

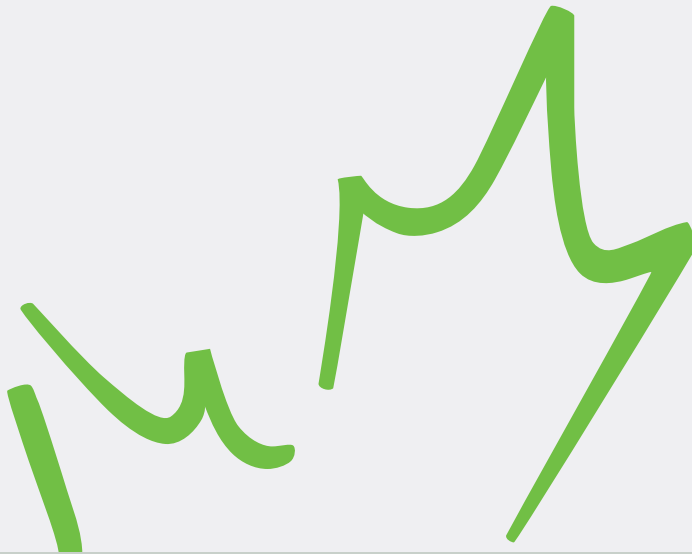


Profile of Canadian Environmental Employment

September 2017



Funded by the Government of Canada's Sectoral Initiatives 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 Canada's growing environmental 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/research

Acknowledgements

ECO Canada wishes to express its gratitude to all the organizations and individuals who contributed their time and effort to this report.

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

We acknowledge the substantial contribution of Insightrix Research Inc and thank them for fielding the 2016 survey of Profile of Canadian Environmental Employment.

Most of all, we thank the many individuals who generously gave their time to speak with researchers. This study would not have been possible without them.

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Glossary of Terms

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

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

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.

NATIONAL OCCUPATIONAL CLASSIFICATION (NOC): a comprehensive hierarchical system Statistics Canada uses in labour market research to describe all employment activity.

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

ENVIRONMENTAL SUB-SECTOR: describes a group of specific areas of practice 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 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.

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.

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 of an organization 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.

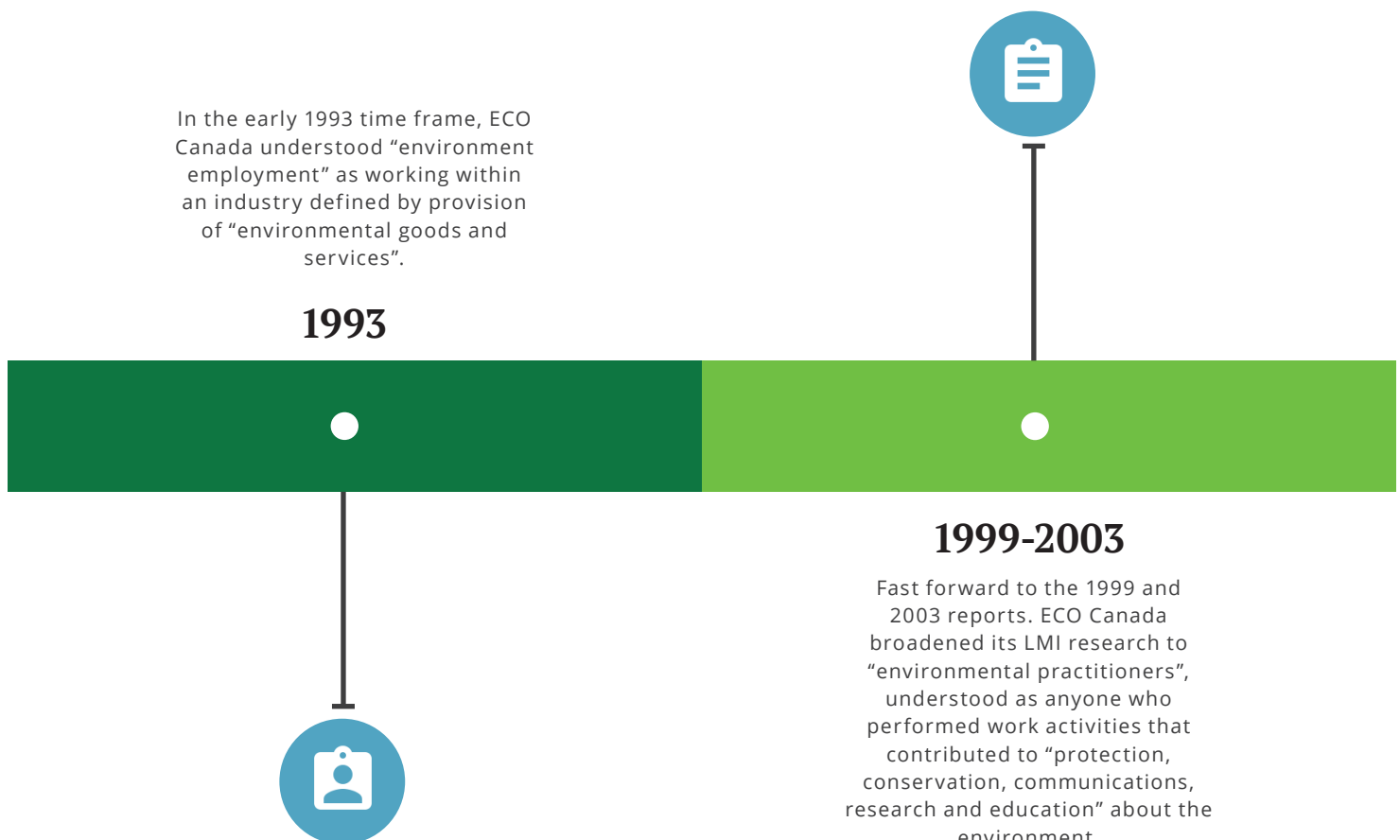
1. Executive Summary

1.1 A Glimpse of the History of the Profile of Canadian Environmental Employment Surveys

The 2016 survey is the most recent in the ECO Canada Profile of Canadian Environmental Employment series, and follows 2013, 2010, 2007, 2003, 1999 and 1993 publications.

It marks a watershed moment and not the first course correction in the history of ECO Canada labour market research.

Since 1993, ECO Canada's understanding of what goes to make up "environmental employment" has shifted and evolved more than once based on experience and learning.



Fast forward to 2007. ECO Canada created a new understanding of “environmental employee” as someone who spent at least 50% of their working time on environmental activities.

2007



2010 and 2013

Fast forward to 2010 and 2013.

ECO Canada differentiated between persons who spent **any amount of their worktime** on environmental activities and persons who spent **at least 50% of their worktime** on environmental activities, calling them “environmental employees” and “environmental professionals” respectively.

The surveys now reported data on two kinds of Environmental workers – “Employees” and “Professionals”.

By 2010, ECO Canada was identifying “environmental activities” as ones which contributed to Protecting, Managing and Sustaining the environment.





2016

Fast forward to 2016.

ECO Canada was again looking to the need to shift understandings and definitions of “environmental employment”. To avoid a scenario where virtually “all” Canadians were classed as environmental workers because, for example, they recycled re-usable materials, ECO Canada had begun to develop new ways of looking at “core” environmental jobs by matching them to the NOS (National Occupational Standards) competencies, a different and more precise way of viewing environmental employment.

Faced with the double need to align the 2016 survey wave with the earlier waves in the interests of tracking environmental employment, but on the other hand, to respect changes in the industry, ECO Canada proceeded with a national survey of businesses with results reported for “Environmental Professionals” only, assuming they would be similar to “Core” workers.

As expected, due to the revised focus on reaching Core Professional workers, the environmental employment figures obtained in the 2016 survey were lower than obtained in previous waves.

