



"Our environment is our future"

## RESEARCH COLLOQUIUM SERIES

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**Friday**  
**Jan. 29, 2010**

**3:30 - 4:30**

**LECTURE THEATRE**

**7 - 152**

LIGHT REFRESHMENTS  
 SERVED AT 3:20 PM

## Impacts of Climate Change on Inland Temperate Rainforests in western North America: Snow Forests No More?

Inland mountain ranges in western North America support a unique wet-temperate rainforest ecosystem on their windward slopes. On first impression these forests, which historically were dominated by old-growth western red-cedar and hemlock, seem closely related to coastal wet-temperate rainforests. Old stands support rich canopy lichen communities, including many taxa from wet maritime forests. In contrast, many of the plants growing on the forest floor are boreal species, consistent with the location of most stands north of 50° latitude, in sites more than 500 km from the ocean. This presents a paradox for the development of this ecosystem. By most measures, the climate of these sites is too dry and continental to support temperate rainforests. One approach for examining this paradox is to look at the distribution of old-growth forest stands against regional climate models and topographic indices. This analysis suggests that the development of inland temperate rainforest ecosystems is closely associated with topographic position. Ecosystem characteristics are best developed in wet "toe-slope" positions at the base of mountain slopes, where summer groundwater flow is sustained by melt from high-elevation snowpack. This forest ecosystem is now threatened at multiple scales. Changes in winter climate are bringing earlier snowmelt, potentially threatening hydrological linkages that sustain this ecosystem. These impacts may be compounded by historical forestry practices and the fragmentation of remaining old forest stands. This raises the spectre that current protected areas may represent ecosystems that can no longer perpetuate themselves, and one-by-one, will be lost, as supporting ecosystem processes are altered.