



CANADA'S OCEAN SUPERCLUSTER

CAREERS IN AN EVOLVING OCEAN INDUSTRY

Perceptions of Access and Opportunity
Among Youth and Young Professionals

www.oceansupercluster.ca

RESEARCH BY SES WORKFORCE RESEARCH & CONSULTING

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
BACKGROUND	8
– BENCHMARKING THE STUDY	10
– OBJECTIVES	11
METHODOLOGY	12
– DATA COLLECTION AND ANALYSIS	12
– SAMPLE GROUP AT A GLANCE	13
• PARTICIPATION BY AGE COHORT	13
• PARTICIPATION BY GENDER IDENTIFICATION	13
• PARTICIPATION BY EDUCATION/EMPLOYMENT STATUS	14
• PARTICIPATION BY MINORITY IDENTIFICATION (AS A PERCENTAGE OF TOTAL MINORITY IDENTIFICATION)	15
• PARTICIPATION BY REGION	16
INDUSTRY AWARENESS	17
– EARLY ENGAGEMENT	17
– PROXIMAL NETWORK	19
– EASE OF PATHWAYS INTO THE INDUSTRY	20
– EXISTING OR DEVELOPING HIGH VALUE SKILLS	21
INDUSTRY PERCEPTIONS	23
– PERCEPTIONS OF DESIRABILITY OF OCEAN CAREERS	23
– PERCEPTIONS OF INDUSTRY'S ROLE IN CLIMATE CHANGE	25
– PERCEPTIONS OF SKILL AND COMPETENCY REQUIREMENTS	27
– PERCEPTIONS OF EASE OF PARTICIPATION	29
• COMPARING PERCEPTIONS OF THE OCEAN INDUSTRY – FEMALE/MALE	31
INTEREST IN CAREERS IN THE OCEAN INDUSTRY	33
– VARIABLES THAT CORELATED WITH 'YES' RESPONSES	34
• PARTICIPANTS FROM INDIGENOUS COMMUNITIES	35
• PARTICIPANTS FROM OTHER UNDERREPRESENTED COMMUNITIES	35
• MALE AND FEMALE PARTICIPANTS	36
• VARIABLES CORRELATING WITH 'NO' RESPONSE	36
– DRIVERS FOR CAREER INTEREST AND SELECTION	37
WHAT CAN WE MAKE OF ALL THIS?	44



ABOUT CANADA'S OCEAN SUPERCLUSTER

The sustainable development of our ocean is one of the most important opportunities of our time. Canada's Ocean Supercluster is a catalyst to achieving transformative growth and advancing Canada's global leadership in the sustainable blue economy.

The OSC is an industry-led, national ocean cluster that brings together startups, scaleups, as well as mature organizations from coast-to-coast-to-coast across the fishery, aquaculture, bioresources, offshore resources, marine renewables, defence, transportation and ocean technology sectors to accelerate the commercialization of leading Canadian ocean solutions that tackle some of the world's biggest challenges.

To support this growth, the cluster is also focused on the development of a robust ecosystem including more ocean companies starting and scaling, engaged communities to identify challenges and solutions, engaging Indigenous Peoples and under-represented groups, and helping build the well-skilled, diverse workforce needed.

EXECUTIVE SUMMARY

This study, commissioned by Canada's Ocean Supercluster, builds on previous work completed by SES Workforce Research & Consulting in 2015 that looked at self-reported data from youth (ages 11-15) from Canada's maritime provinces. The data provided insights into how youth perceptions and attitudes about ocean careers may have been shaped by awareness, proximity to the industry, ocean literacy and ocean STEM education, social narrative, and other variables, and how these early influencers, in turn, prompted interest in participation in the ocean industry. This new report, *Careers in an Evolving Ocean Industry: Perceptions of Access and Opportunity Among Youth and Young Professionals*, builds on the previous report by broadening the focus to a national scope and by shifting the cohort of interest to youth ages 18-35.

This new study aims to understand how similar variables influence the career intentions of young adults who are launching their post-secondary education and careers, or who are already young professionals carving a path. Additional variables, such as perceptions of social equity and sustainable practice, were included to provide a more current picture of how youth evaluate pathway options and regard ongoing barriers (e.g. social, philosophical, systemic, information-based, practical, etc.) and access to industry pathways.

The findings of this study will offer insights from more current data on how the ocean industry can better attract young, diverse talent, as well as experienced talent with transferrable skills who can contribute a breadth of cross-disciplinary competencies to the evolving industry. The findings will also help to inform strategies for building the capacity, competency, and flexibility of a future-ready Canadian ocean workforce.



EXECUTIVE SUMMARY

WHAT ARE THE KEY FINDINGS OF THIS STUDY?

Proximal network continues to play a leading role in influencing perceptions and attitudes.

Research has consistently shown that industry awareness and engagement are strongly influenced through interactions with proximal role models or contacts (i.e. knowing someone who is connected to the industry). 74% of respondents from this current study, who expressed an interest in a career in the ocean sector, said that they already knew someone working in that industry. This may be an indication that the more recent stability and promise of a future in the industry is becoming a dominant narrative or that those working in the industry are becoming stronger advocates.

There is considerable opportunity for Canada's secondary school systems to improve awareness and education in ocean sciences.

The study found that only a third of participants claimed to have learned a lot about the ocean in grade school (grades one through 12). Involvement in post-secondary general STEM education and careers was found to be a stronger contributor to industry awareness and interest among older youth than early engagement through secondary school programming, likely due to the lack of marine curricula in the k-12 system. 84% of participants who said they were interested in a career in the marine industry reported being curious about the ocean as a child, and not surprisingly, the same number reported having learned a lot about the ocean in grade school – though not necessarily through the school system itself. This points to a missed opportunity to build ocean literacy for all youth so that those without access to extracurricular learning or without proximity to a marine environment can still build awareness and knowledge holding.



EXECUTIVE SUMMARY

Perceptions of ease of access to pathways into ocean industry careers remains low.

Statistically significant differences in opinion were observed in the perceptions of ease of access to the industry (16% female and 21% male) and ease of getting a good job (20% female and 29% male). This is in stark contrast to the findings reported regarding the awareness of transferability of skills, which suggests that people recognize that skill alignment or near alignment is insufficient for access to the 'good jobs.' Whether this reflects a proximity-to-jobs challenge or other barrier, this incongruency is worthy of deeper examination in future studies.

Underrepresented workers reported greater interest in ocean-related careers and more optimism in accessing those careers.

68% of participants from underrepresented groups reported the belief that the skills, education, or experience they have in a different industry could transfer well. This was slightly higher for women (71%). This may reflect a broader awareness of the possible transferability of skills among these cohorts, or a more earnest conviction that they are willing to apply their skills wherever they are welcomed. Here we see workforce optimism and skills confidence at odds with employer recognition of transferable skills, which emerges as a significant barrier to entry for talent attempting to access the ocean industry via non-traditional pathways.

There is a need to build awareness of transferrable skills among both employees and job seekers to attract the cross-disciplinary expertise the industry needs.

A third of participants from traditional cohorts reported having existing skills that could transfer into the ocean industry. This suggests that skilled workers who are not from underrepresented communities are less likely to recognize opportunities to transition from adjacent industries. This is worrying given the experience and knowledge transfer that is essential to building capacity, competency, and speed to readiness. The challenge of workers opting out because of perceptions of skill misalignment goes hand in hand with employers screening out potential talent for the same reasons. Employers continue to find validating competencies to be a challenge, primarily because they lack expertise in evaluating non-traditional skills or pathways, or they must adhere to hiring policies that don't recognize prior learning (RPL). This presents a top hiring challenge for employers, as well as a barrier to entry for talent exiting industries in decline. Neither group is served by skills evaluation practices that fail to recognize experience and capabilities that may be differently defined or credentialed in other industries.

EXECUTIVE SUMMARY

Perceptions of the ocean industry are generally positive.

Perceptions of the ocean industry were generally optimistic regarding variables such as industry progress, and attention to social, environmental, and economic wellbeing. A lingering, and likely fair, perception that ocean careers don't pay well (relative to other industries), remains (less than 30% of those who are interested in the industry agreed that they pay well). This would suggest that financial compensation is not the strongest driver for potential and current workers, although other findings in the study showed that financial stability and security ranked in the top 3 influencers. This inconsistency may be attributed to the semantics of well-paid versus compensation that provides financial security – with one suggesting financial abundance and the other financial well-being – similar, but increasingly different espoused financial goals. Anecdotally, the perceptions of a compensation gap have been shown to be more influential for those considering transitioning from the fossil fuel industry into the clean energy sector.

Perceptions of the ocean industry's role in sustainability activities.

Responses demonstrate strong optimism that careers in the ocean industry can effectuate positive environmental change, and that it is not solely focused on harvesting natural resources. Participants also communicated the belief that participation in the industry can be personally fulfilling in terms of 'making a difference.'

Drivers of career interest and selection are more practical than idealistic.

The declared highest-ranking drivers were found to be: providing financial security and stability, having a career that is personally interesting, and contribution to a sustainable future. Well paid work was a top priority for visible minorities and those living in rural communities – consistent with the lived experiences of those marginalized by race or remote regions. Having a career in Canada or close to home was ranked among the lowest influencers for career choices for all age, gender, regional, and identity groups. The findings for key career drivers were consistent across all regions of Canada.



BACKGROUND

Canada is experiencing extraordinary growth in the ocean industry, with sectors such as energy, shipbuilding, transportation, ocean technology, and seafood looking for progressive approaches to advance their sustainability goals while keeping pace with regional and global commercial demand. With the overlap between the blue and green economies, we are also seeing growth in areas such as generative AI (Artificial Intelligence), marine safety, regulation, compliance, research, clean energy, and ocean monitoring. A 2016 OECD report projected that the ocean economy could more than double its contribution to global value added between 2010-2030¹. In simple terms this means that the industry is growing – most say impressively. Others say precipitously, particularly those charged with finding the people to execute the growth.

Retirement and in-sector growth continue to be the biggest drivers of workforce capacity gaps, while the layering of more digital and data heavy roles, as well as the evolution of new sectors, places more emphasis on digital competency and flexible skills than was traditionally required in the sector.

BACKGROUND

Generally, the ratio of workers aged 55 or older to those between 25-34 is near parity, but with ages 15-24 it is 3:1. This presents a significant risk for the sector as masses of older workers retire, and far fewer young workers enter the workforce to replace them. It also demonstrates the opportunity to rapidly feed well-educated, trained, and skilled workers into the talent pipeline continuously rather than trying to sprint from a standing start.

The complexity of industries that balance demand and innovation with environmental, economic, and social well-being, as well as ubiquitous technological changes, have also shifted the skill composition of jobs across the industry.

But the talent challenge is not just a number problem. Capacity building is nothing without competency building, something that takes focused training and application of skills to develop in a landscape that demands more adaptability and breadth of skill than many

current training programs are designed to serve. Progressive employers are now accessing non-traditional pathways to attract a broader range of skills and commit to developing necessary bespoke skills on-the-job. Indeed, building capacity and competency has triggered a tempo challenge that has workforce development experts wondering how to develop enough skilled people, when competency takes experience and time, but capacity has limited patience.

Notwithstanding the above pressures, the need remains clear: to build a reliable, stable, skilled, diverse and adaptable workforce to ready Canada's ocean sector for imminent growth and change. This can occur at many points along a career timeline, but starting at the beginning is an obvious approach for a long-term workforce strategy. It is the development of such a strategy that prompted this study that focuses on youth and their perceptions and ambitions related to the ocean industry.

BACKGROUND

BENCHMARKING THE STUDY

This study, commissioned by Canada's Ocean Supercluster, builds on previous work² that looked at self-reported data from youth (ages 11-15) from Canada's maritime provinces. Student responses showed that youth had broadly traditional conceptions of the industry, primarily centered on fishing, shipbuilding, and the Navy. It concluded that more positive influences in students' personal, social, and academic lives were needed to counteract negative biases associated with opportunities in the ocean sector, recommending interactive methods of education and career coaching to increase ocean and career literacy.

