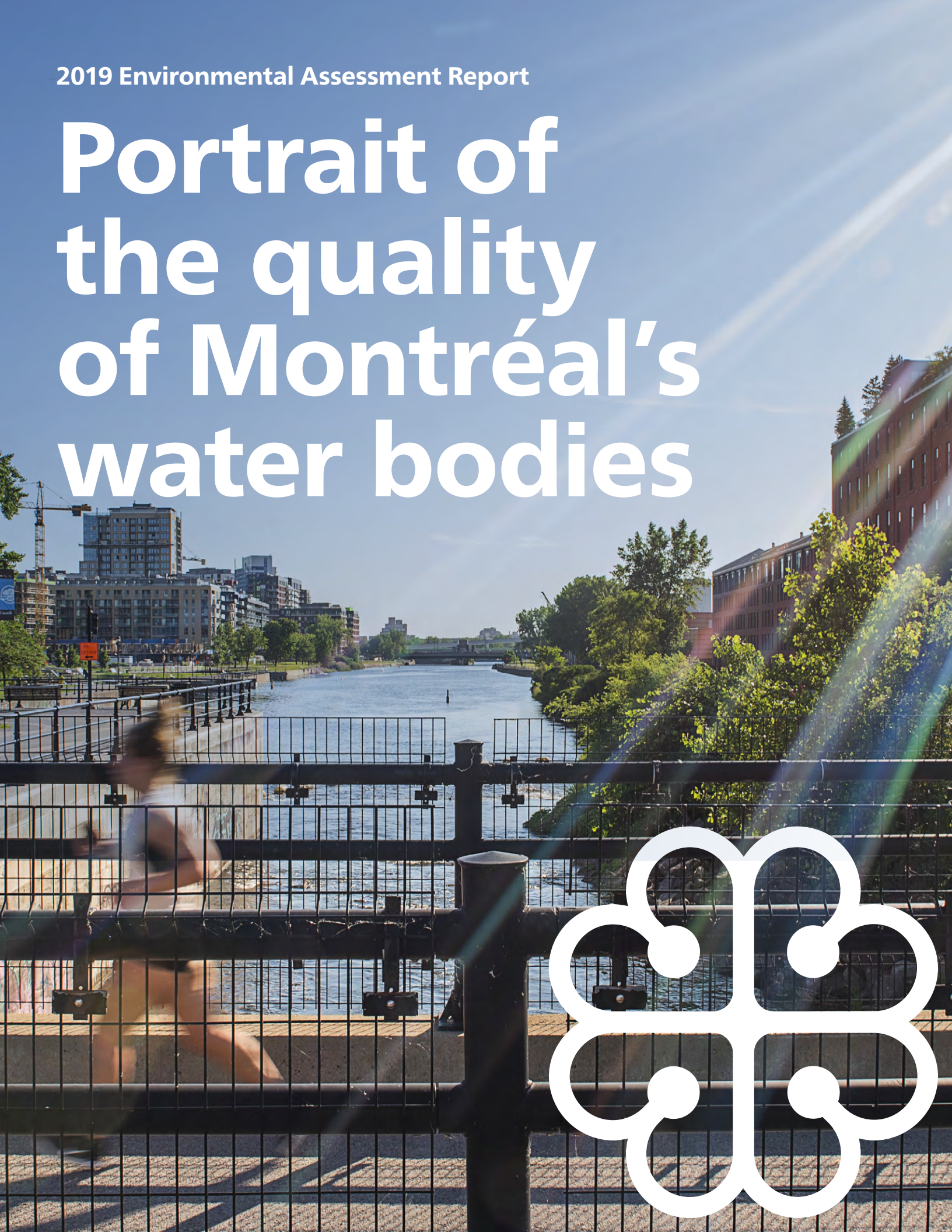
2019 Environmental Assessment Report

Portrait of the quality of Montréal's water bodies



Sainte-Anne-de-Bellevue Channel

QUALO: An Excellent Year

QUALO (the sampling program of the bacterial quality of the Island of Montréal's shoreline waters) was performed for a 21st season, always using the same methodology. To best reflect the quality of the waters surrounding the territory, 103 monitoring stations, chosen on the basis of interesting wildlife sites, shoreline recreational uses, storm sewers and streams, were subjected to the sampling program from May 27th to October 10th, i.e. a period of 20 weeks.