1.2 Future: A New Baseline for Environmental Employment

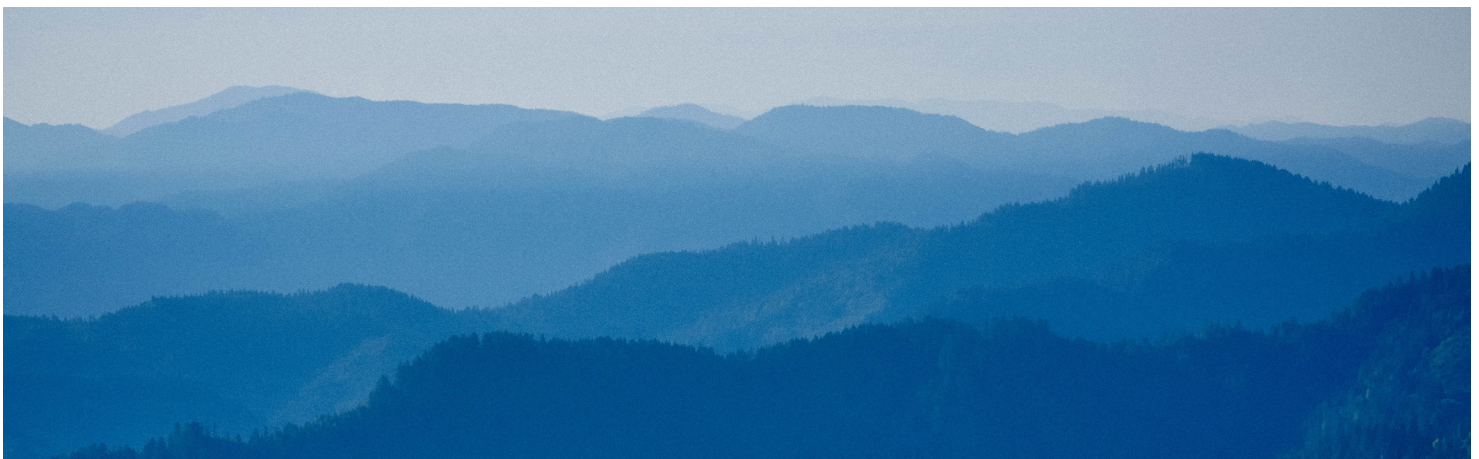
ECO Canada will use this 2016 survey as a new baseline preceding an era of change both in environmental employment and in our measurement of environmental employment.

We believe that the understanding of “environmental employment” is moving toward specialization, and that new technologies will only speed up the process. However, we also believe that this 2016 baseline may prove to have been overly low based on these additional reasons:

- The economic slowdown in 2015-16, which not only reduced employment but may have had a compound effect by impacting employment more with small-to-medium employers than with large employers. This would have shifted environmental employment towards large corporate employers which are traditionally difficult to reach in surveys and therefore the impact of missing data would have been greater
- Possible seasonal effects
- Minor effects due to changes to Statistics Canada definition of "business establishment" in 2014, which could affect the national statistics

We believe that the recovering economy will enhance environmental employment, and that new labour market research techniques will enlighten our understanding of growth drivers, barriers and trends. We are on the threshold of an exciting era of discovery.

For more detail see Section 6.



1.3 Key Findings About Environmental Professionals in 2016

An Environmental Professional in the context of this report is:

- A worker who performs activities on the job associated with any of,
 - ◊ Environmental Protection (e.g. air, water and land quality, waste management, restoration and reclamation, human and environmental health and safety, carbon and climate change mitigation, and environmental protection management)
 - ◊ Resource Management (e.g. fishery, wildlife, forestry, sustainable agriculture, energy efficiency, alternative or renewable energy, parks and natural reserves, and natural resource management)
 - ◊ Environmental Sustainability (e.g. education, research and development, policy and legislation, communications and public awareness, and sustainable development)
 - ◊ Other environment related activities
- For 50% or more of his/her working time

For more detail see Sections 3, 4 and 5.

How many Environmental Professionals?	Where do Environmental Professionals work?	Who are Environmental Professionals?	What are hiring and future employment trends?
<p>There are an estimated 258,724 Environmental Professionals in Canada.</p>	<p>The 5 industry groups with the highest numbers and the highest concentrations of Environmental Professionals are (1) Agriculture, (2) Construction, (3) Professional Scientific and Technical Services, (4) Administrative and Support, Waste Management and Remediation, and (5) Public Administration</p> <p>81% of Environmental Professionals work in establishments with 99 or fewer employees</p> <p>The three ECO sub-sectors (i.e. areas of practice) with the most Environmental Professionals are Waste Management, Natural Resource Management, and Environmental Health and Safety</p> <p>The provinces with the highest numbers of Environmental Professionals are Ontario, British Columbia and Alberta. British Columbia and Alberta have high concentrations within their workforces</p>	<p>They are relatively young. 62% are aged 44 and younger</p> <p>25% are women, 6% are Indigenous persons, and 3% are recent immigrants</p> <p>60% have college education or higher</p> <p>Consistent with their average age, 65% have 4 years or more of work experience</p> <p>28% mainly do managerial work</p>	<p>34% of employers expected an increased workforce in the next 24 months, and 64% expected it to stay the same. Almost none expected a decrease. Small-to-medium employers were much more likely to expect an increase than larger employers</p> <p>14% had experienced difficulty filling some specific occupations, which were mostly specialists such as forestry specialists, environmental engineers, ecologists, aquaculture specialists, climate change specialists, and others</p> <p>46% expected possible difficulties in hiring new staff, with no particular emphasis on seeking any one level of experience</p> <p>As of 2016, 22% of the workforce was expected to retire within 10 years</p>

1.4 Short-term Opportunities for the Environmental Employment Sector

The 2016 survey affirms the importance of education for Environmental Professionals. 60% have post-secondary education.

The prospects in environmental employment are good. Even during economic slowdown (as in the time of this survey), very few employers projected staff decreases. Retirements will drive a need for replacement labour.

Targeted training and support programs could increase the proportions of Indigenous and recent immigrant participants among Employment Professionals.

For more detail see Section 6.

1.5 Future: ECO Canada LMI Directions

ECO Canada will supplement the traditional Profile of Canadian Environmental Employment surveys with Supply/Demand statistical projective models and alternative forms of measurement including Job Posting Analysis (aka “job scraping”), trend monitoring and industry-specific case studies and consultation. The alternative measurement approaches will bring the research closer to time-sensitive reporting of the increasingly rapid changes taking place in Canadian Environmental Protection, Management and Sustainability, and will move closer to in-depth knowledge of core environmental workers.

For more detail see Section 6.



2. Introduction

2.1 About ECO Canada

Since its creation 25 years ago in 1992, ECO Canada has been committed to supporting Canada's environmental sector through in-depth labour market research, professional certification, career development resources and training.

Having certified over 5,000 Environmental Professional (EP®) and Environmental Professional-in-Training (EPt) members, we strive to provide Canada's leading environmental certification, establishing the professional standard and code of ethics for the environmental workforce. We are committed to excellence as we nurture a vibrant community of experienced environmental professionals.

2.2 Objectives of the "Profile of Canadian Environmental Employment" Survey Series

The Profile of Canadian Environmental Employment is a national study that takes place about every three or four years. The current 2016 wave follows previous waves in 1993, 1999, 2003, 2007, 2010 and 2013.

Each wave of the study takes the form of a national survey of business establishments in Canada. Businesses which are identified as contributing to the environmental employment sector are asked questions about their workforce.

The surveys have all been designed to measure key aspects of Canadian "environmental employment". However, the understanding of what goes to make up "environmental employment" has evolved across the years which in turn has affected the questions and the results of the surveys.

In the early infancy of ECO Canada and in order to begin its work, the definition of "environmental employment" was tied specifically to industries which produced specialized environmental goods and services. However, broad and deep industry consultation soon led to new understandings and definitions of "environmental employment" which were based on impact on the environment no matter what the goods and services producing it. These new understandings were based on the need to Protect the Environment, to Manage Resources, and to Sustain the Environment.

"Environment" is a broad term. To simplify, ECO Canada developed a Sector/Sub-Sector model which divided environmental employment into functional areas.

As of 2016, the ECO Canada's Sector/ Sub-Sector model consists of three main sectors: Protect (A), Manage Resources (B) and Sustain (C), 13 sub-sectors within the three main sectors, and 1 intersecting space for the Environmental Manager who links it all.

Figure 1: ECO Canada's Sector/Sub-Sector Model (2016)



2.3 Summary of the Methodology of 2016 Survey

The main objectives of all the Profile of Canadian Environmental Employment surveys have been to describe the Canadian environmental workforce, within the understandings and definitions of the day, by:

- Estimating the number of Environmental Establishments (i.e., business units which employ environmental employees)
- Estimating the total number of Environmental Workers, which in recent surveys have been divided into:
 - ◊ Environmental Employees – defined as persons who spend any amount of their worktime on Protecting, Managing and Sustaining the Canadian Environment
 - ◊ Environmental Professionals – defined as persons who spend at least one-half of their worktime on Protecting, Managing or Sustaining the Canadian environment
- Presenting the estimates by industry and by ECO Canada's sub-sectors
- Profiling the demographic makeup and other useful characteristics of Canadian Environmental Workers
- Predicting future growth trends

The 2016 survey wave was based on a national telephone survey of businesses with most interviews conducted from November 2015 to March 2016. A knowledgeable senior person provided information on the environmental staffing component, if any, of the firm.

The 2016 survey wave focused on Environmental Professionals understood as persons who spend at least one-half of their worktime on Protecting, Managing or Sustaining the Canadian Environment, or performing other environment-related activities.

3. Workforce Distribution of Environmental Professionals

The 2016 Profile of Canadian Environmental Employment report is focused towards Environmental Professionals.

