



Canadian
Ocean
Literacy
Coalition

La coalition
canadienne de
la connaissance
de l'océan

HIGHLIGHTS REPORT, JUNE 2020

OCEAN LITERACY IN THE CANADIAN MEDIA

AUTHORS:

DAVID SHIFFMAN, LILIA YUMAGULOVA, AND LISA (DIZ) GLITHERO

EDITOR:

SARAH MACNEIL

GRAPHIC DESIGN:

MEGHAN CALLON

INTRODUCTION

The media (news, social media, film, and podcasts) plays an important role for advancing ocean literacy (Guest, Lotze and Wallace, 2015; Ashley et al., 2019). In Canada, media is the predominant source for learning about ocean issues (Glithero and Zandvliet, 2020). Remarkably, this holds for both 'ocean-engaged' survey participants (Canadian Ocean Literacy Survey) and a random sampling survey of the general public conducted by Nanos Research (Figure 1).

CANADIANS LEARN ABOUT THE OCEAN THROUGH

● COLSurvey
(OCEAN-ENGAGED) ● NANOS
(GENERAL PUBLIC)

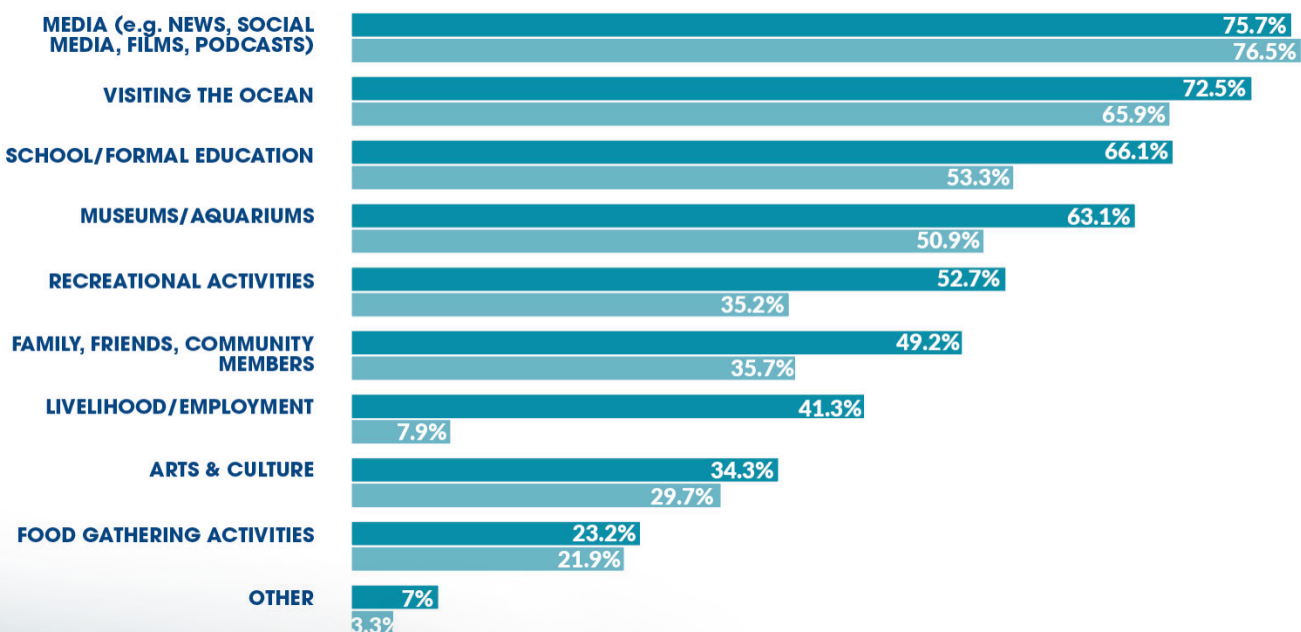


Figure 1: Results from the Canadian Ocean Literacy Survey (ocean-engaged sample) and polling done by Nanos Research (general public sample) (Glithero and Zandvliet, 2020).

To date, no nationwide media and/or social media content analysis has been performed to examine how topics related to ocean literacy are covered in Canada.

To help partially fill this gap, the Canadian Ocean Literacy Coalition (COLC) commissioned Dr. David Shiffman, Lead Consultant, David Shiffman Scientific and Environmental Consulting, Inc., to conduct:

- 1 a coarse-scale media content analysis of how a variety of ocean literacy related topics were discussed in Canadian newspapers from January 2010 to December 2019, specifically focusing on stories about Canada's ocean and coasts; and
- 2 a social media scan to identify Canadian ocean influencers on Twitter, and provide a coarse-scale analysis of the types of topics they discuss. The findings from the media analysis and social media scan served as a basis for this summary report.

Thank you to report reviewers:
Carie Hoover, Julia Ostertag, and
CarolAnne Black

© Shiffman, D., Yumagulova, L. and Glithero, L. (2020) *Ocean Literacy in the Canadian Media: Highlights Report*. Canadian Ocean Literacy Coalition. Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License

PART 1:

OCEAN LITERACY IN CANADIAN NEWSPAPERS

Newspapers are an important information pathway that help inform the public about the ocean (Johns and Jacquet, 2018). Newspapers in Canada are a major source of information for members of the public and are widely read with a total daily average circulation of over 5 million (News Media Canada, 2015).

OUR METHODS

Using a predefined set of keywords, a search of the LexisNexis Uni academic database and a search of the Eureka.CC database of English-language newspaper articles was conducted to identify ocean related content. The Eureka.CC database contains major media outlets not included in the LexisNexis Uni database (such as CBC news outlets, outlets from Newfoundland, Nova Scotia, and Prince Edward Island).

Since ocean literacy is not a term in common usage, the keywords used for the search included terms related to ocean education, ocean values, ocean sectors (e.g., blue economy/ocean industries, fisheries, aquaculture, marine tourism), ocean ecosystems and conservation (e.g., ocean threats, specific ocean species, habitats, ocean advocacy, Marine Protected Areas (MPAs), and Indigenous connections with the ocean).

DATA

Based on the predefined keyword searches, a total of 19,543 articles published in Canadian media outlets from 2010-2019 were identified that mentioned topics of interest related to ocean literacy. From these, a total of 1,253 articles focused on a topic of interest (i.e., not just a passing mention) that could be assigned to a specific media region (i.e., were from a regional media outlet and not nationwide coverage like CBC) and could be used for regional-level analysis, in keeping with COLC's study regions (i.e., Pacific, Inuit Nunangat, Atlantic, Inland Canada, and St. Lawrence).