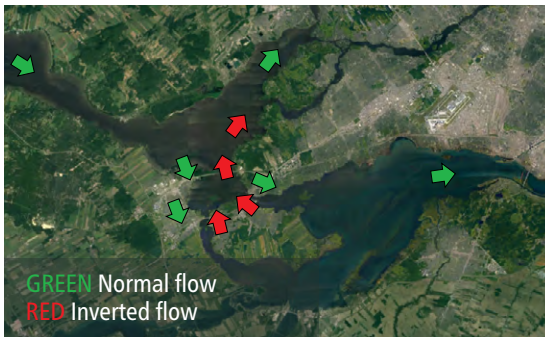
Weather, Flow Rates and Levels

Since its inception in 1999, the overall results of the QUALO program indicate that the bacterial quality of shoreline waters is strongly impacted by precipitations levels. Indeed, the samples collected in the hours following heavy precipitations show a deterioration in the quality of surface waters fed by storm sewers and streams, and result in spillages of overflow structures.

In 2019 however, precipitations totalling 346 mm of rain were recorded during the sampling season. This value is well below the average of 415 mm obtained for the past 10 years. Moreover, the 2019 season was marked by flow rates that exceeded by about 30 % the average recorded for the past 17 years. Thus, the exceptional supply of good quality water from the Fleuve Saint-Laurent, strong flow rates and weaker precipitations all contributed to the lesser bacterial counts obtained in the samples collected.

Inversion of the Flow Between Lac des Deux-Montagnes and Lac Saint-Louis

In 2019, all of the Great Lakes witnessed well above average water levels, such that in order to reduce these levels to accommodate the flood waters expected in 2020, the flow rate of the Fleuve Saint-Laurent was kept at its maximum, while ensuring that no flooding occurred in Lac Saint-Louis.



This exceptional hydraulicity resulted in a situation never encountered before: a complete inversion of the water flow, from July to October, in the Vaudreuil Channel, and in August and September, in the Ste-Anne-de-Bellevue Channel. Generally of better quality, the greenish waters of the St. Lawrence River were clearly observed in all of Vaudreuil Bay and even up to Cap Saint-Jacques, in the direction of the Rivière des Prairies. Consequently, for the better part of the season, no brownish waters from the Rivière des Outaouais skirted the northern shoreline of Lac Saint-Louis, as is normally the case.

81% of Stations QUALO Certified

For a monitoring station to obtain the QUALO certification, it must fulfill the following two conditions: the geometric mean of all its results must not exceed 200 COLI (fecal coliforms, in colony forming units or CFUs per 100 mL) and no more than 10% of its samples can exceed 400 COLI.

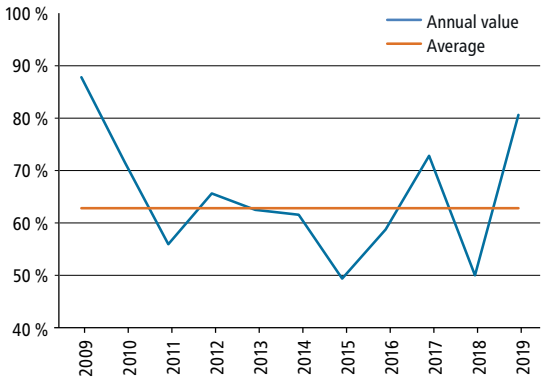
In 2019, 81% of the monitoring stations obtained the QUALO certification compared to 50% in 2018. This percentage is the second best in the history of the program. One needs to look back to 2009, a drier year with normal flow rates, to witness a better percentage, i.e. 88%.

