



# ***Oil and Mining Solutions at the University of Alaska***

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University of Alaska  
Senate Resources Committee

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# Our Mission

*Providing  
Industry Solutions*

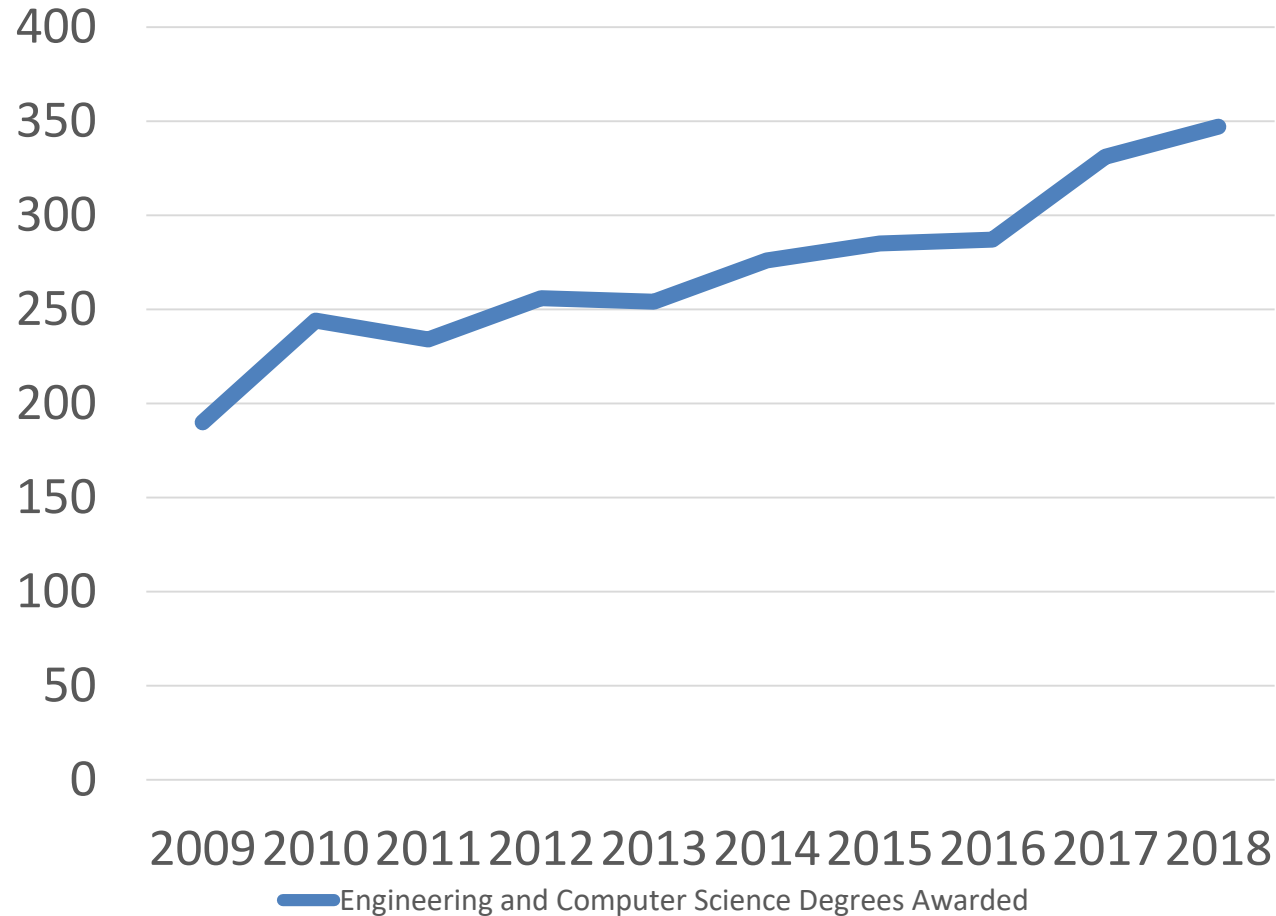


- ✓ Quality Education
- ✓ Engineering Workforce
- ✓ Research and Business Partnerships

