



College Graduation Trends for Environment-related Programs

2002-2005



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ENVIRONMENTAL LABOUR MARKET

**College Graduation Trends for
Environment-related Programs,
2002-2005**

ECO Canada

Canada

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SECTION 1: INTRODUCTION

Environmental employers are finding it increasingly difficult to hire due to growth in the sector. By 2011, environmental employment is expected to reach over 570,000, an increase of 8.1% since 2006. Employment in the environment sector is expected to grow 23% faster than the national average, estimated at 6.6% over the same time period.

With increasing demand, it is invaluable for employers and policy makers to understand labour supply trends. This report focuses on one traditional source of labour supply: graduates from college programs. Data from provincial and territorial educational agencies, and individual colleges were analyzed for this report.

This study is part of a broader research project pertaining to ECO Canada's Environmental Labour Market (ELM) research. ELM research is aimed at improving our understanding of the demand for and supply of human resources in the environmental sector in Canada.

Environment-related programs, however, seem to be following an opposite trend. Our analysis shows that enrolment and graduation numbers for some environment-related programs were in decline prior to 2003.

SECTION 2: METHODOLOGY AND DEFINITIONS

The analysis of graduation trends at Canadian colleges was done by reviewing provincial and territorial education reports for the academic years 2001/2002 to 2004/2005. These reports contained total graduation numbers from all colleges in the respective province or territory, as well as a breakdown of graduation numbers by program type.

In the case where a provincial or territorial report was unavailable, individual institutions were contacted. However, in these cases, not all institutions in the province or territory provided data (see Appendix A).

Analysis of national data represents available and comparable data only. Therefore, national data analysis does not include Nunavut (no data available) and Newfoundland (no data available for total college graduation in the province).

Key terms used in the report are defined below.

Graduate

Counts of the numbers of students who have completed a program at an institution. Each student that has graduated from a program is counted.

Environment-related Program

A total of 27 programs were analyzed in this study.

For this study, the academic programs listed under ECO Canada's 100 environmental occupational profiles were used as a basis to qualify college programs as an environment-related program.¹ A minimum of college-level education was recommended for 34 of these occupations. These environment-related programs were grouped using Statistics Canada's Classification of Instruction Programs (CIP).²

The CIP is subdivided into three levels. For the purpose of this study, the second level was used. The second level, also known as the "subseries," comprises 385 four-digit classes. The subseries represent an intermediate grouping of programs that have comparable content and objectives. In this study, 27 subseries were identified to be linked to environmental employment (see Appendix B).

Environment-related programs have subsequently been classified into large and small programs, in order to facilitate comparison between programs based on size. Large programs had 100 or more graduates in 2005. Small programs had less than 100 graduates in 2005.

It is important to note that graduates from environment-related programs do not necessarily end up employed in the environmental sector, but have the potential to be employed in the sector.

Due to the unavailability of full data for all provinces, we are not able to rank the provinces and territories by their number of graduates. Despite not having full data, there was a clear distinction in the availability of environment-related programs from one jurisdiction to another. Ontario and Quebec, for example, offered the most number of environment-related programs at 19 and 16 programs respectively. The Yukon (one program), the Northwest Territories (two programs), Nunavut (one program), and Prince Edward Island (three programs) offered the least number of programs (Figure 1).

1 ECO Canada. Occupational Profiles. <https://www.eco.ca> (student section)

2 Statistics Canada (2000). *Classification of Instructional Programs (CIP), Canada, 2000*. <http://www.statcan.ca/english/Subjects/Standard/instruction/cip-2000-intro.htm>

FIGURE 1

Number of College Environment-related Programs by Province and Territory



SECTION 3: RESULTS

3.1 College Graduates from Environment-related Programs represent Five Percent of all College Graduates

About five percent of all college graduates graduated from an environment-related program in 2005 (Table 1). Between 2002 and 2005, the number of graduates from environment-related programs increased by approximately 12.6% (Table 1). For college graduation from all programs, the number of graduates increased by approximately 15.7% over the same time period.

