Comment on "Peak flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon" by J. A. Jones and G. E. Grant

J. A. Jones
Department of Geosciences, Oregon State University, Corvallis, Oregon

G. E. Grant
U.S. Forest Service Pacific Northwest Research Station, Corvallis, Oregon

Here we correct an error in the calculation of the percent change in peak discharges associated with timber harvest and road construction in small, experimentally treated basins by Jones and Grant [1996]. This correction reduces the estimated magnitude of changes, but it does not affect the direction or statistical significance of changes nor our interpretation of mechanisms.

In the work of Jones and Grant [1996] we used an index to describe the change in peak discharges in posttreatment relative to pretreatment periods for two small experimentally treated basins (watershed 1 or 3) relative to their control (watershed 2). We calculated the index $I$ as

$$I = \frac{B}{A} 100,$$

where $A$ and $B$ are the mean differences in paired, log-transformed peak discharges in the treated versus control basins, for the pretreatment and posttreatment periods, respectively (columns labeled "mean" in Tables 1 and 2). We interpreted the index $I$ as the percent change in peak discharges in the treated basin relative to the control. However, the index is not a measure of the percent change. The percent change $P$ is

$$P = \left[ \exp^{(B/A)} - 1 \right] 100.$$

The correct percent changes (Tables 1 and 2) are lower than we reported in the work of Jones and Grant [1996], but the direction, statistical significance, and interpreted mechanisms are not affected. For example, 25% harvest and roads are associated with the same magnitude of effect as 100% harvest on large (>0.4 years) peak discharges, although changes in the 100% clear-cut basin were not statistically significant for these two 5-year periods (Table 1). That is, 25% cutting and roads produced a 22–23% increase, whereas 100% cutting without roads produced a 20–25% increase, in >0.4 years peak discharges in the first 10 years after harvest (Table 1). Also, 25% harvest and roads are associated with the same magnitude of effect as 100% harvest on winter peak discharges (Table 1). That is, 25% cutting and roads produced a 22–23% increase, whereas 100% cutting without roads produced a 28–31% increase, in winter peak discharges in the first 10 years after harvest (Table 2).

References

G. E. Grant, U.S. Forest Service Pacific Northwest Research Station, 3200 SW Jefferson Street, Corvallis, OR 97331.
J. A. Jones, Department of Geosciences, Oregon State University, Corvallis, OR 97331. (jonesj@geo.orst.edu)

(Received July 28, 1999; revised April 17, 2000; accepted April 18, 2000.)
### Table 1. Revised Table 2 from Jones and Grant [1996]: Magnitude and Duration of Peak Discharge Response by Size of Storm Flow Event From 1955 to 1988 in 1-km² Basins in the Western Cascades of Oregon Based on Mean Difference in Paired, Log-Transformed Peak Discharges for Treated Versus Control Basins for That Period

<table>
<thead>
<tr>
<th>Years</th>
<th>Treatment</th>
<th>All Sizes</th>
<th>Small (&lt;0.13 Years)</th>
<th>Large (&gt;0.4 Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment</td>
<td>n</td>
<td>Mean</td>
<td>P</td>
</tr>
<tr>
<td>1952–1961</td>
<td>none</td>
<td>74</td>
<td>0.70a</td>
<td>100</td>
</tr>
<tr>
<td>1962–1966</td>
<td>100% clear-cut over 5 years</td>
<td>49</td>
<td>0.94b</td>
<td>134</td>
</tr>
<tr>
<td>1967–1971</td>
<td>0–5 years postcut</td>
<td>50</td>
<td>1.08bc</td>
<td>154</td>
</tr>
<tr>
<td>1972–1976</td>
<td>6–10 years postcut</td>
<td>58</td>
<td>0.95b</td>
<td>136</td>
</tr>
<tr>
<td>1977–1981</td>
<td>11–15 years postcut</td>
<td>54</td>
<td>0.97bc</td>
<td>139</td>
</tr>
<tr>
<td>1982–1988</td>
<td>16–22 years postcut</td>
<td>67</td>
<td>0.96b</td>
<td>137</td>
</tr>
<tr>
<td>1955–1958</td>
<td>none</td>
<td>43</td>
<td>0.50a</td>
<td>100</td>
</tr>
<tr>
<td>1959–1962</td>
<td>6% roads</td>
<td>50</td>
<td>0.60a</td>
<td>120</td>
</tr>
<tr>
<td>1963–1968</td>
<td>25% cut</td>
<td>69</td>
<td>0.75b</td>
<td>150</td>
</tr>
<tr>
<td>1969–1973</td>
<td>6–10 years postcut</td>
<td>53</td>
<td>0.70bc</td>
<td>140</td>
</tr>
<tr>
<td>1974–1978</td>
<td>11–15 years postcut</td>
<td>56</td>
<td>0.66bc</td>
<td>132</td>
</tr>
<tr>
<td>1979–1983</td>
<td>16–20 years postcut</td>
<td>60</td>
<td>0.63c</td>
<td>126</td>
</tr>
<tr>
<td>1984–1988</td>
<td>21–25 years postcut</td>
<td>46</td>
<td>0.63c</td>
<td>126</td>
</tr>
</tbody>
</table>

