



Exploring a Career in the Minerals Sector

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An Industry Perspective

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Overview

Mineral resources are essential for the world, from precious metals such as gold, base metals like copper-zinc-nickel, as well as rare earth and industrial minerals.

Geoscientists play an integral role in the discovery of minerals through to their extraction, as well as ensuring responsible closure and reclamation.

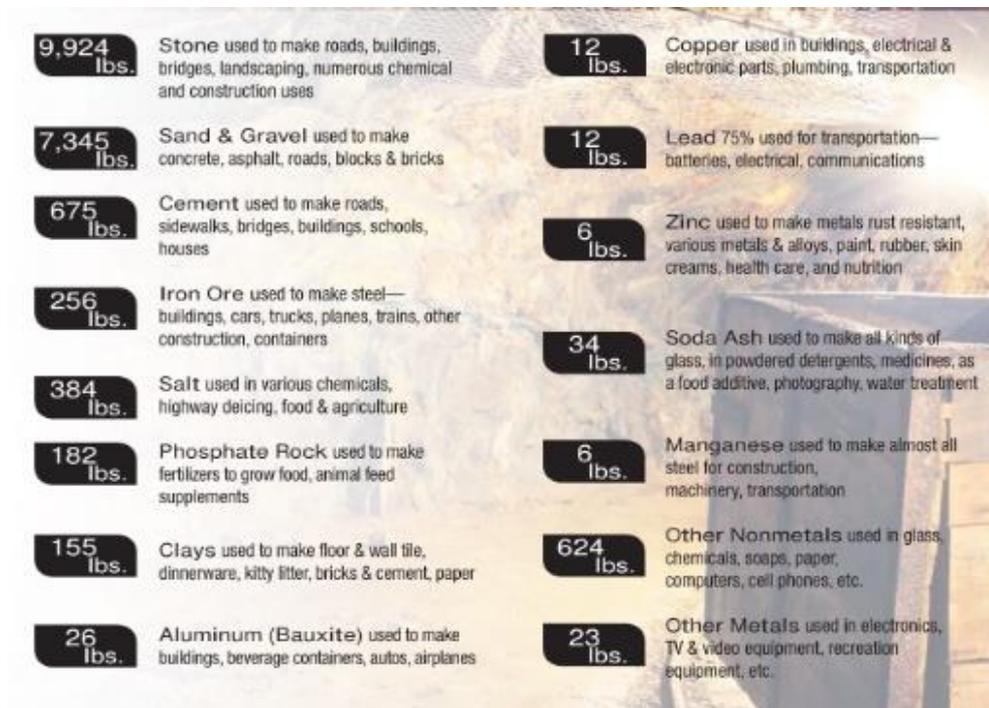
The minerals industry is a global one, and can be extremely rewarding.

Goals of This Webinar

- Describe what the Minerals Industry is, its importance and what type of roles a geoscientists does in this sector
- Outline typical activities that a geologist undertakes and potential career progressions
- Entry requirements to work in Exploration and Mining, as well as tips and suggestions on finding that right role
- Describe what is it like to transition from University to a starting role in the Minerals sector

Importance of the Minerals Sector

- Metalliferous minerals are non-renewable natural resources that are vital for the construction, manufacturing, agriculture and energy industries
- Every year 40,633 pounds of new minerals must be provided for every person in the United States to make the things we use daily