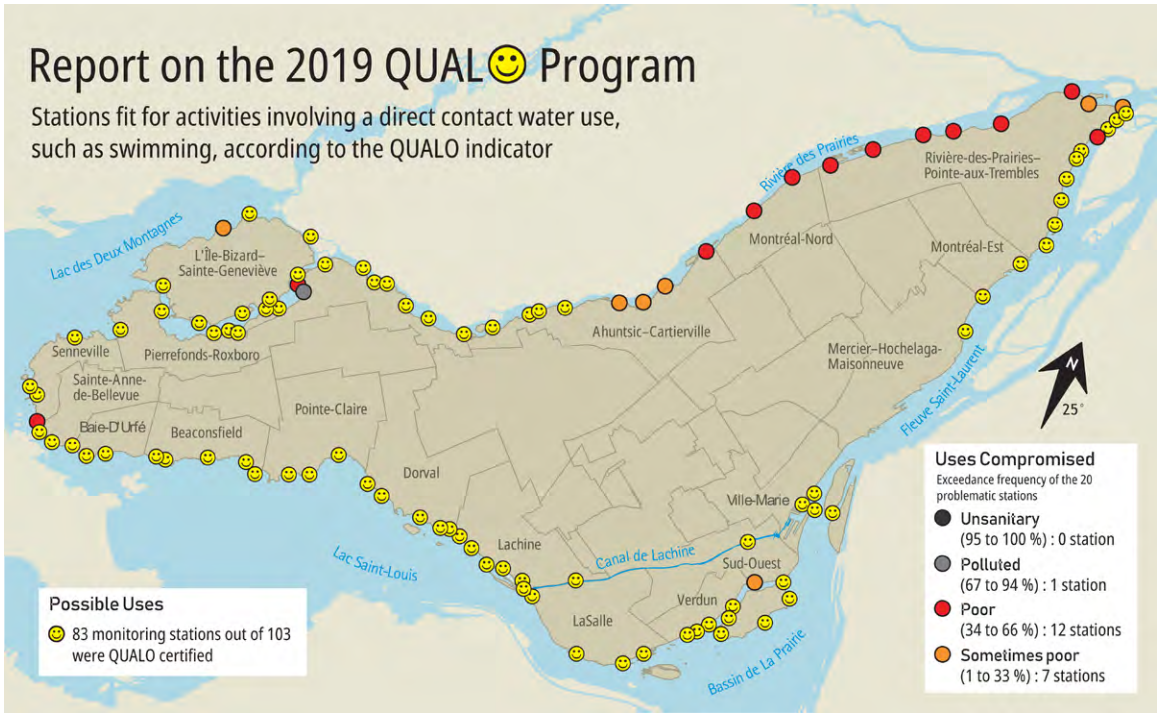
The map below presents the results of the 2019 shoreline water quality monitoring campaign in Montréal. No station was deemed unsanitary in 2019, whereas only 1 was characterized as polluted, 12 as of poor quality and 7 as sometimes poor.

Of the 2,046 bacterial analyses conducted in 2019:

- 85% of samples satisfied the 200 COLI criteria allowing for direct contact water uses, compared to 74% in 2018;
- 4% of samples exceeded the 1000 COLI criteria, thereby compromising indirect contact water uses, compared to 8% in 2018.

Percentage of QUALO stations over 11 years (2009-2019)





Parc de la Merci in Ahuntsic-Cartierville

Evolution of the Quality of Water Bodies

Rivière des Prairies: 57% QUALO

The increased percentage (+22%) of QUALO certified stations in 2019 is mainly due to the supply of good quality water from the Fleuve Saint-Laurent which greatly improved conditions in the upstream part of the Fleuve, from Lac des Deux Montagnes to Parc Raimbault located west of Autoroute 15. This section, which includes 23 stations, recorded its best water quality since the inception of the program with only two stations having failed to be QUALO certified. However, the 14 stations located downstream of Autoroute 15 rated poorly as was the case in 2018.

