

Saskatchewan's Climate Resilience Measurement Framework



A Prairie Resilience Commitment

The Government of Saskatchewan launched *Prairie Resilience: A Made-in-Saskatchewan Climate Change Strategy* in December 2017. The comprehensive climate change strategy is designed to make Saskatchewan more resilient to the climatic, economic and policy impacts of climate change. The strategy focuses on the principles of readiness and resilience to support the province and its people, reduce greenhouse gas (GHG) emissions, and prepare for changing conditions – such as extreme weather, drought or wildfire.

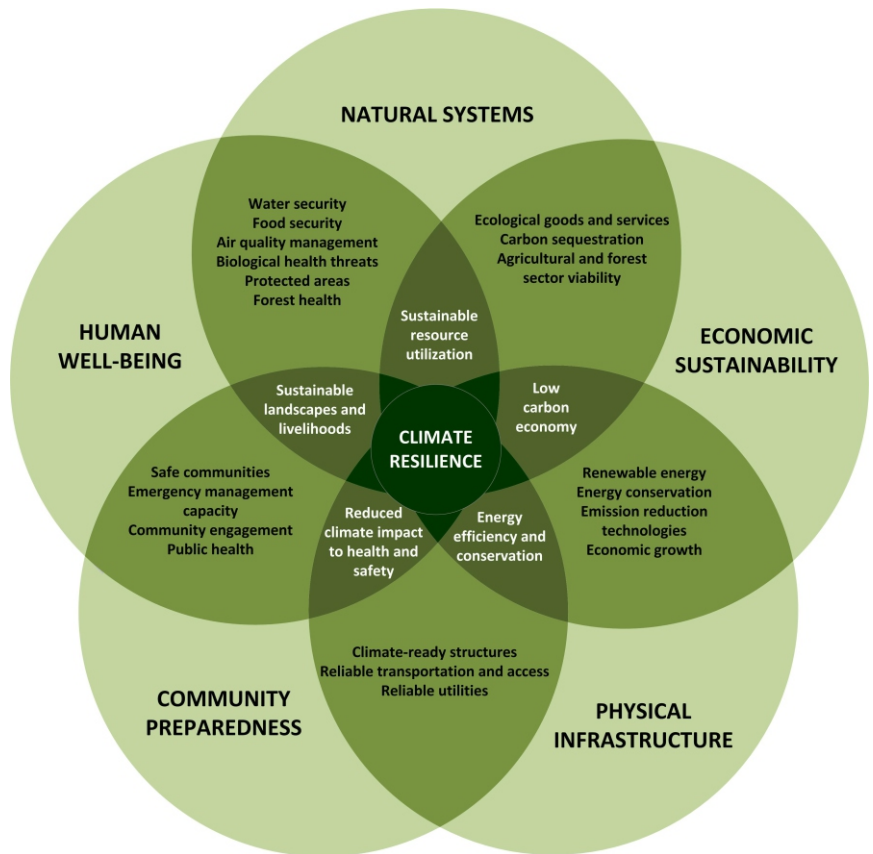
Prairie Resilience commits the provincial government to “track and report across all areas of focus to convey progress in making our province more resilient to climate change.” The Climate Resilience Measurement Framework includes 25 indicators in five key areas, to measure progress in the face of a changing global climate.

Key areas of focus

Multiple systems need to be strengthened to enhance the resilience of the province to climate change. This includes the ability of our natural systems (including our land, water, and forests), physical infrastructure, economic sustainability, community preparedness, and the well-being of people to adapt and thrive in a changing environment and low-carbon economy.

These five key resilience areas are interconnected and promote resilience through interactions that benefit each other. For example:

- Responsible management of our natural resources sustains habitat for plants and animals, while also providing ecological goods and services that support the province's economy and quality of life.
- Strengthening resilience in our highway infrastructure promotes reliable transportation for people and for businesses, while also connecting people and communities to critical goods and services during emergency events.



Key areas of focus in Prairie Resilience and examples of components under each area that contribute to Saskatchewan's resilience

Resilience is the ability to cope with, adapt to and recover from stress and change.

How is Saskatchewan building resilience?

Addressing the impacts of climate change requires capacities in multiple areas. Below are examples of how Saskatchewan is building capacity within the five key resilience areas.

