

# British Columbia Mineral and Coal Exploration Survey

2019



Ministry of  
Energy, Mines and  
Petroleum Resources







# Foreword

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The *British Columbia Mineral and Coal Exploration Survey* is a joint initiative between the Government of British Columbia's Ministry of Energy, Mines and Petroleum Resources (EMPR), the Association for Mineral Exploration (AME) and EY. The survey has been conducted to provide a view of the current state of the mineral and coal exploration sector in British Columbia (BC).

Data and analysis presented in this report are for the period 1 January through 31 December 2019 and are based on a survey that was completed by 29 prospectors and 171 companies operating in BC, which collectively represent 326 projects across the province.

Similar to the past three years, we note that for the 2019 calendar year, this survey replaces the annual EMPR mineral exploration expenditures survey, and for ease of completion it's designed to be similar to (though broader than) the Natural Resources of Canada's (NRCAN) *Survey of Mineral Exploration, Deposit Appraisal and Mine Complex Development Expenditures*.

## **Thank you to our participants**

A special thank you to the survey participants who spent their time and shared their information to continue to support us in this new endeavor of shedding light on the exploration sector in BC.

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# About the collaborators

## EMPR

EMPR is the provincial government agency responsible for overseeing mineral and coal exploration activity in BC. Ministry staff helped in the design of the survey and facilitated response generation. These expenditure data were either solicited directly from the companies and prospectors or estimated by the EMPR Regional Geologists and British Columbia Geological Survey (BCGS) staff under the direction of its Mineral Development Office.



## AME

AME is the lead association for the mineral exploration and development industry based in BC. Established in 1912, AME represents, advocates, protects and promotes the interests of thousands of members who are engaged in mineral exploration and development in BC and throughout the world. AME encourages a safe, economically strong and environmentally responsible industry by providing clear initiatives, policies, events and tools to support its membership in delivering responsible projects that advance reconciliation and provide benefit to all British Columbians. AME's participation has facilitated the collection of previously unavailable insight into the industry.



## EY

EY is a global leader in assurance, tax, transaction and advisory services. The insights and quality services we deliver help build trust and confidence in the capital markets and in economies the world over. We develop outstanding leaders who team to deliver on our promises to all of our stakeholders. In so doing, we play a critical role in building a better working world for our people, for our clients and for our communities.

The mining and metals (M&M) sector is returning to growth, but companies face a transformed competitive and operating landscape. The need to improve shareholder returns will drive bold strategies to accelerate productivity, improve margins and better allocate capital to achieve long-term growth. Digital innovation will be a key tool, but the industry must overcome a poor track record of technology implementations. If M&M companies are to survive and thrive in a new energy world, they must embrace digital to optimize productivity from market to mine.

EY takes a whole-of-value-chain approach to support each client to help seize the potential of digital to fast-track productivity, balance portfolios and set a clear map for the future.



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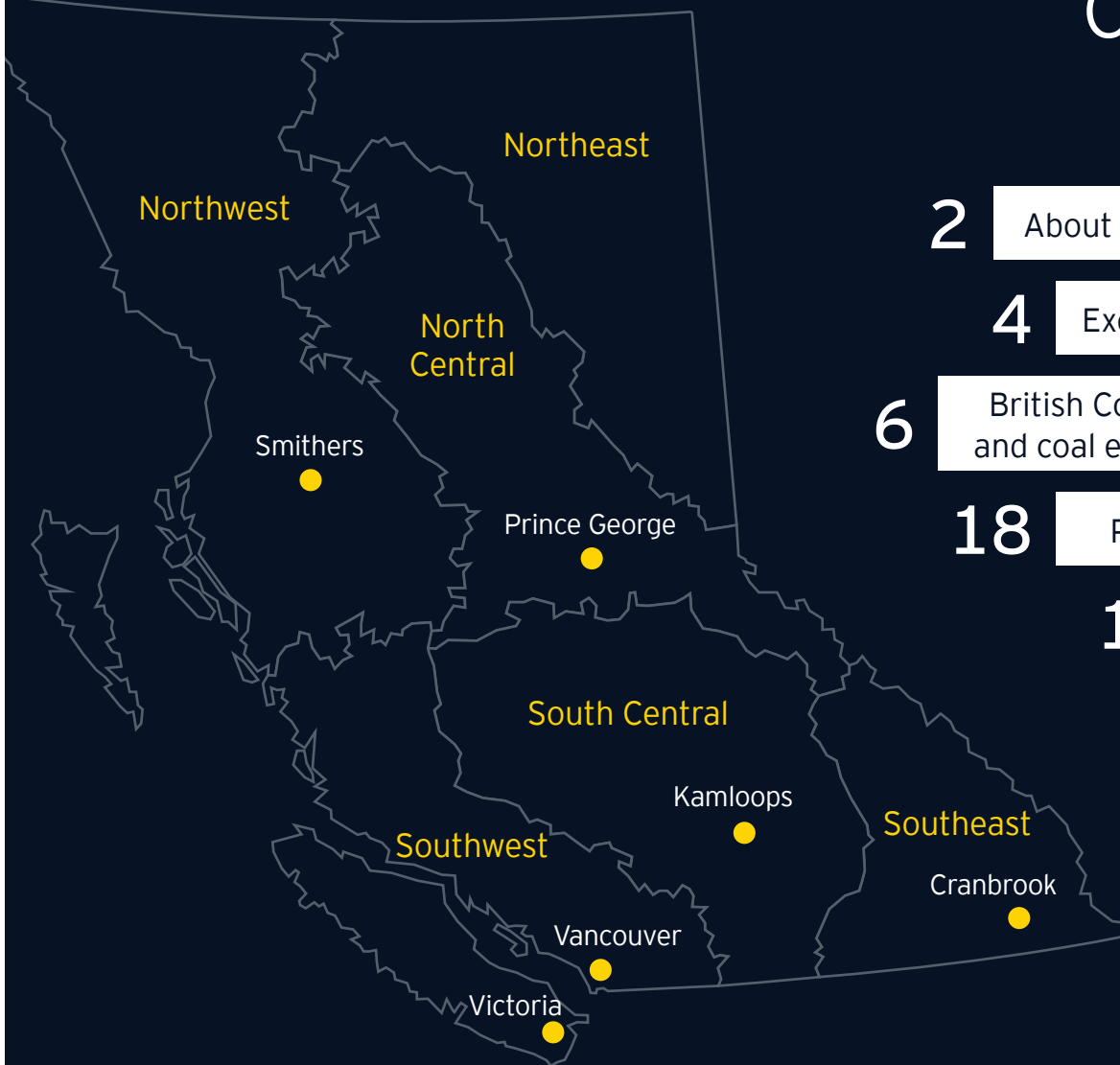
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## Disclaimer

- ▶ EY has relied upon unaudited financial information provided by mineral and coal exploration companies and prospectors in BC, third party research, and information provided by other data sources and relevant associations and bodies. EY has not audited, reviewed or otherwise attempted to verify the accuracy or completeness of such information.
- ▶ Financial information referred to in this report was prepared based on figures provided by entities, estimates and assumptions. As such, readers are cautioned that variations between estimations and actuals could be material.
- ▶ Unless otherwise stated all monetary amounts contained herein are expressed in Canadian dollars.
- ▶ EMPR staff assisted in the collection of survey data and information. Specifically, where a response had incomplete or inconsistent information, key points of data were solicited directly from the companies and prospectors themselves the EMPR regional geologists and British Columbia Geological Survey (BCGS) staff under the direction of the BC Mineral Development Office and assessed through use of professional opinion and experience.



