



Canadian Environmental Job Posting Trends

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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.

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.

Acknowledgements

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1. Synopsis

Real-time job ad data is based on analysis of the millions of job ads posted every day by employers. Every day, bots scan the Internet to collect job ad postings. Software then extracts topline information about each job, identifies those which are classed as “environmental” and further classifies the environmental ads according to ECO Canada’s environmental National Occupational Standards (NOS), National Occupational Classifications (NOC) used by Statistics Canada, and job location.

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

This report is a revision and expansion of preliminary job ads data released in September 2017. The scope is posted English-language ads for jobs in Canadian locations from 2013 to 2016.

Key Findings

Environmental Sector – National Trends

Job ads overall decreased over the 2014-2016 period and environmental job ads followed the same pattern with an even steeper decrease. However, indicators suggest hiring did recover in 2017, and ECO Canada’s next report will illustrate this trend.

Environmental Sector – Provincial Trends

Provincially, Ontario has the highest share of environmental job ads from 2014 to 2016, with Alberta and British Columbia making up the top Three. From 2014-2016, all provinces except for British Columbia posted a decrease in job ads. The largest drops were in Newfoundland and Alberta. BC posted a minor 7% increase.

Trends by ECO Canada Sub-Sectors

The ECO Canada sub-sectors with the highest number of environmental job ads are Natural Resource Management, Environmental Health and Safety and Waste Management.

Trends by NOC

The top three NOCS in terms of share of environmental jobs ads are Agriculture/horticultural workers, Technical inspectors/regulatory officers, and Civil/mechanical/electrical/chemical engineers

ECO Canada welcomes comments and discussion all its LMI (Labour Market Information) reports. Contact research@eco.ca

2. Introduction

2.1 ECO Canada LMI (Labour Market Information)

ECO Canada has long defined environmental work as falling into three sectors: Environmental Protection, Resource Management and Resource Sustainability. Within each sector are sub-sectors, such as Air Quality, Fisheries and Wildlife Management, and Education and Training, which define sub-categories of environmental work (see Figure 1). The sectors and sub-sectors are based either on major areas of practice or major functions, and within each of the sub-sectors is a set of competencies defined by ECO Canada. This framework is referred to as the ECO Canada Sector Model. The competencies which make up the sectors and sub-sectors collectively make up the National Occupational Standards for environmental work (NOS).

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



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, which skills directly relate to ECO Canada's competencies or the NOS.

Statistics Canada defines occupations using the National Occupational Classification (NOC) system. The NOCs classify 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 job data to make it consistent, comprehensive and comparable.

Environmental employment based on the NOS classifications does not align precisely with employment based on NOC classifications.

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

2.2 ECO Canada JPA (Job Posting Analysis) Data

ECO Canada began performing JPA data collection and analysis in 2013. The first year was a pilot year where 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 universe being “scraped”. Since 2014, the universe of sources “scraped” is relatively constant.

2.3 ECO Canada JPA Data - How to Use

The 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 job ad may be poorly written, and the turnover rates in some occupations are higher than others, job ad data needs to be supplemented by primary research to fully explain employment in different occupations.

However, job ads in and of themselves provide valuable information about trends and about the hiring process. These people find JPA useful.

- Job seekers – JPA data says where the jobs are, what skills are in demand and which companies are hiring.
- Employers – JPA data provides insights into which skills are transferable; when supply is short, employers can learn where else to look.
- 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 relevant to industry needs.
- Researchers – JPA is a way to link NOS to NOC classifications for environmental jobs.

2.4 Scope of This Report

This report covers JPA data from the pilot year of 2013 to 2016.

The current job scraping engines work with English-language ads only for jobs in Canada. This will distort some of the results by province; in particular, the results will understate the numbers of job ads in the province of Quebec.

