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# *MMM* SEMINAR *NCAR*

## *Measurement and Impacts of Black Carbon on Tropical Glaciers*


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Glaciers in the tropical Andes have been rapidly losing mass since the 1970s. While rising temperatures are clearly having an impact, an increase in black carbon (BC) and other light-absorbing particles deposited on glaciers is also contributing to glacier loss. I will present the results of five years of snow sampling from glaciers in Peru, which is home to the largest extent of tropical glaciers in the world. During six research expeditions led by the American Climber Science Program, snow samples have been collected from numerous mountains ranging from 4800 to nearly 6800m in altitude. The snow samples were melted and filtered in the field and later analyzed using the Light Absorption Heating Method (LAHM), a new technique that measures the ability of particles on filters to absorb visible light. LAHM results have been calibrated using filters with known amounts of fullerene soot, a common industrial surrogate for black carbon. Beginning in 2013, snow samples have also been collected and kept frozen for analysis with a Single Particle Soot Photometer (SP2). Results from the LAHM analysis and the SP2 refractory BC results are well correlated. These results indicate that a substantial portion of the light-absorbing particles in the more polluted regions is BC. Results from the Cordillera Blanca show that mountains close to human population centers have substantially higher levels of BC (as high as 70 ng of BC per g snow) than remote glaciers (as low as 2.0 ng g−1 BC), indicating that population centers can influence local glaciers by sourcing BC. This amount of BC has been calculated to lead to an additional 0.5 to 1 meter of ice loss per year, a rate that has significant implications for water security in this region.


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**Thursday, 8 October 2015, 3:30 PM**
Refreshments 3:15 PM
NCAR-Foothills Laboratory
3450 Mitchell Lane
Bldg 2 Main Auditorium, Room 1022


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