The data also provided insights into how youth perceptions and attitudes about ocean careers may have been shaped by awareness, proximity to the industry, ocean literacy and ocean STEM education, social narrative, and other variables, and how these early influencers, in turn, prompted interest in participation in the ocean industry. This new report builds on the previous one by broadening the focus to a national scope.

Extant research has found that despite significant growth in the ocean sector over recent years³, awareness of the variety of ocean careers remains generally low. A recent survey by Fisheries and Oceans Canada found that while most respondents held a favourable view of the value of the ocean sector, only about 25% would consider a job in the industry.⁴ Similarly, studies of youth have found that career literacy is low amongst

middle and high school-aged children, despite interest in the ocean remaining high.⁵ To be fair, 25% interest in a single industry from the broad population should not provoke worry. Few industries could boast about that. What is concerning however, is the reasoning for excluding ocean careers from consideration.

While previous research focused on younger students, this broader pan-Canadian study looks at post-secondary youth (and workers from industries in transition) to assess the evolution of perceptions for this cohort years on from the original studies. This study endeavors to form a point of comparison to gauge changes to perceptions and attitudes and gain new insights. As such, the sample group has been adjusted to focus on young adults aged 18-35 from across Canada. Using these insights, this study aims to provide recommendations to the industry ecosystem of Canada's Ocean Supercluster to help build engagement of new talent. With the wide variety of roles available in the ocean sector, many young people may not realize that skills they already possess, or those they are cultivating through post-secondary education, are in high demand. The findings from this study will help to inform strategies for building the capacity, competency and flexibility of a future-ready Canadian ocean workforce.

BACKGROUND

OBJECTIVES

Canada's Ocean Supercluster has an interest in gaining insights into the perceptions held by post-secondary students and early career professionals about the ocean economy. These insights will help identify:

- Variables and drivers that attract/discourage new talent or that create access/barriers to entry.
- Pathways and barriers to entry for underrepresented groups.
- Opportunities for building awareness of high value current and future ocean careers.
- Non-traditional career pathways and transferrable skills to draw or redirect talent from adjacent or declining industries.
- How perceptions translate into participation and engagement.

This study will also help to inform strategies for shaping a more accurate and evidence-based narrative about the industry and the advancements that define its position in Canada's economy. The findings from this study will also highlight opportunities for developing skill diversity that will benefit the industry as it rises to the complex challenges and opportunities before it.

METHODOLOGY

This qualitative study was launched in December 2023. Data collection via online survey occurred between December 2023-March 1st, 2024, from respondents across Canada. Survey links in French and English were made available through social media and through direct sharing via social and professional networks.

DATA COLLECTION AND ANALYSIS

Data collection was conducted online using Survey Monkey. The survey comprised 20 core questions (five demographic, 15 construct-related). The survey used various question styles, including single response, multiple response, true/false, and open-text response. The survey questions were designed to assess constructs relating to career intentions, perceptions of the ocean economy generally, transferable skills, influencers and drivers of career selection, perceptions of ease of access to career pathways, and perceptions of the industry's role in advancing sustainability efforts.

Sampling occurred by a combination of strategies including convenience sampling (i.e. survey link shared via immediate network) and snowball sampling (an extension of convenience sampling). Participants were also reached through social media, with the link shared on the Canada's Ocean Supercluster's LinkedIn, Twitter, Facebook, Instagram and TikTok. To reach further into the general population, survey links were distributed via paid content with Meta (Facebook / Instagram) with 314k impressions over a period of six weeks.

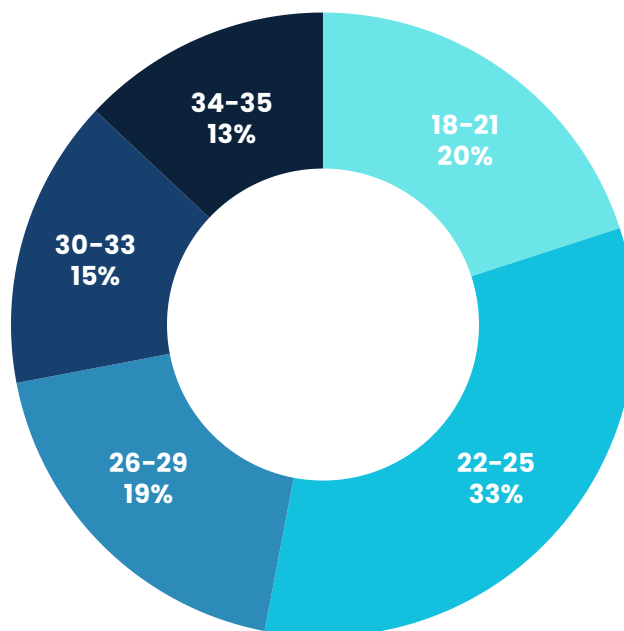
Using Excel, the data was concurrently and separately analyzed by an intern and the principal investigator to evaluate variance/consistency in findings. A thematic analysis for open-text responses was conducted in Excel. The responses were separately analyzed by the two researchers, with each identifying (and then agreeing on) common themes, and were coded according to those themes. For the question "What words come to mind when you hear about the 'sustainable ocean industry?', non-revelatory open-text responses (e.g. 'much', 'ocean', 'blue', 'not sure') were excluded, and less-common responses (e.g. 'equity') were examined if their low-response rates were noteworthy. Among the least common responses were terms relating to marine transportation, equity, and regulations.

SAMPLE GROUP AT A GLANCE

PARTICIPATION BY AGE COHORT

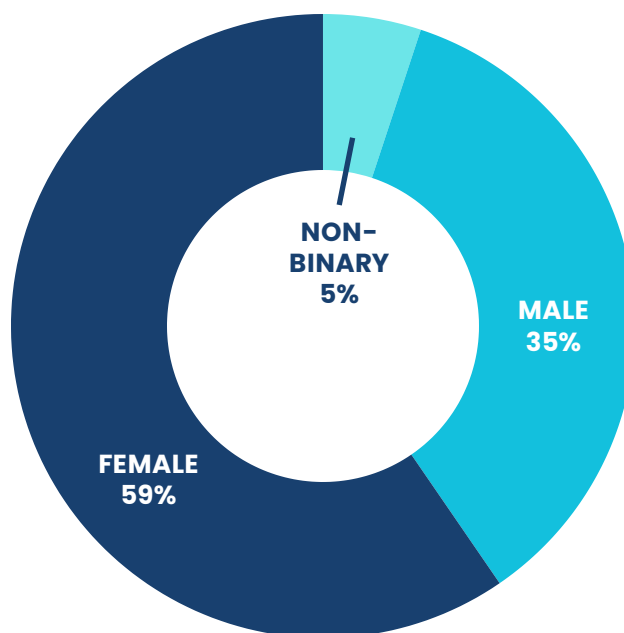
The sample group comprised young adults ages 18-35 from across Canada. Responses were collected from 369⁷ participants representing all regions across Canada. The desired sample size was calculated using the population of youth ages 18-35 from across Canada (~10.7 million)⁸, with a margin of error set at 5%, and confidence level of 95%.

More than half of responses came from youth ages 18-25⁹ resulting in these two cohorts (combined) being slightly over-represented.

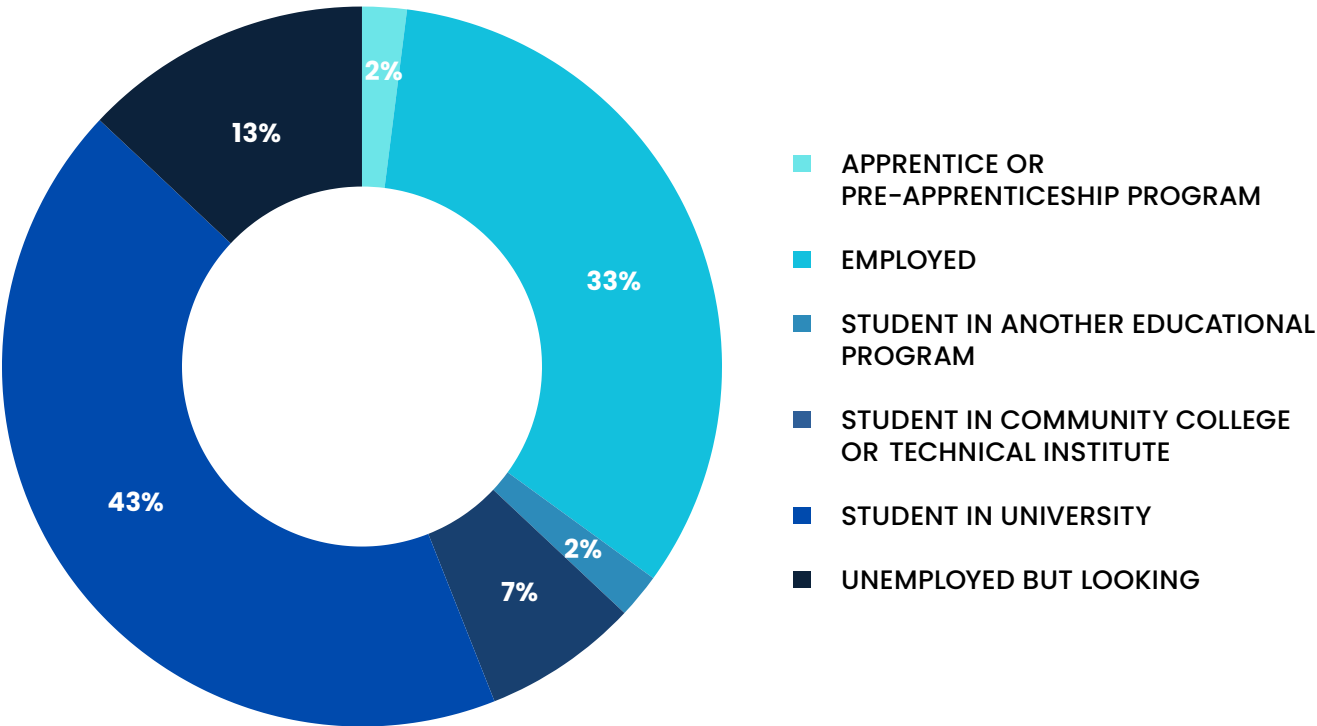


PARTICIPATION BY GENDER IDENTIFICATION

59% of participants identified as female. It is worth noting that among the general working population, women are estimated to comprise only 37% of Canadian ocean industry professionals.¹⁰ Gender-based comparisons of data were calibrated to adjust for proportion of responses



SAMPLE GROUP AT A GLANCE

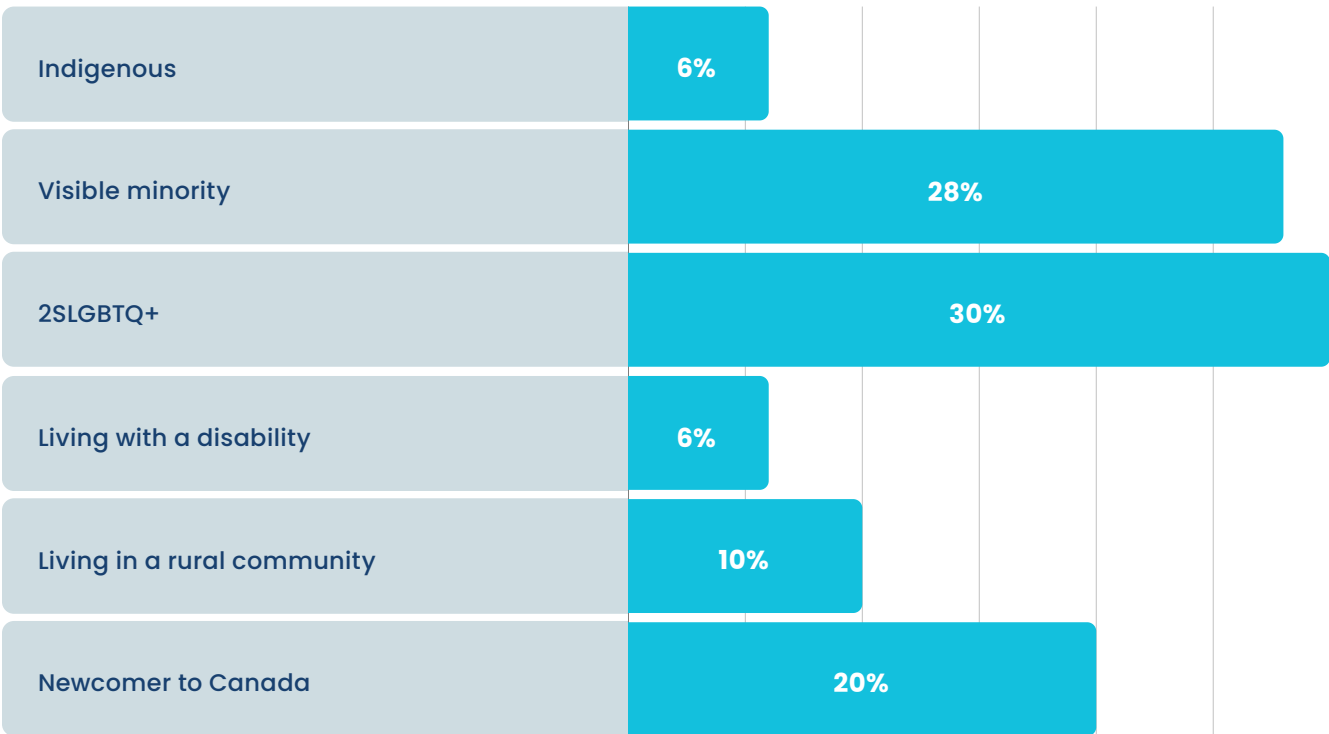


PARTICIPATION BY EDUCATION/EMPLOYMENT STATUS

54% of respondents were registered in post-secondary education, including university, community/technical college apprenticeship or other educational programs, and a third of participants were employed. The remaining 13% self-reported as 'unemployed but looking.'



