

Water Quality

Why it matters

Everyone needs safe drinking water. In 2010, through Resolution 64/292, the United Nations General Assembly made it clear that clean drinking water and sanitation are essential to the realization of all other human rights.

In Saskatchewan, our Water Security Agency monitors the quality of water in our rivers, lakes and streams. From this we can gain a better understanding of normal levels, long-term trends and the impact of human activities.

One tool used is the Canadian Water Quality Index. It provides a standardized way of comparing and reporting the health of surface water in our rivers, streams, and lakes.

The Index assesses the chemical, biological, and physical qualities of water. That assessment is compared to a set of objectives. Scientists look for the number of times the objectives aren't met, and for how long.

Data is collected from a number of monitoring stations throughout the province and is scored:

- Watersheds scoring between 80 and 100 are considered to be healthy. The watershed shows no apparent change and is resistant and resilient to change.
- Watersheds scoring between 45 and 79 are considered to be stressed.
- Watersheds scoring less than 45 are considered to be impacted. The watershed has a change and/or degradation in function and/or services.

What is happening

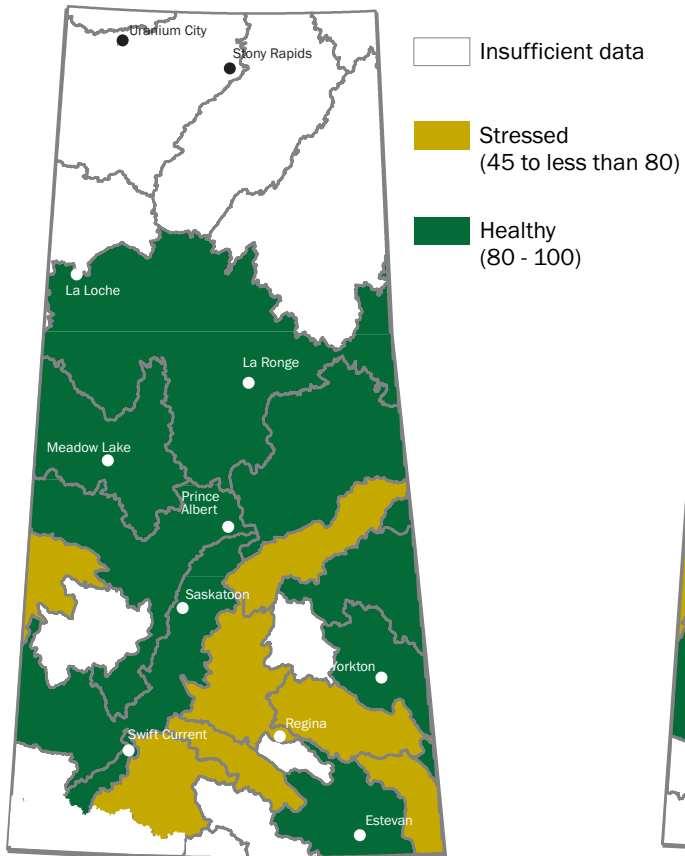
The average Water Quality Index values for 2006-2010 and 2011-2015 are calculated for the watersheds with sufficient monitoring to calculate index values. Sixteen of the 29 watersheds in the province had water quality sites that were sampled in both time frames being compared.

The five-year average Water Quality Index for 2006-2010 was rated as healthy for nine watersheds (56 per cent), and stressed for seven watersheds (44 per cent). The five-year average Water Quality Index for 2011-2015 was rated as healthy for eight watersheds (50 per cent), and stressed for eight watersheds (50 per cent).

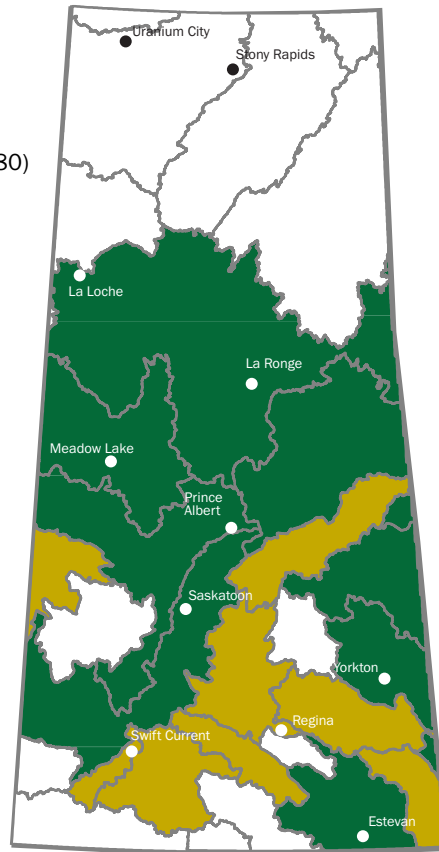
The Battle River had average Water Quality Index values close to a healthy rating in both timeframes, with five-year average values of 79.5 for 2006-2010 and 78 for 2011-2015.

