

Volcanic ash resuspension 100 years after the VEI 6 eruption of Novarupta-Katmai, Alaska

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Resuspension and transport of fine-grained volcanic ash from the Katmai National Park and Preserve region of Alaska has been observed and documented over the past several decades and has likely been occurring ever since the 1912 Novarupta-Katmai eruption. This eruption produced approximately 17 cubic kilometers of ash deposits and 11 cubic kilometers of pyroclastic material that filled nearby valleys, creating what is today known as the Valley of Ten Thousand Smokes. Pyroclastic deposits in this valley are up to 200 meters thick and the valley remains almost entirely free of vegetation. Resuspension into ash clouds occurs most often in the spring and fall when strong northwesterly winds blow over the snow-free, dry landscape. These clouds have been seen by individuals and in satellite imagery. Documented clouds are typically between 1–5 kilometers above sea level and extend up to 250 kilometers downwind. Trace amounts of ash fallout (usually less than 1 mm) have been reported from communities downwind on Kodiak Island. This fallout is composed primarily of glass shards. Clouds of resuspended volcanic ash are not well studied and little is currently known about the amount or sizes of ash particles in the clouds. Unlike many other wind-related erosion events in Alaska composed of non-volcanic sand and silt, these clouds are composed of volcanic ash and are similar to ash clouds generated from a volcanic eruption. Thus, dilute clouds may pose hazards to human health and aircraft operation. In 2015–2016, the Alaska Volcano Observatory deployed particulate monitors to Kodiak Island to: 1) assess the impacts to air quality during these resuspension events, and 2) collect physical samples to assess grain size and composition of fallout. The Observatory has also provided community training on ash collection and observation reporting and is developing a model to forecast ash resuspension.