

Canada's oceans and the economic contribution of marine sectors

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Release date: July 19, 2021



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Highlights

This article examines the economic contributions provided by Canada's marine sector, many of which depend on ocean ecosystems. The main findings include:

- Canada's coastal population—its population living within 10 km of the Pacific, Arctic or Atlantic coasts—was 4.8 million in 2016.
- Marine sectors in Canada make a significant contribution to provincial, regional and national economies. In 2018, activities linked to these sectors represented 1.6% of both Canada's total employment and gross domestic product (GDP) estimates. The contribution of marine sectors was particularly high in Newfoundland and Labrador (employment: 16.8%, GDP: 30.0%), Nova Scotia (employment: 13.3% and GDP: 13.5%), and Prince Edward Island (employment: 9.3%, GDP: 10.3%).
- The private sector was the main driver of the marine economy in 2018, accounting for 79.6% of total employment and 83.1% of total GDP contribution. Fishing and seafood, transportation, and oil and gas were the industries showing the largest economic contribution. The public sector, encompassing federal and provincial governments, universities, and environmental non-governmental organizations (ENGOS), accounted for the remaining 20.4% employment and 16.9% GDP impacts.
- The industries that generated the most employment in 2018 were transportation (23.0% of total employment), fishing and seafood (21.8%), and tourism and recreation (21.3%). The industries that generated the most GDP in 2018 were fishing and seafood (21.1% of total GDP), transportation (20.8%), and oil and gas (20.8%).
- Between 2014 and 2018, employment grew by 11.6% from 267,278 to 298,333 and GDP increased 12.3%, from \$32.1 billion in 2014 to \$36.1 billion in 2018. Employment in the manufacturing and construction and the transportation industries exhibited the strongest growth over the period, increasing by 21.9% and 20.9% respectively. In terms of GDP, the strongest growth was in the manufacturing and construction industry (39.4%), followed by fishing and seafood (32.2%), and tourism and recreation (29.1%). Among the major industry groupings, only offshore oil and gas posted a decline in GDP (of 21.5%), caused in large part by lower oil prices over the period.
- Measured as a share of total employment and GDP, the contribution of marine sectors to the Canadian economy remained relatively stable from 2014 to 2018. The share of employment increased slightly (6.5%) from 1.5% in 2014 to 1.6% in 2018, while the share of total GDP, meanwhile, remained stable at 1.6% in both years.
- To date, Canada has protected and conserved 795,000 km² of ocean, surpassing the international Aichi Biodiversity Target to conserve at least 10% of coastal and marine areas. However, climate change poses a particular challenge to Canada's ocean ecosystems. As ocean waters warm,¹ fish populations are expected to migrate northwards² and new spawning grounds may need protected status.

1. Greenan, B.J.W. et al., 2018, "Chapter 7: Changes in oceans surrounding Canada," *Canada's Changing Climate Report*, Bush and Lemmen (Eds.), Government of Canada, Ottawa, Ontario, p. 343-423.
 2. Morley, J. et al., 2018, "Projecting shifts in thermal habitat for 686 species on the North American continental shelf," *PLoS ONE*, 13(5): e0196127. <https://doi.org/10.1371/journal.pone.0196127> (accessed July 20, 2020).

Introduction

Activities dependent on the ocean make a substantial contribution to the Canadian economy. Fisheries and naval installations provided a rationale for the first European settlement. Fish processing, shipbuilding, and marine transportation followed, providing a basis for economic development and growth on all three of Canada's coasts. These ocean activities defined settlement patterns that continue to this day.

New marine economic activities emerged over the years including tourism, aquaculture, bio-technologies, specialized manufacturing, and offshore oil and gas exploration and development. A wide range of service industries support these activities. Together, they create substantial opportunities as well as challenges, emerging from increased and oftentimes competing uses of ocean space, including the need to protect and conserve Canada's ecosystems and biodiversity.

What you should know about this study

This article provides estimates of the economic contribution of marine sectors in Canada and describes some of the environmental challenges faced by these sectors.

The article is based in part on a report prepared for Fisheries and Oceans Canada by Gardner Pinfeld, "Economic Impact of Marine Related Activities in Canada." This information is also available in the [Marine sectors in Canada summary tables](https://www.dfo-mpo.gc.ca/stats/maritime-eng.htm) (https://www.dfo-mpo.gc.ca/stats/maritime-eng.htm).

Economic estimates are for the years 2014 to 2018, the most recent years for which source data is available.³ These estimates cover all major private sector industries with a direct dependence on the oceans (extractive and non-extractive uses), as well as activities of public sector⁴ organizations with responsibilities for safety, managing ocean activities and research.

Statistics Canada's Inter-provincial Input-Output Model (IO model)⁵ was used to estimate the economic contribution of marine industries to the Canadian economy as measured by gross domestic product (GDP) and employment. This enables a meaningful comparison across industries and geographies.

The selection of marine industries was based on previous work by Gardner Pinfeld.⁶ Gross value of output and/or expenditures data were collected for each marine industry, to which the corresponding IO multipliers were applied.⁷ An exception to this approach was made for marine tourism and recreation, National Defence, and Fisheries and Oceans, where commodity-level expenditures were provided to Statistics Canada for a customized run of the IO model to obtain the related economic impact.

GDP impacts represent an industry's contribution to Canada's GDP. More specifically, the GDP of an industry consists of the value it adds to production of output by applying labour and capital to purchased inputs. GDP is calculated by subtracting from total revenues (or output) of a given industry, the costs of material, energy, and purchased services (e.g. accounting and legal services retained from outside the given industry).

Employment is measured in terms of total number of full-time, part-time and seasonal jobs.

3. The 2018 data presented in this report are preliminary and are subject to revision once updated data sources become available. Estimates of economic impact for the year 2018 relied on the 2017 version of Statistics Canada's IO model. The data source for industry output for several industries—Statistics Canada's *Table 36-10-0488-01, Output, by sector and industry, provincial and territorial*—was only available until 2017 and other sources of data were used to estimate changes in output between 2017 and 2018 (see Annex A).