TABLE 1
College Graduation in Canada, 2002–2005

PROGRAMS	GRADUATION YEAR				CHANGE 2002–2005	RATE OF CHANGE
	2002	2003	2004	2005		
Environment-related Programs	4,514	4,896	4,911	5,084	570	12.6%
All programs	91,530	95,619	102,108	105,857	14,327	15.7%
Share of Environment-related Programs	4.9%	5.1%	8.0%	4.8%	4.8%	

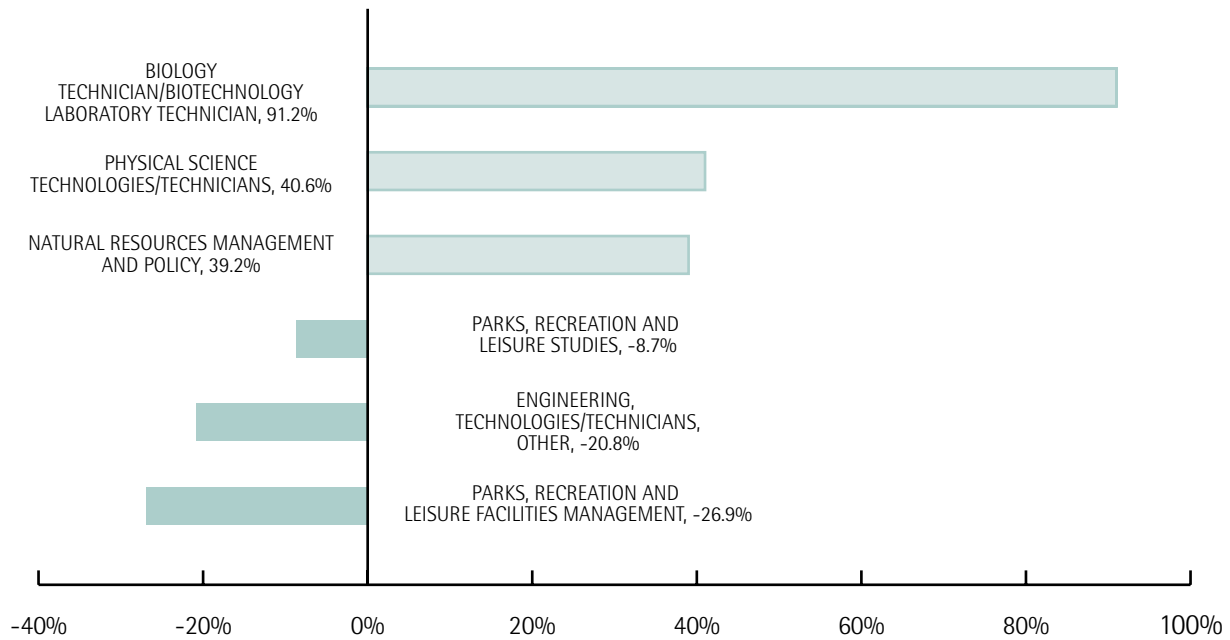
3.2 The Majority of Environment-related Programs Have Experienced Growth in Graduation Numbers

The majority of environment-related programs have experienced an increase in graduates over the time period under investigation. Only nine out of the 27 programs being studied are showing signs of decline.

Among large programs, the Biology Technician/Biotechnology Laboratory Technician program experienced the largest increase in graduates with a growth rate of 91.2% from 2002–2005, followed by Physical Science Technologies/Technicians at 40.6%, and Natural Resources Management and Policy at 39.2% (Figure 2). The large program that has experienced the greatest decline in its graduation rate is Parks, Recreation and Leisure Facilities Management (-26.9% from 2002–2005), followed by Engineering Technologies/Technicians, Other (-20.8%), and Parks, Recreation and Leisure Studies (-8.7%).

