Climate Resilience in Saskatchewan

2024 Report

saskatchewan.ca/climate-change

Saskatchewan

Table of Contents

How to Read this Report

The Resilience Report includes 22 measures organized into five key areas: natural systems, physical infrastructure, economic sustainability, community preparedness and human well-being.

Reporting for each measure is presented in individual sections that include the target, status, trend and a statement of how the measure contributes to building resilience.

The snapshot trend for each measure is visually summarized using an indicator arrow icon (Figure 1). A dark green upward arrow reflects progress on the metric toward greater resilience, a light green horizontal arrow reflects maintenance of the metric, while a yellow downward arrow signals a need to review the metric for progress barriers in that year and how to improve action on the metric in the future.

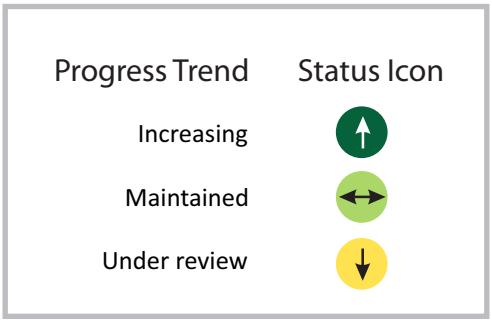

Figure 1: Symbols for classifying the trend and status of progress of measures to achieving their respective target. Both the trend and the status are presented for each measure.

Date published: December 2024

Minister's Message

Hon. Travis Keisig
Minister of Environment

I am pleased to present the 2024 Resilience Report, showcasing Saskatchewan's efforts to strengthen climate resilience in key areas such as natural systems, physical infrastructure, economic stability, community preparedness and human well-being. This report reflects our ongoing commitment to monitoring and improving our province's resilience to the impacts of climate change.

As with previous reports, the overall resilience trends are positive. Building on progress from previous years, there are 12 measures with increasing progress status and seven that are considered maintained. While three additional measures were just shy of meeting the desired annual targets, patterns remain encouraging in all cases and there is an opportunity to evaluate and enhance action on these metrics in future years.

Key highlights from the 2024 Resilience Report include:

- Decrease in total greenhouse gas emissions from the electricity sector.
- Reduced energy consumption in government-owned buildings.
- Reduced greenhouse gas emissions from the oil and gas sector.
- Reduced emission intensity of Saskatchewan's economy.
- Decreased per capita municipal water consumption.

The overall trends across these measures of resilience remain positive, demonstrating Saskatchewan's growing capacity to adapt to the effects of climate change while meeting emission reduction targets.

Our government remains dedicated to tracking, refining and improving these resilience measures, ensuring that we remain on course for a sustainable future.

Executive Summary

The 2024 Resilience Report is the sixth annual report by the Ministry of Environment monitoring resilience in Saskatchewan's natural systems, physical infrastructure, economic stability, community preparedness and human well-being. Ongoing data collection helps to assess trends over time and evaluate the effectiveness of policies and programs.

As with previous reports, the overall improvement trends in the resilience measures are positive. The number of measures with increasing progress status is 12, demonstrating an upward trajectory for progress, and seven measures are considered maintained status, reflecting sustained performance. While three measures were just shy of meeting the desired annual targets, the gaps were marginal and patterns are encouraging.

Collectively, these improvement trends demonstrate an optimistic outlook for the province as it continues to make progress on resiliency to climate change.

The Government of Saskatchewan will continue tracking, reporting and improving climate resilience measures to identify areas to monitor, and better understand and improve the province’s resilience to climate change.

About the Climate Resilience Measurement Framework

Climate change is a multifaceted and multi-sectoral issue requiring an approach that allows Saskatchewan to increase resilience in its natural landscapes, physical infrastructure, economy and communities. *Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy* takes a resiliency-based approach to reduce greenhouse gas emissions intensity while strengthening the province's ability to adapt to climate change.

In 2018, the Government of Saskatchewan released its *Climate Resilience Measurement Framework*. The framework contains a broad and balanced set of measures across five key areas: natural systems, physical infrastructure, economic sustainability, community preparedness and human well-being. The Government of Saskatchewan is committed to tracking progress toward building resilience by reporting and assessing the measures in these five key areas yearly.

The first annual resilience report was released in April 2019 and introduced the baselines and targets for each measure. From 2020, the reports present the trend and status for each measure, showing most measures are improving or maintaining resilience. This document is the sixth annual report, providing each measure's most recent data and status.

Resilience refers to a system's ability – such as a community, ecosystem or province – to cope with, adapt to and recover from stress or change while continuing to grow and evolve.

How is Saskatchewan building its resilience to climate change?

Saskatchewan takes a system-wide approach to prepare for a changing climate. This includes improving the resilience of the province's natural landscapes, physical infrastructure, economy, communities and people (Figure 2). This approach strengthens the province's absorptive, adaptive and transformative capacities in adapting to climate change.

All five resilience areas are interconnected and interdependent. For example, growth in the province's economy has far-reaching benefits to communities and the well-being of people in Saskatchewan. Managing the province's natural landscapes provides multiple benefits, including support for economic growth and ecological services, such as food, fuel, water, air purification, carbon storage and maintenance of wildlife habitats. These interconnections are further highlighted in the following sections describing each indicator.

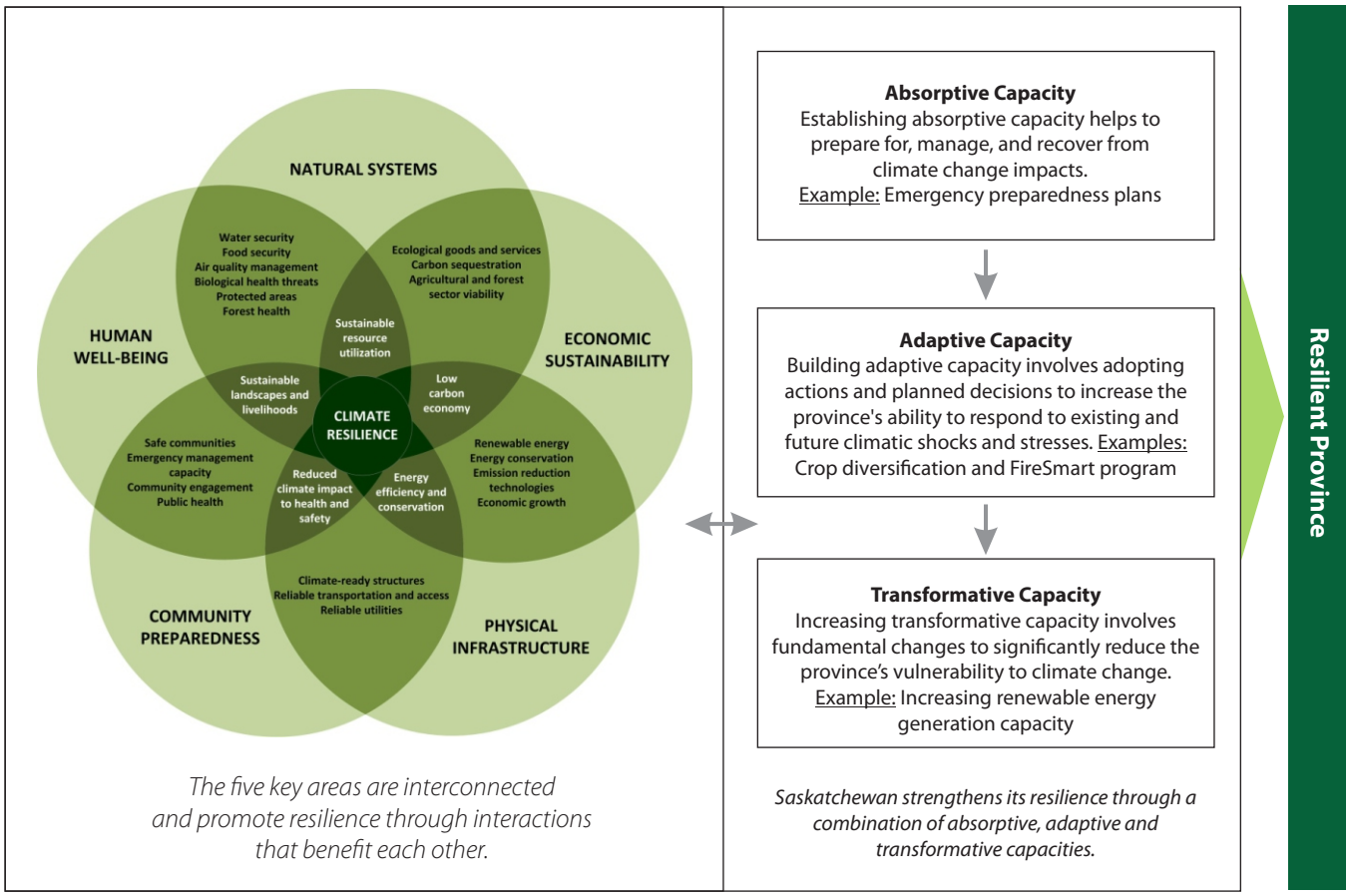

Figure 2: The five key areas of the *Climate Resilience Measurement Framework*. The diagram shows the interrelated nature of the framework, as well as its contribution to three levels of resilience capacity.