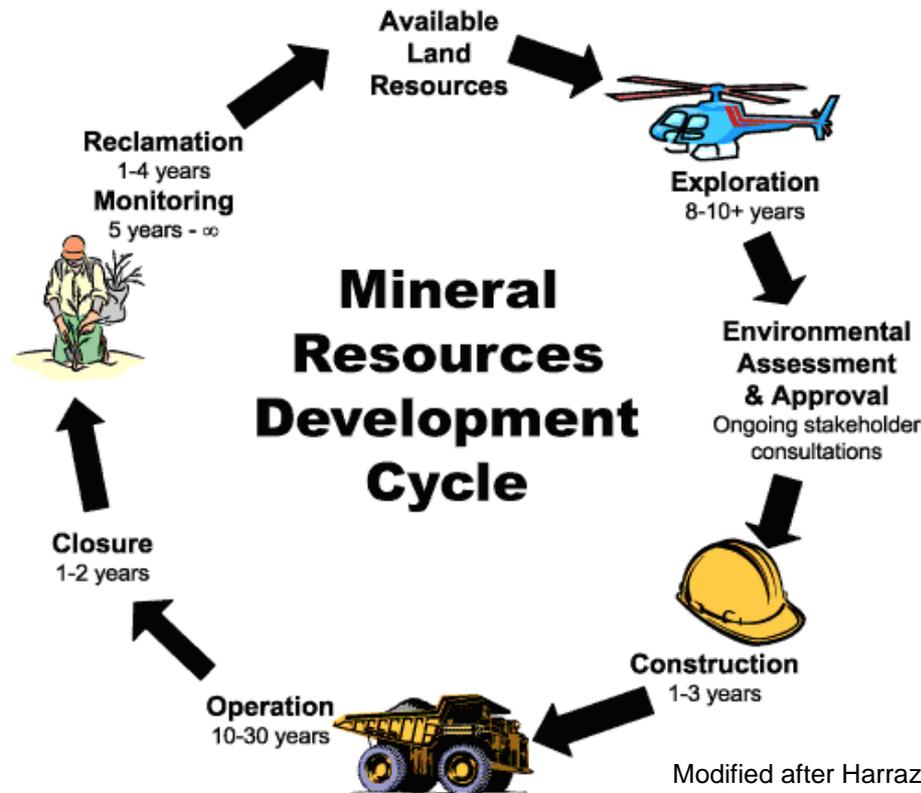


Source:
<https://mineralseducationcoalition.org/mining-mineral-statistics>

- In 2018, the estimated value of total nonfuel mineral production in the United States was \$82.2 billion (source [U.S. Geological Survey, Mineral Commodity Summaries 2019](#))

Metalliferous Minerals Resource Cycle

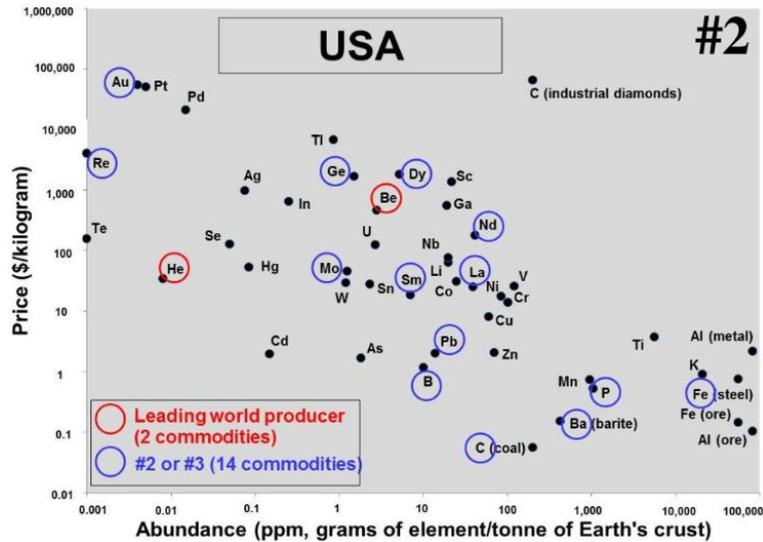
- Roles in the Minerals sector vary depending on where a project is in the Resource Cycle:



