

A map of Alaska is formed by numerous sharp, translucent ice shards of various sizes. The shards are set against a clear blue sky, with a bright sun in the upper right corner creating a lens flare effect. The overall composition is artistic and evocative of the state's icy environment.

# UA SPOTLIGHT

RESEARCH CONDUCTED BY ALASKANS FOR ALASKA



# WE ARE ALASKA.

## University Research Supports the State

UA researchers work to combat challenges Alaskans face on a daily basis. We are helping Alaskans live more comfortably and safely with a secure future by bringing research dollars into the state. More than 80% of the university's research is directly related to Alaska. This UA Spotlight offers just a peek at the positive impact UA research has on Alaskans like us.

# ARCTIC RESEARCH HIGHLIGHTS



## Oil and Gas

Working for the Alaska Gasline Development Corporation, Petroleum Engineering students are developing a user-friendly database to provide evidence validating the potential of North Slope undiscovered natural gas.

## Health and Safety

Nutrition is a key component of disease prevention. UA researchers are evaluating a new suite of technologies to measure the amount of sugar-sweetened beverages, meat, and fish in Alaskans' diet. Expansion of this research area is supported by new funding from the Murdock Charitable Trust to acquire additional state-of-the-art equipment.



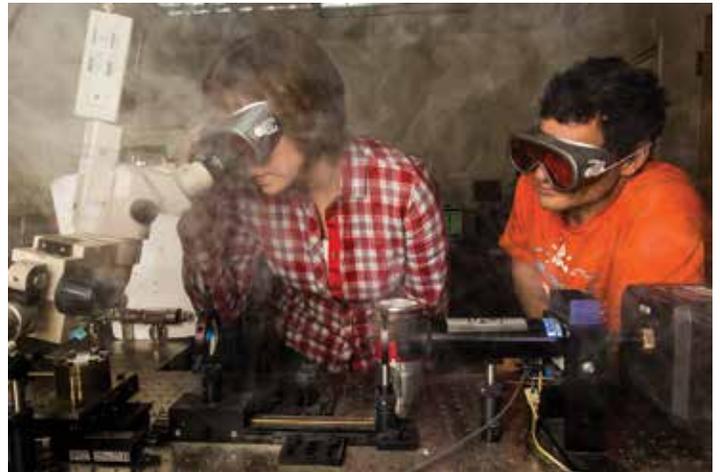
## Permafrost

Permafrost underlying Point Lay was characterized using advanced technologies combined with traditional drilling techniques. From these data, recommendations for better housing and safer water were made to the community.

# INTERIOR RESEARCH HIGHLIGHTS

## Mining

UA researchers assisted the Alaska Division of Geological and Geophysical Surveys and Royal Gold-Contango Ore-Tetlin Native Corporation with understanding the mineralization system on Tetlin Native land, and neighboring state land, through advanced technologies and university expertise. The current recoverable resource on Tetlin Native Corporation is estimated at 1.1 million ounces of gold and 1.1 million ounces of silver.



## Workforce Development

UA research contributes to our workforce:

- Safety training for remote Alaska villages to promote local workforce for construction
- Medical training for Alaskan students in collaboration with medical facilities and clinics throughout Alaska
- Veterinary training for Alaskan students in collaboration with Colorado State University



## Tourism

UA research performed a federal lands use survey for Alaska. In addition to highlighting transportation-related conditions that need attention, results will serve as the basis for performance metrics in the Alaska Federal Lands Long-Range Transportation Plan.



# SOUTHWEST RESEARCH HIGHLIGHTS



## Energy

Renewable energy integrated into microgrids gives communities a chance to keep their money in the community. In the village of Kongiganak, five 95kW wind turbines provide enough electricity to power the community, plus extra electricity to power 50 electric heaters in homes, stretching their dollars spent on energy and food. Local wind technicians have been trained to maintain and operate the turbines keeping the local residents employed.

## Assisting Local Communities

UA researchers worked with the Alaska Native Tribal Health Consortium and the Bristol Bay Native Association to complete an adaptation plan for the community of Port Heiden. This plan identifies public health needs, as well as ways to improve community well-being and resilience through increased infrastructure to support a larger economic base. We are continuing to explore ways to provide resources and tools to Port Heiden as they continue building their plan.



## Food Security

UA's One Health approach brings all aspects of health together. This approach considers the health of animals, what they can tell us about the health of the environment, and the health of humans who share these resources. One project at UA measures mercury concentrations in Steller sea lions, harbor seals, and northern fur seals, as well as the prey they depend on in the Aleutian Islands.

# SOUTHCENTRAL RESEARCH HIGHLIGHTS



## Transportation

Many UA research projects invest in transportation:

- Mapping snow avalanche hazards in transportation corridors to increase public safety
- Evaluating visibility conditions at airports to better inform aviation forecasts and aircraft operations
- Using real-time data for winter operations in Kenai, Anchorage, MatSu and the Arctic



## Agriculture

Driven by Alaskans' food security and food safety concerns, UA is developing a wheat to be grown in Alaska's short spring season. Preliminary results are promising. If successful, Alaska could supply locally-grown food to Alaskans and perhaps become a major wheat producer for the U.S.

