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Ecosystem spotlight—oceans



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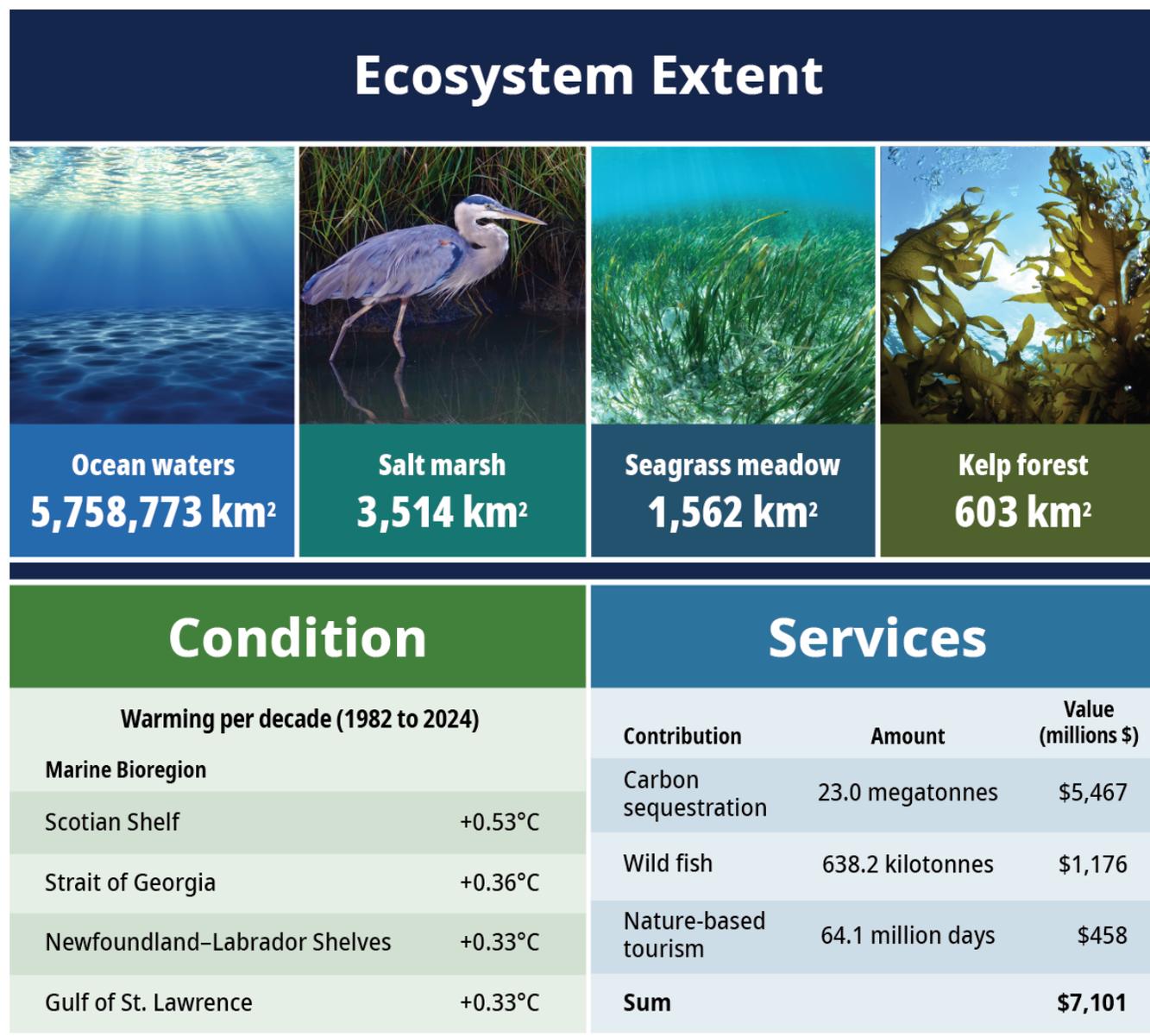
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Introduction

Figure 1
Selected statistics on ocean and coastal ecosystems, 2023



Note: These selected statistics on ocean and coastal extent, condition, and ecosystem services represent a subset of relevant measures in each category. As the Census of Environment develops, statistics will continue to be improved to offer a more comprehensive understanding of ecosystems over time.

Sources: Statistics Canada, Census of Environment, tables 38-10-0153-01, 38-10-0183-01, 38-10-0189-01 and 38-10-0190-01.

Over one-third of Canada’s territory is ocean: spanning nearly 5.8 million square kilometres from the coast to the limits of the exclusive economic zone.¹ Canada’s oceans are home to many species and play a key role in climate systems from local to global scales. They are also important to our economy, society and cultural identities. Canadians need information about marine and coastal natural areas to make decisions about how we interact with them, including tracking changes in their size, health and the ways they contribute to Canadians’ well-being.

What you should know about this study

This study presents efforts to create a suite of ecosystem accounts for Canada as part of the Census of Environment. The goal is to demonstrate the value of producing an integrated set of accounts on ecosystem extent, condition and services for ocean and coastal ecosystems, to showcase how these statistics can be used to understand the relationship between the environment and Canadian society.

This work introduces experimental valuation of ecosystem services in both physical and monetary terms. It expands on the ocean and coastal ecosystem extent and condition accounts already developed as part of the Census of Environment and highlights the links among these accounts.

These accounts bring together data from multiple sources, including economic and environmental data, to provide consistent and comparable statistics. While these accounts are not yet complete, they illustrate ongoing efforts to measure ecosystem extent, condition and their contributions to benefits enjoyed by people. Efforts will be made to improve and expand these statistics over time as new data and methods become available.

The data and methods follow the [System of Environmental-Economic Accounting—Ecosystem Accounting \(SEEA EA\)](#), an international statistical standard for Natural Capital Accounting. For more information on [the ocean and coastal ecosystem extent account](#), [protected and conserved ocean and coastal extent account](#), and [the ocean condition account](#), visit the [Census of Environment portal](#). Data sources and methods for ecosystem service estimates are described in [Appendix A](#).