Île Bizard: 88% QUALO

As in the past, the quality of shoreline waters in this sector was very good. The Parc Denis-Benjamin-Viger station reclaimed its QUALO certification lost in 2018. However, the one located near the extremity of Terrasse Martin, on Lac des Deux Montagnes, did not obtain its QUALO certification for a third consecutive year, owing to four 400 COLI criteria exceedances.

Lac Saint-Louis: 96% QUALO

2019 was one of the best ever for this water body, 24 of the 25 stations being QUALO certified. One has to look back to 2009 to find a better result, when all Lac Saint-Louis stations obtained the QUALO certification. In 2019, more than 90% of the 500 samples showed fecal coliform counts lower than 200, compared to 80% in 2018. The only station that was downgraded was the Parc Godin station in Sainte-Anne-de-Bellevue which is impacted by a storm sewer nearby.

Bassin de La Prairie: 94% QUALO

The percentage of QUALO stations exceeded the 80% average achieved for the sector since the program was launched in 1999. Only the year 2009 did better with a perfect score of 100%. Due to the excellent water quality, 96% of the samples showed a bacterial count lower than the 200 COLI criteria and 9 of the 17 stations did not exceed, even once, the criteria during all of the 2019 season. Just one station did not obtain the QUALO certification, as always since it was set up in 2016. This station is under the immediate influence of the waters of the Saint-Pierre collector sewer.

Fleuve Saint-Laurent: 94% QUALO

In this sector, the 2019 season proved to be the best ever since the program's inception in 1999 with 94% of the stations being QUALO certified. This percentage exceeds by far the average of 48%. In fact, more than 80% of the counts were lower than the 200 COLI criteria (63% in 2018).
The Parc Pierre-Payet station, at the level of 82nd Avenue, is the only one that is not QUALO certified, a certification which it has yet to attain. robation qui lui a toujours échappé d'ailleurs.

Ruisseau De Montigny

RUISSO: A Better Quality

Streams and inland waters are irreplaceable environments necessary for biodiversity in urban areas. In 2019, the 19th year of the program focused on 24 streams and inland waters, and relied on 51 monitoring stations, sampled on seven occasions between May 7th and November 25th.

More than 8,000 measures and physicochemical and bacteriological analysis results, obtained from the 343 water samples collected during the season, were used to calculate the RUISSO Index (RI).

On the basis of this index, we can observe, compared to 2018, that the water quality improved in 12 of the 24 streams and inland waters. It remained stable in 8 of these and deteriorated in the last 4. Overall, for 2019, the results in the 51 stations monitored over the last two years of the program show an increase in the number of stations whose quality was deemed "excellent, good or fair" (from 21 to 22) and the number of stations of "poor" quality (from 11 to 12). Finally, the number of stations whose water quality was found to be "polluted" decreased from 19 to 17.

This slight improvement in the water quality of streams and inland waters, relative to last year, is mainly explained by less frequent rainfalls in the days preceding the sampling.