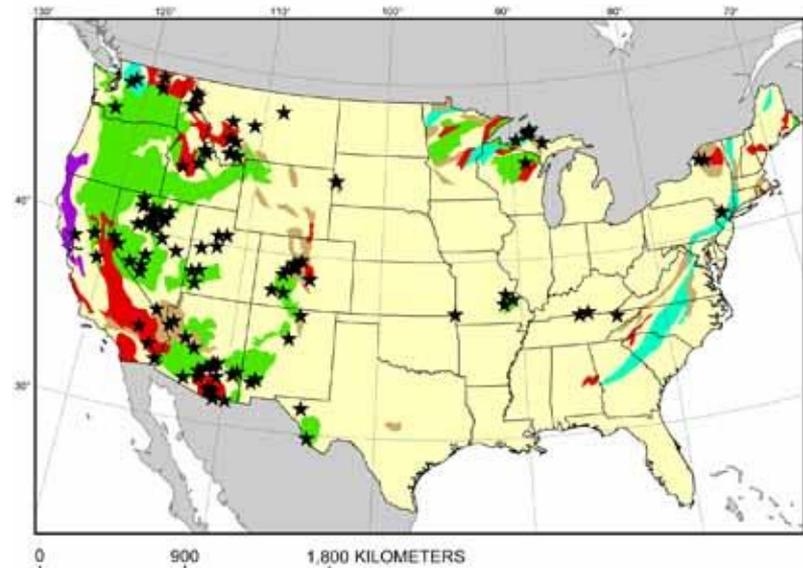
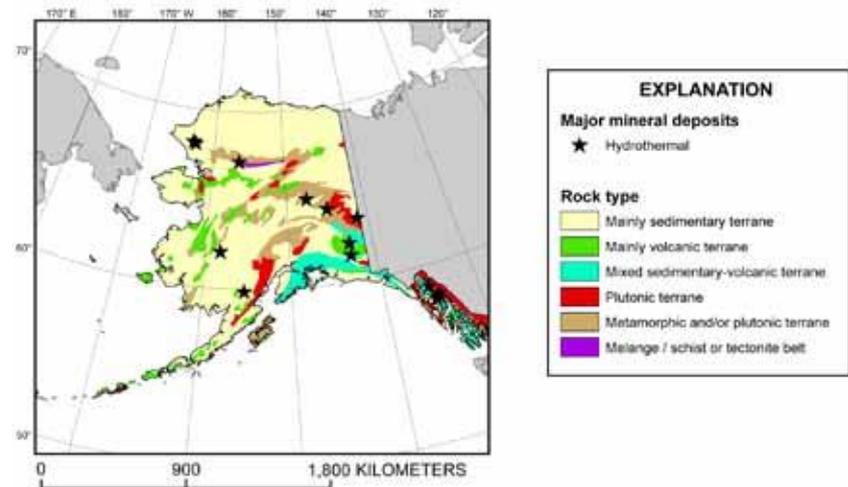
- Minerals are essential, irreplaceable components for the things we use daily, for transportation, our health, our food supply, communication, and energy. Many people don't realize, if it's not grown, it's mined – emphasizing the reality of minerals being used in everything around us.

The Minerals Sector in the United States

- In 2018, US\$10.1B was budgeted globally for nonferrous exploration, of which 8% was budgeted in the U.S.A. (S&P, 2019)
- The U.S.A. is a leading producer of several minerals



- The U.S. minerals sector includes world-class precious metal gold-silver operations in Nevada as well as copper mines in Arizona



Source: [United States Geological Survey Environmental and Energy Study Institute](#)

Industry Roles for Geoscientists

- Minerals Industry Geology Roles:

- Exploration Geologist**
- Geophysicists
- Geochemists
- Structural Geologist
- GIS / Data Geologists
- Project Geologist
- Open Pit Mine Geologist**
- Underground Mine Geologist**
- Geotechnical Engineer
- Resource Modeler**
- Environmental Scientist
- Consultant Geoscientists