3. Canadian Environmental JPA Trends

3.1 Environmental Sector - National Trends

Key findings

Total job ads peaked in 2014 at 1.3 million and decreased to 1 million by 2016 (a drop of 23%)

Environmental job ads peaked in 2014 at 29,000 and decreased to 21,000 by 2016 (a drop of 28%)

2013 (the pilot year) had fewer jobs scraped but a higher proportion (2.8%) than future years were considered environmental

From 2013-2016, the proportion of environmental job ads to total job ads decreased from 2.8% to 2.0%

Figure 2: Environmental Job Ads as Proportion of Total Job Ads 2013-2016



Figure 3: Environmental Job Ads 2013-2016



Environmental job ads mirrored total job ads in their decline from a 2014-high, a reflection of the overall economic downturn. Current economic indicators, however, suggest that hiring returned in 2017 – the job vacancy and wage survey states that job vacancies have improved by 15% in Q3 2017 compared to Q2 2016.¹ ECO Canada's next JPA report will include 2017 job ad data, which is expected to substantiate this notion.

The greater decrease in proportion of environmental job ads compared to the lesser decrease in total job ads could signify a number of things. Firstly, environmental employment is more volatile than total employment as it tracks numerous factors such as technology, regulation and government policy, as well as macroeconomic factors such as commodity prices and is therefore more subject to short-term changes. Secondly, during a recession, employers may want fewer specialized skills and rely more on employees who are adaptable and possess skills of a more general nature. Thirdly, it is possible that during a recession, employers place less emphasis on environmental work, and prioritize revenue-generating operations.

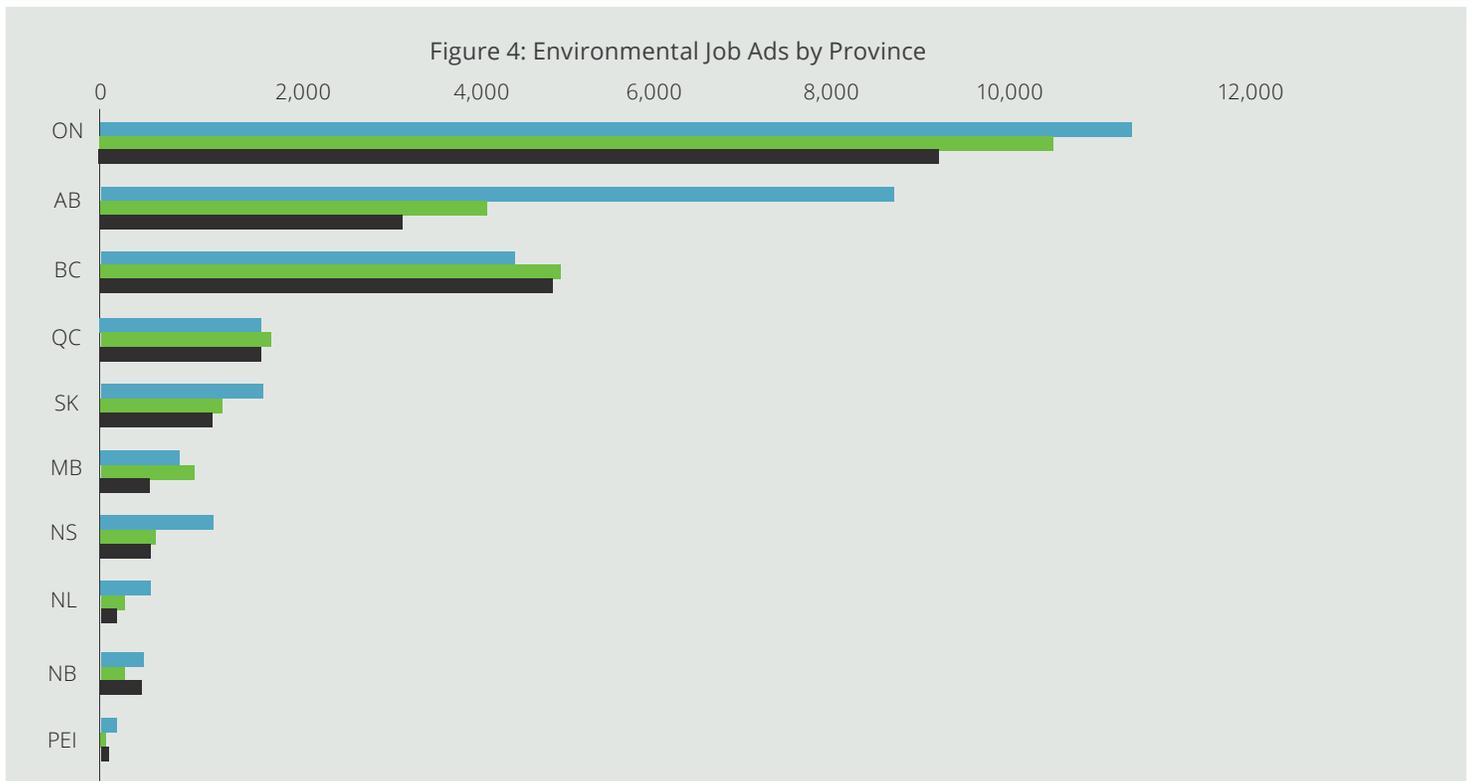
¹ The Daily, Statistics Canada, January 11, 2018 <http://www.statcan.gc.ca/daily-quotidien/180111/dq180111a-eng.pdf>