# Student Success

## Engineering and Computer Science

*(Bachelors and Master Degrees)*



***Over 2,700 degrees  
awarded in past 10  
years***



UNIVERSITY  
of ALASKA  
*Many Traditions One Alaska*



# Just a *glimpse* of what UA offers....

- Civil Engineering, BS, MS, Ph.D
- Computer Engineering, BS, MS, Ph.D
- Computer Science, BS, MS, Ph.D
- Electrical Engineering, BS, MS, Ph.D
- Geomatics, AAS, BS
- Geological Engineering, BS, MS, Ph.D
- Mechanical Engineering, BS, MS, Ph.D
- Mining Engineering, BS, MS, Ph.D
- Petroleum Engineering, BS, MS, Ph.D
- Project Management, MS
- Engineering, Ph.D
- Occupational Safety and Health, AAS, BS
- Entry Level Welding, O.E.
- Construction Management, AAS
- Power plant Maintenance, Cert.
- Drafting/ Design Technology, Cert., AAS
- Diesel/ Heavy Equipment, Cert.
- Diesel Power Technology, AAS, UC
- Process Technology
  - Process Technology AAS
  - Instrumentation Technology, Cert.
  - Safety, Health and Environmental Awareness Technology, Cert.
  - Mining Mill Operations, O.E.
- Information Technology
  - IT Specialist: Computing Technology, AAS
  - IT Specialist: Network and Cybersecurity, AAS
  - IT Specialist: Network and Systems Admin, AAS
  - Information Technology Specialist, Cert.
  - Computer Information Technology (*Minor*)



# MINING & GEOLOGICAL ENGINEERING



- Vital workforce and professional expertise for developing Alaska's resources
- Dates back to University's Founding
- Job placement rate nearly 100% after graduation
- Over 65 students currently enrolled on these tracks at UAF