# Executive summary

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For the fourth year, we are pleased to present the findings of the 2019 *British Columbia Mineral and Coal Exploration Survey*. Data and analysis presented in the survey are based on information collected from 29 prospectors and 171 mineral and coal exploration companies operating in BC. Collectively, they represent 326 exploration projects across the province.

Following two consecutive years of exploration growth, 2019 was relatively steady, with exploration expenditure down less than a percentage point from 2018. The positive momentum gained between 2016 and 2018 has flattened out, with exploration expenditure shifting across the province's regions. Investors continued to broaden their focus from gold toward copper, silver and nickel, as noted in the 2018 report. Exploration spend across the province totaled CA \$329m, almost unchanged from the previous year of CA \$330m but still an increase of 34% from 2017.

Globally, base metals outpaced gold as exploration for precious metal declined. Results in the 2019 survey are consistent with global exploration trends, as gold experienced a decrease, whereas copper and other base metals posted increases. Nationally, Canada's exploration expenditure slid to fourth in global rankings – behind South America, Australia and Europe/Mainland Asia – for the first time since 2001. Relative to exploration expenditures across all Canadian provinces, BC saw a decline of 16.8% in exploration expenditure year on year, compared with both Québec and Ontario, which saw declines of 9% and 13%, respectively.<sup>1</sup>

BC's exploration sector continued the trend from 2018 with a "commodity refocus," as investors shifted investment toward copper, silver and nickel deposits. Decreases in gold were offset by increases in copper, whereas declines in coal were balanced by increases in nickel. The Northwest region continued to attract investment, whereas the Southeast experienced the largest decrease. It remains unclear if this is a long-term trend.

In a continuation from previous trends, investment continued to move across the exploration lifecycle, with BC seeing increasing investments in advanced and mine evaluation.

## **The 2018 "gold rush" sees a shift to copper**

The Golden Triangle of northwestern BC continues to attract exploration activity, as investors capitalize on high-grade discoveries supported by investment from major firms, partnerships with Indigenous groups and continued infrastructure development. Survey results reveal the region incurred CA \$180m in exploration expenditure in 2019. That's a 10% increase over the prior year and more than double 2016 levels.

The Northwest also accounted for 55% of total exploration spend in the province in 2019. However, gold exploration experienced a 39% decline in spending from 2018, with copper exceeding gold exploration and posting an increase of more than 150% from the previous year.

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<sup>1</sup> NRCan Annual and Revised Spending Intentions Statistics of Mineral Exploration report, 2019.

## The exploration diversity trend continued in 2019

In 2018, gold accounted for 43% of total exploration expenditures, almost double that of copper. In 2019, investors broadened their focus and shifted spending across commodities, with gold, copper and coal contributing 82% to total spending.

Although much of the increase in diversity can be attributed to copper and nickel exploration in the Golden Triangle, there were also investments in coal projects in the province's Southeast, Northwest and Northeast regions.

## BC poised for a future of diversified metals

In 2019, base metals comprised 39% of total exploration activity, accounting for CA \$143m, an increase of 39% from 2018. Copper was the leading base metal, contributing 72% of total metal spend, up from CA \$79m to \$103m, an increase of 31% year on year.

Global demand for base metals has seen a significant increase, likely driven by an increased demand for electric vehicles and green energy.

Despite an uptick in coal exploration in 2018 and optimism surrounding future growth, 2019 saw a 20% decline in investment, with all regions except the Northeast experiencing declines.

## Mining lifecycle “reset” complete?

The outlook for the mining and metals sector in BC is largely influenced by the success of early-stage exploration. In 2019, the sector's “reset” trend may be complete, as early-stage exploration decreased relative to 2018 levels.

2019 marks the first year that consecutive early-stage exploration has not increased as a share of total exploration. Grassroots and early-stage exploration accounted for 40% of total exploration in 2019 compared

with 44% in 2018 and just 14% in 2014, as exploration spend moved to advanced and mine evaluation stages.

## Looking forward

Despite flat exploration figures in 2019, a shift in investments toward copper and other base metals provides reason for optimism in BC. Many factors will continue to influence exploration activity in the province in 2020, such as a strengthening of the economy, trends in other resource sectors, global trade tensions, demand for base metals and commodity price volatility.

Figure 1 highlights key statistics and figures for 2019 across all BC regions and shows the growth (or otherwise) when compared with the 2018 survey findings.

Figure 1: Exploration in BC summary statistics

		BC	Northwest	Northeast	North Central	Southwest	South Central	Southeast
Regional centre			Smithers	Prince George	Prince George	Vancouver	Kamloops	Cranbrook
<b>Projects</b>								
2019 projects	#	297	79	11	44	33	60	70
2018 projects	#	261	81	8	36	18	47	71
% year-on-year change	%	14%	-2%	38%	22%	83%	28%	-1%
Share of 2019	%	0%	27%	4%	15%	11%	20%	24%
<b>Expenditure</b>								
2019 expenditure	CA \$m	329	181	9	35	5	54	45
2018 expenditure	CA \$m	330	164	6	33	8	56	64
% year-on-year change	%	0%	10%	46%	7%	-39%	-3%	-30%
Share of 2019	%		55%	3%	11%	1%	17%	14%
<b>Drilling</b>								
2019 total drilling	m	709,734	266,683	11,051	92,583	24,667	197,059	117,691
2018 total drilling	m	730,500	293,467	15,103	69,095	39,791	186,616	126,429
% year-on-year change	%	-3%	-9%	-27%	34%	-38%	6%	-7%
Share of 2019	%		38%	2%	13%	3%	28%	17%

# British Columbia's mineral and coal exploration sector

## Exploration remains integral to the growth of the BC economy

The mining and metals industry plays a significant role in the health of the BC economy. Each year, the sector directly invests billions of dollars in local goods and services, which induces further spending.

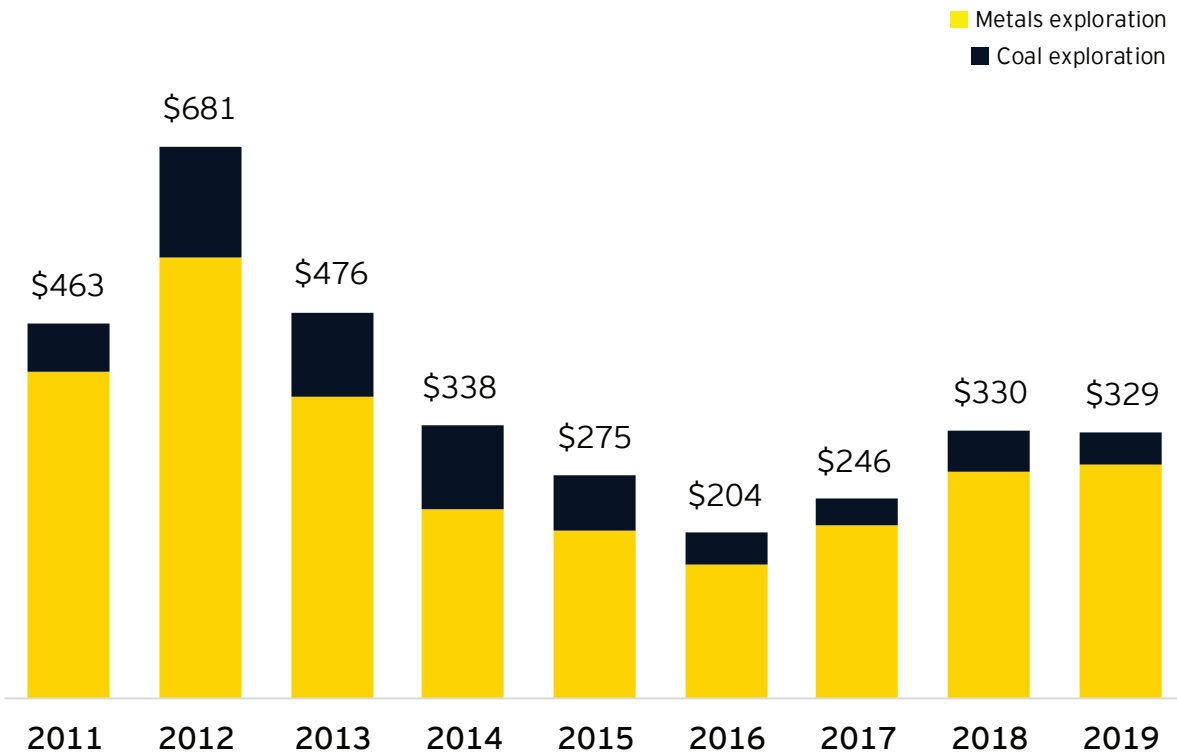
Overall, gross revenues are estimated to approach CA \$9b per annum for the province, and of the 200 companies that reported on the distribution of their spending, 138 spent 50% or more in local communities.