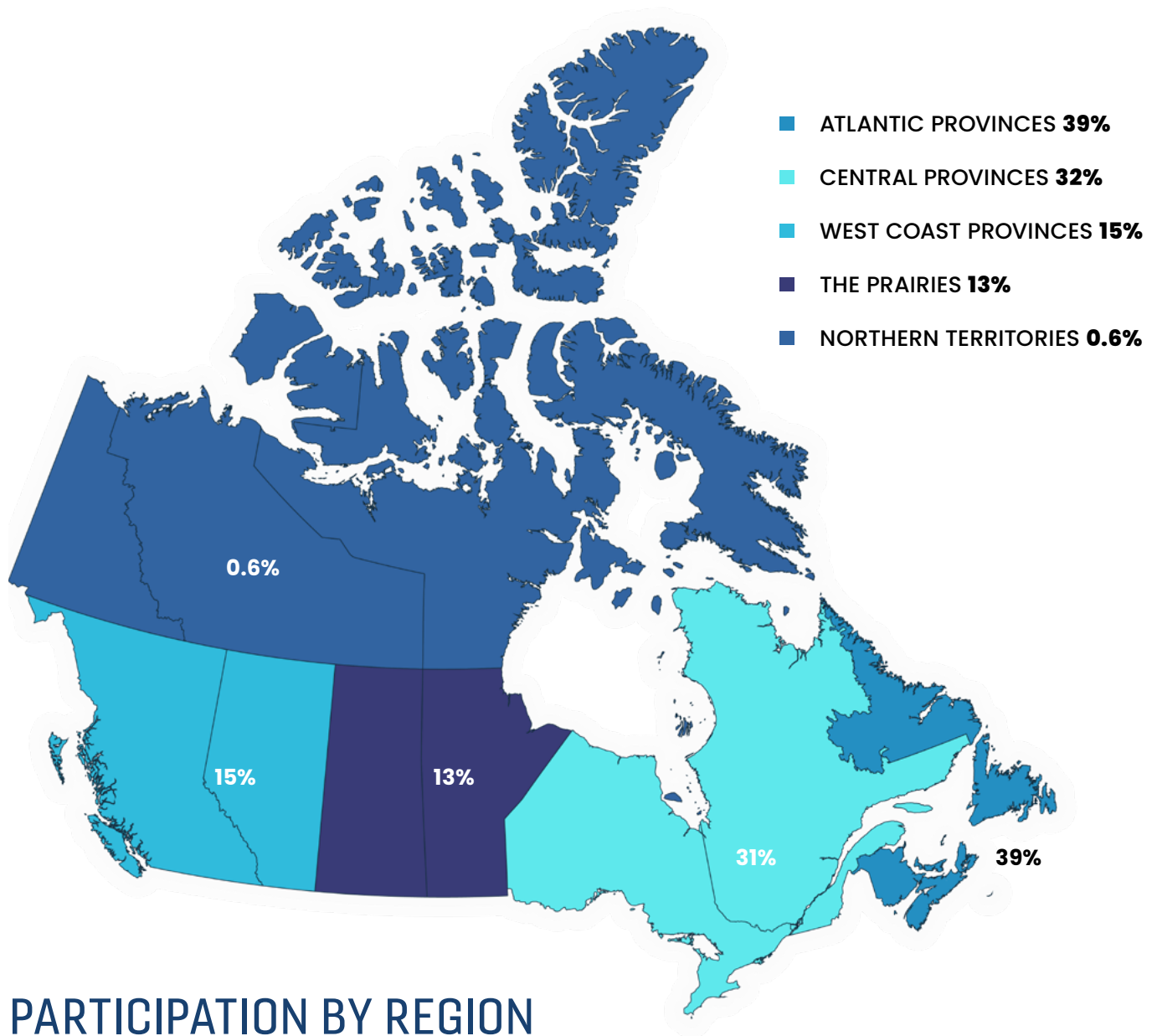
SAMPLE GROUP AT A GLANCE



PARTICIPATION BY MINORITY IDENTIFICATION (AS A PERCENTAGE OF TOTAL MINORITY IDENTIFICATION)

More than two-thirds of participants self-described as at least one minority group. Declarations of minority identification¹¹ were prompted so that the researchers could determine if a diverse sample group, representative of the broader population, had been reached. This information was also examined with all of the other variables of interest in the study to observe any relationships between minority declaration and perceptions of careers in the ocean sector. A limitation of this study is the small sample subsets for Indigenous participants. Although the number of participants (5.6%) is in proportion to the representation within Canada's population (5%)¹², the cohort is a small sample group in count. The researchers would like to recognize that relative values are used to generalize from the sample to the larger population. This needs to be considered in interpreting the findings from a small subset, but the importance of capturing rare data is of considerable value.¹³

SAMPLE GROUP AT A GLANCE



PARTICIPATION BY REGION

All regions were represented in the study. The Northern Territories had the fewest participants, despite strong efforts to engage through various networks and community groups. The regions of the Atlantic Provinces and Central Canada together comprised ~71% of survey responses. The actual combined population of these provinces is ~25 million, roughly 68.5% of the Canadian population. As such, participation is relatively proportionate to the overall population of the country. It is not surprising that Atlantic Canadian participants were more strongly represented as much of the population in this region live in or near coastal communities, the local economies are largely (15-20%) comprised of ocean-related activities, and participation in these regions would have been inflated through network sampling.

INDUSTRY AWARENESS

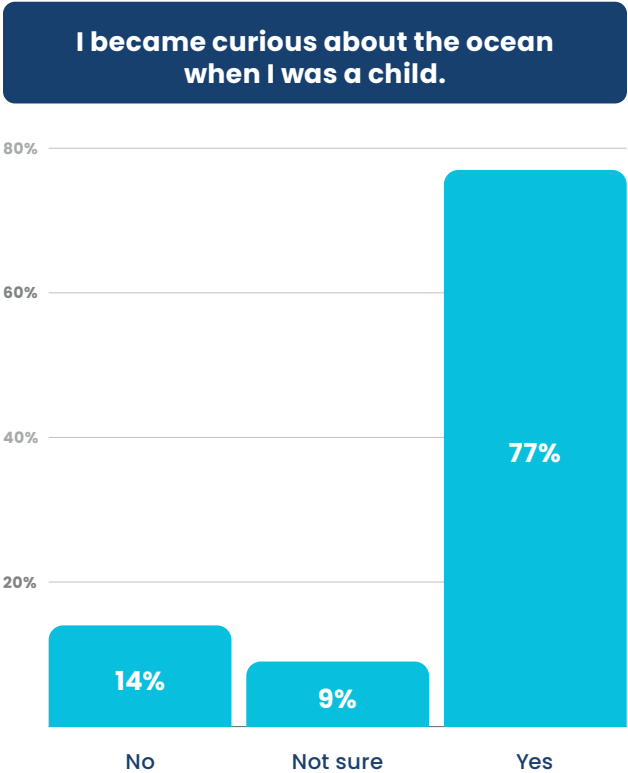
Participants responded to survey questions that provided some insight into their awareness of the industry overall. Constructs of interest included early engagement, proximal networks, perceptions of ease of pathways into the industry, and perceptions of possession of high value skills. This included current skills as well as ongoing education and training, and skills that could readily transition into the ocean sector.

As a first indicator of awareness, participants were asked which sectors of the ocean economy they were familiar with. Unlike the 2016 study, these older participants demonstrated high levels of awareness (i.e. ‘have heard of’) of sectors across the breadth of the industry, with fishing, marine conservation, research and observation, and offshore oil and gas ranking in the top more recognized (above 80%), and boat building and navigation and ship operators ranking lowest (in the 60% range). These results were consistent across age groups, regions, and gender and minority identification. Participants were later prompted to provide open text responses to the question ‘What words come to mind when you hear about the sustainable ocean industry?’ The responses were coded and counted. The word cloud illustrates the frequency of like or similar responses.

EARLY ENGAGEMENT

This study found that early curiosity in the ocean was highly correlated with interest in ocean sector careers. Interestingly, the study found that only a third of participants claimed to have learned a lot about the ocean in grade school. This suggests that curiosity is not being cultivated as much through formal education as it is through extracurricular or family experiences.

Involvement in post-secondary STEM education and careers, particularly ocean sciences, was found to be a stronger contributor to industry awareness and interest among older youth. 84% of participants who said they were interested in a career in the ocean sector reported being curious about the ocean as a child, and not surprisingly, the same number reported having learned a lot about the ocean in grade school.

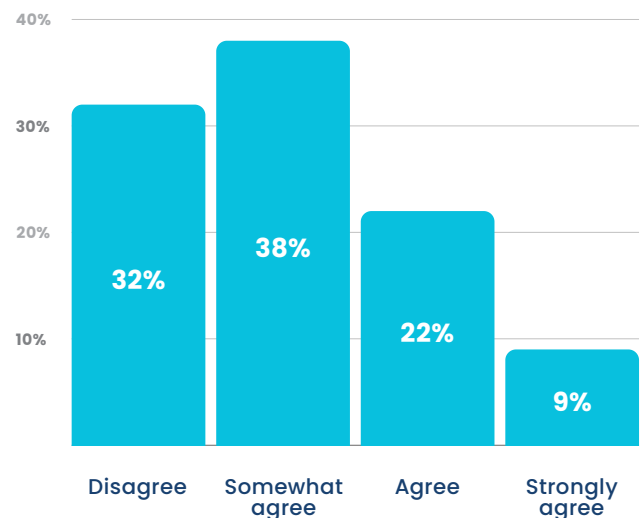


INDUSTRY AWARENESS

Unlike the 2016 study, this work did not examine key constructs such as career literacy and ocean literacy. Whereas career literacy refers to an individual's awareness of career opportunities and pathways, ocean literacy describes an individual's understanding and knowledge-holding of the ocean and our relationship to it. These two constructs are connected in that increasing an individual's ocean literacy can in turn increase their career literacy, at least with regard to ocean careers. However, research suggests that despite significant growth in the ocean sector over recent years, awareness of the variety of ocean careers remains generally low. A recent survey by Fisheries and Oceans Canada found that while most respondents held a favourable view of the value of the ocean sector, only about 25% would consider a job in the sector. This is not an alarming statistic unless we consider that the reasoning behind not

considering a marine career cites the belief in the misalignment of skillsets. More worryingly, those skillsets are often found to be highly relevant to the industry.

