



University of Delaware

Department of Geography

Friday Afternoon Seminar Series

**On the Climatic Causes and Consequences of
North American Snow Depth Variability**

October 30, 2009

203 Pearson Hall

3:30 - 5:00pm

*Seminar Presentation by:***Gavin Gong****Assistant Professor****Department of Earth and
Environmental Engineering****Columbia University**

Snow extent and snow depth are two related but distinct snowpack characteristics that can interact with the overlying atmosphere. However the existing literature on this interaction is dominated by snow extent, due in part to insufficient snow depth datasets. In this seminar, a recently released, long-term, gridded snow depth dataset is used to explore both the climatic causes and consequences of snow depth variability over North America. First, continental-scale snow depth variations are shown to exhibit inconsistencies with snow extent, and have sufficiently large magnitude, spatial scope and temporal duration to interact with regional-hemispheric climate in their own right. Second, climatic causes of this snow depth variability are identified in the form of robust statistical correlations between snow depth and preceding Pacific Decadal Oscillation (PDO) / Pacific-North American (PNA) patterns across North America and throughout the snow season, along with a detailed physically-based interpretation of this relationship. Third, the climatic consequences of this snow depth variability are investigated via atmospheric general circulation model experiments with prescribed North American snow conditions, which yield a coherent tropospheric response involving transient wave activity stretching across the Atlantic Ocean and Eurasia, but only when depth-dominated winter-spring snow variations are included. Acknowledgement of distinct snow depth and snow extent linkages will lead to a more comprehensive understanding of snow – climate relationships, which will provide new information to help identify additional regions/seasons which may hold some predictive hydroclimatic capability.

This seminar is free and open to the public