

Cooperative Research on Glacier-Climate Relationships Begins in the Pacific Northwest



Humes Glacier on the heavily glaciated Mt. Olympus, Olympic NP, Washington

At least 800 glaciers occur in the greater Pacific Northwest, extending from the Pacific Ocean to the Rocky Mountains, between the Columbia River and the Canadian border. This concentration of ice is the largest in the conterminous United States, and crosses a gradient from maritime to continental climate.

Glaciers exist in the Pacific Northwest because winter precipitation often exceeds summer melt, even at relatively low elevations. They are sensitive indicators of climate change due to their size which reflects winter snow accumulation and summer temperature. Melting of glaciers in response to changing climate will have substantial consequences for river hydrology, particularly increasing flow-rate in the short-term and altering seasonality of flow in the long-term. Glacial melt could also result in greater incidence of geologic hazards. These changes will affect vegetation and animal habitat, as well as have economic consequences.

Although the size of glaciers is dependent on climate, defining the precise relationship is difficult. Describing the climate experienced by the glacier is complicated by the lack of local weather records. Detection of changes due to short-term weather trends may be difficult because effects may be obscured by the flow dynamics of glaciers. Finally, there are few long-term records of annual changes in glaciers to compare with climate records. However, these difficulties are not insurmountable, especially if the expertise of researchers from many fields is combined.

Personnel from NPS (some now with NBS) and USGS have been cooperating informally to obtain histories of the glaciers of the Pacific Northwest. Supported by the NBS Global Change Program, the agencies held a workshop entitled Glacier-Climate Relationships on May 17-18, to develop a coordinated glacier-climate research project. Numerous federal agencies, including the NPS, NBS, USGS, and National Weather Service sent representatives. Glacial resource national parks

from the Pacific Northwest, including Olympic, Mount Rainier, North Cascades, and Glacier, as well as Denali, Alaska, also sent staff.

Presentations by participants showed that glaciers throughout the region are currently in retreat, although some glaciers in maritime climates had a period of advance in the 1970s and 1980s. Glaciers now experiencing a continental climate are merely remnants. Climatologists and glaciologists described the available climate models and several approaches to linking glaciers with climate. These participants identified the most valuable variables to collect from historic glacier size records. Finally, the group designed a four-stage research project to study glacier response to climate in the Pacific Northwest. They are currently seeking funding for this project.

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