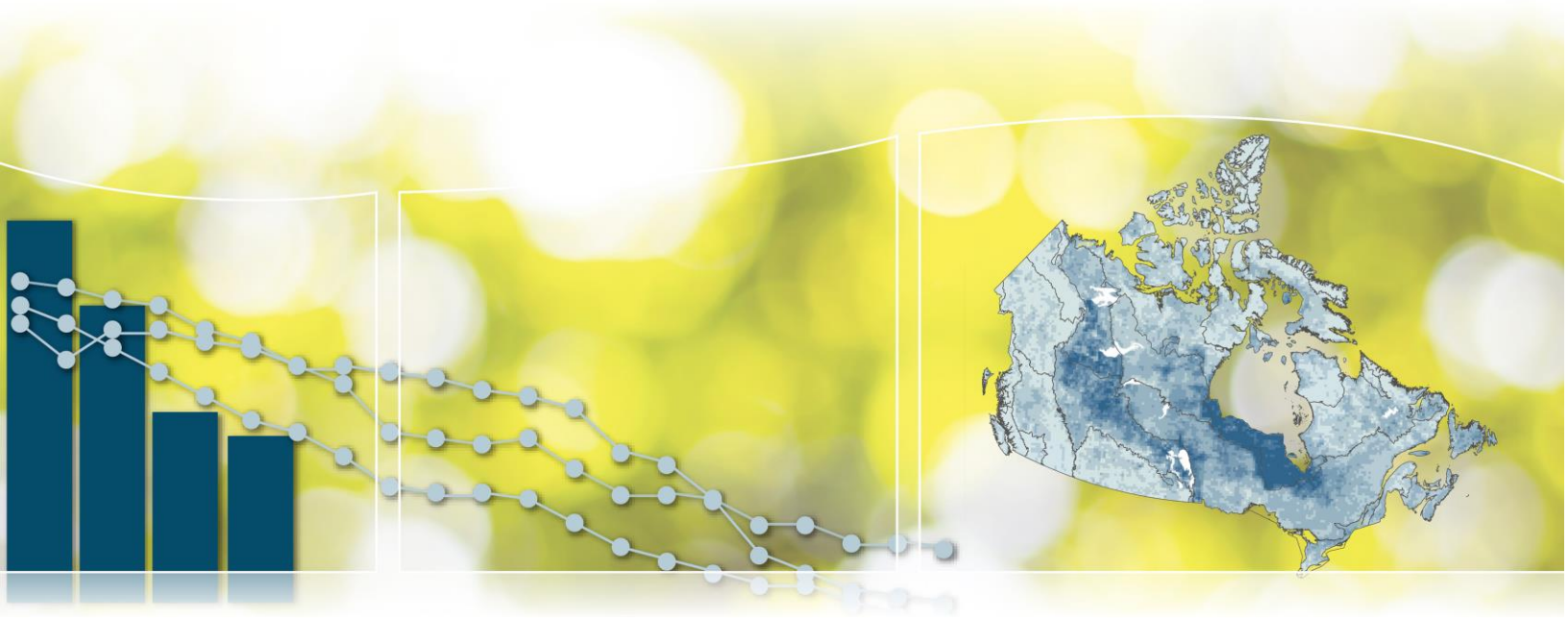
Environment and Climate Change Canada
Environnement et Changement climatique Canada

Canadian Environmental Sustainability Indicators

Shellfish harvest area quality



Canada

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Canadian Environmental Sustainability Indicators