Exploration Field Mapping - Canada



Drilling - Suriname



Drill Core Interpretation - Canada



Digital Modeling - Peru

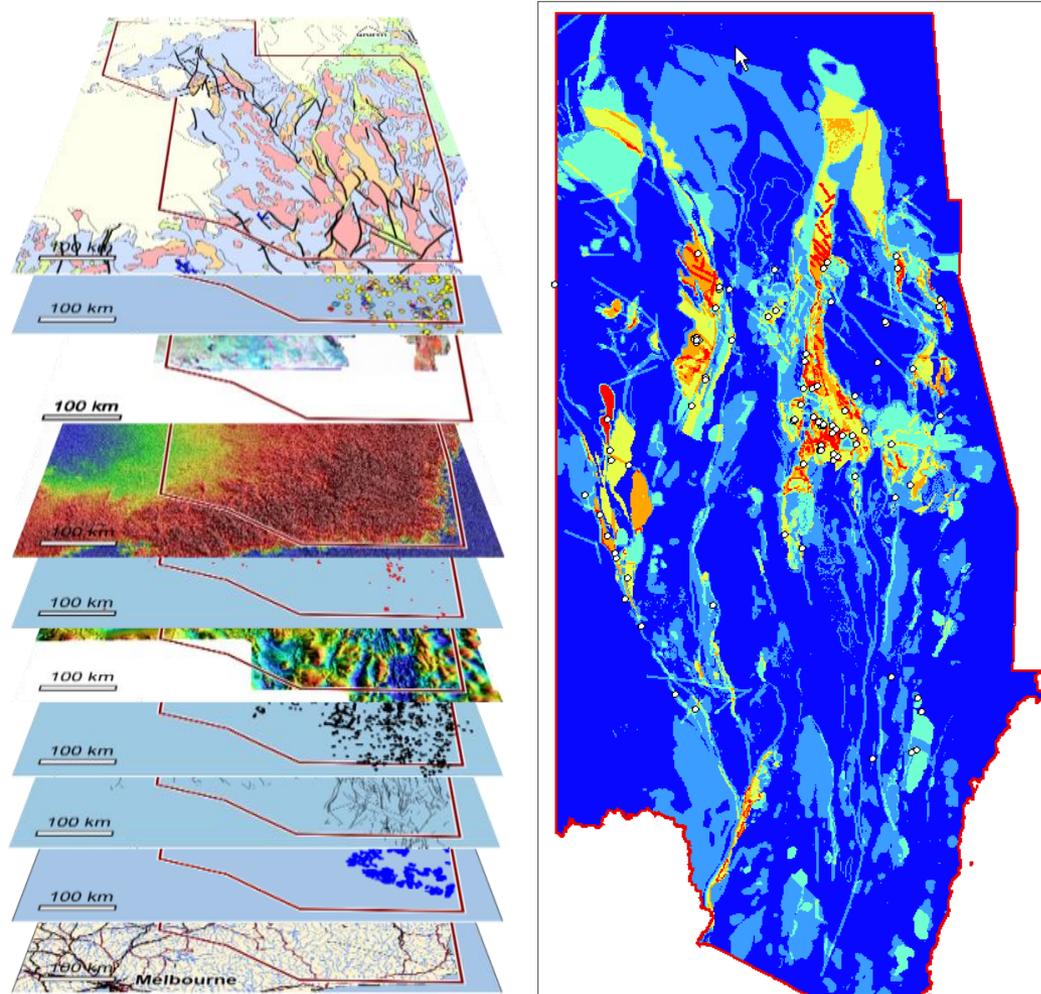


Open Pit Ore Control - Australia



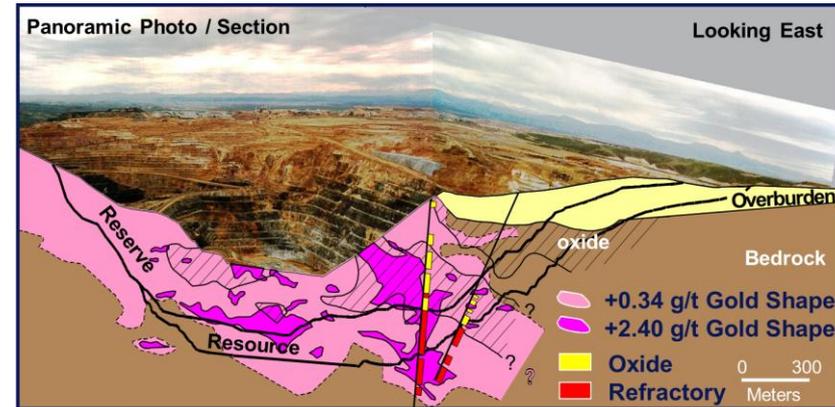
Underground Sampling - Australia

Geologist Activities



Integrating different data sets (left) to create district scale interpretation(right)

Geologists design programs to test geological concepts through a mix of remote data sets and field inspection, through to interpretation in 2D, 3D even in Virtual Reality, leading to communication of results to key stakeholders such as Engineering.



