# eco canada

# Environmental Job Market Trends in Canada 2014-2017

August 2018

Canada

## About 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 gathers and analyzes skill and labour market trends within the environmental profession and provides up-to-date, timely and relevant data and insights that can be applied in policy, business, and educational contexts. The complete collection of reports is available at eco.ca.

ECO Canada is moving away from large multifaceted surveys as its primary source of labour market information and is examining new ways of measuring environmental employment:

- Job posting analysis or real-time LMI to identify hiring trends and skills in demand.

- Exploring demand and supply using secondary statistics, such as Statistics Canada and the Canadian Occupational Projection System. Economic growth factors are also factored in to create a demand forecast for environmental employment.

- Sub-sector profiling with in-depth research on trends and issues driving growth or decline.

ECO Canada welcomes comments and discussion of all its LMI reports. Contact research@eco.ca

## Acknowledgements

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# 1. Synopsis

Real-time job ad data is based on the analysis of millions of job ads posted every day by employers. Bots scan the Internet to collect job ad postings, and a software then extracts top-line information about each one, identifying "environmental jobs" as those requiring specialized environmental skills and training. The environmental ads or jobs are also classified according to ECO Canada's Sub-Sector Model (see Figure 1), which are profiled in greater detail through the National Occupational Standards (NOS). Environmental job ads are also mapped to the National Occupational Classifications (NOC) used by Statistics Canada, and to job location. The scope consists of posted English-language ads in Canadian locations from 2014 to 2017[1].

The analysis of job postings has many uses. The real-time nature of job ad data allows for the early detection of labour demand trends, such as hiring sectors, and skills in demand. Job ad data are leading indicators of employment changes to come.

Data and analysis revealed the following trends:

## Environmental Trends Indicate Positive Outlook

– SECTOR A –
**ENVIRONMENTAL PROTECTION**

1. Air Quality
2. Water Quality
3. Site Assessment & Reclamation
4. Waste Management
5. Health & Safety

– SECTOR B –
**RESOURCE MANAGEMENT**

1. Energy (Efficiency & Renewables)
2. Fisheries & Wildlife
3. Natural Resource Management

**ENVIRONMENTAL MANAGER**

– SECTOR C –
**ENVIRONMENTAL SUSTAINABILITY**

1. Sustainability
2. Education & Training
3. Research & Development
4. Policy & Legislation
5. Communications & Public Awareness

**Figure 1: ECO Canada's Sector/Sub-Sector Model**

The environmental job market rebounded in 2017 with 22.7 thousand job ads, reflecting a 9% increase from 2016 levels. On the other hand, total job ads peaked in 2014 at 1.30 million, decreased to 1.07 million by 2016 (a drop of 18%) and slightly dipped in 2017 with 1.05 million job ads, reflecting a 2% decline.
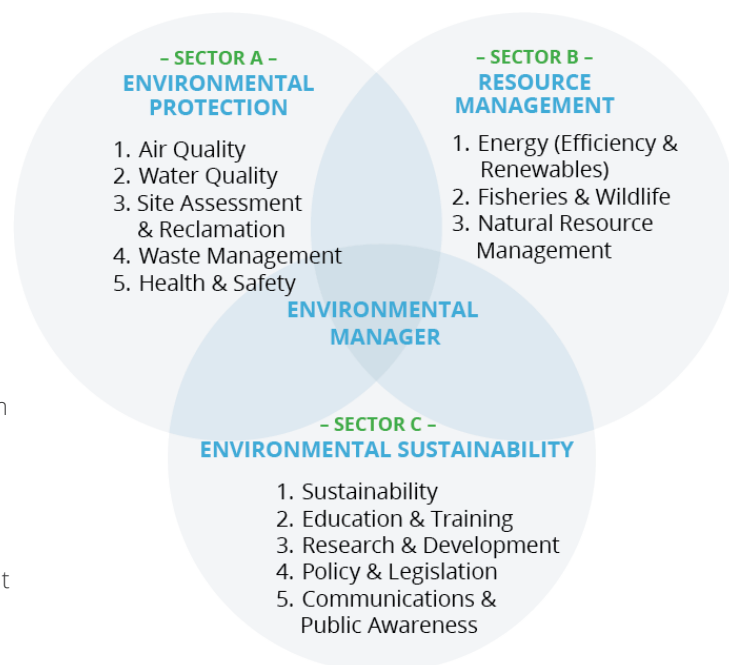
**Table 1: Number of English-language Job Ads in Canada, Total vs. Environmental, 2014 - 2017**

| Job Ad Type | 2014 | 2015 | 2016 | 2017 | % change from 2016 |
|---|---|---|---|---|---|
| Total job ads | 1,302,800 | 1,116,600 | 1,070,700 | 1,050,100 | -2% |
| Environmental job ads | 29,100 | 23,300 | 20,900 | 22,700 | +9% |
| % of environmental to total job ads | 2.2% | 2.1% | 2.0% | 2.2% | |

