



ECO CANADA

Environmental Careers Organization



Profile of Canadian Environmental Employment

LABOUR MARKET RESEARCH STUDY

2013

Canada

Funded by the Government of Canada's Sector Council Program

ECO CANADA

ECO Canada develops programs that help individuals build meaningful environmental careers, provides employers with resources to find and keep the best environmental practitioners, and informs educators and governments of employment trends to ensure the ongoing prosperity of this growing sector.



LABOUR MARKET RESEARCH

ECO Canada Labour Market Research investigates current environmental skill and labour trends within the environmental profession and provides up-to-date, timely and relevant insights that can be applied in policy, business, and educational contexts.

The complete collection of reports is available at eco.ca.

Table of Contents

5	EXECUTIVE SUMMARY
5	INTRODUCTION
6	KEY FINDINGS
8	DISCUSSION
9	NEXT STEPS
11	SECTION 1: INTRODUCTION
11	1.1 ABOUT ECO CANADA
11	1.2 RESEARCH OBJECTIVES
11	1.3 SUMMARY OF METHODOLOGY
14	SECTION 2: PROFILE OF CANADIAN ENVIRONMENTAL EMPLOYMENT
14	2.1 TOTAL ENVIRONMENTAL EMPLOYMENT
16	2.2 ENVIRONMENTAL EMPLOYMENT BY INDUSTRY
17	2.3 ENVIRONMENTAL ESTABLISHMENTS
19	2.4 ENVIRONMENTAL EMPLOYMENT BY ESTABLISHMENT SIZE
19	2.5 ENVIRONMENTAL EMPLOYMENT BY SECTOR
20	2.6 EMPLOYMENT BY ENVIRONMENTAL SUB-SECTOR
21	2.7 ENVIRONMENTAL EMPLOYMENT BY REGION
23	SECTION 3: PROFILE OF ENVIRONMENTAL EMPLOYEES IN CANADA
23	3.1 DEMOGRAPHIC PROFILE
26	3.2 WOMEN IN ENVIRONMENTAL ROLES
27	3.3 EDUCATION AND EXPERIENCE
32	SECTION 4: FUTURE DEMAND FOR ENVIRONMENTAL EMPLOYEES AND SKILLS
32	4.1 PROJECTED GROWTH IN EMPLOYER DEMAND
33	4.2 COMMON HIRING SOURCES
34	4.3 FUTURE DEMAND BY ENVIRONMENTAL SUB-SECTOR
35	4.4 DIFFICULTIES FILLING ENVIRONMENTAL OCCUPATIONS
36	4.5 DIFFICULTIES HIRING FOR EXPERIENCE CRITERIA
38	4.6 UPCOMING RETIREMENTS
41	SECTION 5: DISCUSSION
41	5.1 THERE IS GROWTH POTENTIAL FOR THE ENVIRONMENTAL SECTOR
43	5.2 ENVIRONMENTAL SKILLS ARE BECOMING MORE MAINSTREAM
44	5.3 ENVIRONMENTAL WORK IS BECOMING MORE SPECIALIZED
46	APPENDIX A: DETAILED METHODOLOGY
46	SURVEY DESIGN
48	ANALYSIS
50	RESEARCH LIMITATIONS
51	APPENDIX B: SOURCES OF EMPLOYMENT ESTIMATES
51	DATA SOURCES

LIST OF FIGURES

- 12 **Figure 1.1:** ECO Canada's Sub-Sector Model for Environmental Employment
- 15 **Figure 2.1:** Number of Environmental Professionals Working in Canada, from 1993 to 2013
- 15 **Figure 2.2:** Growth in Canadian Environmental Professionals and Total Canadian Employment
- 18 **Figure 2.3:** Growth in the Proportion and Number of Canadian Establishments Reporting Employing Environmental Employees (2010-2013)
- 20 **Figure 2.4:** Environmental Employees by Environmental Sub-Sector
- 26 **Figure 3.1:** Female Environmental Employees by Environmental Sector
- 32 **Figure 4.1:** Proportion of Environmental Employers Who Anticipate Growth of Their Number of Environmental Employees over the Next Two Years
- 35 **Figure 4.2:** Difficult-to-Fill Occupations

LIST OF TABLES

- 13 **Table 1.1:** NAICS Industries that Correspond to the Sub-Sector Model for Environmental Employment
- 16 **Table 2.1:** Estimation of Environmental Employees in Canada by Industry
- 17 **Table 2.2:** Establishments Employing Environmental Employees
- 19 **Table 2.3:** Environmental Employment by Establishment Size
- 19 **Table 2.4:** Environmental Employees by Sector of Employment
- 21 **Table 2.5:** Environmental Employees by Region
- 23 **Table 3.1:** Distribution of Environmental Workforce by Age
- 24 **Table 3.2:** Demographic Environmental Workforce Characteristics
- 25 **Table 3.3:** Demographic Environmental Workforce Characteristics by Industry
- 26 **Table 3.4:** Change in the Proportion of Women Employed by Environmental Sector
- 27 **Table 3.5:** Education Levels within the Environmental Workforce
- 28 **Table 3.6:** Education Levels by Environmental Sub-Sector
- 29 **Table 3.7:** Experience Levels in the Environmental Workforce
- 29 **Table 3.8:** Proportion of Environmental Workforce that are Managers
- 30 **Table 3.9:** Experience Levels by Environmental Sub-Sector
- 33 **Table 4.1:** Common Hiring Sources
- 34 **Table 4.2:** Anticipated Hiring by Environmental Sub-Sector
- 36 **Table 4.3:** Anticipated Difficulty of Hiring Different Experience Levels
- 37 **Table 4.4:** Anticipated Difficulty of Hiring Different Experience Levels for Sub-Sectors that will be in Future Demand
- 38 **Table 4.5:** Anticipated Upcoming Retirements
- 39 **Table 4.6:** Environmental Workforce Over 55 Years of Age by Industry
- 47 **Table A.4:** Survey Responses
- 49 **Table A.5:** Margins of Error by Industry

GLOSSARY OF TERMS

ENVIRONMENTAL EMPLOYMENT (ALSO ENVIRONMENTAL INDUSTRY): includes activities that support the effective stewardship of natural capital through the management or promotion of sustainable natural resource use, avoidance or mitigation of negative environmental impacts, and the maintenance or restoration of ecological systems.

ENVIRONMENTAL EMPLOYEE: an individual who spends at least some of his/her work time performing activities related to the environmental industry.

ENVIRONMENTAL PROFESSIONAL SERVICES: a distinct category of professional service occupations that require environmental skills, including Environmental Technicians or Technologists, Project Managers, Environmental Coordinators, and Environmental Engineers.

ENVIRONMENTAL PROFESSIONAL: an individual who spends at least half (50%) of his/her work time performing activities related to the environmental industry.

ENVIRONMENTAL PROTECTION (SECTOR A): encompasses the protection of human health and ecosystems through pollution prevention, waste minimization, remediation, rehabilitation, and reclamation of the air, water, and land. Environmental Protection activities are ultimately designed to measure, maintain, protect, and restore the quality of the environment.

ENVIRONMENTAL SUB-SECTOR: describes a group of specific occupations in the environmental industry that share common skills, characteristics and goals. Sub-sectors are further grouped into three major sectors: Environmental Protection, Resource Management, and Environmental Sustainability.

ENVIRONMENTAL SUSTAINABILITY (SECTOR C): includes the development, dissemination, and application of knowledge in support of Sectors A (Environmental Protection) and B (Resource Management). Activities in this sector may involve environmental education and training, scientific and industrial research and development, and legislation or regulation. Practitioners working in Environmental Sustainability develop innovative intellectual resources, create effective communication strategies, and shape public policy to balance economic needs with the sustainability of the biosphere.

ESTABLISHMENT: the smallest unit of measurement in labour market research, representing a level of business in which accounting data can be used to measure production. Statistics Canada uses the term "Establishment" as a standard business classification.

LOCATION: a measure of business activity in which only the number of employees is required. The term "Location" also aligns with the standard business classification used by Statistics Canada in labour market research.

NATIONAL OCCUPATIONAL STANDARDS (NOS): a set of competency statements that describe the required skills and knowledge for different areas of practice. The NOS serve as benchmarks for environmental professionals to measure their level of performance.

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS): a comprehensive hierarchical system that Statistics Canada uses in labour market research to describe all economic activity.

OCCUPATION: a person's principal work or business. Environmental occupations can be grouped together to form environmental sub-sectors.

ORGANIZATION: the level of a business at which operating profit can be measured. The term "Organization" follows the standard business classification terminology used by Statistics Canada in labour market research.

RESOURCE MANAGEMENT (SECTOR B): features the integration of environmental and economic considerations with the principles of natural resource stewardship. Resource Management includes the sustainable use of fish, wildlife, forest and other natural resources, environmental management of mining and energy operations, parks, and outdoor recreational areas, and strategic resource and land use planning. Practitioners who work in this sector must address biological or ecological needs, such as the preservation of ecosystems and biodiversity, while also meeting social and economic needs.

ACKNOWLEDGMENTS

ECO Canada wishes to express its appreciation to all the organizations and individuals that contributed their time and effort to the development of this report.

This study was funded by the **Government of Canada's Sector Council Program**, whose continuous support is much appreciated.

Special thanks are extended to **R.A. Malatest & Associates Ltd.** for conducting the research and analyzing the data collected through the survey.

Finally, this research would not have been possible without the participation of the thousands of individuals who contributed their time to speak with researchers and complete the survey.



EXECUTIVE SUMMARY

INTRODUCTION

As social awareness of the environment's importance continues to grow, so does the impact that environmental work has on the Canadian economy. This growth produces many important benefits, including the creation of new jobs, the reduction of economic costs, and the development of innovative business opportunities. Environmental employment presents a tremendous opportunity for economic development and environmental progress in Canada.

ECO Canada's *2013 Profile of Canadian Environmental Employment* provides the most comprehensive estimate to date of environmental employment and the use of environmental skills in Canada. As a foundational report that measures environmental labour (supply) with the need for skilled employees (demand), this study aligns with ECO Canada's mandate to promote the development of the Canadian environmental sector through targeted and informed human resource strategies.

The *2013 Profile of Canadian Environmental Employment*:

- (1) Provides a comprehensive estimate of the total number of environmental employees in Canada, and compares this number to national employment;
- (2) Documents which sectors employ the most environmental employees and why;
- (3) Establishes a demographic profile of environmental employees;
- (4) Identifies the specific sectors and occupations that will experience the most future demand; and
- (5) Provides recommendations that will promote the environmental sector's future success.

The report is based on ECO Canada's *2013 Survey of Canadian Employers*. Thousands of business owners and human resource (HR) managers from all major industry groups across Canada participated in the survey. Their responses were used to identify the number of environmental employees in specific environmental occupations and to predict the rate of growth for environmental employment overall.



As social awareness of the environment's importance continues to grow, so does the impact that environmental work has on the Canadian economy. This growth produces many important benefits, including the creation of new jobs, the reduction of economic costs, and the development of innovative business opportunities.



KEY FINDINGS

How Many Environmental Professionals Work in Canada?

Over 730,000 environmental professionals in Canada spend at least 50% of their work time performing environmental activities, representing just over 4% of the total Canadian labour force. Since ECO Canada's previous study in 2010, the number of environmental professionals has grown by about 7%. Based on a general comparison of trends over the years, there is a continual increase in the demand for environmental skills. This growth has consistently outpaced that of the overall Canadian workforce.

Which Major Industries Hire Environmental Employees?

More than 10% of all employed workers in Canada use environmental skills, underscoring the diversity and importance of environmental competencies in a wide range of industries. For the purposes of this study, environmental employees are defined as workers who spend at least some of their time (but not necessarily half of their time) on environmental activities.

The following industries have the highest proportion of environmental employees (based on NAICS Codes):

- Administrative and Support, Waste Management and Remediation Services (25.1%),
- Professional, Scientific, and Technical Services (22.4%),
- Wholesale Trade and Retail Trade (13.9%),
- Other Services (13.8%), and
- Manufacturing (13.7%).