Snapshot of 22 Resilience Measures[1]

Measures[2]	Target	Current Status[3]	Progress Trend[4] Status Icon Increasing Maintained Under review
Natural Systems			
1. Total area of agricultural land under permanent cover.	Maintain at 8.06 million hectares (19.93 million acres).	As of 2021, there are 7.91 million hectares (19.56 million acres) of agricultural land under permanent cover. Total agricultural land under permanent cover decreased slightly (374,025 acres or 1.9 per cent) between 2016 and 2021.	Maintained
2. Percentage of agricultural land area with a 4R Nutrient Stewardship Plan.	By 2025, 25 per cent of Saskatchewan's cropland under 4R designation.	As of 2023, approximately 13.1 per cent of the province's agricultural land is under 4R designation.	Increasing
3. Soil protection compliance rate of commercial forest harvesting in Saskatchewan.	Maintain an annual overall compliance rate of 95 per cent with the Forest Operations Standard related to Soil Protection.	In 2022-23 the overall compliance of all inspected Timber Supply Areas (TSAs) was 93 per cent.	Under review
4. Total protected areas in Saskatchewan.	By 2025, 7,812,432 hectares (12 per cent) will be protected[5,6].	As of January 2024, approximately 10 per cent (6.60 million hectares) of the province's total lands are protected areas.	Maintained
5. Seedlings distributed from SaskPower's Shand Greenhouse.	Distribute at least 500,000 seedlings to eligible customers annually.	In 2023, SaskPower distributed 606,752 seedlings across the province, roughly 47,000 more than in 2022 and beyond the target for this measure.	Increasing
Physical Infrastructure			
6. The total number of provincial culverts on the national highway system that meet new provincial flood standards.	Increase the total number of culverts on the national highway system that meet the new provincial flood standard.	In the 2023-24 fiscal year, 33 more culverts were upgraded or replaced on the national highway system.	Increasing
7. Saskatchewan's renewable energy generation capacity.	By 2030, up to 50 per cent of electricity generated from renewable energy sources.	In 2023, roughly 35.5 per cent of SaskPower's electrical generation capacity was composed of renewable energy sources—an increase of 12 MW from 2022.	Increasing
8. Saskatchewan's total greenhouse gas (GHG) emissions from the electricity sector.	By 2030, 7.1 Mt CO_2e GHG emissions from the electricity sector (50 per cent reduction from 2005 levels)[7].	In 2023, emissions on a sector-wide basis decreased to 13.6 Mt CO_2e, which was four per cent lower than in 2005.	Increasing
9. The area of SaskPower power line right-of-way (ROW) widened[8].	By 2030, 10 per cent of ROWs cleared to maintenance standards per year.	In 2023, 1,864 hectares or 13.4 per cent of ROWs were cleared to reduce wildfire risk and ensure service reliability.	Increasing
10. Total energy consumption for Saskatchewan government-owned buildings[9].	Reduce energy intensity consumption to 0.818 GJ/m^2 (gigajoule per square metre) by 2030.	In 2023, government-owned buildings[9] total energy intensity consumption was 1.145 GJ/m^2, slightly lower than last year's intensity consumption.	Increasing
11. Total GHG emissions from Saskatchewan government-owned buildings[9].	By 2030, to reduce GHG emissions to 63,875 tonnes of CO_2e.	The total GHG emissions for 2023 were 82,701 tonnes of CO_2e.	Increasing

1 *The Climate Resilience Measurement Framework and previous Resilience Reports account for 25 measures. This year 22 measures have been reported, and three are under review.*

2 *The numbers of ongoing and updated measures have changed from previous reports. New measures also have new numbers. The measures' names have not changed.*

3 *Some measures have a one- to two-year lag in data availability, including measures 8, 13, 14 and 20. Measure 1 has a five-year lag in data from the Census of Agriculture.*

4 *The symbol indicates how the measurement is trending. An upward dark green arrow indicates that resilience is increasing. A light green horizontal arrow indicates that resilience is being maintained. A downward yellow arrow indicates that the measurement is not increasing resilience and is being reviewed to determine what action can be taken to reverse the trend.*

5 *The timeline for this target has been updated as part of the assessment of this measure. The target is also slightly higher than that used in past reports, which proposed a target of 7,809,629 hectares. The revised target is based on a new protocol by Environment and Climate Change Canada in 2020 to calculate statistics for protected areas, which used a provincial land area of 65,103,600 hectares. This resulted in an increase of approximately 3,000 hectares to achieve 12 per cent protection.*

6 *The methodology to determine total protected areas was adjusted in 2020. As a result, the reported total area in previous reports has been adjusted. Refer to the measure's summary for revised estimates.*

7 *This target increased to a 50 per cent reduction from 2005 levels of 40 per cent, which was given in previous reports. The adjustment is based on an increased commitment to reducing GHG emissions in this sector by 2030.*

8 *Using updated Geographic Information System (GIS) data sources, SaskPower improved the accuracy of this measure's baseline and previous years' reported area. This resulted in a change in the total area managed from 21,785 hectares to 13,894 hectares. Therefore, the target of this measure changed to 1390 hectares.*

9 *"Government-owned buildings" refers to executive government buildings only; excludes Crown, Saskatchewan Health Authority and Education School Board buildings.*

Measures	Target	Current Status	Progress Trend Increasing Maintained Under review	Status Icon
Economic Sustainability				
12. Saskatchewan's total GHG emissions from gas produced in association with oil.	By 2025, reduce GHG emissions to 6.4 Mt CO_2e (4.5 Mt CO_2e reduction from 2015 emissions).	3.6 Mt CO_2e in 2023, falling below the 2025 target.	Increasing	↑
13. Emissions intensity of Saskatchewan's economy (GHG per unit of GDP).	Continued decrease in the emission intensity of Saskatchewan's economy.	In 2022, GHG emission intensity was 926 tonnes of CO_2e per million, chained 2017 dollars.	Increasing	↑
14. Saskatchewan's realized net farm income (RNFI).	No greater than 50 per cent decrease in RNFI from the previous five-year average.	In 2022, realized net farm income showed a decrease of 25 per cent compared to 2021.	Maintained	↔
15. Percentage of cultivated land in different types of crops.	No one crop type to rise above 50 per cent of the cultivated area.	In 2023, no crop comprised more than 50 per cent of the cultivated area.	Maintained	↔
16. Annual sustainable timber harvest utilization.	Not to exceed 100 per cent of the annual allowable cut (AAC) for any TSA.	As of the 2022-23 fiscal year, all TSAs in the province were below the AAC limit.	Maintained	↔
Community Preparedness				
17. Flood mapping completed for high priority communities at risk of flooding and where benefits validate the study costs.	By 2030, more than 50 communities in Saskatchewan considered at risk of flooding will have access to modern flood maps.	In 2022-23, six communities had access to modern maps.	Maintained	↔
18. The number of wildfire community preparedness plans completed for at-risk northern communities.	By 2030, all 84 at-risk communities have wildfire community preparedness plans completed.	In 2022-23, two wildfire community preparedness plans were completed, resulting in 70 at-risk communities (83 per cent) with plans.	Increasing	↑
19. Total hectares of Saskatchewan Crown land with wildfire fuel management work complete.	By 2028, 2,464 hectares adjacent to communities.	As of March 31, 2023, the Saskatchewan Public Safety Agency has completed fuel management for 1,584 hectares of Crown land in the provincial forest. This is an increase of 189 hectares from the previous year.	Increasing	↑
Human Well-Being				
20. Average municipal water consumption per capita and total municipal water consumption.	Decrease municipal water consumption per capita and total municipal water consumption (increased water use efficiency).	Per capita, municipal water use decreased in 2022, with residents using an average of 300 litres per person per day, compared to 323 litres per day in 2022.	Maintained	↔
21. Saskatchewan's Healthy Beaches Program.	No single sample result is greater than 235 *E. coli* organisms in 100 ml of water; and/or Cyanobacteria or their toxins (microcystin) is less than 10 µg/L.	In 2023, 13 single samples exceeded the guideline for *E. coli* and there were three exceedances for microcystin.	Under review	↓
22. The number of active surveys at suitable habitat sites for Lyme disease and other tick-borne diseases.	Beginning in 2022, conduct at least 55 surveys across samples from at least 50 sites annually to monitor the risk of vector-borne illnesses influenced by a changing climate.	In 2023, 46 surveys were conducted at 40 sites for Lyme disease and other tick-borne diseases. Three blacklegged ticks *(Ixodes scapularis)* were detected during active surveys in 2023.	Under review	↓

Five Key Areas of Resilience

This year's report includes 22 measures organized into five key areas:

Natural Systems

1. Total agricultural land under permanent cover.
2. Percentage of agricultural land area with a 4R Nutrient Stewardship Plan.
3. Soil protection compliance rate of commercial forest harvesting in Saskatchewan.
4. Total protected areas in Saskatchewan.
5. Seedlings distributed from SaskPower's Shand Greenhouse.

Physical Infrastructure

6. The total number of provincial culverts on the national highway system that meet new provincial flood standards.
7. Saskatchewan's renewable energy generation capacity.
8. Saskatchewan's total greenhouse gas (GHG) emissions from the electricity sector.
9. The area of SaskPower powerline right-of-way (ROW) widened.
10. Total energy consumption for Saskatchewan government-owned buildings.
11. Total GHG emissions from Saskatchewan government-owned buildings.

Economic Sustainability

12. Saskatchewan's total GHG emissions from gas produced in association with oil.
13. Emissions intensity of Saskatchewan's economy.
14. Saskatchewan's realized net farm income.
15. Percentage of cultivated land in different types of crops.
16. Annual sustainable timber harvest utilization.

Community Preparedness

17. Flood mapping completed for high priority communities at risk of flooding and where benefits validate the study costs.
18. The number of wildfire community preparedness plans completed for at-risk northern communities.
19. Total hectares of Saskatchewan Crown land with wildfire fuel management work complete.

Human Well-Being

20. Average municipal water consumption per capita and total municipal water consumption.
21. Saskatchewan's Healthy Beaches Program.
22. The number of active surveys at suitable habitat sites for Lyme disease and other tick-borne diseases.

Natural Systems

Natural systems refer to the integrity of Saskatchewan's land, water and forests. The management of natural systems determines the resilience of ecosystems to climate change and the ecological goods and services they provide, such as food, fibre, fuel, water, air purification, carbon storage and wildlife habitat. Natural systems also provide cultural ecosystem services, including sites for recreation and the provision of traditional practices. Natural systems inherently support climate change mitigation through carbon sequestration in soils, forests and wetlands.

1. Total area of agricultural land under permanent cover
2. Percentage of agricultural land areas with a 4R Nutrient Stewardship Plan
3. Soil protection compliance rate of commercial forest harvesting in Saskatchewan
4. Total protected areas in Saskatchewan
5. Seedlings distributed from SaskPower's Shand Greenhouse

Measure 1

Total area of agricultural land under permanent cover

This measures the total area of native prairie, tame or seeded pasture and tame hay.

Target

Maintain total area at 8.06 million hectares (19.93 million acres).

Status

The most recent Census of Agriculture (2021) was released by Statistics Canada in May 2022. As of 2021, there are 7.91 million hectares (19.56 million acres) of agricultural land under permanent cover. Saskatchewan's total agricultural land under permanent cover decreased slightly (374,025 acres or 1.9 per cent) between 2016 and 2021 (Figure 3).

Several factors have contributed to the decline of agricultural land under permanent cover. Recent widespread drought has influenced on-farm management decisions and led to declining cattle herd size across the province. Land under permanent crop cover (forage) tends to fluctuate with trends in annual crop prices relative to livestock prices and corresponding changes in cattle herd size. Producers are retiring and exiting from the industry, and there are fewer new entrants to replace them. This is contributing to smaller cattle herd sizes and a reduction in land under permanent cover. While these factors have influenced a decline in total permanent cover acres, enhanced programming to support producers seeding perennial forages and promoting increased seeding of marginal field areas to permanent cover can offer greater efficiency.

How does the measure contribute to building resilience?