TOPICAL AREA

DEFINITION

EXAMPLE/NOTES

Ocean education/
ocean knowledge/
ocean literacy/
ocean culture

Stories about what Canadians know about the ocean and/or campaigns to teach Canadians about the ocean; stories about why the ocean is culturally important to non-Indigenous Canadians

Stories may also touch on blue economy, or conservation, but the focus is on education, culture, and/or literacy

Blue economy
/ocean industry

Stories about economic use of the ocean, including fisheries, offshore oil/gas, shipping, shipbuilding, marine recreation, etc., including policy or governance stories related to these topics

Stories may also touch on advocacy, but the focus is on economic use, not on rules governing that use
Subdivisions: fisheries and aquaculture, energy, recreation

Ocean conservation/
ocean advocacy/
ocean sustainability

Stories about protecting a threatened or overexploited species or habitat, improving a management practice, or NGO/activist campaigns to try and accomplish this, including marine protected areas and ocean protection

Stories may also touch on blue economy, but the focus is on the conservation angle, not on rules or economic use
Subdivisions: threats, MPAs, threatened species

Indigenous
perspectives on and
connections with the
ocean

Stories about any of the above topical areas with a focus on Indigenous perspectives

Stories about Indigenous-owned businesses related to blue economy; Indigenous perspectives on conservation or management; influence of ocean on culture

Table 1: Key Topical Areas Framing Keyword Search in Canadian Media

LIMITATIONS

Due to timeline and funding restrictions, the coarse media analysis took place in English language only. In turn, the St. Lawrence Region – one of COLC's five study regions – is not reflected in this report. Further analysis using Eureka.CC is required to extend and strengthen this initial and limited coarse media analysis of ocean literacy in Canada, including analysis of French-language content. Specific to the Inuit Nunangat Region, although Arctic regional news sources were included in both the LexisNexis and Eureka.CC searches, only 26 articles total from this region were featured in the top 1,000 articles

using keyword searches. In turn, any extrapolation of Arctic newspaper coverage from this coarse analysis should be interpreted with caution.

Overall, this coarse scale analysis approach is useful to help identify how often a given topic is mentioned in the media, but not how each topic is discussed (e.g., is offshore oil an environmental risk or an economic opportunity?). Additionally, this analysis should be considered a conservative minimum estimate rather than a comprehensive list of all articles.

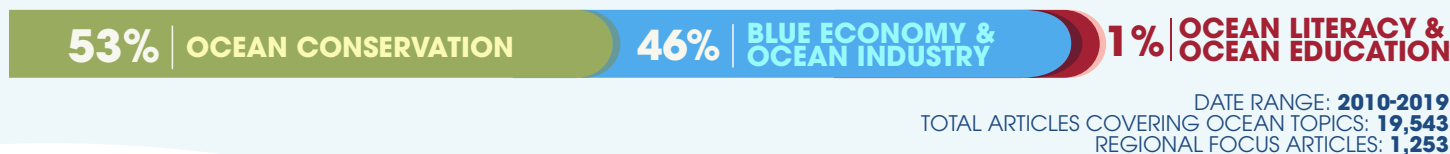
¹ These are academic databases most commonly accessed through a University library subscription but they also have homepages. See: LexisNexis Uni at LexisNexis.ca and Eureka.CC (product name and website URL).

KEY FINDINGS

OVERALL...

Ocean Conservation as a topic received the most coverage with 10,362 articles (53%), followed by **Blue Economy and Ocean Industry**, with 8,981 (46%) articles. **Ocean Literacy and Ocean Education** were the least covered topics (188 articles, 1%) (Figure 2).

Figure 2: Coverage of key ocean topics in Canadian newspapers from 2010-2019.



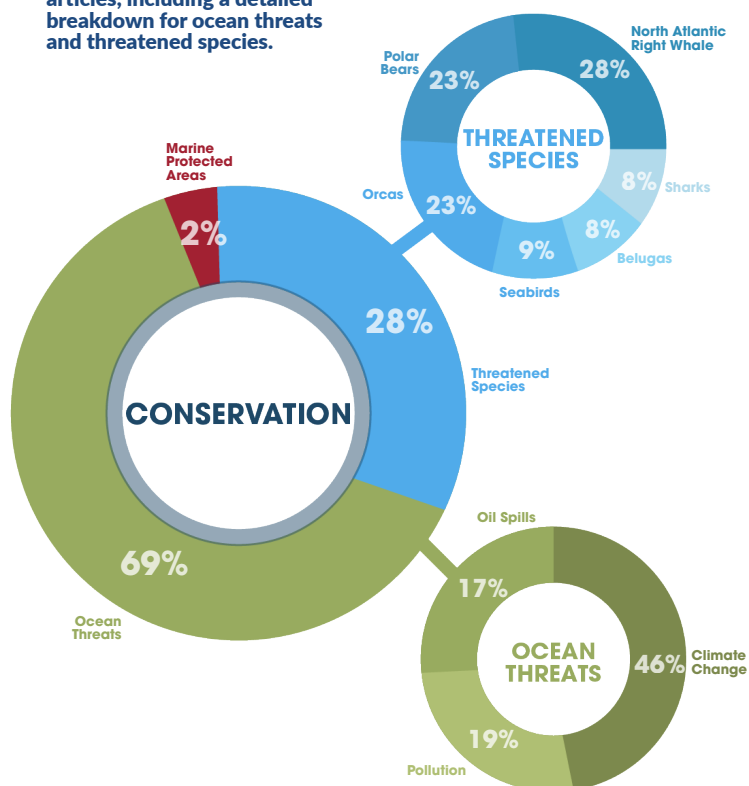
A. CONSERVATION

Of the 10,362 articles that focused on the ocean conservation topic keywords from this study, 69% focused on ocean threats, 28% on issues facing especially charismatic species, and 2% on Marine Protected Areas.

Within the threats, climate change and the ocean were most frequently covered (46%), followed by pollution (including plastic, 19%), and oil spills (17%).

For threatened species, the North Atlantic Right whale (28%), polar bears (23%), and orcas (23%) were the most frequently featured species (Figure 3).

Figure 3: Relative coverage of different subdivisions within the ocean conservation topic in Canadian newspaper articles, including a detailed breakdown for ocean threats and threatened species.



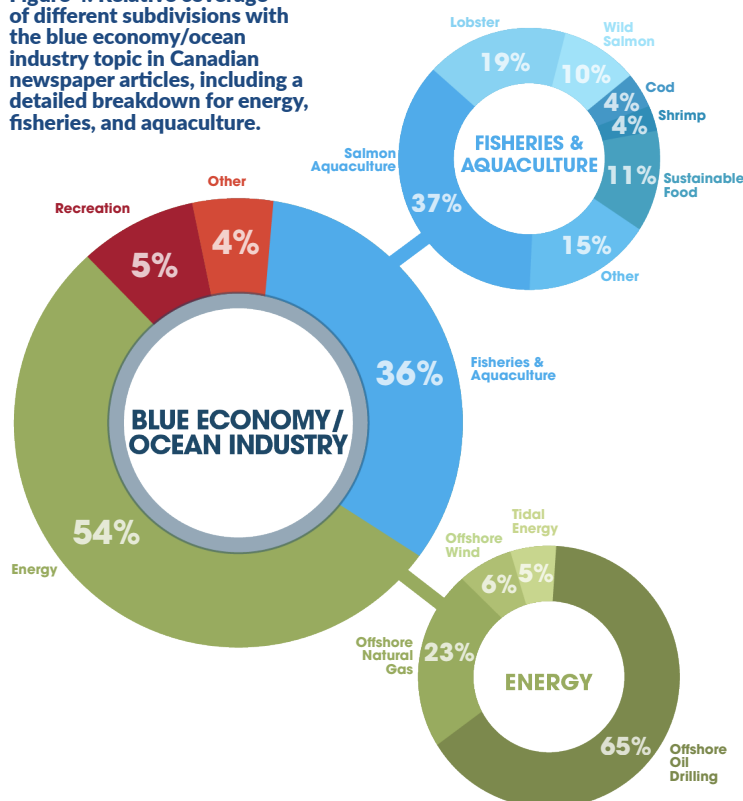
B. BLUE ECONOMY/OCEAN INDUSTRY

Within the 8,981 articles relevant to the blue economy/ocean industry topical area keywords, energy topics were the most commonly discussed (54%), followed by fisheries and aquaculture topics (36%), recreation (6%, excluding cruise ship industry and surfing), and 'other' (4%).

