

OCEANWATCH

SPOTLIGHT COVID-19

Waves of Change – How A Global Pandemic Impacted Our Oceans

 Ocean Wise, Donna Gibbs | *Researcher collecting data on species presence.*



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Overview

On March 11th, 2020, the World Health Organization declared COVID-19 a global pandemic. The early response of many countries was to impose nation-wide lockdowns, impacting how people worked, interacted, and influencing consumption decisions. In some cases, this forced our withdrawal from the ocean, but it also offered a chance to reflect on the many opportunities for a more positive relationship between humans and the oceans.

In this short Spotlight article, we explore how limitations on field work and shifts in seafood harvesting have affected ocean conservation research, volunteer organizations and sustainable fisheries.

Emerging from lockdowns into a new normal, we all have the opportunity to re-imagine how we can better care for our ocean environments. This Spotlight article concludes with a list of actions anyone can take to protect, preserve, and restore these vital life systems.



Introduction

Oceans are the Earth's life support system. They cover over 70% of the planet,¹ are home to oxygen producing organisms^{i,2} and act as a sink (i.e., storage system) for human caused CO₂ emissions.³ The oceans have provided bountiful resources for centuries – fish and shellfish are a staple food source for many communities, and ocean bacteria are used in everything from medicines to coronavirus detection test kits⁴ – even oil⁵ and minerals⁶ are exploited from deep sea locations.

However, the sudden appearance and rapid spread of COVID-19 resulted in country-wide lockdowns, forcing many people to stay at home and economic activity to shift. In our first Ocean Watch Spotlight COVID-19: A Marine Mammal Story, we began an exploration into the indirect impacts of COVID-19 on our marine environments.⁷

In this Spotlight article, we examine how public health restrictions have resulted in lost ocean research opportunities and reductions or cancellation of volunteer work, as well as changes in demand for sustainable seafood.

ⁱParticularly phytoplankton, a diverse group of microscopic organisms that use sunlight for energy i.e., photosynthesis, and consequently produce oxygen.



PEOPLE HAVE CHANGED THEIR INTERACTIONS WITH OCEANS DURING COVID-19

1

Researchers
Miss Ocean
Observations

2

Conservation
Groups Face
Limitations

3

Shifts In
Seafood Related
Industries

Impact 1

Interrupted Field Work

The oceans are vast, deep places, and there is so much we do not yet know. Scientists work to explore our oceans and the creatures that live in them. Collecting information about marine life has become increasingly important due to the diversity of threats facing our oceans, such as climate change and ocean acidificationⁱⁱ, pollution from human activities, and the overexploitation of resources.

For researchers who study the oceans, the implementation of strict COVID-19 health guidelines impeded field work and data collection. It is difficult for researchers to maintain physical distancing in the close quarters of boats or planes used to observe our oceans, or in the group sizes required to ensure safe field work. Many researchers have therefore had to limit or temporarily stop field work while these guidelines remain in place, resulting in knowledge gaps that may limit our ability to protect and conserve species, habitats, and ecosystems. For example, researchers missed the opportunity to monitor the health of endangered North Atlantic right whales (*Eubalaena glacialis*).⁸

Short and long term datasets are valuable for a number of reasons, including the ability to monitor the health of species and habitats over time; whether actions taken to improve or protect an area or species are working; and how habitats and species are adjusting to climate change. Gaps in data collection can make it more difficult to understand and interpret results, as well as impact our ability to protect and conserve these species and ecosystems.

ⁱⁱ Ocean acidification – the decrease in pH level of ocean waters.



© Ocean Wise | Jessica Schultz checks equipment prior to diving.

Gaps in data due to interrupted field work because of COVID-19 impede our ability to protect and conserve species and habitats in the marine environment.