Permanent cover includes native prairie, tame pastures, tame hay and tree cover. Lands covered in grass, especially marginal lands, are more resilient to drought and floods than lands under annual cropping. Grasslands contribute to carbon sequestration and provide habitat for wildlife, which helps maintain biodiversity, especially on native prairie. A permanent cover can also buffer against the spread of weeds.

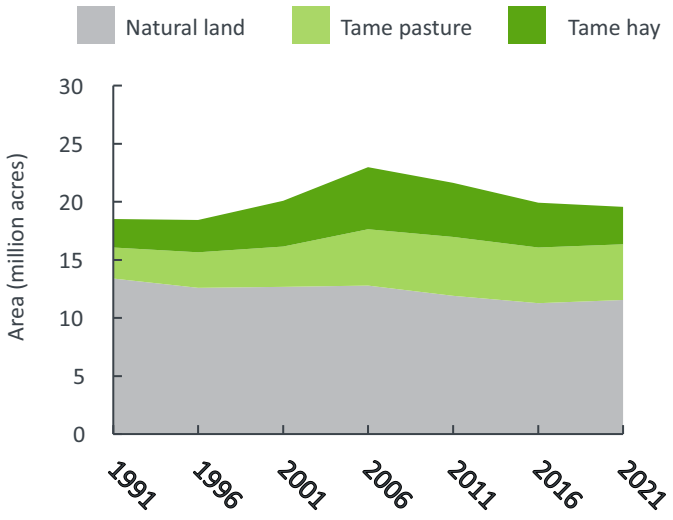

Figure 3: Total area of agricultural land under permanent cover.

Source: Statistics Canada Table 32-10-0406-01 and 32-10-0359-01

Program Highlight

The Resilient Agricultural Landscapes Program

The Resilient Agricultural Landscapes Program, launched in 2023 under the Sustainable Canadian Agricultural Partnership, focuses on increasing the environmental resiliency of agricultural land. Support is available to producers to achieve outcomes related to water quality, soil health and biodiversity. As part of this program, producers can access funding for seeding both tame and native forages. Between the launch of the program in April 2023 and February 2024, the program has paid out 181 applications under the tame forage stream, totaling over $3,673,770.

Measure 2

Percentage of agricultural land area with a 4R Nutrient Stewardship Plan

This measures the total area of agricultural land in Saskatchewan managed under an improved fertilizer management strategy that incorporates the right fertilizer source at the right rate, at the right time and in the right place (4R).

Target

By 2025, 25 per cent of Saskatchewan's cropland is under 4R designation.

Status

As of 2023, approximately 13.1 per cent of the province's agricultural land is under 4R designation. This is an increase from 10.9 per cent from the last report. Uptake of 4R designation continues to increase among Saskatchewan producers. In 2023, the total cultivated area under the 4R designation in Saskatchewan increased by 857,762 acres compared to 2022. These results suggest that the Ministry of Agriculture and Fertilizer Canada's actions to increase 4R designation across the province are effective. The Saskatchewan 4R Nutrient Stewardship Advisory Committee promotes 4R practices in Saskatchewan through communication and extension activities.

How does the measure contribute to building resilience?

A 4R Nutrient Stewardship Plan allows farmers to use fertilizer more efficiently. A 4R approach that considers the right source, rate, time and place of fertilizer application can help protect the environment and water bodies by reducing excess fertilizer washed away by rain or snowmelt. It can also help reduce GHG emissions from fertilizer use, specifically nitrous oxide emissions (N_2O). This is significant as the greenhouse effect of N_2O is at least 265 times more potent than that of carbon dioxide (CO_2).

Saskatchewan's agricultural land under 4R designation (2023)

Total 4R Designation	1,972,059 ha (4,873,065 acres)
Total crop area in Saskatchewan	15,004,812 ha (37,077,700 acres)
% crop area under 4R designation	13.1

Source: Data for 4R designation from Fertilizer Canada; total agricultural land in Saskatchewan from Statistics Canada Table 32-10-0359-01.

Program Highlight

The Agriculture-Applied Research Management program

The Agriculture-Applied Research Management (Agri-ARM) program, administered by the Ministry of Agriculture, provides funding to producer-led groups/sites across the province to support the delivery of agricultural research and demonstration activities (e.g. field day events, trial monitoring plots). One objective of the program is to increase adoption of new agricultural technologies and practices via knowledge transfer and demonstration. Notably, 4R nutrient stewardship principles are being demonstrated at five Agri-ARM sites across Saskatchewan.

Measure 3

Soil protection compliance rate of commercial forest harvesting in Saskatchewan

This measure tracks the soil protection compliance rate of the Forest Operations Standard for all commercial forest operations in Saskatchewan.

Target

Maintain an annual average compliance rate of 95 per cent with the Forest Operations Standard related to soil protection on harvest blocks inspected in the commercial forest zone provincially and by Timber Supply Areas (TSAs).

Status

In 2022-23 the overall compliance of all inspected TSAs was 93 per cent, and the lowest compliance rate for a single TSA was 92 per cent. Not all TSAs were inspected during this period due to the level of harvesting within specific TSAs. Over the last five years, the overall compliance rate has been 96 per cent (Figure 4).

How does the measure contribute to building resilience?

In the boreal forest, a significant amount of carbon is stored in the forest soil, including leaf litter and dead organic matter. Harvesting can cause changes to nutrient cycling in forest soils. These changes can impact soil quality, affecting ecosystem conditions and forest productivity. Saskatchewan legislation is designed to protect forest soils in harvest and riparian management areas through the provincial rutting, soil disturbance and site preparation standards. This ensures the impacts of harvesting on soil quality are minimal, supporting long-term maintenance of forest biodiversity and sustainability.

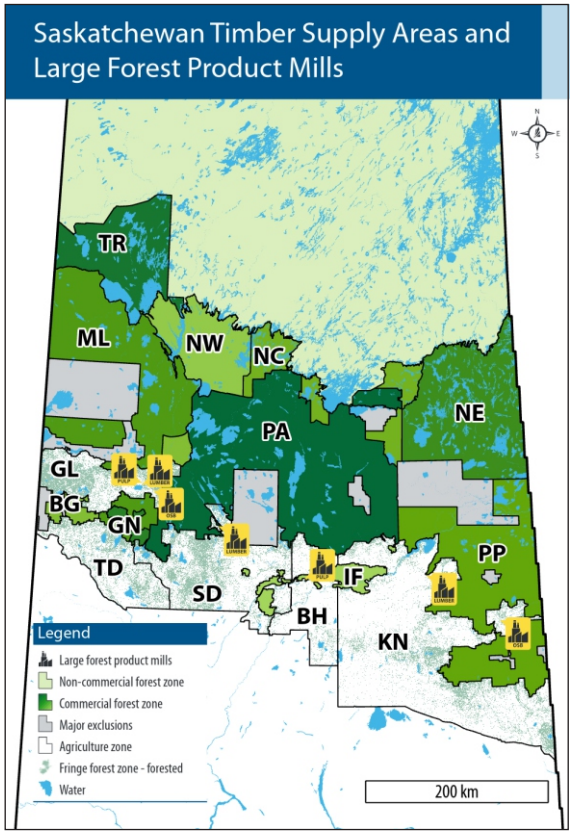

Figure 4: Soil protection compliance rate on timber supply areas and overall provincial rate, by fiscal year.

Timber Supply Areas (TSAs)	2018-19	2019-20	2020-21	2021-22	2022-23
Prince Albert (PA TSA)	↑ 96	↑ 98	↑ 98	→ 94	↓ 92
Bronson-Green Lake (BG TSA)	↑ 100	↑ 100	n/a	n/a	↑ 100
Meadow Lake (ML TSA)	↑ 100	↑ 100	↑ 100	↑ 100	↑ 100
Glaslyn (GN TSA)	↓ 67	n/a	↑ 100	n/a	↑ 100
Pasquia Porcupine (PP TSA)	↑ 100	→ 83	↑ 100	↓ 86	↑ 93
Island Forests (IF TSA)	↑ 100	↑ 100	↑ 100	↑ 100	↑ 100
North West (NW TSA)	n/a	n/a	n/a	n/a	n/a
North Central (NC TSA)	n/a	n/a	n/a	↑ 100	n/a
North East (NE TSA)	n/a	n/a	↑ 100	↑ 100	n/a
Goodsoil (GS TSA)	↑ 100	n/a	n/a	n/a	n/a
Kelvington (KN TSA)	↑ 100	n/a	n/a	↑ 100	↑ 100
Spiritwood (SD TSA)	↑ 100	↑ 100	n/a	n/a	n/a
Turnor (TR TSA)	n/a	n/a	n/a	n/a	n/a
Turtleford (TD TSA)	n/a	n/a	n/a	n/a	n/a
Birch Hills (BH TSA)	n/a	n/a	n/a	n/a	n/a
Overall for Province	↑ 97	↑ 98	↑ 99	→ 95	↓ 93
					Five-year overall = 96%

n/a denotes no timber harvest during the fiscal year

Measure 4

Total protected areas in Saskatchewan

This measure tracks terrestrial and aquatic ecosystems designated as protected and conserved areas in Saskatchewan. Protected areas include Crown lands protected by legislation and private lands managed for biodiversity by agreement. These conservation lands include parks, ecological reserves and pastures.

Target

By 2025, protect 7,812,432 hectares (equivalent to 12 per cent) of Saskatchewan's provincial base.

Status

As of January 2024, approximately 10 per cent (6.60 million hectares) of Saskatchewan's total lands are protected areas (Figure 5). This includes representation from each of the province's 11 ecoregions. As of 2024, there was no increase in Saskatchewan's protected areas. To reach the 2025 target, Saskatchewan must protect approximately 1.2 million additional hectares.

There are challenges to increasing protected areas. In the agricultural areas of the province, a sizable portion of land is privately owned, and additions to protected areas occur in small quantities. Even though much of the area is Crown land in northern Saskatchewan, many interests must be considered to balance conservation, community well-being and economic development. Additional programs, such as Other Effective Area-based Conservation Measures, are in place to ensure natural areas are conserved beyond formal protected area designation.

How does the measure contribute to building resilience?

Protected areas are habitat refuges and genetic reservoirs for species, including at-risk species. They are important to maintaining Saskatchewan's biodiversity. They also serve as ecological benchmarks, allowing for better monitoring of the response of natural ecosystems to climate change. Protected areas help maintain the integrity of traditionally and culturally important sites.