In total, there were 4,558 articles about energy and the ocean. Many articles mentioned energy topics in the context of employment or economic forecasts for a province, region, or all of Canada (Figure 4).

Stories from the Fisheries and Aquaculture subdivision were dominated by discussions of salmon aquaculture (in both Atlantic and Pacific Canada) and lobster (overwhelmingly in media outlets in Atlantic Canada).

Figure 4: Relative coverage of different subdivisions with the blue economy/ocean industry topic in Canadian newspaper articles, including a detailed breakdown for energy, fisheries, and aquaculture.



² Two important areas of marine recreation (surfing and the cruise ship industry) were not included in this analysis, as keywords returned an overwhelming number of irrelevant articles (e.g., articles about Canadians stuck on cruise ships elsewhere, stories about Canadian surfers competing elsewhere).

C. OCEAN LITERACY AND OCEAN EDUCATION

This media scan identified that only 1% of articles (n=188) from 2010-2019 focused specifically on topics of ocean literacy and ocean education. This included the following topics:

Featured academic research:

e.g., "Young People in Nova Scotia get failing grade in ocean literacy: Study," a 2015 article reprinted in media outlets across Canada.

Highlights of ocean literacy programs:

e.g., "Ocean school expected to make waves as it launches in Halifax," Toronto Star, 2018.

Events, festivals, and celebrations:

e.g., "Maritime Museum of BC, Ocean Networks Canada launch new partnership," Postmedia breaking news, 2019, which focused on a new exhibit about the ocean; "Canadians Crazy for lobster Carnival," Calgary Herald, 2011, which focused on the Pictou lobster festival in Nova Scotia; "Hatter wrapping up month of ocean talk," Medicine Hat News, 2018.

REGIONAL ANALYSIS

Of the 1,253 ocean-focused, regionally-published articles, there were four specific topics (right whales, lobster, tidal energy, and offshore oil) in which 50% or more of all articles were in one of three regions (Atlantic, Pacific, and Inland Canada). Figure 5 illustrates this finding.

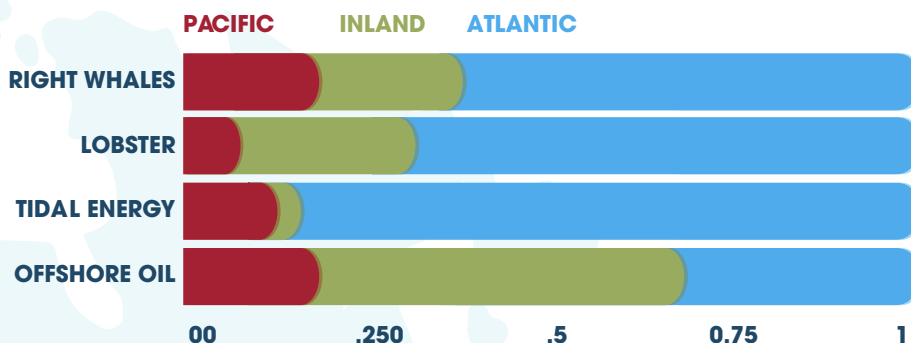


Figure 5: Regional distribution of topics of high interest. The percentage of stories (not the raw count of stories) within a topic published in each region are highlighted.

BELOW IS A DISCUSSION AND PRESENTATION OF THE KEY TOPICS IN NEWSPAPER ARTICLES BY REGION.

ATLANTIC:

Stories about lobster fisheries, tidal energy, and conservation issues surrounding the North Atlantic right whale were much more commonly covered in the Atlantic region than in other regions.

INLAND CANADA:

Stories about offshore oil were more commonly covered in inland newspapers, especially those based in Alberta, than in other regions. Otherwise, broad overview type stories of a variety of ocean issues (e.g., an overview of a debate about the pros and cons of salmon aquaculture) were more common in inland Canada than in Atlantic or Pacific Canada.

PACIFIC:

The only topic more commonly covered in Pacific outlets than in other regions was orca conservation issues, including the possible impact of oil spills and increased shipping traffic.

INUIT NUNANGAT:

Newspaper media outlets from the Arctic did not frequently show up in the results. Only 26 articles total from this region were featured in the top 1,000 articles using ocean topic keyword searches. Of these, twenty articles were focused on polar bear conservation or human-polar bear conflict (n=7), oil spill unpreparedness associated with offshore drilling (n=6), beluga whale conservation (n=4), and Inuit-owned fisheries (n=3), with the remaining six about miscellaneous ocean and coastal topics.

OCEAN SPECIALTY MEDIA

In addition to ocean topics being widely covered or mentioned in the mainstream Canadian press, Canada also has independent or specialty media outlets, including radio and magazines, that extensively cover the ocean and has many excellent journalists who focus largely on these topics. While most of these were included in the search above, we highlight a brief sample of them below.

ATLANTIC CANADA:

CBC Newfoundland and Labrador has a long-running and locally popular radio show called [“The Broadcast”](#) that specifically covers the fishing industry and fishing culture run by journalist Jane Adey. CBC Nova Scotia’s Paul Withers regularly covers blue economy and ocean governance topics and has won awards for his detailed coverage. CBC Halifax’s Mainstreet (radio) regularly features interviews with [“Our Oceans Guy,”](#) Dr. Boris Worm from Dalhousie University. Excellent freelance journalists who regularly cover ocean and coastal topics in Atlantic Canada include Sarah Smellie and Brian Owens.

In terms of newspapers, Brett Bundale with the Chronicle Herald has extensively covered the business side of fisheries, and Glen Whiffen at the Telegram has also extensively covered fisheries topics over the years. Both papers cover blue economy and conservation topics regularly.

[The Aboriginal Peoples Television Network](#) (APTN) also focuses on coastal First Nations communities in Atlantic Canada. APTN journalist Trina Roache has done an exceptional job covering ocean and coastal topics, especially Indigenous fishing rights.

INLAND CANADA:

Inland Canada has few ocean-focused outlets, but [Holly Lake at iPolitics](#)/The Star focuses on ocean and coastal topics extensively. Her articles include issues of governance, blue economy, and conservation.

PACIFIC CANADA:

British Columbia is home to several ocean-focused media. [Hakai Magazine](#), based at but editorially independent from the Hakai Institute in coastal British Columbia, is an online-only publication that focuses exclusively on stories about the regional, national and global ocean, coasts and coastal culture.

[The Tyee](#) is an independent reader-funded publication that covers a variety of topics, with a focus on ocean and coastal conservation issues by seeking out perspectives not often found in mainstream outlets.

[The Narwhal](#) (formerly DeSmog Canada) is an online publication based in Victoria that does in-depth investigative journalism on a variety of topics related to the environment, including but not limited to ocean and coastal topics.

BC also has excellent freelance science and environment journalists who regularly cover these topics for a variety of outlets, including Leslie Evans Ogden, and longtime staff journalists like Larry Pynn who has covered ocean topics for the Vancouver Sun for decades.

INUIT NUNANGAT:

In the Canadian Arctic, the two largest news outlets, [CBC North](#) and [Nunatsiq News](#), provide local and regional coverage of ocean and coastal issues, especially those related to climate change and sea level rise, potential and current Arctic oil exploration, and conservation issues related to marine mammals. Nunatsiq News also does an exceptional job providing an Inuit perspective on news not found in most media outlets.

PART 2:

CANADIAN OCEAN INFLUENCERS ON TWITTER

Internet tools have revolutionized the ways that many ideas are communicated, and social media in particular is an increasingly important pathway, where members of the public can learn about ocean science, conservation, and policy (Thaler et al., 2013).