A healthy exploration industry is foundational to future investment, creation of new jobs and community development. It is also fundamental for maintaining a flow of new projects and the source of new mine development opportunities.

## Exploration expenditure remained constant in 2019

Our 2019 survey shows companies' exploration expenditure remained relatively unchanged from last year's peak of CA \$330m, with a slight decline in expenditure to CA \$329m.

Figure 2: Annual exploration expenditure in BC 2011-19 (\$m)<sup>2</sup>



<sup>2</sup>2011 to 2015 data per MEM (nominal data). Note Industrial Minerals included in metals.

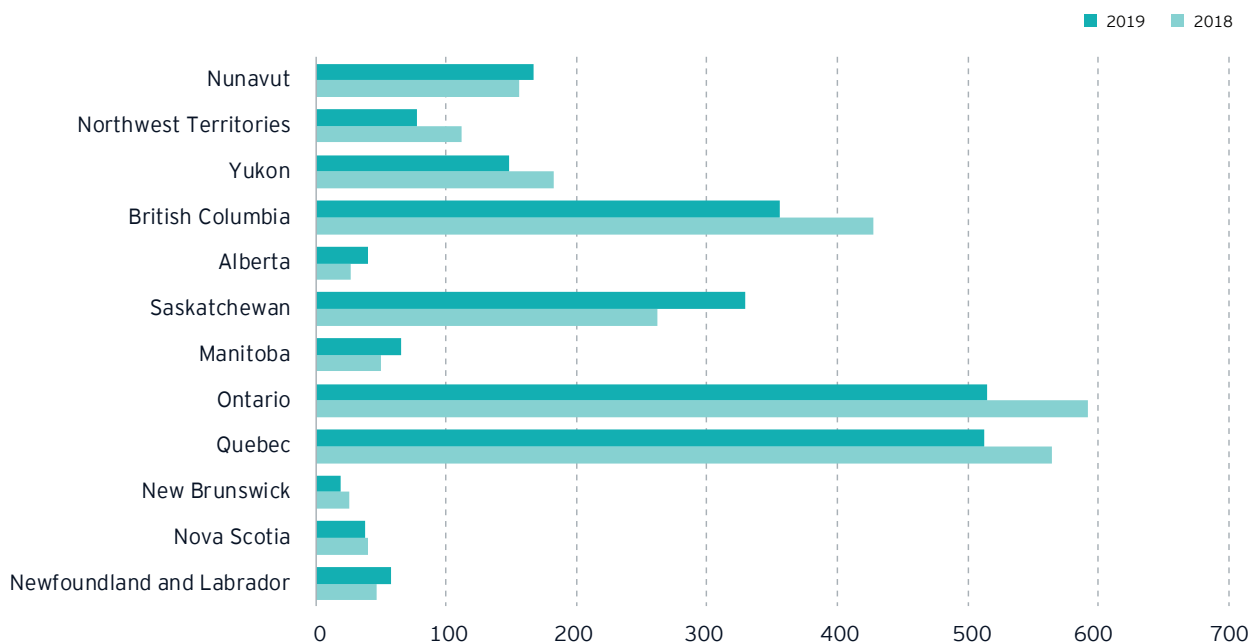
## Canadian exploration down across most provinces

Using Natural Resources Canada (NRCan) data, BC's share of national mineral exploration and deposit appraisal expenditures decreased from CA \$427m in 2018 to CA \$356m in 2019, a decrease of 16.8%.

Exploration expenditure in Ontario and Québec, Canada's two largest mining jurisdictions by production value, decreased by 13% and 9%, respectively, while Manitoba, Nunavut and Newfoundland and Labrador all saw exploration growth respectively.<sup>3</sup>

The significant variance found in values between this survey, reporting a CA \$2m decrease in exploration expenditure compared with CA \$72m in NRCan, is primarily due to survey size, timing of survey and total number of respondents.

Figure 3: Exploration plus deposit appraisal expenditures by province and territory (CA \$m)



Source: National Resources Canada (2019) Table 27 - Exploration Plus Deposit Appraisal Expenditures, by Province and Territory, 2014 - 2018 Annual and 2019 Revised Spending Intentions (current as of October 2019).

<sup>3</sup>NRCan exploration expenditure data 2019.



## Base metals close the gap as the commodities rush continues in the Golden Triangle

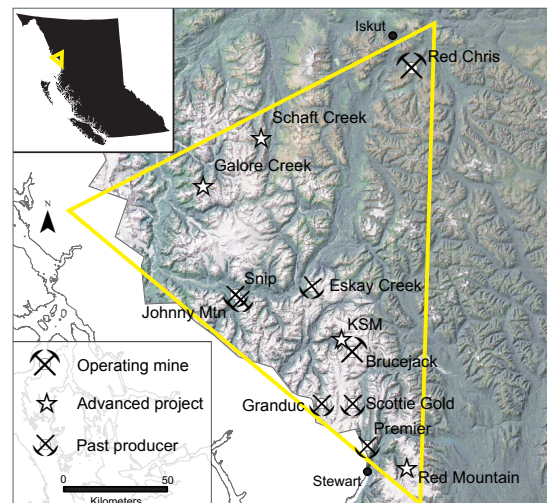
Situated inland from the Alaska panhandle, the Golden Triangle has a strong mining legacy. The region has been the site of three placer gold rushes, including the Stikine gold rush of 1861, followed by the Cassiar (1873) and Atlin (1898) gold rushes. Productive hard rock mining and some very significant discoveries occurred in the region up until the late 20th century, when mining and exploration activity decreased in part due to a protracted global downturn in metal prices, discovery of diamonds in the Northwest Territories and a challenging investment climate.

Several factors continue to drive exploration and development activity in the region, including:

- ▶ A steady increase in investment from major mining companies driving M&A activity in the region, such as the purchase of a 50% interest in the Galore Creek project by Newmont, the purchase of a 70% interest in the Red Chris mine by Newcrest Mining and a focus on junior mining opportunities such as GT Gold (Tatogga Project), Garibaldi Resources (Nickel Mountain Project) and Ascot Resources (Premier Gold)
- ▶ The continued investment in new infrastructure, including the paving of the Stewart-Cassiar Highway, the opening of ocean port facilities for export of concentrate at Stewart, and the completion of a CA \$700m high-voltage transmission line
- ▶ The growing market for electric vehicles (EVs), together with a global shift toward renewable and clean energy, which may increase the demand for base metals<sup>4</sup>
- ▶ Government funding and commitment to the continuation and expansion of the BC Regional Mining Alliance (BCRMA), a Northwest Regional partnership between Indigenous groups, industry and provincial government representatives; the group has collaborated in the promotion of BC and the region as a leading jurisdiction for mineral development

The Northwest region remains a key contributor to BC exploration, accounting for 55% of total expenditure for the province in 2019. Exploration expenditure for the region increased to CA \$180m, up by 10% from the previous year.