An Environmental Professional in the context of this report is,

- A worker who performs activities on the job associated with any of:
 - ◊ Environmental Protection (e.g. air, water and land quality, waste management, restoration and reclamation, human and environmental health and safety, carbon and climate change mitigation, and environmental protection management)
 - ◊ Resource Management (e.g. fishery, wildlife, forestry, sustainable agriculture, energy efficiency, alternative or renewable energy, parks and natural reserves, and natural resource management)
 - ◊ Environmental Sustainability (e.g. education, research and development, policy and legislation, communications and public awareness, and sustainable development)
 - ◊ Other environment-related activities
- For 50% or more of his/her working time

The 2016 survey estimated the number of Environmental Professionals in Canada at 258,724. Section 3 of the report shows the employment patterns of the Environmental Professionals.

3.1 Employment by Industry

Table 1 shows Employment Professional counts for the Statistics Canada industry NAICS of the businesses within which the Employment Professionals work.

The five NAICS groups with the highest absolute numbers of Employment Professionals are, in order with Agriculture at the top,

- Agriculture
- Construction
- Professional, Scientific and Technical Services
- Administrative Support, Waste Management and Remediation
- Public Administration

The same five have the highest proportion of Employment Professionals within their respective workforces, again with Agriculture at the top.

Table 1: Environmental Professionals by Industry (2016)

2016	Labour Force (Canada)	Environmental Professionals (Survey)	
NAICS industry	Count	Count	%
11 - Agriculture	373,997	49,612	13.27%
21 - Mining, Quarrying, Oil and Gas	221,586	4,256	1.92%
22, 48 - 49, Utilities, Transportation and Warehousing	1,032,199	2,708	0.26%
23 - Construction	1,317,139	43,107	3.27%
31 - 33 - Manufacturing	1,669,026	3,791	0.23%
41, 44 - 45 - Wholesale Trade, Retail Trade	2,749,348	15,724	0.57%
51, 52, 53, 55 - Information, Cultural, Finance, Insurance	1,576,152	1,193	0.08%
54 - Professional, Scientific and Technical Services	1,410,122	39,459	2.80%
56 - Administrative and Support, Waste Management and Remediation	617,079	32,693	5.30%
61 - Education	1,319,470	5,057	0.38%
62 - Health Care and Social Assistance	2,338,416	19,234	0.82%
71,72 - Arts, Entertainment and Recreation	1,605,154	13,369	0.83%
81 - Other Services (except Public Administration)	752,145	8,809	1.17%
91 - Public Administration	895,697	19,712	2.20%
Total	17,877,531	258,724	1.45%

Source: ECO Canada 2016 Survey of Environmental Employers; showing NAICS codes of employers of Environmental Professionals; national databases

3.2 Establishments by Industry

Table 2 shows the number of establishments in which Environmental Professionals are employed.

An “establishment” in the context of his survey is a unit within a company responsible for production. A larger number of establishments, all else equal, means the environmental professionals are spread over more operating units or employers. A small number of establishments, all else equal, means the environmental professionals are concentrated into fewer operating units or employers.

The five industries with the largest numbers of establishments employing Environmental Professionals are, in order with Agriculture at the top,

- Agriculture
- Construction
- Professional, Scientific and Technical Services
- Information, Cultural, Finance, Insurance
- Administrative and Support, Waste Management and Remediation

The five industries with the highest concentrations of establishments with Environmental Professionals within their industry are, in order again with Agriculture at the top,

- Agriculture
- Public Administration
- Mining, Quarrying, Oil and Gas
- Administrative and Support, Waste Management and Remediation
- Construction

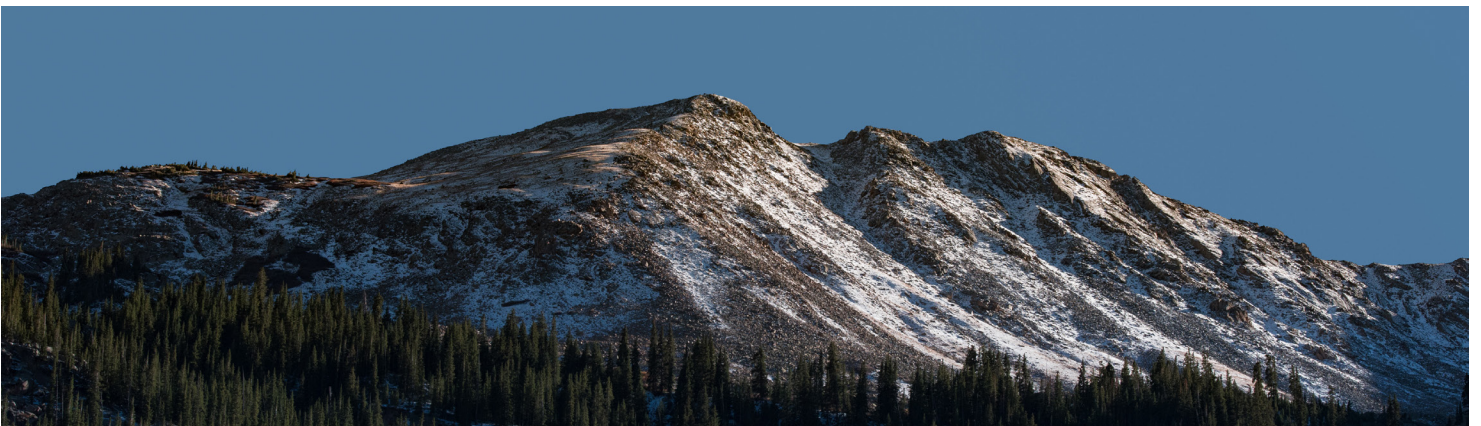


Table 2: Establishments Employing Canadian Environmental Employees by Industry (2016)

2016	Establishments in Canada	With Environmental Professionals	
NAICS industry	Count	Count	%
11 - Agriculture	233,572	46,571	19.94%
21 - Mining, Quarrying, Oil and Gas	24,604	2,714	11.03%
22, 48 - 49, Utilities, Transportation and Warehousing	189,248	1,293	0.68%
23 - Construction	362,583	20,597	5.68%
31 - 33 - Manufacturing	90,082	1,555	1.73%
41, 44 - 45 - Wholesale Trade, Retail Trade	353,206	7,332	2.08%
51, 52, 53, 55 - Information, Cultural, Finance, Insurance	926,038	9,965	1.08%
54 - Professional, Scientific and Technical Services	431,510	15,034	3.48%
56 - Administrative and Support, Waste Management and Remediation	141,881	9,406	6.63%
61 - Education	34,507	1,159	3.36%
62 - Health Care and Social Assistance	247,615	4,503	1.82%
71,72 - Arts, Entertainment and Recreation	174,577	4,010	2.30%
81 - Other Services (except Public Administration)	234,893	4,548	1.94%
91 - Public Administration	9,042	1,356	15.00%
Total	3,453,358	130,043	3.77%

Source: ECO Canada 2016 Survey of Environmental Employers; showing NAICS codes of employers of Environmental Professionals; national databases

3.3 Employment by Establishment Size

Table 3 indicates that in the 2016 survey, most identified Environmental Professionals (61%) were self-employed or worked in small operating units or organizations with 1-19 staff¹.

Table 3 Environmental Professionals by Establishment Size (2016)

2016	Labour Force (Canada)		Environmental Professionals (Survey)	
Establishment Size	Count	%	Count	%
1 to 19 employees	7,704,238	43.1%	157,221	60.8%
20 to 99 employees	5,019,578	28.1%	51,900	20.1%
100 to 499 employees	3,085,155	17.3%	44,558	17.2%
500+ employees	2,068,560	11.6%	5,045	2.0%
Total	17,877,531	100.0%	258,724	100.0%

Source: ECO Canada 2016 Survey of Environmental Employers; national databases

¹ ECO Canada believes that the number identified for employees of establishments with 500+ employees may understate the reality due to anomalies produced by the 2015 economic slowdown and recessions; see Chapter 6, Discussion).

3.4 Employment by Sub-Sector

Table 4 presents the distribution of Environmental Professionals by environmental sub-sector. The individual numbers add up to more than the total of Environmental Professionals as many work in more than one ECO Canada's Sector and/or Sub-Sector.

Sector A on Environmental Protection activities and Sector B on Resource Management activities are more populated than Sector C on Sustainability services.