Twitter, a micro-blogging social media platform, has been widely adopted by many sectors of the ocean community, including educators, government agencies and their staff, activists and environmental non-profit groups, academics, journalists, and industry groups (Parsons et al. 2014, Shiffman 2018).

Canadians are active Twitter users. According to Twitter Canada’s Michelle Slater, more than 15 million Canadians use Twitter every month, which in 2018 amounted to 49.7% of Canada’s online population (Slater, 2018).

Social media platforms have been criticized for enabling online “bubbles” or “echo chambers” that can reinforce certain positions and also “lead to wildly divergent factual beliefs among the mass public” (Eady et al., 2019, p. 18). Côté & Darling (2018) examined the distribution of information by scientists who use Twitter, and found that while academic scientists begin with “preaching to the choir” (i.e., in-reach to other scientists), they do in fact acquire additional followers and retweets on social media, leading to broader and more diverse audiences.

A deeper understanding of social media influencers can enable a better understanding for ocean literacy communication pathways.

For the purposes of this study, a Canadian ocean influencer is defined as an individual or organizational account that:

- 1 is based in Canada
- 2 has over 800 followers
- 3 regularly uses Twitter to speak to a broad audience about ocean issues in Canada
- 4 tweets primarily original content, not just curated re-tweets (i.e., sharing with your followers tweets written by others)
- 5 tweets primarily for a broad audience of people interested in the ocean, not just institutional news relevant only to employees or members

METHODS

Relevant accounts were identified using an advanced keyword search of Twitter bios using the software package FollowerWonk and supplemented by additional methods. Bios and recent tweets of all influencers were briefly scanned to create a coarse-scale overview of the general topics these accounts primarily and occasionally discuss. Topics these accounts discussed included: blue economy/ocean industry, conservation and advocacy, governance and policy, science/natural history, and Indigenous perspectives. Only accounts identified in the users' bios as being in Canada were caught by the FollowerWonk search. See Appendix A for a list of the key words searched in the FollowerWonk advanced bio search.

LIMITATIONS

Since the social media scan was conducted in December 2019, some new and currently (June 2020) influential accounts are not included in this report. For example, a new account affiliated with OceanWise (@OceanWiseEdu) was started in March 2020 after this analysis was conducted, and currently has 7884 followers. This newer account is not included in figures or analysis but is noteworthy.

Overall, and similar to the media analysis, this scan should be considered a conservative minimum estimate of how Canadian ocean issues are discussed in social media as this approach only looked at twitter accounts based in Canada.

DATA

In total, 77 Canadian online ocean influencers were identified according to the selection criteria described above. These 77 accounts (Appendix B) were categorized into one of 8 categories:

- Academic (20 accounts)
- Non-Profit (18)
- Industry (15)
- Government (9)
- Indigenous (6)
- Journalist (5)
- Education/Ocean Literacy (3)
- and Other (1)

Additionally, there are 43 noteworthy accounts (see Appendix C) that contribute to important conversations about the ocean while not meeting some of the criteria outlined above. This compiled supplementary list includes 15 accounts that met all other criteria except follower count, and 28 that met some but not all of the other criteria (usually focusing on a variety of issues not just ocean issues, or focusing on ocean issues but not just Canadian ocean issues). For example, Vancouver Aquarium @vanaqua has 49,900 followers but appears on the 'supplementary list' as the majority of their Twitter talk is focused on institutional details (e.g., events and membership discounts).

GENERAL FINDINGS

- 1 The largest number of accounts discussed conservation and advocacy issues.
- 2 The topics discussed (primarily and occasionally) by users with the highest follower count were blue economy/ocean industry, conservation, and governance/policy, respectively. This suggests that these topics are likely seen on Twitter by more Canadians than the other two topics (natural history/science and Indigenous perspectives).
- 3 Science/natural history and Indigenous perspectives topics were primarily or occasionally discussed by many accounts, but these accounts had relatively few total followers.
- 4 Indigenous perspectives on ocean issues were primarily discussed by accounts categorized as Indigenous. Indigenous perspectives were occasionally discussed by non-profit, journalist, and government accounts.
- 5 Conservation and advocacy topics were primarily discussed by non-profit and academic accounts; they were occasionally discussed by journalist, government, and Indigenous accounts.
- 6 Blue economy topics were primarily discussed by industry accounts with a few academic accounts, but were occasionally discussed by all categories of accounts.
- 7 Science and natural history topics were primarily discussed by academics, followed by industry and government accounts, with occasional discussion by all other categories of accounts.

KEY FINDINGS

FOLLOWERS:

In total, these 77 Canadian ocean influencers amassed over 300,000 followers. The categories with the highest number of total followers were non-profit and government, driven primarily by a few extremely highly followed accounts in these categories. The account with the largest number of followers was the primary Fisheries and Oceans Canada account - FishOceansCAN - with 33,520 followers, though other DFO accounts were also classified as influencers.

Figure 6 below highlights the total number of accounts in each of the categories outlined in the 'Data' box on the above page.

The following accounts had the highest following (as of December 2019):

Government: Fisheries and Oceans Canada - @FishOceansCAN (33,520)

Non-Profit: Ocean Wise Life - @OceanWiseLife (22,090)

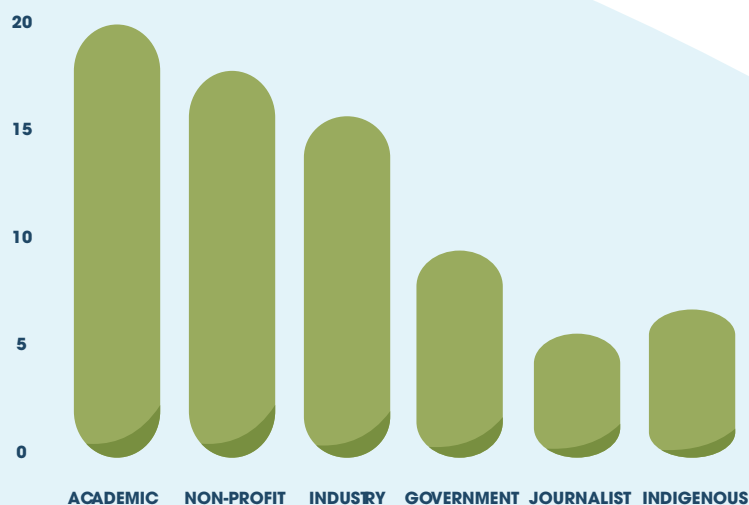
Media: Hakai Magazine - @HakaiMagazine (16,068)

Academic: Ocean Networks Canada - @Ocean_Networks (12,320)

Industry: SeaChoice - @SeaChoice (10,189)

Indigenous: Coastal First Nations - @CFNGBI (7,374)

Figure 6: TOTAL NUMBER OF ACCOUNTS IN EACH CATEGORY



INFLUENTIAL ACCOUNTS BY SECTOR:

The greatest number of ocean influential accounts were categorized as (1) Academic, (2) Non-profit, and (3) Industry, respectively. However, the categories with the most followers, based on the December 2019 analysis, were non-profit and government. This is driven largely by a few government and non-profit accounts with a large number of followers (i.e., relatively few accounts in these categories, but those accounts had a lot of followers).