This growth was likely the result of:

·   Employment increases within key industries that employ a number of environmental workers, which includes professional, scientific and technical services

·   Resurgence in goods-producing sectors such as manufacturing, construction, and energy[2]

·   Provincial governments implementing climate change plans

[1]  Caution is warranted when analyzing provincial job ad numbers since French-language only job ads are not scraped and therefore, job ad numbers may be understated for Quebec and New Brunswick.

[2]  Annual review of the labour market, 2017. Statistics Canada, April 2018.

## High Growth in Key Regions

Ontario, Alberta and British Columbia are the provinces that have consistently shown the most demand for environmental professionals between 2014 and 2017.

- Ontario continued to hold the top spot with the highest share of Canadian environmental job ads in 2017 (41%)

- BC is in second place with 22%

- Alberta earned the third place with 17%

**Figure 2: Number of English-Language Environmental Job Ads by Province, 2017**



Alberta saw the highest increase in environmental job ads from 2016 to 2017 with a 20% increase or 650 more job postings. In British Columbia, the number of environmental job postings grew 13% while Ontario experienced a minor decrease of around 2%.

Nova Scotia (+61%), Saskatchewan (+53%) and Newfoundland and Labrador (+49%) saw the highest growth rates in the number of job ads from 2016 to 2017.

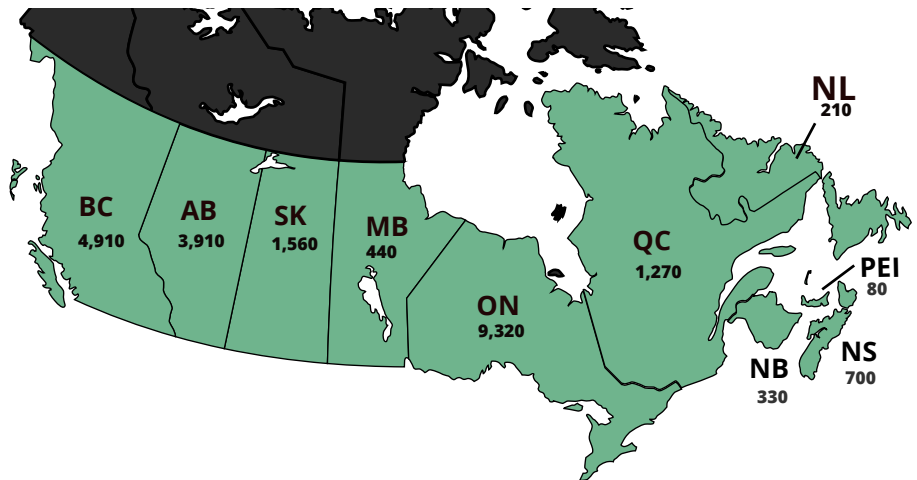## Fastest Growing Occupation: Managers in financial and business services

Managers in financial and business services had the highest job ad growth rate with close to 30%, from 1,090 job ads in 2016 to 1,410 in 2017. Agriculture/horticultural workers, technical inspectors/regulatory officers and engineers, with an environmental function attached to the roles, remained the most sought-after positions with 2,870, 3,020 and 2,110 job ads in 2017 respectively.

## Top 5 Environmental Areas of Practice Experienced Job Recovery in 2017

The top five environmental ECO Canada sub-sectors, based on the number of job ads, all experienced job market recovery from 2016 to 2017:

- Natural Resource Management (2% increase in job ads from 2016 to 2017)

- Environmental Health and Safety (6% increase)

- Waste Management (13% increase)

- Water Quality (7% increase)

- Energy Efficiency (13% increase)