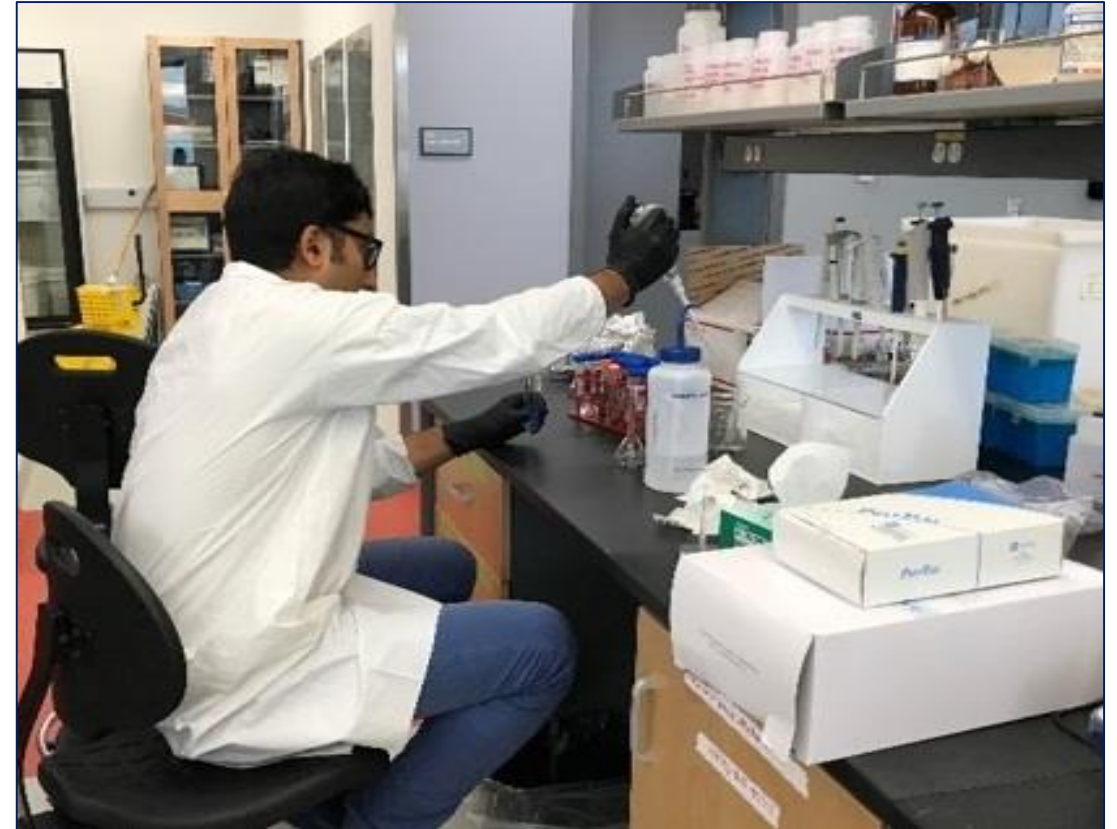


# Arctic Mine Water Remediation at Red Dog Mine

*Dr. T. Ghosh, Dr. R. Ganguli, Post Doc, S. Dev,  
Grad Students F. Dehmi*

**Goal:** *Use bacteria from mine site  
to remedy acid mine water at  
Red Dog Mine*

**Benefits:** *Ecologically sound  
remediation method, and  
supports resource development  
in the arctic on state and ANCSA  
land holdings*



# Increasing Flotation Yield

*Dr. T. Ghosh, Dr. R. Ganguli, Post Doc, S. Dev,  