Of particular significance to the study, only three accounts were identified for Ocean Literacy and Ocean Education (defined as a public educator or public education initiative focusing explicitly on ocean literacy):

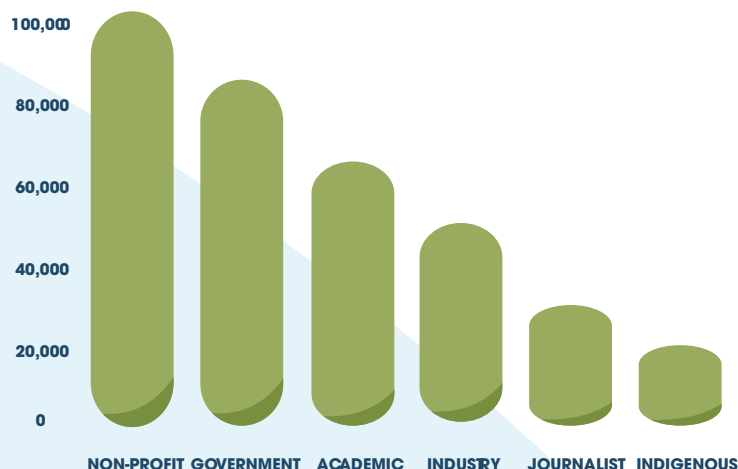
CaNOE - @OceanLitCanada (1,293 followers)

Ocean School - @OceanSchoolNow (1,139 followers)

The Marine Detective - @OceanDetective (830 followers)

Figure 7: Twitter followers for Canadian, ocean-related accounts: as of December 2019, the greatest numbers of followers were for accounts categorized in the non-profit and government sectors.

Figure 7: TOTAL NUMBER OF FOLLOWERS IN EACH CATEGORY (ALL ACCOUNTS COMBINED)



SUMMARY

Overall, this report shows that a variety of topics related to ocean literacy are widely discussed on Twitter by accounts representing a variety of backgrounds and perspectives. Ocean literacy and educational accounts more broadly play a minor role in raising awareness about the ocean on Twitter compared to other categories (such as environmental non-profits).

In summary, the key findings about Canadian ocean-related Twitter accounts and their followers are:

- 1 77 Canadian Twitter accounts reach over 300,000
- 2 most followers follow government or non-profit accounts
- 3 most accounts identified as influencers are run by academics, non-profits, industry
- 4 while topics related to ocean literacy are often discussed by Canadian ocean influencers, few discuss the concept of ocean literacy itself.

LEAD AUTHOR:

DR. DAVID SHIFFMAN IS AN INTERDISCIPLINARY MARINE CONSERVATION BIOLOGIST WHO STUDIES HOW INFORMATION RELATED TO OCEAN CONSERVATION AND MANAGEMENT FLOWS THROUGH INFORMATION PATHWAYS. DAVID SHIFFMAN SCIENTIFIC AND ENVIRONMENTAL CONSULTING, INC. WAS FOUNDED IN 2019.

REFERENCES

- Ashley, M. et al. (2019) 'A change of mind: Applying social and behavioral research methods to the assessment of the effectiveness of ocean literacy initiatives', *Frontiers in Marine Science*, 6(JUN). doi: 10.3389/fmars.2019.00288.
- Côté, I. M., & Darling, E. S. (2018). Scientists on Twitter: Preaching to the choir or singing from the rooftops?. *Facets*, 3(1), 682-694.
- Darling, E. S., Shiffman, D., Côté, I. M., & Drew, J. A. (2013). Future of Publishing. *Ideas in ecology and evolution*, 6, 32-43.
- Eady, G. et al. (2019) 'How Many People Live in Political Bubbles on Social Media? Evidence From Linked Survey and Twitter Data', *SAGE Open*, 9(1), pp. 1-21. doi: 10.1177/2158244019832705.
- Glithero, L. and Zandvliet, D. (2020). Canadian Ocean Literacy Survey: Highlights Report. Canadian Ocean Literacy Coalition. Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License
- Guest, H., Lotze, H. K. and Wallace, D. (2015) 'Youth and the sea: Ocean literacy in Nova Scotia, Canada', *Marine Policy*. doi: 10.1016/j.marpol.2015.04.007.
- News Media Canada (2015). Report on daily newspaper circulation data. Accessible at <https://nmc-mic.ca/about-newspapers/circulation/daily-newspapers/>, accessed November 2019
- Parsons, E. C. M., Shiffman, D. S., Darling, E. S., Spillman, N., & Wright, A. J. (2014). How Twitter literacy can benefit conservation scientists. *Conservation Biology*, 28(2), 299-301.
- Shiffman, D. S. (2018). Social media for fisheries science and management professionals: how to use it and why you should. *Fisheries*, 43(3), 123-129.
- Slater, M. (2018) By the numbers: Twitter Canada at Dx3 2018. Available at: https://blog.twitter.com/en_ca/topics/insights/2018/TwitterCanada_at_Dx3.html
- Thaler, A. D., Zelnio, K. A., Freitag, A., MacPherson, R., Shiffman, D., Bik, H., ... & McClain, C. (2012). Digital environmentalism: tools and strategies for the evolving online ecosystem. *Environmental leadership: a reference handbook*. Sage, Thousand Oaks, California, USA. <http://dx.doi.org/10.4135/9781452218601>, (39), 364-373.

APPENDIX A

KEYWORDS SEARCHED IN THE FOLLOWERWONK ADVANCED BIO SEARCH

aquaculture, aquarium, blue economy, coastal community, coastal policy, cruise ship, fisheries, fishing, marine biology, marine conservation, marine industry, marine museum, marine protected area, MPA, ocean conservation, ocean culture, ocean education, ocean governance, ocean heritage, ocean industry, ocean knowledge, ocean literacy, ocean research, ocean science offshore energy, offshore natural gas, offshore oil, offshore wind, oil spill, overfishing, port, salmon, salmon farm, seafood, shipbuilding, shipping, sustainable fishing, sustainable seafood, whale watching.

APPENDIX B

OCEAN INFLUENCERS IN CANADA - TWITTER ACCOUNTS (DECEMBER 2019)

In total, 77 Canadian online ocean influencers were identified according to the selection criteria (described in Part 2: Canadian Ocean Influencers on Twitter). These accounts were categorized into one of 8 categories: Academic (20 accounts), Non-Profit (18), Industry (15), Government (9), Indigenous (6), Journalist (5), Education/Ocean Literacy (3), and Other (1). Accounts are in alphabetical order by username.

IDENTIFIED CANADIAN OCEAN INFLUENCERS: ACADEMICS (20)

NAME	USERNAME	BIO (DIRECT WORDING FROM ACCOUNT AS IT APPEARED IN DECEMBER 2019)
Cyr Couturier	@AquaCanada	Marine Biologist/Scientist, advocate for responsible aquaculture/fisheries (agrifoods) in a changing climate. Chair CAHRC. Retweets not endorsements.
Canadian Healthy Oceans Network	@CanHealthyOcean	The NSERC CHONe II Strategic Research Program is developing new conservation strategies for Canada's changing oceans.
Dr. Boris Worm	@CBCOceansGuy	Marine ecologist, Columnist on CBC Radio
Chelsea Rochman	@ChelseaRochman	I am an Asst. Prof at U. of Toronto, researching how plastic debris, chemical contaminants and climate change affect aquatic systems alone and in combination.