Spotlight 1

Researchers Adapt

During this time, many researchers have had to delay field work. For example, the National Oceanic and Atmospheric Administration (NOAA) cancelled research surveys in Alaska due to COVID-19.⁹ Confined to home offices, field teams shifted their focus to desktop research, data analyses, and writing. But what does this actually mean for a small research team in the peak of the field work season?

We spoke with Jessica Schultz, Manager of the Ocean Biodiversity Research Team at the Ocean Wise Research Institute, about the impacts to her teams' field work. Their work involves regularly donning cold-water scuba gear to go below the waves in Howe Sound. Here, sights such as glass sponge reefs, once thought to be extinct, and rockfish and lingcod, threatened by overfishing, pollution, and habitat destruction, are observed and recorded. The team conducts ongoing monitoring to better understand and protect these habitats and species, and lead restoration projects. This research team has not been out on the water since the pandemic hit Canada, and therefore experienced a 100% reduction in dives for the period examined (Figure 1). However, from August 13th with strict COVID-19 precautions in place, the team was able to get back out on the water and safely conduct field work again.

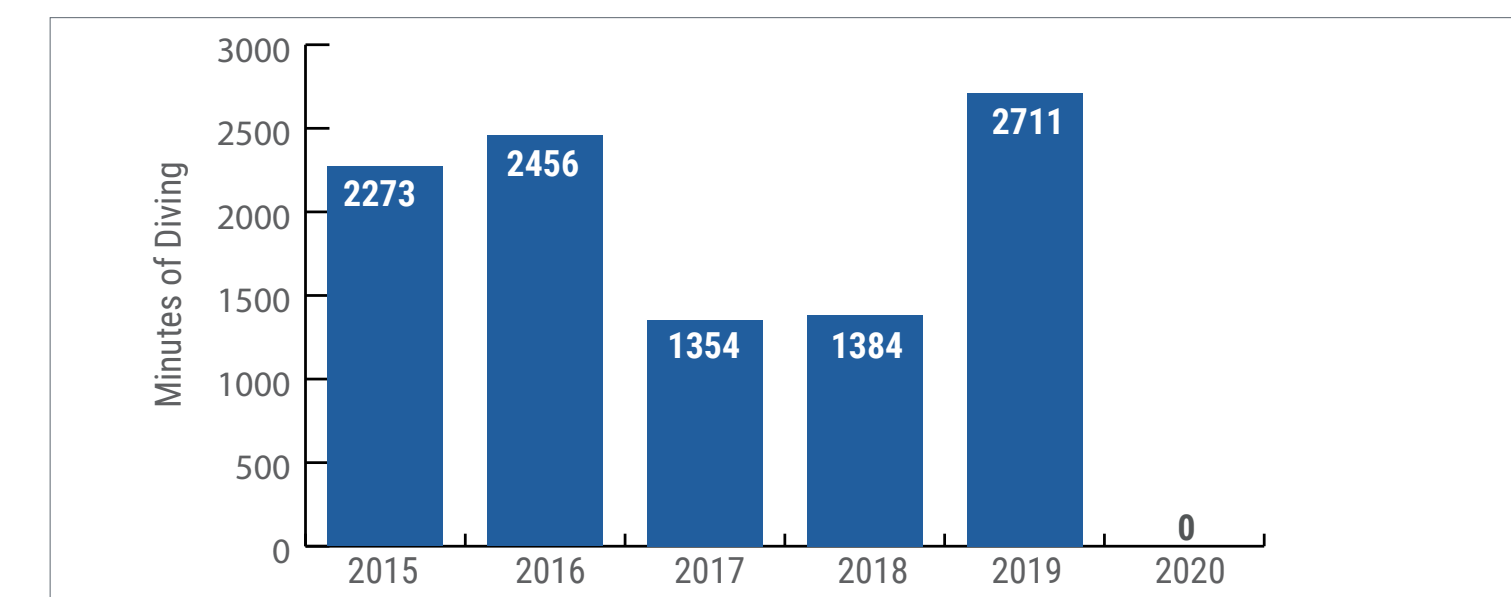


Figure 1. Total number of minutes spent diving by the Ocean Biodiversity Research Team from mid-March to end of May inclusive.