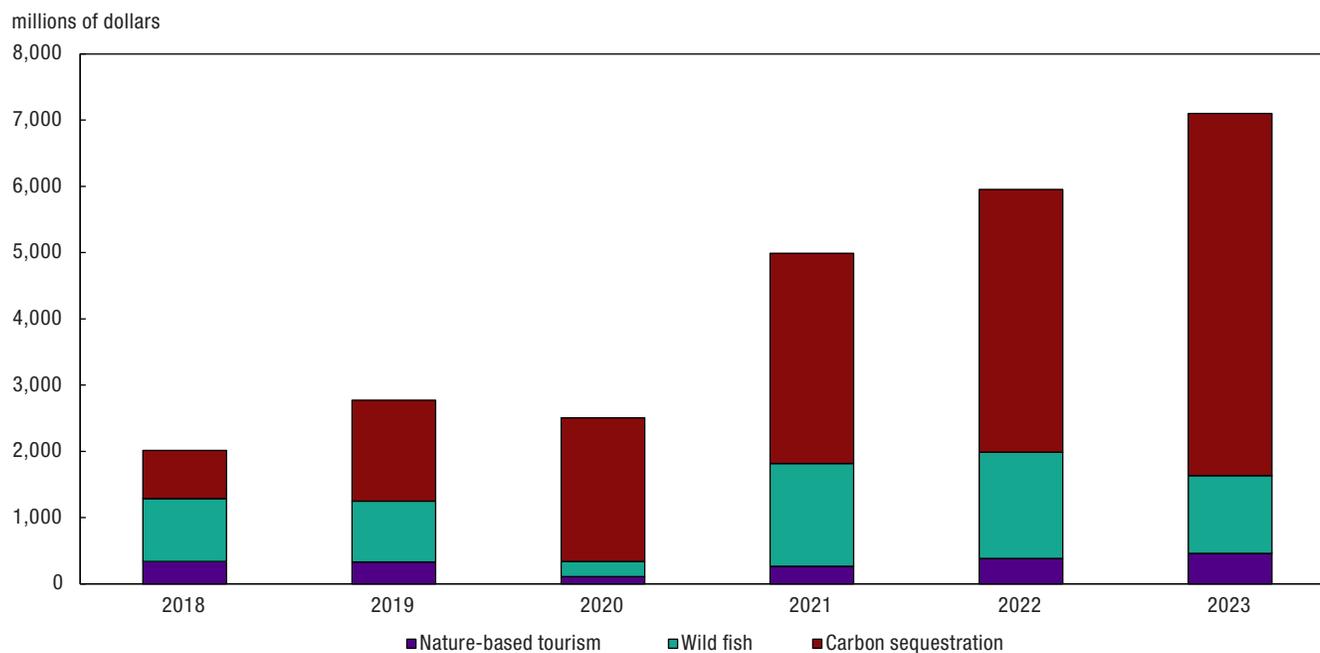
Ecosystem services: Marine contributions to Canadians’ well-being

Canada’s oceans and coastal areas contribute to many aspects of well-being, described as “ecosystem services” or “nature’s contributions to people.”^{2,3} These services include commercially harvested wild fish and seafood, nature-based tourism experiences (e.g., hiking, sightseeing, sea kayaking), and carbon sequestration—the process by which ecosystems capture and store carbon dioxide (CO₂). In 2023, oceans and coastal ecosystems contributed \$7.1 billion worth of ecosystem services, including commercially harvested wild fish and seafood (\$1.2 billion),⁴ nature-based tourism (\$458 million),⁵ and carbon sequestration (\$5.5 billion)⁶ (Chart 1).⁷

This does not include the whole of the ocean’s value. These estimates reveal values embedded in market transactions and are limited to a subset of those values. Furthermore, other valuable and important contributions were not considered in this study, such as protection from coastal flooding and erosion, wildlife habitat, aesthetic values, and cultural activities.

1. Canada’s territory encompasses a total of over 15.7 million square kilometres, including about 9.98 million square kilometres of land and freshwater, and 5.76 million square kilometres of ocean off the coast to the limit of the exclusive economic zone. See Statistics Canada table [38-10-0153-01](#) and [Human Activity and the Environment 2021: Accounting for ecosystem change in Canada](#) (Section 2, footnote 1).
2. Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R. T., Molnár, Z., Hill, R., Chan, K. M. A., Baste, I. A., Brauman, K. A., Polasky, S., Church, A., Lonsdale, M., Larigauderie, A., Leadley, P. W., van Oudenhoven, A. P. E., van der Plaats, F., Schröter, M., Lavorel, S., . . . Shirayama, Y. (2018). [Assessing nature’s contributions to people](#). *Science*, 359(6373), 270–272. <https://doi.org/10.1126/science.aap8826>
3. IPBES. (2019). [Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services \(IPBES\)](#). Brondízio, E. S., Settele, J., Díaz, S., Ngo, H. T. (eds). IPBES secretariat, Bonn, Germany. <https://doi.org/10.5281/zenodo.3831673>
4. The monetary value of fish provisioning services (i.e., contributions to commercially harvested wild fish and seafood) is estimated using the resource rent associated with market values of landed fish (see [Appendix A](#) for details).
5. The monetary value of nature-based tourism is estimated based on the resource rent of economic output needed to meet the demand of tourism spending from the [National Travel Survey](#) and [Visitor Travel Survey](#) (see [Appendix A](#) for details).
6. The monetary value of carbon sequestration is estimated using prices from the federal [Output-Based Pricing System](#) (see [Appendix A](#) for details). This estimate does not reflect the full impact of reducing carbon dioxide (CO₂) in the atmosphere on climate or human well-being.
7. Estimated monetary values are not adjusted for depreciation or depletion, and do not reflect the sustainability of harvests or human activities that benefit from ocean and coastal ecosystems.