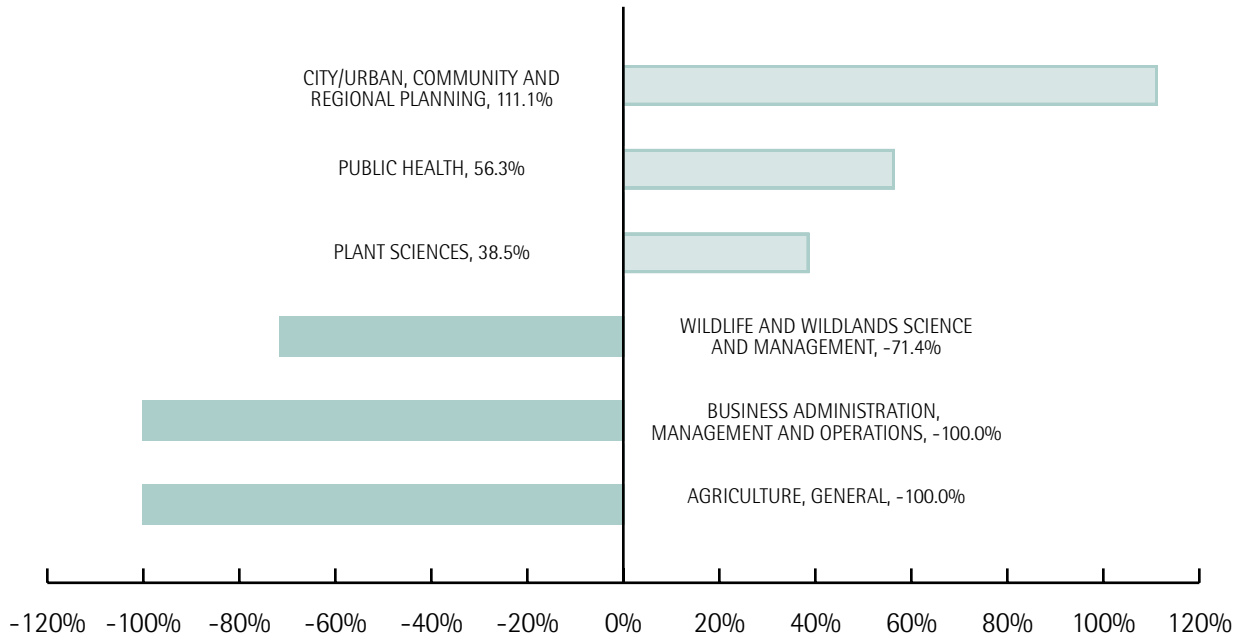
FIGURE 2

College Graduation Trends of Top Three and Bottom Three Programs (Large Programs), 2002–2005



Among small programs, City/Urban, Community and Regional Planning/Architecture and Related Services, Other experienced the largest increase in graduates with a growth rate of 111.1% from 2002–2005, followed by Public Health at 56.3%, and Plant Sciences at 38.5% (Figure 3). On the other hand, the programs that experienced the greatest decline in graduation were Agriculture, General, as well as Business Administration, Management and Operations, both with a 100% decline from 2002–2005. This is followed by Wildlife and Wildlands Science and Management at -71.4%.

FIGURE 3
College Graduation Trends of Top Three and Bottom Three Programs
(Small Programs), 2002–2005