The three sub-sectors with the most Environmental Professional workers are,

- Waste Management – focusing on hazardous and non-hazardous waste management, treatment and beneficial re-use, legislation, regulation and standards
- Natural Resource Management – focusing on balancing socio-economic needs with environmental care, enforcement, regulation and standards
- Environmental Health and Safety – focusing on addressing occupational hazards and hygiene through policies, standards, legislation and programs that maintain and improve environment quality

Table 4 Environmental Professionals by ECO Canada's Sub-Sector (2016)

Environmental Sub-Sector (2016)	Environmental Professionals	% of Environmental Professionals*
Sector A - Environmental Protection		
Waste Management	69,976	27.0%
Environmental Health and Safety	64,745	25.0%
Water Quality	44,984	17.4%
Site Assessment and Reclamation	41,909	16.2%
Air Quality	27,304	10.6%
Sector B - Resource Management		
Natural Resource Management	65,519	25.3%
Energy	31,766	12.3%
Fisheries & Wildlife	26,677	10.3%
Sector C - Environmental Sustainability		
Sustainability	39,969	15.4%
Communications & Public Awareness	28,908	11.2%
Education & Training	26,539	10.3%
Research & Development	16,800	6.5%
Policy & Legislation	15,091	5.8%
Other		
Environmental Manager	41,562	16.1%

Source: ECO Canada 2016 Survey of Environmental Employers.

*Note: Employees can fit into more than one subsector and therefore the % column totals to more than 100%

3.5 Employment by Province or Region

Table 5 shows numbers of Environmental Professionals by Province or Region.

The provinces with the largest number of Environmental Professionals are:

- Ontario
- British Columbia
- Alberta

Ontario has the highest numbers of Environmental Professionals because it has a large population base. However, it does not have the highest proportion of Environmental Professionals in relation to its workforce. British Columbia and Alberta and the Territories are the three areas with the highest concentrations of Environmental Professionals within their workforces.

Table 5: Environmental Professionals by Province/Region (2016)

2016	Labour Force (Canada)	Environmental Professionals (Survey)	
Province	Count	Count	%
BC	2,356,973	62,865	2.8%
AB	2,241,592	47,785	2.1%
Prairies	1,187,422	11,323	0.95%
ON	6,923,326	86,087	1.2%
QC	4,040,629	32,163	0.80%
Maritimes	1,074,002	16,028	1.5%
Territories	53,587	2,472	4.6%
Total	17,877,531	258,724	1.5%

Source: ECO Canada 2016 Survey of Environmental Employers; national databases

4. Demographic Profile of Environmental Professionals

Section 4 presents a demographic profile of Environmental Professionals.

An Environmental Professional in the context of this report is:

- A worker who performs activities on the job associated with any of:
 - ◊ Environmental Protection (e.g. air, water and land quality, waste management, restoration and reclamation, human and environmental health and safety, carbon and climate change mitigation, and environmental protection management)
 - ◊ Resource Management (e.g. fishery, wildlife, forestry, sustainable agriculture, energy efficiency, alternative or renewable energy, parks and natural reserves, and natural resource management)
 - ◊ Environmental Sustainability (e.g. education, research and development, policy and legislation, communications and public awareness, and sustainable development)
 - ◊ Other environment related activities
- For 50% or more of his/her working time

4.1 Age

Table 6 shows the 2006 age distribution of Employment Professionals. This is a relatively young workforce. More than half (62%) are under age 45.

Table 6: Environmental Professionals by Age (2016)

Age	Environmental Professionals	% of Environmental Professionals
29 or under	77,776	30.1%
30 to 44	82,574	31.9%
45 to 54	61,407	23.7%
55 to 64	26,072	10.1%
65 or older	6,102	2.4%
Don't know	4,793	1.9%
Total	258,724	100.0%

Source: ECO Canada 2016 Survey of Environmental Employers

4.2 Gender, Ancestry & Recent Immigrant Status

Table 7 below shows the 2016 proportions of women, Indigenous persons, and recent immigrants within Canadian employment professionals.

THE PROPORTION OF WOMEN IS 24.7%;
INDIGENOUS, 6.3%, AND RECENT
IMMIGRANTS 2.8%

Table 7: Selected Environmental Professional Demographics (2016)

Demographic group	Environmental Professionals	% of Environmental Professionals
Women	63,843	24.7%
Indigenous (including First Nations, Inuit and Métis)	16,275	6.3%
Recent Immigrants	7,294	2.8%

Source: ECO Canada 2016 Survey of Environmental Employers

Information on which industries have high absolute numbers or high proportions of these three demographic groups is tentative due to small sample sizes in some industries. Based on Table 8, we can say that,

- Women have relatively high numbers and representation in Public Administration
- Indigenous persons have relatively high numbers in Agriculture and Construction
- Recent Immigrants have relatively high numbers in Health Care and Social Assistance, and Administrative, Support, Waste Management and Remediation

Table 8 Selected Environmental Professional Demographics by Industry (2016)

2016	Environmental Professionals			
NAICS industry	Count	% women	% aboriginal	% recent immigrant
11 - Agriculture	49,612	28.8%	7.7%	0.0%
21 - Mining, Quarrying, Oil and Gas	4,256	19.7%	6.0%	2.0%
22, 48 - 49, Utilities, Transportation and Warehousing	2,708	29.0%	9.7%	1.4%
23 - Construction	43,107	13.0%	7.4%	3.1%
31 - 33 - Manufacturing	3,791	36.4%	0.0%	4.0%
41, 44 - 45 - Wholesale Trade, Retail Trade	15,724	29.9%	10.4%	4.9%
51, 52, 53, 55 - Information, Cultural, Finance, Insurance	1,193	0.0%	0.0%	0.0%
54 - Professional, Scientific and Technical Services	39,459	29.5%	1.7%	3.9%
56 - Administrative and Support, Waste Management and Remediation	32,693	18.3%	3.1%	4.2%
61 - Education	5,057	49.8%	0.3%	0.0%
62 - Health Care and Social Assistance	19,234	11.7%	0.0%	8.3%
71, 72 - Arts, Entertainment and Recreation	13,369	18.0%	8.6%	0.4%
81 - Other Services (except Public Administration)	8,809	19.7%	12.4%	0.0%
91 - Public Administration	19,712	36.6%	7.2%	0.7%
Total	258,724	24.7%	6.3%	2.8%

Source: ECO Canada 2016 Survey of Environmental Employers

4.3 Education

Table 9 shows the highest educational level reached by Canadian Environmental Professionals.

Most Environmental Professionals (60%) have post-secondary education levels, with the largest group holding a college diploma or equivalent status.

POST-GRADUATE DEGREE - 9.7%

BACHELOR'S DEGREE OR EQUIVALENT - 21.9%

COLLEGE OR EQUIVALENT - 28.7%

POST-SECONDARY TOTAL - 60.3%

Table 9: Environmental Professionals by Highest Education Level (2016)

Education Level	Environmental Professionals	% of Environmental Professionals
Post-graduate degree	25,143	9.7%
Bachelor's degree or equivalent	56,683	21.9%
College or equivalent	74,161	28.7%
Less than post-secondary	78,540	30.4%
Don't know	24,198	9.4%
Total	258,724	100.0%

Source: ECO Canada 2016 Survey of Environmental Employers

4.4 Work Experience

Table 10 shows the 2016 level of work experience of the Environmental Professionals.

The largest single category of Environmental Professionals is senior-level or 8 or more years of experience (39%). A total of 65% have 4 year's experience or more.

Table 10: Environmental Professionals by Work Experience Levels (2016)

Experience Level	Environmental Professionals	% of Environmental Professionals
Entry level (less than 1 year)	30,692	11.9%
Junior level (1-3 years)	56,713	21.5%
Intermediate level (4-7 years)	67,148	26.0%
Senior level (8+ years)	100,910	39.0%
Don't know	4,261	1.6%
Total	258,724	100.0%

Source: ECO Canada 2016 Survey of Environmental Employers

4.5 Currently Do Managerial Work

Table 11 shows the 2016 proportion of Environmental Professionals who do managerial work.

About 1 in 4 (27.9%) are primarily involved in managerial work.

Table 11: Proportion of Environmental Professionals that are Managers (2016)

Mainly do managerial work	Environmental Professionals	% of Environmental Professionals
Yes	72,072	27.9%
No	186,652	72.1%
Total	258,724	100%

Source: ECO Canada 2016 Survey of Environmental Employers

5. Hiring and Replacement Trends

Section 5 presents results which highlight the future of the environmental employment sector in Canada, as seen by employers of Environmental Professionals.

An Environmental Professional in the context of this report is,

- A worker who performs activities on the job associated with any of:
 - ◊ Environmental Protection (e.g. air, water and land quality, waste management, restoration and reclamation, human and environmental health and safety, carbon and climate change mitigation, and environmental protection management)
 - ◊ Resource Management (e.g. fishery, wildlife, forestry, sustainable agriculture, energy efficiency, alternative or renewable energy, parks and natural reserves, and natural resource management)
 - ◊ Environmental Sustainability (e.g. education, research and development, policy and legislation, communications and public awareness, and sustainable development)
 - ◊ Other environment related activities
- For 50% or more of his/her working time

5.1 Projected Growth in Employer Demand

Table 12 shows projections of change by employers in total environmental workforce size over the next 24 months.