Grad Students F. Dehmi*

**Goal:** *Improving metal recover in the mineral processing plant*

**Benefits:** *Directly improves mine economics and helps sustain a key economic driver in the state.*





# Opportunity and Demand for Skilled Workers

World-class underground Surface Mine Training Facility

Alaska Miners Assoc. identified priority occupations:

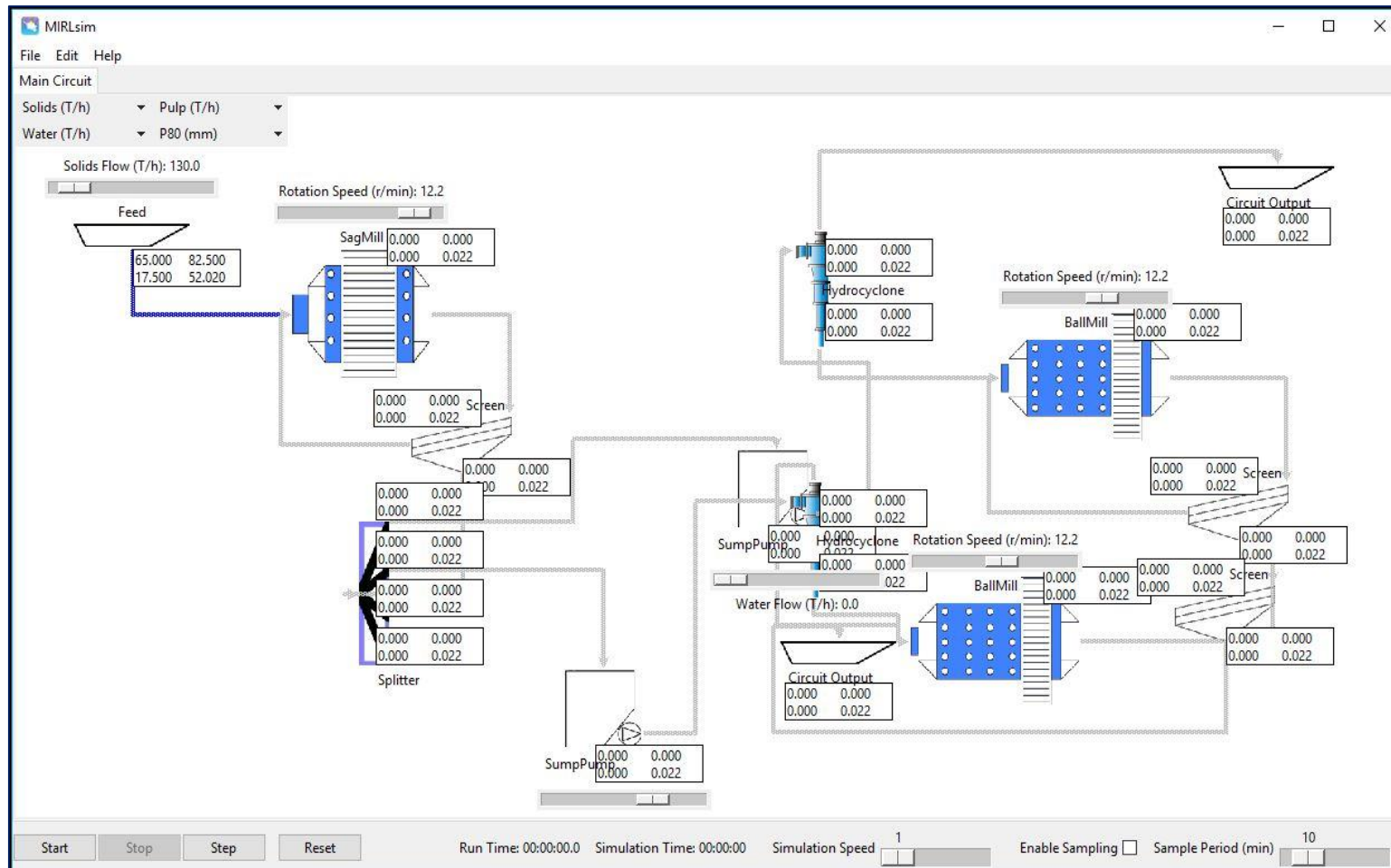
- Mill Process Operators
- Mechanics
- Underground Miners