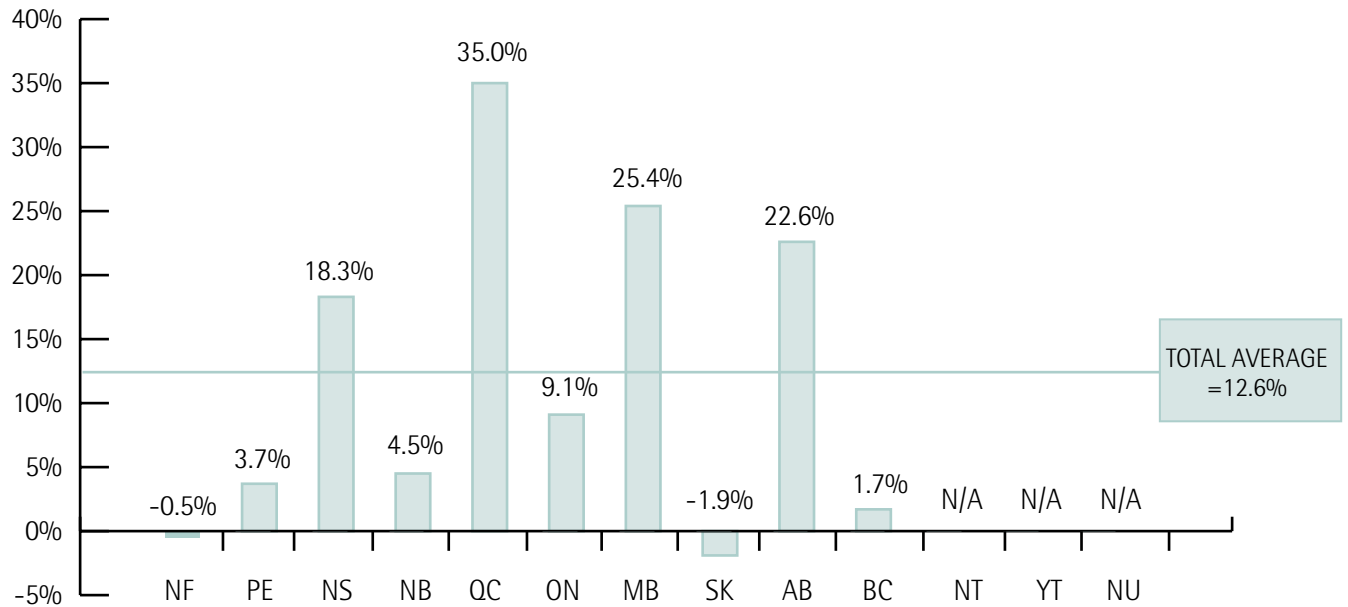


3.3 The Graduation Trends for Environment-related Programs Vary by Province and Territory

Graduation numbers for environment-related programs have steadily increased over the four-year time-period in all jurisdictions, except in Newfoundland (-0.5%) and Saskatchewan (-1.9%) (Figure 4). Four out of 13 jurisdictions experienced growth above the total average (12.6%): Quebec (35%), Manitoba (25.4%), Alberta (22.6%), and Nova Scotia (18.3%).

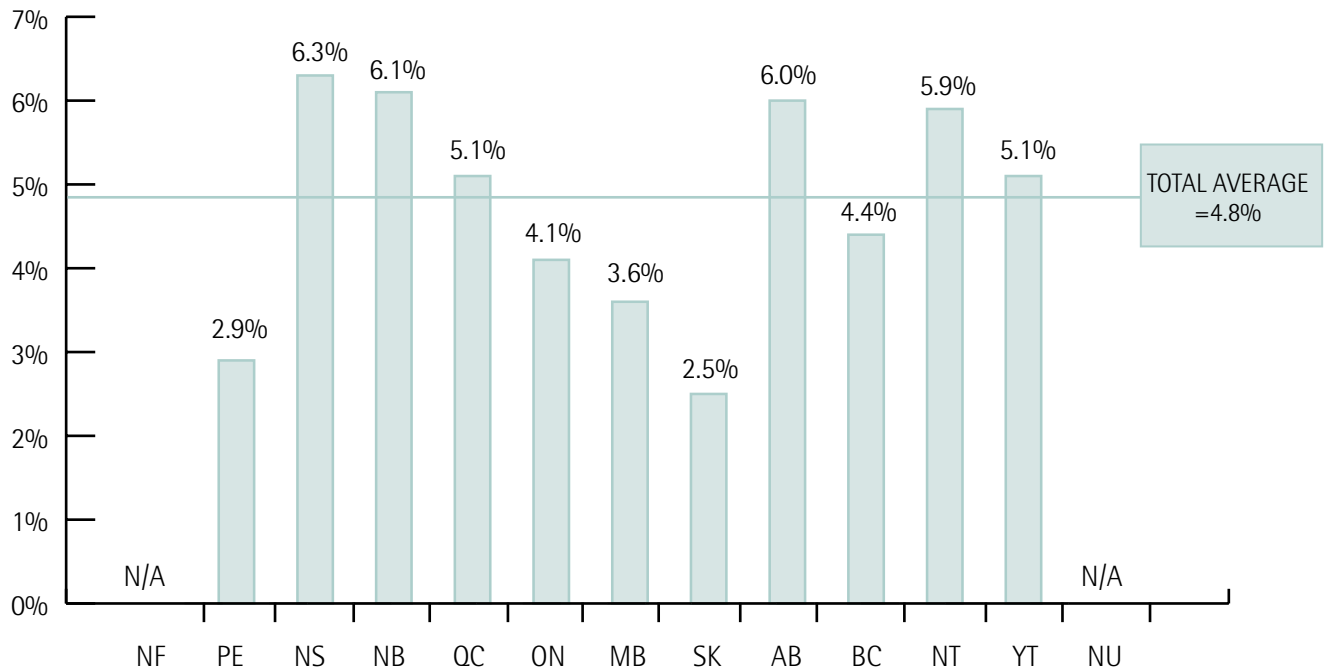
The attractiveness of college environment-related programs varies across Canada. Six jurisdictions had above average proportions of college graduates from environment-related programs (Figure 5). Environment-related programs appeared to be more popular in Nova Scotia (6.3% of all college graduates in the province). On the other hand, Saskatchewan and Prince Edward Island had the lowest proportion of college graduates from environment-related programs.