Conversation with Jessica Schultz, Manager,ⁱⁱⁱ Ocean Biodiversity Research Team

How has COVID-19 impacted your team's field work?

“Most of our field work involves scuba diving. Although there is no risk of COVID-19 transmission once we're underwater, field work involves lots of time on small boats working closely with other people, handling and checking equipment, and helping each other with gear. Some of the emergency procedures in diving also involve sharing equipment, such as breathing from someone else's gear if you run low on air. Because of these risks, and because field research is not an essential service, all of our field work operations have been suspended since mid-March.”

What impact do you think this missing data will have in your datasets?

“One of our strengths is our continuous, long-term biodiversity monitoring program. Because of COVID-19 physical distancing requirements, we have been unable to conduct any field work since the pandemic began. Although we've had minor data gaps in the past for various reasons, this is the first time in the 40-year history of the program that diving has been completely halted for this long. In addition, several of our short-term research projects have been postponed until field work resumes.”

What other consequences has this interruption had?

“Like many other researchers, our graduate and post-doctoral students have had to modify their projects and/or timelines to accommodate the inability to conduct field work, laboratory work or travel during the outbreak. A few projects have been postponed by several months to increase the chances of being able to incorporate field work and travel.”

What might change going forward, if anything? Do you think COVID-19 will have a lasting impact on how we conduct research/field trips?



📷 Ocean Wise | Jessica Schultz holding up a sea star during field work.

Many ocean researchers are missing critical observations and data collection, potentially impacting the protection and recovery of the species and habitats they study.

“As with other sectors, progression towards business-as-usual will be informed by guidelines from health officials, the provincial and federal governments, and Work Safe BC. Likely field work and travel will remain limited for some time, and I suspect the way we interact with one another, both in the field and in general, will be with much more caution. For instance, my team may limit the number of people on the dive boat and restrict intermingling between different crews.”

(Note: dives were conducted prior to mid-March; however, this data has not been included as we focus only on the time from when the pandemic was declared).

ⁱⁱⁱ As of early July, Jessica has moved to full time PhD studies.

Impact 2

Volunteer Conservation Groups Are Limited

Like everyone else, citizen science and conservation groups have had to adapt to COVID-19. Often heavily reliant on community volunteers, conservation groups play a large role in environmental campaigns and projects to improve ecosystem health.

Volunteers may participate by processing data,^{iv} or actively enhance local environments through restoration activities, such as litter collection, removal of invasive plants, or habitat enhancement. Modern participation in citizen science groups began with the Christmas Bird count, run annually since 1900 by the National Audubon Society^{iv,10}

Since then, citizen science groups have grown prolifically. Many conservation groups fall under the category of ‘citizen science’ due to providing contributions to science that would be otherwise unachievable, thereby expanding the capabilities of researchers. The scale of participation greatly increases knowledge on local ecosystems. Additionally, participation connects local communities to science and can provide learning opportunities.

Community engagement via environmental initiatives is immensely valuable. Communities cultivate a sense of place by exploring and learning in their local environments. For example, an [underwater video](#) for local B.C. school groups to encourage outdoor learning during COVID-19 was filmed by a local citizen scientist.

Conservation groups’ activities have been interrupted by COVID-19 lockdowns. While some groups with large, long-term datasets, such as the British Columbia Cetaceans Sighting Network, are not significantly impacted by a short interruption to their work, for others, the story



📷 Ocean Wise | A family participating in a Shoreline Cleanup.

is different.⁷ For example, one citizen run salmon hatchery reported cancelling education events and making changes to its operations to adhere to COVID-19 related social distancing practices.¹¹ Tim Pardee of the Bowen Island Fish and Wildlife Club said of the changes “We have to follow the advice of the health experts – our health depends on it.”