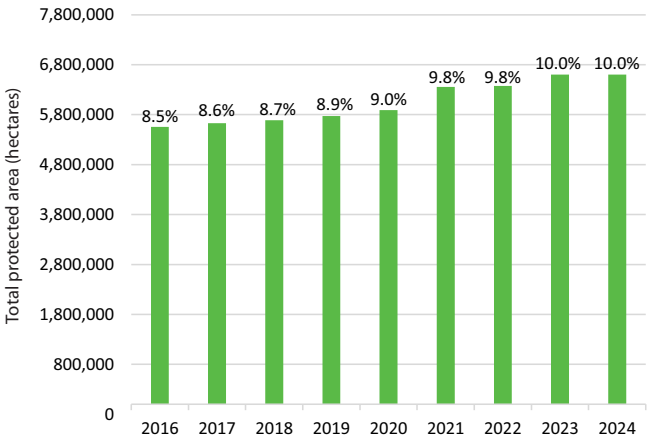

Figure 5: Saskatchewan's total protected area (in hectares) from 2016 to 2024. The value for 2024 is the current status.

Current protected areas in Saskatchewan

Baseline (2017)	5,626,887 ha
Current Status (2024)	6,604,038 ha
Target (2025)	7,812,432 ha

Measure 5

Seedlings distributed from SaskPower's Shand Greenhouse

This measure accounts for the number of seedlings grown and distributed from SaskPower's Shand Greenhouse. Seedlings are distributed to rural landowners to establish shelter belts, environmental groups to support habitat projects and community groups to support cultural projects or activities.

Target

Distribute at least 500,000 seedlings to eligible customers annually.

Status

In 2023, SaskPower distributed 606,752 seedlings across the province, roughly 47,000 more than in 2022 and beyond the target for this measure.

The Shand Greenhouse distributes seedlings free of charge to customers who meet eligibility requirements and submit orders in advance. The program has been successful for more than 30 years, with orders increasing each year. The greenhouse infrastructure and equipment are undergoing refurbishment, which will lead to improved efficiency and crop yields at the facility.

How does the measure contribute to building resilience?

Planting trees is a natural climate solution that removes CO_2 from the atmosphere. In 2023, the Shand Greenhouse provided approximately 26,250 tree and shrub seedlings to various groups including Nature Conservancy of Canada, Nature Saskatchewan, Saskatchewan Wildlife Federation and Saskatchewan Gamebird Habitat Trust to support watershed and wildlife projects. Approximately 1,281 seedlings were also provided to the Native Plant Society of Saskatchewan to support native plants in the province. Additionally, approximately 1,250 seedlings were provided to schools around the province to support planting trees in their communities.

In 2023, SaskPower planted 10,000 seedlings, grown at the Shand Greenhouse on SaskPower owned land near Boundary Dam Power Station. SaskPower plans to plant 20,000 seedlings across four locations in Saskatchewan in 2024, demonstrating their ongoing commitment to this initiative.

Physical Infrastructure

Physical infrastructure refers to the production and movement of goods and the management of the built environment. It includes maintaining reliable transportation, utility services and water resource management. Physical infrastructure also refers to increasing the capacity for renewable energy generation and building more energy-efficient buildings.

6. The total number of provincial culverts on the national highway system that meet new provincial flood standards
7. Saskatchewan's renewable energy generation capacity
8. Saskatchewan's total greenhouse gas (GHG) emissions from the electricity sector
9. The area of SaskPower power line right-of-way (ROW) widened
10. Total energy consumption for Saskatchewan government-owned buildings
11. Total GHG emissions from Saskatchewan government-owned buildings

Measure 6

The total number of provincial culverts on the national highway system that meet the new provincial flood standard

This measure indicates the province's efforts to upgrade vulnerable roadways by tracking the number of culverts on the national highway system that are upgraded or replaced to meet the new provincial flood standard of 800 mm in diameter.

Target

Increase the total number of provincial culverts on the national highway system, meeting the new provincial flood standard.

Status

In the 2023-24 fiscal year, 33 more culverts were upgraded or replaced on the national highway system (Figure 6). The total number of culverts meeting the new flood standard is 411.

How does the measure contribute to building resilience?

Culverts are critical in moving water from one side of roads and highways to the other. They protect the surface infrastructure by preventing flooding and road washouts. In 2014, the province adopted a new provincial flood standard for culverts on the national highway system. The new standard increased the minimum culvert diameter from 600 mm to 800 mm. Modifying culverts helps ensure the province's transportation network is more resilient to extreme weather and climate change. Reliable transportation infrastructure supports economic growth, emergency services and quality of life for Saskatchewan residents.

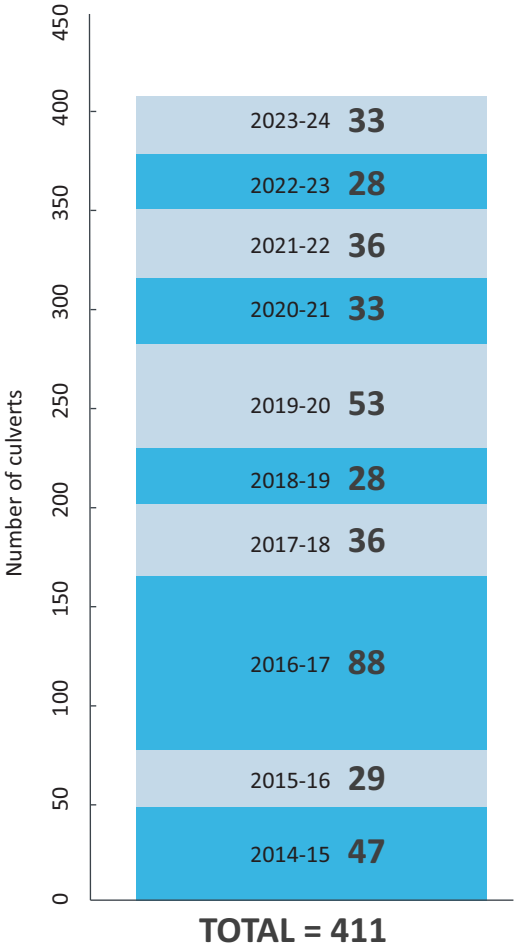

Figure 6: Culverts on the national highway system upgraded/replaced to meet new provincial standards, by fiscal year.

Measure 7

Saskatchewan's renewable energy generation capacity

This measures the amount of electrical generation capacity available from SaskPower from renewable sources.

Target

By 2030, up to 50 per cent of Saskatchewan's electrical generation capacity is from renewable energy sources.[10]

Status

In 2023, roughly 35.5 per cent of SaskPower's electrical generation capacity was composed of renewable energy sources. A total of 1,899 megawatts (MW) of electricity was available from renewable energy sources. Distributed solar generation, whereby SaskPower customers generate and sell power to the company through SaskPower's Net Metering Program and Power Generation Partnership Program, played a significant role in the net increase in 2023, contributing 11 MW. Of note, while renewable energy capacity increased marginally, the overall electrical generation capacity experienced a decline with the retirement of a 95 MW gas-fired unit at the Queen Elizabeth Power Station after more than 50 years of operation.

How does the measure contribute to building resilience?

Increasing Saskatchewan's use of electricity from renewable energy sources lowers the province's GHG emissions. Diversifying energy sources also increases resilience by improving the capacity to manage peak demands and service disruptions. Steady increases in renewable capacity are expected in the province over the next five years. Sources will include imported hydropower, net metering (solar), geothermal, waste heat, flare gas, wind and utility-scale solar projects.

Energy generation capacity in Saskatchewan across renewable and non-renewable sources

Type of energy generation	2022	2023
Hydropower (including imports)	1,154 MW	1,155 MW
Wind	615 MW	615 MW
Solar/Energy recovery	118 MW*	129 MW*
Renewables	1,887 MW (34.7 per cent)	1,899 MW (35.5 per cent)
Natural gas	2,160 MW	2,065 MW**
Coal	1,389 MW	1,389 MW
Non-renewables	3,549 MW	3,454 MW
Total	**5,436 MW**	**5,353 MW**

**Increase from net metering, Power Generation Partnership Program (PGPP) solar and utility scale solar.*
***Decrease due to retirement of unit at Queen Elizabeth Power Station.*

[10] *Targets are driven by the requirements in the Canada-Saskatchewan equivalency agreement for the control of GHG emissions from electricity producers in Saskatchewan.*

Measure 8

Saskatchewan's total greenhouse gas (GHG) emissions from the electricity sector

This measures Saskatchewan's progress towards its commitment to reduce GHG emissions from the electricity sector by 50 per cent from 2005 levels by 2030.

Target

By 2030, reduce GHG emissions from Saskatchewan's electricity sector to 7.1 Mt CO_2e (50 per cent reduction from 2005 levels).

Status

From 2022 to 2023, emissions on a sector-wide basis decreased from 13.8 Mt CO_2e to 13.6 Mt CO_2e. This is an emission decrease of approximately four per cent from 2005 levels.

This change is generally attributable to reduced generation from coal-fired sources and stronger performance at SaskPower's carbon capture facility at Boundary Dam Power Station. As the electricity system integrates more renewable and non- or low-emitting energy capacity through 2030, the trend in emissions is anticipated to decline steadily.

How does the measure contribute to building resilience?

With the electricity sector accounting for approximately 20 per cent of Saskatchewan's total GHG emissions, progress in reducing emissions in this sector can significantly improve the province's overall GHG emissions profile. Additionally, as electrification progresses (e.g. shifts to electric vehicles, heat pumps), reductions in emissions associated with electricity will indirectly help further reduce the emissions footprint of other sectors.

2005	2023	2030
		
Baseline Emissions **14.2 Mt CO_2e**	Reported Emissions **13.6 Mt CO_2e**	Target Emissions **7.1 Mt CO_2e**

Measure 9

The area of SaskPower power line right-of-way widened

This measures SaskPower's vegetation management activities to protect its facilities and reduce the risk of power outages and wildfires from fallen trees. The measure includes right-of-way for transmission and distribution lines.

Target

By 2030, 10 per cent of right-of-way (ROW) will be cleared per year to maintenance standards. In 2022, SaskPower managed 13,894 hectares (at 30 metres in width) of ROW. The annual target area is 1,390 hectares, or 10 per cent of the total managed area.

Status

In 2023, 1,864 hectares (13.4 per cent) of ROW were cleared to reduce wildfire risk and ensure service reliability (Figure 7). The annual ROW area clearing rate surpassed the target.

The total managed area, which includes the adjusted 2019 and 2020 data on cleared ROW, is accounted for in the data. Figure 7 depicts the adjusted ROW areas cleared from 2019 to 2023.

How does the measure contribute to building resilience?

Trees in Saskatchewan cause about 1,000 power outages a year affecting approximately 70,000 customers. They can also cause fires when they contact power lines. Vegetation management is important to prevent wildfires and outages and increase the resilience of the province's electrical system to the impacts of climate change. These efforts also help ensure reliable service delivery to residents and industries. SaskPower focuses on the ROW in fire management plan areas, where vegetation management is a priority.