RUISSO Index, a Water Quality Assessment Tool for Streams and Inland Waters

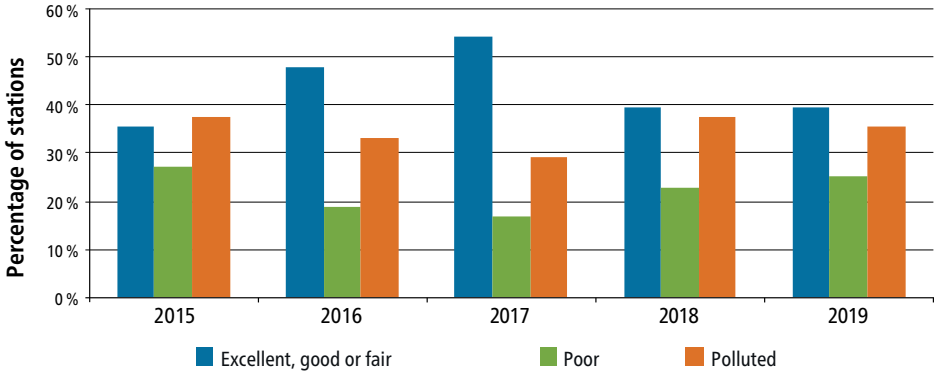
The RUISSO Index is an adaptation of the MELCC's (Ministère de l'Environnement et de la Lutte contre les changements climatiques) index of bacteriological and physicochemical quality (IBPQ). It takes into account the hydrology of streams and water bodies (marshes, swamps, basins or ponds) and the key criteria relative to the protection of aquatic life or to acute and chronic toxicity.

The RI is used to assess the relative quality of streams and inland waters as well as to identify parameters leading to a downgrading of a water's quality. It requires an analysis of 24 parameters: suspended matter (SM), dissolved oxygen (DO), ammoniacal nitrogen (NH_3), total phosphorus (TP), fecal coliforms (COLI) and the main heavy metals. Their analysis allows one to check whether these contaminants are in sufficient quantity to result in a deterioration of the health of aquatic ecosystems.

Evolution of the Water Quality of Streams and Inland Water Bodies

The results obtained for the water bodies in 2019 are compared to those of the previous year, and graded as to whether an improvement (+), a stability (=) or a deterioration (–) of at least five units of the RUISSO Index (RI) has been recorded. The graph below shows the evolution of the water quality of streams and inland water bodies since 2015.

Evolution of the Water Quality of Streams and Inland Water Bodies (at the 48 stations monitored in all year)



Streams Located in Ecoterritories

The water quality of Rivière à l'Orme (+) improved overall in 2019. Indeed, the values of the RI increased significantly at four of the river's six stations. The quality of the water is stable, but "poor" at the station fed by the drainage waters of the City of Kirkland, North of Autoroute 40, as well as at the station located the most upstream, originating in Sainte-Anne-de-Bellevue.

Limiting parameters

For several years now, it can be seen that the limiting parameters that most often result in a deterioration of the water quality of streams and inland waters are phosphorus, COLIs, suspended matters and an oxygen deficiency. Occasionally, a sample can also reveal high metal concentrations. The source of these parameters can be the stormwaters or sanitary wastewaters that make their way to the storm sewer.

Located in the heart of the Bois-de-Liesse Nature Park, Ruisseau Bertrand (+) is fed by the storm waters of the City of Dorval and the boroughs of Saint-Laurent and Pierrefonds- Roxboro, in addition to those of Autoroutes 40 and 13. The water quality improved at four of the seven stations and remained stable at the remaining three. The tributary fed by the stormwaters of the Technoparc de Saint-Laurent showed a better water quality and was dry just once in 2019, compared to four times in 2018. The tributary fed by the stormwaters from the northern portion of the territory of Saint-Laurent is still "polluted" due to the high COLI counts (> 2000) measured during six of the seven sampling tours.

The global water quality of Ruisseau De Montigny (=) remained "polluted" at three of the four stations, at the beginning of the stream, near Bombardier Boulevard, until its mouth in Rivière des Prairies. Occurrences of contamination due to concentrations of SM and metals (copper, lead and chromium) were observed in the stormwater collector draining the industrial sector of the borough of Anjou.

The water quality of Ruisseau Pinel (=) remained stable owing to a decline of less than five units in the RI. However, this decline was sufficient for the stream to be downgraded from the "fair" to the "poor" category. The stream was dry during two of the seven sampling tours conducted in 2019 compared to one such occurrence in 2018.

The water quality at the mouth of Coulée Grou (+) slightly improved, but remained "polluted". A water deficiency was observed 30% of the time (two sampling tours out of seven).