3.2 Environmental Sector - Provincial Trends

Key findings

The three provinces that consistently posted the most English-language environmental job ads from 2014-2016 were Ontario, Alberta and British Columbia.

From 2014-2016, only British Columbia posted an increase in environmental job ads (7%). All the other provinces experienced a decline in environmental job postings, with Newfoundland (-68%) and Alberta (-62%) seeing the greatest reductions.



Year	PEI	NB	NL	NS	MB	SK	QC	BC	AB	ON
2014	87	315	429	901	698	1,506	1,563	4,031	8,507	11,037
2015	43	166	240	493	713	1,139	1,602	4,471	3,956	10,479
2016	60	242	139	433	427	1,022	1,553	4,330	3,259	9,463

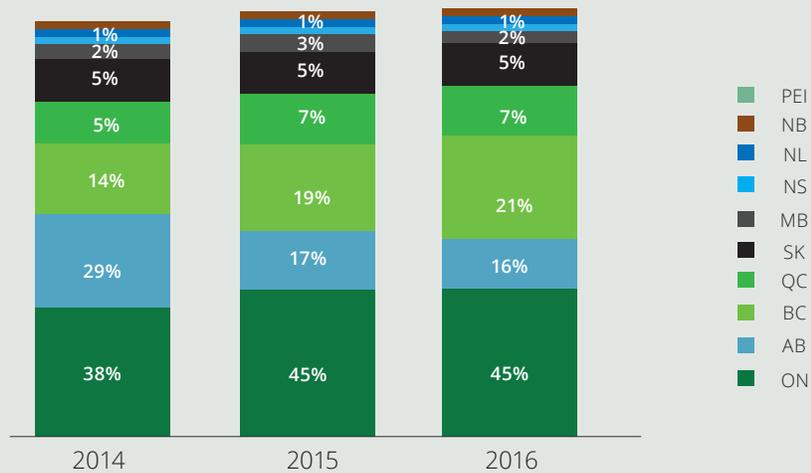
Key findings

Consistent with the absolute numbers of environmental job ads, the three provinces with the largest shares of environmental job ads based on the Canadian total were,

- Ontario (2016 share – 45%)
- BC (2016 share – 21%)
- Alberta (2016 share – 16%)

Alberta's share decreased by 13 percentage points from 2014 to 2016, with both Ontario and BC increasing share by 7 percentage points.