UA maximizes industry partnerships, federal grants, and philanthropic giving to train Alaskans for resource jobs



# Training Mill Operators

## Mineral Industry Research Lab



- Nation's only mill operator training program
- Simulator developed by UA faculty used industry and internationally in Brazil and Mongolia



# PETROLEUM ENGINEERING



- Education for oil & gas development in the home of largest oil field in North America
- 98% of our graduates placed in oil & gas industry after graduation
- Over 65 students currently enrolled on this track at UAF



Our alumni advise legislators and state departments

Pascal Umerwe (*Ph.D. UAF '18*)



# Heavy Oil Enhanced Oil Recovery

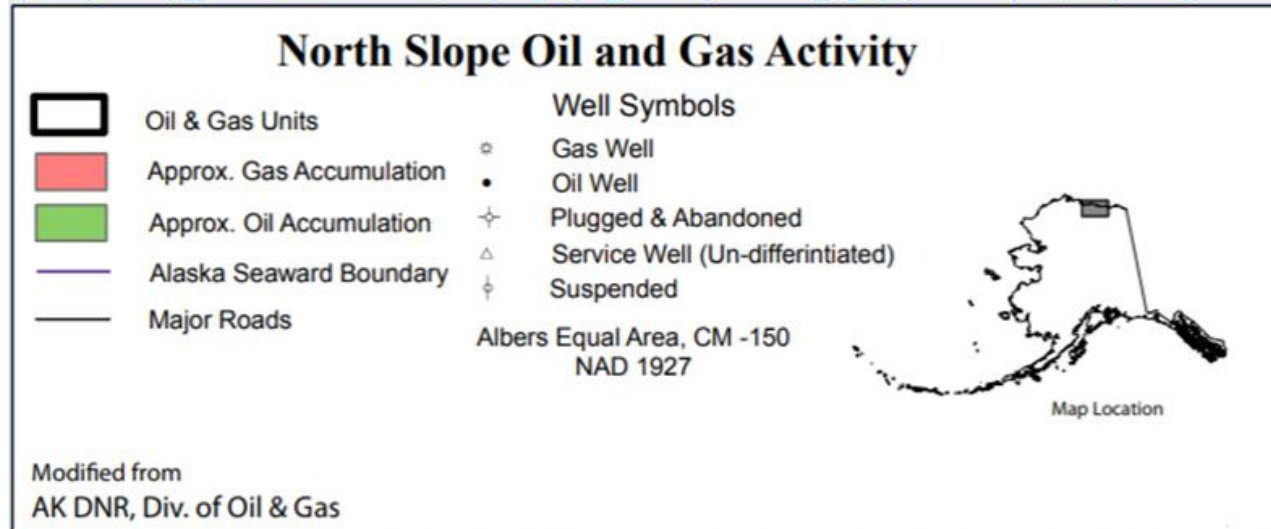
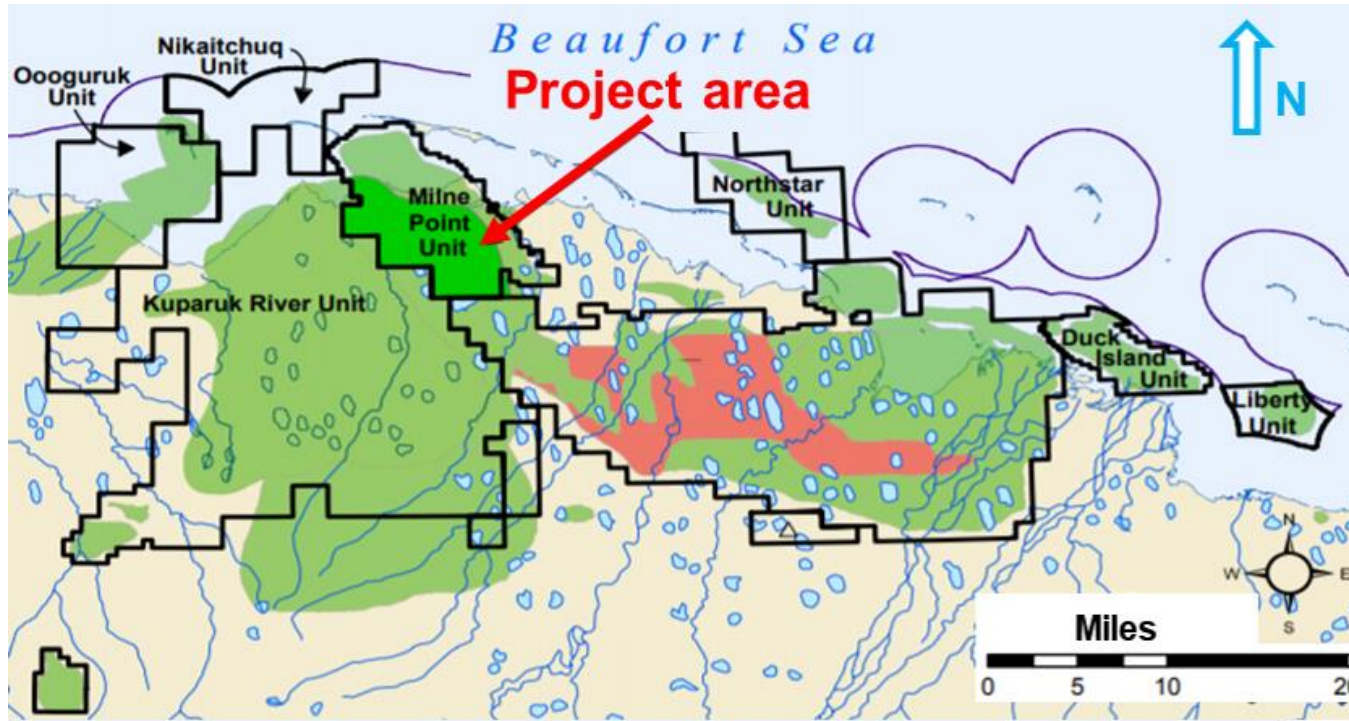
Dr. Abhijit Dandekar