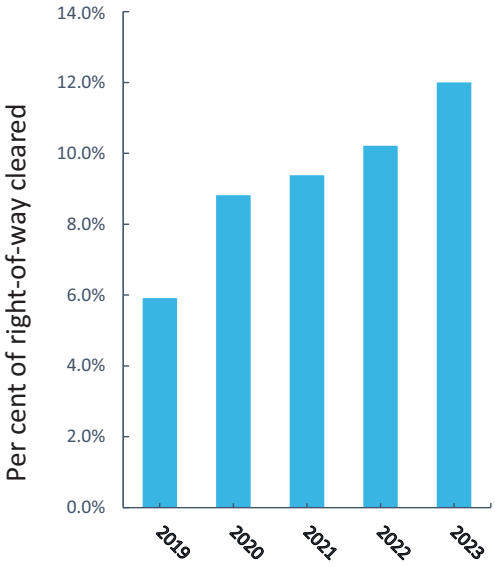

Figure 7: Per cent of managed right-of-way cleared from 2019 to 2023.

Enhancing this measure's accuracy

In 2021, SaskPower improved the accuracy of calculating the ROW total area by using updated Geographic Information System data. This resulted in a change in the total managed area to prevent encroachment of vegetation on electricity infrastructure. The improved data also helped increase the accuracy of the ROW area cleared in 2019 and 2020. These are the revised areas:

ROW total area (baseline)	13,894 ha
Total area treated in 2020	1,225 ha or 8.8%
Total area treated in 2021	1,304 ha or 9.4%
Total area treated in 2022	1,419 ha or 10.2%
Total area treated in 2023	1,864 ha or 13.4%

Measure 10

Total energy consumption for Saskatchewan government-owned buildings

This measures energy intensity consumption in all Ministry of SaskBuilds and Procurement owned and operated buildings. It indicates the province's success in maximizing operational efficiencies while minimizing environmental impacts.

Target

The Ministry of SaskBuilds and Procurement set a new target for this measure: to reduce energy intensity consumption to 0.818 GJ/m^2 (gigajoule per square metre) by 2030.

Status

Since 2014, significant reductions have been made in total energy intensity consumption of government-owned buildings. In 2023, the total energy intensity consumption of government-owned buildings was 1.145 GJ/m^2, slightly lower than last year's intensity consumption (Figure 8).

How does the measure contribute to building resilience?

There are approximately 520 government-owned buildings, covering 828,000 m^2. Most are located in city centres across Saskatchewan. These buildings serve sectors including corrections, justice, education, health, environment, transportation and government administration. Offices account for approximately 33 per cent of the space, followed by education at 25 per cent, corrections at 15 per cent, and warehouses at 14 per cent.

Maximizing operational efficiencies across the portfolio of government-owned buildings increases resilience by reducing GHG emissions and energy costs. This helps the province reduce its overall GHG emissions and energy use and provides provincial leadership in enhancing the energy efficiency of buildings.

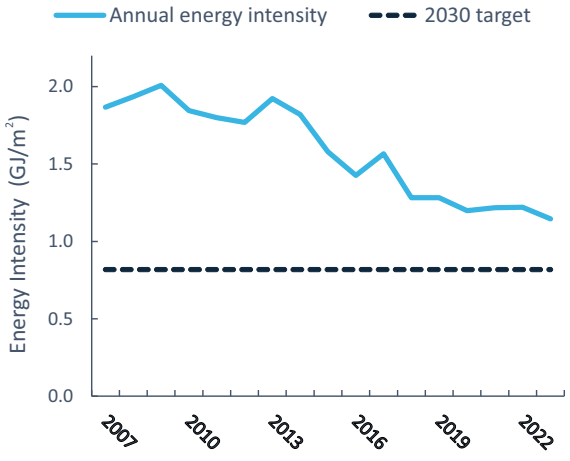

Figure 8: Annual energy intensity consumption from government-owned buildings.

Program Highlight

LEED® and BOMA certification buildings update

As part of the Ministry of SaskBuilds and Procurement's (SBP) sustainability efforts, the ministry adheres to environmental standards and strives to achieve environmental certifications on new builds and major renovations. SBP has increased the number of certified buildings over the past year:

- As of March 31, 2024, SBP had 53 buildings in its portfolio recognized by BOMA for environmental property management.
- A record of 12 government-owned buildings received BOMA BEST certifications in 2023.
- At the end of the 2023-24 fiscal year, SBP has achieved LEED® certification on nine buildings throughout the province.

Measure 11

Total greenhouse gas emissions from Saskatchewan government-owned buildings

This measures GHG emissions from provincial government-owned and operated buildings. Emissions are measured in tonnes of CO_2e, based on energy consumed (i.e. electricity, natural gas) and are estimated from billing information.

Target

By 2030, to reduce GHG emissions to 63,875 tonnes of CO_2e.

Status

The total GHG emissions for 2023 were 82,701 tonnes of CO_2e (Figure 9), a decrease of 10,569 tonnes of CO_2e from 2022. The current target for this measure requires lowering emissions from government-owned buildings by roughly 18,826 tonnes of CO_2e in seven years; this is about 2,689 fewer tonnes of CO_2e per year.

How does the measure contribute to building resilience?

Reducing GHG emissions in government-owned and operated buildings contributes to the province's overall emissions reduction. In this way, the Government of Saskatchewan is leading improvements that can be applied to buildings in other sectors.

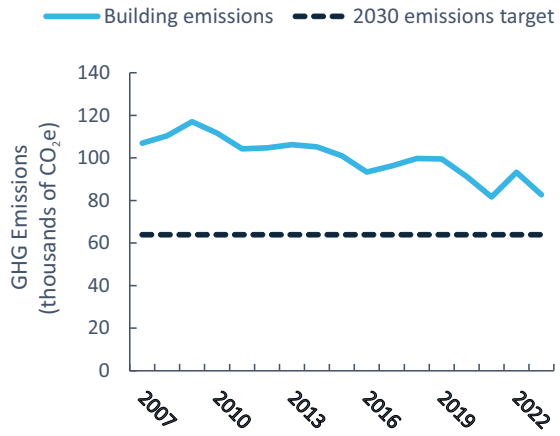

Figure 9: Annual greenhouse gas emissions from government-owned buildings.

2022	2023	2030
Baseline Emissions **93,270 t CO_2e**	Reported Emissions **82,701 t CO_2e**	Target Emissions **63,875 t CO_2e**

Economic Sustainability

Economic sustainability refers to the ability to remain competitive in a global marketplace and encourage investment while reducing greenhouse gas emission intensity. Economic sustainability ensures that Saskatchewan businesses and industries have the support they need to develop marketable innovations that address climate change. This section includes measures relating to key natural resource sectors, like agriculture, forestry and oil and gas.

12. Saskatchewan's total GHG emissions from gas produced in association with oil
13. Emissions intensity of Saskatchewan's economy (GHG per unit of GDP)
14. Saskatchewan's realized net farm income
15. Percentage of cultivated land in different types of crops
16. Annual sustainable timber harvest utilization

Measure 12

Saskatchewan's total GHG emissions from gas produced in association with oil

This measure accounts for reduced GHG emissions from the flaring and venting of gas produced in association with oil.

Target

By 2025, reduce GHG emissions to 6.4 Mt CO_2e. This is equivalent to a 4.5 Mt CO_2e reduction from 2015 emissions.

Status

GHG emissions from reported flaring and venting activities in the upstream oil industry decreased to 3.6 Mt CO_2e in 2023, falling further below the 2025 target and continuing the steady drop of emissions from previous years (Figure 10).

In 2023, Saskatchewan's oil production remained flat compared to 2022. However, GHG emissions from reported flaring and venting activities declined by seven per cent from 2022 levels. Although venting and flaring emissions in 2023 were below the 2025 target outlined in the Methane Action Plan, the Ministry of Energy and Resources and the oil and gas industry are taking ongoing steps to decrease the industry's carbon footprint as development continues.

How does the measure contribute to building resilience?

This contributes to resilience by improving the sustainability of oil and gas operations. It also reduces overall provincial GHG emissions (see Measure 13).

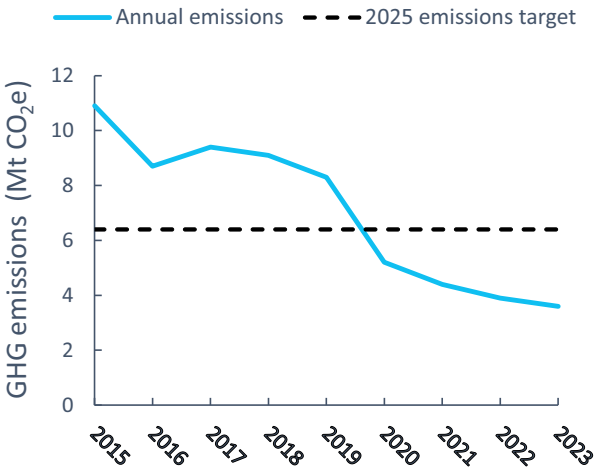

Figure 10: Annual greenhouse gas emissions generated from reported flaring and venting activities in the upstream oil industry.

Program Highlight

Reducing GHG Emissions in Saskatchewan's Oil and Gas Sector

By implementing the Methane Action Plan, the Government of Saskatchewan works with the oil and gas industry to meet provincial GHG emissions reduction targets. The plan uses a results-based system that supports adopting emissions reduction technologies at oil and gas wells and facilities. This increases the incentive for industry to develop innovative solutions and continue to invest in the province.

Measure 13

Emissions intensity of Saskatchewan's economy (GHG per unit of GDP)

This measure identifies whether CO_2e reductions are because of enhanced energy efficiency and productivity derived from new technologies and practices or from reduced energy consumption caused by an economic downturn. Data is available sixteen months after the end of a given year. The data for 2023 will be available in April 2025.

Target

Continue to decrease the GHG emissions intensity of Saskatchewan's economy.

Emissions intensity is the amount of GHG emitted relative to the value of goods and services produced in the economy, reported here as the Real Gross Domestic Product (GDP) (measured in 2017 dollars)[11].

Status

From 2007 to 2022, GHG emissions intensity dropped by 26 per cent, while the province's GDP increased by 26 per cent during the same period (Figure 11). The similar rates of emission intensity reduction and GDP growth are indicative of Saskatchewan's balanced approach to economic and environmental policy.

Saskatchewan's GHG emissions intensity peaked in 1995 at 1,430 tonnes of CO_2e per million dollars and has declined 35 per cent since then to 926 tonnes of CO_2e per million dollars.

