

The Role of UAF in the Development of Alaska's Mineral Resources

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Mineral/REE Related Strengths

- People
 - Geology
 - Mining Engineering
 - Geological Engineering
 - Mineral Preparation
 - Mineral Economics
 - REE Applications / Alternatives

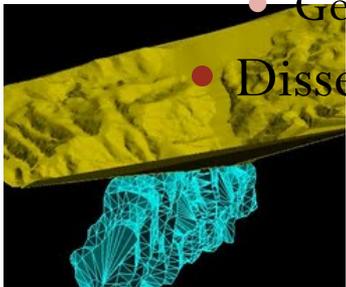


- Facilities
 - Advanced Instrumentation Laboratory
 - Advanced Materials Laboratory
 - Silver Fox Underground Mine
 - Various mining, mineral preparation & geology labs

Harnessing Alaska's Critical Minerals: Role of UAF

Exploration Activities

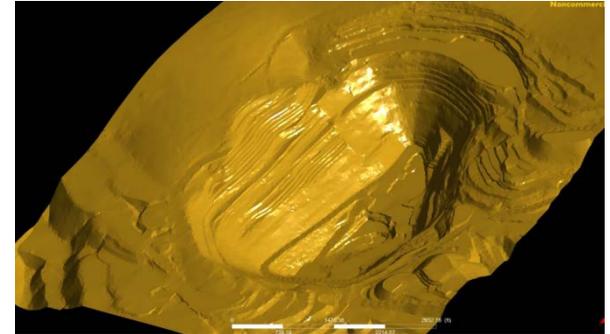
- Can assist/complement State efforts in exploration
 - Example: UAF DGGS MoA
- Faculty expertise and lab facilities in
 - Geology & Geophysics
 - Remote sensing, GIS
 - Physical/chemical analyses of rocks
 - Surface & elemental analysis, electron microscopy
 - Resource quantification
 - 3D orebody modeling
 - Geostatistics/neural nets
 - Dissemination of geological datasets/knowledge



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Mining & Mineral Processing

- Mine Design: Impacts Quantities Minable
 - Geotech
 - Mine ventilation
 - Water
 - Hydrology including water sources
 - Discharges, contaminants



- Mineral processing
 - Quantifying mineral recoveries
 - Recycling of minerals
- Cold climate issues
 - Remediation





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Advanced Materials

- **Develop sensors for detecting and mining rare earths**
- **Application of Rare Earths**
 - **Nano-processing (create composites etc)**
 - **Exploit rare earths for stealth technology**
- **Develop alternatives to rare earth**
 - **High energy density magnets**
 - **Miniaturized motors**

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Advanced Skills Shortage

Comparison of Degrees Conferred

	United States (2009 ¹)	UAF (typical ranges)
Mining and Mineral Engineering (BS/MS/PhD)	176/48/10	2-4/ 0 - 2 / 0-1
Geological / Geophysical Engineering (BS/MS/PhD)	133/78/4	3-7/ 3-5 / 0-2
Geology/Earth Sciences ² (BS/MS/PhD)	3257/ 1015/ 396	10-12/ 9-12/ 2-6

1: <http://nces.ed.gov/>

2. This category only shows 'general' geology/earth sciences and not specialized categories

NOTE: UAF is the only Alaska institution offering Mining Engg & Geological Engg

- Expect advanced skill shortage in Alaska

Obtaining Social License to Operate

- Challenge: Help the general populace understand highly technical information
 - Project details
 - Impacts – enviro, social, cultural economic
- Challenge: Unbiased source of information
- Challenge: - Equitable sharing of wealth
 - Public and Corporate policies

Technical Challenges

- Challenge: Mining in Alaska
 - Infrastructure / Energy / Logistical / Water etc
 - Cold climate issues
 - Air quality, permafrost, remediation

- Challenge: Other / site specific

Harnessing Alaska's Critical Minerals:

Addressing Impediments

- Center for Mineral Resources at UAF
 - Tap into the vast network of expertise spanning the entire UA system
 - Scientists (social and natural) , engineers (all types), humanities
 - Utilize available capacity
 - Many faculty only have 9 month contracts
- Role
 - Contribute to pre-permit phase discussions
 - Maybe even “create” information through research
 - Develop solutions for technical challenges
 - Serve as one-stop shop for mineral related issues

Harnessing Alaska's Critical Minerals:

University of Alaska Fairbanks

- Capable and Ready to Play its Part

Questions?

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