Marshes and Swamps

Marshes and swamps are mainly fed by the drainage waters brought by stormwaters and snowmelts.

The quality of the waters at the outlet of the marshes of the Pointe-aux-Prairies Nature Park slightly improved this year (+), but they still are considered as being "polluted". The decomposition of organic matter and animal droppings affect the quality of these waters. This situation can only be improved through a better water supply.

At the Lac des Battures (=) monitoring station, the value of the RI remained stable in the "fair" category. The pumping station for the waters of the Fleuve Saint-Laurent, commissioned by the borough of Verdun in Île-des-Sœurs District, seems to have had a beneficial impact on the lake's waters, particularly in terms of phosphorus concentrations (a reduction from 41.0 to 34.3 µg/L in 2019).

Streams with a Stormwater Vocation

The quality of the waters of Ruisseau Saint-James (+) improved somewhat but still remained in the "polluted" category. As was the case last year, a deterioration was observed between the stream's two monitoring stations, one located downstream from Autoroute 20 and the other at the entrance to Lac Saint-Louis, where the geometric mean of counts increased from 219 to 3466 COLI.

The waters of Ruisseau Meadowbrook (-) showed a deterioration and always seem affected by discharges of sanitary wastewater (five of seven COLI results> 2000 and seven of seven phosphorus results> 30 µg/L). The quality of the waters of Ruisseau Terra-Cotta (-) was considerably poorer in 2019, resulting in a downgrading to the "polluted" category owing to a greater bacterial contamination (four counts > 500 COLI) and greater phosphorus concentrations (average 60 µg/L). Also, an episode of suspended matter at the level of 94 µg/L was observed, the highest ever value over the 13 years that data has been collected. This is probably due to poor water management related to the work conducted on the huge stormwater system feeding the stream.

The waters of Ruisseau O'Connell (+) slightly improved, but remained in the "good" category, whereas those of Ruisseau Château-Pierrefonds (=) remained "polluted" due to the presence of sanitary wastewaters from the large stormwater system feeding the stream.

Streams Draining the Airport Zone

The quality of the waters of Fossé Smith (+) were upgraded to the "excellent" level. This ditch drains a significant portion of the stormwaters originating from the Montréal-Trudeau Airport. As far as Ruisseau Denis (+) is concerned, its water quality improved in 2019, from a rating of "polluted" to "fair". Particularly high concentrations of SM from the Pointe-Claire and Montréal-Trudeau Airport snow deposits continue to result in a deterioration of the stream's water quality.

Overall, the quality of the waters of Ruisseau Bouchard (=) remained stable this year. However, after examining each station, it is worthwhile mentioning that the water quality of three of the stream's seven stations deteriorated and that just one station, the one located most upstream and whose waters come from the airport, showed some improvement.


Ruisseau Bouchard

Inland Waters

The quality of the waters of Canal de Lachine (+), fed by the Fleuve St-Laurent, recorded an increase of their RUISSO Index while remaining in the "good" category. Just one value exceeded the 200 COLI criteria. However, a single occurrence of high copper concentrations was measured, possibly due to the important repair work done on the walls of the canal.

The waters of Lac aux Castors (Beaver Lake) (=) and of the Parc Angrignon (+) pond were once again categorized as being "good". As for the water quality of Lac Lacoursière (=), it remained stable, but an increase of just 2 points allowed it to be upgraded to the "excellent" category, also the case for the Parc Dr-Bernard-Paquet pond (=) which obtained an index of over 90 out of 100. These were the two water bodies that rated as the best quality water under the RUISSO program this year.

The quality of the waters of Lac de la Brunante (-), while declining by 11 points, remained "fair", while those of the Parc La Fontaine pond (+) were upgraded to "good" from "fair" owing to an increase of 7 points.

