

**Project Title:** On the Decay of Downslope Continuity of Post-Fire Water Repellency and Its Influence on BAER Treatment Effectiveness

**Project Leader:** Charlie Luce

**Participating Research Contacts:** Jim Clayton (emeritus)

**Participating Forests/Grassland Contacts:** T.J. Clifford (Boise NF), Terry Hardy (Boise NF), Henry Shovic (Gallatin NF)

### **Funds**

**Total Project Cost:** \$148,000

**Timeframe (within 2001-2005):** 2001-2004

**2003:** \$60,500

**2004-2005:** (remaining costs): \$14,500

**Progress from 2002-2003:** (Description of work accomplished; attach more detailed description, map, or pictures that could be used for tech transfer on the web or w/in compiled monitoring report.)

Measurements were taken again at the Trail Creek Fire (4<sup>th</sup> year of measurements) and the Fridley Fire (3<sup>rd</sup> year of measurements).

Analyses were completed to determine the relationship between particle size distributions and the initial continuity of water repellency. Also analyses were completed showing the decay of water repellency over the 4 years at Trail Creek.

The computer model to calculate runoff from water repellent slopes (with and without log erosion barriers) has been coupled with a climate generator and the two programs are being set up to run on the web to provide calculations estimating the probabilistic effectiveness of log erosion barriers as a function of easily measured site characteristics. The name of the new Model is FERGI (Fire enhanced runoff and gully initiation).

The measurement techniques used in this study, data from the study, and the newly developed model were used as the basis for peak runoff estimates for three fires on the Boise and Payette National Forests in the summer of 2004. The results were used as a basis to choose against installing log erosion barriers over a large area, saving the government on the order of 6 million dollars. Without the analysis the BAER team would have recommended installation of the barriers.

Data on continuity of water repellency and its time decay were used in two papers published in Water Resources Research in FY 2003 and on a third paper in Journal of Geophysical Research – Earth Surface Processes that is in press. Another paper on fire effects using this data is in review.

Some results were presented at a Friends of the Pleistocene field trip, the Region 4 Hydrology/soil science/fish biology/botany meeting, the Western Division of the

American Fisheries Society, and at a Geological Society of America special session on wildfire impacts on watersheds.

**Plans for 2004:** (Description of work.)

We expect to complete analyses of the temporal trends and soil characteristic relationships and assemble a publication on the results. Another paper will be produced on the expected effectiveness of log erosion barriers conditioned on the continuity of water repellency. In addition we expect to complete the FERGI web site to allow field users to estimate the probabilistic effectiveness of treatments for controlling runoff for their site.

**Products and/or tech transfer expected in 2004:** (Incl. Web links if you have them)

The FERGI website should be completed within the next few months, depending on availability of time from permanent staff. Presentations will continue as will production of publications.

**Issues that need discussion with the R1/R4/RMRS Steering Group?:** (list)

Continuing work on the FERGI website requires assistance from temporary employees to gather weather and geographic data. We had set aside \$14,500 for FY 2004 in hopes that fire borrowing would not occur. It did occur, and the \$14,500 has been lost, greatly slowing our progress getting the website up. Any efforts to restore these funds would be very helpful to the completion of the project.