

The Statewide Committee for Research honors Alaska's

# Northern Innovators



**Peter Webley**

*Northern Innovators Hall of Fame Member*

Right now, there are at least 6,000 planes in the skies above our planet. More than 1 million people are moving a few hundred miles an hour, at heights from a few to 40,000 feet, heading somewhere. The ability to move across the country in less than a day is part of modern life. Volcanic ash is one of the few forces of nature that interferes with it.

In 1989, a 747 landing at Ted Stevens International Airport in Anchorage descended through a plume from the previous day's eruption of nearby Mt. Redoubt. All four engines sucked up ash, which melted to form a glass coating inside leading to the engines needing a total overhaul costing \$80 million. While in 2010, a series of eruptions from Eyjafjallajökull Volcano in Iceland sent up ash plumes that stranded 10 million travelers. Twenty countries, most of them in Europe, had closed airspaces.

Peter Webley and his colleagues in the remote sensing group at the University of Alaska's Geophysical Institute developed novel tools to predict the drift of volcanic ash and assess its impact on daily operations. Building on more than 20 years of monitoring volcanoes and improving tools to track ash clouds, the University of Alaska Fairbanks associate research professor helped develop one of the first companies to be spun off

from the university and develop new intellectual property.

The aviation community and other transportation industry planners wishing to avoid putting their infrastructure and personnel at risk have the option of purchasing and obtaining access to online "decision support software," available from Webley's company: Volcanic Ash Detection, Avoidance, and Preparedness for Transportation (V-ADAPT), Inc.

He has also developed other software applications, such as a new approach to archiving online webcam data. His method allows users to back up their data despite not having available storage at the beginning of the process. The archived data provides the users to create their own assessments using a large database to analyze to assess patterns and track changes.

Seeing an opportunity in their growing ability to track and monitor volcanic ash clouds, Webley teamed with his colleague Jonathan Dehn to develop the products available within V-ADAPT, Inc. Active since 2013, their tools allow users to browse near real-time satellite data and imagery, receive automated event detection, and forecast ash particulate locations.

"Right now, we can provide the tools to forecast where an ash cloud will disperse based on simulations made before the eruptive event and users can then evaluate how much ash will impact an airport, city, or an oil platform and impact their operations" Webley says. "These tools help engineers, strategists, and risk analysts, so that when the local volcano observatory releases a notice for aviation they can make decisions quickly and integrate our data and information into their operations."

In 2016, Webley, along with Keith Cunningham, was awarded a U.S. patent for coming up with a new method of validating the accuracy of particle-cloud-forecasting transport and dispersion models. His role as vice president of the company is one of Webley's many professional interests. Webley is also the associate director of research at the Alaska Center for Unmanned Aircraft Systems Integration and deputy director of the Center for the Study of Securities, Hazards, Response, and Preparedness at UAF. Webley is a sought-after expert on natural hazards event detection and impact assessment worldwide.

"Preparedness is the key," Webley said. "It's about working together to make it safe for all."