The waters of the Parc Centenaire William Cosgrove basin (-) were of lesser quality and were categorized as "poor". Finally, the waters of Ruisseau Provost (+) improved by 21 points and returned to the "good" category.

PLUVIO: More than Half of Ic corrected

The PLUVIO program was launched in 2007 to identify, locate and correct problems related to illicit connections (Ic) on the Montréal agglomeration territory.

The territory of Montréal has 585 stormwater networks. Of the 194 networks deemed problematic, because their outfall showed signs of contamination, detailed studies revealed that 83 were exempt from Ic.

In fact, the contamination of these networks was revealed to be of a diffuse or animal origin. However, all Ic were corrected in 17 networks. As for the remaining 94 problematic networks, our screening and correction efforts will continue over the next few years.

Status of stormwater networks in 2019		
Non problematic networks	391	
Problematic networks	194	
Details re. problematic networks		
No illicit connection (Ic)	83	100
Corrected	17	
Awaiting corrections	58	94
Awaiting screening or validation	36	
Total	**194**	

RSMA Studies in 2019

The RSMA validated sectors where no Ic had been confirmed and where corrections had been done by boroughs and reconstituted municipalities. 60 problematic sectors were thus identified in 25 stormwater systems. These were located in the boroughs of Anjou, L'Île-Bizard—Sainte-Geneviève, Pierrefonds-Roxboro and Rivière-des-Prairies—Pointe-aux-Trembles as well as in the municipalities of Côte Saint-Luc, Dollard-Des Ormeaux, Dorval, Montréal-Ouest, Pointe-Claire and Sainte-Anne-de-Bellevue.

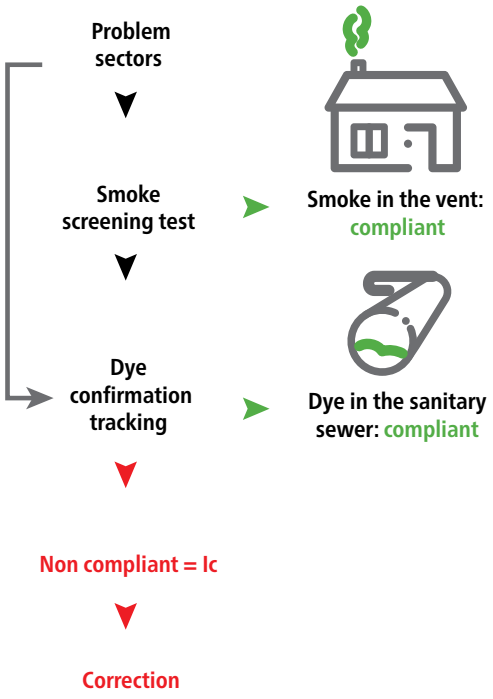
Once the study was completed, 37 problematic sectors were located. Their location was then communicated to local authorities in order for the buildings located in these sectors to be subjected to a detailed screening. As for the remaining 23 problematic sectors, they revealed themselves to be exempt of any signs of sanitary contamination.

Progression of the Correction of Ic (at December 31, 2019)			
	Cities	Boroughs	Total
Corrected Ic	300	277	577
Non corrected Ic	19	542	561
Confirmed Ic	319	819	1138