Shellfish harvest area quality

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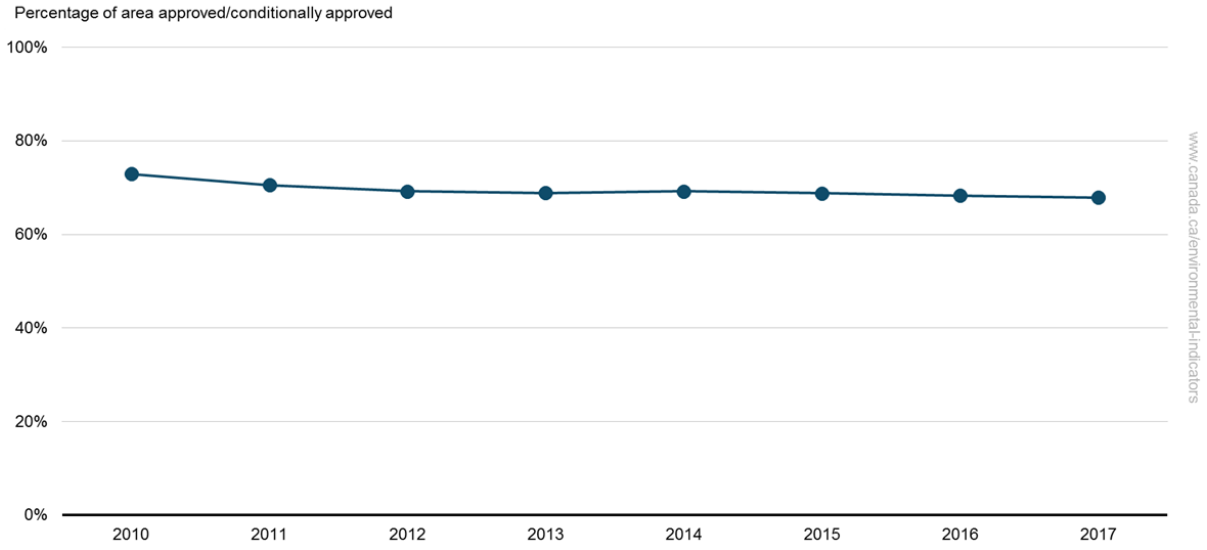
Shellfish harvest area quality

Shellfish are filter feeders that accumulate contaminants, such as bacteria or pollutants, from their surroundings. When contaminants have the potential to make shellfish unsafe to eat, harvest areas are closed to ensure food safety. The proportion of harvest area open is a partial measure of the quality of marine coastal water.

Key results

- In 2017, 68% of Canada's shellfish harvest area was classified as approved or conditionally approved for harvest for human consumption

Figure 1. Status of shellfish harvest areas, Canada, 2010 to 2017



Data for Figure 1

Note: Shellfish harvest area classifications are based in part on contamination by fecal coliform bacteria. These are microorganisms that originate from human and animal waste. Although shellfish harvest areas were classified prior to 2010, the earlier data were omitted due to subsequent changes in the way they were compiled.
Source: Environment and Climate Change Canada (2018) Shellfish Water Classification Program.

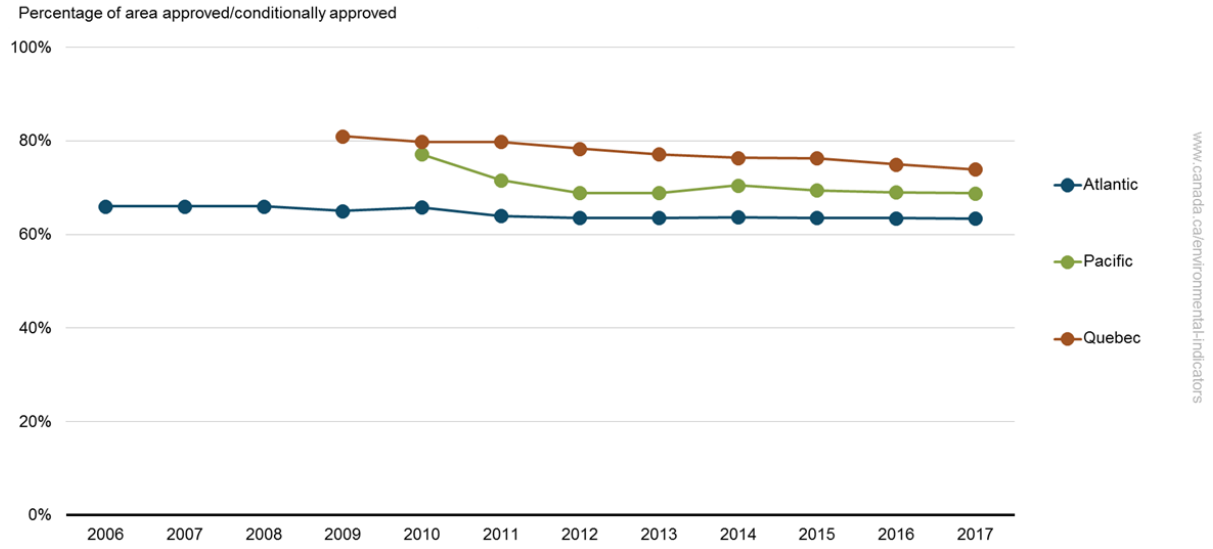
Shellfish can be harvested from approved areas with appropriate permits. If bacterial levels are high enough to create health concerns, areas may be restricted or prohibited. Shellfish harvested from restricted areas need to undergo a purification process before they can be safely consumed.