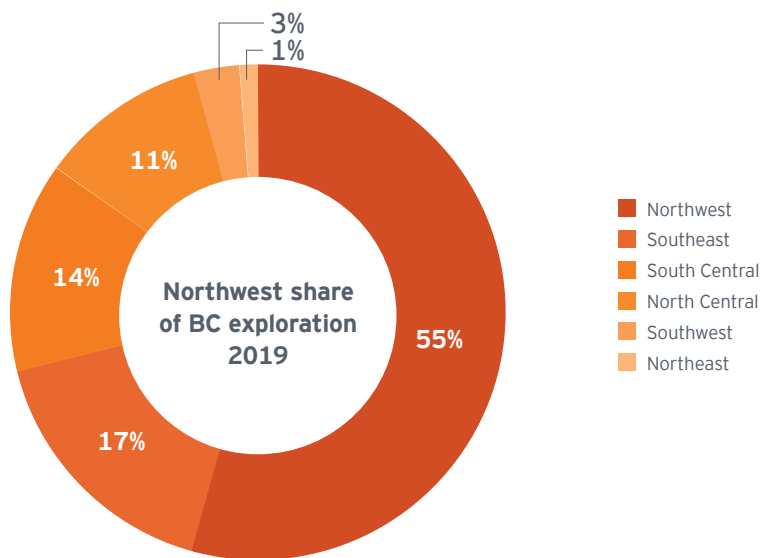
Figure 4: The Golden Triangle



Exploration expenditure in the Northwest region 2016-19 (CA \$m)



<sup>4</sup>“Copper Forecast 2020: CEOs Optimistic on EV Boom,” Investing News, 18 December 2019.



The number of exploration projects in the Northwest region with investment exceeding CA \$1m in 2019 was more than double the number of such projects in other regions in the province. Furthermore, gold and copper accounted for 35% and 32% of all projects over CA \$1m in investment, with 22 and 20 individual projects, respectively. For projects over \$1m, the average spend per project increased from CA \$4.1m in 2018 to CA \$4.6m in 2019.

Figure 5: Number of exploration projects with expenditure exceeding CA \$1m in 2019 by region

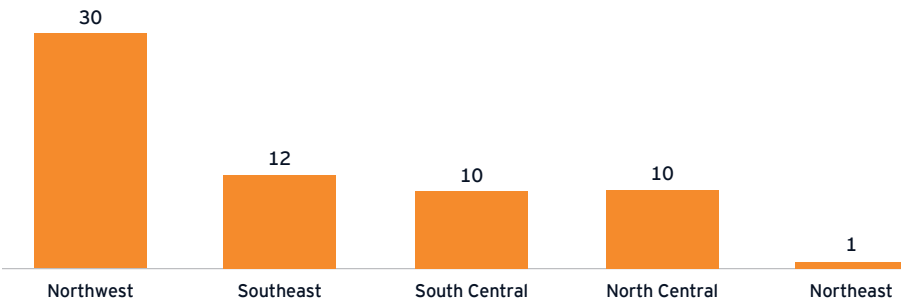
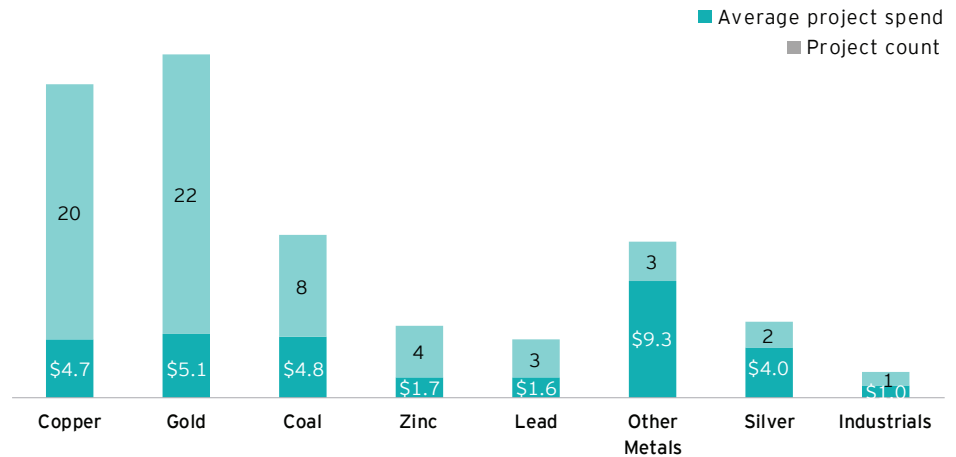


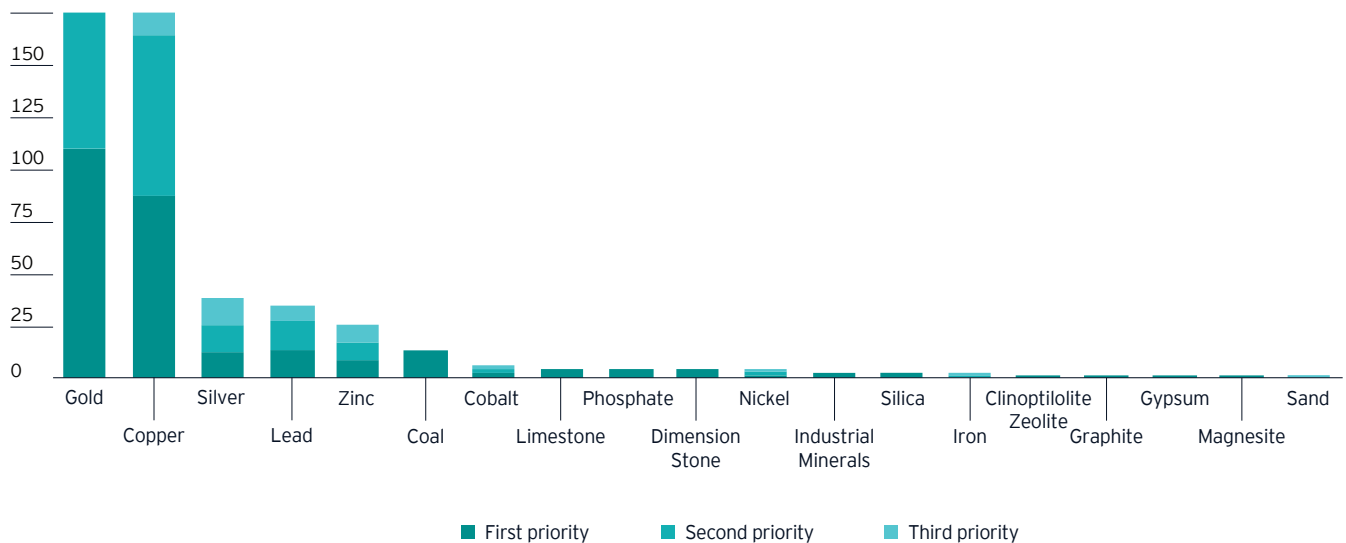
Figure 6: Exploration projects with expenditure exceeding CA \$1m in 2019 by commodity



## BC mining poised for a future of diversified metals

In 2019, survey respondents reported 297 projects, a 14% increase relative to 2018. This year's survey identified a wide variety of commodities of interest, with exploration targeting 32 metals, industrial minerals and coal. Gold and copper continued to be the most targeted commodities in BC, with copper and nickel seeing increases in expenditure of over 30% and 50% in 2019, respectively, driven by large investments in fewer projects.