First ever field pilot on Alaska North Slope to validate use of Polymer Floods

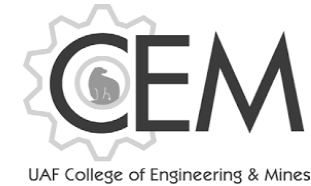


**Potentially produce 10% more heavy oil than current technology used on the North Slope**





## Partnership



*Industry-driven  
research leveraging  
federal funds*



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# Energy Research Consortium of Alaska (ERCA)



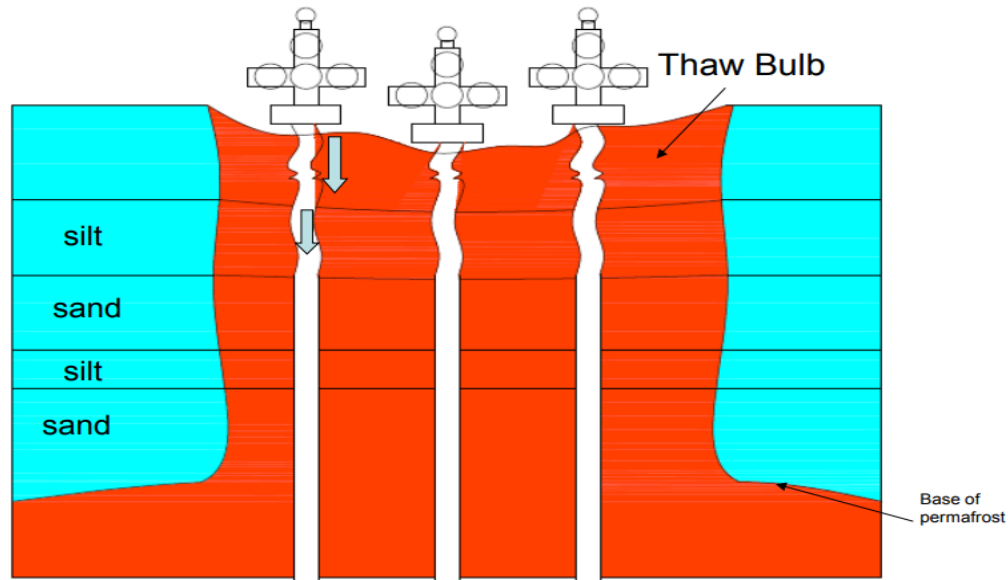
*Consortium Kick-off Meeting  
October 20, 2017*

- Pair industry with university researchers and assets
- Collaboratively address research needs and gaps
- Further technology that shapes the future of energy
- Fully utilize the expertise of University of Alaska

