



THE CLIMATE IS CHANGING – ARE YOU READY?

Climate Resilience for Municipalities

Alberta's climate is changing. In fact, over the past century, the province has warmed by about 1.4°C. The flooding of southern Alberta in 2013 may not be an anomaly — a changing climate is a certainty and will mean changes in the frequency, intensity and distribution of extreme weather. We are increasingly aware of the vulnerability of ecosystems, human health and man-made systems (buildings, industrial processes, energy systems, public infrastructure).

Municipalities need to take steps now to ensure they are better prepared for the next weather event and indeed, for the future climate. Waiting to act will be costly. Municipalities would be prudent to integrate the risks associated with a changing climate into municipal planning and operations. Taking these steps now will not only help avoid disaster, it will preserve and enhance quality of life and economic prosperity for generations.

THE TWO BIG QUESTIONS YOUR MUNICIPALITY SHOULD ASK:

“WHAT ARE THE IMPACTS OF EXISTING AND FUTURE CLIMATE FOR OUR CITIZENS?”

AND

“HOW CAN WE TAKE STEPS TO BUILD RESILIENCE AND ADAPT TO A CHANGING CLIMATE?”

Understanding Alberta's future climate

Southern Alberta woke up to a new climate reality in June of 2013 when extreme flooding caused damage estimated at \$3-5 billion. Alberta is at the forefront of extreme weather and natural disasters which have increased in frequency over the last century.

Temperature

We know that Alberta's mean annual temperature has increased by about 1.4°C over the last 100 years. We know too, that winter and spring seasons are warming more than summers.

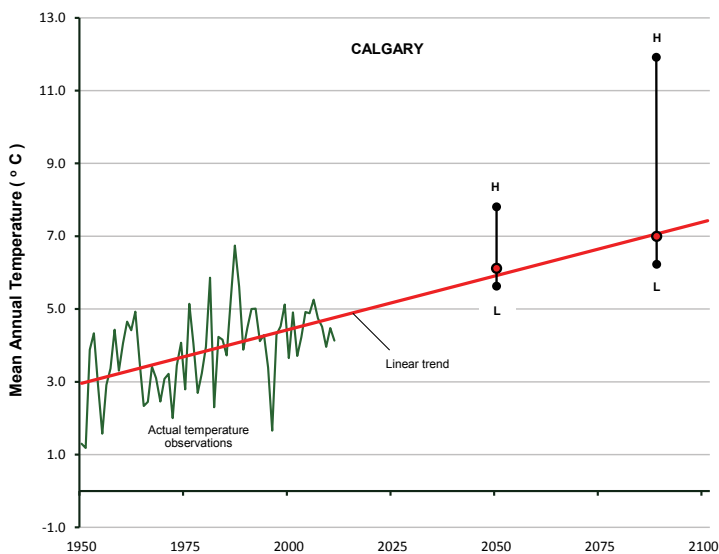
Regardless of the cause, scientists project that mean annual temperatures will continue to rise over the remainder of the century, (2–3°C by the 2050s from the 1961–1990 average). These changes may seem small, but even small changes in average temperatures will lead to more hot (and extreme hot) weather and less cold weather, which can have a significant impact on municipalities.

According to Canada's disaster database, five of the top six most costly disasters in Canadian history affected Alberta*:

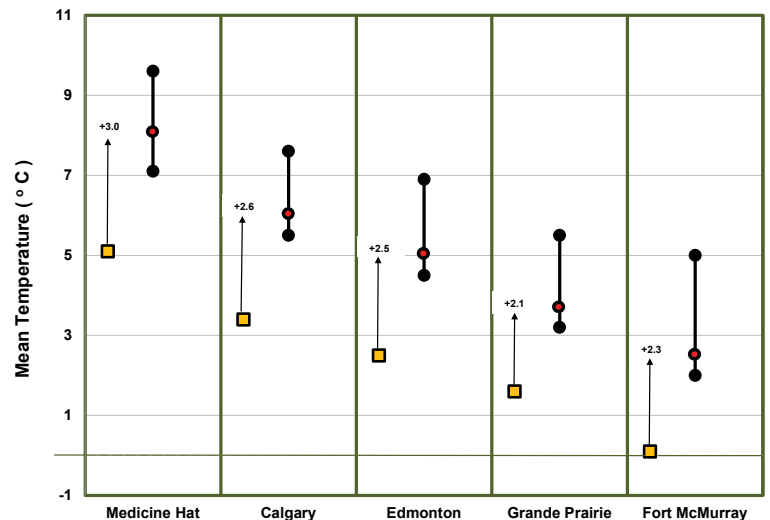
- May 2011 wildfires in Slave Lake
- June 2010 flooding in southern Alberta
- January 1992 drought in the prairie provinces
- September 1991 storms in Calgary
- January 1990 drought in the prairie provinces

*Statistic is prior to the June 2013 flooding event.