Chart 1
Monetary values of ecosystem contributions from Canada's ocean and coastal areas



Source: Statistics Canada table 38-10-0190-01.

Oceans also contribute to Canada's economy through employment and other productive activities.⁸ In 2021, an average of 29.7% of employment income in [fishing-based communities](#) came directly from fishing-related industries.^{9,10} Employment income is complementary to the monetary values associated with commercially harvested fish reported above, which exclude costs such as labour (see [Appendix A](#)).

The value of ocean ecosystems can be understood in more than just monetary terms—their importance can be felt in terms of their influence on livelihoods, health, cultural identity and other relationships between people and nature. For example, sea ice extent is declining,¹¹ with longer ice-free periods caused by climate change.¹² This has profound impacts on Arctic ecosystems and important species, such as polar bears, whales, seals, walrus and other Arctic animals. The loss of key species and declining sea ice threatens Inuit food security, access to fishing and hunting areas, and travel between communities. Many Inuit rely on country foods¹³ that are fished or hunted and subsequently shared within extended families and communities, the loss of which contributes to food insecurity and has negative consequences on cultural identity, traditions and health.^{14,15}

Still, measurements of ecosystem services reveal important relationships between human activity and marine ecosystems. Looking at the physical quantities and dollar values of these services together over time provides a better understanding of how these relationships might be changing. For example, the impact of the COVID-19

8. For examples, see [Canada's Fisheries Fast Facts 2024](#).

9. "Fishing-based communities" are census subdivisions (CSDs) with the highest proportion of employment income from commercial fishing (top 2% of all CSDs). See [Statistics on resource-based communities: concepts, definitions and classifications](#). Because of data limitations, this includes fishing in both marine and freshwater ecosystems, although most commercial fishing in Canada is marine (based on [landings data from Fisheries and Oceans Canada](#)).

10. Statistics Canada. (2023). [Table 38-10-0169-01 Selected population and resource income statistics, by resource industry](#). <https://doi.org/10.25318/3810016901-eng>

11. Environment and Climate Change Canada (ECCC). (n.d.). [Canadian Environmental Sustainability Indicators \(CESI\): Sea ice in Canada](#). Retrieved August 08, 2025. <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/sea-ice.html>

12. [Section 3.2](#) in: Statistics Canada. (2022). [Human Activity and the Environment 2021: Accounting for ecosystem change in Canada](#). Statistics Canada Catalogue no. 16-201-X. <https://www150.statcan.gc.ca/n1/pub/16-201-x/16-201-x2021001-eng.htm>

13. Country food refers to locally or regionally harvested marine and terrestrial wildlife, fish, and plants. The term "country food" is used interchangeably with the terms "wild food" and "traditional food."

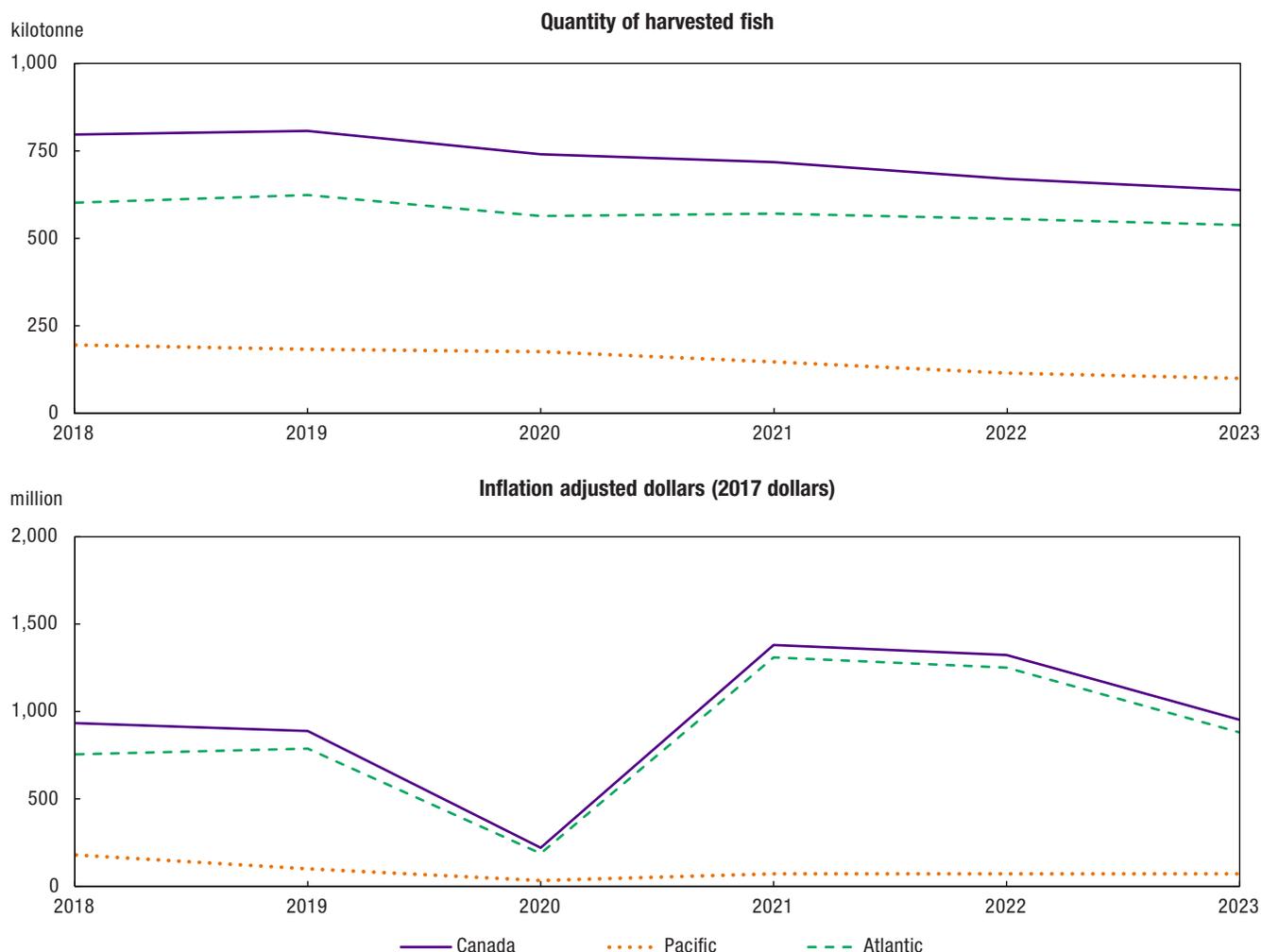
14. Arriagada, P. (2017). [Food insecurity among Inuit living in Inuit Nunangat](#). (Insights on Canadian Society). Statistics Canada Catalogue no. 75-006-X. <https://www150.statcan.gc.ca/n1/pub/75-006-x/2017001/article/14774-eng.htm>