The programs and regulations introduced by Saskatchewan will continue to reduce Saskatchewan's GHG emissions intensity. These include SaskPower's commitment to reach net-zero electricity by 2050; the Methane Action Plan, which regulates methane emissions from the upstream oil and gas sector; the Output-Based Performance Standards program for Saskatchewan's emissions intensive and trade exposed emitters; and other energy efficiency programs.

How does the measure contribute to building resilience?

This measure investigates the effectiveness of climate change policies. If GDP falls alongside GHG emissions, policies may be addressing climate change but at the expense of prosperity. Saskatchewan builds resilience when GHG emissions intensity declines while GDP grows.

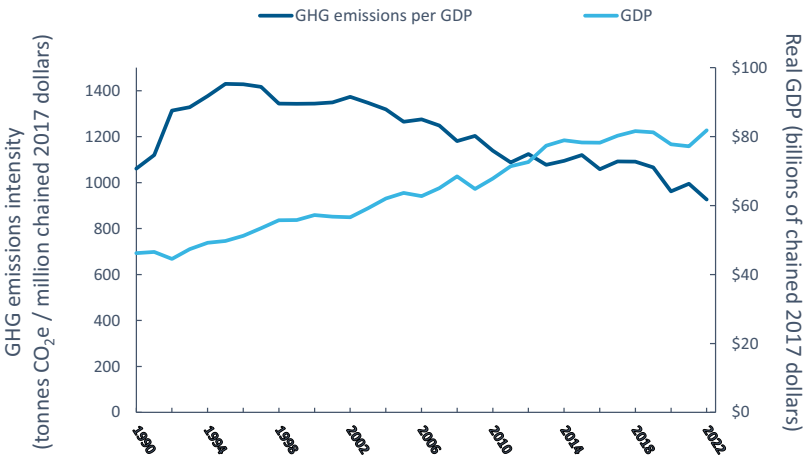

Figure 11: Saskatchewan's GHG emissions intensity, 1990 to 2022.

Source: Environment and Climate Change Canada's National Inventory Report (2024) and Statistics Canada

[11] *Real GDP is measured in "chained 2017 dollars," a form of GDP that factors out inflation to reveal changes in production over time. The GDP and GHG data were obtained from Statistics Canada and ECCC websites, respectively. The most recent data for GHG emissions is for 2022 since there is a standard two-year delay for the National Inventory Report data processing.*

Measure 14

Saskatchewan's realized net farm income

This is a measure of farm business income. Realized net farm income is the difference between a farmer's cash receipts (crop receipts + receipts from livestock and livestock products + government program payments) and expenses (operating expenses + depreciation) plus income in kind. Data is available up to 2022, representing a lag of approximately one year.

Target

No greater than 50 per cent decrease in realized net farm income from the previous five-year average. The target for this measure aims to limit drastic declines in profitability relative to the past five years.

Status

In 2022, realized net farm income showed a decrease of 25 per cent compared to 2021 and a 21 per cent rise compared to Saskatchewan's previous five-year average (Figure 12). There was a rise in farm cash receipts in 2022 compared to the previous year, however it was offset by a record surge in operating expenses such as increased costs for essential farm inputs (e.g. fertilizer and lime, machinery fuel, pesticides), interest payments and depreciation charges.

How does the measure contribute to building resilience?

Agriculture is a key economic driver in our province. Reduced volatility in realized net farm income indicates the agricultural sector's resilience from a production and financial perspective.

Joint business risk management programs with the province and Agriculture and Agri-Food Canada help limit farmers' income volatility. These include AgriInsurance encompassing fire insurance through the Forage Rainfall Insurance Program, AgriInvest, AgriStability, Western Livestock Price Insurance Program and compensation for livestock predation and wildlife damage to crops. Saskatchewan also provides funding for crop-related research that helps farmers adapt to climate change (e.g. research into drought-resistant crops).

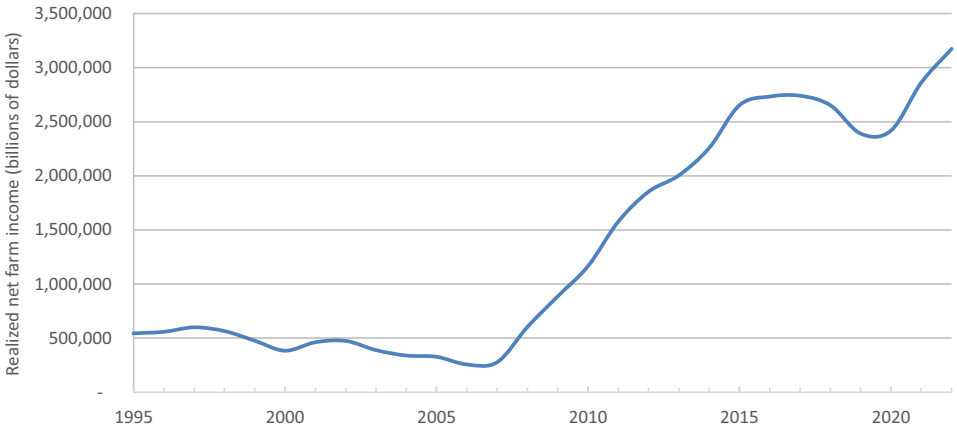

Figure 12: Realized net farm income (five-year average) in Saskatchewan from 1995 to 2022.

Source: Statistics Canada Table 32-10-0052-01

Realized net farm income reached $3,845,630 in 2022, a decrease from the previous year. While there was a rise in farm cash receipts in 2022, record high operating expenses of $15,120,206 (after rebates) offset this increase. Input costs such as fertilizer and lime, machinery fuel and pesticides contributed to this record number. Depreciation charges and interest payments also contributed to the decline.

Measure 15

Percentage of cultivated land in different types of crops

The crop diversity target measures the mix of crops in Saskatchewan. This measure organizes crop types into cereals, oilseeds, pulses and soybeans and summer fallow. A measure of one crop type above 50 per cent would suggest more potential risk than a broader mix of crops.

Target

No one crop type rises above 50 per cent of the annual cultivated area.

Status

In 2023, no crop comprised more than 50 per cent of the cultivated area. Cereals have consistently comprised the largest cultivated land area in the last five years (Figure 13). However, they have not exceeded 50 per cent of the total area since 2008. In 2023, cereals made up 49 per cent of the cultivated land area (7.4 million hectares or 18.3 million acres), oilseeds made up approximately 35 per cent (5.4 million hectares or 13.3 million acres), pulses and soybeans made up 14 per cent (two million hectares or 5.2 million acres), summer fallow (SMF) made roughly two per cent (0.28 million hectares or 700,000 acres) and other crops less than one per cent.

How does the measure contribute to building resilience?

Coverage of one crop type exceeding 50 per cent of the total cultivated area would suggest more potential risk from drought, pests and diseases than a more diverse mix of crops. For example, diseases that target cereals will generally have less impact on the farm and provincial-level productivity if a broader range of crops is cultivated, thereby reducing the volatility of farm revenue.

In addition to mitigating financial risk, crop diversification supports resilience by enhancing soil health and assisting with managing pests and diseases. Adding pulses to crop rotations also helps reduce GHG emissions through reduced fertilizer use.

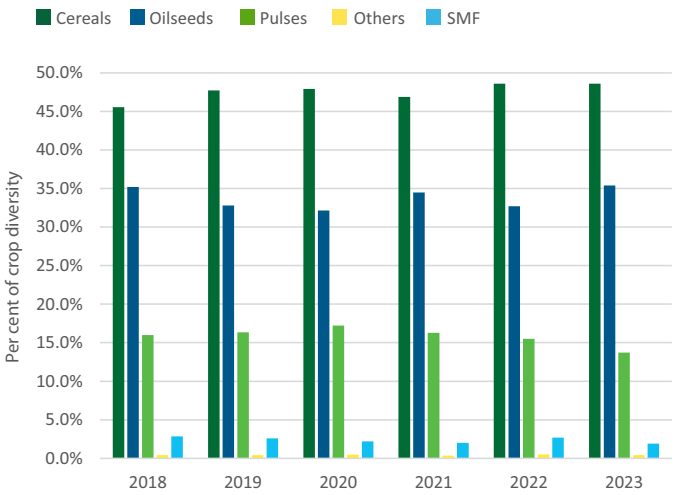

Figure 13: Crop diversity across Saskatchewan in the last 5 years.

Source: Statistics Canada Table 32-10-0359-01. Others include buckwheat, corn, hemp and mixed grains, which comprised less than one per cent of cultivated land in 2023.

Program Highlight

The Crop Development Centre

Continued research and development through the Crop Development Centre at the University of Saskatchewan and in partnership with the Ministry of Agriculture contribute to diversifying crop production in the province. Increased variety and quality of crops have allowed farmers to take advantage of more diverse market opportunities in Canada and worldwide.

For instance, plant breeding technology and variety development has the potential to produce pulse crops more suitable to Saskatchewan's climate. Pulse crops also contribute to soil management, health and disease mitigation.

Measure 16

Annual sustainable timber harvest utilization

This measure tracks the annual ratio of harvested timber volume to the sustainable limit for the commercial forest in Saskatchewan.

Target

The annual allowable cut (AAC) will not exceed 100 per cent for any Timber Supply Area (TSA) in the province.

Status

The Ministry of Environment has tracked the annual sustainable timber harvest utilization since 1990. As of the 2022-23 fiscal year, all TSAs in the province were below the AAC limit. Cumulatively, Saskatchewan's commercial forest reached 45 per cent of the provincial AAC (Figure 14).

How does the measure contribute to building resilience?

This indicator reflects sustainable harvesting management for the Crown's commercial forest areas. It also illustrates how appropriate forest resource utilization promotes ecological resilience while supporting jobs and communities.

Forest management that adheres to the AAC ensures a range of ages and conditions in forests across the province. Harvesting creates diverse patches of forest habitat, which support biodiversity. When guided by a forest management plan, a TSA fully using the AAC will comprise a mixture of young to old stands that are more resilient to wildfire, pest outbreaks and extreme weather events and may help mitigate large GHG emissions from these natural disturbances.