The Water Quality Index did not change for 15 out of 16 watersheds between 2006 and 2015. Swift Current Creek was the only watershed with a different rating category between the two time periods. It changed from healthy in 2006-2010 to stressed in 2011-2015. The five-year average Water Quality Index value for the Swift Current Creek for 2006-2010 was 83 and 78 for 2011-2015. No specific trends in the water quality samples from the watershed indicate why the watershed moved from healthy to stressed.

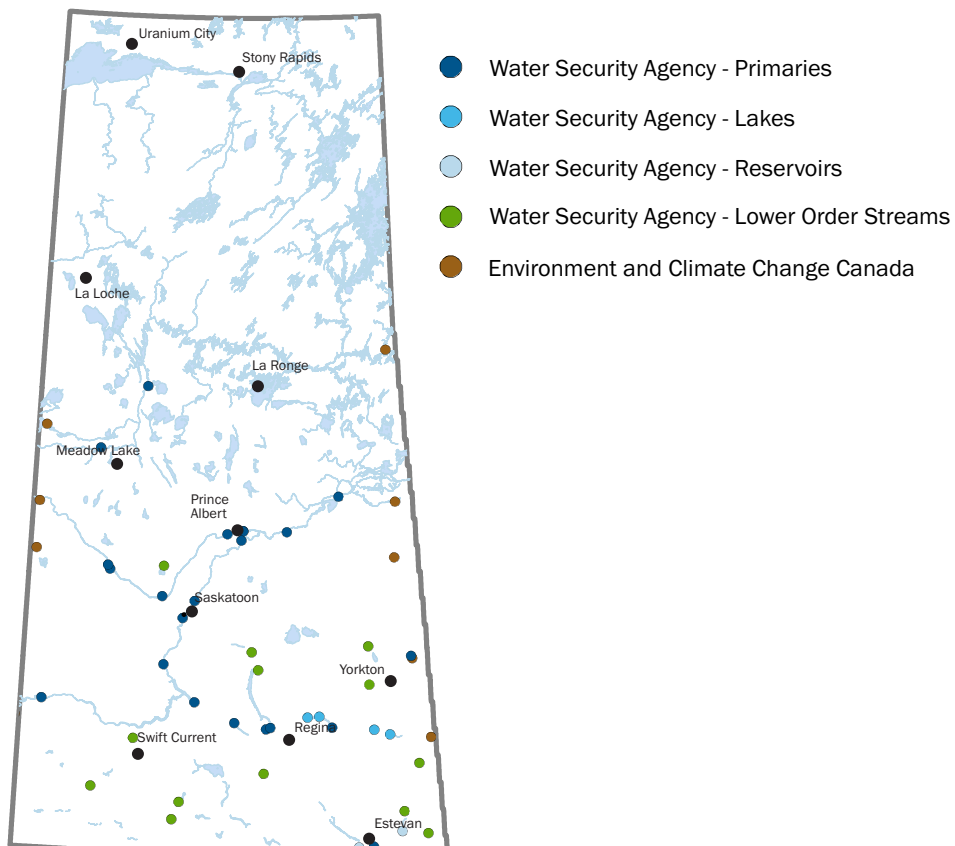
Average Water Quality Index, 2006-2010



Average Water Quality Index, 2011-2015



Water Quality Index Monitoring Sites



What we are doing

Provincial and federal government programs are monitoring surface water quality for the protection of both the aquatic environment and water for human uses.

Water Security Agency - Surface Water Quality Monitoring Programs

The Surface Water Quality Monitoring Program monitors water quality in select watercourses and waterbodies. These programs cover 13 of Saskatchewan's 29 watersheds. The water quality parameters measured include nutrients, major ions, bacteriological tests, general water quality [pH, dissolved oxygen (DO), temperature], organic carbon, chlorophyll (lakes), suspended solids, trace metals and, at primary stations, select pesticides.

- **24 primary monitoring stations** along Saskatchewan waterways, including the Assiniboine, Battle, Beaver, Qu'Appelle, Churchill, Clearwater, North Saskatchewan, Saskatchewan, South Saskatchewan, and Souris rivers.