I learned a lot about ocean science and the ocean generally in grade school
(i.e. kindergarten/primary – grade 12)



Enviromnment Climate
Future STEWARDSHIP Wind Clean Growth
REDUCTIONS Conservation Innovation
Protection INDIGENOUS Pollution
Preservation Carbon Life Resources
EQUITY Biodiversity Economy
Technology Aquaculture
Fishing REGULATIONS Change Energy

INDUSTRY AWARENESS

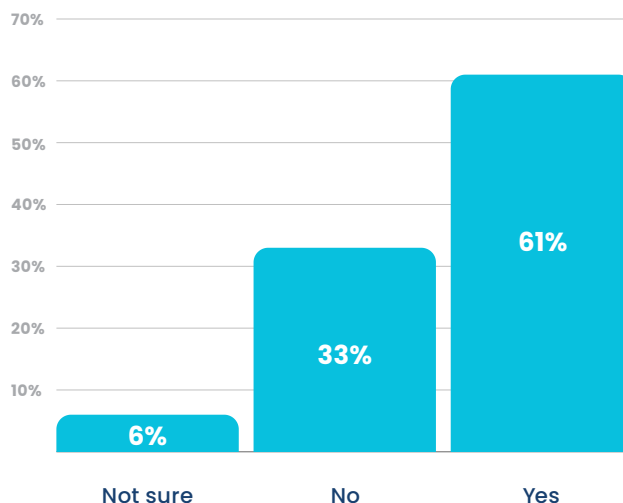
PROXIMAL NETWORK

Research has consistently shown that industry awareness and engagement is strongly influenced through interactions with proximal role models or contacts (i.e. knowing someone who is connected to the industry). The 2016 study also found that proximity to someone else in the industry was strongly correlated with engagement. It found that among younger students, correlation influenced both positively and more often negatively, contributing to enthusiastic interest less often than disparaging perceptions of the ocean and related careers. This may have reflected in the lived experience (or historical memory) of proximal role models in Atlantic Canada, where the traditional regional ocean industries such as fishing and shipbuilding have suffered unpredictable swings between profitable and hopeful – and fruitless, unstable, and dangerous. The influence of disparaging perceptions was not found in the current study.

Atlantic Canadians and those from the West Coast were more likely to know someone who works in the ocean industry. 77% of respondents from the Atlantic provinces and 70% from the West Coast reported knowing someone who works/worked in the industry. Fewer than half of participants from the other regions, including Canada's coastal northern territories, reported knowing someone in the industry.

74% of respondents from this current study, who expressed an interest in a career in the ocean sector, said they already knew someone working in the industry. This may be an indication that the more recent stability and promise of the ocean sector is becoming the dominant narrative.

Do you know someone who works or worked in the ocean industry?

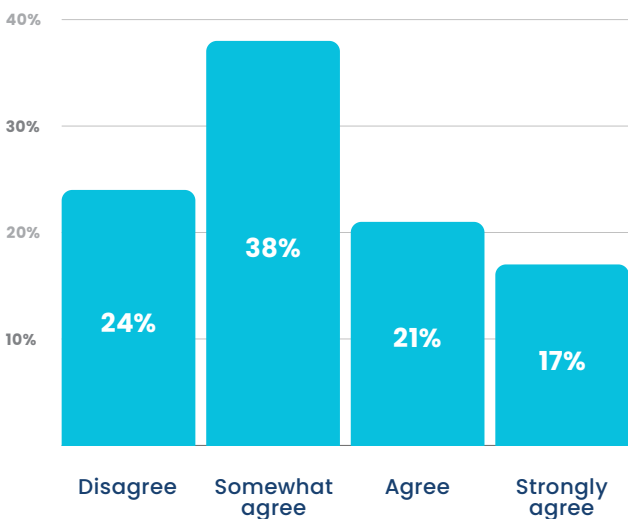


INDUSTRY AWARENESS

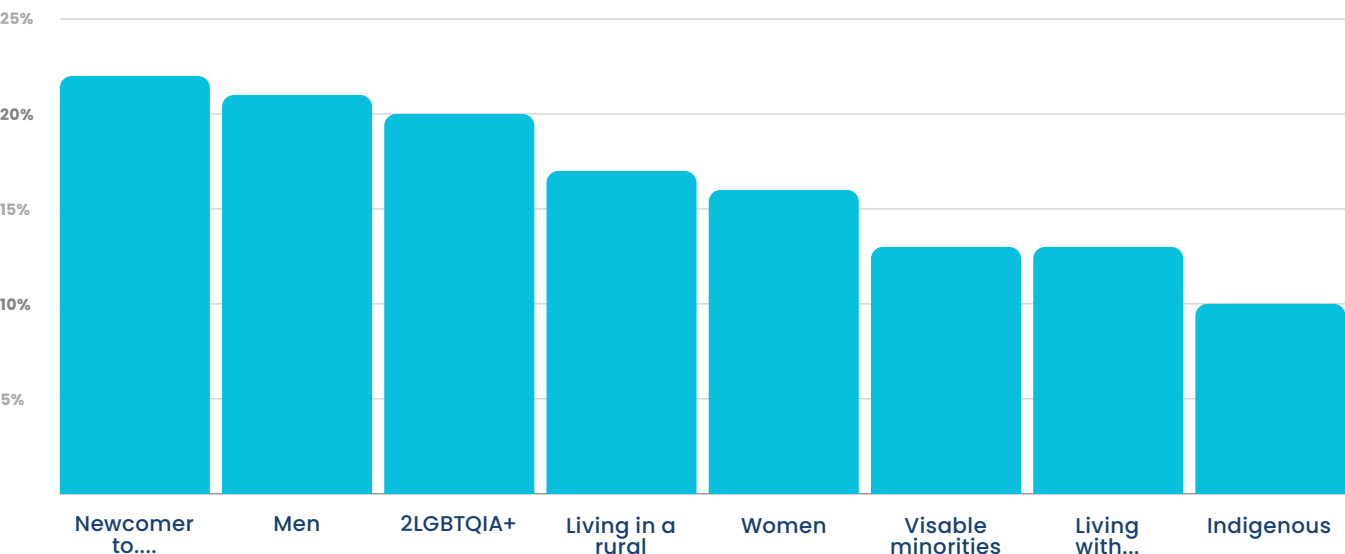
EASE OF PATHWAYS INTO THE INDUSTRY

Self-efficacy, or the belief that one can succeed is a powerful predictor of engagement.¹⁴ In the context of career engagement, access to careers is a contributor to feelings of efficacy – or in this case, lack of self-efficacy (i.e. why bother trying if barriers are too encumbering). 17% of participants strongly agreed that there is an easy pathway to enter the industry. This number was less for participants identifying as Indigenous (11%), visible minorities (11%), those living with a disability (12%), and women (16%). However, there was more optimism among men generally (21%), participants from the LGBTQ2S+ community (20%), and for newcomers to Canada (22%). This may be due to lack of general awareness of non-traditional pathways into the industry.

There is an easy pathway for me to enter the ocean industry or continue to work and advance in it.



There is an easy pathway into the industry
(for participants identifying as a minority group)



INDUSTRY AWARENESS

EXISTING OR DEVELOPING HIGH VALUE SKILLS

High value skills across the industry have evolved beyond traditional STEM and marine disciplines. A recent study⁴⁵ found that employers are beginning to recognize the need for workers with more expansive competencies that include depth of expertise in a core discipline, as well as a combination of inter-disciplinary cross-competencies and socio-cognitive abilities (e.g. managing complexity, resourcefulness) that allow for flexibility within evolving sectors and resilience against myriad external pressures.

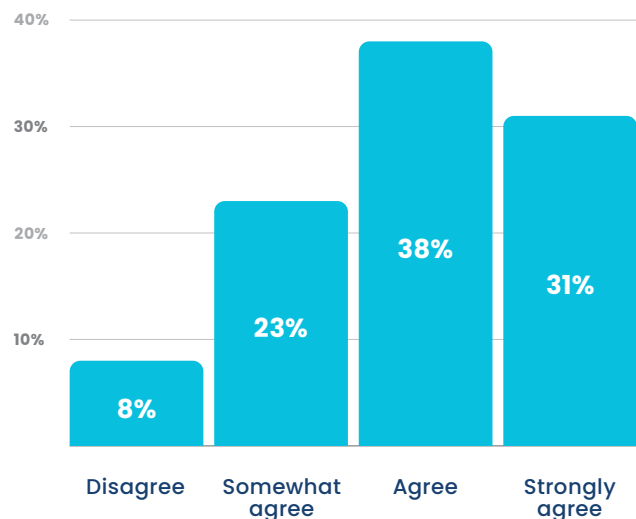


INDUSTRY AWARENESS

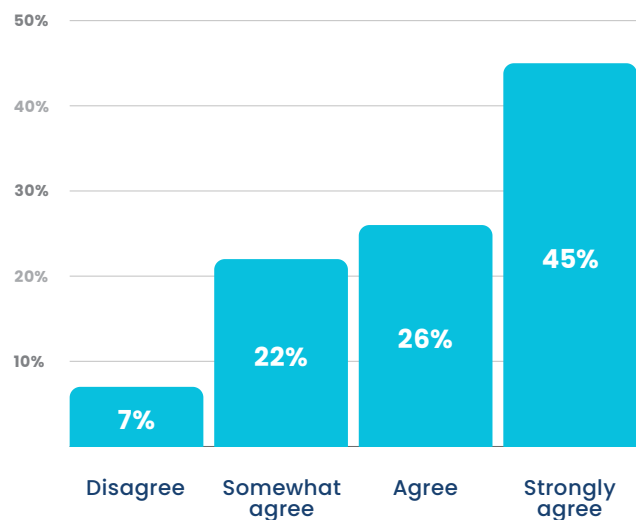
Nearly half (45%) of participants felt that the skills they currently have would be relevant to the ocean sector, and a third reported that the skills they have in a different industry could transfer well into the industry. This is encouraging as it may suggest growing general awareness of high demand and highly transferrable skills among job seekers. But this is good news only insofar as employers also know how to evaluate talent outside of traditional pathways and skillsets.

According to a McKinsey report¹⁶, employers lag in human capital thinking that should be more aware of transferrable skills. This does not mean that progressive industries and employers do not recognize that prior learning and skills are highly transferrable, but rather that they don't know how to turn this understanding into practice. Employers continue to find validating competencies to be a challenge, primarily because they lack expertise in evaluating non-traditional skills or pathways, or they must adhere to hiring policies that don't recognize prior learning (RPL). This presents a top hiring challenge for employers and a barrier to entry for talent hoping to transition their experience and abilities that may be defined or credentialed differently in other industries. This refers both to transfer to other occupations within the same industry and transfer to occupations with original technical skills into other industries.¹⁷

The skills, education, and/or experience I have are in a different industry, but could transfer well into the ocean industry.



I believe the skills I currently have and am developing would be relevant to a career in the ocean industry.

