

FY 2009 RESEARCH PROBLEM STATEMENT

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TITLE

Flood Frequency Analysis at Stream Crossings using Monte Carlo Methods

PROBLEM (Description of need)

Flood frequency relations are used to determine design flows at stream crossings. There have been numerous methodologies created for performing flood frequency analysis. There have been fewer studies that show which methodologies are most effective. The last nationwide study occurred in the 1980's through the Watershed Research Council, Bulletin 17B. In addition, a particular methodology which may be the most effective in one geographic area may not prove to be most effective in a different region.

PROPOSED RESEARCH, DEVELOPMENT OR TECHNOLOGY TRANSFER ACTIVITY

The objective is to resolve what flood frequency analysis methodology would prove best for various regions of Oregon. This will be resolved by performing multiple Monte Carlo simulations within various homogeneous regions within the state. Each simulation would utilize conditions presupposed to exist within each region. Subsequently, a plethora of flood frequency analysis methodologies will be performed on the simulated data from each region in order to gauge the effectiveness of each technique. Having known the exact parameters used to perform each Monte Carlo simulation, it will be rudimentary to determine the effectiveness of each methodology under given assumptions.

BENEFITS

Knowing which flood frequency analysis methodologies work best under specific assumptions and conditions results in greater accuracy when calculating design floods for stream structures such as culverts and bridges. In addition, study results will indicate which regions are most difficult to quantify, and consequently may require further data collection, study and/or higher safety factors for design.

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