The job ad data for 2017 indicates that a job market recovery is underway for Canada's environmental sector. This data supports ECO Canada's projections in its Canadian Environmental Employment: Supply and Demand report (September, 2017), where environmental employment was expected to rebound in 2017 after experiencing a downturn that began in late-2014. In the report, projections indicate that 90,000 additional jobs will be created by 2024.
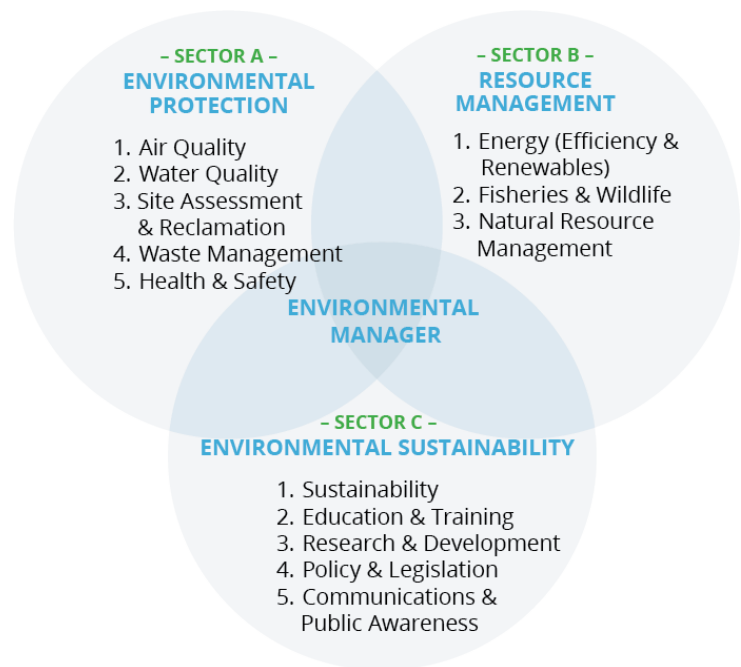
# 2. Introduction

## 2.1 ECO Canada Labour Market Information (LMI)

ECO Canada has long defined environmental work as falling into three key areas: Environmental Protection, Resource Management and Environmental Sustainability. Within each area are sub-sectors or sub-categories, such as Air Quality, Fisheries & Wildlife, and Education & Training, which relate to specific functions or disciplines of environmental work. This framework is referred to as the ECO Canada Sector/Sub-Sector Model (see figure 3).

The sub-sectors are distinguished by a set of competencies identified by ECO Canada in consultation with subject matter experts. The competencies collectively make up the National Occupational Standards (NOS) for environmental work.

The environmental sector has evolved over the years and so have definitions of the environmental workforce. Currently, ECO Canada defines environmental workers as those who work in occupations requiring specialized environmental skills and training, wherein the skills directly relate to ECO Canada's NOS.

**– SECTOR A –**
**ENVIRONMENTAL PROTECTION**

1. Air Quality
2. Water Quality
3. Site Assessment & Reclamation
4. Waste Management
5. Health & Safety

**– SECTOR B –**
**RESOURCE MANAGEMENT**

1. Energy (Efficiency & Renewables)
2. Fisheries & Wildlife
3. Natural Resource Management

**ENVIRONMENTAL MANAGER**

**– SECTOR C –**
**ENVIRONMENTAL SUSTAINABILITY**

1. Sustainability
2. Education & Training
3. Research & Development
4. Policy & Legislation
5. Communications & Public Awareness

**Figure 3: ECO Canada's Sector/Sub-Sector Model**

Statistics Canada defines occupations using the National Occupational Classification (NOC) system. The NOC system classifies similar jobs according to the scope of work performed by workers who typically share similar job duties, competencies, skills, knowledge, training and education. This framework serves to standardize labour force data to make it consistent, comprehensive and comparable.

Environmental employment based on the NOS classifications does not align precisely with employment based on the NOC codes[3]. As an example, environmental geologists, hydrologists, and mineralogists are grouped under NOC 2113 along with geoscientists and oceanographers, petroleum geologists, paleontologists and many more.

ECO Canada conducts labour market research using survey data, secondary statistics from large government databases and Job Posting Analysis (JPA) data. Recent developments in JPA methods allow us to compute a form of relation between NOS and NOC employment data.

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[3] There are 500 occupational unit groups at the four-digit NOC code. See NOC Structure.

## 2.2 ECO Canada JPA Data

ECO Canada began performing JPA data collection and analysis in 2013. During that pilot year, algorithms based on keywords, key phrases and more advanced artificial intelligence techniques were developed to identify and classify environmental job ads. Starting in 2014, new job ad sources were added to the "scraped" universe. Since 2014, the universe of "scraped" sources has remained relatively constant.

## 2.3 How to Use ECO Canada JPA Data

Job ads provide valuable information about trends and hiring processes, which are useful to:

- Job seekers – data says where the jobs are, what skills are in demand and which companies are hiring.