Regional shellfish harvest area quality

Key results

- On the Quebec coast, 74% of the shellfish harvest area was approved or conditionally approved, compared to 69% on the Pacific coast and 63% on the Atlantic coast
- The Quebec area open to harvest is slowly declining. Areas along the Atlantic and Pacific coasts appear to be relatively stable since 2012

Figure 2. Status of regional shellfish harvest areas, Canada, 2006 to 2017



Data for Figure 2

Note: Shellfish harvest area classifications are based in part on contamination by fecal coliform bacteria. These are microorganisms that originate from human and animal waste.
Source: Environment and Climate Change Canada (2018) Shellfish Water Classification Program.

Results reported in the Quebec and Pacific regions prior to 2009 and 2010 cannot be compared to those from subsequent years because:

- in 2009, the total shellfish area for Quebec increased significantly
- in 2010, changes were made to the classification methods in the Pacific

About the indicator

What the indicator measures

If unsafe bacterial levels are measured or if shoreline investigations show pollution concerns, Environment and Climate Change Canada makes classification recommendations to its Canadian Shellfish Sanitation Program partners. Fisheries and Oceans Canada opens or closes harvest areas based on those recommendations. The indicator tracks the proportion of harvest area that is open as a coarse measure of the quality of marine coastal water.

Why this indicator is important

The fecal coliform levels in marine waters of shellfish harvest areas are monitored to ensure that shellfish are safe for human consumption. The indicator reflects the quality of, and the extent of bacterial contamination in, marine coastal waters where shellfish are harvested.

Related indicators

The Monitoring disposal at sea indicator reports on the number of disposal sites that show no evidence of pollution in order to determine whether marine disposal site activities have an environmental impact.

The Marine pollution spills indicator reports on oil spills along Canada's coasts that are detected through surveilance. This type of marine pollution could affect shellfish growing areas.

Healthy coasts and oceans

This indicator supports the measurement of progress towards the following 2016–2019 Federal Sustainable Development Strategy long-term goal: State goal Coasts and oceans support healthy, resilient and productive ecosystems.

Data sources and methods

Data sources

Sampling and analysis for this indicator are conducted under Environment and Climate Change Canada's Shellfish Water Classification Program.

Data are available for all regions from 2006 to 2017. They represent the known shellfish harvest areas along the Atlantic, Quebec and Pacific coasts where harvesting is active, or prohibited due to poor water quality or nearby pollution sources. Earlier information is included where appropriate.

More information

Due to changes in the Shellfish Water Classification Program, Quebec data prior to 2009 and Pacific data prior to 2010 are not included.

As there were no significant changes to the Atlantic region, data is included from 2006.

Shellfish Water Classification Program

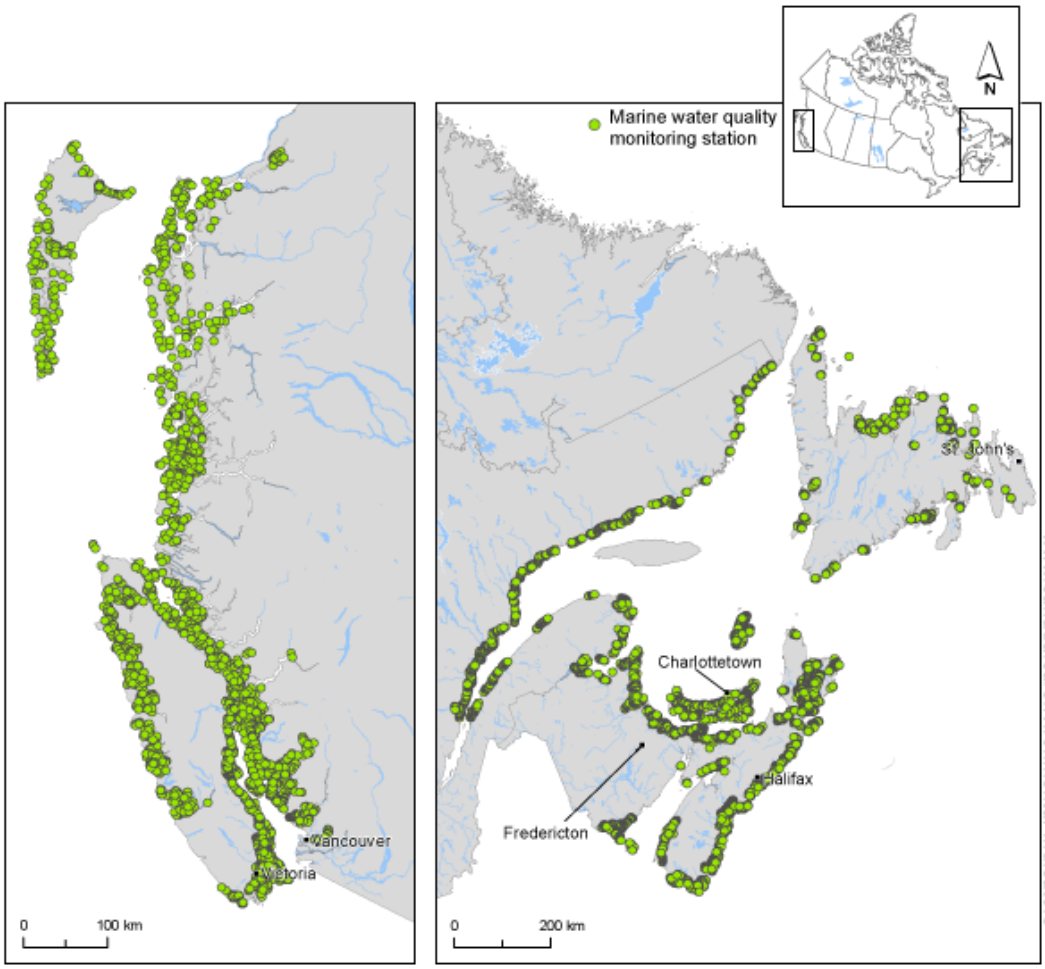
The Shellfish Water Classification Program is part of the Canadian Shellfish Sanitation Program, a food safety program led by the Canadian Food Inspection Agency in partnership with Environment and Climate Change Canada and Fisheries and Oceans Canada.