Establishing **absorptive capacity** helps to *prepare for, manage* and *recover* from climate change impacts.

- Providing public education and monitoring of vector-borne diseases – those transmitted by insects – helps the province prepare and respond to potential intensification of these diseases.
- Planning and training help local governments and communities respond to emergencies (e.g., flooding and wildfires) in a timely and efficient manner.

Building **adaptive capacity** involves adopting *deliberate actions* and *planned decisions* to increase the province's ability *to respond* to existing and future climatic shocks and stresses.

- Diversification of crops by Saskatchewan farmers enhances soil health and helps manage pests and diseases.
- Continued adoption of zero-tillage practices sequesters significant carbon dioxide from the atmosphere.
- Continued implementation of Saskatchewan's agricultural water management framework helps assure continued productivity, enhances wetland habitat conservation and improves runoff management in times of both drought and flood.
- Continued implementation and expansion of the FireSmart program helps residents safeguard their homes and communities by providing tools and information to reduce wildfire risks.

Increasing **transformative capacity** involves *fundamental changes* to significantly *reduce the province's vulnerability* to climate change.

- The province's commitment to maintain or restore landscape integrity helps optimize ecological goods and services, enhance resilience to extreme weather events, and manage risks to biodiversity.
- SaskPower's expansion of renewable energy sources significantly contributes to reducing the province's greenhouse gas (GHG) emissions.
- Development and implementation of a provincial solid waste management strategy will play a vital role in diverting wastes, conserving resources and reducing GHG emissions.

Climate resilience measures, capacities and targets

The Climate Resilience Measurement Framework contains a broad and balanced set of measures across the five key areas. The Government of Saskatchewan commits to track and report on the resilience framework every year. Yearly assessment and reporting may indicate where, in future years, alternative or additional policies or programs could enhance resilience.

The next section contains the measures and their associated targets under each of the five key areas.

Natural systems

- Lands under permanent cover retain soil moisture, are more resilient to drought and flood events, and sequester carbon.
- Sequestering organic matter into the soil reduces net GHG emissions from agricultural activities.
- Increasing agricultural land managed under a 4R nutrient stewardship plan (right source, right rate, right time, right place) contributes to reduced GHG emissions from fertilizer application.
- Forests with a balanced distribution of tree ages are more resilient to extreme weather events.

	Measures	Resilience Target	Capacity Type
1.	Total area of agricultural land under permanent cover in Saskatchewan	Maintain total permanent cover (native prairie, tame pasture and tame hay) at the 2016 level of 19.93 million acres (8.06 million hectares)	Adaptive
2.	Total amount of soil organic matter sequestered in cultivated land*	Maintain soil organic matter sequestration level of 5.60 M tonnes per year	Adaptive
3.	Percentage of agricultural land area with 4R nutrient stewardship plan	By 2025, 25% of Saskatchewan's cropland under 4R designation	Adaptive
4.	Number of Forest Management Plans that incorporate Values, Objectives, Indicators, and Targets (VOITs) related to forest age class distribution for the licence area	By 2020, 100% of approved Forest Management Plans will contain a VOIT that identifies approved age class profile target, by area on the managed forest land base	Adaptive
5.	Total protected areas in Saskatchewan	By 2020, 7,809,629 hectares (12%)	Adaptive

* Carbon sequestered in soil can be expressed as tonnes of soil organic matter (SOM) or tonnes of CO₂ equivalent (Co₂e). One tonne of SOM is roughly equivalent to two tonnes of CO₂e.

Physical infrastructure

- Modifying culverts to the new provincial standards makes the province's transportation network more resilient to extreme weather events.
- Adoption of energy efficiency, conservation and self-generation programs by SaskPower clients through its Demand Side Management Program (DSM)* reduces strain on the system and lowers the costs associated with building and maintaining new energy generating capacity. Customers are also able to use energy more efficiently, thereby reducing energy costs and GHG emissions.
- Vegetation management along SaskPower power lines protects facilities, buildings and other valuable infrastructure from wildfire and also contributes to reliable service delivery to residents and industries.
- Maximizing operational efficiencies in government-owned buildings increases resilience by reducing energy costs and GHG emissions.