The answers reflect the timing of the survey. This survey was completed in 2016, on the heels of a major economic downturn, when the ability to project ahead was compromised, especially for larger organizations. Despite the challenges, most employers (34%) projected an increased workforce over the next 24 months. The smaller organizations with 99 employees or fewer are the most likely to foresee an increase in size of workforce with about 1 in 3 projecting an increase. The larger organizations mostly projected a holding pattern, with none projecting an actual decrease.

Table 12: Employer Expectations of Change in Size of Environmental Workforce Within Next 24 Months by Size of Establishment

Establishments that expect the Environmental Workforce to: (2016)	1 to 19 employees	20 to 99 employees	100 to 499 employees	500+ employees	Total (Weighted Average)
Increase	34.1%	36.6%	16.3%	8.4%	33.7%
Stay about the same	63.9%	47.8%	82.7%	90.6%	63.8%
Decrease	1.6%	9.0%	0.0%	0.0%	1.9%
Not sure	0.4%	6.6%	1.0%	1.0%	0.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

5.2 Common Hiring Sources

Table 13 addresses sources of hiring Environmental Professionals within the past two years, and gives insight into hiring patterns. Just over 60% had experience with hiring within the past two years.

Two frequent recent sources for Environmental Professionals are directly from school (27%) and among those with prior environmental experience (24%). A modest proportion also transitioned workers from other industries (14%).

Table 13: Common Hiring Sources (2016)

Hiring Sources for Environmental Professionals (past 2 years)	% of Hiring Employers who have used this source*
Recent students	26.8%
Previous environmental workers	24.4%
Transitioning workers from other industries	14.0%
Individuals who moved from other provinces or territories	8.5%
Aboriginal Canadians	3.8%
Recent immigrants	1.7%
International workers	0.6%
Did not hire in previous 2 years or unable to provide number hired	38.5%

Source: ECO Canada 2016 Survey of Environmental Employers. *Multiple responses - columns may add to more than 100%

5.3 Difficult-to-Fill Occupations

A relatively small percentage of the workforce employers (only 14%) were able to name specific occupations which had been hard-to-fill. The list was long and varied, with the ones named most often shown in Table 14.

The hard-to-fill occupations are generally skilled, specialty occupations with forestry specialists at the top.

Table 14: Difficult-to-Fill Occupations (2016)

Difficult-to-Fill Occupations	% of Employers mentioning them
Mentioned specific occupations which are hard-to-fill:	
• Forestry specialists, arborists	
• Environmental Engineers	
• Ecologists	
• Aquaculture specialists, wetland biologists, water and wastewater treatment operators, hydrologists	14%
• Horticulture specialists	
• Climate change specialists	
• Others	

Source: ECO Canada 2016 Survey of Environmental Employers

5.4 Anticipated Difficulty of Future Hiring

Table 15 shows the proportions of workforce employers anticipating difficulty hiring environmental professionals in the next 24 months.

Just over one-half of employers (54%) foresee no difficulties hiring environmental professionals within the next 24 months. Those who do foresee possible difficulties were about equally likely to expect difficulty finding entry/junior level, intermediate level or senior level staff.

Table 15: Anticipated Difficulty of Hiring by Experience Levels (2016)

Experience level wanting to hire	% of respondents expecting Difficulty Hiring this level of staff (2016)
Entry/Junior level	26.9%
Intermediate level	28.1%
Senior level	31.2%
Or	
Do Not Anticipate Difficulty	53.6%

Source: ECO Canada 2016 Survey of Environmental Employers. *Multiple responses - columns may add to more than 100%

5.5 Upcoming Retirements

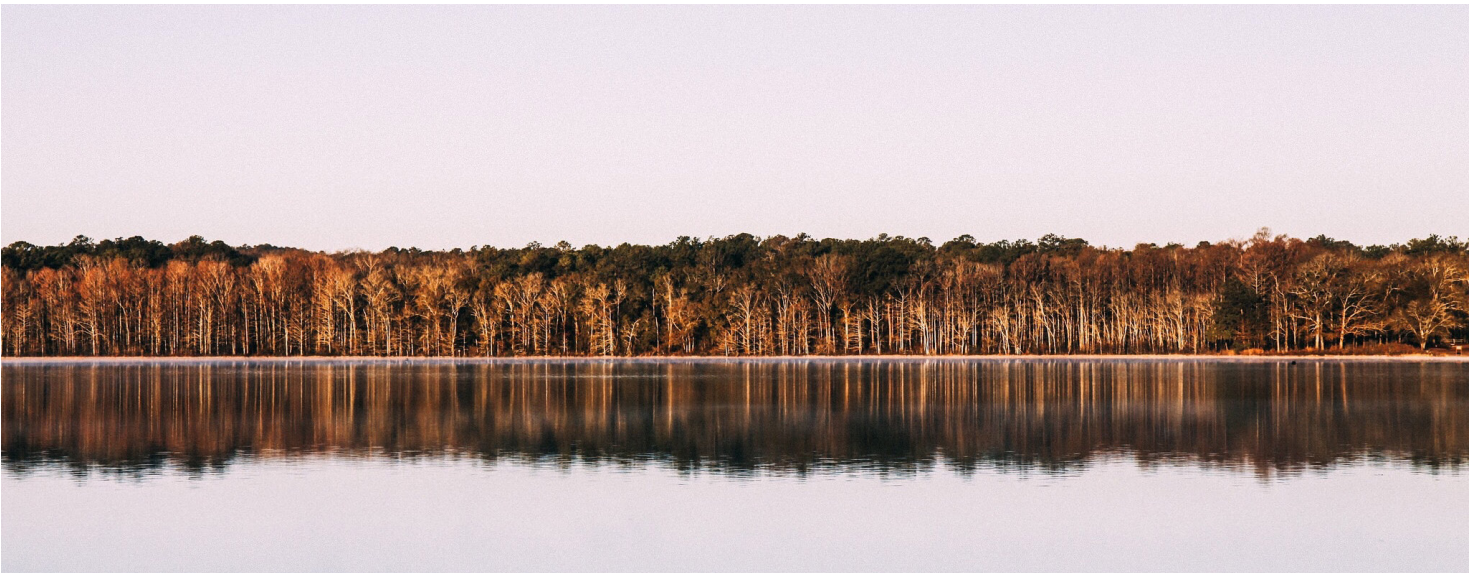
Table 16 shows the percentages and numbers of Environmental Professionals expected to retire within time frames leading up to 10 years.

22% of the 2016 Environmental Professional workforce is expected to retire within the next 10 years, for a total of about 57,000 workers.

Table 16: Anticipated Environmental Professional Retirements by Timeframe (2016)

Expected Retirement Timeframe	Environmental Professionals expected to retire	% of Environmental Professionals
Within the next 2 years	10,734	4.1%
Between 3 to 5 years from now	16,882	6.5%
Between 6 to 10 years from now	29,967	11.6%
Total expected retirements in the next 10 years	57,583	22.2%

Source: ECO Canada 2016 Survey of Environmental Employers



Another way of looking at retirement prospects is to consider the age distribution of workers. Table 17 below presents the proportions of environmental professionals aged 55 years or older by industry in which they work.

The NAICS groups with the largest absolute numbers of Environmental Professionals aged 55 and over are the same as the largest industry groups namely:

- Agriculture
- Construction
- Administrative and Support, Waste Management and Remediation
- Professional, Scientific and Technical Services
- Public Administration

Of these, Agriculture also has a relatively high proportion of Age 55 and over compared to the workforce of Environmental Professionals (19.4%).

Table 17: Environmental Workforce Age 55 and older by Industry (2016)

NAICS Industry (2016)	# of Environmental Professionals Age 55 and older	% of Environmental Professionals Age 55 and older
11 - Agriculture	9,625	19.4%
21 - Mining, Quarrying, Oil and Gas	358	8.4%
22, 48-49, Utilities, Transportation and Warehousing	292	10.8%
23 - Construction	4,483	10.4%
31-33 - Manufacturing	880	23.2%
41,44-45 - Wholesale Trade, Retail Trade	16	0.1%
51, 52, 53, 55 - Information, Cultural, Finance, Insurance Services	539	45.2%
54 - Professional, Scientific and Technical Services	4,143	10.5%
56 - Administrative and Support, Waste Management and Remediation	4,315	13.2%
61 - Education	1,729	34.2%
62 - Health Care and Social Assistance	19	0.1%
71, 72 - Arts, Entertainment and Recreation	1,751	13.1%
81 - Other Services (except Public Administration)	18	0.2%
91 - Public Administration	2,030	10.3%
Total	32,341	12.5%

6. Discussion

6.1 2016 Results compared to earlier trends

This report is based on a survey completed in 2016. It marks a watershed moment and not the first course correction in the history of ECO Canada Labour Market Information (LMI) research.

The 2016 survey is the most recent in the Profile of Canadian Environmental Employment series, and follows 2013, 2010, 2007, 2003, 1999 and 1993 publications.

