**Development of a Boat Traffic Prediction Model Using an Artificial Neural Network**

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Riverbank erosion is a major concern to neighboring inhabitants and the surrounding environment. Boat generated waves can significantly contribute to riverbank erosion in navigable rivers and waterways. Waves created by high-speed vessels can have wave heights large enough to cause significant damage to the riverbanks. A preliminary step to predicting the impact of boat generated waves is to predict local boat traffic. In this study, 8 models for predicting boat traffic along a reach of the Connecticut River were created using a Feed-Forward Artificial Neural Network, considering different combinations of a variety of inputs. Wave data was collected using four capacitance type wave staffs installed at three sites along the study reach, and processed in a deterministic identification model to define boat traffic counts. Weather conditions were categorized using time-lapse videos recorded at the study sites. Other variables for the development of the boat traffic prediction models were the month of the year, day of the month, day of the week, river stage, water depth, logger location, and measured temperature and precipitation data collected at a nearby weather station in Amherst, MA. 7 models were constructed to predict daily boat traffic. 1 model was constructed to predict hourly boat traffic for comparison. This paper presents a comparison of results and the performance of these various models.