^{iv} audubon.org/conservation/science/christmas-bird-count

Spotlight 2

The Great Canadian Shoreline Cleanup during COVID-19

The Ocean Wise - World Wildlife Fund (WWF-Canada) [Great Canadian Shoreline Cleanup](#) (GCSC) is considered one of the largest national conservation programs taking direct action.¹² Shoreline cleanups remove litter such as plastics, cigarette butts, fishing gear, and construction materials.¹³ Tracking the type of litter removed provides insight into where the trash came from (e.g., fishing or shipping, natural disasters).¹³

The COVID-19 pandemic has seen an increase in plastic usage such as plastic grocery bags¹⁴ and personal protective equipment (e.g., masks, gloves).¹⁵ These are concerning trends because plastics often enter the ocean where they can have detrimental effects on wildlife and habitats.

Fewer cleanups mean more plastics and garbage remain on shorelines, posing a continuing hazard to marine life and the environment.

In response to the strict health guidelines imposed due to COVID-19, the GCSC recommended that cleanups be postponed to ensure adherence to public health recommendations.¹⁶ Looking at differences between 2019 and 2020 for March through to May, when public health measures were most restrictive, gives an idea of the impact of COVID-19 on voluntary stewardship initiatives.

In 2019 there were over 1,000 registered cleanups across Canada; however, during the same period in 2020, there were only 117 registered cleanup events, an almost 90% decrease (Figure 2).

In 2019, between March and May alone, over 72,000 kgs of litter were removed by 29,000 shoreline cleanup participants. By contrast, for the same period in 2020, only around 2,500 kg of litter has been collected by fewer than 3,000 participants^v, which is a participation reduction of 90% and a 96% decrease in litter removal.

While it is unclear what the impact of missed cleanups will be, there is good news. With restarts and our new ‘normal’ emerging, the GCSC team has taken steps to adapt. After almost four months of cleanup postponements, July 14th marked the restart of this program, and the commencement of solo, household and small team cleanups.¹⁶