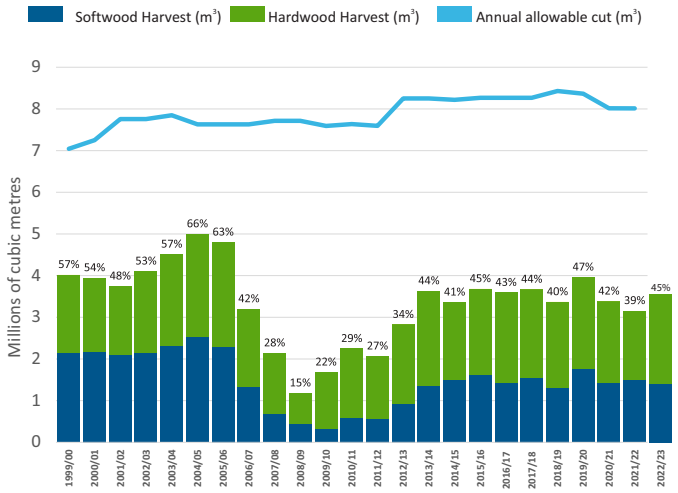

Figure 14: Annual allowable cut (AAC) and Timber Harvest from 1999-00 to 2022-23 fiscal years, in millions of cubic metres and percentage of AAC, for the Commercial Forest in Saskatchewan.

Source: Forest Service Branch

Program Highlight

Modelling Sustainable Timber Harvest

The AAC is determined by wood supply analysis results, which use computer models to assess sustainable wood supply over 200 years. The calculated AAC for a given timber supply area represents what can be sustainably harvested while ensuring enough forest remains to meet ecosystem management goals, such as wildlife habitat, forest age class distribution, natural forest patterns and forest regeneration.

Community Preparedness

Community preparedness refers to Saskatchewan communities' resilience to climate change's impacts. It includes providing the necessary information to the public; responding to and recovering from extreme weather events; understanding the risks of flood, drought and wildfires; establishing emergency preparedness and management plans; and adopting appropriate standards and practices to reduce risks from extreme weather events.

17. Flood mapping completed for high priority communities at risk of flooding and where benefits validate the study costs

18. The number of wildfire community preparedness plans completed for at-risk northern communities

19. Total hectares of Saskatchewan Crown land with wildfire fuel management work complete

Measure 17

Flood mapping completed for high priority communities at risk of flooding and where benefits validate the study costs

This measures the number of flood-prone Saskatchewan communities that would benefit from access to modern engineered flood mapping and have access to such maps.

Target

By 2030, communities in Saskatchewan considered at risk of flooding will have access to modern flood maps. More than 50 communities may benefit from new or updated river hydraulic and flood mapping studies or regulatory lake flood maps.

Status

Guided and/or partially funded by the Water Security Agency (WSA), six communities at risk of recurrent flood damage have access to modern flood maps.

The WSA, in partnership with Natural Resources Canada, is working with higher priority communities to develop modern flood maps. WSA will continue reviewing and endorsing community flood map studies for the foreseeable future and will provide these maps and datasets to the communities as they are complete. Seven more communities at risk of flood damage are expected to have access to completed flood maps in the next year. Data collection is either underway or will be planned for additional communities and may include the collection of new LiDAR elevation data, flood high water mark surveys or river bathymetric surveys and structure surveys to support future hydraulic modelling efforts.

How does the measure contribute to building resilience?

Flood maps show the areas that could be flooded within community areas adjacent to streams, rivers or lakes. Flood maps and data provide important information for official community plans and zoning bylaws and assist with developing emergency flood plans and guide the construction of flood-protection works. Identifying flood-prone lands can help communities assess risk and employ informed actions to mitigate impacts. Such actions are important to prevent recurrent flood damage, reduce flood recovery time and cost and reduce stress to citizens.

Program Highlight

Additional Strategies to Mitigate and Protect Against Floods in the Prairies

Flood mapping generally benefits communities near a stream, river or lake. Other communities experience floods from soil saturation (groundwater) and/or flooding from overland flows or urban runoff during extreme runoff events. In these circumstances, conventional flood mapping may not be practical.

However, there are other programs to help these communities. WSA administers the Emergency Flood Damage Reduction Program and Flood Damage Reduction Program to support communities with proactive long-term flood mitigation and protection projects.

The Saskatchewan Public Safety Agency provides emergency response services to situations such as evacuations and to implement temporary flood protection measures that can be cost-recovered through the Provincial Disaster Assistance Program (PDAP). Once an urban or rural municipality declares a state of emergency, PDAP also provides cost-recovery to homeowners suffering uninsured flood losses, enabling them to return their homes to pre-disaster states following significant flooding.

Measure 18

The number of wildfire community preparedness plans completed for at-risk northern communities

This measures the number of at-risk northern communities in Saskatchewan's wildland-urban interface that have wildfire community preparedness plans. These communities are rated as being moderate to high-risk of wildfire based on a 2004 Community Risk Assessment.

Target

By 2030, all 84 at-risk communities will have wildfire community preparedness plans completed.

Status

As of March 31, 2023, there were 70 wildfire community preparedness plans completed for at-risk northern communities. These communities are rated as being moderate to high-risk of wildfire based on a 2004 Community Risk Assessment. In 2022-23, two new plans were completed.

How does the measure contribute to building resilience?

Wildfire community preparedness plans support a commitment in the province's Prairie Resilience climate change strategy. The plans assess the risk of wildfire to communities by providing an overview of the planning area, fire behaviour potential, values-at-risk such as infrastructure and buildings and fire operations that can be used if a wildfire threatens wildland-urban interface values. The plans also enable communities to identify hazards and vulnerable areas/populations with higher risks; prioritize efforts to address risks well in advance of potential wildfire impacts to the area; and help with wildfire suppression efforts when communities are threatened by wildfire.

Number of at-risk communities with wildfire preparedness plans

Number of communities with wildfire community risk assessments	104
Total number of communities identified as at-risk	84
Total number of at-risk communities with preparedness plans as of March 31, 2023	70 (83%)
Remaining number of communities with preparedness plans needed	14 (17%)

Measure 19

Total hectares of Saskatchewan Crown land with wildfire fuel management work complete

This measures wildfire mitigation projects completed in Saskatchewan's provincial forest within and adjacent to communities.

Target

Complete all mitigation work on 2,464 hectares of Crown land adjacent to at-risk communities (84) by 2028.

Status

In 2022-23, 189 hectares of fuel mitigation work was completed by the Saskatchewan Public Safety Agency (SPSA) at the following locations: Bear Creek, Black Point, Candle Lake, Crutwell, Cypress Hills Provincial Park, Dore Lake, Garson Lake, Greig Lake, Howe Bay, Hudson Bay, Jan Lake, Jeannette Lake, La Ronge, Little Amyot Lake, Lower Fishing Lake, Matheson Lake, Napatak, Prince Albert, Sandy Bay, Tobin Lake, Uranium City and Waterhen Lake.

As of March 31, 2023, the SPSA has completed fuel management for 1,584 hectares of Crown land in the provincial forest. This is an increase of 189 hectares from the previous year.

How does the measure contribute to building resilience?

Vegetation and wildfire fuel management projects enhance the effectiveness of wildfire suppression. Vegetation management reduces the intensity of fire behaviour, providing an anchor point for suppression activities and reducing the level of wildfire risk to the community. This mitigates the risk of severe wildfires. The Saskatchewan Community Wildfire Risk Assessment identifies all Crown land locations requiring fuel management projects and sets priorities for project completion.

Tracking areas managed for fuel load on Crown land

Date	Crown land with fuel management
As of March 31, 2021	1,197 hectares
As of March 31, 2022	1,395 hectares
As of March 31, 2023	1,584 hectares
Target over 2021-2028	2,464 hectares

Program Highlight

Reducing Wildfire Fuel Load in First Nation Communities

Since 2015, a partnership with the Saskatchewan Public Safety Agency, First Nations and Indigenous Services Canada has resulted in fuel mitigation work now completed in most First Nations communities in Saskatchewan. The project is being used as a template for Canada-wide fuel mitigation programs funded by the federal First Nation Emergency Management Mitigation Program, which began in 2019.

Human Well-Being

Human well-being refers to Saskatchewan residents' resilience to climate change's impacts. It ensures that residents are healthy and can provide for their needs and families. The measures under this area focus on the amount of water available and consumed by communities, as well as monitoring the potential risk of exposure to vector-borne illnesses.

20. Average municipal water consumption per capita and total municipal water consumption

21. Saskatchewan's Healthy Beaches Program

22. The number of active surveys at suitable habitat sites for Lyme disease and other tick-borne diseases

Measure 20

Average municipal water consumption per capita and total municipal water consumption

This measures the change in water use efficiency as a relationship between per capita and total municipal water consumption. Data is available up to 2023.

Target

Decrease per capita municipal water consumption and decrease or stabilize total water use. Together, these measures approximate relative water use efficiency.

Status

Per capita municipal water use decreased in 2023, with residents using an average of 300 litres per person per day, compared to 323 litres per day in 2022. Total municipal water use also decreased from 135 million cubic metres in 2022 to 132 million cubic metres in 2023, a decrease of approximately three million cubic metres (Figure 15).

How does the measure contribute to building resilience?

Declining trends in per capita use indicate gains in water use efficiency. Compared with per capita use, total use can indicate how water conservation efforts support population and economic growth, even under water resource constraints. Greater water use efficiency can support a water source's sustainability and the infrastructure used to provide water. Using less water helps reduce GHG emissions, as less energy is needed to pump and treat water. This may also buffer against impacts on water resources, where climate change may affect municipal water sources' reliability (e.g. water quality or quantity).

The Water Security Agency promotes responsible water use through public education, partnerships and other programs. Water rates set by waterworks owners that recognize the true and full cost of system design, construction, operation and maintenance also help promote water conservation.

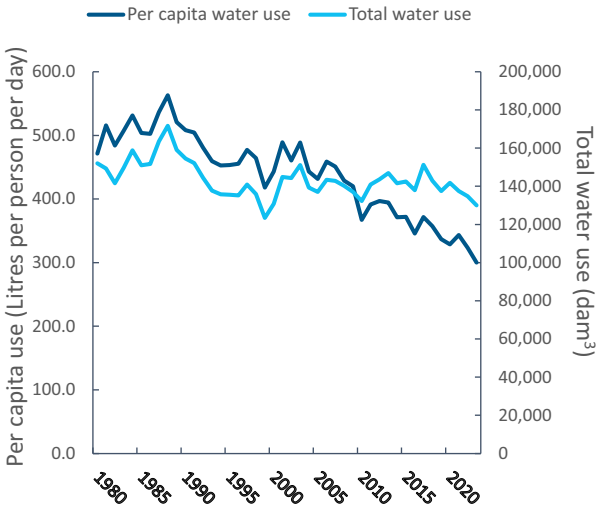

Figure 15: Per capita municipal water use and total municipal water use

The data in Figure 15 may differ from previous reports because the Water Security Agency receives reports irregularly, and initial data submissions are not always complete.

Measure 21

Saskatchewan's Healthy Beaches Program

This measure helps monitor and ensure safe water quality for users of selected public beaches that may carry some risk for human health due to pollutants and other environmental factors, including climate-related events.

