

FY 2009 RESEARCH PROBLEM STATEMENT

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TITLE

Investigation of road crossings below active glaciers based on flow characteristics adjustments from climate change scenarios

PROBLEM (Description of need)

Design streamflows at road crossings requires knowledge and development of water resources data. Due to glacial retreat the streamflows in some Oregon streams may be influenced by climate change. Annual streamflow peaks often result from spring snowmelt and late summer storms, and as the distribution and timing of these events change, the timing, magnitude, frequency, and character of flooding will change as well.

PROPOSED RESEARCH, DEVELOPMENT OR TECHNOLOGY TRANSFER ACTIVITY

A tabulation of ODOT road crossings related to upstream active glaciers would determine the scope of the road crossings to be reviewed. Using existing USGS flow data, streamflow models would be simulated. Then use existing General Circulation Models (GCM) with 100 years of daily air temperature and precipitation. Use existing regional streamflow model to calculate recharge and runoff in Oregon using downscaled GCM results. Simultaneously, apply a simple +3 °C increase to minimum and maximum temperatures to existing surface-water models (i.e. Precipitation-Runoff Modeling System) to evaluate affects of climate change on water availability and changes in water balance in forested watersheds. Evaluate climate change flood characteristics related to road crossing flow design specifications.

BENEFITS

Economical road crossing design flows can only proceed with knowledge of flood peaks. Describing those basin where glacial flow are part of the streamflow would assist in defining potential crossings where streamflow changes due to climate change may be significant. Quantifying the timing, distribution and characteristics (snowmelt vs. rainfall) of flood peaks due to climate change will be defined with global climate change models. Potential PSU links through OTREC will be reviewed.

CONTACT PERSON:

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