When ECO Canada began its work in the mid-1990s, there was no commonly-accepted definition of “environmental employment”. The “environmental good and services sector”, based on products and services which clearly impacted the physical environment, was familiar. But no systematic way of identifying and measuring persons whose work impacted the physical environment, no matter what products and services they provided or used, had been developed.

Since 1993, ECO Canada's understanding of what goes to make up “environmental employment” has shifted and evolved more than once based on experience and learning.

- As noted, in the early 1993 time frame, ECO Canada understood “environment employment” as working within an industry defined by provision of “environmental goods and services”.
- Fast forward to the 1999 and 2003 reports. ECO Canada had found the “goods and services” definition too narrow because it left out the many persons who worked outside the environmental “good and services” industry but whose work definitely had a positive impact on the environment.

After extensive industry consultation, ECO Canada broadened its LMI research to “environmental practitioners”, understood as anyone who performed work activities that contributed to “protection, conservation, communications, research and education” about the environment.

- Fast forward to 2007. ECO Canada had learned that the “practitioner” definition had set the bar too low in terms of what most people would consider “environmental employment”. The definition was classifying many people as “environmental practitioners” when their contribution to environmental practice was minor.

So ECO Canada created a new understanding of “environmental employee” as someone who spent at least 50% of their working time on environmental activities.

- Fast forward to 2010 and 2013. ECO Canada again made a change by differentiating between persons who spent any amount of their worktime on environmental activities and persons who spent at least 50% of their worktime on environmental activities, calling them “environmental employees” and “environmental professionals” respectively (this 2010 and 2013 definition of “environmental professional” was the same as the 2007 definition of “environmental employee”). The surveys now reported data on two kinds of Environmental workers – “Employees” and “Professionals”. As well, by 2010, ECO Canada was identifying “environmental activities” as ones which contributed to Protecting, Managing and Sustaining the environment according to the ECO Canada's Sector/Sub-Sector model.

- Fast forward to 2016:

- ◊ By then, ECO Canada had started to use a new form of LMI based on computer-analysis of information in posted job ads (called “JPA” or Job Posting Analysis). Job ads which contained language parallel to the ECO Canada NOS (“National Occupational Standards”, competencies which form standards for environmental work) were classified as advertising an “environmental” job.

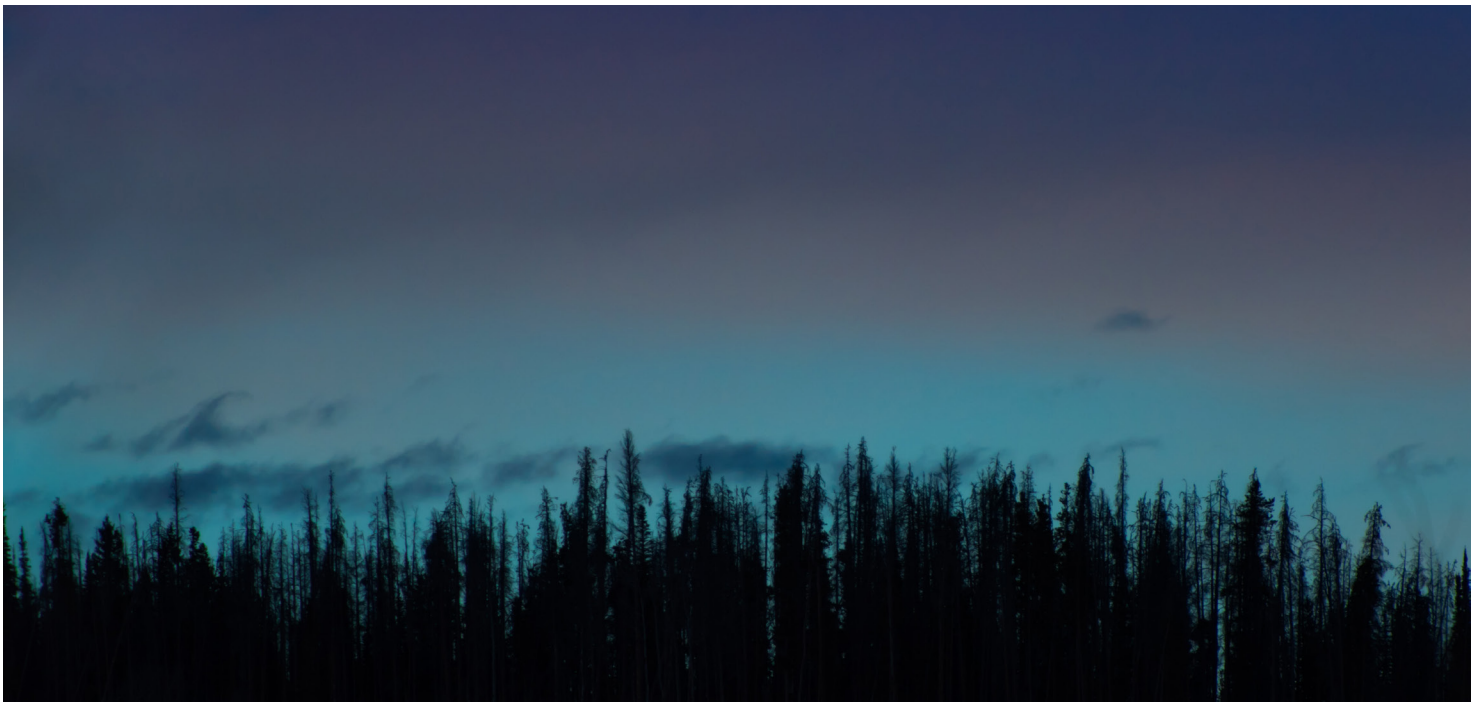
Because these competencies were mentioned in job ads, ECO Canada assumed that special skills and training for them were needed. These jobs were therefore classified as “core” environmental jobs. JPA was becoming very useful as a companion to traditional survey-based labour market research; ECO Canada was becoming more and more comfortable with the concept of “core” jobs.

- ◊ There was evidence from several sources that “environmental work” was starting to become more specialized, a phenomenon referred to as the “Mainstream” theory. The theory says that a decade ago, many activities which were then thought of as “environmental” have become commonplace or “mainstream” today. Example, recycling. There was a time when the person doing the office recycling would have been identified by survey respondents as an “environmental worker”; today, recycling is mainstream and would not be so identified. The likely consequence then is that the measured numbers of “environmental workers” would decrease because people just don’t think of them as “environmental”. On the other hand, if the surveys pushed to define “recycling” as environmental work, the measures of environmental employment quickly become unrealistically inflated.
- ◊ ECO Canada was also aware that the economic downturn of 2015 would surely affect environmental employment but the degree was unknown.
- ◊ Faced with the double needs to align the 2016 wave with the earlier waves in the interests of tracking environmental employment, but on the other hand, to respect and capture changes in measurement methods and the industry, ECO Canada proceeded with a national survey of businesses, similar to the earlier waves, but reported data only on Environmental Professionals. The reason for reporting only on Environmental Professionals was the assumption that they would be closer to “Core” workers than the Environmental Employees coincident with ECO Canada moving towards a focus on Core workers.

As expected, due to the revised focus on reaching Core Professional workers, the environmental employment figures obtained in the 2016 survey were lower than obtained in previous waves. Even though the profiles of workers were not dissimilar from earlier surveys, the measured size of the employment sector has decreased, and it declined to a level below what would be predicted by the "mainstream" theory.

ECO Canada believes that the additional reasons for the lowered numbers include:

- The economic slowdown in 2015-16, which may have had a compound effect by impacting employment more with small-to-medium employers than with large employers. Mergers and acquisitions often increase in economic downturns. This would have shifted environmental employment towards large corporate employers which are traditionally difficult to reach in surveys and therefore the impact of missing data would have been greater.
- Possible seasonal effects.
- Minor issues due to changes to Statistics Canada definitions of "business establishment" in 2014 which may have affected the national statistics and/or randomization issues



6.2 Predictions for Future of the Canadian Environmental Workforce

ECO Canada believes that changes to the Canadian business structure of environmental employment are now visible and still in their infancy but will surely grow. We see first-hand the entrepreneurial growth and opportunity for professionals to make a difference.

The future growth and development of Environmental Employment will take shape from the confluence of two main factors identified in this analysis.

ECO Canada predicts that:

- As the Canadian economy strengthens, environmental employment will also continue to strengthen
- However, as predicted by the mainstream theory, the understanding of the environmental employment sector will move in the direction of specialized occupations which have direct impact on the environment

ECO Canada believes that technology will ultimately impact the environmental employment sector, although the impacts may be mixed and are not yet obvious.

6.3 Short-term Opportunities for the Environmental Workforce

The 2016 survey affirms yet again the importance of education for Environmental Professionals. 60% of those employed today have post-secondary education. Occupations which employers have difficulty filling are highly skilled technical jobs requiring training.