Economic Mineral Envelope Interpretation – Open Pit Operation
Mineral Industry geologists typically undertake mapping and core logging, to gather information to spatially determine the economic potential of a mineral resource with advanced computer models

Industry Requirements

Skills, Knowledge & Experience:

- Bachelor of Science (Geology) and a Master of Science for senior roles
- Previous industry / internship work experience preferred
- Exposure to geological specific software, i.e. ArcGIS 2D or Leapfrog 3D

Personal Attributes:

- Demonstrate a strong commitment to safety
- High written & verbal communication skills with excellent interpersonal skills
- Be able to analyze numerical and graphical data
- Identify, analyze and solve problems and apply innovative solutions
- Have an ability to work in multidisciplinary teams

Working Conditions:

- Interest in working in remote project locations or on mine sites
- Commonly work in adverse weather conditions from the Andes to the Amazon
- Geologists may get to see the world, future may involve international travel

Preparation Guidance

How to get a Start in the Industry

Focus on what will set you up for success in your Education

- Undergraduate Subjects: Economic Geology, Field Mapping, GIS/3D Modeling along with ensuring core knowledge in sedimentology, mineralogy...
- Non-technical Skills: Collaboration, communication, cross-functional engagement and presentation experience, safety awareness.



Open Pit Zinc-Lead Mapping – Queensland, Australia



Underground Gold-Silver Ore Drive - Argentina

Preparation Guidance

Engage in the geological community and gain experience

- Participate in meetings/proceedings/workshops undertaken by the Geological Society of America, Society of Economic Geologists, Society for Mining, Metallurgy & Exploration, Geological Society of Nevada and others
- Do an internship if possible, with one of a number of operators in the minerals sector and be flexible to working in rural and urban environments

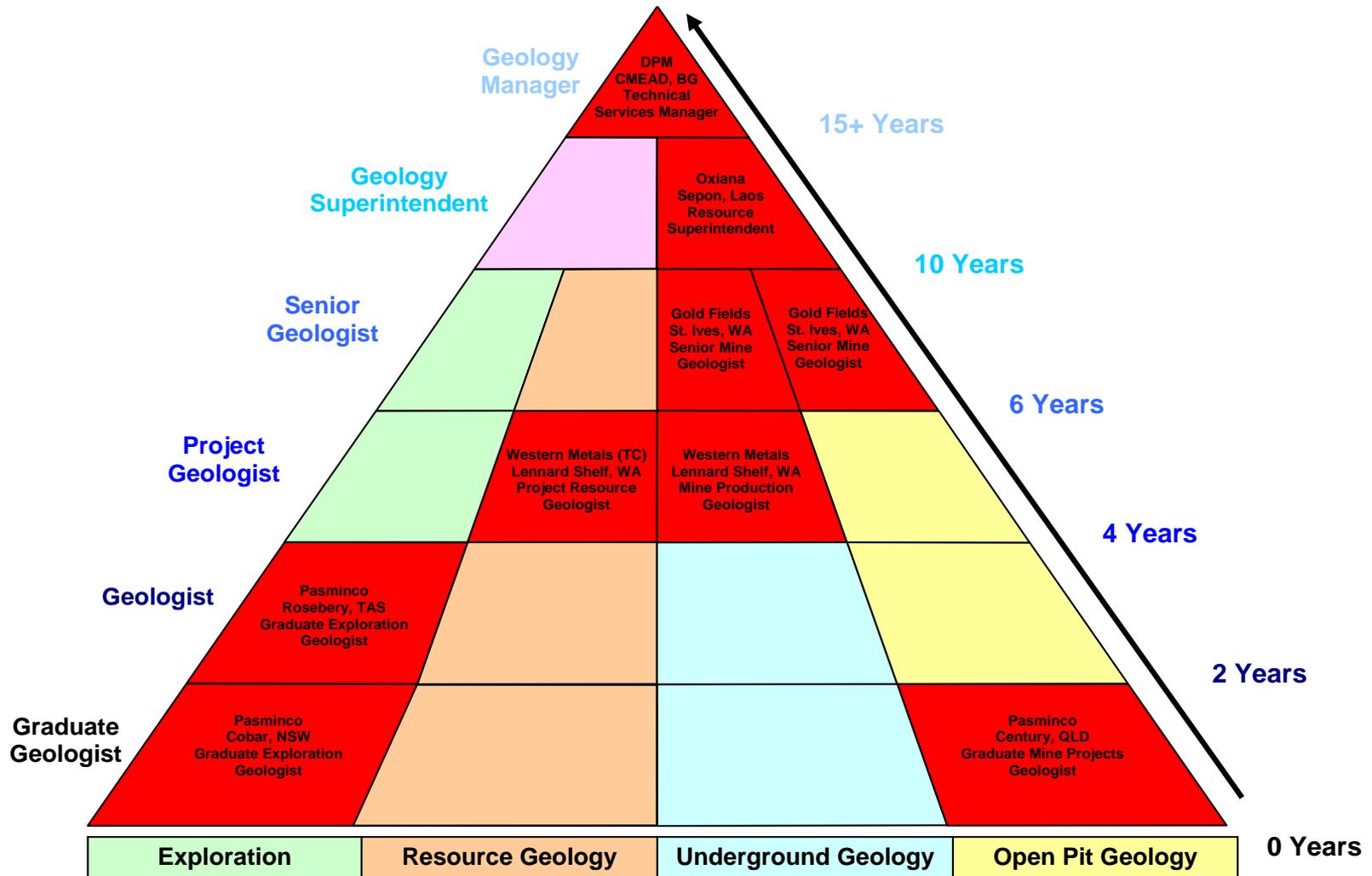
Steps in applying for a role in the minerals sector