Figure 5: Share of Environmental Job Ads by Province



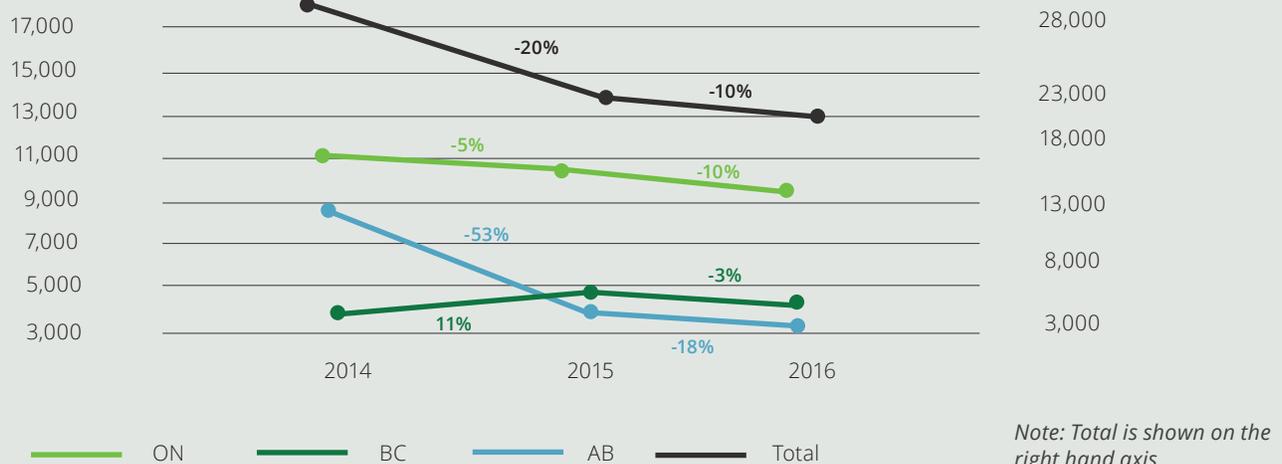
Key Findings

The decline of environmental job postings between 2014 and 2016 occurred mostly in the years 2014 – 2015, except for BC where the number increased.

Amongst the three top environmental job posting provinces, from 2014-2015,

- Alberta experienced a significant decrease (-53%)
- Ontario remained somewhat flat (decrease of -5%)
- British Columbia increased (11%)

Figure 6: Environmental Job Ads for Top Regions 2014-2016



The total number of environmental job ads somewhat mirrors the Alberta curve, which is not surprising as Alberta posted a high percentage² of environmental job ads out of all the jobs advertised in this province. As Alberta is one of the provinces most affected by the decline in oil and gas activity, it is reasonable to assume that oil and gas companies employed a significant proportion of Alberta’s environmental employees. The somewhat flatter nature of Ontario’s curve suggests that Ontario has a more diverse economy, but it was not unaffected by the oil price collapse.

On the other hand, B.C. posted an increase in environmental job ads, perhaps because of government supported projects, such as Site C Clean Energy Project (hydroelectric generating station on the Peace River in northeast B.C.) and escalating agriculture employment.³

² In 2016, AB posted 2.7% environmental job ads related to total job ads, B.C. posted 2.5% and ON posted 2.3%. These were the only provinces showing 2.0% or above.

³ "Economic Analysis of British Columbia," Central 1, Volume 37, Issue 3, September 2017

3.3 Trends by ECO Canada Sub-Sectors

Key findings

The ECO Canada sub-sectors that have the highest number of environmental job ads are:

- Natural Resource Management (NRM)
- Environmental Health and Safety (EHS)
- Waste Management (WM)

For these three highest sub-sectors,

- From 2014-2015, all three contracted.
- From 2015-2016, NRM and EHS continued to contract, and WM saw a slight increase.

Figure 7: Number of Environmental Job Ads Matched to ECO Canada Sub-Sectors 2014-2016



The competencies within the top three sub-sectors were in-demand:

- NRM: workers develop and implement plans, programs and practices for ecosystem and habitat preservation and/or the management of natural resources.
- EHS: workers monitor/address occupational and public health and safety.
- WM: workers monitor waste application/disposal/reduction programs and activities.