4. The public sector category here includes federal and provincial governments, universities, and environmental non-governmental organizations.

5. Statistics Canada, 2019, *Input-Output Model Simulations (Interprovincial Model)*, <https://www150.statcan.gc.ca/n1/en/catalogue/36230002> (accessed April 7, 2021).

6. Gardner Pinfeld, 2009, "Economic Impact of Marine Related Activities in Canada," *Statistical and Economic Analysis Series*, Publication 1-1, Fisheries and Oceans Canada, Economic Analysis and Statistics Branch.

7. Statistics Canada, *Table 36-10-0595-01 Input-output multipliers, provincial and territorial*, detail level, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610059501> (accessed April 7, 2021). Note that for the year 2018, the 2017 IO multipliers were applied.

Economic impacts are driven by direct, indirect and induced demand, expressed in terms of industry and consumer purchases of goods and services. The sum of impacts flowing from each level of demand gives the overall economic impact of marine sectors in Canada:

- Direct impacts are generated by direct demand for the products and services produced and sold by the marine industries included in this study. These marine industries directly add value to the goods and services purchased to produce their outputs. For example, the fishing industry adds value to the vessel, nets and traps and other supplies it purchases from manufacturers, by harvesting and selling fish; the shipping industry adds value to the ships, fuel and other supplies, by providing marine transportation services
- Indirect impacts are concerned with the indirect demand created by the marine industries for goods and services in other industries. For example, commercial fishing enterprises buy fishing gear from manufacturers, who in turn buy necessary raw material from other manufacturers and suppliers; oil and gas companies buy services from maintenance contractors, who in turn purchase tools and materials from other businesses. These industries in turn buy more basic goods and services, and so on.
- Induced impacts are generated on account of the demand created in the broader economy through consumer spending of incomes earned by those employed in direct and indirect industries and activities. It may take a year or more for these rounds of consumer spending to work their way through an economy.

When two marine industries are linked by a supply chain, such as commercial fishing and fish and seafood processing or marine transportation and support activities for marine transportation, there is a risk of double counting economic impacts, as one industry generates demand for the outputs of the linked industry. For example, fish and seafood processing generates demand for the outputs of the commercial fishing industry, causing the indirect impacts of the fish and seafood processing industry to double count at least a portion of the direct and indirect impacts corresponding to the commercial fishing industry.

The existence of double counting between marine industries was assessed using the IO Supply and Use Tables.⁸ Double counting of economic impacts between commercial fishing and fish and seafood processing in the seafood sector, and between marine transportation and support activities for marine transportation in the transportation sector were removed in proportion to their respective IO linkages.

Measuring the economic contribution of marine sectors presents many challenges. The standard classification of industries (NAICS – North American Industry Classification System) does not separate out the marine component for many industries, such as tourism. In such cases, the marine component was extracted by focusing on coastal provinces and territories, which could result in some inaccuracies. Suppressed data due to confidentiality constraints was remedied by employing reasonable proxies to distribute national estimates among provinces and territories or by applying annual growth rates. The latter were also used in cases where data was not readily available or had been discontinued.

8. Statistics Canada, Table 36-10-0478-01 *Supply and use tables, detail level, provincial and territorial*. <https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3610047801> (accessed April 7, 2020).

A coastal Canada

Canada has the longest coastline in the world and its exclusive economic zone (EEZ) extends across 5.75 million km² of the Pacific, Arctic and Atlantic oceans. In 2016, 4.8 million Canadians, 13.5% of the population, lived within 10 km of the coast and a further 4.0% lived within 100 km of the coast (Table 1). The coastal share of population was highest in Prince Edward Island, Nunavut, Newfoundland and Labrador and Nova Scotia.

People living near the coast are most able to benefit from the ocean and its resources, through employment and participation in recreational activities. However, they, and many others, enjoy the ecosystem services provided by the ocean including fish and seafood, climate regulation, carbon storage services, as well as opportunities for tourism and recreation.

Table 1
Canada's coast and coastal population by province and territory, 2016

	Coastline	Total population	Population within 10 km of coast	Share of population within 10 km of coast	Population within 100 km of coast	Share of population within 100 km of coast
	km	number	number	percentage	number	percentage
Canada	247,007	35,151,728	4,755,541	13.5	6,150,316	17.5
Newfoundland and Labrador	25,940	519,716	454,093	87.4	509,715	98.1
Prince Edward Island	1,371	142,907	138,142	96.7	142,907	100.0
Nova Scotia	8,122	923,598	754,012	81.6	923,598	100.0
New Brunswick	2,732	747,101	242,035	32.4	677,380	90.7
Quebec	15,699	8,164,361	147,138	1.8	174,903	2.1
Ontario	1,406	13,448,494	2,474	0.0	7,939	0.1
Manitoba	974	1,278,365	920	0.1	990	0.1
Saskatchewan	0	1,098,352	0	0.0	0	0.0
Alberta	0	4,067,175	0	0.0	0	0.0
British Columbia	26,507	4,648,055	2,981,321	64.1	3,673,448	79.0
Yukon	540	35,874	0	0.0	0	0.0
Northwest Territories	19,026	41,786	1,655	4.0	5,498	13.2
Nunavut	144,689	35,944	33,750	93.9	33,938	94.4

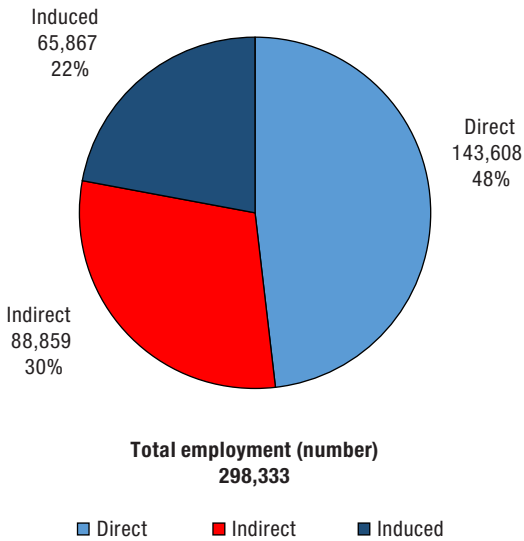
Note: Coastline length varies depending on the scale at which the data were compiled and will differ from previously published values. Coastlines extend along the west, north and east coasts of Canada, ending in the Gulf of St. Lawrence at Pointe-des-Monts and exclude islands under 1 km². Coastal populations were calculated using area-weighted dissemination block population data.