*Means in the same column followed by the same letter are not significantly different from each other according to Tukey's highest significant difference multiple comparisons procedure with an overall protection level of p < 0.05. I, index; n, number, P, percent change.

### Table 2. Revised Table 3 from Jones and Grant [1996]: Magnitude and Duration of Peak Discharge Response by Season of Storm Flow Event From 1955 to 1988 in 1-km² Basins in the Western Cascades of Oregon Based on Mean Difference in Paired, Log-Transformed Peak Discharges for Treated Versus Control Basins for That Period

<table>
<thead>
<tr>
<th>Years</th>
<th>Treatment</th>
<th>All Sizes</th>
<th>Fall (Aug.–Nov.)</th>
<th>Winter (Dec.–Feb.)</th>
<th>Spring (Mar.–July)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Treatment</td>
<td>n</td>
<td>Mean</td>
<td>P</td>
<td>n</td>
</tr>
<tr>
<td>1952–1961</td>
<td>none</td>
<td>74</td>
<td>0.70a</td>
<td>100</td>
<td>0b</td>
</tr>
<tr>
<td>1962–1966</td>
<td>100% cut</td>
<td>49</td>
<td>0.94b</td>
<td>134</td>
<td>27b</td>
</tr>
<tr>
<td>1967–1971</td>
<td>0–5 years postcut</td>
<td>50</td>
<td>1.08c</td>
<td>154</td>
<td>46c</td>
</tr>
<tr>
<td>1972–1976</td>
<td>6–10 years postcut</td>
<td>58</td>
<td>0.95b</td>
<td>136</td>
<td>28b</td>
</tr>
<tr>
<td>1977–1981</td>
<td>11–15 years postcut</td>
<td>54</td>
<td>0.97bc</td>
<td>139</td>
<td>31bc</td>
</tr>
<tr>
<td>1982–1988</td>
<td>16–22 years postcut</td>
<td>67</td>
<td>0.96b</td>
<td>137</td>
<td>30b</td>
</tr>
<tr>
<td>1955–1958</td>
<td>none</td>
<td>43</td>
<td>0.50a</td>
<td>100</td>
<td>0b</td>
</tr>
<tr>
<td>1959–1962</td>
<td>6% roads</td>
<td>50</td>
<td>0.60a</td>
<td>120</td>
<td>11b</td>
</tr>
<tr>
<td>1963–1968</td>
<td>25% cut</td>
<td>69</td>
<td>0.75b</td>
<td>150</td>
<td>28b</td>
</tr>
<tr>
<td>1969–1973</td>
<td>6–10 years postcut</td>
<td>53</td>
<td>0.70bc</td>
<td>140</td>
<td>22b</td>
</tr>
<tr>
<td>1974–1978</td>
<td>11–15 years postcut</td>
<td>56</td>
<td>0.66bc</td>
<td>132</td>
<td>17b</td>
</tr>
<tr>
<td>1979–1983</td>
<td>16–20 years postcut</td>
<td>60</td>
<td>0.63c</td>
<td>126</td>
<td>14b</td>
</tr>
<tr>
<td>1984–1988</td>
<td>21–25 years postcut</td>
<td>46</td>
<td>0.63c</td>
<td>126</td>
<td>14b</td>
</tr>
</tbody>
</table>

*Means in the same column followed by the same letter are not significantly different from each other according to Tukey's highest significant difference multiple comparisons procedure with an overall protection level of p < 0.05. I, index; n, number, P, percent change.

*These values have been corrected.