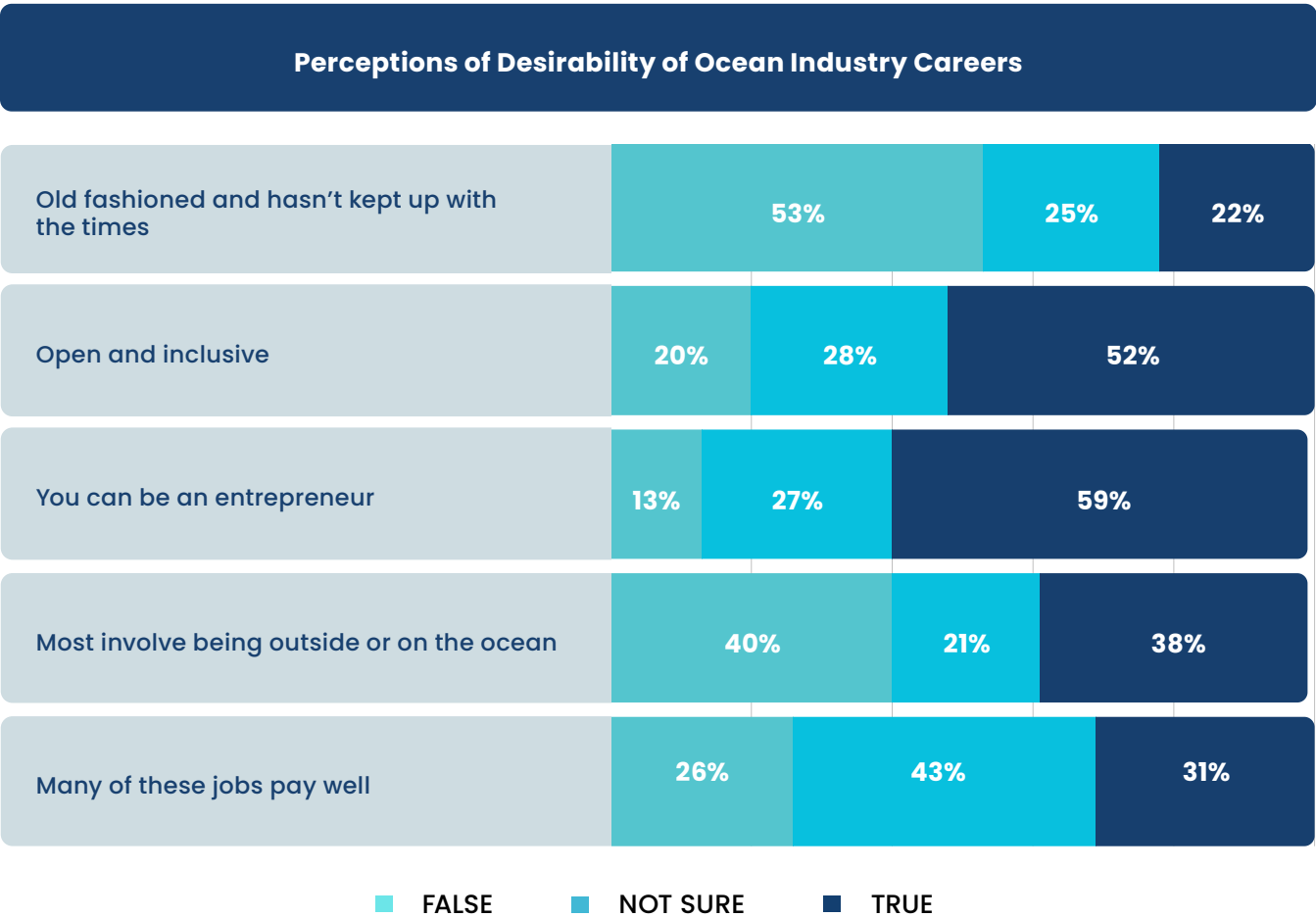




INDUSTRY PERCEPTIONS

PERCEPTIONS OF DESIRABILITY OF OCEAN CAREERS

Participants responded to true/false statements about the industry that targeted variables such as perceptions of industry progress, and attention to social, and economic wellbeing. Other variables included proximity to the ocean as a factor relating to access, and opportunities for entrepreneurship as a non-traditional (for many) pathway to industry. These variables represent key considerations that guide evaluation of the desirability and progress of evolving economies and work environments.



INDUSTRY PERCEPTIONS

Encouragingly, responses showed that 53% of participants disagreed with the sentiment that the industry isn't advancing alongside other progressive ones. Conversely, less than a third believe ocean careers pay well, and more than a third believe that proximity to an ocean is a requirement for most jobs. 77% expressed that they feel the industry contributes to climate and environmental crises, but this is an ambiguous response as it could reflect beliefs that the industry is involved in creating the challenges or trying to resolve the challenges. Nearly 60% recognize that the industry has evolved beyond traditional research and saturated resource-claiming sectors and now include more opportunities for entrepreneurship (59%).

It is also encouraging to note that 52% of respondents agreed that the industry is open and inclusive. While there is no earlier data to use as a reference point, anecdotally this shows progress in an industry that has been homogenous and protectively so for generations.

With the diversification of the ocean sector, new career options and fields are being created in real time. A new generation of ocean professionals will look quite different to those who came before. A recent report from Fisheries and Oceans Canada¹⁸ concluded that given the aging workforce of commercial fisheries, marine transport, shipbuilding and other industries, new accessible pathways should be created to help young people succeed their older predecessors. While young professionals were found to have valuable skills to contribute, they were not found to have strong career literacy. "Youth do not always consider careers in the blue economy nor are they aware of the many emerging technology-based employment opportunities within ocean-based sectors" (p.18). The report concluded that the evolution of a sustainable ocean workforce will require an increasingly diverse set of job skills, bridging modern and traditional knowledge areas.

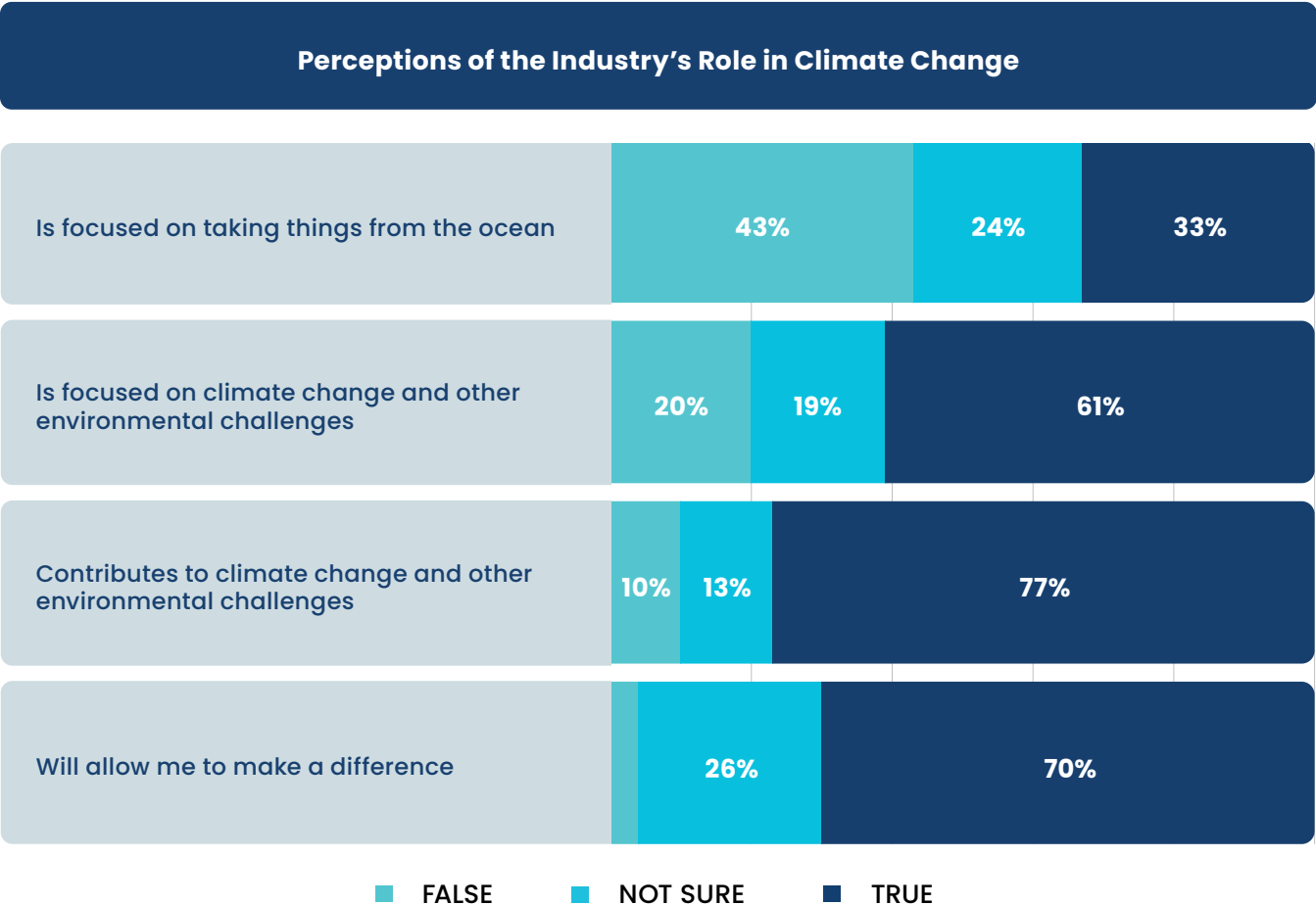
To some extent, new accessible pathways are already being organically created through osmosis of external social change – but more deliberate efforts still need to be made.

INDUSTRY PERCEPTIONS

PERCEPTIONS OF INDUSTRY'S ROLE IN CLIMATE CHANGE

This section solicited responses to true/false statements about the industry that targeted variables related to the industry's role in the advancement of ocean and environment positive strategies and operations to increase sustainability.

Environmental justice advocacy is found among all generations, and is expressed, at least anecdotally, as a key variable for consumer or career seeking choices. The public and social media report that youth and young professionals place high value on an industry's role in climate change and other environmental challenges.



INDUSTRY PERCEPTIONS

Responses demonstrate strong optimism that careers in the ocean sector can effectuate positive environmental change, and that it is not solely focused on harvesting natural resources. Participants also communicated the belief that participation in the industry can be personally fulfilling in terms of ‘making a difference.’

Interestingly, responses to a question presented later in the survey that asked youth what they regard as most important in making career selections, “participation in an industry that contributes to a sustainable future” ranked only midway for non-minority groups. Among participants who identified as members of Indigenous, visible minority, 2SLGBTQ+, and rural communities, and newcomers to Canada, it was ranked in the top third. This illustrates the paradox of an idealistic preference for participation in environment-positive industries, that, among the non-minority population, slides in rank against other practical criteria for career selection. Environmental concern and social equity are often coupled in the wellbeing dialogue, which may account for the higher ranking of careers in environmentally focused industries among minority groups.

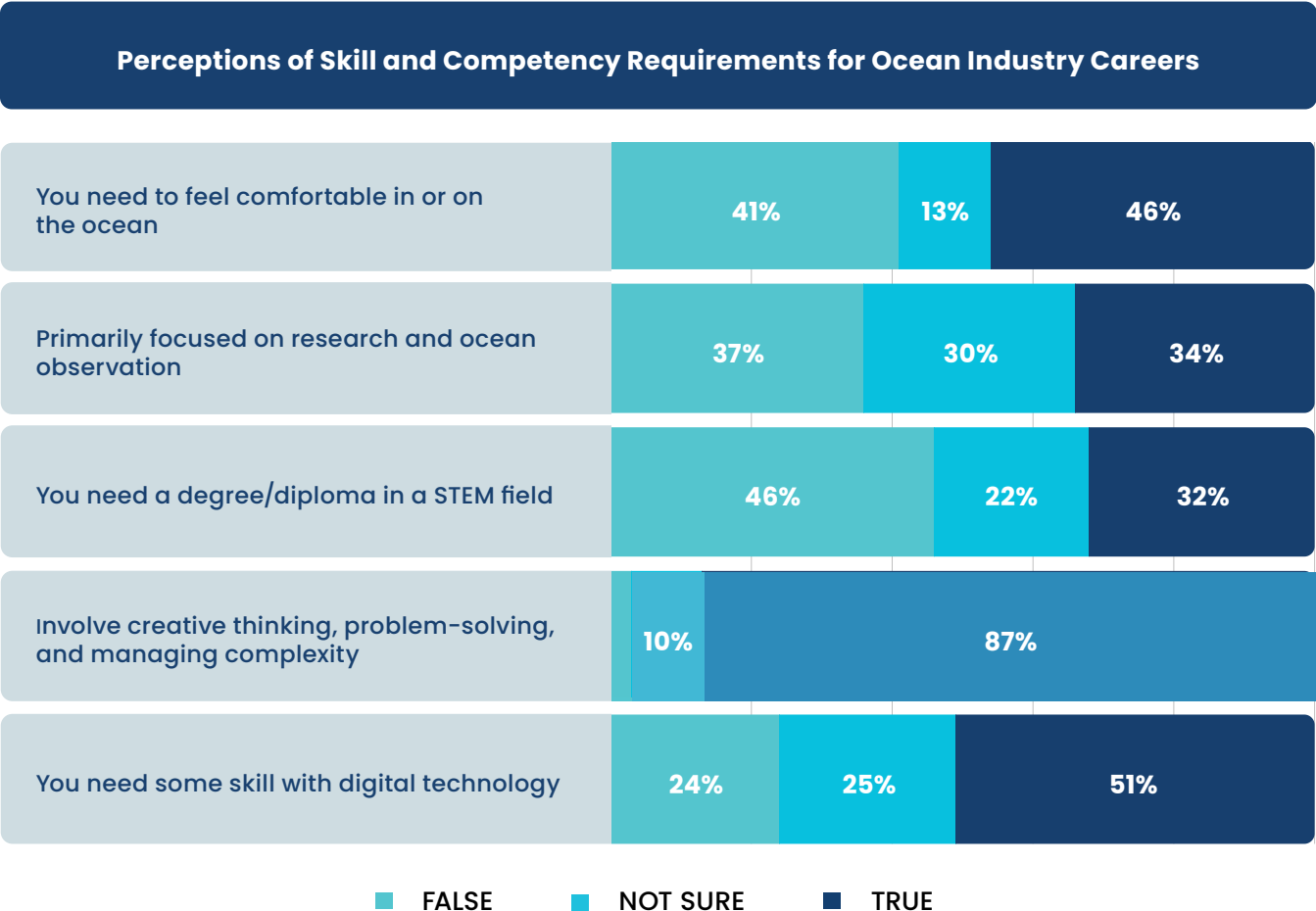


INDUSTRY PERCEPTIONS

PERCEPTIONS OF SKILL AND COMPETENCY REQUIREMENTS

An obvious variable related to career selection is perception of skill alignment, though this can also be a barrier when actual and perceived requirements aren't consistent. Persistent beliefs (often reinforced by dated recruitment strategies) can reinforce selection or self-selection of talent with traditional skillsets. Studies¹⁹ over the past decade have concluded that the range and variety of skillsets have expanded.