Source: Statistics Canada, 2017, *Boundary Files, Census Year 2016*, Catalogue no. 92-160-X, <https://www12.statcan.gc.ca/census-recensement/2011/geo/bound-limit/bound-limit-2016-eng.cfm> (accessed April 15, 2020); Statistics Canada, Census of Population, 2016, special tabulation.

Economic contribution of marine sectors

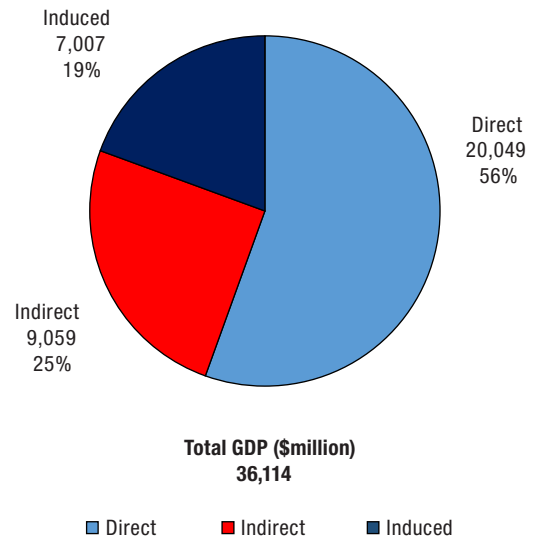
In 2018, marine sectors in Canada generated 298,333 jobs and contributed \$36.1 billion in GDP to Canada's economy (Charts 1 and 2). A significant proportion of the employment and GDP was created in industries that are directly dedicated to the use or extraction of marine resources in Canada (direct impacts): 143,608 jobs and \$20.0 billion in GDP. An additional 88,859 jobs and \$9.1 billion in GDP were created in upstream industries that supply those directly involved in using and extracting marine resources (indirect impacts). Induced impacts, those corresponding to economic activity triggered by the expenditure of labour incomes generated by marine industries, contributed to creating 65,867 jobs and \$7.0 billion in GDP.

Chart 1
Marine sector direct, indirect and induced employment, 2018



Sources: Fisheries and Oceans Canada based on Statistics Canada 2017 Input-Output multipliers and industry gross output, except for Marine tourism and recreation, Fisheries and Oceans Canada and National Defence, which were based on a customized Statistics Canada IO model run (see Annex A for data sources by industry).

Chart 2
Marine sector direct, indirect and induced GDP, 2018

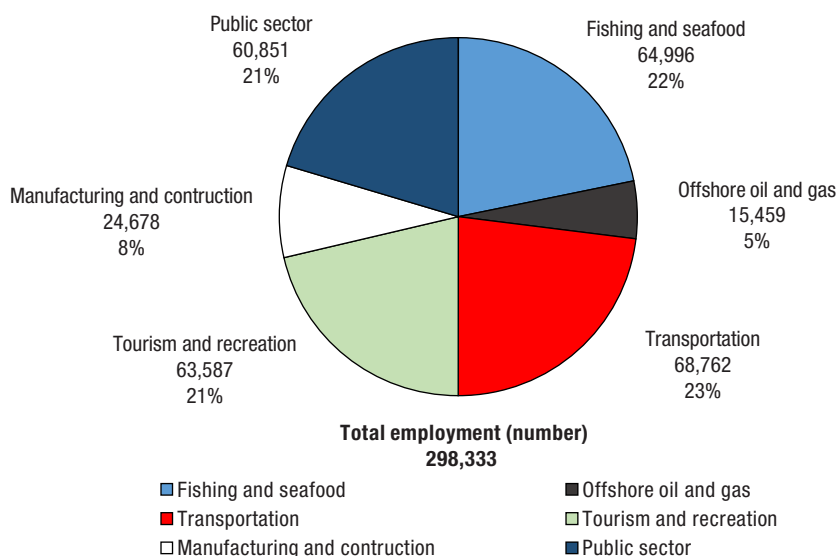


Sources: Fisheries and Oceans Canada based on Statistics Canada 2017 Input-Output multipliers and industry gross output, except for Marine tourism and recreation, Fisheries and Oceans Canada and National Defence, which were based on a customized Statistics Canada IO model run (see Annex A for data sources by industry).

Charts 3 and 4 provide breakdowns of total marine sector employment and GDP into its component industries. The economic activity of marine sectors was led by private sector industries, which contributed 79.6% of jobs (237,482) and 83.1% of GDP (\$30.0 billion). The industries that generated the most employment were transportation (68,762), fishing and seafood (64,996), and tourism and recreation (63,587). The industries that generated the most GDP were fishing and seafood (\$7.6 billion), oil and gas (\$7.5 billion), and transportation (\$7.5 billion).

Canada's public sector⁹ contributed the remaining 20.4% of employment (60,851) and 16.9% of GDP (\$6.1 billion, Chart 4). The federal departments of National Defence and Fisheries and Oceans Canada (including the Canadian Coast Guard) contributed most of the jobs (26,054 and 21,476 respectively) and of the GDP (\$2.6 billion and \$2.2 billion respectively) generated by the public sector ([Annex Tables 1 and 2](#)).