Canadian environmental employees are well-represented across all environmental sub-sectors and use a wide variety of environmental skills. Most employers (82.4%) report that their environmental employees perform tasks in multiple sub-sectors, demonstrating the interdisciplinary nature of environmental work.

Canadian environmental employees frequently perform tasks related to these environmental sub-sectors (based on NOS codes):

- Environmental Health and Safety (37.1%),
- Waste Management (33.5%), and
- Communication and Public Awareness (31.2%).

How Many Environmental Establishments are There?

An estimated 460,000 Canadian establishments (19.6% of all Canadian establishments) employ at least one environmental employee, up from 17% in 2010.

These industries are the most likely to have **environmental establishments**:

- Administrative and Support, Waste Management and Remediation Services (41.6%),
- Public Administration (41.4%),
- Professional, Scientific and Technical Services (36.9%), and
- Wholesale Trade and Retail Trade (33.9%).

What is the Demographic Profile of Environmental Employees?

Most Canadian environmental employees are male (65.3%) and approximately two-thirds (67.0%) are between the ages of 30 and 54. Nearly one in six environmental employees (13.8%) are aged 55 or older. On average, the environmental workforce is slightly younger than the overall Canadian workforce.

Compared to overall Canadian population demographics, a higher proportion of environmental employees also have Aboriginal heritage (First Nations, Inuit or Métis). While only 4.3% of the Canadian population identified as Aboriginal in 2011, 6.2% of environmental employees in this study had Aboriginal ancestry.

Environmental employees tend to be well educated - over a third (36.6%) hold at least a Bachelor's degree. Environmental employees also have high levels of experience and responsibility. More than one-third (37.1%) of environmental employees hold managerial roles, while only a quarter (25.2%) of environmental employees occupy entry or junior-level positions.

What is the Future Demand for Environmental Employees?

The demand for workers with environmental skills will increase in the near future. Most employers (74.5%) intend to hire new environmental employees over the next two years, both for newly created roles and replacement positions following staff departures and retirements. In addition to growth among current environmental employers, the number of environmental employees may also expand as regulatory requirements continue to evolve and a greater number of Canadian establishments adopt environmental practices.

New job openings will include technical roles, such as Forestry and Mining Workers, and Environmental Technicians, as well as specialist roles that require advanced education, such as Environmental Engineers, Marine Biologists, and Geoscientists. If recent trends hold, employers will need to hire recent graduates and transitioning workers from other industries to fill these positions. A notable proportion (13.1%) of job opportunities will be for past employees who have changed positions within the same establishment or changed employers.

Retirements will create many job openings in the near future. Nearly one-fifth (19.0%) of the environmental workforce is expected to retire over the next 10 years, creating openings for primarily intermediate- and senior-level roles. Employers will need to rely on existing junior- and intermediate-level employees to fill some of these senior roles. Transitioning workers from other sectors and industries may also help meet this increased demand for experienced practitioners.

Employers have had some difficulty filling a wide variety of different environmental occupations, including both technical occupations and specialist roles that require advanced education. Some employers found it especially difficult to fill positions for Environmental Engineers, Environmental Technicians or Technologists, Forestry or Mining Workers, and Remediation Specialists.

Employers in this survey did not expect to have difficulty hiring as a result of the levels of experience they were looking for. However, among those who did anticipate this challenge, a majority expected to face the most difficulty when hiring for intermediate and senior level roles.



DISCUSSION

The Environmental Sector Has Significant Growth Potential

Since the demand for environmental employees is clearly on the rise, stakeholders in the environmental sector need to be prepared to accommodate this growth. Policy-makers, industry leaders and educators must ensure that there are enough workers with environmental skills in order for the environmental industry to continue to grow and contribute positively to the Canadian economy.

A viable, balanced environmental labour market depends on workforce development strategies that engage previously under-utilized labour sources, such as Aboriginal communities and recent immigrants. The existing environmental workforce is also fairly young, with a healthy influx of students into post-secondary environmental programs.¹ As a result, industry stakeholders should focus on establishing programs that attract workers to intermediate and senior level positions. These initiatives should also account for the environmental sub-sectors that are likely to have the greatest increased demand for workers, including: Waste Management, Health & Safety, Site Assessment & Reclamation, and Sustainability.

Environmental Skills are Becoming More Mainstream

As the general Canadian population becomes increasingly engaged with environmental issues, a growing number of Canadian employers are also aware of what constitutes environmental employment. However, environmental work activities may have become so mainstream in some industries that these activities are less likely to be perceived as expressly “environmental.” Although this may be a natural byproduct of the increased integration of environmental practices into all work areas, there is a risk that employers may eventually take environmental skills for granted and fail to recognize specialized environmental knowledge or expertise.

Over time, the decreased awareness of uniquely environmental work could lead to a reduced emphasis on environmental stewardship and sustainability. Thus, environmental professionals must make sure they are being recognized as a distinct labour market within the Canadian economy. Environmental Professional (EP) certification is one way to meet this goal. The continued development of **National Occupational Standards (NOS)**, which define environmental employment and required environmental competencies, is another solution.

Environmental Work is Becoming More Specialized

Although the overall number of environmental professionals has increased, these professionals now work in different areas. Today, environmental work is more centralized in industry groups such as Professional, Scientific and Technical Services, Administration & Support, and Waste Management & Remediation.

One possible explanation for this finding is that environmental professionals now perform increasingly specialized work and have found employment opportunities in a more select group of industries. Another potential reason is that more niche environmental consulting establishments have emerged to meet the demand for environmental expertise. Employers in these industries may prefer to outsource their environmental work to the specialized consulting firms, since a neutral third party can help them accomplish different objectives.



A viable, balanced environmental labour market depends on workforce development strategies that engage previously under-utilized labour sources, such as Aboriginal communities and recent immigrants.



¹ ECO Canada, Labour Market Information Report: Post-Secondary Environmental Education in Canada, 2011.

NEXT STEPS

(1) Stakeholders must continue to invest in training programs and professional certification for environmental professionals.

Considerable workforce development is needed to ensure that there will be enough environmental professionals with the right skills to meet future demand, particularly for senior level positions. Training programs must address the unique needs of different labour force segments, such as newcomers to Canada and Aboriginal communities, to ensure that future environmental workers have equivalent skill levels. In addition, these programs should focus on developing the skills that will be needed for high-demand, high-growth environmental sub-sectors. Professional certification provides one inexpensive means for employers to verify that future job candidates meet industry standards for required skills and knowledge.

(2) Post-secondary institutions should attract students to programs that focus on Environmental Professional Services.

Although a significant number of students are entering environmental programs in Canada and the environmental workforce is relatively young, educators must provide clear guidance on viable career paths. Students need to be aware of the top occupations that will have high future demand and relevant areas of study that will help them train for these careers.

(3) Further research is needed on how to attract transitioning workers to environmental work.

Since transitioning workers can help fill the demand for experienced environmental workers, researchers need to understand how demand in the environmental sector corresponds to other industries. Future research could identify declining industries and assess whether workers in these areas are a good fit for the environmental sector.

(4) Professionals must continue to support their professional designations and industry associations.

As environmental work becomes more mainstream, environmental professionals will need to ensure that they are recognized as a distinct professional group with a unique role to play across different industries. Certification provides an excellent rallying point around which professionals can promote the importance and relevance of their specialized expertise.





SECTION 1: INTRODUCTION

1.1 ABOUT ECO CANADA

ECO (Environmental Careers Organization) Canada develops programs that help individuals build meaningful environmental careers, provides employers with resources to find and keep the best employees, and informs educators and governments of employment trends to ensure the ongoing prosperity of the Canadian environmental sector.

Since 1992, ECO Canada has established itself as the national, industry-initiated and led organization for environmental human resources issues. ECO Canada's extensive labour market intelligence provides insight on the opportunities, challenges and solutions for building a world-leading environmental workforce.

1.2 RESEARCH OBJECTIVES

The main objective of the *2013 Profile of Canadian Environmental Employment* was to produce an estimate of the total number of environmental employees in Canada and to predict future growth for the environmental labour force in Canada.

The study also provides insight into the distribution of the environmental workforce across ECO Canada's *Sub-Sector Model for Environmental Employment*, the demographics of the environmental workforce, and future projected growth in the industry.

The *Profile of Canadian Environmental Employment* is a longitudinal study that takes place every three years, with previous iterations in 2007 and 2010.



ECO Canada's extensive labour market intelligence provides insight on the opportunities, challenges and solutions for building a world-leading environmental workforce.



1.3 SUMMARY OF METHODOLOGY

The *2013 Survey of Canadian Employers* consisted of a long and short version questionnaire. In total, 3,485 long surveys were completed with business owners and HR managers from all industries across Canada. The long survey required employers to identify the size of their staff and to report how many of their staff members would be considered environmental professionals (those spending at least half of their work time performing environmental activities) and how many would be considered environmental employees (those spending any amount of their time performing environmental activities). Those who reported having at least one environmental employee were asked to complete the long survey. A total of 720 long surveys were completed.

Researchers used data from the short survey to estimate the number of environmental employees and environmental professionals in Canada. Data from the long survey provided insight on workforce demographics and human resources factors that impact the future of the environmental sector.

ECO Canada's *Sub-Sector Model for Environmental Employment* established a definition of environmental employment, highlighting the cross-sectoral and multi-disciplinary nature of work within the environmental sector. The Sub-Sector Model was developed in consultation with industry experts, and it provides a vital foundation for ECO Canada's ongoing labour market research of the environmental sector. The term "Environmental Employment" encompasses all employees who perform work activities in one or more of these areas: Environmental Protection, Resource Management, and Environmental Sustainability:

Figure 1.1
ECO Canada's Sub-Sector Model for Environmental Employment



ECO Canada's *Sub-Sector Model* is based on the *National Occupational Standards (NOS) for Environmental Employment*, a set of competency statements that describe the standard skills and knowledge that an individual needs to perform successfully in a particular occupation. All of ECO Canada's NOS reflect extensive input and review from professionals in the field.

Environmental sub-sectors are spread across various industry groups within the North American Industrial Classification System (NAICS) – a system that categorizes establishments according to the goods and services that each industry produces. In order to align research findings with national labour force data, this study combines some industries that have a lower estimated density of environmental employment, providing a complete picture of where environmental employees work within the Canadian labour force. Table 1.1 outlines the industry groups that were included in the analysis.

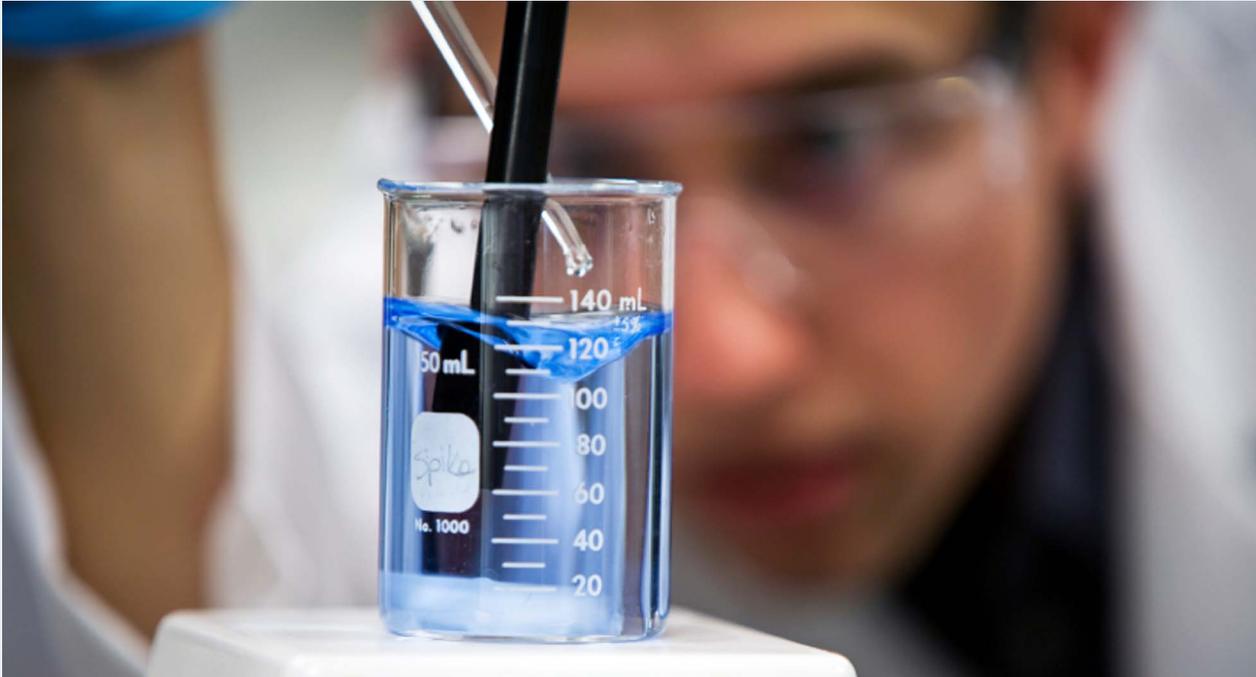
Table 1.1
NAICS Industries that Correspond to the Sub-Sector Model for Environmental Employment

NAICS CODE(S)	INDUSTRY GROUPS
11	Agriculture, Forestry, Fishing and Hunting
21	Mining, Quarrying, and Oil and Gas Extraction
23	Construction
31-33	Manufacturing
41-45	Wholesale Trade/Retail Trade
22, 48-49	Utilities, Transportation and Warehousing
51-53, 55	Information and Culture, Finance and Insurance, Real Estate and Management of Companies
54	Professional, Scientific, and Technical Services
56	Administrative and Support, Waste Management and Remediation Services
61,62	Education, Health Care and Social Assistance
71,72	Arts, Entertainment and Recreation, Accommodation and Food Services
81	Other Services ²
91	Public Administration

For a more detailed explanation of this study's methodology, please see **Appendix A**.