- Make sure your resume is up to date, and best sells the value you can add
- Positions are typically advertised: directly on **company websites**, [LinkedIn](#), [InfoMine](#), [Northern Miner](#), [SEG](#) / [GSA](#) / [SME](#) websites and campus events



Career Development Paths

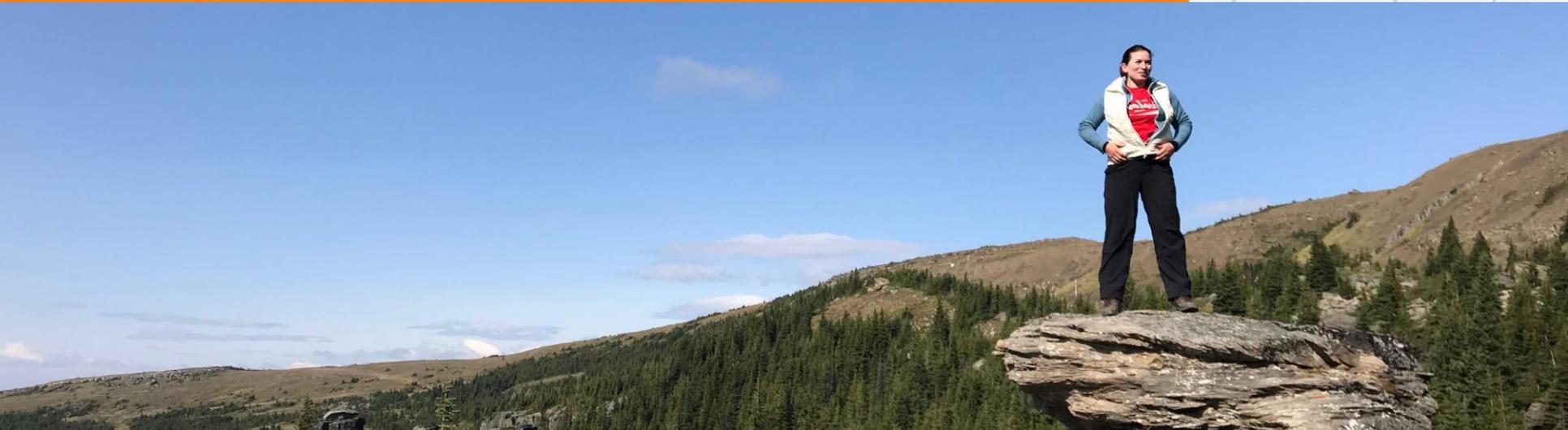
Geology career pathways take on many forms from graduate to managing departments, below is an example of my career/experience as a geoscientist



