



UNIVERSITY  
of HAWAII  
MĀNOA

## Department of Atmospheric Sciences M.S. Defense Announcement

Department of Atmospheric Sciences, S.O.E.S.T., University of Hawai'i at Mānoa  
2525 Correa Road, HIG 350; Honolulu, HI 96822 ☎956-8775



M.S. Defense Title:

# Aerosol-Cloud Interactions from Hawaii's Kilauea Volcano

**Ms. Kayla Yamamoto**

Atmospheric Sciences M.S. Candidate  
Department of Atmospheric Sciences  
School of Ocean and Earth Science and Technology  
University of Hawai'i at Mānoa

**Date: Tuesday, July 17, 2018**  
**Time: 9:30am**  
**Location: IPRC Conference Room, POST 414**

### Abstract:

Aerosol-cloud interactions (ACI) play an important role in the global radiative budget, yet they remain poorly understood and account for much of the current uncertainty in global climate forcing models. Studies have shown the effectiveness of using natural laboratories, such as effusive volcanoes, to study the impact of sulfate aerosols on local cloud properties. Additionally, these studies can be used as an analog for the effects of traditional point sources, such as power plants, to improve our understanding of anthropogenic climate change. Kīlauea Volcano on the Big Island of Hawaii provides a unique opportunity to explore ACI, in a remote setting characterized by a continuous sulfur source and favorable background conditions. Thus, in this study we investigate the impact of sulfate aerosols on shallow marine cloud characteristics downwind of the Kīlauea Volcano. We combine MODIS/Aqua Level-2 collection 6 cloud properties together with results from a regional Vog model to compare clouds within the Kīlauea aerosol plume to clouds located out of plume. We identify a total of 127 MODIS cases from JJA 2011 – 2017, providing a robust statistical analysis of the impact of the Kīlauea aerosol plume on downstream cloud properties. In addition, we provide an illustrating case study and consider the role of over-island pollution sources and orographic effects using preliminary ambient air quality data from the Hawaii State Department of Health.