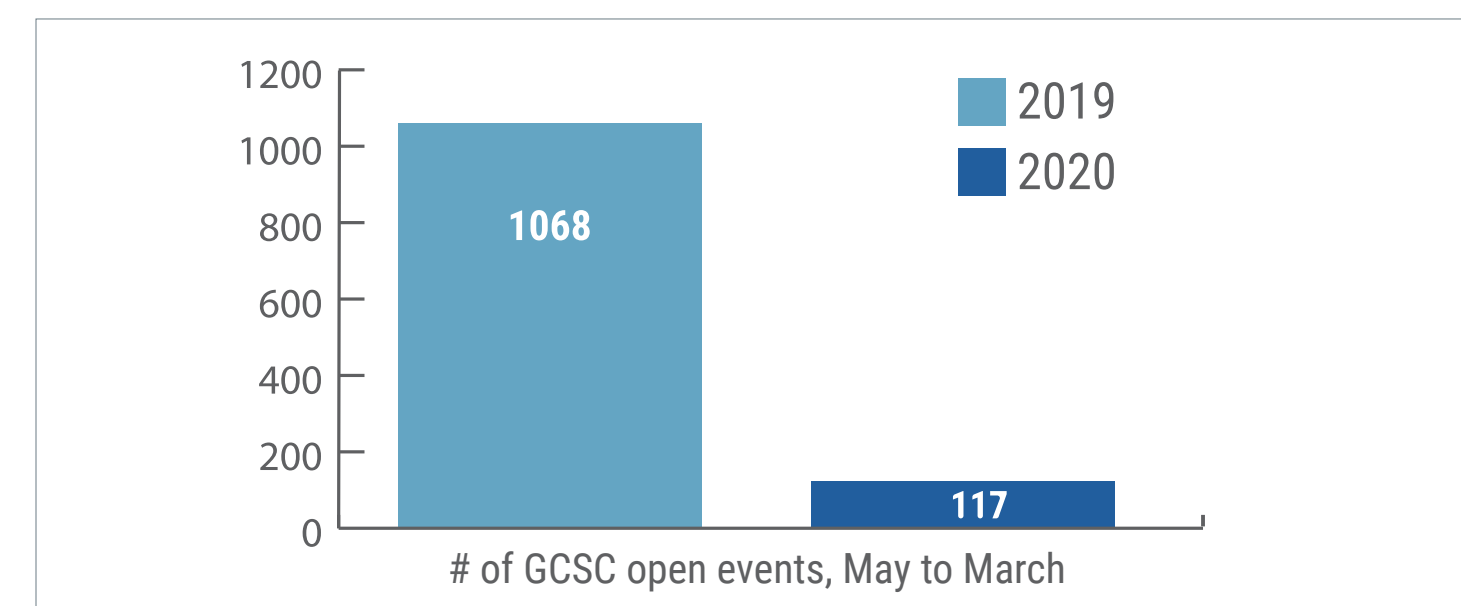


Figure 2. Open and cancelled shoreline events for the GCSC across Canada for the period March to May in 2019 and 2020.

^v GCSC team is currently confirming if open events did proceed across Canada.



GREAT CANADIAN
Shoreline
Cleanup
OCEAN WISE & WWF

Impact 3

Sustainable Seafood

The global fishing and aquaculture^{vi} industries are important for both feeding and employing people. In 2018, the global seafood industry employed an estimated 59 million people, with a total seafood harvest of 180 million tonnes, a record high.¹⁷ Around 3.3 billion people rely on seafood as an important source of daily protein.¹⁷

Demand for seafood is growing faster than our population, partly due to factors such as increasing incomes and the recognition of its health benefits.¹⁷ Technology has advanced rapidly to enable bigger catches in less time to meet this growing demand; however, these changes can, and often do, have significant conservation impacts.

Many fish stocks are overfished, impacting the ability of a species to maintain a healthy population size.

Overharvesting and other unsustainable fishing and aquaculture practices contribute to humans having greater environmental impacts on aquatic systems than ever before. In fact, the Food and Agriculture Organization (FAO) of the United Nations estimates that only around two-thirds (65.8%)^{vii} of assessed^{viii} marine stocks are being extracted at a biologically sustainable level (i.e., they are able to retain abundant stocks over time, enough to maintain population numbers).¹⁷



The Ocean Wise symbol next to a seafood item is our assurance of an ocean-friendly choice.

Programs such as [Ocean Wise Seafood](#) support sustainable fisheries and aquaculture operations in a number of ways. Having the Ocean Wise recommended label on a product or menu item informs consumers that the product is sustainably harvested and supports healthy oceans^{ix}.¹⁸ Additionally, this program works to leverage industry purchasing power to influence demand for sustainable seafood.

Businesses within the seafood supply chain, including restaurants, have suffered significant economic burdens because of COVID-19. To meet government restrictions, business were forced to close fully or operate with limited capacity resulting in over 800,000 restaurant employees losing their incomes and closure of nearly 1 in 10 independent restaurants thus far.¹⁹ The long-term impacts of closures and recovery will likely be experienced by restaurants for a minimum of 12-18 months, if not longer.

Even in times of crisis, the value and importance of sourcing and selling sustainable seafood remains critical to ensuring healthy fish populations. Closely monitoring impacts to industry and helping to support businesses that promote sustainable seafood throughout the pandemic, as is being done by the Ocean Wise Seafood team, is required to ensure sustainable seafood remains in-demand post-COVID.

^{vi} Aquaculture – the farming or culture of aquatic animals or plants.

^{vii} Based on data from 2017.

^{viii} Globally, there are many small-scale fisheries supplying subsistence harvests that are not measured due to lack of management and funding.