3.4 Trends by NOC

Key findings

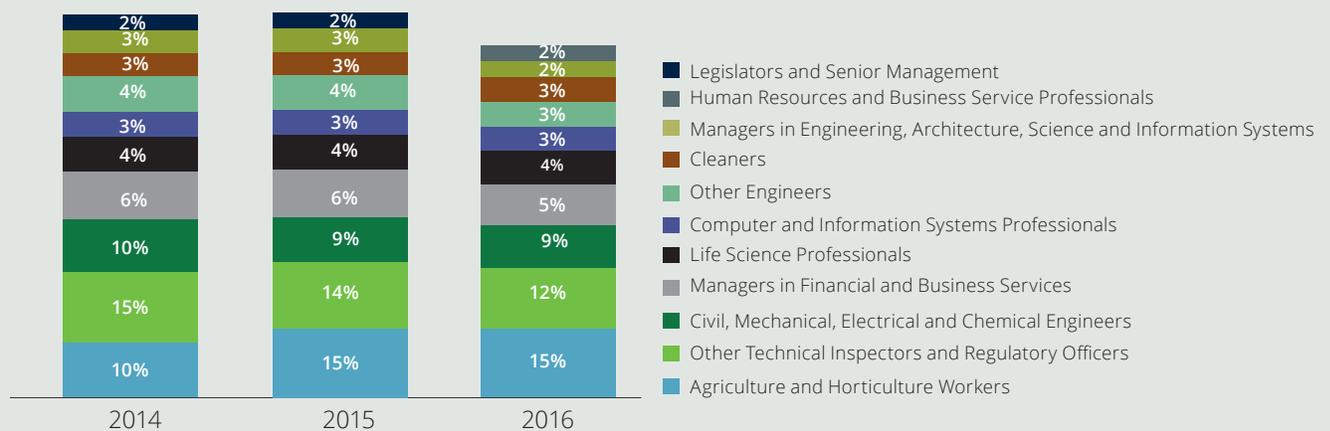
The top three NOCS in terms of share of environmental jobs ads are

- Agriculture and horticultural workers
- Technical inspectors and regulatory officers
- Civil, mechanical, electrical and chemical engineers

The top 10 NOCs have remained consistent from 2014 to 2016, and together account for 60% of environmental job ads.

The only NOC to grow in share over 2014 to 2016 is Agriculture and Horticulture workers.

Figure 8: Top 10 NOCS only; Share of Environmental Job Ads



The definitions of the top three NOCs⁴ help explain why they figure prominently within environmental workers.

Agriculture and horticultural workers: "(...) includes general farm workers and nursery and greenhouse workers (...)" (NOC 843). These workers are often associated with jobs on the land and in natural resources.

Technical inspectors and regulatory officers: "includes testers, inspection technicians, inspectors and regulatory officers (...)" (NOC 226). These workers are associated with jobs across many sub-sectors where regulation takes place.

Civil, mechanical, electrical and chemical engineers: "plan, design, develop and manage projects, machinery and systems, electrical and electronic equipment (...); research, design and develop machinery and systems, chemical processes and equipment (...)" (NOC 213). These workers are heavily involved with events, activities and installations with environmental implications.

3.5 Future Analysis - Trends by ECO Canada Sub-Sector by NOC

The next ECO Canada report on JPA will analyse trends in inter-relations between the NOS sub-sectors and the NOC occupations. The results will speak strongly to identification of transferable skills.

4 ECO Canada JPA Publications

ECO Canada first analyzed the job posting data 2013-2016 in a preliminary report: ***Canadian Environmental Employment: Job Posting Trends***, published September 2017 on ECO Canada's website, <http://www.eco.ca/reports/measuring-environmental-employment-2017>.

This report is a revision and enhancement of the September 2017 preliminary data release. It presents some information differently and includes additional analysis on job postings by region.

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.

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Labour Market Research.
Environmental Careers Organization of Canada.



CONTACT US

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

P : (403) 233-0748
F : (403) 269-9544
E : info@eco.ca
W : eco.ca



@ecocanada