Date: March 8, 2012

To: Chehalis Basin Flood Authority

From: Dean Dahlin   *Ax AL*

Subject: Impact of Tree Canopy on Evaporation During Flood Events

I have been a professional Weather forecaster for 29 years. My reports are heard locally on Radio Stations KELA-AM 1470 and KMNT-FM 104.3. I have been qualified as an expert witness on weather issues in Superior Courts of Washington State.

The Flood Authority is gathering information about causes and solutions to major flooding in the Chehalis basin. One question that has arisen is whether larger tree canopies in the forested areas of the upper basin could serve to measurably reduce flooding by causing more evaporation of rainwater than if the rain fell on land without trees. The theory has been advanced that larger tree canopies may cause rainwater to evaporate upon hitting the tree instead of quickly falling to the ground and becoming part of the runoff contributing to downstream flooding.

The short answer is that tree canopies will not measurably increase evaporation during high rain events because those events are also accompanied by saturated ground and with high humidity.

Humidity in the winter time on rainy days is usually in the 85 to 95 percent range causing much slower evaporation than summer. The publication Washington Climate, for counties of Clark, Cowlitz, Lewis, Skamania and Thurston will provide an example of what is called "Evapotranspiration". This is a table involving precipitation in a given month and the rate of moisture leaving the top 6-inch layer of soil of water holding capacity. The following figures go from the peak evaporation in June to the lowest in January.

Example:

Centralia-Average Precipitation for June is 1.80 inches Evap. is 3.2 inches for the month.

Centralia Average Precipitation for January is 6.30 inches Evap. is .4 of an inch."

Chehalis basin flooding occurs In winter months when our soils are usually saturated. During flood events we experience high humidity when no measurable evaporation takes place. The summary is that we can't look to evaporation to solve flooding in the Chehalis basin.