² Other Services include Repair, Maintenance, Personal and Laundry Services, Religious, Grant-Making, Civic, Professional and Similar Organizations, and Private Households.

SECTION 2: PROFILE OF CANADIAN ENVIRONMENTAL EMPLOYMENT



2.1 TOTAL ENVIRONMENTAL EMPLOYMENT

An estimated 1,799,695 Canadian workers dedicate at least some of their time to activities related to the environment, a number that represents 10.3% of the entire Canadian labour force.

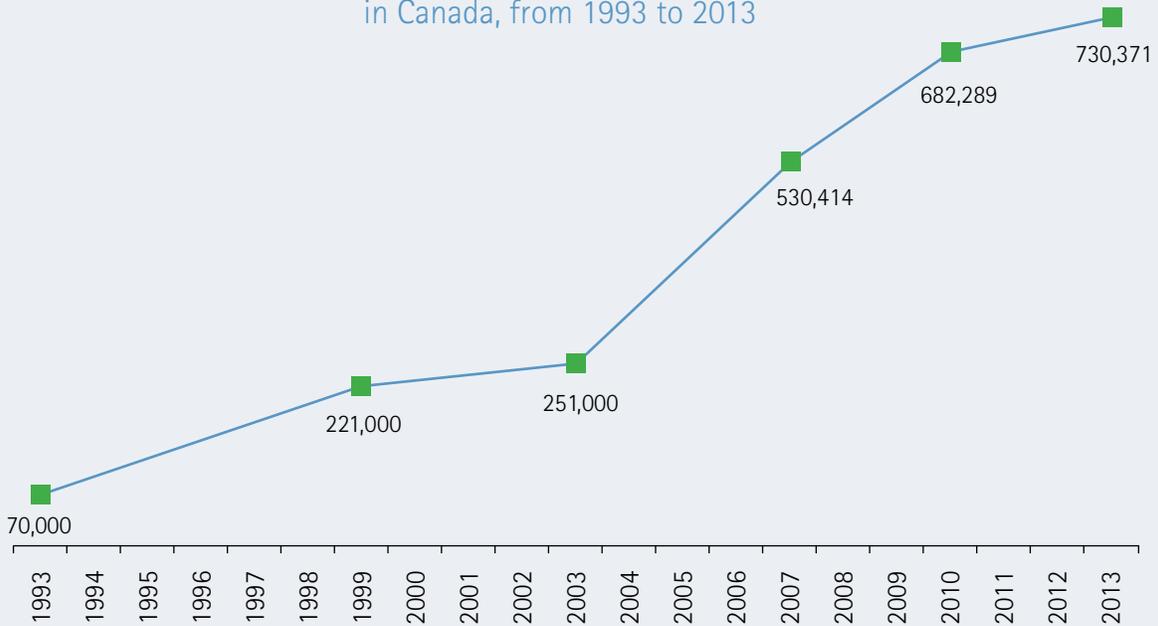
As the number of environmental employees continues to rise, Canada's workforce appears to be becoming more "green." Figure 2.1 compares employment data from studies conducted by ECO Canada since 1993. Based on this data, Canada's environmental workforce has grown by a factor of ten, reflecting the growing importance of this sector to the Canadian economy.

The growth of environmental employment may also reflect these trends:

- Workplace legislation that requires employers to address an increasing range of environmental issues, and
- Increased employer awareness of skills that would be considered "environmental."

Notwithstanding these factors, the results of ECO Canada's research over the past 20 years confirm that environmental employment has been on the rise and it is an integral part of Canada's overall workforce.

Figure 2.1
Number of Environmental Professionals Working
in Canada, from 1993 to 2013



Source: CCHREI / ECO Canada research (see Appendix D for additional details).

Figure 2.2
Growth in Canadian Environmental
Professionals and Total Canadian Employment

— Canadian Environmental Professionals
— Total Canadian Employment



Source for Total Canadian Employment:
Statistics Canada. Labour Force Survey; CANSIM Table 282-0007.

Canada's professional environmental workforce has also consistently outpaced the growth of Canada's total workforce since 2003. Figure 2.2 highlights this comparison.

While there is clear growth in the number of environmental professionals in Canada, the total number of estimated environmental employees in this study is slightly lower than the over 2.2 million environmental employees estimated in the 2010 study (referred to in the 2010 report as "environmental workers"). It is beyond the scope of this study to explain in depth why these decreases may be occurring. However, one possible explanation for this decrease is that employers have likely grown more aware of "environmental" job duties since 1993, and this awareness may have peaked since 2010. As environmental skills become more mainstream, many employers may not view these work activities as environmental, leading to an under-reported number of environmental employees in the survey.

2.2 ENVIRONMENTAL EMPLOYMENT BY INDUSTRY

ECO Canada used specific NAICS industry clusters to capture the full breadth of the sector and estimate total environmental employment. The industry groups that contain the highest proportions of environmental employees are:

- Administrative and Support, Waste Management and Remediation Services (25.1%),
- Professional, Scientific, and Technical Services (22.4%),
- Wholesale Trade and Retail Trade (13.9%),
- Other Services (13.8%), and
- Manufacturing (13.7%).

In several industry groups, workers who perform environmental tasks are more likely to be environmental professionals who spend at least half to their time performing these environment-related activities.

This is the case for the following industry groups:

- Other Services,
- Public Administration,
- Mining, Quarrying, and Oil and Gas Extraction,
- Administrative and Support, Waste Management and Remediation Services,
- Professional, Scientific, and Technical Services, and
- Agriculture, Forestry, Fishing, and Hunting.

In the Construction, Manufacturing, and Wholesale Trade and Retail Trade industry groups, however, environmental tasks tend to be more peripheral. Only a small proportion of environmental workers in these industries devote more than half of their time to environmental tasks, as indicated in Table 2.1.

Table 2.1
Estimate of Environmental Employees in Canada by Industry

NAICS CODE(S)	Industry Group	ENVIRONMENTAL PROFESSIONALS (>50%)		TOTAL ENVIRONMENTAL EMPLOYEES		TOTAL CANADIAN EMPLOYMENT
		2013 Total	2013 %	2013 Total	2013 %	2013 Total
11	Agriculture, Forestry, Fishing, and Hunting	28,425	5.4%	52,029	9.9%	523,650
21	Mining, Quarrying, and Oil and Gas Extraction	13,483	5.9%	19,410	8.5%	229,187
23	Construction	27,131	2.2%	124,602	10.3%	1,209,200
31-33	Manufacturing	43,843	2.6%	230,053	13.7%	1,673,600
41-45	Wholesale Trade/Retail Trade	54,027	2.0%	369,875	13.9%	2,657,500
22, 48-49	Utilities, Transportation and Warehousing	17,885	1.8%	36,463	3.7%	984,100
51-53, 55	Information and Culture, Finance and Insurance, Real Estate and Management of Companies	3,682	0.2%	14,672	1.0%	1,534,307
54	Professional, Scientific, and Technical Services	168,997	11.9%	317,396	22.4%	1,414,974
56	Administrative and Support, Waste Management and Remediation Services	96,394	13.3%	181,250	25.1%	722,733
61,62	Education, Health Care and Social Assistance	71,217	2.0%	138,446	4.0%	3,503,500
71,72	Arts, Entertainment and Recreation, Accommodation and Food Services	63,136	4.6%	106,991	7.8%	1,365,328
81	Other Services	63,658	8.4%	104,168	13.8%	755,800
91	Public Administration	78,493	8.2%	104,338	10.9%	960,106
	Total:	730,371	4.2%	1,799,695	10.3%	17,533,984

Source: Questions S0, S1, and S2, n = 3,485.

2.3 ENVIRONMENTAL ESTABLISHMENTS

Nearly one-fifth (19.6%) of over two million establishments across Canada have at least one environmental employee on staff. This translates to over 450,000 establishments that perform some kind of in-house environmental work.

Environmental employees are most likely to be found these industries:

- Administrative and Support, Waste Management and Remediation Services (41.6%),
- Public Administration (41.4%),
- Professional, Scientific and Technical Services (36.9%), and
- Wholesale Trade and Retail Trade (33.9%).

Table 2.2
Establishments Employing Environmental Employees

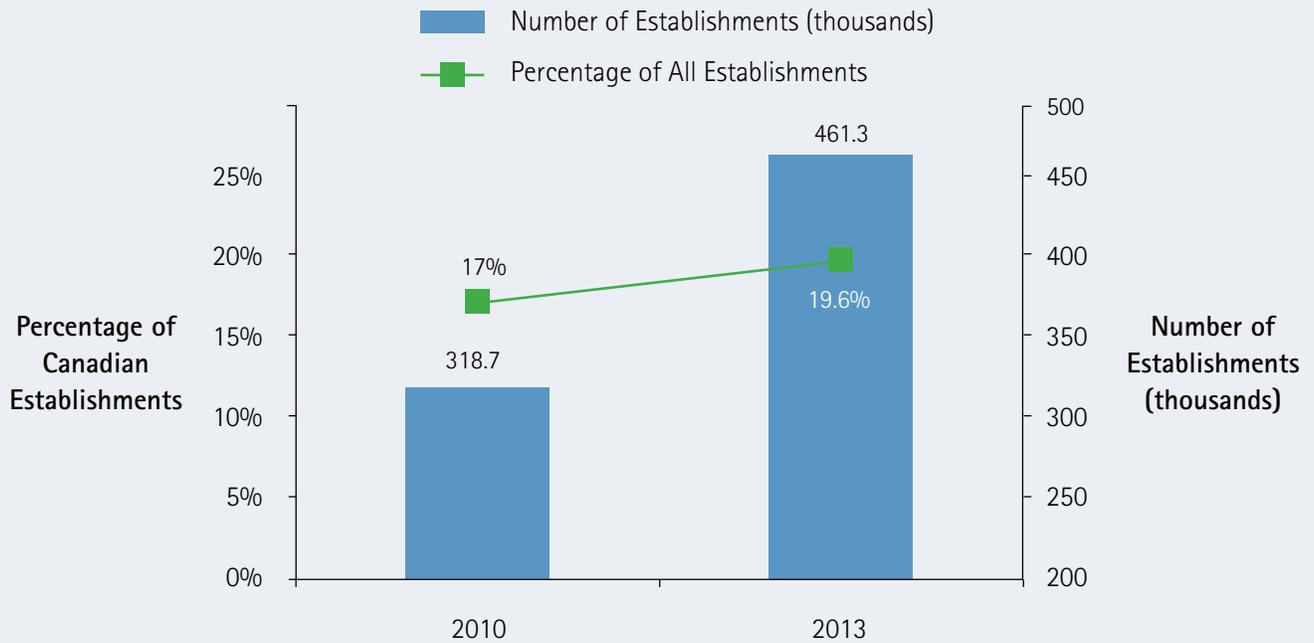
NAICS CODE(S)	INDUSTRY GROUP	TOTAL ESTABLISHMENTS IN CANADA ³	PROPORTION OF ESTABLISHMENTS EMPLOYING ENVIRONMENTAL EMPLOYEES	NUMBER OF ESTABLISHMENTS EMPLOYING ENVIRONMENTAL EMPLOYEES
11	Agriculture, Forestry, Fishing and Hunting	169,538	21.5%	36,483
21	Mining, Quarrying, and Oil and Gas Extraction	18,089	24.1%	4,355
23	Construction	276,942	13.2%	36,423
31-33	Manufacturing	78,912	11.2%	8,813
41-45	Wholesale Trade and Retail Trade	262,150	33.9%	88,793
22, 48-49	Utilities and Transportation and Warehousing	127,269	10.6%	13,456
51-53, 55	Information and Culture, Finance and Insurance, Real Estate and Management of Companies	497,006	5.6%	27,637
54	Professional, Scientific, and Technical Services	318,624	36.9%	117,679
56	Administrative and Support, Waste Management and Remediation Services	109,590	41.6%	45,537
61,62	Education, Health Care and Social Assistance	149,893	9.9%	14,789
71,72	Arts, Entertainment and Recreation, Accommodation and Food Services	137,149	16.1%	22,038
81	Other Services	197,135	21.2%	41,729
91	Public Administration	8,540	41.4%	3,534
	Total	2,350,837	19.6%	461,266