FIGURE 4
Graduation Rate Change for College Environment-related Programs by Province/Territory, 2002–2005



Note: Nunavut, Yukon, and the Northwest Territories had fewer than 12 students as of 2005. Prince Edward Island had data for 2002 and 2004 only.

FIGURE 5
Share of College Graduation from Environment-related Programs by Province and Territory, 2005



Note: Prince Edward Island average is from 2004 data.

SECTION 4: CONCLUSION

In 2005, five percent of all Canadian college graduates completed an environment-related program. The majority of environment-related programs experienced an increase in graduates between 2001 and 2005. Only nine out of the 27 programs under study are showing signs of decline. Despite the growth, graduation from environment-related programs did not increase as fast (13%) as overall college graduation (16%) over the time period under investigation.

At the regional level, graduation numbers for environment-related programs have steadily increased over the four-year time-period under study in all jurisdictions, except in Newfoundland (-0.5%) and Saskatchewan (-1.9%). Four out of 13 jurisdictions experienced above average growth: Quebec (35%), Manitoba (25.4%), Alberta (22.6 %), and Nova Scotia (18.3%). Finally, environment-related programs appear to have been more popular in Nova Scotia (6.3% of all college graduates in the province). On the other hand, Saskatchewan and Prince Edward Island had the smallest proportion of college graduates from environment-related programs.

Further research should focus on the numbers of college students from each program who have obtained environmental employment following graduation. In addition, understanding the motivation of students may help attract more students into environment-related programs, and as a result, attract more people to work in the environmental sector.



APPENDIX A. DATA SOURCES

Colleges included in this study are accredited colleges that offer science-based programs and are listed under the Canadian Information Centre for International Credentials' (CICIC) directory. Below is a list of the available reports used to complete this data analysis. When a provincial or territorial report was not available, a selected number of colleges were contacted individually. Only those colleges that provided data are listed below.

TABLE A1
College Data Sources

PROVINCE/TERRITORY	DATA SOURCES FOR THIS STUDY
Newfoundland	N = 1 college College of the North Atlantic is the only college in Newfoundland. No overall college graduation data available.
Prince Edward Island	N = 1 college Holland College is the only college in Prince Edward Island.
Nova Scotia	N = 1 college Nova Scotia Community College is the only college in Nova Scotia.
New Brunswick	N = 1 college New Brunswick Community College
Quebec	N = 24 colleges Gouvernement du Québec. (2005). <i>Relance Survey of College Graduates Technical Training – 2004</i> . Ministère de l'Éducation, du Loisir et du Sport.
Ontario	N = 31 colleges Government of Ontario. (2003 to 2006). <i>Employment Profile</i> . Ministry of Training, Colleges, and Universities.
Manitoba	N = 4 colleges Government of Manitoba. (2007). <i>Statistical Compendium for the Academic Years Ending in 2006</i> . Council of Post-Secondary Education.
Saskatchewan	N = 1 college Saskatchewan Institute of Applied Science and Technology
Alberta	N = 4 college Grant MacEwan College Medicine Hat College Northern Alberta Institute of Technology SAIT Polytechnic
British Columbia	N = 1 college British Columbia Institute of Technology
Yukon	N = 1 college Yukon College is the only college in the Yukon.
Northwest Territories	N = 1 college Government of the Northwest Territories. (2007). <i>Towards Excellence 2005: A Report on Post-Secondary Education in the NWT</i> . Department of Education, Culture and Employment. Aurora College is the only college in the Northwest Territories.
Nunavut	No available data

APPENDIX B. COLLEGE ENVIRONMENT-RELATED PROGRAMS

Occupational titles may appear under more than one program due to the multi-disciplinary nature of environmental occupations.