The Primary Station Monitoring Program is a continuation of a group of water quality monitoring stations established in the 1970s. The original goal was to monitor variables in water quality in major transboundary waters (Alberta, Manitoba, and North Dakota). These stations also support work conducted by the Prairie Provinces Water Board. Some sites were located to gain a better understanding of contributions from major point source discharges or to assess changes from reservoir impoundments. Ongoing monitoring is important for understanding the state and change in water quality which assists with management. Sampling and analysis of benthic macroinvertebrates began in the autumn of 2013. Data from the monitoring stations are also provided to Environment and Climate Change Canada's Canadian Environmental Sustainability Indicators program.

- **Five lakes along the Qu'Appelle River** (including Pasqua, Echo, Katepwa, Crooked and Round)

Long-term monitoring of the downstream Qu'Appelle lakes is conducted in compliance with water management agreements with First Nations. Monitoring also supports watershed plan implementation and the province's water quality priorities of protection, enhancement and management of water resources. Monitoring goals include collecting data to assess and improve understanding of trends and, in conjunction with other projects, to assess nutrient loading on the Qu'Appelle River. This work also supports the development of site-specific water quality objectives.

- **Two reservoirs** (Alameda and Rafferty)

Water quality monitoring of Rafferty and Alameda reservoirs is part of the province's regulatory requirements. Monitoring includes sites on the reservoirs and spring monitoring upstream on the Souris River, Roughbark Creek and Moose Mountain Creek.

- **Lake Diefenbaker**

Lake Diefenbaker is of high economic, social and recreational value to the province. Water from the reservoir flows down the Qu'Appelle channel to Buffalo Pound Reservoir, which is the water supply for Regina, Moose Jaw and surrounding areas. The main outflow from Diefenbaker is the water supply for downstream communities, including Saskatoon. The Water Security Agency initiated a water quality monitoring program in Lake Diefenbaker in the autumn of 2009. WSA also supports and participates in research examining various aspects of water quality in Lake Diefenbaker. Published works and ongoing research is complementary to WSA's long-term monitoring program by providing detailed assessments to better understand the current state and assess longer-term changes in water quality.

- **14 lower order streams** (Avonlea Creek, Lanigan Creek, Lightning Creek, McDonald Creek, Moose Jaw River, Moose Mountain Creek, Oscar Creek, Saline Creek, upstream portion of the Souris River, Spirit Creek, Swift Current Creek, Willowbrook Creek, and Wood River)

This program examines water quality in streams that arise within Saskatchewan and are located in regions where agricultural group plans have been established. WSA conducts and reports on water at 14 sites chosen because they are lower order streams than the rivers monitored through the Primary Monitoring Program or by the Prairie Provinces Water Board (PPWB). The objective of the study is to conduct long-term water quality monitoring to determine how land use, land use changes and water quality are interconnected. Benthic macroinvertebrates are also being monitored at a number of the 14 lower order stream sampling water quality monitoring sites. Because of their smaller size, these streams are more closely linked to land use influences than larger rivers.

Saskatchewan's Surface Water Quality Monitoring Program includes 24 monitoring stations, five lakes along the Qu'Appelle River, two reservoirs, Lake Diefenbaker, and 14 streams.

Special Water Quality Programs

- The Quill Lakes are large saline lakes located north of Last Mountain Lake in central Saskatchewan. There used to be two Quill Lakes. Over the years, water levels have risen and formed one big lake, flooding thousands of acres of farmland and threatening infrastructure. The situation in the Quill Lakes is one of the most complex water management issues in Canada.
- The Nutrient Mass Balance study was completed on the Qu'Appelle River. This study was initiated by WSA in 2013 to identify and quantify sources of nutrient loading to the Qu'Appelle River, from the Qu'Appelle dam to the outflow of Round Lake. Such studies are designed to improve understanding of risks to water quality and provide insight into how management activities can improve water quality. To date, study results have not been published.
- To ensure that water resources are shared fairly, the Prairie Provinces Water Board was formed in 1948. PPWB water quality monitoring ensures that water quality at interprovincial boundaries is maintained at acceptable levels. Water quality is monitored along 12 major eastward-flowing rivers that cross inter-provincial boundaries between the three Canadian prairie provinces.

Watershed Stewardship

As of 2016, source water protection plans have been developed for eleven watersheds and the Yorkton area aquifer. There are eleven non-profit community-based watershed groups formed to focus on source water protection.

[Assiniboine Watershed Stewardship Association](#)
[Carrot River Valley Watershed Association](#)
[Lower Souris River Watershed Stewards](#)
[Moose Jaw River Watershed Stewards](#)
[North Saskatchewan River Basin Council](#)
[South Saskatchewan River Watershed Stewards](#)
[Swift Current Creek Watershed Stewards](#)
[Wascana Upper Qu'Appelle Watersheds Taking Responsibility](#)
[Lower Qu'Appelle River Watershed Stewards](#)
[Old Wives Watershed Association](#)
[Upper Souris Watershed Association](#)