A Graduate Perspective

Elaine Lord

Intern, Newmont Goldcorp



Expectations and surprises

- Expecting:
 - **Exposure**
 - **Mentorship**
 - **Networking opportunities**



Intern and Guide – Colorado



Field Geologist – Canada

- Surprised by:
 - **Robust safety culture**
 - **Emphasis on “onsite” work experience**
 - **Misconceptions about the industry**
 - Safety
 - Cleanliness
 - Social responsibilities
 - Communication with the public



Headquarters



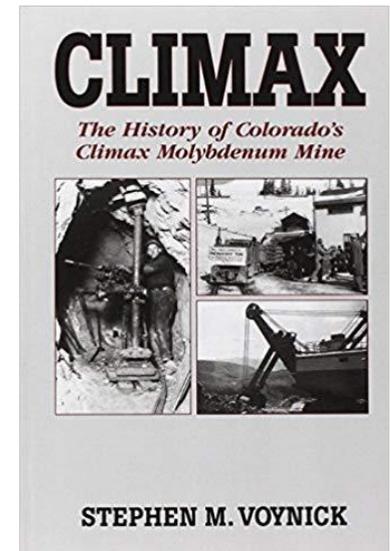
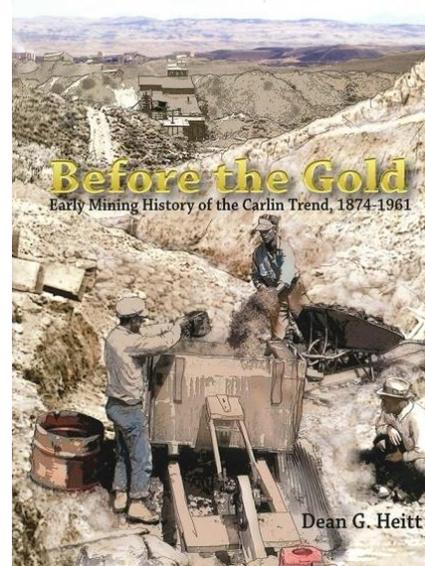
Water sampling – Western Australia

Finding your internship

- Internships are a partnership between new workers and companies
- What work environment do you want to work in?
- Pre-requisites, and other things you can do/learn to increase your chances of acceptance
 - **Don't have the skill? Ask your school to hold a seminar or training class**
 - **Try to get the trial version (do this far in advance)**
- Where to look, and why you should apply
 - **“Have I worded this strongly enough? You should get an internship.”**
 - **On the websites of each large mining company, booths at conventions, school career fairs, professors, your network**
 - **Internships open doors to opportunities that would normally be out of reach**
- Tips for your interview:
 - **Research beforehand, pick your 3 strengths, and practice what you want to say (S.T.A.R.: situation, task, action, result)**

Entering the mining industry

- Jargon
 - (i.e. size of core NQ,HQ..., testing “pigeon pairs” ..., stoping and block mining...RQD...)
 - Read books about mine histories to understand the development of the industry.
- The large scope of the industry and camps/onsite mine communities
 - Industrial hygienists, electrical/mechanical engineers, nurses, community relations...
 - Primary production, jobs for the community, byproducts, partnerships



Haul trucks – Western Australia

Making the most of your internship

- The 3N rule:
 - **Network, Network, Network...**
- Work on time, be reliable, follow your common sense instincts
- View this as a learning experience, if you've worked hard and come out enriched you did your job
- Remember that everyone around you is also human, they have unique experiences you can learn from and problems you can help solve
- Taking feedback: "Thank you for your feedback, is there anything else I can do better?" Ask questions and stay open to their answers
- Be Flexible to change, travel, and extra work(experience)!