The Shellfish Water Classification Program collects information through site surveys and bacteriological monitoring. Sampling to monitor for fecal coliform bacteria is conducted throughout the year under different environmental conditions to ensure that microbiological contamination does not exceed the appropriate guidelines.

That information is the basis for the classification of each area.

Location of monitoring stations

Figure 3. Shellfish harvest area monitoring stations, Canada, 2006 to 2017



Source: Environment and Climate Change Canada (2011) Shellfish Water Classification Program.

Methods

The indicator is the proportion of shellfish harvest area that is classified as approved or conditionally approved for harvest. Unless the indicator suggests that there is a food safety risk, monitored harvest areas are generally approved for harvest.

More information

Site surveys

Site surveys are conducted for each area. They identify actual and potential sources of sanitary pollution and evaluate the meteorological and hydrographic factors that can affect the distribution of microbiological contamination.

Three (3) types of surveys are conducted:

- Comprehensive surveys are conducted when a new area is established and no historical data are available

- Annual review surveys are conducted for previously identified areas. This is to ensure that no significant change has occurred in the area and that the previous classification is still appropriate
- Re-evaluation surveys are conducted when significant changes are found in a previously identified area and a new classification is required

The surveys are paired with bacteriological monitoring and may include a shoreline sanitary investigation.

Bacteriological monitoring

Bacteriological monitoring is conducted to determine the extent of microbiological contamination in marine waters. It is conducted throughout the year and under various environmental conditions to ensure that seasonal factors are considered.

Based on the results, the classification of an area will be recommended by Environment and Climate Change Canada for regulatory implementation by Fisheries and Oceans Canada.

Table 1. Shellfish harvest area classifications

Classification	Definition	Guideline
Approved	Shellfish can be harvested from these areas for sale. The area is not contaminated with fecal material, pathogenic microorganisms, or poisonous or deleterious substances to the extent that consumption of the shellfish might be hazardous.	The median or geometric mean fecal coliform Most Probable Number (MPN) does not exceed 14/100 mL, and no more than 10% of samples exceed a fecal coliform MPN of 43/100 mL.
Conditionally approved	The area meets the approved classification criteria for a predictable period.	The site mostly meets the approved requirements, but fails to meet them at predictable or controllable times. When requirements are not met, the site is closed.
Restricted	Shellfish harvest in the area is prohibited, except by special permission requiring that the shellfish go through a purification process prior to sale.	The median or geometric mean fecal coliform MPN exceeds 14/100 mL, and more than 10% of samples exceed a fecal coliform MPN of 43/100 mL.
Conditionally restricted	The area meets, at a minimum, the restricted classification criteria for a predictable period. Harvest is prohibited when a conditionally restricted area is in the closed status.	The site meets the restricted criteria, at a minimum, at predictable or controllable times.
Prohibited	Shellfish are not to be harvested from prohibited areas for any purpose, with the exception of licensed and regulated harvest for seed, spat and bait and for scientific purposes.	The site is located near pollution sources and shellfish depuration cannot be performed adequately due to the degree of contamination.