Figure 7: Prioritization of ores related to project

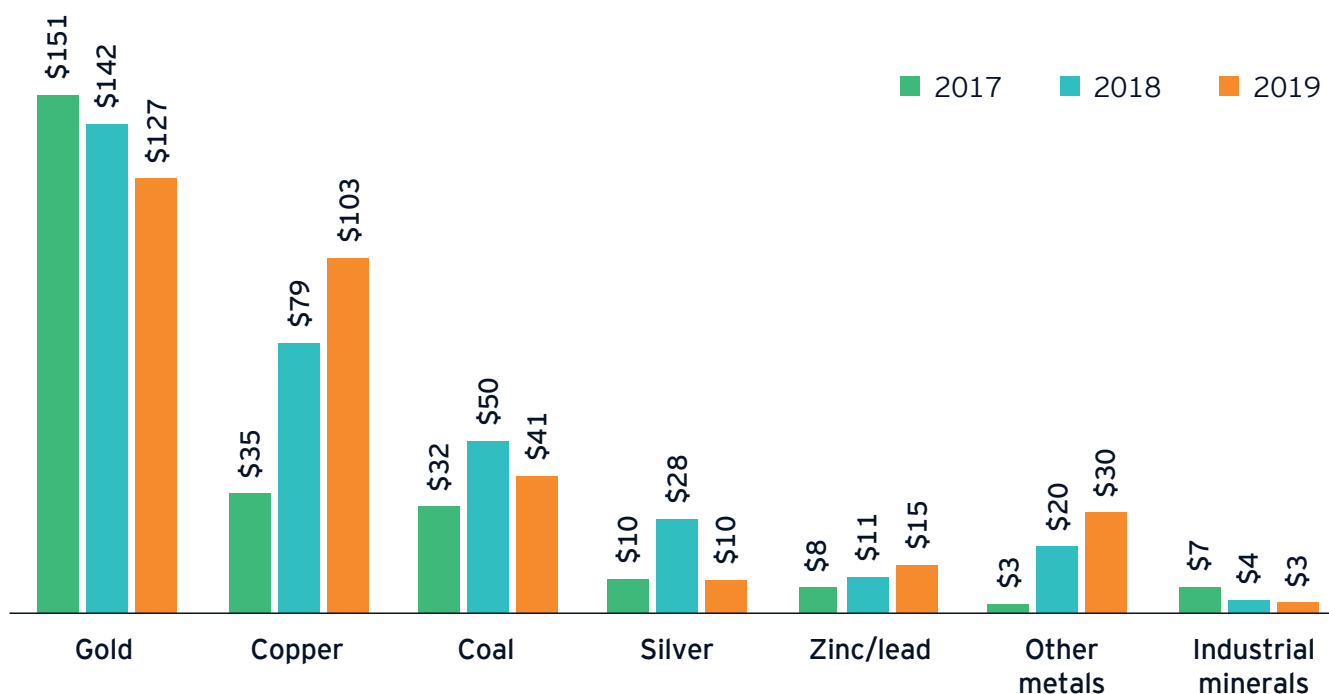




In 2019, the decline in gold exploration investment continued, with its share declining by 11% as investors increased their focus on base metals and other commodities. Nonetheless, gold continued to attract the largest exploration spending, contributing CA \$127m toward the province's total exploration spend.

Much of the increase in copper and other metals can be attributed to exploration projects in the Northwest. A regional comparison of exploration expenditure in 2018 and 2019 is presented in Figure 9.

Figure 8: Exploration investment by commodity, 2017-19



Growth in the Northwest region was attributed to a few large investments in copper exploration on sites which had previously focused on gold.<sup>5</sup> Growth in “other metals” doubled in expenditure in 2019, driven primarily by a large nickel exploration investment.

<sup>5</sup> Note, due to reclassification of Au vs. Cu data in previous studies, minor adjustments to historic data were recognized in 2019.