NAME	USERNAME	BIO
Megan Bailey	@FishGovernance	Assistant Professor & Canada Research Chair Integrated Ocean & Coastal Governance, Marine Affairs, Dalhousie University #sustainableseafood #fisheriesgovernance
Hakai Institute	@HakaiInstitute	Scientific research institution conducting long-term environmental research on the coastal margins of British Columbia, Canada Part of @TulaFoundation
Iain McKechnie	@IainMcKechnie	Coastal Archaeologist, counter of ancient animal bones & shellfish @HECA_Lab Assistant Professor @UVicAnthro & @HakaiInstitute Scholar #zooarchaeology
Jay Cullen	@JayTCullen	Marine chemist, oceanographer and Professor and Provost's Engaged Scholar at the University of Victoria. Failed astronaut. he/him
Jennifer Sunday	@JennSunday	Assistant professor at McGill University, macroecology, climate change, evolutionary ecology, marine ecology, mom-scientist
Justine Ammendolia	@JustineAmmendo1	Marine Biologist Plastic Pollution-Marine Debris Researcher @NatGeo Explorer #CitizenScience #Scicomm Newfoundland Coordinator @CANoceanlitCO
Dr. Brett Favaro	@LetsFishSmarter	Ph.D in biology: instructor, scientist. Author: The Carbon Code: How You Can Become a Climate Change Hero. Tweets abt fisheries, climate, and democracy
Natalie Ban	@MarineCons	Associate Professor at the University of Victoria, marine conservation, ethnoecology, conservation planning
Dr. Max Liboiron	@MaxLiboiron	Michif Feminist scientist on waste, plastic pollution, anti-colonial science. #CLEAR lab. Editor: @DiscardStudies. AVP Indigenous Research, Memorial U she/her
MEOPAR	@MEOPAR_NCE	We are a national Network of Centres of Excellence working to observe, predict and respond to a changing marine environment.
Mary O'Connor	@MIOConnor	Associate Professor UBC, marine ecology, especially in seagrass; metabolic ecology, even limnology. Dachshund lover, mother, passionate about brussels sprouts.
Nathan Bennett	@NathanJBennett	Humans Environments Oceans, Critical & Solution Oriented #ConSocSci #MarSocSci @ubcoceans @IUCN_CEESP Alum @LiberEroFellows @F_Trudeau_F @FulbrightCanada
OceanCanada	@OceanCanada	The Ocean Canada Partnership
Ocean Frontier Institute	@OceanFrontier	One ocean Understanding change Seeking solutions through research
Ocean Networks Canada	@Ocean_Networks	ONC's cabled observatories bring real-time continuous ocean data to the surface for research and decision-making to #knowtheocean. A @UVic initiative.
Rhiannon Moore	@RhiannonCMoore	Plastic Pollution Researcher for @OceanWise and @SFU Top #30under30 sustainability leader @eXXpedition and @Canada_c3 alumni Views are my own

IDENTIFIED CANADIAN OCEAN INFLUENCERS: NON-PROFIT (18)

NAME	USERNAME	BIO
Jenn Burt	@Burt_Jenn	Marine ecologist. B.C. Marine Program Lead for Nature United. Interests in kelp, fisheries, SESSs, marine planning & Indigenous-led conservation. Tweets my own.
Shoreline Cleanup	@CleanShorelines	The Great Canadian Shoreline Cleanup is a conservation partnership by @oceanwise & @wwfcanad Lead a shoreline cleanup near you at: http://shorelinecleanup.ca

NAME	USERNAME	BIO
Ecology Action Centre Marine	@EACmarine	Ecology Action Centre works to ensure the conservation, protection & restoration of the ocean, & to maintain sustainable fisheries & vibrant coastal communities
Hector the Blue Shark	@HectorBlueShark	Meet Hector - a Canadian blue shark on a mission. Hector and his friends love the waters of the Atlantic Ocean, but it is not a safe place to be these days.
Kristin Westdal	@KWestdal	Arctic Marine Biologist & Field Research Director Science, conservation & policy @Oceans_North Facing beluga & narwhal fish breath since 2001 Views my own
Linda Nowlan	@Linda_Nowlan	Spreading environmental law news from BC, Canada, Pacific and beyond. #TheLawAquatic.Transforming law + leading the marine law program @WCELaw Tweets my own.
Sarah Saunders	@Ocean_Panda	Marine biologist, Specialist in Marine Protection & Renewables with @WWFCanada Miramicher turned Haligonian. Nerd. Tweets are my own personal views. She/her.
Oceana Canada	@OceanaCAN	Save the oceans, feed the world. Oceana Canada is an independent charity established to restore Canadian oceans to health & abundance. Affiliated with @Oceana
Oceans North	@Oceans_North	Oceans North is a nonprofit organization that fosters science- and community-based conservation in the Arctic regions of Canada and Greenland.
OceanWise	@OceanWise	A global not-for-profit organization whose vision is a world in which oceans are healthy and flourishing. #OceanWise
OceanWise Life	@OceanWiseLife	A sustainable seafood program to help you live an Ocean Wise life. Look for the symbol wherever you enjoy seafood. #OceanWiseLife #OceanWise
Pacific Salmon Foundation	@PSF	Pacific Salmon Foundation is a charitable non-profit granting organization dedicated to conserving and restoring Pacific salmon and their home watersheds.
Raincoast Foundation	@Raincoast	Raincoast Conservation Foundation is a team of scientists & conservationists empowered by our research to protect the lands, waters & wildlife of coastal BC.
Atlantic Salmon Foundation	@SalmonNews	Est. in 1948, the Atlantic Salmon Federation is dedicated to conserving and restoring wild Atlantic salmon. Tweets (mostly) by @neville_c
Sedna Epic	@SednaEpic	Since 2014, Sedna's sea women have recorded disappearing sea ice in the Arctic, bringing the ocean to eye level for more than 1,000 Inuit youth, girls & Elders.
Surfrider Pacific Rim	@SurfriderPacRim	Surfrider are a volunteer run organization, dedicated to the protection and enjoyment of the beaches, waves & ocean. Share your solutions for positive change!
Surfrider Vancouver	@SurfriderVan	Vancouver chapter of Surfrider Foundation. Dedicated to the protection and enjoyment of our oceans, waves and beaches. #protectwhereyouplay
West Coast Environmental Law	@WCElaw	Transforming the legal landscape. Strengthening protection for the environment through collaborative legal strategies that bridge Canadian and Indigenous law.

IDENTIFIED CANADIAN OCEAN INFLUENCERS: INDUSTRY (15)

NAME	USERNAME	BIO
Aquaculture Aware	@BCaquaculture	Grassroots society promoting awareness of aquaculture in BC, Canada.
BC Salmon Farmers Association	@BCSalmonFarmers	The BCSFA represents BC's vibrant salmon farming industry to the public, government & stakeholders, providing an industry forum for communication

NAME	USERNAME	BIO
Marine Renewables Canada	@Canadian_MRE	Canada's association for wave, tidal, river current, and offshore wind energy. Ensuring that Canada is a leader in providing marine renewable solutions.
Ocean Supercluster	@CanadaOSC	Driving innovation in Canada's ocean economy through technology leadership and collaboration.
Clear Seas Centre for Responsible Marine Shipping	@ClearSeasOrg	Centre for Responsible Marine Shipping Centre pour le Transport Maritime Responsable
CNLOPB	@CNLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board. Regulates offshore safety, environmental protection, resource management and industrial benefits.
Chamber of Shipping	@COSBCTweets	The informed voice for marine shipping industry in Canada
COVE	@COVE_Ocean	The Centre for Ocean Ventures & Entrepreneurship (COVE): A catalyst in creating the world's next revolutionary ocean technology advances.
Eagle Wing Tours	@EagleWingTours	Guaranteed Whales & Adventure! 1st Carbon Neutral & 1% for the Planet eco adventure whale watching tour company in Canada. We are #Wild4Whales
FFAWUnifor	@FFAW_Unifor	Fish, Food and Allied Workers - over 15,000 working women and men in Newfoundland and Labrador, a history steeped in the fishing industry.
Keith Sullivan	@KSullivanFFAW	President of the Fish, Food and Allied Workers Union
SeaSpan Shipyards	@MoreThanShips	#SeaspanShipyards is a leader in shipbuilding and ship repair on Canada's West Coast. Proud to be Canada's non-combat shipbuilder #NSS https://nss.seaspan.com
SSI Ship Construction	@SSI_CAD	SSI provides #Autodesk based software solutions to the #shipbuilding & offshore industry incl. ShipConstructor. Find more here: http://bit.ly/SSISocial
Prince of Whales	@Whale_Sightings	Victoria & Vancouver's Premier Whale Watching Company.