^{ix} Ocean Wise recommended label is based on 1) ensuring the long-term health and resiliency of target, bycatch, and farmed species; 2) utilizing effective and adaptive management and enforcement; 3) Limiting negative impacts of fishing or farming on habitats and the greater ecosystem. Please see <https://seafood.ocean.org/> for more information, including initiatives such as education on sustainable seafood.



Spotlight 3

Halibut Fishery

Pacific halibut (*Hippoglossus stenolepis*) is a large flatfish native to the North Pacific. This lucrative fishery is a high-end product more typically served in fine dining restaurants.²⁰ Some Pacific halibut harvested by longlines in the Pacific Northwest (along the B.C. and Alaska coast)^{*} is currently recommended by Ocean Wise as a sustainable source of protein.²¹

Requirements for social distancing due to COVID-19 caused delays to fishery openings and decreased operations within fisheries, aquaculture, and restaurants. Pacific halibut, as a high-end product that sells internationally, particularly to Asian markets, has seen a

drop in demand.²² Since there are still fish to catch and fisherman that need work, Pacific halibut is ending up in local grocery stores, but not necessarily with a decreased price.²²

The total weight of Pacific halibut caught in 2020 is noticeably below the landed catch in the same period over the previous two years (Figure 3). The gap between 2020 and 2018/2019 has consistently been more than 1 million kg lower since week 18 (April 26th). Compared to the mid-September cumulative catch in 2019, the 2020 catch is almost 15% lower for the same week^{xi}. To date, the ecological impacts of these changes, if any, remain unknown.

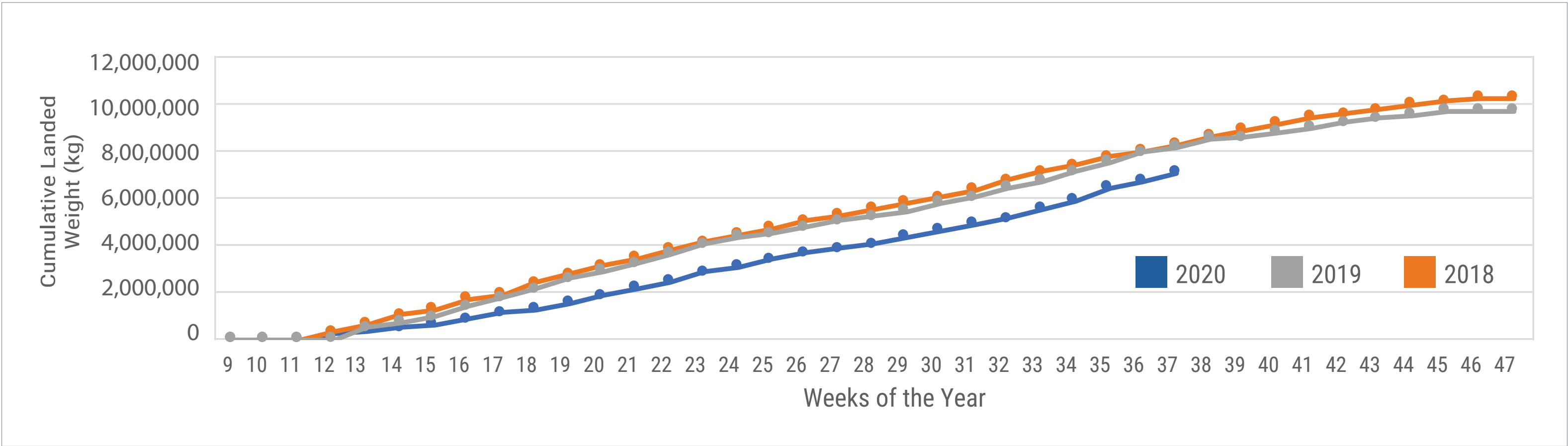


Figure 3. The cumulative landed weight (kg) of Pacific halibut by week for B.C. and Alaska. Data source: International Pacific Halibut Commission.²³ Note: at the time of writing, data was only available up to September 9th 2020 (week 37).²³

^{*} Pacific halibut from waters around Northern Asia are not currently recommended by Ocean Wise Seafood
^{xi} September is the latest week of data available at time of writing.