# Oil and Changing Permafrost

UAF CEM & Petroleum Development Laboratory

Soil compaction well casing damage and wellbore stability



Frozen gravelly silty sand till



Thawed gravelly silty sand till

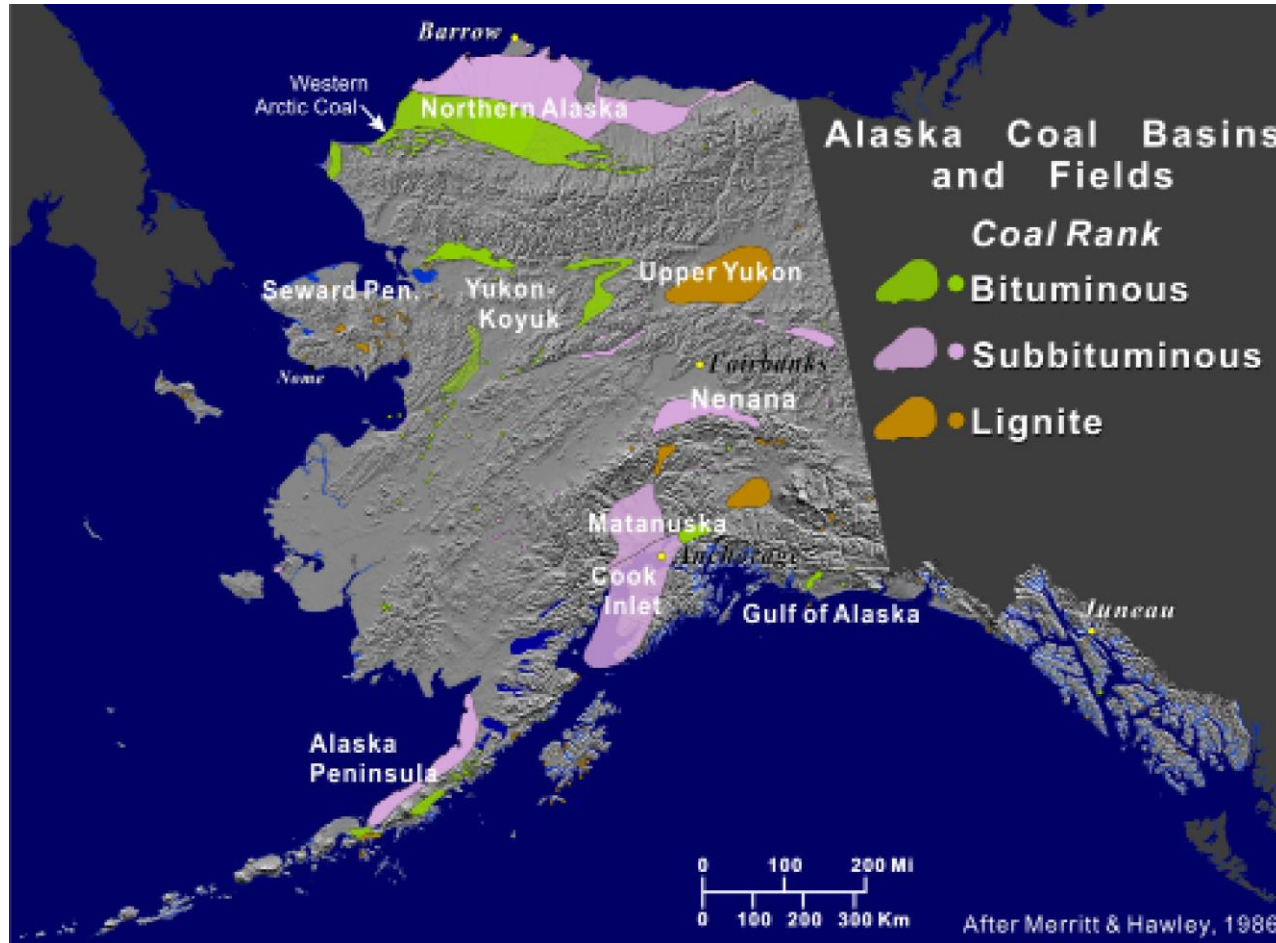


- Permafrost effects on infrastructure – roads, pads, pipelines, well heat
- Research funding consideration by 2 major companies