- Employers – get insights into which skills are transferable and when supply is short.

- Policymakers – JPA provides real-time data that shows early detection of labour demand trends and leading indicators of the direction of the economy.

- Academic planners – JPA helps them stay up-to-date regarding the environmental sector's workforce needs.

- Researchers – JPA is a way to link NOS to NOC classifications for environmental jobs.

The environmental LMI numbers in this report are based on job ads. Because jobs may be advertised and not filled, or some jobs may never be advertised at all, or the turnover rates in some occupations are higher than others, job ad data needs to be supplemented by primary and secondary research to fully explain employment and job trends.

## 2.4 Scope of this Report

This report covers JPA data from 2014 to 2017[4].

The job scraping engines currently used by ECO Canada capture only English-language ads in Canada. This will distort some of the results by province and will likely understate the numbers of job ads in certain jurisdictions (e.g., Quebec). Except for the table in the Appendix, all numbers presented in this report have been rounded for readability.

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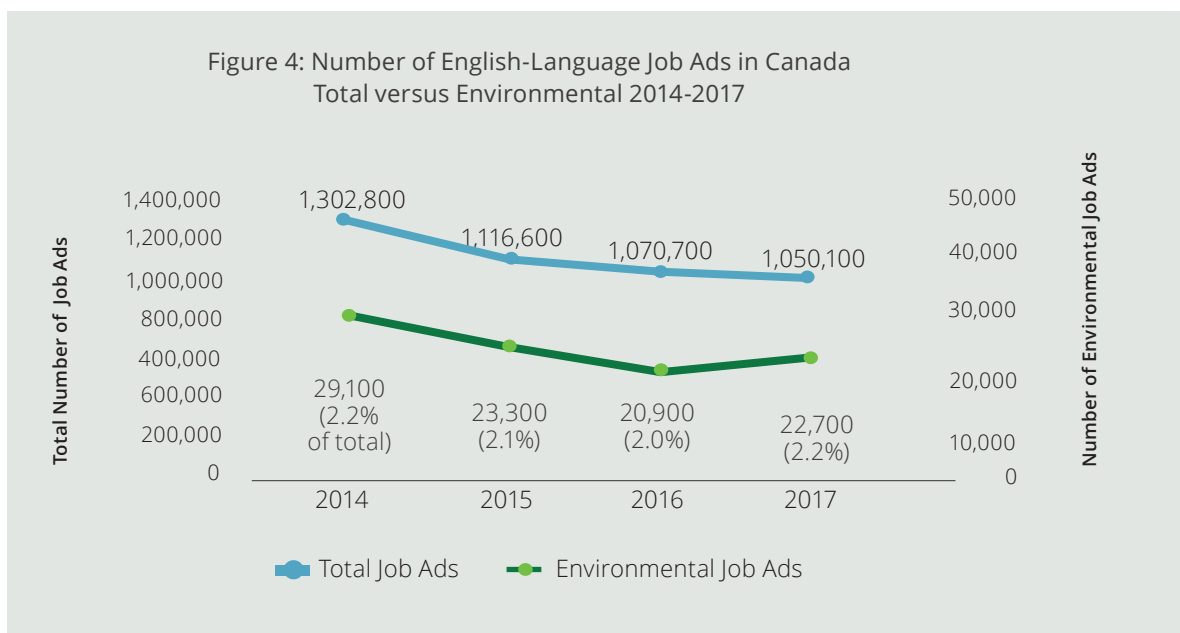[4] ECO Canada's first report Canadian Environmental Job Posting Trends (February 2018) included ads from 2013.

# 3. Environmental Job Market Findings

## 3.1 Environmental Jobs Recovered at a National Level in 2017

Between 2016 and 2017, the total number of English-language job postings was little changed while environmental job postings increased, resulting in a higher ratio of environmental to total job ads.

Detailed findings between 2014 and 2017 indicate that:

- Environmental job ads peaked in 2014 at 29,100, decreased to 20,900 by 2016 (a drop of 28%), and increased to 22,700 in 2017 (+9%)

- Total job ads peaked in 2014 at 1.30 million, decreased to 1.07 million by 2016 (-18%) and slightly declined in 2017 at 1.05 million, reflecting a 2% decrease

- The proportion of environmental job ads to total job ads increased from 2.0% in 2016 to 2.2% in 2017, matching 2014 shares (2.2%)

Figure 4: Number of English-Language Job Ads in Canada
Total versus Environmental 2014-2017

Following a peak in 2014, environmental job ads mirrored total job ads in their decline to 2016. This decrease was in part the result of job losses from the economic downturn that a few provincial economies experienced in 2015-16. However, by 2017, economic recovery had begun. The Canadian economy had added 336,500 jobs[5] from 2016 to 2017. Job vacancies and wages also improved compared to 2016. Improvement in economic conditions not only helped total employment in Canada, but also had an impact on environmental jobs[6]. Environmental job ads increased 9% from 2016 to 2017.

