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Nota di contenuto	Front Cover; Numerical Models for Submerged Breakwaters; Copyright Page; Contents; 1 Introduction; 1.1 Coastal Erosion and Defense; 1.2 Submerged Breakwaters for Coast Protection; 1.3 Coastal Processes and Submerged Breakwaters; 1.4 Numerical Modeling for Submerged Breakwaters; 1.5 Purposes and Significances; 1.6 Main Objectives of Book; 1.7 Layout of Book; References; 2 Fundamental Concepts; 2.1 Introduction; 2.2 Physical Parameters Related to Submerged Breakwaters; 2.3 Physical Processes in The Presence of Submerged Breakwaters; 2.4 Performance of The Submerged Breakwaters; References 3 Literature Review and BackgroundReferences; 4 Theories and Methodologies; 4.1 Introduction; 4.2 Traditional Models for Water Waves; 4.3 New Approaches; 4.3.1 Meshless Methods; 4.3.2 Artificial Intelligence Methods; MLP Networks; Back-Propagation Algorithm; Levenberg-Marquardt Algorithm; RBF Networks; References; 5 Mathematical Modeling and Algorithm Development; 5.1 Navier-Stokes Equations; 5.2 The Turbulent Model; 5.3 Initial and Boundary Conditions; 5.4 Shallow Waters; 5.5 The Extended Mild-Slope Equation;

5.6 Boussinesq Equations; 5.7 Smoothed Particles Hydrodynamics
5.8 Artificial Neural Networks
5.8.1 MLP Model; Algorithm Derivation; Transfer Function; 5.8.2 RBF Model; References; 6 Numerical Methods and Procedures; 6.1 Introduction; 6.2 Finite Difference Method; 6.2.1 Discretization of Equations; 6.2.2 Grids; 6.2.3 The Discretizations in Time; 6.3 Finite Volume Method; The Finite Volume Method for the Navier-Stokes Equations; 6.4 Artificial Neural Networks Modeling; 6.4.1 MLP Training Process; 6.4.2 RBF Network Training; References; 7 Numerical Modeling and Simulation; 7.1 Modeling the Shallow Water Equations; 7.1.1 Setting Up; 7.1.2 Calibration
7.1.3 Simulation
7.2 Modeling with Neural Networks; 7.2.1 Data Preparation; 7.2.2 Data Set and Selection; 7.2.3 Variable Selection; 7.2.4 Data Division; 7.2.5 Data Transformation; 7.2.6 Model Set-Up and Calibration; 7.2.7 Multilayer Perceptrons; 7.2.8 Radial Basis Function Networks; 7.2.9 Performance Analysis and Comparison; 2D Model; Accuracy Analysis; Sensitivity Analysis; Comparison with Other Empirical Formulae; 3D Model; Accuracy Analysis; Sensitivity Analysis; Comparison with Available Approach; References; 8 Design Model Development and Analysis; 8.1 Experimental Data
8.1.1 Two-Dimensional Experiments
Tests in 0.45m Wide Flume; Tests in 1.2m Wide Flume; 8.1.2 Three-Dimensional Experiments; Small-Scale Model; Large-Scale Model; 8.1.3 Experiments without Breakwater; 8.1.4 Experiments with Breakwater; 8.2 Analysis Approaches for ann Model Results; 8.2.1 The Root-Mean-Square Transmitted Wave Height (H_t, rms); 8.2.2 Wave Transmission Coefficient (K_t); 8.2.3 Dimensional Analysis; 8.2.4 Nondimensional Analysis; 8.2.5 Accuracy Analysis; Interpolation; Extrapolation; Larger Scale; 8.2.6 Sensitivity Analysis; 8.3 Development of Shallow Water Equations Model
8.3.1 Description (Shallow Water Equations)

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