Research also indicates that in addition to the application of STEM-based job skills, social and interpersonal skills will be in high demand in years to come, with the sustainable ocean industry growing to include more supportive and collaborative roles. This also reflects general workforce trends in the greater Canadian economy. 87% of participants recognized the relevance of these skills in the ocean industry.



INDUSTRY PERCEPTIONS

46% of participants disagreed that a degree/diploma in a STEM field is a requirement for careers in the ocean industry. This reflects growing awareness of the need for diverse cross-functional skills. According to a 2018 study, “Breadth of skills will be more critical than proficiency; this is good for young Canadians, who typically lack the years of experience needed to develop expert proficiency.”²⁰ The authors of this report would argue that proficiency remains most critical, but the point remains that breadth of skills is being recognized more than ever before, as essential to evaluations of high value competency.

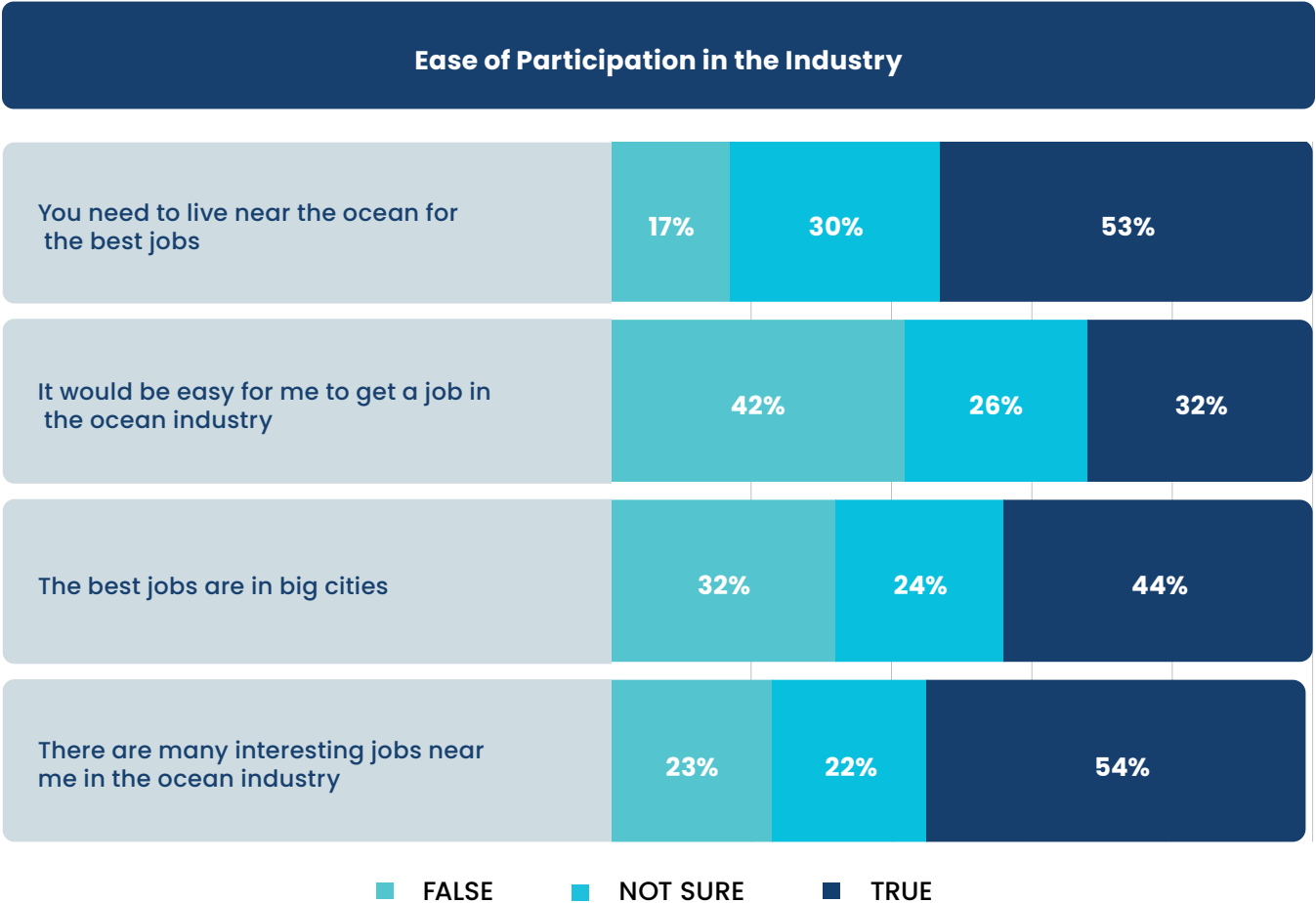
Of the 2.4 million jobs estimated to have been created in the 2018-2021 period, studies show that nearly all require some combination of active listening and critical thinking skills. The report also concludes that the ability to communicate with an interdisciplinary team will become an asset for young professionals. A study²¹ looking at skills and competencies in Nova Scotia’s ocean industries similarly identifies verbal/communication skills as well as analytical/critical thinking skills as crucial across industries, with non-traditional skills becoming increasingly important.



INDUSTRY PERCEPTIONS

PERCEPTIONS OF EASE OF PARTICIPATION

A key variable involved in self-selection in or out of an industry is the perception of proximity to good jobs. Not operationally defined or calibrated, a ‘good job’ is a personal appraisal. Some qualities that reflect the appraisal of a ‘good job’ are explored further in the study. More than half of participants believe that the best ocean industry jobs are near the ocean, and more than half felt there are interesting jobs near them. This may not be particularly noteworthy given that 55% of participants were from Canada’s east and west coasts. However, given the trends in other industries to live-here-work-there²², we are seeing more geography-free evaluations of industry participation. The ongoing perception that proximity is a limiting factor for an ocean career seems to be distinctive for this industry. There is an opportunity for a future study to validate this assumption and understand this as a complicating factor in talent attraction, or highlight the myriad ocean careers that occur on dry land, far from a coastline.



INDUSTRY PERCEPTIONS

The data did show growing doubt (false/not sure), in comparison with the 2016 study, that the best jobs are in big cities. This may indicate more awareness of industry presence and growth in remote and rural areas, more awareness that opportunities outside of cities already existed, or evolving ideas of what ‘good jobs’ are.

Nearly a third of participants expressed it would be easy to get a job in the ocean industry, though not all were interested in doing so. Participants from the Atlantic Provinces (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, New Brunswick) were the most likely to respond that there was an easy pathway into a career in the ocean industry. Similarly, participants from coastal regions were more likely to believe their skills, education, and/or experience in a different industry would transfer well into the ocean industry. Participants from the northern Territories were most likely to respond that they were ‘not sure.’



INDUSTRY PERCEPTIONS

COMPARING PERCEPTIONS OF THE OCEAN INDUSTRY – FEMALE/MALE

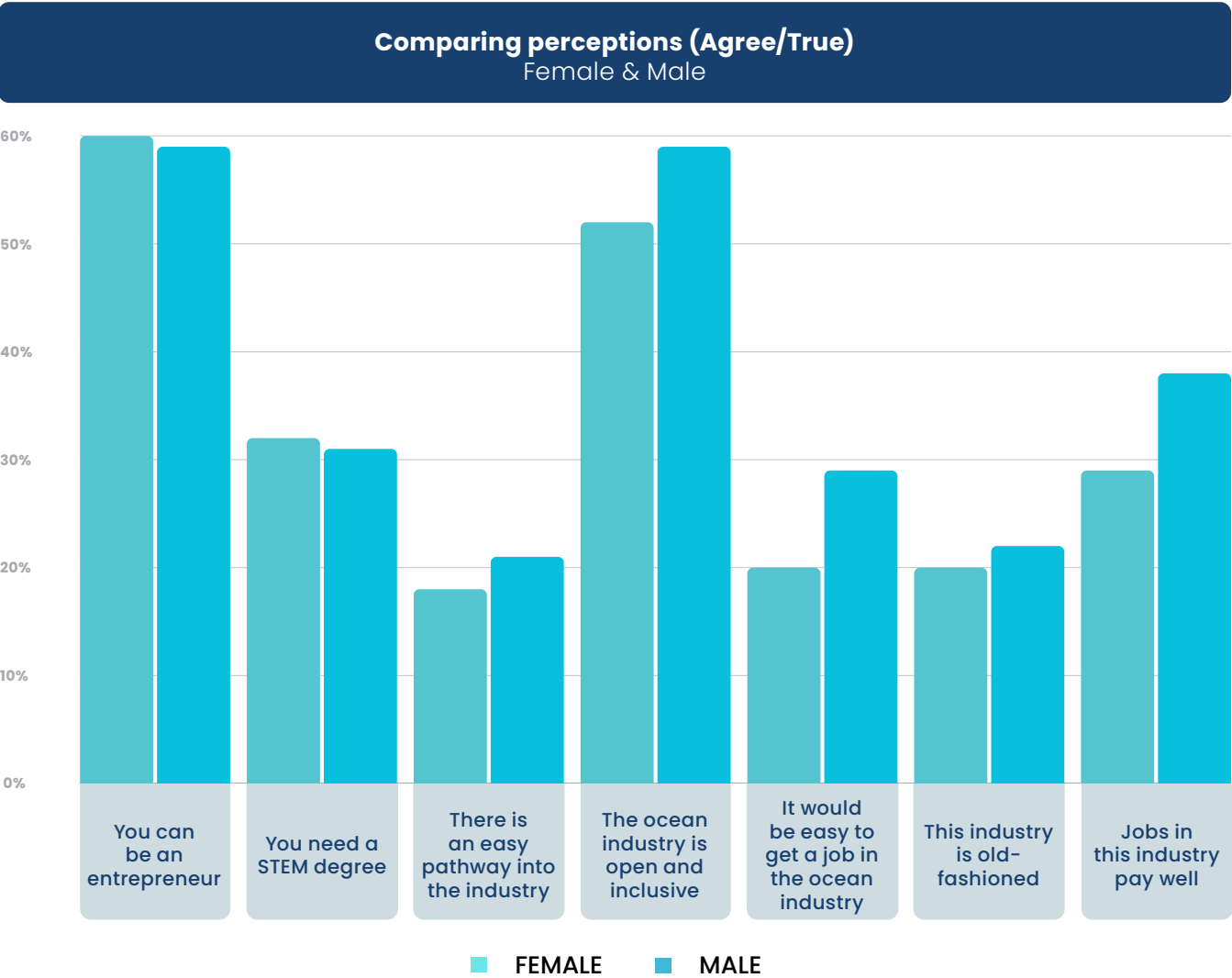
A recent study²³ looked at the ratios of women to men graduates from key ocean-related roles and found that women continue to be underrepresented, resulting in fewer women finding traditional pathways to high demand careers in the industry. This also means that there are fewer women traveling up the pipeline towards more senior and influential roles in the industry.