Figure 9: Exploration investment by geographic region 2018 vs. 2019

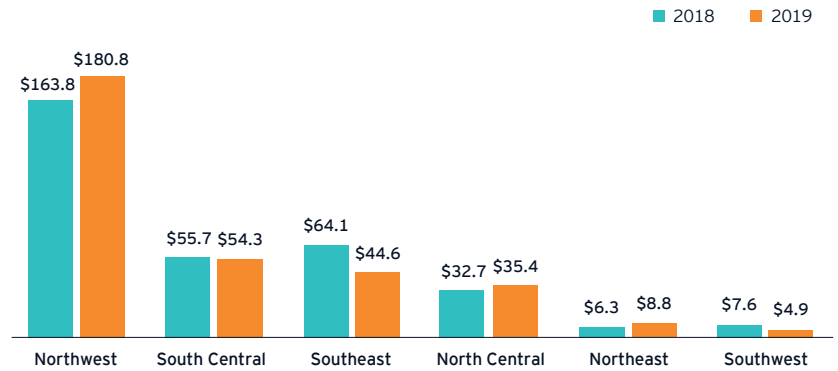


Figure 10: Exploration investment by commodity in Northwest region 2017-19

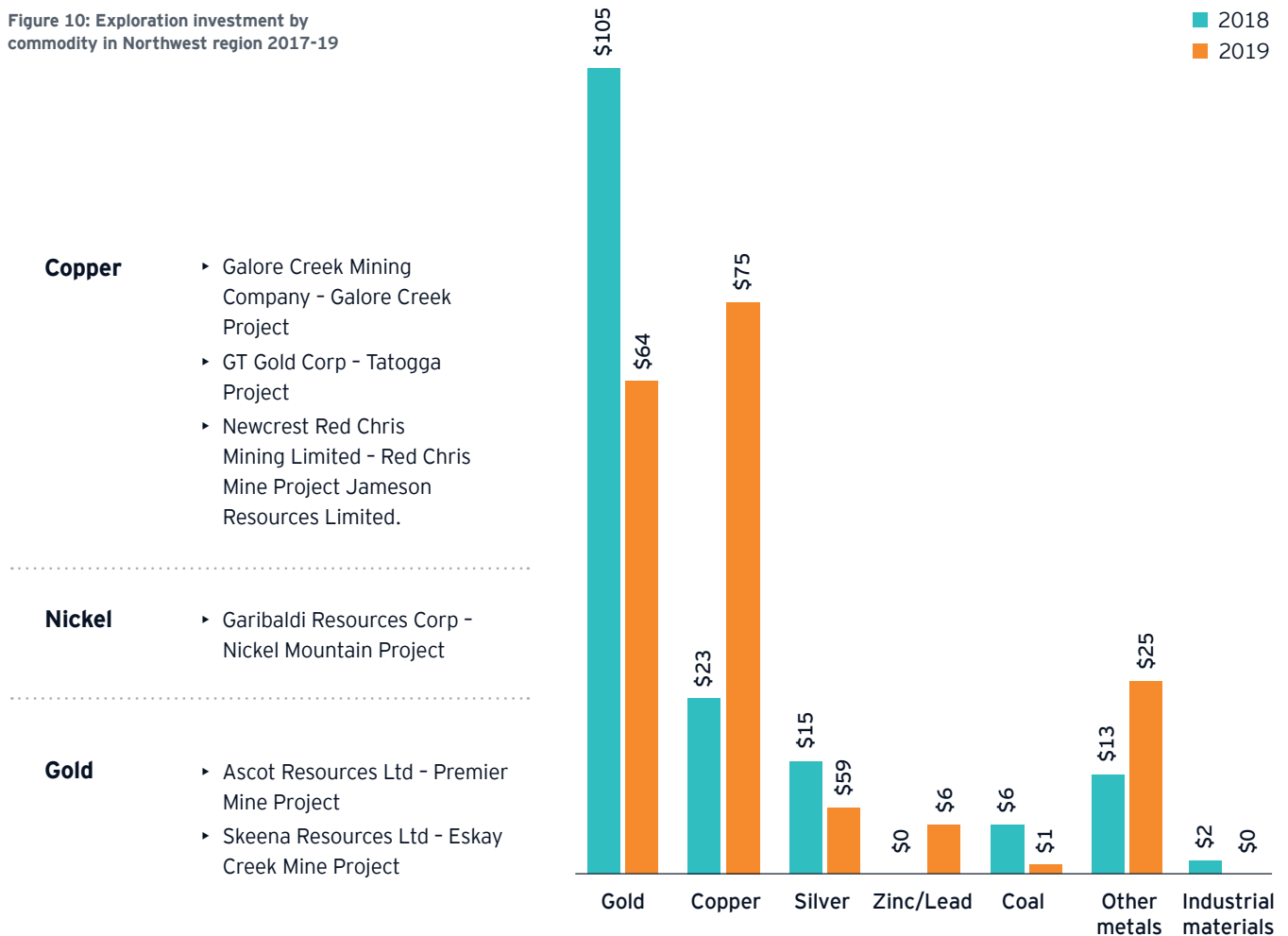
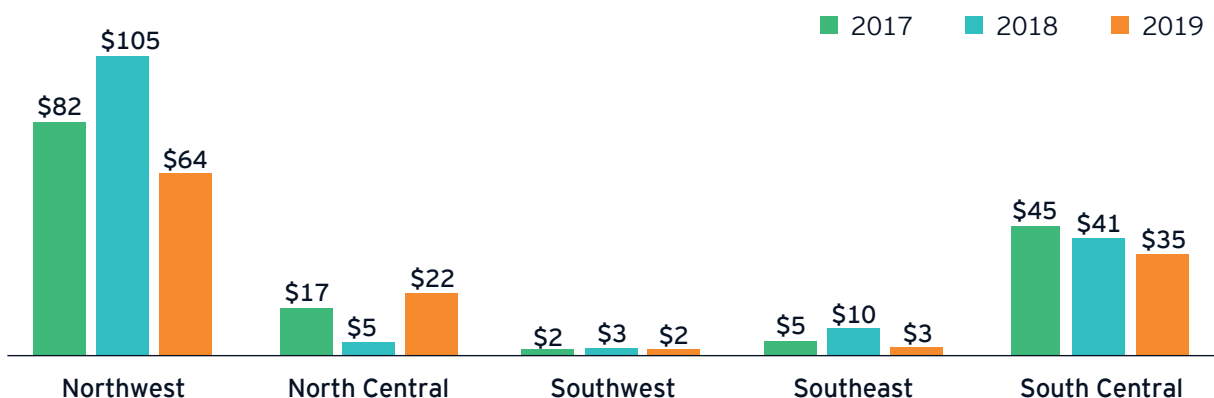


Figure 11: Gold exploration investment by region - 2017-19



## The start of a trend or a commodity reset?

Base metals, such as copper, zinc, nickel and lead, play an integral role in the global economy and are often considered to be a key indicator of economic growth. Base metals exploration expenditure of CA \$143m in 2019 represents a 39% increase from 2018 levels. It is noted, however, that this figure largely represents a focus on base metals in polymetallic projects (copper-gold).

Figure 12: Expenditure of base metals (copper, lead/zinc, nickel) 2016-19

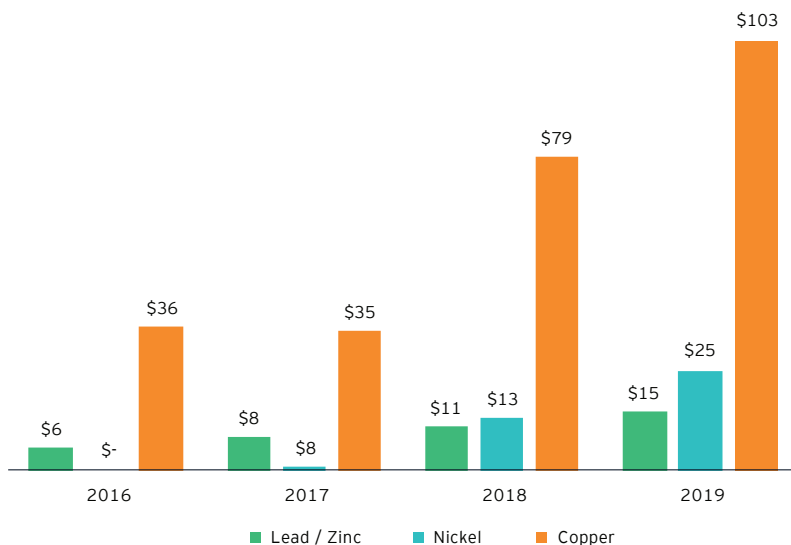
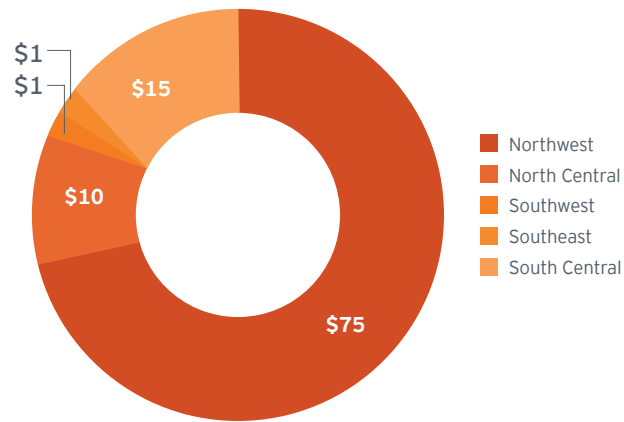




Figure 13: Copper expenditure by region  
2018-19 (CA \$m)

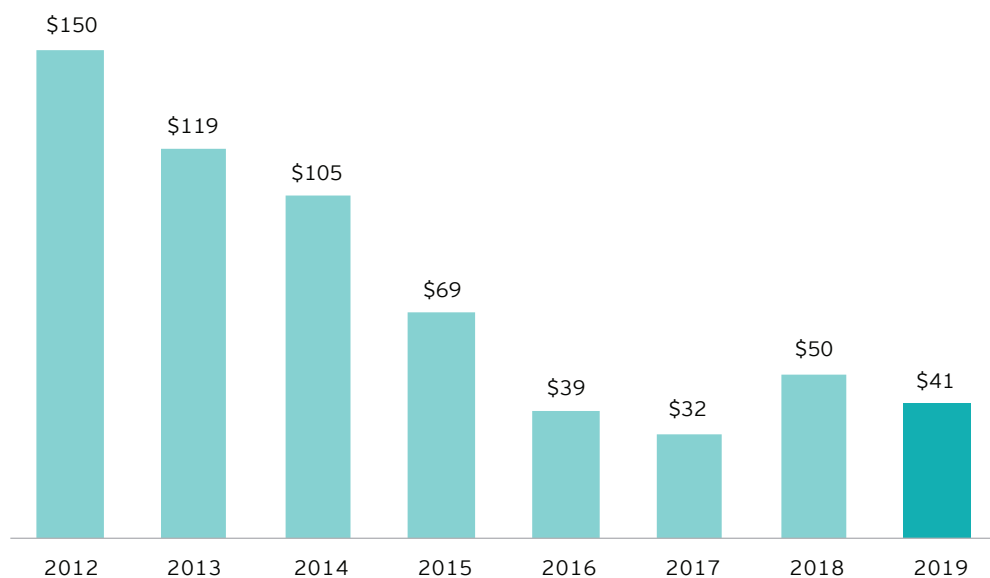


Large investments in copper exploration by a few investors contributed primarily to this increase. This shift appears to show increased optimism for exploration in base metals in BC. Copper accounted for 72% of base metals exploration in BC in 2019. Whether this is the start of a longer-term shift to base metals or simply a one-off will need to be monitored in the coming years.

