

FY 2010 RESEARCH PROBLEM STATEMENT

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TITLE ([more info](#))

Streamflow peak flows in small, mountainous streams

PROBLEM (Description of need) ([more info](#))

Small, mountainous streams are some of the most difficult places for estimating peak flows. Large variability in soil and vegetation conditions, differences in elevation and a scarcity of long-term/ small drainage area stream gaging stations results in poor flood estimates for watersheds with drainage areas of less than 5 square miles. Predictions are worse still for watersheds with drainage areas of less than a square mile.

PROPOSED RESEARCH, DEVELOPMENT OR TECHNOLOGY TRANSFER ACTIVITY ([more info](#))

Research is a two-step process. Step one involves collecting five years worth of low-cost peak streamflow estimates across a variety of watershed conditions in the Coast and Cascade mountain ranges. Peaks will be estimated using crest stage gages, a simplistic non-electronic device that measures peak stage with cork. These peak stages are translated into peak flows by surveying in the crest stage gage readings and other high water marks, and inputting the elevations into a peak flow model. This procedure, called "Indirect Flow Modeling," has been utilized by the USGS for decades in determining peak flows for stations without stage/discharge relations. Crest stage gages will also be set up at preexisting streamflow stations with small drainage areas, including USGS sites funded by the Bureau of Land Management and Oregon State University sites in HJ Andrews experimental forest. Accuracy of the indirect flow measurements can be verified by comparing flow estimates made using the indirect model with those estimated using the stage/discharge relationship.

Step two involves creating equations for predicting peak streamflows statistics throughout the Coast and Cascade mountain ranges. The peak discharges at the crest stage gage sites will be combined with the long-term records of the BLM and HJ Andrews sites to create regional equations for estimating flood levels of various return intervals.

BENEFITS ([more info](#))

Having more precise estimates of small watershed peak flows will provide fiduciary benefits in the design and upkeep of flow structures, including bridges and culverts. All new equations will be entered into USGS StreamStats. Personnel from BLM and USFS will assist with data collection analysis.

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Problem Statement Number: