Ashes to ashes
Fingerprinting volcanic eruptions helps further complete climate puzzles.

By Jennifer Pascoe on November 24, 2017

When it comes to understanding the past in order to predict the future, Britta Jensen, new assistant professor in the Department of Earth and Atmospheric Sciences, takes a keen interest in the study of volcanic ash, also known as tephrochronology.

This rapidly growing field of science uses the unique geochemical fingerprint of volcanic ashes spread around the globe by violent eruptions to date and correlate environmental records to provide a fuller picture of past environmental change.

“In climate change science, we’re always looking for a cause and effect,” said Jensen. “You don’t necessarily get a complete record of past climate change by just looking at one site. A volcanic ash acts as a tie-line between different sources of climate information, like ice cores, peat bogs or lake sediments, each of which tells a different part of the story about past climates and environments. This can help us get a more complete picture of some past climate events.”

Jensen explained how uncovering crypto-tephra—volcanic ash deposits that can’t be seen with the naked eye—has greatly expanded the region that we can use tephrochronology in, and has shown us that ash from volcanic eruptions can travel much further than we previously thought it could. The geologist said this has major implications for hazard planning against future impacts from volcanic eruptions, for example. “The other reason to study volcanic ash are the stories they tell us about the volcanoes themselves—these are geologic records of volcanic eruptions. How often have they erupted? Is there a pattern to their eruptions? How can this information help us understand how they may behave in the future? The volcanic ash deposits I study, ones far from the volcanoes, are very important in supplementing studies closer to or on the volcanoes themselves. They give us a more complete history of their past behavior, which is incredibly important in understanding the hazard they represent, and can help us better prepare for the future.”

Prior to starting her academic appointment, Jensen completed a stint at the Royal Alberta Museum (RAM), helping to create new exhibitions for the new museum slated to open in 2018.

Previous to the RAM, and following a PhD with UAlberta Professor Duane Froese, Jensen completed an NSERC postdoctoral fellowship in Belfast. Jensen said Europe is ahead of North America in its work in “crypto”tephrochronology, and she’s excited to impart that knowledge on her students here in Canada. Jensen will be teaching the first year Earth and Atmospheric Sciences field school this spring. Her own fieldwork takes her mostly to the Yukon and Alaska.

Source: Faculty of Science