## Coal exploration slows in 2019

Since peaking in 2012, annual investment in coal exploration in BC has trended downward in an environment of mixed global economic conditions, poor investor sentiment and price volatility.<sup>6</sup> Despite an uptick in 2018, expenditure on coal exploration in the province decreased in 2019 by 18% to CA \$41m. In this year's survey, coal comprised 12.5% of the province's total exploration budget, a decrease from 15% in last year's survey.

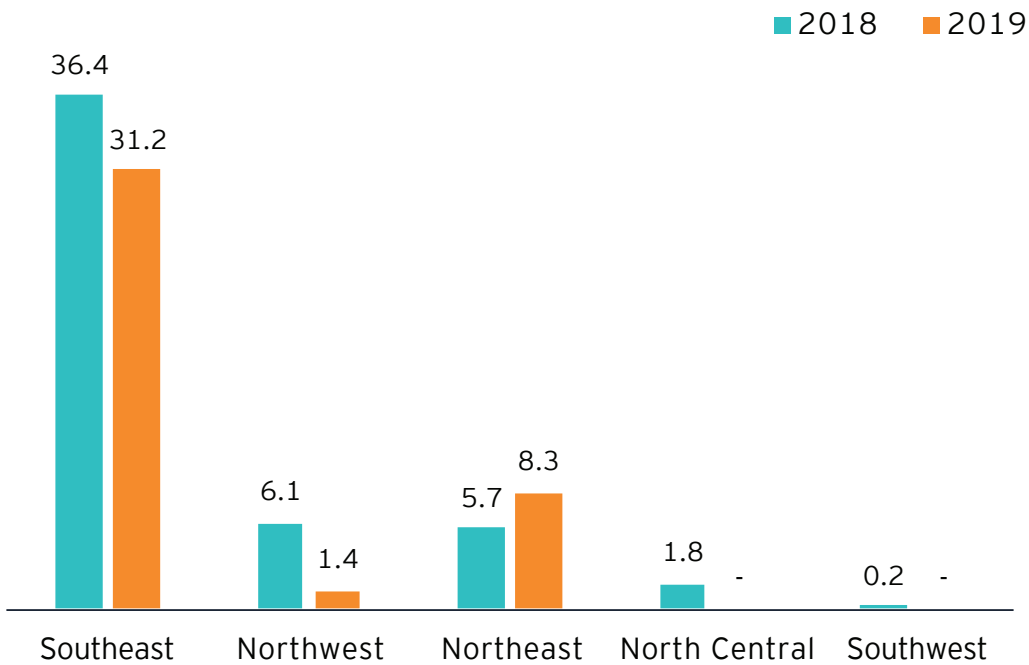
Figure 14: Annual coal exploration expenditure in BC 2012-19 (CA \$m)



<sup>6</sup>S&P Global Intelligence 2019, Global coal demand to remain stable through 2024: IEA, December 2019.

Despite decreased exploration activity in the Southeast region of the province, an increase in activity was reported in the Northeast. Figure 15 shows annual coal exploration spend by region.

Figure 15: Annual coal exploration expenditure by region 2018-19 (CA \$m)



**Exploration continues to contribute to BC job market**

Based on data provided by respondents, 3,960 jobs were created in BC through exploration activity in 2019. Seasonal contractors contributed to more than 40% of this total, with 560 positions created for First Nations people (contract, seasonal, permanent) compared with 355 in 2018, a 58% increase.

In line with regional spending, the Northwest region contributed 46% to total employment opportunities, with the South Central region following with 27%. The exploration industry continues to play an integral role as a job creator in BC.

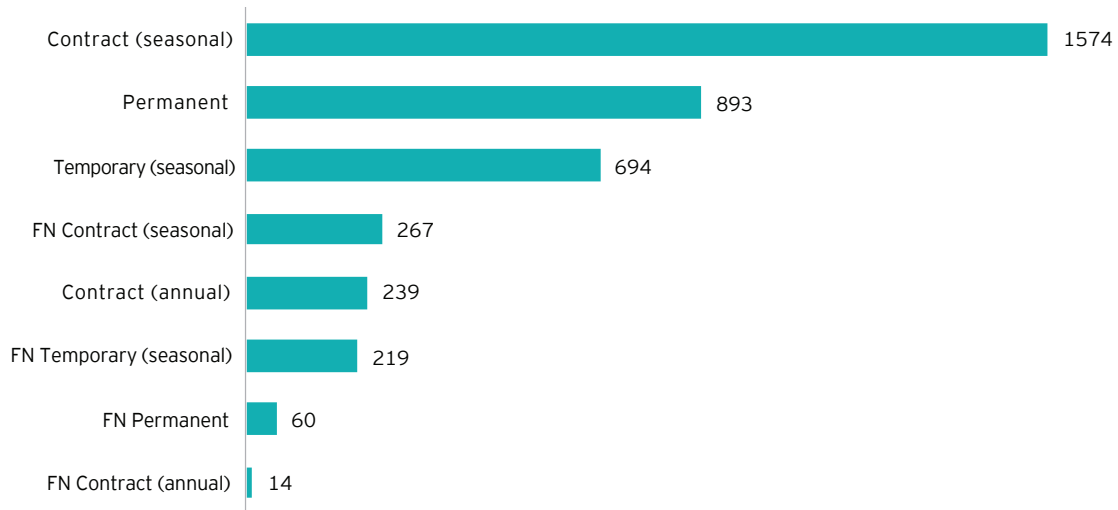


Figure 16: Employment distribution by employment type across BC (total number #)

### A shift in spending along the exploration lifecycle

The outlook for BC's mining sector is largely influenced by the success of early-stage exploration. Five years ago, the prospects for new discoveries leading to new mines in the province appeared bleak given the limited investment that was being made in early-stage exploration.

The exploration lifecycle consists of five core stages as demonstrated in the graphic below.



In 2015, only 15% of exploration in the province could be characterized as grassroots (prospecting, sampling, airborne geophysics) or early stage (geophysics, geochemistry, trenching and drilling), compared with 85% late-stage (advanced stage, mine evaluation) or mine lease exploration.



