

Career Outcomes of Canadian Astronomy Graduates

Data Collection

Contacts in each A&A department in Canada were contacted for a list of astronomy graduates (MSc and PhD) from 2010 onward. Almost all Departments responded to my request for the data but I am still waiting for data from two significant Departments.

I was concerned that I would have trouble getting the names of graduates (privacy reasons) but this turned out to be a problem for only one Department. It turns out that the University in question publishes a list of graduates on their website, so I was able to retrieve their data with no issues.

Number of Degrees

The mean number of PhDs granted in Canada per year is approximately 27. (I have assumed the two missing Departments produce PhDs at the average rate). Figure 1 shows the number of PhDs per year (excluding the two missing Departments). There does not seem to be any significant trend in the data.

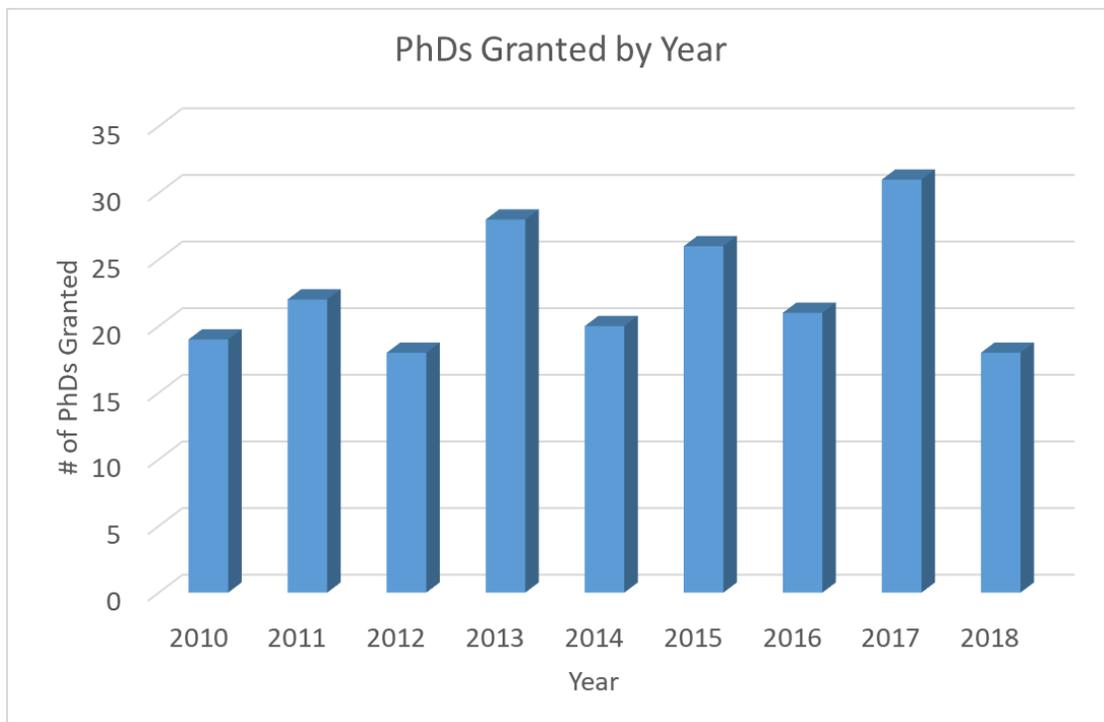


Figure 1 The Number of PhDs produced annually in Canada

The number of PhDs produced by each Department as well as the number of PhDs granted per faculty member are shown in Figure 2. The latter number is only an estimate as the current number of faculty is used, and the actual number of faculty may have varied over the time period.

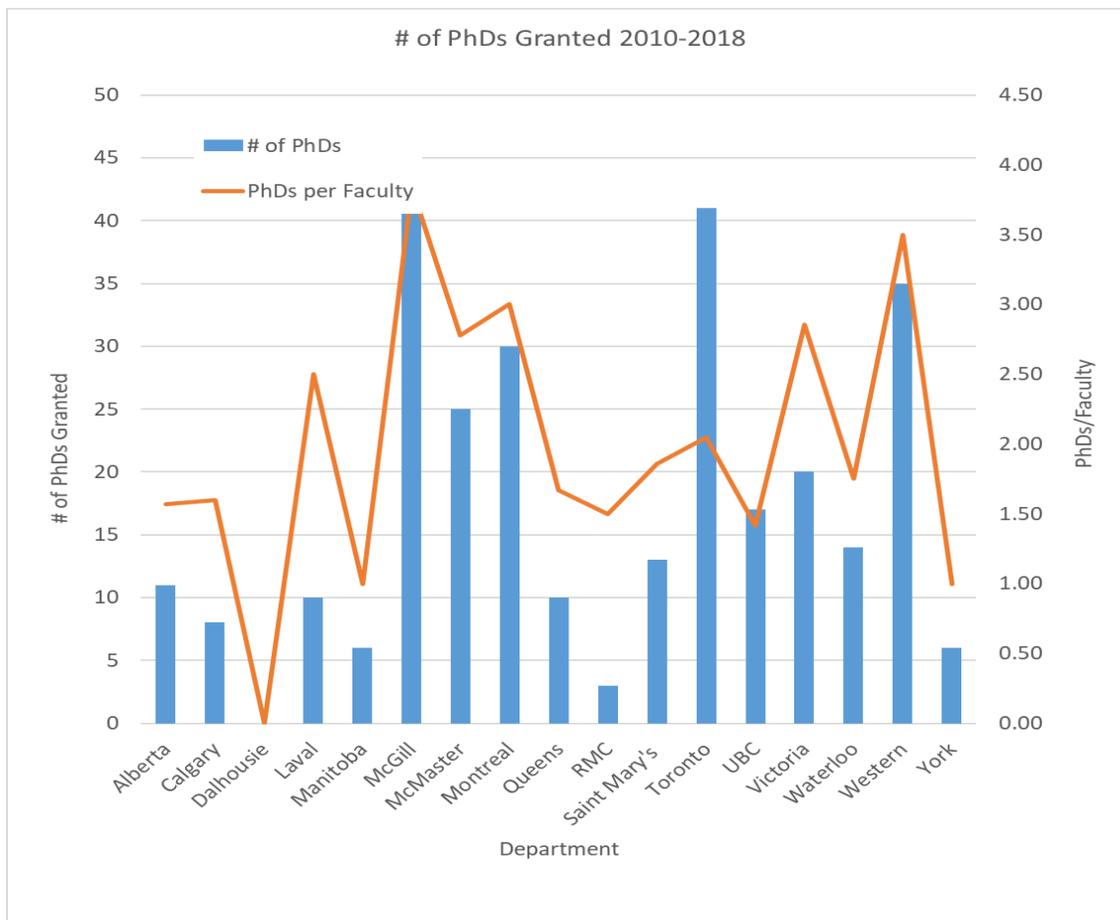


Figure 2 The # of PhDs granted by Department as well as the rate per faculty member

Career Outcomes – PhDs

The current position of each of the graduates was determined by searching the Internet for everyone. LinkedIn was quite useful as the first site searched. Graduate's current positions were able to be determined for 91% of the sample of 158 PhD graduates.

Positions were classified as belonging to one of four 'sectors': Post-Secondary Education, Public, Private and Individual. Post-Secondary positions include faculty, PDF, adjunct faculty and any position associated with a Post-Secondary institute. High-school teachers are classified as being in the Public Sector as are government positions of any level. There were two individuals who are self-employed; one as game board designer and the other as a flamenco guitarist!

For PhD graduates of all years (2010-2018) 62%, 26%, and 7% are in Post-Secondary, Private and Public Sector positions respectively. The breakdown by year of graduation is shown in Figure 3. For the period between 2010 and 2016 the trend was for more graduates to be in the private sector. This trend changes abruptly for graduates in 2017 and 2018. The break in this trend is likely due to more recent graduates currently being in PDF positions, but a significant fraction of which will move to the private sector after their first or second PDF position.

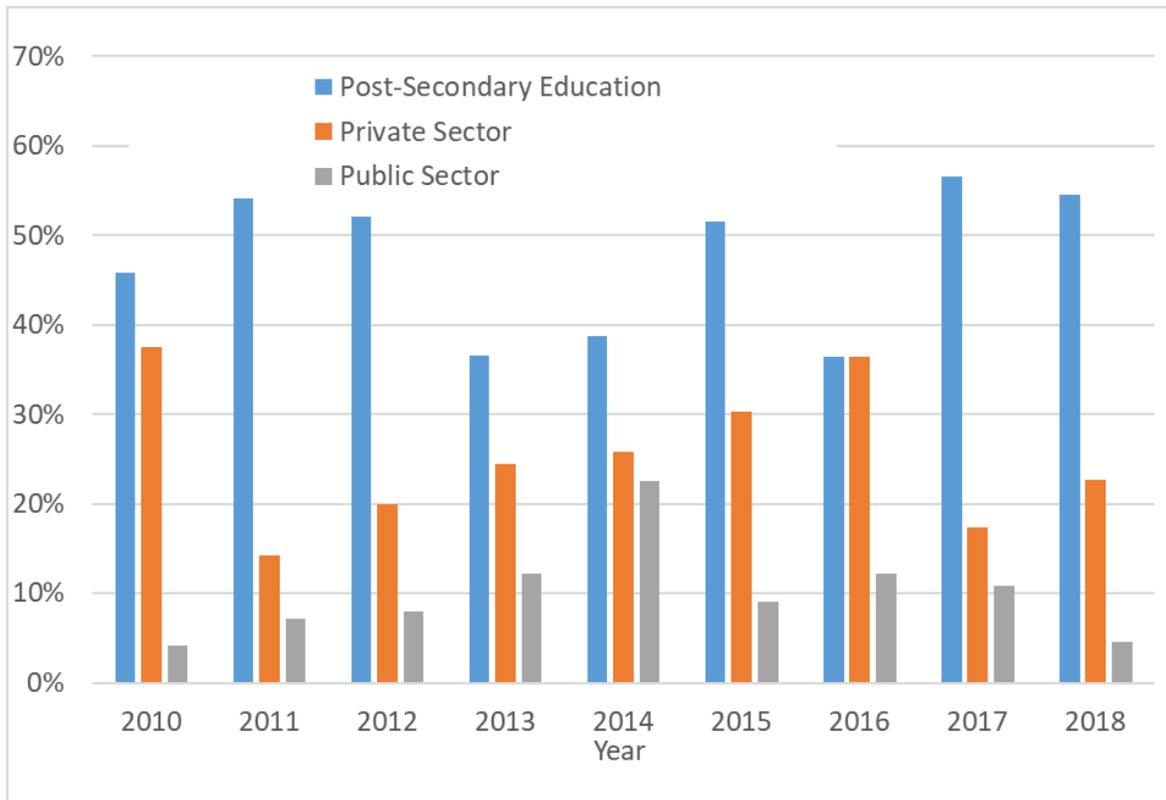


Figure 3 Sector of current position for PhD graduates by year of graduation

UBC recently published their survey of 2016 PhD graduates. For their 3-7 years post-graduation cohort in the sciences, 44%, 32%, and 8% were in the post-secondary, private and public sectors respectively. Assuming the 3-7 years post-graduation cohort in our sample corresponds to the 2012 – 2016 graduates, my percentages in the three sectors are 55%, 32% and 8%. The UBC survey had additional categories (not-for-profit, seeking employment) not included in my categories. Altogether it seems that career outcomes in astronomy are not terribly different from the career outcomes of UBC Science PhDs, although the percentage in the post-secondary sector is slightly higher

The University of Toronto has released the results of their 10,000 PhDs project “which used Internet searches of open-access data sources such as official university and company websites to determine the current and/or first (2016) employment status of the 10,886 PhDs who graduated from U of T between 2000 and 2015 in all disciplines”

Using the 10,000 PhDs dashboard to isolate the 2012 – 2015 cohort in Physical Sciences in the Faculty of Arts & Science shows that 52% are in the post-secondary sector, 45% are in the private sector and 4% in the public sector. As the data for the 10,000 PhDs project was collected in 2016, the 2012-2015 cohort is like the 2015-2018 cohort in my sample. For this cohort 64%, 29% and 5% are in the post-secondary, private and public sectors. In this case, it seems more astronomy PhDs are in post-secondary positions compared to the University of Toronto Physical Science sample.

Another interesting metric is the fraction of PhD graduates remaining in astronomy-related jobs. Figure 4 shows the percentage of PhD grads in astro-related positions by year of PhD

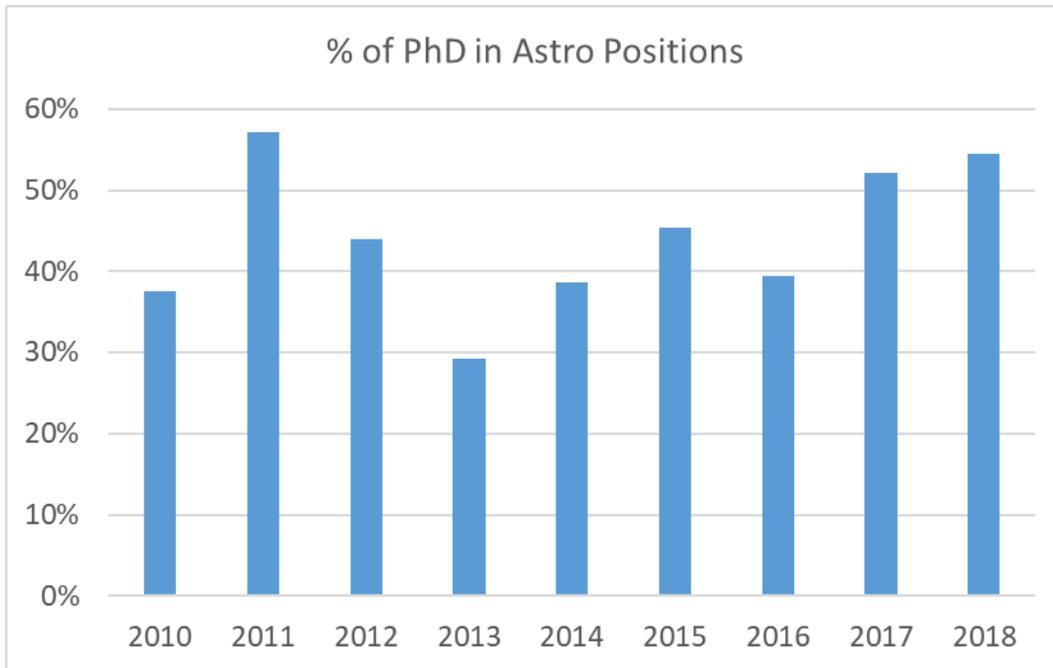


Figure 4 Percentage of PhD graduates in astro-related positions by year of PhD

Figure 5 shows the percentage of PhD graduates that are currently in Faculty positions by year of graduation. For the graduates from the earliest years in this sample, 20-25% of them are in Faculty positions. This is likely the 'plateau' level' of the percentage of graduates that will end up in Faculty positions.

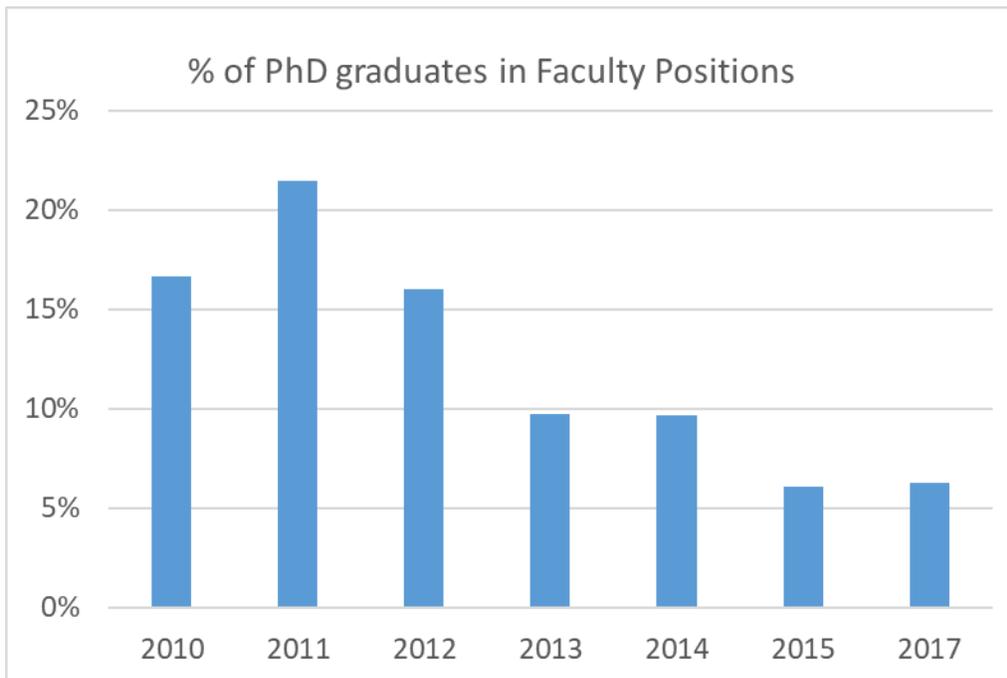


Figure 5 Percentage of PhD graduates currently in Faculty positions

The percentage of PhD graduates currently holding PDF positions is shown in Figure 6. There appears to be a significant drop in the fraction of graduates that go on to hold a 2nd PDF position.

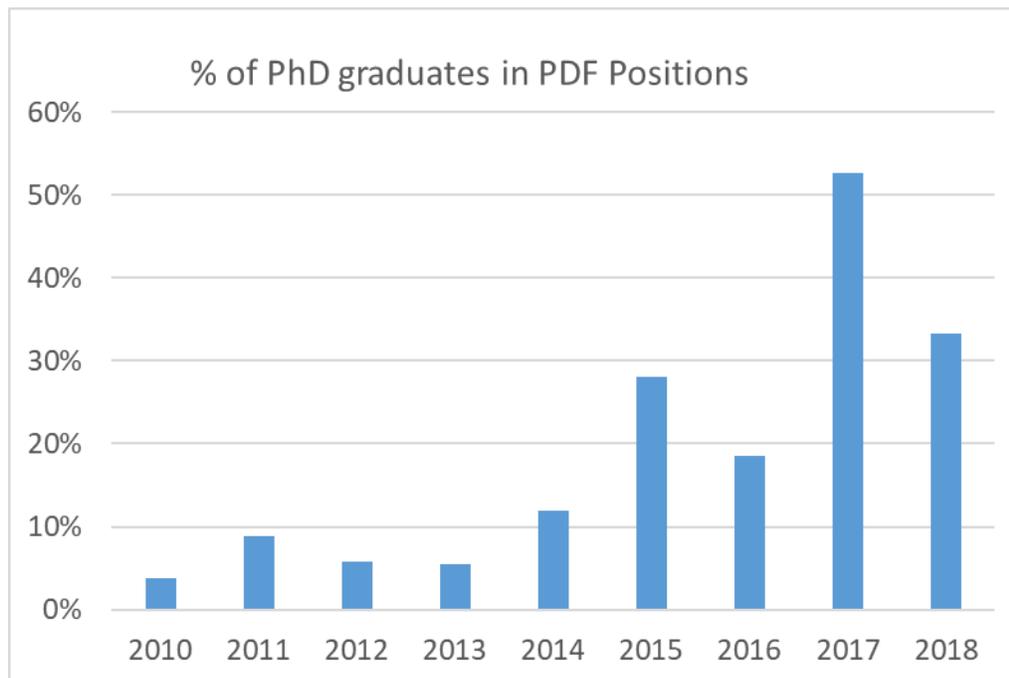


Figure 6 Percentage of PhD graduates currently holding PDF positions

Career Outcomes – MScs

Departments were also asked for the name of their Master graduates. Of course, many of these will go on to do a PhD, but it is worth analyzing MSc graduates as a separate aggregate. It was more difficult tracking the current positions of MSc graduates with 12% remaining unidentified

The mean number of MSc degrees granted in the years 2010-2018 is 26 per year (this does not include McGill or Western who have not reported their numbers. Also, Toronto did not report the number of MSc degrees granted). Given that the reported number of MSc degrees close to the number of PhDs produced each year, the actual number will be somewhat larger once the missing data is accounted for. Removing Toronto from the sample, Canadian universities graduate 1.4 MSc students for every PhD. This number varies significantly between universities. The number of MSc's produced each year is shown in Figure 7. The number per year is a more variable than the number of PhDs granted each year.

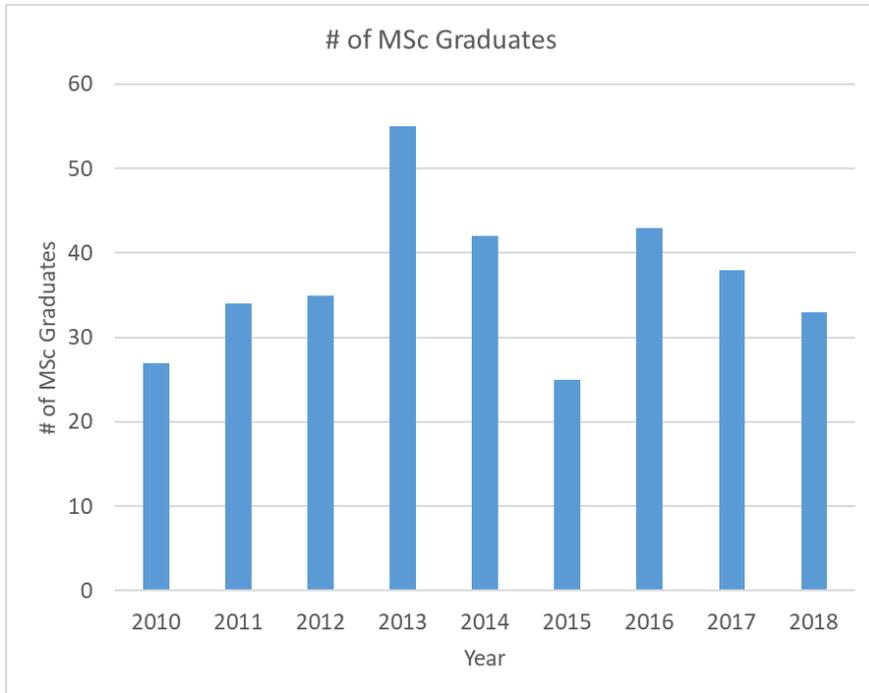
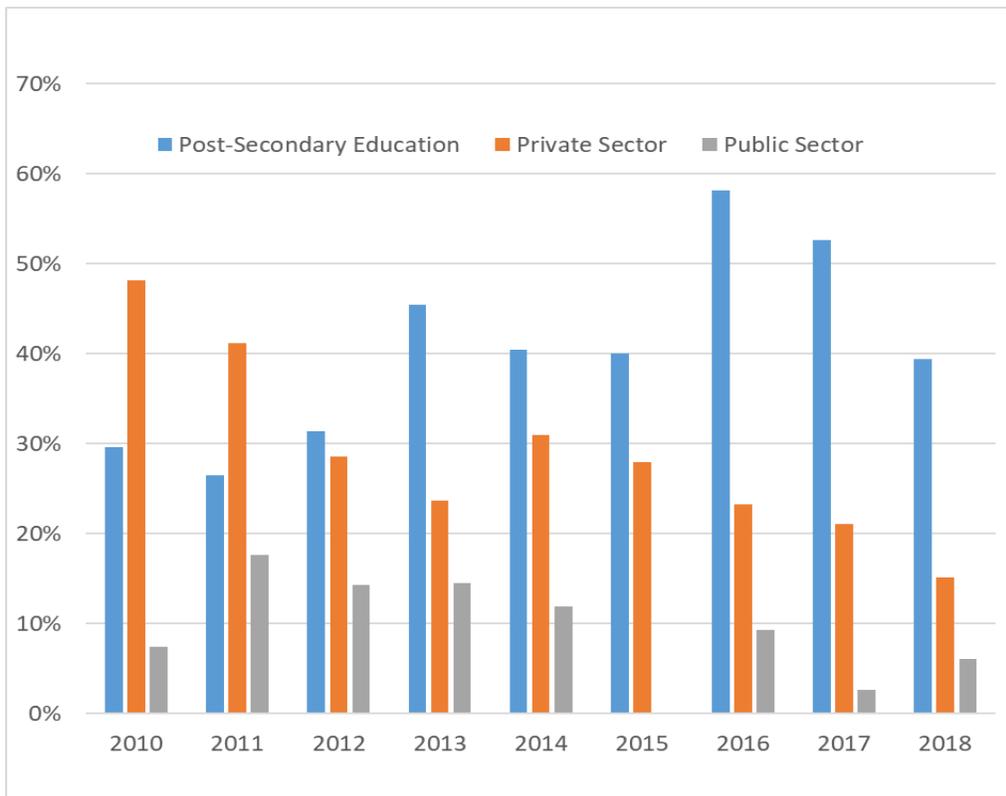


Figure 7 Number of MSc degrees granted each year

Of MSc graduates in this period 44%, 32% and 11% end up in post-secondary, private or public sector positions respectively. Figure shows the current sector of employment for MSc graduates separated by year of graduation.



Country Breakdown

Finally, we can look at where PhD and MSc graduates hold their positions. The two Figures below show the distribution of countries for PhD and MSc graduates. As expected a smaller fraction of PhD graduates have positions in Canada, although the totals for positions in North America are more similar.

