

neural network architecture which consists of two hidden layers and 35 neurons. This model is used to capture the distribution of the ADCP features for each output (e.g., physically measured transport rates and grain size from bedload samples) in the training sample. The back-propagation algorithm (BPA) is still one of the most widely used learning algorithms in the training process and thus herein applied. The learning rate, number of neurons and hidden layers were optimized by using Bayesian optimization techniques. The network was trained with more than 60 bedload samples and corresponding 5 - 10 min time series of ADCP preprocessed data. The rest of the samples were used for validation of the model. The validation resulted in correlation coefficients higher than 0.9 and the, which is significantly higher value than the corresponding values for the methodologies developed before. Aiming to develop a more robust and stable ANN model, further testing of different training algorithms must be performed, different ANN architecture should be tested, and more data shall be included.