Apart from the general growth in the Canadian economy, the rise in environmental job ads was likely driven by specific trends. In 2017, employment grew in key sectors that hire environmental workers such as professional, scientific and technical services, manufacturing and construction. Employment in the energy sector also recovered slightly. Two provincial economies, Ontario and Alberta, saw environmental programs come into force in 2017, which may have resulted in more environmental job openings for Canadians. For example, Alberta's carbon tax kicked off on January 1st 2017[7]. The increase in environmental job ads from 2016 can also be attributed to diversity in the country's energy sector. Canadian businesses and governments have been increasingly focused on diversifying the energy sector and investing in more sustainable and environmental technologies. These trends may have also given a slight boost to the number of environmental jobs available in 2017.



[5] Annual review of the labour market, 2017. Statistics Canada, April 2018.

[6] Although the number of English-language job ads in Canada decreased by 2% from 2016 to 2017 while employment in Canada increased by 2% for the same period, it is important to note that not all job openings are posted or advertised online. Job ad data analysis would need to be supplemented with primary and secondary research to fully explain trends in different occupations and jurisdictions.

[7] Alberta's carbon levy and rebates

# 3.2 Environmental Job Growth Rate in 2017 Higher than the National Average for Many Provinces

Total job ads in Canada increased by 9% from 2016 to 2017.

Recovery is evident from 2016 to 2017 for the three provinces that post the most English-language environmental jobs:

- Ontario stayed virtually the same in 2017 over 2016 with a 2% decrease

- Alberta increased by 20%

- British Columbia increased by 13%

The highest increases of 2017 over 2016 are:

- Nova Scotia (+270 jobs ads or 61% increase)

- Saskatchewan (+540 jobs ads or 53% increase)

- Newfoundland and Labrador (+70 job ads or 49% increase)

The differing natures of the provincial economies explain why some provinces follow the national pattern of increased environmental employment from 2016 to 2017 while others do not.

## 80% of English-language environmental job opportunities are in 3 key regions

The three provinces that consistently posted the most English-language environmental job ads from 2014 to 2017 are:

- Ontario (9,320 job ads or 41% share of total job ads in 2017)

- BC (4,910 or 22% share)

- Alberta (3,910 or 17% share)

The fact that these three rank among the top provinces for environmental job ads is not surprising given the gross domestic product (GDP), population, labour force size, and total land area of each province.

Ontario has a more diversified economy, which is why its environmental job ad curve appears steadier or aligns with national trends. Although the number of environmental job postings in the province has been on the decline since 2014, the number of job ads in 2017 was virtually unchanged from 2016.

In Alberta, given the 2017 uptick in economic activity in the province's energy sector, even if not a full return to earlier years, it's not surprising to see the national increasing environmental job ad curve resemble Alberta's. The region continues to post a relatively high percentage of environmental job ads out of all environmental jobs advertised in the country. In 2017, the share of the province's energy sector, as a percentage of Gross Domestic Product (GDP), grew four percentage points and represented about 25%[8] ($74.2 billion[9]) of the province's GDP. Alberta is highly sensitive to the volatile nature of energy prices, and that means so are environmental positions—the decline from 2014 underscores this. The mild resurgence in the oil and gas sector and the implementation of the province's Climate Leadership Plan have likely resulted in a greater number of environmental jobs posted in Alberta in 2017.