15. Barrette, P., & Sudom, D. (2022). [Sea ice in a changing climate and impact on Inuit communities](#). National Research Council of Canada. Ocean, Coastal and River Engineering Research Centre. <https://doi.org/10.4224/40002800>

pandemic is evident in sharp drops in the dollar values¹⁶ of both commercially harvested fish (Chart 2) and nature-based tourism (Chart 3) in 2020, but for different reasons.

Chart 2

Fish provisioning services to commercially harvested wild fish and seafood, in physical and monetary terms, 2018 to 2023



Note: "Canada" refers to the total of available data over all Canadian ocean territory, including the Atlantic, Pacific, and Arctic Oceans. There were no marine fish landings in provinces or territories bordering on the Arctic Ocean in available data (data on where fish were harvested are not available). See Appendix A for details.

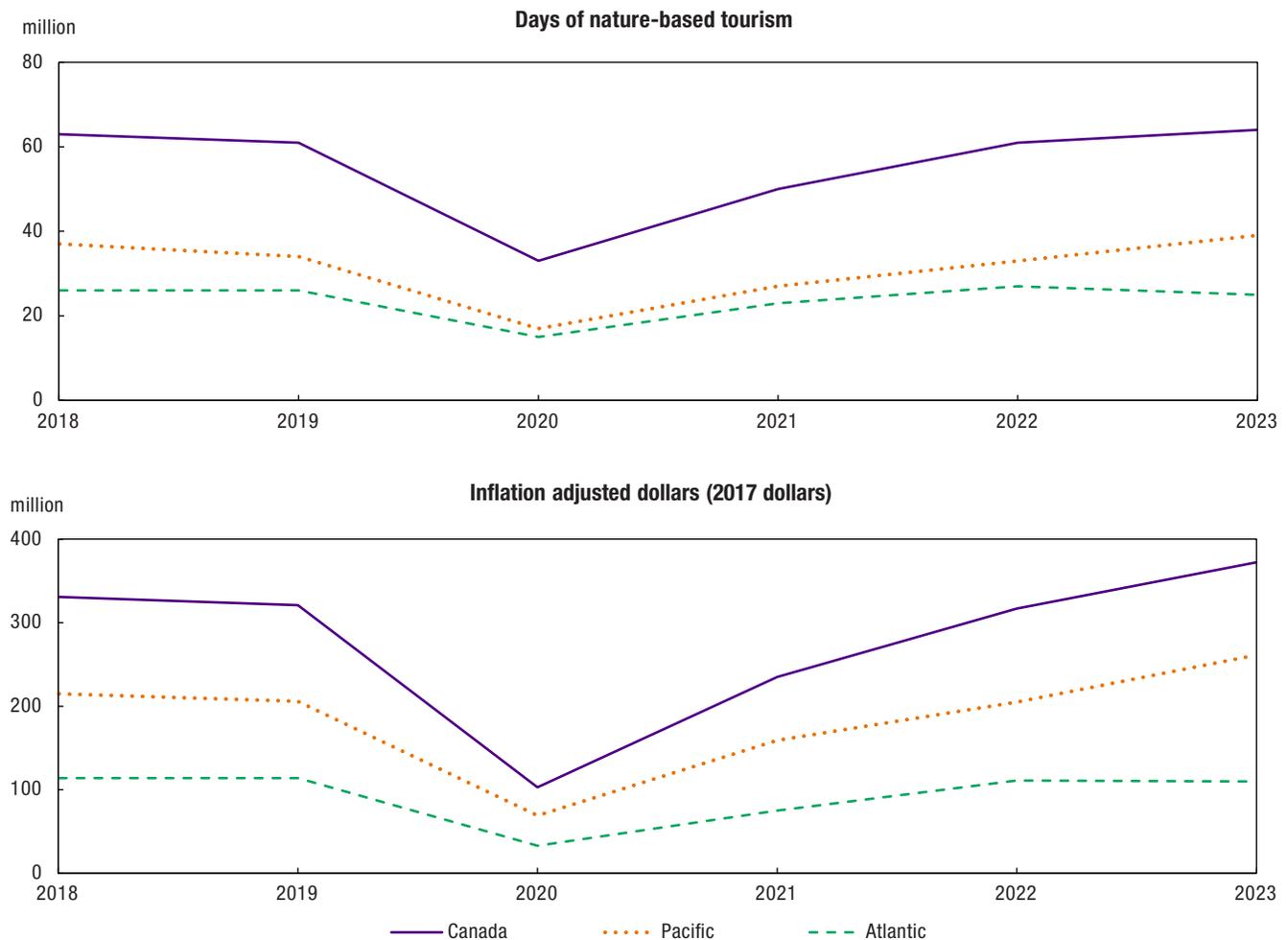
Source: Statistics Canada tables 38-10-0189-01, 38-10-0190-01.