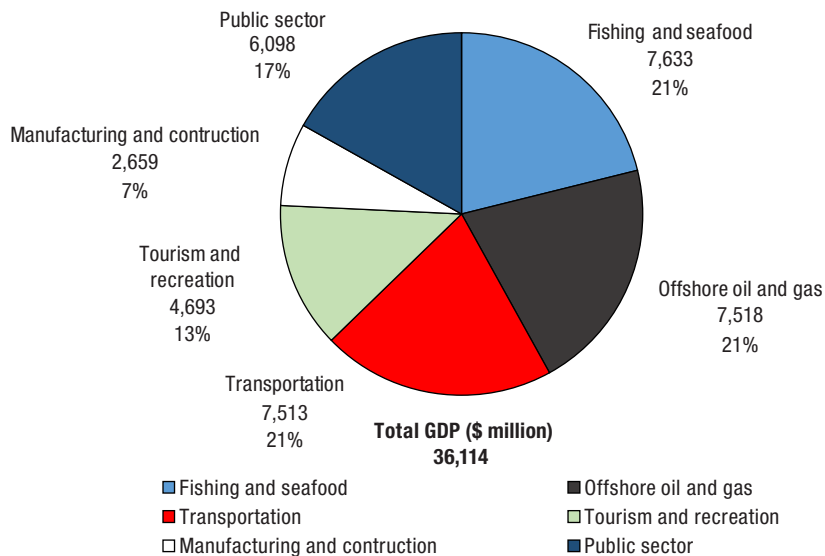
Chart 3
Marine sector total employment by activity, 2018



Sources: Fisheries and Oceans Canada based on Statistics Canada 2017 Input-Output multipliers and industry gross output, except for three industries: Marine Tourism & Recreation, Fisheries and Oceans Canada, and National Defence; based on a customized Statistics Canada IO model run for three of the underlying industries (see Annex A for data sources by industry).

9. The public sector category here includes federal and provincial governments, universities, and environmental non-governmental organizations.

Chart 4
Marine sector total GDP by activity, 2018



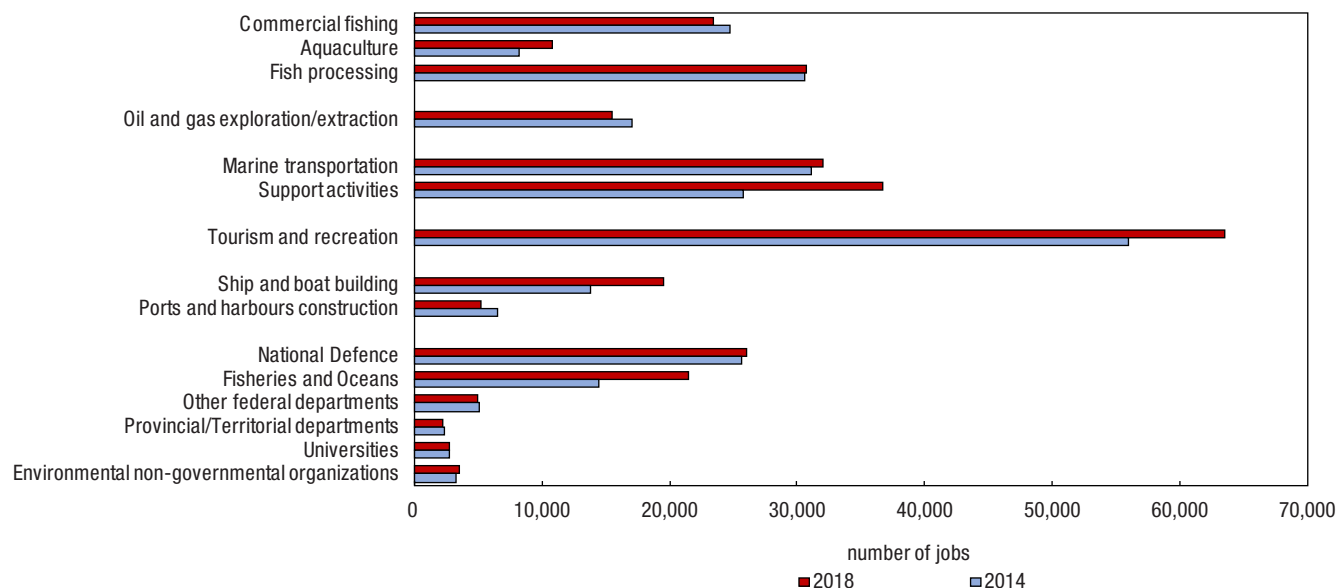
Sources: Fisheries and Oceans Canada based on Statistics Canada 2017 Input-Output multipliers and industry gross output, except for three industries: Marine Tourism & Recreation, Fisheries and Oceans Canada, and National Defence; based on a customized Statistics Canada IO model run for three of the underlying industries (see Annex A for data sources by industry).

The overall contribution of marine sectors to the Canadian economy represented 1.6% of national employment and GDP ([Annex Tables 3 and 4](#)). The influence and significance of marine sectors on the economy of coastal provinces and territories is much larger, particularly in Atlantic Canada where marine sectors accounted for substantial shares of total provincial employment in Newfoundland and Labrador (16.8%), Nova Scotia (13.3%), and Prince Edward Island (9.3%). The contribution of marine sectors to total provincial GDP was also particularly high in Newfoundland and Labrador (30.0%), Nova Scotia (13.5%), and Prince Edward Island (10.3%). Overall, marine sectors contributed 3.8% of Canada's marine regions' employment and 4.1% of the country's marine regions' GDP ([Annex Tables 3 and 4](#)).

