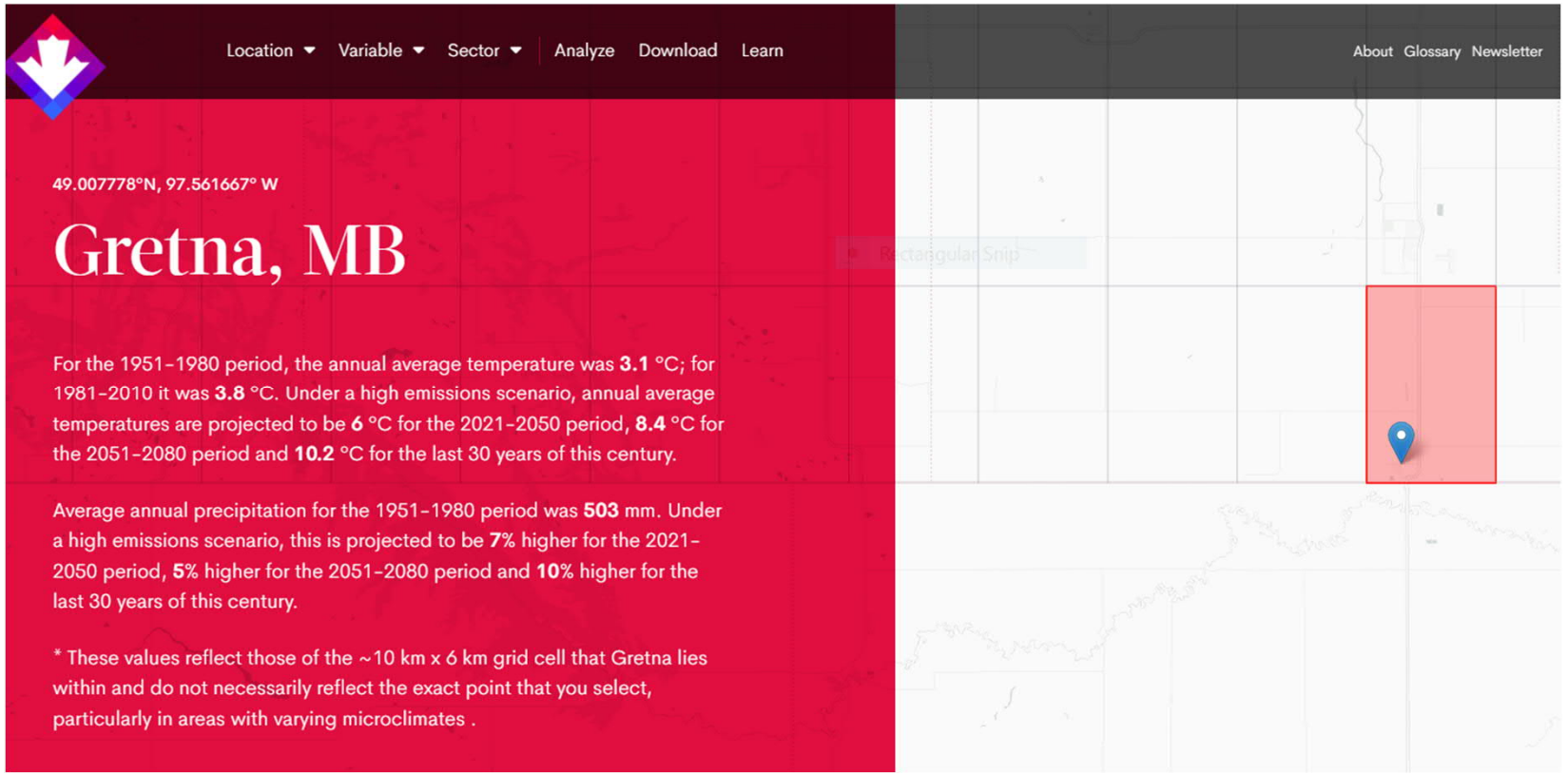


Gretna Arena Upgrades



- Green and Inclusive Community Buildings Application



City of Regina 4th Ave Pumping Station

CCRA as part of Predesign

Associated Engineering | 75 YEARS

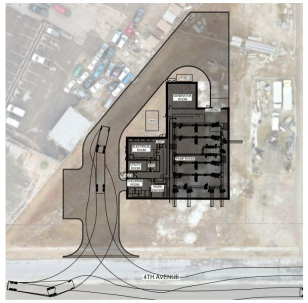
REGINA | City of Regina

REPORT

City of Regina

4th Avenue Pumping Station

Climate Resilience Assessment



DECEMBER 2021

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Infrastructure Component	Risk Assessment Comments and Resilience Measures
Ventilation of Chemical Storage Areas	**Risk Assessment Summary:** **Medium Risks:** Increasing average temperatures and very hot days may affect capacity of the HVAC to meet occupancy and other level of service requirements for the facility. Winter precipitation (snow) could affect intakes and block access to equipment. **High Risks:** Increasing very hot days may exceed the capacity of the HVAC to meet occupancy requirements or overload equipment resulting in failure. **Resilience Measures:** HVAC design should consider climate projection data on temperature, especially related to very hot days and heat waves in the design of the HVAC systems.

CRWC Drought Management Study

5.12 Drought Response