During the pandemic period (2020), the market price paid for commercially harvested fish and seafood declined more than fishing effort,¹⁷ resulting in a large temporary drop in the value of the oceans' contributions to the production of commercially harvested fish (Chart 2). The monetary value of this ecosystem service is based on a residual (resource rent; see [Appendix A](#))—the amount left from revenues after removing operating costs such as labour, fuel and machinery maintenance. Therefore, if revenues decline relative to costs, the residual can be small, as in this case. The national trends in both physical and monetary terms are driven by changes in the Atlantic Ocean, which supports a larger fishing industry than the Pacific Ocean.

16. Values were deflated using the implicit price index of gross domestic product at market prices, from table [36-10-0223-01](#) (retrieved August 27, 2025).

17. Based on analysis of [landings data from Fisheries and Oceans Canada](#).

Chart 3
Contributions to coastal nature-based tourism, in physical and monetary terms, 2018 to 2023



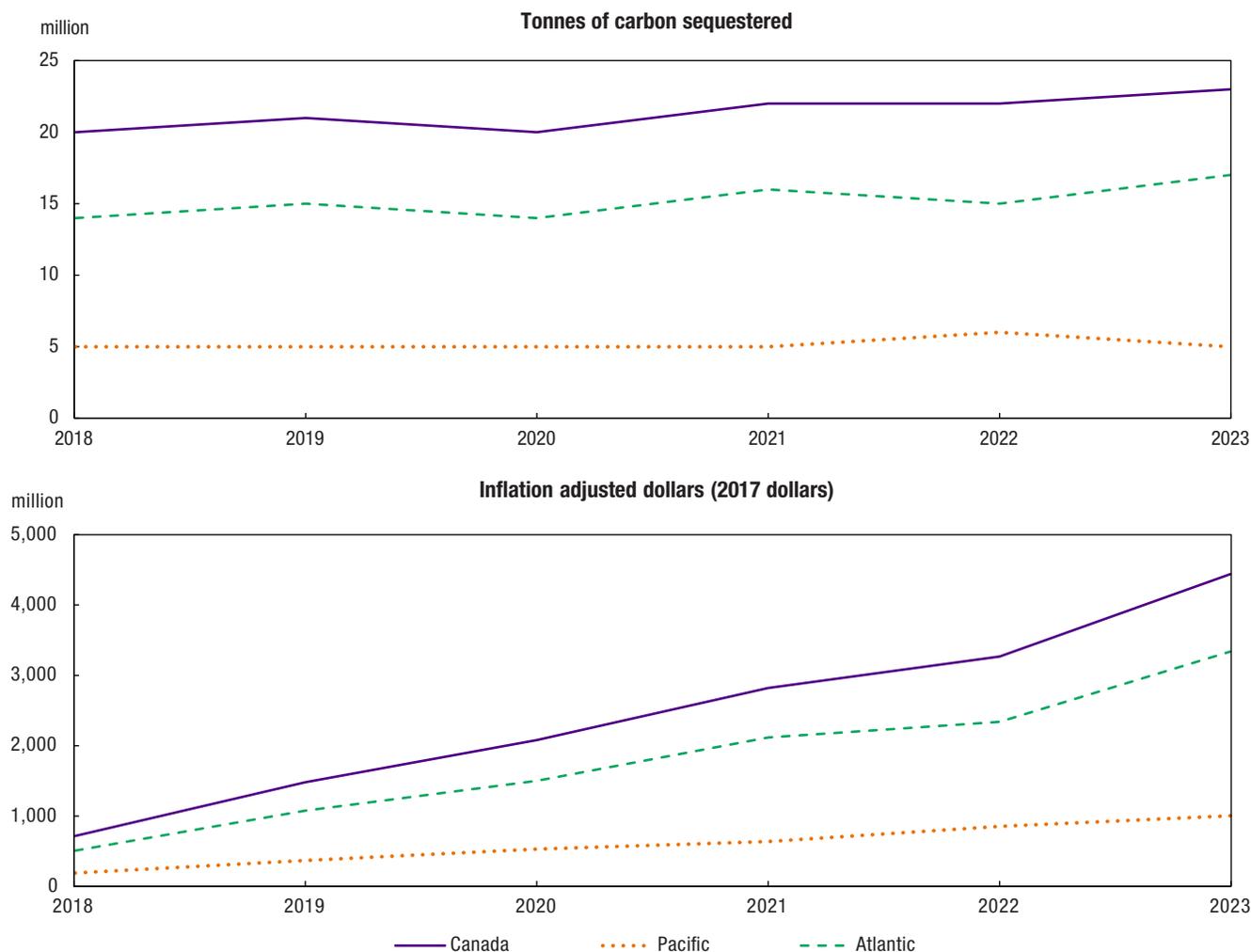
Note: Nature-based tourism includes activities related to the use and enjoyment of the environment by people travelling outside their usual location. It does not include recreation by local residents. See Appendix A for details.

“Canada” refers to the total of Atlantic, Arctic and Pacific Oceans in Canadian territory. Data for the Arctic Ocean are not shown because of small values relative to other regions, but are included in the national totals.

Source: Statistics Canada tables 38-10-0189-01, 38-10-0190-01.

In contrast to commercial fishing, the drop in the value of nature-based tourism in 2020 and subsequent recovery matched the same trends in activity over the same period (see Chart 3). Fewer visits to marine and coastal areas led to less spending on tourism activities and a drop in the associated value of ecosystem services to nature-based tourism.

Chart 4
Ocean carbon sequestration, in physical and monetary terms, 2018 to 2023



Note: Estimates of carbon sequestration in Arctic ocean waters are not available due to lack of input data on sea surface temperature and chlorophyll-a for this region (see Appendix A). Data for other ecosystems in the Arctic Ocean are not shown because of small values relative to other regions, but are included in the national totals.
Source: Statistics Canada tables 38-10-0189-01, 38-10-0190-01.