Source: Questions S0 and S1, n = 3,485.

³ Canadian Business Patterns Database 2011.

Figure 2.3

Growth in the Proportion and Number of Canadian Establishments Reporting Environmental Employees on Staff (2010-2013)



Source: ECO Canada Surveys, 2010 to 2013.

This study also suggests that the proportion of Canadian establishments with at least one environmental employee has increased since the previous study. In 2010, approximately 17% of Canadian establishments employed an environmental worker who spent any amount of time performing environmental activities. In 2013, that proportion rose to 19.6% of all Canadian establishments. This growth is illustrated in Figure 2.3.



Table 2.3
Employment by Establishment Size

ESTABLISHMENT SIZE	NUMBER OF ENVIRONMENTAL EMPLOYEES	TOTAL CANADIAN EMPLOYMENT	DISTRIBUTION OF ENVIRONMENTAL EMPLOYEES BY ESTABLISHMENT SIZE	DISTRIBUTION OF ENVIRONMENTAL EMPLOYEES BY ESTABLISHMENT SIZE
Less than 20 employees, or self-employed	868,444	7,012,187	48.3%	12.4%
20 to 99 employees	566,579	4,901,008	31.5%	11.6%
100 or more employees	364,672	5,744,973	20.3%	6.3%
Total	1,799,695	17,533,984	100%	10.3%

Source: Questions S0 and S1, n = 3,485.

2.4 ENVIRONMENTAL EMPLOYMENT BY ESTABLISHMENT SIZE

The largest number of environmental employees are either self-employed or work at establishments that have fewer than 20 people on staff (48.3% of environmental employees). Medium size establishments with between 20 and 99 staff employ nearly one-third of environmental employees in Canada (31.5%). Another 20.3% of environmental employees work in large establishments that have 100 or more staff members. Table 2.3 compares environmental employment by establishment size to the overall Canadian labour force.

2.5 ENVIRONMENTAL EMPLOYMENT BY SECTOR

As shown in Table 2.4, the vast majority of environmental employees in Canada can be found in the private sector (90.4%), including not-for-profit and charitable organizations. Establishments that were unsure of which sector they belonged to were coded as part of the private sector in this analysis.

Table 2.4
Environmental Employees by Sector of Employment

SECTOR	PROPORTION OF ENVIRONMENTAL EMPLOYEES	TOTAL ENVIRONMENTAL EMPLOYEES
Private Sector	90.4%	1,628,106
<i>Private sector</i>	<i>82.4%</i>	<i>1,483,844</i>
<i>Not-for-profit or charitable establishment</i>	<i>6.1%</i>	<i>110,651</i>
<i>Don't Know</i>	<i>1.9%</i>	<i>33,611</i>
Public Sector	9.6%	171,589
<i>Municipal</i>	<i>3.5%</i>	<i>62,276</i>
<i>Provincial</i>	<i>2.7%</i>	<i>48,727</i>
<i>Federal</i>	<i>3.4%</i>	<i>60,586</i>
Total	100.0%	1,799,695

Source: Question A7, n = 3,485.

2.6 EMPLOYMENT BY ENVIRONMENTAL SUB-SECTOR

Canadian environmental employees are distributed fairly evenly across all environmental sub-sectors, as defined by the *Sub-Sector Model for Environmental Employment* (see Figure 1.1). *Environmental Protection* employs the largest proportion of environmental employees, including the Environmental Health and Safety sub-sector (37.1% of environmental employees) and Waste Management (33.5%). *Environmental Sustainability* accounts for the second highest proportion of environmental workers, particularly in the Communications and Public Awareness sub-sector (31.2% of environmental employees). *Resource Management* has the smallest percentage of environmental employees - each sub-sector within Resource Management represents only 15% or less of all environmental employees, as illustrated in Figure 2.4.

More than four-fifths (82.4%) of environmental employers reported that their environmental employees work in multiple sub-sectors, indicating that environmental work continues to be highly interdisciplinary.

Figure 2.4
Environmental Employees by Environmental Sub-Sector



Source: Question B8, n=614

Note: Responses add to greater than 100%, since workers may perform tasks in multiple environmental sub-sectors.

2.7 ENVIRONMENTAL EMPLOYMENT BY REGION

Environmental employees and environmental professionals are fairly evenly distributed across all Canadian regions, but the greatest numbers of employees can be found in Ontario and Québec, followed by British Columbia and Alberta. As shown in Table 2.5, these findings are consistent with the regional distribution of the overall Canadian labour force.

Table 2.5
Environmental Employees by Region

PROVINCE / TERRITORY	ENVIRONMENTAL PROFESSIONALS (>50%)	PERCENTAGE	TOTAL ENVIRONMENTAL EMPLOYEES	PERCENTAGE	TOTAL CANADIAN EMPLOYMENT
BC	95,529	4.2%	234,563	10.4%	2,252,920
AB	91,391	4.0%	219,287	9.7%	2,268,080
Prairies	48,707	4.0%	117,464	9.7%	1,212,226
ON	285,169	4.3%	708,138	10.6%	6,663,174
QC	162,291	4.1%	407,020	10.3%	3,966,344
Maritimes	44,153	4.0%	106,146	9.6%	1,102,340
Territories	3,130	4.5%	7,077	10.3%	68,899
Total	730,371	4.2%	1,799,695	10.3%	17,533,984

Source: Questions S0, S1, n = 3,485.





SECTION 3: PROFILE OF ENVIRONMENTAL EMPLOYEES IN CANADA

3.1 DEMOGRAPHIC PROFILE

3.1.1 Age

Table 3.1 illustrates the difference in age distribution between environmental employees and the overall Canadian labour force. Environmental employees are younger: 62.0% are 44 years of age or younger. This is in contrast to the 57.2% of the Canadian workforce who belong to the same age cohort. Considering the relatively high education and experience levels of environmental employees, the age distribution of environmental employees suggests that they experience rapid career advancement and their skills are highly valued.



Table 3.1
Distribution of Environmental Workforce by Age

AGE GROUP	NUMBER OF ENVIRONMENTAL EMPLOYEES	PERCENTAGE OF ENVIRONMENTAL EMPLOYEES	DISTRIBUTION OF ALL CANADIAN EMPLOYEES ⁴
29 or under	368,937	20.5%	24.7%
30 to 44	746,873	41.5%	32.5%
45 to 54	458,922	25.5%	24.4%
55 to 64	201,566	11.2%	15.1%
65 or older	46,792	2.6%	3.3%
Total	1,799,695	100%	100%

Source: Question B4, n = 614.

⁴ Statistics Canada. *Labour Force Survey*; Cansim Table 282-0002. Retrieved from <http://www5.statcan.gc.ca/cansim/a26> on May 30, 2013.

3.1.2 Demographic Group

This study examined a number of different demographic groups in an effort to provide a comprehensive description of the environmental labour force (shown in Table 3.2). The findings suggest that women are slightly under-represented, comprising only 34.7% of the environmental workforce. In contrast, Aboriginal Canadians (First Nations, Inuit or Métis) are fairly well represented at 6.2%, in comparison to 4.3% of the general Canadian population as of 2011.⁵ Finally, recent immigrants account for 3.0% of environmental employees, a percentage on par with the 2.9% estimated recent immigrants in the overall Canadian workforce. In this study, a recent immigrant is defined as an individual who has arrived in Canada within the past five years.

When researchers analyzed this demographic information according to industry, the proportions of women, Aboriginal Canadians, and recent immigrants varied considerably. In the construction industry, women comprise less than a tenth (8.9%) of the total workforce. In contrast, nearly three-quarters (74.7%) of environmental workers in Education, Health Care and Social Assistance are women.

Environmental employees with Aboriginal ancestry are well represented in Public Administration (15.3%), and Utilities, Transportation and Warehousing (15.3%). However, there are significantly lower proportions in Professional, Scientific and Technical Services (1.7%) and the Wholesale Trade/Retail Trade (1.1%) industries.

Recent immigrants are most likely to be found in Agriculture, Forestry, Fishing and Hunting (7.0%) and in Administration and Support, Waste Management and Remediation (5.7%). Recent immigrants are the least represented in Utilities, Transportation and Warehousing (0.2%). Table 3.3 describes these demographic breakdowns by industry.

Table 3.2
Demographic Environmental Workforce Characteristics

DEMOGRAPHIC GROUP	TOTAL	PERCENTAGE OF ENVIRONMENTAL WORKFORCE	PERCENTAGE OF TOTAL
Female	623,969	34.7%	48.1% ⁶
Aboriginal	111,262	6.2%	Unknown
Recent immigrant	54,131	3.0%	2.9% ⁷

Source: Question B2, n = 614.

⁵ Statistics Canada. 2011 *National Household Survey: Aboriginal Peoples in Canada: First Nations People, Métis and Inuit*. 2013. Retrieved from <http://www.statcan.gc.ca/daily-quotidien/130508/dq130508a-eng.htm?HPA> on May 24, 2013. Note that this number represents the proportion of Aboriginal Canadians in the overall population, not the overall workforce. It is unclear for the purposes of this study what proportion of the overall Canadian workforce is Aboriginal.

⁶ Statistics Canada. *Labour Force Survey*. 2013. Cansim Table 282-0007. Retrieved from <http://www5.statcan.gc.ca/cansim/a26> on June 3, 2013. March 2013 totals used.

⁷ Statistics Canada. *Labour Force Survey*. 2013. Cansim Table 282-0102. Retrieved from <http://www5.statcan.gc.ca/cansim/a26> on June 3, 2013. March 2013 totals used.



Table 3.3
Demographic Environmental Workforce Characteristics by Industry

NAICS	INDUSTRY GROUP	PERCENTAGE FEMALE	PERCENTAGE ABORIGINAL CANADIAN	PERCENTAGE RECENT IMMIGRANT
11	Agriculture, Forestry, Fishing, and Hunting	29.2%	5.9%	7.0%
21	Mining, Quarrying, and Oil and Gas Extraction	19.0%	7.1%	3.7%
23	Construction	8.9%	6.3%	3.4%
31-33	Manufacturing	23.2%	5.4%	5.0%
41-45	Wholesale Trade/Retail Trade	41.5%	1.1%	3.1%
22, 48-49	Utilities, Transportation and Warehousing	16.4%	15.3%	0.2%
51-53, 55	Information and Culture, Finance and Insurance, Real Estate and Management of Companies	57.3%	10.8%	5.2%
54	Professional, Scientific, and Technical Services	23.7%	1.7%	4.2%
56	Administrative and Support, Waste Management and Remediation Services	17.9%	11.5%	5.7%
61,62	Education, Health Care and Social Assistance	74.7%	4.2%	0.3%
71,72	Arts, Entertainment and Recreation, Accommodation and Food Services	37.4%	5.8%	2.9%
81	Other Services ⁸	42.4%	11.4%	3.1%
91	Public Administration	20.7%	15.3%	1.0%

Source: Questions A4 and B2, n = 614.