Female	:	Male
-1.62	Natural resources conservation and research	1
-0.92	Business admin, management, and operations	1
-0.33	Computer/Information technology	1
-0.23	Electrical, electronics and communications engineering	1
-0.17	Mechanical engineering	1
-0.17	Electrical, electronic engineering techs	1
-0.13	Electromechanical tech	1

INDUSTRY PERCEPTIONS

This study endeavored to identify how perceptions of the industry influenced interest in participating in ocean industry careers. Few insights were gained as the perceptions of female and male participants showed strong agreement in most areas, including the awareness of entrepreneurship opportunities, views of minimum credential requirements, and views that the industry is old fashioned (only 20% and 22% agreed with the statement).

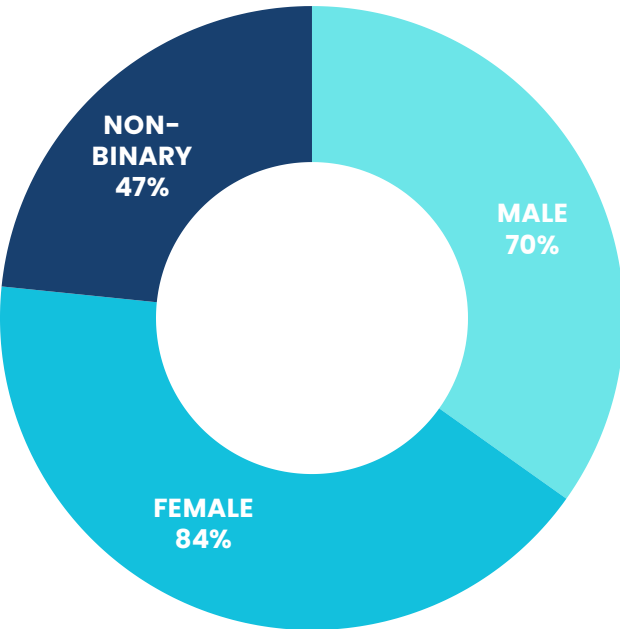
Statistically significant differences in opinion between female and male participants were observed in perceptions of ease of access to the industry (16% and 21%, female to male) and ease of getting a good job (20% and 29%). It is interesting that perceptions of access to pathways and ease of good employment do not overlap more perfectly. This may suggest that women see fewer pathways into the industry, but better job prospects if they are allowed that access. Males have similar perceptions of access but with greater confidence in their ability to find good jobs.



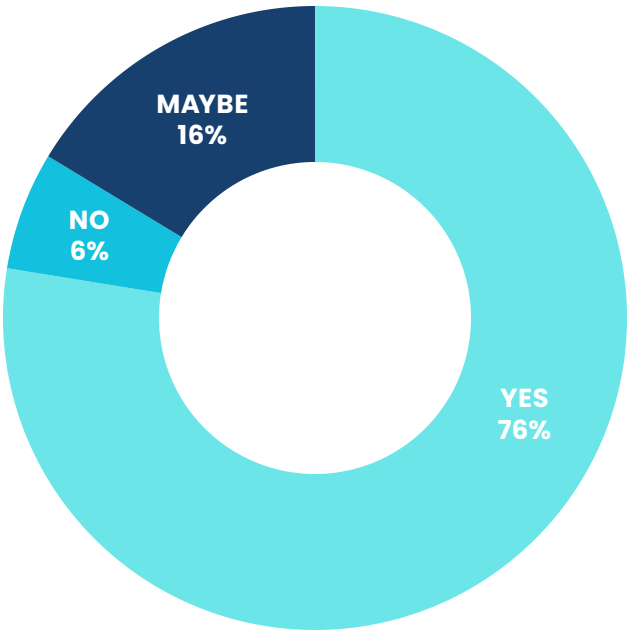
INTEREST IN CAREERS IN THE OCEAN INDUSTRY

Interest in careers in the ocean industry was considerably higher in this study (76%) compared with responses from the initial 2016 student intentions study (13% interested), and the follow-on 2019 study²⁴ (12%). Much of this difference may be accounted for by network sampling but may also reflect broader awareness of the range of sectors and career options in the industry, through maturity and life experience.

Interest in a career in the ocean industry by gender



Are you interested in a career in the ocean industry?



In the initial two studies, which surveyed Nova Scotian students in grades six-nine and six-12 respectively, the responses of interest were evenly divided between males and females, while in the more recent study females were 14% more likely than males to indicate that they were interested; 70% of men and 84% of women. These figures are corrected for proportionality.

An attempt was made to compare apples to apples by isolating the responses from participants from Nova Scotia between the ages of 18-25 which would be representative of the cohort from the original study (who were 11-15 years old at the time) and the same results were found as with the broad sample group.

INTEREST IN CAREERS IN THE OCEAN INDUSTRY

VARIABLES THAT CORELATED WITH 'YES' RESPONSES

Several other variables were examined for influence on interest in careers in the ocean industry. For example, one study found that experiential approaches to building ocean awareness, particularly ocean STEM knowledge, have been shown to be effective at guiding career choice²⁵. Likewise, a higher level of STEM knowledge is strongly correlated with greater relevant career literacy, helping young people gain awareness of ocean professions²⁶. Among the full sample of participants who said they are interested in a career in the ocean industry:

- 42% are students registered in a university or college program (in any program);
- 61% are currently studying STEM subjects or working in a STEM field;
- More than half agreed or strongly agreed that there is an easy pathway to enter the industry, but less than a third said they think they would have an easy time finding a good job. This inconsistency could reflect awareness of accessible pathways, but uncertainty about the labour market or recruitment opportunities for new graduates or early professionals. In an industry that is still dominated by older workers (over age 45), young people may feel that the pipeline to opportunity is plugged and not shifting any time soon.

INTEREST IN CAREERS IN THE OCEAN INDUSTRY

PARTICIPANTS FROM INDIGENOUS COMMUNITIES

Among the participants who identified as Indigenous, the following variables were found to correlate with interest in a career in the ocean industry:

- 74% of Indigenous participants said they were interested, and half agreed or somewhat agreed that they had an easy pathway to enter.
- 54% strongly agreed that the skills they currently have or are developing are relevant to the industry. Among the much smaller sample subset of Indigenous women (see comment on page 10 regarding small sample subsets), nearly all expressed a belief that they possess or are developing industry relevant skills. This may suggest that more Indigenous women are pursuing some discipline relating to an ocean career, or they have more awareness of the relevance of adjacent and transferable skills.

PARTICIPANTS FROM OTHER UNDERREPRESENTED COMMUNITIES

Among participants from other underrepresented communities, including individuals from visible minority groups, 2SLGBTQ+, persons living with disabilities, persons from rural communities, and newcomers to Canada, the following variables were found to correlate with interest in a career in the ocean industry:

- 68% believe that the skills, education, or experience they have in a different industry could transfer well. This was slightly higher for women (71%). This may reflect broader awareness of the transferability of skills, or a more earnest conviction they are willing to apply their skills wherever they are welcomed.
- In contrast with the belief that their skills can transfer easily into ocean industry careers, only 38% of participants from underrepresented communities agree or strongly agree that there is an easy pathway into the industry. This was slightly higher for women (40%).

INTEREST IN CAREERS IN THE OCEAN INDUSTRY

MALE AND FEMALE PARTICIPANTS ²⁷

This study found little variation between responses from male and female participants. Variables that did show some statistically significant difference are:

- 29% of women and 38% of men felt that jobs in the ocean industry pay well;
- Half of women (51%) reported the perception that the industry is open and inclusive, while 58% of men reported the same;
- 30% of men perceived that it would be easy to get a job in the ocean industry, while only 20% of women shared this perception.
- 52% of women and 42% of men recognized that some skill with digital technology was essential to participate in the industry. This difference may come down to the interpretation of 'some skill.' It may also be indicative of a perceived pathway barrier, as we continue to see more men than women pursuing credentials in information and computer sciences.

VARIABLES CORRELATING WITH 'NO' RESPONSE

Of those who said they were not interested in a career in the ocean industry:

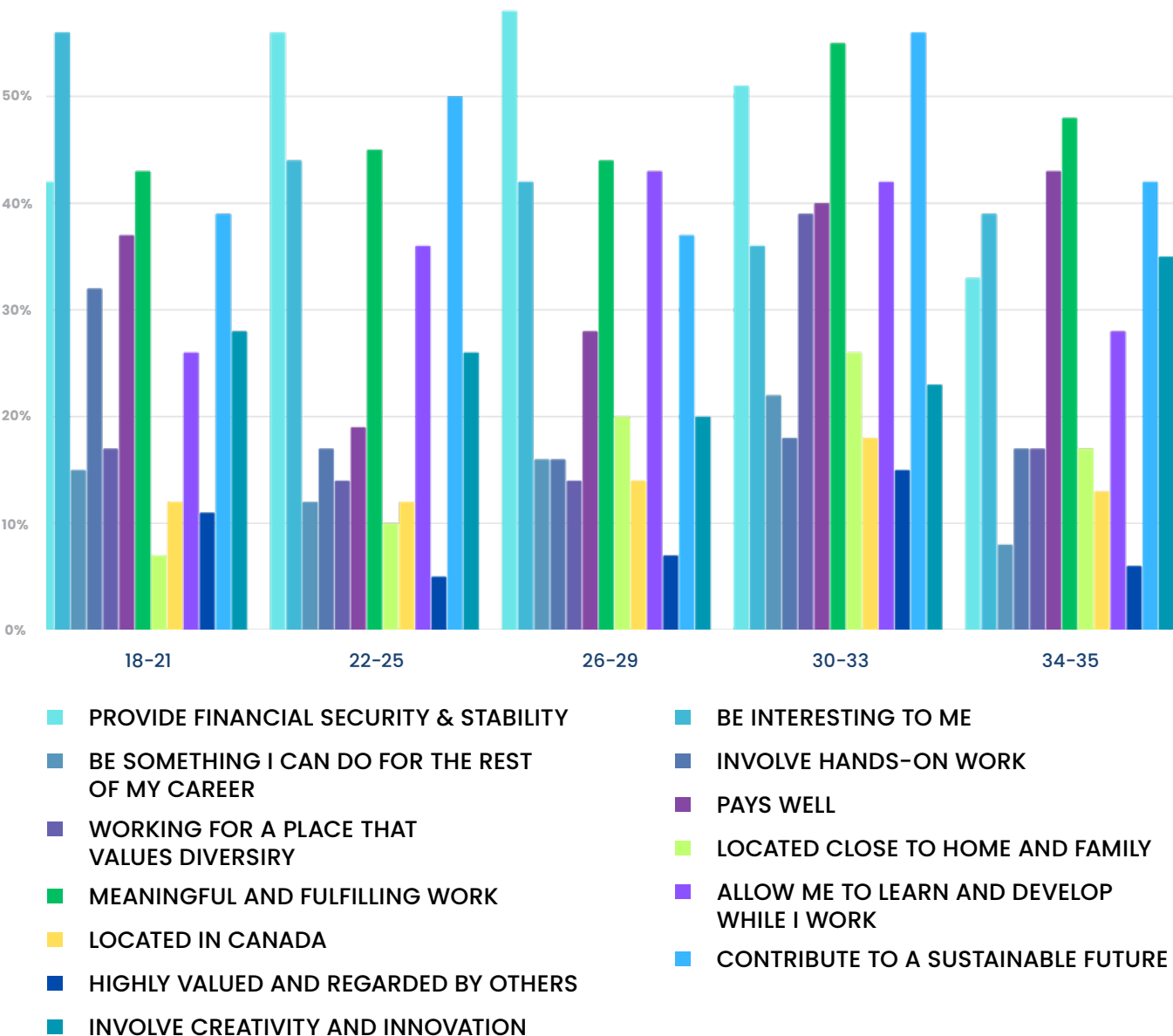
- The 'no' responses were proportionally split among the age groups;
- The most 'no' responses came from those who were already employed (38%)²⁸ suggesting that pathways had already been selected and participants weren't considering a potential future shift;
- Less than 1/3 of Indigenous respondents perceived that these jobs pay well, and nearly half were not sure. This response was consistent, almost identical, across all participants and across all age groups, indicating that financial compensation may be a key factor in influencing interest in ocean sector careers.