Ocean and coastal ecosystems also play a crucial role in absorbing and storing carbon, which helps to reduce carbon dioxide in the atmosphere. The physical amount of carbon sequestered increased 22% in the Atlantic Ocean from 2018 to 2023, as a result of warming temperatures and increased algae growth (measured by chlorophyll-a concentrations). From 2018 to 2023, the increase in the dollar value¹⁶ of carbon sequestration (Chart 4) is explained by increases in the unit price applied to carbon sequestration estimates. The price of carbon increased from \$10 per tonne of CO₂-equivalent in 2018 to \$65 in 2023.¹⁸

18. The [federal Output-Based Pricing System](#) came into effect in 2019 with a minimum price set at \$20 per tonne CO₂-equivalent, but the [original benchmark](#) price was set at \$10 per tonne for 2018. The [current benchmark](#) includes annual price increases of \$15 per year after 2022.

Benefits from nature depend on extent and condition

The capacity to provide ecosystem services depends on an ecosystem's type, its condition (health) and its extent (size). This can be illustrated through the lens of blue carbon sequestration—biological processes that capture and store CO₂ in ocean and coastal ecosystems. The extent of different types of ecosystems directly affects the quantity of carbon that can be sequestered. For example, in Canada, ocean waters account for the vast majority of the extent of ocean and coastal ecosystems (more than 99.9%; Table 1). So, although they are not the most efficient ecosystem at sequestering carbon, they account for most (96%) of the blue carbon that was captured in 2023.

Each ecosystem has a unique capacity to sequester carbon that also varies with its condition. Ocean conditions, such as sea surface temperature, chlorophyll concentrations and organic particle concentrations, all influence the capacity of ocean waters to provide this ecosystem service. One pathway for carbon sequestration in ocean waters is through phytoplankton growth, which absorbs CO₂ via photosynthesis. This carbon enters the marine food web and eventually falls as organic debris to deep ocean layers, where it can remain trapped for 100 years or more (see [Appendix A](#)).

Table 1
Carbon sequestration and extent of ocean and coastal ecosystems, by ocean, 2023

Ocean	Ecosystem	Extent (thousand km ²)	Carbon sequestration (million t per year)	Average carbon sequestration rate ¹ (t/km ² per year)
Canada	Ocean waters	5,758.8	22.10	10.3
	Salt marsh	3.5	0.77	218.0
	Seagrass meadow	1.6	0.04	23.2
	Kelp forest	0.6	0.04	60.0
Atlantic	Ocean waters	1,707.8	17.13	10.0
	Seagrass meadow	0.8	0.03	30.7
	Salt marsh	0.5	0.11	218.0
	Kelp forest
Pacific	Ocean waters	453.7	4.97	11.2
	Salt marsh	0.7	0.16	218.0
	Kelp forest	0.6	0.04	60.0
	Seagrass meadow	0.5	0.01	19.9
Arctic	Ocean waters	3,597.2
	Salt marsh	2.3	0.50	218.0
	Seagrass meadow	0.3	0.00	5.2
	Kelp forest

.. not available for a specific reference period.

1. The carbon sequestration rate per unit area was calculated excluding areas where carbon sequestration estimates were not available.

Note: Estimates of carbon sequestration by phytoplankton in the Arctic Ocean are not available due to lack of input data on sea surface temperature and chlorophyll-a for this region (see Appendix A).

National-level estimates for Canada also exclude values for the Arctic Ocean.

Sources: Statistics Canada calculations, tables 38-10-0153-01 and 38-10-0189-01.

Salt marshes, a type of coastal wetland, trap carbon in sediments for long-term storage.¹⁹ Salt marshes cover an area of less than 1% of Canada's ocean and coastal ecosystems, but account for 3% of all blue carbon sequestration in 2023 (Table 1). Salt marshes and other coastal ecosystems, such as seagrass meadows and kelp forest, contribute more to blue carbon sequestration by unit area than ocean water. They are also directly affected by human activities, such as pollution, nearby construction and land use change,²⁰ which can alter their extent and condition, consequently affecting their ability to store carbon.

19. Mcleod, E., Chmura, G. L., Bouillon, S., Salm, R., Björk, M., Duarte, C. M., Lovelock, C. E., Schlesinger, W. H., & Silliman, B. R. (2011). [A blueprint for blue carbon: toward an improved understanding of the role of vegetated coastal habitats in sequestering CO₂](#). *Frontiers in Ecology and the Environment*, 9(10), 552–560. <https://doi.org/10.1890/110004>

20. Rabinowitz, T., & Andrews, J. (2022). [Valuing the Salt Marsh Ecosystem: Developing Ecosystem Accounts](#). Statistics Canada Catalogue no. 16-001-M. <https://www150.statcan.gc.ca/n1/en/catalogue/16-001-M2022001>

Table 2

Average carbon sequestration per square kilometre, concentrations of chlorophyll-a and particulate organic carbon of ocean waters in Canada, by marine bioregion, 2018 to 2024

Ocean	Marine bioregion	Average carbon sequestration (t/km ² per year)	Chlorophyll-a concentration (mg/m ³)	Particulate organic carbon concentration (mg/m ³)
Atlantic	Estuary and Gulf of St. Lawrence	20.3	1.7 to 5.6	257.5 to 1,039.5
	Scotian Shelf	9.4	0.5 to 1.2	130.7 to 267.6
	Newfoundland–Labrador Shelves	6.2	0.6 to 1.0	150.3 to 330.4
Pacific	Southern Shelf	28.5	1.6 to 6.5	308.9 to 1,468.9
	Northern Shelf	22.1	1.2 to 4.4	412.8 to 1,514.6
	Offshore Pacific	6.3	0.4 to 1.0	109.0 to 304.2

Sources: Statistics Canada calculations, and tables 38-10-0153-01, 38-10-0183-01 and 38-10-0189-01.

The highest rates of carbon sequestration in ocean waters, averaged over 2018 to 2024, were seen in the Southern Shelf and Northern Shelf marine bioregions in the Pacific Ocean, as well as the Estuary and Gulf of St. Lawrence marine bioregion. These regions also had the highest concentrations of chlorophyll-a and particulate organic carbon over the same period (Table 2). Both of these attributes directly affect the amount of CO₂ absorbed and stored by the ocean waters and are example indicators of ecosystem condition.

