



P O B o x 4 2 3 , T r o u t L a k e , W A 9 8 6 5 0

Mount Adams in a Warming Climate

ABSTRACTS

Speaker: Darryl Lloyd

Title: *Mount Adams (Pahto): A Geographic Overview*

Abstract: My half-hour slide presentation covers the geography of Mount Adams with maps, graphics and photos. Four general topics are summarized: (1) Mount Adams Volcano: the size, extent and age of the the 230-square-mile stratovolcano and the shifting volcanic vents and features on its flanks; (2) Land ownership and management: how the mountain is divided between the Forest Service, Yakama Nation (YN), Washington Dept. of Natural Resources and private landowners, and what characterizes the YN Recreation Area and Mount Adams Wilderness; (3) River drainages and major streams: drainage maps and photos of the four rivers (White Salmon, Lewis, Cispus and Klickitat) and the large streams that feed them; (4) Forests and habitat zones: Located east of the Cascade Crest and with 10,000 feet of relief, the massive bulk of Mount Adams creates a wide range of ecosystems with a "dry flavor." The different habitats are discussed at length with aerial and ground photos. Particular attention is given to the montane and subalpine zones, where tree mortality from insects and fungus is increasing.

Speakers: Cheryl Mack, U.S. Forest Service, Mount Adams Ranger District (Retired); and Rick McClure, U.S. Forest Service, Gifford Pinchot National Forest

Title: *Human Ecology, Culture, and History of Mt. Adams*

Abstract: Oral traditions of the Yakama and other local native groups clearly indicate the cultural significance and sacred qualities of the great snow peak known as Pahto. For archaeologists, the mountain has provided evidence that native people ventured high into the alpine zone at an early date, possibly in pursuit of mountain goats. Artifact material recovered at more than 10,000 feet is the highest yet found in Washington. The subalpine zone was also important, and 19th century accounts demonstrate that native people utilized a series of trails to access huckleberry fields on the flanks of the mountain, collecting and processing the berries in quantity for preservation and storage. In the 1880s, ranchers discovered the meadows around the mountain and began trailing sheep to the area for summer grazing. Federal land management began with the establishment of a Forest Reserve in 1897, and the national forest in 1908. Subsequent historic uses of the mountain have included fire detection, mining of sulfur, and recreational mountaineering.

Speaker: Dr. Andrew Fountain, Portland State University

Title: *Twentieth Century Glacier Change on Mount Adams*

Abstract: Mount Adams is a large glacier-clad volcano located in southern Washington, USA. We examined the area change of the 12 glaciers on the mountain during the 20th century using historical topographic maps and aerial photographs. The total glacier area decreased by 49% (31.5 km² to 16.2 km²) from 1904 to 2006. The glaciers retreated quickly during the first half of the century, followed by either a slowing of retreat or an advance from the 1960s to the 1990s. Subsequently, the glaciers resumed their rapid retreat. Glaciers on Mt. Adams show similar trends to those on both Mt. Hood and Mt. Rainier. Glacier change is controlled by winter snowfall, which adds to the glacier, and summer melt that removes the ice and snow. The long-term trends in glacier change are qualitatively correlated with trends in air temperature rather than in winter snowfall.

Speaker: Dr. Jeremy Littell, University of Washington Climate Impacts Group

Title: *The View from Treeline: Climate Change Impacts on Alpine and Subalpine Ecosystems*

Abstract: Climate affects most aspects of the biology of alpine and subalpine organisms. Short growing seasons, deep snow cover, and exposure to the atmosphere present unique challenges to the establishment and growth of plants and animals. Because climate is one of the main limiting factors in alpine and subalpine ecosystems, the impacts of climate change are expected to (and are currently) changing the nature of these places. In this talk, I will present a tour of the physical factors that affect high elevation systems, how those physical factors have changed, how they may change in the future under climate change, and what the expected ecological responses would be if those changes come to pass. I will draw on my own research projects in subalpine forests, in the alpine treeline ecotone, and with snow-sensitive mammals as well as the work of others on the ecology and hydrology of these high elevation environments. I will also bring these impacts closer to home and discuss briefly what they might mean for Mount Adams.

Speaker: Dr. Robert Scheller, Portland State University

Title: *Management Options for Minimizing Wildfire Risk and Maximizing Carbon Storage in Western Forests under Future Climate Changes*

Abstract: Forested high-elevation landscapes are subject to increasingly diverse and often competing demands from society. In recent years this has come to include the net sequestration of C from the atmosphere. Managing such landscapes for the reduction of fire risk and atmospheric C regulation, in the context of changing climate regimes and altered disturbance regimes, presents many new challenges. Successful management of these landscapes requires information about the inherent trade-offs among multiple objectives and requires an integrated assessment. As a case study, I will discuss our research in the Lake Tahoe basin of CA and NV. Our goal is to evaluate the long-term impacts of climate change, wildfire, and fuel treatments on the long-term potential for forests to sequester carbon and maintain resilience. The results indicate that fuel treatments may have minimal effects on the overall carbon balance while being essential to maintaining diversity and resilience. These results may be generally applicable to high-elevation forests throughout the west.