Progression of the PLUVIO Program

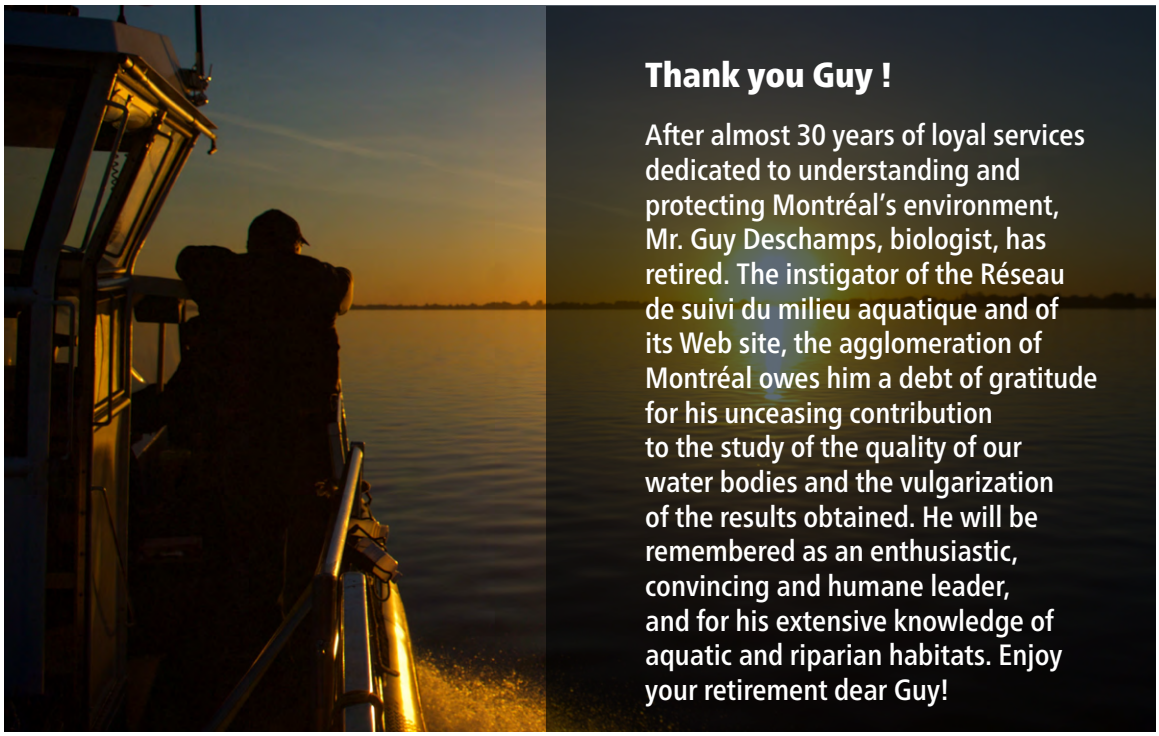
Since the inception of the PLUVIO program, more than 19,500 civic addresses have been identified and 93% of these were exempt of IC. To date, of the 1,138 confirmed Ic[1], 577 or 51% have been corrected.

Smoke and a dye to screen for Ic*



* An illicit connection (c) is a connection or defect that allows sanitary wastewaters to seep elsewhere than in a domestic or combined sewer network, for instance in a storm sewer network, on the ground, in a ditch or in a water body, with the exception of septic tanks.

1 The number of confirmed Ic changes according to the information sent by the related cities and boroughs following their verifications.



Thank you Guy !

After almost 30 years of loyal services dedicated to understanding and protecting Montréal's environment, Mr. Guy Deschamps, biologist, has retired. The instigator of the Réseau de suivi du milieu aquatique and of its Web site, the agglomeration of Montréal owes him a debt of gratitude for his unceasing contribution to the study of the quality of our water bodies and the vulgarization of the results obtained. He will be remembered as an enthusiastic, convincing and humane leader, and for his extensive knowledge of aquatic and riparian habitats. Enjoy your retirement dear Guy!

For further information

The reader is invited to consult the RSMA's Web site at **rsma.qc.ca** and Ville de Montréal's open data site at **donnees.ville.montreal.qc.ca**

Ville de Montréal

Production
Service de l'environnement
Division du contrôle des rejets et
suivi environnemental
Réseau de suivi du milieu aquatique

Information
environnement@ville.montreal.qc.ca

Photography
Réseau de suivi du milieu aquatique
Ville de Montréal

Graphic design
Service des communications

2nd quarter 2019
ISSN 1925-6582 (PDF)
Legal deposit –Bibliothèque et
Archives nationales du Québec, 2019