Between 2014 and 2018, employment grew by 11.6% from 267,278 to 298,333 ([Annex Table 5](#), Chart 5), compared to an increase in GDP of 12.3%, from \$32.1 billion in 2014 to \$36.1 billion in 2018 ([Annex Table 6](#)). The manufacturing and construction and the transportation industries exhibited the strongest employment growth over the period, increasing by 21.9% and 20.9% respectively. In terms of GDP, the strongest growth was in the manufacturing and construction industry (39.4%), followed by fishing and seafood (32.2%), and tourism and recreation (29.1%). Among the major industry groupings, only offshore oil and gas posted a decline in GDP (-21.5%). This substantial decline in GDP was caused in part by a significant drop (-28.3%) in oil prices, from an average of US\$99.02 in 2014 to \$US 71.06 in 2018.¹⁰

10. U.S. Energy Information Administration, 2019, [Europe Brent Spot Price FOB](https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RBRT&f=M), <https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RBRT&f=M> (accessed April 8, 2021).

Chart 5
Total employment by industry, 2014 and 2018



Sources: Fisheries and Oceans Canada based on Statistics Canada 2014 and 2017 Input-Output multipliers and industry gross output, except for marine tourism and recreation, Fisheries and Oceans Canada and National Defence, which were based on a customized Statistics Canada IO model run (see Annex A for data sources by industry).

Measured as a share of total employment and GDP, the contribution of marine sectors to the Canadian economy remained relatively stable from 2014 to 2018. The share of employment increased slightly (6.5%) from 1.5% in 2014 to 1.6% in 2018, while the share of total GDP, meanwhile, remained stable at 1.6% in both years. The main driver of this trend was the offshore oil and gas sector, which experienced a substantial drop in GDP, while employment dropped to a lesser extent.

Ocean ecosystems

In addition to the economic contributions provided by the marine sector, consideration must be given to the importance of protecting the ocean environment and biodiversity.

In 2010, Canada agreed to meet 20 global biodiversity targets by 2020, including Aichi Target 11, to conserve at least 10% of coastal and marine areas¹¹ and has now set a target of reaching 30% by 2030.¹² Protecting Canada's ocean territory will contribute to species resilience and will help support sustainable industries and coastal communities and adaptation to future pressures.¹³

In 2019, 13.8% or 795,000 km² of Canada's marine areas was conserved through a variety of measures including marine protected areas (6.1%), other effective marine conserved areas (4.9%), national marine conservation areas (2.0%) and national parks (0.2%) (Table 2).¹⁴ The newest addition, Tuvaijuituk Marine Protected Area, is also the largest, covering 319,411 km² of the Arctic Ocean off the coast of Ellesmere Island.

11. Fisheries and Oceans Canada, 2018, [Oceans collaboration](https://www.dfo-mpo.gc.ca/oceans/collaboration/international-eng.html), <https://www.dfo-mpo.gc.ca/oceans/collaboration/international-eng.html> (accessed March 23, 2020).
 12. Fisheries and Oceans Canada, 2020, [Canada joins Global Ocean Alliance: Advocates for protecting 30 per cent of the world's ocean by 2030](https://www.canada.ca/en/fisheries-oceans/news/2020/07/canada-joins-global-ocean-alliance-advocates-for-protecting-30-per-cent-of-the-worlds-ocean-by-2030.html), News release, July 9, 2020, <https://www.canada.ca/en/fisheries-oceans/news/2020/07/canada-joins-global-ocean-alliance-advocates-for-protecting-30-per-cent-of-the-worlds-ocean-by-2030.html> (accessed July 21, 2020).
 13. Fisheries and Oceans Canada, 2020, [About Marine Protected Areas](https://www.dfo-mpo.gc.ca/oceans/mpa-zpm/info-eng.html), <https://www.dfo-mpo.gc.ca/oceans/mpa-zpm/info-eng.html> (accessed July 21, 2020).
 14. Fisheries and Oceans Canada, 2019, [Canada's marine protected and conserved areas](https://www.dfo-mpo.gc.ca/oceans/conservation/areas-zones/index-eng.html), <https://www.dfo-mpo.gc.ca/oceans/conservation/areas-zones/index-eng.html> (accessed March 16, 2020).

Table 2
Marine protected and conserved areas, 2019

Type	Share of protected area within the exclusive economic zone	
	Area km ²	percent
Total	795,000	13.8
Total Environment and Climate Change Canada sites	31,193	0.5
National wildlife area	17,214	0.3
Migratory bird sanctuary	13,979	0.2
Total Fisheries and Oceans Canada sites	634,643	11.0
Marine protected area	351,517	6.1
Marine refuge	283,231	4.9
Total Parks Canada sites	122,090	2.1
Canadian landmark	5	0.0
National marine conservation area	113,088	2.0
National park	8,998	0.2
Total provincial sites	10,271	0.2
British Columbia	4,648	0.1
Manitoba	80	0.0
Quebec	5,375	0.1
Atlantic provinces	168	0.0
Other	8	0.0
Overlap	3,205	0.1

Note: This table includes only the marine portion of protected and conserved areas with both terrestrial and marine regions. The subtotals have been adjusted to remove overlap and thus will not necessarily be equal to the sum of the parts. Each line item has also had its internal overlaps removed.

Source: Environment and Climate Change Canada, 2019, *Canadian Protected and Conserved Areas Database*, December 2019, <https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/protected-conserved-areas-database.html> (accessed March 15, 2020).

