Department of Natural Resources
Division of Geological & Geophysical Surveys

Alaska Strategic & Critical Minerals Potential and Assessment

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Strategic & Critical Minerals Summit
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Current USGS List of Strategic & Critical Minerals

USGS (Long 2009; Long and others 2010)

- Antimony
- Barite
- Chromite
- Cobalt
- Fluorite
- Gallium
- Graphite
- Indium
- Platinum Group Elements (PGE)
- Rare Earth Elements (REE)
- Rhenium
- Tantalum
- Titanium
- Tungsten
- Yttrium
- Niobium

- This list will change over time
- Merely a subset of Alaska Mineral Potential
Alaska is Complex; Topographically & Geologically

63 mm/yr
Geologic Terrains in Alaska
Regions of Primary Mineral Occurrence

Base Metals
- Cu, Pb, Zn, Mo
  + Au, Ag,

Precious Metals
- Au, Ag
  + Sb

Strategic Minerals
- PGE, REE, Graphite, In, Nb, Ta, Ge

Coal, Oil, and Gas
- Conventional & Unconventional Energy Resources

Mineralization Traverses Most of Alaska
The “Prize is Hidden in the Details”
Existing Data Sets and Studies

From Work Performed by: DGGS, USGS, USBM, BLM, University, & Industry
DGGS Airborne Geophysical/Geological Mineral Inventory (AGGMI) Program:

Legend
- State land

DGGS AGGMI Program
- Red: Geologic Mapping
- Blue: State Airborne Geophysical Surveys (funded by the State of Alaska)
- Yellow: US BLM Airborne Geophysical Surveys (funded by US BLM; contracts were administered by DGGS)
New DGGS Farewell Geophysical Survey

Rare-Earth Elements

Mafic/Ultramafic-related Cu, Ni, PGE

Epithermal/Hot Springs

Plutonic-related gold
  - Hypabyssal
  - Porphyry Cu ± Mo ± Au
  - Skarn

Polymetallic veins of uncertain origin

Sediment-hosted base metals

Placer gold

Styx River Survey

New Farewell Survey
New Donlin-Area Geophysical Survey

Epithermal/Hot Springs

Plutonic-related gold
  - Hypabyssal
  - Plutonic
  - Hornfels/Skarn

Polymetallic veins of uncertain origin

Mafic/Ultramafic-related Cr, Ni

Placer gold
Statewide Geochemical Analysis

- Samples reanalyzed by DGGS - Strategic & Critical Minerals (SCM) Program
- Samples recently reanalyzed by USGS
- USGS samples available for obtaining modern geochemical analyses

State Land
Strategic & Critical Minerals (SCM) Assessment

Summary of Assessment Milestones to date:

• 3,500-square-mile field project in the Ray Mountains-Dalton Highway
• 2,075-square-mile SCM-related airborne geophysical surveys
• Compiled historic geochemical data for more than 5,387 analyses
• Donations of 2 privately held SCM-related databases
• Modern geochemical analyses for 1,209 historic U.S.B.M samples
• Comprehensive geochemical sampling in the Western Moran area
  • Documented new gold-REE bearing stream drainages
• Discovered new lode gold occurrence near William Henry Bay, SE Alaska
• MOU with USGS for modern chemical analyses of sample databases
• Supporting graduate thesis work at UAF
• Evaluating State-selected land for SCM potential
• Scanning and making historic databases and reports available online
Strategic & Critical Minerals (SCM) Assessment

Future Work Plans:

✓ Continue focus in areas of mineral entry and highest potential
✓ Perform high resolution geologic mapping and geochemical sampling
✓ Acquire and distribute high-resolution geophysics
✓ Continue compiling digital database of all available information
✓ Finalize modern geochemical analyses of archived samples
✓ Publish results and make all data available on the web (free access)
Summary of available information on fossil fuel and geothermal energy in Alaska

Available for Download
www.dggs.alaska.gov
Commitment