	Measures	Resilience Target	Capacity Type
6.	Total number of provincial culverts on the national highway system meeting new provincial flood standard	Increase	Adaptive
7.	Renewable energy generation capacity	By 2030, up to 50% of electricity generated from renewable energy sources	Transformative
8.	Total GHG emissions from electricity sector	By 2030, 8.52 Mt CO ₂ e (40% reduction of 2005 levels)	Transformative
9.	Total amount of energy savings from SaskPower's Energy Efficiency, Conservation and Self-Generation Program	By 2030, 20 MW peak demand reduction and 140 GWh energy savings	Adaptive/Transformative
10.	Area of SaskPower powerline right-of-ways widened	10% of right-of-ways cleared to maintenance standard per year (10-year maintenance cycle)	Adaptive
11.	Total energy consumption for government-owned buildings**	By 2020, reduced energy consumption to 1.494 GJ/m ²	Transformative
12.	Total GHG emissions from government-owned buildings**	By 2020, reduced GHG emissions to 85,489 tonnes (20% reduction from 2007 levels)	Transformative

*Demand Side Management refers to electricity use reduction, or electricity use planning, to limit the need for growth in power grid capacity.

**Refers to Executive Government buildings only (excluding Crown buildings).

Economic sustainability

- Balancing economic growth and emissions reduction strengthens economic resilience and environmental integrity.
- Reducing volatility in realized net farm income increases resilience of the agriculture sector from both a production and financial perspective.
- Incorporating natural disturbance patterns in provincial forest harvest designs increases resilience by helping maintain healthy and biologically diverse forests.

	Measures	Resilience Target	Capacity Type
13.	Total GHG emissions from gas produced in association with oil	By 2025, reduced GHG emissions from flaring and venting of gas produced in association with oil by 4.5 Mt of CO ₂ e annually	Transformative
14.	Emissions intensity of Saskatchewan's economy (GHG's per unit of GDP)	Continued decrease in the emission intensity of Saskatchewan's economy	Transformative
15.	Realized net farm income	No greater than 50% decrease in realized net farm income from the previous five-year average	Adaptive
16.	Percentage of cultivated land in different types of crops	No one crop type to rise above 50% of the cultivated area	Adaptive
17.	Incorporation of natural forest disturbance patterns in provincial forest harvest design	Beginning April 1, 2019, 100% of forest harvest designs incorporate natural disturbance patterns	Transformative



Community preparedness

- Floodplain mapping informs community plans and bylaws to prevent development in floodplain areas.
- Having emergency preparedness plans in place will help communities respond to emergencies in a timely, efficient and coordinated manner.
- Wildfire community pre-plans assist communities in being prepared for suppression action during a wildfire event.
- Wildfire fuel management reduces vulnerability of communities to wildfire.

Measures	Resilience Target	Capacity Type
18. Floodplain mapping completed for communities identified as being at risk of flooding	By 2030, 100% of communities at risk of flooding have completed floodplain mapping	Adaptive
19. Number of communities with a standardized and ratified emergency preparedness plan	Target will be set in 2019	Absorptive
20. Number of wildfire operational pre-plans completed for "at-risk"* northern communities	By 2036, all "at-risk" communities have wildfire operational pre-plans completed (3 communities/year)	Absorptive
21. Total Crown land with wildfire fuel management work completed	By 2030, complete 747 hectares adjacent to communities (30 hectares/year)	Adaptive

* Communities in the Wildland-Urban Interface rated with moderate or high risk of wildfire.



Human well-being

- Reducing the number of communities with vulnerable water supply systems increases resilience to drought. This is important considering that future duration and intensity of droughts may increase due to climate change.
- Water use efficiency increases climate resilience by reducing risk of water shortages and reducing energy required for delivery.
- Monitoring vector-borne diseases – those transmitted by insects – allows the provision of better information to the public and informs interventions to prevent and control vector-borne diseases.

Measures	Resilience Target	Capacity Type
22. Number of communities reliant on water supplies vulnerable to drought	Decrease	Adaptive
23. Average municipal water consumption per capita and total municipal water consumption	Decrease	Adaptive
24. Number of communities (with suitable habitat) where active surveillance for West Nile Virus and other mosquito-borne diseases occurs	By 2020, increase to 20 communities	Absorptive
25. Number of active surveys at suitable habitat sites for Lyme disease and other tick-borne diseases	By 2020, increase to 60 survey sample sites	Absorptive

More info?

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