The prospects for employment in environmental work are good. Even during economic slowdown as in the time of this survey, very few employers projected staff decreases. Most projected their workforce to at least stay steady with about 1 in 3 employers in small-to-medium establishments projecting increased employment in the next 24 months. Retirements, which are projected to be between 35,000 and 55,000 over the next 10 years, will drive a need for replacement labour.

Targeted training and support programs could increase the modest proportions of Indigenous and recent immigrant participants amongst Employment Professionals (6.3% and 2.8% respectively).

6.4 ECO Canada LMI Directions

ECO Canada is in the process of developing new methods of conducting its LMI research. We intend to use this 2016 survey as a new baseline leading to an era of change in environmental employment and in measurement of environmental employment.

To cover the wide range of stakeholders, future ECO Canada labour market information will need to capture the wide, “macro-level” patterns and be able to explain them. But it will also need to drill down to “micro-level” patterns of key industries or occupations to stay leading-edge in environmental industry knowledge.

ECO Canada's mandate is to produce labour market information useful to government, business, academic and labour force stakeholders.

ECO Canada intends to:

- Continue to produce macro-level, Canada-wide environmental employment estimates in the Profile of Canadian Environmental Employment survey series and Supply/Demand projective statistical models
- Simultaneously build up micro-level, direct knowledge of Core employment in specific industries through alternative forms of measurement and engagement such as Job Posting Analysis, trends identification, and industry case studies and consultation, which will improve capacity to produce granular results and to adjust macro data when unusual circumstances arise.
- Continue the path of moving away from the definitions of Environmental Employee as “any amount of worktime to protect, manage and sustain the environment” and Environmental Professional as “≥50% of worktime to protect, manage and sustain the environment” in favour of researching Core Workers in jobs requiring specialized skills and training.





Appendix: Design of the 2007 to 2016 Surveys

A.1 Design

Figure 2 illustrates the design of the surveys from 2007 to 2016.

There are 4 steps to the design.

Step 1

The surveys start with a sample of contacts of Canadian business establishments; these are available from several sources, both from the Canadian federal government and from the private-sector. The samples have varied from survey to survey. On occasion, the initial surveys have been topped-up with a special sample of establishments known to have many environmental members in order to increase response rates and improve the efficiency of these very costly surveys. **Block A1.**

Contact is established with the business establishment, and questions identify whether or not the firm employs environmental workers who Protect, Manage or Sustain the physical environment. **Block B1.**

For those firms who do employ environmental workers, questions identify whether (and how many) workers are classified as “Environmental Employees” (any amount of time spent on environmental tasks) or “Environmental Professionals” (50% or more of time spent on environmental tasks); supplementary information is also obtained. (The extent of information gathered about either “Environmental employees” and/or “Environmental professionals” has varied from survey to survey). **Blocks C1, D1 and E1.**

Step 2

Because the original sample may have been skewed towards environmental employers, normally, various statistical techniques or adjustments are used to align the distribution of the sample to known parameters of Canadian business establishment. This may mean excluding “top-up” sample results from some calculations or statistically weighting the initial sample to align with Canadian business distributions.

The factors used to attribute weight for the different surveys can vary and ideally would include company size, industry and geographic location. For the 2016 survey, these three factors were applied in weighting. The original survey results are adjusted to align with the weighted sample; the survey measures based on an adjusted or weighted sample are reported. **Blocks B2, C2, D2 and E2.**

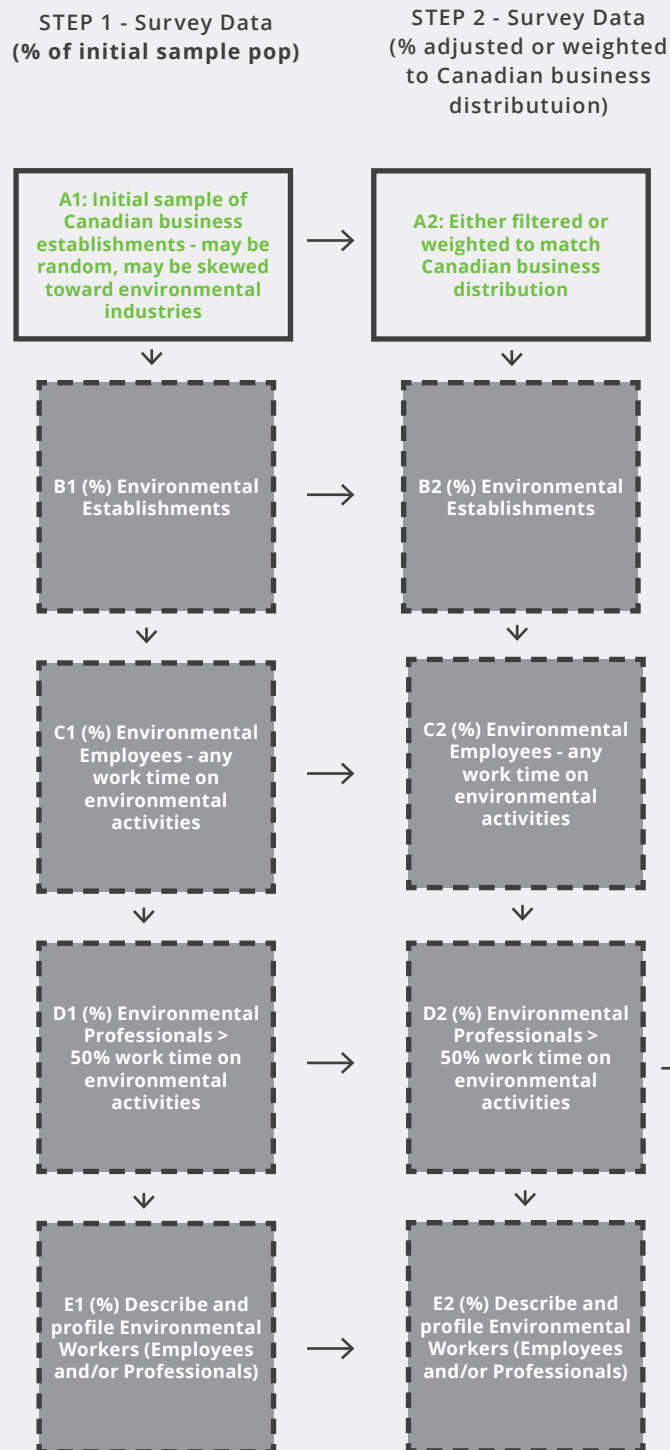
Step 3

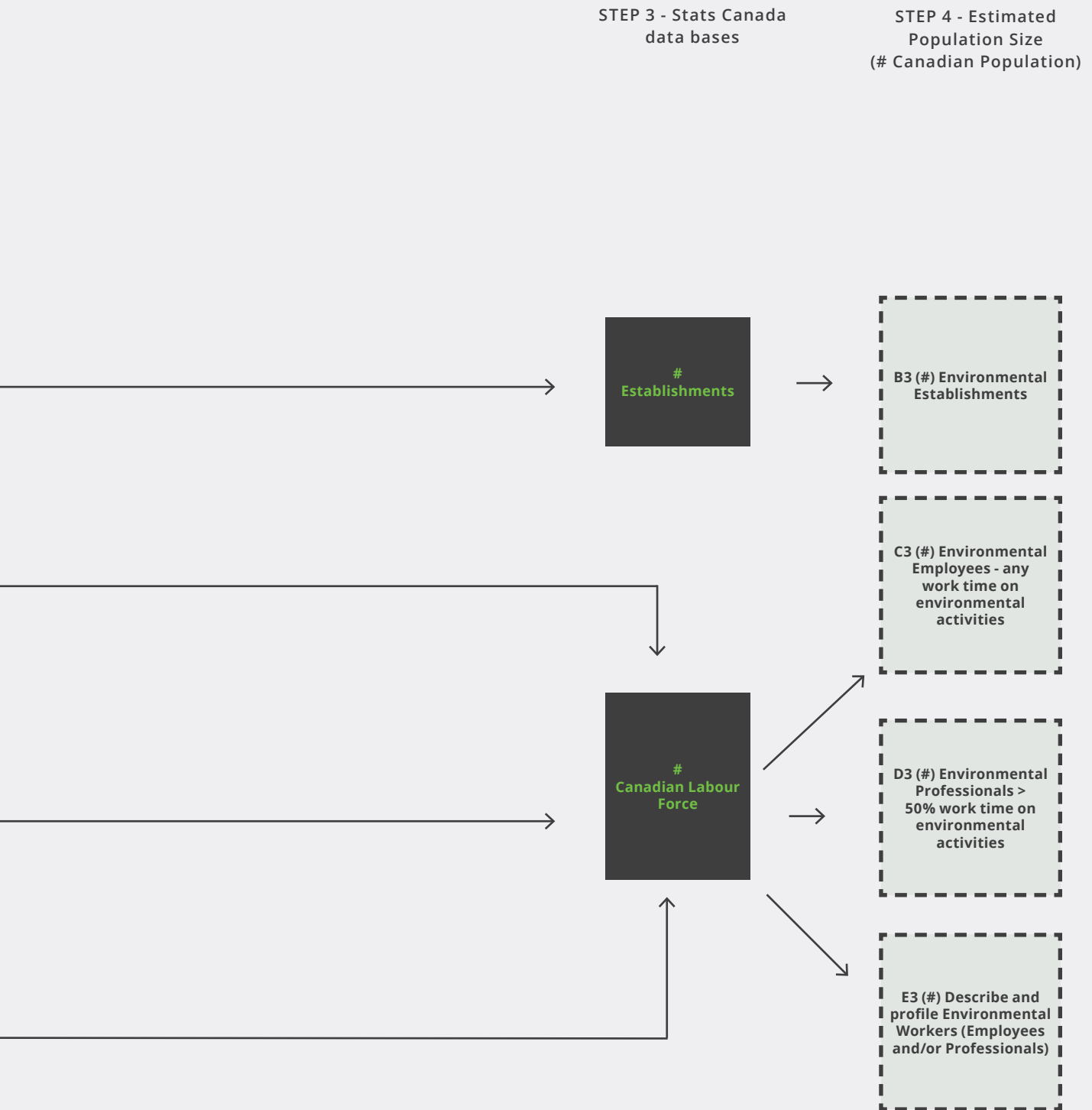
The survey results based on adjusted or weighted data are then applied to Canadian base statistics to produce estimates of absolute numbers.