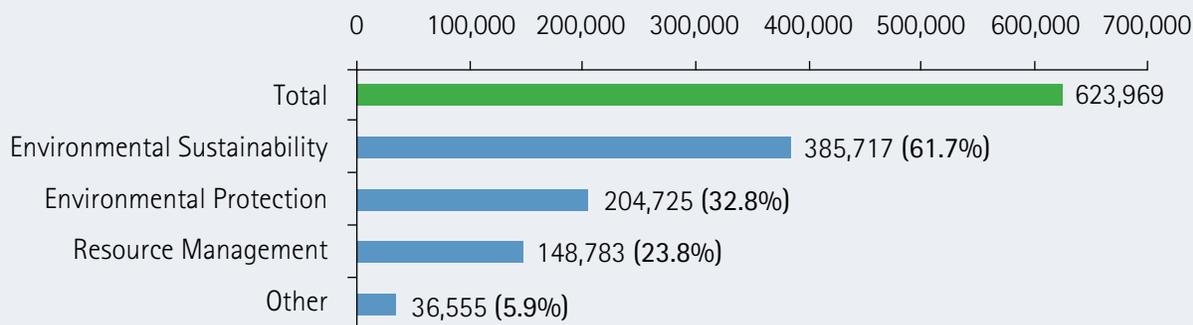
⁸ Other Services include Repair, Maintenance, Personal and Laundry Services, Religious, Grant-Making, Civic, Professional and Similar Organizations, and Private Households.

3.2 WOMEN IN ENVIRONMENTAL ROLES

The majority of women involved in environmental work perform tasks related to the *Environmental Sustainability* sector. Relatively few women are involved in activities related to *Resource Management*, although this finding is consistent with trends in the entire environmental workforce. Figure 3.1 illustrates the distribution of female environmental employees according to sector.

While only 34.7% of Canadian environmental employees are women (see Section 3.1.2), the proportion of women involved in each environmental sector is slowly increasing. Although the majority of employers report that the number of women working within each environmental sector has stayed the same over the past year, some employers have experienced increases in the number of women and a select few have seen decreases, as demonstrated in Table 3.4.

Figure 3.1
Female Environmental Employees by Environmental Sector



Source: Question B9, n=614

Note: Responses add to greater than 100%, since workers may perform tasks in multiple environmental sub-sectors.

Table 3.4
Change in the Proportion of Women Employed by Environmental Sector

ENVIRONMENTAL SECTOR	INCREASED	STAYED THE SAME	DECREASED	NET CHANGE
Environmental Sustainability	14.9%	84.0%	1.1%	+13.8%
Environmental Protection	9.0%	89.7%	1.3%	+7.7%
Resource Management	8.9%	89.8%	1.3%	+7.6%
Other	31.5%	67.4%	1.1%	+30.4%

Source: Question B10, n = 614.



3.3 EDUCATION AND EXPERIENCE

3.3.1 Education Levels

Overall, the environmental workforce is highly educated relative to the rest of the Canadian labour force. Table 3.5 shows that more than one-third (36.6%) of environmental employees have completed at least a bachelor's degree, compared to 26.9% of the overall workforce. Similarly, only 31.1% of the environmental workforce has not completed any post-secondary education, compared to 37.3% of the overall workforce.

This study also examined differences in education levels depending on environmental sub-sector and found that these levels vary to some extent, reflecting the typical employment requirements in each area. For example, environmental employees in Research and Development were the most likely to have completed a graduate degree, whereas those in Environmental Health and Safety or Waste Management were the least likely to have completed any post-secondary education. Table 3.6 presents the education levels within each environmental sub-sector.

Table 3.5
Education Levels within the Environmental Workforce

LEVEL OF EDUCATION	NUMBER OF ENVIRONMENTAL EMPLOYEES	PERCENTAGE OF ENVIRONMENTAL WORKFORCE	PERCENTAGE IN THE TOTAL CANADIAN WORKFORCE ⁹
Master's, Doctorate, or higher	165,794	9.2%	8.6%
Bachelor's degree or equivalent	493,720	27.4%	18.3%
College or equivalent	609,032	33.8%	35.8%
Less than post-secondary	559,364	31.1%	37.3%
Total	1,799,695	100%	100%

Source: Question B1, n = 614.

⁹ Statistics Canada. *Labour Force Survey*. 2013. Cansim Table 282-0004. Retrieved from <http://www5.statcan.gc.ca/cansim/a26> on June 3, 2013. 2012 totals used.

Table 3.6
Education Levels by Environmental Sub-Sector

ENVIRONMENTAL SUB-SECTOR	MASTERS, DOCTORATE, OR HIGHER	BACHELOR DEGREE	COLLEGE OR EQUIVALENT	LESS THAN POST- SECONDARY
Air Quality	15.2%	27.0%	30.8%	28.3%
Water Quality	16.8%	25.7%	26.2%	30.8%
Site Assessment and Reclamation	14.8%	30.6%	27.7%	27.4%
Waste Management	9.8%	25.3%	30.1%	38.0%
Environmental Health and Safety	13.4%	25.8%	27.9%	32.8%
Energy	11.5%	29.9%	32.5%	26.9%
Fisheries and Wildlife	17.7%	42.9%	25.6%	16.1%
Natural Resource Management	16.5%	36.6%	26.9%	21.4%
Environmental Education and Training	16.0%	39.8%	26.2%	16.9%
Research and Development	21.5%	33.2%	28.6%	17.8%
Policy and Legislation	13.4%	32.8%	31.1%	21.5%
Communication and Public Awareness	11.9%	37.5%	28.5%	22.4%
Sustainability	17.3%	31.4%	28.6%	22.7%

Source: Questions B1 and B8, n = 614.



3.3.2 Level of Experience

Despite their relative youth, the environmental workforce holds a high proportion of intermediate and senior level positions within their establishments. Only a quarter (25.2%) of environmental employees are entry or junior level workers, as outlined in Table 3.7. In this study, an entry or junior level employee was defined as a worker with up to three years of on-the-job experience, an intermediate level employee had four to seven years' experience, and a senior level employee held eight or more years of work experience.

As shown in Table 3.8, well over one-third (37.1%) of environmental employees hold managerial positions. Clearly, many of the positions that exist for environmental employees are senior level ones that require management skills. While this may be the case, the relative youth of the environmental workforce suggests that those who do hold senior level positions are likely less experienced, with fewer than ten or fifteen years of work experience.

Table 3.7
Experience Levels in the Environmental Workforce

EXPERIENCE LEVEL	PERCENTAGE OF ENVIRONMENTAL WORKFORCE	NUMBER OF ENVIRONMENTAL EMPLOYEES
Entry/Junior level	25.2%	453,540
Intermediate level	33.9%	609,352
Senior level	40.9%	735,245
Total	100.0%	1,799,695

Source: Question B5, n = 614.

Table 3.8
Proportion of Environmental Workforce that are Managers

EMPLOYEES WHO MAINLY DO MANAGERIAL WORK	EMPLOYEES WHO MAINLY DO NON-MANAGERIAL WORK
667,687 (37.1%)	1,132,008 (62.9%)

Source: Question B6, n = 614.



A higher proportion of environmental employees working in Research and Development hold senior level positions, while junior level positions are more common for those working in Communications and Public Awareness.



Researchers also compared levels of experience across environmental sub-sectors. As outlined in Table 3.9, experience levels remain fairly consistent, regardless of the sub-sector in question. A higher proportion of environmental employees working in Research and Development hold senior level positions, while junior level positions are more common for those working in Communications and Public Awareness.

Considering the relatively young age of most environmental employees, the high proportion of workers in senior level roles indicates that employees with environmental skills are able to quickly advance within their fields. The large number of environmental employees who are managers may also reflect the high proportion of environmental employees that work for smaller establishments or are self-employed.

Table 3.9
Experience Levels by Environmental Sub-Sector

ENVIRONMENTAL SUB-SECTOR	ENTRY / JUNIOR	INTERMEDIATE	SENIOR
Air Quality	19.9%	32.7%	45.9%
Water Quality	19.7%	30.0%	47.1%
Site Assessment and Reclamation	20.6%	32.7%	45.8%
Waste Management	23.0%	33.5%	42.1%
Environmental Health and Safety	20.2%	37.8%	41.4%
Energy	18.3%	33.1%	47.5%
Fisheries and Wildlife	19.7%	31.0%	48.2%
Natural Resource Management	19.0%	36.1%	44.5%
Education and Training	18.9%	36.2%	45.0%
Research and Development	17.5%	30.0%	52.4%
Policy and Legislation	18.4%	32.9%	47.8%
Communication and Public Awareness	23.5%	39.0%	37.4%
Sustainability	20.2%	33.2%	46.4%

Source: Questions B5 and B8, n = 614.



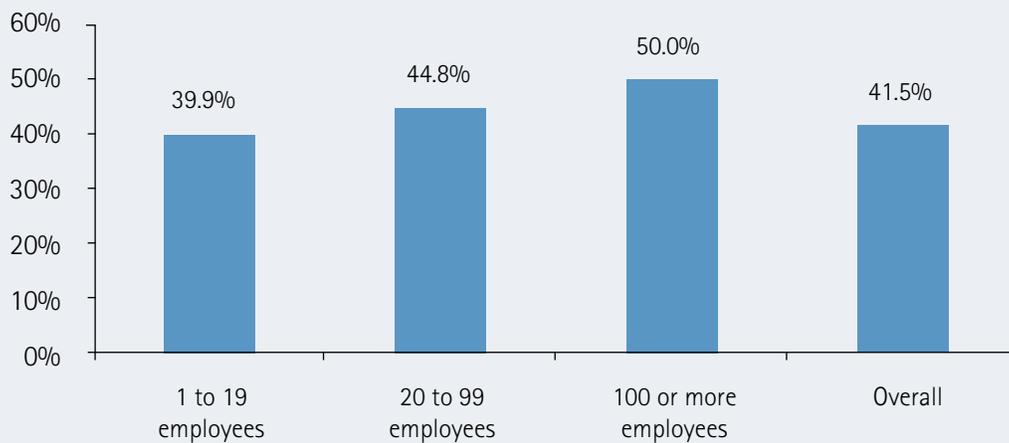
SECTION 4: FUTURE DEMAND FOR ENVIRONMENTAL EMPLOYEES AND SKILLS

4.1 PROJECTED GROWTH IN EMPLOYER DEMAND

Over two-fifths (41.5%) of employers anticipate that the total number of environmental employees will increase over the next two years. Large employers with 100 or more people on staff are the most likely to anticipate growth, with half expecting to hire more environmental employees in the next two years. Figure 4.1 compares these findings.

As noted in Section 2.1, environmental employment will continue to increase as more establishments make room for these professionals on their staff. As existing employers strive to meet the growing demand for environmental skills and as new establishments emerge, this trend will continue.

Figure 4.1
Proportion of Environmental Employers Who Anticipate Growth of Their Number of Environmental Employees over the Next Two Years



Source: Question C1, n = 614.



Table 4.1
Common Hiring Sources

4.2 COMMON HIRING SOURCES

Employers often hire from a variety of sources, ranging from recent students and Aboriginal Canadians, to transitioning workers and recent immigrants. Amongst survey respondents, most employers filled environmental job vacancies by hiring transitioning workers from other industries (20.8% of new hires) or recent students (20.2%). It is unknown how often workers are reassigned from non-environmental roles to environmental ones within their current establishment, but this may account for some of the workers who are not represented in this survey.