British Columbia showed growth in the number of environmental job ads due to **government-backed infrastructure projects increasing agriculture employment, land-use studies and consultation work around pipelines.**
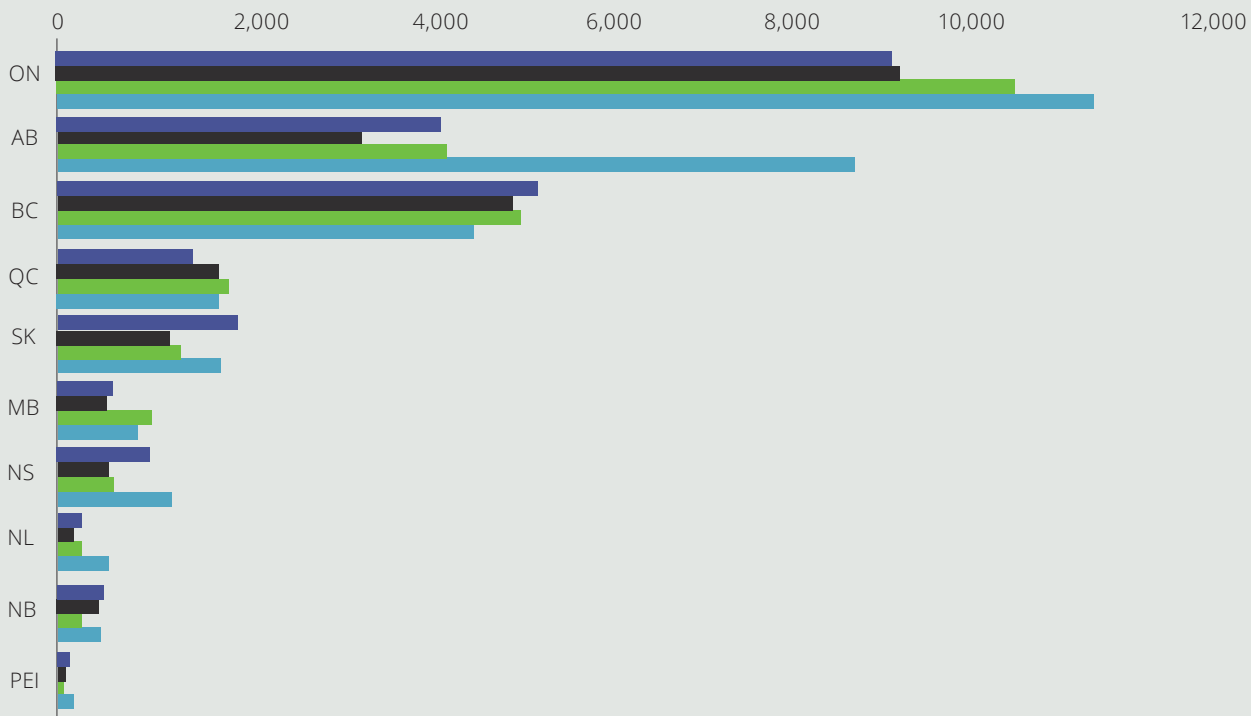
Figure 5: Number of English-Language Jod Ads by Province, 2014-2017



| Year | | PEI | NB | NL | NS | MB | SK | QC | BC | AB | ON |
|------|---|-----|-----|-----|-----|-----|-------|-------|-------|-------|--------|
| ■ | 2017 | 80 | 330 | 210 | 700 | 440 | 1,560 | 1,270 | 4,910 | 3,910 | 9,320 |
| ■ | 2016 | 60 | 240 | 140 | 430 | 430 | 1,020 | 1,550 | 4,330 | 3,260 | 9,460 |
| ■ | 2015 | 40 | 170 | 240 | 490 | 710 | 1,140 | 1,600 | 4,470 | 3,960 | 10,480 |
| ■ | 2014 | 90 | 320 | 430 | 900 | 695 | 1,510 | 1,560 | 4,030 | 8,510 | 11,040 |

## 3.3 Top 10 Environmental-Related Occupations Continue to Account for over 60% of Total Environmental Jobs in Canada

The top 10 occupations, which are grouped and mapped to three-digit National Occupation Classification (NOC) titles and codes, have remained consistent from 2014 to 2017, and together account for 60% of environmental job ads.

Within the top 10 environmental-related occupations, the largest increases in job ads between 2016 and 2017 were:

· Regulatory officers and other technical inspectors (+410 job ads or 16% increase)

· Civil, mechanical, electrical and chemical engineers (+320 job ads or 18% increase)

· Managers in financial and business services (+320 job ads or 29% increase)

