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Hydrologic Responses of Large Drainage to Clearcutting: A
Modeling Perspective

J. Duan (University of California - Lawrence Livermore National Lab, Box 808, L-2 56, Livermore, CA 94550; ph. 510-422-5710; e-mail: duanl@llnl.gov); R. R. Ziemer (USDA Forest Service, Redwood Science Lab, 1700 Bayview Drive, Arcata, CA 95521; ph. 707-825-2936; e-mail: rrz7001@axe.humboldt.edu); G. E. Grant (USDA Forest Service, Forest Science Lab, 3200 Jefferson, Corvallis, OR 97331; ph. 541-750-7328; e-mail: grant@fsl.orst.edu)

As forested watersheds become more intensively managed, it is increasingly important to understand the range of hydrologic impacts in order to maintain the biodiversity and sustainability of these forested systems. Paired-watershed studies are often used to evaluate effects of timber harvest on watershed processes. It can be difficult, however, to generalize hydrologic response from a specific site to a larger region. Also, paired-watershed experiments are rarely implemented over large spatial scales, where many key questions about effects of forest harvesting on downstream resources are posed. One alternative is to use computer models to simulate watershed responses to different scenarios of forest management. In this paper, we explore hydrologic responses of watersheds at the 100-1000 km² scale using a river routing model based on knowledge derived from paired-watershed studies at the 10-100 hectare scale. Primary results demonstrate both scale-independent and dependent changes in runoff volume, peak flow size and timing in response to various scenarios of cutting pattern and proportion of area cut.

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