SOURCE	PERCENTAGE OF EMPLOYERS WHO HIRED FROM THIS SOURCE
Transitioning workers from other industries	20.8%
Recent students	20.2%
Workers from the environmental industry	13.1%
Aboriginal Canadians	5.1%
Recent immigrants	3.0%
International workers	0.7%

Source: Question B3, n = 614.

4.3 FUTURE DEMAND BY ENVIRONMENTAL SUB-SECTOR

Nearly three-quarters (74.5%) of employers expect to hire new environmental employees in at least one sub-sector in the next two years. When asked which specific environmental sub-sectors they planned to hire for, employers mention Waste Management, Environmental Health and Safety, Water Quality, Site Assessment and Reclamation, and Sustainability. Fewer job openings are expected in areas such as Research and Development and Policy and Legislation. Table 4.2 outlines these future hiring trends.

Table 4.2
Anticipated Hiring by Environmental Sub-Sector

ENVIRONMENTAL SUB-SECTORS	PERCENTAGE OF EMPLOYERS PLANNING TO HIRE IN THE NEXT TWO YEARS
Planning to hire in at least one environmental sub-sector	74.5%
Waste Management	29.6%
Environmental Health and Safety	25.9%
Water Quality	24.5%
Site Assessment and Reclamation	22.3%
Sustainability	20.4%
Communication and Public Awareness	17.1%
Environmental Education and Training	16.0%
Energy	14.0%
Air Quality	13.2%
Natural Resource Management	12.4%
Fisheries and Wildlife	11.7%
Research and Development	8.8%
Policy and Legislation	7.7%
Other Activities	6.1%

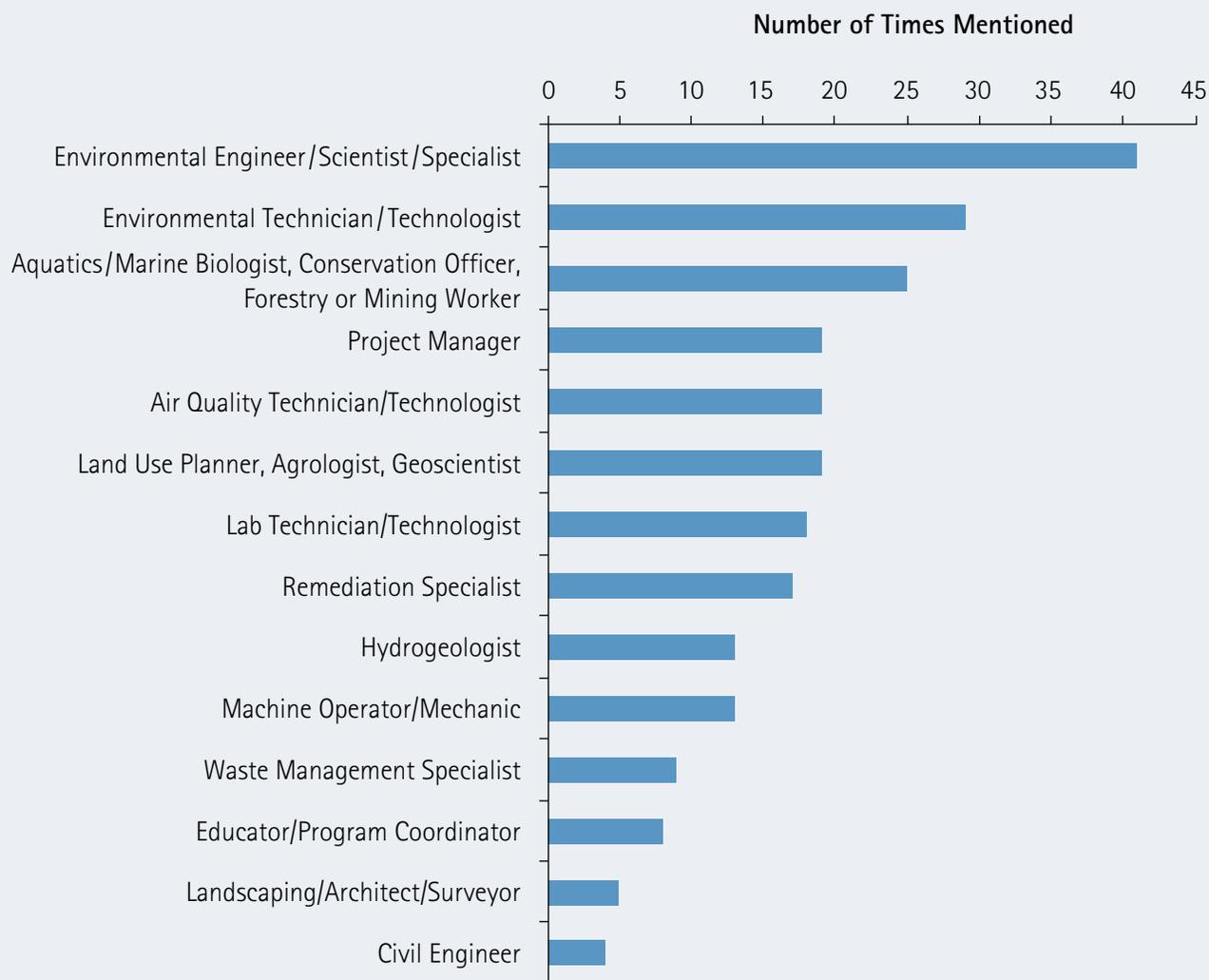
Note: Totals add to greater than 100% due to multiple responses.

Source: Question C2, n = 614.

4.4 DIFFICULTIES FILLING ENVIRONMENTAL OCCUPATIONS

Over 11.5% of environmental employers have experienced difficulties hiring environmental employees for occupations that are in high demand. These occupations range from highly specialized roles such as Environmental Engineers and Remediation Specialists, to more technical roles such as Lab Technicians, Machine Operators and Waste Management Specialists, as seen in Figure 4.2.

Figure 4.2
Difficult-to-Fill Occupations



Source: Question C3, n = 614.

4.5 DIFFICULTIES HIRING FOR EXPERIENCE CRITERIA

Many environmental employers do not anticipate any difficulty finding candidates with a particular level of experience in the future (50.5% of employers). As illustrated in Table 4.3, the employers who *did* anticipate this difficulty were the most likely to foresee challenges with filling intermediate and senior level positions (50.2%). A much smaller proportion anticipated difficulty hiring for entry or junior level positions (11.4%).

These findings are consistent with the idea that there is currently a healthy influx of young professionals into the environmental industry. Difficulties may arise in securing more experienced personnel, especially for select environmental sub-sectors.

Table 4.3
Anticipated Difficulty of Hiring Different Experience Levels

EXPERIENCE LEVEL	RESPONDENTS ANTICIPATING DIFFICULTY HIRING
Entry/Junior Level	11.4%
Intermediate Level	22.6%
Senior Level	27.6%
No anticipated difficulties	50.5%

Source: Question C5, n = 451.

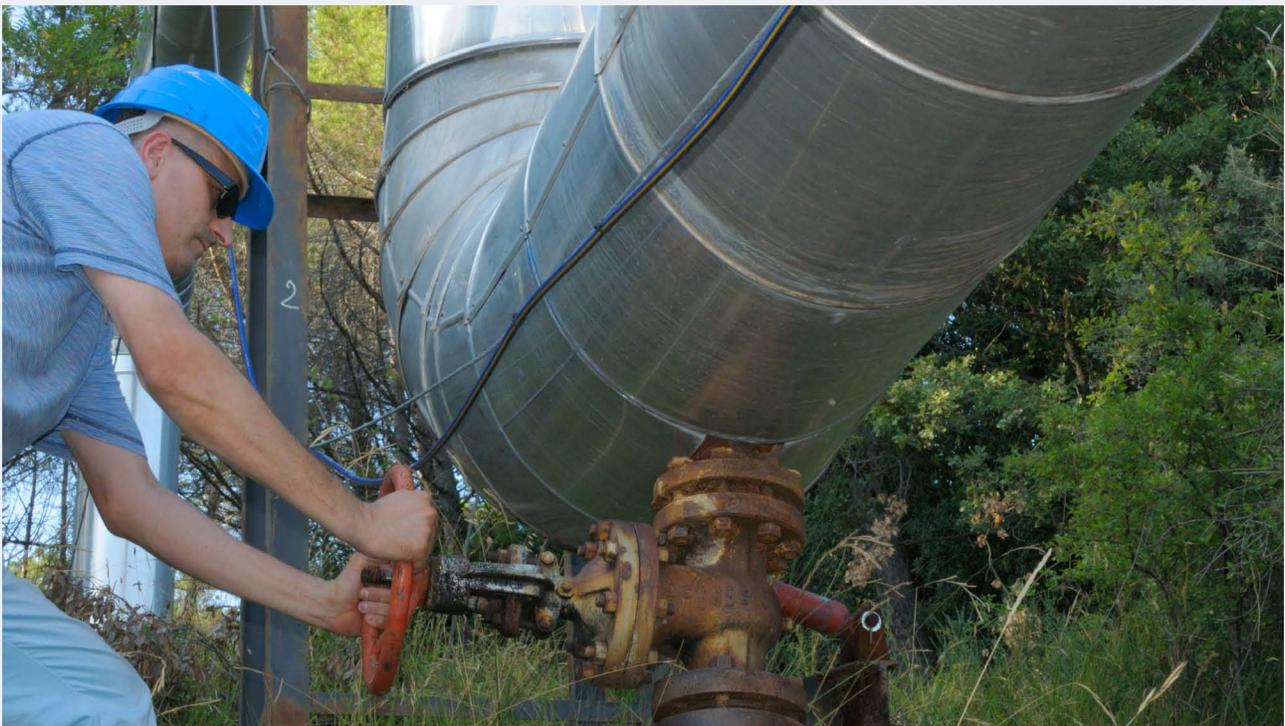


Table 4.4 compares employers' anticipated hiring challenges for specific experience levels across environmental sub-sectors. The sub-sectors that are associated with more traditional activities in Environmental Protection and Resource Management, such as Air Quality, Water Quality, Energy, Fisheries and Wildlife, and Natural Resource Management, will have the highest anticipated shortage of senior-level candidates.



Table 4.4
Anticipated Difficulty of Hiring Different Experience Levels
for Sub-Sectors that Will Be in Future Demand

ENVIRONMENTAL SUB-SECTOR	ENTRY / JUNIOR	INTERMEDIATE	SENIOR	NO ANTICIPATED DIFFICULTIES
Air Quality	10.5%	22.8%	42.3%	31.0%
Water Quality	22.8%	32.8%	57.9%	29.2%
Site Assessment and Reclamation	11.4%	36.9%	43.0%	28.1%
Waste Management	24.9%	28.7%	35.2%	39.5%
Environmental Health and Safety	32.8%	32.2%	49.8%	32.5%
Energy	12.0%	20.5%	32.5%	51.2%
Fisheries and Wildlife	8.7%	35.3%	53.4%	26.9%
Natural Resource Management	5.4%	45.2%	55.5%	21.5%
Education and Training	27.0%	17.6%	41.1%	42.0%
Research and Development	22.5%	13.4%	43.2%	34.4%
Policy and Legislation	17.0%	15.9%	27.9%	50.5%
Communication and Public Awareness	18.3%	31.6%	29.3%	47.7%
Sustainability	16.4%	34.7%	48.9%	31.7%
Don't expect to hire	8.4%	17.4%	24.2%	62.6%

Source: Question C2 and Question C5, n = 531.



Nearly one-fifth (19.0%) of the environmental workforce is expected to retire over the next 10 years, representing a total of 341,942 environmental employees.



4.6 UPCOMING RETIREMENTS

Nearly one-fifth (19.0%) of the environmental workforce is expected to retire over the next 10 years, representing a total of 341,942 environmental employees. Since the environmental workforce is comparatively younger than the overall Canadian average, it is likely that these workers will not retire at the same rate as the rest of the Canadian workforce. Despite this age distribution, environmental employers still need to consider future retirements in their human resource planning, because retirees are more likely to hold senior-level positions. In light of the current demand for intermediate and senior-level employees, future retirements could compound this recruitment challenge. In particular, environmental employers should begin to plan for six to ten years from now, a time during which 11.0% of the environmental workforce, or 197,966 environmental employees, are expected to retire.