The Pacific continental shelf tends to be more productive than the Atlantic Ocean, absorbing more CO₂ per unit area (Table 2). However, more carbon sequestration is attributed to the Atlantic Ocean because of its larger extent (Table 1).

Protecting nature's capacity for future generations

[Protected areas](#) and [other effective area-based conservation measures](#) help to reduce the negative impacts of human activity on ocean and coastal ecosystems, contributing to better ecosystem health and capacity to supply ecosystem services into the future.²¹

For example, salt marshes support fisheries indirectly by providing food and refuge for multiple fish species.^{22,23} The Hudson Bay Complex marine bioregion has the largest documented area of salt marsh in Canada and has sequestered over 495 000 tonnes of carbon in 2023.²⁴ This region also has the second-highest share of protected or conserved salt marsh areas (43.1%), after the Estuary and Gulf of St. Lawrence (45.4% of salt marsh protected or conserved).²⁵

New marine conserved and protected areas are in the process of being established to fulfill Canada's goal of conserving 30% of ocean area by 2030,²⁶ in line with [Global Biodiversity Framework targets](#).²⁷ In 2024, [Tang.gwan — ḥačx'iqak — Tsigis](#) was designated as a Marine Protected Area in the Offshore Pacific marine bioregion, bringing the proportion of protected and conserved area to 15.5% of Canadian oceans, and over 30% of Canadian Pacific waters.^{25,28} Conservation measures and other policies can reduce negative impacts of human activity and ensure that coastal and marine ecosystems are maintained in a condition that allows them to be a part of Canadians' lives for generations.

Statistics Canada's Census of Environment Program will continue to produce and update statistics on the environment and economy for marine and other ecosystems across Canada. Integrated data on ecosystem extent, condition and services, such as those presented here, are essential for tracking changes over time and supporting informed decisions about Canada's natural areas.

21. Environment and Climate Change Canada (ECCC). (2022, December 16). [Other Effective area-based Conservation Measures](#).

<https://www.canada.ca/en/environment-climate-change/services/nature-legacy/other-effective-area-based-measures.html>

22. Boesch, D. F., & Turner, R. E. (1984). [Dependence of Fishery Species on Salt Marshes: The Role of Food and Refuge](#). *Estuaries*, 7(4), 460–468.

<https://doi.org/10.2307/1351627>

23. Jänes, H., Macreadie, P. I., Zu Ermgassen, P. S. E., Gair, J. R., Treby, S., Reeves, S., Nicholson, E., Ierodiaconou, D., & Carnell, P. (2020). [Quantifying fisheries enhancement from coastal vegetated ecosystems](#). *Ecosystem Services*, 43, 101105. <https://doi.org/10.1016/j.ecoser.2020.101105>

24. Existing data on the extent of salt marshes are limited and incomplete. Many known areas have not yet been mapped, so they are excluded from current total area estimates. As a result, the amount of carbon sequestered by salt marshes is likely underestimated.

25. Statistics Canada. (2024). [Table 38-10-0157-01 Protected and conserved ocean and coastal ecosystem extent account](#).

<https://doi.org/10.25318/3810015701-eng>

26. Fisheries and Oceans Canada (DFO). (n.d.). [Conserving Canada's oceans by 2030 and beyond](#). Retrieved November 7, 2025.

<https://www.dfo-mpo.gc.ca/oceans/conservation/plan/MCT-OCM-eng.html>

27. Government of Canada. (2024, November 18). [Conserving 30% of Canada by 2030: Vision for the future](#).

<https://www.canada.ca/en/services/environment/conservation/conserving-30-by-2030.html>

28. Environment and Climate Change Canada (ECCC). (n.d.). [Canadian Environmental Sustainability Indicators \(CESI\): Canada's conserved areas](#). Retrieved November 7, 2025. <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html>

Appendix A: Methods for estimating ecosystem services

This appendix briefly summarizes the methods used to measure ecosystem services in physical and monetary terms for the development of ecosystem service accounts following the [System of Environmental-Economic Accounting—Ecosystem Accounting](#).

Carbon sequestration

Carbon sequestration is defined as carbon that is removed from the atmosphere by biological processes and stored in ecosystems for a long period of time. Carbon sequestration was measured using two different methods:

- For coastal ecosystems—seagrass, salt marshes and kelp forest—carbon sequestration estimates were obtained by integrating published carbon sequestration rates with the spatially explicit extent of each ecosystem type from the [Ocean and coastal ecosystem extent account](#). Carbon sequestration rates (i.e., average annual tonnes of carbon sequestered per square metre) were retrieved from the scientific literature, with a focus on published studies that included sites in Canada, supplemented by others when local results were not available.
- For ocean water, carbon sequestration was modelled using Earth observation data on chlorophyll-a concentration, sea surface temperature, diffuse attenuation and photosynthetically active radiation. The model estimated the quantity of carbon removed from the atmosphere by phytoplankton through photosynthesis. Net primary production (NPP) by phytoplankton was estimated using the Vertically Generalized Production Model.²⁹ To evaluate the contribution of this production to long-term storage, the export flux of NPP-derived organic carbon from the surface layer was calculated, and the fraction of this flux reaching 1 000 metre depth, which is commonly used as a threshold for storage lasting at least 100 years, was taken to represent the component contributing to long-term carbon storage.

The estimates represent net carbon sinks because they only include carbon that is stored in the environment by ecosystems. The model used takes into account carbon that is emitted by ecosystems as part of natural processes, and removes these quantities from estimates of carbon uptake to produce a net estimate of carbon stored. Impacts from human disturbances are not accounted for in these estimates.