Target

Saskatchewan beaches are monitored by the Ministry of Health to protect swimmers from illnesses associated with unacceptable bacteria levels. Swimming in contaminated water can increase risk of ear, nose and throat infections or gastrointestinal illnesses.

Recreational water is considered safe for swimming and other in-water activities when:

- No single sample result is greater than 235 *E. coli* organisms in 100 ml of water; and/or
- Cyanobacteria or their toxins (microcystin) is less than 10 µg/L.

Beach sample results, including exceedances, are shared with the public to help them make informed decisions about their recreational water activities.

Status

In 2023, 47 beaches were sampled between the end of June and the beginning of September on a weekly or bi-weekly basis. The beaches were priority-ranked based on usage (popularity) and historical data, including past exceedances. In response to complaints (i.e. algae concerns), two additional beaches were sampled. Visits were conducted at 199 sites.

The program recorded 990 *E. coli* samples of which 13 single samples exceeded the guideline values at six different locations: Leroy Leisureland, Rowan's Ravine Provincial Park, Leslie Beach, Regina Beach, Macklin Lake Regional Park and Katepwa Point Provincial Park. One hundred and ninety-eight (198) composite samples were submitted for microcystin with three exceedances at Stoney Beach and one at Macklin Lake Regional Park Beach.

How does the measure contribute to building resilience?

The Ministry of Health runs the Healthy Beaches Program at recreational beaches across the province. During the summer, active monitoring of these sites ensures that water quality is safe for swimming. Bacteriological tests for *E. coli* are analyzed at the Roy Romanow Provincial Laboratory. The samples are also screened for microcystin, harmful toxins released by cyanobacteria (blue-green algae) during algal blooms. Microcystin can affect human and animal liver and nervous systems, resulting in severe illness or death. The local authority may advise the public to avoid swimming and other in-water activities in recreational areas when test results indicate poor water quality.

During the beach sampling process, temperature and precipitation are recorded and information is available upon request. Beach exceedances are also shared with key stakeholders, including the Water Security Agency and the ministries of Environment and Agriculture. These stakeholders, guided by their agency mandates, engage with lake ecosystems that extend beyond the scope of the Ministry of Health. For example, addressing the broader impact of surrounding land use on lake health.

Percentage of *E. coli* and Microcystin Exceedances (2017 to 2023)

Year	Percentage of *E. coli* Single Sample Exceedances	Percentage of *E. coli* Geomean Exceedances	Percentage Microcystin Positive Samples
2017	2.2%	2.3%	0.0%
2018	0.3%	0.4%	0.0%
2019	1.4%	1.7%	0.0%
2020	0.9%	0.0%	0.0%
2021	0.2%	1.2%	0.0%
2022	4.4%	4.7%	1.6%
2023	1.3%	1.5%	2.0%

Note: The percentage in the E. coli geomean exceedances column has been updated throughout to reflect the correct percentage. The percentage is calculated by dividing the geomean in exceedance by the total number of geomean groups.

Measure 22

The number of active surveys at suitable habitat sites for Lyme disease and other tick-borne diseases

This measures the number of active surveillance surveys conducted at sites in Saskatchewan for tick-borne diseases.

Target

This measure aims to conduct at least 55 surveys at a minimum of 50 sites annually, targeting sites with suitable habitat for tick establishment.

Status

In 2023, 46 surveys were conducted at 40 sites to monitor tick populations in the province. Some planned surveys could not be completed due to poor weather conditions in late spring and fall. Three blacklegged ticks *(Ixodes scapularis),* which are potential vectors for Lyme disease, were collected through active surveys in 2023 for the first time since active surveillance began in 2008.

Survey sites included areas with high likelihood of tick exposure for humans or domestic animals. Sites also included sentinel sites sampled multiple times yearly and new locations where blacklegged ticks are found through passive surveillance. These include parks, recreation and historic sites and select ecological reserves.

Program Highlight

eTick: 2023 tick surveillance results

To improve passive tick surveillance in Saskatchewan, the Ministry of Health collaborated with researchers at the University of Saskatchewan and Bishop's University to launch eTick in 2020, a digital tick identification platform (www.eTick.ca).

Here are some results from the eTick platform based on the data submitted by the public in 2023:

- In total, 814 valid submissions were received via eTick for Saskatchewan.
- Like previous years, the vast majority were American dog ticks, Rocky Mountain wood ticks or winter ticks, which are not known to transmit Lyme disease.
- Approximately three per cent of submissions (27 out of 814) were blacklegged ticks.

How does the measure contribute to building resilience?

Monitoring and surveillance inform risk messaging to the public and provide details about the encroachment of ticks into environments with supportive habitats. Monitoring also informs adaptive measures to control tick populations.

Active surveillance for blacklegged ticks has been ongoing in Saskatchewan since 2008. This tick is the primary carrier for the agents that cause Lyme disease and several other tick-borne diseases in Canada and the United States. The active tick surveillance program aims to assess the risk of Lyme disease in Saskatchewan by checking for blacklegged ticks and determining if they have become established in any area of the province.

Glossary

4R Nutrient Stewardship Plan: a nutrient management plan that supports fertilizer's effective and efficient application. The 4R Nutrient Stewardship Plan incorporates the right fertilizer source at the right rate, at the right time and in the right place to achieve cropping system goals. It helps organize decisions toward high production, increased profitability, improved environmental protection and improved sustainability.

Absorptive capacity: the ability of a system to prepare for, mitigate or recover from climate change impacts using predetermined coping responses to preserve and restore essential basic structures and functions (e.g. human life, housing, productive assets). It refers to the capacity to recover from specific shocks and short-term stresses.

Adaptation: in human systems, this refers to the adjustment process to actual or expected climate change and its effects to moderate harm or access to beneficial opportunities. In natural systems, this refers to the adjustment process to the actual climate and its effects; human intervention may facilitate adjustment to the expected climate.

Adaptive capacity: the ability of a system to adjust, modify or change its characteristics and actions to better respond to existing and anticipated future climatic shocks and stresses.

Annual allowable cut (AAC): a term that represents the annual amount of timber that can be harvested sustainably while ensuring that enough forest remains to meet ecosystem management goals within a defined forest area.

At-risk communities: communities in Saskatchewan's wildland-urban interface are rated as having moderate to high risks of wildfires, based on the Saskatchewan Ministry of Environment's Community Wildfire Risk Assessment. This may also refer to the Water Security Agency's assessment of communities potentially at risk of flooding due to being adjacent to waterbodies or other topographic characteristics (e.g. low relief).

Carbon dioxide equivalent (CO_2e): a term for describing different GHGs in a common unit. CO_2e signifies the amount of CO_2 that would have the equivalent global warming impact. A quantity of GHG can be expressed as CO_2e by multiplying the amount of GHG by its global warming potential. For example, given a GWP of 28 for methane (CH_4), if 1kg of CH_4 is emitted, this can be expressed as 28 kg of CO_2e (1 kg CH_4 * 28 = 28 kg CO_2e).

Climate change: a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties and persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces and persistent human-caused changes in the composition of the atmosphere or land.

Climate: the average weather conditions over a long period (decades and longer).

Community preparedness: the resilience of Saskatchewan communities to climate change impacts. It includes providing the public with the necessary information, responding to and recovering from extreme weather, understanding flood risks, drought and wildfires, establishing emergency preparedness/ management plans and adopting appropriate standards and practices to reduce risks.

Economic sustainability: the ability to remain competitive in a global marketplace and encourage investment while reducing GHG emissions. This includes ensuring businesses and industries receive the support they need to develop marketable innovations to address climate change.

Human well-being: the resilience of Saskatchewan residents to climate change impacts. It includes ensuring residents are healthy and have stable jobs to provide for their needs and families.

Land under permanent cover: land cultivated with long-term crops replanted for several years, land under trees and shrubs producing flowers or nurseries (except those of forest trees, which are classified as Forestry). This includes native prairie, tame or seeded pasture and tame hay.

Lyme disease: an illness caused by *Borrelia* bacteria. Humans may contract the disease from the bite of a tick carrying the bacteria.

Mitigation (of climate change): a human intervention to reduce the sources or enhance the sinks of greenhouse gases.

Natural systems: maintaining the integrity of Saskatchewan's land, water and forests. Management of natural systems determines the ecosystem's resilience to climate change and the ecological goods and services derived from them (e.g. food, fuel, water, air purification, carbon storage, wildlife habitat and cultural provisions). Natural systems also inherently support mitigation through carbon sequestration in soils, forests and wetlands.

Physical infrastructure: producing and moving goods and managing the built environment. It includes maintaining reliable transportation and utility services and water resource management. This also means increasing the capacity for renewable energy generation and building more energy-efficient buildings.

Resilience: the ability to cope with, adapt to and recover from stress and change. It is scalable and can refer to, for example, the resilience of individuals, communities, ecosystems or provinces.

Right-of-way (ROW): it refers to a type of easement that grants access to your property. This easement enables SaskPower to safely operate the power line and maintain a clear area around it to prevent any interference with construction, inspection or repair activities.

Summer fallow: keeping normally cultivated land free of vegetation throughout one growing season by cultivating and/or applying chemicals to destroy pests and diseases and allowing a buildup of soil moisture reserves for the next crop year. This practice can result in the loss of soil organic matter through erosion.

Transformative capacity: the ability of a system to holistically and fundamentally change its characteristics and actions when the existing conditions become untenable in the face of climatic shocks and stresses. It goes beyond incremental adjustments by changing primary systems, structures and assumptions to substantially reduce vulnerability.

Weather: the state of the atmosphere at a given time, which changes with the passing of hours, days and seasons.

List of Abbreviations

AAC	Annual allowable cut
Agri-ARM	Agriculture-Applied Research Management
BOMA	Building Owners and Managers Association
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
dam^3	cubic decametres
ECCC	Environment and Climate Change Canada
E. coli	*Escherichia coli*
GDP	Gross domestic product
GHG	Greenhouse gas
GIS	Geographical Information System
GJ/m^2	Gigajoule per square metre
m^2	square metre
m^3	cubic metre
Mt	Million (or mega) tonnes
MW	Megawatts
N_2O	Nitrous oxide
PGPP	Power Generation Partner Program
PDAP	Provincial Disaster Assistance Program
RNFI	Realized net farm income
ROW	Right-of-way
SBP	Ministry of SaskBuilds and Procurement
SMF	Summer fallow
SPSA	Saskatchewan Public Safety Agency
TSA	Timber Supply Area
µg/L	Microgram per litre
WSA	Water Security Agency

More info?

Further information about the Climate Resilience Measurement Framework and *Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy* is available at saskatchewan.ca/climate-change.