INTEREST IN CAREERS IN THE OCEAN INDUSTRY

DRIVERS FOR CAREER INTEREST AND SELECTION²⁹

Participants were asked what is most important to them as they consider their future career. Respondents were allowed to choose up to three categories, and the chart illustrates a collective ranking of most/least from the options that were given.

What is the most/least important in choosing a career (by age cohorts)



INTEREST IN CAREERS IN THE OCEAN INDUSTRY

Highest ranking drivers were found to be:

- Providing financial security and stability ranked in the top three highest across ages 18-33.
- Having a career that is personally interesting was ranked highest for 18-29.
- Contribution to a sustainable future ranked in the top third among non-traditional cohorts, but only midway for participants from non-minority groups.

Finding meaningful and fulfilling work ranked among highest for all age cohorts

Lowest ranking drivers were found to be:

- Although, providing financial stability and security was ranked highest for most groups, 'pays well' ranked in the middle for all groups. By contrast, in the 2016 study 'pays well' was ranked second. This may be due to participants interpreting good compensation as something in excess of financial security, which itself may be a marker of the current social tone that prioritizes community and environmental prosperity and well-being over disproportionate individual prosperity. It may also suggest that social prestige and power can be found more in financial security and career pathways, and attention to impacts on others and the environment, than in overt status indicators such as compensation.

Flexible, remote and virtual work was not offered as an option among the drivers of interest. It would be interesting to measure this option in future studies to determine its ranking as an influencer.

Having a career in Canada or close to home was ranked among the lowest influencers for career choices for all age, gender, regional, and identity groups.

- In the 2016 study, parental approval was found to be a powerful influencer of young people's career perceptions and intentions. This current study looked more generally at external locus of approval (i.e. having a career that is highly valued and regarded by others) which was ranked lowest across all age, gender, geographic, and identity groups, suggesting that external approval is less of a factor. This may be the case, but may also be an expression of agency, self-determination, and a, perhaps false, assertion that approval from peers and community weakens as an influencer as youth launch their careers.

INTEREST IN CAREERS IN THE OCEAN INDUSTRY

- Curiously, working in a place that values diversity was in the lowest third for all age cohorts. It is important to note that rankings represent only the options given, and a lower ranking doesn't denote 'not important,' but less of a driver relative to the other options.

Well paid work was top priority for visible minorities and those living in rural communities – consistent with lived experiences of those marginalized by race or remote region.

- Other results not highlighted in this section were found to be consistent across all cohorts.

There was significant overlap in 'most important' and 'least important' responses for men and women with one exception for each.

HIGHEST RANKED DRIVERS FOR MEN AND WOMEN (HIGHEST 4)

Men

Provide financial security and stability.

Most Important (Both)

Meaningful and fulfilling work.
Contribute to a sustainable future.
Be interesting to me.

Women

Allow me to learn and develop while I work.

LOWEST RANKED DRIVERS FOR MEN AND WOMEN (LOWEST 4)

Men

Working in a place that values diversity and is a place of belonging.

Least Important (Both)

Be something I can do for the rest of my career.
Be highly valued and regarded by others.

Women

Provide financial security and stability.



WHAT CAN WE MAKE OF ALL THIS?

Proximal network continues to play a role in influencing perceptions and attitudes.

Research has consistently shown that industry awareness and engagement are strongly influenced through interactions with proximal role models or contacts (i.e. knowing someone who is connected to the industry). 74% of respondents from this current study, who expressed an interest in a career in the ocean sector, said that they already knew someone working in that industry. This may be an indication that the more recent profile, stability and promise of the industry is becoming a dominant narrative or that those working in the industry are becoming stronger advocates.

WHAT CAN WE MAKE OF ALL THIS?

There is considerable opportunity for Canada's secondary school systems to improve awareness and interest in the ocean through both humanities and STEM education.

The 2016 study³⁰ found that industry awareness was low, with youth mainly recognizing the most traditional sectors like fishing and shipbuilding. Lack of awareness was the single-most significant indicator of lack of interest in an ocean sector career. Over 14,000 students, all living within an hour of a coastline, were asked if they would consider a career in the industry – and only 17% said ‘yes.’ That study also demonstrated that interest in ocean careers is powerfully impacted by lack of information and persistent bias.

This current study found that only a third of participants claimed to have learned ‘a lot’ about the ocean in grade school. Involvement in post-secondary general STEM education and careers was found to be a stronger contributor to industry awareness and interest among older youth than early engagement through secondary school programming, likely due to the lack of marine curricula in the k-12 system. 84% of participants who said they were interested in a career in the marine industry reported being curious about the ocean as a child, and not surprisingly, the same number reported having learned a lot about the ocean in grade school – though not necessarily through the school system itself. This points to a missed opportunity to build ocean literacy for all youth so that those without access to extracurricular learning or without proximity to a marine environment can still build awareness and knowledge holding.

Perceptions of ease of access to pathways into ocean industry careers remains low.

Statistically significant differences in opinion were observed in the perceptions of ease of access to the industry (16% female and 21% male) and ease of getting a good job (20% female and 29% male). This is in stark contrast to the findings reported above regarding the awareness of transferability of skills, which suggests that people recognize that skill alignment or near alignment is insufficient for access to the ‘good jobs.’ Whether this reflects a proximity to jobs challenge or other barrier, this incongruity is worthy of deeper examination in future studies.

Underrepresented workers reported greater interest in ocean-related careers and more optimism in accessing those careers. 68% of participants from underrepresented groups reported the belief that the skills, education, or experience they have in a different industry could transfer well. This was slightly higher for women (71%). This may reflect a broader awareness of the possible transferability of skills among these cohorts than among the general population, or a more earnest conviction that they are willing to apply their skills wherever they are welcomed. Here we see workforce optimism and skills confidence at odds with employer recognition of transferable skills, which emerges as a significant barrier to entry for talent attempting to access the ocean industry via non-traditional pathways.

WHAT CAN WE MAKE OF ALL THIS?

There is a need to build awareness of transferrable skills among both employees and job seekers to attract the cross-disciplinary expertise the industry needs.

A third of participants from traditional cohorts reported having existing skills that could transfer into the ocean industry. This suggests that skilled workers who are not from underrepresented communities are less likely to recognize opportunities to transition from adjacent industries. This is worrying given the experience and knowledge transfer that is essential to building capacity, competency, and speed to readiness. The challenge of workers opting out because of perceptions of skill misalignment goes hand in hand with employers screening out potential talent for the same reasons. Employers continue to find validating competencies to be a challenge, primarily because they lack expertise in evaluating non-traditional skills or pathways, or they must adhere to hiring policies that don't recognize prior learning (RPL). This presents a top hiring challenge for employers as well as a barrier to entry to talent exiting industries in decline. Neither group is served by skills evaluation practices that fail to recognize experience and capabilities that may be differently defined or credentialed in other industries.

Perceptions of the ocean industry are generally positive.

Perceptions of the ocean industry were generally optimistic regarding variables such as industry progress, attention to social, environmental, and economic wellbeing. A lingering, and likely fair, perception that ocean careers don't pay well, remains (less than 30% of those who are interested in the industry agreed that they pay well). This would suggest that financial compensation is not the strongest driver for potential and current workers, although other findings in the study showed that financial stability and security ranked in the top 3 influencers. This inconsistency may be attributed to the semantics of well-paid versus compensation that provides financial security – with one defining financial abundance and the other financial well-being – similar, but increasingly different espoused financial goals. Anecdotally, the perceptions of a compensation gap is more influential for those considering transitioning from the fossil fuel industry into the clean energy sector.

WHAT CAN WE MAKE OF ALL THIS?

Perceptions of the ocean industry's role in sustainability activities.

Responses demonstrate strong optimism that careers in the industry can effectuate positive environmental change, and that it is not solely focused on harvesting natural resources. Participants also communicated the belief that participation in the industry can be personally fulfilling in terms of 'making a difference'.

Drivers of career interest and selection are more practical than idealistic.

The declared highest-ranking drivers were found to be: providing financial security and stability, having a career that is personally interesting, and contribution to a sustainable future. Well paid work was top priority for visible minorities and those living in rural communities – consistent with the lived experiences of those marginalized by race or remote region. Having a career in Canada or close to home was ranked among the lowest influencers for career choices for all age, gender, regional, and identity groups. The findings for key career drivers were consistent across all regions of Canada.

As with every study trying to point the way for workforce development, we are again left with the question, Do we build numbers with foundation skills first and develop expertise along the way, or direct our resources into cultivating a core group of experts who can validate Canada's leading role in the ocean sector? The obvious answer is 'both,' but to do either, we first need to be able to draw new talent to the industry. Not an easy task when the terms 'ocean industry' or 'sustainable blue economy' continue to draw uncertain looks from across the young talent pool, and doubtful looks from the wise and tenured from other industries – and when other industries are courting the same talent.

Over the next decade new global, geopolitical, technological, economic, social, or environmental factors will unfold that will alter the ocean sector landscape, shifting priority ocean sectors and revealing new ones, accelerating workforce demand, and reshaping high value skills. This report provides guidance to understand how talent strategies can respond to the perceptions and influences that could drive top talent to the industry, and position it with a reliable, skilled, adaptable, and future-ready workforce.

ENDNOTES

- 1 OCDE. L'économie océanique en 2030. (27 avril 2016)
<https://www.oecd.org/environment/the-ocean-economy-in-2030-9789264251724-en.html>
- 2 Scully, Sherry. (June 2016). Marine People Partnership: Student Intentions and Perceptions Survey. The Institute for Ocean Research Enterprise (IORE)
- 3 Fisheries and Oceans Canada and Statistics Canada, Canada's oceans and the economic contribution of marine sectors, July 2021.
- 4 Fisheries and Oceans Canada, Canadians' Awareness and Understanding of Canada's Blue Economy, April 2022.
- 5 Stiles-Clarke, L & MacLeod. Linking STEM, Oceans Education, and Career Education in Junior High Schools, June 2018.
- 6 Upon completion of the survey, data were transferred as an Excel spreadsheet to be analyzed by the research intern, after which point it was handled exclusively by the lead researcher and intern. All working data was stored on the secure devices of the two investigators. All French-language responses were translated by the intern and principal investigator and integrated into the English data. A primary analysis was conducted to provide an overview of select questions.
- 7 The desired sample size was 385. The actual sample group was slightly below this target.
- 8 The actual groupings were slightly different than the Statistics Canada grouping (15-34) which slightly changes the population used to calculate desired sample size, but the difference is immaterial.
<https://www.statista.com/statistics/444868/canada-resident-population-by-age-group/>
- 9 This cohort is relatively representative of the population. According to Stats Canada, they comprise around 45.1% of Canadians 15-34 vs 53% in our data.
- 10 Fisheries and Oceans Canada (2021) Advancing Gender Equity in the Ocean Decade
- 11 Respondents were able to select more than one minority identification.
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- 25 Van Eijk & Roth. Authentic science experiences as a vehicle to change students' orientation toward scientific career choice: Learning from the path followed by Brad, March 2009.
- 26 Albuquerque, M & Zandyliet. The Many Currents of Ocean Literacy: A Case Study of Ocean Wise Programming, June 2021.
- 27 The data for individuals identifying as non-binary or who preferred not to say was too small a data set to allow for valid analysis.
- 28 This does help to validate the sample group, as it suggests that sampling did extend beyond the network into the broader population that was not already connected in some way to the ocean industry.
- 29 The higher counts for the 22-25 cohort is in proportion to the larger sampling of this cohort.
- 30 Scully, Sherry. (June 2016). Marine People Partnership: Student Intentions and Perceptions Survey. The Institute for Ocean Research Enterprise (IORE)



Questions? Please contact:
contact@oceansupercluster.ca

www.oceansupercluster.ca