Eric Enno Tamm | Harvested halibut are put on ice as soon as possible after capture to keep them fresh.

Conclusion

Unique challenges and opportunities are faced by everyone during this time. Researchers have missed potentially valuable observations and have been forced to adapt their work. This experience is mirrored by environmental community groups and missed volunteer work, such as shoreline cleanups. Likewise, the catch quantity of Pacific halibut has dropped due to changes in demand.

The immensity of global actions to slow the spread of COVID-19 demonstrates that we can make large changes to better care for our oceans. What we do to restart after COVID-19 restrictions are lifted will define a new 'normal' for our oceans. We have an opportunity to prioritize ocean health, to invest in research to improve our knowledge, re-evaluate our waste production, and choose sustainable seafood in support of healthy oceans.



What can you do?

Individual and Organization Actions

- ❑ Help contribute to monitoring wildlife by downloading the WhaleReport app for [iOS](#) or [Android](#).
- ❑ Participate in community environmental and citizen science groups.
- ❑ Consider a safe shoreline cleanup, either solo, household or small team. See [shorelinecleanup.ca/](#) for more details.
- ❑ Reduce waste and consider taking the Ocean Wise plastic pledge [ocean.org/plastic-wise/](#)
- ❑ Look for the fish symbol and choose to buy sustainable Ocean Wise recommended seafood. <https://seafood.ocean.org/>
- ❑ Support local and seasonal seafood.
- ❑ Support Ocean Wise Seafood partners near you. [Partner Map](#)

Government Actions and Policy

- ❑ Fund and support marine environmental research and consider it vital to our welfare and economy.
- ❑ Support the creation of ocean management plans and networks of Marine Protected Areas to protect habitats and species, with the goal of healthy oceans.
- ❑ Support programs for reduced waste.
- ❑ Incentivise sustainable fishing methods.
- ❑ Phase out fishing methods that are damaging to the environment or have high bycatch.