Climate change poses a particular challenge to Canada's ocean ecosystems. As ocean waters warm,¹⁵ fish populations are expected to migrate northwards¹⁶ and new spawning grounds may need protected status. The abundance and mix of species is expected to change, affecting fisheries. Canadian waters are also experiencing changes in ocean chemistry. The ocean has absorbed more than a quarter of the carbon dioxide produced by human activities, increasing the acidity of ocean water.¹⁷ This increased acidity corrodes the shells and exoskeletons of molluscs and crustaceans, may impact mortality rates of young fish, and may increase the impact of harmful algal blooms.¹⁸

Climate change will potentially also result in increased storm events and larger waves, impacting many marine industries. Arctic waters in particular are experiencing larger waves as sea ice melts which in turn is helping to speed up the retreat of sea ice.¹⁹

15. Greenan, B.J.W. et al. 2018.

16. Morley, J. et al. 2018.

17. Greenan, B.J.W. et al. 2018.

18. Haigh, R. et al., 2015, "Effects of ocean acidification on temperate coastal marine ecosystems and fisheries in the north east Pacific," *PLoS ONE*, 10(2): e0117533. <https://doi.org/10.1371/journal.pone.0117533> (accessed July 20th, 2020)

19. Greenan, B.J.W. et al. 2018.

Annex A: Data sources

Fishing and seafood

Commercial fishing:

Atlantic and Pacific Regions: [Fisheries and Oceans Canada \(DFO\), commercial sea fisheries landings, Canada Provincial - Values](http://www.dfo-mpo.gc.ca/stats/commercial/sea-maritimes-eng.htm), <http://www.dfo-mpo.gc.ca/stats/commercial/sea-maritimes-eng.htm>.

Arctic Region: [Pacific Region Integrated Fisheries Management Plans](http://www.pac.dfo-mpo.gc.ca/fm-gp/ifmp-eng.html) (<http://www.pac.dfo-mpo.gc.ca/fm-gp/ifmp-eng.html>) and DFO Central and Arctic region internal catch data.

Aquaculture: Statistics Canada Table 36-10-0488-01, Output, by sector and industry, provincial and territorial, Aquaculture [BS112500]. 2018 extrapolated from 2017 using Statistics Canada Table 3210010801, Aquaculture economic statistics, value added account, gross output.

Fish processing: Statistics Canada Table 36-10-0488-01, Output, by sector and industry, provincial and territorial, [BS311700], seafood preparation and packaging, 2018 extrapolated from 2017 using Statistics Canada Table 36-10-0402-01, Gross domestic product (GDP) at basic prices, by industry, provinces and territories, adjusted using Statistics Canada Table 18-10-0030-01, Industrial product price index, by product, NAPCS 171.

Offshore oil and gas

Oil and gas exploration/extraction: Statistics Canada Table 36-10-0488-01, Output, by sector and industry, provincial and territorial, [BS21100], oil and gas extraction, 2018 extrapolated from 2017 using Statistics Canada Table 36-10-0402-01 (Gross domestic product (GDP) at basic prices, by industry, provinces and territories) adjusted using Statistics Canada Table 18-10-0268-01 (Raw materials price index), NAPCS14111 for crude oil and NAPCS 142 for natural gas.

Transportation

Marine transportation: Statistics Canada Table 36-10-0488-01, Output, by sector and industry, provincial and territorial, Water transportation [BS483000]. 2018 extrapolated from 2017 using Statistics Canada Table 36-10-0402-01, Gross domestic product (GDP) at basic prices, by industry, provinces and territories; adjusted using Statistics Canada Table 18-10-0005-01 Consumer Price Index, annual average, not seasonally adjusted, Services

Support activities: Statistics Canada, Table 36-10-0478-01 Supply and use tables, detail level, provincial and territorial, Water transportation support, maintenance and repair services [MPS488004] products supplied by Support activities for transportation [BS488000] industry at basic prices. 2018 extrapolated from 2017 using Marine transportation growth rate.

Tourism and recreation

Recreational fishing: [Fisheries and Oceans Canada 2015 Survey of Recreational Fishing data on expenditures](http://www.dfo-mpo.gc.ca/stats/recreational-eng.htm), <http://www.dfo-mpo.gc.ca/stats/recreational-eng.htm>, adjusted for saltwater expenditures only, and extrapolated forward using average growth rate.

Recreational boating: 2016 estimates on expenditures by type taking from 2018 National Marine Manufacturer Association (NMMA) Canadian Recreational Boating Statistical Abstract. Values back casted and extrapolated using new boat sales.

Cruise ships: 2012 and 2016 Business Research and Economic Advisors (BREA) reports: "The Economic Contribution of the International Cruise Industry in Canada" (interpolated for 2013 to 2015), total annual expenditures. Values for 2017 and 2018 extrapolated using number of cruise visitors sourced from Transport Canada annual reports and provincial government tourism ministries.

Coastal tourism: 2006 coastal tourism spending (calculated by Gardner Pinfold) extrapolated using reallocated expenditures by province/territory from Statistics Canada Table 24-10-0013-01 (2006-2010) and Table 24-10-0027-01 (2011-2017) and Table 24-10-0045-01 (2018).

Manufacturing and construction

Shipbuilding and boat building: Statistics Canada Table 36-10-0488-01, Output, by sector and industry, provincial and territorial, Ship and boat building [BS336600]. 2018 extrapolated from 2017 using Statistics Canada Table 36-10-0402-01, Gross domestic product (GDP) at basic prices, by industry, provinces and territories, Ship and boat building [3366]; adjusted using Table 1810003001, Industrial product price index, by product, monthly, Ships [44111] and Boats and personal watercraft [44211].

Ports and harbours construction:

Atlantic and Pacific Regions:

- Transport Canada, Transportation in Canada, Canada Port Authorities (CPA) Financial Profiles, Acquisition of Capital Assets
- Department of National Defence (DND) Estimated Expenditures by Electoral District and Province, Capital Investment
- [Capital Expenditures for Marine Atlantic](https://www.marineatlantic.ca/en/about-us/corporate-information/Reports/) (<https://www.marineatlantic.ca/en/about-us/corporate-information/Reports/>) and [BC Ferries](http://www.bcferries.com/our-company/investor-relations/) (<http://www.bcferries.com/our-company/investor-relations/>)

Arctic Region: Statistics Canada Table 34-10-0063-01, Capital expenditures, non-residential tangible assets, by type of asset and geography, plus Pangnirtung harbour expenditures (DFO internal data).