IDENTIFIED CANADIAN OCEAN INFLUENCERS: GOVERNMENT (9) *INDICATES IT'S A REGIONAL OR TOPICAL DFO OFFICE

NAME	USERNAME	BIO
Grant Gilchrist	@AChangingArctic	Research Scientist at Environment and Climate Change Canada studying Arctic Marine Ecosystems. Research findings and wildlife updates from the field.
Canadian Coast Guard	@CoastGuardCan	Suivez en français: @GardeCotiereCAN http://ow.ly/EEE930dMTKC This account is not monitored 24/7. Please do not use Twitter for reporting maritime emergencies.
DFO Maritimes*	@DFO_Mar	Information about Fisheries and Oceans Canada, Maritimes
DFO Newfoundland*	@DFO_NL	Fisheries & Oceans Canada's most easterly Twitter account! Evening/weekend posts are scheduled. #DFONL
DFO Pacific*	@DFO_Pacific	Information about Fisheries and Oceans Canada in the Pacific Terms and Conditions: http://goo.gl/gsDum
Fisheries and Oceans Canada*	@FishOceansCAN	Information about Fisheries and Oceans Canada Terms and Conditions: http://goo.gl/gsDum

NAME	USERNAME	BIO
Dr. Jennifer Provencher	@Jenni_Pro	Working on wildlife health issues #plastic #contaminants #parasites #pathogens. @LiberEroFellows @environmentca She/her. Mom. Settler. Tweets are mine.
Polar Knowledge Canada	@POLARcanada	N/A
DFO BC Sportfishing*	@SportfishingBC	Fisheries and Oceans Canada information for the BC Sport Fishing Community

IDENTIFIED CANADIAN OCEAN INFLUENCERS: INDIGENOUS (6)

NAME	USERNAME	BIO
Arctic Eider Society	@ArcticEider	A registered charity supporting Indigenous-driven solutions for thriving northern communities
Coastal First Nations Alliance	@CFNGBI	The Coastal First Nations is an alliance of First Nations on British Columbia's North and Central Coast and Haida Gwaii.
Coast Funds	@CoastFunds	Supporting First Nations in the #GreatBearRainforest and #HaidaGwaii to achieve their goals for permanent conservation, stewardship, and sustainable economies.
FN Fisheries Council	@FNfish	The First Nations Fisheries Council of BC advocates for fishing rights and healthy aquatic resources and ecosystems. Like us on Facebook: http://goo.gl/BJ7WbZ
Torngat Secretariat	@TWPFS	The Torngat Joint Fisheries Board and the Torngat Wildlife & Plants Co-Management Board were established in 2005 through the Labrador Inuit Land Claim.
Uu-a-thluk	@Uuathluk	Nuu-chah-nulth Nations managing our traditional ocean foods for future generations.

IDENTIFIED CANADIAN OCEAN INFLUENCERS: JOURNALIST (5)

NAME	USERNAME	BIO
Colin Schultz	@_ColinS_	News editor @HakaiMagazine Pitch me a story: Someone doing something for a reason. Don't send me press releases.colin.schultz@hakaimagazine.com
Hakai Magazine	@HakaiMagazine	Official tidal flow of tweets from Hakai Magazine
Holly Lake	@_HollyLake	Labrador lass. Law student @uottawa Love a good story & a good laugh. Journalist writing about the ocean & the finned, fluked & furry in spare time.
Adrienne Mason	@ToughCltyWriter	Writer, editor, biologist, occasional collage artist. Trying to live the creative life. Managing editor at Hakai Magazine (but these tweets are mine).
The Broadcast	@TheBroadcastCBC	Longest-running current affairs radio show in NA. Casts broad net. Industry, coastal communities & people connected to sea. On CBC since 1951. Host @janeaadey

IDENTIFIED CANADIAN OCEAN INFLUENCERS: EDUCATION AND OCEAN LITERACY (3)

NAME	USERNAME	BIO
The Marine Detective	@OceanDetective	Join me in the cold, dark, rich waters of the NE Pacific Ocean to discover the great beauty, mystery & fragility hidden there. themarinedetective.ca.
CaNOE	@OceanLitCanada	We connect Canadians doing work related to the ocean & marine education to advance ocean literacy in Canada #oceanlitcanada
Ocean School	@OceanSchoolNow	A free, bilingual, web platform integrated with Google Classroom from @DalhousieU @IngeniumCa and @TheNFBused to advance ocean literacy! #OceanSchool

IDENTIFIED CANADIAN OCEAN INFLUENCERS: OTHER (1)

NAME	USERNAME	BIO
Michelle Young	@Wild4Salmon	Concerned about negative impacts of open net-cage #aquaculture on wild #salmon and marine environment. Opinions are my own. Love ocean & any boat I can paddle!

APPENDIX C

SUPPLEMENTARY LIST OF OTHER NOTEWORTHY ACCOUNTS

In addition to the 77 identified ocean influencers (based on December 2019 numbers), there are 43 noteworthy accounts that contribute to important conversations about the ocean in Canada but did not meet some of the criteria for this baseline scan. This supplementary list includes 15 accounts that met all other criteria except follower count (i.e., less than 800 followers), and 28 that met some but not all of the other criteria (usually focusing on a variety of issues not just ocean issues, or focusing on ocean issues but not just Canadian ocean issues).

PART 1: THOSE WHO MET ALL CRITERIA EXCEPT FOLLOWER COUNT

ACADEMICS (5)

NAME	USERNAME	BIO
Sandra Scott	@BayPipefish	Science & Environmental Ed at UBC - Orca Lover, Defender, & Protector - Birder - Cat Obsessed! Love Dogs too!
Changing Ocean research Unit*	@CORU_UBC	Interdisciplinary research team led by William Cheung to generate and provide knowledge to find solutions to achieve ocean sustainability.
FERU*	@FisheryEconomic	The Fisheries Economics Research Unit (FERU) is one of the world's foremost research groups focusing on the economics of global fisheries.
Seagrass BC	@SeagrassBC	A network for #seagrass research & monitoring in British Columbia. Connecting coastal habitats, communities & researchers. #eelgrass #seagrass #surfgrass
Kim Juniper	@SKJUniper	Chief Scientist, Ocean Networks Canada Professor, School of Earth and Ocean Sciences & Biology Dept. BC Leadership Chair in Ocean Ecosystems & Global Change

*NOTE: AFFILIATED WITH UBC'S INSTITUTE FOR THE OCEANS AND FISHERIES

INDUSTRY (4)

NAME	USERNAME	BIO
Fisheries Council	@FishCan_FCC	The voice of Canada's fishing industry for over 100 years.
Fish NL Union	@FishNLUnion	Federation of Independent Sea Harvesters
Ocean Choice International	@OceanChoice	Ocean Choice International (OCI) is a global seafood company. We deliver over 100 million pounds of finished product to more than 30 countries every year.
Offshore Fishery Association	@OffshoreFishery	A modern, thriving industry in Newfoundland and Labrador and Atlantic Canada. Creating jobs & strengthening our economy through innovation & sustainability.