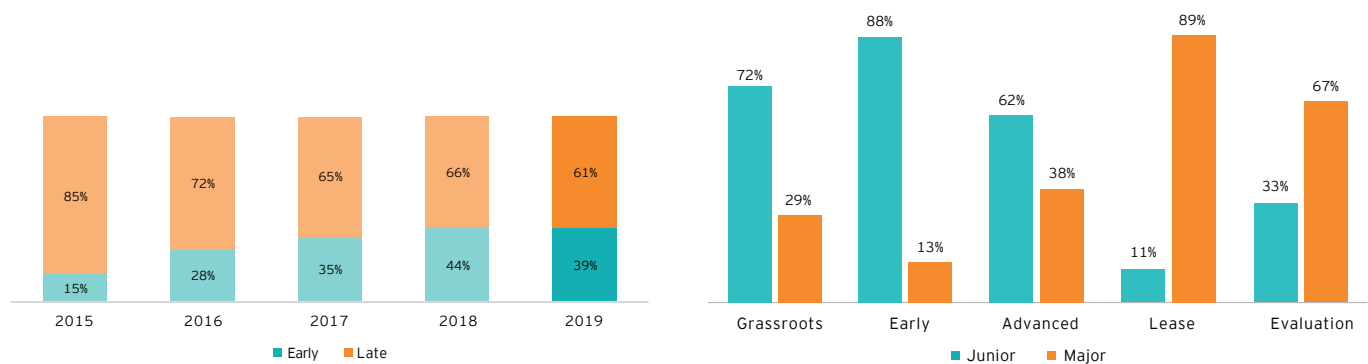
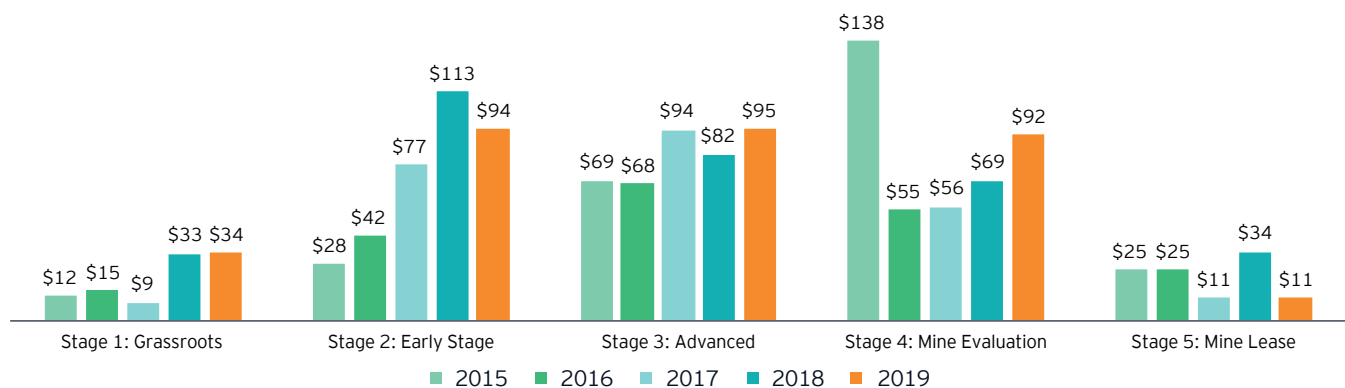


Figure 17: Exploration expenditure by stage - early vs. late 2015-19

As highlighted in the 2016 *British Columbia Mineral and Coal Exploration Survey*, and reinforced in last year's survey, the sector embarked on a mining lifecycle reset driven by improved macroeconomic conditions and by financial markets further opening to the junior sector.

Figure 18 shows the changing pattern in expenditures across the stages and is consistent with a resetting sector that continues to see projects progress through the stages of the exploration cycle.

Figure 18: Distribution of exploration expenditure by stage 2015-19 (\$m)



Whereas early-stage exploration is down in contribution by 4%, this is primarily due to the shifting of investment from early-stage to late-stage exploration. In 2019, investment increased in both the advanced and mine evaluation stages. Growth in these latter stages may be driven by increasing optimism in the market and the resulting decision made by producers to invest in or reevaluate proposed mines.

Grassroots exploration also marginally increased year over year in 2019, reaching its highest level over the past five years.

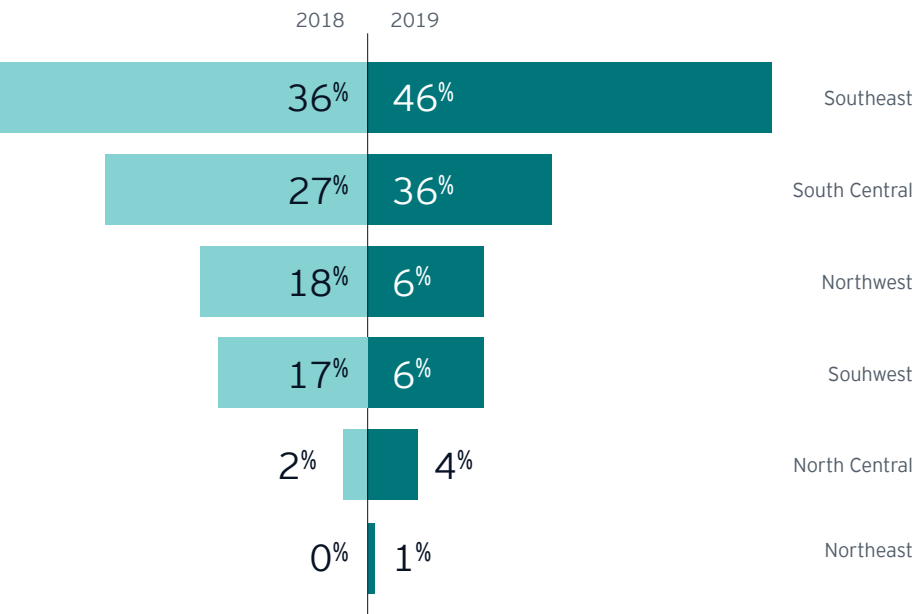
# Prospecting in BC

## Prospectors spent over \$750,000 collectively across the province in 2019

Information was collected from 29 prospectors in this year's survey. Each prospector spent on average CA \$26k prospecting in 2019 for a total of CA \$757,000, a decrease of approximately 27% from 2018 spend. Total identified prospector spend was CA \$1.2m in 2018 at an average of CA \$36k per prospector. As highlighted in last year's survey, tracking prospectors is difficult, because many prefer not to disclose work.

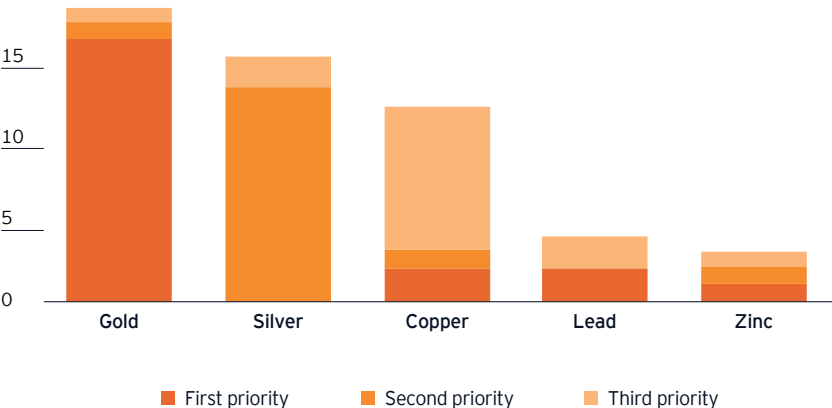
Last year, prospectors focused on the province's Southern and Western regions. This year, the focus was more specifically on the Southeast and South Central regions, with a significant decrease in the Southwest region.

Figure 19: Expenditure by prospectors by region 2018-19



The commodities trend from last year continues, as gold remains the most searched-for commodity, followed closely by silver, copper, lead and zinc.

Figure 20: Top prospected commodities in 2019



# Contacts

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Should you require any information regarding this report and its contents, please contact the relevant organization through the following representatives:

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