In total, 13.8% of the environmental workforce is aged 55 or older (see Section 3.1.1). Proportions vary widely by industry, from as low as 5.0% in Wholesale Trade and Retail Trade to as high as 26.5% in the Other Services industry. Other industries with high proportions of environmental employees over 55 include:

- Arts, Recreation, Accommodation and Food Services (24.1%),
- Administration and Support, Waste Management and Remediation (20.5%), and
- Agriculture, Forestry, Fishing, and Hunting (19.6%).

These industries are likely to see the highest rate of retirements in the coming years. Table 4.5 displays the proportion of environmental employees over 55.

Table 4.5
Anticipated Upcoming Retirements

TIMELINE FOR RETIREMENT	NUMBER OF EMPLOYEES	PERCENTAGE OF WORKFORCE
Expected to retire within 2 years	59,390	3.3%
Expected to retire in the next 3 to 5 years	84,586	4.7%
Expected to retire in the next 6 to 10 years	197,966	11.0%
Total expected retirements in next 10 years	341,942	19.0%

Source: Question B7, n = 614.



Table 4.6
Environmental Workforce Over 55 Years of Age by Industry

NAICS CODE(S)	INDUSTRY GROUP	PROPORTION OF EMPLOYEES OVER 55
11	Agriculture, Forestry, Fishing, and Hunting	19.6%
21	Mining, Quarrying, and Oil and Gas Extraction	8.9%
23	Construction	15.2%
31-33	Manufacturing	15.6%
41-45	Wholesale Trade/Retail Trade	5.0%
22, 48-49	Utilities, Transportation and Warehousing	8.9%
51-53, 55	Information and Culture, Finance and Insurance, Real Estate and Management of Companies	17.0%
54	Professional, Scientific, and Technical Services	14.8%
56	Administrative and Support, Waste Management and Remediation Services	20.5%
61,62	Education, Health Care and Social Assistance	13.7%
71,72	Arts, Entertainment and Recreation, Accommodation and Food Services	24.1%
81	Other Services ¹⁰	26.5%
91	Public Administration	18.3%
	Total	13.8%

Source: Questions A4 and B4, n = 614.

¹⁰ Other Services include Repair, Maintenance, Personal and Laundry Services, Religious, Grant-Making, Civic, Professional and Similar Organizations, and Private Households.



SECTION 5: DISCUSSION

5.1 THERE IS GROWTH POTENTIAL FOR THE ENVIRONMENTAL SECTOR

Since 2010, the number of Canadian establishments with environmental employees on staff has grown significantly. Furthermore, a large proportion of these establishments expect these numbers to grow in the near future. In order to meet this future demand, there must be an adequate supply of workers who hold the right skills and knowledge to fill environmental roles.

Several environmental sub-sectors will account for most of the demand for environmental employees, including Waste Management, Environmental Health and Safety, Site Assessment and Reclamation, and Sustainability. Within these sub-sectors, employers will be hiring for a number of high-demand occupations, and they already anticipate difficulty finding enough candidates for these. Most of these occupations fall under the category of *Environmental Professional Services*, including Environmental Engineers, Environmental Technicians/Technologists, Project Managers, and Lab Technicians/Technologists.

In some sub-sectors, employers will experience a shortage of experienced environmental employees. These sub-sectors include more traditional areas of environmental activity, such as Air Quality, Water Quality, Energy, Fisheries and Wildlife, and Natural Resource Management.

Ensuring an Adequate Supply

To address these potential HR challenges for the environmental sector, industry stakeholders must develop strategies that will increase the supply of available workers with environmental skills and promote innovative recruitment strategies so that employers are able to tap into this pool of skilled labour.

The top environmental sub-sectors with high demand are relatively non-technical, representing a great opportunity for companies to tap into new areas of the Canadian labour market that may have been under-utilized in the past, such as Aboriginal Canadians (First Nations, Inuit or Métis) and recent immigrants. This workforce diversification will require targeted training programs to help future workers build the skills they will need for specific environmental sub-sectors. National Occupational Standards (NOS) are vital to this process, since they provide a means to document the skills that employers are looking for and ensure that training curricula are developed in accordance with these requirements. Programs such as the ECO Academy, Environmental Immigrant Bridging (EIB) and the BEAHR Training Program provide future environmental workers with the NOS-based skills they need to be successful in a particular field.¹¹ In addition, certification is an effective way of to ensure the equivalence and transferability of environmental skills across sectors and regions, especially for recent immigrants. Thus, ECO Canada's Environmental Professional (EP) certification can also play a pivotal role in the skills development and recognition of environmental employees.



The top environmental sub-sectors with high demand are relatively non-technical, representing a great opportunity for companies to tap into new areas of the Canadian labour market that may have been under-utilized in the past.



¹¹ More details on these programs are available at: www.eco.ca/training.

Since many of the occupations that will be in high demand fall under the umbrella of Environmental Professional Services (EPS), ECO Canada has conducted an upcoming follow-up study on this particular occupational group. This upcoming report found that the majority of EPS positions fall into four main categories: Environmental Technicians/Technologists, Project Managers, Environmental Coordinators, and Environmental Engineers.¹² The occupations within these categories will account for the most future environmental job vacancies. HR strategies should focus on attracting environmental employees to these positions, with targeted communications for post-secondary institutions to help attract students to high-demand areas.

There is a strong need for experienced, senior-level environmental employees in specific sub-sectors, and Canada's transitioning workforce may be one source to help fill this gap. A continued emphasis on certification and environmental training programs, such as the ECO Academy, will help smooth the transition of workers from other industries. Additionally, stakeholders can support the integration of transitioning workers by identifying the industries that are experiencing a surplus of labour supply or high unemployment, and encouraging workers from these industries to enter the environmental labour market.



¹² ECO Canada, *Environmental Professional Services: Discover Canada's Top Environmental Careers*, 2013 forthcoming.

5.2 ENVIRONMENTAL SKILLS ARE BECOMING MORE MAINSTREAM

For some industries, Canadian employers may have a different perception of what environmental employment encompasses. As environmental matters become more commonplace within mainstream Canadian society, the skills and activities associated with environmental work may become more familiar, leading employers to not view these skills as "environmental."

In the Construction industry for instance, many employers have adapted their practices to adhere to more strict environmental regulations and now have a stronger awareness of the environmental tasks that their employees must perform. As these regulations become standard, employers may be less likely to report those same tasks as environmental, viewing them instead as another aspect of daily work. As a result, there may be more environmental employees in some industries than the numbers that employers report. This trend may also be particularly true for Agriculture, Forestry, Fishing, and Hunting, Utilities and Transportation and Warehousing, and Arts, Recreation, and Accommodation and Food Services. However, industries such as Mining, Quarrying, and Oil and Gas Extraction represent a different case. Since the Canadian economy is heavily based on natural resource extraction, the Canadian public and government pay more attention to environmental issues in associated industries. For example, oil extraction from Alberta's oil sands continues to be an area of strong public and political interest, warranting additional engagement from the environmental workforce.

Education may be another area where an increased familiarity with environmental tasks has meant that employers see these tasks as more mainstream or typical, rather than environmental. Educators may add environment-related teaching materials as simply another part of their curricula, and they may be less likely than they once were to identify their use of environmental teaching material as an environmental task.

Promoting Environmental Skills

Environmental professionals must focus on ensuring that they are recognized as a distinct professional group with skills that can only be found amongst qualified practitioners. If employers are less likely to view environmental work as the unique domain of environmental employees, they may also become less likely to recruit the individuals that have the specialized skills to carry out environmental work. Professional certification becomes a vital tool not only to ensure that job candidates have the necessary skills and knowledge, but also to promote environmental work as a unique area of expertise.



Professional certification becomes a vital tool not only to ensure that job candidates have the necessary skills and knowledge, but also to promote environmental work as a unique area of expertise.



5.3 ENVIRONMENTAL WORK IS BECOMING MORE SPECIALIZED

Compared with previous iterations of this study, more environmental employees are found in a select group of industries, including Professional, Scientific, and Technical Services, Administrative and Support, Waste Management, and Remediation Services, with decreases in most other industries.

Some of these shifts may reflect different contextual factors, such as technological advancements that have reduced the impact of resource use in Agriculture, Forestry, Fishing, and Hunting, Construction, Manufacturing, Mining, Quarrying, and Oil and Gas Extraction, and Utilities and Transportation and Warehousing. These advancements could mean that workers now spend less time actively monitoring, preventing and mitigating environmental impacts. Urbanization may also play a role, as the Canadian workforce continues to grow more in urban areas rather than rural ones.¹³ These factors may contribute to the slow growth or decline of traditionally in-demand environmental areas, such as Agriculture, Forestry, Fishing, and Hunting, Mining, Quarrying, and Oil and Gas Extraction, and other primary industry areas.



Employers may consider outsourcing environmental work for a variety of reasons, including the benefits of having third-party bodies assess sensitive issues about environmental performance.

This trend is reflected in the sharp increase in the number of environmental establishments.



Contextual influences aside, the most likely reason for the growth of environmental employment in specific industries is the fact that environmental skills are becoming more specialized. As the demand for environmental employees has increased, the market has responded by providing services through targeted consulting firms. Employers may consider outsourcing environmental work for a variety of reasons, including the benefits of having third-party bodies assess sensitive issues about environmental performance. This trend is reflected in the sharp increase in the number of environmental establishments (as seen in Figure 2.3), as well as in the high proportion of environmental employees that are either self-employed or work in small-size establishments. However, this trend may undergo further changes as more large-scale employers plan to expand their environmental staff in the near future.

Outsourcing Environmental Work

As an alternative option to hiring an in-house professional, environmental employers might consider outsourcing their environmental work to a qualified third party with specialized expertise. Considering that some of the most in-demand areas will include Waste Management, Environmental Health and Safety, Site Assessment and Reclamation, and Sustainability (as demonstrated in Table 4.2), employers may consider contracting this required work as their most feasible option.

¹³ Statistics Canada. *Labour Force Survey*. 2013. Cansim Table 282-0120. Retrieved from <http://www5.statcan.gc.ca/cansim/a47> on June 13, 2013.

APPENDICES



APPENDIX A: DETAILED METHODOLOGY

SURVEY DESIGN

The *2013 Survey of Environmental Employers* provides an estimate of how many environmental workers exist in the Canadian labour force, as well as information on demographics and the demand for environmental work. The first section of the survey, the short questionnaire, provides the basis for formulating national estimates by using a random sample of Canadian employers to identify how many environmental employees are working at their establishment. The remaining section, the long questionnaire, deals with demographics and labour demand. Researchers administered this version only to those who employed at least one environmental employee.

The survey questionnaire was adapted from the *2010 Survey of Environmental Employers*. Some sections were removed in order to streamline the survey, including:

- Current Labour Demand and Employee Turnover,
- Current Recruitment Strategies in the Environmental Sector, and
- Engagement, Retention, and Turnover of Environmental Employees.

Three questions were added to the survey. These questions were designed to gather more information on the distribution of female employees across the environmental workforce (questions B9 and B10) and to learn more about upcoming retirement trends (question B7).

The survey targeted human resource managers who were asked to estimate based on their knowledge of their environmental personnel.

Business Classification Terminology

This report presents the findings according to Statistics Canada's model of business classification.¹⁴ An "Organization" is defined as the level of a business at which operating profit can be measured. An "Establishment" is defined as the level of a business at which the accounting data required to measure production is available. A "Location" is defined as the level at which only the number of employees is required for delineation.

Organizations with Multiple Establishments or Locations

Some organizations in the sample operated multiple establishments or locations within the same province or across Canada. For these organizations, each unique establishment in the sample was surveyed individually. In some cases, researchers were referred to the establishment's head office. In these situations, the head office contact provided unique employment numbers for each of the establishments which appeared in the sample separately. This process ensured that estimates could be organized according to establishment size and region.

