UNIVERSITY of HAWAI'I MĀNOA

Department of Atmospheric Sciences Seminar 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

SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY

ENSO response to high-latitude volcanic eruptions

Dr. Christina Karamperidou
Assistant Professor
Department of Atmospheric Sciences
University of Hawai'i at Mānoa

Date: **Wednesday, November 2, 2016**
Refreshments: **3:00pm at MSB courtyard**
Free Cookies, Coffee & Tea Provided
(Please Bring Your Own Cup)
Seminar Time: **3:30pm**
Location: **Marine Sciences Building, MSB 100**

Abstract:

Large volcanic eruptions release a plume of sulfate aerosols, and produce aerosol clouds, which reflect incoming solar radiation and cool the earth's surface. These direct climatic impacts are short-lived; however, volcanic eruptions may affect climate at longer time scales through their impact on ocean-atmosphere phenomena, such as the El Niño/Southern Oscillation (ENSO). Most previous studies have focused on ENSO response to tropical eruptions; high-latitude eruptions have been largely neglected, because their aerosol plume and thus their impacts are thought to be restricted to the hemisphere of the eruption.

In this talk, I will present new results that indicate that the ENSO response to high-latitude eruptions is highly sensitive to the initial state of the tropical Pacific atmosphere-ocean system at the time of the eruption. Differences in the response based on ENSO initial conditions continue through the second and third years following the eruption. This study uses a large ensemble of simulations from an Earth System Model with interactive aerosols, designed to mimic the summer 1783 eruption of Laki (Iceland). Additional simulations were performed with varying hemisphere and season of eruption, which also show that the efficiency of volcanic forcing strongly depends on the initial ENSO state.

These results stress the importance of separating ENSO initial states when investigating the tropical Pacific response to volcanic forcing. In addition, they provide a modeling framework for better interpretation of paleoclimate proxy data, and for inter-model comparison. Lastly, assessing the robustness of ENSO response to volcanic eruptions in different seasons and latitudes may improve early warning systems and mitigation of climate stresses that result from high-latitude volcanic eruptions.