# Coal Gasification

*Brent Sheets, UAF Petroleum Development Laboratory*

Lowering energy costs in rural Alaska



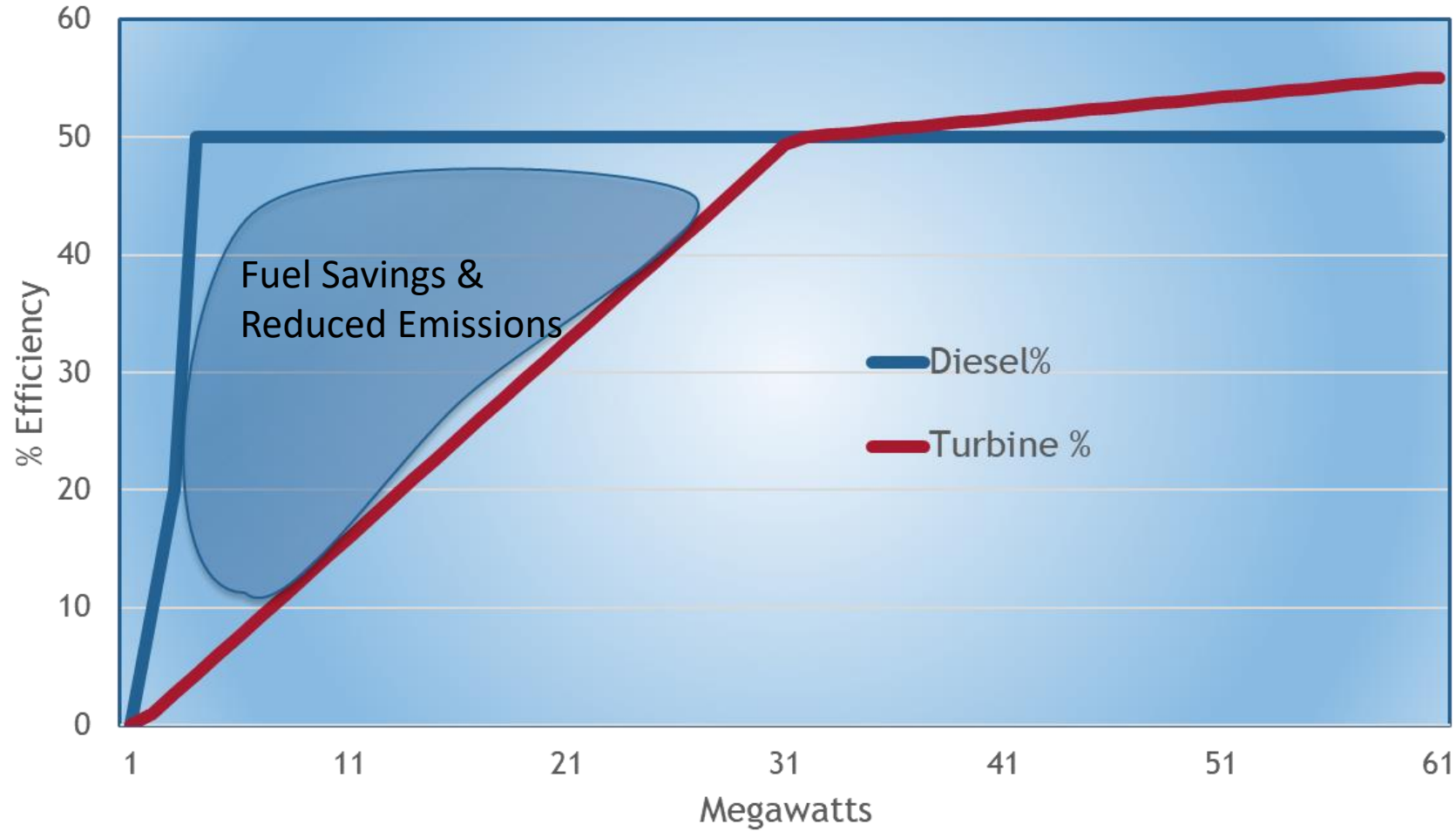
Existing Energy Infrastructure

Syngas





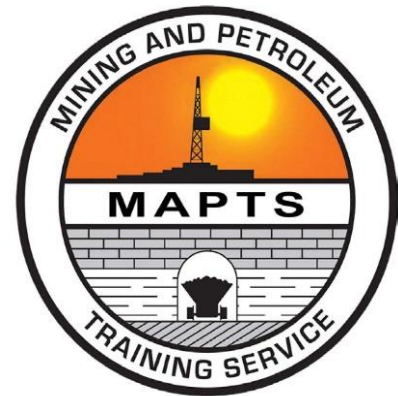
# Prospective Research: Employing Coal-Syngas to Promote Renewable Energy Sources



# Resource Industry Training Programs

*Sponsored by UA*

University of Alaska has trained over **1,500 workers** for oil & gas and mining industries in past five years



**Skilled Workforce Development** for Alaskans - with proven results



**85% of MAPTS graduates are still employed 1 year after graduation**  
(Education Northwest, Final TAACCCT Report, 2018)

Mining and Petroleum Training Service - Alaska Process Industries Careers Consortium

**A strong engineering workforce is  
critical to Alaska's economic future.**

**Thank you!**