Survey Sample

For this survey, a random stratified sample of 27,500 Canadian employers was drawn primarily from the Info Canada Database and supplemented with a seeded sample of environmental employers from ECO Canada's Online Employer Directory. Cases from this seeded sample were not used to calculate the national estimate of environmental workers. Some cases were removed where duplications existed or where businesses were no longer operating.

To receive a copy of the survey questionnaire, please contact ECO Canada's research team at: research@eco.ca or 403-233-0748.

¹⁴ For more information on Statistics Canada's business classification model, see <http://www.statcan.gc.ca/pub/65-507-m/2011011/method-eng.htm>.

A total of approximately 2,600 survey completions were targeted, with specific quotas for each industry group and geographic region. Higher quotas were specified for industries that were expected to have greater numbers of environmental employees, in order to ensure an adequate number of full survey completions. Some industry groups were combined for the purpose of simplifying quota tracking. Regional quotas were designed to ensure equal geographic representation across Canada.

In certain industry groups, researchers could not obtain the targeted quotas. Notably, completions fell short for Administrative and Support, Waste Management and Remediation Services, and Public Administration. One reason for this shortage was low response rates in these industry groups, particularly in the case of Public Administration. When drawing the initial sample in the future, researchers should identify and reduce the duplications of establishments that are listed under multiple NAICS codes.

A sampling matrix was created which specified the total sample to be drawn from each industry within each region, based on the established quotas. Industries were identified using the North America Industrial Classification System (NAICS), and were primarily delineated at the 2-digit level. In some areas, 3-digit, 4-digit, or 5-digit NAICS industries were specified. These NAICS areas were expected to contain higher proportions of environmental employees, and were targeted to obtain more completions from environmental employers. Sub-industry selection followed the targeting established by the 2010 study.

Survey Administration

The survey was in the field from April 1, 2013 to April 26, 2013, and was conducted over the phone by trained survey interviewers. Respondents who were unavailable to complete the survey at the time of the call were also given the option of either rescheduling or accessing the survey through an online link so they could finish at their own convenience.

Field Test

A field test of the survey was conducted during the week of March 25, 2013, in order to identify any difficulties that respondents might experience completing the survey. Field test activities included:

- Verification of survey programming (e.g. skip patterns, wording) and minor programming corrections;
- Preparation of a field test sample of 188 cases;
- Training and monitoring of three experienced survey staff;
- Administration of 38 completed surveys; and
- Review of completed surveys for potential issues.

As a result of the field test, there was a minor change in wording to question S2, so that the question asked how many of the respondent's employees spent "at least half" of their time on environmental work, rather than asking how many employees spent "50% or more" of their time on environmental work. This change was intended to make the question more clear for respondents.

Response Rates

As outlined below, 3,485 survey completions were achieved from a valid sample of 21,275 Canadian employers, which yielded a valid response rate of 16.4%. This represented an improvement on the 10% response rate witnessed in 2010.

Out of the 3,486 Canadian employers that responded to the short questionnaire, 720 indicated that they employed at least one environmental employee, and 614 of these completed the long survey. Of the non-seeded cases, 21.4% employed at least one environmental employee. As discussed in **Section 2.2**, employers within Administrative and Support, Waste Management and Remediation Services, Public Administration, Professional, Scientific, and Technical Services, and Wholesale Trade and Retail Trade were the most likely to report employing environmental employees.

Table A.4
Survey Responses

INITIAL SAMPLE SIZE	PHONE NUMBERS NOT IN SERVICE	VALID SAMPLE	ESTABLISHMENTS CONTACTED	SHORT SURVEYS COMPLETED	LONG SURVEYS COMPLETED	VALID RESPONSE RATE
22,268	992	21,276	17,242	3,485	614	16.4%

ANALYSIS

Estimations of Environmental Employment

Estimations of the number of environmental employees in Canada followed the approach established by the 2010 study. Estimates were first generated within each identified industry group, and then summed to produce the national total. The proportion of workers who performed environmental tasks was calculated separately for a range of establishment sizes within each industry. Using population totals gathered from the Labour Force Survey, the Survey of Employment, Payrolls, and Hours, the 2006 Census, and the Canadian Business Patterns database, researchers used these proportions to estimate the total number of environmental employees within each industry and establishment size grouping.

The formula used for these calculations is as follows:

$$Population(EnvEmp_{ind}) = \sum_{ind=1}^{99} \left(TotalEmp_{ind} * \frac{SREnvEmp_{ind}}{SRTotEmp_{ind}} \right)$$

Population(EnvEmp) is the estimated total Environmental Employment in Canada

Ind is the industry

TotalEmp is the population of workers reported in the Labour Force Survey

SREnvEmp is the reported number of environmental employees from the survey

SRTotalEmp is the reported number of total employees from the survey

The number of environmental professionals (those who spend at least half of their time on environmental tasks) was estimated based on the proportions identified by environmental employers in response to question S2. Regional estimates were calculated by industry, based on the population of each industry within the region and using the overall proportion of environmental employees within that industry calculated using the method outlined above.

Education, Health Care and Social Assistance Adjustment

Upon initial analysis of the survey findings, researchers determined that the estimated number of environmental professionals within the Education, Health Care and Social Assistance industry aggregation was noticeably lower than in previous studies. Close review of this industry aggregation suggested that the estimate may have been low due to statistical variance caused by random sampling. The employers in this industry aggregation who completed the survey happened, by random chance, to employ fewer environmental professionals than the average for the industry. Given that this industry aggregation represents the largest single group of Canadian employees (3,503,300), any variation in the proportion of environmental professionals can significantly affect the total estimate. Furthermore, the size of the population for this industry aggregation increases the margin of error for the calculations, leading to greater possible variation in the results. The sample drawn for this study was also not stratified by establishment size, and the 2010 study oversampled large establishments. This may have further contributed to the differences in the estimates between the two studies. Future studies should further stratify the sample by establishment size in order to oversample large employers to address this issue.

In response, a scaling factor was applied to bring the 2013 estimate for the Education, Health Care and Social Assistance industry group in line with the "pooled average" proportion calculated for the 2007, 2010, and 2013 studies. The estimated number of environmental professionals identified for Education, Health Care and Social Assistance in this report reflects this new ratio.

Margins of Error

The margins of error at a 95% confidence level for the estimations of environmental employment within each industry group are provided in Table A5, below. The overall margin of error for the national estimate is $\pm 1.7\%$.

Table A.5
Margins of Error by Industry below this section

NAICS CODE(S)	INDUSTRY GROUP	TOTAL ESTABLISHMENTS IN CANADA	SURVEY COMPLETIONS	MARGIN OF ERROR
11	Agriculture, Forestry, Fishing and Hunting	169,538	322	±5.5%
21	Mining, Quarrying, and Oil and Gas Extraction	18,089	219	±6.6%
23	Construction	276,942	449	±4.6%
31-33	Manufacturing	78,912	400	±4.9%
41-45	Wholesale Trade and Retail Trade	262,150	62	±12.4%
22, 48-49	Utilities and Transportation and Warehousing	127,269	211	±6.7%
51-53, 55	Information and Culture, Finance and Insurance, Real Estate and Management of Companies	497,006	238	±6.4%
54	Professional, Scientific, and Technical Services	318,624	720	±3.7%
56	Administrative and Support, Waste Management and Remediation Services	109,590	173	±7.4%
61, 62	Education, Health Care and Social Assistance	149,893	268	±6.0%
71, 72	Arts, Entertainment and Recreation, Accommodation and Food Services	137,149	226	±6.5%
81	Other Services	197,135	139	±8.3%
91	Public Administration	8,540	58	±12.8%
	Total	2,350,837	3,485	±1.7%

RESEARCH LIMITATIONS

Sampling Error

The results of this survey represent the responses from establishments that agreed to complete the survey, from a stratified random sample of Canadian employers. Random sampling was conducted for each industry group within Canada's provinces and territories. The use of random sampling can lead to variability in results. The margins of error for this study's estimation of each industry are described in Table A5 above.

Regional Estimates

Estimates of environmental employment by region were based on the industrial proportions identified through the national estimates. Initially, it was hoped that regional calculations could be completed by industry, and these region-by-industry estimates could be summed to produce both regional and national totals. However, because of the dual stratification of the sample by both industry and region, it was not possible to obtain sufficient survey completions within each region-by-industry stratum for this method of calculation. Instead, it was necessary to calculate industry proportions nationally and calculate regional estimates based on these national industry proportions.

Verification from Other Data Sources

Other than the previous iterations of this study in 2010 and 2007, no other sources of comparable research are available to provide comparison and verification with these findings. The results obtained in 2007 and 2010 were based on certain differences in methodology which make direct comparison imperfect.

Comparability with Previous Research

While efforts were made to replicate the methodology of the *2010 Profile of Canadian Environmental Employment* and facilitate the comparability of the findings, some differences exist between the 2010 study and the current research. The primary difference involves changes to the survey questionnaire. Some survey sections were removed in order to streamline the survey. The removed sections involved employee recruitment, hiring practices during the economic downturn in 2008, and employee engagement and turnover. Three questions were added to the survey to gather more information on the distribution of female employees across the environmental workforce (questions B9 and B10), as well as to learn more about upcoming retirement trends (question B7). See Appendices B and C for the full survey questionnaire in English and French.

Some differences may also exist in the construction of the sample. In the current study, sample quotas were set by industry, following the proportional quotas employed by the *2010 Profile*. Quotas were also implemented by region. The effects of random sampling may lead to variation in the findings.

The current study reports its demographic and human resources findings based on the estimated total number of environmental employees, rather than on the number of environmental professionals (those that spend at least half of their time on environmental tasks). In the 2010 study, demographic and human resources findings were reported based on the estimate of those that spend at least half of their time on environmental tasks.

Comparability with future studies may be affected by the pooled average adjustment made to the Education, Health Care and Social Assistance industry aggregation, as described in the Analysis subsection of this appendix. Caution should be taken in future studies when comparing estimates within this industry aggregation.

APPENDIX B: SOURCES OF EMPLOYMENT ESTIMATES

DATA SOURCES

CCHREI 1993 Report: Human Resources in the Environmental Industry

The 1993 study targeted companies and organizations whose revenue was primarily based on the production and supply of environmental goods and services.

CCHREI 1999 Report: Human Resources in the Canadian Environmental Sector

In addition to the pre-existing focus on environmental organizations, the second iteration of this study included an examination of environmental practitioners who worked for a multitude of public and private sector organizations.

CCHREI 2003 Report: Environmental Employment in Canada

The 2003 study of Environmental Employment in Canada provided an overview of environmental practitioners and organizations in Canada.

ECO Canada 2007 Report: The Profile of Canadian Environmental Employment

The 2007 Profile of Canadian Environmental Employment represented a shift in focus for ECO Canada. While prior reports focused on environmental establishments and their employees, the 2007 report tracked employment across all sectors of the economy. These results reflected the cross-sectoral nature of environmental work and the breadth of occupations that fall under the environmental umbrella.

ECO Canada 2010 Report: The Profile of Canadian Environmental Employment

The 2010 Profile of Canadian Environmental Employment continued to work within the methodological framework of the 2007 study. The 2010 study introduced the distinction between environmental employees (referred to as workers who spent < 50% of their time on environmental tasks in the 2010 report) and environmental professionals (referred to as "environmental employees" in the 2010 report). The report arrived at a final estimate of 682,289 environmental professionals.



ECO CANADA

Environmental Careers Organization

This project was funded by the Government of Canada's Sector Council Program.
The opinions and interpretations in this publication are the author's and do not necessarily
reflect those held by the Government of Canada.

Copyright © 2013 ECO Canada

All rights reserved. The use of any part of this publication, whether it is reproduced, stored in a retrieval system,
or transmitted in any form or means (including electronic, mechanical, photographic, photocopying or recording),
without the prior written permission of ECO Canada is an infringement of copyright law.

ECO Canada (2013).

Profile of Canadian Environmental Employment

Labour Market Research.

Environmental Careers Organization of Canada.



ECO CANADA

Environmental Careers Organization



Suite 200, 308 - 11th Avenue S.E., Calgary, Alberta, Canada T2G 0Y2

Telephone: (403) 233-0748 Fax: (403) 269-9544

eco.ca