Calgary mean annual temperatures (1950-2011) and projections



Mean annual temperatures for select Alberta municipalities for the 2050s



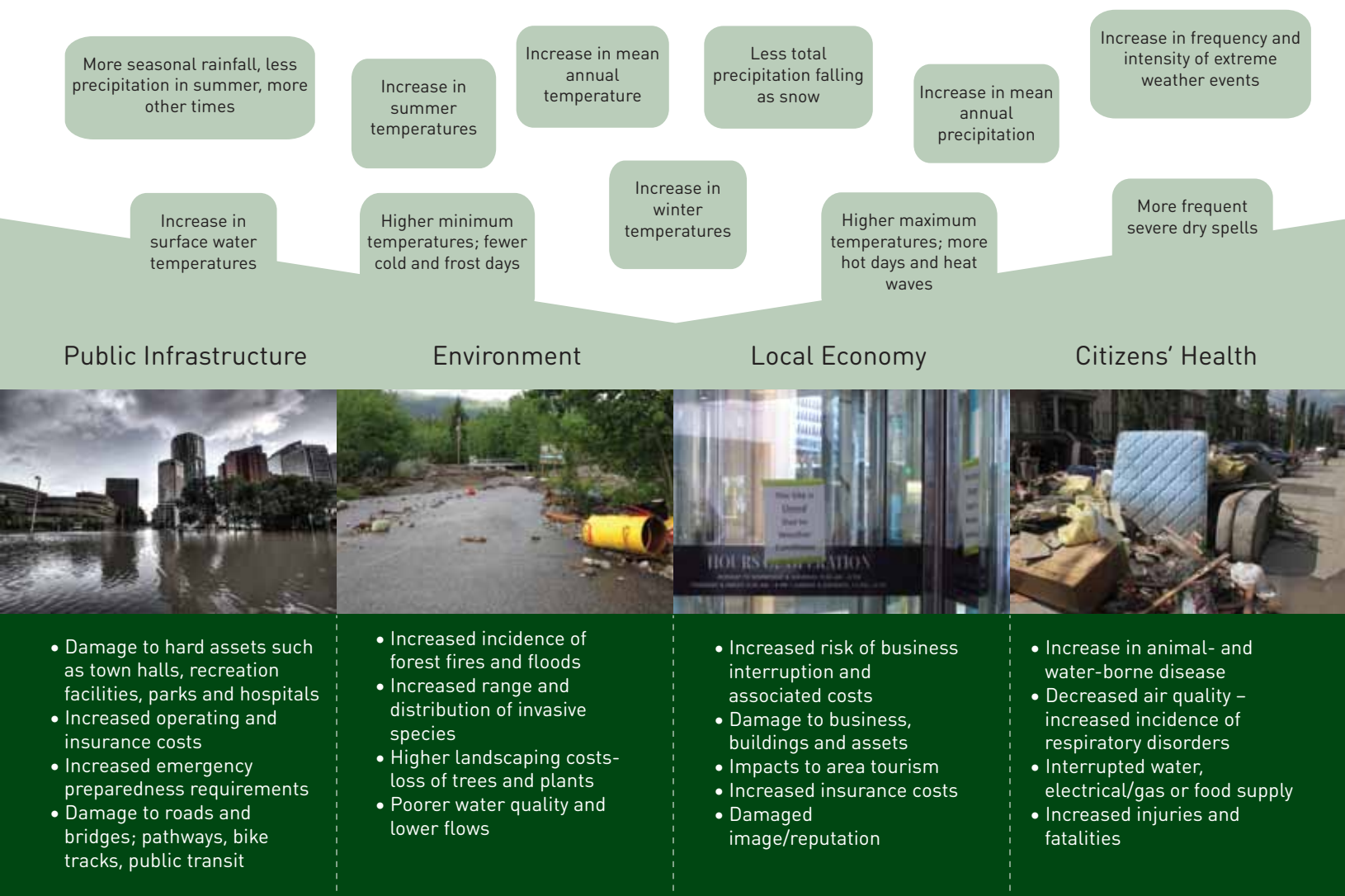
- Median scenario for mean annual temperature as defined by Barrow and Yu (2005)
- Baseline mean annual temperature averaged over 1961-1990
- Range of uncertainty - mean annual temperature projections for extreme "futures" (highs and lows)

Precipitation

Although over the last 100 years there is no discernible trend in mean annual precipitation for Alberta, it is projected to increase across the province by the end of this century. This increase varies across regions - about 6% for Medicine Hat and 12-15% for Grande Prairie.