TABLE B1
College Environment-related Programs

ENVIRONMENT-RELATED PROGRAMS BY CLASSIFICATION OF INSTRUCTION PROGRAMS (CIP) CODES	EXAMPLES OF PROGRAM TITLES	EXAMPLES OF OCCUPATIONS
Agriculture, General (01.00)	Agriculture Technician/Technology	
Agricultural Business and Management (01.01)	Agribusiness	Agriculture Technician/Technologist, Crop and Livestock Producer, Aquaculture Support Worker, Aquaculturist
Agricultural Production Operations (01.03)	Aquaculture, Crop Production, Agriculture Production	
Applied Horticulture/Horticulture Business Services (01.06)	Landscape Design, Greenspace Management, Horticulture Technician	Horticulturalist, Arborist
Plant Sciences (01.11)	Environmental Pest Management	
Natural Resources Conservation and Research (03.01)	Natural Resource Technician/Technology, Environmental Studies, Environmental Protection Technology	Conservation Officer, Wildlife Technician/Technologist, Environmental Enforcement Officer, Environmental Reporter, Environmental Monitoring Technician, Park Warden, Recycling Coordinator
Natural Resources Management and Policy (03.02)	Water Resources Technology, Natural/Renewable Resource Management, Land and Water Management, Resource and Environmental Law	
Forestry (03.05)	Forest Resources Technician, Forest Technology	Forestry Technician/Technologist
Wildlife and Wildlands Science and Management (03.06)	Wildlife Conservation Technology, Wildlife Management	Conservation Officer, Wildlife Technician, Technologist
Natural Resources and Conservation, Other (03.99)	Fish and Wildlife Technician/Technology	Fisheries Technician/Technologist, Park Warden
City/Urban, Community and Regional Planning (04.03)	Urban and Regional Planning, Community Planning, Rural Planning, Planning Land Information Technology	Recycling Coordinator, Geomatics Technician/Technologist
Engineering Technology, General (15.00)	Engineering Technology	Wastewater Collection and Treatment Operator, Water Treatment and Distribution Operator
Civil Engineering Technology/Technician (15.02)	Civil Engineering Technician/Technology	Avalanche Forecaster
Environmental Control Technologies/Technicians (15.05)	Environmental Technician/Technology, Environmental Engineering Technician/Technology, Water Sanitation, Environmental Control, Waste Facility Management, Water Resources Engineering Technician/Technology, Water and Wastewater Technician	Environmental Technician/Technologist, Pollution Control Technologist, Air Quality Technician/Technologist, Hazardous Materials Specialist, Wastewater Collection and Treatment Operator, Water Treatment and Distribution Operator, Recycling Coordinator
Quality Control and Safety Technologies/Technicians (15.07)	Occupational Health and Safety and Environmental Protection	Hazardous Materials Specialist

Engineering-related Technologies (15.11)	Geomatics Engineering Technician/Technology	Geomatics Technician/Technologist
Engineering Technologies/Technicians, Other (15.99)	Chemical Engineering Technician/Technology, Geological Engineering Technician/Technology	Chemical Technician/Technologist, Hazardous Materials Specialist
Biology, General (26.01)	Biological Sciences	Naturalist
Parks, Recreation and Leisure Studies (31.01)	Adventure Tourism, Ecotourism, Outdoor Recreation Leadership	Ecotourism Operator, Park Interpreter
Parks, Recreation and Leisure Facilities Management (31.03)	Parks Operation and Services, Park Facility Maintenance and Management	
Biology Technician/Biotechnology Laboratory Technician (41.01)	Biotechnology Technician/Technology, Bioscience Technology, Laboratory Technology: Specialization in Biotechnology	Biological Technician
Physical Science Technologies/Technicians (41.03)	Chemical Technician/Technology, Chemical Laboratory Technician/Technology	Chemical Technician/Technologist, Environmental Monitoring Technician, Water Quality Technician/Technologist
Science Technologies/Technicians, Other (41.99)	Environmental Applied Science Technology, Ecological Technology, Applied Geology, Chemical and Biosciences Technology	Environmental Monitoring Technician, Pollution Control Technologist
Geography and Cartography (45.07)	Geographic Information Systems Technician/Technology, Cartography, Geomatics Technician/Technology	Cartographer, Avalanche Forecaster, Geological and Geophysical Technician
Public Health (51.22)	Environmental Health	Environmental Health Officer, Emergency Preparedness Manager
Business Administration, Management and Operations (52.02)	Business Administration: Environmental Waste Management	Environmental Technical Salesperson

APPENDIX C. GRADUATION FROM ENVIRONMENT-RELATED PROGRAMS

Below is the actual graduation numbers from environment-related programs by province and territory in 2005.