Once the Drought Stage is established based on the indicators and flow monitoring provided by the Province, a detail response should be initiated for the affected area(s). Response will be classified as Normal, Moderate, Severe and Extreme.

For each Drought Stage, the Province, CRWC and the Municipal Members and customers will have a different response. In each successive stage, the response escalates from normal, business as usual operations to extreme measures. This includes more frequent monitoring, meetings and reporting, staged demand reduction with more severe restrictions and actions by each stakeholder.

For the Province, the response is outlined in the Manitoba Drought Management Strategy. For CRWC and their Members, the following responses have been drafted for review and discussion and initial implementation.

Drought Stage Summaries are included in the Appendix.

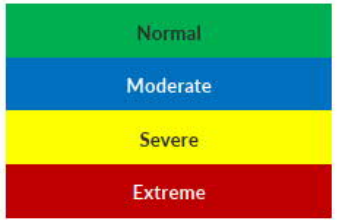
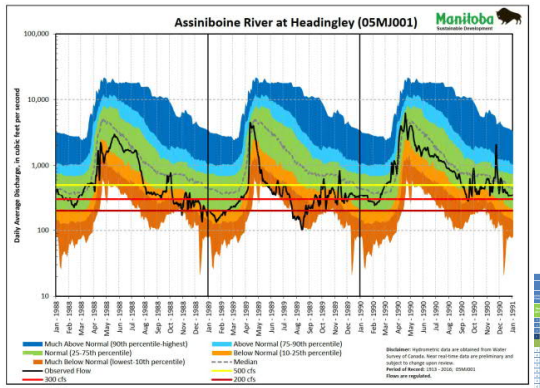
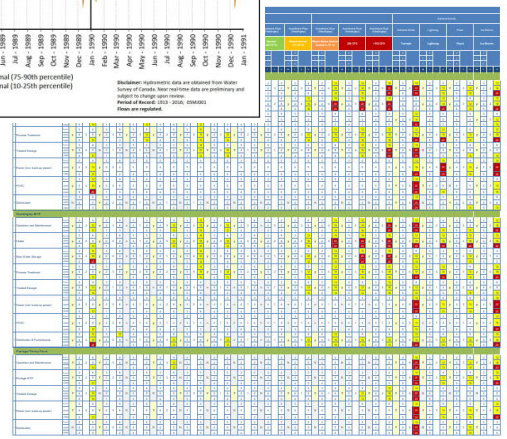


Figure 5-4
Sample Assiniboine River Streamflow for the Assiniboine River at Headingley





Questions?

Contact Jeff O’Driscoll, odriscollj@ae.ca


Questions?

ClimateWest
Building Prairie Resilience

Thank you!

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