**Table 2: Top 10 Occupations with the Greatest Number of English-Language Environmental Job Ads in Canada, 2016-2017**

| Occupation (3-digit NOC) | Number (and % share) of environmental-related job ads | | Change from 2016 to 2017 |
| --- | --- | --- | --- |
| | 2016 | 2017 | |
| Regulatory officers and other technical inspectors (NOC 226) | 2,610 (12%) | 3,020 (13%) | +410 (+16%) |
| Agriculture and horticultural workers (NOC 843) | 3,210 (15%) | 2,870 (13%) | -340 (-11%) |
| Civil, mechanical, electrical and chemical engineers (NOC 213) | 1,800 (9%) | 2,110 (9%) | +320 (+18%) |
| Managers in financial and business services (NOC 012) | 1,090 (5%) | 1,410 (6%) | +320 (+29%) |
| Life science professionals (NOC 212) | 910 (4%) | 950 (4%) | +40 (+5%) |
| Computer and information systems professionals (NOC 217) | 690 (3%) | 750 (3%) | +60 (+9%) |
| Other engineers (NOC 214) | 680 (3%) | 750 (3%) | +70 (+11%) |
| Cleaners (NOC 673) | 600 (3%) | 670 (3%) | +70 (+11%) |
| Managers in engineering, architecture, science and information systems (NOC 021) | 515 (2%) | 500 (2%) | -15 (-3%) |
| Legislators and senior management (NOC 001) | 510 (2%) | 495 (2%) | -15 (-3%) |

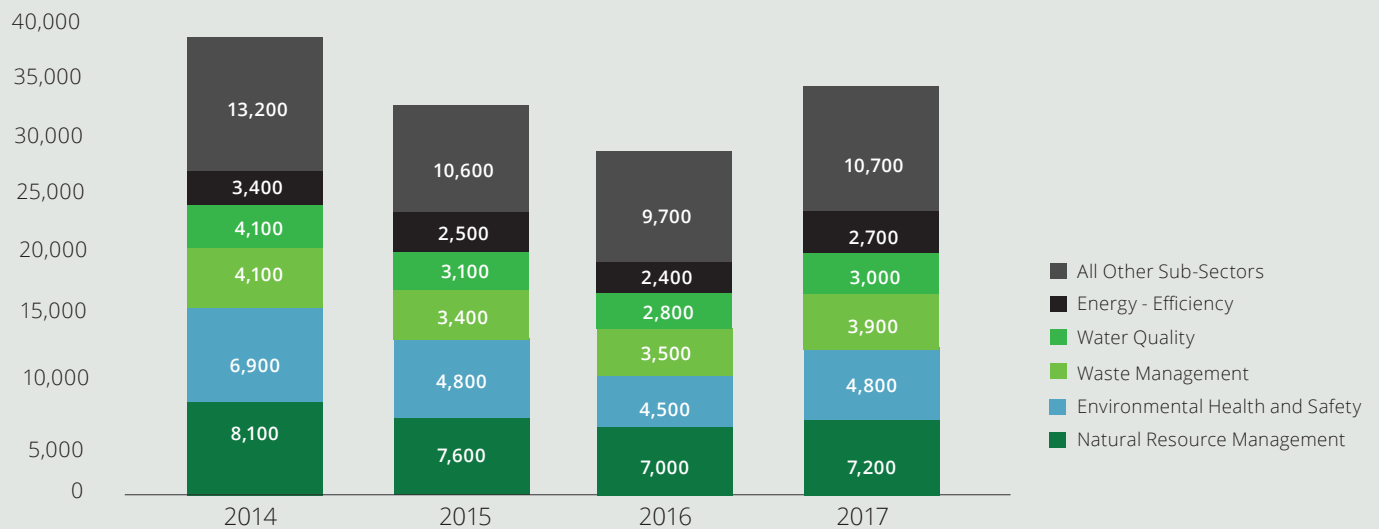*Note: Click on each link to see a description of the occupation*

# 3.4 Job Market Recovery Occurred within the Top 5 ECO Canada Sub-Sectors in 2017

The ECO Canada sub-sectors that have the highest number of English-language environmental job ads consistently from 2014 to 2017 data are:

- Natural Resource Management (7,200 job ads in 2017)

- Environmental Health and Safety (4,800)

- Waste Management (3,900)

- Water Quality (3,000)

- Energy Efficiency (2,700)

The top five sub-sectors are all linked relatively closely to Canada's energy industry, broadly defined. As noted in Section 3.2, the slight resurgence of oil and gas activity in Alberta in 2017, combined with the introduction of the province's environmental programs, has likely helped bump up the total number of environmental job ads in the province.

Figure 6: Number of Environmental Job Ads by ECO Canada Sub-Sector, 2014-2017



Note: Top five sub-sectors are detailed on this graph while the remaining are grouped as All Other Sub-sectors (refer to the Appendix for a detailed breakdown). Note that an environmental job ad may be mapped to one or more sub-sectors.

Caution is warranted in comparing the sum of the sub-sector totals to the total number of job ads reported in previous sections as an environmental job ad may be mapped to one or more ECO sub-sectors. It should be noted that this duplicate counting is removed when reporting total environmental job ads in Canada, by province and by occupation.