Public sector, universities and environmental non-governmental organizations

Department of National Defence (DND): Data on defence services operations and maintenance (O&M) and capital expenditures for coastal provinces and territories were obtained from DND. The data was derived from DND Estimated Expenditures by Electoral District and Province.

Fisheries and Oceans Canada (DFO): Expenditures were obtained by using DFO expenditures data sourced from the internally available Multi Year Financial Planning System.

Other federal departments: Total spending on marine-related activities from Departmental Performance Reports and Reports on Plans and Priorities for Canadian Food Inspection Agency (CFIA), Environment and Climate Change Canada (ECCC), Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), Parks Canada (PCA), and Transport Canada (TC).

Provincial/territorial government departments: Provincial and territorial expenditures associated with the ocean economy were obtained from the Main Estimates and Public Accounts for each respective province and territory. An effort was made to exclude data otherwise counted in the National Accounts including ferry transportation, services to water transportation and marine-related construction.

Universities: Estimates of university ocean-related expenditures are based on a two-stage approach. The first stage is compiling all ocean-related grants from the Natural Sciences and Engineering Research Council of Canada (NSERC) and the federal Council for Innovation (CFI). In the case of the Territories, as there are no universities located there, they are allocated a portion of any grant relating to the Arctic Ocean. The second stage involved grossing up estimated annual expenditures for coastal universities (based on marine expenditures estimated from university budgets) using the increase in total university budgets from the Canadian Association of University Business Officers (CAUBO).

Environmental non-governmental organizations (ENGOS): 2008 expenditures (calculated by Acton White) grossed up using the growth rate of financial data of representative ENGOS (taken from the CRA Registered Charity Information Return).

Annex B: Summary tables

Table A.1
Canadian marine sector direct, indirect and induced employment, 2018

Industry	2018 ^p			Total
	Direct	Indirect	Induced	
	number of jobs			
Private sector	113,676	74,995	48,810	237,482
Fishing and seafood	31,671	21,288	12,037	64,996
Commercial fishing	11,431	7,600	4,388	23,420
Aquaculture	3,750	5,140	1,973	10,863
Fish processing	16,489	8,548	5,676	30,713
Offshore oil and gas	2,277	8,756	4,426	15,459
Transportation	29,491	22,708	16,563	68,762
Marine transportation	13,390	10,446	8,222	32,058
Support activities	16,102	12,262	8,341	36,704
Tourism and recreation	39,405	14,299	9,884	63,587
Manufacturing and construction	10,832	7,944	5,901	24,678
Ship and boat building	8,250	6,537	4,715	19,502
Ports and harbours construction	2,582	1,407	1,186	5,176
Public sector, universities and environmental non-governmental organizations (ENGOS)	29,931	13,863	17,057	60,851
National Defence	14,810	3,082	8,162	26,054
Fisheries and Oceans	8,214	7,349	5,914	21,476
Other federal departments	2,189	1,393	1,367	4,949
Provincial/Territorial Departments	872	844	486	2,201
Universities	1,826	324	538	2,687
ENGOS	2,021	872	591	3,483
Total	143,608	88,859	65,867	298,333

p: preliminary

Note: Total figures may not add up due to rounding.**Source:** Fisheries and Oceans Canada based on Statistics Canada 2017 Input-Output multipliers and industry gross output, except for Marine tourism and recreation, Fisheries and Oceans Canada and National Defence, which were based on a customized Statistics Canada IO model run (see Annex A for data sources by industry).

Table A.2
Marine sector direct, indirect and induced gross domestic product, 2018

Industry	2018 ^p			Total
	Direct	Indirect	Induced	
	\$ million			
Private sector	16,985	7,840	5,190	30,016
Fishing and seafood	4,198	2,243	1,192	7,633
Commercial fishing	2,275	729	451	3,455
Aquaculture	687	510	215	1,412
Fish processing	1,236	1,004	526	2,765
Offshore oil and gas	6,021	1,021	476	7,518
Transportation	3,341	2,362	1,810	7,513
Marine transportation	1,584	1,194	901	3,679
Support activities	1,757	1,168	909	3,835
Tourism and recreation	2,196	1,412	1,085	4,693
Manufacturing and construction	1,230	803	627	2,659
Ship and boat building	979	643	500	2,123
Ports and harbours construction	250	160	126	537
Public sector, universities and environmental non-governmental organizations (ENGOS)	3,063	1,218	1,816	6,098
National Defence	1,458	287	866	2,611
Fisheries and Oceans	945	617	629	2,190
Other federal departments	298	118	148	564
Provincial/Territorial Departments	97	88	51	236
Universities	176	27	59	262
ENGOS	89	81	64	234
Total	20,049	9,059	7,007	36,114

p: preliminary

Note: Total figures may not add up due to rounding.**Source:** Fisheries and Oceans Canada based on Statistics Canada 2017 Input-Output multipliers and industry gross output, except for Marine tourism and recreation, Fisheries and Oceans Canada and National Defence, which were based on a customized Statistics Canada IO model run (see Annex A for data sources by industry).

Table A.3
Marine sector employment contribution to provincial and territorial economies, 2018

Province/Territory	2018 ^p		
	Marine employment	Provincial employment	Share of provincial employment
	number of jobs		percentage
Newfoundland and Labrador	37,755	225,300	16.8
Prince Edward Island	7,035	76,000	9.3
Nova Scotia	60,814	455,900	13.3
New Brunswick	22,599	353,800	6.4
Quebec	42,150	4,262,200	1.0
British Columbia	123,074	2,493,600	4.9
Yukon	1,772	21,300	8.3
Northwest Territories	1,744	21,400	8.1
Nunavut	1,391	13,500	10.3
Marine regions	298,333	7,923,000	3.8
Canada	298,333	18,657,500	1.6

p: preliminary

Note: Total figures may not add up due to rounding.