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References

1. National Oceanic and Atmospheric Administration (NOAA). How much water is in the ocean? [Internet]. National Ocean Service website. 2020 [cited 2020 Jul 21]. Available from: oceanservice.noaa.gov/facts/oceanwater.html
2. National Oceanic and Atmospheric Administration (NOAA). How much oxygen comes from the ocean? [Internet]. National Ocean Service website. 2020 [cited 2020 Jul 21]. Available from: oceanservice.noaa.gov/facts/ocean-oxygen.html
3. Bindoff NL, Cheung WWL, Kairo JG, Aristegui J, Guinder VA, Hallberg R, et al. Changing Ocean, Marine Ecosystems, and Dependent Communities. In: Pörtner H-O, Roberts D., Masson-Delmotte V, Zhai P, Tignor M, Poloczanska E, et al., editors. IPCC Special Report on the Ocean and Cryosphere in a Changing Climate. 2019.
4. UNESCO. COVID-19: the ocean, an ally against the virus [Internet]. 2020 [cited 2020 Jul 21]. Available from: <https://en.unesco.org/news/covid-19-ocean-ally-against-virus-0>
5. Cordes EE, Jones DOB, Schlacher TA, Amon DJ, Bernardino AF, Brooke S, et al. Environmental Impacts of the Deep-Water Oil and Gas Industry: A Review to Guide Management Strategies. Front Environ Sci [Internet]. 2016;4. Available from: <http://journal.frontiersin.org/Article/10.3389/fenvs.2016.00058/abstract>
6. International Union for Conservation of Nature and Natural Resources (IUCN). Deep-sea mining [Internet]. 2018. Available from: https://www.iucn.org/sites/dev/files/deep-sea_mining_issues_brief.pdf
7. Dearden A, Chapman J, Miller A, Vergara V, Haulena M, Akhurst L, et al. COVID-19: A story of marine mammals. In: Ocean Watch Spotlight [Internet]. Vancouver, Canada: Ocean Wise Conservation Association; 2020. p. 16. Available from: <http://oceanwatch.ca>
8. Morin S. Researchers worry pandemic creating gaps in North Atlantic right whale tracking. CBC News [Internet]. 2020; Available from: <https://www.cbc.ca/news/canada/new-brunswick/right-whales-tracking-covid19-pandemic-research-1.5541318>
9. National Oceanic and Atmospheric Administration (NOAA). NOAA Fisheries will Cancel Five Alaska Research Surveys for 2020. 2020; Available from: <https://www.fisheries.noaa.gov/media-release/noaa-fisheries-will-cancel-five-alaska-research-surveys-2020>
10. Silvertown J. A new dawn for citizen science. Trends Ecol Evol. 2009; 24:467–71.
11. Pardee T. Bowen Island Fish and Wildlife Club. Personal communications. Bowen Island; 2020.
12. Great Canadian Shoreline Cleanup. Our History [Internet]. Ocean Wise and WWF. [cited 2020 Jun 2]. Available from: <https://www.shorelinecleanup.ca/history>
13. Schoeler R. Tons of debris removed from the West Coast Trail. In: Bodtker K, editor. Ocean Watch BC Coast Edition. Vancouver, B.C., Canada: Coastal Ocean Research Institute; 2018.
14. Dayman I. Single-use plastic ban delayed to reduce coronavirus risk at restaurants and cafes. ABC News [Internet]. 2020; Available from: <https://www.abc.net.au/news/2020-04-30/plastic-ban-delayed-to-help-cafes-reopen-amid-coronavirus/12200530>
15. Picheta R. Coronavirus is causing a flurry of plastic waste. Campaigners fear it may be permanent. CNN [Internet]. 2020; Available from: <https://www.cnn.com/2020/05/04/world/coronavirus-plastic-waste-pollution-intl/index.html>
16. Ocean Wise. Great Canadian Shoreline Cleanup [Internet]. 2019 [cited 2019 Oct 24]. Available from: <https://www.shorelinecleanup.ca>
17. Food and Agriculture Organization (FAO). The State of World Fisheries and Aquaculture 2020. Sustainability in action. Rome; 2020.
18. Ocean Wise Seafood Program. Our Standards [Internet]. 2020 [cited 2020 Aug 18]. Available from: <https://seafood.ocean.org/seafood-guide/how-we-grade/>
19. Restaurants Canada. Rapid Recovery Series. Presentation by Shanna Munro, President & CEO of Restaurants Canada, via webinar on June 9th, 2020.
20. Penner D. B.C. commercial fishery among sectors fearing COVID-19 market fallout. Vancouver Sun [Internet]. 2020; Available from: <https://vancouversun.com/business/b-c-commercial-fishery-among-sectors-fearing-covid-19-market-fallout/>
21. Ocean Wise Seafood Program. Halibut [Internet]. 2020 [cited 2020 Jul 24]. Available from: <https://seafood.ocean.org/seafood/type/halibut/>
22. Currie E, McLaughlin R. Local fishermen can't sell their catch after COVID-19 closes restaurants, slows exports. CTV News [Internet]. 2020; Available from: <https://bc.ctvnews.ca/local-fishermen-can-t-sell-their-catch-after-covid-19-closes-restaurants-slows-exports-1.4887400>
23. International Pacific Halibut Commission. Year to date directed commercial landing patterns (AK and BC) [Internet]. 2017 [cited 2020 Jul 17]. Available from: <https://www.iphc.int/data/year-to-date-directed-commercial-landing-patterns-ak-and-bc>

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📷 Ocean Wise | Senior Scientist Emeritus Jeff Marliave at work, pre-COVID pandemic.



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