

Water Resources Research Center <wrrc@hawaii.edu>
Seminar Nov. 1, 2007 Thursday

TIME: 3:00 - 4:00PM
PLACE: MSB 114, UH Manoa Campus

Impact of Invasive Species (animals and plants) on Hawaii Coastal Watersheds: A Modeling Approach

by
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Impaired water quality caused by human activity and the spread of invasive plant and animal species has been identified as a major factor of degradation of coastal ecosystems in the tropics. This talk will summarize the research results of evaluating the performance of two watershed models AnnAGNPS (Annualized Agricultural Non-Point Source) and Non-Point Source Pollution and Erosion Comparison Tool (N-SPECT) in simulating surface runoff and sediment transport in Hanalei Bay Watershed as affected by invasive species (feral pigs and plants). The models were calibrated and validated using site specific water flow and sediment loads. Two sets of input parameters, mainly soil hydrological parameters and land cover maps, were used in this exercise to show the impact of data accuracy on the models performance. Alternative scenarios of spatial rainfall distribution and canopy interception were also evaluated.

During sensitivity analysis it was found that simulated sediment yield from the watershed was closely related to: vegetation root mass, average canopy fall height, soil erodibility, percentage of ground residue cover, and canopy cover ratio. Soil disturbance due to feral pigs activities in the watershed were implement in the AnnAGNPS; with nearly 90% of the study area affected by feral pig activity, predicted sedimentation was 2.5 times larger than that without pig damage. This substantial increase in sedimentation is expected due to highly sensitivity of the model to the surface residue cover parameter as shown in the sensitivity analysis section of this report. More details about the performance of the two models and the needs for future field and watershed modeling work will also be discussed.