Sources: Statistics Canada. [Table 14-10-0090-01 Labour force characteristics by province, territory and economic region, annual, inactive](https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410009001), <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410009001> (accessed April 9, 2021); Fisheries and Oceans Canada based on Statistics Canada 2017 Input-Output multipliers and industry gross output, except for Marine tourism and recreation, Fisheries and Oceans Canada and National Defence, which were based on a customized Statistics Canada IO model run (see Annex A for data sources by industry).

Table A.4
Marine sector employment contribution to provincial and territorial economies, 2018

Province/Territory	2018 ^p		
	Marine sector GDP	Provincial GDP	Share of provincial GDP
	\$ million		percentage
Newfoundland and Labrador	10,195	33,961	30.0
Prince Edward Island	726	7,033	10.3
Nova Scotia	6,049	44,877	13.5
New Brunswick	2,024	37,105	5.5
Quebec	4,074	441,388	0.9
British Columbia	12,371	296,135	4.2
Yukon	197	3,056	6.4
Northwest Territories	221	4,738	4.7
Nunavut	257	3,353	7.7
Marine regions	36,114	871,646	4.1
Canada	36,114	2,231,168	1.6

p: preliminary

Note: Total figures may not add up due to rounding.

Sources: Statistics Canada. [Table 36-10-0222-01 Gross domestic product, expenditure-based, provincial and territorial, annual](https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610022201), <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610022201> (accessed April 9, 2021); Fisheries and Oceans Canada based on Statistics Canada 2017 Input-Output multipliers and industry gross output, except for Marine tourism and recreation, Fisheries and Oceans Canada and National Defence, which were based on a customized Statistics Canada IO model run (see Annex A for data sources by industry)..

Table A.5
Marine sector employment by industry, 2014 to 2018

Industry	2014	2015	2016	2017	2018 ^p
	number of jobs				
Private sector	213,681	213,679	218,021	233,186	237,482
Fishing and seafood	63,608	66,468	69,081	67,674	64,996
Commercial fishing	24,776	24,795	25,359	24,384	23,420
Aquaculture	8,257	9,266	9,781	10,654	10,863
Fish processing	30,574	32,407	33,941	32,636	30,713
Offshore oil and gas	17,004	15,189	18,081	13,065	15,459
Transportation	56,891	59,994	60,598	64,886	68,762
Marine transportation	31,148	30,476	29,290	30,413	32,058
Support activities	25,743	29,518	31,308	34,473	36,704
Tourism and recreation	55,926	52,474	47,681	63,992	63,587
Manufacturing and construction	20,251	19,554	22,580	23,568	24,678
Ship and boat building	13,764	14,536	17,662	17,924	19,502
Ports and harbours construction	6,487	5,018	4,918	5,644	5,176
Public sector, universities and environmental non-governmental organizations	53,597	53,739	52,176	58,676	60,851
National Defence	25,674	23,505	22,885	22,744	26,054
Fisheries and Oceans	14,481	17,714	17,297	23,069	21,476
Other federal departments	5,142	4,949	4,385	4,225	4,949
Provincial/Territorial Departments	2,372	2,197	1,980	2,537	2,201
Universities	2,697	2,482	2,712	2,869	2,687
ENGOS	3,230	2,892	2,917	3,232	3,483
Total Marine sector	267,278	267,418	270,197	291,862	298,333
Total Canadian employment	17,802,200	17,946,600	18,079,900	18,416,400	18,657,500

p: preliminary

Note: Total figures may not add up due to rounding.

Sources: Statistics Canada. *Table 14-10-0090-01 Labour force characteristics by province, territory and economic region, annual*, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410009001> (accessed April 9, 2021); Fisheries and Oceans Canada based on Statistics Canada 2017 Input-Output multipliers and industry gross output, except for Marine tourism and recreation, Fisheries and Oceans Canada and National Defence, which were based on a customized Statistics Canada IO model run (see Annex A for data sources by industry).

Table A.6
Marine sector gross domestic product by industry, 2014 to 2018

Industry	2014	2015	2016	2017	2018 ^p
	\$ million				
Private sector	27,138	23,757	24,663	28,270	30,016
Fishing and seafood	5,775	6,521	7,219	7,913	7,633
Commercial fishing	2,585	2,965	3,088	3,587	3,455
Aquaculture	783	880	1,289	1,391	1,412
Fish processing	2,408	2,676	2,841	2,935	2,765
Offshore oil and gas	9,581	4,959	5,255	6,033	7,518
Transportation	6,239	6,588	6,515	7,088	7,513
Marine transportation	3,682	3,605	3,330	3,484	3,679
Support activities	2,557	2,983	3,185	3,604	3,835
Tourism and recreation	3,634	3,682	3,399	4,713	4,693
Manufacturing and construction	1,908	2,006	2,276	2,523	2,659
Ship and boat building	1,261	1,513	1,772	1,920	2,123
Ports and harbours construction	647	504	602	3,604	537
Public sector, universities and environmental non-governmental organizations (ENGOS)	5,009	5,092	5,048	5,870	6,098
National Defence	2,327	2,167	2,174	2,286	2,611
Fisheries and Oceans	1,427	1,728	1,734	2,333	2,190
Other federal departments	568	542	480	480	564
Provincial/Territorial Departments	240	232	212	272	236
Universities	248	234	257	281	262
ENGOS	199	190	192	217	234
Total Marine sector	32,147	28,849	29,710	34,140	36,114
Total Canadian economy	1,994,898	1,990,441	2,025,535	2,140,641	2,231,168

p: preliminary

Note: Total figures may not add up due to rounding.

Sources: Statistics Canada. *Table 36-10-0222-01 Gross domestic product, expenditure-based, provincial and territorial, annual*, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610022201> (accessed April 9, 2021); Fisheries and Oceans Canada based on Statistics Canada 2017 Input-Output multipliers and industry gross output, except for Marine tourism and recreation, Fisheries and Oceans Canada and National Defence, which were based on a customized Statistics Canada IO model run (see Annex A for data sources by industry).