## Health and Safety

UA researchers are improving volcano eruption forecasting and detection to mitigate volcanic disasters. Research on ash clouds and sulfur dioxide produced by volcanic eruptions are used to create geological hazard maps used by the Federal Aviation Administration, Alaska Department of Transportation and emergency responders.



# SOUTHEAST RESEARCH HIGHLIGHTS



## Seafood

UA researchers are partnering with the North Pacific Research Board, Alaska Ocean Observing System, NOAA, and other universities to investigate the natural variability and long-term trend of chemical conditions in Alaska's oceans. Ocean acidification threatens marine resources and we need more data for a better understanding. For Alaska's fishing industry, a better understanding will help us prepare for a sustainable future.



## Assisting Communities

A new National Science Foundation grant has funded a collaboration between UA and the University of Calgary to model food, energy, and water resources in rural Alaska. Case study communities include Tanana, Kongiganak, Cordova and Igiugig. This project examines the impact of renewable energy generation on food and water systems, including optimization to increase overall community wellness.

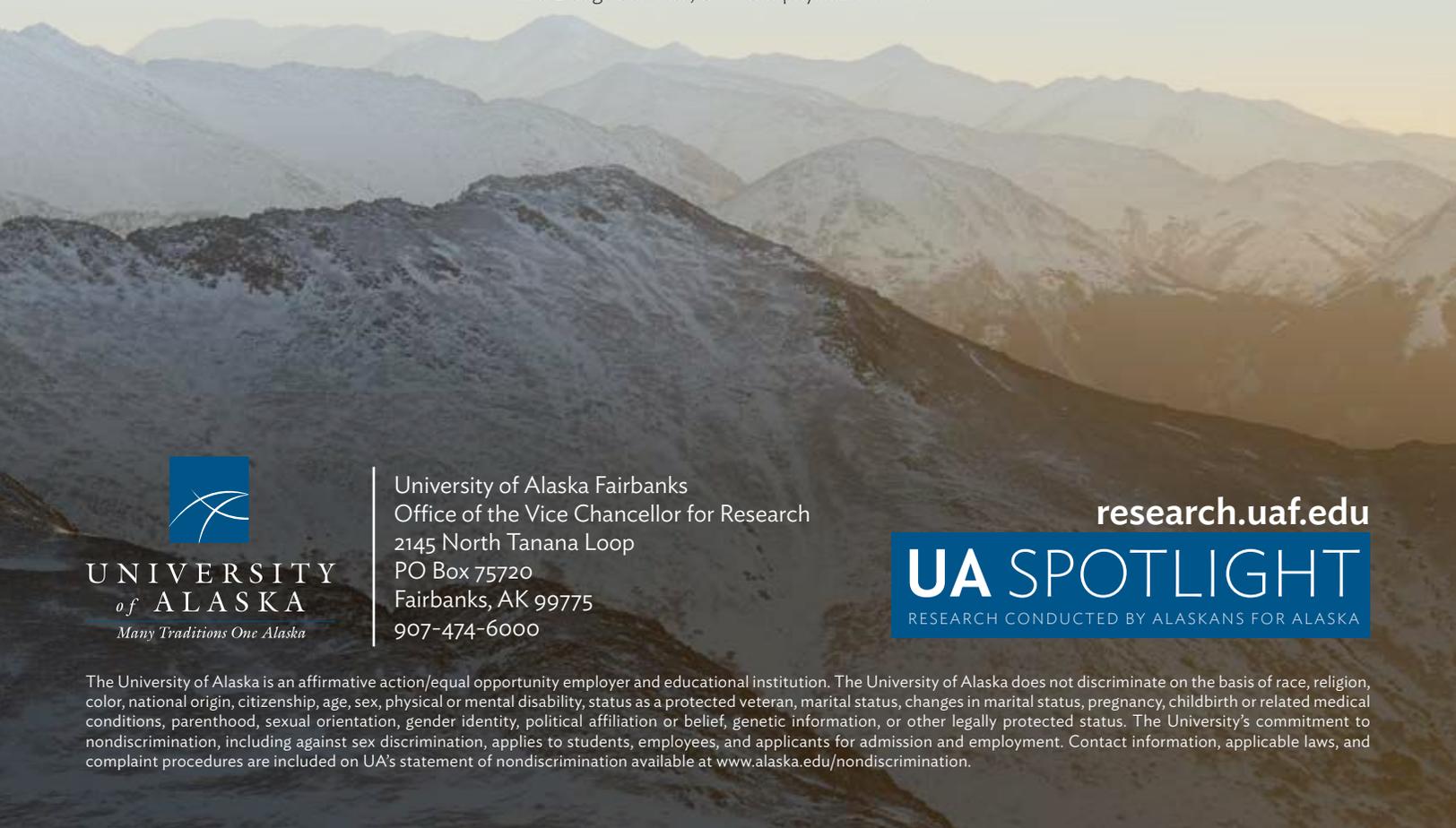
## Energy

Hydropower energy projects need to be engineered to account for precipitation patterns and low water flows over the full lifespan of the structure. In Southeast Alaska this information is scarce and dramatic shifts to precipitation and temperature mean that even when historic data are present they may not represent future conditions. Alaska Climate Adaptation Science Center is generating freshwater discharge models to help infrastructure planning, including hydropower design.



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