TABLE C1
Proportion of College Graduation from Environment-related Programs by Province/Territory, 2005

PROVINCE/TERRITORY	Environment-related Graduation Numbers	Overall Graduation Numbers	Share of Environment-related Graduation
Newfoundland	406	N/A	N/A
Prince Edward Island	28	935	2.9%
Nova Scotia	149	2,347	6.3%
New Brunswick	201	2654	7.6%
Quebec	1,267	16,961	7.5%
Ontario	3,200	59,419	5.4%
Manitoba	169	4,256	4.0%
Saskatchewan	135	4,194	3.2%
Alberta	629	9,338	6.7%
British Columbia	241	5,431	4.4%
Yukon	7	119	5.9%
Northwest Territories	11	217	5.1%
Newfoundland and Labrador	N/A	N/A	N/A
TOTAL	6,415	105,857	6.1%

Note: Prince Edward Island data is from 2004.

APPENDIX D. COLLEGE GRADUATION TRENDS

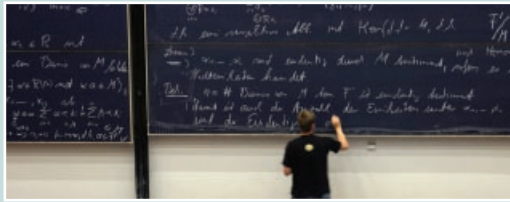
Below is the actual graduation numbers from environment-related programs by province and territory in 2005.

TABLE D1
College Graduation Trends (Large Programs) 2002–2005

ENVIRONMENT-RELATED PROGRAMS	GRADUATION YEAR				CHANGE 2002–2005	RATE OF CHANGE
	2002	2003	2004	2005		
Biology Technician/Biotechnology Laboratory Technician (41.01)	137	239	223	262	125	91.2%
Physical Science Technologies/Technicians (41.03)	234	332	390	329	95	40.6%
Natural Resources Management and Policy (03.02)	125	147	133	174	49	39.2%
Geography and Cartography (45.07)	313	408	444	421	108	34.5%
Civil Engineering Technology/Technician (15.02)	724	757	789	921	197	27.2%
Science Technologies/Technicians, Other (41.99)	150	161	153	188	38	25.3%
Environmental Control Technologies/Technicians (15.05)	484	480	476	548	64	13.2%
Engineering-related Technologies (15.11)	120	101	117	135	15	12.5%
Applied Horticulture/Horticulture Business Services (01.06)	201	253	240	225	24	11.9%
Natural Resources and Conservation, Other (03.99)	205	197	251	223	18	8.8%
Engineering Technology, General (15.00)	258	264	269	276	18	7.0%
Natural Resources Conservation and Research (03.01)	186	196	214	198	12	6.5%
Forestry (03.05)	438	421	464	454	16	3.7%
Parks, Recreation and Leisure Studies (31.01)	115	167	92	105	-10	-8.7%
Engineering Technologies/Technicians, Other (15.99)	346	334	294	274	-72	-20.8%
Parks, Recreation and Leisure Facilities Management (31.03)	175	154	121	128	-47	-26.9%

TABLE D2
College Graduation Trends (Small Programs) 2002–2005

ENVIRONMENT-RELATED PROGRAMS	GRADUATION YEAR				CHANGE 2002–2005	RATE OF CHANGE
	2002	2003	2004	2005		
City/Urban, Community and Regional Planning (04.03)	18	49	14	38	20	111.1%
Public Health (51.22)	16	14	26	25	9	56.3%
Plant Sciences (01.11)	0	13	0	18	5	38.5%
Agricultural Business and Management (01.01)	35	32	26	35	0	0.0%
Biology, General (26.01)	67	62	57	51	-16	-23.9%
Quality Control and Safety Technologies/Technicians (15.07)	26	20	17	14	-12	-46.2%
Agricultural Production Operations (01.03)	78	79	75	32	-46	-59.0%
Wildlife and Wildlands Science and Management (03.06)	35	8	26	10	-25	-71.4%
Agriculture, General (01.00)	21	7	0	0	-21	-100.0%
Business Administration, Management and Operations (52.02)	7	1	0	0	-7	-100.0%





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