NON-PROFIT (3)

NAME	USERNAME	BIO
Back to the Sea	@Backtothesea_NS	Charity dedicated to sparking curiosity about local marine life. Our goal is to open the first collect-hold-and-release aquarium in Nova Scotia! BackToTheSea.Org
Doug Chiaason	@DougChiaason	#Caper by birth, now #YOW, into FishShrimpCrab in Nunavut. WWF Senior Specialist, Sustainable Marine Development. Opinions are mine. RTs not necessarily endorsements
World Ocean Day	@WorldOceanDayCA	Information & Education to preserve our water, waterways and habitat. Become an Ocean Hero

INDIGENOUS (2)

NAME	USERNAME	BIO
Imappivut	@Immapivut	N/A
Nunavut Fisheries Association	@NFAAnunavut	NFA is a not for profit corporation established to present a united voice for Nunavut's commercial fishing industry to stakeholders and the public.

EDUCATION/OCEAN LITERACY (1)

NAME	USERNAME	BIO
Melanie Knight	@MelanieKnight7	Founder of the @PettyHrMiniAquaCEO of @oceantoeylevel Consulting Vancouver, British Columbia miniaqua.org

PART 2: OTHER ACCOUNTS THAT MET SOME, BUT NOT ALL, OF THE CRITERIA TO BE AN INFLUENCER

KEY

- * Discusses many issues, of which ocean and coastal issues are a small part
- + Discusses ocean issues, but not primarily Canadian ocean issues
- Feed consists of curated retweets of interest, but contains little original commentary
- ++ Feed consists of a large amount of institutional news
- U: Associated with UBC's Institute of Oceans and Fisheries

ACADEMICS (13)

NAME	USERNAME	BIO
Amanda Vincent + U	@AmandaVincent1	Marine conservation Prof @UBCOceans Lead @ProjectSeahorse @IUCNseahorse @SSCmarine Parent. Finding practical solutions. We know enough. Views my own.
Dr. Julia K Baum +	@BaumLab	applied ecology for impacted oceans coral reefs climate change Me: scientist mom coffee aficionado aging runner feminist optimist
Rashid Sumaila + U	@DrRashidSumaila	Professor, UBC Fisheries Centre. How can economics be used to help ensure that environmental resources are sustainably managed? Gave a talk at the White House.
Tim Cashion + U	@FishingForFeed	PhD Candidate @UBCOceans Fisheries researcher focusing on the little guys and how we use them
Madeline Cashion +	@MadForSharks	Woman scientist marine ecology/fisheries/sharks+rays Marine Biologist @TheHemmeraWayCo-Chair @CoastConnectVan SparklesWitch @HogwartsIt she/her
Emilie Novaczek * +	@MapTheBlue	I make maps underwater. Marine conservation biologist, @MUNGeog PhD candidate, scientific diver, & fish shitposter. She/her.
Nicholas Dulvy +	@NickDulvy	Secures a living for fishes & fisheries; especially sustainability for sharks, rays & chimaeras.
Isabelle M Cote +	@RedLipBlenny	Professor of Marine Ecology, Simon Fraser University. I love the oceans, fish, coral reefs, diving, and open-water swimming.
John Reynolds *	@Reynolds_JohnD	Conservation biologist, birder, long-distance trail runner, naturalist, Chair of @COSEWIC living in beautiful British Columbia.
Sea Around Us + U	@SeaAroundUs	A research initiative at UBC and UWA led by #DanielPauly, Deng Palomares & Dirk Zeller. We assess the impact of fisheries on marine ecosystems
Steven J Cooke *	@SJC_Fishy	Dad of 3 meatballs, Professor in Fish Ecol & Cons Physiol @Carleton_U, Editor of @conphysjournal Secretary of College of @RSCTheAcademie, Fellow of @rcgs_sgrc
Tyler Eddy + -	@TyZissou	The Life Aquatic with @tyzissou Faculty @MemorialU @FishMIP coordinator Past, present, & future human interactions with, & ecology of, marine ecosystems
UBC Oceans + U	@UBCOceans	UBC Institute for the Oceans and Fisheries is working towards a world in which the oceans are healthy and their resources are used sustainably and equitably

NON-PROFIT (5)

NAME	USERNAME	BIO
Chris Miller *	@NSWilderness	Protecting wild places. Conservation Biologist/Executive Director. Enjoying life on the East Coast
Petty Harbor Mini Aqua ++	@PettyHrMiniAqua	A hands-on catch-and-release mini aquarium in Petty Harbour, NL. A charity with a mission to foster curiosity about local marine life. Open 10-6 daily!
SDFuller -	@SDFuller	Tweeting now and then on ocean issues, bicycle advocacy and change making, primarily in Nova Scotia.
Vancouver Aquarium ++	@VanAqua	A non-for-profit @OceanWise initiative that connects more than one million people to stories of our blue planet each year. Tag @VanAqua to be featured.

NAME	USERNAME	BIO
WWF Canada *	@WWFCanada	Building a future in which people and nature thrive. Pour le français, suivez @WWFCanadaFR #StopWildlifeLoss

INDIGENOUS (5)

NAME	USERNAME	BIO
Heiltsuk Council *	@HeiltsukCouncil	Definition of Heiltsuk: To Speak and Act Correctly We honor the meaning of Heiltsuk and affirm Gvilas, which is to uphold the laws of our ancestors. Bella Bella, BC heiltsuknation.ca
Inuit Tapiriit Kanatami *	@ITK_CanadaInuit	Canada's national Inuit organization
Jess Housty *	@jesshousty	'Cúagilákv: Community agitator; mother; land-based educator; plant worker; writer; unapologetically #Haitzaqv. Executive Director at @qqsprojects She/her. Bella Bella jesshousty.com
Nunavut Tunngavik Incorporated *	@NTunngavik	Toll Free Iqaluit-1 888 646 0006 Toll Free Rankin-1 888 236 5400 Toll Free CamBay- 1 888 388 8028 Nunavuttunngavik.com
William Dúqvaísla Housty *	@WilliamHousty	Haitzaqvqmñúgva. I was born here, I will die here. I speak my mind. I love my family, my culture, my sports teams, my work and I love my people! Waglisla B.C. HIRMD.ca

INDUSTRY (3)

NAME	USERNAME	BIO
Carey Bonnell -	@CareyBonnell	Vice President - Sustainability & Engagement - Ocean Choice International
Ryan Cleary *	@FishermansRoad	Pictures and observations from a passionate Newfoundlander, NLER first, lover of freedom/good journalism, and former Member of Parliament.
Paul Lansbergen * -	@PaulJLansbergen	Association executive advocating on behalf of Canada's fisheries industry. Woodlot owner, cottage builder, and rec hockey player

JOURNALIST (1)

NAME	USERNAME	BIO
Paul Withers *	@WithersCBC	CBC reporter covering politics, industry and environment in Nova Scotia and Atlantic Canada.

GOVERNMENT (1)

NAME	USERNAME	BIO
COSEWIC *	@COSEWIC	Independent panel of scientists advising the federal government on status of Canada's wild species. Tweets are ours, not the government's.