

## Summary Notes from OSU Presentation 11/8/01

### Julia Jones, Ph.D., "Rain-on-Snow Floods in Forested Basins of Western Oregon"

- Oregon flood of record, 1861, rain-on-snow event (Corvallis moved to present location after flood)

#### -Study area

Andrews Experimental Forest, Lane County, OR

Lookout Creek = 64 sq. km

Blue River = 128 sq. km

Flood records available for experimental watersheds, focus of experimental forest work is hydrology, long term ecological research (LTER) and timber harvest experiments

#### Data

Stream discharge / gauge data

meteorological data estimated from models

snow pack analysis estimated from models

#### -Analytical Techniques

\*compare peak discharge and stage data to timing of rain / snow melt maximums in watersheds

\*goal to compare timing and synchronicity of stream discharge to timing of rain / snow melt events

#### -Ideas / Concepts

- forest canopy vs. clear-cut areas = influence on snow accumulation / melting characteristics

harvested areas = no interception, > snow pack and storage

harvested areas = open canopy, > snow accumulation, > snow melt, > flooding(?)

- timing of snow accumulation, rainfall events, and snow melt control downstream flooding

- degree of tributary basin convergence and synchronicity of tributary basin snow melt effect timing of maximum flood patterns; also affected by synchronization of hillslope infiltration from forested to non-forested areas

"transient snow zone" - elevations in western Oregon with limited snow cover in winter (snow, with quick melting afterwards)

"seasonal snow zone" - elevations with persistent winter snow cover

critical factors: event precipitation, peak discharge in streams, event duration, timing of peak stage, infiltration capacity of regolith

#### Model Parameters

- rain on unsaturated soil

- rain on saturated soil

- rain-on-snow on saturated soil

#### Storm hydrographs

long duration, low intensity precipitation common in W. Oregon

result: long hydrographs with long duration peak Q and flattened curves

-synchronization of Qp from small tributary basins is necessary for large basin flooding

Results:

small basins show little difference in hydrographs between rain flood events, and rain-on-snow flood events

large basins show great difference in hydrographs between rain flood events, and rain-on-snow flood events

MORAL OF STORY:

-Timber harvesting enhances effects of rain-on-snow flood events

-R-n-S events lead to the greatest floods of record in western Oregon

-large basins (e.g. Willamette, McKenzie) are more effected by R-n-S events than small mountain tributary basins.