For more information, visit Shellfish Area Survey and Classification.

Recent changes

In the previous version of this indicator, data from 2006 for the Quebec and Pacific regions were included. However, due to the addition of the Magdalen Islands in 2009 for Quebec and changes in the monitoring program in 2010 for Pacific, data from previous years were excluded in this update.

Caveats and limitations

This indicator looks at shellfish harvest area closures based on the measured concentrations and potential for microbiological contamination. It does not provide an analysis, nor does it account for chemical or biotoxin contamination.

Classification boundaries are defined with respect to a variety of factors. Therefore, they are frequently modified and small changes in the monitored area occur over time.

Areas may be classified as prohibited even if routine monitoring indicates that bacteria are at safe levels. That includes buffer zones around current and potential pollution sources and wharves as a precautionary measure.

Closure boundaries are drawn for enforcement purposes and may exceed the boundary of the potential pollution and often any shellfish resources within it.

Although Environment and Climate Change Canada assesses shellfish harvest areas to determine levels of microbiological contamination, those classifications do not reflect whether shellfish harvesting is authorized at a particular location. Areas classified as approved for harvesting may be closed temporarily due to significant weather events, sewage bypasses, or elevated biotoxin contamination as monitored by the Canadian Food Inspection Agency. For more information on the status of shellfish harvest areas, see Fisheries and Oceans Canada's Fishery Openings and Closures.

Resources

References

Canadian Food Inspection Agency (2012) Canadian Shellfish Sanitation Program – Manual of Operations. Retrieved on June 5, 2018.

Related information

Canadian Shellfish Sanitation Program

Fishery Openings and Closures

Monitoring Marine Water Quality

Annex

Annex A. Data tables for the figures presented in this document

Table A.1. Data for Figure 1. Status of shellfish harvest areas, Canada, 2010 to 2017

Year	Approved or conditionally approved shellfish harvest area (percentage)	Total harvest area (square kilometres)
2010	73	15 426
2011	71	14 625
2012	69	14 981
2013	69	15 026
2014	69	15 061
2015	69	14 920
2016	68	14 931
2017	68	14 885

Note: Shellfish harvest area classifications are based in part on contamination by fecal coliform bacteria. These are microorganisms that originate from human and animal waste. Although shellfish harvest areas were classified prior to 2010, the earlier data were omitted due to subsequent changes in the way they were compiled.
Source: Environment and Climate Change Canada (2018) Shellfish Water Classification Program.

Table A.2. Data for Figure 2. Status of regional shellfish harvest areas, Canada, 2006 to 2017

Year	Atlantic Approved or conditionally approved harvest area (percentage)	Atlantic Harvest area (square kilometres)	Quebec Approved or conditionally approved harvest area (percentage)	Quebec Harvest area (square kilometres)	Pacific Approved or conditionally approved harvest area (percentage)	Pacific Harvest area (square kilometres)
2006	66	6 461	n/a	n/a	n/a	n/a
2007	66	6 531	n/a	n/a	n/a	n/a
2008	66	6 534	n/a	n/a	n/a	n/a
2009	65	6 705	81	4 052	n/a	n/a
2010	66	6 683	80	4 120	77	4 263
2011	64	6 343	80	4 126	72	4 156
2012	64	6 424	78	4 144	69	4 413
2013	64	6 426	77	4 197	69	4 403

Year	Atlantic Approved or conditionally approved harvest area (percentage)	Atlantic Harvest area (square kilometres)	Quebec Approved or conditionally approved harvest area (percentage)	Quebec Harvest area (square kilometres)	Pacific Approved or conditionally approved harvest area (percentage)	Pacific Harvest area (square kilometres)
2014	64	6 433	76	4 197	71	4 431
2015	64	6 435	76	4 152	69	4 333
2016	63	6 441	75	4 211	69	4 279
2017	63	6 432	74	4 210	69	4 243

Note: Although shellfish harvest areas were classified in Quebec and Pacific prior to 2009 and 2010 respectively, due to changes in the methods of classifying and compiling total shellfish area, figures from before those years cannot be compared to later years and have been omitted from this report (indicated by “n/a”). Shellfish harvest area classifications are based in part on contamination by fecal coliform bacteria. These are microorganisms that originate from human and animal waste.
Source: Environment and Climate Change Canada (2018) Shellfish Water Classification Program.

Additional information can be obtained at:

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