## Occupational Transferability Within ECO Canada Sub-Sectors

The analysis in this section starts by taking jobs from 2014 to 2017 within each ECO Canada sub-sector, one at a time, and mapping them to a NOC. The top three NOCs for each sub-sector are then selected. Finally, a chart is created, which shows the NOCs in relation to the sub-sectors in which they are one of the top three. The number of dotted cells in each row is an indication of transferability within the environmental employment sector. Managers in financial and business services (NOC 012) and Civil, mechanical, electrical and chemical engineers (NOC 213) appear to have the greatest transferability across the ECO sub-sectors.

**Table 3: Top 3 Occupations for each ECO Canada Sub-Sector based on Number of English-Language Environmental Job Ads, 2014-2017**

| Occupation (3-digit NOC) | Air Quality | Water Quality | Site Assessment & Reclamation | Waste Management | Environmental Health & Safety | Natural Resource Management | Energy - Efficiency | Energy - Renewables | Fisheries & Wildlife | Policy & Legislation | Sustainability | Education & Training | Research & Development | Communications & Public Awareness |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Managers in financial and business services (012) | | ● | ● | ● | ● | | ● | ● | | ● | ● | ● | ● | ● |
| Civil, mechanical, electrical and chemical engineers (213) | ● | ● | ● | ● | | ● | ● | ● | | ● | ● | | ● | |
| Life science professionals (212) | ● | | ● | | | ● | | | ● | | ● | | ● | ● |
| Regulatory officers and other technical inspectors (226) | ● | | | | ● | | | | | | | ● | | |
| Computer and information systems professionals (217) | | | | | | | ● | ● | | | | | | |
| Policy and program researchers, consultants and officers (416) | | | | | | | | | | | ● | | | ● |
| Other engineers (214) | | | | | ● | | | | | | | | | |
| Motor vehicle and transit drivers (751) | | | | ● | | | | | | | | | | |
| Utilities equipment operators and controllers (924) | | ● | | | | | | | | | | | | |
| Agriculture and horticulture workers (843) | | | | | | ● | | | | | | | | |
| Technical occupations in life sciences (222) | | | | | | | | | ● | | | | | |
| Managers in agriculture, horticulture and aquaculture (082) | | | | | | | | | ● | | | | | |

*Note: Click on each link to see a description of the occupation*

# 4. Appendix: Number of English-Language Environmental Job Ads by ECO Canada Sub-Sector, 2014-2017

**Table 4: Number of English-Language Environmental Job Ads
by ECO Canada Sub-Sector, 2014-2017**

| ECO Canada Sub-Sector | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|
| Air Quality | 994 | 753 | 839 | 1,025 |
| Communications and Public Awareness | 1,763 | 1,303 | 1,266 | 1,296 |
| Education and Training | 1,396 | 1,315 | 966 | 1,091 |
| Energy Efficiency | 3,417 | 2,476 | 2,411 | 2,713 |
| Energy Renewables | 1,127 | 933 | 885 | 880 |
| Environmental Health and Safety | 6,881 | 4,811 | 4,517 | 4,802 |
| Fisheries and Wildlife | 1,077 | 782 | 747 | 814 |
| Natural Resource Management | 8,138 | 7,587 | 7,048 | 7,160 |
| Policy and Legislation | 1,632 | 1,202 | 1,263 | 1,258 |
| Research and Development | 1,806 | 1,484 | 1,313 | 1,728 |
| Site Assessment and Reclamation | 1,437 | 1,089 | 967 | 1,152 |
| Sustainability | 1,942 | 1,078 | 1,497 | 1,465 |
| Waste Management | 4,107 | 3.440 | 3,461 | 3,907 |
| Water Quality | 4,059 | 3,196 | 2,792 | 2,977 |

# 5. ECO Canada JPA Publications

ECO Canada first analyzed job posting data from 2013 to 2016 in a preliminary report: Canadian Environmental Employment: Job Posting Analysis, published September 2017 on ECO Canada's website.

Canadian Environmental Job Posting Trends February 2018 was a revision and enhancement of the preliminary data.

Environmental Job Market Trends in Canada August 2018 reports data from 2014 to 2017, and it extends the data by one more year and adds new analysis of NOC by ECO Canada sub-sectors.

ECO Canada will continue to release reports to capture the most current job scraping data. In addition, ECO will continually evolve the JPA analysis and utility.

ECO Canada (2018)
Environmental Job Market Trends in Canada - August 2018

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