What form precipitation takes and when it falls is projected to change - we may, for example, experience more rain than snow and rainfall events will be more intense. Despite projected increases in mean annual precipitation, amounts during summer months are expected to decrease, when soil moisture stress is highest.

What does the changing climate mean for municipal governments?



Why build resilience now?

- The climate in Alberta is changing and we should expect further changes.
- Municipalities are not very well adapted to the existing climate in Alberta, with many experiencing multiple events over the past two decades.
- Municipalities are on the frontline of climate impacts, as a result of density of people, assets, and infrastructure.
- Anticipatory, proactive measures are much cheaper and have less social and economic impact than reactive measures.
- Adaptation measures can provide multiple co-benefits for greenhouse gas mitigation and economic development.
- Some measures are complex, require further understanding, have long lead times, or require a number of partnerships to be established, and may take several decades to effectively implement.

Are YOU ready?

- Has your municipality considered recent climate trends, projected changes, and potential impacts to operations and planning?
- Do you understand your exposure, sensitivity and adaptive capacity to key risks - more frequent and intense flooding, wildfires and droughts?
- Have you identified, assessed and prioritized actions to build resiliency and limit vulnerabilities to key risks, as well as take advantage of opportunities that may be presented?
- Have you developed, implemented, monitored and reviewed these actions, and continued the journey toward a resilient and prosperous community?

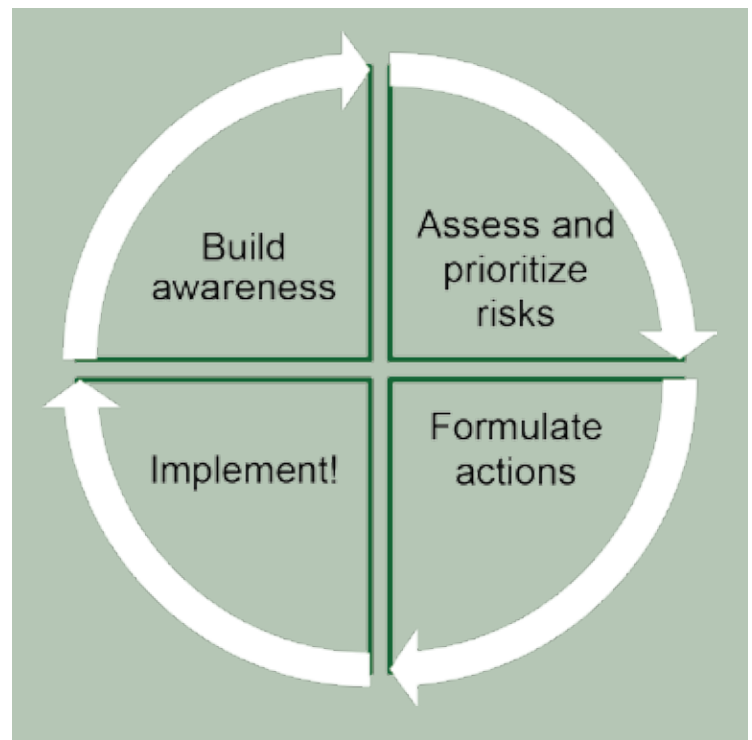
Given the inherent uncertainty in projecting the future, these questions need to be addressed through a risk-based approach, with due consideration given to flexible, robust and cost-effective (“no-regret”) adaptation strategies, which yield tangible benefits today.

C3 can help

With over a decade of experience in climate change and adaptation, C3’s experts can answer your questions and guide you through the development and implementation of your adaptation plan.

C3 believes that planning to increase resiliency and adapt to climate change should be integrated or “mainstreamed” into your organization’s existing strategic plans, policies and decision-making processes. The diagram on the right shows C3’s process for how we do just that. We can help you with the entire process or any piece of it, depending on your organization’s needs.

Municipalities that are able to effectively integrate adaptation into existing planning processes will be best positioned to achieve sustainable development goals in the face of a changing climate.



LET'S TALK.

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C3 – Energy. Ideas. Change.

About C3

C3 is a full-service climate change and sustainability agency based in Alberta. Combining innovative, evidence-based thinking, pragmatic solutions, and an extensive network of relationships, C3 plans, designs, implements and measures climate change and sustainability programs to meet government and business goals; and has been doing so for more than a decade. C3 is built upon the enduring values of integrity, honesty and the belief that real solutions to climate change are found in measurable change, tonne by tonne.