The monetary value of carbon sequestration was estimated by applying prices from the federal [Output-Based Pricing System](#) (OBPS). Although the federal fuel charge was set to \$0 on April 1, 2025, the OBPS remained in effect.³⁰ The federal OBPS provides the most relevant market prices for carbon sequestration in oceans, which are under federal jurisdiction. While these prices reflect current institutional arrangements and market conditions, they do not capture the full impact of reducing carbon dioxide (CO₂) in the atmosphere on climate or human well-being. The [social cost of carbon](#) is a measure of expected damages from greenhouse gas emissions, but it is sensitive to the choice of discount rate and includes a broad range of direct and indirect costs. Such costs may not be comparable to other values presented here, which were calculated using resource rent (see below).

The estimated physical flow of carbon sequestration (tonnes of carbon) was converted to tonnes of CO₂-equivalent and multiplied by the carbon price from the federal OBPS for the corresponding reference year to calculate a total monetary value of carbon sequestration for each reference year.

Nature-based tourism

Nature-based tourism is defined as people travelling and staying in places outside their usual location for periods of time lasting less than a year to enjoy the environment through direct, in situ, physical and experiential interactions with the environment.³¹

29. Behrenfeld, M. J., & Falkowski, P. G. (1997). [Photosynthetic rates derived from satellite-based chlorophyll concentration](#). *Limnology and Oceanography*, 42(1), 1–20. <https://doi.org/10.4319/lo.1997.42.1.0001>

30. Environment and Climate Change Canada (ECCC). (n.d.). [Output-Based Pricing System](#). Retrieved November 4, 2025. from <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system.html>

31. The definition of nature-based tourism combines the definition of tourism used at Statistics Canada by the [Provincial and Territorial Tourism Satellite Account](#) and the definition of recreation services provided in the [SEEA EA reference guide](#) (Table 6.3 – Reference list of selected ecosystem services).

For ocean and coastal ecosystems, it was measured by estimating the number of days of nature-based tourism that occurred near ocean and coastal areas. Estimated days include all visits where the main purpose of travel was for leisure or other personal reasons, but exclude visits where the main purpose was for employment reasons.

The number of days was obtained from the [National Travel Survey](#) (NTS) and [Visitor Travel Survey](#) (VTS). All trips for leisure, visiting friends and families, and other non-routine personal reasons that occurred in a coastal census subdivision (CSD) were included if any of the following activities were reported: sightseeing; going wildlife viewing or bird watching; visiting a national, provincial or nature park; boating; canoeing or kayaking; camping; hiking or backpacking; visiting a beach; or cross-country skiing or snowshoeing. For in-scope trips, the number of days was estimated by summing the number of nights reported, plus one, for each trip. Because of data availability issues with the VTS, the number of days for international visitors was extrapolated using ratios calculated from the NTS (Canadian residents travelling in Canada).

The monetary value of nature-based tourism was estimated using a resource rent approach (see below for more details) using the expenditure reported in the surveys as an estimate of output related to nature-based tourism.

Provincial data from Newfoundland and Labrador, Prince Edward Island, Nova Scotia, New Brunswick, and Quebec were aggregated to the Atlantic Ocean; Ontario, Manitoba and the territories (Yukon, Northwest Territories and Nunavut) to the Arctic Ocean; and British Columbia to the Pacific Ocean.

Commercially harvested fish and seafood

The values in this article correspond to landings from commercial sea fisheries, including groundfish, pelagic and other finfish, and shellfish, as reported by [Fisheries and Oceans Canada](#). The data may include some farmed shellfish production (for example, Atlantic oysters). Commercial landings are an underestimate of the provisioning service supplied, since not all bycatch is included.

The monetary value of ecosystem contributions to fish production is estimated as the resource rent approach (see below), using market values of fish landings reported by Fisheries and Oceans Canada as an estimate of output related to commercial fishing.

Provincial data were aggregated to ocean regions in the same way as nature-based tourism (see above).

Resource rent

Resource rent is the surplus value that accrues to users of a natural resource, which represents returns to the natural resource itself.³² Resource rent is calculated as the difference between total revenue generated from extraction of the resource and all costs incurred during the extraction process, including the consumption of produced capital (depreciation), returns to produced assets, labour and intermediate inputs, but excluding taxes, royalties and other costs that are not specific to the extraction process.^{33,34,35} Resource rent is the basis for estimates of Canada's natural resource wealth in the [Natural Resource Asset Accounts](#), which is integrated into Canada's quarterly [National Balance Sheet Accounts](#).³³

Resource rent is a type of economic rent that only includes returns to natural **non-produced capital**. In the case of harvesting natural resources, such as minerals, timber or fish, all returns to non-produced capital, calculated as described above, are typically attributed to the natural resource as resource rent. More generally, however, **non-produced capital** can also include contracts, marketing, monopoly control or other unique characteristics of an asset that are not the result of a production process.

32. Par. 5.113, 5.114 in: United Nations. (2014). *System of Environmental-Economic Accounting 2012—Central Framework*.

33. Statistics Canada. (2006). [Concepts, Sources and Methods of the Canadian System of Environmental and Resource Accounts](#). (Econnections: linking the environment and the economy). Ottawa: Statistics Canada Catalogue no.16-505-GIE. <https://www150.statcan.gc.ca/n1/en/catalogue/16-505-G>

34. Par. 9.3.6 in: Nations. (2024). [System of Environmental-Economic Accounting-Ecosystem Accounting](#). <https://doi.org/10.2785/903845>

35. Sections 5.4.4, 5.4.5 in: United Nations. (2014). *System of Environmental-Economic Accounting 2012—Central Framework*.

To estimate resource rent for selected ecosystem services, returns to **non-produced** capital were estimated for all industries in the Canadian economy by combining economy-wide data from several sources, including the [Supply and Use Tables](#), [investment flows and capital stock](#) data (includes net stock and depreciation estimates), and Government of Canada five-year [bond yields](#) (combined with capital stock data to calculate returns to **produced** capital). These estimates were considered to be resource rent when they were associated with harvesting natural resources or other ecosystem contributions to market revenue. Rent-to-output ratios were combined with spending on nature-based tourism activities or market values of harvested fish—expressed as output by supplying industry at basic prices—to estimate resource rent for each ecosystem service.