Step 4

The absolute number estimates are reported. **Blocks B3, C3, D3 and E3.**

Figure 2 - Detailed Survey Design





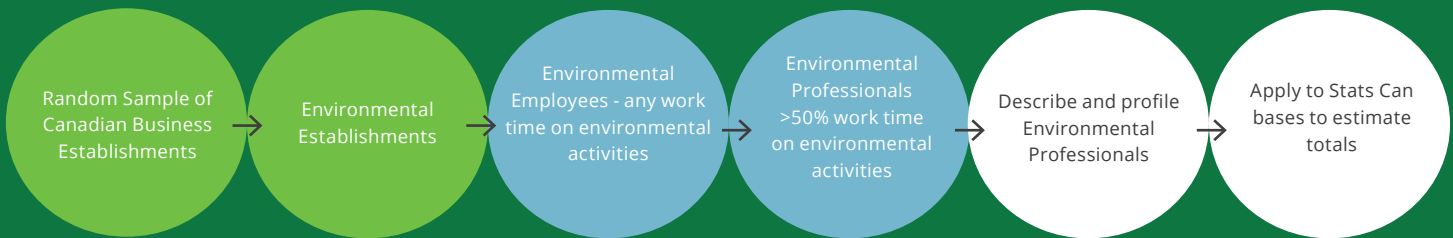
A.2 2016 Survey

Survey Design

The survey design called for a sample of Canadian business establishments within which Environmental Establishments would be identified.

Estimates of numbers of staff classed as “Environmental Employees” and “Environmental Professionals” would be gathered, following which descriptive information on the “Environmental Professional” staff would be gathered².

Figure 3 - Abbreviated Survey Design



² A more detailed diagram of the methods is shown in Figure 2 – Detailed Survey Design

Sampling

A detailed sample plan was developed to ensure a balanced mix of the population of employers based on province, company size and industry within which they operate. Nested quotas were set for province and company size within North American Industry Classification System (NAICS) codes.

Consistent with earlier PCEE surveys, sampling is based on establishments (i.e. specific physical location for a business) meaning that each location for a company with multiple locations could be randomly selected for participation in the study.

Initial oversampling was applied within specific industries when prior information indicated they would have a high incidence numbers of environmental establishments³.

The sample frame (i.e., records from which the sample was selected) was obtained from a combination of random sampling from the InfoCanada business directory together with supplementary sampling for the oversampled NAICS codes from both InfoCanada and the Industry Canada website. The two sample sources in combination resulted in a total of 61,371 sample records acquired.

Questionnaire Design

Similar to previous iterations of this research, the 2016 survey of Canadian employers was comprised of both short-form and long-form questionnaires.

The short-form questionnaire screened for business establishments which employed staff who spent any amount of time on environmental activities, defined as,

Environmental employment is any activity associated with:

- *Environmental Protection (e.g. air, water and land quality, waste management, restoration and reclamation, human and environmental health and safety, carbon and climate change mitigation, and environmental protection management);*
- *Resource Management (e.g. fishery, wildlife, forestry, sustainable agriculture, energy efficiency, alternative or renewable energy, parks and natural reserves, and natural resource management);*
- *Environmental Sustainability (e.g. education, research and development, policy and legislation, communications and public awareness, and sustainable development);*
- *Other environment related activities.*

³ Oversampled NAICS included: 11251 – Aquaculture; 221122 – Electric Power Distribution; 2213 – Water, Sewage and Other Systems; 5413 – Architectural, Engineering and Related services; 54162 – Environmental Consulting Services; 5417 – Scientific Research and Development Services; 562 except 56291 – Waste Management and Remediation Services, except Remediation Services; 56291 – Remediation Services; 71213 – Zoos and Botanical Gardens; 71219 – Parks and Other Similar Institutions

Business locations screened in at this stage were classified as “Environmental Establishments”.

For Environmental Establishments, further screening questions asked for the number of staff who spent any amount of their working time on environmental activities (classified as “Environmental Employees”) and the number of staff who spent >50% of their working time on environmental activities (classified as “Environmental Professionals”).

Respondents with Environmental Professionals on staff then received a long-form interview asking many other questions to profile the establishment being surveyed and the Environmental Professionals. The full questionnaire was broken up into six sections:

Figure 4 - Questionnaire Design

Section	Questionnaire Type
Screening	Short Form
Section A - Employer Establishment Profile	Long form
Section B - Environmental Professional Profile	
Section C - Future Growth & Demand	
Section D- Special Sub-sector Details (only some; supplementary to main study) ⁴	
Section E- Closing	

⁴ Establishments with environmental professionals in 6 of the 14 ECO subsectors received special additional questions for use in a separate ECO study procedure, not reported in this document.

Data Collection

All potential respondents were initially contacted via telephone to participate in the study. Trained research interviewers followed a standardized script informing potential respondents of the study sponsor and the purpose of the study, and asked to speak with the individual in charge of hiring and employee management such as a Human Resources Manager, Owner or General Manager. Once the target respondent was reached, screening for Environmental Establishments and Environmental Professionals took place.

Because the questionnaire could become very lengthy for large employers that had several Environmental Professionals on staff, or if the respondent wished to end the call for any reason, the telephone interviewers offered the option to complete the remainder of the questionnaire online.

Data were collected from October 30th, 2015 to March 18th, 2016, with some additional data collected for specific industries in April 2016.

Telephone interviews were conducted in either French or English at the choice of the respondent, and the online version was available in both English and French.

Out of the initial sample frame of 61,371 records, attempts were made to contact 47,103 establishments. 6,879 surveys were completed (all short-forms fully completed and most long-forms fully completed) for an overall response rate of 14.6%.

The majority of survey completions were from establishments with 99 employees or fewer.

Table 18: Sample Completions by Establishment Size (Unweighted)

Establishment Size (employees)	Survey Completions	% of Sample
Small (1-99)	6,158	89.5%
Medium (100-499)	541	7.9%
Large (500+)	180	2.6%
Total	6,879	100.0%

Source: ECO Canada 2016 Survey of Environmental Employers

Survey completions were obtained in all provinces and territories.

Table 19: Sample Completions by Province (Unweighted)

Province	Survey Completions Distribution	% of Sample
BC	1,108	16.1%
AB	1,238	18.0%
SK	401	5.8%
MB	351	5.1%
ON	1,623	23.6%
QC	940	13.7%
NB	287	4.2%
NS	299	4.3%
PE	138	2.0%
NL	188	2.7%
YT	119	1.7%
NT	120	1.7%
NU	67	1.0%
Total	6,879	100.0%

Source: ECO Canada 2016 Survey of Environmental Employers

Data Weighting

Due to oversampling of specific NAICS and given that some of the quotas were adjusted mid-field to compensate for slow returns, the raw data were weighted to match the known distributions of the overall Canadian business population.

Classification into ECO Sub-sectors

Some tables in this report will show the Environmental Professionals classified according to the ECO Canada's sub-sectors in which they work. Figure 1 shows the ECO Canada's sectors and sub-sectors.

Figure 1: ECO Canada's Sector/Sub-Sector Model (2016)



The classification of Environmental Professionals into sub-sectors is based upon questions asked during the survey, and did not form part of the sample selection or screening.





This project was funded by the Government of Canada's Sectoral Initiatives Program.
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ECO Canada (2017).
Profile of Canadian Environmental Employment

Labour Market Research.
Environmental Careers Organization of Canada.

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