Long-term Impacts of Vog from Kilauea Volcano on Hawai`i Island's Climate

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Studies involving the direct as well as indirect impacts of volcanic gases on the atmosphere usually focus on explosive, composite eruptions. Specifically, scientists have attempted to determine if or how much these type of eruptions contribute to global cooling along with other environmental impacts. Unlike these previous studies that emphasized impacts of volcanic gases in the stratosphere, this study examined the climatic effects of sulfur gases (and resulting sulfate aerosols or "vog") released by a continuous, non-explosive eruption into the troposphere. Basaltic events, such as Kilauea's current eruption, typically are not as dynamic as composite eruptions. Yet they can eject significantly greater amounts of sulfur into the atmosphere than a more silicic magma of the same volume. This is important because changes in specific climate variables have been attributed to a larger than normal presence of sulfur compounds in the atmosphere. Our investigation attempted to discern changes to spatial and temporal patterns in precipitation and surface temperature using exploratory statistics and a geographic information system (GIS). Results suggest that the vog produced by Kilauea Volcano may be influencing both rainfall and surface temperature trends as well as patterns on Hawai`i Island.